

# **Joules Command and Attribute Reference**

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- [Additional References](#) on page 16
- [Reporting Problems or Errors in Documentation](#) on page 16
- [What We Changed in this Edition](#) on page 17
- [Customer Support](#) on page 20
- [Command-Line Help](#) on page 22
- [Documentation Conventions](#) on page 24

## About This Manual

This manual provides a concise reference of the commands available to the user when using Joules. This manual describes each command available within the Joules command shell with their command options.

## Additional References

The following sources are helpful references, but are not included with the product documentation:

- TclTutor, a computer aided instruction package for learning the Tcl language:  
<http://www.msen.com/~clif/TclTutor.html>.
- TCL Reference, *Tcl and the Tk Toolkit*, John K. Ousterhout, Addison-Wesley Publishing Company
- IEEE Standard Hardware Description Language Based on the Verilog Hardware Description Language (IEEE Std. 1364-1995)
- IEEE Standard Hardware Description Language Based on the Verilog Hardware Description Language (IEEE Std. 1364-2001)
- IEEE Standard VHDL Language Reference Manual (IEEE Std. 1076-1987)
- IEEE Standard VHDL Language Reference Manual (IEEE Std. 1076-1993)

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## Supported User Interfaces

Joules supports the following user interfaces:

- **Unified User Interface** Genus, Innovus and Tempus offer a fully unified Tcl scripting language and GUI environment. This unified user interface (also referred to as Stylus common UI) streamlines flow development and improves productivity of multi-tool users.

By default, Joules starts in Stylus common UI.

- Switch to Stylus common UI if you started the tool with the legacy UI.

```
@joules:/> set_attr common_ui true
joules:root:>
```

- **Legacy User Interface** To access Joules with Legacy UI, launch the tool with -legacy\_ui option.



This document provides information specific to the Stylus common UI.

## What We Changed in this Edition

### 23.12

Added new commands:

- compare\_sim

Added new options for commands:

- read\_stimulus

- -ignore\_tg\_width

- -ignore\_ig\_width

- scan\_stimulus

- -delay\_info

- set\_pin\_waveform

- -master\_clock

## Joules Command and Attribute Reference

### Preface

---

- xreplay
  - **-compare\_sim**
  - **-obj\_handle**
  - **-show\_details**

Added new attributes **ignore\_instance\_pattern\_for\_annotation\_summary** and **stim\_name\_map\_file** in Joules Attributes.

Removed options for commands:

- xreplay
  - **-init\_script**

## 23.11

Added new commands:

- read\_rdb
- write\_rdb

Added new options for commands:

- compute\_cglar
  - **-time\_based**
- implement\_odc
  - **-max\_rtl\_signal\_oper\_count**
- query\_batch\_power\_report
  - **-rail**
  - **-show\_rails**
- read\_stimulus
  - **-export\_map\_file\_data**
- replay\_rtl\_stim\_to\_gate
  - **-gen\_power\_profile -by\_rail**
- report\_activity

- ☐ **-skip\_port\_switching\_activity**
- report\_energy
  - ☐ **-by\_leaf\_instance -max**
- report\_logic\_gating
  - ☐ **-max\_oper\_count**
  - ☐ **-max\_rtl\_signal\_oper\_count**
- report\_odc
  - ☐ **-max\_rtl\_signal\_oper\_count**
- report\_power
  - ☐ **-by\_leaf\_instance -max**
- xreplay
  - ☐ **-extra\_pin\_naming\_rule**
  - ☐ **-init\_script**
  - ☐ **-port\_delay\_file**

Made updates to several command options and examples.

## 23.10

Added new commands:

- add\_override\_logic
- ignore\_odc
- ignore\_stb
- report\_inst\_property
- report\_joules\_memory\_cells

Added new options for commands:

- cdn\_table
  - ☐ **-ascending**

- ☐ **-top**
- get\_cell\_param
  - ☐ **-pin\_avg**
- get\_inst\_activity
  - ☐ **-glitch**
- power\_hdl
  - ☐ **-delay**
- report\_clock\_tree
  - ☐ **-skip\_end\_points**
  - ☐ **-fanout\_cols**
  - ☐ **-lint**
  - ☐ **-create\_ideal\_clock\_tree**
- report\_ideal\_power
  - ☐ **-gen\_csv**
- scrub\_library
  - ☐ **-save**
  - ☐ **-png**
- xreplay
  - ☐ **-post\_cts\_netlist**

Made updates to several command options and examples.

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- **Video Library** - Several videos are available on the support website: [Joules Video Library](#).
- **Trainings Offerings** - Cadence offers the following training courses for Joules:
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  - ❑ [Fundamentals of IEEE 1801 Low-Power Specification Format](#)
  - ❑ [Low-Power Synthesis Flow with Genus Synthesis Solution](#)
  - ❑ [Test Synthesis with Genus Stylus Common UI](#)
- **Digital Badge Exams** - Cadence offers Digital Badge exams for all the Joules courses for our customers and University students. The exams can be taken from Training Courses ([cadence.com](http://cadence.com)).

Upon passing the exams, you get certificates (verified by <https://credly.com/>), which can then be shared on your LinkedIn profiles, Facebook, and Twitter. For more Information, refer to '[Become Cadence Certified](#)'.

## Command-Line Help

**Note:** The command syntax representation in this document does not necessarily match the information that you get when you type `help command_name`. In many cases, the order of the arguments is different. Furthermore, the syntax in this document includes all of the dependencies, where the help information does this only to a certain degree.

### Related Topics

- [Getting the Syntax for a Command](#)

### Getting the Syntax for a Command

Type either of the following to get the syntax and example usage of a command:

- `help <command name>`
- `<command name> -h`

For example:

```
Joules> help read_libs
```

or

```
Joules> read_libs -h
```

Returns the syntax and example usage for the `read_libs` command.

**Note:** Examples are shown using Joules tutorial design.

## Getting Attribute Help

Type the following:

```
Joules> help attribute_name
```

For example:

```
Joules> help max_transition
```

This returns the help for the `max_transition` attribute and shows on which object types the attribute can be specified.

## Searching For Commands When You Are Unsure of the Name

You can use help to find a command if you only know part of its name, even as little as one letter.

- You can type a single letter and press `Tab` to get a list of all commands that start with that letter.

For example:

```
Joules> c <Tab>
```

Returns all command names starting with `c`.

- You can type a sequence of letters and press `Tab` to get a list of all commands that start with those letters.

For example:

```
Joules> read_<Tab>
```

Returns all command names starting with `read_`.

## Documentation Conventions

The list below describes the syntax conventions used for the Joules commands and attributes.

<code>literal</code>	Non italic words indicate keywords that you must type literally. These keywords represent command, attribute or option names
<i>arguments and options</i>	Words in italics indicate user-defined arguments or options for which you must substitute a name or a value.
	Vertical bars (OR-bars) separate possible choices for a single argument.
[ ]	Brackets denote options. When used with OR-bars, they enclose a list of choices from which you can choose one.
{ }	Braces denote arguments and are used to indicate that a choice is required from the list of arguments separated by OR-bars. You must choose one from the list  <code>{ argument1   argument2   argument3 }</code>  Braces, used in Tcl command examples, indicate that the braces must be typed in.
...	Three dots (...) indicate that you can repeat the previous argument. If the three dots are used with brackets (that is, <code>[argument]...</code> ), you can specify zero or more arguments.  If the three dots are used without brackets ( <code>argument...</code> ), you must specify at least one argument, but can specify more.
#	The pound sign precedes comments in command examples.



---

## General Commands

---

- [bexpr](#)
- [cdn\\_table](#)
- [compare\\_db](#)
- [plot\\_data](#)
- [plot\\_pie\\_chart](#)
- [read\\_db](#)
- [read\\_netlist](#)
- [set\\_multibit\\_controls](#)
- [voltus\\_compare](#)
- [write\\_db](#)
- [write\\_template](#)

## bexpr

Boolean algebra version of Tcl `expr` command. Boolean expressions are created using symbols/variables and operators (see below). Round brackets '()' can be used to group expressions and force precedence.

A symbol or variable is any combination of alphanumeric characters. It cannot include any character that represents an operator (see below).

## Syntax

Operators: (in order of precedence)

- NOT = [! ~]
- AND = [. \*]
- OR = [+ |]
- XOR = [^]
- COFAC = [/] (cofactor)
- DIFF = [%] (boolean difference)

## Joules Command and Attribute Reference

### General Commands - bexpr

---

#### Functions

<code>class(fn)</code>	Returns class of function (notlandlorlxorlmuxl...) Used to determine type of LIB cell from its function
<code>type(fn)</code>	Same as <code>class(fn)</code>
<code>pos(fn)</code>	Converts fn to product-of-sums form
<code>sop(fn)</code>	Converts fn to sum-of-products form
<code>leq(fn1, fn2)</code>	Returns 1 (=true) if <code>fn1 == fn2</code>
<code>leq_iso(fn1, fn2)</code>	Isomorphic version of <code>leq</code> .  <code>leq_iso((a . b), (c . d))</code> will return 1
<code>mutex(fn1, fn2)</code>	Returns 1 (=true) if <code>fn1, fn2</code> are mutually exclusive
<code>contain(fn1, fn2)</code>	Returns 1 (=true) if <code>fn2</code> is contained in <code>fn1</code>
<code>cof(fn1, fn2)</code>	Returns cofactor of <code>fn1</code> w.r.t <code>fn2</code>
<code>diff(fn1, fn2)</code>	Returns boolean difference of <code>fn1</code> w.r.t <code>fn2</code>  <code>diff(fn, a) = cof(fn, a) ^ cof(fn, !a)</code>
<code>gcd(fn1, fn2)</code>	Returns the greatest common divisor of <code>fn1</code> and <code>fn2</code>

#### Example(s)

- `bexpr ((a+!b).(!b + c).(!a + !c))`
- `bexpr pos(a + a.~b + b.!c) ;# show in POS form`
- `bexpr leq((a + b), (a + !a . b))`
- `bexpr leq((a . b), (c . d)) ;# will return 0`
- `bexpr leq_isomorphic((a . b), (c . d)) ;# will return 1`
- `set f1 "a + b" ; set f2 "a + ~a.b + !b.c"`
- `bexpr contains($f1, $f2)`
- `bexpr cof(a.b, a)`
- `bexpr diff(a+b, b)`
- `bexpr mutex((a.b), (!a.c), (!b.!c))`
- `set f1 "(a+b).c" ; set f2 "(a+b).(c+!d)"`
- `bexpr gcd($f1, $f2)`

## Joules Command and Attribute Reference

### General Commands - `cdn_table`

---

## `cdn_table`

Creates a table in Cadence standard format with the specified list of lists.

### Syntax

```
cdn_table [-table] $table \  
  [-validate]  
  [-get row_idx col_idx]  
  [-insert row|col idx]  
  [-replace row|col idx1 [idx2]]  
    (<idx> = index where row/col will be inserted/replaced, for example 1,2, ..)  
  [-data data]  
  [-sort_by col_id]  
  [-ascending]  
  [-scale table|row|col scale_fac+]  
  [-transpose]  
  [-compare table1 table2]  
  [-cols col_id+]  
  [-extract f_rpt+]  
  [-lsep regexp_pattern]  
  [-row_range idx1[:idx2][,idx3]+]  
  [-col_range idx1[:idx2][,idx3]+]  
  [-stats row|col]  
  [-metrics {sum|avg|min|max|stddev|pct}+]  
  [-dump]  
  [-add_stats {{row|col|both}:{sum|pct|min|max|stddev}}+]  
    [-row_range idx1[:idx2][,idx3]]  
    [-col_range idx1[:idx2][,idx3]]  
  [-format fmt]  
  [-skip_auto_suffixing]  
  [-header table_header]  
  [-row_names row_name+]  
  [-col_names col_name+]  
  [-row_head left|right|skip]  
  [-col_head top|bot|skip]  
  [-line_sep {top|bot|left|right|all|skip}+]  
  [-prefix string]  
  [-caller_cmd]  
  [-widget]  
    [-win_title window_title]  
  [-top_n count]  
  [>|-out f_dat]
```

## Joules Command and Attribute Reference

### General Commands - `cdn_table`

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-table]</code>	Specify the list of lists for the table.
<code>[-validate]</code>	Validate the consistency of the table. By default, it is set to false.
<code>[-get]</code>	Get the specified element, row ( <code>&lt;col_idx&gt;=-1</code> ), or column ( <code>&lt;row_idx&gt;=-1</code> )
<code>[-insert]</code>	Insert row or column at the specified <code>&lt;idx&gt;</code> position.
<code>[-replace]</code>	Replace rows or columns from position <code>&lt;idx1&gt;</code> to <code>&lt;idx2&gt;</code> .  If <code>&lt;idx2&gt;</code> is not specified, <code>&lt;idx2&gt; = &lt;idx1&gt;</code>
<code>[-data]</code>	Suboption of <code>-replace</code> .  Specify the row or column data (list of values) to insert.
<code>[-sort_by &lt;col_id&gt;]</code>	Sort the table by the specified column ID. Column ID is equivalent to the column number. For example, column 1 = Col ID 1, column 2= Col ID 2, and so on. By default, the table is not sorted.
<code>[-ascending]</code>	Suboption of <code>-sort_by</code> .  Sort by ascending order. By default, sorts in descending order.
<code>[-scale]</code>	Scale table by <code>&lt;scale_fac&gt;</code> , or each row or column using specified list of scale factors.
<code>[-transpose]</code>	Swap rows and columns in the table.
<code>[-compare]</code>	Compare two tables.
<code>[-cols]</code>	Suboption of <code>-compare</code> .  Specify the list or range of columns to compare. By default, all columns are considered.
<code>[-extract]</code>	Extract table(s) from report file(s) and return list of triples <code>{&lt;row_names&gt; &lt;col_names&gt; &lt;table&gt;}+</code>
<code>[-lsep]</code>	Suboption of <code>-extract</code> .  Specify the expression patterns to extract. The default expression is <code>{^[ ]*[-+]+\$}</code> .

## Joules Command and Attribute Reference

### General Commands - `cdn_table`

---

<code>[-row_range]</code>	Suboption of <code>-extract</code> .  Extract the specified range of rows.
<code>[-col_range]</code>	Suboption of <code>-extract</code> .  Extract the specified range of columns.
<code>[-stats row col]</code>	Compute and return the row or column statistics of the table.
<code>[-metrics {sum avg min max stddev pct}+]</code>	Specify the metrics to return with <code>-stats</code> option. The default metrics are <code>sum pct (%)</code> .
<code>[-dump]</code>	Dump the contents of the table to either stdout or the specified file.
<code>[-add_stats]</code>	Add a row or column or both showing the specified statistics (sum, percentage, minimum, maximum, standard deviation).
<code>[-row_range]</code>	Suboption of <code>-add_stats</code> .  Show statistics of the specified range of rows.
<code>[-col_range]</code>	Suboption of <code>-add_stats</code> .  Show statistics of the specified range of columns.
<code>[-format]</code>	Format of the table, for example, <code>"%.2f"</code> , <code>"%.3e"</code> . By default, the table is auto formatted based on the table data.
<code>[-skip_auto_suffixing]</code>	Skip auto suffixing of percent sign <code>"%"</code> in data for percentage columns.
<code>[-header]</code>	Specify the table header string.
<code>[-row_names]</code>	List of row names. If not specified, the rows are named as <code>r1</code> , <code>r2</code> , and so on.
<code>[-col_names]</code>	List of column names. If not specified, the columns are named as <code>c1</code> , <code>c2</code> , and so on.
<code>[-row_head]</code>	Specify where to add row header. By default, it is placed on the right.
<code>[-col_head]</code>	Specify where to add column header. By default, it is placed on the top.
<code>[-line_sep]</code>	Specify where to add line separator(s).

## Joules Command and Attribute Reference

### General Commands - cdn\_table

---

<code>[-prefix]</code>	Suboption of <code>-line_sep</code> .  Specify the prefix for line separators. This option applies to non data rows such as <code>-line_sep</code> , <code>-col_head</code> , <code>-line_sep</code> , <code>-header</code> . The default value is <code>" "</code> .
<code>[-caller_cmd]</code>	Specify the command calling the <code>cdn_table</code> routine.
<code>[-widget]</code>	Pop up smart table if running in GUI mode. The default value is <code>false</code> .
<code>[-win_title]</code>	Suboption of <code>-widget</code> .  Specify the title of the smart table widget.
<code>[-top_n]</code>	Specify the number of top count rows to dump. By default dumps all.
<code>[&gt; -out]</code>	Output the table in the specified file. By default, the output is directed to <code>stdout</code> .

### Example(s)

- `set table { {1 2 3 4 5} {11 12 13 14 15} {31 32 33 34 35} }`
- `cdn_table $table -get 2 -1 ;# get 2nd row, returns: 11 12 13 14 15`
- `cdn_table $table -get -1 3 ;# get 3rd col, returns: 3 13 33`
- `cdn_table $table -get 2:3 3:5 ;# get sub-table, rows 2,3, and cols 3,4,5`
- `cdn_table $table -validate ;# validate the table`
- `set t2 [cdn_table $table -insert row 2 -data {21 22 23 24 25}]`
- `cdn_table $t2 -replace col 3 -data {33 23 13 3}`
- `cdn_table $table -scale table 1.5 ;# return table scaled by factor of 1.5`
- `cdn_table $table -scale row 10.0 0.5 0.1 ;# return table by scaling r1 by 10, r2 by 0.5, and r3 by 0.1`
- `cdn_table $table -stats row -metrics sum avg min max pct ;# return table with added stats`
- `cdn_table $table -transpose ;# return transposed table`
- `cdn_table $table -dump ;# dump the table`
- `cdn_table $table -dump -add_stats both:sum # dump table w/ col and row sums`
- `cdn_table -compare $table1 $table2 -cols "1 3:4" ;# compare cols 1, 3, 4 of $table1 and $table2 both with same number of rows and cols`
- `set triple [lindex [cdn_table -extract joules_work/joules.log] 0]`

## Joules Command and Attribute Reference

### General Commands - cdn\_table

---

- `set row_names [lindex $triple 0] ; set col_names [lindex $triple 1]`
- `set table [lindex $triple 2]`
- `cdn_table $table -dump -row_names $row_names -col_names $col_names -prefix "#"`

### Return Value

0 indicates success, 1 indicates failure in execution.



## compare\_db

Compares two databases generated by Joules and highlights the difference in properties such as drive strength and slack with the help of a plot.

### Syntax

```
compare_db <f_jdb1> <f_jdb2> \  
  [-compute_stats]  
  [-f_stimulus <stimulus-file>]  
  [-top_instance <top-inst-path>]  
  [-plot_profile {ds|slack|all}+]  
  [-resolution <frac>]  
  [-ykey count|pct]  
  [-xrange <from>:<to>] )  
  [-yrange <from>:<to>] )  
  [-title <title-string>] )  
  [-format {gnuplot|native}]  
  [-png <f_png>]  
  [>|-out <f_data>]
```

## Joules Command and Attribute Reference

### General Commands - compare\_db

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>&lt;f_jdb1&gt; &lt;f_jdb2&gt;</code>	<p>Names of database files to be compared.</p> <p>Only databases written out after techmap can be compared with this command as driving strength can be computed once the design is mapped.</p> <p>Specify <code>-1</code> for Joules database to compare with currently loaded DB.</p>
<code>[-compute_stats]</code>	<p>Score <code>&lt;j_db_2&gt;</code> with <code>&lt;j_db_1&gt;</code> as reference and rate the databases on following five parameters:</p> <ul style="list-style-type: none"><li>■ Cell Count</li><li>■ Total Driving Strength</li><li>■ Total Flop Driving Strength</li><li>■ Total Cell Area</li><li>■ Negative Slack</li></ul> <p>For each parameter, the command scores the databases out of 10 points.</p> <p>Thus, the final total is computed out of total of 50 points.</p>
<code>[-f_stimulus]</code>	<p>Compute power of both the database files for stimulus specified with this option.</p> <p>If you are specifying any stimulus other than SDB with this option, then specify the top instance of the stimulus with <code>-top_instance</code> option.</p>
<code>[-top_instance]</code>	<p>Suboption of <code>-f_stimulus</code>. Top module of stimulus mentioned with <code>-f_stimulus</code> option.</p> <p>This option is used only if any stimulus other than SDB is specified with <code>-f_stimulus</code> option.</p>

## Joules Command and Attribute Reference

### General Commands - compare\_db

---

<code>[-plot_profile]</code>	<p>The profile for the plot. This option can have one of the following values:</p> <ul style="list-style-type: none"><li>■ <code>ds</code> - Plot for cell count vs driving strength will be generated.</li><li>■ <code>slack</code> - Plot for flop count vs slack will be generated.</li><li>■ <code>all</code> - Two plots will be generated, one each for:<ul style="list-style-type: none"><li>□ Cell Count vs Driving strength</li><li>□ Flop Count vs Slack</li></ul></li></ul> <p>By default, plot will be generated for the profiling of driving strength.</p>
<code>[-resolution]</code>	<p>Sampling interval while generating the plot.</p> <p>By default, the co-ordinate will be sampled at 0.25 of the unit. For example, if you are generating the plot for DS profiling, coordinates will be sampled at 0.25, 0.50, 0.75, 1.00, 1.25, 1.50, and so on.</p>
<code>[-ykey]</code>	<p>Key of Y axis of the plot. Y-axis can have either cell count or % of inst count.</p>
<code>[-xrange]</code>	<p>Range of X axis of plot.</p>
<code>[-yrange]</code>	<p>Range of Y axis of plot.</p>
<code>[-title]</code>	<p>Title of the generated plot.</p>
<code>[-format]</code>	<p>Specify the plotting program to use. Valid values are:</p> <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ Native (default format)</li></ul>
<code>[-png]</code>	<p>Save the generated plot as the specified PNG file.</p>
<code>[&gt; -out]</code>	<p>Redirect the output of the command to the specified file. By default, the output is stored in <code>\$joulesWorkDir/compare_db.data</code>.</p>

### Example(s)

■ `compare_db cpu_10bit_proto.jdb cpu_10bit_synth.db -plot_profile ds slack`

## **Joules Command and Attribute Reference**

### General Commands - compare\_db

---

#### **Return Value**

0 for success, 1 indicates failure in execution.

#### **Related Topics**

[Simulation, Simulation Read, and SDB Creation](#)

## plot\_data

Compares and plots data for two sets of data.

### Syntax

```
plot_data -data f_data [-gold f_gold]
  [-plot scatter|histogram|bell]
  [-with {points|lines|linespoints|boxes}+]
  [-compare f1:k1 f2:k2]
  [-insert_png <f_png>]
  [-location top_right|top_left|bot_right|bot_left]
  [-shrink_range <min>:<max>]
  [-xkey [file:]key]
  [-ykey {[file:]key}+]
  [-when {<expr>}+]
  [-group_by [file:]key]
  [-lckey {[file:]key}+]
  [-yscale <list-of-scale-factors>]
  [-key {[file:]key}+]
  [-weight {file:key}+]
  [-missing <string>]
  [-fill_missing]
  [-xrange x_from:x_to]
  [-yrange y_from:y_to]
  [-title title_string]
  [-xlabel xlabel_string]
  [-ylabel ylabel_string]
  [-ykeylabel <list-of-ykey-labels>]
  [-vlines {x_val[:line_width][:label]}+]
  [-line_fit {cx:cy [<slope> <yintc>]}+]
  [-xtics|-x2tics " ('label1' x_val1, 'label2' x_val2, ...) [rotate by <val>]"]
  [-other_plot_cmds {<gnuplot_cmd>}+]
  [-image <f_image>.<ext>]
  [-save dir]
  [-bg]
```

## Joules Command and Attribute Reference

### General Commands - plot\_data

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>-data</code>	Name of the file containing the set of data.
<code>[-gold]</code>	Name of the file containing another set of data.
<code>[-plot]</code>	Type of plot to generate. By default, scattered plot is generated.
<code>[-with]</code>	Suboption of <code>-plot</code> . Specify (one for each ykey) whether to use lines (default), points, line points, or boxes in the plot.
<code>[-compare]</code>	Specify the key values to compare between the two sets of data. For example, <code>-compare f1:k1 f2:k2</code> is equivalent to  <code>-xkey f1:k1 -ykey f2:k2</code>
<code>[-insert_png]</code>	Insert a PNG image in the plot.
<code>[-location]</code>	Sub-option of <code>-insert_png</code> . Specify the location to plot. The default location is <code>top_right</code> .
<code>[-shrink_range]</code>	Sub-option of <code>-insert_png</code> . Specify the ratio to shrink the plot. By default, it is set to <code>2:5</code> .
<code>[-xkey]</code>	Specify the data key to display on X axis. Specify the option in form of <code>[data file:]column ID</code> , for example, <code>data:c1</code>
<code>[-ykey]</code>	Specify the data key to display on Y axis. Specify the option as <code>[[data file:]column ID+]</code> , for example, <code>data:c1 gold:c2</code> .
<code>[-when]</code>	Specify the row selection condition, for example, <code>{c5 == "and"}</code> .
<code>[-group_by]</code>	Group the data by specified column.
<code>[-lckey]</code>	Specify the linecolor key, for example, <code>data:c3 gold:c</code> .
<code>[-yscale]</code>	List of scale factors for Y axis, one for each value of <code>-ykey</code> option.
<code>[-key]</code>	List of key values for the plot. Specify each key as <code>[file:]key</code> .
<code>[-weight]</code>	Specify the weight for the plot as <code>[{file:key}+]</code> , with one weight for each ykey
<code>[-missing]</code>	Consider the specified string as missing data.
<code>[-fill_missing]</code>	Fill missing data with last good data.

## Joules Command and Attribute Reference

### General Commands - plot\_data

---

<code>[-xrange]</code>	Specify the range of values for X axis.
<code>[-yrange]</code>	Specify the range of values for Y axis.
<code>[-title]</code>	Title for the plot output.
<code>[-xlabel]</code>	Specify the X axis label.
<code>[-ylabel]</code>	Specify the Y axis label.
<code>[-ykeylabel]</code>	Specify the label for Y axis keys.
<code>[-vlines]</code>	Plot vertical lines with the specified value, label, and width.
<code>[-line_fit]</code>	Specify how to fit the plot line. This option applies only to scatter plots.
<code>[--xtics -x2tics]</code>	Rotate the plot by the specified value.
<code>[-other_plot_cmds]</code>	Use the specified command(s) for plotting.
<code>[-image]</code>	Save the plot image in the file specified as <i>&lt;filename&gt;.ext</i> , where the file extension can be gif, jpg, png, or ps (default).
<code>[-save]</code>	Save the gnuplot data/command files in the specified directory.
<code>[-bg]</code>	Run the plotting activity as a background process.

### Example(s)

- `plot_data -data sim1.data -xkey c2 -ykey c3 c4 -ylabel "Power" -image sim1.png`
- `plot_data -data sim2.data -xkey c1 -ykey c2 -lkey c3 -xlabel "Simulation Time" -xlabel "Power"`
- `plot_data -data data -gold gold -compare data:c0 gold:c0`
- `plot_data -data data -gold gold -ykey data:c2 gold:c3`
- `plot_data -data data -plot histogram -key c2 -bin_size pct:0.01 ;# 100 bins`
- `plot_data -data data -plot bell -key c1 -weight c2`
- `plot_data -data data -gold gold -plot scatter -xkey data:c2 -ykey gold:c`
- `plot_data -data data -xkey c1 -ykey c2 -when {{c5 == "and"}} {c5 == "flop"}}`
- `plot_data -data data -xkey c1 -ykey c2 -group_by data:c5`

### Return Value

0 indicates success, 1 indicates failure in execution.

***Related Topics***

[Power Analysis and Reporting](#)



## plot\_pie\_chart

Plots data from a given data file in form of piechart.

### Syntax

```
plot_pie_chart
  [-data <f_data>]
  [-chartcols <column>+]
  [-chartlabels <chart-label>+]
  [-labelcol <column>]
  [-chartdata {{pie1 cat11:<val> cat12:<val> ...}{pie2 cat21:<val>
cat22:<val>...} ...}]
  [-chartfont <font>]
  [-labelfont <font>]
  [-title <title>]
  [-image <f_image>.<ext>]
  [-save dir]
  [-help|-h]
```

## Joules Command and Attribute Reference

### General Commands - plot\_pie\_chart

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-data]</code>	Data file to use for creating the piechart.
<code>[-chartcols]</code>	Suboption of <code>-data</code> . Columns in data file to use in piechart.
<code>[-chartlabels]</code>	Suboption of <code>-data</code> . Labels for each chart column.
<code>[-labelcol]</code>	Suboption of <code>-data</code> . Columns in the data file to be assigned labels.
<code>[-chartdata {{pie1 cat11:&lt;val&gt; cat12:&lt;val&gt; ...} {pie2 cat21:&lt;val&gt; cat22:&lt;val&gt; ...} ...}]</code>	Extract the list of data for the piechart from the data file in the format of <i>category: value for the category</i>
<code>[-chartfont]</code>	Font for the piechart, for example, <code>-chartfont lucidasans-bold-18</code> .
<code>[-labelfont]</code>	Font for the piechart labels, for example, <code>lucidasans-14</code> .
<code>[-title]</code>	Title for the piechart.
<code>[-image]</code>	Save the image in the file specified as <i>filename.ext</i> , where the file extension can be jpg, png, gif or ps. The default extension is ps.
<code>[-save]</code>	Save the gnuplot command file in the specified directory.

#### Example(s)

##### ■ Sample data file

```
# CDN_DATA_FORMAT_BEG
# Category   Leakage      Internal      Switching     Total
# CDN_DATA_FORMAT_END
memory  2.46300e-08  3.53839e-04  4.08240e-05  3.94688e-04
flop    1.82368e-08  9.91160e-05  6.18359e-05  1.60970e-04
logic   1.98244e-08  2.31849e-04  2.84305e-04  5.16174e-04
bbox    0.00000e+00  0.00000e+00  0.00000e+00  0.00000e+00
clock   1.10521e-08  1.48320e-04  3.21670e-04  4.70001e-04
```

##### ■ Sample command usage:

```
plot_pie_chart -data report_power.data -chartcols c2 c3 c4 -labelcol c1
plot_pie_chart -chartdata {{leakage memory:2.46e-08 flop:1.82e-08 logic:1.98e-08 clock:1.11e-08} {internal memory:3.54e-04 flop:9.91e-05 logic:2.32e-04 clock:1.48e-04}}
```

## **Return Value**

0 for success, 1 indicates failure in execution.

## ***Related Topics***

[Power Analysis and Reporting](#)

## **read\_db**

Loads the specified database file or Tcl object.

If the database contains setup information, the setup is restored as well. If the setup was written to a separate script, you must source that script before you read the database file.

For more information, refer to `read_db` in *Genus Command Reference*.

### ***Related Commands***

`read_db`

## read\_netlist

Reads (and elaborates) Structural Verilog (v2001) files.

### Syntax

```
read_netlist [-top <string>] [-define <string>]+ <string>+
```

### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-top]</code>	Specify the top-level structural Verilog module to be read and elaborated
<code>[-define]</code>	Define Verilog macro.
<code>&lt;string&gt;+</code>	Specify the name of the HDL files to read.

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## set\_multibit\_controls

Applies MBCI mapping controls in a cumulative way.

This command manages:

```
set_db {<inst_name>} .dont_merge_multibit [true|false]
```

### Syntax

```
set_multibit_controls \  
  [-min_bit_width <mbw>]  
  [-root <root_inst>]  
  [-enable]  
  [-module <module>]  
  [-inst <inst>]
```

### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-min_bit_width]</code>	Specify the minimum bit width. The default width is 2.
<code>[-root]</code>	Suboption of <code>-min_bit_width</code> . List of root instances for <code>-min_bit_width</code> . Default is design root.
<code>[-enable]</code>	Enable the following list of flops. Default is skip.
<code>[-module]</code>	Suboption of <code>-enable</code> . Enable all registers in specified modules.
<code>[-inst]</code>	Suboption of <code>-enable</code> . Enable all registers in specified list of hierarchical instances.

**Note:** *<inst>* can be a register.

### Example(s)

- `set_multibit_controls -min_bit_width 2 ; #Skip all single bit registers`
- `set_multibit_controls -min_bit_width 5 -root /cpu_10bit/FSM ; #Also, under FSM, skip registers less than or equal to 4 bits`
- `set_multibit_controls -min_bit_width 7 -root /cpu_10bit/DP ; #Also, under DP, skip registers less than 7 bits`
- `set_multibit_controls -enable -inst {/cpu_10bit/DP/PC_reg/qout_reg[0:5]};  
#Enable 6-bit register /cpu_10bit/DP/PC_reg/qout_reg[0:5]`

## **Joules Command and Attribute Reference**

### General Commands - set\_multibit\_controls

---

#### **Return Value**

0 for success, 1 indicates failure in execution.

#### ***Related Topics***

Simulation, Simulation Read, and SDB Creation

## Joules Command and Attribute Reference

### General Commands - voltus\_compare

---

## voltus\_compare

Generates scripts and data necessary to run Voltus, extracts pin activity information, compares it with Joules' pin activity and generates comparison plots.

## Syntax

```
voltus_compare \  
  [-stimulus <stim_id>]  
  [-start <window-start-time>]  
  [-end <window-end-time>]  
  [-generate script|data|both]  
  [-skip_compare]  
  [-skip_pin_list]  
  [-use_joules tcf] (  
    [-nodes {<obj_type>[:<annotation_type>]}+]  
    obj_type = port|seq|comb|all  
    annotation_type = asserted|computed|all  
    [-duration <duration in ns>]  
  [-use_joules_slew] (  
  [-use_eps]  
  [-work_dir <work_dir>]  
  [-bname <script_basename>]  
  [-f_voltus_data <voltus_computed_activity_file>]  
  [-f_joules_data <joules_computed_activity_file>]  
  [-f_pin_list <pin_list_file>]  
  [-root <inst>+]  
  [-rtl_type  
    {memory|register|flop|latch|icgc|add|sub|mult|div|decoder|comp|shift|mmux|  
    buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|  
    delay|iso|srpg|ls|els|ps|bbox}+]  
  [-rtl_group seq|macro|alu|dpx|logic|pm]  
  [-leaf_insts {<leaf_inst>}+]  
  [-pin_dir in|out|inout]  
  [-pin_type  
    {data|address|clock|enable|select|reset|set|scan|tie|rail|vdd|gnd|save|  
    restore}+]  
  [-pin_name <pin_name_regexp>]  
  [-max_points <num>]  
  [-compute_stats  
    [-tolerance <frac>]  
  [-plot duty|toggle|all]  
    [-xrange x_from:x_to]  
    [-yrange y_from:y_to]  
    [-title title_string]  
    [-xlabel xlabel_string]  
    [-ylabel ylabel_string]  
    [-ylabel <list-of-ykey-labels>]  
    [-png <f_png>]  
    [-save <dir>]
```



## Joules Command and Attribute Reference

### General Commands - voltus\_compare

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-stimulus]</code>	Compare activity for specified stimulus. By default, the first stimulus in SDB is considered.
<code>[-start]</code>	Suboption of <code>-stimulus</code> . Start time for activity compare. Default is simulation start time.
<code>[-end]</code>	Suboption of <code>-stimulus</code> . End time for activity compare. Default is simulation end time.
<code>[-generate]</code>	Specify whether to generate Voltus run script, Joules activity data, or both.
<code>[-skip_compare]</code>	Suboption of <code>-generate</code> . Make the pin list empty.
<code>[-skip_pin_list]</code>	Suboption of <code>-generate</code> . Do not regenerate the list if the pin list already exists.
<code>[-use_joules_tcf]</code>	Suboption of <code>-generate</code> . Use Joules activity file.
<code>[-nodes]</code>	Suboption of <code>-use_joules_tcf</code> . Specify the node (in form of object type(s):pin type) for which to generate the power signals. Valid object types and pin types are mentioned in the syntax above.  If not specified, the primary input and output ports, and sequential outputs are reported.
<code>[-duration]</code>	Suboption of <code>-use_joules_tcf</code> . If specified, the Joules activity file with given duration will be used.
<code>[-use_joules_slew]</code>	Suboption of <code>-generate</code> . Use slew value of Joules for comparison.
<code>[-use_eps]</code>	Suboption of <code>-generate</code> . Use EPS instead of Voltus.
<code>[-work_dir]</code>	The directory containing Voltus scripts and the generated files. The default directory is <code>./voltus_work</code> .
<code>[-bname]</code>	Baseline for the Voltus script that is used to name files.  Voltus run script is: <code>&lt;work_dir&gt;/&lt;bname&gt;_run_voltus.tcl</code>
<code>[-f_voltus_data]</code>	Name of the Voltus computed activity file. The default file is <code>&lt;work_dir&gt;/&lt;bname&gt;_data.voltus</code> .

## Joules Command and Attribute Reference

### General Commands - voltus\_compare

---

<code>[-f_joules_data]</code>	Name of the Joules computed activity file. <code>&lt;work_dir&gt;/&lt;bname&gt;_data.joules</code> .
<code>[-f_pin_list]</code>	File with list of pins for comparison. By default, file <code>&lt;work_dir&gt;/&lt;bname&gt;_pin_list.tcl</code> is used.
<code>[-root]</code>	List of hierarchical instances. By default, design root is considered.
<code>[-rtl_type]</code>	List of RTL types.
<code>[-rtl_group]</code>	List of RTL groups.
<code>[-leaf_insts]</code>	List of leaf instances. To be used in lieu of <code>-root</code> , <code>-rtl_type</code> , and <code>-rtl_group</code> options.
<code>[-pin_dir]</code>	If specified, pins of the given direction are considered for comparison.
<code>[-pin_type]</code>	If specified, pins of the given type are considered for comparison.
<code>[-pin_name]</code>	Return pin names in the comparison output.
<code>[-max_points]</code>	Specify maximum graph points. Default is 5000. Set this option to -1 for all pins.
<code>[-compute_stats]</code>	Compute statistics.
<code>[-tolerance]</code>	Suboption of <code>-compute_stats</code> . Specify the tolerance fraction, for example, 0.05 - 5%.
<code>[-plot]</code>	Scatter plot comparison between Joules and Voltus.
<code>[-xrange x_from:x_to]</code>	Suboption of <code>-plot</code> . Show the specified range in X axis of the plot.
<code>[-yrange y_from:y_to]</code>	Suboption of <code>-plot</code> . Show the specified range in Y axis of the plot.
<code>[-title title_string]</code>	Suboption of <code>-plot</code> . Title of the comparison plot.
<code>[-xlabel xlabel_string]</code>	Suboption of <code>-plot</code> . Label for X axis.
<code>[-ylabel ylabel_string]</code>	Suboption of <code>-plot</code> . Label for Y axis.
<code>[-ykeylabel]</code>	Suboption of <code>-plot</code> . List of key labels on Y axis.
<code>[-png]</code>	Suboption of <code>-plot</code> . Save the plot output in the specified PNG file.

## Joules Command and Attribute Reference

### General Commands - voltus\_compare

---

`[-save]` Suboption of `-plot`. Save the gnuplot data/command files in the specified directory. By default, the output is saved in `voltus_work/`.

### Example(s)

Joules vs Voltus activity comparison is a four step process:

#### 1. Generate Voltus run script

```
voltus_compare -bname all_seq_out_pins -generate script -root /cpu_10bit/FSM -  
rtl_group seq -pin_dir out -use_joules_tcf -use_joules_slew -add_power
```

#### 2. Generate Joules activity data

```
voltus_compare -bname all_seq_out_pins -generate data -add_power
```

#### 3. Generate Voltus activity data

```
exec voltus -init voltus_work/all_seq_out_pins_run_voltus.tcl
```

#### 4. Compare Joules vs Voltus data

```
voltus_compare -bname all_seq_out_pins -compute_stats -tolerance 0.05 -plot  
all -add_power
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Activity Processing and Reporting](#)

## write\_db

Writes the netlist to a database file or returns a Tcl list. Root attributes with non-default settings can be included in the database.

### Syntax

```
write_db
    <design>
    [-quiet]
    [-all_root_attributes]
    [-no_root_attributes]
    [-verbose]
    [-to_file <f_db>]
    [-script <f_tcl>]
```

### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>&lt;design&gt;</code>	The design for which to write out the database information.
<code>[-quiet]</code>	Suppress any warning messages. Only error messages are printed.
<code>[-all_root_attributes]</code>	Write out all the root attributes with non-default settings.
<code>[-no_root_attributes]</code>	Avoid writing out of the root attributes with non-default settings.
<code>[-verbose]</code>	Enables verbose output while writing out the database file.
<code>[-to_file]</code>	Name of the database file to be written.
<code>[-script]</code>	Generate a split Tcl and database file.

### Example(s)

#### ■ Write to a file.

```
write_db -to_file joules.jdb ;
```

#### ■ Write to a variable.

```
set jdb [write_db] ;
```

### Return Value

0 indicates success, 1 indicates failure in execution.

## Joules Command and Attribute Reference

### General Commands - write\_db

---

#### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## write\_template

Generates a template script with the commands and attributes needed to run Joules. Use the command options to include specific commands and attributes in the script.

### Syntax

```
write_template
  [-n2n]
  [-rtlstim2gate]
  [-physical]
  [-cpf]
  [-clock_tree]
  [-flow <odc|logic_gating|stb_dont_care|dont_care_const_stb|
    sdf_glitch_flow|zero_delay_glitch_flow|xreplay>]
  [-out <f_tmpI>]
  [-help|-h]
```

### Options and Arguments

[-h]	Displays help for all options.
[-n2n]	Writes template script for netlist to netlist flow.
[-rtlstim2gate]	Writes rtlstim2gate rules in the template script.
[-physical]	Writes physical information in the template script.
[-cpf]	Writes template script for CPF-based flow.
[-clock_tree]	Writes gen_clock_tree information in the template script.
[-flow]	Writes flow information in the template script.
[-out]	Specify filename to write the template script. By default, the script is written to file joules_work/joules_template.tcl.

### Example(s)

- write\_template
- write\_template -out joules\_runme.tcl
- write\_template -out template.tcl -cpf
- write\_template -out template.tcl -cpf -clock\_tree

## **Joules Command and Attribute Reference**

### General Commands - write\_template

---

#### **Return Value**

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### General Commands - write\_template

---



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## Library Read and Analysis Commands

---

**Note:** In Joules terminology, *library set* and *library domain* are used interchangeably when referring to libraries.

- report\_libs
- compare\_libs
- get\_library\_cells
- plot\_cell\_sensitivity
- plot\_drive\_profile
- plot\_lib\_quality
- get\_libraries
- read\_libs
- get\_lib\_domains
- get\_lib\_param
- set\_lib\_param
- report\_lib\_params
- get\_cell\_param
- get\_cell\_pins
- report\_cell\_info
- get\_cell\_pin\_type
- report\_libcells
- report\_cell\_tables
- set\_memory\_cell

## Joules Command and Attribute Reference

### Library Read and Analysis Commands -

---

- report joules memory cells
- report x1\_drive\_cell
- compare\_memory
- scrub\_library
- report\_libcell\_arc
- report\_memory\_frequency
- report\_user\_set\_memory\_params
- get\_analysis\_views
- get\_sdc\_units

## report\_libs

Reports the specified information about design libraries.

### Syntax

```
report_libs \  
  [-domain <lib_domain>+]  
  [-name <lib_name_regex>]  
  [-ldb_libpath [/libraries/][<domain>/]<lib>/+]  
    [-op_cond <opc>]  
    [-op_volt <val>] )  
    [-op_temp <val>]  
    [-cell_count <cnt> [<op>]]  
    (<op> :: eq|ne|lt|gt|le|ge, default=ge)  
  [-cols  
    {op_cond|op_volt|op_temp|cells|ldb_libpath|node|vt|domain|lib|rails|memory|  
    flop|icgc|latch|comb|seq|pm|avoid|area|delay|leakage_power}+]  
  [-cols_add  
    {node|vt|domain|lib|rails|memory|flop|icgc|latch|comb|seq|pm|avoid|area|  
    delay|leakage_power}+]  
  [-cols_del{op_cond|op_volt|op_temp|cells|ldb_libpath}+]  
  [-sort_by <col_title>]  
  [-out <f_dat>]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - report\_libs

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-domain]</code>	Return all libraries of the specified domain(s).
<code>[-name]</code>	Search the specified library name. The default is <code>*</code> .
<code>[-ldb_libpath]</code>	Full vdir path of the library. By default, all library paths are considered.
<code>[-op_cond]</code>	Suboption <code>-ldb_libpath</code> . Search for libraries by the specified default operating condition name.
<code>[-op_volt]</code>	Suboption <code>-ldb_libpath</code> . Search for libraries by the voltage of the specified default operating condition.
<code>[-op_temp]</code>	Suboption <code>-ldb_libpath</code> . Search for libraries by the temperature of the specified default operating condition name.
<code>[-col_count]</code>	Suboption <code>-ldb_libpath</code> . Search for libraries with cells with the specified condition.
<code>[-cols]</code>	Specify the columns to report in the output. By default, the following are reported:  <code>op_cond op_volt op_temp cells ldb_libpath</code>
<code>[-cols_add]</code>	Add the specified column(s) in the output.
<code>[-cols_del]</code>	Delete the specified column(s) from the output.
<code>[-sort_by]</code>	Sort the output by the specified column. By default, the output is sorted by <code>op_cond</code> .
<code>[-out]</code>	Save the output data in the specified file.

#### Example(s)

- `report_libs -cols volt temp cells`
- `report_libs -ldb_libpath [get_libraries -op_volt 1.2 -full_path]`

## **Joules Command and Attribute Reference**

### **Library Read and Analysis Commands - report\_libs**

---

#### **Return Value**

1 indicates error in execution.

#### **Related Topics**

- [Library Read and Analysis](#)

## compare\_libs

Compares the plots data for two libraries.

### Syntax

```
compare_libs \  
  [-ldb_libpath <x_ldb_libpath> <y_ldb_libpath>+]  
  [-lib <xlib> <ylib>+]  
  [-domain <lib_domain>]  
  [-prop leakage_power|internal_power|delay|transition|avg_ipin_cap|area]  
  [-force]  
  [-by type]  
  [-cells <cell>+]  
  [-cell_type  
    {memory|flop|latch|icgc|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|  
    tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps|bbox|scan|unknown}+]  
  [-cell_group {comb|seq|memory|pm}+]  
    [-name <cell_name_regex>]  
    [-ipin_cnt <cnt>]  
    [-drive_strength <ds> <ds_margin>]  
  [-group_by {cell_type|ipin_cnt|drive_strength|none}+]  
  [-slew <slew>+]  
  [-max_slew_points <N>]  
  [-slew_unit <pS/nS/uS/mS/S>]  
  [-load <load>+]  
  [-max_load_points <N>]  
  [-load_unit <fF/pF/nF/uF/mF/F>]  
  [-lut_idx_range_pct <%beg>:<%end>]  
  [-match_names <lib1_mask> <lib2_mask>]  
  [-plot scatter|ratio]  
  [-ignore_neg_points]  
  [-xrange <min>:<max>]  
  [-yrange <min>:<max>]  
  [-format gnuplot|native]  
  [-out <f_data>]  
  [-png <f_png>]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - compare\_libs

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-ldb_libpath]</code>	Specify the full vdir path of the libraries to compare.
<code>[-lib]</code>	Specify names of the libraries to compare. The first specified library is represented on X axis and the second library is represented on Y axis.
<code>[-domain]</code>	Specify the domain of the libraries to compare.
<code>[-prop]</code>	Compare the specify property of the libraries. By default, <code>internal_power</code> of the libraries is compared.
<code>[-force]</code>	Perform force comparison even if no variations or >1 variations in PVT exist.
<code>[-by_type]</code>	Compare cells by type instead of matching names.
<code>[-cells]</code>	Specify the cells to be reported in the output. By default, all cells are reported.
<code>[-cell_type]</code>	Specify the cell types to report.
<code>[-cell_group]</code>	Specify the cell groups to report.
<code>[-name]</code>	Suboption of <code>-cell_group</code> . Specify the cell name. By default, it is set to <code>*</code> .
<code>[-ipin_cnt]</code>	Suboption of <code>-cell_group</code> . Specify the count of input pins. By default, it is set to <code>don't care</code> .
<code>[-drive_strength]</code>	Suboption of <code>-cell_group</code> . Specify the drive strength percentage. By default, it is calculated as <code>ds_margin = +/-10% of ds</code> .
<code>[-group_by]</code>	Group by the specified metrics for comparison.  If you specify this option, an additional column is added to the output table with entries of format: <code>&lt;cell_type&gt;:&lt;ipin_cnt&gt;:x&lt;drive_strength&gt;</code>
<code>[-slew]</code>	Use the specified list of slews for comparison.
<code>[-max_slew_points]</code>	Specify the maximum slew points to use. By default, all slew values in table are used.
<code>[-slew_unit]</code>	Specify the slew unit. Default is unit from first library.
<code>[-load]</code>	Use the specified list of loads for comparison.

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - compare\_libs

---

<code>[-max_load_points]</code>	Specify the maximum load points to use. By default, all slew values in table are used.
<code>[-load_unit]</code>	Specify the load unit. Default is unit from first library.
<code>[-lut_idx_range_pct]</code>	Specify the percentage range of lut index. By Default, it is set to 0:1.
<code>[-match_names]</code>	Match the library names with the specified patterns.
<code>[-plot]</code>	Type of plot to generate. By default, scattered plot is generated.
<code>[-ignore_neg_points]</code>	Specify this option to ignore points with negative x or y value. By default, it is set to <code>false</code> .
<code>[-xrange]</code>	Specify the range of values for X axis.
<code>[-yrange]</code>	Specify the range of values for Y axis.
<code>[-format]</code>	Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>Native</code> (default format)</li></ul>
<code>[-out]</code>	Save the plot data file in the specified directory.
<code>[-png]</code>	Save the gnuplot file in the specified directory.

### Example(s)

■ `compare_libs -ldb_libpath [get_libraries -op_volt 1.2 -full_path]`

### Return Value

-1 indicates error in execution.

### Related Topics

■ [Library Read and Analysis](#)



## get\_library\_cells

Returns cells that meet specific condition.

### Syntax

```
get_library_cells \  
  [-lib <library>]  
  [-domain <domain>]  
  [-ldb_libpath [/libraries/][<domain>/]<lib>/]  
  [-avoid true|false]  
  [-name <cell_name_regexp>]  
  [-cell_function {"<func-string>"}+]  
  [-cell_type  
    <memory|flop|latch|icgc|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|  
    tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps|scan|unknown>+]  
  [-cell_group <comb|seq|memory|pm>]  
    [-ipin_cnt <cnt>]  
    [-opin_cnt <cnt>]  
    [-bit_width <n>]  
    [-op eq|ne|gt|lt|ge|le]  
  [-drive_strength <ds> [<ds_margin>]]  
    [-sense <rise|fall|avg>]  
    [-slew <slew>] [-load <load>]  
    [-x1_cell <x1_cell>]  
  [-common <lib>+]  
    [-match_names <pat>+]  
  [-by_score]  
    [-weights {<prop>=<val>}+]  
      (<prop> = area|delay|transition|leakage_power|internal_power|setup|hold|  
        avg_ipin_cap)  
      (default: area=1 delay=2 transition=1 leakage_power=1 internal_power=1)  
    [-cells_per_ds_cluster <num>]  
    [-pct_keep <pct>]  
    [-slew <slew>]  
    [-load <load>]  
  [-full_path]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_library\_cells

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-lib]</code>	<p>Return all cells of the specified library.</p> <p>If the same library is picked for multiple library domains considering design is CPF-based, then cells of the first specified library domain are reported.</p>
<code>[-domain]</code>	<p>Return all libcells in the specified library domain.</p> <p>You can also query libcells from specific library and library domain as shown below:</p> <pre>get_library_cells -domain "ld0" -lib tutorial</pre> <p>While combining <code>-lib</code> and <code>-domain</code> options, make sure that the specified library exists in library domain.</p>
<code>[-ldb_libpath]</code>	Full vdir path of the library.
<code>[-avoid]</code>	Gets the list of library cells where this option is specified. Default is don't care.
<code>[-name]</code>	<p>Return all libcells that match the specified name or pattern.</p> <p>By default, this option returns all cells from all library domains.</p>
<code>[-cell_function]</code>	Return libcells whose function matches user-specified function.
<code>[-cell_type]</code>	<p>Return list of libcells belonging to the specified type.</p> <p>By default, all types of cells are returned.</p> <p>This option accepts more than one <code>cell_type</code>.</p>
<code>[-cell_group]</code>	<p>Return list of libcells belonging to the specified group.</p> <p>By default, all cells are reported.</p>
<code>[-ipin_cnt]</code>	<p>Suboption of <code>-cell_group</code>. Return list of all libcells with the number of inputs pins as specified with this option.</p> <p>By default, all libcells are reported.</p>
<code>[-opin_cnt]</code>	<p>Suboption of <code>-cell_group</code>. Return list of all libcells with the number of output pins as specified with this option.</p> <p>By default, all libcells are reported.</p>

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_library\_cells

---

<code>[-bit_width]</code>	Suboption of <code>-cell_group</code> . Specify cell <code>bit_width</code> attribute. Default is any.
<code>[-op]</code>	Suboption of <code>-cell_group</code> . Specify the operand.  Applies to <code>-ipin_cnt</code> , <code>-opin_cnt</code> , <code>-bit_width</code>  Default is <code>eq</code> .
<code>[-drive_strength]</code>	Drive strength of the cell. By default, <code>ds_margin</code> is calculated as $\pm 10\%$ of <code>ds</code> or $\pm (0.1) * ds$ .
<code>[-sense]</code>	Suboption of <code>-drive_strength</code> . Driving direction of the cell. The default sense is the average of both rising and falling directions.
<code>[-slew]</code>	Suboption of <code>-drive_strength</code> . Slew value for the cell.
<code>[-load]</code>	Suboption of <code>-drive_strength</code> . External fanout load and the capacitance values of the cell.
<code>[-x1_cell]</code>	Suboption of <code>-drive_strength</code> . X1 cell name.
<code>[-common &lt;lib&gt;+]</code>	Report common cells in the specified list of libraries.
<code>[-match_names &lt;pat&gt;+]</code>	Suboption of <code>-common</code> . Match the library names with the specified pattern(s).
<code>[-by_score]</code>	Return cells based on computed scores. The default value is false.
<code>[-weights]</code>	Suboption of <code>-by_score</code> . Compute score by <code>&lt;prop&gt;=&lt;val&gt;</code> .
<code>[-cells_per_ds_cluster]</code>	Suboption of <code>-common</code> . Specify the number of cells per DS cluster. The default value is 1.
<code>[-pct_keep]</code>	Suboption of <code>-common</code> . Return top <code>&lt;pct&gt;</code> cells by score. The default value is don't care.
<code>[-slew]</code>	Suboption of <code>-common</code> . Slew value for the cell.
<code>[-load]</code>	Suboption of <code>-common</code> . External fanout load and the capacitance values of the cell.
<code>[-full_path]</code>	Report the full name of libcell with library and domain information. By default, this is set to false.

### Example(s)

- `get_library_cells -lib $lvt_lib -cell_type and # get a list of AND cells from LVT library`

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_library\_cells

---

- `get_library_cells -lib slow -cell_type and -cell_function {a.b} # get cells of type AND but exclude cells with function a.!b`
- `get_library_cells -cell_group comb -drive_strength 1.0 0.2 # get all x1 combinational cells (use DS margin of 20%)`
- `get_library_cells -cell_group comb -drive_strength 2:4 # get x2 to x4 cells`
- `get_library_cells -common slow typical -cell_type flop # get flops common in slow and typical libraries`
- `get_library_cells -avoid false -cell_type buf -lib slow # get buffers marked avoid = false from slow library`

### Return Value

-1 indicates error in execution.

### Related Topics

- [Library Read and Analysis](#)

## plot\_cell\_sensitivity

Uses gnuplot to plot cell sensitivity, which is useful for trend analysis. Before running this command, ensure that DISPLAY is set properly.

### Syntax

```
plot_cell_sensitivity \  
  [-cells] <cell>+  
  [-show_all_arcs]  
  [-lib <library_name>] [-domain <domain>]  
  [-ldb_libpath [/libraries/][<domain>/]<lib>]  
  [-ldb_cellpath {[/libraries/][<domain>/][<lib>/]<cell>}+]  
  [-xkey slew|load|slew2]  
  [-ykey  
    cell_rise|cell_fall|trans_rise|trans_fall|delay|transition|slew_degradation|  
    retaining|retain_slew|setup|hold|recovery|removal|min_pulse_width|  
    internal_power|leakage_power]  
  [-zval <val>+]  
  [-cond <condition>]  
  [-format gnuplot|native]  
  [-png <f_png>]  
  [-xrange <min>:<max>]  
  [-yrange <min>:<max>]  
  [-save <dir>]  
    [-bname <tag>]  
  [>|-out <f_dat>]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - plot\_cell\_sensitivity

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-cells]</code>	Libcell name whose sensitivity plot needs to be analyzed. List of cells can be specified with this option, however, wildcards are not allowed.  RC-returned libcell names are not supported by this option.
<code>[-show_all_arcs]</code>	Suboption of <code>-cells</code> . Specify this option to display all cell arcs. By default, the first input/output arc is displayed.
<code>[-lib]</code>	Name of the library in which the specified cell needs to be searched.  This option works only with <code>-cells</code> option and can accept single value <code>./lib</code> .
<code>[-domain]</code>	Plot sensitivity of cells in the specified domain.
<code>[-ldb_libpath]</code>	Full vdir path of the library.
<code>[-ldb_cellpath]</code>	Full vdir path of the cell.
<code>[-xkey]</code>	Value to be display on X axis. The default is slew.
<code>[-ykey]</code>	Value to be display on Y axis. The default is delay.
<code>[-zval]</code>	List of load/slew2 values for <code>-xkey</code> slew.
<code>[-cond]</code>	Select table with the specified when <i>&lt;condition&gt;</i> .
<code>[-format]</code>	Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ gnuplot</li><li>■ native (default format)</li></ul>
<code>[-png]</code>	If specified, the generated sensitivity plot will be saved as the specified PNG file.
<code>[-xrange]</code>	Range (minimum and maximum) for the X axis.
<code>[-yrange]</code>	Range (minimum and maximum) for the Y axis.
<code>[-save]</code>	Save the plot data/command files in the specified directory.
<code>[-bname]</code>	Suboption of <code>-save</code> . Basename for the plot file. By default, it is: <i>&lt;dir&gt;/&lt;tag&gt;_&lt;format&gt;.[cmd,data]</i>

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - plot\_cell\_sensitivity

---

[>|-out]

If specified, redirect the output of the command in the specified file.

By default, the output of the command is dumped in  
`<work_dir>/<cell>_sens.data`

If the specified file needs to be created in some other directory then make sure the directory exists.

#### Example(s)

- `plot_cell_sensitivity BUFX1 -lib slow -xkey slew`
- `plot_cell_sensitivity -cells BUFX2 -png bufx2_load_sens.png`
- `plot_cell_sensitivity -cells BUFX1 BUFX2 BUFX3 BUFX4 -zval 0.050 ;# use  
load=0.050 for each cell`

#### Return Value

0 for success, 1 indicates error in execution.

#### Related Topics

- [Library Read and Analysis](#)

## plot\_drive\_profile

Plots the driving strength of design cells.

### Syntax

```
plot_drive_profile
  [-format gnuplot|native]
  [-lib library_name] [-domain domain_name]
  [-cells cell+ ]
  [-ldb_libpath [/libraries/][domain/]lib]
  [-ldb_cellpath {[/libraries/][domain/][lib/]cell}+]
  [-cell_type
    {flop|latch|icgc|comp|shift|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|
    mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps|bbox|scan|unknown}+]
  [-cell_group <comb|seq|pm>]
  [-ipin_cnt cnt]
  [-name cell_name_regex]
  [-by score]
  [-weights {prop=val}+]
    (<prop> = area|delay|transition|leakage_power|internal_power|setup|hold)
  [-cells_per_ds cluster num]
  [-pct_keep pct]
  [-slew slew]
  [-load slew]
  [-slew2 slew]
  [-lines
    area|delay|transition|leakage_power|internal_power|setup|hold|
    slew_degradation|ipin_cap|max_cap]
    [-pin_type {data|clock|enable|select|reset|set|scan|save|restore}]
    [-slew slew]
    [-load slew]
    [-slew2 slew]
    [-cond condition]
  [-show_cell]
  [-x1_cell x1_cell]
  [-xrange xmin:xmax]
  [-yrange ymin:ymax]
  [-show_line_fit]
  [-png f_png]
  [-save dir]
    [-bname tag]
```



## Joules Command and Attribute Reference

### Library Read and Analysis Commands - plot\_drive\_profile

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-format]</code>	Specify the plot format. The default format is native.
<code>[-lib]</code>	Specify the library.
<code>[-domain]</code>	Specify the domain.
<code>[-cells]</code>	List of cells to plot.
<code>[-ldb_libpath]</code>	Full vdir path of the cell library.
<code>[-ldb_cellpath]</code>	Full vdir path of the cells to plot.
<code>[-cell_type]</code>	List of cell types to plot. By default, inv cells are considered.
<code>[-cell_group]</code>	Plot the specified group of cells.
<code>[-ipin_cnt]</code>	Suboption of <code>cell_group</code> . Use it to select cells with the specified number of inputs.
<code>[-name]</code>	Suboption of <code>cell_group</code> . Use it to select cells with the specified name expression. The default expression is <code>*</code> .
<code>[-by_score]</code>	Filter cells by computed scores. Default is <code>false</code> .
<code>[-weights]</code>	Suboption of <code>by_score</code> . Filter cells by weights specified as <code>prop=val</code> , where:  <code>prop=area delay transition leakage_power internal_power</code>  By default, <code>area=1 delay=2 transition=1 leakage=1 internal=1</code>
<code>[-cells_per_ds_cluster]</code>	Suboption of <code>by_score</code> . Specify the number of cells per DS cluster. Default is 1.
<code>[-pct_keep]</code>	Suboption of <code>by_score</code> . Return the top specified percentage of cells by scores. Default is don't care.
<code>[-slew]</code>	Suboption of <code>-by_score</code> . Use the specified slew value.
<code>[-load]</code>	Suboption of <code>-by_score</code> . Use specified load value.
<code>[-slew2]</code>	Suboption of <code>-by_score</code> . Use the specified slew value.
<code>[-lines]</code>	Plot the specified property as lines in the plot. Refer to syntax for valid values for this option.

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - plot\_drive\_profile

---

<code>[-pin_type]</code>	Suboption to be used only when you specify <code>ipin_cap</code> for the <code>-lines</code> option. The default pin type is data.
<code>[-slew]</code>	Suboption of <code>-lines</code> . Use the specified slew value.
<code>[-load]</code>	Suboption of <code>-lines</code> . Use specified load value.
<code>[-slew2]</code>	Suboption of <code>-by_score</code> . Use the specified slew value.
<code>[-cond]</code>	Suboption of <code>-lines</code> . Select table with the specified when <i>&lt;condition&gt;</i> .
<code>[-show_cell]</code>	Show cells in the plot output.
<code>[-x1_cell]</code>	Use the specified X1 cell for computing drive strength.
<code>[-xrange]</code>	Specify the X-axis range for the plot.
<code>[-yrange]</code>	Specify the Y-axis range for the plot.
<code>[-show_line_fit]</code>	Show the plot lines as they fit.
<code>[-png]</code>	Save the plot in specified PNG file.
<code>[-save]</code>	Save gnuplot data/command files in the specified directory.
<code>[-bname]</code>	Basename of the gnuplot output file. The basename is set as <i>&lt;dir&gt;/&lt;tag&gt;_guplot.[cmd,data]</i> .

### Example(s)

- `plot_drive_profile -cell_type inv -lines area leakage_power`
- `plot_drive_profile -cell_type inv buf nand -lines area`
- `plot_drive_profile -cell_type and -ipin_cnt 2 -lines area`

### Return Value

0 for success, -1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## plot\_lib\_quality

Plots waterfall chart of cell types and drive\_strengths for a library.

### Syntax

```
plot_lib_quality [-lib <library_name>+] [-domain <domain>+]
  [-ldb_libpath [/libraries/][<domain>/]<lib>]
  [-cell_type
    {memory|register|flop|latch|icgc|add|sub|mult|div|decoder|comp|shift|mmux|
    buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|
    delay|iso|srpg|ls|els|ps|bbox}+]
  [-cell_group seq|dpx|logic|pm]
  [-ipin_cnt <cnt>]
  [-opin_cnt <cnt>]
  [-design_context]
  [-param cnt|area|power|leakage|internal]
  [-ykey drive_strength|drive_res|leakage_power|internal_power]
  [-x1_cell <x1_cell>]
  [-format gnuplot|native]
  [-xrange <xmin>:<xmax>]
  [-yrange <ymin>:<ymax>]
  [-cond <condition>]
  [-png <f_png>]
  [-save <dir>]
  [-bname <tag>]
```

## Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-lib]</code>	List of libraries.
<code>[-domain]</code>	List of domains.
<code>[-ldb_libpath]</code>	Full vdir path of the cell library.
<code>[-cell_type]</code>	List of cell types to plot. By default, all cells are considered.
<code>[-cell_group]</code>	Plot the specified group of cells.
<code>[-ipin_cnt]</code>	Suboption of <code>-cell_group</code> . Reports the specified input pin count. Default is <code>any</code> .
<code>[-opin_cnt]</code>	Suboption of <code>-cell_group</code> . Reports the specified output pin count. Default is <code>any</code> .
<code>[-design_context]</code>	Display the plot in design context.
<code>[-param]</code>	Suboption of <code>-design_context</code> . Specify the parameter for design context. The default parameter is <code>cnt</code> .
<code>[-ykey]</code>	Plot the specified property on Y axis. By default, <code>drive_strength</code> is plotted on Y axis.
<code>[-x1_cell]</code>	Use the specified X1 cell for computing drive strength.  This option is mandatory for <code>-ykey drive_strength</code> .
<code>[-format]</code>	Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>native</code> (default format)</li></ul>
<code>[-xrange]</code>	Show the range on X axis of the plot.  This option applies to <code>-format native</code> .
<code>[-yrange]</code>	Show the range on Y axis of the plot.
<code>[-cond]</code>	Select table with the specified when <code>&lt;condition&gt;</code> .
<code>[-png]</code>	Save the plot in specified PNG file.
<code>[-save]</code>	Save plot data/command files in the specified directory.
<code>[-bname]</code>	Suboption of <code>-save</code> . Basename of the plot output file. The basename is set as <code>&lt;dir&gt;/&lt;tag&gt;_&lt;format&gt;.[cmd,data]</code> .

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - plot\_lib\_quality

---

#### Example(s)

- `plot_lib_quality -lib slow -cell_group logic -x1_cell BUFX4`
- `plot_lib_quality -cell_type inv buf nand nor -ykey drive_res`
- `plot_lib_quality -cell_type mux -save "./data" -bname mux -x1_cell TLATNTSCAX3;# will save ./data/mux_gnuplot.[cmd,data]`

#### Return Value

0 for success, 1 indicates failure in execution.

#### Related Topics

- [Power Analysis and Reporting](#)

## get\_libraries

Returns the list of libraries (LIBs).

### Syntax

```
get_libraries \
  [-domain <domain_name>]
  [-name <lib_name_regexp>]
  [-view_type {timing|setup|hold|power|leakage|dynamic}+]
  [-mode <mode>+]
  [-files <src_file_path>+]
  [-op_volt|-op_temp|-op_cond|-node|-vt <val>]
  [-cell_count <num> [<op>]]
  (<op> :: eq|ne|lt|gt|le|ge, default=ge)
  [-full_path]
```

### Options and Arguments

[-h]	Displays help for all options.
[-domain]	Return list of libraries for the specified domain. By default, all domain libraries are reported.
[-name]	Return list of libraries matching the specified name expression. By default, all libraries are reported.
[-view_type]	
[-mode]	
[-files]	Return libraries matching the specified LIB file paths.
[-op_volt -op_temp -op_cond]	<ul style="list-style-type: none"><li>■ op_temp - search libraries with default operating temperature as specified</li><li>■ op_volt - search libraries with default operating voltage as specified</li><li>■ op_cond - search libraries with default operation condition as specified</li></ul>
[-cell_count]	Return libraries with greater than <num> cells.
[-full_path]	Return list of library VDIR path names.

### Example(s)

```
■ get_libraries ; # get list of ALL libraries
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_libraries

---

- `get_libraries -name "*LVT*" ; # get a LVT library`
- `get_libraries -name "*HVT*"; # get a HVT library`
- `get_libraries -name "^p*" # get library name starting with p`
- `# get library with 477 cells`  
`get_libraries -cell_count 477 ;# returns slow`
- `# get libraries with 477 cells or more`  
`get_libraries -cell_count 477 ge ;# returns slow typical`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)

## **read\_libs**

Reads the libraries. The command will search for libraries with the specified name. If not found, it will search for the libraries in the library search path. Only the first library encountered will be loaded.

For more information, refer to `read_libs` in *Genus Command Reference*.

### ***Related Commands***

`read_libs`

### ***Related Topics***

- Library Read and Analysis



## get\_lib\_domains

Returns the list of library domains read into Joules.

### Syntax

```
get_lib_domains \  
  [-view_type {timing|setup|hold|leakage|dynamic}+]  
  [-mode <mode>+]  
  [-name <glob>]  
    [-nocase]  
    [-invert]
```

### Options and Arguments

[-h]	Displays help for all options.
[-view_type]	
[-mode]	
[-name]	Match domain names with the specified pattern.
[-nocase]	Suboption of -name. Perform case-insensitive name match.
[-invert]	Suboption of -name. Filter out domains that match the pattern and return those that do not.

### Example(s)

- `get_lib_domains ; # get list of ALL library domains`
- `get_lib_domains -name "*1p2*" ; # get a LVT/HVT library`
- `get_lib_domains -name "1P2" -nocase -invert ; # get a LVT/HVT library`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_lib\_param

---

## get\_lib\_param

Returns queried library parameter.

### Syntax

```
get_lib_param \  
[-lib <library_name>] [-domain <domain_name>]  
[-ldb_libpath [/libraries/][<domain>/]<lib>]  
[-unit <voltage|current|time|slew|energy|area|delay|power|res[istance]|  
cap[acitance]>]  
[-default op_cond|power_rail|max_fanout|max_trans|wire_load|wlm]  
[-power_rails]  
[-rail_voltage <rail_name>]  
[-op_conds]  
[-pvt <op_condition_name>]  
[-op_slew|-op_load|-op_slew2|-op_rail|-x1_cell|-node|-vt]  
[-area|-avg_ipin_cap|-max_load|-max_fanout]  
[-avoid]  
(use following options to select list of cells)  
[-cells <cell>+]  
[-cell_type  
  <memory|flop|latch|icgc|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|  
  mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps|bbox|scan|unknown>+]  
[-cell_group <comb|seq|memory|pm>+]  
[-drive_strength <ds> <ds_margin>]  
[-delay|-transition|-slew_degradation|-internal_power|-leakage_power|  
-rf_ratio|-setup|-hold|-recovery|-removal|-min_pulse_width]  
(use following options to further qualify param values)  
[-sense rise|fall|avg]  
[-constr rise|fall]  
[-slew <slew>]  
[-load <load>]  
[-rail <power_rail_name>]  
[-files]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_lib\_param

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-lib]</code>	Library name.
<code>[-domain]</code>	Domain name.
<code>[-ldb_libpath]</code>	Full vdir path of library.
<code>[-unit]</code>	Attribute unit type.
<code>[-default]</code>	Return the default value of the specified parameter.
<code>[-power_rails]</code>	Return all power rails defined in the library.
<code>[-rail_voltage]</code>	Return the rail voltage of the specified power cell.
<code>[-op_conds]</code>	Return all the operating conditions in the library.
<code>[-pvt]</code>	Return the PVT (process factor, volume, and temperature) conditions for the specified operating condition.
<code>[-op_slew  -op_load  -op_rail  -x1_cell]</code>	Return the slew value, load, rail, and x1 cell set using <code>set_lib_param</code> command
<code>[-area  -avg_ipin_cap  -max_load  -max_fanout]</code>	Return the area, average input pin capacitance, maximum load, and maximum fanout of the selected cells.
<code>[-avoid]</code>	Return number of cells marked avoid.
<code>[-cells]</code>	List of cells for which average input pin capacitance, maximum load, and maximum fanout are required.
<code>[-cell_type]</code>	Type of cell for which average input pin capacitance, maximum load, and maximum fanout are required.
<code>[-cell_group]</code>	Group of cells for which average input pin capacitance, maximum load, and maximum fanout are required.
<code>[-drive_strength]</code>	Drive strength of the cell. By default, <code>ds_margin</code> is calculated as $\pm 10\%$ of <code>ds</code> or $\pm (0.1) * ds$ .
<code>[-delay  -transition  -slew_degradation  -internal_power  -leakage_power  -rf_ratio  -setup  -hold  -recovery  -removal  -min_pulse_width]</code>	Return average value of the specified parameter.
<code>[-sense]</code>	Specify the driving direction as rising, falling, or average of both (default).

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_lib\_param

---

<code>[-constr]</code>	Specify the table to use, rise_constraint or fall_constraint. Applies only to:  <code>-setup -hold -recovery -removal -min_pulse_width</code>
<code>[-slew]</code>	Use the specified slew value.
<code>[-load]</code>	Use the specified load value.
<code>[-rail]</code>	Use the specified power_rail.
<code>[-files]</code>	Return path to source library files.

### Example(s)

- `get_lib_param -lib $hvt_lib -avg_ipin_cap -cell_type inv ; # what is the avg pin cap of all INV cells in the HVT library`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)

## set\_lib\_param

Sets a parameter on a library.

### Syntax

```
set_lib_param [-lib <library_name>] [-domain <library_domain>]  
[-ldb_libpath [/libraries/][<domain>/]<lib>]  
[-op_rail <operating_rail>]  
[-op_slew <operating_slew>]  
[-op_load <operating_load>]  
[-op_slew2 <operating_slew2>]  
[-x1_cell <x1_cell_name>]  
[-unit <voltage|current|time|slew|delay|power|res[istance]|cap[acitance]>]  
[-node <node_name>]  
[-vt <vt_name>]  
[-avoid true|false]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - set\_lib\_param

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-lib]</code>	Name of the library whose parameter values need to be set.
<code>[-domain]</code>	Domain name for the library.
<code>[-ldb_libpath]</code>	Full vdir path of library whose parameter values need to be set.
<code>[-op_rail]</code>	Set the operating rail of the various library parameters.
<code>[-op_slew]</code>	Set the operating slew of the various library parameters.
<code>[-op_load]</code>	Set the operating load of the various library parameters.
<code>[-op_slew2]</code>	Set the operating slew of the various library parameters.
<code>[-x1_cell]</code>	Set the X1 cell for the library.
<code>[-unit]</code>	Set the unit of various library parameters.
<code>[-node]</code>	Associate a technology node name with a library.
	Sample specification - tsmc65nm
<code>[-vt]</code>	Associate a VT name with the library
	Sample specification - HVTISVTILVT
<code>[-avoid]</code>	Mark avoid attribute on all cells in the library. By default, no change is done.

#### Example(s)

- `set_lib_param -lib $lvt_lib -unit power uW ; # set LVT library power unit to uW (micro watt)`
- `set_lib_param -node 28nm|65nm ; # estimate power across two tech nodes`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Library Read and Analysis](#)

## report\_lib\_params

Shows summary information for specified library.

### Syntax

```
report_lib_params [-libs <lib>+] [-domain <domain>]  
  [-ldb_libpath {[/libraries/][<domain>/]<lib>}+]  
  [-groups {unit|default|op_set|lib_params|cell_params}+]  
  [-lib_params {power_rails|op_conds|rail_voltages|pvts}+]  
  [-cell_params  
    {area|delay|transition|internal_power|leakage_power|hold|recovery|removal|  
      min_pulse_width|slew_degradation|rf_ratio|setup|avg_ipin_cap|max_load|  
      max_fanout}+]  
  [>|-out outfile]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - report\_lib\_params

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-libs]</code>	Library name.
<code>[-domain]</code>	Library domain name.
<code>[-ldb_libpath]</code>	Full vdir path of library.
<code>[-groups]</code>	Show information for specified library groups.  Default:  <code>unit default op_set lib_params</code>
<code>[-lib_params]</code>	Show information for specified library parameters.  Default:  <code>power_rails op_conds</code>
<code>[-cell_params]</code>	Show information for specified cell parameters.  Default:  <code>area leakage_power avg_ipin_cap</code>
<code>[&gt; -out]</code>	Redirect the output to the specified file.  By default, the output of the command is dumped in stdout.

#### Example(s)

■ `report_lib_params -lib slow -out slow.params`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

■ [Library Read and Analysis](#)



## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_cell\_param

---

## get\_cell\_param

Returns cell parameter values.

### Syntax

```
get_cell_param [-cell] <cell_name>
  [-owning_lib|-all_owning_libs]
  [-full_path]
  [-lib <library_name>]
  [-domain <lib_domain_name>]
  [-ldb_libpath [/libraries/][<domain>/]<lib>]
  [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]
  [-avoid|-function|-cell_type]
  [-area|-height|-width|-max_cap|-max_fanout]
  [-ipin_cap <input_pin>]
  [-avg_ipin_cap]
  [-load threshold]
  [-slew_margin <frac>]
  [-ipin <input_pin>] [-opin <output_pin>]
  [-delay|-transition|-slew_degradation|-internal_power|-leakage_power|
  -rf_ratio|-setup|-hold|-recovery|-removal|-min_pulse_width|-retaining|
  -retain_slew|-d2q]
  [-ipin <input_pin>] [-opin <output_pin>]
  [-sense rise|fall|avg]
  [-constr rise|fall]
  [-related_pins]
  [-when_conditions]
  [-slew <slew>]
  [-load <load>]
  [-slew2 <slew>]
  [-cond <condition>]
  [-partial_cond]
  [-rail <power_rail_name>]
  [-drive_strength | -drive_res]
  [-sense <rise|fall|avg>]
  [-slew <slew>] [-load <load>]
  [-x1_cell <x1_cell>]
  [-allow_cross_lib_compare]
  [-score]
  [-weights {<prop>=<val>}+]
    (<prop> = area|delay|transition|leakage_power|internal_power|setup|hold|
    avg_ipin_cap)
  [-slew <slew>] [-load <load>]
  [-x1_cell <x1_cell>]
  [-allow_cross_lib_compare]
  [-lut_values <slew|load|slew2>]
  [-ipin <input_pin>] [-opin <output_pin>]
  [-table_type cell_rise|cell_fall|trans_rise|trans_fall|rise_power|
  fall_power|retaining_rise|retaining_fall|retain_slew_rise|
  retain_slew_fall|setup_rise|setup_fall|hold_rise|hold_fall]
  [-timing_type_names]
  [-timing_type <timing_type_name>]
  [-mem_address_size|-mem_data_size]
  [-pin_avg]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_cell\_param

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-cell]</code>	Cell name.
<code>[-owning_lib -all_owning_libs]</code>	Return libraries containing the specified cell.
<code>[-full_path]</code>	Suboption of <code>-owning_lib -all_owning_libs</code> .  Return the vdir path. By default, this is set to false.
<code>[-lib]</code>	Library name for the cell.
<code>[-domain]</code>	Domain name.
<code>[-ldb_libpath]</code>	Full vdir path of library.
<code>[-ldb_cellpath]</code>	Full vdir path of cell.
<code>[-avoid -function -cell_type]</code>	Return the specified cell-level parameter.
<code>[-area -max_cap -max_fanout]</code>	Return area, max_capacitance and max_fanout cell-level parameter.
<code>[-ipin_cap]</code>	Return the input pin capacitance.
<code>[-avg_ipin_cap]</code>	Return the average capacitance of all input pins.
<code>[-load_threshold]</code>	Return the capacitance load at which the slew degrades.
<code>[-slew_margin]</code>	Suboption of <code>-load_threshold</code> .  This specifies the slew degradation margin as fraction. The default fraction is 0.0.
<code>[-ipin]</code>	Suboption of <code>-load_threshold</code> .  This is the arc specification.

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_cell\_param

---

`[-opin]`

Suboption of `-load_threshold`.

This is the arc specification.

`[-delay|-transition|-slew_degradation|-internal_power|-leakage_power|-  
rf_ratio|-setup|-hold|-recovery|-removal|-min_pulse_width|-retaining|-  
retain_slew|-d2q]`

Has following suboptions:

- `-ipin` - Input pin
- `-opin` - Output pin
- `-sense` - Rising, falling, or average of both (default)
- `-constr` - Specify the table to use, `rise_constraint` or `fall_constraint`, or average (default). Applies only to:  
`-setup|-hold|-recovery|-removal|-min_pulse_width`
- `-related_pins` - Returns `related_pin` for the specified param, arc, and sense table
- `-when_conditions` - Returns the list of when conditions for the specified param, arc, and sense tables
- `-slew` - Slew value
- `-load` - Maximum load value
- `-slew2` - Slew value
- `-cond` - Condition
- `-partial_cond` - Selects table which contains the specified partial
- `-rail` - Power rail name

`[-drive_strength | -drive_res]`

Has following suboptions:

- `-sense` - Rising, falling, or average of both (default)
- `-slew` - Slew value
- `-x1_cell` - X1 cell name
- `-allow_cross_lib_compare` - default is false

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_cell\_param

---

<code>[-score]</code>	<p>Has the following suboptions:</p> <ul style="list-style-type: none"><li>■ <code>-weights-</code> In the format of <code>property=value</code>  If a property is not specified, its weight is considered as 0.  Property can be: <code>area delay transition leakage_power internal_power</code>  Default values: <code>area=1 delay=2 transition=1 leakage=1 internal=1</code></li><li>■ <code>-slew</code></li><li>■ <code>-load</code></li><li>■ <code>-x1_cell</code></li><li>■ <code>-allow_cross_lib_compare</code> - default is false</li></ul>
<code>[-lut_values]</code>	<p>Get the look-up table slew or load values. Has following suboptions:</p> <ul style="list-style-type: none"><li>■ <code>-ipin</code> - Input pin</li><li>■ <code>-opin</code> - Output pin</li><li>■ <code>-table_type</code> - Type of table. Select from: <code>cell_rise, cell_fall, trans_rise, trans_fall, rise_power, fall_power, retaining_rise, retaining_fall, retain_slew_rise, retain_slew_fall</code>.</li></ul>
<code>[-timing_type_names]</code>	Reports the timing types for a given ipin-opin arc.
<code>[-timing_type]</code>	Specify the timing type name.
<code>[-mem_address_size  -mem_data_size]</code>	Specify memory address bus size or memory data bus size.
<code>[-pin_avg]</code>	Provides the average value for all input-output pin arcs if the input/output pins are not user-specified.

### Example(s)

- `get_cell_param AOI2BB2X2 -function ;# get cell function`
- `get_cell_param BUFX1 -lut_values slew # get lut slew values for BUFX1`

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - get\_cell\_param

---

- `get_cell_param FD2SQX4_D -setup -sense rise -constr rise -ipin D`
- `get_cell_param FD2SQX4_D -hold -sense fall -constr rise -ipin D`
- `get_cell_param FD2SQX4_D -recovery -sense rise -constr fall -ipin CD`
- `get_cell_param -cell ADDFHX2 -domain lib_1p08v -area`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)

## get\_cell\_pins

Returns a list of cell pins.

### Syntax

```
get_cell_pins \  
-cell <cell_name>  
[-lib <lib_name>]  
[-domain <domain_name>]  
[-ldb_libpath [/libraries/][<domain>/]<lib>] (  
[-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]  
[-name <pin_name_regexp>]  
[-direction <input|output|inout|any>]  
[-pin_type  
  <data|address|clock|enable|select|reset|set|scan|tie|rail|vdd|gnd|save|  
  restore>]  
[-bus]  
[-arcs]
```

### Options and Arguments

[-h]	Displays help for all options.
-cell	Cell name.
[-lib]	Library name.
[-domain]	Library domain name.
[-ldb_libpath]	Full vdir path of library.
[-ldb_cellpath]	Full vdir path of cell.
[-name]	Pin name. Default is *.
[-direction]	Cell direction. Default is any.
[-pin_type]	Type of pin. Default is any.
[-bus]	Show bussed form.
[-arc]	Return list of IO arcs for selected set of input/output pins.

### Example(s)

- `get_cell_pins -cell $and_cell -lib $lvt_lib -direction input ; # get a list of input pins of a cell`

## **Joules Command and Attribute Reference**

### Library Read and Analysis Commands - get\_cell\_pins

---

#### **Return Value**

-1 indicates failure in execution.

#### **Related Topics**

- [Library Read and Analysis](#)

## report\_cell\_info

Shows summary information for specified cell. If an x1\_cell is specified, then drive strength of the cell w.r.t. the specified x1\_cell will be shown.

### Syntax

```
report_cell_info \
  [-cell] <cell> [-lib <lib>] [-domain <domain>]
  [-ldb_libpath [/libraries/][<domain>/]<lib>]
  [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]
  [-x1_cell <x1_cell>]
```

### Options and Arguments

[-h]	Displays help for all options.
[-cell]	Cell name.
[-lib]	Library name.
[-domain]	Library domain name.
[-ldb_libpath]	Full vdir path of library.
[-ldb_cellpath]	Full vdir path of cell.
[-x1_cell]	X1 cell name. If this is specified, then drive strength of the cell w.r.t. the specified x1 cell will be shown.

### Example(s)

- `report_cell_info -cell BUFX1`
- `report_cell_info -cell BUFX4 -lib $lib -x1_cell $x1_cell`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)



## get\_cell\_pin\_type

Returns pin type for specified cell pin.

### Syntax

```
get_cell_pin_type [-pin] <pin_name>
                  -cell <cell_name>
                  [-lib <lib_name>]
                  [-domain <domain>]
                  [-ldb_libpath [/libraries/][<domain>/]<lib>]
                  [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]
```

### Options and Arguments

[-h]	Displays help for all options.
[-pin]	Pin name.
-cell	Cell name. This is a mandatory option.
[-lib]	Library name.
[-domain]	Library domain name.
[-ldb_libpath]	Full vdir path of library.
[-ldb_cellpath]	Full vdir path of cell.

### Example(s)

- `get_cell_pin_type -pin D -cell $flop_cell -lib $slow_lib ; # get pin type for the D pin of a cell`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)

## report\_libcells

Generates a tabular report for specified cells.

### Syntax

```
report libcells \
  [-lib <lib_name>] [-domain <lib_domain>]
  [-cells <cell>+]
  [-ldb_libpath [/libraries/][<domain>/]<lib>]
  [-ldb_cellpath {[/libraries/][<domain>/][<lib>/]<cell>}+]
  [-name <cell_name_regexp>]
  [-cell_type
    <memory|flop|latch|icgc|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|
    tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps|bbox|scan|unknown>+]
  [-cell_group <comb|seq|memory|pm>]
  [-drive_strength <ds> <ds_margin>]
    [-sense <rise|fall|avg>]
    [-slew <slew>]
    [-load <load>]
    [-x1_cell <x1_cell>]
  [-ipin_cnt <num>]
  [-opin_cnt <num>]
  [-bit_width <n>]
  [-op_eq|ne|gt|lt|ge|le]
  [-cols
    {avoid|drive_strength|load_threshold|rf_ratio|avg_ipin_cap|max_cap|
    max_fanout|pin_cnt|ipin_cnt|opin_cnt|bit_width|rail_cnt|area|height|width|c
ell_type|
    function|delay|transition|slew_degradation|internal_power|leakage_power|
    setup|hold|d2q|score|lib|domain}+]
  [-cols_add
    {max_fanout|pin_cnt|opin_cnt|bit_width|rail_cnt|cell_type|function|delay|
    transition|slew_degradation|internal_power|leakage_power|score}+]
  [-cols_del
    {area|ipin_cnt|drive_strength|max_cap|load_threshold|avg_ipin_cap|rf_ratio}
    +]
  [-cond <condition>]
  [-partial_cond]
  [-rail <power_rail_name>]
  [-ipin <input_pin>]
  [-opin <output_pin>]
  [-slew_margin <frac>]
  [-weights {<prop>=<val>}+]
    (<prop> = area|delay|transition|leakage_power|internal_power|setup|hold)
  [-infer_x1_cell_per_cell_type]
    [-ds_margin <frac>]
  [-sort_by <col_title>]
  [-out <f_dat>]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - report\_libcells

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-lib]</code>	Name of library.
<code>[-domain]</code>	Name of library domain.
<code>[-cells]</code>	Cells to report. By default, all cells are reported.
<code>[-ldb_libpath]</code>	Full vdir path of library.
<code>[-ldb_cellpath]</code>	Full vdir path of cell.
<code>[-name]</code>	Name of cell.
<code>[-cell_type]</code>	Type of cell.
<code>[-cell_group]</code>	Group of cell.
<code>[-drive_strength]</code>	Drive strength (ds) of the cell. By default, <code>ds_margin = +/-10% of ds</code>  This has the following suboptions: <ul style="list-style-type: none"><li>■ <code>-sense</code> - rise, fall, or avg (default) - driving direction of the cell</li><li>■ <code>-slew</code> - slew value</li><li>■ <code>-load</code> - load value</li><li>■ <code>-x1_cell</code> - X1 cell</li></ul>
<code>[-ipin_cnt]</code>	Specify the input pin count. Default is <code>dont_care</code> .
<code>[-opin_cnt]</code>	Specify the output pin count. Default is <code>dont_care</code> .
<code>[-bit_width]</code>	Specify cell <code>bit_width</code> attribute. Default is <code>any</code> .
<code>[-op]</code>	Specify the operand.  Applies to <code>-ipin_cnt</code> , <code>-opin_cnt</code> , <code>-bit_width</code>  Default is <code>eq</code> .
<code>[-cols]</code>	Columns to show in the report.
<code>[-cols_add]</code>	Columns to add to the default columns.
<code>[-cols_del]</code>	Columns to delete from the default columns.
<code>[-cond]</code>	Select table with the specified when <i>&lt;condition&gt;</i> .

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - report\_libcells

---

<code>[-partial_cond]</code>	Select table that contains the specified partial <when> condition.
<code>[-rail]</code>	Use the specified power rail to report the value.
<code>[-ipin]</code>	Use the specified input pin of the cell.
<code>[-opin]</code>	Use the specified output pin of the cell.
<code>[-slew_margin]</code>	Applies to <code>load_threshold</code> . The default <code>slew_margin</code> is 0.0.
<code>[-weights]</code>	<p>This option applies to <code>-cols score</code>. Specify the weight in format:</p> <p><code>&lt;prop&gt;=&lt;val&gt;</code></p> <p>Default is:</p> <p><code>area=1 delay=2 transition=1 leakage=1</code> <code>internal=1</code></p>
<code>[-infer_x1_cell_per_cell_type]</code>	<p>Infer <code>x1_cell</code> for each cell type. Drive strength of the <code>x1_cell</code> should not be greater than the <code>-ds_margin</code> option given below.</p> <p>This option applies to <code>-cols score</code></p> <p>Default is false.</p>
<code>[-ds_margin]</code>	<p>Suboption of <code>-infer_x1_cell_per_cell_type</code>.</p> <p>Specify the percentage deviation allowed from library <code>x1_cell</code>. Default is 0.1 (10%).</p>
<code>[-sort_by]</code>	Sort by specified column. By default, the report is sorted by <code>drive_strength</code> .
<code>[-out]</code>	Save the output data in the specified file.

### Example(s)

- `report_libcells -cell_type buf -lib slow -cols drive_strength load_threshold rf_ratio`
- `report_libcells -cells [get_library_cells -cell_type flop]`
- `report_libcells -cells $x1_comb_cells -slew_margin 0.2 -lib typical`  
#-----  
# cell : area iCnt drive max\_cap load\_thresh avg\_icap rf\_fac  
#-----

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - report\_libcells

---

XNOR3XL	:	7.5200	3	0.8174	0.1431	2.000e-01	0.0013	1.4840
DLY1X1	:	3.0800	1	0.9727	0.2569	2.500e-01	0.0006	1.0120
DLY3X1	:	8.2100	1	0.9727	0.2590	2.500e-01	0.0007	1.0140
NAND4BX1	:	2.3900	4	0.9727	0.0717	2.500e-01	0.0008	0.2990
NAND3BX1	:	2.0500	3	0.9732	0.0959	2.500e-01	0.0008	0.3900

#-----

In the report:

- ☐ cell - libcell name
- ☐ area - cell area
- ☐ iCnt - cell input pin count
- ☐ drive - cell drive strength
- ☐ max\_cap - maximum output capacitance
- ☐ load\_thresh - load threshold beyond slew degradation > slew\_margin
- ☐ avg\_icap - average input pin capacitance
- ☐ rf\_fac - rise fall ratio

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Library Read and Analysis](#)

## report\_cell\_tables

Displays specified cell table.

### Syntax

```
report_cell_tables \  
  [-cell] <cell> [-lib <lib>] [-domain <domain>]  
  [-ldb_libpath [/libraries/][<domain>/]<lib>]  
  [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]  
  [-ipin <input_pin>+]  
  [-opin <output_pin>+]  
  [-table_type  
    {cell_rise|cell_fall|trans_rise|trans_fall|rise_power|fall_power}]+  
  [-delay|-transition |-internal_power|-drive_res]  
    [-sense rise|fall|avg|both]  
    [-mode avg|max|min]  
  [-slew <slew>+]  
  [-load <load>+]  
  [-out <outfile>]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - report\_cell\_tables

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-cell]</code>	Name of cell.
<code>[-lib]</code>	Name of library.
<code>[-domain]</code>	Name of library domain.
<code>[-ldb_libpath]</code>	Full vdir path of library.
<code>[-ldb_cellpath]</code>	Full vdir path of cell.
<code>[-ipin]</code>	Input pin name.
<code>[-opin]</code>	Output pin name.
<code>[-table_type]</code>	Type of table to display.
<code>[-delay -transition   -internal_power -drive_res]</code>	This has the following suboptions: <ul style="list-style-type: none"><li>■ <code>-sense</code> - The default sense is average of rising and falling directions.</li><li>■ <code>-mode</code> - Applies to <code>-drive_res</code> option. The default mode is average.</li></ul>
<code>[-slew]</code>	List of slew values.
<code>[-load]</code>	List of load values.
<code>[-out]</code>	Redirect the output to the specified file. By default, the output is directed to stdout.

#### Example(s)

- `report_cell_tables BUFX1 -table_type trans_rise trans_fall`
- `report_cell_tables BUFX4 -drive_res -sense both`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Library Read and Analysis](#)

## set\_memory\_cell

Tags (annotate) information on the memory.

### Syntax

```
set_memory_cell \  
[-cell] <cell>  
  [-lib <lib>]  
  [-domain <domain>]  
  [-ldb_libpath [/libraries/][<domain>/]<lib>]  
[-ldb_cellpath [/libraries/][<domain>/]<lib>]<cell>]  
[-clock <glob_clock_port>]  
-addr <glob_rd_addr_port>+  
  [-rd_addr <glob_rd_addr_port>+]  
  [-wr_addr <glob_wr_addr_port>+]  
-mem_enable <glob_rd_enable_port>+  
-wr_enable <glob_wr_enable_port>+  
-din <glob_data_in_port>+  
[-dout <glob_data_out_port>+]  
[-depth num]  
[-width num]
```



## Joules Command and Attribute Reference

### Library Read and Analysis Commands - set\_memory\_cell

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-cell]</code>	Name of cell.
<code>[-lib]</code>	Suboption of <code>-cell</code> . Name of library.
<code>[-domain]</code>	Suboption of <code>-cell</code> . Name of library domain.
<code>[-ldb_libpath]</code>	Suboption of <code>-cell</code> . Full vdir path of library.
<code>[-ldb_cellpath]</code>	Full vdir path of cell.
<code>[-clock]</code>	Clock port.
<code>-addr</code>	Address port.
	This has the following suboptions:
	■ <code>-rd_addr</code> - read address port
	■ <code>-wr_addr</code> - write address port
<code>-mem_enable</code>	Read-enable port.
<code>-wr_enable</code>	Write-enable port.
<code>-din</code>	Input port.
<code>[-dout]</code>	Output port.
<code>[-depth]</code>	Depth of memory address port. The default depth is: <code>2**width(rd_addr)</code>
<code>[-width]</code>	Width of memory address port. The default width is: <code>width of dout</code>

#### Example(s)

```
■ set_memory_cell CDK_S256x12 \  
  -addr ADDR* -din DATA_IN -clock CLOCK \  
  -wr_enable WR_EN* -mem_enable ENABLE \  
  -depth 256 -width 12
```

#### Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### Library Read and Analysis Commands - set\_memory\_cell

---

#### **Related Topics**

- [Library Read and Analysis](#)

## report\_joules\_memory\_cells

Infers memory cells from library.

**Note:** Previously named report\_memory\_cells.

### Syntax

```
report_joules_memory_cells \  
  [-tag_as_memory]  
  [-memory2cell_area_multiple <factor>]  
  [-base_cell <cell>]  
  [-min_word_width <integer>]  
  [-min_addr_width <integer>]  
  [-match_rom]  
  [-lib <lib_name>]  
  [-domain <domain_name>]  
  [-ldb_libpath [/libraries/][<domain>/][<lib>/] ]  
  [-name <cell_name_regexp>]
```

### Options and Arguments

[-h]	Displays help for all options.
[-tag_as_memory]	Tag the inferred cell as memory.
[-memory2cell_area_multiple]	Ratio of memory to cell area. The default ratio is 100.0.
[-base_cell]	Use area of this cell as unit for area comparison.
[-min_word_width]	Minimum data width. Default width is 4.
[-min_addr_width]	Minimum address width. Default width is 4 units.
[-match_rom]	Specify when RAMs have no input data bus. Default is false.
[-lib]	Name of library.
[-domain]	Name of library domain.
[-ldb_libpath]	Full vdir path of library.
[-name]	Name of cell. Default is *.

### Example(s)

- `report_joules_memory_cells -name {CDK_*}`
- `report_joules_memory_cells -memory2cell_area_multiple 200 -base_cell DFFX1`

## **Return Value**

0 indicates success, 1 indicates failure in execution.

## **Related Topics**

- [Library Read and Analysis](#)

## report\_x1\_drive\_cell

Searches the design library for probable X1 cells

### Syntax

```
report_x1_drive_cell [-lib] <lib_name> [-domain <domain>] \  
  [-ldb_libpath [/libraries/][<domain>/]<lib>/]  
  [-has_x1_cell]  
  [-use_cell_types  
    {memory|flop|latch|icgc|comp|shift|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|  
    oa|oai|mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps|scan|unknown}+]  
  [-force]
```

### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-lib]</code>	Search for the X1 cell in the specified library.
<code>[-domain]</code>	Search for the X1 cell in the specified domain.
<code>[-ldb_libpath]</code>	Full vdir path of library to search for X1 cell.
<code>[-has_x1_cell]</code>	Specify this option if the library contains cells of drive strength 0.5. By default, it is set to false.
<code>[-use_cell_types]</code>	Infer X1 cell of the specified cell type. Default cell types are inv, nand, nor, buf, and, or, flop.
<code>[-force]</code>	Specify to force x1_cell inferencing. Default is false.

### Example(s)

```
■ report_x1_drive_cell -lib $lvt_lib
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

■ [Activity Processing and Reporting](#)

## compare\_memory

Compares two libraries of the same memory, presumably characterized for different corners.

### Syntax

```
compare_memory \  
  [-ldb_libpath <x_ldb_libpath> <y_ldb_libpath>+]  
  [-lib <xlib> <ylib>+] [-domain <lib_domain>]  
  [-cells <cell>+]  
    [-name <cell_name_regexp>]  
  [-match_names <lib1_mask> <lib2_mask>]  
  [-arc_prop  
    delay|transition|internal_power|setup|hold|recovery|removal|min_pulse_width]  
    [-sense {rise|fall|avg|both}]  
    [-constraint {rise|fall|avg}]  
  [-slew <slew>]  
  [-load <load>]  
  [-cols {prop|pin|related_pin|slew|load|sense|constraint|rail|when}+]  
  [-diff_threshold <pct>]  
  [-out <f_data>]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - compare\_memory

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-ldb_libpath]</code>	Full vdir path of the libraries to compare.
<code>[-lib]</code>	Name of the libraries to compare.
<code>[-domain]</code>	Name of library domain.
<code>[-cells]</code>	Specify the cells for comparison. By default, all memory cells are considered.
<code>[-name]</code>	Suboption of <code>-cells</code> . Specify the cell name pattern. The default is <code>*</code> .
<code>[-match_names]</code>	Match the library names with the specified patterns.
<code>[-arc_prop]</code>	Compare the specified property. By default, all properties of the specified libraries are compared.
<code>[-sense]</code>	Suboption of <code>arc_prop</code> .  Specify the sense of <code>-arc_prop</code> , for example, <code>setup_rise</code> .  The default is average.
<code>[-constraint]</code>	Suboption of <code>arc_prop</code> .  Specify the table to use, <code>rise_constraint</code> , <code>fall_constraint</code> , or <code>average</code> (default).  This option applies only to:  <code>-arc_prop</code> <code>setup hold recovery removal pulse_width</code>
<code>[-slew]</code>	Use the specified slew for comparison.
<code>[-load]</code>	Use the specified load for comparison.
<code>[-cols]</code>	List specified columns in the comparison table. By default, the following columns are listed:  <code>prop pin related_pin slew load sense</code>
<code>[-diff_threshold]</code>	Show entries where the difference is greater than the specified value <code>&lt;pct&gt;</code> . By default, all entries are displayed.
<code>[-out]</code>	Save the output plot data in the specified file.

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - compare\_memory

---

#### Example(s)

- `compare_memory -arc_prop setup -cells RAM16Kx32 -ldb_libpath $libpath1 $libpath2 -diff_threshold 0.05 ;# show setup variance with diff > 5%`
- `compare_memory -arc_prop delay -cells RAM8Kx16 -ldb_libpath $libpath1 $libpath2 -diff_threshold 0.05 -cols prop pin related_pin slew load -arc_prop delay -out joules_work/compare_memory.rpt`

#### Return Value

-1 indicates error in execution.

#### Related Topics

- [Library Read and Analysis](#)



## scrub\_library

Scores cells in a library and selects the best cells.

- Scores are computed based on cell area, delay, transition, leakage\_power, internal\_power values, setup, hold, avg\_ipin\_cap values and weights specified using -weights option.
- By default, cells are bucketized by cell type and input pin count. Use -buckets option to change this.
- Cells in each bucket are clustered by their drive\_strength. By default, cell with highest score is kept. Use -cells\_per\_ds\_cluster or -pct\_keep option to change this.
- If -buckets option is used, you can use -per\_bucket\_cells\_per\_ds\_cluster or -per\_bucket\_pct\_keep options to specify cells\_per\_ds\_cluster and pct\_keep values for each specified bucket.
- Script file with cell dont\_use commands is generated in joules\_work/dont\_use\_<lib\_name>.tcl, where <lib> = logical name of the library. Use the -f\_script option to change this.

## Syntax

```
scrub_library \  
  [-handle handle]  
  [-work_dir work_dir]  
  [-set]  
    [-lib library_name+] [-domain domain_name+]  
    [-ldb libpath [/libraries/][domain/]lib]  
    [-cell_type {memory|flop|latch|icgc|comp|shift|buf|inv|and|nand|or|nor|  
                xor|xnor|ao|aoi|oa|oai|mux|tri||pad|fadd|hadd|delay|iso|  
                srpg|ls|els|ps|bbox|scan|unknown}+]  
    [-cell_group <comb|seq|memory>]  
    [-ipin_cnt cnt[:cnt2][,cnt3]]  
    [-weights {prop=val}+]  
      (prop = area|delay|transition|leakage_power|internal_power|setup|hold  
        avg_ipin_cap)  
    [-cells_per_ds_cluster num]  
    [-pct_keep pct]  
    [-buckets {cell_type[:ipin_cnt]}+]  
      (cell_type = memory|flop|latch|icgc|comp|shift|buf|inv|and|nand|or|nor|  
        xor|xnor|ao|aoi|oa|oai|mux|tri||pad|fadd|hadd|delay|iso|  
        srpg|ls|els|ps|bbox|scan|unknown)  
      [-per_bucket_cells_per_ds_cluster num+]  
      [-per_bucket_pct_keep pct+]  
    [-f_config file]  
    [-slew slew]  
    [-load slew]  
  [-scrub]  
    [-handle handle]  
    [-pset pset]  
    [-f_config file]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - scrub\_library

---

```
[-force]
[-action script|live]
[-mark avoid|keep|both]
[-f_script file]
[-report summary|table|both]
[-handle handle]
[-f_report file]
[-append]
[-cols_add <transition_rise|transition_fall|delay_rise|delay_fall>]
[-plot]
[-handle handle]
[-pset pset]
[-lines {param[:ltype]}+]
  param = area|delay|transition|leakage_power|internal_power|setup|hold
          avg_ipin_cap
  ltype = orig|scored|both
[-buckets {cell_type[:ipin_cnt]}+]
  (cell_type = memory|flop|latch|icgc|comp|shift|buf|inv|and|nand|or|
              nor|xor|xnor|ao|aoi|oa|oai|mux|tri||pad|fadd|hadd|delay|
              iso|srpg|ls|els|ps|bbox|scan|unknown)
[-show_cell]
[-save dir]
[-png f_png]
```

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - scrub\_library

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-handle]</code>	Required run handle for -scrub, -plot options. If not specified for -set, a four-letter handle is auto generated.
<code>[-work_dir]</code>	Directory for run data and script files. Default directory is ./scrub_library_work_<handle>.
<code>[-set]</code>	Set run parameters
<code>[-lib]</code>	Suboption of -set. List of libraries.
<code>[-domain]</code>	Suboption of -set. List of library domains.
<code>[-ldb_libpath]</code>	Suboption of -set. Full vdir path of library.
<code>[-cell_type]</code>	Suboption of -set. Type of cells. By default, all cell types are considered.
<code>[-cell_group]</code>	Suboption of -set. Group of cells. By default, all groups are considered.
<code>[-ipin_cnt]</code>	Suboption of -cell_group. Specified pin count or range.
<code>[-weights]</code>	Suboption of -set. Scoring weights. Default: area=1 delay=2 transition=1 leakage_power=1 internal_power=1.

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - scrub\_library

---

<code>[-cells_per_ds_cluster]</code>	<p>Suboption of <code>-set</code>.</p> <p>Number of cells per DS cluster.</p> <p>Default is 1.</p>
<code>[-pct_keep]</code>	<p>Suboption of <code>-set</code>.</p> <p>Keep <code>&lt;pct&gt;%</code> cells.</p> <p>Default setting is to keep cell with highest score in each DS cluster.</p>
<code>[-buckets]</code>	<p>Suboption of <code>-set</code>.</p> <p>Specify bucket(s) in the format:</p> <p><code>&lt;cell_type&gt;[:&lt;ipin_cnt&gt;]</code></p>
<code>[-per_bucket_cells_per_ds_cluster]</code>	<p>Suboption of <code>-buckets</code>.</p> <p><code>cells_per_ds_cluster</code> for each of the specified bucket.</p>
<code>[-per_bucket_pct_keep]</code>	<p>Suboption of <code>-buckets</code>.</p> <p><code>pct_keep</code> value for each of the specified bucket.</p>
<code>[-f_config]</code>	<p>Suboption of <code>-set</code>.</p> <p>Output configuration file with recorded run settings.</p> <p>Default file is <code>&lt;work_dir&gt;/scrub_library_&lt;handle&gt;.tcl</code>.</p>
<code>[-slew]</code>	<p>Suboption of <code>-set</code>.</p> <p>Default is mid slew value of <code>x1_cell</code> of each cell class LUT.</p>
<code>[-load]</code>	<p>Suboption of <code>-set</code>.</p> <p>Default is mid load value of <code>x1_cell</code> of each cell class LUT.</p>
<code>[-scrub]</code>	<p>Scrub cells in specified buckets.</p>
<code>[-handle]</code>	<p>Suboption of <code>-scrub</code>.</p> <p>Handle for scrub settings.</p>

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - scrub\_library

---

<code>[-pset]</code>	<p>Suboption of <code>-scrub</code>.</p> <p>Scrub specified pset of the handle.</p>
<code>[-f_config]</code>	<p>Suboption of <code>-scrub</code>.</p> <p>Input configuration file with run settings.</p> <p>The default file is <code>&lt;work_dir&gt;/scrub_library-&lt;handle&gt;.tcl</code>.</p>
<code>[-force]</code>	<p>Suboption of <code>-scrub</code>.</p> <p>Specify for force scrubbing.</p>
<code>[-action]</code>	<p>Specify scrub action to take: <code>-action script</code> generates a script while <code>-action live</code> marks cells avoid in live session.</p>
<code>[-mark]</code>	<p>Suboption of <code>-action</code> to decide the selection of cells for marking 'avoid'.</p> <p>For example, for a library with 150 cells, the tool may decide 50 cells should be marked avoid. In that case,</p> <ul style="list-style-type: none"><li>■ <code>-mark avoid</code>: will only mark 50 cells as <code>avoid = true</code></li><li>■ <code>-mark keep</code>: will mark 100 cells as <code>avoid = false</code></li><li>■ <code>-mark both</code>: will mark 50 cells as <code>avoid = true</code>, and 100 cells <code>avoid = false</code></li></ul>
<code>[-f_script]</code>	<p>Suboption of <code>-action</code>.</p> <p>Specify script file.</p> <p>Default file is <code>joules_work/dont_use_cells.tcl</code>.</p>
<code>[-report]</code>	<p>Specify the type of scrub report - summary, table, or both.</p> <p>Default is summary.</p>
<code>[-handle]</code>	<p>Suboption of <code>-report</code>.</p> <p>Scrub run handle.</p>
<code>[-f_report]</code>	<p>Suboption of <code>-report</code>.</p> <p>Specify report file.</p>

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - scrub\_library

---

<code>[-append]</code>	Suboption of <code>-report</code> .  Append if file exists. Applies to both <code>-f_script</code> and <code>-f_report</code> .  By default, the file is overwritten.
<code>[-cols_add]</code>	Suboption of <code>-report</code> .  Add columns to report table.
<code>[-plot]</code>	Specify to plot scrub results.
<code>[-handle]</code>	Suboption of <code>-plot</code> .  Scrub run handle.
<code>[-pset]</code>	Suboption of <code>-plot</code> .  Plot specified pset.
<code>[-lines]</code>	Suboption of <code>-plot</code> .  Specify plot lines.
<code>[-buckets]</code>	Suboption of <code>-plot</code> .  Plot specified buckets.
<code>[-show_cell]</code>	Suboption of <code>-plot</code> .  Show cells. By default, it is set to false.
<code>[-save]</code>	Suboption of <code>-plot</code> .  Specify to save the gnuplot data or command files in directory.
<code>[-png]</code>	Suboption of <code>-plot</code> .  Specify to save PNG plot.

### Example(s)

- # Step 1. set scrub params and associate a handle  
`scrub_library -handle slow_flop -set -lib slow -cell_type flop -cells_per_ds_cluster 2`
- # Step 2. do the scrubbing  
`scrub_library -handle slow_flops -scrub`

## Joules Command and Attribute Reference

### Library Read and Analysis Commands - scrub\_library

---

- # Step 3. generate avoid script  
scrub\_library -handle slow\_flops -action script -f\_script avoid\_flops.tcl
- # Step 4. report scrub results  
scrub\_library -handle slow\_flops -report summary table
- # Step 5. plot scrub results  
scrub\_library -handle slow\_flops -plot

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Scrubbing Libraries](#)

## report\_libcell\_arc

Reports libcell arcs in the form of tuple of *<From>* *<To>* *<When>* for specified cell.

### Syntax

```
report_libcell_arc \  
  [-cell] <cell_name>  
  [-lib <library_name>]  
  [-domain <lib_domain_name>]  
  [-ldb_libpath /libraries/domain/lib]  
  [-ldb_cellpath /libraries/domain/lib/cell]  
  [-inpin <bool>]
```

### Options and Arguments

[-cell]	Specify the cell for which you want the arc info. This option is mandatory.
[-lib]	Specify lib name for the cell.
[-domain]	Specify domain name for the cell.
[-ldb_libpath]	Specify the full vdir path of lib in form of /libraries/domain/lib
[ldb_cellpath]	Specify the full vdir path of cell in form of /libraries/domain/lib/cell
[-inpin]	Specify whether to include inpin. Default: false

### Examples

- `report_libcell_arc -cell ADDFHX2 -lib slow`
- `report_libcell_arc -cell ADDFHX2 -domain lib_1p08v`
- `report_libcell_arc -cell ADDFHX2 -ldb_libpath [vfind / -library slow]`
- `report_libcell_arc -ldb_cellpath /libraries/lib_1p08v/slow/ADDFHX2`

### Return Value

0 indicates success, 1 indicates failure in execution.



## report\_memory\_frequency

Generates a table containing the read/write frequency of a memory.

### Syntax

```
report_memory_frequency \  
  [-inst <vdir path of an inst>+]  
  [-root <vdir path of a hier inst or design dir>]  
  [-stim <stimId>]
```

### Options and Arguments

[-inst]	Returns the read or write frequencies of the instance.
[-root]	Returns the frequency of all memory instances within the hierarchy.
[-stim]	Specify the stim ID for which to set the alias. Default stim is /stim#1.

### Examples

```
■ report_memory_frequency -inst /top/m/RAM_256x12
```

## **report\_user\_set\_memory\_params**

Reports the user set memory parameters.

### **Syntax**

```
report_user_set_memory_params \  
  [-lib_cell <vdir path of libcell>]
```

### **Options and Arguments**

[-lib_cell]	Returns the user set memory parameters for this libcell.
-------------	--

### **Examples**

```
■ report_user_set_memory_params -libcell /ld/libcell
```

## get\_analysis\_views

Returns analysis views in the design.

**Note:** This command works only in CUI/Stylus mode.

### Syntax

```
get_analysis_views \  
  [-all]  
  [-view_type {timing|setup|hold|power|leakage|dynamic}+]  
  [-mode <mode>+]
```

### Options and Arguments

<code>[-all]</code>	Returns all views in the design.
<code>[-view_type]</code>	Returns all views of the given <code>view_type</code> .
<code>[-mode]</code>	Returns analysis view corresponding to the given mode.

### Examples

- `get_analysis_view ;# get current view`
- `get_analysis_views -all ;# get all views`
- `get_analysis_views -view_type power ;# get power related views`
- `get_analysis_views -mode <mode> ;# get views that support specified mode`

## **get\_sdc\_units**

Returns the units of time and capacitance.

### **Syntax**

```
get_sdc_units  
  [-capacitance]  
  [-time]
```

### **Options and Arguments**

<code>[-capacitance]</code>	Returns capacitance units as factor in femtofarads.
<code>[-time]</code>	Returns time units as factor in picoseconds.

### **Example(s)**

- `get_sdc_units -time ; # Returns time unit is picoseconds`
- `get_sdc_units ; # Returns time unit is picoseconds, capacitance in femtofarads`

---

## Design Read and Elaboration Commands

---

- read\_hdl
- read\_power\_intent
- elaborate

## read\_hdl

Loads one or more HDL files in the order given into memory. Files containing macro definitions should be loaded before the macros are used. Otherwise, there are no ordering of constraints.

If you do not specify either the v1995, v2001, sv or vhdl as the language, the default language format is that specified by the `hdl_language` attribute. The default value for the `hdl_language` attribute is v2001.

The HDL files can contain structural code for combining lower level modules, behavioral design specifications, or RTL implementations.

You can automatically read in or write out a compressed HDL file in gzip format.

When you load a parameterized Verilog module or VHDL architecture, each parameter in the module or architecture will be identified as an `hdl_parameter` object and located under `../architecture_name/parameters`. The default `hdl_parameter` attribute value for these parameters will be true.

## Syntax

```
read_hdl [-language <string>] [-library <string>] [-netlist] [-define <string>]+  
[<string>+] [-f <string>]
```

## Joules Command and Attribute Reference

### Design Read and Elaboration Commands - read\_hdl

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-language]</code>	Specifies the language of HDL files. The following languages can be used as string: v1995, v2001, sv, or vhdl.
<code>[-library]</code>	Specifies the name of a VHDL or Verilog library.
<code>[-netlist]</code>	Specifies that HDL files conform to structural Verilog-1995 and are intended to be used in mixed input elaboration mode.
<code>[-define]</code>	Defines the Verilog macro.
<code>[&lt;string&gt;+]</code>	Names of HDL files to read.
<code>[-f]</code>	Name of list file for reading files from simulation environment.

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Design and Power Intent - Read and Elaboration](#)

## read\_power\_intent

Reads the power intent files for a design.

### Syntax

```
read_power_intent [-module <string>] [-1801] [-cpf] [-version <string>]  
<string>+
```

### Options and Arguments

[-h]	Displays help for all options.
[-module]	Name of top module of the power intent file.
[-1801]	Specifies that the power intent file is a 1801 file.
[-cpf]	Specifies that the power intent file is a CPF file.
[-version]	Version of the power intent file.
<string>+	List of power intent file to read.

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Design and Power Intent - Read and Elaboration](#)



## **elaborate**

Creates the design hierarchy. Use this command after:

- ☐ Reading the library and creating necessary library domains
- ☐ Reading the HDL design
- ☐ Reading the power intent

For more information, refer to `elaborate` in *Genus Command Reference*.

### ***Related Commands***

`elaborate`

### ***Related Topics***

- Design and Power Intent - Read and Elaboration

## **Joules Command and Attribute Reference**

### Design Read and Elaboration Commands - elaborate

---

---

## Power Intent Commands

---

- get\_domain\_power
- get\_power\_domains
- get\_power\_modes
- get\_cell\_power

## **get\_domain\_power**

Returns leakage, internal, switching, and total power for specified power and clock domains.

### **Syntax**

```
get_domain_power -clock_domain prim-clock-net|-power_domain prim-clock-net  
  [-frame frame_id]  
  [-power_mode power_mode]  
  [-power_rail power_rail]  
  [-category memory|register|latch|logic|bbox|clock|pad|pm]  
  [-add_clkpin_power]  
  [-skip_port_switching_power]  
  [-glitch_power <TG|IG>]
```

## Joules Command and Attribute Reference

### Power Intent Commands - get\_domain\_power

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>-clock_domain   -power_domain</code>	Return power quad for the specified power or clock domain.
<code>[-frames]</code>	Return power quad for the specified frame ID. By default, average of all frames in SDB is considered.
<code>[-power_mode]</code>	Return power quad for the specified power mode as defined in the CPF/1801 power intent. Default power mode is dont care.
<code>[-power_rail]</code>	Return power quad for the specified power rail as defined in the CPF/1801 power intent. Default power rail is dont care.
<code>[-category]</code>	Applies only to hierarchical instance. If specified, power quad for the specified category is returned. Default is all.
<code>[-add_clkpin_power]</code>	Applies only to hierarchical instances. If specified, a fifth element, which is the clock pin power of all sequential elements in the specified hierarchical instance, is added to the return list. Default is false.
<code>[-skip_port_switching_power]</code>	If specified, the primary ports' switching power is not added to the switching power section. Default is false.
<code>[-glitch_power]</code>	Return the transport or inertial glitch power. Default is dont care.

#### Example(s)

- `get_domain_power -clock_domain /cpu_10bit/clk -power_mode pwr_all_on`
- `get_domain_power -power_domain PD_fsm -category logic`

#### Return Value

-1 indicates failure in execution.

#### *Related Topics*

- [Power Analysis and Reporting](#)

## get\_power\_domains

Returns power domains in the design.

### Syntax

```
get_power_domains [-root] <design>+
```

### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-root]</code>	Root module of the design.
<code>&lt;-design&gt;+</code>	Return the power domains for the specified design. By default, power domains for the current design are reported.

### Example(s)

- `get_power_domains ; # get power domains for current design`
- `get_power_domains -root /cup_10bit`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Clock Gating](#)

## get\_power\_modes

Returns power modes in the design.

### Syntax

```
get_power_modes [-root] <design>+
```

### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-root]</code>	Return the power modes for the specified design. By default, power modes for the current design are reported.

### Example(s)

- `get_power_modes ;` return power modes for current design
- `get_power_modes -root /cup_10bit`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Power Structures in Design](#)

## get\_cell\_power

Returns cell power in the following format:

<leakage> <internal> <switching> <total> \{\<ipin>:<val>\}+

### Syntax

```
get_cell_power [-cell <cell_name>]
               [-lib <library_name>]
               [-domain <lib_domain_name>]
               [-ldb_libpath [/libraries/][<domain>/]<lib>]
               [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]
               [-slew \{\{\<ipin>|default\}:<val>\}+\}
               [-load \{\{\<opin>|default\}:<val>+\}+\}
               [-activity \{\{\<pin>|default\}:<duty>:<freq>\}+\}
               [-post_cts_clock]
```

### Options and Arguments

[-h]	Displays help for all options.
[-cell]	Specify name of the cell for power report.
[-lib]	Specify library name for the cell for power report.
[-domain]	Specify domain name for the cell for power report.
[-ldb_libpath]	Specify full vdir path of the library.
[-ldb_cellpath]	Specify full vdir path of the cell.
[-slew]	List of <ipin>:<slew> tuples. Keyword default can be used in place of <ipin>. Slew value is calculated in picoseconds.
[-load]	List of <opin>:<load> tuples. Keyword default can be used in place of <opin>. Load value is calculated in femtofarads.
[-activity]	List of <pin>:<duty>:<freq> triples. Keyword default can be used in place of <pin>. Freq value is considered in Hz
[-post_cts_clock]	Mark clock network as non-ideal.

### Example(s)

```
■ get_cell_power AOI2BB2X2 -activity {default:0.5:5000}
```



## Joules Command and Attribute Reference

### Power Intent Commands - get\_cell\_power

---

■ `get_cell_power AOI2BB2X2 -activity {{A0:0.25:2500} {default:0.5:5000}} -slew {{A0:30} {default:12}}`

#### Return Value

-1 indicates failure in execution.

#### Related Topics

■ [Power Structures in Design](#)

## **Joules Command and Attribute Reference**

### Power Intent Commands - get\_cell\_power

---

---

## Simulation Interface Commands

---

- compare\_sim
- delete\_sdb
- generate\_activity\_model
- get\_sdb\_alias
- merge\_stimulus
- read\_stimulus
- read\_vf
- replay\_rtl\_stim\_to\_gate
- report\_inst\_property
- reset\_pin\_waveform
- reset\_skip\_assertion
- scan\_stimulus
- set\_pin\_waveform
- set\_rtl\_stim\_to\_gate\_config
- set\_sdb\_alias
- write\_forward\_saif
- write\_sdb
- write\_vf
- xreplay

## **compare\_sim**

Compares two or multiple stimulus and reports the comparison for the specified object types between them.

### **Syntax**

```
compare_sim \  
  [-stims stim1 stim2]  
  [-root hier_inst]  
  [-signal_file file]  
  [-exclude_signal_file file]  
  [-obj_handle]  
  [-out f_rpt]  
  [-show_details]  
  [-filter_time_axis]  
  [-filter_x z_transitions]  
  [-correlation_threshold]  
  [-x_value 0|1|x]  
  [-z_value 0|1|z]  
  [-status_threshold threshold_value]
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - compare\_sim

---

#### Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-stims]</code>	Specify the stimulus IDs to compare.
<code>[-root]</code>	Specify the list of pins under hierarchical instance to compare.  Default: design root
<code>[-signal_file]</code>	Specify the signal file containing pins with regular expressions.
<code>[-exclude_signal_file]</code>	Specify the file containing pins, ports, and instances to be excluded for comparison.
<code>[-obj_handle]</code>	Specify the object type and pin direction whose status is to be reported.  The option accepts the following format: <code>&lt;obj_type&gt;:&lt;pin_dir&gt;</code>  Where <code>obj_type</code> : mem, reg, latch, icgc, or port and <code>pin_dir</code> : in, out, inout, or all  The default is <code>port:out</code> .
<code>[-out]</code>	Saves the report in specified file.
<code>[-show_details]</code>	Displays a detailed report.
<code>[-filter_time_axis]</code>	Filters the time stamp and compares only the transition order for each value.
<code>[-filter_x_z_transitions]</code>	Filters the X and Z transition from both the stimulus for all signals for comparison.
<code>[-correlation_threshold]</code>	Reports the signal if its correlation is less than the given threshold.
<code>[-x_value]</code>	Specify the x value for transition.
<code>[-z_value]</code>	Specify the z value for transition.
<code>[-status_threshold]</code>	Changes the pass or fail status based on the specified value.

#### Example(s)

■ `compare_sim /TestHash /TestGCF`

## Joules Command and Attribute Reference

### Simulation Interface Commands - compare\_sim

---

■ `compare_sim /TestHash /TestGCF -obj_handle reg mem:out reg:in`

## **delete\_sdb**

Removes a stimulus database (SDB) from the disk.

### **Syntax**

```
delete_sdb \  
  [-stims <stim_id>+]
```

### **Options and Arguments**

<code>[-h]</code>	Displays help for all options.
<code>[-stims]</code>	Specify the stim IDs to remove from SDB.

### **Example(s)**

- `delete_sdb ;# remove all stims from SDB`
- `delete_sdb -stims {/stim#5} ;# remove /stim#5 from SDB`

### **Return Value**

0 indicates success, 1 indicates failure in execution.

### **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)

## generate\_activity\_model

Generates a merged TCF file for optimization for next stage of synthesis or PNR.

### Syntax

```
generate_activity_model \  
-rtl_stim {<f_rtl_stim>}+}  
[-stim_format {<vcd|shm|phy|fsdb|vwdb>}+}]  
[-dut_instance {<dut-inst-name>}+}]  
[-design_root <root>]  
[-tb_design_tuple {<dut> <root>}]  
[-start {<window-start-time>}+}]  
[-end {<window-end-time>}+}]  
[-frame_count <cnt>]  
[-interval_size {<{<time-val>}+}>}+}]  
[-interval_list {<{<time-val>[:<time-val>]}+}>}+}]  
  <time-val> = <num>[<unit>]  
  <unit> = ms|us|ns|ps|fs  
[-cycles {<{<num> <vdir_path_of_design_signal> [<edge_type>]}+}>}+}]  
  (extract frames of size = <num> * period of specified signal)  
  (edge_type=pos|neg|none)  
[-peak_interval {<{<peak_interval>}+}>}+}]  
[-multi_host_read]  
[-x_value 0|1|ignore|x]  
[-initial_x_value 0|1|x]  
[-resim_cg_enables]  
[-stim_annotation {<obj_type>[:<pin_type>]}+}]  
  (<obj_type> = port|seq|comb|reg|mem|icgc|latch|bbox|all|none|preserve|  
  state)  
  (<pin_type> = in|out|both)  
[-elab_db <f_elab>]  
-mapped_db <f_genus_db> | -netlist <f_netlist>  
-top_design <f_top>  
-sdc <f_sdc>  
  (<f_genus_db> = Genus mapped DB, <f_netlist> = 3rd party netlist file,  
  <f_top> = design top with netlist, <f_sdc> = sdc file with netlist)  
[-rule_proc <Tcl_proc_that_applies_rtlstim2gate_rules>]  
[-map_file <map_file> [conformal|genus|dc]]  
[-peak_window_cnt <cnt>]  
[-activity avg|max]  
[-out <file_name>]  
[-write_format <tcf|saif>]  
[-do_not_write_top_instance]
```



## Joules Command and Attribute Reference

### Simulation Interface Commands - generate\_activity\_model

---

#### Options and Arguments

<code>[-rtl_stim]</code>	List of RTL stimuli files.
<code>[-stim_format]</code>	Specify stimulus format.
<code>[-dut_instance]</code>	Specify DUT instance name in testbench for each specified RTL stimulus.
<code>[-design_root]</code>	Apply activity on specified design hierarchy. Default value is design root.
<code>[-tb_design_tuple]</code>	Map stimulus <code>&lt;dut&gt;</code> to design <code>&lt;root&gt;</code> .
<code>[-start]</code>	Specify window start time, for example <code>24ns</code> . Default value is simulation start time.
<code>[-end]</code>	Specify window end time, for example <code>10us</code> . Default value is simulation end time.
<code>[-frame_count]</code>	Extract <code>&lt;cnt&gt;</code> equal sized frames. These can be combined with <code>-cycles</code> or <code>-interval_size</code> options. Default value is <code>10</code> .
<code>[-interval_size]</code>	Extract fixed sized frames.
<code>[-interval_list]</code>	Extract variable sized frame(s), example <code>5ns, 5e-9</code> . Default unit is <code>sec</code> .
<code>[-cycles]</code>	Extract frames based on number of cycles of a specified signal. Default is <code>none</code> . If you specify <code>pos neg</code> , then frames are created at <code>pos neg</code> edge of clock. If you specify <code>none</code> , then frames are created using the standard method.
<code>[-peak_interval]</code>	Specify peak activity window interval. By default, tool will automatically identify peak activity window.
<code>[-multi_host_read]</code>	Use multiple joules processes to read the stimulus. This option is supported only for <code>fsdb</code> and <code>phy</code> .
<code>[-x_value]</code>	Specify the value for <code>x</code> in a transition. Default value is <code>x</code> .

## Joules Command and Attribute Reference

### Simulation Interface Commands - generate\_activity\_model

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<code>[-initial_x_value]</code>	<p>As each transition needs to start with a value, this option allows you to handle cases where you want to ignore x value but the first value itself is X.</p> <ul style="list-style-type: none"><li>■ If <code>initial_x_value</code> is specified, its value will override <code>-x_value</code> value for initial values (initial x will get value from this option irrespective of any other value specified)</li><li>■ If <code>initial_x_value</code> is not specified, initial x will get values from <code>-x_value</code> option. If <code>-x_value</code> is not specified or is set to ignore, then initial x will get X value.</li></ul> <p>Default value is x.</p>
<code>[-resim_cg_enables]</code>	Simulate unasserted ICGC enables.
<code>[-stim_annotation]</code>	Honors the stim annotation of only given objects.
<code>[-elab_db]</code>	Specify the database with Joules default naming rules for <code>rtlstim2gate</code> flow.
<code>[-mapped_db   -netlist]</code>	Specify either Genus mapped database or a 3rd-party netlist file.
<code>[-top_design]</code>	Specify top design name with netlist, if multi-top netlist is read-in.
<code>[-sdc]</code>	Specify the <code>sdc</code> file with netlist.
<code>[-rule_proc]</code>	Specify the Tcl procedure that applies the <code>rtlstim2gate</code> rules.
<code>[-map_file]</code>	Specify either Conformal or Genus RTL to netlist map file. Default is Conformal map file.
<code>[-peak_window_cnt]</code>	Select number of peak window for flop selection. Default value is 1.
<code>[-activity avg max]</code>	Select toggles or duty for high activity flops in case of multiple peak frames. Default value is max.
<code>[-out]</code>	Specify the file name of the replay TCF/SAIF file.
<code>[-write_format]</code>	Output replay TCF/SAIF file. Default is TCF.
<code>[-do_not_write_top_instance]</code>	Specify to not write the top instance name in TCF. Default value is 0.

## Joules Command and Attribute Reference

### Simulation Interface Commands - generate\_activity\_model

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#### Example(s)

```
■ generate_activity_model -rtl_stim {data/top.vcd data/top2.vcd} \  
-stim_format {vcd vcd} -tb_design_tuple { {{/tb/top_inst /top/U1_[2]} {/tb/  
top_inst /top/U1_[1]}} {{/tb/top_inst1 /top/U1_[2]} {/tb/top_inst1 /top/  
U1_[3]}}}  
-elab_tcl elab.tcl -elab_db elab.db -netlist mapped.v -map_file map.file -start  
{110ns 1080ps} -end {1000ns 880ns} -out stim5.tcf
```

## get\_sdb\_alias

Retrieve the alias name associated with a stim ID or frame ID. The command can also be used to retrieve the stim ID (or frame ID) associated with an alias name.

### Syntax

```
get_sdb_alias  
  [-stim <stim-id>]  
  [-handle <handle>]  
  [-frame <frame-id>]
```

### Options and Arguments

[-h]	Displays help for all options.
[-stim]	Return alias name of the specified stim ID.
[-handle]	Return handle of the specified alias name.
[-frame]	Return alias name of the specified frame ID.

### Example(s)

- `get_sdb_alias -stim /stim#1`; Returns the alias name of /stim#1
- `get_sdb_alias -handle /TestGCF`; Returns the stim id of the alias name /TestGCF
- `get_sdb_alias -frame /stim#1/frame#20`; Returns the alias name of the specified frame (frame#20 of stim#1)

### Return Value

-1 indicates failure in execution.

### Related Topics

[Adding Alias Names to Stims and Frames](#)

## merge\_stimulus

Merges multiple stimuli in parallel or series to create a new stimulus in memory.

- When merged in series, you can scale the stimulus using either duration or frequency, and each series entry will form one frame in the merged stimulus.
- In parallel merge, the start/end points of the input stimuli will decide the number of frames in the merged stimulus.

### Syntax

```
merge_stimulus
  [-series { {<stimulus> [<fspec>] [<dspec>] [root=<root>]]+}]
  [-keep_frames]
  [-parallel { {<entry> [start=<start>[unit]]}+}]
  [-merge_frames]
  [-asserted_only]
  [-mode <max|avg|sum>]
  [-weighted {<0-1> stim_id+}]
  [-start <start_time>]
  [-alias <stimulus_name>]
    <start> = start:<time> (default = start time of stim)
```

## Options and Arguments

<code>[-h]</code>	Displays help for all options.
<code>[-series]</code>	<p>Merge the stimulus in series. Also specify the duration (default unit = ns) or frequency (default unit = MHz) to scale the stimulus.</p> <p><code>&lt;stimulus&gt;: &lt;stim_id&gt; &lt;frame_id&gt;+</code> <code>&lt;fspec&gt;: [frequency]=&lt;val&gt;</code> <code>&lt;val&gt; = &lt;abs&gt; &lt;factor&gt;x</code> (default: 1.0x) <b>Example:</b> frequency=200MHz or freq=1.2x</p> <p><code>&lt;dspec&gt;: [duration]=&lt;val&gt;</code> <code>&lt;val&gt; = &lt;abs&gt; &lt;factor&gt;x</code> (default: 1.0x) <b>Example:</b> duration=1ms, or dur=0.9x</p> <p><code>&lt;root&gt;: root=&lt;root&gt;</code> (default = design root)</p> <p>The <code>-series</code> option is mutually exclusive to <code>-parallel</code> and <code>-weighted</code>.</p>
<code>[-keep_frames]</code>	Keep the frames of source stimulus while merging. This option is applicable only for <code>-series</code> , and is by default set to false.
<code>[-parallel]</code>	<p>Merge the stimulus in parallel. Also specify the start and end points of the stimulus to merge.</p> <p><code>&lt;start&gt; = start:&lt;time&gt;</code> (default = start time of stim)</p> <p>The <code>-parallel</code> option is mutually exclusive to <code>-series</code> and <code>-weighted</code>.</p>
<code>[-merge_stimulus]</code>	<p>Sub-option of <code>-parallel</code>.</p> <p>Merge the frames of source stimulus.</p> <p>Default is false.</p>
<code>[-asserted_only]</code>	<p>Sub-option of <code>-parallel</code>.</p> <p>Use only the asserted values from source stimulus.</p> <p>By default, it is set to false.</p>

## Joules Command and Attribute Reference

### Simulation Interface Commands - merge\_stimulus

---

<code>[-mode]</code>	<p>Sub-option of <code>-parallel</code>.</p> <p>Use the average, maximum, or sum values from source stimulus.</p> <p>Default value is avg.</p>
<code>[-weighted]</code>	<p>Apply weights to each stimulus for a parallel merge.</p> <p>Sum of weights of all stimulus must be 1 or else normalize the weights to 1 and use the corresponding weights for each stimulus.</p> <p>The <code>-weighted</code> option is mutually exclusive to <code>-series</code> and <code>-parallel</code>.</p>
<code>[-start]</code>	<p>Specify the start time for merging the stimulus.</p>
<code>[-alias]</code>	<p>Specify an alias name for the merged stimulus. Default alias is:</p> <p><i>/stim#N</i>, N = 1 more than the number of SDB stimuli</p>

### Example(s)

- ```
merge_stimulus -series \  
  {{ /stim#1 duration=1.25x root=/cpu_10bit/DP } \  
  {{ /stim#2/frame#3 /stim#2/frame#[6:7]} frequency=1.5x root=/cpu_10bit }}\  
-start 20uS \  
-alias my_stim4
```
- ```
merge_stimulus -parallel \  
  {{ /stim#3 start=50uS } \  
  { /my_stim4 }} \  
-alias my_stim5
```
- ```
merge_stimulus -weighted  
  { { 0.2 /stim#1 } \  
  { 0.3 /stim#2 } \  
  { 0.4 /turboMode } \  
  { 0.1 /stim#4 } }
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

#### Merging Stimulus in Joules

## read\_stimulus

Reads stimulus into Joules and creates SDB.

### Syntax

```
read_stimulus [-file] <stimulus-file-name>
  [-dut_instance dut]
  [-design_root root]
  [-tb_design_tuple <{dut root}>]
  [-format vcd|shm|phy|fsdb|saif|tcf|sdb|vwdb]
  [-start_window-start-time unit]
  [-end_window-end-time unit]
  [-append]
  [-interval_size time-val]
  [-interval_list <{<time-val>[:<time-val>]}+>]
    <time-val> = <num>[<unit>] (e.g. 5ns, 5e-9)
    <unit> = ms|us|ns|ps|fs
  [-cycles num design_signal_name[edge_type]]
    (extract frames of size = num * period of specified signal)
    (edge_type=pos|neg|none)
  [-frame_count cnt]
  [-power_mode_frames [power_mode+]]
  [-compat voltus|pt]
  [-alias alias_name]
  [-ignorecase]
  [-critical_signal_flow]
  [-allow_n_nets]
  [-trace_arcs <memory|icgc|flop|latch|all>+]
    [-arc_counting_method at_eot|at_event]
    [-emulate_sdf_sim]
  [-filter_zero_delay_glitch]
  [-glitch_flow <TG|IG|Both>]
    [-slew_type max_slew|min_slew|typical_slew|none]
    [-ignore_tg_width value]
    [-ignore_ig_width value]
  [-compute_glitch_flow <TG|IG|Both>]
  [-store_glitch_start_ends]
  [-store_value_changes]
  [-feed_through_signals_file path_to_the_file]
  [-dump_sdb num]
  [-master_slave [f_config]]
  [-disable_rtlstim2gate]
  [-scrub_prep]
  [-skip_activity_analysis]
  [-selective_debug {tag {option_list} tag {option_list} ... tag
    {option_list}}]
  [-resim_cg_enables]
  [-multi_host_read]
  [-report_missing_signals all|design|stim|none]
  [-report_x_summary]
  [-report_z_summary]
  [-x_report_out]
  [-z_report_out]
  [-x_value 0|1|ignore|x]
  [-initial_x_value 0|1|x]
  [-out_report_file_name]
  [-export_map_file_data none|all|add]
```



## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

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```
[-stim_annotation_report_file report_file]  
[-honor_skip_assertion]
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

#### Options and Arguments

|                                 |                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>               | Displays help for all options.                                                                                                                                     |
| <code>[-file]</code>            | Name of the stimulus file to be read.                                                                                                                              |
| <code>[-dut_instance]</code>    | Design Under Test (DUT) path in stimulus. If not specified, the name is inferred by the command.                                                                   |
| <code>[-design_root]</code>     | Apply activity on the specified design hierarchy. Default is design root.                                                                                          |
| <code>[-tb_design_tuple]</code> | Use this option to annotate activity for a specific design instance from a specific stimulus instance (you may have multiple such non-overlapping design entries). |

For example, consider a stimulus with following hierarchies:

```
Tb (module testbench)
  M1 (module foo)
    M2 (module car)
      B1 (module bar)
```

And a design with following structure:

```
top (module top)
  U1 (module foo)
  U2 (module bar)
```

Sample usage of the option would be:

```
-tb_design_tuple {{/Tb/M1 /top/U1}} {{/Tb/M2/B1 /top/
U2}}
```

To read in a block-level stimulus (value of -1 uses auto top instance determination), you can specify:

```
read_stimulus -file block.vcd -tb_design_tuple {{-1 /
top/U2}}
```

|                        |                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------|
| <code>[-format]</code> | Format of the stimulus to be read. If not specified, it is inferred from the extension of the file. |
|------------------------|-----------------------------------------------------------------------------------------------------|

If the filename is specified without the path, the specified file is searched in the PWD directory.

`read_stimulus` can also read from VCD, SAIF, TCF and FSDB files in compressed format. However, PHY, SHM, and VWDB formats cannot be read in compressed form.

**Note:** `read_stimulus` does not support master/slave TCF.

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

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|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-start]</code>         | Analysis start time along with the unit. The default is simulation start time. If you do not specify the time unit, the command uses the unit specified in the input stimulus file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-end]</code>           | Analysis end time along with the unit. The default is simulation end time. If you do not specify the time unit, the command uses the unit specified in the input stimulus file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-append]</code>        | Append the stimulus to SDB.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-interval_size]</code> | <p>Divide the stimulus into frames of the specified interval size; average activity of signals over each interval will be computed and saved in SDB. This option, in conjunction with <code>-start</code> and <code>-finish</code> options, would determine the number of frames extracted from the stimulus.</p> <p>For example, for a stimulus of 100ns duration (start=0ns, finish=100ns),</p> <pre>read_stimulus -interval_size 20ns</pre> <p>This will extract 5 frames of 20ns each.</p> <p><b>Note:</b> Options <code>-interval_size</code>, <code>-interval_list</code>, and <code>-cycles</code> are mutually exclusive. If specified together, Joules will issue a warning and ignore frame-based extraction.</p>                                                             |
| <code>[-interval_list]</code> | <p>This option can be used in two ways: (i) specify a list of time markers (list of single time values), and (ii) specify list of time pairs, one for each frame. In the first method, you can extract variable-sized frames from a contiguous simulation time range. The second form allows specification of time pairs for each frame. Mixing of these two forms is not allowed.</p> <p>For example,</p> <pre>read_stimulus -interval_list 10ns 25ns 35ns</pre> <p>This will create three frames with duration of 10ns, 25ns, and 35ns respectively.</p> <p><b>Note:</b> Options <code>-interval_size</code>, <code>-interval_list</code>, and <code>-cycles</code> are mutually exclusive. If specified together, Joules will issue a warning and ignore frame-based extraction.</p> |

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

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|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-cycles]</code>            | <p>Using this option, you can extract frames based on number of cycles of a specified signal. A cycle is a pair of rise and fall (or fall and rise) transitions of the signal. This is intended to be used in conjunction with repetitive signals such as a clock. If the specified signal is a clock, the extracted frames will be of the same size. If the signal is not a clock (for example, <code>memory write_enable</code>), the frame sizes will likely be different.</p> <p>For example,</p> <pre>read_stimulus -start 20ns -cycles 10 /<br/>cpu_10bit/clock</pre> <p>This will extract 10 cycle frames of <code>/cpu_10bit/clock</code> starting 20ns.</p> <p><code>&lt;edge_type&gt;</code> defaults to <code>none</code>. If you specify, <code>pos neg</code>, frames are created at <code>pos neg</code> edge of clock; if you specify <code>none</code>, the frames are created using the standard method.</p> <p><b>Note:</b> Options <code>-interval_size</code>, <code>-interval_list</code>, and <code>-cycles</code> are mutually exclusive. If specified together, Joules will issue a warning and ignore frame-based extraction.</p> |
| <code>[-frame_count]</code>       | <p>Extract the specified number of equal sized frames. This option can be combined with <code>-cycles</code> or <code>-interval_size</code> options. You can specify upto maximum of 1000 frames.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-power_mode_frames]</code> | <p>Use this option for auto framing to detect power mode changes from CPF and UPF-based stimuli. This option uses the specified <code>power_modes</code> and <code>power_mode</code> aware stimulus and creates frames in which the corresponding mode is active.</p> <p>This option cannot be combined with any other framing option.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-compat]</code>            | <p>Specify X handling compatibility with other tools. Refer to <i>Handling Stimulus File Constructs in Joules vs Voltus</i> for more information in the usage of this option.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>[-alias]</code>             | <p>Add an alias name to the stimulus that is being read.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-ignorecase]</code>        | <p>Ignore case while searching for design object names.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

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|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-critical_signal_flow]</code>     | Read designs critical signals only. The option is valid only for PHY mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-allow_n_nets]</code>             | <p>Allow <i>n_&lt;number&gt;</i> nets to be annotated. This option is required for gate-level stimulus.</p> <p><b>Note:</b> Always use this option to read Gate stimuli. Do not use it for RTL stimuli if the netlist or mapped db is generated using Genus version prior to 16.13 or Joules 16.20.</p>                                                                                                                                                                                                                                                                                                                   |
| <code>[-trace_arcs]</code>               | <p>Monitor arcs of instantiated gates.</p> <p>With time-based stimulus inputs (vcd, fsdb, shm, phy), Joules can perform arc-based power estimation for memories and ICGCs, which is more accurate than pin-based estimation.</p>                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>[-arc_counting_method]</code>      | <p>Suboption of <code>-trace_arcs</code>.</p> <p>Arc counting can be done at a specific event or at the end of time stamp (when all value changes settled down):</p> <ul style="list-style-type: none"><li>■ <code>at_event</code> - as soon as a signal changes its value all related arcs of this signal are evaluated</li><li>■ <code>at_eot</code> (end of time ) - arc is evaluated at the end of time stamp</li></ul> <p>Sequencing of value changes might impact arc count. <code>at_eot</code> provides order independent arc computation and <code>at_event</code> provides order dependent arc computation.</p> |
| <code>[-emulate_sdf_sim]</code>          | <p>Suboption of <code>-trace_arcs</code>.</p> <p>Enable delay memory to mimic SDF based simulation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-filter_zero_delay_glitch]</code> | <p>Remove 0-delay glitches. By default, it is set as false.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-glitch_flow]</code>              | <p>Find inertial and transport glitches and store them separately. By default, it is set as false.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-slew_type]</code>                | <p>Suboption of <code>-glitch_flow</code>.</p> <p>Specify slew types. Default is none.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-ignore_tg_width]</code>          | <p>Suboption of <code>-glitch_flow</code>.</p> <p>Specify the width value under which to ignore transport glitches. The default unit is fs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

|                                           |                                                                                                                                                                                                                                         |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-ignore_ig_width]</code>           | Suboption of <code>-glitch_flow</code> .<br><br>Specify the width value under which to ignore inertial glitches. The default unit is fs.                                                                                                |
| <code>[-compute_glitch_flow]</code>       | Compute inertial, transport glitches from 0-delay stimulus and stores them separately.                                                                                                                                                  |
| <code>[-store_glitch_start_ends]</code>   | Stores the start and end timestamps of the glitches.                                                                                                                                                                                    |
| <code>[-store_value_changes]</code>       | Stores the value changes of all signals.                                                                                                                                                                                                |
| <code>[-feed_through_signals_file]</code> | Feeds through the signals file.                                                                                                                                                                                                         |
| <code>[-dump_sdb]</code>                  | Dump SDB file for each of the specified number of frames.                                                                                                                                                                               |
| <code>[-master_slave]</code>              | Dump master slave SDB files for each of the frames specified with <code>-dump_sdb</code> option. Save the config file in <code>&lt;f_config&gt;</code> . It is, by default, saved in <code>joules_work/master_slave_sdb.config</code> . |
| <code>[-disable_rtlstim2gate]</code>      | Disable RTLStim2Gate flow (if already on) if this is a gate-level stimulus.                                                                                                                                                             |
| <code>[-scrub_prep]</code>                | Collect data for power scrubbing.                                                                                                                                                                                                       |
| <code>[-skip_activity_analysis]</code>    | If specified, Joules stops the command execution after mapping the design hierarchy and provides an annotation summary, skipping the activity analysis. Supported formats are VCD,FSDB,SHM,PHY.                                         |

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

`[-selective_debug]`

Selectively debug `read_stimulus` debug logs based on user-specified tags and option list in the following format:

```
{<tag> {option_list} <tag> {option_list}
... <tag> {option_list}}
```

`<tag> {option_list}` can have the following combinations:

- `stim_inst {list of design instances}` - Debug listed instances. `design_name/*` allows you to debug all sub-instances as well
- `stim_signal {list of design nets}` - Debug listed nets.
- `dut {list of design instances}` - Debug listed instances.
- `trace_arc {list of design instances}` - Debug listed arc instances.
- `value_change {list of design nets}` - Debug listed nets.

Following tags do not have any supported option list:

- `all` - print all debug logs
- `stim_scope` - print all scope logs
- `frame` - print all frame logs

Refer to *Selective Debug during read\_stimulus* for more information on using this option.

`[-resim_cg_enables]`

Simulate unasserted ICGC enables. Refer to *Estimating Gated Leaf Clock Waveform* for more information on using this option.

`[-multi_host_read]`

Use multiple Joules processes to read the stimulus. This option is supported only for FSDB, PHY, and SHM formats.

Refer to *Reading Stimulus using Multiple Processes* for more information.

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

`[-report_missing_signals]` Report stimulus objects that do not match any design object. It has the following values:

- `all` - reports the signals that are missing in design but present in stimulus and signals that are missing in stimulus but present in design
- `design` - reports only the signals that are missing in design but present in stimulus
- `stim` - reports only the signals that are missing in stimulus but present in design
- `none` - does not report missing signals

`[-report_x_summary]` Provide X summary report. Entire stimulus will be processed and SDB will be available.

`[-report_z_summary]` Provide Z summary report. Entire stimulus will be processed and SDB will be available.

`[-x_report_out]` For each signal which acquired X state during analysis period, report the following:

```
<signal_name> <object_type> <initial_x>  
<entire_x> <X_duration> <num_X_transitions>
```

`[-z_report_out]` For each signal which acquired Z state during analysis period, report the following:

```
<signal_name> <object_type> <initial_z>  
<entire_z> <Z_duration> <num_Z_transitions>
```

`[-x_value]` Specify the value for x in a transition. Default is to consider x transitions as toggle.

Refer to *Ignoring X Transitions while Reading Stimuli* for more information.

For example,

```
Read_stimulus -x_value 1;
```

will use 1 as the value of x including the initial x.



## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

`[-initial_x_value]`

As each transition needs to start with a value, this option allows you to handle cases where you want to ignore x value but the first value itself is X.

- If `initial_x_value` is specified, its value will override `-x_value` value for initial values (initial x will get value from this option irrespective of any other value specified)
- If `initial_x_value` is not specified, initial x will get values from `-x_value` option. If `-x_value` is not specified or is set to `ignore`, then initial x will get x value.

For example,

```
Read_stimulus -initial_x_value 1 -x_value ignore;
```

will use 1 for the initial x, and will ignore all the x's in simulation.

```
Read_stimulus -initial_x_value 0 -x_value 1;
```

will use 0 for the initial x, and 1 for all other x's in simulation.

Refer to *Ignoring X Transitions while Reading Stimuli* for more information.

`[-out]`

Write the missing signals to the specified file. The default file is `$joulesWorkDir/missing_signals.rpt`.

`[-export_map_file_data]`

Defines the data to be written to the name mapping report file.

- `all`: Exports every mapping.
- `add`: Writes mismatches between simulation and synthesis.
- `none`: Does not write by default.

`[-stim_annotation_report_file]`

Generates stim annotation report file for the given input stimulus file.

`[-honor_skip_assertion]`

Ignore assertion of pins which has `skip_assertion` attribute set to true.

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

#### Example(s)

- `read_stimulus cpu_10bit_pgm_hash.vcd -dut_instance /cpu_10bit_tb/CPU`
- `read_stimulus -file cpu_10bit_pgm_gcf.fsdb -start 10ns ;# infer -dut_instance`
- `read_stimulus cpu_10bit_pgm_gcf.fsdb -append ;# append mode`
- `read_stimulus -file ./trace.phy -dut_instance /CPU`
- `read_stimulus -file ./trace.phy -start 10ns`
- `read_stimulus cpu_10bit_pgm_hash.vcd -interval_size 20ns ;# extract fixed sized frames`
- `read_stimulus cpu_10bit_pgm_hash.fsdb -interval_list 10ns 25ns 35ns 60ns ;# extract contiguous variable sized frames`
- **Extract non contiguous variable sized frames**  
`read_stimulus cpu_10bit_pgm_hash.vcd -interval_list 10ns:20ns 40ns:65ns 85ns:100e-9`
- `read_stimulus cpu_10bit_pgm_gcf.fsdb -cycles 10 /cpu_10bit/clock ;# extract 10 cycle frames`
- `read_stimulus cpu_10bit_pgm_gcf.fsdb -frame_count 10 ;# chop stim up in 10 frames`
- `read_stimulus cpu_10bit_pgm_gcf.fsdb -frame_count 10 -interval_size 20ns ;# extract 10 frames of 20ns each`
- **Extract only first 5 frames, each of 10 clock cycles**  
`read_stimulus cpu_10bit_pgm_gcf.fsdb -cycles 10 /cpu_10bit/clock -frame_count 5`
- `read_stimulus cpu_10bit_gates.fsdb -allow_n_nets ;# -allow_n_nets needed for gate stimuli`
- `read_stimulus cpu_10bit_gates.fsdb -alias /gcf ;# name the stimulus gcf`
- **Read and report signals missing in design but present in stimulus.**  
`read_stimulus cpu_10bit_gates.fsdb -report_missing_signals design -out missing.rpt`
- **Read and report signals missing in stimulus but present in design.**  
`read_stimulus cpu_10bit_gates.fsdb -report_missing_signals stim -out missing.rpt`
- **Read stimulus and report both types of missing signals**  
`read_stimulus cpu_10bit_gates.fsdb -report_missing_signals all -out missing.rpt`
- **Read stimulus and selectively debug its logs for instance /CPU and for instance /CPU/ RAM\_64x10 and all its sub-instances, scopes and frames**  
`read_stimulus cpu_10bit_gates.fsdb -selective_debug { stim_inst {/CPU/ /CPU/ RAM_64x10/*} stim_scope frame }`

## Joules Command and Attribute Reference

### Simulation Interface Commands - read\_stimulus

---

- `read_stimulus cpu_10bit_pgm_hash.vcd -report_x_summary -x_report_out x_report.rpt`

#### Return Value

0 for success, 1 indicates failure in execution.

#### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)
- [Handling Stimulus File Constructs in Joules vs Other Industry Tools](#)
- [Selective Debug During Joules read\\_stimulus Command](#)
- [Estimating Gated Leaf Clock Waveform](#)
- [Reading Stimulus using Multiple Processes](#)
- [Ignoring X Transitions while Reading Stimuli](#)

## read\_vf

In vectorless mode of `xreplay`, use the `read_vf` command to read the file containing the `set_pin_waveform` commands into Joules before issuing the `xreplay` command. You can either read the vector file using the `read_vf` command before the `xreplay` command or pass the vector file as an argument to the `xreplay` command.

## Syntax

```
read_vf\  
    [-file <file name>]
```

## Options and Arguments

`[-file]` Specify the complete path to the vector file.

## Example(s)

```
■ read_vf -file ./vector_file.txt
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

---

#### replay\_rtl\_stim\_to\_gate

Generates cycle accurate activity information on logic nets by running the `rtlstim2gate` command in cycle accurate mode.

**Note:** Alias for this command is `replay_rtlstim2gate`.

#### Syntax

```
replay rtl_stim_to_gate \  
  -rtl_stim <f_rtl_stim>  
    [-stim format vcd|shm|phy|fsdb|vwdb]  
    [-dut_instance <dut-inst-name>]  
  [design_root <root>]  
    [-tb_design_tuple {dut} <root>]  
    -clock <clock-pin/port-name> [pos|neg]  
    [-start <window-start-time>]  
    [-end <window-end-time>]  
    [-peak_interval <f_peak_interval.rpt>]  
    [-frames_per_sdb <cnt>]  
    [-x value 0|1|ignore|x]  
    [-initial_x_value 0|1|x]  
    [-trace_arcs {memory|icgc|flop|latch|all}+]  
      [-arc counting_method <at_eot|at_event>]  
      [-emulate_sdf_sim]  
    [-report_missing_signals all|design|stim|none]  
  [-elab_db <f_elab>]  
  [-disable rtlstim2gate]  
  -mapped_db <f_genus_db>|-netlist <f_netlist>  
  -top_design <f_top>  
  -sdc <f_sdc>  
    (<f_genus_db> = Genus mapped DB, <f_netlist> = 3rd party netlist file)  
  [-rule_proc <Tcl_proc_that_applies_rtlstim2gate_rules>]  
  [-map_file <map_file> [conformal|genus|dc]]  
  [-keep_in_memory]  
  [-gen_power_profile <f_power_profile.rpt>]  
    [-total_power]  
    [-levels <hier_depth>]  
    [-category_power_report]  
    [-profile_group_report]  
    [-include_current]  
    [-by_rail]  
    [-user_group_proc <Tcl_proc_that_specifies_profile_groups>]  
    [-gen_peak_power_report <f_peak_power.rpt>]  
    [-cycles_per_window <N in terms of number of clock cycles>]  
  [-gen_activity_profile <f_activity_profile.rpt>]  
    [-levels <hier_depth>]  
    [-gen_peak_activity_report <f_peak_activity.rpt>]  
    [-cycles_per_window <N in terms of number of clock cycles>]  
  [-write_sdb <f_sdb>]  
  [-scale_to_sdc_frequency]  
  [-out <f_tcf>]  
    [-write_format <tcf/saif>]  
    [-write_interval <peak/full>]  
    [-do_not_write_top_instance]  
  [-stim_annotation {<obj_type>[:<pin_type>]}+]  
    (<obj_type> = port|seq|comb|reg|mem|icgc|latch|bbox|state|all|
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

---

```
                                none|preserve)
(<pin_type> = in|out|both)
[-feed_through_signals_file <f_feed_file>]
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

---

#### Options and Arguments

|                                 |                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>               | Displays help for all options.                                                                                                                                                                                                                |
| <code>-rtl_stim</code>          | Mandatory option. Specify the input RTL stimulus file.                                                                                                                                                                                        |
| <code>[-stim_format]</code>     | Specify the stimulus format.                                                                                                                                                                                                                  |
| <code>[-dut_instance]</code>    | Mandatory suboption of <code>-rtl_stim</code> . Specify the DUT instance name in Testbench.                                                                                                                                                   |
| <code>[design_root]</code>      | Apply activity on specified design hierarchy.<br>Default is design root.                                                                                                                                                                      |
| <code>[-tb_design_tuple]</code> | Map stimulus <code>&lt;dut&gt;</code> to design <code>&lt;root&gt;</code> .                                                                                                                                                                   |
| <code>[-clock]</code>           | Mandatory option. Specify the pin/ port name of design clock and active edge (default is <code>pos</code> ).                                                                                                                                  |
| <code>[-start]</code>           | Specify the activity propagation start time, for example, 24ns.<br>Default is simulation start time.                                                                                                                                          |
| <code>[-end]</code>             | Specify the activity propagation end time, for example, 10us.<br>Default is simulation end time.                                                                                                                                              |
| <code>[-peak_interval]</code>   | The file generated using <code>-gen_peak_activity_report</code> or <code>-gen_peak_power_report</code> in the previous run of <code>replay_rtlstim2gate</code> command. The start and end times are obtained from this file. Default is skip. |
| <code>[-frames_per_sdb]</code>  | Specify the number of frames for each SDB. Default is 100.                                                                                                                                                                                    |
| <code>[-x_value]</code>         | Specify the value for x for transition while reading stimulus.<br><br>Refer to <i>Ignoring X Transitions while Reading Stimuli</i> for more information.                                                                                      |

## Joules Command and Attribute Reference

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

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|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-initial_x_value]</code>        | <p>Specify this option to handle cases where you want to ignore x value but the first value itself is X.</p> <ul style="list-style-type: none"><li>■ If <code>-initial_x_value</code> is specified, its value will override <code>-x_value</code> value for initial values (initial x will get value from this option irrespective of any other value specified).</li><li>■ If <code>-initial_x_value</code> is not specified, initial x will get values from <code>-x_value</code> option. If <code>-x_value</code> is not specified or is set to <code>ignore</code>, then initial x will get X value.</li></ul> <p>Refer to <i>Ignoring X Transitions while Reading Stimuli</i> for more information.</p> |
| <code>[-trace_arcs]</code>             | Monitor the specified arcs of instantiated gates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-arc_counting_method]</code>    | Sub-option of <code>-trace_arcs</code> . Compute arc either at the end of time stamp or at the specified event. By default, arc is computed at the end of time stamp.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-emulate_sdf_stim]</code>       | Delay memory enable to mimic SDF-based simulation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-report_missing_signals]</code> | Save the missing signal report in <code>\$joulesWorkDir/missing_signals.rpt</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-elab_db]</code>                | Specify the database with Joules default naming rules for rtlstim2gate flow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-disable_rtlstim2gate]</code>   | Disable rtlstim2gate, required for gate level input stimulus.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>-mapped_db   -netlist</code>     | Mandatory option. Specify either Genus-mapped database or a 3rd-party netlist file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>-top_design</code>               | Specify the top design file name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>-sdc</code>                      | Specify the SDC file with netlist.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-rule_proc]</code>              | Specify the Tcl procedure that applies the rtlstim2gate rules.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-map_file]</code>               | Specify either Conformal or Genus RTL to netlist map file. Default is Conformal map file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-keep_in_memory]</code>         | Keep SDB/PDB in memory (not recommended). Default is false.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-gen_power_profile]</code>      | Generate power profile in the specified <code>.rpt</code> file. Default is to skip this.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



## Joules Command and Attribute Reference

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

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|                                          |                                                                                                                                                      |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-total_power]</code>              | Suboption of <code>-gen_power_profile</code> .<br><br>Display total power profile. Default is dynamic.                                               |
| <code>[-levels]</code>                   | Suboption of <code>-gen_power_profile</code> .<br><br>Specify the hierarchy level for power reporting. Default is 2.                                 |
| <code>[-category_power_report]</code>    | Suboption of <code>-gen_power_profile</code> .<br><br>Report the specified category power in the batch file. By default, total power is reported.    |
| <code>[-profile_group_report]</code>     | Suboption of <code>-gen_power_profile</code> .<br><br>Reports group power in batch file.                                                             |
| <code>[-include_current]</code>          | Suboption of <code>-gen_power_profile</code> .<br><br>Reports current columns in batch file.                                                         |
| <code>[-by_rail]</code>                  | Suboption of <code>-gen_power_profile</code> .<br><br>Reports rail-based power in batch file.                                                        |
| <code>[-user_group_proc]</code>          | Suboption of <code>-gen_power_profile</code> .<br><br>Tcl proc that specifies profile groups.                                                        |
| <code>[-gen_peak_power_report]</code>    | Suboption of <code>-gen_power_profile</code> .<br><br>Generate peak power report in the specified <code>.rpt</code> file. Default is to skip this.   |
| <code>[-cycles_per_window]</code>        | Suboption of <code>-gen_power_profile</code> .<br><br>Number of clock cycles per window. Default is 100 clock cycles.                                |
| <code>[-gen_activity_profile]</code>     | Generate activity profile in the specified <code>.rpt</code> file. Default is to skip this. Report will be generated in encrypted format by default. |
| <code>[-gen_peak_activity_report]</code> | Generate peak activity report in the specified <code>.rpt</code> file. Default is to skip this.                                                      |
| <code>[-write_sdb]</code>                | Specify the output SDB file.                                                                                                                         |
| <code>[-scale_to_sdc_frequency]</code>   | Scale replay stimulus to SDC frequency.                                                                                                              |

## Joules Command and Attribute Reference

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

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|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-out]</code>                       | Specify the output replay TCF file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-write_format]</code>              | Output replay TCF/SAIF file. Default is TCF.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-write_interval]</code>            | Output replay TCF/SAIF file of only the peak window or the full window. This option can be used only if <code>-out</code> and <code>-gen_peak_activity_report</code> are specified. Default is full.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>[-do_not_write_top_instance]</code> | Specify to not write the top instance name in TCF. Default value is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-stim_annotation]</code>           | <p>Honor stim annotation of only the specified objects.</p> <p>Specify the option in the following format:</p> <pre>{&lt;obj_type&gt;[:&lt;pin_type&gt;]}+</pre> <p><code>&lt;obj_type&gt;</code> can have any of the following values:</p> <pre>port seq comb reg mem icgc latch bbox state all none preserve</pre> <p>State means all state points. It includes <code>port:in</code>, <code>reg:out</code>, <code>latch:out</code>, <code>icgc:out</code>, <code>mem:both</code>, <code>bbox:both</code>, and <code>preserve:both</code></p> <p><code>&lt;pin_type&gt;</code> can have any of the following values:</p> <pre>in out both</pre> <p>Default value for <code>pin_type</code> is <code>both</code>. For <code>all</code> or <code>none</code> <code>obj_types</code>, <code>pin_type</code> is not honored.</p> |
| <code>[-feed_through_signals_file]</code> | Feeds through the signals file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### Example(s)

- `set d_tutorial $env(RTLCORE_ROOT)/tutorial`
- `replay_rtl_stim_to_gate -out cpu_10bit_pgm_gcf.replay.tcf \  
-rtl_stim $d_tutorial/stimulus/cpu_10bit_pgm_gcf.vcd \  
-elab_db $d_tutorial/rundir/joules_work/cpu_10bit.elab.db \  
-mapped_db $d_tutorial/rundir/joules_work/cpu_10bit.proto.db \  
-dut_instance /cpu_10bit_tb/CPU \  
-clock port: cpu_10bit/clock`

## **Joules Command and Attribute Reference**

### Simulation Interface Commands - replay\_rtl\_stim\_to\_gate

---

#### **Return Value**

0 indicates success, 1 indicates failure in execution.

#### **Related Topics**

- [Propagating Cycle Activity through Joules replay\\_rtl\\_stim\\_to\\_gate Command](#)
- [Ignoring X Transitions while Reading Stimuli](#)

## Joules Command and Attribute Reference

### Simulation Interface Commands - report\_inst\_property

---

## report\_inst\_property

Reports the instance properties in a table.

Sample output for reference:

```
Joules> report_inst_property
PDB Frames: /stim#0/frame#0
Power Unit: nW
-----Inst Property Report -----
Leakage_Power   Internal_Power   Switching_Power   Total_Power       Avg_Out_Duty
Avg_Out_TC     Instance
-----
3.622898e+01    4.677753e+02      0.000000e+00      5.040043e+02      2.500000e-01
10000000 /top/q_reg0
3.622898e+01    4.657614e+02      0.000000e+00      5.019904e+02      7.500000e-01
10000000 /top/q_reg1
3.622898e+01    4.661498e+02      0.000000e+00      5.023788e+02      2.500000e-01
10000000 /top/q_reg2
3.622898e+01    4.655405e+02      0.000000e+00      5.017694e+02      7.500000e-01
10000000 /top/q_reg3
3.622898e+01    4.659158e+02      0.000000e+00      5.021448e+02      7.500000e-01
10000000 /top/q_reg4
3.622898e+01    4.657378e+02      0.000000e+00      5.019668e+02      2.500000e-01
10000000 /top/q_reg5
3.622898e+01    5.146735e+02      0.000000e+00      5.509025e+02      5.000000e-01
10000000 /top/q_reg6
3.622898e+01    5.146302e+02      0.000000e+00      5.508592e+02      5.000000e-01
10000000 /top/q_reg7
3.622898e+01    4.664512e+02      0.000000e+00      5.026801e+02      2.500000e-01
10000000 /top/q_reg8
-----
```

## Syntax

```
report_inst_property
  -frame frame_id
  [-show {leakage_power|internal_power|switching_power|dynamic_power|
          total_power|tglitch_internal|tglitch_switching|iglitch_internal|
          iglitch_switching|tglitch_dynamic|iglitch_dynamic|avg_in_duty|
          avg_out_duty|avg_in_tc|avg_out_tc|avg_in_tgtc|avg_out_tgtc|
          avg_in_igtc|avg_out_igtc|inputs|outputs+}]>]
  [-attributes {list of attributes on instance+}]
  [-inst_property_proc inst_property_proc]
  [-insts inst vdirs]
  [-out output_file]
  [-avg_out_tc_count <min:max>]
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - report\_inst\_property

---

```
[-total_power_range <min:max>]  
[-unit {W|nW|mW|uW|pW|fW}]  
[-append]
```

### Options and Arguments

|                       |                                                                                                                                                                                                                 |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]                  | Displays help for all options.                                                                                                                                                                                  |
| -frame                | Reports instance property for the given frame.                                                                                                                                                                  |
| [-show]               | Reports the given properties of the instance.                                                                                                                                                                   |
| [-attributes]         | Reports the given attributes of the instance after the properties given in -show option.                                                                                                                        |
| [-inst_property_proc] | Reports the string returned by inst_property_proc for each instance after the attributes of instance.                                                                                                           |
| [-insts]              | Reports only leaf instances.                                                                                                                                                                                    |
| [-out]                | Specify to write the report in the output file.                                                                                                                                                                 |
| [-avg_out_tc_count]   | Reports instances with average output toggle count more than equal to min and less than equal to max.<br><br>■ min: Minimum average output pins toggle count<br>■ max: Maximum average output pins toggle count |
| [-total_power_range]  | Reports instances with total_power more than equal to min and less than equal to max.<br><br>■ min: Minimum total power<br>■ max: Maximum total power<br>Default nW will be used as power unit.                 |
| [-unit]               | Specify the unit for reporting power.                                                                                                                                                                           |
| [-append]             | Specify to append the report in the output file.                                                                                                                                                                |

### Example(s)

- `report_inst_property -frame /stim#2/frame#0 -show {leakage_power total_power avg_in_duty avg_out_duty}`
- `report_inst_property -unit pW -total_power_range 0.21mW:2.156642e+02nW -avg_out_tc_count 20000000:25000000`

## reset\_pin\_waveform

Deletes the waveform definition of a pin from Joules database.

### Syntax

```
reset_pin_waveform\  
    [-name <pin name>]
```

### Options and Arguments

|         |                                                               |
|---------|---------------------------------------------------------------|
| [-name] | Specify name of the pin for which waveform needs to be reset. |
|---------|---------------------------------------------------------------|

### Example(s)

```
■ reset_pin_waveform -name /cpu_10bit/clock
```

## **reset\_skip\_assertion**

Resets the attribute `skip_assertion` for all pins that is set to true.

### **Syntax**

```
reset_skip_assertion \
```

### **Options and Arguments**

|                   |                                |
|-------------------|--------------------------------|
| <code>[-h]</code> | Displays help for all options. |
|-------------------|--------------------------------|

### **Return Value**

0 indicates success, 1 indicates failure in execution.

## scan\_stimulus

Identifies and examines special periods in the simulation where an interesting function is active.

An interesting function can be a non-repetitive signal (clock is an example of a repetitive signal) or an expression of non-repetitive signals. Such a function is supposed to be defining a state or a mode of operation of the design.

Some examples of interesting functions are:

- Block-level clock gating enable
- Bypass mode enables
- State of a control logic or FSM
- A CPU instruction such as Fetch or decode

## Syntax

```
scan_stimulus \  
  [-file <stimulus-file-name>]  
  [-format vcd|shm|phy|fsdb|vwdb]  
  [-dut_instance <dut-inst-name>]  
  [-design_root <top_design_name>]  
  [-tb_design_tuple <{dut_instance design_root}>]  
  [-start <window-start-time>]  
  [-end <window-end-time>]  
  [-ignorecase]  
  [-filter_zero delay glitch]  
  [-x_value 0|1|ignore|x]  
  [-initial_x_value 0|1|x]  
  [-expr <str>]  
  [-uniform_clk { list of clock nets }]  
  [-clock_span <span value>]  
  [-time_info]  
  [-delay_info]  
  [-out <file_name>]  
  [-print_output]
```



## Options and Arguments

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                        | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-file]</code>                     | The stimulus file name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-format]</code>                   | Stimulus format. If not specified, it is inferred from the stimulus file extension.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-dut_instance]</code>             | DUT instance name in testbench. Inferred, if not specified.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-design_root]</code>              | Design name in the design hierarchy. If not specified, default is inferred as top design.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-tb_design_tuple]</code>          | Tuple of dut_instance and design_root                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>[-start]</code>                    | Start time for stimulus scan. The default is the simulation start time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-end]</code>                      | End time for stimulus scan. The default is simulation end time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-ignorecase]</code>               | Ignore case while searching for design object names.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-filter_zero_delay_glitch]</code> | Remove zero-delay glitches. By default, it is set to false.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-x_value]</code>                  | Specify the value for x in a transition.<br><br>Default is to consider x transitions as toggle.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-initial_x_value]</code>          | As each transition needs to start with a value, this option allows you to handle cases where you want to ignore x value but the first value itself is X. <ul style="list-style-type: none"><li>■ If <code>initial_x_value</code> is specified, its value will override <code>-x_value</code> value for initial values (initial x will get value from this option irrespective of any other value specified)</li><li>■ If <code>initial_x_value</code> is not specified, initial x will get values from <code>-x_value</code> option. If <code>-x_value</code> is not specified or is set to <code>ignore</code>, then initial x will get x value.</li></ul> |

`[-expr]`

Boolean expression of design signals.

Following are expected values for this option:

- Variables of the expression are expected to be design nets or pins. Pins in the expression are replaced by their attached nets before processing.
- Single bit nets
- Supported expression types:
  - $E = \langle ID \rangle \Rightarrow$  single variable expression (can have scalar or bussed net)
  - $E = \sim \langle ID \rangle \Rightarrow$  inverted expression
  - $E = \langle E1 \rangle \langle \text{binary\_op} \rangle \langle E2 \rangle \Rightarrow$  binary expression of expressions
  - $E = \langle E\_cond \rangle ? \langle E\_true \rangle : \langle E\_false \rangle \Rightarrow$  ternary expression of expressions
- Supported operators:
- Inversion  $\Rightarrow [\sim !]$
- Binary  $\Rightarrow$  AND  $[* \&]$ , OR  $[+ |]$ , XOR  $[^]$
- Ternary  $\Rightarrow ? :$

## Joules Command and Attribute Reference

### Simulation Interface Commands - scan\_stimulus

---

`[-uniform_clk]`

Checks if the specified list of clock nets are uniform in the given time range. You can specify `-start` and `-end` options to define the time range between which to check the clock signals for uniformity.

When you specify this option, the `scan_stimulus` command checks whether the clock nets correspond to design clock signals. If not, the command generates an error.

Sample usage is given below:

```
scan_stimulus -file activity.vcd -tb_design_tuple {{/testbench/myTop /top}} -uniform_clk {{/top/clk2}}
```

The above command checks if the clock signal is part of design clock or not. If it is part of design clock, then it checks if the clock is uniform throughout the stimulus duration and prints the following:

```
Info: STIM-0023 [StimInfo] /top/clk2 clock is uniform
within start_time:0 and end_time : 288
Stim file : activity.vcd
Stim file format : vcd
Scan stim clk span : 50
Scan stim time unit : ns
Scan stim duration : 288
```

```
-----Scan stimulus uniform clock report-----
---Reference clock cycle for clock : /top/clk2, t0 :
2.000000, t1 : 2.000000, and the start_time : 196,
end_time : 200
Clock : /top/clk2 is uniform within start_time : 0 and
end_time : 288
```

`[-clock_span]`

Specify the number of clock cycles used to determine the reference clock (default clock cycle). This option is used in combination with `-uniform_clk`.

For example, if `clock_span` value is specified as 100, `scan_stimulus` will capture the first 100 cycles for each clock signal and decide, based on majority, the default clock value for each of the clock signals.

If not specified, default value is 50.

## Joules Command and Attribute Reference

### Simulation Interface Commands - scan\_stimulus

---

|                              |                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-time_info]</code>    | <p>Print the start and end time of the stimulus. Sample usage:</p> <pre>scan_stimulus -file activity.vcd -tb_design_tuple {{/testbench/myTop /top}} -time_info</pre> <p>Its output will be:</p> <pre>Info : STIM-0024 [StimInfo] Stimulus duration is from<br/>: 0 ns to : 88 ns</pre> <p>This option is supported for VCD, FSDB, SHM, and PHY formats.</p> |
| <code>[-delay_info]</code>   | <p>Reports whether the stimulus has zero or non-zero delay.</p> <p>The option provides the average delay value for a delayed stimulus.</p>                                                                                                                                                                                                                  |
| <code>[-out]</code>          | <p>Print all non-uniform clock intervals in the specified file. The default file is <code>joules_work/joules.scan_clk</code>.</p>                                                                                                                                                                                                                           |
| <code>[-print_output]</code> | <p>Prints all the time stamps of toggle data on console.</p>                                                                                                                                                                                                                                                                                                |

### Example(s)

- `scan_stimulus -file activity.vcd -dut_instance /testbench/top -expr /top/a`
- `scan_stimulus -file activity.fsdb -dut_instance /testbench/top -expr {/top/a & /top/b}`
- `scan_stimulus -file activity.vcd -tb_design_tuple {{/testbench/myTop /top}} -time_info`
- `scan_stimulus -file activity.vcd -tb_design_tuple {{/testbench/myTop /top}} -uniform_clk {{/top/clk2}} -start 0ns -end 100ns`
- `scan_stimulus -file activity.vcd -tb_design_tuple {{/testbench/myTop /top}} -uniform_clk {{/top/clk2}} -out scan_report_vcd.log -clock_span 45`
- `scan_stimulus -file activity.vcd -dut_instance /testbench/top -expr /top/a -print_output`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

[Merging Stimulus in Joules](#)

## set\_pin\_waveform

Defines the waveform for a pin. This waveform is used in vectorless flow of xreplay.

### Syntax

```
set_pin_waveform\  
[-name pin_name]  
[-initial_value <0|1>]  
[-duty duty]  
[-period period]  
[-divide_by factor | -multiply_by factor]  
[-percentage_values {{percentage val}+}]  
[-value_changes {{time val}+}]  
[-pattern {{cycle_num value}+}]  
[-waveform {rise | fall}]  
[-num_cycles num_cycles]  
[-duty_factor factor]  
[-toggle_factor factor]  
[-periodic_start_time time]  
[-master_clock pin name]
```

## Options and Arguments

|                                     |                                                                                                                                        |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-name]</code>                | Specify name of the pin for which waveform needs to be defined.                                                                        |
| <code>[-initial_value]</code>       | Specify initial value of the signal.                                                                                                   |
| <code>[-duty]</code>                | Specify duty of the signal.                                                                                                            |
| <code>[-period]</code>              | Specify period of the signal.                                                                                                          |
| <code>[-divide_by]</code>           | Specify the factor by which waveform frequency should be multiplied or divided.                                                        |
| <code>[-percentage_values]</code>   | Specify the percentage of time, value should be 0/1 for the complete duration.                                                         |
| <code>[-value_changes]</code>       | Specify the value change on particular time stamp.                                                                                     |
| <code>[-pattern]</code>             | Specify the value on a particular cycle.                                                                                               |
| <code>[-waveform]</code>            | Specify the edge for which pattern needs to be applied.                                                                                |
| <code>[-num_cycles]</code>          | Specify the number of cycles for which patterns needs to be defined and after which signal will be repeated for the complete duration. |
| <code>[-duty_factor]</code>         | Specify the factor of simulation time the signal should be on.                                                                         |
| <code>[-toggle_factor]</code>       | Specify the number of toggles of signal will be factor times toggles of master clock.                                                  |
| <code>[-periodic_start_time]</code> | Specify the start time for unasserted clock signal.                                                                                    |
| <code>[-master_clock]</code>        | Specify the master clock of given signal.                                                                                              |

## Example(s)

- `set_pin_waveform -name /cpu_10bit/clk -period 100ns -duty 0.5 -initial_value 0`
- `set_pin_waveform -name /cpu_10bit/clk -period 100ns -duty 0.5 -initial_value 0 -periodic_start_time 50ns`
- `set_pin_waveform -name /cpu_10bit/rst -master_clock /cpu_10bit/clk -divide_by 4`
- `set_pin_waveform -name /cpu_10bit/start -percentage_values {{20% 0} {40.0% 1} {40% 0}}`
- `set_pin_waveform -name /cpu_10bit/err -value_changes {{20ns 0} {120ns 1} {200ns 0}}`

## Joules Command and Attribute Reference

### Simulation Interface Commands - set\_pin\_waveform

---

- `set_pin_waveform -name /top/clk_1 -master_clock /top/clk -num_cycles 10 -pattern { {2 1} {4 0} {8 1} {10 0} } -waveform rise -initial_value 0`
- `set_pin_waveform -name /top/start -master_clock /top/clk -duty_factor 0.2 -toggle_factor 0.3`

## set\_rtl\_stim\_to\_gate\_config

Allows name mapping support with Joules. Sets separate naming rules for simulation/emulation and implementation (synthesis/P&R). The naming rules mimic the common RTL name transformations.

### Syntax

```
set_rtl_stim_to_gate_config \  
  [-init <f_elab_db>]  
    [-tcl <f_elab_tcl>]  
    [-keep_libraries]  
    [-ignorecase]  
  [-map_file <map_file> [conformal|genus|dc]]  
    [-hier_separator <char>]  
    [-golden rtl|gate]  
    [-gate_block <sub-hierarchy of gate design>]  
    [-rtl_block <sub-hierarchy of rtl design>]  
    [-force_qn_invert]  
  [-discard]  
  [-load]  
  [-infer_rules]  
  [-rule <type> <format>]  
    [-get]  
    [-target syn|sim]  
    <type> =  
      ungroup|reg_ext|bit_slice|array_slice|hier_slice|generate|record|proc|  
      hier_proc|flop_slice|no_prefix  
    <format> = string format
```



## Options and Arguments

|                                 |                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>               | Displays help for all options.                                                                                                                      |
| <code>[-init]</code>            | Initialize the command using elab DB.                                                                                                               |
| <code>[-tcl]</code>             | Suboption of <code>-init</code> . Specify the Tcl portion of elab DB.                                                                               |
| <code>[-keep_libraries]</code>  | Suboption of <code>-init</code> . Keep elab DB libraries and MMMC information. By default, these are deleted.                                       |
| <code>[-ignorecase]</code>      | Suboption of <code>-init</code> . Enable case insensitive search. This option is set by default for VHDL.                                           |
| <code>[-map_file]</code>        | Read the specified map file. Default is Conformal <code>map_file</code> .                                                                           |
| <code>[-hier_separator]</code>  | Suboption of <code>-map_file</code> . Specify the hierarchy separator. The default separator is <code>/</code> .                                    |
| <code>[-golden]</code>          | Suboption of <code>-map_file</code> . Specify the golden file to consider. By default, rtl file is considered as the golden file.                   |
| <code>[-gate_block]</code>      | Suboption of <code>-map_file</code> . Specify the sub hierarchy of gate design. Default is <code>"</code> .                                         |
| <code>[-rtl_block]</code>       | Suboption of <code>-map_file</code> . Specify the sub hierarchy of RTL design. Default is <code>"</code> .                                          |
| <code>[-force_qn_invert]</code> | Suboption of <code>-map_file</code> . Specify this option to force a change in polarity for QN pins if both golden and revised phases are positive. |

In the following example, option changes the phase if both phases are + in conformal map file, and the revised pin in concern is a QN.

10-th mapped points:

(G) + 10 DFF /inst/out1\_reg[3]

(R) + 11 DFF /foo/my\_mbc/Q3N

To

10-th mapped points:

(G) + 10 DFF /inst/out1\_reg[3]

(R) - 11 DFF /foo/my\_mbc/Q3N

## Joules Command and Attribute Reference

### Simulation Interface Commands - set\_rtl\_stim\_to\_gate\_config

---

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-discard]</code>     | Throw away all rtlstim2gate data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-load]</code>        | Initialize using the current design. This option is used primarily for gate-level stimulus handling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-infer_rules]</code> | Infer synthesis rules from attributes; use in netlist based flows.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-rule]</code>        | <p>Specify the naming rule in form of &lt; type&gt; &lt;format&gt;.</p> <p>Default format for each rule type is given below:</p> <ul style="list-style-type: none"><li>■ <code>ungroup</code> : "%s/%s" (ungroup separator)</li><li>■ <code>reg_ext</code> : "%s_reg%s" (register/flop name extension)</li><li>■ <code>bit_slice</code> : {[%s]} (applies to packed dimension of MDA nets)</li><li>■ <code>array_slice</code>: {[%s]} (applies to unpacked dimensions of MDA nets and all dimensions of flops)</li><li>■ <code>hier_slice</code> : {[%s]} (applies to generate hierarchy slices)</li><li>■ <code>generate</code> : "%s.%s" (applies to implicit generate hierarchy)</li><li>■ <code>record</code> : "%s.%s" (applies to record/struct names)</li><li>■ <code>flop_slice</code> : {} (applies MDA expansion for flops, msb&gt;lsb, overrides array_slice)</li></ul> |
| <code>[-get]</code>         | Suboption of <code>-rule</code> . Gets an existing rule value (default = set rule).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-target]</code>      | Suboption of <code>-rule</code> . Applies rule to simulation or synthesis, (default = syn).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Example(s)

- `set_rtl_stim_to_gate_config -init ./joules_work/cpu_10bit.elab.db ;# initialize rtlstim2gate`
- `set_rtl_stim_to_gate_config -rule ungroup "%s/%s" ;# ungrouping rule`
- `set_rtl_stim_to_gate_config -rule reg_ext "%s_reg%s" ;# register name extension rule`
- `set_rtl_stim_to_gate_config -rule bit_slice {[%s]} ;# bit slicing rule`
- `set_rtl_stim_to_gate_config -rule hier_slice {_%s_} ;# generate index rule`

## Joules Command and Attribute Reference

### Simulation Interface Commands - set\_rtl\_stim\_to\_gate\_config

---

- `set_rtl_stim_to_gate_config -rule array_slice {[%s]} ;# array (except LSB) slicing rule`
- `set_rtl_stim_to_gate_config -rule generate "%s.%s" ;# generate statement expansion rule`
- `set_rtl_stim_to_gate_config -rule flop_slice {[%s] _%s_} ;# flop slice expansion rule`
- `set_rtl_stim_to_gate_config -rule proc "my_custom_rename" ;# custom renaming  
proc my_custom_rename { type name hierarchy }`
- `set_rtl_stim_to_gate_config -rule hier_proc "my_custom_rename" ;# custom  
renaming proc for genblk my_custom_rename { type name hierarchy }`
- `set_rtl_stim_to_gate_config -map_file mapped.rpt;# Specify a top-level  
conformal map file`
- `set_rtl_stim_to_gate_config -map_file mapped.rpt -gate_block /DUMMY -rtl_block  
/dummy ;# Specify a block specific map file`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

[Using RTLStim2Gate on Netlist](#)

## set\_sdb\_alias

Assigns alias names for the stims and frames. After assigning alias names to the stims or frames, you can use the alias names as arguments to all commands that accept stim ID or frame ID as an argument.

### Syntax

```
set_sdb_alias
  [-alias <alias-name>]
  [-stim <stim-id>]
  [-frame_bname <frame-bname>]
  [-frame_seperator <frame-seperator>]
  [-frame_idx_start <frame-idx-start>]
  [-frame_idx_incr <frame-idx-incr>]
  [-frame <frame-id>]
```

### Options and Arguments

|                    |                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]               | Displays help for all options.                                                                                                                     |
| [-alias]           | Specify the alias name for the stim or frame ID.                                                                                                   |
| [-stim]            | Specify the stim ID for which to set the alias.                                                                                                    |
| [-frame_bname]     | In case of multiple frames, specify the alias base name, which remain the same for all frames.                                                     |
| [-frame_seperator] | In case of multiple frames, specify the separator to use between the frame base name and the frame index. See examples below for sample usage.     |
| [-frame_idx_start] | In case of multiple frames, specify the starting index for the frame alias. See examples below for sample usage.                                   |
| [-frame_idx_incr]  | In case of multiple frames, specify the number by which to increases the index of the subsequent frame alias. See examples below for sample usage. |
| [-frame]           | Specify the frame ID for which to set the alias.                                                                                                   |

### Example(s)

- `set_sdb_alias -alias /gcf -stim /stim#1; /stim#1 can be referenced using /gcf`
- `set_sdb_alias -alias /gcf/idle -frame /stim#1/frame#20; /stim#1/frame#20 can be referenced using /gcf/idle`

## Joules Command and Attribute Reference

### Simulation Interface Commands - set\_sdb\_alias

---

- `set_sdb_alias -alias /idle -stim /stim#2 -frame_bname myframe -frame_seperator ;` The frames in stim#2 can be referenced using idle and myframe for example /idle/myframe:1 /idle/myframe:2 etc
- `set_sdb_alias -stim /stim#1 -alias /mystim -frame_bname /myframe -frame_seperator $ -frame_idx_start 10 -frame_idx_incr 5`  
#The above command will set the following alias names for the /stim#1 and its frames.  

|                 |                          |
|-----------------|--------------------------|
| /stim#1/frame#1 | /mystim/myframe\$10,     |
| /stim#1/frame#2 | /mystim/myframe\$15,     |
| /stim#1/frame#3 | /mystim/myframe\$20 etc. |

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

[Adding Alias Names to Stims and Frames](#)

## write\_forward\_saif

Writes the library forward SAIF file. This file contains the state-dependent and path-dependent (SDPD) directives needed to generate backward SAIF files during simulation.

### Syntax

```
write_forward_saif \  
  [-root <design|instance>]  
  [-design_state <elab|mapped>]  
  [-rtl_nodes {<obj_type>[:<port_type>]}+]  
    obj_type = port|memory|flop|icgc|latch|seq|bbox|logic|all  
    port_type = input|output|all  
  [-hier_separator <separator>]  
    separator = .|/ (default : /)  
  [-sdpd {<cell_type>}+ ]  
    cell_type =  
      memory|flop|latch|icgc|hadd|fadd|mux|inv|buf|and|nand|or|nor|xor|xnor|ao|  
      aoi|oa|oai|ls|els|iso|pad|tri|tie|srpg  
  [-lib <lib>+]  
  [-domain <domain>+]  
  [-dut_instance <dut-inst-name>]  
  [-rtl_out <output-rtl-fsaif-file-name>]  
  [-sdpd_out <output-sdpd-fsaif-file-name>]
```

## Options and Arguments

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>              | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-root]</code>           | <p>Specify the root entity for generating the forward SAIF information. This option is valid for both RTL and SDPD files. By default, the top design is considered. If specified, instances of only the specified root are considered.</p>                                                                                                                                                                                             |
| <code>[-design_state]</code>   | <p>Specify the design state to be considered. The default state is <code>elab</code>.</p> <p>For writing RTL forward SAIF file, only the instances of the specified design state are considered.</p> <p>For writing SDPD forward SAIF file, if you specify <code>-design_state elab</code>, only write RTL initiated instances are considered; and if you specify <code>-design_state mapped</code>, all instances are considered.</p> |
| <code>[-rtl_nodes]</code>      | <p>Specify the list of RTL nodes in the format:</p> <p><code>&lt;obj_type&gt;[:&lt;port_type&gt;]</code></p> <p>Only the signals that satisfy the specified constraint are written in the RTL forward SAIF file.</p> <p>See the command syntax for supported object and port types. By default, all object and port types are considered.</p> <p><b>Note:</b> This option is valid only for writing RTL forward SAIF file.</p>         |
| <code>[-hier_separator]</code> | <p>Specify the separator for the hierarchies. By default, <code>:</code> / is used as separator.</p>                                                                                                                                                                                                                                                                                                                                   |
| <code>[-sdpd]</code>           | <p>Specify the SDPD cell types. Only the library cells of the specified cell types are written in the SDPD forward SAIF file.</p> <p>See the command syntax for the list of supported cell types.</p> <p><b>Note:</b> This option is valid only for writing SDPD forward SAIF file.</p>                                                                                                                                                |

## Joules Command and Attribute Reference

### Simulation Interface Commands - write\_forward\_saif

---

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-lib]</code>          | <p>Specify the list of libraries for which to generate the forward SAIF information.</p> <p>For RTL forward SAIF file, only the instances whose library cells exist in the specified library are written in the forward SAIF file.</p> <p>For SDPD forward SAIF file, only the library cells from the specified library are written in the forward SAIF file.</p> <p>If not specified, the information is generated for all libraries that are loaded.</p>                                                        |
| <code>[-domain]</code>       | <p>Specify the path to the library domain containing the libraries for which to generate the forward SAIF information.</p> <p>For RTL forward SAIF file, only the instances whose library cells exist in the specified library domain are written in the forward SAIF file.</p> <p>For SDPD forward SAIF file, only the library cells from the specified library domain are written in the forward SAIF file.</p> <p>If not specified, the information is generated for all libraries in all library domains.</p> |
| <code>[-dut_instance]</code> | <p>Specify the DUT instance name in testbench; if not specified, the top name is used.</p>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-rtl_out]</code>      | <p>If specified, only RTL forward SAIF file is written in the specified file. By default, the output is written in <code>joules_work/joules_RTL.forward_saif</code>.</p>                                                                                                                                                                                                                                                                                                                                          |
| <code>[-sdpd_out]</code>     | <p>If specified, only SDPD forward SAIF file is written in the specified file. By default, the output is written in <code>joules_work/joules_SDPD.forward_saif</code>.</p>                                                                                                                                                                                                                                                                                                                                        |

### Example(s)

- `write_forward_saif ;# create joules_work/joules_SDPD.forward_saif joules_work/joules_RTL.forward_saif (default SAIF file name)`
- `write_forward_saif -root /cpu_10bit -sdpd_out cpu.forward_saif;# create forward cpu.forward_saif`
- `write_forward_saif -lib slow.lib typical.lib -domain ld1 -sdpd_out ld1.forward_saif`
- `write_forward_saif -rtl_nodes memory:output flop:all port:all -rtl_out rtl.forward_saif`



## Joules Command and Attribute Reference

### Simulation Interface Commands - write\_forward\_saif

---

■ `write_forward_saif -rtl_nodes memory:output flop:all port:all -rtl_out  
rtl.forward_saif -dut_instance cpu_10bit_inst`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

[Simulation, Simulation Read, and SDB Creation](#)

## write\_sdb

Writes out all in-memory frames onto the disk.

### Syntax

```
write_sdb \  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]  
  [-average]  
  [-merge]  
    [-nodal <stim_id>]  
    [-sdpd <stim_id>]  
  [>|-out <output-sdb-file-name>]
```

### Options and Arguments

|            |                                                                                                                  |
|------------|------------------------------------------------------------------------------------------------------------------|
| [-h]       | Displays help for all options.                                                                                   |
| [-stims]   | Specify the list of stim IDs to write. By default, all SDB stims are written.                                    |
| [-frames]  | Specify the frames IDs to write. By default, all frames of all specified stims are written.                      |
| [-average] | Write out average of the frames to SDB.                                                                          |
| [-merge]   | Merge all stimuli in memory and write out SDB.                                                                   |
| [-nodal]   | Sub-option of -merge. Use nodal data from the stimulus.                                                          |
| [-sdpd]    | Sub-option of -merge. Use sdpd data from the stimulus.                                                           |
| [> -out]   | Specify the name of the output SDB file name. By default, the output is saved in <i>joules_work/joules.sdb</i> . |

### Example(s)

- `write_sdb ; # create joules_work/joules.sdb (default SDB file name) with all frames from all stims`
- `write_sdb -out cpu_10bit.sdb ; # create ./cpu_10bit.sdb with all frames from all stims`
- `write_sdb -average -out cpu_10bit.sdb ; # create average of all frames from all stims and write to file ./cpu_10bit.sdb`
- `write_sdb -stims {/stim#5} ; # create an sdb file with all frames from /stim#5`

## Joules Command and Attribute Reference

### Simulation Interface Commands - write\_sdb

---

- `write_sdb -average -frames {/stim#1/frame#1 /stim#2/frame#3} -out cpu_10bit.sdb ; # create average of /stim#1/frame#1, /stim#2/frame#3 and write to the file ./cpu_10bit.sdb`
- `write_sdb -merge -frames {/stim#1/frame#1 /stim#2/frame#3} -out cpu_10bit.sdb ; # Merge /stim#1/frame#1 and /stim#2/frame#3 and write to the file ./cpu_10bit.sdb`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## **write\_vf**

Writes the currently stored waveform definitions to the file.

### **Syntax**

```
write_vf\  
    [-out <file name>]
```

### **Options and Arguments**

[-out]                                      Specify the complete path to the output vector file.

### **Example(s)**

```
■ write_vf -out ./vector_file.txt
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

## xreplay

Runs the gate-level simulation using RTL stimulus. It reads the RTL stimulus and generates the required stimulus database that is needed for Xcelium to run the replay simulation.

## Syntax

```
xreplay \  
  [-xrun_path path_to_xrun]  
  [-mapped_db f_genus_db|-netlist {<f_netlist>+}]  
    (f_genus_db = Genus mapped DB, <f_netlist>+ = 3rd party netlist file(s))  
  [-sdc f_sdc]  
  [-top top_level_module]  
  [-post_cts_netlist]  
  [-lib_proc libproc]  
  [-elab_db f_elab]  
  [-disable_rtlstim2gate]  
  [-rule_proc Tcl_proc_that_applies_rtlstim2gate_rules]  
  [-map_file map_file [conformal|genus|dc]]  
  [-rtl_stim f_rtl_stim]  
    [-stim_format vcd|shm|phy|fsdb|vwdb]  
    [-dut_instance dut-inst-name]  
  [-design_root root]  
  [-tb_design_tuple {dut root}]  
  [-clocks <clock-pin|port-names>]  
  [-start_window_start_time]  
  [-end_window_end_time]  
  [-x_value 0|1|ignore|x]  
  [-initial_x_value 0|1|x]  
  [-initial_state_point_value 0|1|x|z|rtlstim|auto|none]  
  [-timescale timescale_string]  
    [-override_timescale]  
  [-gen_sim_models lec|liberate]  
  [-lec_path path_to_lec]  
  [-liberate_path path_to_liberate]  
  [-ignorecase]  
  [-delay_mode <none|zero|unit|punit|delay|pdelay|distributed>]  
    [-sdf SDF_file]  
    [-clock sdf Clock SDF_file]  
    [-spef SPEF_file]  
    [-pdelay_value "logic:<val> seq:<val> cgic:<val> port:<val>"]  
  [-port_delay_file port_delay_file]  
  [-ignore_internal_vars 0|1]  
  [-verilog_model_files list of verilog model files]  
  [-verilog_model_startup_file verilog_startup_file]  
  [-xreplay_output_stim_format shm|vcd|fsdb|vwdb|tcf|tcf_flat|saif|saif_flat]  
  [-novas_inst_dir Novas Installation dir]  
  [-cloned_signals {{primary input pin {<primary input pin>+}}+}]  
  [-assign_unasserted_seed 0|1|x|X|z|Z]  
  [-assign_pin_values {{pin value override+}}]  
  [-pin_values_file pin_values_file]  
  [-inverted_pins_file inverted_pins_file]  
  [-initial_pin_values_file initial_pin_values_file]  
  [-stim_annotation {obj_type[:pin_type]}+]  
    (obj_type = port|seq|reg|latch|icgc|bbox|macro|mem|state)  
    (pin_type = in|out|both)  
  [-annotation_threshold {obj_type:percentage}+]  
    (obj_type = port|flop|latch|mem)
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

```
[-feed_through signals_file path_to_the_file]
[-selective_debug { tag {option_list} tag {option_list} ... tag
{option_list} }]
[-pre_script pre_script tcl file]
[-post_script post_script tcl file]
[-out <Replay Output file>]
[-report_missing_signals all|design|stim|none]
  [-out_report_file f_rpt]
[-vector_file f_vector_file]
  [-duration duration of vector]
[-gen vector_file]
  [-duration duration_of_vector]
  [-cg_enable_duty duty]
  [-memory_rate pct]
  [-bbox_rate pct]
  [-primary_input_rate pct]
  [-flop_rate pct]
  [-latch_rate pct]
  [-primary_clock clock_pin_name]
[-gen_dut_instance test_bench_name.top_instance_name]
[-stim_annotation_report_file report_file]
[-honor_skip_assertion]
[-skip_assertion_file file_name]
[-use_sdc_for_unasserted_clock]
[-extra_pin_naming_rule rule]
[-compare_sim]
  [-obj_handle]
  [-show_details]
```

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

#### Options and Arguments

|                                      |                                                                                                                                |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <code>[-xrun_path]</code>            | Specify xrun binary path to run Xcelium for replay simulation.                                                                 |
| <code>[-mapped_db   -netlist]</code> | Specify either Genus mapped database or a 3rd-party netlist file.                                                              |
| <code>[-sdc]</code>                  | Specify the sdc file with netlist.                                                                                             |
| <code>[-top]</code>                  | Specify the top level verilog module when multiple top level modules are specified in netlist files.                           |
| <code>[-post_cts_netlist]</code>     | Marks the netlist as post cts.<br><br>As a result, the clock network is made non ideal to get accurate delays.                 |
| <code>[-lib_proc]</code>             | Specify the Tcl procedure for library settings.                                                                                |
| <code>[-elab_db]</code>              | Specify the database with Joules default naming rules for rtlstim2gate flow.                                                   |
| <code>[-disable_rtlstim2gate]</code> | Disables rtlstim2gate.<br><br>This option is required for gate level input stimulus.                                           |
| <code>[-rule_proc]</code>            | Specify the Tcl procedure that applies the rtlstim2gate rules.                                                                 |
| <code>[-map_file]</code>             | Specify either Conformal or Genus RTL to netlist map file. Default is Conformal map file.                                      |
| <code>[-rtl_stim]</code>             | Specify the input RTL stimulus file.                                                                                           |
| <code>[-stim_format]</code>          | Suboption of rtl_stim, provides format of rtl stimulus.                                                                        |
| <code>[-dut_instance]</code>         | Suboption of rtl_stim, provides dut hierarchy in rtl stimulus.                                                                 |
| <code>[-design_root]</code>          | Apply activity on specified design hierarchy. Default is design root.                                                          |
| <code>[-tb_design_tuple]</code>      | Map stimulus <dut> to design <root>.                                                                                           |
| <code>[-clocks]</code>               | Specify the pin/ port names of design clock and active edge.                                                                   |
| <code>[-start]</code>                | Specify start time to run replay for particular stimulation time duration, for example 24ns. Default is simulation start time. |

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

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|                                           |                                                                                                                                                                                               |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-end]</code>                       | Specify end time to run replay for particular stimulation time duration, for example <code>10us</code> . Default is simulation end time.                                                      |
| <code>[-x_value]</code>                   | Assign x values of rtl stimulus to 0 or 1. Default is x.                                                                                                                                      |
| <code>[-initial_x_value]</code>           | Initial x value to be considered as 0 or 1.<br><br>Default is x.                                                                                                                              |
| <code>[-initial_state_point_value]</code> | Specify initial state point value.<br><br>Default is auto.                                                                                                                                    |
| <code>[-timescale]</code>                 | Specify the timescale values on which replay needs to be run. Default is timescale from rtl stimulus.                                                                                         |
| <code>[-override_timescale]</code>        | Override the existing timescale value with the timescale value provided in <code>-timescale</code> option.                                                                                    |
| <code>[-gen_sim_models]</code>            | Specify the models. Default is none.                                                                                                                                                          |
| <code>[-lec_path]</code>                  | Specify complete path to <code>lec</code> executable.                                                                                                                                         |
| <code>[-liberate_path]</code>             | Complete path to <code>liberate</code> executable.                                                                                                                                            |
| <code>[-ignorecase]</code>                | Ignore case while searching for design object names.                                                                                                                                          |
| <code>[-delay_mode]</code>                | Specify the delay mode value.<br><br>Default is none.                                                                                                                                         |
| <code>[-sdf]</code>                       | Suboption of <code>-delay_mode</code> .<br><br>Specify the SDF file to be used in delay mode and pdelay mode flows.                                                                           |
| <code>[-clock_sdf]</code>                 | Suboption of <code>-delay_mode</code> .<br><br>Specify the SDF file for clock network.<br><br>The file is read by Joules in delay mode.                                                       |
| <code>[-spef]</code>                      | Suboption of <code>-delay_mode</code> .<br><br>Specify the SPEF file to be used in delay mode flow.                                                                                           |
| <code>[-pdelay_value]</code>              | Suboption of <code>-delay_mode</code> .<br><br>Specify the <code>pdelay</code> value. This is a mandatory option if you specify <code>delay_mode</code> option value as <code>pdelay</code> . |



## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

|                                            |                                                                                                                                                                                                                           |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-port_delay_file]</code>            | <p>Specify the port delay file to shift the waveform of ports.</p> <p>This file contains the delay value entries in the following format:</p> <p><code>&lt;port_name&gt; &lt;rise_delay&gt; &lt;fall_delay&gt;</code></p> |
| <code>[-ignore_internal_vars]</code>       | <p>Specify this option to ignore the internal signals simulation of the design. Default is 0.</p>                                                                                                                         |
| <code>[-verilog_model_files]</code>        | <p>Specify list of library verilog models.</p>                                                                                                                                                                            |
| <code>[-verilog_model_startup_file]</code> | <p>Specify the file which contains all the library verilog models files path.</p>                                                                                                                                         |
| <code>[-xreplay_output_stim_format]</code> | <p>Provides format of replay gate-level stimulus. Default is SHM.</p>                                                                                                                                                     |
| <code>[-novas_inst_dir]</code>             | <p>Specify the Novas installation directory. This option is required for <code>fsdb</code> output format.</p>                                                                                                             |
| <code>[-cloned_signals]</code>             | <p>Clones the value changes of specified primary input pin to other specified primary input pins.</p>                                                                                                                     |
| <code>[-assign_unasserted_seed]</code>     | <p>Specify the value to be assigned to unasserted seed points. Default is none.</p>                                                                                                                                       |
| <code>[-assign_pin_values]</code>          | <p>Specify the values to be assigned to pins. If override is 1 then stimulus annotation for the pin is ignored. Override is optional and its default value is 1.</p>                                                      |
| <code>[-pin_values_file]</code>            | <p>Contains the values to be assigned to unasserted pins. This file contains the entries in <code>pin_name=value</code> format.</p>                                                                                       |
| <code>[-inverted_pins_file]</code>         | <p>Contains pins that need to be inverted.</p>                                                                                                                                                                            |
| <code>[-initial_pin_values_file]</code>    | <p>Specifies the file containing pins and their initial values.</p>                                                                                                                                                       |

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

`[-stim_annotation]`

Honor stim annotation of only the specified objects.

Specify the option in the following format:

`{<obj_type>[:<pin_type>]}+`

`<obj_type>` can have any of the following values:

`port|seq|bbox|macro|mem|state|reg|latch|icg  
c`

State means “port:in reg:out latch:out mem:out  
bbox:out macro:out”.

It does not support `all none preserve comb.`

`<pin_type>` can have any of the following values:

`in|out|both`

Default value for `pin_type` is `both`. For state there is no `pin_type`.

`[-annotation_threshold]`

Skips the xrun execution, if the intermediate shm annotation percentage is lesser than the threshold. This option considers input ports, flop outputs, latch outputs, and memory outputs. Memory outputs include black box, memory, and macro outputs.)

`[-feed_through_signals_file]`

Feeds through the signals file.

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

[-selective\_debug]

<tag>

<option\_list>

Description

stim\_inst

{list of design instances}

Debug listed instances  
\*Note design\_name/\* allows to debug all sub-instances as well

stim\_signal

{list of design nets}

Debug listed nets

dut

{list of design instances}

Debug listed instances

trace\_arc

{list of design instances}

Debug listed arc instances

value\_change

{list of design nets}

Debug listed nets

all|frame|stim\_scope

no options supported

Print all debug logs| all scope logs| all frame logs

[-pre\_script]

Specify the Tcl file to be sourced after loading the design.

[-post\_script]

Specify the Tcl file to be sourced after xreplay command.

[-out]

Specify the output replayed gate-level stimulus file. Default is joulesWorkDir/replayed\_stim.shm or joulesWorkDir/replayed\_stim.vcd or joulesWorkDir/replay\_stim.fsdb.

[-report\_missing\_signals]

Report stimulus objects that do not match any design object. It has the following values:

■

all - reports the signals that are missing in design but present in stimulus and signals that are missing in stimulus but present in design

■

design - reports only the signals that are missing in design but present in stimulus

■

stim - reports only the signals that are missing in stimulus but present in design

■

none - does not report missing signals

[-out\_report\_file]

Suboption of -report\_missing\_signals.

Save the missing signal report in \$joulesWorkDir/missing\_signals.rpt.

[-vector\_file]

Specify the vector file for generating intermediate stimulus.

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

|                                    |                                                                                                                                                                                                                                                                         |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-duration]</code>           | <p>Suboption of <code>-vector_file</code>.</p> <p>Specify the vector duration for generating intermediate stimulus.</p>                                                                                                                                                 |
| <code>[-gen_vector_file]</code>    | <p>Generates the vector file containing list of <code>set_pin_waveform</code> commands for ports, memory outputs, bbox outputs and clock gate enables.</p>                                                                                                              |
| <code>[-duration]</code>           | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specifies the vector duration for generating intermediate stimulus.</p>                                                                                                                                           |
| <code>[-cg_enable_duty]</code>     | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the duty of enable signal of cgics.</p> <p>Default: 0.5</p>                                                                                                                                               |
| <code>[-memory_rate]</code>        | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the rate at which memory outputs are toggling w.r.t related clock.</p> <p>Default is 20% of related clock.</p>                                                                                            |
| <code>[-bbox_rate]</code>          | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the rate at which bbox outputs are toggling w.r.t related clock.</p> <p>Default is 20% of related clock.</p>                                                                                              |
| <code>[-primary_input_rate]</code> | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the rate at which primary inputs are toggling w.r.t related clock.</p> <p>Default is 20% of related clock.</p>                                                                                            |
| <code>[-flop_rate]</code>          | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the rate at which flops are toggling w.r.t related clock.</p> <p><b>Note:</b> <code>set_pin_waveform</code> commands are written for flops only in vector file when <code>-flop_rate</code> is given.</p> |

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-latch_rate]</code>                   | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the rate at which latches are toggling w.r.t related clock.</p> <p><b>Note:</b> <code>set_pin_waveform</code> commands are written for latches only in vector file when <code>-latch_rate</code> is given.</p>                                                                                                                          |
| <code>[-primary_clock]</code>                | <p>Suboption of <code>-gen_vector_file</code>.</p> <p>Specify the primary clock for analysis w.r.t related clock.</p>                                                                                                                                                                                                                                                                                 |
| <code>[-gen_dut_instance]</code>             | <p>Specify DUT instance name in output stimulus file.<br/>Hierarchical separator can be either “.” or “/”.</p> <p>By default generates the output stimulus file with the DUT instance as <code>joules_testbench.joules_top_inst</code>.</p>                                                                                                                                                           |
| <code>[-stim_annotation_report_file]</code>  | <p>Generates stim annotation report file for the given input stimulus file.</p>                                                                                                                                                                                                                                                                                                                       |
| <code>[-honor_skip_assertion]</code>         | <p>Specify to ignore assertion of pins which has <code>skip_assertion</code> attribute set to true.</p>                                                                                                                                                                                                                                                                                               |
| <code>[-skip_assertion_file]</code>          | <p>Specifies the file containing pins whose attribute <code>skip_assertion</code> needs to be set to true.</p> <p>The file should follow format of one line containing one pin.</p>                                                                                                                                                                                                                   |
| <code>[-use_sdc_for_unasserted_clock]</code> | <p>Create waveform for unasserted clock pins using SDC.</p>                                                                                                                                                                                                                                                                                                                                           |
| <code>[-extra_pin_naming_rule]</code>        | <p>Specify additional regex rules for auto mapping pins.</p>                                                                                                                                                                                                                                                                                                                                          |
| <code>[-compare_sim]</code>                  | <p>Reports confidence factor between RTL and stimulus performed by <code>xreplay</code>.</p>                                                                                                                                                                                                                                                                                                          |
| <code>[-obj_handle]</code>                   | <p>Suboption of <code>-compare_sim</code>.</p> <p>Specify the object type and pin direction whose status is to be reported.</p> <p>Th option accepts the following format:<br/><code>&lt;obj_type&gt;:&lt;pin_dir&gt;</code></p> <p>Where <code>obj_type</code>: mem, reg, latch, icgc, or port<br/>and <code>pin_dir</code>: in, out, inout, or all</p> <p>The default is <code>port:out</code>.</p> |

## Joules Command and Attribute Reference

### Simulation Interface Commands - xreplay

---

`[-show_details]`

Suboption of `-compare_sim`.

Displays a detailed report.

### Example(s)

```
xreplay \  
-rtl_stim hdl/activity.fsdb \  
-netlist map.v \  
-verilog_model_files slow_verilog.v \  
-clocks clk \  
-xrun_path /grid/avs/install/xcelium/MAIN/latest/tools/bin/xrun \  
-delay_mode unit \  
-timescale 1ns/10ps \  
-stim_annotation {seq:both bbox:both port:in macro:both mem:both} \  
-annotation_threshold {port:99 flop:100 latch:98.9 mem:100} \  
-cloned_signals {{clk_1 {clk_1_1 clk1_2}} {clk2 {clk_2_1 clk2_2}}}  
xreplay \  
-rtl_stim hdl/activity.fsdb \  
-netlist map.v \  
-verilog_model_files slow_verilog.v \  
-clocks clk \  
-xrun_path /grid/avs/install/xcelium/MAIN/latest/tools/bin/xrun \  
-delay_mode unit \  
-timescale 1ns/10ps \  
-override_timescale \  
-stim_annotation {seq:both bbox:both port:in macro:both mem:both} \  
-cloned_signals {{clk_1 {clk_1_1 clk1_2}}}  
-report_missing_signals design -out_report_file missing.rpt  
-gen_dut_instance joules testbench.joules_top_inst  
-stim_annotation_report_file stim_annotation_file.rpt  
-compare_sim -show_details -obj_handle port:out reg:in
```

### Return Value

0 indicates success, 1 indicates failure in execution.

---

## Clock Tree - Setup and Analysis Commands

---

- get\_clock\_tree\_info
- set\_clock\_tree\_for\_power
- report\_clocks
- report\_clock\_buffers
- create\_clock\_tree
- report\_clock\_tree
- delete\_clock\_tree

## get\_clock\_tree\_info

Returns the required clock gate information.

### Syntax

```
get_clock_tree_info \  
  [-active]  
  [-ctg_name] <clock_tree_name>  
  [-active]  
  [-clock_roots]  
  [-power]  
    [-stims <stim_id>+]  
    [-frames <frame_id>+]  
  [-depth]  
  [-buffers leaf|branch|root|all]  
  [-buffer_cnt leaf|branch|root|all]  
  [-buffer_ds leaf|branch|root|all]  
  [-buffer_area leaf|branch|root|all]  
  [-buffer_power leaf|branch|root|all]  
    [-stims <stim_id>+]  
    [-frames <frame_id>+]  
  [-clock_domain <clock_src>  
  [-fanout leaf|branch|root|all]  
    [-add_min_max]  
    [-level <num>]
```



## Joules Command and Attribute Reference

### Clock Tree - Setup and Analysis Commands - get\_clock\_tree\_info

---

#### Options and Arguments

|                              |                                                                                                                                                  |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                   |
| <code>[-active]</code>       | Return the list of CTGs used for clock power.                                                                                                    |
| <code>[-ctg_name]</code>     | Return the clock tree name.                                                                                                                      |
| <code>[-active]</code>       | Suboption of <code>-ctg_name</code> . Returns 1 if CTG is active, otherwise returns 0.                                                           |
| <code>[-clock_roots]</code>  | Return the list of clock roots in the CTG.                                                                                                       |
| <code>[-power]</code>        | Return the power quad information for the clock gate:<br><br><leakage> <internal> <switching> <total>                                            |
| <code>[-stims]</code>        | Suboption of <code>-power</code> . List of stim IDs.                                                                                             |
| <code>[-frames]</code>       | Suboption of <code>-power</code> . List of frame IDs.                                                                                            |
| <code>[-depth]</code>        | Return depth of the clock tree.                                                                                                                  |
| <code>[-buffers]</code>      | Return the specified list of buffers. By default, entire tree is considered,                                                                     |
| <code>[-buffer_cnt]</code>   | Return buffer count for the leaf, branch, root, or all of them. By default, buffer count for the entire clock tree is returned.                  |
| <code>[-buffer_ds]</code>    | Return the sum of buffer drive strength of the leaf, branch, root, or all of them. By default, buffer drive strength of all buffers is returned. |
| <code>[-buffer_area]</code>  | Return the sum of buffer area of the leaf, branch, root, or all of them. By default, buffer area of all buffers is returned.                     |
| <code>[-buffer_power]</code> | Return the sum of buffer power of the leaf, branch, root, or all of them. By default, buffer power of all buffers is returned.                   |
| <code>[-stims]</code>        | Sub-option of <code>-buffer_power</code> .<br><br>Specify the list of stimuli for reporting buffer power.                                        |
| <code>[-frames]</code>       | Sub-option of <code>-buffer_power</code> .<br><br>Specify the list of frames for reporting buffer power.                                         |
| <code>[-clock_domain]</code> | Sub-option of <code>-buffer_power</code> .<br><br>Specify the list of clock domains for reporting buffer power.                                  |

## Joules Command and Attribute Reference

### Clock Tree - Setup and Analysis Commands - get\_clock\_tree\_info

---

|                                   |                                                                                                                                                                                                                                                                                |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-fanout]</code>            | Return the average fanout of buffers. By default, fanout of entire clock tree is returned.                                                                                                                                                                                     |
| <code>[-add_min_max]</code>       | Suboption of <code>-fanout</code> . Return fanout triple: <code>&lt;avg&gt; &lt;min&gt; &lt;max&gt;</code> .                                                                                                                                                                   |
| <code>[-level &lt;num&gt;]</code> | Suboption of <code>-fanout</code> . Return the value at specified level of design hierarchy. The level of design root is 1.<br><br>This suboption applies to options <code>-buffer</code> , <code>-buffer_cnt</code> , <code>-buffer_ds</code> , <code>-fanout</code> options. |

#### Example(s)

- `get_clock_tree_info -ctg_name CT1 -depth`
- `get_clock_tree_info -ctg_name CT1 -buffers branch`
- `get_clock_tree_info -ctg_name CT1 -buffer_cnt leaf`
- `get_clock_tree_info -ctg_name CT1 -buffer_ds all`
- `get_clock_tree_info -ctg_name CT1 -fanout -level 2`
- `get_clock_tree_info -ctg_name CT1 -power`
- `get_clock_tree_info -ctg_name CT1 -power -stim /stim#2`
- `get_clock_tree_info -ctg_name CT1 -power -frame {/stim#1/frame#[3:7]}`

#### Return Value

-1 indicates failure in execution.

#### Related Topics

- [Clock Gating](#)

## **set\_clock\_tree\_for\_power**

Tags (annotate) the clock tree for power.

### **Syntax**

```
set_clock_tree_for_power \  
[-ctg_name] <clock_tree_name>  
[-clock_root <clock_root>+]  
[-sdc_name <sdc_clock_name>+]
```

### **Options and Arguments**

|                            |                                                |
|----------------------------|------------------------------------------------|
| <code>[-h]</code>          | Displays help for all options.                 |
| <code>[-ctg_name]</code>   | Name of cell.                                  |
| <code>[-clock_root]</code> | List of root pins or ports for the clock tree. |
| <code>[-sdc_name]</code>   | List of SDC clock names.                       |

### **Example(s)**

```
■ set_clock_tree_for_power -ctg_name CT1
```

### **Return Value**

0 indicates success, 1 indicates failure in execution.

### **Related Topics**

■ [Clock Gating](#)

## report\_clocks

Reports gate count, flop count, ICGC count, area (in LIB units), freq (in Hz), power, and SDC name by clock domain. For power information, `compute_power` must be run before.

### Syntax

```
report_clocks \  
  [-clocks] <prim_clock>+  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]  
  [-power tree|tree_seq|tree_comb|tree_icgc|domain|network]  
    tree = power of clock tree  
    tree_seq = power of clock tree seq elements  
    tree_comb = power of clock tree comb elements  
    tree_icgc = power of clock tree ICGCs  
    domain = power of clock domain elements  
    network = power of clock tree + clock domain  
  [-cols  
    {sdc_freq|gates|flops|latches|icgcs|area|sim_freq|leakage|internal|  
      switching|total|sdc_name|clock_pin}+]  
  [-sort_by  
    {sdc_freq|gates|flops|latches|icgcs|area|sim_freq|leakage|internal|  
      switching|total|clkpin}]  
  [-header]  
  [>|-out <output-file-name>] [-append]
```

## Joules Command and Attribute Reference

### Clock Tree - Setup and Analysis Commands - report\_clocks

---

#### Options and Arguments

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>      | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-clocks]</code> | <p>Name of SDC clock pins/nets whose details need to be reported.</p> <p>By default, all clocks will be reported.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-stims]</code>  | <p>List of stimulus IDs for which different properties of clock need to be displayed.</p> <p>By default, clock properties will be reported for all the stimulus read for the design. If no stimulus is read, then the command will return NULL.</p> <p>Multiple stimulus IDs can be specified with this option.</p> <p>Stimulus ID can be found out using <code>get_sdb_stim</code> command.</p>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-frames]</code> | <p>List of frame IDs for which clock properties need to be displayed.</p> <p>This option is applicable if read stimulus is divided into frames.</p> <p>By default, clock parameters will be reported for frame#0 of each stimuli read for the design.</p> <p>If the specified frame does not exist, then the command will return NULL.</p> <p>If both the <code>-stims</code> and <code>-frames</code> options are specified, then the command will print the required information for all the valid frames that are specified with <code>-frames</code> option. In the following example, the command will display info for both frames irrespective of whether <code>/stim#2</code> is mentioned with <code>-stims</code> or not.</p> <pre>report_clocks -stims /stim#2 -frames /stim#1/<br/>frame#4 /stim#2/frame#17</pre> |
| <code>[-power]</code>  | <p>Return power of the specified component.</p> <p>See the command syntax for list of valid values.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Joules Command and Attribute Reference

### Clock Tree - Setup and Analysis Commands - report\_clocks

---

|                          |                                                                                                                                                                                                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-cols]</code>     | <p>Report the clock properties in the specified columns. The valid stimulus and non-stimulus specific values are mentioned above with the syntax.</p> <p>Default columns are:</p> <pre>sdc_freq gates flops icgcs area sim_freq leakage<br/>internal switching total sdc_name</pre>                       |
| <code>[-sort_by]</code>  | <p>Sort the output based on the specified parameter in case multiple clocks are being reported. Valid parameters are mentioned with the syntax. By default, the output is sorted by gates.</p> <p>If multiple values are specified with this option, then only first value is considered for sorting.</p> |
| <code>[-header]</code>   | <p>Dump the report header.</p>                                                                                                                                                                                                                                                                            |
| <code>[&gt; -out]</code> | <p>Redirect the output of the command in the specified file.</p>                                                                                                                                                                                                                                          |
| <code>[-append]</code>   | <p>Append to the file specified with <code>-out</code> option.</p>                                                                                                                                                                                                                                        |

### Example(s)

- ```
# report all clock domains list of primary clock nets  
report_clocks ;
```
- ```
# report sdc_freq, flops, leakage, and internal power for clock /cpu_10bit/clk  
for stimulus /stim#1  
  
report_clocks -clock /cpu_10bit/clk -cols sdc_freq flops leakage internal -stim  
/stim#1
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Clock Gating](#)

## report\_clock\_buffers

Infers clock buffers from library.

### Syntax

```
report_clock_buffers
[-lib <lib_name>] [-domain <domain>]
[-ldb_libpath [/libraries/][<domain>/]<lib>]
[-rf_margin <frac>]
[-name <cell_name_regexp>]
[-cell_type inv|buf|both]
[-drive_strength <ds> <ds_margin>] )
[-x1_cell <x1_cell>] )
[-full_path]
```

### Options and Arguments

|                   |                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------|
| [-h]              | Displays help for all options.                                                                    |
| [-lib]            | Library name.                                                                                     |
| [-domain]         | Library domain name.                                                                              |
| [-ldb_libpath]    | Full vdir path of library.                                                                        |
| [-rf_margin]      | Rise-fall margin. The default margin is 0.1 (rise/fall ratio of 0.9 to 1.1)                       |
| [-name]           | Name of cell. By default, it is *.                                                                |
| [-cell_type]      | Type of cell. The default cell type is buf.                                                       |
| [-drive_strength] | Drive strength of the cell. By default, ds_margin is calculated as +/- 10% of ds or +/- (0.1)*ds. |
| [-x1_cell]        | X1 cell name. If specified, this cell is used for drive strength computation.                     |
| [-full_path]      | Returns full path names. By default, this option is set to false.                                 |

### Example(s)

- `report_clock_buffers -cell_type buf -name {CK*}`
- `report_clock_buffers -drive_strength 2.0 -rf_margin 0.15`
- `report_clock_buffers -drive_strength 4 0.8 -x1_cell INVX16`

## **Return Value**

0 indicates success, 1 indicates failure in execution.

## **Related Topics**

- [Library Read and Analysis](#)



## create\_clock\_tree

Generates the clock tree structure for the ideal or partially specified RTL clock, including presence of ICGCs (post clock gating) and generated clocks; returns handle/path (string) of the generated clock tree.

### Syntax

```
create_clock_tree \  
  [-ideal_clock]  
  [-name <clock_tree_name>]  
  [-clock_root <pin/port>+]  
  [-arch balanced]  
  [-max_skew <val>[<unit>]]  
  [-max_skew_frac <frac>]  
  [-max_sink_slew <val>[<unit>]]  
  [-max_slew_degradation <frac>]  
  [-max_insertion_delay <val>[<unit>]]  
  [-max_tree_depth <val>]  
  [-clock_buffers {[/libraries/][<domain>/][<lib>/]<cell>}+]  
  [-root_buffers {[/libraries/][<domain>/][<lib>/]<cell>}+]  
  [-branch_buffers {[/libraries/][<domain>/][<lib>/]<cell>}+]  
  [-leaf_buffers {[/libraries/][<domain>/][<lib>/]<cell>}+]  
  [-infer_clock_buffers]  
    [-lib <lib>] [-domain <domain>]  
    [-ds_range <min_ds> <max_ds>]  
    [-x1_cell {[/libraries/][<domain>/][<lib>/]<x1_cell>}]  
    [-rf_margin]  
  [-fanout root=<val> branch=<val> leaf=<val>|compute]  
  [-strict_fanout_target]  
  [-show_computed_params]  
  [-edi_spec <f_edi_spec>]  
  [-ccopt_spec <f_ccopt_spec>]  
  [-spef <spef_file>]
```

## Joules Command and Attribute Reference

### Clock Tree - Setup and Analysis Commands - create\_clock\_tree

---

#### Options and Arguments

|                                      |                                                                                                                                                                                                                                                            |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                    | Displays help for all options.                                                                                                                                                                                                                             |
| <code>[-ideal_clock]</code>          | Create ideal clock tree /ctg/CT#0.                                                                                                                                                                                                                         |
| <code>[-name]</code>                 | Name or handle for the generated clock tree. This name/handle must be used to get information, report or delete the clock tree.                                                                                                                            |
| <code>[-clock_root]</code>           | List of root clock pins or nets. If not specified, command takes into consideration all ideal clocks.                                                                                                                                                      |
| <code>[-arch]</code>                 | The clock tree architecture. By default, balanced architecture is considered.                                                                                                                                                                              |
| <code>[-max_skew]</code>             | Maximum clock skew, which, by default is 6% of clock period. Joules minimizes the clock skew by creating a balanced clock tree with similar drive-strength buffers in all clock-tree paths. After the clock tree is generated, the clock skew is reported. |
| <code>[-max_skew_frac]</code>        | Maximum skew to clock period fraction, which is, by default, 0.06.                                                                                                                                                                                         |
| <code>[-max_sink_slew]</code>        | Maximum slew at the clock end point. If not specified, 10% of clock period is used as the allowable maximum slew at clock end points.                                                                                                                      |
| <code>[-max_slew_degradation]</code> | Alternate to the <code>-max_sink_slew</code> , you can use this option to specify the maximum allowable slew degradation at any clock end point.                                                                                                           |
| <code>[-max_insertion_delay]</code>  | Maximum allowable path delay from the clock-root to clock end point. This option determines the optimal depth of the clock tree. Default is $0.75 * \text{clock period}$ .                                                                                 |
| <code>[-max_tree_depth]</code>       | Maximum depth of the clock tree. This option can be used as alternate to <code>-max_insertion_delay</code> option                                                                                                                                          |
| <code>[-clock_buffers]</code>        | List of buffers to use for the clock tree.                                                                                                                                                                                                                 |
| <code>[-root_buffers]</code>         | List of buffers at the root of balanced clock tree.                                                                                                                                                                                                        |
| <code>[-branch_buffers]</code>       | List of buffers for branch level of balanced clock tree.                                                                                                                                                                                                   |
| <code>[-leaf_buffers]</code>         | List of buffers for leaf level of balanced clock tree.                                                                                                                                                                                                     |
| <code>[-infer_clock_buffers]</code>  | Infer clock buffers.                                                                                                                                                                                                                                       |

## Joules Command and Attribute Reference

### Clock Tree - Setup and Analysis Commands - create\_clock\_tree

---

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-lib] [-domain]</code>        | Suboption of <code>-infer_clock_buffers</code> . Infer clock buffers from the specified <code>&lt;domain&gt;/&lt;lib&gt;</code> .                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-ds_range]</code>             | Suboption of <code>-infer_clock_buffers</code> . Range of drive strength. Default range is <code>&lt;min_ds&gt; = 2</code> and <code>&lt;max_ds&gt; = 12</code>                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-x1_cell]</code>              | Suboption of <code>-infer_clock_buffers</code> . X1_cell to use to compute drive_strength of clock buffers.                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[rf_margin]</code>             | Suboption of <code>-infer_clock_buffers</code> . Specify the rise/fall ratio for clock buffers. The default ratio is 0.1.                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-fanout]</code>               | <p>Use this option to override the default fanouts at the root, branch, and leaf levels for a balanced clock-tree implementation.</p> <p>The default fanouts are:</p> <p>root=2 branch=5 leaf=12</p> <p>If you specify <code>compute</code>, the command automatically identifies the list of necessary clock buffers and the root, branch, leaf fanout settings based on other provided constraints (or defaults): (i) slew degradation, (ii) insertion delay, (iii) skew, and (iv) DRC (max fanout) rules.</p> |
| <code>[-strict_fanout_target]</code> | If you specify this option while adding buffers between ICGC and flops, the command will follow the fanout options strictly.                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-show_computed_params]</code> | Computes and displays the parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                      | <b>Note:</b> This option does not create the clock tree.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-edi_spec]</code>             | Convert EDI clock tree spec to Joules clock tree spec.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-ccopt_spec]</code>           | Convert CCOPT clock tree spec to Joules clock tree spec.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-spef]</code>                 | Use spef file to create clock tree.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

### Example(s)

- `create_clock_tree -clock_root /top/clock1 -name myCT`
- `create_clock_tree -clock_buffers CLKBUF1:slow:domain1 -clock_root /top/clock1 -name myCT`
- `create_clock_tree -fanout root=2 branch=5 leaf=8`
- `create_clock_tree -max_insertion_delay 3.5ns`

## **Joules Command and Attribute Reference**

### **Clock Tree - Setup and Analysis Commands - create\_clock\_tree**

---

■ `create_clock_tree -edi_spec edi.cts -out joules_clk_tree`

#### **Return Value**

Handle/path (string) of the generated clock tree.

#### **Related Topics**

■ [Clock Tree Power Estimation](#)

## report\_clock\_tree

Reports information about the structure of the generated clock tree.

### Syntax

```
report_clock_tree \  
  [-ctg_name] {<clock_tree_name>}+  
  [-clock_root <clock_root>+]  
  [-sdc_name <sdc_clock_name>+]  
  [-summary]  
  [-power]  
  [-skip_end_points]  
  [-fanout_cols]  
  [-lint]  
  [-create_ideal_clock_tree]  
  [-gui]  
  [>|-out <file_name>]
```

## Options and Arguments

|                                         |                                                                                         |
|-----------------------------------------|-----------------------------------------------------------------------------------------|
| <code>[-h]</code>                       | Displays help for all options.                                                          |
| <code>[-ctg_name]</code>                | Specify the name/handle of the clock tree.                                              |
| <code>[-clock_root]</code>              | List of root pins or ports for the clock tree.                                          |
| <code>[-sdc_name]</code>                | List of SDC clock names.                                                                |
| <code>[-summary]</code>                 | Specify whether to print the summary/detailed report.<br><br>Default: false             |
| <code>[-power]</code>                   | Specify whether to report the power for the specified clock tree.<br><br>Default: false |
| <code>[-skip_end_points]</code>         | Specify whether to skip end points in report.<br><br>Default: false                     |
| <code>[-fanout_cols]</code>             | Specify whether to print fanout columns in report.<br><br>Default: false                |
| <code>[-lint]</code>                    | Specify whether to print report timing warning report.<br><br>Default: false            |
| <code>[-create_ideal_clock_tree]</code> | Specify whether to create ideal clock tree if not present.<br><br>Default: false        |
| <code>[-gui]</code>                     | Generate output in GUI interface.                                                       |
| <code>[&gt; -out]</code>                | Redirect the output to the specified file.                                              |

## Example(s)

```
■ report_clock_tree -ctg_name CTG1 -out ctg1.rpt
```

## Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### Clock Tree - Setup and Analysis Commands - report\_clock\_tree

---

#### **Related Topics**

- [Clock Tree Power Estimation](#)

## delete\_clock\_tree

Deletes the specified clock tree.

### Syntax

```
delete_clock_tree \  
    [-ctg_name <clock_tree_name>]  
    [-clock_root <pin|port>+]  
    [-sdc_name <sdc_clock_name>+]
```

### Options and Arguments

|               |                                                                        |
|---------------|------------------------------------------------------------------------|
| [-h]          | Displays help for all options.                                         |
| [-ctg_name]   | Name of the clock tree. If not specified, all clock trees are deleted. |
| [-clock_root] | List of root pins or ports for the clock tree.                         |
| [-sdc_name]   | Name of the SDC clock.                                                 |

### Example(s)

- `delete_clock_tree -ctg_name CT1 ; # deletes clock tree CT1`
- `delete_clock_tree -all`
- `delete_clock_tree ; # deletes all clock trees`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Clock Tree Power Estimation](#)



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## Mapping and DFT Insertion Commands

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- syn\_power
- commit\_drc\_rules
- commit\_drc\_rules
- set\_joules\_cost\_groups
- add\_data\_buffers

## Joules Command and Attribute Reference

### Mapping and DFT Insertion Commands - syn\_power

---

## syn\_power

Performs synthesis and creates a fully functional prototype netlist for power analysis and PPA exploration.

## Syntax

```
syn_power \  
  [-legacy]  
  [-effort express|low|medium|high]  
  [-leakage_power_effort none|low|medium|high|auto]  
    [-area_sensitive leakage_opt]  
  [-relax_clock <pct>]  
    [-sdc_time_unit ns|ps]  
    [-force]  
  [-relax_io {i2r|r2o|i2o|none}+]  
  (i2r = input2reg, r2o = reg2output, i2o = input2output)  
    [-method FP|MCP]  
      (FP = false_path, MCP = multicycle_path)  
  [-scrub_library yes|no]  
    [-weights {<prop>=<val>}+]  
      (<prop> = area|delay|transition|leakage_power|internal_power|setup|  
        hold|avg_ipin_cap)  
    [-cells_per_ds_cluster <N>]  
    [-avoid_threshold <pct>] (  
  [-clock_gating <min> <max>]  
  [-physical]  
  [-spatial]  
  [-tune_ple_from_spef <f_spef> [<damp_factor>]]  
  [-auto_identify_shift_register]  
    [-shift_register_length <min> <max>]  
  [-save_generic_db <f_gen_db>]  
  [-save_mapped_db <f_map_db>]  
  [-to_file <f_db>]  
  [-script <f_tcl>]  
  [-add_proc {tuple of procs}]  
  (Keys: pre_syn_generic post_syn_generic pre_syn_map post_syn_map  
    pre_syn_opt post_syn_opt)
```

## Options and Arguments

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                          | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-legacy]</code>                     | Invokes the command in legacy mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-effort]</code>                     | Specify the synthesis effort. The default effort is <i>medium</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-leakage_power_effort]</code>       | Control leakage power optimization. Default is <i>auto</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-area_sensitive_leakage_opt]</code> | <p>Sub-option of <code>-leakage_power_effort</code>.</p> <p>Give preference to area over leakage during optimization. Default is <i>false</i>.</p>                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-relax_clock]</code>                | Relax all clock frequencies by <i>&lt;pct&gt;</i> . Default is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-sdc_time_unit]</code>              | <p>Sub-option of <code>-relax_clock</code>.</p> <p>Specify the SDC timing unit. Default is <i>ns</i>.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-force]</code>                      | <p>Sub-option of <code>-relax_clock</code>.</p> <p>Use this option to force a negative (-ve) value for <code>-relax_clock &lt;pct&gt;</code>.</p>                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-relax_io]</code>                   | Relax constraints on the specified IO paths. Default is <i>none</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-method]</code>                     | <p>Sub-option of <code>-relax_io</code>. It can have either of the following values:</p> <ul style="list-style-type: none"><li>■ <b>FP</b> - depicts a timing path which is not required to be optimized for timing as it will never be required to get captured in a limited time when excited in normal working situation of the chip</li><li>■ <b>MCP</b> - depicts that some data is captured only after a specified number of clock cycles. Till then, the data at the capturing flop will not be used.</li></ul> |

Defaults are as follows:

`-effort express` | `low` = FP, `medium` = MCP (2 cycle), `high` = none

## Joules Command and Attribute Reference

### Mapping and DFT Insertion Commands - syn\_power

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|                                              |                                                                                                                                                                                                                                                            |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-scrub_library]</code>                | <p>Scrub library and use scrubbed cells.</p> <p>Defaults are as follows:</p> <p><code>-effort express = yes, medium high low = no</code></p>                                                                                                               |
| <code>[-weights]</code>                      | <p>Sub-option of <code>-scrub_library</code>.</p> <p>Specify the cell scoring weights. Default is <code>area=1</code><br/><code>delay=2 transition=1 leakage_power=1</code><br/><code>internal_power=1</code>.</p>                                         |
| <code>[-cells_per_ds_cluster]</code>         | <p>Sub-option of <code>-scrub_library</code>.</p> <p>Select <code>&lt;N&gt;</code> cells per DS cluster.</p> <p>Defaults are as follows:</p> <p><code>-effort express   low = 1, medium = 2, high = 3</code></p>                                           |
| <code>[-avoid_threshold]</code>              | <p>Sub-option of <code>-scrub_library</code>.</p> <p>Scrub libraries with less than <code>&lt;pct&gt;</code> avoid cells.</p> <p>Defaults are as follows:</p> <p><code>-effort express   low = 0.4 (40%), medium = 0.25 (25%), high = 0.1 (10%)</code></p> |
| <code>[-clock_gating]</code>                 | <p>Specify the minimum and maximum flops for clock gating.<br/>Default is <code>min=3, max=32</code></p>                                                                                                                                                   |
| <code>[-physical]</code>                     | <p>Enable the physical flow.</p>                                                                                                                                                                                                                           |
| <code>[-spatial]</code>                      | <p>Turns on the iSpatial flow.</p>                                                                                                                                                                                                                         |
| <code>[-tune_ple_from_spef]</code>           | <p>Tune PLE model using post route SPEF of similar design.</p> <p><code>&lt;damp_factor&gt;</code> is less than or equal to 1.0</p>                                                                                                                        |
| <code>[-auto_identify_shift_register]</code> | <p>Auto detect shift registers for scan post generic synthesis.</p>                                                                                                                                                                                        |
| <code>[-shift_register_length]</code>        | <p>Sub-option of <code>-auto_identify_shift_register</code>.</p> <p>Specify the minimum and maximum length of shift register to be converted to scan.</p>                                                                                                  |
| <code>[-save_generic_db]</code>              | <p>Save generic database, which includes <code>clock_gating</code>.</p>                                                                                                                                                                                    |

## **Joules Command and Attribute Reference**

### Mapping and DFT Insertion Commands - syn\_power

---

|                                |                                                                                                         |
|--------------------------------|---------------------------------------------------------------------------------------------------------|
| <code>[-save_mapped_db]</code> | Save mapped database.                                                                                   |
| <code>[-to_file]</code>        | Specify the syn_power database file.<br><br>Default file is <code>\$joulesWorkDir/base_proto.jdb</code> |
| <code>[-script]</code>         | Generate split Tcl and database file. The default is single unified database.                           |

## Joules Command and Attribute Reference

### Mapping and DFT Insertion Commands - syn\_power

---

`[-add_proc]`

Specify the list of *<keyword>* *<user-defined Tcl proc name>* pairs. Default is none.

The keyword that you specify decides before or after which flow step is the procedure called.

A sample usage is given below:

```
proc helper_proc { stage design } {
    if { $stage eq "pre_syn_generic" } {
        puts "DESIGN_STATE at: $type@$stage [get_db
$design .state]"
        set_db lp_insert_clock_gating true /
        set_db lp_clock_gating_min_flops 3 $design
    } elseif { $stage eq "post_syn_generic" } {
        puts "DESIGN_STATE at: $stage [get_db $design
.state]"
        write_db -to_file $::joulesWorkDir/$stage.db
    } elseif { $stage eq "pre_syn_map" } {
        puts "DESIGN_STATE at: $stage [get_db $design
.state]"
    } elseif { $stage eq "post_syn_map" } {
        puts "DESIGN_STATE at: $stage [get_db $design
.state]"
        write_db -to_file $::joulesWorkDir/$stage.db
    } elseif { $stage eq "pre_syn_opt" } {
        puts "DESIGN_STATE at: $stage [get_db $design
.state]"
    } elseif { $stage eq "post_syn_opt" } {
        puts "DESIGN_STATE at: $stage [get_db $design
.state]"
        write_db -to_file $::joulesWorkDir/
$stage.$type.db
    } else {
        puts "Unknown stage: $stage"
        error "HALT"
    }
}

syn_power -add_proc pre_syn_generic helper_proc
post_syn_map helper_proc pre_syn_opt helper_proc
post_syn_opt helper_proc
```

## Joules Command and Attribute Reference

### Mapping and DFT Insertion Commands - syn\_power

---

#### Example(s)

Multi-CPU configuration tips:

1. Configure CPUs to use -

```
set_db super_thread_servers {<sever-name>+}
```

2. Configure command to submit to LSF -

```
set_db super_thread_batch_command {<lsf-submission-cmd>}
```

3. Configure command to remote login to a non-LSF host -

```
set_db super_thread_rsh_command {<rsh-command>}
```

Multi-CPU configuration examples:

- ```
set_db super_thread_servers {localhost localhost localhost localhost}
syn_power ; # run on 4-CPU local machine
```
- ```
set_db super_thread_servers {lsf localhost server1 server2}
set_db super_thread_batch_command {bsub -R "type==X86_64 && mem >=12000"
-q "lsf_queue_1 lsf_queue_2"}
syn_power ; # run on one lsf, one localhost and two specific servers
```
- ```
syn_power -add_proc {post_syn_generic my_proc1 post_syn_map my_proc2}
```
- ```
proc my_proc1 { key design } { puts "Done: $key $design"}
```

Usage examples:

- ```
syn_power -clock_gating 2 16
```
- ```
syn_power -effort low -scrub_library no
```
- ```
syn_power -effort high -save_generic_db ./joules_work/-1.generic.db
```
- ```
syn_power -save_mapped_db ./joules_work/-1.map.db
```
- ```
syn_power -add_proc {post_syn_generic my_proc1 post_syn_map my_proc2}
```
- ```
proc my_proc1 { key design } { puts "Done: $key $design"}
```

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Mapping and DFT Insertion](#)

## commit\_drc\_rules

Modifies the specified max\_fanout, max\_capacitance, and max\_transition attributes for the design.

### Syntax

```
commit_drc_rules \  
    [-type {max_fanout|max_capacitance|max_transition}+] \  
    [-max_fanout <integer>] \  
    [-max_capacitance <cap_value>] \  
    [-max_transition <transition_time>]
```

### Options and Arguments

|                    |                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------|
| [-h]               | Displays help for all options.                                                                                       |
| [-type]            | Attribute of the design to be modified. The value for each specified attribute is taken from relevant library files. |
| [-max_fanout]      | Maximum fanout value to be set.                                                                                      |
| [-max_capacitance] | Maximum capacitance value to be set.                                                                                 |
| [-max_transition]  | Maximum transition value to be set.                                                                                  |

### Example(s)

- `commit_drc_rules`
- `commit_drc_rules -type max_fanout`
- `commit_drc_rules -max_fanout 20 -max_transition 200`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Design and Power Intent - Read and Elaboration](#)



## set\_joules\_cost\_groups

Defines a cost group (a set of critical paths to which you can apply weights or priorities that the optimizer will recognize). The command returns the directory path to the object that it creates.

### Syntax

```
set_joules_cost_groups \  
  [-cost_groups] {-1}+  
  (I2C=input2clock, C2C=clock2clock, C2O=clock2output, I2O=input2output,  
   2M=to_memory, FM=from_memory)  
  [-design <design>]  
  [-mode <timing_mode>]
```

### Options and Arguments

|                |                                                                                                                                      |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| [-h]           | Displays help for all options.                                                                                                       |
| [-cost_groups] | Name(s) of the cost group you want to create. Refer to syntax for valid cost group names. If not specified, all of them are created. |
| [-design]      | Name of the design for which you want to set the cost group.                                                                         |
| [-mode]        | Timing mode for the cost group.                                                                                                      |

### Example(s)

- `set_joules_cost_groups ;# set cost_groups: -1`
- `set_joules_cost_groups I2C C2O`

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## add\_data\_buffers

Estimates the number of additional data buffers and the estimated buffer power.

### Syntax

```
add_data_buffers \  
  [-max_fanout <integer>]  
  [-detailed]  
  [-net_cap_factor <factor>]
```

### Options and Arguments

|                   |                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------|
| [-h]              | Displays help for all options.                                                                     |
| [-max_fanout]     | Maximum number of fanout for the buffer. If not specified, 16 is considered as the maximum fanout. |
| [-detailed]       | Generate detailed report of the distribution.                                                      |
| [-net_cap_factor] | Apply net capacitance factor.                                                                      |

### Example(s)

- add\_data\_buffers
- add\_data\_buffers -max\_fanout 20

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

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## Power Scrubbing Commands

---

- compute odc
- report odc
- power\_hdl
- compute ideal power
- report ideal power
- plot ideal power
- implement odc
- report logic gating
- report redundant resets
- implement logic gating
- define reg bank
- compute cglar
- report cglar
- compute stb
- report stb
- implement stb
- mark quasi static signal
- implement mem stb
- compute logic opt
- compute reset opt
- show odc\_gui

## Joules Command and Attribute Reference

### Power Scrubbing Commands -

---

- show stb gui
- report cglar regs of da threshold
- ignore odc
- ignore stb

## **compute\_odc**

Performs structural/topological analysis to identify Observability Don't Care (ODC) conditions at elaboration, power\_hdl, syn\_gen or netlist stage.

### **Syntax**

```
compute_odc \  
  [-inst <inst_path>]  
  [-max_precompute_levels <num>]  
  [-init_point <mux|onehot_mux|all>]  
  [-effort]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - compute\_odc

---

#### Options and Arguments

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                     | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-inst]</code>                  | Specify the root hierarchical instance for ODC analysis. By default, design root is considered.                                                                                                                                                                                                                                                                                                                    |
| <code>[-max_precompute_levels]</code> | <p>Sub-option of <code>allow_precompute</code>.</p> <p>Specify the maximum combinational levels backtraced for precomputation. The default is 5.</p>                                                                                                                                                                                                                                                               |
| <code>[-init_point]</code>            | <p>Controls the origination points for the ODC conditions, which are originated at various combinational gates as their default behavior.</p> <p>The <code>mux</code> value organizes the ODC expression only from mux'es. Whereas, the <code>onehot_mux</code> value organizes it only from the onehot mux'es.</p> <p>The default is all.</p>                                                                     |
| <code>[-effort]</code>                | <p>Sets the effort incurred in performing the ODC analysis.</p> <ul style="list-style-type: none"><li>■ With the <code>low</code> effort value, single cycle ODC analysis is performed.</li><li>■ With <code>medium</code>, multi-cycle ODC analysis is performed.</li><li>■ With <code>high</code>, more intensive ODC analysis is performed alongside multi-cycle.</li></ul> <p>Default: <code>medium</code></p> |

#### Example(s)

- `compute_odc ;# compute odc candidates from the design root`
- `compute_odc -inst /top/blk1 ;# compute odc candidates starting from /top/blk1`
- `compute_odc -max_precompute_levels 2 ;# compute odc candidates and precompute till 2 levels of combinational fanin.`
- `compute_odc -effort high ;# compute multicycle odc expression and precompute till 5(default) levels of combinational fanin.`
- `compute_odc -effort high -init_point mux ;# compute multicycle odc expressions with origination from binary muxes.`

## Joules Command and Attribute Reference

### Power Scrubbing Commands - compute\_odc

---

#### Return Value

0 for success, 1 indicates failure in execution.

#### Related Topics

- [ODC-based Sequential Clock Gating Exploration in Joules](#)

## report\_odc

Reports ODC details on the complete design or on a specific hierarchy level.

### Syntax

```
report_odc \  
  [-inst {inst_path}+]  
    [-levels <num|all>]  
  [-summary]  
    [-detail]  
  [-show_power_details]  
  [-unit W|mW|uW|nW|pW]  
  [-all]  
  [-min_reg_width num]  
  [-max_reg_width num]  
  [-max_oper_count num]  
  [-max_rtl_signal_oper_count num]  
  [-ps_threshold]  
  [-id {id}+]  
    [-show_details]  
    [-show_wasted_waveform]  
  [-common_exprsn common_exprsn_name]  
  [-full_path]  
  [-relative_path]  
  [-show_depth]  
  [-show_port_punching_info]  
  [-expand_to_signals]  
  [-max_expr_print_length length]  
  [-cols {dyn_pow dyn_pow_saving dyn_pow_saving_pct wasted_toggles wasted_pct  
    cumm_wasted_toggles cumm_wasted_pct total_toggles clock_toggle  
    asrtd_exprsn file_row_col enable_exprsn exprsn_metadata odc_exprsn  
    cg_status bank_id enable_id id bank_name en_exprsn_pow  
    design_dyn_pct enable_area enable_area_pct max_signal_depth  
    max_expr_depth worst_depth curr_en_depth port_punching  
    punched_modules}+]  
  [-sort_by <column_name>|bank_width]  
  [-target_power_saving target power saving]  
  [-filter_expr {conditional_expression}]  
  [>|-out output-file-name]  
  [-append]  
  [-header]  
  [-gen_html]  
    [-html_out_dir]  
  [-gen_csv]  
    [-csv_out_dir]  
  [-get_id_list]  
  [-only_file_row_info]
```



## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_odc

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#### Options and Arguments

|                                           |                                                                                                                                                                                                                                                        |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                         | Displays help for all options.                                                                                                                                                                                                                         |
| <code>[-inst]</code>                      | Specify the list of hierarchical instances or flops. By default, design root is considered.                                                                                                                                                            |
| <code>[-levels]</code>                    | Sub-option of <code>-inst</code> .<br><br>Process all downstream hierarchies/flops till the specified level.                                                                                                                                           |
| <code>[-summary]</code>                   | Print summary of the analysis.                                                                                                                                                                                                                         |
| <code>[-detail]</code>                    | Print additional area and power summary.                                                                                                                                                                                                               |
| <code>[-show_power_details]</code>        | Print report with dynamic power savings.                                                                                                                                                                                                               |
| <code>[-unit]</code>                      | Specify the power unit. Default: value of attribute <code>power_unit</code> .                                                                                                                                                                          |
| <code>[-all]</code>                       | Report all ODC conditions.<br><br>By default ODC conditions are reported when following conditions are fulfilled:<br><br>Enable expression is not "n/a"<br><br>For reg banks: If reg bank width is > <code>lp_clock_gating_min_flops</code> attribute. |
| <code>[-min_reg_width]</code>             | Filter out all the reg banks from the report with width less than the specified value.                                                                                                                                                                 |
| <code>[-max_reg_width]</code>             | Filter out all the reg banks from the report with width more than the specified value.                                                                                                                                                                 |
| <code>[-max_oper_count]</code>            | Filter out all the reg banks with enable expression having operations more than the specified value.                                                                                                                                                   |
| <code>[-max_rtl_signal_oper_count]</code> | Prints only expressions having less <code>op_count</code> (Post trace RTL) than the specified value.                                                                                                                                                   |
| <code>[-ps_threshold]</code>              | Prints only the expressions that are more than <code>dyn_pow_saving_pct</code> threshold.                                                                                                                                                              |
| <code>[-id]</code>                        | Specify the ID of the ODC candidate. The command prints full expression string. Default is none.                                                                                                                                                       |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_odc

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|                                         |                                                                                                                                                                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-show_details]</code>            | <p>Sub-option of <code>-id</code>.</p> <p>Show detailed report for the ODC candidate.</p>                                                                                                                                                                                      |
| <code>[-show_wasted_waveform]</code>    | <p>Sub-option of <code>-show_details</code>.</p> <p>Print details of wasted toggle as <code>&lt;time val&gt;</code> tuple that can be used to identify the time and value of flop Q pin toggle that is wasted.</p>                                                             |
| <code>[-full_path]</code>               | <p>Accepts full path of literals in ODC expression for printing enable expression. By default, local (within hierarchy) names are used.</p>                                                                                                                                    |
| <code>[-relative_path]</code>           | <p>Accepts relative path of literals in ODC expression for printing enable expression.</p>                                                                                                                                                                                     |
| <code>[-show_depth]</code>              | <p>Prints depth information for the enable expression.</p>                                                                                                                                                                                                                     |
| <code>[-show_port_punching_info]</code> | <p>Prints the module that are required to be port punched to implement the ODC expression.</p> <p>An asterisk (*) in front of the module means that module is parent of the candidate register.</p>                                                                            |
| <code>[-expand_to_signals]</code>       | <p>Print signals instead of sub-expressions.</p>                                                                                                                                                                                                                               |
| <code>[-common_exprsn]</code>           | <p>Print details of common expression reported.</p>                                                                                                                                                                                                                            |
| <code>[-max_expr_print_length]</code>   | <p>In case expressions are long, then print only partial expression in full ODC report.</p> <p>To display complete expressions in the report, either increase the expression column width using this option, or print details using the <code>-show_details</code> option.</p> |
| <code>[-cols]</code>                    | <p>Include the specified columns in output report.</p> <p>By default, following columns are included:</p> <p>wasted_toggles wasted_pct<br/>cumm_wasted_toggles cumm_wasted_pct<br/>enable_exprsn exprsn_metadata enable_id id<br/>bank_name</p>                                |
| <code>[-sort_by]</code>                 | <p>Sort the report by the specified column or bank_width.</p>                                                                                                                                                                                                                  |
| <code>[-target_power_saving]</code>     | <p>Specify the ODC candidates required to save target power saving. Default unit: value of attribute <code>power_unit</code>.</p>                                                                                                                                              |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_odc

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|                                    |                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-filter_expr]</code>        | <p>Filter candidate flops based on the specified condition.</p> <p>For example, you can specify this option to flag all ODC candidates with wasted toggle count &gt; 10</p>                                                                                                                                                                                  |
| <code>[-out]</code>                | <p>Save the output in the specified file.</p>                                                                                                                                                                                                                                                                                                                |
| <code>[-append]</code>             | <p>Append to the file instead of overwriting it.</p>                                                                                                                                                                                                                                                                                                         |
| <code>[-header]</code>             | <p>Print column description in the report.</p>                                                                                                                                                                                                                                                                                                               |
| <code>[-gen_html]</code>           | <p>Generates HTML format reports to review ODC analysis results.</p> <p>The generated reports include only the default and user-specified columns. Each Bank ID in this report file is hyperlinked, clicking which you can open the detailed report of the bank.</p> <p>In this report, the same enable expressions are combined and reported only once.</p> |
| <code>[-html_out_dir]</code>       | <p>Suboption of <code>-gen_html</code>.</p> <p>Saves the HTML format reports at the specified path, instead of the default <code>joules_work</code> directory.</p>                                                                                                                                                                                           |
| <code>[-gen_csv]</code>            | <p>Generates CSV format reports to review ODC analysis results.</p> <p>All the options that are supported in HTML reporting through <code>-gen_html</code> are also supported in CSV reporting.</p>                                                                                                                                                          |
| <code>[-csv_out_dir]</code>        | <p>Suboption of <code>-gen_csv</code>.</p> <p>Saves the CSV format reports at the specified path, instead of the default <code>joules_work</code> directory.</p>                                                                                                                                                                                             |
| <code>[-get_id_list]</code>        | <p>Returns an iterated list of the all the final reg banks IDs that are reported.</p> <p>The returned value is a TCL list that can be iterated upon in a loop to get the detailed ID wise report of all the reported IDs.</p>                                                                                                                                |
| <code>[-only_file_row_info]</code> | <p>Print short filename and row info.</p> <p>Only applicable with <code>file_row_col</code>.</p>                                                                                                                                                                                                                                                             |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_odc

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The following table provides details about the ODC header:

|                    |                                                                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| id                 | Identifier for further referencing the data.                                                                                                                                                                             |
| pin                | Q-pin of the flop.                                                                                                                                                                                                       |
| bank_id            | ID of register bank.                                                                                                                                                                                                     |
| cg_status          | Clock gating status of flop.                                                                                                                                                                                             |
| enable_exprsn      | Cycle early enable expression, this can be used for clock gate enable strengthening.                                                                                                                                     |
| enable_id          | ID of enable expression.                                                                                                                                                                                                 |
| enable_occur       | Occurrence count of enable expression.                                                                                                                                                                                   |
| odc_exprsn         | Expression which governs the observability of pin.                                                                                                                                                                       |
| asrtd_exprsn       | ODC expression reduced for the stimulus, used for cycle based wasted toggles analysis.                                                                                                                                   |
| exprsn_metadata    | Triplet of {Unique literal count, operation count} for enable_exprsn, odc_exprsn and asrtd_exprsn respectively.<br><br>Provides quick overview of analysis strength and implementation cost.                             |
| skip_gating        | Id(s) of cross dependency candidate(s), if current ODC is implemented, these should be skipped.<br><br>For example, two inputs of an AND gate will each be ODC opportunity for the other, but can not be gated together. |
| wasted_toggles     | Toggle count for which pin was unobservable.                                                                                                                                                                             |
| total_toggles      | Total toggles on pin.                                                                                                                                                                                                    |
| wasted_pct         | $\text{wasted\_toggles} / \text{total\_toggles} * 100$                                                                                                                                                                   |
| wasted_clocks      | Clock cycles for which pin was unobservable.                                                                                                                                                                             |
| clock_toggles      | Total clock cycles on the flop.                                                                                                                                                                                          |
| wasted_clock_pct   | $\text{wasted\_clocks} / \text{clock\_toggles} * 100$                                                                                                                                                                    |
| dyn_pow            | Total dynamic power of the flop bank.                                                                                                                                                                                    |
| dyn_pow_saving     | Total dynamic power savings for flop bank.                                                                                                                                                                               |
| dyn_pow_saving_pct | $\text{dyn\_pow\_saving} / \text{dyn\_pow} * 100$                                                                                                                                                                        |
| design_dyn_pct     | $\text{dyn\_pow\_saving} / \text{total\_design\_dyn\_pow} * 100$                                                                                                                                                         |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_odc

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|                    |                                                                                                                             |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| enable_area        | Additional area required for implementing enable logic                                                                      |
| en_exprsn_pow      | Additional power consumed for implementing enable logic                                                                     |
| dyn_pow_saving_pct | $\text{enable\_area} / \text{total\_design\_area} * 100$                                                                    |
| file_row_col       | File, row and column information for this flop.<br>Set <code>hdl_track_filename_row_col</code> attribute before elaboration |

### Example(s)

- `report_odc ;# report all odc candidates from the design root`
- `report_odc -inst /top/blk1 ;# report all odc candidates starting from /top/blk1`
- `report_odc -inst /top/blk1 -level 0 ;# report odc candidates till level 0 from /top/blk1`
- `report_odc -inst /top -filter_expr {wasted_toggles > 5 && wasted_pct > 60} ;# report odc candidates for which this filter_expr is true`

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [ODC-based Sequential Clock Gating Exploration in Joules](#)

## power\_hdl

Performs elaboration and fast generic synthesis to prepare clock-gated design for ODC analysis.

### Syntax

```
power_hdl [<top_module>] \  
  [-parameters { <tuple>+ }] \  
  [-lib_path <string>]+ \  
  [-lib_extension <string>]+ \  
  [-run <elaborate|syn_generic|map>] \  
  [-generic_flow <cg_only|fast|scrub|full>] \  
  [-effort <medium|high>] \  
  [-add_proc { tuple of procs }] \  
    (Keys: pre_elaborate post_elaborate pre_syn_generic post_syn_generic ) \  
  [-map_to_multibit] \  
    [-allow_mixed_multibit] \  
  [-spef <spef_file>] \  
    [-cap_tuning <global|category|none>] \  
  [-power] \  
  [-delay] \  
  [-vt <design:ulvt:ulvtll:lvt:lvttl:svt:hvt>+]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - power\_hdl

---

#### Options and Arguments

|                                      |                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                    | Displays help for all options.                                                                                                                                                                                                                                                                                                                                        |
| <code>[-&lt;top_module&gt;]</code>   | Specify the top module to process.                                                                                                                                                                                                                                                                                                                                    |
| <code>[-parameters]</code>           | Specify the list of {parameter value} tuples for the specified module.                                                                                                                                                                                                                                                                                                |
| <code>[-lib_path]</code>             | Specify the Verilog library search path.                                                                                                                                                                                                                                                                                                                              |
| <code>[-lib_extension]</code>        | Specify the Verilog library file extension.                                                                                                                                                                                                                                                                                                                           |
| <code>[-run]</code>                  | Perform till either custom elaboration, custom generic synthesis, or custom map.<br><br>By default, elaboration and generic synthesis are run.                                                                                                                                                                                                                        |
| <code>[-generic_flow]</code>         | Specify the flavor of flow to be run via one of the following values: <ul style="list-style-type: none"><li>■ <code>cg_only</code> - For performing only clock gating</li><li>■ <code>fast</code> (default) - For optimized generic stage</li><li>■ <code>scrub</code> - For generic stage for ODC</li><li>■ <code>full</code> - For full syn_gen execution</li></ul> |
| <code>[-effort]</code>               | Specify the effort level for generic synthesis. Default is high.                                                                                                                                                                                                                                                                                                      |
| <code>[-add_proc]</code>             | Specify the list of <i>&lt;keyword&gt; &lt;user-defined Tcl proc name&gt;</i> pairs. Default is none.<br><br>The keyword that you specify decides before or after which flow step is the procedure called.                                                                                                                                                            |
| <code>[-map_to_multibit]</code>      | Enable multibit flop mapping.                                                                                                                                                                                                                                                                                                                                         |
| <code>[-allow_mixed_multibit]</code> | Sub-option of <code>-map_to_multibit</code> .<br><br>Allow bits from different busses or scalar to be grouped together in a multibit flop.                                                                                                                                                                                                                            |
| <code>[-spef]</code>                 | Specify to run spef-based mapping.                                                                                                                                                                                                                                                                                                                                    |
| <code>[-cap_tuning]</code>           | Sub-option of <code>-spef</code> .<br><br>Specify if <code>tune_ple_from_spef</code> should to be run using spef. Default: <code>category</code>                                                                                                                                                                                                                      |
| <code>[-power]</code>                | Use power aware mapping.                                                                                                                                                                                                                                                                                                                                              |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - power\_hdl

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|                       |                               |
|-----------------------|-------------------------------|
| <code>[-delay]</code> | Use fast cells in mapping.    |
| <code>[-vt]</code>    | Specify the vt-based mapping. |

#### Example(s)

- Elaborate via top level parameter by positions

```
power_hdl -parameters {5 1} -run elaborate
```

- Elaborate via top level parameter by names

```
power_hdl -parameters { {FOO 1} {BAR 5} } -run elaborate
```

- Elaborate specifying library paths.

```
power_hdl -lib_path {LIBp LIBq} -lib_extension {.vp .vq} -run elaborate
```

- Elaborate and do generic synthesis

```
power_hdl
```

- Do generic synthesis

```
power_hdl -run syn_generic
power_hdl -add_proc {post_syn_generic my_proc1 pre_elaborate my_proc2}
proc my_proc1 { key design } { puts "Done: $key $design"}
proc my_proc2 { key design } { puts "Done: $key $design"}
power_hdl -run syn_generic -generic_flow cg_only -effort medium
```

#### Return Value

0 for success, 1 indicates failure in execution.

#### Related Topics

- [ODC-based Sequential Clock Gating Exploration in Joules](#)



## compute\_ideal\_power

Performs efficiency computation once activities have been propagated or power has been computed.

**Note:** Alias for this command is `compute_efficiency`.

### Syntax

```
compute_ideal_power \  
  [-mode average|time_based]  
  [-stims {stim_id}+]  
  [-frames {frame_id|frame_range}+]  
  [-exclude_insts {<flops/hier_inst>+}]
```

### Options and Arguments

|                               |                                                                                                             |
|-------------------------------|-------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>             | Displays help for all options.                                                                              |
| <code>[-mode]</code>          | Mode to compute efficiency. Default mode is average.                                                        |
| <code>[-stims]</code>         | List of stimulus ID(s) for computing efficiency. By default, all SDB stimulus is considered.                |
| <code>[-frames]</code>        | List or frame ID(s) or range of frames for computing efficiency. By default, all SDB frames are considered. |
| <code>[-exclude_insts]</code> | List of leaf level flops or hierarchical instances to be excluded. By default, none are excluded.           |

### Example(s)

- `compute_ideal_power`
- `compute_ideal_power -mode average`
- `compute_ideal_power -mode time_based`
- `compute_ideal_power -mode average -stims {/stim#1 /stim#2}`
- `compute_ideal_power -mode average -exclude_insts {/cpu_10bit/DP}`
- `compute_ideal_power -mode time_based -stims {/stim#1 /stim#2} -frames {/frame#1 /frame#2}`

### Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### Power Scrubbing Commands - compute\_ideal\_power

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#### **Related Topics**

- [Power Analysis and Reporting](#)

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_ideal\_power

---

## report\_ideal\_power

Reports power efficiencies for design components, such as for blocks, instances, clocks, and interfaces.

**Note:** This command does not report synchronizer cells in a design. Alias for this command is `report_power_efficiency`.

## Syntax

```
report_ideal_power \
  [-inst {<inst_path>}+]
  [-indent_insts]
  [-levels <num|all>]
  [-show_zero_flop_hierarchies]
  [-skip_unconnected_flops]
  [-use_local_clock]
  [-cols {flops cg toggles cg_eff dag_eff clk_eff level inst wasted_power
          total_power clock_power seq_power logic_power mod_name
          file_row col eff_type dvcr}]
  [-sort_by {flops|cg|toggles|cg_eff|dag_eff|clk_eff|inst|wasted_power|
            total_power|clock_power|seq_power|logic_power|dvcr}]
  [-increasing]
  [-module {<module>}+]
  [-by_enable]
  [-by_leaf]
  [-cols {flops cg toggles cg_eff dag_eff clk_eff bit_activity inst
          wasted_power seq_power mod_name file_row col eff_type dvcr}]
  [-sort_by {flops|cg|toggles|cg_eff|dag_eff|clk_eff|inst|wasted_power|
            seq_power|dvcr}]
  [-increasing]
  [-stims {<stim_id>}+]
  [-frames {<frame_id>/<frame_range>}+]
  [-show_power_data <abs|pct|both>]
  [-unit W|mW|uW|nW]
  [-power_type leakage|internal|dynamic|total]
  [-excluded_flops <include|skip|only>]
  [>|-out <output_file_name>]
  [-header]
  [-append]
  [-gen_html]
  [-gen_csv]
  [-latch_based]
  [-cols {latches en_toggles wasted_en_toggles wasted_data_toggles en_eff
          data_eff level latch wasted_power latch_total_power}]
  [-sort_by {latches|en_toggles|wasted_en_toggles|wasted_data_toggles|
            en_eff|data_eff|latch_wasted_power|latch_total_power}]
  [-increasing]
  [-by_leaf]
```

## Options and Arguments

|                                            |                                                                                                                                                                                         |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                          | Displays help for all options.                                                                                                                                                          |
| <code>[-inst]</code>                       | List of hierarchical instances. By default, design root is considered.                                                                                                                  |
| <code>[-indent_insts]</code>               | Sub-option of <code>-inst</code> .<br><br>If specified, power efficiency is reported in indented fashion. By default, full instance path is displayed.                                  |
| <code>[-levels]</code>                     | Sub-option of <code>-inst</code> .<br><br>If specified, power efficiency is reported for the specified number of hierarchy levels. By default, all downstream hierarchies are reported. |
| <code>[-show_zero_flop_hierarchies]</code> | Sub-option of <code>-inst</code> .<br><br>If specified, hierarchies without any flops are also reported. By default, hierarchies with no flops are discarded.                           |
| <code>[-skip_unconnected_flops]</code>     | Sub-option of <code>-inst</code> .<br><br>If specified, unconnected flops are not reported. By default, unconnected flops, for example, spare flops, are considered.                    |
| <code>[-use_local_clock]</code>            | Sub-option of <code>-inst</code> .<br><br>Use local clock for reporting power. Default default, root clock is used.                                                                     |
| <code>[-cols]</code>                       | Sub-option of <code>-inst</code> .<br><br>Specify the columns to report. By default, the following columns are reported:<br><br>flops cg toggles cg_eff dag_eff clk_eff level<br>inst   |
| <code>[-sort_by]</code>                    | Sub-option of <code>-inst</code> .<br><br>Sort the output based on the specified parameter.                                                                                             |
| <code>[-module]</code>                     | Report power efficiency for the specified list of modules. Default is none.                                                                                                             |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_ideal\_power

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|                                 |                                                                                                                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-by_enable]</code>       | Report power efficiency by enable. By default, power efficiency is reported by register.                                                                                                                      |
| <code>[-by_leaf]</code>         | Report power efficiency for leaf instances. By default, power efficiency is reported by hierarchies.                                                                                                          |
| <code>[-cols]</code>            | Sub-option of <code>-by_leaf</code> .<br><br>Specify the columns to report. By default, the following columns are reported:<br><br><code>flops cg toggles cg_eff dag_eff clk_eff<br/>bit_activity inst</code> |
| <code>[-sort_by]</code>         | Sub-option of <code>-by_leaf</code> .<br><br>Sort the output based on the specified parameter.                                                                                                                |
| <code>[-by_memory]</code>       | Report power efficiency by memory instance. By default, power efficiency is reported by flops.                                                                                                                |
| <code>[-stims]</code>           | List of stimulus IDs. By default, all SDB stimulus is considered.                                                                                                                                             |
| <code>[-frames]</code>          | List of frames (frame ID or range of frames). By default, all SDB frames are considered.                                                                                                                      |
| <code>[-show_power_data]</code> | Specify whether to report power values in absolute value or percentage or both. By default, power values are not reported.                                                                                    |
| <code>[-unit]</code>            | Sub-option of <code>-show_power_data</code> .<br><br>Specify unit of reported power values. Default unit is the value of attribute <code>power_unit</code> .                                                  |
| <code>[-power_type]</code>      | Sub-option of <code>-show_power_data</code> .<br><br>Specify type of power for reporting power data. Default value is total.                                                                                  |
| <code>[-excluded_flops]</code>  | Specify to include, skip, or show only excluded flops. By default excluded flops are included.                                                                                                                |
| <code>[-out]</code>             | Redirect or save power efficiency data to the specified file.                                                                                                                                                 |
| <code>[-header]</code>          | Sub-option of <code>-out</code> .<br><br>Specify header for the output file. By default, this is set to false.                                                                                                |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_ideal\_power

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|                             |                                                                                                                                                                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-append]</code>      | Sub-option of <code>-out</code> .<br><br>Append results to the output file.                                                                                                                                                            |
| <code>[-gen_html]</code>    | Generates HTML format reports for power efficiency analysis.                                                                                                                                                                           |
| <code>[-gen_csv]</code>     | Generates CSV format reports for power efficiency analysis.                                                                                                                                                                            |
| <code>[-latch_based]</code> | Dumps ideal latch based analysis report.                                                                                                                                                                                               |
| <code>[-cols]</code>        | Sub-option of <code>-latch_based</code> .<br><br>Specify the columns to report. By default, the following columns are reported:<br><br><code>latches en_toggles wasted_en_toggles<br/>wasted_data_toggles en_eff data_eff level</code> |
| <code>[-sort_by]</code>     | Sub-option of <code>-latch_based</code> .<br><br>Sort the output based on the specified parameter.                                                                                                                                     |
| <code>[-increasing]</code>  | Suboption of <code>-sort_by</code> .<br><br>Sort the output is increasing order. By default, the output is sorted in decreasing order.                                                                                                 |
| <code>[-by_leaf]</code>     | Sub-option of <code>-latch_based</code> .<br><br>Report power efficiency for leaf instances. By default, power efficiency is reported by hierarchies.                                                                                  |

The following table provides details about the ideal power header:

|               |                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------|
| Synth         | Percentage of flop bits gated by synthesis inserted ICGs                                                             |
| Arch          | Percentage of flop bits gated by architectural ICGs                                                                  |
| Ungated       | Percentage of flop bits that are not clock gated                                                                     |
| Clock Toggles | Sum of rise and fall toggles at the clock pins of flops                                                              |
| DvCr          | Ratio of average data and clock toggles ( $Q/C_{clk}$ )                                                              |
| CG Eff        | Percentage of gated clock cycles ( $1 - \frac{\text{clock\_cycles\_at\_flops}}{\text{clock\_cycles\_at\_source}}$ )% |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_ideal\_power

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|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DAG Eff               | Percentage of gated and data active cycles ( $1 - ((\text{clock\_cycles\_at\_flops} - \text{data\_active\_clock\_cycles}) / \text{clock\_cycles\_at\_source}))\%$                                                                                                                                                                                                                                                                                                    |
| Clock Eff             | <p>Percentage of data active clock cycles (<math>(\text{data\_active\_clock\_cycles} / \text{total\_clock\_cycles\_at\_flops})\%</math>)</p> <ul style="list-style-type: none"><li>■ High number implies high alignment of clock with data toggles</li><li>■ Scope of power optimization is <math>(100 - \text{clock\_efficiency})\%</math> of total clock toggles</li><li>■ High switching flops can have potential unobservable writes</li></ul>                   |
| Wasted Power          | Internal power of flops that is considered waste because of redundant clock switching                                                                                                                                                                                                                                                                                                                                                                                |
| Activity Distribution | <p>Grouping of flop bits based on their activity ratio with respect to the clock</p> <ul style="list-style-type: none"><li>■ Identify cases where clock efficiency is high with only few bits toggling</li><li>■ Columns titled 0 and 100 list percentage of static and always toggling bits respectively.</li></ul>                                                                                                                                                 |
| Eff Type              | <p>Type of activity used for clock and data pins in efficiency calculations.</p> <ul style="list-style-type: none"><li>■ (CC) Both clock and data pins have cycle-based activity</li><li>■ (CA) Data pins are either not asserted from stimulus or don't have cycle-based activity</li><li>■ (AC) Clock pin is not asserted from stimulus</li><li>■ (AA) Both clock and data pins are either not asserted from stimulus or don't have cycle-based activity</li></ul> |

### Example(s)

- `report_ideal_power ; # report power efficiency by hierarchy starting from the design root`
- `report_ideal_power -inst /top/blk1 ; # report power efficiency by hierarchy starting from /top/blk1`

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_ideal\_power

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- `report_ideal_power -inst /top/blk1 -indent_insts; # report power efficiency by hierarchy in indented fashion`
- `report_ideal_power -inst /top/blk1 -levels 2 ; # report power efficiency by hierarchy for 2 levels starting from /top/blk1`
- `report_ideal_power -inst /top/blk1 -by_leaf ; # report power efficiency for leaf instances in /top/blk1`
- `report_ideal_power -stims {/stim#1 /stim#2} ; # report power efficiency based on the two stim ids`
- `report_ideal_power -frames {/stim#1/frame#1 /stim#1/frame#10} ; # report power efficiency based on the specified frames`
- `report_ideal_power -latch_based; #report latch based analysis`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)



## plot\_ideal\_power

Displays or plots the ideal power of the design.

### Syntax

```
plot_ideal_power \  
  [-stims {<stim_id>}+]   
  [-frames {<frame_id>|<frame_range>}+]   
  [-inst {<inst_path>}+]   
    [-skip_unconnected_flops]   
    [-use_local_clock]   
  [-module {<module>}+]   
  [-by_enable]   
  [-power_type leakage|internal|dynamic|total]   
  [-unit W|mW|uW|nW]   
  [-ideal_power]   
    [-xkey simtime|frame_id]   
    [-ykey power|freq|toggle|toggles]   
    [-mode {sum|avg}]   
  [-power_savings]   
    [-ykey total|pct]   
    [-xrange <min>:<max>]   
    [-format gnuplot|native|shm|png]   
  [>|-out <f_dat>]
```

### Options and Arguments

|                                        |                                                                                                                                                               |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stims]</code>                  | Specify the list of stim IDs. By default first SDB stim is considered.                                                                                        |
| <code>[-frames]</code>                 | Specify the list of contiguous frames. By default, all SDB frames are considered.                                                                             |
| <code>[-inst]</code>                   | Specify the list of hierarchical or leaf instances. Default is design root.                                                                                   |
| <code>[-skip_unconnected_flops]</code> | Sub-option of <code>-inst</code> . If specified, unconnected flops are not reported. By default, unconnected flops, for example, spare flops, are considered. |
| <code>[-use_local_clock]</code>        | Sub-option of <code>-inst</code> . Use local clock for plotting power. Default root clock is used.                                                            |
| <code>[-module]</code>                 | Specify the list of modules. Default is none.                                                                                                                 |
| <code>[-by_enable]</code>              | Plot power efficiency by enable. By default, plot power efficiency by register bank                                                                           |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - plot\_ideal\_power

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|                               |                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-power_type]</code>    | Specify type of power to plot. Default value is total.                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-unit]</code>          | Specify unit for power value. By default, value of <code>power_unit</code> attribute is considered.                                                                                                                                                                                                                                                                                                         |
| <code>[-ideal_power]</code>   | Plot actual vs ideal profile. Default is true.                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-xkey]</code>          | Sub-option of <code>-ideal_power</code> . Show the value specified with this option on X axis. By default, <code>simtime</code> is displayed on X axis.                                                                                                                                                                                                                                                     |
| <code>[-ykey]</code>          | Sub-option of <code>-ideal_power</code> . Show the value specified with this option on Y axis. By default, <code>power</code> is displayed on Y axis.                                                                                                                                                                                                                                                       |
| <code>[-mode]</code>          | Sub-option of <code>-ideal_power</code> . Specify whether to run <code>ykey</code> in average or sum mode. Default mode is average.                                                                                                                                                                                                                                                                         |
| <code>[-power_savings]</code> | Plot register fixes vs cumulative power savings.                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-ykey]</code>          | Sub-option of <code>-power_savings</code> . Specify the value to display on Y axis. By default, <code>total</code> is displayed.                                                                                                                                                                                                                                                                            |
| <code>[-xrange]</code>        | Sub-option of <code>-power_savings</code> . Specify the range of values for X axis. By default, all the registers are plotted.                                                                                                                                                                                                                                                                              |
| <code>[format]</code>         | Sub-option of <code>-power_savings</code> .<br><br>Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>native</code> (default format)</li><li>■ <code>PNG</code></li><li>■ <code>SHM</code> (Simulation History Manager) - a binary format (*.trn *.shm); output can be viewed using the NCSim simvision utility.</li></ul> |
| <code>[&gt; -out]</code>      | Save the report in the specified file. By default, the output is saved in <code>&lt;work_dir&gt;/joules_waveform_pwr.&lt;format&gt;</code>                                                                                                                                                                                                                                                                  |

### Example(s)

- `plot_ideal_power -ideal_power -stims /stim#1 ;# ideal power profile for 1st SDB stimulus`
- `plot_ideal_power -ideal_power -stims /stim#1 -inst /cpu_10bit/DP -by_enable ;# profile based on clock enable`

## Joules Command and Attribute Reference

### Power Scrubbing Commands - plot\_ideal\_power

---

- `plot_ideal_power -ideal_power -xkey frame_id ;# use frame_id instead of simulation time`
- `plot_ideal_power -ideal_power -ykey power ;# default is power plot`
- `plot_ideal_power -ideal_power -ykey toggles ;# plot clock pin toggles instead of power`
- `plot_ideal_power -ideal_power -ykey freq ;# plot clock pin freq instead of power`
- `plot_ideal_power -power_savings ;# plot total power savings`
- `plot_ideal_power -power_savings -ykey pct ;# plot percent power savings`
- `plot_ideal_power -power_savings -xrange 1:10 ;# plot power savings from top 10 registers`

## **implement\_odc**

Implements ODC enable expressions for register banks.

### **Syntax**

```
implement_odc
  [-inst {inst_path}+]
  [-id]
  [-min_reg_width num]
  [_max_reg_width num]
  [-max_literals num]
  [-max_rtl_signal_oper_count num]
  [-ps_threshold <pct>]
  [-report]
  [-by_reg_bit]
  [-modify_activity]
  [-verify]
  [-dump_lec_constraints]
  [-lec_cmd]
  [-jg_cmd]
  [-sim_model_files]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - implement\_odc

---

#### Options and Arguments

|                                           |                                                                                                                                        |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-inst]</code>                      | Specify list of hierarchical instances. Default is design root.                                                                        |
| <code>[-id]</code>                        | Implement ODC enable expression associated with ID.                                                                                    |
| <code>[-min_reg_width]</code>             | Filter out all the reg banks with width less than the specified numerical argument.                                                    |
| <code>[-max_reg_width]</code>             | Filter out all the reg banks with width more than the specified numerical argument.                                                    |
| <code>[-max_literals]</code>              | Filter out all the reg banks with enable expression having literals more than the specified numerical argument. Default is 15.         |
| <code>[-max_rtl_signal_oper_count]</code> | Prints only expressions having less <code>op_count</code> (Post trace RTL) than the specified value.                                   |
| <code>[-ps_threshold]</code>              | Specify percentage power savings threshold. Default: 0.01 = power saving > 0.01% of flop power.                                        |
| <code>[-report]</code>                    | Reports the implemented ODC candidates.                                                                                                |
| <code>[-by_reg_bit]</code>                | Implement ODC enable expressions for register bits.                                                                                    |
| <code>[-modify_activity]</code>           | Modify pin activity at Q-pin of candidate flops.                                                                                       |
| <code>[-verify]</code>                    | Verify the implemented ODC expressions using Jasper SEC. Requires LEC and Jasper executables to be set in the path variable.           |
| <code>[-dump_lec_constraints]</code>      | Dumps the LEC verification constraints for all the candidate flop by default in <code>joules_work_dir/lec_verify.tcl</code> .          |
| <code>[-lec_cmd]</code>                   | LEC command for running the verify script. By default it uses <code>&lt;lec_path from env path/lec_executable attr&gt; -XL</code> .    |
|                                           | <b>Note:</b> Do not specify Logfile and GUI options. This is set internally.                                                           |
| <code>[-jg_cmd]</code>                    | Jasper command for running the verify script. By default it uses <code>&lt;jg_path from env path/lec_executable attr&gt; -sec</code> . |
|                                           | <b>Note:</b> Do not specify Logfile and GUI options. This is set internally.                                                           |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - implement\_odc

---

`[-sim_model_files]` Specify list of verilog model files.  
Only applicable with `-verify` option.

#### Examples

- `implement_odc -id ODC_B1`
- `implement_odc -id ODC_B1 -verify`

## report\_logic\_gating

Reports logic gating optimization.

### Syntax

```
report_logic_gating
  [-summary]
  [-id]
  [-expand_to_signals]
  [-show_depth]
  [-ps_threshold]
  [-toggle_threshold]
  [-operators_only]
  [-full_path]
  [-get_id_list]
  [-max_expr_print_length length]
  [-max_oper_count]
  [-max_rtl_signal_oper_count]
  [-cols {exprsn exprsn_metadata area_score score width file_row_col
         function_type impl id logic max_signal_depth max_expr_depth
         worst_depth}+]
  [-header]
  [-sort_by column_name]
  [-increasing]
  [-inst inst_path]
  [-show_power_details]
  [>|-out output-file-name] [-append]
  [-unit W|mW|uW|nW|pW]
  [-gen_html]
  [-html_out_dir]
  [-gen_csv]
  [-csv_out_dir]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_logic\_gating

---

#### Options and Arguments

|                                           |                                                                                                                                                                                                                                             |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-summary]</code>                   | Report logic opt summary.                                                                                                                                                                                                                   |
| <code>[-id]</code>                        | Report logic opt data by id.                                                                                                                                                                                                                |
| <code>[-expand_to_signals]</code>         | Print signals instead of sub-expressions.                                                                                                                                                                                                   |
| <code>[-show_depth]</code>                | Print depth information for the logic gating expression.                                                                                                                                                                                    |
| <code>[-ps_threshold]</code>              | Print only expressions more than <code>dyn_pow_saving_pct</code> threshold. Default: 2.                                                                                                                                                     |
| <code>[-toggle_threshold]</code>          | Print only expressions more than <code>wasted_toggle_pct</code> threshold.                                                                                                                                                                  |
| <code>[-operators_only]</code>            | Print operators only.                                                                                                                                                                                                                       |
| <code>[-full_path]</code>                 | Print full path of expression.                                                                                                                                                                                                              |
| <code>[-get_id_list]</code>               | Print list of IDs of logic opt data.                                                                                                                                                                                                        |
| <code>[-max_expr_print_length]</code>     | Specify maximum number of characters printed for the expression(s) string. Default is 20.                                                                                                                                                   |
| <code>[-max_oper_count]</code>            | Prints expressions having less <code>op_count</code> (post-trace RTL) than the specified cutoff number provided.<br>Default: 500                                                                                                            |
| <code>[-max_rtl_signal_oper_count]</code> | Prints expressions having less <code>op_count</code> (post-trace RTL) than the specified cutoff number provided.<br>Default: 1000                                                                                                           |
| <code>[-cols]</code>                      | Print the specified columns in the output report.<br>By default, following columns are included:<br><br><code>exprsn exprsn_metadata area_score score</code><br><code>width file_row_col function_type impl id</code><br><code>logic</code> |
| <code>[-header]</code>                    | Print information about column headers.                                                                                                                                                                                                     |
| <code>[-sort_by]</code>                   | Sort the report by the specified column. By default, the table is not sorted.                                                                                                                                                               |
| <code>[-increasing]</code>                | Suboption of <code>-sort_by</code> .<br><br>Sort the output is increasing order. By default, the output is sorted in decreasing order.                                                                                                      |



## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_logic\_gating

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|                                    |                                                                                                                                                              |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-inst]</code>               | Specify the hierarchical instance for logic gating.                                                                                                          |
| <code>[-show_power_details]</code> | Prints report with dynamic power savings.                                                                                                                    |
| <code>[-out]</code>                | Save the output data in the specified file.                                                                                                                  |
| <code>[-append]</code>             | Append to the file specified with <code>-out</code> option.                                                                                                  |
| <code>[-unit]</code>               | Specify the power unit. Default: value of attribute <code>power_unit</code> .                                                                                |
| <code>[-gen_html]</code>           | Generates HTML format reports for logic gating.                                                                                                              |
| <code>[-html_out_dir]</code>       | Suboption of <code>-gen_html</code> .<br><br>Saves the HTML format reports at the specified path, instead of the default <code>joules_work</code> directory. |
| <code>[-gen_csv]</code>            | Generated CSV format reports for logic gating.                                                                                                               |
| <code>[-csv_out_dir]</code>        | Suboption of <code>-gen_csv</code> .<br><br>Saves the CSV format reports at the specified path, instead of the default <code>joules_work</code> directory.   |

The following table provides details about the logic gating header:

|                              |                                                                                                                                           |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <code>exprsn</code>          | Enable expression for gating the combinational logic gates.<br><br>Same enable expression is applicable for all the gates in the same id. |
| <code>exprsn_metadata</code> | Pair of literal count and number of operators in enable expression.                                                                       |
| <code>file_row_col</code>    | Location of the combinational logic gate in the original design RTL with line and column info.                                            |
| <code>function_type</code>   | Function type of the combination gate mentioned in column logic.                                                                          |
| <code>score</code>           | Efficacy of the enable expression. Higher score would lead to more power savings.                                                         |
| <code>impl</code>            | Info whether associated comb instance needs gating or not.                                                                                |
| <code>id</code>              | Unique ID for each enable expression.                                                                                                     |
| <code>logic</code>           | Full path of the combination logic gate.                                                                                                  |
| <code>width</code>           | Width of comb instance.                                                                                                                   |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_logic\_gating

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|                |                                                                                      |
|----------------|--------------------------------------------------------------------------------------|
| area_score     | Impact of area due to additional gates. Higher score would lead to less area impact. |
| wasted_toggles | Wasted toggles on comb instances under associated id.                                |
| total_toggles  | Total toggles on comb instances under associated id.                                 |
| wt_pct         | Percent of wasted toggles.                                                           |

### Examples

- `report_logic_gating`
- `report_logic_gating -summary`
- `report_logic_gating -inst /design/top/instances_hier/a1`

### Return Value

0 for success, 1 indicates failure in execution.

## report\_redundant\_resets

Reports redundant reset data. This can be called only after `compute_odc` command has been executed.

### Syntax

```
report_redundant_resets  
  [-summary]  
  [>|-out <output-file-name>] [-append]
```

### Options and Arguments

|                          |                                                             |
|--------------------------|-------------------------------------------------------------|
| <code>[-summary]</code>  | Report redundant reset summary.                             |
| <code>[&gt; -out]</code> | Redirect the output of the command in the specified file.   |
| <code>[-append]</code>   | Append to the file specified with <code>-out</code> option. |

### Examples

- `report_redundant_resets`
- `report_redundant_resets -summary`
- `report_redundant_resets -out report_redundant_resets.rpt`

### Return Value

0 for success, 1 indicates failure in execution.

## implement\_logic\_gating

Implements logic gating expressions.

### Syntax

```
implement_logic_gating  
  [-id]  
  [-ps_threshold]  
  [-toggle_threshold]  
  [-verify]  
  [-lec_cmd]
```

### Options and Arguments

|                                                                              |                                                                                                                                    |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-id]</code>                                                           | Implement expression associated with ID.                                                                                           |
| <code>[-ps_threshold]</code>                                                 | Implement all expressions having power saving pct above threshold. Default: 2                                                      |
| <code>[-toggle_threshold]</code>                                             | Implement all expressions having toggle saving pct above threshold.                                                                |
| <code>[-verify]</code>                                                       | Verify the implemented expressions using LEC. Requires LEC executable to be set in path variable.                                  |
| <code>[-lec_cmd]</code>                                                      | LEC command for running the verify script. By default it uses <code>&lt;lec_path from env path/lec_executable attr&gt;</code> -XL. |
| <b>Note:</b> Do not specify Logfile and GUI options. This is set internally. |                                                                                                                                    |

### Examples

- `implement_logic_gating -threshold 5`
- `implement_logic_gating -id 1`
- `implement_logic_gating -threshold 5 -verify`

### Return Value

0 for success, 1 indicates failure in execution.

## define\_reg\_bank

Defines the `wrapper_reg_banks` present in a given source RTL. It allows considering such flop banks for ODC or STB analysis without using the `-allow_port_punching` option, else such candidate flops will not be considered for ODC or STB analysis.

### Syntax

```
define_reg_bank  
    [-mod <Register bank wrapper name>]  
    [-auto_detect]
```

### Options and Arguments

|                             |                                                                           |
|-----------------------------|---------------------------------------------------------------------------|
| <code>[-mod]</code>         | All instances of wrapper name will be considered for ODC or STB analysis. |
| <code>[-auto_detect]</code> | Report all auto detected wrapper bank modules.                            |

### Examples

- `define_reg_bank -mod flop_bank ;# will consider all instances of flop_bank module for ODC/STB Analysis`
- `define_reg_bank -auto_detect ;# will report all detected flop bank wrapper modules`

### Return Value

0 for success, 1 indicates failure in execution.

## compute\_cglar

Identifies low activity registers in the design based on given constraints and computes estimate XOR gating costs.

**Note:** Run this command on a post-mapped design after power has been computed (compute\_power has been run).

## Syntax

```
compute_cglar \  
  [-root hier+]  
  [-clock_domain prim_clock_net]  
  [-power_domain power_domain_name] (  
  [-reg_list register+]  
  [-group_across_bus]  
  [-libcells libcell+]  
  [-process_gated_flops]  
    [-cg_type arch|synth|both]  
    [-ignore_ungated]  
  [-stims stim_id+]  
  [-frames frame_id+]  
  [-da_threshold ratio]  
  [-combine_0_bits force|honor_mbw]  
  [-min_slack_threshold slack]  
  [-custom_slacks slacks+]  
  [-min_cg_en_slack_threshold slack]  
  [-custom_cg_en_slacks slacks+]  
  [-max_distance distance]  
    [-locations locations+]  
  [-min_bank_size value]  
  [-max_bank_size value]  
  [-exclude_flops flops+]  
  [-custom_banks bank+]  
  [-summary]  
  [-detailed]  
  [-time_based]  
  [-out f_rpt]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - compute\_cglar

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#### Options and Arguments

|                                     |                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                   | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-root]</code>                | Use registers under specified hierarchies.                                                                                                                                                                                                                                                                                                                                       |
| <code>[-clock_domain]</code>        | Use registers in specified clock domain.                                                                                                                                                                                                                                                                                                                                         |
| <code>[-power_domain]</code>        | Use registers in specified power domain.                                                                                                                                                                                                                                                                                                                                         |
| <code>[-libcells]</code>            | Specify list of libcells to be used for CGLAR.                                                                                                                                                                                                                                                                                                                                   |
| <code>[-reg_list]</code>            | List of registers for CGLAR analysis. By default, all registers are considered.                                                                                                                                                                                                                                                                                                  |
| <code>[-group_across_bus]</code>    | Creates low activity flop groups across buses (RTL flop banks). By default, it is set to false.                                                                                                                                                                                                                                                                                  |
| <code>[-process_gated_flops]</code> | If specified, gated flops are also processed. By default, it is set to false.                                                                                                                                                                                                                                                                                                    |
| <code>[-cg_type]</code>             | Processes flops that are gated by architectural clock gating/synthesis clock gating. By default processes both.                                                                                                                                                                                                                                                                  |
| <code>[-ignore_ungated]</code>      | Processes only gated flops and ignores ungated flops. Default: false.                                                                                                                                                                                                                                                                                                            |
| <code>[-stims]</code>               | Use frame#0 of the specified stimulus for CGLAR analysis. By default, all SDB stims are considered.                                                                                                                                                                                                                                                                              |
| <code>[-frames]</code>              | Use specified frame for CGLAR analysis. By default, average of all SDB stims is considered.                                                                                                                                                                                                                                                                                      |
| <code>[-da_threshold]</code>        | Data activity ratio threshold. Default is 0.10 = 10% of flop clock.                                                                                                                                                                                                                                                                                                              |
| <code>[-combine_0_bits]</code>      | Combines 0 data activity bits in a separate bank.<br>Specify any one of the following options: <ul style="list-style-type: none"><li>■ <code>force</code>: forcefully separate 0 activity bits.</li><li>■ <code>honor_mbw</code>: separate only if the remainder low activity bits satisfy <code>min_width</code>.</li><li>■ Default: do not separate 0 activity bits.</li></ul> |
| <code>[-min_slack_threshold]</code> | Unit: ps. Minimum timing slack on flop d pin to be considered for XOR candidate, filter flops which have less than this slack. Default: skip.                                                                                                                                                                                                                                    |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - compute\_cglar

---

|                                           |                                                                                                                                                                     |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-custom_slacks]</code>             | Unit: ps. List of slack pairs {inst slack}, to be used for delay based filtering. Default: uses slack from design.                                                  |
| <code>[-min_cg_en_slack_threshold]</code> | Unit: ps. Minimum timing slack on enable pin of existing CG which will be strengthened for XOR gating, filter flops which have less than this slack. Default: skip. |
| <code>[-custom_cg_en_slacks]</code>       | Unit: ps. List of slack pairs {flop cg_en_slack}, to be used for delay based filtering on CG Enable. Default: uses slack from design.                               |
| <code>[-max_distance]</code>              | Unit: microns. Bank low activity flops based on proximity, Default: does not consider proximity.                                                                    |
| <code>[-locations]</code>                 | Unit: microns. List of location triplets{inst x y} to be used for clustering. Default: uses placement information.                                                  |
| <code>[-min_bank_size]</code>             | Minimum bank size for XOR gating. Default: CG min_bit_width.                                                                                                        |
| <code>[-max_bank_size]</code>             | Maximum bank size for XOR gating. Default: CG max_bit_width.                                                                                                        |
| <code>[-exclude_flops]</code>             | Specify list of flops to be excluded for CGLAR.                                                                                                                     |
| <code>[-custom_banks]</code>              | Specifies the list of flops to be considered as list of banks for cglar.                                                                                            |
| <code>[-summary]</code>                   | List summary report for flops.                                                                                                                                      |
| <code>[-detailed]</code>                  | List detailed report for flops.                                                                                                                                     |
| <code>[-time_based]</code>                | Performs waveform-based CGLAR analysis.                                                                                                                             |
| <code>[-out]</code>                       | Save report to file.                                                                                                                                                |

### Example(s)

- `compute_cglar -da_threshold 0.25 -process_gated_flops`
- `set reg_list [get_registers -inst /cpu_10bit/DP]`
- `compute_cglar -reg_list $reg_list -da_threshold 0.25`
- `compute_cglar -custom_banks {{a[0] b[0] b[1]} {a[1] a[2] d_reg} {hier/c[0] hier/c[1] hier/d[2]}}`



## **Joules Command and Attribute Reference**

### **Power Scrubbing Commands - compute\_cglar**

---

#### **Return Value**

0 for success, 1 indicates failure in execution.

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_cglar

---

## report\_cglar

Reports the CGLAR data computed by the preceding `compute_cglar` command.

**Note:** Run this command on a post-mapped design after power has been computed (`compute_power` has been run).

## Syntax

```
report_cglar \  
  [-root <hier>+]  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]  
  [-collate]  
  [-ps_threshold <ratio>]  
  [-ps_absolute <power_val>]  
  [-ps_start <initial_value>]  
  [-ps_step <step_size>]  
  [-min_slack_margin <slack>]  
  [-min_cg_en_slack_margin <slack>]  
  [-only_0_act_banks]  
  [-bit_blast]  
  [-cglar_collection]  
  [-force]  
  [-cols  
    {flops|avg_data_freq|clk_freq|+gates|+icgcs|enable_freq|orig_power|  
    cglar_power|save_power|clock_power_save|pct_redn|min_data_freq|  
    max_data_freq|orig_slack|new_slack|slack_penalty|design_slack|  
    user_slack|orig_cgen_slack|cgen_new_slack|cgen_slack_penalty|  
    design_cgen_slack|user_cgen_slack|design_location|user_location|  
    preview_location|preview_slack}+]  
  [-sort_by  
    {avg_data_freq|clk_freq|orig_power|cglar_power|save_power|  
    clock_power_save|pct_redn|min_data_freq|max_data_freq|register|  
    orig_slack|new_slack|slack_penalty|design_slack|user_slack|  
    design_location|user_location}]  
  [-increasing]  
  [-min_bank_size <value>]  
  [-max_bank_size <value>]  
  [-return cglar_registers|cglar_banks|flops]  
  [-report_summary]  
  [-unit W|mW|uW|nW|pW]  
  [-format <format>]  
  [-generate_script bit|bank]  
  [-add_xor_options <options>]  
  [-out <f_rpt>] [-append]  
  [-dump_debug_info <f_log>] [-append_debug_info]  
    [-detailed]  
  [-widget]  
  [-help|-h]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_cglar

---

#### Options and Arguments

|                                        |                                                                                                                                                      |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                      | Displays help for all options.                                                                                                                       |
| <code>[-root]</code>                   | Use registers under specified hierarchies.                                                                                                           |
| <code>[-stims]</code>                  | Use frame#0 of the specified stimulus for CGLAR analysis. By default, all SDB stims are considered.                                                  |
| <code>[-frames]</code>                 | Use specified frame for CGLAR analysis. By default, average of all SDB stims is considered.                                                          |
| <code>[-collate]</code>                | Collate power and activity data for all stims or frames.<br>Default: false                                                                           |
| <code>[-ps_threshold]</code>           | Percentage (pct) power savings threshold.<br>Default is 0 = power saving > 0                                                                         |
| <code>[-ps_absolute]</code>            | Absolute (abs) power savings threshold.<br>Default is 0 = saving > 0                                                                                 |
| <code>[-ps_start]</code>               | Power savings threshold initial value.                                                                                                               |
| <code>[-ps_step]</code>                | Power savings threshold step size.                                                                                                                   |
| <code>[-min_slack_margin]</code>       | Unit: ps. Minimum timing slack on flop d pin after XOR implementation, filter flops which have less than this slack.<br>Default: skip                |
| <code>[-min_cg_en_slack_margin]</code> | Unit: ps. Minimum timing slack on enable pin of existing CG after XOR implementation, filter flops which have less than this slack.<br>Default: skip |
| <code>[-only_0_act_banks]</code>       | Report or return only flop banks with 0 data activity.<br>Default: false                                                                             |
| <code>[-bit_blast]</code>              | Show all flops and apply abs/pct power savings threshold per flop.<br>Default: false                                                                 |
| <code>[-cglar_collection]</code>       | Report only user collections.<br>Default: false                                                                                                      |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_cglar

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|                                 |                                                                                                                                                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-force]</code>           | Report all the flops gathered after <code>compute_cglar</code> without any further filtering.<br><br>Default: <code>false</code>                                 |
| <code>[-cols]</code>            | Specify the columns to show in CGLAR report.                                                                                                                     |
| <code>[-sort_by]</code>         | Sort the report by the specified column.<br><br>By default, the table is not sorted.                                                                             |
| <code>[-increasing]</code>      | Suboption of <code>-sort_by</code> .<br><br>Sort the output is increasing order.<br><br>By default, the output is sorted in decreasing order.                    |
| <code>[-min_bank_size]</code>   | Minimum bank size for XOR gating.<br><br>Default: <code>CG min_bit_width</code>                                                                                  |
| <code>[-max_bank_size]</code>   | Maximum bank size for XOR gating.<br><br>Default: <code>CG max_bit_width</code>                                                                                  |
| <code>[-return]</code>          | Returns list ( <code>flops</code> or <code>cglar_registers</code> ) or list-of-list ( <code>cglar_banks</code> ) of the candidates. Only one frame will be used. |
| <code>[-report_summary]</code>  | Shows summary of results.                                                                                                                                        |
| <code>[-unit]</code>            | Specify the power unit.<br><br>Default: value of attribute <code>power_unit</code>                                                                               |
| <code>[-format]</code>          | Specify the format.<br><br>Default: value of attribute <code>power_format</code>                                                                                 |
| <code>[-generate_script]</code> | Supplements the report or return, by dumping a Tcl script file with <code>clock_gating</code> and <code>add_xor_gating</code> command(s).                        |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_cglar

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|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-add_xor_options]</code>   | <p>Adds extra options for Genus internal clock gating command.</p> <p>It instructs Genus how to implement the clock gating on the flops banks passed by Joules.</p> <p>The following options are available:</p> <ul style="list-style-type: none"><li>■ <code>-flops <i>inst+</i></code></li><li>■ <code>-max_distance <i>integer</i></code></li><li>■ <code>-skip_async_check</code></li><li>■ <code>-threshold <i>integer</i></code></li><li>■ <code>-detailed_log <i>string</i></code></li></ul> |
| <code>[-out]</code>               | Save the output data in the specified report file <code>&lt;f_rpt&gt;</code> .                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-dump_debug_info]</code>   | Dumps debug information of the CGLAR-based scrubbing. It dumps out the reasons by which flops were skipped and disregarded as XOR gating candidates by CGLAR. The information is displayed in the structural, activity-based, timing-based, and power saving-based filtering. By default, only flop count is dumped. With the <code>-detailed</code> option, each flop is categorized.                                                                                                              |
| <code>[-append_debug_info]</code> | Saves the flop pruning information in the <code>&lt;f_log&gt;</code> file.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>[-detailed]</code>          | Dumps detailed debug information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-append]</code>            | Append to the file specified with <code>-out</code> option.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-widget]</code>            | Pop up smart table if running in GUI mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                   | The default value is <code>false</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### Example(s)

- `report_cglar -root /cpu_10bit/DP -ps_threshold 0.07`
- `report_cglar -generate_script bank -add_xor_options "-skip_async_check -max_distance 100" -out bank`

### Return Value

0 for success, 1 indicates failure in execution.

## compute\_stb

Performs structural or topological analysis of the design to identify stability-based sequential clock gating originated from the design constraints.

### Syntax

```
compute_stb  
[-const_based]  
[-effort]
```

### Options and Arguments

|                             |                                                                                                                                                                                                                                                                                                                           |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-const_based]</code> | Computes the stability-based sequential clock gating originated from the design constants.                                                                                                                                                                                                                                |
| <code>[-effort]</code>      | Sets the effort incurred in performing the ODC analysis.<br><br>With the <code>low</code> effort value, single cycle ODC analysis is performed with port-punching flow. With <code>high</code> , more intensive ODC analysis is performed alongside multi-cycle and port-punching flow.<br><br>Default: <code>high</code> |

### Examples

- `compute_stb ;# Computes enable forwarding stability-based sequential clock gating for registers.`
- `compute_stb -const_based ;# Computes constant stability-based sequential clock gating for registers.`
- `compute_stb -effort high ;# Computes multi-cycle stability-based clock gating for registers.`

## report\_stb

Implements ODC enable expressions for register banks.

### Syntax

```
report_stb
  [-inst inst_path]
  [-summary]
  [-detail]
  [-show_power_details]
  [-unit W|mW|uW|nW|pW]
  [-min_reg_width num]
  [-max_reg_width num]
  [-max_oper_count num]
  [-max_rtl_signal_oper_count num]
  [-ps_threshold num]
  [-id id]
  [-show_details]
  [-full_path]
  [-relative_path]
  [-show_depth]
  [-show_port_punching_info]
  [-max_expr_print_length length]
  [-cols {id dyn_pow dyn_pow_saving dyn_pow_saving_pct en_exprsn pow
         enable_exprsn exprsn_metadata file_row_col wasted_clocks
         wasted_clock_pct dyn_pow dyn_pow_saving dyn_pow_saving_pct
         flop_bank max_signal_depth en_exprsn_depth worst_depth
         curr_en_depth port_punching punched_modules}+]
  [-sort_by <column name>|bank_width]
  [-filter_expr {conditional_expression}]
  [>|-out output-file-name] [-append]
  [-header]
  [-gen html]
  [-html_out_dir]
  [-gen_csv]
  [-csv_out_dir]
  [-const_based]
  [-detail_rtl]
  [-increasing]
  [-get_id_list]
  [-only_file_row_info]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_stb

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#### Options and Arguments

|                                           |                                                                                                                                                                |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-inst]</code>                      | Specify flop instance path.                                                                                                                                    |
| <code>[-summary]</code>                   | Prints summary of the analysis.                                                                                                                                |
| <code>[-detail]</code>                    | Prints additional area and power summary.                                                                                                                      |
| <code>[-show_power_details]</code>        | Prints report with dynamic power savings.                                                                                                                      |
| <code>[-unit]</code>                      | Specify the power unit. Default value of attribute of <code>power_unit</code> .                                                                                |
| <code>[-min_reg_width]</code>             | Filter out all the reg banks from the report with width less than the specified numerical argument.                                                            |
| <code>[-max_reg_width]</code>             | Filter out all the reg banks from the report with width more than the specified numerical argument.                                                            |
| <code>[-max_oper_count]</code>            | Filter out all the reg banks with enable expression having operations more than the specified numerical argument.                                              |
| <code>[-max_rtl_signal_oper_count]</code> | Prints expressions having less <code>op_count</code> (post-trace RTL) than the cutoff number provided with the option <code>max_rtl_signal_oper_count</code> . |
| <code>[-ps_threshold]</code>              | Prints only the expressions above <code>dyn_pow_saving_pct</code> threshold.<br><br>Default: 0.01                                                              |
| <code>[-id]</code>                        | Prints details for the STB ID.<br><br>Default: none                                                                                                            |
| <code>[-show_details]</code>              | Shows details of the current opportunity.                                                                                                                      |
| <code>[-full_path]</code>                 | Prints full path of the signals in the generated RTL.                                                                                                          |
| <code>[-relative_path]</code>             | Prints relative path of signals in the generated RTL.                                                                                                          |



## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_stb

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|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-show_depth]</code>              | <p>Prints expression depths in the report.</p> <ul style="list-style-type: none"><li>■ Max signal depth: The maximum combinational depth of any signal participating in the enable expression from its fanin flops.</li><li>■ Max expression depth: The maximum combinational depth of enable expression.</li><li>■ Worst depth: The maximum depth of the enable expression and its participating signals.</li><li>■ Current enable depth: The combinational depth of the existing enable of the candidate register from its fanin flops.</li></ul> |
| <code>[-show_port_punching_info]</code> | <p>Prints the modules that are required to be port punched to implement the STB expression.</p> <p>An asterisk (*) in front of the module means that module is parent of the candidate register.</p>                                                                                                                                                                                                                                                                                                                                                |
| <code>[-max_expr_print_length]</code>   | <p>Specify max characters printed for the expression (s) string. Default: 20.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-cols]</code>                    | <p>Specify the columns to report in the output. By default, the following are reported:</p> <p>enable_exprsn exprsn_metadata file_row_col</p> <p>Default: enable_exprsn exprsn_metadata file_row_col</p>                                                                                                                                                                                                                                                                                                                                            |
| <code>[-sort_by]</code>                 | <p>Sorts the table by the specified column name or bank_width. By default, the table is not sorted.</p> <p>Default: unsorted</p>                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-filter_expr]</code>             | <p>Enables to use the expression for filtering rows. It replaces the column names with the specified row values.</p> <p><b>Note:</b> The expression should be compatible with this option and evaluate to 1 or 0.</p>                                                                                                                                                                                                                                                                                                                               |
| <code>[-out]</code>                     | <p>Specify the output file name.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-header]</code>                  | <p>Prints column description.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_stb

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|                                    |                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-gen_html]</code>           | <p>Generates HTML format reports to review STB analysis results. The generated reports include only the default and user-specified columns.</p> <p>Each Bank ID in this report file is hyperlinked, clicking which you can open the detailed report of the bank. In this report, the same enable expressions are combined and reported only once.</p> |
| <code>[-html_out_dir]</code>       | <p>Suboption of <code>-gen_html</code>.</p> <p>Saves the HTML format reports at the specified path, instead of the default <code>joules_work</code> directory.</p>                                                                                                                                                                                    |
| <code>[-gen_csv]</code>            | <p>Generates CSV format reports to review STB analysis results.</p> <p>All the options that are supported in HTML reporting through <code>-gen_html</code> are also supported in CSV reporting.</p>                                                                                                                                                   |
| <code>[-csv_out_dir]</code>        | <p>Suboption of <code>-gen_csv</code>.</p> <p>Saves the CSV format reports at the specified path, instead of the default <code>joules_work</code> directory.</p>                                                                                                                                                                                      |
| <code>[-only_file_row_info]</code> | <p>Prints short filename and row information. Only applicable with <code>file_row_col</code>.</p>                                                                                                                                                                                                                                                     |
| <code>[-const_based]</code>        | <p>Implement const-based candidates.</p>                                                                                                                                                                                                                                                                                                              |
| <code>[-detail_rtl]</code>         | <p>Print detailed rtl for const stb till primary inputs.</p>                                                                                                                                                                                                                                                                                          |
| <code>[-increasing]</code>         | <p>Suboption of <code>-sort_by</code>. Sorts the output in increasing order. By default, the output is sorted in decreasing order.</p>                                                                                                                                                                                                                |
| <code>[-get_id_list]</code>        | <p>Returns an iterated list of the all the final reg banks IDs that are reported.</p> <p>The returned value is a TCL list that can be iterated upon in a loop to get the detailed ID wise report of all the reported IDs.</p>                                                                                                                         |
| <code>[-only_file_row_info]</code> | <p>Prints short filename and row information. This argument is applicable only to <code>file_row_col</code>.</p>                                                                                                                                                                                                                                      |

The following table provides details about the STB header:

|                        |                                              |
|------------------------|----------------------------------------------|
| <code>id</code>        | Identifier for further referencing the data. |
| <code>flop_bank</code> | Flop bank name of the candidate.             |

## Joules Command and Attribute Reference

### Power Scrubbing Commands - report\_stb

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|                    |                                                                                                                                   |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| enable_exprsn      | Stability enable expression, this can be used for clock gate enable strengthening.                                                |
| exprsn_metadata    | {literal count, operation count} for enable_exprsn. Provides quick overview of analysis strength and implementation cost.         |
| file_row_col       | File, row, and column information for this flop.<br><br><b>Note:</b> Set hdl_track_filename_row_col attribute before elaboration. |
| dyn_pow            | Total dynamic power of the flop bank.                                                                                             |
| dyn_pow_saving     | Total dynamic power savings for flop banks.                                                                                       |
| dyn_pow_saving_pct | $\text{dyn\_pow\_saving} / \text{dyn\_pow} * 100$                                                                                 |

### Examples

- `report_stb -id STB_B1`
- `report_stb -id STB_B2`
- `report_stb -id STB_B1 -full_path`
- `report_stb -id STB_B2 -full_path`

## **`implement_stb`**

Implements stb enable expressions for register banks.

### **Syntax**

```
implement_stb
  [-id redn_id]
  [-min_reg_width num]
  [-max_reg_width num]
  [-max_literals num]
  [-max_rtl_signal_oper_count num]
  [-ps_threshold pct]
  [-report]
  [-const_based]
  [-reset]
  [-no_port_punching]
  [-verify]
  [-dump_lec_constraints]
  [-lec_cmd]
  [-jg_cmd]
  [-sim_model_files]
```

## Joules Command and Attribute Reference

### Power Scrubbing Commands - implement\_stb

---

#### Options and Arguments

|                                           |                                                                                                                                                                |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-id]</code>                        | Implements STB enable expression associated with ID.                                                                                                           |
| <code>[-min_reg_width]</code>             | Filter out all the reg banks with width less than the specified numerical argument.                                                                            |
| <code>[-max_reg_width]</code>             | Filter out all the reg banks with width more than the specified numerical argument.                                                                            |
| <code>[-max_literals]</code>              | Filter out all the reg banks with enable expression having literals more than the specified numerical argument. Default is 15.                                 |
| <code>[-max_rtl_signal_oper_count]</code> | Prints expressions having less <code>op_count</code> (post-trace RTL) than the cutoff number provided with the option <code>max_rtl_signal_oper_count</code> . |
| <code>[-ps_threshold]</code>              | Specify percentage power savings threshold. Default: 0.01 = power saving > 0.01% of flop power.                                                                |
| <code>[-report]</code>                    | Reports the implemented STB candidates.                                                                                                                        |
| <code>[-const_based]</code>               | Implement const based candidates.                                                                                                                              |
| <code>[-reset]</code>                     | Reset or list of resets to be used for verifying STB expressions using Jasper SEC. Default: None.                                                              |
| <code>[-no_port_punching]</code>          | Skips the candidates which require port punching on the corresponding module.                                                                                  |
| <code>[-verify]</code>                    | Verify the implemented STB expressions using Jasper SEC. Requires LEC and Jasper executables to be set in the path variable.                                   |
| <code>[-dump_lec_constraints]</code>      | Dumps the LEC verification constraints for all the candidate flop by default in <code>joules_work_dir/lec_verify.tcl</code> .                                  |
| <code>[-lec_cmd]</code>                   | LEC command for running the verify script. By default it uses <code>&lt;lec_path from env path/lec_executable attr&gt; -XL</code> .                            |

**Note:** Do not specify Logfile and GUI options. This is set internally.

## Joules Command and Attribute Reference

### Power Scrubbing Commands - implement\_stb

---

`[-jg_cmd]` Jasper command for running the verify script. By default it uses `<jg_path` from `env path/lec_executable attr>` `-sec`.

**Note:** Do not specify Logfile and GUI options. This is set internally.

`[-sim_model_files]` Specify list of verilog model files.  
Only applicable with `-verify` option.

### Examples

- `implement_stb -id STB_B1`
- `implement_stb -min_reg_width 1`
- `implement_stb -id STB_B1 -verify -reset rst`
- `implement_stb -id STB_B1 -verify -reset {!rst rst2}`
- `implement_stb -const_based`
- `implement_stb -id STB_C1 -const_based`

## mark\_quasi\_static\_signal

Marks the top level nets of the design as quasi-static signals. It can automatically identifies the equivalent delayed versions of the marked quasi-static signals and mark them as quasi-static as well.

### Syntax

```
mark_quasi_static_signal\  
    [-net <net_path>]  
    [-show_nets]  
    [-reset]  
    [-remove <net_path>]
```

### Options and Arguments

|              |                                                        |
|--------------|--------------------------------------------------------|
| [-net]       | Marks net as quasi static signal.                      |
| [-show_nets] | Reports all marked nets.                               |
| [-reset]     | Clears list of previously marked quasi static signals. |
| [-remove]    | Unmarks net as quasi static signal.                    |

### Example(s)

- mark\_quasi\_static\_signal -net /top/n\_10
- mark\_quasi\_static\_signal -show\_nets
- mark\_quasi\_static\_signal -reset
- mark\_quasi\_static\_signal -remove /top/n\_10

## **implement\_mem\_stb**

Implements auto-mem implementation for the memory.

### **Syntax**

```
implement_mem_stb  
  [-id <redn_id>]
```

### **Options and Arguments**

|       |                                                                         |
|-------|-------------------------------------------------------------------------|
| [-id] | Implements auto-memory implementation associated with the specified Id. |
|-------|-------------------------------------------------------------------------|

### **Example(s)**

```
■  implement_mem_stb -id STB_M1
```



## compute\_logic\_opt

Runs logic optimization on the register banks.

### Syntax

```
compute_logic_opt  
  [-inst <inst_path>]  
  [-allow_port_punching]
```

### Options and Arguments

|                        |                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------|
| [-inst]                | Specifies the root hierarchical instance for logic optimization.<br><br>Default: design root   |
| [-allow_port_punching] | Allows punching of new port(s) in the module to export the ODC signal in another module scope. |

### Example(s)

- `compute_logic_opt ;# Computes logic optimization for the ODC candidates from the design root`
- `compute_logic_opt -inst /top/blk1 ;# Runs logic optimization for candidates starting from /top/blk1`

## compute\_reset\_opt

Runs reset optimization on the register banks.

### Syntax

```
compute_reset_opt  
  [-inst <inst_path>]
```

### Options and Arguments

|         |                                                                                          |
|---------|------------------------------------------------------------------------------------------|
| [-inst] | Specifies the root hierarchical instance for reset optimization.<br>Default: design root |
|---------|------------------------------------------------------------------------------------------|

### Example(s)

- `compute_reset_opt ;# Computes reset optimization for the ODC candidates from the design root`
- `compute_reset_opt -inst /top/blk1 ;# Runs reset optimization for candidates starting from /top/blk1`

## **show\_odc\_gui**

Highlights the implemented ODC data in GUI.

### **Syntax**

```
show_odc_gui \
  [-id]
```

### **Options and Arguments**

[-id] Specify the ID associated with the implemented ODC data.

### **Example(s)**

- `show_odc_gui -id ODC_B1 ;# highlights the implemented ODC instances and candidate register banks for ODC_B1 in GUI.`

## **show\_stb\_gui**

Highlights the implemented STB data in GUI.

### **Syntax**

```
show_stb_gui \
    [-id]
    [-const_based]
```

### **Options and Arguments**

|                             |                                                          |
|-----------------------------|----------------------------------------------------------|
| <code>[-id]</code>          | Specify the ID associated with the implemented STB data. |
| <code>[-const_based]</code> | Specify the const-based candidates to highlight.         |

### **Example(s)**

- `show_stb_gui -id STB_B1 ;# highlights the implemented STB instances and candidate register banks for STB_B1 in GUI.`

## report\_cglar\_regs\_of\_da\_threshold

Reports D, Q, Clock toggles and the activity ratios used for da\_threshold checks.

### Syntax

```
report_cglar_regs_of_da_threshold \  
  [-root hier]  
  [-reg_list <register>+]  
  [-da_threshold ratio]  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]  
  [-sort_by {clk_t_cnt|d_t_cnt|q_t_cnt|act_ratio}]  
  [-increasing]  
  [-out f_rpt]
```

### Options and Arguments

|                 |                                                                                                                                               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]            | Displays help for all options.                                                                                                                |
| [-root]         | Use flops under specified hierarchical instances.                                                                                             |
| [-reg_list]     | List of registers for CGLAR analysis. By default, all registers are considered.                                                               |
| [-da_threshold] | Specify the data activity ratio threshold.<br>Default: 0.10 (10% of flop clock)                                                               |
| [-stims]        | Use frame#0 of the specified stimulus for CGLAR analysis.<br>By default, all SDB stims are considered.                                        |
| [-frames]       | Use specified frame for CGLAR analysis.<br>By default, average of all SDB stims is considered.                                                |
| [-sort_by]      | Sort the report by the specified column.                                                                                                      |
| [-increasing]   | Suboption of -sort_by.<br>Sort the output in increasing order.                                                                                |
| [-out]          | Save the output data in the specified report file <f_rpt>.<br>If no argument is provided, then the default report is<br>joules_work/\$cmd.rpt |

### Example(s)

```
■ report_cglar_regs_of_da_threshold  
  set reg_list [get_registers -inst /cpu_10bit/DP]
```

## **Joules Command and Attribute Reference**

### **Power Scrubbing Commands - report\_cglar\_regs\_of\_da\_threshold**

---

■ `report_cglar_regs_of_da_threshold -reg_list $reg_list`

## ignore\_odc

Ignores flops and signal during ODC computation.

### Syntax

```
ignore_odc \  
  [-inst {flop list}+]  
  [-signal {signal list}+]  
  [-remove]
```

### Options and Arguments

|           |                                                    |
|-----------|----------------------------------------------------|
| [-h]      | Displays help for all options.                     |
| [-inst    | Specify list of instances or flops for ignore ODC. |
| [-signal] | Specify list of signals for ignore ODC.            |
| [-remove] | Removes signal or flops from ignore list.          |

### Example(s)

- `ignore_odc -inst f2_reg`
- `ignore_odc -remove -inst f2_reg`
- `ignore_odc -signal sel2_reg1`
- `ignore_odc -remove -signal sel2_reg1`
- `ignore_odc -inst in1_reg1_reg[0] -signal sel_reg1`
- `ignore_odc -remove -inst in1_reg1_reg[0] -signal sel_reg1`

## ignore\_stb

Ignores flops while STB computations.

### Syntax

```
ignore_stb \  
    [-inst {inst_path}+]  
    [-remove]
```

### Options and Arguments

|           |                                                    |
|-----------|----------------------------------------------------|
| [-h]      | Displays help for all options.                     |
| [-inst    | Specify list of instances or flops for ignore STB. |
| [-remove] | Removes instances or flops from ignore list.       |

### Example(s)

- `ignore_stb -inst f2_reg`
- `ignore_stb -remove -inst f2_reg`



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## Memory Power Reduction Commands

---

- add override logic
- compute\_memory\_ideal\_power
- compute\_memory\_reduction
- define\_memory
- implement\_memory\_reduction
- read\_rdb
- report\_memory\_ideal\_power
- report\_memory\_reduction
- write\_rdb

## **add\_override\_logic**

Adds override logic to the design which helps users to hookup enable signals (by automated implementation of reduction techniques). The signals can then be lifted to a top-level port.

Controlling the signals help to confirm that the automated implementation are actually reducing power.

This command should be executed after the last `implement_*` command of the flow and before `syn_generic` command.

### **Syntax**

```
add_override_logic \  
  [-name <override_port_name>]  
  [-allow_new_port]
```

### **Options and Arguments**

|                                |                                                                                             |
|--------------------------------|---------------------------------------------------------------------------------------------|
| <code>[-h]</code>              | Displays help for all options                                                               |
| <code>[-name]</code>           | Specify name of override port. This option is mandatory.<br>By default, “override” is used. |
| <code>[-allow_new_port]</code> | Allows new port creation.                                                                   |

### **Examples**

- `add_override_logic -name override_port`
- `add_override_logic -name override_port -allow_new_port`

### **Return Value**

0 indicates success, 1 indicates failure in execution.

### ***Related Commands***

`implement_odc`, `implement_stb`, `syn_generic`

## **compute\_memory\_ideal\_power**

Computes the redundant power for each redundant clock cycle categories but not the penalty power.

### **Syntax**

```
compute_memory_ideal_power  
    [-debug]
```

### **Options and Arguments**

|          |                                                 |
|----------|-------------------------------------------------|
| [-h]     | Displays help for all options                   |
| [-debug] | Prints the power calculation debug information. |

### **Examples**

```
■ compute_memory_ideal_power
```

### **Return Value**

0 indicates success, 1 indicates failure in execution.

## **compute\_memory\_reduction**

Generates the stability Read and Write detection logic for the instantiated memories.

It also performs structural analysis of the design to give memory power reductions and generate the RTL.

### **Syntax**

```
compute_memory_reduction  
    [-debug]
```

### **Options and Arguments**

|          |                                  |
|----------|----------------------------------|
| [-debug] | Generates the debug information. |
|----------|----------------------------------|

### **Return Value**

0 indicates success, 1 indicates failure in execution.

## Joules Command and Attribute Reference

### Memory Power Reduction Commands

---

#### define\_memory

Defines memory-related information to perform the power reduction analysis for instantiated memories.

You must specify the category to tag the memories of a particular cell and the ports to associate with the type (such as address, data, or enables).

For multi-clock memories, provide the association between a clock and its critical ports as well.

**Note:** Critical ports constitute Read Address, Write Address, Read Data, Write Data, Read Enable, Write Enable, and Memory Enable.

#### Syntax

```
define_memory
  [-cell <glob memory cell>]
  [-memory_enable <clk, <list of memory enable ports>>]
  [-access_enable <clk, <list of read enable signals> <list of write enable
signals>>]
  [-data <clk <list of read data ports> <list of write data ports>>]
  [-address <clk <list of read address ports> <list of write address ports>>]
  [-mem_type 1RW|1R1W|ROM]
  [-read_enable_polarity < 0 : For low, 1 : For high >]
  [-write_enable_polarity < 0 : For low, 1 : For high >]
  [-memory_enable_polarity < 0 : For low, 1 : For high >]
```

## Joules Command and Attribute Reference

### Memory Power Reduction Commands

---

#### Options and Arguments

|                                        |                                                                                                                                                                                                                                     |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                      | Displays help for all options.                                                                                                                                                                                                      |
| <code>[-cell]</code>                   | Specifies the memory cell whose instances need to be analyzed.                                                                                                                                                                      |
| <code>[-memory_enable]</code>          | <p>Specifies the memory enable ports.</p> <p>The following format is used:</p> <pre>{ {&lt;Clock1&gt; {{&lt;Memory Enable&gt;}}} {&lt;Clock2&gt; {{&lt;Memory Enable&gt;}}} ..... }</pre>                                           |
| <code>[-access_enable]</code>          | <p>Specifies the access enable ports.</p> <p>The following format is used:</p> <pre>{ {&lt;Clock1&gt; {{&lt;Read Enable&gt;} {&lt;Write Enable&gt;}}} {&lt;Clock2&gt; {{&lt;Read Enable&gt;} {&lt;Write Enable&gt;}}} ..... }</pre> |
| <code>[-data]</code>                   | <p>Specifies the data ports.</p> <p>The following format is used:</p> <pre>{ {&lt;Clock1&gt; {{&lt;Read Data&gt;} {&lt;Write Data&gt;}}} {&lt;Clock2&gt; {{&lt;Read Data&gt;} {&lt;Write Data&gt;}}} ..... }</pre>                  |
| <code>[-address]</code>                | <p>Specifies the address ports.</p> <p>The following format is used:</p> <pre>{ {&lt;Clock1&gt; {{&lt;Read Address&gt;} {&lt;Write Address&gt;}}} {&lt;Clock2&gt; {{&lt;Read Address&gt;} {&lt;Write Address&gt;}}} ..... }</pre>   |
| <code>[-mem_type]</code>               | <p>Specifies the type of memory.</p> <p>Accepts the following values: 1RW, 1R1W, ROM</p>                                                                                                                                            |
| <code>[-read_enable_polarity]</code>   | <p>Specifies whether the read enable polarity of a port is active high (1) or low (0).</p> <p>Default is 1 (high).</p>                                                                                                              |
| <code>[-write_enable_polarity]</code>  | <p>Specifies whether the write enable polarity of a port is active high (1) or low (0).</p> <p>Default is 1 (high).</p>                                                                                                             |
| <code>[-memory_enable_polarity]</code> |                                                                                                                                                                                                                                     |

## Joules Command and Attribute Reference

### Memory Power Reduction Commands

---

Specifies whether the memory enable polarity of a port is active high (1) or low (0).

Default is 1 (high).

### Examples

```
■ define_memory -cell vir_sr1p_2048x16_cr_125 \  
  -mem_type 1RW -address { {CLK {{ADR} {ADR} }} } \  
  -data {{CLK {{Q} {D}}}} \  
  -memory_enable {{CLK {{ME}}}} \  
  -access_enable {{CLK {{WE} {WE}}}}
```

### Return Value

0 indicates success, 1 indicates failure in execution.

## **implement\_memory\_reduction**

Implements the read and write enable logic for all the memories analyzed by default.

This command also takes a reduction ID and implements the logic for the specified ID only.

### **Syntax**

```
implement_memory_reduction  
  [-id <Reduction ID>]
```

### **Options and Arguments**

- |       |                                                      |
|-------|------------------------------------------------------|
| [-h]  | Displays help for all options.                       |
| [-id] | Implements the enable logic of the corresponding ID. |

### **Examples**

- `implement_memory_reduction`
- `implement_memory_reduction -id <ID>`

### **Return Value**

0 indicates success, 1 indicates failure in execution.



## Joules Command and Attribute Reference

### Memory Power Reduction Commands

---

#### read\_rdb

Reads reduction database and utilizes the computed or implemented data.

#### Syntax

```
read_rdb \  
  [-db_dir directory_path]
```

#### Options and Arguments

|           |                                               |
|-----------|-----------------------------------------------|
| [-h]      | Displays help for all options.                |
| [-db_dir] | Specify the directory path to read databases. |

#### Example(s)

```
■ read_rdb -db_dir test/db_dir
```

## report\_memory\_ideal\_power

Generates all the memory ideal power analysis reports.

### Syntax

```
report_memory_ideal_power  
  [-inst <inst_path>]  
  [-show_power_details]  
  [-unit W|mW|nW|pW]  
  [-out <output-dir-name>]
```

### Options and Arguments

|                                    |                                                                                                                            |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                  | Displays help for all options.                                                                                             |
| <code>[-inst]</code>               | Specifies the hierarchical instance.                                                                                       |
| <code>[-show_power_details]</code> | Prints report with dynamic power savings.                                                                                  |
| <code>[-unit W mW nW pW]</code>    | Specifies the power unit.<br>By default uses the value of attribute <code>power_unit</code> .                              |
| <code>[-out]</code>                | Saves the report in the specified output directory.<br>By default, the reports are saved in the present working directory. |

### Examples

- `report_memory_ideal_power -out MemoryIdealReports`
- `report_memory_ideal_power -show_power_details -out MemoryIdealReports`

### Return Value

0 indicates success, 1 indicates failure in execution.

## report\_memory\_reduction

Provides the memory scrubber results either on stdout or in the user-specified report file.

The report can be generated in two formats - summarized and detailed.

### Syntax

```
report_memory_reduction
  [-id <Reduction id>]
  [-inst <inst_path>]
  [-detailed]
  [-show_power_details]
  [-unit W|mW|uW|nW|pW]
  [-debug]
```

### Options and Arguments

|                       |                                                                                               |
|-----------------------|-----------------------------------------------------------------------------------------------|
| [-h]                  | Displays help for all options.                                                                |
| [-id]                 | Prints the report only for the specified ID.                                                  |
| [-inst]               | Specifies the hierarchical instance.                                                          |
| [-detailed]           | Prints the detailed report.                                                                   |
| [-show_power_details] | Prints report with dynamic power savings.                                                     |
| [-unit W mW uW nW pW] | Specifies the power unit.<br>By default uses the value of attribute <code>power_unit</code> . |
| [-debug]              | Prints the power savings calculation debug information.                                       |

### Examples

- `report_memory_reduction`
- `report_memory_reduction -id MEM_CGM_1`

### Return Value

0 indicates success, 1 indicates failure in execution.

## Joules Command and Attribute Reference

### Memory Power Reduction Commands

---

#### **write\_rdb**

Writes the computed or implemented ODC/STB information in a database.

#### **Syntax**

```
write_rdb \  
  [-db_dir directory_path]
```

#### **Options and Arguments**

|           |                                             |
|-----------|---------------------------------------------|
| [-h]      | Displays help for all options.              |
| [-db_dir] | Specify the directory to save the database. |

#### **Example(s)**

```
■ write_rdb -db_dir test/db_dir
```

---

## Stimulus Interface, Vectorless, and Activity Commands

---

- get\_default\_activity
- plot\_activity\_profile
- plot\_sdb
- propagate\_activity
- reset\_default\_activity
- set\_default\_activity
- set\_pin\_activity
- reset\_pin\_activity
- report\_activity
- report\_user\_activity
- get\_pin\_activity
- get\_net\_activity
- get\_sdb\_stims
- get\_pdb\_stims
- get\_sdb\_frames
- get\_pdb\_frames
- get\_stim\_info
- get\_frame\_info
- get\_inst\_activity
- copy\_activity

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands -

---

- write power critical signals
- report\_sdb\_annotation
- report\_spef\_annotation
- report\_stim\_hierarchy
- write\_stimulus
- read\_spef
- set\_vectorless\_controls
- get\_domain\_activity
- reset\_memory\_params
- set\_memory\_params
- get\_xor\_candidate\_bits
- compare\_stims
- report\_pin\_property
- report\_glitches
- get\_glitches
- plot\_glitches
- report\_fanin\_property
- report\_fanout\_property
- get\_adb\_stims
- get\_adb\_frames

## get\_default\_activity

Returns the default activity value for the specified pin.

### Syntax

```
get_default_activity
  -activity_type default|system
  -pin_types {primary_input|seq_out|flop_out|latch_out|memory_out|icgc_out|
             icgc_enable|bbox_out|comb_out|clk_comb_out|all}+
  -global
  [-stim stim_name]
```

### Options and Arguments

|                             |                                                                                              |
|-----------------------------|----------------------------------------------------------------------------------------------|
| <code>[-h]</code>           | Displays help for all options.                                                               |
| <code>-activity_type</code> | Type of default activity to report. By default, only default activity is reported.           |
| <code>-pin_types</code>     | Pin type for which to return the default activity. By default, all pin types are considered. |
| <code>-global</code>        | Get default activity for all stimuli.                                                        |
| <code>[-stim]</code>        | Name of the stimulus associated with the pin. By default, all stims are considered.          |

### Example(s)

- `get_default_activity -pin_type primary_input`
- `get_default_activity -pin_type all -stim /stim#1`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## plot\_activity\_profile

If you have extracted multiple frames from a stimulus and run the `compute_power` command in time-based mode, you can plot the activity profile for pins, leaf insts, categories of hier insts, clock\_domain, or power\_domain, for the specified stim/frames using this command.

For hier insts, activity on output pins of each leaf element for each category is collated and displayed.

The activity profile plot assumes that the specified SDB frames are contiguous in time. This command uses gnuplot to plot time-based profile of activities. Before running this command, ensure that DISPLAY is set properly.

**Note:** You can run this command after `read_stimulus`, `propagate_activity`, or `compute_power` commands. However, on running this command after `read_stimulus`, only the annotated pins information is reported.

### Syntax

```
plot_activity_profile \  
  [-stims {<stim_id>}+]   
  [-frames {<frame_id>|<frame_range>}+]   
  [-pin <pin>+]   
  [-inst <inst>+]   
  [-module {<module-name>}+]   
    [-levels <levels>|all]   
  [-clock_domain {<prim-clock-net>}+]   
  [-power_domain {<domain_name>}+]   
  [-by_category {memory|register|latch|logic|bbox|clock|pad|pm|total}+]   
  [-groups <profile_group>+]   
  [-annotation_type   
    {asserted|user_asserted|computed|default|clock_source|constant|unasserted|   
    all}]   
  [-collate annotation_type|none]   
  [-xkey simtime|frame_id]   
  [-ykey freq|toggle|toggles|duty]   
  [-mode {sum|avg}]   
    [-xrange <xrange>]   
    [-yrange <yrange>]   
  [-format fsdb|shm|gnuplot|native|png]   
  [>|-out <f_dat>]
```



## Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-stims]</code>        | <p>Specify the stimulus for which time-based profile needs to be generated. Make sure that stimulus is already read in.</p> <p>Valid Stim IDs can be queried through command <code>get_sdb_stim</code>.</p> <p>By default, the command plots the activity profile of the first read SDB stim.</p>                                                                                                                                                                               |
| <code>[-frames]</code>       | <p>Specify the list of frames for activity profile display. The list can include individual frames (for example, <code>/stim#1/frame#1</code>) or a range of frames.</p> <p>Ensure that stimulus is read in and well divided into frames.</p> <p>Valid Frame IDs can be queried through command <code>get_sdb_frame</code>.</p> <p>Frames must be contiguous, as shown in the following example:</p> <pre>plot_activity_profile -frame "/stim#2/frame#0 / stim#2/frame#1"</pre> |
| <code>[-pin]</code>          | List of pins for which activity profile will be displayed. The default is none.                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-inst]</code>         | List of hierarchical or leaf instances for which activity profile will be displayed. By default, the plot will have a line for each specified instance.                                                                                                                                                                                                                                                                                                                         |
| <code>[-module]</code>       | <p>Use all instances of the specified module(s) for the plot.</p> <p>When both <code>inst</code> and <code>module</code> names are specified, then the command ignores the module name.</p>                                                                                                                                                                                                                                                                                     |
| <code>[-levels]</code>       | A suboption for <code>-module</code> option. If specified, all children hierarchical instances upto the specified level are used for the plot. Its default value is 0.                                                                                                                                                                                                                                                                                                          |
| <code>[-clock_domain]</code> | <p>Display the activity profile of all elements in the domain of the specified clocks.</p> <p><b>Note:</b> <code>-inst</code> and <code>-module</code> options are not compatible with the <code>-clock_domain</code> option.</p>                                                                                                                                                                                                                                               |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - plot\_activity\_profile

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-power_domain]</code>    | Display the power profile for the specified list of power domains as defined in the CPF/1801 power intent.<br><br><b>Note:</b> <code>-inst</code> and <code>-module</code> options are not compatible with <code>-power_domain</code> option.                                                                                                                                                                                      |
| <code>[-by_category]</code>     | Display a line for each specified category in the activity plot. For FSDB or SHM formats (set using <code>-format</code> option), all categories are considered by default.                                                                                                                                                                                                                                                        |
| <code>[-groups]</code>          | Specify the profile group(s) to plot.                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-annotation_type]</code> | Type of annotation to include in the plot. By default, all annotations are plotted.                                                                                                                                                                                                                                                                                                                                                |
| <code>[-collate]</code>         | Criteria to collate plot data. By default, the data is not collated.                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-xkey]</code>            | Display the simtime or frame ID as specified on X axis. By default, simtime is displayed on X axis.                                                                                                                                                                                                                                                                                                                                |
| <code>[-ykey]</code>            | Display the selected criteria on Y axis. By default, the Y axis displays frequency.                                                                                                                                                                                                                                                                                                                                                |
| <code>[-mode]</code>            | Specify whether to plot the data by sum or average (default). This option applies to <code>-ykey freq tog</code> .                                                                                                                                                                                                                                                                                                                 |
| <code>[-xrange]</code>          | Sub-option of <code>-mode</code> . Specify the range of values for X axis.<br><br>Applies to <code>-format gnuplot native png</code> .                                                                                                                                                                                                                                                                                             |
| <code>[-yrange]</code>          | Sub-option of <code>-mode</code> . Specify the range of values for Y axis.<br><br>Applies to <code>-format gnuplot native png</code> .                                                                                                                                                                                                                                                                                             |
| <code>[-format]</code>          | Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ Native (default format)</li><li>■ PNG</li><li>■ FSDB (FastSignal Database) - a binary format (fsdb); output can be viewed using Verdi waveform viewer.</li><li>■ SHM (Simulation History Manager) - a binary format (*.trn *.shm); output can be viewed using the NCSim simvision utility.</li></ul> |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - plot\_activity\_profile

---

[>|-out]

Redirect the output of the command to the specified file.

By default, the output of the command is dumped in  
*<work\_dir>/joules\_waveform\_act.<format>*.

If the file specified with this option needs to be created in some other directory, then ensure that the directory exists.

### Example(s)

- `plot_activity_profile -inst /cpu_10bit/FSM -by_category flop icgc memory -stim /stim#1`
- `plot_activity_profile -by_category -power_domain PD_fsm PD_alu -stim /stim#2 -xkey frame_id`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## plot\_sdb

Plots the SDB properties through gnuplot.

### Syntax

```
plot_sdb  
    [-out <output-plot-file-name>]
```

### Options and Arguments

|        |                                                                                                               |
|--------|---------------------------------------------------------------------------------------------------------------|
| [-h]   | Displays help for all options.                                                                                |
| [-out] | Save the plot output in the specified file. By default, the output is directed to joules_work/joules_sdb.dat. |

### Example(s)

- `plot_sdb`
- `plot_sdb -out design_sdb.dat`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## propagate\_activity

Propagates the activity for all primary inputs, nets, and other elements in the design.

### Syntax

```
propagate_activity
  [-mode average|time_based|vectorless]
  [-force]
  [-stim <stim ids>+]
  [-scale_frequency {<scale_factor> <obj_path>}+ ]
    (<obj_path> = clock pin/net or hierarchy or power domain)
  [-scale_to_sdc_frequency]
  [-no_glitch <TG|IG|Both>]
  [-stim_annotation {<obj_type>[:<pin_type>]}+]
    (<obj_type> = port|seq|comb|reg|mem|icgc|latch|bbox|state|all|
               none|preserve)
    (<pin_type> = in|out|both)
  [-use_clock_freq sdc|stim|min_stim_sdc]
  [-compat voltus]
  [-append]
```

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - propagate\_activity

---

#### Options and Arguments

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                      | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-mode]</code>                   | Specify the mode for propagating activity. The default mode is the one in which the last <code>compute_power</code> command was executed; otherwise the default mode is average.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-force]</code>                  | Force the <code>-mode</code> option. By default, it is set to false.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-stim]</code>                   | Specify the stimulus ID(s) for activity propagation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-scale_frequency]</code>        | <p>Scale frequency of all ASSERTED signals in the specified <i>&lt;obj_path&gt;</i> by <i>&lt;scale_factor&gt;</i>. For example:</p> <ul style="list-style-type: none"><li>■ If <i>&lt;obj_path&gt;</i> is clock pin/net, frequency of all ASSERTED signals in the domain of the specified clock is scaled by <i>&lt;scale_factor&gt;</i>.</li><li>■ If <i>&lt;obj_path&gt;</i> is a hierarchy, frequency of all ASSERTED signals in the specified hierarchy is scaled by <i>&lt;scale_factor&gt;</i>.</li><li>■ If <i>&lt;obj_path&gt;</i> is a power domain, frequency of all ASSERTED signals in the specified power domain is scaled by <i>&lt;scale_factor&gt;</i>.</li></ul> |
| <code>[-scale_to_sdc_frequency]</code> | <p>If specified, all clock domain, clock network, and clk pins activity is computed by factor where</p> $\text{factor} = \text{sdc\_freq} / \text{stim\_freq}$ <p>If multiple clocks reach a pin, then the fastest clock is considered.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-no_glitch]</code>              | If specified, does not consider glitch power separately.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - propagate\_activity

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|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stim_annotation]</code> | <p>Honor stim annotation of only the specified objects.</p> <p>Specify the option in the following format:</p> <pre>{&lt;obj_type&gt;[:&lt;pin_type&gt;]}+</pre> <p><code>&lt;obj_type&gt;</code> can have any of the following values:</p> <pre>port seq comb reg mem icgc latch bbox state all none preserve</pre> <p>State means all state points. It includes <code>port:in</code>, <code>reg:out</code>, <code>latch:out</code>, <code>icgc:out</code>, <code>mem:both</code>, <code>bbox:both</code>, and <code>preserve:both</code></p> <p><code>&lt;pin_type&gt;</code> can have any of the following values:</p> <pre>in out both</pre> <p>Default value for <code>pin_type</code> is <code>both</code>. For <code>all</code> or <code>none</code> <code>obj_types</code>, <code>pin_type</code> is not honored.</p> |
| <code>[-use_clock_freq]</code>  | Use the specified clock frequency. Default in stim.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-compat]</code>          | Specify this option to run the propagate activity process in Voltus compatibility mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>[-append]</code>          | Append activity computation to activity database.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Example(s)

- `propagate_activity`
- `propagate_activity -stim /stim#1 /stim#2`
- `propagate_activity -stim /stim#3 -append`

### Return Value

0 for success. 1 indicates failure in execution.

### Related Topics

- [Activity Processing and Reporting](#)

## reset\_default\_activity

Resets the default activity and power information for design elements.

### Syntax

```
reset_default_activity
  -activity_type default|system
  [-pin_types {primary_input|seq_out|flop_out|latch_out|memory_out|icgc_out|
               icgc_enable|bbox_out|comb_out|clk_comb_out|all}+]
  -global
  [-stim <stim_name>]
```

### Options and Arguments

|                |                                                                                             |
|----------------|---------------------------------------------------------------------------------------------|
| [-h]           | Displays help for all options.                                                              |
| -activity_type | Set either default or system default activity.                                              |
| [-pin_types]   | Reset activity for the specified pin types. If not specified, all pin types are considered. |
| -global        | Reset the activity for all stimuli.                                                         |
| [-stim]        | Reset the activity for the specified stimulus.                                              |

### Example(s)

- `reset_default_activity -pin_types flop_out -stim /stim#1 ; # Reset the default activity for flop_out`
- `reset_default_activity -stim /stim#1 ; # Reset all default activities for the stimulus`
- `reset_default_activity -activity_type system -stim /stim#1 ; # Reset all system default activities for the stimulus`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)



## **set\_default\_activity**

Defines the default activity for design elements.

### **Syntax**

```
set_default_activity \
  -duty val
  -freq val
    [-clock related|local|clock_pin_or_net]
  [-pin_types {primary_input|seq_out|flop_out|latch_out|memory_out|icgc_out|
               icgc_enable|bbox_out|comb_out|clk_comb_out|all}+]
  [-global]
  [-stim stim_name]
```

## Options and Arguments

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>     | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>-duty</code>    | Default activity that will be applied on the specified seed category.<br><br>The specified duty fraction should be between 0 and 1.                                                                                                                                                                                                                                                                                     |
| <code>-freq</code>    | Default frequency that will be applied on the specified seed category. You can specify the frequency either as an absolute number or a percentage of the specified clocks.                                                                                                                                                                                                                                              |
| <code>[-clock]</code> | Sub-option of <code>-freq</code> . Default frequency related to a specific clock.<br><br>Valid values are: <ul style="list-style-type: none"><li>■ <code>related</code> (default) - Frequency will be a fraction of related clock</li><li>■ <code>local</code> - Supported only for <code>icgc_out</code></li><li>■ <code>clock</code> - Frequency will be a fraction of the clock specified with this option</li></ul> |

`-pin_types`

Design objects for which the default activity needs to be set.

Joules will use the activity specified with this option only when it is not able to compute the activity from any other sources such as stimulus, activity supplied through `set_pin_activity`, or `.sdc` (in case of clocks only).

If the activity of a pin is already asserted, the values specified with the `set_default_activity` command will be ignored. However, if the pin whose activity has been set using this command passes through Stimulus or `set_pin_activity`, then the new value will override the existing value.

Valid values are:

- `primary_input` - default activity will be applicable for Primary inputs only.
- `seq_out` - default activity will be applicable for sequential output only
- `flop_out` - default activity will be applicable for output flops only
- `latch_out` - default activity will be applicable for output latches only
- `memory_out` - default activity will be applicable for output memory only
- `icgc_out` - default activity will be applicable for output CG only
- `icgc_enable` - default activity will be applicable for CG enable only
- `bbox_out` - default activity will be applicable for black-box outputs only
- `all (Default)` - default activity will be applicable for all the above mentioned categories

**Note:**

- The `-pin_types` option covers only non-clock primary inputs.
- Default activity of clock pins are derived from SDC.

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - set\_default\_activity

---

`[-global]`

Apply the default activity on all the pins in the design.

For example, if you run the following commands :

```
set_default_activity -pin_types primary_input -duty 0.3 -
freq 3333
set_default_activity -pin_types memory_output -duty 0.4 -
freq 4444
set_default_activity -global -duty 0.5 -freq 5555
```

Then:

- All the primary inputs get activity as (0.3, 3333).
- All the memory outputs get activity as (0.4, 4444).
- All the pins other than primary inputs and memory outputs(i.e flop\_out, icgc\_out, latch\_out, bbox\_out, combination outputs) get activity as (0.5, 5555)

`[-stim]`

Apply the default activity for the specified stimulus.

By default, the default activity supplied with the command will be applied for all the stimulus read in for the design.

You can report the default activity per stimulus by:

```
get_pin_activity <pin_name> -stims
<stimulus_name>
```

### Example(s)

- `set_default_activity -pin_types primary_input -freq 25MHz -duty 0.20`
- `set_default_activity -pin_types icgc_enable -duty 0.20 -freq 0.15 -clock related`
- `set_default_activity -global -duty 0.5 -freq 50MHz`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Activity Processing and Reporting](#)

## **set\_pin\_activity**

Specifies activity for design pins.

### **Syntax**

```
set_pin_activity [-pin] pin-path \  
  -activity_type user|default|system  
  -duty duty  
  -freq freq  
  [-toggles tcnt]  
    [-duration duration]  
  -pin_types {primary_input|seq_out|flop_out|latch_out|memory_out|icgc_out|  
             icgc_enable|bbox_out|comb_out|clk_comb_out|all}+  
  [-clock related|local|clock_pin_or_net]  
  [-global]  
  [-force_propagate]  
  [-stims stim_id+]  
  [-frames frame_id+]  
  [-silent]
```

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - set\_pin\_activity

---

#### Options and Arguments

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>             | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-pin]</code>           | Path of the pin for setting the activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-activity_type]</code> | <p>Specifying one of the following:</p> <ul style="list-style-type: none"><li>■ <code>user</code> (default) - reports information about user activity (prob, toggle) set on pin on the specified stims and frames.</li><li>■ <code>system</code> - reports information about system activity (prob, toggle) set on pin on the specified stims and frames.</li><li>■ <code>default</code> - reports information about user/system default activity (prob, toggle) set on pin types of the specified stims.</li></ul> |
| <code>-duty</code>            | Duty cycle for the pin, which is a fraction from 0 to 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>-freq</code>            | <p>Frequency for the pin, for example, <code>150.0e+6</code></p> <p>For <code>activity_type user</code>, sample frequency specification: <code>150.0e+6</code></p> <p>For <code>activity_type default system</code>, frequency is defined as absolute freq or percentage of the specified -<br/><code>clock option</code></p>                                                                                                                                                                                       |
| <code>[-toggles]</code>       | Toggle count for the pin.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-duration]</code>      | Specify duration for given toggles. Suboption only applicable for <code>-toggles</code> . By default, stim duration is used.                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>-pin_types</code>       | Specify the types of pins to report. By default, all types of pins are reported.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-clock]</code>         | <p>Default frequency related to a specific clock.</p> <p>Valid values are:</p> <ul style="list-style-type: none"><li>■ <code>related</code> (default) - Frequency will be a fraction of related clock</li><li>■ <code>local</code> - Supported only for <code>icgc_out</code></li><li>■ <code>clock</code> - Frequency will be a fraction of the clock specified with this option</li></ul>                                                                                                                         |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - set\_pin\_activity

---

|                                 |                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-global]</code>          | Set activity for all pins.                                                                                                                            |
| <code>[-force_propagate]</code> | Removes the asserted activity in the fanout cone of given pin.                                                                                        |
| <code>[-stims]</code>           | Stim ID. By default, all stim IDs are considered.                                                                                                     |
| <code>[-frames]</code>          | Frame ID. This option is applicable if you have specified the <code>-pin</code> option. By default, all frames of the specified stims are considered. |
| <code>[-silent]</code>          | Specify this option to disable printing warning messages.                                                                                             |

### Example(s)

- `set_pin_activity /cpu_10bit/clk -duty 0.4 -freq 200e6 -stim /stim#1`
- `set_pin_activity /cpu_10bit/rst -duty 0.02 -toggles 2 -frames /stim#1/frame#7 /stim#2/frame#12`
- `set_pin_activity -activity_type default -pin_types primary_input -duty 0.3 -freq 2e7 -stims /stim#1`
- `set_pin_activity -activity_type system -pin_types flop_out -duty 0.5 -freq 2e6`
- `set_pin_activity -activity_type system -pin_types flop_out -duty 0.5 -freq 0.3 -clock related`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## reset\_pin\_activity

Resets all activity and power information for design pins.

### Syntax

```
reset_pin_activity [-pin] <pin-path>  
    -activity_type user|default|system  
    [-pin_types {primary_input|seq_out|flop_out|latch_out|memory_out|icgc_out|  
                icgc_enable|bbox_out|comb_out|clk_comb_out|all}+]  
    [-all]  
    [-global]  
    [-stims <stim_id>+]  
    [-frames <frame_id>+]
```



## Options and Arguments

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>           | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-pin]</code>         | Reset the activity for the pin in the specified path.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>-activity_type</code> | Specifying one of the following: <ul style="list-style-type: none"><li>■ <code>user</code> (default) - reports information about user activity (prob, toggle) reset on pin on the specified stims and frames.</li><li>■ <code>system</code> - reports information about system activity (prob, toggle) reset on pin on the specified stims and frames.</li><li>■ <code>default</code> - reports information about user/system default activity (prob, toggle) reset on pin types of the specified stims.</li></ul> |
| <code>[-pin_types]</code>   | Specify the types of pins to set activity. By default, all types of pins are considered.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-all]</code>         | Specify whether to reset user pin activity of all pins. This option is applicable for <code>-activity_type user</code> . Default is false.                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-global]</code>      | Specify whether to reset global activities of all pins. This option is applicable for <code>-activity_type default system</code> .<br><br>This option is mutually exclusive with <code>-pin_types</code> .                                                                                                                                                                                                                                                                                                         |
| <code>[-stims]</code>       | Specify the stims to report. By default, SDB stims are reported.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-frames]</code>      | Specify the frames to report. This option is applicable only for <code>-pin</code> option.<br><br>By default, all frames of specified stims(s) are reported.                                                                                                                                                                                                                                                                                                                                                       |

## Example(s)

- `reset_pin_activity -activity_type user -pin /cpu_10bit/clock -frames /stim#1/frame#1`
- `reset_pin_activity -activity_type user -all`
- `reset_pin_activity -activity_type default -pin_types primary_input -stims /stim#1`
- `reset_pin_activity -activity_type system -global`

## **Return Value**

0 indicates success, 1 indicates failure in execution.

## **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)

## report\_activity

Reports activity post SDB creation.

### Syntax

```
report_activity
[-stims {stim_id}+]
[-frames {frame_id/frame_range}+]
[-inst {inst-path}+]
[-module {module-name}+]
  [-levels levels|all]
[-collate frames|hier|domain|all|none]
[-clock_domain {prim-clock-net}+]
[-power_domain {domain-name}+]
[-by_macro]
[-by_category] (default)
  [-cols {cells|area|duty|freq|toggles|tgfreq|
          tgtoggles|igfreq|igtoggles|pins}+]
  [-category {memory|register|latch|icgc|logic|bbox|clock|pad|pm|port}+]
  [-sort_by category[:type]]
[-by_hierarchy]
  [-levels num]
  [-min_leaf_cnt min]
  [-cols
    {cells pct_cells flops pct_flops area pct_area pins toggles duty freq
     tgtoggles tgfreq igtoggles igfreq hier module level}+]
  [-sort_by duty|freq|toggles|tgfreq|tgtoggles|igfreq|igtoggles|pins|none]
  [-increasing]
  [-indent_inst]
[-by_path]
  [-from pin+]
  [-thru pin+]
  [-to pin+]
  [-num_paths integer]
  [-min_level integer]
  [-max_level integer]
[-no_glitch TG|IG|Both]
[-skip_port_switching_activity]
[-format format]
[-header]
[>|-out output-file-name] [-append]
```

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_activity

---

#### Options and Arguments

|                              |                                                                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                      |
| <code>[-stims]</code>        | List of stim IDs for which average activity will be computed. If not specified, activity of all stims is reported.                                                                  |
| <code>[-frames]</code>       | List of frames for which average activity will be computed. If not specified, activity of all frames is reported.                                                                   |
| <code>[-inst]</code>         | List of hierarchical or leaf instances for activity report.                                                                                                                         |
| <code>[-module]</code>       | Alternately, you can specify the RTL module name. If specified, all instances of the specified module are selected for reporting.                                                   |
| <code>[-levels]</code>       | Suboption of <code>-module</code> . If specified, activity is reported for all hierarchical instances found upto the specified level (level for specified root = 0).                |
| <code>[-collate]</code>      | Collate activity reports across frames, or hierarchical instances, or clock/power domains, or all of these. By default, the report is collated across frames.                       |
| <code>[-clock_domain]</code> | Report activity for the specified clock domain.                                                                                                                                     |
| <code>[-power_domain]</code> | Reports activity for the specified power domain.                                                                                                                                    |
| <code>[-by_macro]</code>     | Report the activity by running macro. Use this option to report Data (input pins), Clock, and Enable activities in output.                                                          |
| <code>[-by_category]</code>  | Report a line each for the list of specified design element categories. This is selected by default.<br><br>By default, activity is reported by category.                           |
| <code>[-cols]</code>         | Suboption of <code>-by_category</code> . Columns to report. Default columns are:<br><br><code>duty freq pins</code>                                                                 |
| <code>[-category]</code>     | Suboption of <code>-by_category</code> . Report activity by the selected category.<br><br>Default categories are:<br><br><code>memory register latch logic bbox clock pad pm</code> |
| <code>[-sort_by]</code>      | Suboption of <code>-by_category</code> . Sort the output based on the selected parameter. Default sorting is <code>all:toggles</code> .                                             |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_activity

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|                                              |                                                                                                                                             |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-by_hierarchy]</code>                 | Report activity by hierarchy.                                                                                                               |
| <code>[-levels]</code>                       | Suboption of <code>-by_hierarchy</code> . Number of levels to report. Default is 2.                                                         |
| <code>[-min_leaf_cnt]</code>                 | Suboption of <code>-by_hierarchy</code> . Skip hierarchies with leaf cells less than the specified value.                                   |
| <code>[-cols]</code>                         | Suboption of <code>-by_hierarchy</code> . Columns to report. Default columns are<br><br>cells area pct_area flops pins duty freq level hier |
| <code>[-sort_by]</code>                      | Suboption of <code>-by_hierarchy</code> . Sort the report based on the specified parameter. Default sorting is done by toggles.             |
| <code>[-increasing]</code>                   | Suboption of <code>-sort_by</code> . Sort by increasing order. The default order is decreasing,                                             |
| <code>[-indent_inst]</code>                  | Suboption of <code>-by_hierarchy</code> . Indentation to report for the instance. By default, full inst path is reported.                   |
| <code>[-by_path]</code>                      | Report activity based on instance path.                                                                                                     |
| <code>[-from]</code>                         | Mandatory suboption for <code>-by_path</code> . List of start pins for the paths.                                                           |
| <code>[-thru]</code>                         | Suboption for <code>-by_path</code> . List of thru pins for the paths.                                                                      |
| <code>[-to]</code>                           | Suboption for <code>-by_path</code> . List of end pins for the paths.                                                                       |
| <code>[-num_paths]</code>                    | Suboption for <code>-by_path</code> . Limit the number of paths. Default is 1.                                                              |
| <code>[-min_level]</code>                    | Suboption for <code>-by_path</code> . Show segment between logic levels min:max. Default is 0.                                              |
| <code>[-max_level]</code>                    | Suboption for <code>-by_path</code> . Show segment between logic levels min:max. max_level=0 will display only owning instance of pin.      |
| <code>[-no_glitch]</code>                    | Do not consider given glitch power separately.                                                                                              |
| <code>[-skip_port_switching_activity]</code> | Skips the distribution of ports' switching activity.                                                                                        |
| <code>[-format]</code>                       | Specify the format of the report data. The default format is <code>%.5e</code> .                                                            |
| <code>[-header]</code>                       | Generate report header. Default is false.                                                                                                   |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_activity

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|           |                                                                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| [> -out]  | Save the power report in the specified file. If <code>-append</code> is specified, append to the file instead of overwriting it (which is default). |
| [-append] | Append to the file instead of overwriting it (which is default).                                                                                    |

#### Example(s)

- `report_activity ;# report power for top-level design(s)`
- `report_activity -frames /stim#1/frame#1 {/stim#1/frame#[5:8]}`
- `report_activity -module cpu_10bit__fsm`
- `report_activity -inst /cpu_10bit/DP -levels 1`
- `report_activity -by_path -from /cpu_10bit/DP/ACC_reg/qout_reg[8]/Q`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Activity Processing and Reporting](#)

## report\_user\_activity

Reports the user activity set by `set_pin_activity` or `set_default_activity` in a tabular format.

### Syntax

```
report_user_activity
  -activity_type user|default|system
  [-pins pin+]
```

[-pin\_types {primary\_input|seq\_out|flop\_out|latch\_out|memory\_out|icgc\_out|  
icgc\_enable|bbox\_out|comb\_out|clk\_comb\_out|all}+]

```
  [-global]
  [-stims stim_id+]
```

[-frames *frame\_id*+]

```
  [-out out_file]
```

## Options and Arguments

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>           | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>-activity_type</code> | <p>Specify one of the following:</p> <ul style="list-style-type: none"><li>■ <code>user</code> - reports information about user activity (prob, toggle) set on pin on the specified stims and frames.</li><li>■ <code>system</code> - reports information about system activity (prob, toggle) set on pin on the specified stims and frames.</li><li>■ <code>default</code> - reports information about user/system default activity (prob, toggle) set on pin types of the specified stims.</li></ul> |
| <code>[-pins]</code>        | <p>Report the specified pins.</p> <p>By default, all pins are reported.</p>                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-pin_types]</code>   | <p>Specify the types of pins to report.</p> <p>By default, all types of pins are reported.</p>                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-global]</code>      | Report only global activities set by <code>set_pin_activity/</code><br><code>set_default_activity</code> .                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-stims]</code>       | <p>Specify the stims to report.</p> <p>By default, all stim IDs are reported.</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-frames]</code>      | <p>Specify the frames to report. This option is applicable only for <code>-activity_type user</code>.</p> <p>By default, all frames of specified stim(s) are reported.</p>                                                                                                                                                                                                                                                                                                                             |
| <code>[-out]</code>         | Save the output in the specified file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## Example(s)

- `report_user_activity -activity_type user -frames /stim#1/frame#1`
- `report_user_activity -activity_type user -pins clk rst`
- `report_user_activity -activity_type default -stims /stim#1`
- `report_user_activity -activity_type system -pin_types primary_input flop_out -global -stims /stim#1 -out system.rpt`



## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - report\_user\_activity

---

### **Return Value**

0 indicates success, 1 indicates failure in execution.

### **Related Topics**

- [Activity Processing and Reporting](#)

## get\_pin\_activity

Returns the activity information, by default, frequency and activity type are returned for the specified pin.

**Note:** After `read_stimulus`, only the annotated pins can be queried using this command; for all other non-annotated pins, the command returns -1. After `propagate_activity`/`compute_power`, activities of all pins can be queried.

The activity information is shown in the following format by default:

```
<duty>:<freq>:<act_type>
```

Following is a sample output of this command:

```
get_pin_activity -pin clk
0.50000:4.50000e+07:Act_Asserted
```

`act_type` in the above output represents the type/source of activity, and can be one of the following:

- **Act\_Asserted:** Specifies that the activity assertion is done directly from stimulus.
- **Act\_PropAsserted:** Specifies that the activity is inferred using backward propagation.
- **Act\_UserAsserted:** Specifies that the activity assertion is due to the `set_pin_activity` command.
- **Act\_Constant:** Specifies that the activity is constant after computation (not from stimulus).
- **Act\_ClkFromSDC:** Specifies that the activity is inferred from SDC (only applicable to clocks).
- **Act\_Computed:** Specifies that the activity is computed using the activity propagation, and not directly from stimulus.
- **Act\_Default:** Indicates the default switching activity.

## Syntax

```
get_pin_activity [-pin] <pin-path> \  
  [-props  
    {duty|freq|toggles|toggle_rate|tglitch_toggles|tglitch_toggle_rate|  
    iglitch_toggles|iglitch_toggle_rate|type}+]  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]
```

## Options and Arguments

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>      | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-pin]</code>    | Path of the design pin for which to return the activity value. You can specify only a single pin for this option.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-props]</code>  | <p>Return colon (:) separated list of property values. Valid values are:</p> <ul style="list-style-type: none"><li>■ <code>duty</code>: returns average over all frames</li><li>■ <code>freq</code>: returns average over all frames</li><li>■ <code>toggles</code>: returns sum over all frames</li><li>■ <code>toggle_rate</code>: returns average over all frames</li><li>■ <code>glitch_toggles</code>: returns sum over all frames</li><li>■ <code>glitch_toggle_rate</code>: returns average over all frames</li><li>■ <code>type</code>: returns activity type in the first frame</li></ul> <p>Possible values for activity type are:<br/><code>Act_Default</code>   <code>Act_Computed</code>   <code>Act_ClkFromSDC</code>  <br/><code>Act_Constant</code>   <code>Act_Asserted</code>   <code>Act_UserAsserted</code>.</p> <p>By default, <code>duty</code>, <code>freq</code>, and <code>type</code> values are returned.</p> |
| <code>[-stims]</code>  | Stim ID for the pin. By default, all stim IDs are considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-frames]</code> | Frame ID for the pin. By default, frame#0 of all specified stims are considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Example(s)

- `get_pin_activity /cpu_10bit/clk ; #returns 0.498:4.976e+08:Act_Asserted`
- `get_pin_activity /cpu_10bit/DP/ACC_reg/qout_reg[0]/Q -prop toggle_count -stim /stim#1 # Returns: 4`

## Return Value

-1 indicates failure in execution.

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - get\_pin\_activity

---

### **Related Topics**

- [Activity Processing and Reporting](#)

## get\_net\_activity

Returns the source of activity for the specified net.

### Syntax

```
get_net_activity [-net] <net> \  
  [-props {duty|freq|toggles|toggle_rate|type}+]  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]
```

### Options and Arguments

|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]      | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| [-net]    | Specify the net for which to return the activity value. You can specify only a single pin for this option.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| [-props]  | <p>Return colon (:) separated list of property values. Valid values are:</p> <ul style="list-style-type: none"><li>■ duty: returns average over all frames</li><li>■ freq: returns average over all frames</li><li>■ toggles: returns sum over all frames</li><li>■ toggle_rate: returns average over all frames</li><li>■ type: returns activity type in the first frame</li></ul> <p>Possible values for activity type are:<br/>Act_Default   Act_Computed   Act_ClkFromSDC  <br/>Act_Constant   Act_Asserted   Act_UserAsserted.</p> <p>By default, duty, freq, and type values are returned.</p> |
| [-stims]  | Stim ID for the pin(s). By default, all SDB stims are considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| [-frames] | Frame ID for the pin(s). By default, frame#0 of all specified stims are considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

### Example(s)

- `get_net_activity /cpu_10bit/clk ; #returns 0.498:4.976e+08:Act_Asserted`
- `get_net_activity /cpu_10bit/pc_load_en -prop toggle_count -stim /stim#1`

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - get\_net\_activity

---

### **Return Value**

-1 indicates failure in execution.

### **Related Topics**

- [Activity Processing and Reporting](#)

## get\_sdb\_stims

Returns information about stimuli read into Joules SDB.

### Syntax

```
get_sdb_stims \  
  [-range <val>:<val2>]  
  [-list <num>+]  
  [-name <pattern>]  
  [-count]
```

### Options and Arguments

|          |                                                            |
|----------|------------------------------------------------------------|
| [-h]     | Displays help for all options.                             |
| [-range] | Return the stimuli within the specified range.             |
| [-list]  | Return the list of stimuli matching the specified numbers. |
| [-name]  | Return the names of the stimuli in SDB.                    |
| [-count] | Return the number of stimuli present in SDB.               |

### Example(s)

- `get_sdb_stims ;# returns list of all stimuli`
- `get_sdb_stims -range 2:4 ;# returns /stim#2 /stim#3 /stim#4`
- `get_sdb_stims -count ;# returns the total number of stimuli present in the SDB`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## get\_pdb\_stims

Returns information about stimuli read into Joules power DB (PDB).

### Syntax

```
get_pdb_stims \
  [-count]
```

### Options and Arguments

|          |                                              |
|----------|----------------------------------------------|
| [-h]     | Displays help for all options.               |
| [-count] | Return the number of stimuli present in PDB. |

### Example(s)

- `get_pdb_stims ;#` returns list of all stimuli.
- `get_pdb_stims -count ;#` returns the total number of stimuli present in the PDB

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)



## get\_sdb\_frames

Returns information about frames present in Joules SDB.

### Syntax

```
get_sdb_frames \  
  [-stims <stimID>+]  
  [-range <val>[:<val2>]]  
  [-list <num>+]  
  [-name <pattern>]  
  [-count]
```

### Options and Arguments

|          |                                                              |
|----------|--------------------------------------------------------------|
| [-h]     | Displays help for all options.                               |
| [-stims] | Return the stim IDs for the specified frames.                |
| [-range] | Return the frame IDs within the specified range.             |
| [-list]  | Return the list of Frame IDs matching the specified numbers. |
| [-name]  | Return the names of the frames in SDB.                       |
| [-count] | Return the number of frames present in SDB.                  |

### Example(s)

- `get_sdb_frames ;#` returns list of all stimuli.
- `get_sdb_frames -stim /stim#1 /stim#3 ;#` returns `/stim#1/frame#0 /stim#1/frame#1 /stim#3/frame#1`
- `get_sdb_frames -stim /stim#1 -range 4:6 ;#` returns `/stim#1/frame#4 /stim#1/frame#5 /stim#1/frame#6`
- `get_sdb_frames -count ;#` returns the count of frames in the specified stimulus

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## get\_pdb\_frames

Returns information about frames present in Joules power DB (PDB).

### Syntax

```
get_pdb_frames \
  [-stim <stimID>+]
  [-count]
```

### Options and Arguments

|          |                                               |
|----------|-----------------------------------------------|
| [-h]     | Displays help for all options.                |
| [-stim]  | Return the stim IDs for the specified frames. |
| [-count] | Return the number of frames present in PDB.   |

### Example(s)

- `get_pdb_frames ;#` returns list of all frames.
- `get_pdb_frames -stim /stim#1 /stim#3 ;#` returns `/stim#1/frame#0 /stim#1/frame#1 /stim#3/frame#1`
- `get_pdb_frames -count ;#` returns the count of frames in the specified stimulus

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## get\_stim\_info

Returns requested information about the stimuli present in Joules SDB.

### Syntax

```
get_stim_info [-stim] <stim_id> [-id] <stim_alias>
               [-src_file|-file_format|-start_time|-end_time|-duration|-top_instance|
               -frame_count|-signal_count|-tglitch_info|-iglitch_info|-pdb|
               -dump_off_ranges]
```

### Options and Arguments

- |                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                                                                                                                                                | Displays help for all options.                                                                                                                                                                                                                                                                                                                            |
| <code>[-stim]</code>                                                                                                                                             | Stim ID for which information is required.                                                                                                                                                                                                                                                                                                                |
| <code>[-id]</code>                                                                                                                                               | Specify the stim alias.                                                                                                                                                                                                                                                                                                                                   |
| <code>[-src_file -file_format -start_time -end_time -duration -top_instance -frame_count -signal_count -tglitch_info -iglitch_info -pdb -dump_off_ranges]</code> | Type of information required for the specified stimulus. The command can return the following information about stimulus: <ul style="list-style-type: none"><li>■ source file path</li><li>■ format of file</li><li>■ start time, end time, and duration</li><li>■ top instance name</li><li>■ frame and signal count</li><li>■ dump off ranges</li></ul> |

### Example(s)

- `get_stim_info /stim#1 -src_file ;# return source stimulus file path`
- `get_stim_info /stim#2 -top_instance ;# return top_instance name in stimulus`
- `get_stim_info -id /stim#1 ;# return same stimulus name i.e. /stim#1`
- `get_stim_info -id /abc ;# (/abc is alias of /stim#1) return original stimulus name for the alias /abc i.e. /stim#1`

## **Return Value**

-1 indicates failure in execution.

## **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)

## get\_stim\_arc\_info

Reports instances in the design that have state dependent path dependent (SDPD) data from the stimulus file.

The report contains information for all leakage and internal power arcs for the instance, and depending on the arc type specified, the arcs annotation from the stimulus.

**Note:** The stimulus should be read with `-trace_arcs` option.

### Syntax

```
get_stim_arc_info \  
  [-inst <inst_name>]  
  [-stim <stim_id>]  
  [-arcs all|annotated|unannotated]  
  [-num_instances]  
  [-out <output-file-name>]
```

### Options and Arguments

|                               |                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>             | Displays help for all options.                                                                                            |
| <code>[-inst]</code>          | Specify leaf or hierarchical instance. The default instance is <code>top_design</code> .                                  |
| <code>[-stim]</code>          | Specify the stim ID for which information is required. Default value is <code>/stim#1</code> .                            |
| <code>[-arcs]</code>          | Specify the type of arcs to report. Default value is <code>annotated</code> .                                             |
| <code>[-num_instances]</code> | Specify the count of arcs annotated. By default, this option is set to <code>false</code> .                               |
| <code>[-out]</code>           | Save the output in the specified file. By default, the information is stored in <code>joules_work/joules_arc.rpt</code> . |

### Example(s)

- `get_stim_arc_info -num_instances -out arc_count.rpt`
- `get_stim_arc_info -arcs unannotated -stim /stim#2 -out arc_count.rpt`

### Return Value

-1 indicates failure in execution.

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - get\_stim\_arc\_info

---

### **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)

## get\_frame\_info

Returns requested information about a specific frame in the SDB.

### Syntax

```
get_frame_info [-frame] <frame_id> [-id] <frame_alias>
               [-owning_stim|-start_time|-end_time|-duration|pdb]
```

### Options and Arguments

|                                                    |                                                                                                                                                                                                                                      |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]                                               | Displays help for all options.                                                                                                                                                                                                       |
| [-frame]                                           | Frame ID for which information is required.                                                                                                                                                                                          |
| [-id]                                              | Specify the frame alias.                                                                                                                                                                                                             |
| [-owning_stim -start_time -end_time -duration pdb] | Type of information required for the specified frame. The command can return the following information about a frame: <ul style="list-style-type: none"><li>■ owning stim ID</li><li>■ start time, end time, duration, pdb</li></ul> |

### Example(s)

- `get_frame_info /stim#1/frame#1 -owning_stim ;# returns /stim#1`
- `get_frame_info /stim#1/frame#1 -start_time ;# returns start_time for /stim#1/frame#1`
- `get_frame_info /stim#2/frame#2 -end_time ;# returns end_time for /stim#2/frame#2`
- `get_frame_info /stim#2/frame#3 -duration ;# returns duration (in ns) for /stim#2/frame#3`
- `get_frame_info -id /stim#1/frame#0 ;# return same stimulus and frame name i.e. /stim#1/frame#0`
- `get_frame_info -id /abc/f0 ;# (/abc/f0 is alias of /stim#1/frame#0) return original stimulus and frame name for the alias /abc/f0 i.e. /stim#1/frame#0`

### Return Value

-1 indicates failure in execution.

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - get\_frame\_info

---

### **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)



## get\_inst\_activity

Returns pin activity of specified instance in form of:

<data\_pin\_triple> <clk\_pin\_triple> <en\_pin\_triple> <out\_pin\_triple>  
where each <triple> = <pin\_cnt>:<avg\_duty>:<avg\_toggle>

### Syntax

```
get_inst_activity [-inst] <inst>  
  [-direction {in|out}]  
  [-glitch {TG|IG|Both}]  
  [-frames <frame_id>+]  
  [-rtl_type  
    {memory|register|flop|latch|icgc|add|sub|mult|div|decoder|comp|shift|mmux|  
    buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|  
    delay|iso|srpg|ls|els|ps|bbox}+]  
  [-rtl_group seq|macro|alu|dpx|logic|pm]
```

### Options and Arguments

|              |                                                                                                    |
|--------------|----------------------------------------------------------------------------------------------------|
| [-h]         | Displays help for all options.                                                                     |
| [-inst]      | Hierarchical or leaf instance path.                                                                |
| [-direction] | Input or output side activity. Default is out.                                                     |
| [-glitch]    | Specify to report glitch toggles.                                                                  |
| [-frames]    | Specify the list of frames for activity display. By default, average of all frames are considered. |
| [-rtl_type]  | List of RTL types (applies only to hierarchical insts).                                            |
| [-rtl_group] | List of RTL groups (applies only to hierarchical insts).                                           |

### Example(s)

- `get_inst_activity /cpu_10bit/FSM`
- `get_inst_activity /cpu_10bit/DP/ALU/add_55_37`
- `get_inst_activity /cpu_10bit/FSM/pst_reg[3]`

### Return Value

-1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### Stimulus Interface, Vectorless, and Activity Commands - get\_inst\_activity

---

#### **Related Topics**

- [Activity Processing and Reporting](#)

## copy\_activity

Copies activity (toggle/duty) from stims/frames specified using `-from` option and apply them to stims/frames specified with `-to` option.

**Note:** Use the `-apply` option to apply the activity copy in the current session.

### Syntax

```
copy_activity \  
  [-from] <stim_or_frame_id>+  
  [-to <stim_or_frame_id>+]]  
  [-annotation_type  
    {asserted|user_asserted|computed|default|clock_source|constant|unasserted|  
    unconnected|all}+]  
  [-apply]  
# Use the following options to specify leaf insts for selective activity copy  
  [-root <inst>+]  
  [-module <module-name>+]  
    [-levels <levels>|all]  
  [-clock_domain {<prim-clock-net>}+]  
  [-power_domain {<domain_name>}+]  
  [-rtl_type  
    {none|memory|register|flop|latch|icgc|add|sub|mult|div|decoder|comp|  
    shift|mmux|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|  
    fadd|hadd|delay|iso|srpg|ls|els|ps}+]  
  [-rtl_group {seq|macro|alu|dpx|logic|pm}+]  
  [-leaf macro|gate]  
# Use following options to select pins of selected leaf insts  
  [-pin_type  
    {data|address|clock|enable|select|reset|set|scan|tie|rail|vdd|gnd|save|  
    restore}+]  
  [-port_type {clock|data|reset|set|test}+]  
  [-direction in|out|inout]  
  [>|-out <f_activity>]
```

## Options and Arguments

|                                 |                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>               | Displays help for all options.                                                                                                              |
| <code>[-from]</code>            | Copy activity from the specified stim or frame ID(s).                                                                                       |
| <code>[-to]</code>              | Copy activities to the specified stim or frame ID(s).                                                                                       |
| <code>[-annotation_type]</code> | Annotation type for copying activity. Default is all.                                                                                       |
| <code>[-apply]</code>           | Apply the copied activity in current session.                                                                                               |
| <code>[-root]</code>            | Specify the list of root instances for copying activity. Default is design root.                                                            |
| <code>[-module]</code>          | Specify the list of modules for copying activity. Default is design root.                                                                   |
| <code>[-levels]</code>          | Suboption of <code>-module</code> . Specify the levels of the selected module(s).                                                           |
| <code>[-clock_domain]</code>    | Specify the primary clock domain name for copying activity.                                                                                 |
| <code>[-power_domain]</code>    | Specify the power domain name for copying activity.                                                                                         |
| <code>[-rtl_type]</code>        | Specify the RTL type for copying activity. Default is any.                                                                                  |
| <code>[-rtl_group]</code>       | Specify the RTL group for copying activity. Default is any.                                                                                 |
| <code>[-leaf]</code>            | Treat either macro (for example, adder) or gate as leaf object. Default is macro.                                                           |
| <code>[-pin_type]</code>        | Copy activity of the selected hierarchy pins. Default is any.                                                                               |
| <code>[-port_type]</code>       | Copy activity of the selected hierarchy ports. Default is none.                                                                             |
| <code>[-direction]</code>       | Specify direction of the selected pins. This option applies to <code>-pin_type</code>   <code>-port_type</code> . Default is any direction. |
| <code>[-out]</code>             | Save <code>set_pin_activity</code> commands in the specified file. By default, it is saved in <code>joules_work/copy_activity.tcl</code> .  |

## Example(s)

- `copy_activity -from /stim#1/frame#5 -to /stim#2/frame#14`
- `copy_activity -from /stim#2 -to /stim#2 -rtl_type icgc -pin_type enable ;# copy ICGC/enable activity`

## **Return Value**

-1 indicates failure in execution.

## **Related Topics**

- [Activity Processing and Reporting](#)

## Joules Command and Attribute Reference

Stimulus Interface, Vectorless, and Activity Commands - write\_power\_critical\_signals

---

### write\_power\_critical\_signals

Generates power critical signals for the specified design elements.

#### Syntax

```
write_power_critical_signals \  
  [-root <root_inst>]  
  [-tb_dut_inst <dut_inst_path_in_tb>]  
  [-nodes {<obj_type>[:<port_type>]}+]  
    obj_type = port|memory|flop|icgc|latch|seq|bbox|mux|xor|adder|alu|all  
    pin_type = input|output|data|clock|enable|reset|all  
  [-target_tool pxp|ies|fsdb]  
  [>|-out <output-file-name>]
```

#### Options and Arguments

|                                      |                                                                                                                                                                                                                                                                         |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]                                 | Displays help for all options.                                                                                                                                                                                                                                          |
| [-root]                              | Specify the root hierarchy containing the pins. By default, the design root is considered.                                                                                                                                                                              |
| [-tb_dut_inst]                       | Testbench DUT instance path for the signals.                                                                                                                                                                                                                            |
| [-nodes {<obj_type>[:<port_type>]}+] | <p>Specify the node (in form of <i>object type(s):pin type</i>) for which to generate the power signals. Valid object types and pin types are mentioned in the syntax above.</p> <p>If not specified, all primary input and output ports of seq nodes are reported.</p> |
| [-target_tool]                       | The target tool that will use the generated power signals file. Default is pxp.                                                                                                                                                                                         |
| [> -out]                             | Direct the output to the specified file. By default, the output goes to the file <i>joules_work/&lt;root&gt;.power_critical_signals</i> .                                                                                                                               |

#### Example(s)

- `write_power_critical_signals ; # dump primary in/out ports and all ports of seq nodes`
- `write_power_critical_signals -tb_dut_inst /cpu_10bit_tb/CPU ; # prefix testbench DUT path to signals`

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - write\_power\_critical\_signals

---

- `write_power_critical_signals -nodes port memory icgc:in flop:out -out cpu_10bit.my_signal_list ; # dump primary in/out ports, in/out ports of memories, in ports of ICGCs, and q/qn ports of flops and save in file cpu_10bit.my_signal_list`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Power Analysis and Reporting](#)

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_sdb\_annotation

---

#### report\_sdb\_annotation

Reports the annotation information of pins in the design.

Following is the sample output of this command after reading the stimulus using read\_stimulus:

```
Stim Id           : /stim#1
Stim file          : activity.shm
Stim file format   : shm
Top instance       : /testbench/top
Design Top         : /top
Num frames         : 1
Duration           : 100ns
----- Annotation Report -----
Object Type        Asserted  UnAsserted  Unconnected  Total  Asserted%
                   + Constant
-----
Primary Ports
  Inputs           6         0         0         6      100.00%
  Outputs          4         0         0         4      100.00%
  I/O              0         0         0         0         N/A
Sequential Outputs
  Memory           0         0         0         0         N/A
  Flop             6         0         0         6      100.00%
  Latch            0         0         0         0         N/A
  Arch ICGC        0         0         0         0         N/A
  Inferred ICGC    1         0         0         1      100.00%
  Total ICGC       1         0         0         1      100.00%
Drivers
  Driver nets      13         0         0        13      100.00%
  RTL Driver nets  7         0         0         7      100.00%
DFT
  Input Ports      0         0         0         0         N/A
  Flop Outputs     0         0         0         0         N/A
  Memory Outputs   0         0         0         0         N/A
-----
```

Following is the sample output of this command after running the propagate\_activity/ compute\_power command:

```
report_sdb_annotation
Stim Id           : /stim#1
```



## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_sdb\_annotation

```

Stim file           : activity.shm
Stim file format    : shm
Top instance        : /testbench/top
Design Top          : /top
Num frames          : 1
Duration            : 100ns
  
```

| ----- Annotation Report ----- |          |               |         |          |              |                           |       |           |  |
|-------------------------------|----------|---------------|---------|----------|--------------|---------------------------|-------|-----------|--|
| Object Type                   | Asserted | User_Asserted | Default | Computed | Clock_Source | Unconnected<br>+ Constant | Total | Asserted% |  |
| -----                         |          |               |         |          |              |                           |       |           |  |
| Primary Ports                 |          |               |         |          |              |                           |       |           |  |
| Inputs                        | 6        | 0             | 0       | 0        | 0            | 0                         | 6     | 100.00%   |  |
| Outputs                       | 4        | 0             | 0       | 0        | 0            | 0                         | 4     | 100.00%   |  |
| I/O                           | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| Sequential Outputs            |          |               |         |          |              |                           |       |           |  |
| Memory                        | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| Flop                          | 6        | 0             | 0       | 0        | 0            | 0                         | 6     | 100.00%   |  |
| Latch                         | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| Arch ICGC                     | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| Inferred ICGC                 | 1        | 0             | 0       | 0        | 0            | 0                         | 1     | 100.00%   |  |
| Total ICGC                    | 1        | 0             | 0       | 0        | 0            | 0                         | 1     | 100.00%   |  |
| Drivers                       |          |               |         |          |              |                           |       |           |  |
| Driver nets                   | 13       | 0             | 0       | 0        | 0            | 0                         | 13    | 100.00%   |  |
| RTL Driver nets               | 7        | 0             | 0       | 0        | 0            | 0                         | 7     | 100.00%   |  |
| DFT                           |          |               |         |          |              |                           |       |           |  |
| Input Ports                   | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| Flop Outputs                  | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| Memory Outputs                | 0        | 0             | 0       | 0        | 0            | 0                         | 0     | N/A       |  |
| -----                         |          |               |         |          |              |                           |       |           |  |

Following are the types of activities that can be seen in the output of the `report_sdb_annotation` command:

- **Asserted:** Number of asserted pins for the given object type. Asserted pins are the ones whose activities are annotated from stimulus.
- **User\_Asserted:** Number of user asserted pins for the specified object type. User asserted pins are the ones whose activities are annotated using the `set_pin_activity` command.
- **Default:** Number of default activity pins for the specified object type. Default activity pins are the ones whose activities are the default values assigned by the software
- **Computed:** Number of computed activity pins for the specified object type. Computed activity pins are the ones whose activities are computed using activity propagation.
- **Clock\_Source:** Number of clock source pins for the specified object type. Clock source pins are the ones whose activities are inferred from SDC (applicable to clock pin).
- **Unconnected + Constant:** These are the pins which are either unconnected or have constant activity values.
- **Total:** Specifies the total number of pins for an object type.

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_sdb\_annotation

---

- **Asserted%:** Specifies the percentage of the total number of asserted pins for an object type.

#### Syntax

```
report_sdb_annotation
[-inst <design|inst>]
[-stims <stim_id>+] (default: all stims)
[-inputs]
[-show_details <obj_type>[:<annotation_type>[:<pin_prop_type>]]]
  <obj_type>=port|port_dft|seq|comb|reg|reg_dft|mem|mem_dft|icgc|latch|bbox|
            pad|pm|mux|drivers|rtl_drivers|all
  <annotation_type>=asserted|unasserted|unconnected|non_toggle|all|ignored
                    (after read_stimulus and before compute_power)
                    =asserted|user_asserted|computed|default|clock_source|
                    constant|unasserted|unconnected|non_toggle|all|ignored
                    (after compute_power or propagate_activity)
  <pin_prop_type> = in|out|clock|enable|all
[[-show_xz_details <xz_obj_type>[:<xz_value_type>[:<xz_pin_type>]] ]
  <xz_obj_type> = reg|mem|icgc|others|all
  <xz_value_type> = x_type|z_type
  <xz_pin_type> = in|out|scan_in|scan_en|enable|reset|all
[-min_mda_annotation_percentage <expected_MDA_annotation_percentage>]
[-from_sdb]
[-summary]
[-out <file_name>]
```

## Options and Arguments

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                             | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-inst]</code>                          | Report annotations for the specified instance. By default, the top design is considered.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-stims]</code>                         | Report annotations for the specified stimulus IDs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-inputs]</code>                        | Display flop, memory, latch, and icgc inputs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-show_details]</code>                  | <p>Report annotation details for the specified object, annotation type, and pin type set.</p> <p>If not specified, details of all annotation types for all object and pin types is reported.</p>                                                                                                                                                                                                                                                                                                                   |
| <code>[-show_xz_details]</code>               | <p>Report X/Z values of nets and their corresponding driver pins.</p> <p>Specify the option in following format:</p> <p><code>&lt;xz_obj_type&gt;[:&lt;xz_value_type&gt;[:&lt;xz_pin_type&gt;]]</code></p> <p>where:</p> <p><code>&lt;xz_obj_type&gt; = reg   mem   icgc   others   all (default is all)</code></p> <p><code>&lt;xz_value_type&gt; = x_type   z_type (default is x_type)</code></p> <p><code>&lt;xz_pin_type&gt; = in   out   scan_in   scan_en   enable   reset   all (default is all)</code></p> |
| <code>[-min_mda_annotation_percentage]</code> | <p>Specifies the expected MDA annotation percentage.</p> <p>Default: 50.0%</p>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <code>[-from_sdb]</code>                      | Use SDB for reporting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-summary]</code>                       | Prints percentage and count for particular rtl_type and activity_type nets.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-out]</code>                           | Direct the output to the specified file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Example(s)

- `report_sdb_annotation -stims /stim#1`
- `report_sdb_annotation -stims /stim#1 /stim#2 -out annot.rpt`
- `report_sdb_annotation -stims /stim#1 -show_details seq:computed:out`

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_sdb\_annotation

---

- `report_sdb_annotation -stims /stim#1 -show_details reg:asserted:clock`
- `report_sdb_annotation -stims /stim#1 -show_details reg:ignored:out`
- `report_sdb_annotation -stims /stim#1 -show_details icgc:asserted:enable`
- `report_sdb_annotation -stims /stim#1 -show_details icgc:asserted:enable -summary`
- `report_sdb_annotation -stims /stim#1 -show_details port:default:in`
- `report_sdb_annotation -stims /stim#1 -show_details port:default:in -summary`
- `report_sdb_annotation -show_xz_details reg:x_type:scan_in`
- `report_sdb_annotation -show_xz_details mem:z_type:out`
- `report_sdb_annotation -show_xz_details icgc:z_type:out`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Activity Processing and Reporting](#)

## report\_spef\_annotation

Reports parasitic annotation property of nets in specified design hierarchy. These include nets of different categories such as normal, undriven, unloaded, constant and total.

### Syntax

```
report_spef_annotation \  
  [-inst {<root>}+] \  
  [-category {memory|register|latch|logic|bbox|clock|pad|pm}] \  
  [-net_category {normal|unloaded|undriven|const|total|all}+] \  
  [-show_details <annotated|unannotated|all>] (default: all) \  
  [>|-out <f_rpt>] \  
  [-append]
```

### Options and Arguments

|                 |                                                                                             |
|-----------------|---------------------------------------------------------------------------------------------|
| [-h]            | Displays help for all options.                                                              |
| [-nets]         | Report annotations for the specified nets. By default, all nets are considered.             |
| [-inst]         | Report annotations for the specified root instances. By default, design root is considered. |
| [-category]     | Specify the power category to be reported. Default category is none.                        |
| [-net_category] | Specify the category of nets to be reported. Default category is normal.                    |
| [-show_details] | Specify the type of detailed output to report. Default is all.                              |
| [-out]          | Direct the output to the specified file.                                                    |
| [-append]       | Append the output in the file instead of overwriting it.                                    |

### Example(s)

- `report_spef_annotation -out cpu_10bit.all_nets.rpt # report specific type of nets like constant/undriven in /cpu_10bit/DP/ALU`
- `report_spef_annotation /cpu_10bit/DP/ALU -net_category const undriven total`

### Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - report\_spef\_annotation

---

### **Related Topics**

- [Activity Processing and Reporting](#)

## report\_stim\_hierarchy

Reports stimulus hierarchy of the specified stimulus in text format.

### Syntax

```
report_stim_hierarchy \  
  [-file <stimulus-file>]  
  [-format <stimulus-file-format>]  
  [-stim <stim_id>]  
  [-levels <num>]  
  [-flat_hierarchy]  
  [-out <output-file-name>]
```

### Options and Arguments

|                   |                                                                 |
|-------------------|-----------------------------------------------------------------|
| [-h]              | Displays help for all options.                                  |
| [-file]           | Specify the input stimulus file.                                |
| [-format]         | Specify the format of the stimulus file.                        |
| [-stim]           | Specify the stim ID for which to report the stimulus hierarchy. |
| [-levels]         | Specify the number of stimulus hierarchy levels to report.      |
| [-flat_hierarchy] | Print the stimulus hierarchy in flat format.                    |
| [-out]            | Direct the output to the specified file.                        |

### Example(s)

- `report_stim_hierarchy -file activity.vcd -format vcd -out output_file` # Writes the stimulus hierarchy of activity.vcd to output\_file
- `report_stim_hierarchy -file activity.vcd -format vcd` # Writes the stimulus hierarchy of activity.vcd to stdout
- `report_stim_hierarchy -stim /stim#1 -out output_file` # Writes the stimulus hierarchy of /stim#1 to output\_file
- `report_stim_hierarchy -stim /stim#1 -levels 10` # Writes the first 10 levels of stimulus hierarchy of /stim#1 to stdout

### Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - report\_stim\_hierarchy

---

### **Related Topics**

- [Activity Processing and Reporting](#)



## write\_stimulus

Writes a stimulus database in either TCF or SAIF format. The command writes out a compressed file if you add the .gz extension to the file name.

### Syntax

```
write_stimulus \  
  [-format] <tcf|saif|vsdb>  
  [-root <design/instance>]  
  [-frames <frame_ids>+]  
  [-weight <factor>]  
  [-rfw_triple {<root> <frame_id>+ <weight>}+}]  
  [-hierarchical]  
  [-do_not_write_top_instance]  
  [-prefix_top_instance <top_instance>]  
  [-nodes {<obj_type>[:<annotation_type>[:<pin_prop_type>]]}+]  
    obj_type = port|seq|comb|reg|mem|bbox|icgc|latch|all  
    annotation_type = asserted|computed|all  
    pin_prop_type = in|out|inout|all  
  [-inpins]  
  [-duration <duration in ns>]  
  [>|-out <output-file-name>]  
Additional options for vsdb format:  
  [-input_file <file-name>]  
  [-dut_instance <dut-inst-name>]  
  [-input_format fsdb|vcd|phy|shm|vwdb]  
  [-start <window-start-time>]  
  [-end <window-end-time>]  
  [-resim_cg_enables]
```

## Options and Arguments

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>          | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-format]</code>     | <p>Specify the format of the stimulus file to write.</p> <p>Options used for writing in VSDB format:</p> <ul style="list-style-type: none"><li>■ <code>-input_file</code> (mandatory)</li><li>■ <code>-dut_instance</code></li><li>■ <code>-input_format</code></li><li>■ <code>-start</code></li><li>■ <code>-end</code></li><li>■ <code>-resim_cg_enables</code></li></ul> <p><b>Note:</b> Clocks must be defined for writing in VSDB format.</p>                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-root]</code>       | Specify the root hierarchy. If not specified, the top design is used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-frames]</code>     | Write the toggle count for the pins in the specified frame. If not specified, /stim#1/frame#1 is considered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>[-weight]</code>     | Scale the frequency by the specified weight factor. The default factor is 1.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-rfw_triple]</code> | <p>Specify the { root {frame_ids} weight} triplet.</p> <ul style="list-style-type: none"><li>■ <code>root</code> - can be any hierarchical instance in the design.</li><li>■ <code>frame_id</code> - to be used for pins in the specified root.</li><li>■ <code>weight</code> - scales the frequency by given weight.</li></ul> <p>The default value is:</p> <pre>{/top_design {-1} 1.0}</pre> <p>This option is typically used to specify different stimulus to different blocks in the design. Also multiple frames and weight can be specified for a block.</p> <p><b>Note:</b> If you are working with only a single hierarchy, then instead of using the <code>rfw_triple</code> option, you can directly use the <code>-root</code>, <code>-frames</code> and <code>-weight</code> options.</p> |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - write\_stimulus

---

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-hierarchical]</code>              | Write a hierarchical output file. Default is <code>false</code> , which writes a flat output file.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <code>[-do_not_write_top_instance]</code> | Specify to not write the top instance name in TCF. Default value is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-prefix_top_instance]</code>       | Prefix the top instance to all pins in the output file. The default is design root.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-nodes]</code>                     | <p>Specify in the format of<br/><code>&lt;obj_type&gt;[:&lt;annotation_type&gt;[:&lt;pin_prop_type&gt;]]}+:</code></p> <ul style="list-style-type: none"><li>■ <code>&lt;obj_type&gt;</code> - the object type (for valid values, see syntax above) for which to write probability and toggle count. The default object type is <code>all</code>.</li><li>■ <code>&lt;annotation_type&gt;</code> - whether to add the computed or asserted probability and toggle count of the pins and nets to the TCF file. By default only the asserted values are written out.</li><li>■ <code>&lt;pin_prop_type&gt;</code> - write activity for the specified pin property. The default pin property is <code>out</code>.</li></ul> |
| <code>[-inpins]</code>                    | Write out a pin-based stimulus file. This implies that switching activities on all input pins are written out.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-duration]</code>                  | <p>Write the stimulus file for the specified duration. For example, If you specify <code>-duration 1ms</code>, then stimulus using data frequency for 1ms will be computed and dumped.</p> <p>By default, stimulus files are written for the duration of a single frame.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[&gt; -out]</code>                  | Write stimulus data in the specified file. If not specified, the output is written to <code>joules_work/joules.&lt;format&gt;</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-input_file]</code>                | Specify the input stimulus file name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-dut_instance]</code>              | DUT instance name in testbench. If not specified, it is inferred.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-input_format]</code>              | Input stimulus format. If not specified, it is inferred from file extension.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-start]</code>                     | Analysis start time. Default is simulation start time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-end]</code>                       | Analysis end time. Default is simulation end time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - write\_stimulus

---

`[-resim_cg_enables]`      Simulate unasserted ICGC enables.

#### Example(s)

- `write_stimulus -format vsdb -input_file cpu_10bit_pgm_gcf.fsdb -start 10ns;# infer -dut_instance`
- `write_stimulus -format vsdb -input_file ./trace.phy -dut_instance /CPU -start 10ns -end 40ns`
- `write_stimulus -format tcf ;# saved in joules_work/joules.tcf (default TCF file name)`
- `write_stimulus -format saif ;# saved in joules_work/joules.saif (default SAIF file name)`
- `# write a flat TCF activity for /cpu_10bit from /stim#1/frame#0 and scale frequency by 0.8`  
`write_stimulus -format tcf -root /cpu_10bit -frames /stim#1/frame#0 -weight 0.8`
- `# write a flat SAIF file with asserted sequential input and output pins for duration of 10ns`  
`write_stimulus -format saif -duration 10 -inpins`
- `# write flat TCF with asserted seq input+output pins for duration of 15ns, infer sim top instance from the stimulus`  
`write_stimulus -format saif -duration 20 -inpins -hierarchical`
- `# write a flat TCF file named cpu_10bit.tcf with all seq outputs and comb asserted outputs`  
`write_stimulus -format tcf -nodes comb seq:all -out cpu_10bit.tcf`
- `# write vectorless activity`  
`write_stimulus -format saif -nodes port:all seq:all -frames /stim#0/frame#1 -out cpu_10bit_vectorless.saif`
- `# write activity of /cpu_10bit from /stim#1/frame#0 and scale frequency by 0.8`  
`write_stimulus -format tcf -rfw_triple { {/cpu_10bit /stim#1/frame#0 0.8} }`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## read\_spef

Reads the parasitics in SPEF format and loads the resistance and grounded capacitors from the file. Gzip compressed files (.gz extension) can also be loaded.

### Syntax

```
read_spef [ -detailed_parasitics | -lumped_cap_only ] [-hierarchical]
          [-max_fanout <integer>] [-incremental] [-rc_corner <rc_corner>] <string>
          [-memory_only]
```

### Options and Arguments

|                                     |                                                                                                                                 |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                   | Displays help for all options.                                                                                                  |
| <code>[-detailed_parasitics]</code> | Load all the segmented caps (default).                                                                                          |
| <code>[-lumped_cap_only]</code>     | Load only the lumped caps.                                                                                                      |
| <code>[-hierarchical]</code>        | Read hierarchical SPEF file.                                                                                                    |
| <code>[-max_fanout]</code>          | Skip nets with fanout greater than the specified value (default 1000).                                                          |
| <code>[-incremental]</code>         | Do not reset already annotated net(s).                                                                                          |
| <code>[-rc_corner]</code>           | RC corner object that the SPEF values are associated with.                                                                      |
| <code>&lt;string&gt;</code>         | SPEF file name.                                                                                                                 |
| <code>[-memory_only]</code>         | When specified, the <code>read_spef</code> command annotates all nets connected to memory pins only. All other nets are ignored |

### Example(s)

Use the following flow for reading hierarchical SPEF files:

```
read_spef <top_spef>
read_spef -incremental -hierarchical <module_1_spef>
read_spef -incremental -hierarchical <module_2_spef>
read_spef -incremental -hierarchical <module_3_spef>
```

If there is no top SPEF then first `read_spef` should run without `-incremental` option:

```
read_spef -hierarchical <module_1_spef>
read_spef -incremental -hierarchical <module_2_spef>
read_spef -incremental -hierarchical <module_3_spef>
```

## **Joules Command and Attribute Reference**

### Stimulus Interface, Vectorless, and Activity Commands - read\_spef

---

Read `top_spef` without `-hierarchical` option, and module SPEF files always with `-hierarchical` option. Use `-incremental` option is only if you want the cap values to be additive.

#### **Return Value**

0 indicates success, 1 indicates failure in execution.

#### **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - set\_vectorless\_controls

---

#### set\_vectorless\_controls

Applies vectorless settings to specified list of root instances or power domains. Frequency of ICGC enables, outputs of memory, and register, can be specified per clock, as percentage of related clock frequency. Frequency of primary inputs (pi) related to clock, can be specified as percentage of related clocks.

For primary inputs (pi) not related to clock and latches, frequency can be specified either as an absolute value or as percentage of fastest clock using the `-clock_unrelated` option. Effect of the command is cumulative. In case of conflict, the last command wins.

#### Syntax

```
set_vectorless_controls \  
  [[-root] <root_inst>+]  
  [-power_domain <pd_name>+]  
  [-cg_enable_rate <pct> [<primary_clock>+]]  
  [-memory_rate <pct> [<primary_clock>+]]  
  [-register_rate <pct> [<primary_clock>+]]  
  [-latch_enable_rate <pct_of_fastest_clock>|<freq>]  
  [-pi_rate <pct_of_related_clock_freq>]  
  [-clock_unrelated <pct_of_fastest_clock>|<freq>]
```

## Options and Arguments

|                                   |                                                                                                                                                                            |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                 | Displays help for all options.                                                                                                                                             |
| <code>[-root]</code>              | List of root instances to apply vectorless settings. Default is design root.                                                                                               |
| <code>[-power_domain]</code>      | List of power domains to apply vectorless settings. Default is none.                                                                                                       |
| <code>[-cg_enable_rate]</code>    | Specify the frequency of ICGC enable as percentage of related clock frequency.                                                                                             |
| <code>[-memory_rate]</code>       | Specify the frequency of outputs of memory as percentage of related clock frequency.                                                                                       |
| <code>[-register_rate]</code>     | Specify the frequency of registers as percentage of related clock frequency.                                                                                               |
| <code>[-latch_enable_rate]</code> | Specify the frequency of enable latches as percentage of fastest clock.                                                                                                    |
| <code>[pi_rate]</code>            | Specify the frequency of primary inputs (pi) as percentage of related clock.                                                                                               |
| <code>[-clock_unrelated]</code>   | Suboption of <code>-pi_rate</code> . Specify the frequency of primary inputs (pi) not related to clock and latches as an absolute value or as percentage of fastest clock. |

## Example(s)

- `set_vectorless_controls -root /cpu_10bit/DP -cg_enable_rate 0.2`
- `set_vectorless_controls -root /cpu_10bit/FSM -cg_enable_rate 0.3 # set ICGC enable freq (relative to clock) of 20% for DP, and 30% for FSM`
- `set_vectorless_controls -memory_rate 0.08 -register_rate 0.1 # set data freq (relative to clock) of 10% for registers, and 8% for memories`
- `set_vectorless_controls -pi_rate 0.05 -clock_unrelated 10MHz # for primary inputs (PIs) related to clock, set data freq 5% of clock, for PIs unrelated to clock, set freq of 10MHz`

## Return Value

0 indicates success, 1 indicates failure in execution.



## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - set\_vectorless\_controls

---

### **Related Topics**

- [Simulation, Simulation Read, and SDB Creation](#)

## get\_domain\_activity

Returns the following activity values for the specified power domain:

<avg\_duty> <avg\_freq> <toggles> <pins>

### Syntax

```
get_domain_activity -clock_domain <prim-clock-net>|-power_domain  
    <power_domain_name>  
    [-frame <frame_id>]  
    [-power_mode <power_mode>]  
    [-category memory|register|latch|icgc|logic|bbox|clock|pad|pm|port]
```

### Options and Arguments

|                             |                                                                                                   |
|-----------------------------|---------------------------------------------------------------------------------------------------|
| [-h]                        | Displays help for all options.                                                                    |
| -clock_domain -power_domain | Specify the clock domain or power domain for reporting activity                                   |
| [-frame]                    | Specify frame ID for reporting activity. By default, average of all frames in SDB are considered. |
| [-power_mode]               | Specify power mode for reporting activity. Default mode is dont care.                             |
| [-category]                 | Specify domain category for activity reporting.                                                   |

### Example(s)

- `get_domain_activity -clock_domain /cpu_10bit/clock -power_mode pwr_all_on`
- `get_domain_activity -power_domain PD_fsm -category logic`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## reset\_memory\_params

Resets the parameters of the memory.

### Syntax

```
reset_memory_params \  
  [-lib_cell <vdir path of libcell>]
```

### Options and Arguments

|                          |                                               |
|--------------------------|-----------------------------------------------|
| <code>[-lib_cell]</code> | Resets the memory parameters of this libcell. |
|--------------------------|-----------------------------------------------|

### Examples

■ `reset_memory_params -lib_cell /library/libcell`

### Return Value

■ 0 indicates success, 1 indicates failure in execution.

## set\_memory\_params

Sets the parameters of the memory.

### Syntax

```
set_memory_params  
  [-lib_cell <libcell>]  
  [-rclk <clk_pin_name[:R|F]>]  
  [-renable {renable expression}]  
  [-wclk <clk_pin_name[:R|F]>]  
  [-wenable {wenable expression}]
```

### Options and Arguments

|             |                                      |
|-------------|--------------------------------------|
| [-lib_cell] | Specify the fully qualified libcell. |
| [-rclk]     | Read the clock pin name.             |
| [-renable]  | Read the enabled expression.         |
| [-wclk]     | Write the clock pin name.            |
| [-wenable]  | Write the enabled expression.        |

### Examples

■ `set_memory_params -lib_cell /ld/libcell -rclk clka -renable {a&b}`

## get\_xor\_candidate\_bits

Returns the list of low activity bits for XOR-based clock gate opportunity.

### Syntax

```
get_xor_candidate_bits \  
[-root <hier>]  
[-clock_domain <prim_clock_net>]  
[-power_domain <power_domain_name>]  
[-flop_list <flops>+]  
[-process_gated_flops]  
  [-cg_type arch|synth|both]  
  [-ignore_ungated]  
[-stims <stim_id>+]  
[-frames <frame_id>+]  
[-da_threshold <ratio>]  
[-power_threshold <value>]  
[-min_slack_threshold <slack>]  
[-custom_slacks <slacks>+]  
[-original_name]  
[-print_summary]  
[-help|-h]
```

## Options and Arguments

|                                     |                                                                                                                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-root]</code>                | Specify flops in specified <hier> inst.                                                                                                                               |
| <code>[-clock_domain]</code>        | Specify flops in specified clock domain.                                                                                                                              |
| <code>[-power_domain]</code>        | Specify flops in specified power domain.                                                                                                                              |
| <code>[-flop_list]</code>           | Specify list of flops. Default is all flops.                                                                                                                          |
| <code>[-process_gated_flops]</code> | Process gated flops. Default is false.                                                                                                                                |
| <code>[-cg_type]</code>             | Process flops that are gated by architectural cg/synth cg. Default is both.                                                                                           |
| <code>[-ignore_ungated]</code>      | Process only gated flops and ignore ungated flops. Default is false.                                                                                                  |
| <code>[-stims]</code>               | Specify the stim ID. Default is all SDB stims.                                                                                                                        |
| <code>[-frames]</code>              | Specify frame ID. Default is average of all SDB frames.                                                                                                               |
| <code>[-da_threshold]</code>        | Specify data activity ratio threshold. Default is 0.10 = 10% of flop clock.                                                                                           |
| <code>[-power_threshold]</code>     | Clock power threshold, flops with clock power less than value are ignored. Unit: nW. Default: do not check.                                                           |
| <code>[-min_slack_threshold]</code> | Minimum timing slack on flop d pin to be considered for XOR candidate. The command will filter bits that have less than the specified slack. Unit: ps. Default: skip. |
| <code>[-custom_slacks]</code>       | List of slack pairs {data_input_pin slack} to be used for delay-based filtering. Unit: ps. Default: use slack from design.                                            |
| <code>[-original_name]</code>       | Return original RTL names. Default: false.                                                                                                                            |
| <code>[-print_summary]</code>       | Prints summary. Default: false.                                                                                                                                       |

## Example(s)

- `get_xor_candidate_bits -da_threshold 0.25 -process_gated_flops`
- `set flop_list [get_insts -root /cpu_10bit/DP -rtl_type flop]`
- `get_xor_candidate_bits -flop_list $flop_list -da_threshold 0.25`

## **Joules Command and Attribute Reference**

Stimulus Interface, Vectorless, and Activity Commands - get\_xor\_candidate\_bits

---

### **Return Value**

0 indicates success, 1 indicates failure in execution.

## compare\_stims

Compares the duty, frequency, toggles, transport and inertial glitch toggles of two stimuli.

### Syntax

```
compare_stims \
  [-stims] <stim1> <stim2>
  [-root <hier_inst>]
  [-annotation_type {asserted| prop_asserted| user_asserted| computed|default|
    clock_source| constant| unasserted| unconnected| all}+]
  [-category {pi| po| pio| memory| register| latch| icgc| logic| bbox| clock|
    pad| pm}+]
  [-obj_handle {<key>:<val>+:<pin_dir>:<pin_type>}+]
  <key> = rtl_type|rtl_group
  <val> = value for -rtl_type|-rtl_group
  (-rtl_group: {seq| macro| alu| dpx| logic| pm}+)
  (-rtl_type: {memory| register| flop| latch| icgc| add| sub| mult| div|
    decoder| comp| shift| mmux| buf| inv| and| nand| or| nor| xor| xnor|
    ao| aoil| oa| oai| mux| tri| tie| pad| fadd| hadd| delay| iso| srpg|
    ls| els| ps| bbox}+)
  <pin_dir>= {in| out| inout| any}+
  <pin_type>= {data| clock| scan}+
  [-props {freq| duty| toggles| tglitch_toggles| ighitch_toggles}+]
  [-metrics {avg|min|max|stddev|sum}+]
  [>|-out <f_rpt>]
  [-append]
  [-plot <scatter|histogram>]
  [-format {gnuplot|native|png}]
  [-data {duty| freq| tglitch_toggles| ighitch_toggles}+]
  [-show details]
  [-diff_threshold <pct>]
  [-sort_by {s1_duty| s2_duty| duty_diff| s1_freq| s2_freq| freq_diff|
    s1_type| s2_type| pin_path| s1_tglitch_toggles| s2_tglitch_toggles|
    tglitch_diff| s1_ighitch_toggles| s2_ighitch_toggles| ighitch_diff}]
```



## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - compare\_stims

---

#### Options and Arguments

|                                 |                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stims]</code>           | Specify the stim ID.<br><stim1> and <stim2> specify the stimuli to compare.                                                                                                                                                                                        |
| <code>[-root]</code>            | Specify the list of pins under <hier> inst to compare.                                                                                                                                                                                                             |
| <code>[-annotation_type]</code> | Specify annotation type for list of pins to compare.                                                                                                                                                                                                               |
| <code>[-category]</code>        | Specify category for each property in summary report.                                                                                                                                                                                                              |
| <code>[-obj_handle]</code>      | Specify list of pins selected on the basis of <key>, <val>, <pin_dir>, and <pin_type>.                                                                                                                                                                             |
| <code>[-props]</code>           | Specify properties to compare between the two stimuli. By default, only frequency is compared in the summary report.                                                                                                                                               |
| <code>[-metrics]</code>         | Specify different metrics to be reported in the summary report.                                                                                                                                                                                                    |
| <code>[-out]</code>             | Save the output in the specified file.                                                                                                                                                                                                                             |
| <code>[-append]</code>          | Append to the file instead of overwriting it. Default is overwrite.                                                                                                                                                                                                |
| <code>[-plot]</code>            | Plot the scatter or histogram plot. In the scatter plot, property selected using <code>-data</code> is plotted with /stim#1 on x-axis and /stim#2 on y-axis. In the histogram plot, the error percentage of property selected using <code>-data</code> is plotted. |
| <code>[-format]</code>          | Sub-option of <code>-plot</code> . Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>Native</code> (default format)</li><li>■ <code>PNG</code></li></ul>                         |
| <code>[-data]</code>            | Specify the data to be plotted.                                                                                                                                                                                                                                    |
| <code>[-show_details]</code>    | Show the detailed comparison report between /stim#1 and /stim#2.                                                                                                                                                                                                   |
| <code>[-diff_threshold]</code>  | Show entries where frequency difference is greater than <pct>. Default is <pct>=0.                                                                                                                                                                                 |
| <code>[-sort_by]</code>         | Sorts the data based on given column.                                                                                                                                                                                                                              |

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - compare\_stims

---

#### Example(s)

- `compare_stims /TestHash /TestGCF`
- `compare_stims /TestHash /TestGCF -props freq duty`
- `compare_stims /TestHash /TestGCF -metrics avg min max`
- `compare_stims /TestHash /TestGCF -category memory register clock`
- `compare_stims /TestHash /TestGCF -obj_handle rtl_type:xor,xnor:out:any  
rtl_group:alu:out:any`
- `compare_stims /TestHash /TestGCF -show_details -diff_threshold 0.15`

#### Return Value

0 indicates success, 1 indicates failure in execution.

## report\_pin\_property

Reports the pin properties in a table. The properties to be displayed are from `-show`, `-attributes`, `-pin_property_proc` options.

### Syntax

```
report_pin_property \  
  [-frame <frame_id>]  
  [-show {duty|freq|tc|tr|tg|tc|tgtr|tggtc|tgptc|igtc|igtr|level|act_type|  
    gate_type|tgwidth_min|tgwidth_max|tgwidth_avg|tgwidth_median|igwidth_min|  
    igwidth_max|igwidth_avg|igwidth_median|max_arr_diff|min_rise_arr|  
    min_fall_arr|min_avg_arr|max_rise_arr|max_fall_arr|max_avg_arr|  
    avg_rise_arr|avg_fall_arr|avg_arr|min_rise_slew|min_fall_slew|  
    max_rise_slew|max_fall_slew+}>]  
  [-attributes {<list of attributes on pin>+}]  
  [-pin_property_proc <pin_property_proc>]  
  [-duty_value <min:max>]  
  [-toggle_count <min:max>]  
  [-tglitch_count <min:max>]  
  [-iglitch_count <min:max>]  
  [-levels <min:max>]  
  [-skip_pins <pins>]  
  [-skip_pin_proc <skip_pin_proc>]  
  [-net_based_report]  
  [-insts <inst vdirs>]  
  [-iter <iter id>]  
  [-pins <pin vdirs>]  
  [-act_types {<list of act_types>}]  
  [-input_pins]  
  [-out <output_file>]  
  [-append]  
  [-debug]
```

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_pin\_property

---

#### Options and Arguments

|                                   |                                                                                  |
|-----------------------------------|----------------------------------------------------------------------------------|
| <code>[-frame]</code>             | Specify the frame ID.                                                            |
| <code>[-show]</code>              | Reports pin properties.                                                          |
| <code>[-attributes]</code>        | Reports attributes of the pin.                                                   |
| <code>[-pin_property_proc]</code> | Reports the string returned by <code>pin_property_proc</code> for each pin.      |
| <code>[-duty_value]</code>        | Reports pins with duty $\geq$ min and duty $\leq$ max.                           |
| <code>[-toggle_count]</code>      | Reports pins with toggle count $\geq$ min and toggle count $\leq$ max.           |
| <code>[-tglitch_count]</code>     | Reports pins with transport glitch count $\geq$ min and $\leq$ max.              |
| <code>[-iglitch_count]</code>     | Reports pins with inertial glitch count $\geq$ min and $\leq$ max.               |
| <code>[-levels]</code>            | Reports pins with level $\geq$ min and level $\leq$ max.                         |
| <code>[-skip_pins]</code>         | Skips the specified pins for reporting.                                          |
| <code>[-skip_pin_proc]</code>     | Skips the reporting pin if the proc returns true for a pin.                      |
| <code>[-net_based_report]</code>  | Reports net names instead of pin names. By default, pin names are reported.      |
| <code>[-insts]</code>             | Reports only the pins of instances specified here.                               |
| <code>[-iter]</code>              | Reports only the pins of instances selected using <code>get_insts -iter</code> . |
| <code>[-pins]</code>              | Reports only the given pins.                                                     |
| <code>[-act_types]</code>         | Reports only the given <code>act_types</code> .                                  |
| <code>[-input_pins]</code>        | Reports input pins also.                                                         |
| <code>[-out]</code>               | Writes the report in the output file.                                            |
| <code>[-append]</code>            | Appends the report in the output file.                                           |

#### Example(s)

■ `report_pin_property -frame /stim#2/frame#0 -show {duty freq tc tgtc igtc type level} -tglitch_count 1:3`

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_pin\_property

---

- `report_pin_property -frame /stim#1/frame#0 -show {duty freq tc tgtc igtc} -igltch_count:3`
- `report_pin_property -frame /stim#1/frame#0 -show {duty freq tc} -toggle_count 30`

The following is a sample report:

```
report_pin_property -frame /stim#2/frame#0 -show {duty tc tgtc level act_type  
gate_type} -attribute pin_capacitance -level :3 -tglitch_count 2
```

```
----- Pin Activity Report -----  
-----  
Duty      TC  TG_TC  Level      ActType  GateType  pin_capacitance  
Net  
-----  
-----  
0.006500   1    2      3  Act_Asserted      and      0.605 0.605 /cpu_10bit/  
err  
0.951900   1    6      1  Act_Asserted      xnor      0.910 0.910 /cpu_10bit/  
n_75  
-----  
-----
```

## report\_glitches

Reports all the pins/nets in the design that have transport or inertial glitches.

### Syntax

```
report_glitches \  
  [-stim <stim_id>]  
  [-type <TG|IG>]  
  [-detailed]  
  [-glitch_count <min:max>]  
  [-pin_based_report]  
  [-from_sdb]  
  [-out <output_file>]  
  [-append]  
  [-debug]
```

### Options and Arguments

|                     |                                                                      |
|---------------------|----------------------------------------------------------------------|
| [-stim]             | Specify the stim ID.                                                 |
| [-type]             | Specify the glitch type. Default is TG.                              |
| [-detailed]         | Provides detailed glitch report for each frame.                      |
| [-glitch_count]     | Reports pins or nets which have TG or IG glitches >= min and <= max. |
| [-net_based_report] | Reports nets instead of pins. By default, pins are reported.         |
| [-from_sdb]         | Queries data from SDB instead of ADB.                                |
| [-out]              | Writes the report in the output file.                                |
| [-append]           | Appends the report in the output file.                               |

### Example(s)

- `report_glitches -stim /stim#2 -type TG -glitch_count 1:3 -net_based_report`
- `report_glitches -stim /stim#1 -type IG -glitch_count 3 -from_sdb`
- `report_glitches -stim /stim#2 -type TG -glitch_count:3 -out glitch.rpt`

The following is a sample report:

```
report_glitches -stim /stim#2 -glitch_count 5 -pin_based  
----- Glitch Report -----  
Glitch Pin                                     /frame#0
```

**Joules Command and Attribute Reference**  
Stimulus Interface, Vectorless, and Activity Commands - report\_glitches

---

|                                            |      |
|--------------------------------------------|------|
| -----                                      |      |
| /cpu_10bit/DFT_testpoint_19/Y              | 6.00 |
| /cpu_10bit/DP/ALU/mul_116_37\g1174__4296/Y | 6.00 |
| /cpu_10bit/DP/ALU/mul_116_37\g1171__1857/S | 6.00 |
| /cpu_10bit/DP/ALU/mul_116_37\g1158__8757/Y | 6.00 |
| /cpu_10bit/DP/ALU/mul_116_37\g1150__9682/Y | 6.00 |
| /cpu_10bit/FSM/g1192__7114/Y               | 6.00 |
| /cpu_10bit/FSM/g1191__5703/Y               | 6.00 |
| -----                                      |      |

## get\_glitches

Returns the list of transport or inertial glitches for the given pin within given `-start` and `-end` times.

### Syntax

```
get_glitches \  
  [-pin <pin>]  
  [-stim <stim_id>]  
  [-type <TG|IG>]  
  [-start <start_time>]  
  [-end <end_time>]  
  [-debug]
```

### Options and Arguments

|                       |                                                 |
|-----------------------|-------------------------------------------------|
| <code>[-pin]</code>   | Returns glitches of the specified pin.          |
| <code>[-stim]</code>  | Specify the stim ID. Default: /stim#1.          |
| <code>[-type]</code>  | Specify the glitch type. Default is TG.         |
| <code>[-start]</code> | Returns glitches from <code>start_time</code> . |
| <code>[-end]</code>   | Returns glitches till <code>end_time</code> .   |

### Example(s)

- `get_glitches -pin /top/xor1/Y -stim /stim#2 -type TG -end 2000ns`
- `get_glitches -pin /top/and/Y -stim /stim#1 -type IG -start 1000ps -end 2000ps`
- `get_glitches -pin /top/nand/Y -stim /stim#2 -type TG -start 100ns`

The following is a sample report:

```
get_glitches /dbus_if_fsm/g5386__1617/Y -start 2000ns -end 3000ns  
{21000000000.0 2100469000.0} {23800000000.0 2380469000.0} {24200000000.0  
2420469000.0} {25400000000.0 2540469000.0} {25800000000.0 2580469000.0}  
{26600000000.0 2660469000.0} {28400000000.0 2840469000.0}
```



## plot\_glitches

Plots different properties of transport or inertial glitches of all or the specified design pins.

### Syntax

```
plot_glitches \  
  [-stim <stim_id>]  
  [-pins <pin vdirs>]  
  [-type <TG|IG>]  
  [-property <glitch_width_histogram|glitch_width_scatter|min_glitch_width|  
    max_glitch_width|avg_glitch_width|glitch_median|glitch_count>]  
  [-clock <clock|pin>]  
  [-start <start_time>]  
  [-end <end_time>]  
  [-format {gnuplot|native|png}]  
  [-bin_size {abs|pct}:<val>]  
  [-out <output_file>]  
  [-png <output_png_file>]  
  [-debug]
```

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - plot\_glitches

---

#### Options and Arguments

|                          |                                                                                                                                                    |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stim]</code>     | Specify the stim ID. Default: /stim#1.                                                                                                             |
| <code>[-pins]</code>     | Considers the specified pins for plotting. Default is all design pins.                                                                             |
| <code>[-type]</code>     | Specify the glitch type. Default is TG.                                                                                                            |
| <code>[-property]</code> | Plots the specified property.                                                                                                                      |
| <code>[-clock]</code>    | Plots the number of glitches for each clock cycle.                                                                                                 |
| <code>[-start]</code>    | Plots the glitch property by considering glitches after <code>start_time</code> .                                                                  |
| <code>[-end]</code>      | Plots the glitch property by considering glitches till <code>end_time</code> .                                                                     |
| <code>[-format]</code>   | Specify the plotting format to use.                                                                                                                |
| <code>[-bin_size]</code> | Specify the size of the bin in absolute or percentage value.<br><br><b>Note:</b> This is applicable only for histogram reports and format gnuplot. |
| <code>[-out]</code>      | Writes the plot data in the output file.                                                                                                           |
| <code>[-png]</code>      | Save the generated plot in the specified PNG file.                                                                                                 |

#### Example(s)

- `plot_glitches -stim /stim#2 -type TG -pins /top/xor1/Y /top/xor2/Y -property glitch_width_histogram`
- `plot_glitches -stim /stim#1 -type IG -pins /top/xor1/Y /top/xor2/Y -property min_glitch_width`

## report\_fanin\_property

Reports the fanin cone of the specified pin in depth first traversal or breadth first traversal. It also shows the properties of fanin pin from -show, -attributes, -pin\_property\_proc options.

### Syntax

```
report_fanin_property \  
  [-pin <pin>]  
  [-frame <frame_id>]  
  [-traversal_type <bfs|dfs>]  
  [-levels <level>]  
  [-stop_at_asserted]  
  [-stop_at_zero_tglitch]  
  [-stop_at_sequential]  
  [-stop_at_pins <pins>]  
  [-stop_at_pin_proc <stop_at_pin_proc>]  
  [-ignore_combinational]  
  [-print_net_name]  
  [-detailed]  
  [-show {duty|freq|tc|tr|tgtc|tgtr|tggtc|tgptc|igtc|igtr|level|act_type|  
    gate_type|tgwidth_min|tgwidth_max|tgwidth_avg|tgwidth_median|igwidth_min|  
    igwidth_max|igwidth_avg|igwidth_median|max_arr_diff|min_rise_arr|  
    min_fall_arr|min_avg_arr|max_rise_arr|max_fall_arr|max_avg_arr|  
    avg_rise_arr|avg_fall_arr|avg_arr|min_rise_slew|min_fall_slew|  
    max_rise_slew|max_fall_slew+}>]  
  [-attributes {<list of attributes on pin>+}]  
  [-pin_property_proc <pin_property_proc>]  
  [-out <output_file>]  
  [-debug]
```

## Options and Arguments

|                                      |                                                                                         |
|--------------------------------------|-----------------------------------------------------------------------------------------|
| <code>[-pin]</code>                  | Reports property of the specified pin.                                                  |
| <code>[-frame]</code>                | Specify the frame ID.                                                                   |
| <code>[-traversal_type]</code>       | Specify the type of traversal. Default is dfs.                                          |
| <code>[-levels]</code>               | Displays the specified number of fanin levels.                                          |
| <code>[-stop_at_asserted]</code>     | Stops fanin traversal if the fanin pin is asserted.                                     |
| <code>[-stop_at_zero_tglitch]</code> | Stops fanin traversal if the fanin pin has zero transport glitches.                     |
| <code>[-stop_at_sequential]</code>   | Stops fanin traversal if the fanin pin belongs to a sequential instance.                |
| <code>[-stop_at_pins]</code>         | Stops fanin traversal at the specified set of pins.                                     |
| <code>[-stop_at_pin_proc]</code>     | Stops fanin traversal if the proc returns true for fanin pin.                           |
| <code>[-ignore_combinational]</code> | Does not report combinational pins.                                                     |
| <code>[-print_net_name]</code>       | Prints net name as well.                                                                |
| <code>[-detailed]</code>             | Provides detailed report containing driver and load information during fanin traversal. |
| <code>[-show]</code>                 | Reports the specified properties of the fanin pin.                                      |
| <code>[-attributes]</code>           | Reports the specified attributes of the fanin pin.                                      |
| <code>[-pin_property_proc]</code>    | Reports the string returned by <code>pin_property_proc</code> for fanin pin.            |
| <code>[-out]</code>                  | Writes the fanin pin property report in the output file.                                |

## Example(s)

- `report_fanin_property /top/xor/Y -frame /stim#2/frame#0 -show {duty freq tc tgtc igtc act_type level} -levels 4`
- `report_fanin_property /top/xor/Y -frame /stim#1/frame#0 -show {duty freq tc tgtc igtc} -stop_at_asserted`
- `report_fanin_property /top/xor/Y -frame /stim#1/frame#0 -show {duty freq tc} -attributes {pin_capacitance} -stop_at_sequential`

The following is a sample report:

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_fanin\_property

---

```
report_fanin_property /cpu_10bit/FSM/g1192__7114/Y -frame /stim#1/frame#0 -show
{duty tc tgtc level act_type gate_type} -levels 2
0./cpu_10bit/FSM/g1192__7114/Y (0.3408,21,0,6,Act_Asserted,oai) (!((B0) | (B1)) &
((A0) | (A1)) | (A2)))
1./cpu_10bit/FSM/g1220/Y (0.1916,21,0,3,Act_Asserted,nor) (!((A) | (B)))
2./cpu_10bit/FSM/g1246/Y (0.6779,21,0,1,Act_Asserted,inv) !(A)
2./cpu_10bit/FSM/g1227/Y (0.4525,27,0,2,Act_Asserted,xnor) (!((A) ^ (B)))
1./cpu_10bit/FSM/pst_reg[3]/Q (0.1291,15,0,0,Act_Asserted,flop) N30
2./cpu_10bit/FSM/g1252/Y (0.9361,6,0,1,Act_Asserted,inv) !(A)
2./cpu_10bit/FSM/RC.CG_HIER_INST5/RC.CGIC_INST/ECK
(0.479,96,0,5,Act_Asserted,icgc) ((CK) & (EINT))
2./cpu_10bit/FSM/g1185__7118/Y (0.1232,17,0,11,Act_Asserted,oai) (!((A0) |
(A1)) & (B0)))
2./cpu_10bit/FSM/pst_reg[2]/Q (0.3204,15,0,0,Act_Asserted,flop) N30
2./cpu_10bit/scan_en (0,0,0,0,Act_Asserted,)
1./cpu_10bit/FSM/g1196/Y (0.4809,15,0,5,Act_Asserted,aoi) (!(((A0) & (A1)) &
(A2)) | (B0)))
2./cpu_10bit/FSM/g1262/Y (0.9876,3,0,4,Act_Asserted,oai) (!((A0) | (A1)) &
(B0)))
2./cpu_10bit/FSM/g1206/Y (0.6209,27,0,4,Act_Asserted,nand) (!((A) & (B)))
2./cpu_10bit/FSM/pst_reg[1]/Q (0.3204,21,0,0,Act_Asserted,flop) N30
1./cpu_10bit/FSM/g1241/Y (0.8693,15,0,1,Act_Asserted,inv) !(A)
1./cpu_10bit/FSM/g830/Y (0.9325,9,0,3,Act_Asserted,inv) !(A)
2./cpu_10bit/FSM/g918__9682/Y (0.0667,9,0,2,Act_Asserted,and) ((A) & (B))
```

## report\_fanout\_property

Reports the fanout cone of the specified pin in depth first traversal or breadth first traversal. It also shows the properties of fanout pin from -show, -attributes, -pin\_property\_proc options.

### Syntax

```
report_fanout_property \  
  [-pin <pin>]  
  [-frame <frame_id>]  
  [-traversal_type <bfs|dfs>]  
  [-levels <level>]  
  [-stop_at_asserted]  
  [-stop_at_zero_tglitch]  
  [-stop_at_sequential]  
  [-stop_at_pins <pins>]  
  [-stop_at_pin_proc <stop_at_pin_proc>]  
  [-ignore_combinational]  
  [-print_net_name]  
  [-detailed]  
  [-show {duty|freq|tc|tr|tgtc|tgtr|tggtc|tgptc|igtc|igtr|level|act_type|  
    gate_type|tgwidth_min|tgwidth_max|tgwidth_avg|tgwidth_median|igwidth_min|  
    igwidth_max|igwidth_avg|igwidth_median|max_arr_diff|min_rise_arr|  
    min_fall_arr|min_avg_arr|max_rise_arr|max_fall_arr|max_avg_arr|  
    avg_rise_arr|avg_fall_arr|avg_arr|min_rise_slew|min_fall_slew|  
    max_rise_slew|max_fall_slew+}>]  
  [-attributes {<list of attributes on pin>+}]  
  [-pin_property_proc <pin_property_proc>]  
  [-out <output_file>]  
  [-debug]
```

## Options and Arguments

|                                      |                                                                                          |
|--------------------------------------|------------------------------------------------------------------------------------------|
| <code>[-pin]</code>                  | Reports property of the specified pin.                                                   |
| <code>[-frame]</code>                | Specify the frame ID.                                                                    |
| <code>[-traversal_type]</code>       | Specify the type of traversal. Default is dfs.                                           |
| <code>[-levels]</code>               | Displays the specified number of fanout levels.                                          |
| <code>[-stop_at_asserted]</code>     | Stops fanout traversal if the fanout pin is asserted.                                    |
| <code>[-stop_at_zero_tglitch]</code> | Stops fanout traversal if the fanout pin has zero transport glitches.                    |
| <code>[-stop_at_sequential]</code>   | Stops fanout traversal if the fanout pin belongs to a sequential instance.               |
| <code>[-stop_at_pins]</code>         | Stops fanout traversal at the specified set of pins.                                     |
| <code>[-stop_at_pin_proc]</code>     | Stops fanout traversal if the proc returns true for fanout traversal pin.                |
| <code>[-ignore_combinational]</code> | Does not report combinational pins.                                                      |
| <code>[-print_net_name]</code>       | Prints net name as well.                                                                 |
| <code>[-detailed]</code>             | Provides detailed report containing driver and load information during fanout traversal. |
| <code>[-show]</code>                 | Reports the specified properties of the fanout pin.                                      |
| <code>[-attributes]</code>           | Reports the specified attributes of the fanout pin.                                      |
| <code>[-pin_property_proc]</code>    | Reports the string returned by <code>pin_property_proc</code> for fanout pin.            |
| <code>[-out]</code>                  | Writes the fanout pin property report in the output file.                                |

## Example(s)

- `report_fanout_property /top/xor/Y -frame /stim#2/frame#0 -show {duty freq tc tgtc igtc act_type level} -levels 4`
- `report_fanout_property /top/xor/Y -frame /stim#1/frame#0 -show {duty freq tc tgtc igtc} -stop_at_asserted`
- `report_fanout_property /top/xor/Y -frame /stim#1/frame#0 -show {duty freq tc} -attribute {pin_capacitance} -stop_at_sequential`

The following is a sample report:

## Joules Command and Attribute Reference

### Stimulus Interface, Vectorless, and Activity Commands - report\_fanout\_property

---

```
report_fanout_property /cpu_10bit/FSM/g1192__7114/Y -frame /stim#1/frame#0 -show
{duty tc tgtc level act_type gate_type} -levels 2
0./cpu_10bit/FSM/g1192__7114/Y (0.3408,21,0,6,Act_Asserted,oai) (!(((B0) | (B1)) &
((A0) | (A1)) | (A2))))
1./cpu_10bit/FSM/pst_reg[2]/Q (0.3204,15,0,0,Act_Asserted,flop) N30 /cpu_10bit/
FSM/pst_reg[2]/D
2./cpu_10bit/FSM/g1253/Y (0.6782,15,0,1,Act_Asserted,inv) !(A) /cpu_10bit/FSM/
g1253/A
2./cpu_10bit/FSM/g1232/Y (0.3557,24,0,1,Act_Asserted,nor) (!((A) | (B))) /
cpu_10bit/FSM/g1232/B
2./cpu_10bit/FSM/g1227/Y (0.4525,27,0,2,Act_Asserted,xnor) (!((A) ^ (B))) /
cpu_10bit/FSM/g1227/B
2./cpu_10bit/FSM/g1203/Y (0.8623,13,0,4,Act_Asserted,nand) (!((A) & (B))) /
cpu_10bit/FSM/g1203/A
2./cpu_10bit/FSM/g1196/Y (0.4809,15,0,5,Act_Asserted,aoi) (!((((A0) & (A1)) &
(A2)) | (B0))) /cpu_10bit/FSM/g1196/A1
2./cpu_10bit/FSM/g1189__1786/Y (0.708,21,0,6,Act_Asserted,oai) (!((((A0) | (A1))
& ((B0) | (B1))) & (C0))) /cpu_10bit/FSM/g1189__1786/A0
2./cpu_10bit/FSM/pst_reg[3]/Q (0.1291,15,0,0,Act_Asserted,flop) N30 /cpu_10bit/
FSM/pst_reg[3]/SI
2./cpu_10bit/FSM/g928/Y (0.679,15,0,1,Act_Asserted,inv) !(A) /cpu_10bit/FSM/
g928/A
2./cpu_10bit/FSM/g925__7675/Y (0.1253,12,0,2,Act_Asserted,nor) (!((A) | (B))) /
cpu_10bit/FSM/g925__7675/B
2./cpu_10bit/FSM/g920__2683/Y (0.1946,15,0,1,Act_Asserted,and) ((A) & (B)) /
cpu_10bit/FSM/g920__2683/B
2./cpu_10bit/FSM/g913__8780/Y (0.0054,3,0,2,Act_Asserted,and) (((A) & (B)) &
(C)) /cpu_10bit/FSM/g913__8780/A
2./cpu_10bit/FSM/g910__5019/Y (0.1229,15,0,2,Act_Asserted,and) (((A) & (B)) &
(C)) /cpu_10bit/FSM/g910__5019/A
```



## get\_adb\_stims

Returns information about stimuli read into Joules Activity DB (ADB).

### Syntax

```
get_adb_stims  
  [-count]
```

### Options and Arguments

|                       |                                              |
|-----------------------|----------------------------------------------|
| <code>[-h]</code>     | Displays help for all options.               |
| <code>[-count]</code> | Return the number of stimuli present in ADB. |

### Example(s)

- `get_adb_stims ;#` returns list of all stimuli.
- `get_adb_stims -count ;#` returns the total number of stimuli present in the ADB

### Return Value

-1 indicates failure in execution.

## get\_adb\_frames

Returns information about frames present in Joules Activity DB (ADB).

### Syntax

```
get_adb_frames \  
  [-stim <stimID>+]  
  [-count]
```

### Options and Arguments

|          |                                               |
|----------|-----------------------------------------------|
| [-h]     | Displays help for all options.                |
| [-stim]  | Return the stim IDs for the specified frames. |
| [-count] | Return the number of frames present in ADB.   |

### Example(s)

- `get_adb_frames ;#` returns list of all frames.
- `get_adb_frames -stim /stim#1 /stim#3 ;#` returns `/stim#1/frame#0 /stim#1/frame#1 /stim#3/frame#1`
- `get_adb_frames -count ;#` returns the count of frames in the specified stimulus

### Return Value

-1 indicates failure in execution.

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## Power Analysis and PPA Reporting Commands

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- [compute\\_power](#)
- [set\\_power\\_scale\\_factor](#)
- [report\\_power](#)
- [report\\_power\\_datapath](#)
- [plot\\_power\\_profile](#)
- [write\\_power\\_profile](#)
- [write\\_activity\\_profile](#)
- [report\\_ppa](#)
- [set\\_inst\\_power](#)
- [report\\_power\\_collate](#)
- [report\\_net\\_switching](#)
- [scale\\_ple\\_from\\_spef](#)
- [report\\_power\\_sweep](#)
- [report\\_power\\_regress](#)
- [get\\_power\\_rails](#)
- [compute\\_logic\\_scale\\_factor](#)
- [read\\_batch\\_power\\_report](#)
- [query\\_batch\\_power\\_report](#)
- [read\\_power\\_db](#)
- [write\\_power\\_db](#)

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands -

---

- query batch activity report
- read batch activity report
- merge batch activity reports
- merge batch power reports
- report peak2avg
- report tile power
- report energy
- plot energy
- get category
- report category power

## compute\_power

Performs power analysis.

### Syntax

```
compute_power
[-mode average|time_based|vectorless]
[-post_cts_clock]
[-clock_network slew propagate|mixed|generic]
[-skip_propagation]
[-frequency_scale_factor <factor>]
[-scale_frequency { <factor> <name> }+]
    (<factor> = scale factor)
    (<name> = clock pin/net or hierarchy or power domain)
[-scale_to_sdc frequency]
[-no_glitch <TG|IG|Both>]
[-stim_annotation {<obj_type>[:<pin_type>]}+]
    (<obj_type> = port|seq|comb|reg|mem|icgc|latch|bbox|state|all|
               none|preserve)
    (<pin_type> = in|out|both)
[-scale_to_sdc frequency]
[-auto_tune {clock|memory|logic}+]
    [-levels <hier_depth>]
    [-range <min> <max>]
[-stim <stim_id>]
[-append]
[-by_rail]
[-master_slave_config <config-file>]
[-batch]
    [-levels <hier_depth>]
    [-category_power_report]
    [-profile_group_report]
    [-write_batch_report ]
    [-include_current]
[-help|-h]
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - compute\_power

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#### Options and Arguments

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                      | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-mode]</code>                   | Specify whether to run <code>compute_power</code> in average, time-based, or vectorless mode. When run in average mode (default), power is computed for each stimulus by averaging all.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-post_cts_clock]</code>         | <p>Mark clock tree as non-ideal and propagate slew in clock tree for accurate power analysis. This option is recommended for designs with CTS.</p> <p>If a design has Joules clock tree then it is applied automatically by <code>compute_power</code>.</p> <p><b>Note:</b> The slew propagation does not happen on actual DB (present in /designs), so there is no timing impact on DB/design loaded. The changes are applied on pseudo clock tree created by Joules under /ctgs.</p>                                                                                                                                                     |
| <code>[-clock_network_slew]</code>     | Specify the clock network slew as propagate, mixed, or generic.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-skip_propagation]</code>       | By default, the <code>compute_power</code> command runs activity propagation. If activity propagation has already been run, it can be skipped using this option.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-frequency_scale_factor]</code> | Specify the global frequency scaling factor. The default factor is 1.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-scale_frequency]</code>        | <p>Scale frequency of all ASSERTED signals in the specified <i>&lt;name&gt;</i> by <i>&lt;factor&gt;</i>. For example:</p> <ul style="list-style-type: none"><li>■ If <i>&lt;name&gt;</i> is clock pin/net, frequency of all ASSERTED signals in the domain of the specified clock is scaled by <i>&lt;factor&gt;</i>.</li><li>■ If <i>&lt;name&gt;</i> is a hierarchy, frequency of all ASSERTED signals in the specified hierarchy is scaled by <i>&lt;factor&gt;</i>.</li><li>■ If <i>&lt;name&gt;</i> is a power domain, frequency of all ASSERTED signals in the specified power domain is scaled by <i>&lt;factor&gt;</i>.</li></ul> |
| <code>[-scale_to_sdc_frequency]</code> | Scale the frequency of asserted signals to SDC frequency.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-no_glitch]</code>              | If specified, does not consider glitch power separately.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - compute\_power

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|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stim_annotation]</code>        | <p>Honor stim annotation of only the specified objects.</p> <p>Specify the option in the following format:</p> <pre>{&lt;obj_type&gt;[:&lt;pin_type&gt;]}+</pre> <p><code>&lt;obj_type&gt;</code> can have any of the following values:</p> <pre>port seq comb reg mem icgc latch bbox state all none preserve</pre> <p>State means all state points. It includes <code>port:in</code>, <code>reg:out</code>, <code>latch:out</code>, <code>icgc:out</code>, <code>mem:both</code>, <code>bbox:both</code>, and <code>preserve:both</code></p> <p><code>&lt;pin_type&gt;</code> can have any of the following values:</p> <pre>in out both</pre> <p>Default value for <code>pin_type</code> is <code>both</code>. For <code>all</code> or <code>none</code> <code>obj_types</code>, <code>pin_type</code> is not honored.</p> |
| <code>[-scale_to_sdc_frequency]</code> | <p>If specified, all clock domain, clock network, and clk pins activity is computed by factor where</p> <pre>factor = sdc_freq/stim_freq</pre> <p>If multiple clocks reach a pin, then the fastest clock is considered.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-auto_tune]</code>              | <p>Tune the specified memory, clock, and/or logic power using area and physical-based heuristics.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-levels]</code>                 | <p>Suboption of <code>-auto_tune</code>. Compute and apply scale factor for each leaf hierarchy till the specified level. The hierarchy level of design root is considered as 0. This sub-option is applicable for <code>-auto_tune logic</code>. The default level is 2.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-range]</code>                  | <p>Suboption of <code>-auto_tune</code>. Reject computed scale factor if it falls outside the specified range. Default range is 0 to 1.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-stim]</code>                   | <p>Stimulus ID for power computation. By default, all stimulus in SDB or vectorless are considered, depending on <code>-mode</code> option.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-append]</code>                 | <p>Append power computation result to PDB.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-by_rail]</code>                | <p>Store computed power in PDB for rail-based reporting.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - compute\_power

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|                                       |                                                                                                                                                                                                                                                                 |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-master_slave_config]</code>   | Compute power for SDBs specified in master-slave configuration file.                                                                                                                                                                                            |
| <code>[-batch]</code>                 | If specified, power results are not stored in PDB.<br><br>Default is false.                                                                                                                                                                                     |
| <code>[-levels]</code>                | Sub-option of <code>-batch</code> . Compute and apply scale factor for each leaf hierarchy till the specified level. The hierarchy level of design root is considered as 0. This sub-option is applicable for <code>-batch</code> mode. The default level is 2. |
| <code>[-category_power_report]</code> | Sub-option of <code>-batch</code> . Report category power in batch file. This sub-option is applicable for <code>-batch</code> mode. By default, reports total power.                                                                                           |
| <code>[-profile_group_report]</code>  | Sub-option of <code>-batch</code> . Report group power in batch file. This sub-option is applicable for <code>-batch</code> mode.                                                                                                                               |
| <code>[-write_batch_report]</code>    | Specify batch report file name. This sub-option is applicable for <code>-batch</code> mode.                                                                                                                                                                     |
| <code>[-include_current]</code>       | Reports current columns in batch file. This sub-option is applicable for <code>-batch</code> mode.                                                                                                                                                              |

### Example(s)

- `compute_power`
- `compute_power -mode average`
- `compute_power -mode time_based`
- `compute_power -mode vectorless ;# run compute_power in vectorless mode`
- `compute_power -frequency_scale_factor 0.6 ;# reduce frequency of signals by 40%`
- `compute_power -frequency_scale_factor 1.5 ;# increase frequency of signals by 50%`
- `read_stimulus cpu_10bit_gates.fsdb -selective_debug { stim_inst {/CPU/ /CPU/RAM_64x10/*} scope frame } ;# read stimulus and selectively debug its logs for instance /CPU, instance /CPU/RAM_64x10 and all its sub-instances, scopes and frames`

### Return Value

0 indicates success, 1 indicates failure in execution.



## **Joules Command and Attribute Reference**

### Power Analysis and PPA Reporting Commands - compute\_power

---

#### **Related Topics**

- [Power Analysis and Reporting](#)

## set\_power\_scale\_factor

Sets scaling factors for power analysis.

### Syntax

```
set_power_scale_factor \  
  [-reset]  
  [-leakage <fac>]  
  [-internal <fac>]  
  [-switching <fac>]  
  [-clock_pin <fac>]  
  [-frames <frames>]  
  [-stims <stims>]  
  [-category {memory|register|latch|logic|bbox|clock|pad|pm}]  
  [-root <insts>+]  
  [-iter <iter>]  
  [-power_domain <power_domain_name>]  
  [-clock_domain <prim_clock_net>]  
  [-sticky]
```

## Options and Arguments

|                              |                                                                                                                                                                                                |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                 |
| <code>[-reset]</code>        | Reset all the previously set scaling options by <code>set_power_scale_factor</code>                                                                                                            |
| <code>[-leakage]</code>      | Set the scaling factor for leakage. The default factor is 1.                                                                                                                                   |
| <code>[-internal]</code>     | Set the scaling factor for internal power. The default factor is 1.                                                                                                                            |
| <code>[-switching]</code>    | Set the scaling factor for power switching. The default factor is 1.                                                                                                                           |
| <code>[-clock_pin]</code>    | Set the scaling factor for clock pins. The default factor is 1.                                                                                                                                |
| <code>[-frames]</code>       | Specify the list of frame for scaling. By default, all frames are considered.                                                                                                                  |
| <code>[-stims]</code>        | Specify the list of stim IDs for scaling. By default, all stims are considered.                                                                                                                |
| <code>[-category]</code>     | Set the scaling factor for the specified category of component.                                                                                                                                |
| <code>[-root]</code>         | Specify the list of instances or root for scaling. By default, the design root is considered.                                                                                                  |
| <code>[-iter]</code>         | Specify the iterator of list of leaf instances.                                                                                                                                                |
| <code>[-power_domain]</code> | Specify the power domain name.                                                                                                                                                                 |
| <code>[-clock_domain]</code> | Specify the clock domain name.                                                                                                                                                                 |
| <code>[-sticky]</code>       | Suboption of <code>-clock_domain</code> . In case of overlapping/ conflicting clock domains elements, use this option to specify which value overrides the other values. The default is false. |

## Example(s)

- `set_power_scale_factor -reset ;# reset scaling`
- `set_power_scale_factor -category logic -leakage 0.75`
- `set_power_scale_factor -category register -internal 1.1 -root /cpu_10bit/DP`

## Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

Power Analysis and PPA Reporting Commands - set\_power\_scale\_factor

---

### **Related Topics**

- [Power Analysis and Reporting](#)

## report\_power

Report power for the specified parameter.

### Syntax

```
report_power \
  [-stims {stim_id}+]
  [-frames {frame_id/frame_range}+]
  [-inst {inst-path}+]
  [-module {module-name}+]
  [-levels levels|all]
  [-no_glitch <TG|IG|Both>]
  [-clock_domain {prim-clock-net}+]
  [-power_domain {domain-name}+]
  [-collate frames|hier|domain|all|none]
  [-power_mode {power_mode}+]
  [-power_rail {power_rail}+]
  [-rail_type <power_format|logical|both>]
  [-assign2clk {memory|register|latch|pad}+]
  [-by_category]
    [-cols {cells|area|leakage|internal|switching|clkpin|static|dynamic|
            total}+]
    [-category {memory|register|latch|logic|bbox|clock|clock_comb|clock_seq|
               pad|pm}+]
    [-sort_by category[:type]]
    [-reassign power from_cat to_cat[iter]]
      [-root hier_inst]
      [-module {module-name}+]
      [-levels levels|all]
      [-power_domain power_domain]
      [-clock_domain clock_domain]
      [-power_rail {power_rail}]
      [-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|
                 sub|mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|
                 nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|
                 iso|srpg|ls|els|ps}+]
      [-rtl_group {seq|macro|alu|dpx|logic|pm}+]
      [-name glob]
      [-cell glob]
      [-lib glob]
      [-nocase]
      [-invert]
  [-by_hierarchy]
    [-levels num]
    [-min leaf cnt min]
    [-cols {cells|pct_cells|flops|pct_flops|area|pct_area|dynamic|pct_leakage|
            pct_internal|pct_switching|pct_dynamic|pct_power|module|hier|
            level|leakage|internal|switching|clkpin|static|dynamic|total}+]
    [-sort_by leakage|internal|switching|static|dynamic|total|none]
    [-indent inst]
  [-by_leaf_instance]
    [-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|sub|
               mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|nor|xor|
               xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|
               ls|els|ps}+]
    [-rtl_group {seq|macro|alu|dpx|logic|pm}+]
    [-leaf macro|gate]
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

---

```
[-cell glob]
[-lib glob]
[-name glob]
  [-nocase]
  [-invert]
[-cols {cell|lib|domain|type|leakage|internal|switching|static|dynamic|
        total}+]
[-sort_by leakage|internal|switching|static|dynamic|total]
  [-increasing]
[-max num]
[-by rail]
  [-cols {leakage|internal|switching|clkpin|static|dynamic|tginternal|
          tgswitching|tgclkpin|tgdynamic|iginternal|igclkpin|igdynamic|
          total}+]
  [-category {memory|register|latch|logic|bbox|clock|pad|pm}+]
  [-exclude_zero_power_rail]
[-by_func_type {bbox|memory|flop|latch|icgc|add|sub|mult|div|decoder|comp|
               shift|mmux|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|
               mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps}+]
  [-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|sub|
             mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|nor|xor|
             xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|
             ls|els|ps}+]
  [-rtl_group {seq|macro|alu|dpx|logic|pm}+]
[-cell glob]
[-lib glob]
[-name glob]
  [-nocase]
  [-invert]
[-cols {instances|leakage|internal|switching|total|type}+]
[-sort_by instances|leakage|internal|switching|total|type]
  [-increasing]
[-by_libcell {libcell}+]
  [-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|sub|
             mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|nor|xor|
             xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|
             ls|els|ps}+]
  [-rtl_group {seq|macro|alu|dpx|logic|pm}+]
[-cell glob]
[-lib glob]
[-name glob]
  [-nocase]
  [-invert]
[-cols {instances|domain|leakage|internal|switching|total|cell|lib}+]
[-sort_by instances|domain|leakage|internal|switching|total|cell|lib]
  [-increasing]
[-by_tiles rowsXcols]
  [-style simple|transient]
  [-cols {leakage|internal|switching|total}+]
[-compat voltus]
[-unit W|mW|uW|nW|pW]
[-format format]
[-header]
[-skip_port_switching_power]
[>|-out output-file-name] [-append] [-csv]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                                                                                                                                           |
| <code>[-stims]</code>        | Report power for specified list of stims. By default, all stimulus is reported.                                                                                                                                                                                                                                                                          |
| <code>[-frames]</code>       | Report power for specified list of SDB frames. By default, power for all SDB frames will be reported.                                                                                                                                                                                                                                                    |
| <code>[-inst]</code>         | List of root hierarchical and/or leaf instances for power reporting                                                                                                                                                                                                                                                                                      |
| <code>[-module]</code>       | Alternately, you can specify the RTL module name. If specified, all instances of the specified module are selected for power reporting.                                                                                                                                                                                                                  |
| <code>[-levels]</code>       | Suboption of <code>-module</code> .<br><br>Reports power for all hierarchical instances found upto the specified level (level for specified root = 0).                                                                                                                                                                                                   |
| <code>[-no_glitch]</code>    | If specified, does not consider glitch power separately.                                                                                                                                                                                                                                                                                                 |
| <code>[-clock_domain]</code> | Report power for the specified clock domain.                                                                                                                                                                                                                                                                                                             |
| <code>[-power_domain]</code> | Reports power for the specified power domain.                                                                                                                                                                                                                                                                                                            |
| <code>[-collate]</code>      | Collate power reports across frames, or hierarchical instances, or clock/power domains, or all of these.<br><br>By default, the report is collated across frames.                                                                                                                                                                                        |
| <code>[-power_mode]</code>   | Report power for the specified power mode.<br><br>The default power mode is dont care.                                                                                                                                                                                                                                                                   |
| <code>[-power_rail]</code>   | Report power for the specified power rail.<br><br>The default is dont care.                                                                                                                                                                                                                                                                              |
| <code>[-rail_type]</code>    | Specify the rail type for reporting. <ul style="list-style-type: none"><li>■ <code>power_format</code>: Specifies rails from cpf or upf</li><li>■ <code>logical</code>: Specifies rails from library</li><li>■ <code>both</code>: Specifies rails from both cpf/upf and library</li></ul> By default, rails are specified from both cpf/upf and library. |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-assign2clk]</code>     | Assign clock pin power of memory, flop, latch to the clock network. By default, the clock pin power for the instance is contained in the instance internal power.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-by_category]</code>    | Report a line each for the list of specified design element categories. PM stands for power management cells (such as level shifter, retention, isolation cells).<br><br>By default, power is reported by category.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-cols]</code>           | Suboption of <code>-by_category</code> .<br><br>Specify columns to report. Default columns are:<br><br>leakage internal switching                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-category]</code>       | Suboption of <code>-by_category</code> .<br><br>Report power by the selected category.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-sort_by]</code>        | Suboption of <code>-by_category</code> .<br><br>Sorts the output based on the selected parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-reassign_power]</code> | Suboption of <code>-by_category</code> .<br><br>Redistributes power of leaf instances specified using suboptions below from <code>&lt;from_cat&gt;</code> to <code>&lt;to_cat&gt;</code> .<br><br>You can specify multiple <code>-reassign_power</code> options in the same command. Consider the following sample usage:<br><br><pre>set iter1 [get_insts -iter -cell *BBND*] set iter2 [get_insts -iter -cell lef*] report_power -unit mW -format %.5f \ -category memory register latch logic bbox clock_comb clock_seq pad pm \ -cols internal switching leakage total \ -reassign_power bbox logic \$iter1 \ -reassign_power bbox memory \$iter2</pre> |
| <code>[-root]</code>           | Suboption of <code>-reassign_power</code> .<br><br>Redistributes power in leaf instances in the specified hierarchical instance.<br><br>By default, the hierarchical instance specified with <code>-inst</code> option is considered.                                                                                                                                                                                                                                                                                                                                                                                                                       |



## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|                              |                                                                                                                                                 |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-module]</code>       | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the module(s) for power redistribution.</p>                                        |
| <code>[-levels]</code>       | <p>Suboption of <code>-module</code>.</p> <p>Specify the module level(s). Default is 0.</p>                                                     |
| <code>[-power_domain]</code> | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistributes power in leaf instances in the specified power domain.</p>                   |
| <code>[-clock_domain]</code> | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistributes power in leaf instances in the specified clock domain.</p>                   |
| <code>[-power_rail]</code>   | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the power rail for power redistribution. The default group is dont care.</p>       |
| <code>[-rtl_type]</code>     | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the RTL type(s) for power redistribution. The default group is any.</p>            |
| <code>[-rtl_group]</code>    | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the RTL group(s) for power redistribution. The default group is any.</p>           |
| <code>[-name]</code>         | <p>Suboption of <code>-reassign_power</code>.</p> <p>Considers leaf instances matching the specified pattern.</p>                               |
| <code>[-cell]</code>         | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistributes leaf instances mapped to cell matching the specified pattern.</p>            |
| <code>[-lib]</code>          | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistributes leaf instances mapped to cell in library matching the specified pattern.</p> |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|                                  |                                                                                                                                                                                                                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-nocase]</code>           | Suboption of <code>-lib</code> .<br><br>Performs case-insensitive name match.                                                                                                                                                                                                                      |
| <code>[-invert]</code>           | Suboption of <code>-lib</code> .<br><br>Inverts name match.                                                                                                                                                                                                                                        |
| <code>[-by_hierarchy]</code>     | Report power by hierarchy. The hierarchy name is always displayed as the rightmost column in the report.                                                                                                                                                                                           |
| <code>[-levels]</code>           | Suboption of <code>-by_hierarchy</code> .<br><br>Specify the number of levels to report. Default is 2.                                                                                                                                                                                             |
| <code>[-min_leaf_cnt]</code>     | Suboption of <code>-by_hierarchy</code> .<br><br>Skip hierarchies with leaf cells less than the specified value.                                                                                                                                                                                   |
| <code>[-cols]</code>             | Suboption of <code>-by_hierarchy</code> .<br><br>Specify columns to report. Default columns are<br><br><code>cells pct_cells leakage internal switching<br/>total level hier</code>                                                                                                                |
| <code>[-sort_by]</code>          | Suboption of <code>-by_hierarchy</code> . Sort the report based on the specified parameter.                                                                                                                                                                                                        |
| <code>[-indent_inst]</code>      | Suboption of <code>-by_hierarchy</code> . Indentation to report for the instance. By default, full inst path is reported.                                                                                                                                                                          |
| <code>[-by_leaf_instance]</code> | Report power by leaf instance (equivalent of Genus <code>report_power -flat</code> command)                                                                                                                                                                                                        |
| <code>[-rtl_type]</code>         | Suboption of <code>-by_leaf_instance</code> . Used to select the type of leaf instance for reporting.                                                                                                                                                                                              |
| <code>[-rtl_group]</code>        | Suboption of <code>-by_leaf_instance</code> . Used to select the type of leaf instance for reporting. Each RTL group above is mapped to a set of RTL types. Mappings of these RTL groups to RTL types are saved in the global Tcl variable <code>RTLS_CellInfo(group, &lt;group_name&gt;)</code> . |
| <code>[-leaf]</code>             | Suboption of <code>-by_leaf_instance</code><br><br>directing Joules to treat either a macro (for example, adder, multiplier) or gate (library element) as the leaf instance.                                                                                                                       |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|                            |                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-cell]</code>       | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Leaf instances mapped to cell matching the specified pattern.</p>                                                                                                                                                                                                                                                        |
| <code>[-lib]</code>        | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Leaf instances mapped to cell in library matching the specified pattern.</p>                                                                                                                                                                                                                                             |
| <code>[-name]</code>       | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Used to match the leaf instance by name (using glob expression), case insensitive match, and inverting the match.</p>                                                                                                                                                                                                    |
| <code>[-nocase]</code>     | <p>Suboption of <code>-name</code>.</p> <p>Case sensitive name match.</p>                                                                                                                                                                                                                                                                                                       |
| <code>[-invert]</code>     | <p>Suboption of <code>-name</code>.</p> <p>Filter out names that match the pattern and return those that do not.</p>                                                                                                                                                                                                                                                            |
| <code>[-cols]</code>       | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Specify the columns to report. Default columns that are reported are:</p> <p>leakage internal switching total leaf</p>                                                                                                                                                                                                   |
| <code>[-sort_by]</code>    | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>If multiple tables are displayed (for example, for several hierarchical instances), sort the order in which the tables are displayed by the specified category (register, memory, logic, clock, etc.) and optionally power type (leakage, internal, switching).</p> <p>By default, the tables are sorted by 'total'.</p> |
| <code>[-increasing]</code> | <p>Suboption of <code>-sort_by</code>.</p> <p>Sort by increasing order. If not specified, the data is sorted in decreasing order.</p>                                                                                                                                                                                                                                           |
| <code>[-max]</code>        | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Reports specified number of instances.</p>                                                                                                                                                                                                                                                                               |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|                                         |                                                                                                                                                                                                                                        |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-by_rail]</code>                 | Report power dissipation for each rail. The default is dont care.                                                                                                                                                                      |
| <code>[-cols]</code>                    | Suboption of <code>-by_rail</code> .<br><br>Specify the columns to report. Default columns are leakage<br>internal switching                                                                                                           |
| <code>[-category]</code>                | Suboption of <code>-by_rail</code> .<br><br>Report the power in the given category.                                                                                                                                                    |
| <code>[-exclude_zero_power_rail]</code> | Suboption of <code>-by_rail</code> .<br><br>Reports only non zero power for each rail. Only available for <code>-by_rail</code> flow.                                                                                                  |
| <code>[-by_func_type]</code>            | Report power by function type. By default, all function types are reported.                                                                                                                                                            |
| <code>[-rtl_type]</code>                | Suboption of <code>-by_func_type</code> . Select the RTL type for reporting.                                                                                                                                                           |
| <code>[-rtl_group]</code>               | Suboption of <code>-by_func_type</code> . Each RTL group above is mapped to a set of RTL types. Mappings of these RTL groups to RTL types are saved in the global Tcl variable <code>RTLS_CellInfo(group, &lt;group_name&gt;)</code> . |
| <code>[-cell]</code>                    | Suboption of <code>-by_func_type</code> . Specify cells for reporting.                                                                                                                                                                 |
| <code>[-lib]</code>                     | Suboption of <code>-by_func_type</code> . Specify cell libraries for reporting.                                                                                                                                                        |
| <code>[-name]</code>                    | Suboption of <code>-by_func_type</code> . Used to match the cell names (using glob expression), case insensitive match, and inverting the match.                                                                                       |
| <code>[-nocase]</code>                  | Suboption of <code>-name</code> . Case sensitive name match.                                                                                                                                                                           |
| <code>[-invert]</code>                  | Suboption of <code>-name</code> . Filter out names that match the pattern and return those that do not.                                                                                                                                |
| <code>[-cols]</code>                    | Sub-option of <code>-by_func_type</code> . Specify the columns to report. Default columns reported are:<br><br>leakage internal switching total type                                                                                   |
| <code>[-sort_by]</code>                 | Sub-option of <code>-by_func_type</code> . Sort the report by specified criteria. By default, the report is unsorted.                                                                                                                  |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-increasing]</code> | Sub-option of <code>-sort_by</code> . Sort the report by increasing order of the specified criteria. The default is set to decreasing order.                                                                                         |
| <code>[-by_libcell]</code> | Report power by the specified library cells.                                                                                                                                                                                         |
| <code>[-rtl_type]</code>   | Suboption of <code>-by_libcell</code> . Used to select the RTL type for reporting.                                                                                                                                                   |
| <code>[-rtl_group]</code>  | Suboption of <code>-by_libcell</code> . Each RTL group above is mapped to a set of RTL types. Mappings of these RTL groups to RTL types are saved in the global Tcl variable <code>RTLS_CellInfo(group, &lt;group_name&gt;)</code> . |
| <code>[-cell]</code>       | Suboption of <code>-by_libcell</code> . Specify cells for reporting.                                                                                                                                                                 |
| <code>[-lib]</code>        | Suboption of <code>-by_libcell</code> . Specify cell libraries for reporting.                                                                                                                                                        |
| <code>[-name]</code>       | Suboption of <code>-by_libcell</code> . Used to match cell names (using glob expression), case insensitive match, and inverting the match.                                                                                           |
| <code>[-nocase]</code>     | Suboption of <code>-name</code> . Case sensitive name match.                                                                                                                                                                         |
| <code>[-invert]</code>     | Suboption of <code>-name</code> . Filter out names that match the pattern and return those that do not.                                                                                                                              |
| <code>[-cols]</code>       | Sub-option of <code>-by_libcell</code> . Specify the columns to report. Default columns reported are:<br><br>leakage internal switching total cell lib                                                                               |
| <code>[-sort_by]</code>    | Sub-option of <code>-by_libcell</code> . Sort the report by specified criteria. By default, the report is unsorted.                                                                                                                  |
| <code>[-increasing]</code> | Sub-option of <code>-sort_by</code> . Sort the report by increasing order of the specified criteria. The default is set to decreasing order.                                                                                         |
| <code>[-by_tiles]</code>   | Generate Power Profile By Tile (PPBT).                                                                                                                                                                                               |
| <code>[-style]</code>      | Suboption of <code>-by_tiles</code> . Specify style of power reporting. Default style is transient.                                                                                                                                  |
| <code>[-cols]</code>       | Suboption of <code>-by_tiles</code> . Specify column(s) to report. By default, Total column is reported.                                                                                                                             |
| <code>[-compat]</code>     | Specify this option to report power in Voltus format.                                                                                                                                                                                |
| <code>[-unit]</code>       | Specify unit for power profile. W = Watt, mW = milliWatt, uW = microWatt, nW = nanoWatt, pW = picoWatt. Default is value of attribute <code>power_unit</code> .                                                                      |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power

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|                                           |                                                                                                                                                                  |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-format]</code>                    | Specify the format of the report data. The default format is <code>%.5e</code> .                                                                                 |
| <code>[-header]</code>                    | Generate report header. Default is false. When used in CUI mode, this option displays analysis view of the output.                                               |
| <code>[-skip_port_switching_power]</code> | If specified, the primary ports' switching power is not added to the switching power section                                                                     |
| <code>[&gt; -out]</code>                  | Save the power report in the specified file. If <code>-append</code> is specified, append to the file instead of overwriting it (which is default).              |
| <code>[-append]</code>                    | Append to the file specified with <code>-out</code> option.                                                                                                      |
| <code>[-csv]</code>                       | Generates Excel style (Comma Separated Values) report.<br><br>The CSV can only be generated for <code>-by_category</code> or <code>-by_hierarchy</code> reports. |

### Example(s)

- `report_power ;# report power for top level design(s)`
- `report_power -frames /stim#1/frame#1 {/stim#1/frame#[5:8]}`
- `report_power -module cpu_10bit__fsm`
- `report_power -inst /cpu_10bit/DP -levels 1`
- `report_power -inst /cpu_10bit/FSM -level 1 -unit mW -format %.5f`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## report\_power\_datapath

Reports power consumed by datapath elements in a design.

The command reports operator, type, power numbers, input/output width, area, line file information, and instance name in tabular format.

### Syntax

```
report_power_datapath \  
  [-stims {<stim_id>}+]  
  [-sort_by <power_type>]  
    (power_type=leakage, internal, switching, dynamic, total)  
  [-increasing]  
  [>|-out <output-file-name>]
```

### Options and Arguments

|               |                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]          | Displays help for all options.                                                                                                                                               |
| [-stims]      | Report power for the specified stim ID. By default, all stims are considered.                                                                                                |
| [-sort_by]    | Sort the power report by specified power type. You can sort the report by leakage, internal, switching, dynamic, or total.<br><br>By default, the report is sorted by total. |
| [-increasing] | Suboption of -sort_by. Sorts the power report in increasing order of the specified power type. By default, the report is sorted in decreasing order.                         |
| [> -out]      | Save the power report in the specified file name.                                                                                                                            |

### Example(s)

■ `report_power_datapath`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

■ [Power Analysis and Reporting](#)

## **Joules Command and Attribute Reference**

### Power Analysis and PPA Reporting Commands - report\_power\_datapath

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## plot\_power\_profile

If you have extracted multiple frames from a stimulus and run the `compute_power` command in time-based mode, you can view the power profile over time using the `plot_power_profile` command. The power profile plot assumes that the specified SDB frames are contiguous in time.

### Syntax

```
plot_power_profile \  
  [-stim {<stim_id>}+]   
  [-frames {<frame_id>|<frame_range>}+]   
  [-inst <inst>+]   
  [-module {<module-name>}+]   
    [-levels <levels>|all]   
  [-no_glitch TG|IG|Both]   
  [-clock_domain {<prim-clock-net>}+]   
  [-power_domain {<domain_name>}+]   
  [-power_mode {<power_mode>}+]   
  [-power_rail {<power_rail>}]   
  [-by_category {memory|register|flop|latch|logic|bbox|clock|pad|pm|total}+]   
  [-types   
    {leakage|internal|switching|clkpin|dynamic|total|tginternal|tgswitching|   
    tgclkpin|tgdynamic|iginternal|igclkpin|igdynamic}+]   
  [-groups <profile_group>+]   
  [-unit W|mW|uW|nW]   
  [-xkey simtime|frame_id]   
  [-format fsdb|shm|gnuplot|native|png]   
  [-xrange <xrange>]   
  [-yrange <yrange>]   
  [>|-out <f_dat>]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                                                   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                                                    |
| <code>[-stims]</code>        | Stim ID for power profile display. By default, first SDB stim is considered.                                                                                                                                                                                      |
| <code>[-frames]</code>       | <p>Specify list of frames for power profile display. The list can include individual frames (for example, <code>/stim#1/frame#1</code>) or range of frames (for example, <code>{/stim#1/frame#[2:4]}</code>).</p> <p>The specified frames must be contiguous.</p> |
| <code>[-inst]</code>         | List of hierarchical or leaf instances for which power profile will be displayed. By default, the plot will have a line for each specified instance.                                                                                                              |
| <code>[-module]</code>       | If specified, all instances of the specified module(s) are used for the plot.                                                                                                                                                                                     |
| <code>[-levels]</code>       | A suboption that applies to <code>-inst</code> or <code>-module</code> options. If specified, all children hierarchical instances upto the specified level are used for the plot. The default level considered is 0.                                              |
| <code>[-no_glitch]</code>    | If specified, does not consider glitch power separately.                                                                                                                                                                                                          |
| <code>[-clock_domain]</code> | View the power profile of all elements in the domain of the specified clocks.                                                                                                                                                                                     |
| <code>[-power_domain]</code> | View the power profile for specified list of power domains as defined in the CPF/1801 power intent.                                                                                                                                                               |
| <code>[-power_mode]</code>   | Plot power profile for the specified power mode.                                                                                                                                                                                                                  |
| <code>[-power_rail]</code>   | Plot power profile for the specified power rail.                                                                                                                                                                                                                  |
| <code>[-by_category]</code>  | <p>If specified, the plot will contain a line for each specified category. The category will be displayed for each hierarchy.</p> <p>For FSDB or SHM formats (set using <code>-format</code> option), all categories are considered by default.</p>               |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - plot\_power\_profile

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|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-types]</code>    | <p>If specified, the plot will contain a line for each specified power type.</p> <p>The number of lines in the plot is a cross product of</p> $(\# \text{ instances or power/clock domains}) \times (\# \text{ of categories}) \times (\# \text{ of power types})$ <p>The specified power type will be shown for all the hierarchies and the categories within each hierarchy.</p> <p>For FSDB or SHM formats (set using <code>-format</code> option), all power types are considered by default.</p> |
| <code>[-groups]</code>   | Specify the profile group(s) to plot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-unit]</code>     | Specify unit for power profile. W (default) = Watt, mW = milliWatt, uW = microWatt, nW = nanoWatt.                                                                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-xkey]</code>     | Show the value specified with this option on X axis. By default, simtime is displayed on X axis.                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-format]</code>   | <p>Specify the plotting program to use. Valid values are:</p> <ul style="list-style-type: none"><li>■ gnuplot</li><li>■ Native (default format)</li><li>■ PNG</li><li>■ FSDB (FastSignal Database) - a binary format (fsdb); output can be viewed using Verdi waveform viewer.</li><li>■ SHM (Simulation History Manager) - a binary format (*.trn *.shm); output can be viewed using the NCSim simvision utility.</li></ul>                                                                          |
| <code>[-xrange]</code>   | <p>Specify the X range for the power profile plot.</p> <p>This options applies to <code>-format gnuplot native png</code>.</p>                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[-yrange]</code>   | <p>Specify the Y range for the power profile plot.</p> <p>This options applies to <code>-format gnuplot native png</code>.</p>                                                                                                                                                                                                                                                                                                                                                                        |
| <code>[&gt; -out]</code> | <p>Save the power report in the specified file. By default, the output is saved in <code>&lt;work_dir&gt;/joules_waveform_pwr.&lt;format&gt;</code></p>                                                                                                                                                                                                                                                                                                                                               |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - plot\_power\_profile

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#### Example(s)

- `plot_power_profile -frames /stim#1/frame#1 {/stim#1/frame#[2:9]}`
- `plot_power_profile -by_category memory register logic clock`
- `plot_power_profile -types internal switching`
- `plot_power_profile -by_category -inst [get_insts -rtl_type hier -levels 1:1]`
- `plot_power_profile -by_category -clock_domain /cpu_10bit/clock`

#### Return Value

0 indicates success, 1 indicates failure in execution.

#### Related Topics

- [Power Analysis and Reporting](#)

## write\_power\_profile

Profiles all power types on all categories for all the sub-hierarchies for a given design instance.

### Syntax

```
write_power_profile \  
  [-root <root_inst>+]  
    [-levels <depth_from_root>]  
  [-rtl_type {hier|bbox|memory|register|add|sub|mult|div|decoder|comp|shift}+]  
  [-stims {<stim_id>}+]  
  [-frames {<frame_id>|<frame_range>}+]  
  [-unit W|mW|uW|nW]  
  [-xkey simtime|frame_id]  
  [-clock_domain {<prim-clock-net>}+]  
  [-power_domain {<domain_name>}+]  
  [-power_mode {<power_mode>}]  
  [-power_rail {<power_rail>}]  
  [-format fsdb|shm]  
  [>|-out <f_dat>]
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - write\_power\_profile

---

#### Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                                                                                                                                     |
| <code>[-root]</code>         | Specify the list of hier or leaf instances.                                                                                                                                                                                                                                                                                                        |
| <code>[-levels]</code>       | Sub-option of <code>-root</code> . Specify the number of levels from the root. By default, the entire hierarchy is considered.                                                                                                                                                                                                                     |
| <code>[-rtl_type]</code>     | Specify the RTL type for power profile.                                                                                                                                                                                                                                                                                                            |
| <code>[-stims]</code>        | List of stims for power profile display. By default, first SDB stim is considered.                                                                                                                                                                                                                                                                 |
| <code>[-frames]</code>       | Specify list of frames for power profile display.<br><br>The specified frames must be contiguous.                                                                                                                                                                                                                                                  |
| <code>[-unit]</code>         | Specify unit for power profile. W (default) = Watt, mW = milliWatt, uW = microWatt, nW = nanoWatt.                                                                                                                                                                                                                                                 |
| <code>[-xkey]</code>         | Show the value specified with this option on X axis. By default, simtime is displayed on X axis.                                                                                                                                                                                                                                                   |
| <code>[-clock_domain]</code> | View the power profile of all elements in the domain of the specified clocks.                                                                                                                                                                                                                                                                      |
| <code>[-power_domain]</code> | View the power profile for specified list of power domains as defined in the CPF/1801 power intent.                                                                                                                                                                                                                                                |
| <code>[-power_mode]</code>   | Write power profile for the specified power mode.                                                                                                                                                                                                                                                                                                  |
| <code>[-power_rail]</code>   | Write power profile for the specified power rail.                                                                                                                                                                                                                                                                                                  |
| <code>[-format]</code>       | Specify the plotting format to use. Valid values are: <ul style="list-style-type: none"><li>■ FSDB (FastSignal Database) - a binary format (fsdb); output can be viewed using Verdi waveform viewer.</li><li>■ SHM (Simulation History Manager) - a binary format (*.trn *.shm); output can be viewed using the NCSim simvision utility.</li></ul> |
| <code>[&gt; -out]</code>     | Save the power report in the specified file. By default, the output is saved in <code>&lt;work_dir&gt;/joules_waveform_pwr.&lt;format&gt;</code>                                                                                                                                                                                                   |

#### Example(s)

```
■ write_power_profile -frames /stim#1/frame#1 {/stim#1/frame#[2:9]}
```

## **Joules Command and Attribute Reference**

### **Power Analysis and PPA Reporting Commands - write\_power\_profile**

---

■ `write_power_profile -root [get_insts -rtl_type hier]`

#### **Return Value**

0 indicates success, 1 indicates failure in execution.

#### **Related Topics**

■ [Generating SHM/FSDB to View Power/Activity Profiles](#)

## write\_activity\_profile

Profiles all power types on all categories for all the sub-hierarchies for a given design instance.

### Syntax

```
write_activity_profile \  
  [-root <root_inst>+]  
    [-levels <depth_from_root>]  
  [-rtl_type {hier|bbox|memory|register|add|sub|mult|div|decoder|comp|shift}+]  
  [-stims {<stim_id>}+]  
  [-frames {<frame_id>/<frame_range>}+]  
  [-xkey simtime|frame_id]  
  [-format fsdb|shm]  
  [>|-out <f_dat>]
```



## Options and Arguments

|                          |                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>        | Displays help for all options.                                                                                                                                                                                                                                                                                                                     |
| <code>[-root]</code>     | Specify the list of hierarchical or leaf instances. The default is root.                                                                                                                                                                                                                                                                           |
| <code>[-levels]</code>   | Sub-option of <code>-root</code> . Specify the number of levels from the root. By default, the entire hierarchy is considered.                                                                                                                                                                                                                     |
| <code>[-rtl_type]</code> | Specify the RTL type for activity profile. The default is any.                                                                                                                                                                                                                                                                                     |
| <code>[-stims]</code>    | List of stims for activity profile display. By default, first SDB stim is considered.                                                                                                                                                                                                                                                              |
| <code>[-frames]</code>   | Specify list of frames for power activity display.<br><br>The specified frames must be contiguous.                                                                                                                                                                                                                                                 |
| <code>[-xkey]</code>     | Show the value specified with this option on X axis. By default, simtime is displayed on X axis.                                                                                                                                                                                                                                                   |
| <code>[-format]</code>   | Specify the plotting format to use. Valid values are: <ul style="list-style-type: none"><li>■ FSDB (FastSignal Database) - a binary format (fsdb); output can be viewed using Verdi waveform viewer.</li><li>■ SHM (Simulation History Manager) - a binary format (*.trn *.shm); output can be viewed using the NCSim simvision utility.</li></ul> |
| <code>[&gt; -out]</code> | Save the activity report in the specified file. By default, the output is saved in <code>&lt;work_dir&gt;/joules_waveform_actv.&lt;format&gt;</code>                                                                                                                                                                                               |

## Example(s)

- `write_activity_profile -frames /stim#1/frame#1 {/stim#1/frame#[2:9]}`
- `write_activity_profile -root [get_insts -rtl_type hier]`

## Return Value

0 indicates success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### Power Analysis and PPA Reporting Commands - write\_activity\_profile

---

#### **Related Topics**

- [Generating SHM/FSDB to View Power/Activity Profiles](#)

## report\_ppa

Reports power, performance, and area characteristics of key design elements.

### Syntax

```
report_ppa \
  [-root {<root-inst-path>}+]
  [-module {<module-name>}+]
  [>|-out <output-file-name>] [-append]
```

### Options and Arguments

|           |                                                                                                                                                      |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]      | Displays help for all options.                                                                                                                       |
| [-root]   | List of root hierarchical instances for which the PPA report will be generated.                                                                      |
| [-module] | List of hierarchical modules. All instances of the module will be used for reporting.                                                                |
| [> -out]  | Save the report in the specified file. If <code>-append</code> option is specified, append to the file instead of overwriting it (which is default). |
| [-append] | Append to the specified file.                                                                                                                        |

### Example(s)

```
■ report_ppa -out sample1
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

■ [Power Analysis and Reporting](#)

## set\_inst\_power

Defines the specified power on instances. You must specify this command before report\_power.

### Syntax

```
set_inst_power [-inst <inst>]
               [-frames <frame_id>]
               [-stims <stim_id> ]
               [-power {leakage internal switching <clock_pin>}]
               [-clear]
```

### Options and Arguments

|           |                                                                                                                                                                                                                                                                                                            |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]      | Displays help for all options.                                                                                                                                                                                                                                                                             |
| [-inst]   | Set the power for the specified instance.                                                                                                                                                                                                                                                                  |
| [-frames] | Frame ID for the instance. By default, all frames in SDB are considered. Specify this option only if you are using compute_power in time_based mode.<br><br>Specify -1 to use the computed power numbers for leaf-level instances. For hierarchical instances, a negative value specification is an error. |
| [-stims]  | Stim ID for the instance. By default, all stims in SDB are considered.                                                                                                                                                                                                                                     |
| [-power]  | Specify the target leakage power (in nW) for the clock pin.                                                                                                                                                                                                                                                |
| [-clear]  | Ignore all previous power values in the current session.                                                                                                                                                                                                                                                   |

### Example(s)

- set\_inst\_power -inst /cpu\_10bit/FSM -power { 1.0 3.4 2.1 0.01 }
- set\_inst\_power -inst /cpu\_10bit/DP/ALU -frames /stim#1/frame#1 -power { 0.0 0.0 0.0 }
- set\_inst\_power -inst /cpu\_10bit/RAM\_64x10/RAM\_64x10 -power { -1.0 3.4 2.1 }
- set\_inst\_power -clear

## **Joules Command and Attribute Reference**

### Power Analysis and PPA Reporting Commands - set\_inst\_power

---

#### **Return Value**

0 for success, 1 indicates failure in execution.

#### **Related Topics**

- [Power Analysis and Reporting](#)

## report\_power\_collate

Computes power of the blocks with specified settings and collates power at SoC level.

### Syntax

```
report_power_collate \  
-reset  
-set  
  [-inst {<inst>}+]  
  [-module {<module-name>}+]  
    [-levels <levels>|all]  
  [-stims {<stim_id>}+]  
  [-frames {<frame_id>|<frame_range>}+]  
    [-weights {<val>}+]  
  [-power_mode {<power_mode>}+]  
  [-power_rail {<power_rail>}+]  
  [-scale_freq {<factor>}]  
  [-scale_power  
    {<category>=<leakage_factor>:<internal_factor>:<switching_factor>}  
    +]  
  [-assign2clk {memory|flop|latch}+]  
-report  
  [-by_category]  
    [-cols {leakage|internal|switching|total}+]  
    [-category {memory|register|latch|logic|bbox|clock|pad|pm}+]  
    [-sort_by <category>[:<type>]]  
  [-by_hierarchy]  
    [-inst <root>]  
    [-levels <num>]  
    [-cols  
      {cells|pct_cells|flops|pct_flops|area|pct_area|dynamic|hier|level|  
      leakage|internal|switching|total}+]  
    [-indent_inst]  
    [-tab]  
    [-sort_by leakage|internal|switching|total]  
  [-unit W|mW|uW|nW]  
  [-format <format>]  
  [>|-out <f_rpt>] [-append]
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power\_collate

---

#### Options and Arguments

|                             |                                                                                                                                                                                                                                                                               |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>           | Displays help for all options.                                                                                                                                                                                                                                                |
| <code>-reset</code>         | Initialize or reset <code>report_power_collate</code> settings.                                                                                                                                                                                                               |
| <code>-set</code>           | Specify this option to set the power analysis options.                                                                                                                                                                                                                        |
| <code>[-inst]</code>        | Suboption of <code>-set</code> . List of hierarchical blocks.                                                                                                                                                                                                                 |
| <code>[-module]</code>      | Suboption of <code>-set</code> . List of module names.                                                                                                                                                                                                                        |
| <code>[-levels]</code>      | Suboption of <code>-module</code> . Design levels for power analysis. The default level is 0.                                                                                                                                                                                 |
| <code>[-stims]</code>       | Suboption of <code>-set</code> . List of stim IDs for power analysis. By default, the first SDB stim is considered.                                                                                                                                                           |
| <code>[-frames]</code>      | Suboption of <code>-set</code> . Specify either a list or range of frame IDs for power analysis. By default, all SDB frames are considered.                                                                                                                                   |
| <code>[-weights]</code>     | Suboption of <code>-frames</code> . Specify weight for each specified stim or frame. Default value is the duration of each frame.<br><br>Relative weight for each frame is calculated as:<br>$\text{weight}(\text{frame\_id}) / \text{sum\_of\_weights\_of\_all\_frame\_ids}$ |
| <code>[-power_mode]</code>  | Suboption of <code>-set</code> . List of power modes. The default mode is <code>dont care</code> .                                                                                                                                                                            |
| <code>[-power_rail]</code>  | Suboption of <code>-set</code> . List of power rails. Default is <code>all</code> .                                                                                                                                                                                           |
| <code>[-scale_freq]</code>  | Suboption of <code>-set</code> . Scale frequency of <code>-inst</code> hierarchies by specified <i>&lt;factor&gt;</i> .                                                                                                                                                       |
| <code>[-scale_power]</code> | Suboption of <code>-set</code> . Default is <code>all=1.0:1.0:1.0</code>                                                                                                                                                                                                      |
| <code>[-assign2clk]</code>  | Suboption of <code>-set</code> . Allocate memory, flop, or latch clock pin power to clock network.                                                                                                                                                                            |
| <code>-report</code>        | Report the collated power.                                                                                                                                                                                                                                                    |
| <code>[-by_category]</code> | Suboption of <code>-report</code> . Report by power category.                                                                                                                                                                                                                 |
| <code>[-cols]</code>        | Suboption of <code>-by_category</code> . Specify the columns is the collated power report. Default columns are:<br><br><code>leakage internal switching total</code>                                                                                                          |
| <code>[-category]</code>    | Suboption of <code>-by_category</code> . Specify the power categories to report. By default, all categories are reported.                                                                                                                                                     |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power\_collate

---

|                              |                                                                                                                                                                                               |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-sort_by]</code>      | Suboption of <code>-by_category</code> . Sort the power reported by the specified <code>&lt;category&gt;[:&lt;type&gt;]</code> . By default, the report is sorted by <code>all:total</code> . |
| <code>[-by_hierarchy]</code> | Report hierarchical power table.                                                                                                                                                              |
| <code>[-inst]</code>         | Suboption of <code>-by_hierarchy</code> . Specify the instance to report. Default is design root.                                                                                             |
| <code>[-levels]</code>       | Suboption of <code>-by_hierarchy</code> . Specify the levels down from <code>-inst</code> to report. Default is 2 levels.                                                                     |
| <code>[-cols]</code>         | Suboption of <code>-by_hierarchy</code> . Specify the columns to show in power table. Default columns are:<br><br>cells pct_cells leakage internal switching<br>total level hier              |
| <code>[-indent_inst]</code>  | Suboption of <code>-by_hierarchy</code> . Shows indented inst basenames to reflect hierarchy. By default, full inst path is displayed                                                         |
| <code>[-tab]</code>          | Suboption of <code>-by_hierarchy</code> . Shows tabbed data. By default, full inst path is displayed.                                                                                         |
| <code>[-sort_by]</code>      | Suboption of <code>-by_hierarchy</code> . Specify the criteria to sort the power table. By default, it is unsorted.                                                                           |
| <code>[-unit]</code>         | Suboption of <code>-report</code> . Specify unit for collate power. W (default) = Watt, mW = milliWatt, uW = microWatt, nW = nanoWatt.                                                        |
| <code>[-format]</code>       | Suboption of <code>-report</code> . Specify the format for reporting. The default format is <code>%.5e</code> .                                                                               |
| <code>[&gt; -out]</code>     | Suboption of <code>-report</code> . Specify the name of the output file name.                                                                                                                 |
| <code>[-append]</code>       | Suboption of <code>-report</code> . Append to the file specified with <code>-out</code> option.                                                                                               |

### Example(s)

Power collation at the SOC level is a two-step process:

- # Step 1: initialize report\_power\_collate  
report\_power\_collate -reset ;# initialize
- # Step 2: specify power analysis options per block



## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power\_collate

---

```
report_power_collate -set -inst /cpu_10bit -frames {/stim#1/frame#[5:9]} -  
power_mode pwr_init  
report_power_collate -set -inst /cpu_10bit/FSM -stim /stim#1  
report_power_collate -set -inst /cpu_10bit/RAM_64x10 -stim /stim#1 -power_mode  
pwr_mem_on  
report_power_collate -set -inst /cpu_10bit/DP -stim /stim#2 -power_mode  
pwr_alu_on
```

- # Step 3: report collated power  
report\_power\_collate -report -unit mW -format {%.3f}

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## report\_net\_switching

Reports property of nets in specified design hierarchy, clock\_domain, or power\_domain. These include nets connected to output pins of leaf instances contained in the specified hierarchy, clock or power domain, and nets connected to input, inout, and output ports of the specified design hierarchy or power\_domain.

### Syntax:

```
report_net_switching \  
  [-stim {<stim_id>}+] \  
  [-frame {<frame_id>|<frame_range>}+] \  
  [-power_mode {<power_mode>}+] \  
  [-inst {<root>}+] \  
  [-net {<fnet|net>}+] \  
  [-category <macro(memory+bbbox)|memory|bbbox|register|latch|logic|clock>] \  
  [-no_glitch <TG|IG|Both>] \  
  [-clock_domain {<prim-clock-net>}+] \  
  [-power_domain {<domain-name>}+] \  
    [-skip_ports in|out|inout] \  
  [-cols \  
    {fanout|drivers|wire_cap|wire_res|sink_cap|load_cap|voltage|freq|toggle| \  
    power|pin_power|net_power|tgfreq|tgtoggle|tgpower|tgpin_power| \  
    tgnnet_power}+] \  
  [-min_fanout <min>] \  
  [-max_fanout <min>] \  
  [-cap_worst <cnt>] \  
  [-sort_by \  
    fanout|wire_res|wire_cap|sink_cap|load_cap|voltage|freq|tgfreq|toggle| \  
    tgtoggle|power|pin_power|net_power|tgpower|tgpin_power|tgnnet_power] \  
  [-skip_header] \  
  [-spef_annotated_nets] \  
  [>|-out <f_rpt>] \  
    [-append]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all keywords.                                                                                                                                                                                                                                                                                                                         |
| <code>[-stim]</code>         | <p>Stimulus for which nets with required properties will be reported.</p> <p><b>Note:</b> If multiple stimuli are specified and one (or more) of the stims does not exist, command will generate the report for only the valid stims.</p> <p>If no stimulus is specified, then the command will generate the report for stimulus with ID '/stim#1'.</p> |
| <code>[-frame]</code>        | <p>Frame for which data will be reported. Complete frame ID needs to be mentioned with the option. You can specify multiple frames or a range of frames for this option.</p> <p>By default, the command will report data as the average of all the frames for a given stimulus, that is, /frame#0 of given stimulus.</p>                                |
| <code>[-power_mode]</code>   | <p>Power mode based on which the nets will be reported.</p> <p>If not specified, the reported data will be independent of all power_mode.</p> <p>The command supports both formats of specifying power_mode with this option, that is, with/without VDIRs.</p>                                                                                          |
| <code>[-inst]</code>         | <p>Generate report for the specified instance(s). Instance name can be hierarchical name or path with VDIRs.</p> <p>If no instance is specified, the command reports the data for the current scope.</p>                                                                                                                                                |
| <code>[-net]</code>          | <p>Report the property of specified nets.</p> <p>This option is mutually exclusive with <code>-inst</code>, <code>-power_domain</code>, <code>-clock_domain</code>, and <code>-category</code>.</p>                                                                                                                                                     |
| <code>[-category]</code>     | Specify the power category for reporting. Default is all.                                                                                                                                                                                                                                                                                               |
| <code>[-no_glitch]</code>    | If specified, does not consider glitch power separately.                                                                                                                                                                                                                                                                                                |
| <code>[-clock_domain]</code> | Generate data based on primary clock domain(s).                                                                                                                                                                                                                                                                                                         |
| <code>[-power_domain]</code> | Generate data based on power domain(s) for the net.                                                                                                                                                                                                                                                                                                     |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_net\_switching

---

|                                     |                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-skip_ports]</code>          | Suboption of <code>-power_domain</code> . If specified, skip the hier boundary ports.                                                                      |
| <code>[-cols]</code>                | Columns to include in the report. By default, the following columns are considered:<br><br><code>-cols fanout wire_cap sink_cap load_cap freq power</code> |
| <code>[-min_fanout]</code>          | Report nets with fanout greater than or equal to the specified value.                                                                                      |
| <code>[-max_fanout]</code>          | Report nets with fanout less than or equal to the specified value.                                                                                         |
| <code>[-cap_worst]</code>           | Report nets with worst load capacitance.                                                                                                                   |
| <code>[-sort_by]</code>             | Sort the reported data based on specified parameter. By default, the data is sorted by fanout.                                                             |
| <code>[-skip_header]</code>         | Skip the header in the generated output. By default, it is set to false.                                                                                   |
| <code>[-spef_annotated_nets]</code> | If specified, displays the distribution of SPEF annotated nets. Default is false.                                                                          |
| <code>[&gt; -out]</code>            | Save report in the specified file.                                                                                                                         |
| <code>[-append]</code>              | Suboption of <code>-out</code> . Append to the specified file.                                                                                             |

### Example(s)

- `report_net_switching -hierarchical -out cpu_10bit.all_nets.rpt`
- `report_net_switching /cpu_10bit/DP/ALU -cap_worst 20 -sort_by load_cap ; # report top 20 nets with worst load in /cpu_10bit/DP/ALU`
- `report_net_switching -min_fanout 20 -max_fanout 64 ; # report nets with: fanout greater than 10, and less than 64`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## scale\_ple\_from\_spef

Tunes the physical layout estimation (PLE) model using the specified SPEF file. This command should be run post synthesis.

Points to consider:

- Global PLE factor: Use attribute `scale_of_cap_per_unit_length`; it will scale capacitance values globally for all categories. Example:
- Category wise PLE factor: Use attribute `pwra_cap_scaling`; it will scale category wise capacitance only for power analysis. Example:

```
set_db scale_of_cap_per_unit_length true /
```

```
set_db pwra_cap_scaling "memory:<val> bbox:<val> register:<val> latch:<val>  
logic:<val> clock:<val>"
```

## Syntax

```
scale_ple_from_spef  
  [-f_spef] <f_spef>  
  [-f_spef_proc] <f_spef>  
  [-type {global|category}]  
  [-damp_factor <factor>]  
  [-refine_net_cap {memory|clock}+]  
  [-annotate]  
  [-spef_only]  
  [-clock_split]  
  [-show_details]  
  [-help|-h]
```

## Options and Arguments

|                                |                                                                                                                                                                                                    |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>              | Displays help for all options.                                                                                                                                                                     |
| <code>[-type]</code>           | Specify whether to scale capacitance values globally for all categories or to scale category-wise capacitance only for power analysis.                                                             |
| <code>[-f_spef]</code>         | Specify the spef file. <code>.gz</code> version is also accepted.                                                                                                                                  |
| <code>[-f_spef_proc]</code>    | Specify the tcl file containing <code>read_spef</code> commands. This option is used to read multiple spef files.                                                                                  |
| <code>[-damp_factor]</code>    | Specify factor less than or equal to 1.0.                                                                                                                                                          |
| <code>[-refine_net_cap]</code> | Refine memory and clock net caps.                                                                                                                                                                  |
| <code>[-annotate]</code>       | Read spef to find the category values.<br><br>This option is applicable only for <code>-type category</code> .                                                                                     |
| <code>[-spef_only]</code>      | Sub-option of <code>-annotate</code> .<br><br>Use only spef annotated nets for computation. By default, all nets are used.<br><br>This option is applicable only for <code>-type category</code> . |
| <code>[-clock_split]</code>    | Separates clock category into sequences and combinations.<br><br>Default: false                                                                                                                    |
| <code>[-show_details]</code>   | Display detailed output report.                                                                                                                                                                    |

## Example(s)

- `scale_ple_from_spef /full/path/to/design1.spef`
- `scale_ple_from_spef -f_spef /another/gz/spef/file/design2.spef.gz -refine memory clock`

## Return Value

0 for success, 1 indicates failure in execution.

## Related Topics

- [Simulation, Simulation Read, and SDB Creation](#)

## report\_power\_sweep

Executes power sweep using the specified parameters. The effect of the command is cumulative; in case of conflict, the last run of the command overrides.

### Syntax

```
report_power_sweep \  
  [-reset]  
  [-axis freq|volt|temp]  
  [-effort fast|accurate]  
  [-handle <sweep_axis_handle>+]  
  [-sdc_name <sdc_name>+] (  
  [-max_val <max_val>]  
  [-min_val <min_val>]  
  [-incr <incr>|-points <N>]  
  [-auto_sweep]  
    [-num_clocks <N>]  
    [-num_roots <N>]  
    [-points <N>]  
  [-set] )  
  [-plot]  
    [-by_clock_domain]  
    [-by_hierarchy]  
    [-root <root>+]  
    [-power_domain <pd>+]  
  [-stims <stim>+]  
  [-max_points <N>]  
  [-show_sweep_table]  
    [-shrink_range <min>:<max>]  
    [-location top_left|bot_left|bot_right|top_right]  
  [-unit W|mW|uW|nW]  
  [-png <f_png>]
```

## Options and Arguments

|                                 |                                                                                                                        |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>               | Displays help for all options.                                                                                         |
| <code>[-reset]</code>           | Reset report_power_sweep settings.                                                                                     |
| <code>[-axis]</code>            | Specify the sweep axis. The default axis is freq.                                                                      |
| <code>[-effort]</code>          | Specify the sweep effort. The default effort is fast.                                                                  |
| <code>[-handle]</code>          | Specify the sweep axis handle. While the default handle is fastest clock, for freq sweep, the handle is clock pin/net. |
| <code>[-sdc_name]</code>        | Specify the list of SDC clock names. This option applies only to -axis freq.                                           |
| <code>[-max_val]</code>         | Specify the maximum value of the specified sweep axis.                                                                 |
| <code>[-min_val]</code>         | Specify the minimum value of the specified sweep axis.                                                                 |
| <code>[-incr -points]</code>    | Perform sweep in increments of the specified value (-incr) or number of specified points (-points)                     |
| <code>[-auto_sweep]</code>      | Perform auto sweep of top 3 clocks, top 3 blocks                                                                       |
| <code>[-num_clocks]</code>      | Suboption of -auto_sweep. Specify the number of top clocks. By default, it is 3.                                       |
| <code>[-num_roots]</code>       | Suboption of -auto_sweep. Specify the number of top hierarchies by power. By default, it is 3                          |
| <code>[-points]</code>          | Suboption of -auto_sweep. Specify the number of sweep points. By default, it is 10                                     |
| <code>[-set]</code>             | Record settings for power sweep. See example below for sample usage.                                                   |
| <code>[-plot]</code>            | Sweep power and plot the data. See example below for sample usage.                                                     |
| <code>[-by_clock_domain]</code> | Suboption of -plot. Plot data by clock domain.                                                                         |
| <code>[-by_hierarchy]</code>    | Suboption of -plot. Plot data by hierarchy.                                                                            |
| <code>[-root]</code>            | Suboption of -by_hierarchy. Show a line in the plot for the specified root. By default, the design root is considered. |
| <code>[-power_domain]</code>    | Suboption of -by_hierarchy. Show a line in the plot for the specified power domain.                                    |
| <code>[-stims]</code>           | Suboption of -plot. In the plot, show duplicate lines for each stim. By default, all stims are considered.             |



## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power\_sweep

---

|                                  |                                                                                                                                                  |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-max_points]</code>       | Suboption of <code>-plot</code> . Specify the maximum number of points per line.                                                                 |
| <code>[-show_sweep_table]</code> | Suboption of <code>-plot</code> . Show freq sweep table in plot. By default, the table is displayed in stdout.                                   |
| <code>[-shrink_range]</code>     | Suboption of <code>-show_sweep_table</code> . Specify the minimum/maximum shrink of the image. The default shrink range is 2.0:4.5.              |
| <code>[-location]</code>         | Suboption of <code>-show_sweep_table</code> . Specify the location of the image on display. By default, the image is displayed on top_left side. |
| <code>[-unit]</code>             | Suboption of <code>-plot</code> . Specify the Y-axis power unit. Default unit is mW.                                                             |
| <code>[-png]</code>              | Suboption of <code>-plot</code> . Save the plot output in the specified PNG file.                                                                |

### Example(s)

- `# reset report_power_sweep settings`  
`report_power_sweep -reset`
- `# sweep /cpu_10bit/clock freq from 500MHz to 250MHz in increments of 50MHz`  
`report_power_sweep -set -axis freq -max_val 500e6 -min_val 250e6 -incr 50e6 -`  
`handle /cpu_10bit/clock`
- `# sweep voltage from 1.08V down to 0.84V in increments of 0.04V`  
`report_power_sweep -set -axis volt -max_val 1.08 -min_val 0.84 -incr 0.04 -`  
`handle VDD ;# coming soon`
- `# sweep power by clock_domain and plot`  
`report_power_sweep -plot -by_clock_domain`
- `# sweep power by hierarchy and plot`  
`report_power_sweep -plot -by_hier -root /cpu_10bit/DP/ALU /cpu_10bit/FSM -`  
`show_sweep_table`
- `# plot with xkey = volt, zkey = freq`  
`report_power_sweep -plot -xkey volt -zkey freq ;# coming soon`
- `# auto sweep and plot`  
`report_power_sweep -auto_sweep -num_roots 2 -num_points 5`

### Return Value

0 for success, 1 indicates failure in execution.

## Joules Command and Attribute Reference

Power Analysis and PPA Reporting Commands - report\_power\_sweep

---

### Related Topics

- [Power Sweep](#)

## report\_power\_regress

Creates, populates, reports, and plots power regression DB (PRDB) data.

### Syntax

```
report_power_regress \  
  [-reset_cache]  
  -prdb_id <id>  
  [-create]  
    [-work_dir <work_dir>]  
    [-power_mode {<power_mode>}+]  
    [-power_rail {<power_rail>}]  
    [-assign2clk {memory|flop|latch}+]  
    [-save_db <d> <m> <w>]  
  [-record]  
    [-today <yyyy-dd-mm>]  
  [-get <obj_key>]  
    (<obj_key> =  
    config_file|work_dir|start_date|end_date|date_list|design|item_list|  
    item_id_list|item|item_id)  
    [-key_val <val>]  
  [-load_config <config_file_with_path>]  
  [-plot|-report]  
    [-start_date <start-date>]  
    [-end_date <end-date>]  
    [-category {memory|register|latch|logic|bbox|clock|pad|pm}+]  
    [-type {leakage|internal|switching|total}+]  
    [-ykey {<catg>[:<type>]}+]  
      (<catg> = memory|register|latch|logic|bbox|clock|pad|pm, default = all)  
      (<type> = leakage|internal|switching|total, default = total)  
    [-png <f_png>]  
  [-inst {<root>}+]  
  [-module {<module>}+]  
    [-levels <num>|all]  
  [-clock_domain {<prim-clock-net>}+]  
  [-power_domain {<domain-name>}+]  
  [-stims {<stim_id>}+]  
  [-frames {<frame_id>|<frame_range>}+]
```

## Options and Arguments

|                             |                                                                                                                                                                                          |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>           | Displays help for all options.                                                                                                                                                           |
| <code>[-reset_cache]</code> | Clears all the data from caches.                                                                                                                                                         |
| <code>[-prdb_id]</code>     | Specify the PRDB ID (string) to be reported.                                                                                                                                             |
| <code>[-create]</code>      | Create a new PRDB with specified ID.                                                                                                                                                     |
| <code>[-work_dir]</code>    | Suboption of <code>-create</code> . Specify the PRDB data directory; the default directory is <code>./&lt;id&gt;_prdb_work</code> .                                                      |
| <code>[-power_mode]</code>  | Suboption of <code>-create</code> . Specify the power mode for the PRDB. The default mode is dont care.                                                                                  |
| <code>[-power_rail]</code>  | Suboption of <code>-create</code> . Specify the power rail for PRDB. Default is dont care.                                                                                               |
| <code>[-assign2clk]</code>  | Suboption of <code>-create</code> . Allocate memory/flop/latch clock pin power to clock network.                                                                                         |
| <code>[-save_db]</code>     | Suboption of <code>-create</code> . Save the PRDB in cron format: <code>&lt;d&gt;</code> = day [1-31], <code>&lt;m&gt;</code> = month [1-12], <code>&lt;w&gt;</code> = day of week [1-7] |
| <code>[-record]</code>      | Record the current day's regression data in PRDB.                                                                                                                                        |
| <code>[-today]</code>       | Suboption of <code>-record</code> . Use the specified date to record instead of the current day's date.                                                                                  |
| <code>[-get]</code>         | Get the requested PRDB object. Some PRDB objects may require <code>&lt;val&gt;</code> .                                                                                                  |
| <code>[-key_val]</code>     | Suboption of <code>-get</code> . Some PRDB objects require <code>&lt;key_val&gt;</code> )                                                                                                |

For example:

```
-get item_id -key_val PD_alu : get item_id for  
PRDB object PD_alu
```

`[-load_config]`

Loads the specified configuration file.

`[-plot|-report]`

Specify whether to plot or report regression data.

For plot: x-axis = date, y-axis = power, line = inst or clock/  
power domain item

For report: row = date, col = inst or clock/power domain item)

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power\_regress

---

|                              |                                                                                                                                                                               |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-start_date]</code>   | Suboption of <code>-plot report</code> . Regression start date in <code>yyyy-mm-dd</code> format.                                                                             |
| <code>[-end_date]</code>     | Suboption of <code>-plot report</code> . Regression end date in <code>yyyy-mm-dd</code> format.                                                                               |
| <code>[-category]</code>     | Suboption of <code>-plot report</code> . Specify the cell categories to plot/report. Default is <code>all</code> .                                                            |
| <code>[-type]</code>         | Suboption of <code>-plot report</code> . Specify the cell type(s) to plot/report. Default is <code>total</code> .                                                             |
| <code>[-ykey]</code>         | Suboption of <code>-plot report</code> . Specify the <code>&lt;category&gt;:&lt;type&gt;</code> values to display on Y axis. By default, <code>all:total</code> is displayed. |
| <code>[-png]</code>          | Suboption of <code>-plot report</code> . Save the plot in the specified PNG file.                                                                                             |
| <code>[-inst]</code>         | List of root instances. The default is design root                                                                                                                            |
| <code>[-module]</code>       | Report all instances of the specified module(s).                                                                                                                              |
| <code>[-levels]</code>       | This suboption applies to <code>-inst  -module</code> . The default level is 0.                                                                                               |
| <code>[-clock_domain]</code> | Specify the clock domain(s) for the PRDB.                                                                                                                                     |
| <code>[-power_domain]</code> | Specify the power domain(s) for the PRDB.                                                                                                                                     |
| <code>[-stims]</code>        | Specify the stim ID(s) for the PRDB. By default, all stimuli is considered.                                                                                                   |
| <code>[-frames]</code>       | Specify the frame ID for the stimuli. By default, frame#0 of the specified stimuli is considered.                                                                             |

### Example(s)

- `report_power_regress -prdb_id cpu_10bit -create -work_dir cpu_10bit_prdb \`  
`-inst /cpu_10bit -levels 1 -power_domain PD_alu -clock_domain /cpu_10bit/clock \`  
`-save_db * * 7 ; # create PRDB of ID "cpu_10bit" and save db every sunday`
- `report_power_regress -load_config ./cpu_10bit_prdb_work/cpu_10it.prdb #loads`  
`PRDB data`
- `report_power_regress -reset_cache #resets all cache data`
- `report_power_regress -prdb_id cpu_10bit -record ;# record today's data`
- `report_power_regress -prdb_id cpu_10bit -plot -inst /cpu_10bit -category`  
`register logic clock -stim /stim#1 ; # plot/report PRDB history by category`

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_power\_regress

---

- `report_power_regress -prdb_id cpu_10bit -report -inst /cpu_10bit -type leakage internal switching total -stim /stim#2 ; # report by power_type`
- `report_power_regress -prdb_id cpu_10bit -plot -inst /cpu_10bit /cpu_10bit/DP -power_domain PD_alu -stim /stim#1 ; # plot by item (hierarchy, clock/power domain)`
- `report_power_regress -prdb_id cpu_10bit -report -ykey register:internal logic:switching -stim /stim#2 ; # report by mix of category X power_type`

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## get\_power\_rails

Returns list of all power rails in the libraries used for the design.

### Syntax

```
get_power_rails /  
  [-power_domain <pd_name>+]  
  [-rail_type <power_format|logical|both>]  
  [-domain <lib_domain_name>+]  
  [-lib <lib_name>+]  
  [-cell <cell_name>+]  
  [-inst <inst_name>+]  
  [-ldb_libpath [/libraries/][<domain>/]<lib>+]  
  [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>+]
```

### Options and Arguments

|                 |                                                                                                                                                                                                                                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]            | Displays help for all options.                                                                                                                                                                                                                                                                                    |
| [-power_domain] | Specify the power domain name for reporting.                                                                                                                                                                                                                                                                      |
| [-rail_type]    | Specify the rail type for reporting. <ul style="list-style-type: none"><li>■ power_format: Specifies rails from cpf or upf</li><li>■ logical: Specifies rails from library</li><li>■ both: Specifies rails from both cpf/upf and library</li></ul> By default, rails are specified from both cpf/upf and library. |
| [-domain]       | Specify the library domain name for reporting.                                                                                                                                                                                                                                                                    |
| [-lib]          | Specify the library name for reporting. By default, all libraries are considered.                                                                                                                                                                                                                                 |
| [-cell]         | Specify the cell name for reporting.                                                                                                                                                                                                                                                                              |
| [-inst]         | Specify the instance name for reporting.                                                                                                                                                                                                                                                                          |
| [-ldb_libpath]  | Specify full vdir path of the library.                                                                                                                                                                                                                                                                            |
| [-ldb_cellpath] | Specify full vdir path of the cell.                                                                                                                                                                                                                                                                               |

### Example(s)

- get\_power\_rails
- get\_power\_rails -domain lib\_1p08v

## **Joules Command and Attribute Reference**

### **Power Analysis and PPA Reporting Commands - get\_power\_rails**

---

■ `get_power_rails -lib slow -cell TLATX4`

#### **Return Value**

-1 indicates failure in execution.

#### **Related Topics**

■ [Power Analysis and Reporting](#)



## compute\_logic\_scale\_factor

Computes scaling factor to dampen amplification of activity through logic cones due to activity propagation.

### Syntax

```
compute_logic_scale_factor \  
  [-root <root_inst>]  
  [-stim <stim>+]  
  [-power_domain <power_domain>]  
  [-clock_domain <clock_domain>]  
  [-levels <levels>|<min_level>:<max_level>]  
  [-range <min> <max>]  
  [-max_factor <val>]  
  [-tcl]  
  [-legacy]  
  [-out <f_rpt>]  
  [-f_script <f_script>]  
    [-apply]  
  [-return error|factor]
```

## Options and Arguments

|                              |                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                      |
| <code>[-root]</code>         | Specify the root hierarchy for scaling factor computation. By default, design root is considered.                                   |
| <code>[-stim]</code>         | Specify the stim IDs for scaling factor computation. By default, average of all SDB stims is considered.                            |
| <code>[-power_domain]</code> | Specify the power domains for scaling factor computation. By default, all power domains are considered.                             |
| <code>[-clock_domain]</code> | Specify the clock domains for scaling factor computation. By default, all clock domains are considered.                             |
| <code>[-levels]</code>       | Specify the levels of hierarchies for computing scale factors. The default level is 2. The level of design root is considered as 0. |
| <code>[-range]</code>        | Reject computed scale factor if it falls outside the specified range. Default range is 0 to 1.                                      |
| <code>[-max_factor]</code>   | Specify maximum value of computed factor. Default is 1.0.                                                                           |
| <code>[-tcl]</code>          | Specify whether to use Tcl code. Default is yes.                                                                                    |
| <code>[-legacy]</code>       | Specify whether to use TUI for computing scale factors.                                                                             |
| <code>[-out]</code>          | Specify the file name to save the output report.                                                                                    |
| <code>[-f_script]</code>     | Generate Tcl script to apply computed logic scale factors for leaf hierarchies. By default, no script is generated.                 |
| <code>[-apply]</code>        | Sub-option of <code>-f_script</code> . Source the <code>&lt;f_script&gt;</code> in session. By default, it is set to false.         |
| <code>[-return]</code>       | Return either an error message or list of following triples:<br><code>&lt;factor&gt;:&lt;obj_type&gt;:&lt;obj_path&gt;</code>       |

## Example(s)

- `compute_logic_scale_factor -out joules_work/compute_logic_scale_factor.rpt`
- `compute_logic_scale_factor -root top -stim /stim#1`
- `compute_logic_scale_factor -return factor -clock_domain /top/clock`
- `compute_logic_scale_factor -power_domain PD_def`

## **Joules Command and Attribute Reference**

Power Analysis and PPA Reporting Commands - compute\_logic\_scale\_factor

---

### **Return Value**

0 indicates success, 1 indicates failure in execution.

### **Related Topics**

- [Power Analysis and Reporting](#)

## **read\_batch\_power\_report**

Reads the batch power report file and populates the cache.

### **Syntax**

```
read_batch_power_report \  
    [-rpt <batch report file>]
```

### **Options and Arguments**

|        |                                              |
|--------|----------------------------------------------|
| [-rpt] | Specify the batch power report file to read. |
|--------|----------------------------------------------|

### **Example(s)**

```
read_batch_power_report -rpt batch.power.rpt
```

## query\_batch\_power\_report

Displays or plots the power of selected frames, category, power type of the batch power report read using read\_batch\_power\_report.

### Syntax

```
query_batch_power_report \  
  [-power_type <leakage|internal|switching|dynamic|total|all>+]  
  [-category <memory|register|logic|clock|total|user_group|all>+]  
  [-levels num]  
  [-min_leaf_cnt num]  
  [-hinst inst_name+]  
  [-gname group_name+]  
  [-frames <frame_num|frame_range>+]  
  [-rail <rail_name|total|all>+]  
  [-show_rails]  
  [-power <avg|rpt> ]  
  [-plot]  
    [-format gnuplot|native|fsdb|shm|png]]  
    [-window_size N]  
    [-xkey simtime|frame_id]  
  [-peak N]  
    [-window_size N]  
  [-out output file]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                         |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-power_type]</code>   | Specify the type of power to report. Default is total.                                                                                                                                                                                  |
| <code>[-category]</code>     | Report power for the specified category. Default is total.                                                                                                                                                                              |
| <code>[-levels]</code>       | Specify the levels of hierarchy for power reporting. <ul style="list-style-type: none"><li>■ 0 = all hierarchies</li><li>■ 1 = only top</li><li>■ 2 = top and first level of hierarchies</li></ul> Default is 1                         |
| <code>[-min_leaf_cnt]</code> | Skips hierarchies with the leaf cells lesser with values than the specified value.                                                                                                                                                      |
| <code>[-hinst]</code>        | Specify the instance name.                                                                                                                                                                                                              |
| <code>[-gname]</code>        | Specify the group name.                                                                                                                                                                                                                 |
| <code>[-frames]</code>       | Specify either the specific frame numbers a range of frames for power reporting. By default, all frames are considered.                                                                                                                 |
| <code>[-rail]</code>         | Plots all specified rails' power across the given range of frames.<br><br><b>Note:</b> The argument 'total' includes rail "JLS_RAIL_TOTAL", that is, the total power.<br>It includes power for instances not attached to rails as well. |
| <code>[-show_rails]</code>   | Displays all the rails available in the batch power report.                                                                                                                                                                             |
| <code>[-power]</code>        | Specify whether to report average power or power of selected category, levels, frames.                                                                                                                                                  |
| <code>[-plot]</code>         | Plot the power of selected categories, levels, and frames.                                                                                                                                                                              |
| <code>[-format]</code>       | Sub-option of <code>-plot</code> .<br>Specify the plotting program to use. Default: native                                                                                                                                              |
| <code>[-window_size]</code>  | Sub-option of <code>-plot</code> .<br>Number of frames for one data point. Default is 1.                                                                                                                                                |
| <code>[-xkey]</code>         | Sub-option of <code>-plot</code> .<br><br>Show the value specified with this option on X axis. By default, simtime is displayed on X axis.                                                                                              |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - query\_batch\_power\_report

---

|                             |                                                                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------|
| <code>[-peak]</code>        | Find N number of peaks from batch mode file for selected categories, levels, frames. Default is 1. |
| <code>[-window_size]</code> | Suboption of <code>-peak</code> .<br>Number of frames for one data point. Default is 1.            |
| <code>[-out]</code>         | Write the data in the specified file.                                                              |

### Examples

- `query_batch_power_report -category memory register -levels 2 -frames 1:9 -power avg -out memory.rpt;`
- `query_batch_power_report -category all -levels 1 -frames 1:9 -plot -window_size 3;`
- `query_batch_power_report -category all -levels 1 -frames 1:9 -peak 2 -window_size 2;`
- `query_batch_power_report -category clock total register -levels 2 -power rpt;`
- `query_batch_power_report -category clock total register -power rpt -rail VDD;`
- `query_batch_power_report -category register -peak 3 -power_type leakage internal -rail VDD VSS;`
- `query_batch_power_report -category register -plot -power_type switching -frames 1:20 -rail VDD;`
- `query_batch_power_report -show_rails;`

## read\_power\_db

Reads the power information using the existing stored database so that you do not require to call `compute_power`.

### Syntax

```
read_power_db \  
  [-stims <stim_id>+]  
  [-format <sdb|adb|pdb>+]  
  [>|-base_name <base-(sdb|adb|pdb)-file-name>]
```

### Options and Arguments

|                           |                                                                                                                                                                            |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stims]</code>     | Specify stims to read. By default reads all SDB stims.                                                                                                                     |
| <code>[-format]</code>    | Specify file format to read. By default reads all.                                                                                                                         |
| <code>[-base_name]</code> | Specify the path and base filename for the output data<br>Default: joules_work/power_db/joules.sdb,<br>joules_work/power_db/joules.adb,<br>joules_work/power_db/joules.pdb |

### Example(s)

```
■ read_power_db -stims {/stim#5} ;  
  # read an sdb, adb and pdb file with all frames from /stim#5
```

### Return Value

0 for success, 1 indicates failure in execution.



## write\_power\_db

Writes the power database so that you will not have to call the `compute_power` twice.

### Syntax

```
write_power_db  
  [-stim <stim_id>+]  
  [-exclude <sdb | adb | pdb>+]  
  [>|-base_name <base-(sdb | adb | pdb)-file-name>]
```

### Option and Arguments

|                           |                                                                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stims]</code>     | Specify stims to write. By default will write all SDB stims.                                                                                                            |
| <code>[-exclude]</code>   | Exclude specified stims. By default will write all.                                                                                                                     |
| <code>[-base_name]</code> | Specify the path and base filename for output data.<br>Default: joules_work/power_db/joules.sdb,<br>joules_work/power_db/joules.adb,<br>joules_work/power_db/joules.pdb |

### Example(s)

- `write_power_db ;`  
# create joules\_work/power\_db/joules.sdb, joules\_work/power\_db/joules.adb, joules\_work/power\_db/joules.pdb (default SDB|ADB|PDB file name) with all frames from all stims
- `write_power_db -base_name cpu_10bit.sdb cpu_10bit.adb, cpu_10bit.pdb;`  
# create ./cpu\_10bit.sdb with all frames from all stims
- `write_power_db -stims {/stim#5} ;`  
# create an sdb, adb and pdb file with all frames from /stim#5

### Return Value

0 for success, 1 indicates failure in execution.

## query\_batch\_activity\_report

Displays or plots the duties or activities for different frames, categories, or hierarchies.

### Syntax

```
query_batch_activity_report \  
  [-activity_type <duty|toggle|all>+]  
  [-category <memory|register|logic|clock|bbox|total|all>+]  
  [-levels <num>]  
  [-min_leaf_cnt <num>]  
  [-frames <frame_num|frame_range>+]  
  [-activity <avg|rpt> ]  
  [-plot]  
    [-format gnuplot|native|png]  
    [-window_size <N>]  
    [-xkey simtime|frame_id]  
  [-peak <N>]  
  [-window_size <N>]  
  [-out <output file>]
```

### Options and Arguments

|                               |                                                                                                                                                          |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-activity_type]</code> | Specify the type of activity to report. Default: all                                                                                                     |
| <code>[-category]</code>      | Report activity for the specified category. Default is total.                                                                                            |
| <code>[-levels]</code>        | Specify the levels of hierarchy for activity reporting.<br>0 = all hierarchies<br>1 = only top<br>2 = top and first level of hierarchies<br>Default is 1 |
| <code>[-min_leaf_cnt]</code>  | Skips hierarchies with the leaf cells lesser with values than the specified value.                                                                       |
| <code>[-frames]</code>        | Specify either the specific frame numbers a range of frames for activity reporting. By default, all frames are considered.                               |
| <code>[-activity]</code>      | Report average activities or activities of selected category, levels, frames.                                                                            |
| <code>[-plot]</code>          | Plot the activity of selected categories, levels, and frames.                                                                                            |
| <code>[-format]</code>        | Sub-option of <code>-plot</code> .<br>Specify the plotting program to use. Default: gnuplot                                                              |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - query\_batch\_activity\_report

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|                             |                                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-window_size]</code> | Sub-option of <code>-plot</code> .<br>Number of frames for one data point. Default is 1.                                                            |
| <code>[-xkey]</code>        | Sub-option of <code>-plot</code> .<br>Show the value specified with this option on X axis. By default, <code>simtime</code> is displayed on X axis. |
| <code>[-peak]</code>        | Find N number of peaks from batch mode file for selected categories, levels, frames. Default is 1.                                                  |
| <code>[-window_size]</code> | Sub-option of <code>-peak</code> .<br>Number of frames for one data point. Default is 1.                                                            |
| <code>[-out]</code>         | Write the data in the specified file.                                                                                                               |

### Examples

■ `query_batch_activity_report -window_size 5 -out window_5_activity.rpt;`

## **read\_batch\_activity\_report**

Reads the batch activity report file and populates the data.

### **Syntax**

```
read_batch_activity_report \  
    [-rpt <batch activity report file>]
```

### **Options and Arguments**

|        |                                                 |
|--------|-------------------------------------------------|
| [-rpt] | Specify the batch activity report file to read. |
|--------|-------------------------------------------------|

### **Examples**

■ `read_batch_activity_report -rpt batch_activity.rpt ;`

## merge\_batch\_activity\_reports

Merges all the partial batch activity reports.

### Syntax

```
merge_batch_activity_reports \  
    [-rpt_info_file] <report info file>  
    [-reports_dir <reports directory>]  
    [-out] <merged output file>
```

### Options and Arguments

|                               |                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------|
| <code>[-rpt_info_file]</code> | Specify the report info file.                                                    |
| <code>[-report_dir]</code>    | Specify the reports directory. By default chooses the present working directory. |
| <code>[-out]</code>           | Specify the name of merged output file.                                          |

### Examples

■ `merge_batch_activity_reports -rpt_info_file info_file.rpt -out merged.rpt;`

## merge\_batch\_power\_reports

Merges all the partial batch power reports.

### Syntax

```
merge_batch_power_reports \  
    [-rpt_info_file] <report info file>  
    [-reports_dir <reports directory>]  
    [-out] <merged output file>
```

### Options and Arguments

|                               |                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------|
| <code>[-rpt_info_file]</code> | Specify the report info file.                                                    |
| <code>[-report_dir]</code>    | Specify the reports directory. By default chooses the present working directory. |
| <code>[-out]</code>           | Specify the name of merged output file.                                          |

### Examples

```
■ merge_batch_power_reports -rpt_info_file info_file.rpt -out merged.rpt;
```

## report\_peak2avg

Reports peak2avg power analysis around peak frame for provided window size. It also reports max power window for given frame range and window size.

**Note:** You should have batch power report file generated for peak2avg or max sliding window analysis before executing this command.

### Syntax

```
report_peak2avg \  
  [-f_data <f_data>]  
  [-force]  
  [-analysis_type <sliding|adjacent_window|adjacent_frame|sliding_around_peak>]  
  [-frame_size <num_cycles>]  
  [-window_size <num_frames>]  
  [-window_stride <num_frames>]  
  [-num_window <number_of_window/all>]  
  [-sort_by <power|frames>]  
  [-get_max_window_info <time_range|frame_range|power/all>]  
  [-type <dynamic|total>]  
  [>|-out <f_report>] [-append]  
  [-start_frame <start_frame>]  
  [-end_frame <end_frame>]  
  [-plot]  
    [-ykey <peak2avg/peak_power/window_avg/frame_power/  
      Prev_frame_power/adjacent_power_diff>]  
    [-format <gnuplot|native/png>]
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_peak2avg

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#### Options and Arguments

|                                     |                                                                                                                                                                                                           |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                   | Displays help for all the options.                                                                                                                                                                        |
| <code>[-f_data]</code>              | Specify batch file for peak power analysis.                                                                                                                                                               |
| <code>[-force]</code>               | Sub-option of <code>-f_data</code> .<br><br>Force option to read database again for same file. Default is false.                                                                                          |
| <code>[-analysis_type]</code>       | Specify type of analysis.                                                                                                                                                                                 |
| <code>[-frame_size]</code>          | Specify the number of frames user want to merge as single frame.<br><br>For example: Total Frames: 20<br><code>-frame_size</code> option value 5<br>New Total frames for analysis: 4<br><br>Default is 1. |
| <code>[-window_size]</code>         | Specify the frames window size for which you want to do peak power or sliding window analysis. Default is 50.                                                                                             |
| <code>[-window_stride]</code>       | Number of frames you want to shift. Default is 1.                                                                                                                                                         |
| <code>[-num_window]</code>          | Number of max peak power windows to report. By default, top 10 windows will be reported.                                                                                                                  |
| <code>[-sort_by]</code>             | Sort based on power or frames. Default is power.                                                                                                                                                          |
| <code>[-get_max_window_info]</code> | Returns the max power or <code>peak2avg</code> window information.                                                                                                                                        |
| <code>[-type]</code>                | Specify Power Analysis type.                                                                                                                                                                              |
| <code>[-out]</code>                 | Specify file name to redirect report.                                                                                                                                                                     |
| <code>[-start_frame]</code>         | Use to specify start frame for analysis. By default, start frame is 1.                                                                                                                                    |
| <code>[-end_frame]</code>           | Use to specify end frame for analysis.<br><br>Default: <code>total_frames/frame_size</code> .                                                                                                             |
| <code>[-plot]</code>                | Specifies the plot information for the selected column.                                                                                                                                                   |
| <code>[-ykey]</code>                | Selects the ykey.                                                                                                                                                                                         |
| <code>[-format]</code>              | Selects the plot format.<br><br>Default: native                                                                                                                                                           |



## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_peak2avg

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#### Examples

- `set f_data joules_work/cpu_10bit_pgm_gcf.power_profile.rpt`
- `report_peak2avg -f_data $f_data -frame_size 3 -window_size 5 ;# window = 5 frames`

If `$f_data` has not changed, it will not be re-read.

- `report_peak2avg -f_data $f_data -frame_size 5 -window_size 6 -num_window 5 ;# window = 6 frames`
- `report_peak2avg -f_data $f_data -analysis_type adjacent_window -start_frame 4 -end_frame 95 -window_size 5`
- `report_peak2avg -f_data $f_data -analysis_type sliding_around_peak -start_frame 4 -end_frame 95 -window_size 5 -get_max_window_info time_range`

## report\_tile\_power

Dumps tile-based power reports.

### Syntax

```
report_tile_power  
  [-tile <rowXcol | widthuXheightu>]  
  [-type <leakage internal switching total all>+]  
  [-category <memory register latch logic clock pm>+]  
  [-include_tile_details]  
  [-include_inst_details]  
  [-save]  
  [-out <out_file>]  
  [-plot]  
  [-unit <unit_val>]  
  [-format <fmt>]  
  [-get]  
  [-tile_details]  
  [-insts_by_tile <tile_info>]  
  [-power_by_tile <tile_info>]  
  [-peak_tiles <N>]
```

## Options and Arguments

|                                      |                                                                                                                                                                                                                                                                                                               |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-tile]</code>                 | <p>Divides the tile size into specified rows and columns. It also removes previous cached data and computes it based on the new tile. If the tile is not specified, then this parameter uses the previous cached data.</p> <p>Format: rowCntXcolCnt or &lt;width&gt;uX&lt;height&gt;u, u refers to micron</p> |
| <code>[-type]</code>                 | <p>Specifies the type of power to be reported.</p> <p>Default: total</p>                                                                                                                                                                                                                                      |
| <code>[-category]</code>             | <p>Reports tile power for the specified design element categories.</p> <p>Default: no category based power</p>                                                                                                                                                                                                |
| <code>[-include_tile_details]</code> | <p>Specifies that the output file will have tile details.</p> <p>Default: no</p>                                                                                                                                                                                                                              |
| <code>[-include_inst_details]</code> | <p>Specifies that the output file will have instance details of each tile.</p> <p>Default: no</p>                                                                                                                                                                                                             |
| <code>[-save]</code>                 | <p>Saves the generated data.</p>                                                                                                                                                                                                                                                                              |
| <code>[-out]</code>                  | <p>Writes the tile information onto the disk.</p>                                                                                                                                                                                                                                                             |
| <code>[-plot]</code>                 | <p>Plots the tile power data.</p> <p>Default: no</p>                                                                                                                                                                                                                                                          |
| <code>[-unit]</code>                 | <p>Specifies the units in which the power values are needed to be dumped.</p>                                                                                                                                                                                                                                 |
| <code>[-format]</code>               | <p>Specifies the format to print the power numbers.</p>                                                                                                                                                                                                                                                       |
| <code>[-get]</code>                  | <p>Based on the stored data, either stores in the current or previous session.</p> <p>Default: no</p>                                                                                                                                                                                                         |
| <code>[-tile_details]</code>         | <p>Prints the tile grid.</p> <p>Default: no</p>                                                                                                                                                                                                                                                               |
| <code>[-insts_by_tile]</code>        | <p>Prints the instance information of the specified tile.</p> <p>Format: rowNoXcolNo</p>                                                                                                                                                                                                                      |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_tile\_power

---

`[-power_by_tile]` Prints the power information of the specified tile.  
Format: rowNoXcolNo

`[-peak_tiles]` Prints the information of the peak tiles.  
Default: 5

### Examples

- `report_tile_power -tile 5X5 -type internal -category register -out out_5x5_internal_flop.rpt -unit nW`
- `report_tile_power -tile 500uX500u -out out_tile500uX500u.rpt -unit nW -plot -save`
- `report_tile_power -get -insts_by_tile 2x3`

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

---

## report\_energy

Reports energy for the specified parameter.

### Syntax

```
report_energy \  
  [-stims {<stim_id>}+]   
  [-frames {<frame_id> | <frame_range>}+]   
  [-inst {<inst-path>}+]   
  [-module {<module-name>}+]   
    [-levels <levels>|all]   
  [-no_glitch <TG|IG|Both>]   
  [-clock_domain {<prim-clock-net>}+]   
  [-power_domain {<domain-name>}+]   
  [-collate frames|hier|domain|all|none]   
  [-power_mode {<power_mode>}]   
  [-power_rail {<power_rail>}+]   
  [-rail_type <power_format|logical|both>]   
  [-assign2clk {memory|register|latch|pad}+]   
  [-by category]   
    [-cols {cells|area|leakage|internal|switching|clkpin|static|   
            dynamic|tginternal|tgswitching|tgclkpin|tgdynamic|iginternal|   
            igclkpin|igdynamic|total}+]   
  [-category {memory|register|latch|logic|bbox|clock|clock_comb|clock_seq|   
            pad|pm|physical_only_cells}+]   
  [-sort_by category[:<type>]]   
  [-reassign power_from_cat to_cat [iter]]   
    [-root hier_inst]   
    [-module {module-name}+]   
      [-levels levels|all]   
    [-power_domain power_domain]   
    [-clock_domain clock_domain]   
    [-power_rail {power_rail}]   
    [-rail_type power_format|logical|both]   
    [-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|   
              add|sub|mult|div|decoder|comp|shift|mmux|buf|inv|and|   
              nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|   
              fadd|hadd|delay|iso|srpg|ls|els|ps|bbox}+]   
    [-rtl_group {seq|macro|alu|dpx|logic|pm}+]   
    [-name glob]   
    [-cell glob]   
    [-lib glob]   
      [-nocase]   
      [-invert]   
  [-by hierarchy]   
    [-levels num]   
    [-min_leaf cnt min]   
    [-cols {cells|pct_cells|flops|pct_flops|area|pct_area|dynamic|   
            pct_leakage|pct_internal|pct_switching|pct_dynamic|pct_power|   
            module|hier|level|leakage_density|internal_density|   
            dynamic_density|switching_density|static_density|total_density|   
            leakage|internal|switching|clkpin|static|dynamic|tginternal|   
            tgswitching|tgclkpin|tgdynamic|iginternal|igclkpin|igdynamic|   
            total}+]   
  [-category {memory|register|latch|logic|bbox|clock|pad|pm}+]   
  [-sort_by leakage|internal|switching|clkpin|static|dynamic|tginternal|   
            tgswitching|tgclkpin|tgdynamic|iginternal|igclkpin|igdynamic|
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

---

```
total|none]
[-exclude_down_hier]
[-indent_inst]
[-by_leaf_instance]
[-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|sub|
mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|nor|xor|
xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|
ls|els|ps|bbox)+}]
[-rtl_group {seq|macro|alu|dpx|logic|pm)+}]
[-leaf_macro|gate]
[-cell_glob]
[-lib_glob]
[-name_glob]
[-nocase]
[-invert]
[-cols {cell|lib|domain|type|leakage|internal|switching|clkpin|static|
dynamic|tginternal|tgswitching|tgclkpin|tgdynamic|iginternal|
igclkpin|igdynamic|total)+}]
[-sort_by leakage|internal|switching|clkpin|static|dynamic|tginternal|
tgswitching|tgclkpin|tgdynamic|iginternal|igclkpin|igdynamic|
total]
[-increasing]
[-max_num]
[-by_rail]
[-cols {leakage|internal|switching|clkpin|static|dynamic|tginternal|
tgswitching|tgclkpin|tgdynamic|iginternal|igclkpin|igdynamic|
total)+}]
[-category {memory|register|latch|logic|bbox|clock|pad|pm)+}]
[-exclude_zero_power_rail]
[-by_func_type]
[-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|
sub|mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|
nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|
iso|srpg|ls|els|ps|bbox)+}]
[-rtl_group {seq|macro|alu|dpx|logic|pm)+}]
[-cell_glob]
[-lib_glob]
[-name_glob]
[-nocase]
[-invert]
[-cols {instances|tginternal|tgswitching|iginternal|leakage|
internal|switching|total|type)+}]
[-sort_by instances|tginternal|tgswitching|iginternal|leakage|internal|
switching|total|type]
[-increasing]
[-by_libcell]
[-rtl_type {hier|hadd|fadd|bbox|memory|register|flop|latch|icgc|add|
sub|mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|
nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|
iso|srpg|ls|els|ps|bbox)+}]
[-rtl_group {seq|macro|alu|dpx|logic|pm)+}]
[-cell_glob]
[-lib_glob]
[-name_glob]
[-nocase]
[-invert]
[-cols {instances|domain|leakage|internal|switching|total|cell|lib)+}]
[-sort_by instances|domain|leakage|internal|switching|total|cell|lib]
[-increasing]
[-eunit J|mJ|uJ|nJ|pJ]
[-format <format>]
```

## **Joules Command and Attribute Reference**

### Power Analysis and PPA Reporting Commands - report\_energy

---

```
[-header]  
[-skip_port_switching_energy]  
[>|-out <output-file-name>] [-append] [-csv]
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

---

#### Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stims]</code>        | Reports power for specified list of stims. By default, all stimulus is reported.                                                                                                                                                                                                                                                                                                                             |
| <code>[-frames]</code>       | Reports power for specified list of SDB frames. By default, power for all SDB frames will be reported.                                                                                                                                                                                                                                                                                                       |
| <code>[-inst]</code>         | Specifies the list of root hierarchical instances for the energy report.                                                                                                                                                                                                                                                                                                                                     |
| <code>[-module]</code>       | Specifies the RTL module name. If specified, all instances of the specified module are selected for power reporting.                                                                                                                                                                                                                                                                                         |
| <code>[-levels]</code>       | Specifies the sub-option of <code>-module</code> . If specified, power is reported for all hierarchical instances found upto the specified level (the level for the specified root = 0).<br>Default: 0                                                                                                                                                                                                       |
| <code>[-no_glitch]</code>    | Skips considering the specified glitch energy separately.                                                                                                                                                                                                                                                                                                                                                    |
| <code>[-clock_domain]</code> | Reports power for the specified clock domain.                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-power_domain]</code> | Reports power for the specified power domain.                                                                                                                                                                                                                                                                                                                                                                |
| <code>[-collate]</code>      | Collates power reports across the frames, hierarchical instances, clock/power domains, or all of these. By default, the report is collated across frames.                                                                                                                                                                                                                                                    |
| <code>[-power_mode]</code>   | Reports power for the specified power mode. The default power mode is <code>dont care</code> .                                                                                                                                                                                                                                                                                                               |
| <code>[-power_rail]</code>   | Reports power for the specified power rail. The default power mode is <code>dont care</code> .                                                                                                                                                                                                                                                                                                               |
| <code>[-rail_type]</code>    | Specify the rail type for reporting. <ul style="list-style-type: none"><li>■ <code>power_format</code>: Specifies rails from <code>cpf</code> or <code>upf</code></li><li>■ <code>logical</code>: Specifies rails from library</li><li>■ <code>both</code>: Specifies rails from both <code>cpf/upf</code> and library</li></ul> By default, rails are specified from both <code>cpf/upf</code> and library. |
| <code>[-assign2clk]</code>   | Allocates energy of memory/flop/latch clock pin and pad in the clock path to the clock network.                                                                                                                                                                                                                                                                                                              |
| <code>[-by_category]</code>  | Reports energy by category.                                                                                                                                                                                                                                                                                                                                                                                  |



## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-cols]</code>           | <p>Suboption of <code>-by_category</code>.</p> <p>Specify the columns to report. Default columns are:</p> <pre>leakage internal switching</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <code>[-category]</code>       | <p>Suboption of <code>-by_category</code>.</p> <p>Report energy by the selected category.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-sort_by]</code>        | <p>Suboption of <code>-by_category</code>.</p> <p>Sort the output based on the selected parameter.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-reassign_power]</code> | <p>Suboption of <code>-by_category</code>.</p> <p>Redistribute power of leaf instances specified using suboptions below from <code>&lt;from_cat&gt;</code> to <code>&lt;to_cat&gt;</code>.</p> <p>You can specify multiple <code>-reassign_power</code> options in the same command. Consider the following sample usage:</p> <pre>set iter1 [get_insts -iter -cell *BBND*] set iter2 [get_insts -iter -cell lef*] report_power -unit mW -format %.5f \ -category memory register latch logic bbox clock_comb clock_seq pad pm \ -cols internal switching leakage total \ -reassign_power bbox logic \$iter1 \ -reassign_power bbox memory \$iter2</pre> |
| <code>[-root]</code>           | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistribute power in leaf instances in the specified hierarchical instance. By default, the hierarchical instance specified with <code>-inst</code> option is considered.</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-module]</code>         | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the module(s) for power redistribution.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-levels]</code>         | <p>Suboption of <code>-module</code>.</p> <p>Specify the module level(s). Default is 0.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-power_domain]</code>   | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistribute power in leaf instances in the specified power domain.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                              |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-clock_domain]</code> | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistribute power in leaf instances in the specified clock domain.</p>                                                                                                                                                                                                                                                                                             |
| <code>[-power_rail]</code>   | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the power rail for power redistribution. The default group is dont care.</p>                                                                                                                                                                                                                                                                                |
| <code>[-rail_type]</code>    | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the rail type for reporting.</p> <ul style="list-style-type: none"><li>■ <code>power_format</code>: Specifies rails from cpf or upf</li><li>■ <code>logical</code>: Specifies rails from library</li><li>■ <code>both</code>: Specifies rails from both cpf/upf and library</li></ul> <p>By default, rails are specified from both cpf/upf and library.</p> |
| <code>[-rtl_type]</code>     | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the RTL type(s) for power redistribution. The default group is any.</p>                                                                                                                                                                                                                                                                                     |
| <code>[-rtl_group]</code>    | <p>Suboption of <code>-reassign_power</code>.</p> <p>Specify the RTL group(s) for power redistribution. The default group is any.</p>                                                                                                                                                                                                                                                                                    |
| <code>[-name]</code>         | <p>Suboption of <code>-reassign_power</code>.</p> <p>Consider leaf instances matching the specified pattern.</p>                                                                                                                                                                                                                                                                                                         |
| <code>[-cell]</code>         | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistribute leaf instances mapped to cell matching the specified pattern.</p>                                                                                                                                                                                                                                                                                      |
| <code>[-lib]</code>          | <p>Suboption of <code>-reassign_power</code>.</p> <p>Redistribute leaf instances mapped to cell in library matching the specified pattern.</p>                                                                                                                                                                                                                                                                           |
| <code>[-nocase]</code>       | <p>Suboption of <code>-lib</code>.</p> <p>Perform case-insensitive name match.</p>                                                                                                                                                                                                                                                                                                                                       |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                                   |                                                                                                                                                                                         |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-invert]</code>            | Suboption of <code>-lib</code> .<br><br>Invert name match.                                                                                                                              |
| <code>[-by_hierarchy]</code>      | Reports hierarchical energy table.                                                                                                                                                      |
| <code>[-levels]</code>            | Suboption of <code>-by_hierarchy</code> .<br><br>Number of levels to report. Default is 2.                                                                                              |
| <code>[-min_leaf_cnt]</code>      | Suboption of <code>-by_hierarchy</code> .<br><br>Skip hierarchies with leaf cells less than the specified value.                                                                        |
| <code>[-cols]</code>              | Suboption of <code>-by_hierarchy</code> .<br><br>Specify columns to report. Default columns are<br><br>cells pct_cells leakage internal switching<br>total level hier                   |
| <code>[-cols]</code>              | Suboption of <code>-by_hierarchy</code> .<br><br>Specify the columns to show in power table. Default columns are:<br><br>cells pct_cells leakage internal switching<br>total level hier |
| <code>[-sort_by]</code>           | Suboption of <code>-by_hierarchy</code> .<br><br>Sort the report based on the specified parameter.                                                                                      |
| <code>[-exclude_down_hier]</code> | Suboption of <code>-by_hierarchy</code> .<br><br>Report hierarchy power with only leaf instances at the same level.                                                                     |
| <code>[-indent_inst]</code>       | Suboption of <code>-by_hierarchy</code> .<br><br>Indentation to report for the instance. By default, full inst path is reported.                                                        |
| <code>[-by_leaf_instance]</code>  | Reports energy by leaf instances.                                                                                                                                                       |
| <code>[-rtl_type]</code>          | Suboption of <code>-by_leaf_instance</code> .<br><br>Used to select the type of leaf instance for reporting.                                                                            |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                           |                                                                                                                                                                                                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-rtl_group]</code> | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Used to select the type of leaf instance for reporting. Each RTL group above is mapped to a set of RTL types. Mappings of these RTL groups to RTL types are saved in the global Tcl variable <code>RTLSCellInfo(group, group_name)</code>.</p> |
| <code>[-leaf]</code>      | <p>Suboption of <code>-by_leaf_instance</code></p> <p>Directs Joules to treat either a macro (for example, adder, multiplier) or gate (library element) as the leaf instance.</p>                                                                                                                     |
| <code>[-cell]</code>      | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Leaf instances mapped to cell matching the specified pattern.</p>                                                                                                                                                                              |
| <code>[-lib]</code>       | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Leaf instances mapped to cell in library matching the specified pattern.</p>                                                                                                                                                                   |
| <code>[-name]</code>      | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Used to match the leaf instance by name (using glob expression), case insensitive match, and inverting the match.</p>                                                                                                                          |
| <code>[-nocase]</code>    | <p>Suboption of <code>-name</code>.</p> <p>Case sensitive name match.</p>                                                                                                                                                                                                                             |
| <code>[-invert]</code>    | <p>Suboption of <code>-name</code>.</p> <p>Filter out names that match the pattern and return those that do not.</p>                                                                                                                                                                                  |
| <code>[-cols]</code>      | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Columns to report. Default columns that are reported are:</p> <p>leakage internal switching total leaf</p>                                                                                                                                     |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                                         |                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-sort_by]</code>                 | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>If multiple tables are displayed (for example, for several hierarchical instances), sort the order in which the tables are displayed by the specified category (register, memory, logic, clock, etc.) and optionally power type (leakage, internal, switching).</p> <p>By default, the tables are sorted by 'total'.</p> |
| <code>[-increasing]</code>              | <p>Suboption of <code>-sort_by</code>.</p> <p>Sort by increasing order. If not specified, the data is sorted in decreasing order.</p>                                                                                                                                                                                                                                           |
| <code>[-max]</code>                     | <p>Suboption of <code>-by_leaf_instance</code>.</p> <p>Reports specified number of instances.</p>                                                                                                                                                                                                                                                                               |
| <code>[-by_rail]</code>                 | <p>Reports energy by rail.</p>                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-cols]</code>                    | <p>Suboption of <code>-by_rail</code>.</p> <p>Specify the columns to report. Default columns are leakage internal switching</p>                                                                                                                                                                                                                                                 |
| <code>[-category]</code>                | <p>Suboption of <code>-by_rail</code>.</p> <p>Report the power in the given category.</p>                                                                                                                                                                                                                                                                                       |
| <code>[-exclude_zero_power_rail]</code> | <p>Suboption of <code>-by_rail</code>.</p> <p>Reports only non-zero power for each rail. Only available for <code>-by_rail</code> flow.</p>                                                                                                                                                                                                                                     |
| <code>[-by_func_type]</code>            | <p>Reports energy by function type.</p>                                                                                                                                                                                                                                                                                                                                         |
| <code>[-rtl_type]</code>                | <p>Suboption of <code>-by_func_type</code>.</p> <p>Select the RTL type for reporting.</p>                                                                                                                                                                                                                                                                                       |
| <code>[-rtl_group]</code>               | <p>Suboption of <code>-by_func_type</code>.</p> <p>Each RTL group above is mapped to a set of RTL types. Mappings of these RTL groups to RTL types are saved in the global Tcl variable <code>RTLSCellInfo(group, group_name)</code>.</p>                                                                                                                                       |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                            |                                                                                                                                                             |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-cell]</code>       | Suboption of <code>-by_func_type</code> .<br><br>Specify cells for reporting.                                                                               |
| <code>[-lib]</code>        | Suboption of <code>-by_func_type</code> .<br><br>Specify cell libraries for reporting.                                                                      |
| <code>[-name]</code>       | Suboption of <code>-by_func_type</code> .<br><br>Used to match the cell names (using glob expression), case insensitive match, and inverting the match.     |
| <code>[-nocase]</code>     | Suboption of <code>-name</code> .<br><br>Case sensitive name match.                                                                                         |
| <code>[-invert]</code>     | Suboption of <code>-name</code> .<br><br>Filter out names that match the pattern and return those that do not.                                              |
| <code>[-cols]</code>       | Sub-option of <code>-by_func_type</code> .<br><br>Specify the columns to report. Default columns reported are:<br><br>leakage internal switching total type |
| <code>[-sort_by]</code>    | Sub-option of <code>-by_func_type</code> .<br><br>Sort the report by specified criteria. By default, the report is unsorted.                                |
| <code>[-increasing]</code> | Sub-option of <code>-sort_by</code> .<br><br>Sort the report by increasing order of the specified criteria. The default is set to decreasing order.         |
| <code>[-by_libcell]</code> | Reports energy by library cell.                                                                                                                             |
| <code>[-rtl_type]</code>   | Suboption of <code>-by_libcell</code> .<br><br>Used to select the RTL type for reporting.                                                                   |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                            |                                                                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-rtl_group]</code>  | <p>Suboption of <code>-by_libcell</code>.</p> <p>Each RTL group above is mapped to a set of RTL types. Mappings of these RTL groups to RTL types are saved in the global Tcl variable <code>RTLS_CellInfo(group, group_name)</code>.</p> |
| <code>[-cell]</code>       | <p>Suboption of <code>-by_libcell</code>.</p> <p>Specify cells for reporting.</p>                                                                                                                                                        |
| <code>[-lib]</code>        | <p>Suboption of <code>-by_libcell</code>.</p> <p>Specify cell libraries for reporting.</p>                                                                                                                                               |
| <code>[-name]</code>       | <p>Suboption of <code>-by_libcell</code>.</p> <p>Used to match cell names (using glob expression), case insensitive match, and inverting the match.</p>                                                                                  |
| <code>[-nocase]</code>     | <p>Suboption of <code>-name</code>.</p> <p>Case sensitive name match.</p>                                                                                                                                                                |
| <code>[-invert]</code>     | <p>Suboption of <code>-name</code>.</p> <p>Filter out names that match the pattern and return those that do not.</p>                                                                                                                     |
| <code>[-cols]</code>       | <p>Sub-option of <code>-by_libcell</code>.</p> <p>Specify the columns to report. Default columns reported are:</p> <p>leakage internal switching total cell lib</p>                                                                      |
| <code>[-sort_by]</code>    | <p>Sub-option of <code>-by_libcell</code>.</p> <p>Sort the report by specified criteria. By default, the report is unsorted.</p>                                                                                                         |
| <code>[-increasing]</code> | <p>Sub-option of <code>-sort_by</code>.</p> <p>Sort the report by increasing order of the specified criteria. The default is set to decreasing order.</p>                                                                                |
| <code>[-eunit]</code>      | <p>Specifies the unit for the power profile.</p> <p>Default: J</p>                                                                                                                                                                       |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_energy

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|                                            |                                                                                                                                                                            |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-format]</code>                     | Specifies the format of the report data.<br>Default: Value of <code>power_format</code> attribute                                                                          |
| <code>[-header]</code>                     | Generates report header.<br>Default: false                                                                                                                                 |
| <code>[-skip_port_switching_energy]</code> | Prevents adding of the primary ports' switching energy to the switching energy section.                                                                                    |
| <code>[&gt; -out]</code>                   | Saves the power report in the specified file. If <code>-append</code> is specified, it appends the power report to the file, instead of overwriting it (which is default). |
| <code>[-append]</code>                     | Appends the energy report to the specified file.                                                                                                                           |
| <code>[-csv]</code>                        | Generates the energy report in the Excel style (Comma Separated Values).                                                                                                   |

### Examples

- `report_energy ;# reports energy for top level design(s)`
- `report_energy -frames /stim#1/frame#1 {/stim#1/frame#[5:8]}`
- `report_energy -module cpu_10bit__fsm`
- `report_energy -inst /cpu_10bit/DP -levels 1`
- `report_energy -help -by_hier ;# show suboptions of -by_hier`



## plot\_energy

Plots the energy values over the given frames or for all the frames in a stimulus.

### Syntax

```
plot_energy \  
  [-stim {<stim_id>}]  
  [-frames {<frame_id>|<frame_range>}+]  
  [-inst <inst>+]  
  [-module {<module_name>}+]  
  [-clock_domain {<prim_clock_net>}+]  
  [-power_domain {<domain_name>}+]  
  [-by_category [{memory|register|latch|logic|bbox|clock|pad|pm|total}+]]  
  [-type [{leakage|internal|switching|dynamic|total}+]]  
  [-unit J|mJ|uJ|nJ|pJ|fJ|aJ]  
  [-xkey simtime|frame_id]  
  [-format native|png]  
  [-yrange <yrange>]  
  [-cumulative]  
  [>|-out <f_dat>]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-stim]</code>         | <p>Specifies the list of stim IDs whose frames are used for plotting the energy values.</p> <p>By default, the first STB stim is used.</p>                                                                        |
| <code>[-frames]</code>       | <p>Specifies the list of frames considered for plotting energy. The frames can be provided as a range as well.</p> <p><b>Note:</b> Frames must be contiguous.</p>                                                 |
| <code>[-inst]</code>         | <p>List of hierarchical or leaf instances to be considered for energy calculation. The default is design root.</p>                                                                                                |
| <code>[-module]</code>       | <p>The module name in the design whose instances need to be considered for energy calculation.</p>                                                                                                                |
| <code>[-clock_domain]</code> | <p>Specifies the clock domain instances which can be considered for the energy calculation.</p>                                                                                                                   |
| <code>[-power_domain]</code> | <p>Specifies the power domain instances which can be considered for the energy calculation.</p>                                                                                                                   |
| <code>[-by_category]</code>  | <p>Specifies the categories of instances to be picked from the given hierarchical instance list of design root. By default, “total” is used.</p> <p><b>Note:</b> This option does not work on leaf instances.</p> |
| <code>[-type]</code>         | <p>Specifies the type of energy to be used for plotting. By default, “total” is used.</p>                                                                                                                         |
| <code>[-unit]</code>         | <p>Specifies the unit to display energy. Default = fJ.</p>                                                                                                                                                        |
| <code>[-xkey]</code>         | <p>Specifies the x-axis of the plot. It can be either of simulation time or frame IDs.</p> <p>By default, frame ID is used.</p>                                                                                   |
| <code>[-format]</code>       | <p>Specifies whether to display the plot or dump it in a png format. By default, the native format is used.</p>                                                                                                   |
| <code>[-yrange]</code>       | <p>Specifies the lower and upper range for energy numbers in y-axis.</p>                                                                                                                                          |
| <code>[-cumulative]</code>   | <p>Plots the cumulative energy values over all the frames.</p>                                                                                                                                                    |
| <code>[-out]</code>          | <p>Specifies the name of the output image file.</p> <p>The default is <code>joules_work/<br/>joules_waveform_pwr.&lt;format&gt;</code></p>                                                                        |

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - plot\_energy

---

#### Example(s)

- `plot_energy -frames /stim#1/frame#1 {/stim#1/frame#[2:9]}`
- `plot_energy -by_category memory`
- `plot_energy -type internal`
- `plot_energy -by_category logic -inst [get_insts -rtl_type hier -levels 1:1]`
- `plot_energy -clock_domain /cpu_10bit/clock`

## **get\_category**

Returns the category of the specified instance.

### **Syntax**

```
get_category \  
  [-inst <inst>]
```

### **Options and Arguments**

[-inst]            Specify the instance name.

### **Example(s)**

```
■ get_category -inst [vfind / -inst /joules_top/and_inst_1 ]
```

## report\_category\_power

Reports the details or summary of category power for given stimulus.

### Syntax

```
report_category_power \
  [-root <root>]
  [-type <detailed|summary>]
  [-frame <frame_id>]
  [-categories {memory|register|latch|logic|bbox|clock|pad|pm|all}+]
  [-get_insts]
  [-out <out_file>]
```

### Options and Arguments

|               |                                                                                                                                                                                 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [-root]       | Specify the hierarchy instance or top design to report the category power.                                                                                                      |
| [-type]       | Specify the type of report. The default is “summary”.<br>If the type is summary, it gives the leakage, internal, switching power of the given categories of the specified root. |
| [-frame]      | Specify frame ID for leakage, internal, switching power.<br>Default: /stim#1/frame#0                                                                                            |
| [-categories] | Specify the list of categories for reporting power.<br>By default all categories are reported.                                                                                  |
| [-get_insts]  | Returns the list of instances for the specified category.                                                                                                                       |
| [-out]        | Writes the report in the output file.                                                                                                                                           |

### Example(s)

```
■ report_category_power -categories logic -frame /stim#1/frame#0 -type summary
  Leakage (W)      Internal (W)      Switching (W)      Total (W)      Category
  -----
  1.57407e-08      7.17079e-07      1.14664e-07      8.47484e-07      logic
  1.57407e-08      7.17079e-07      1.14664e-07      8.47484e-07      total

■ report_category_power -categories logic -frame /stim#1/frame#0 -type detailed
  Leakage (W) Internal (W) Switching (W) Total (W) Category Libcell Instance
  -----
  5.22222e-09 2.13173e-07 4.29968e-08 2.61392e-07 logic AND2X1HS /designs/
  joules_top/instances_comb/and_inst_1
```

## Joules Command and Attribute Reference

### Power Analysis and PPA Reporting Commands - report\_category\_power

---

```
5.17776e-09 3.18926e-07 7.16671e-08 3.95771e-07 logic AND2X1HS /designs/  
joules_top/instances_comb/and_inst_2
```

```
5.34072e-09 1.84980e-07 0.00000e+00 1.90320e-07 logic AND2X1HS /designs/  
joules_top/instances_comb/and_inst_3
```

■ `report_category_power -categories all -get_insts`

```
/designs/joules_top/instances_comb/and_inst_1 /designs/joules_top/  
instances_comb/and_inst_2 /designs/joules_top/instances_comb/and_inst_3
```

---

## Design Query and Navigation Commands

---

- get inst area
- get inst delay
- get seqs
- report design hierarchy
- get insts
- get inst slack
- get inst power
- get inst pins
- get clock info
- get clock trees
- get combs
- get design clocks
- plot slack profile
- plot activity distribution
- get icg info
- get flop info
- report icg efficiency
- report icg scrub
- plot net distribution
- plot inst distribution
- report area

## Joules Command and Attribute Reference

### Design Query and Navigation Commands -

---

- report design stats
- tag icgc
- report naming rules
- report design info



## get\_inst\_area

Returns (i) cell area, (ii) routing area, and (iii) total area for the specified leaf or hierarchical instance.

### Syntax

```
get_inst_area [-inst] <inst>
```

### Options and Arguments

|         |                                |
|---------|--------------------------------|
| [-h]    | Displays help for all options. |
| [-inst] | Hierarchical or leaf instance. |

### Example(s)

```
■ get_inst_area /cpu_10bit/FSM
```

### Return Value

-1 indicates failure in execution.

### Related Topics

■ [Power Analysis and Reporting](#)

## get\_inst\_delay

Returns: (i) worst pin to pin (or port to port) delay, and (ii) worst delay arc for the specified hierarchical or leaf instance.

### Syntax

```
get_inst_delay <inst>
```

### Options and Arguments

|                           |                                |
|---------------------------|--------------------------------|
| <code>[-h]</code>         | Displays help for all options. |
| <code>&lt;inst&gt;</code> | Hierarchical or leaf instance. |

### Example(s)

```
■ get_inst_delay /cpu_10bit/FSM ;  
  #returns 45.0 /cpu_10bit/FSM/ovrfl->/cpu_10bit/FSM/pc_mux_sel
```

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## get\_seqs

Returns all sequential instances such as flops, latches, and ICGCs

### Syntax

```
get_seqs \  
  [-root] <root_inst>  
  [-module <module>]  
    [-levels <num>]  
  [-rtl_type memory|register|flop|latch|icgc]  
  [-clock_domain <clock_pin_or_net>]  
  [-power_domain <power_domain_name>]  
  [-name <glob>]  
  [-cell <glob>]  
    [-nocase]  
    [-invert]  
  [-wns <val>[:<val2>]]  
  [-width num]  
    [-op eq|gt|lt|ge|le]  
  [-bit_blast]  
  [-cg_status gated|enabled_but_ungated|not_enabled]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                             |
| <code>[-root]</code>         | Return sequential instances in the specified root instance.                                                                                                                                                                                |
| <code>[-module]</code>       | Return sequential instances in the specified module. The command searches all instances of the specified module.                                                                                                                           |
| <code>[-levels]</code>       | Suboption of <code>-module</code> . Search the specified number of levels in the hierarchy.                                                                                                                                                |
| <code>[-rtl_type]</code>     | Return the sequential instances in the specified RTL type.                                                                                                                                                                                 |
| <code>[-clock_domain]</code> | Return the sequential instances in the specified clock domain.                                                                                                                                                                             |
| <code>[-power_domain]</code> | Return the sequential instances in the specified power domain.                                                                                                                                                                             |
| <code>[-name]</code>         | Return the sequential instances with instance name matching the specified pattern.                                                                                                                                                         |
| <code>[-cell]</code>         | Return the sequential instances mapped with cells matching the specified pattern.                                                                                                                                                          |
| <code>[-nocase]</code>       | Suboption of <code>-cell</code> . Perform case insensitive match.                                                                                                                                                                          |
| <code>[-invert]</code>       | Suboption of <code>-cell</code> . Filters out names that match the pattern and return those that do not.                                                                                                                                   |
| <code>[-wns]</code>          | Return sequential instances with slack less than or equal to the specified value (in ps) within the specified range.                                                                                                                       |
| <code>[-width]</code>        | Return sequential instances of the specified width.                                                                                                                                                                                        |
| <code>[-op]</code>           | Suboption of <code>-width</code> . Return entries with width of <code>&lt;op&gt;</code> <code>&lt;num&gt;</code> . For example, to get sequential instances with width of less than 10, specify:<br><br><code>get_seqs -width lt 10</code> |
| <code>[-bit_blast]</code>    | Return bit-blasted list of sequential instances.                                                                                                                                                                                           |
| <code>[-cg_status]</code>    | Return sequential instances with the specified clock gate status. The default status is dont care.                                                                                                                                         |

## Example(s)

- `get_seqs -rtl_type register -root /cpu_10bit/FSM ;# get seqs in hierarchy /cpu_10bit/FSM`
- `get_seqs -rtl_type register -module cpu_10bit__fsm ;# get seqs in module /cpu_10bit/FSM`

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_seqs

---

- `get_seqs -rtl_type register -name *DFT* ;# get seqs matching DFT in name`
- `get_seqs -rtl_type register -clock_domain /cpu_10bit/clock ;# get seqs in domain of clock /cpu_10bit/clock`
- `get_seqs -rtl_type register -cg_status gated ;# get clock_gated seqs`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Activity Processing and Reporting](#)

## report\_design\_hierarchy

Reports the specified hierarchy of a design in text format. The command reports only hierarchical instances.

### Syntax

```
report_design_hierarchy \  
  [-root {<root-inst-path>}+] \  
  [-module {<module-name>}+] \  
  [-levels <num>] \  
  [-out <output-file-name>] [-append]
```

### Options and Arguments

|           |                                                                                                                                               |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| [-h]      | Displays help for all options.                                                                                                                |
| [-root]   | Root instance path.                                                                                                                           |
| [-module] | Module name.                                                                                                                                  |
| [-levels] | Levels of hierarchies to report. By default, three levels are reported.                                                                       |
| [-out]    | Save the output in the specified file. If <code>-append</code> is specified, append to the file instead of overwriting it (which is default). |
| [-append] | Append to the file specified with <code>-out</code> option.                                                                                   |

### Example(s)

- `report_design_hierarchy -out output_file # Writes the design hierarchy to output_file`
- `report_design_hierarchy -levels 10 # Writes the first 10 levels of design hierarchy to stdout`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Clock Gating](#)

## get\_insts

Returns the list of hierarchical/leaf instances based on specified parameters.

### Syntax

```
get_insts \  
[-root <root_inst>+ | -clk_tree <clk_tree_name>+]  
  [-levels <levels>|<min_level>:<max_level>]  
  [-clock_domain <prim_clock_net>]  
  [-power_domain <power_domain_name>]  
  [-power_rails <power_rail_name>+]  
  [-rtl_type  
    {hier|glatch|memory|register|flop|latch|icgc|add|sub|mult|div|decoder|  
    comp|shift|mmux|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|  
    tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps}+]  
  [-rtl_group {seq|macro|alu|dpx|logic|pm}+]  
  [-leaf macro|gate|no]  
  [-name <glob>]  
    [-nocase]  
  [-cell <glob>]  
  [-lib <list>]  
    [-invert]  
  [-wns <val>[:<val2>]]  
  [-bit_blast]  
  [-lindex <idx>]  
  [-lrange <idx1> <idx2>]  
  [-count]  
  [-skip_clock_path]  
  [-iter]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-root]</code>         | <p>Get instances that are in the hierarchy of the specified list of root instances. The command will accept instance name even if it is specified without the <code>-root</code> option.</p> <p><b>Note:</b> By default, Joules assumes adders/dividers as leaf instances. To see combinational instances inside adder/dividers, specify <code>-leaf gate</code> with this option.</p> |
| <code>[-levels]</code>       | Sub-option of <code>-root</code> . Specify either number of levels from the root or a range of level to get instances. Default level is -1, which means the entire design.                                                                                                                                                                                                             |
| <code>[-clock_domain]</code> | Return the list of instances which exist in the domain of the specified clock.                                                                                                                                                                                                                                                                                                         |
| <code>[-power_domain]</code> | <p>Return the list of instances that are part of the specified power domain.</p> <p>This option can return, at a time, list of instances that exist in a single power domain. Multiple power domains are not accepted.</p>                                                                                                                                                             |
| <code>[-power_rails]</code>  | Return the list of instances that have the specified power rails defined.                                                                                                                                                                                                                                                                                                              |
| <code>[-rtl_type]</code>     | <p>Match instance type with the specified list of RTL types. Supported RTL types are listed in syntax above.</p> <p>This option can also accept a list, for example:</p> <pre>get_insts -rtl_type "ls iso"</pre>                                                                                                                                                                       |
| <code>[-rtl_group]</code>    | <p>Select the group from the set that map to a set of RTL types. Mapping of these RTL groups to RTL types can be found in the global Tcl variable,</p> <pre>RTLS_CellInfo(group, &lt;group_name&gt;)</pre> <p>. If this option is specified, instances are matched with the list of specified RTL groups. Mixing <code>-rtl_type</code> and <code>-rtl_group</code> is allowed.</p>    |



## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_insts

---

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-leaf]</code>      | <p>Return the list of leaf-level instances.</p> <p>Joules, by default, considers all RTL macros such as adder/dividers in the design as leaf instances. Therefore, the default value of <code>leaf</code> is <code>macros</code>.</p> <p>To get a list of libcell level instances, specify <code>-leaf gate</code>.</p> <p>To get a list of instances other than leaf instance, specify <code>-leaf no</code>.</p> <p><b>Note:</b> The option does not work with a list.</p> |
| <code>[-name]</code>      | <p>Match instance name with the specified global pattern. You can also specify wildcard (*).</p> <p><code>-nocase</code> is a suboption for case insensitive match</p> <p><code>-invert</code> is a suboption to invert the match.</p> <p>To get a list of instances in a specific hierarchy, specify full vname path, for example:</p> <pre>get_insts -name DP/ALU/div*</pre>                                                                                               |
| <code>[-nocase]</code>    | Suboption of <code>-name</code> . Perform case insensitive match.                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-cell]</code>      | <p>Match mapped cell name with the specified global pattern.</p> <p><code>-nocase</code> is a suboption for case insensitive match</p> <p><code>-invert</code> is a suboption to filter out names that match the pattern and return those that do not.</p> <p><b>Note:</b> This option works only on mapped netlists.</p>                                                                                                                                                    |
| <code>[-lib]</code>       | Match mapped cell library/domain/set with specified pattern; ignore if instance is not mapped.                                                                                                                                                                                                                                                                                                                                                                               |
| <code>[-invert]</code>    | Suboption of <code>-lib</code> . Filters out names that match the pattern and return those that do not.                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-wns]</code>       | Return the list of instances whose worst slack of all IO arcs is less than the specified value, or falls between <i>value1</i> and <i>value2</i> .                                                                                                                                                                                                                                                                                                                           |
| <code>[-bit_blast]</code> | Returns bit-level objects.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-lindex]</code>    | Returns element number <idx> where <idx> = 0 to n-1.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-lrange]</code>    | Returns range of elements from index 1 to index 2.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-count]</code>     | Return the count of matching instances instead of the list.                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_insts

---

- `[-skip_clock_path]` Ignore elements in the clock path.
- `[-iter]` Return an iterator instead of list of instances.

The return iterator can be used as follows:

```
set root "/cpu_10bit" ; set total_flop_area 0.0
set iter [get_insts -root $root/FSM -rtl_type flop -
iter]
for { ; } { [rtls_iter::is_valid $iter] } {
[rtls_iter::incr $iter] } {
    set obj [rtls_iter::get_obj $iter]
    set iter_inst [rtls_iter::get_path -vname $obj]
    set inst "$root/$iter_inst"
    set triple [get_inst_area__leaf $inst $validate
$debug]
    set _area [lindex $triple 2]
    set total_flop_area [expr $total_flop_area + $_area]
}
rtls_iter::release $iter
```

**Note:** `iter` and `count` are mutually exclusive options.

### Example(s)

- `get_insts /cpu_10bit -rtl_type hier ;# return design hierarchy`
- `get_insts -root [lindex [get_alus] 1] -leaf gate ;# get leaf instances of adder`
- `get_insts /cpu_10bit/DP -leaf gate -wns -50:100 -count ;# get count of leaf instances with slack of -50ps to +100ps`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Design Navigation and Power Debug](#)

## get\_inst\_power

Returns leakage, internal, switching, and total power for the specified leaf or hierarchical instance.

### Syntax

```
get_inst_power [-inst] <inst>
  [-stims <stim_id>+]
  [-frames <frame_id>]
  [-power_mode <power_mode>]
  [-power_rail <power_rail>]
  [-category memory|register|latch|logic|bbox|clock|pad|pm]
  [-add_clkpin power]
  [-show_details]
  [-show_activity]
  [-by_rail]
  [-skip_port_switching_power]
  [-no_glitch <TG|IG|Both>]
  [-glitch_power <TG|IG>]
  [-compute]
  [-slew \{<ipin>:<val>\}+]
  [-load \{<opin>:<val>+\}+]
  [-activity \{<ipin>:<duty>:<freq>\}]
  [-ldb_cellpath [/libraries/][<domain>/][<lib>/]<cell>]
```

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_inst\_power

---

#### Options and Arguments

|                                           |                                                                                                                                                                                                     |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                         | Displays help for all options.                                                                                                                                                                      |
| <code>[-inst]</code>                      | Return power quad for the specified instance.                                                                                                                                                       |
| <code>[-stims]</code>                     | Return power quad for the specified stim ID (s). By default, all SDB stims are considered.                                                                                                          |
| <code>[-frames]</code>                    | Return power quad for the specified frame. By default, average of all frames in SDB is considered.                                                                                                  |
| <code>[-power_mode]</code>                | Return power quad for the specified power mode as defined in the CPF/1801 power intent. Default power mode is dont care.                                                                            |
| <code>[-power_rail]</code>                | Return quad for the specified power rail as defined in the CPF/1801 power intent. Default is dont care.                                                                                             |
| <code>[-category]</code>                  | Applies only to hierarchical instance. If specified, power quad for the specified category is returned.                                                                                             |
| <code>[-add_clkpin_power]</code>          | Applies only to hierarchical instances. If specified, a fifth element, which is the clock pin power of all sequential elements in the specified hierarchical instance, is added to the return list. |
| <code>[-show_details]</code>              | Applies only to leaf instances. If specified, the command shows all power calculation details.                                                                                                      |
| <code>[-show_activity]</code>             | Shows activity details and applies only to the leaf insts.                                                                                                                                          |
| <code>[-by_rail]</code>                   | Shows power calculation details based on rail.                                                                                                                                                      |
| <code>[-skip_port_switching_power]</code> | If specified, the primary ports' switching power is not added to the switching power section.                                                                                                       |
| <code>[-no_glitch]</code>                 | If specified, does not consider glitch power separately.                                                                                                                                            |
| <code>[-glitch_power]</code>              | Report the glitch power.                                                                                                                                                                            |
| <code>[-compute]</code>                   | Compute power for instance using user-defined slew/load/activity values.                                                                                                                            |
| <code>[-slew]</code>                      | Suboption of <code>-compute</code> . Slew value for each input pin in picoseconds.                                                                                                                  |
| <code>[-load]</code>                      | Suboption of <code>-compute</code> . Slew value for each input pin in femtofarads.                                                                                                                  |
| <code>[-activity]</code>                  | Suboption of <code>-compute</code> . Activity value ( <i>&lt;duty&gt; : &lt;freq&gt;</i> ) for all input and output pins.                                                                           |

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_inst\_power

---

[-ldb\_cellpath]

Suboption of -compute. Full vdir path of cell.

#### Example(s)

- `get_inst_power /cpu_10bit/FSM`
- `get_inst_power /cpu_10bit/DP/ALU -category logic`
- `get_inst_power /cpu_10bit/DP/FSM -category clock`
- `get_inst_power /cpu_10bit/DP -add_clkpin_power`
- `get_inst_power {/cpu_10bit/FSM/pst_reg[3]} -show_details`

#### Return Value

-1 indicates failure in execution.

#### Related Topics

- [Power Analysis and Reporting](#)

## get\_inst\_slack

Returns the worst pin to pin (or port to port) slack of the specified instance.

### Syntax

```
get_inst_slack \  
  [-inst] <inst>  
    [-add_ws_pin]  
  [-pin <leaf_inst_pin>]
```

### Options and Arguments

|               |                                                                         |
|---------------|-------------------------------------------------------------------------|
| [-h]          | Displays help for all options.                                          |
| [-inst]       | Return the slack of specified leaf or hierarchical instance.            |
| [-add_ws_pin] | Suboption of -inst.<br><br>Return tuple: <slack> <pin_with_worst_slack> |
| [-pin]        | Return the slack of the specified pin.                                  |

### Example(s)

- `get_inst_slack -inst [lindex [get_registers] end] -add_ws_pin`
- `get_inst_slack -inst [get_insts -rtl_type div] -add_ws_pin`
- `get_inst_slack -inst /cpu_10bit/DP`
- `set adder [lindex [get_insts -rtl_type add] 0] ; set pin "$adder/Z\[1\]"`
- `get_inst_slack -pin $pin`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## get\_inst\_pins

Returns the pin/port of any hierarchical/leaf instance based on different properties of the pin/port.

### Syntax

```
get_inst_pins \  
  [-inst] <inst>  
  [-direction in|out|inout]  
  [-pin_type  
    {data|address|clock|enable|select|reset|set|scan|tie|rail|vdd|gnd|save|  
      restore}+] (for hier insts, -pin_type = {clock|data|reset|set|test}+)  
  [-name <port_name_regexp>]  
  [-bus]  
  [-full_path]
```

## Options and Arguments

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>         | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-inst]</code>      | <p>Search the pin/port for the specified hierarchical instance name. The command will run even if the instance name is specified without the <code>-inst</code> option.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"><li>■ Full hierarchical name of instance needs to be specified with this option.</li><li>■ No regular expression is allowed.</li><li>■ Hierarchical name should not contain internal directory.</li><li>■ If multiple instance names are specified with this option, then Joules will only return the pins/ports of the first instance, and rest of the instances will be ignored.</li></ul> |
| <code>[-direction]</code> | <p>Sort the pin/port based on the direction of its library pin. The following types are supported:</p> <ul style="list-style-type: none"><li>■ in - for input pin/port</li><li>■ out - for output pin/port</li><li>■ inout - for inout pin/port</li></ul> <p>If this option is not specified, then all the pins/ports of the instance will be returned.</p>                                                                                                                                                                                                                                                                    |
| <code>[-pin_type]</code>  | <p>Query the pin/port of hierarchical/leaf instances based on its <code>pin_type</code> defined in the library. Supported pin types can be classified into two groups based on the instance type on which these are applicable:</p> <ul style="list-style-type: none"><li>■ <code>pin_type</code> applicable on Leaf instance</li><li>■ <code>pin_type</code> applicable on Hierarchical instance</li></ul> <p>Values supported for each instance type are mentioned in the syntax above.</p> <p><b>Note:</b> If the specified <code>pin_type</code> is not applicable for the given instance, NULL will be returned.</p>      |



## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_inst\_pins

---

|                           |                                                                            |
|---------------------------|----------------------------------------------------------------------------|
| <code>[-name]</code>      | Match the pin/port with the regular expression specified with this option. |
| <code>[-bus]</code>       | If specified, the output does not bit-blast the BUS while reporting.       |
| <code>[-full_path]</code> | Report the complete hierarchical path of each pin.                         |

#### Example(s)

- `get_inst_pins /cpu_10bit/DP -bus`
- `get_inst_pins /cpu_10bit/DP/ALU -direction in`
- `get_inst_pins /cpu_10bit/RAM_64x10/RAM_64x10 -pin_type address`

#### Return Value

-1 indicates failure in execution.

#### Related Topics

- [Design Navigation and Power Debug](#)

## get\_clock\_info

Return information on a clock defined in SDC and related parameters.

### Syntax

```
get_clock_info \  
[-clock <prim_clock_pin>]  
[-sdc_name <sdc_name>]  
[-sdc_name]  
[-clock_obj]  
[-master]  
[-ctg]  
[-active]  
[-freq|-duty_cycle]  
[-stim <stim_id>]  
[-frame <frame_id>]  
[-power tree|tree_seq|tree_comb|tree_icgc|domain|network]  
tree = power of clock tree  
tree_seq = power of clock tree seq elements  
tree_comb = power of clock tree comb elements  
tree_icgc = power of clock tree ICGCs  
domain = power of clock domain elements  
network = power of clock tree + clock domain)  
[-add_clkpin_power]  
[-stim <stim_id>] )  
[-frame <frame_id>]  
[-inst <inst>]  
[-domain_elements]  
[-domain_seqs]  
[-domain_flops]  
[-domain_latches]  
[-domain_icgcs]  
[-count]  
[-iter]  
[-bit_blast]  
[-domain_area]
```

## Options and Arguments

|                                           |                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                         | Displays help for all options.                                                                                                                                                                                                                                                                                                         |
| <code>[-clock]</code>                     | Primary clock pin whose information is required.                                                                                                                                                                                                                                                                                       |
| <code>[-sdc_name &lt;sdc_name&gt;]</code> | Use the specified SDC clock name.                                                                                                                                                                                                                                                                                                      |
| <code>[-sdc_name]</code>                  | Return SDC name of the specified clock pin/net.                                                                                                                                                                                                                                                                                        |
| <code>[-clock_obj]</code>                 | Return SDC name of all clocks-specified clock pin/net                                                                                                                                                                                                                                                                                  |
| <code>[-master]</code>                    | Return master clock for the specified derivative clock.                                                                                                                                                                                                                                                                                |
| <code>[-ctg]</code>                       | Return the list of CTGs with the specified clock as clock_root                                                                                                                                                                                                                                                                         |
| <code>[-active]</code>                    | Suboption of <code>-ctg</code> . Use active CTG for clock power.                                                                                                                                                                                                                                                                       |
| <code>[-freq -duty_cycle]</code>          | Return frequency or duty_cycle in SDC.<br><br>If you specify both <code>-freq</code> and <code>duty_cycle</code> options, the command will only return the frequency.<br><br>If the design has multiple clocks, then you need to explicitly specify the clock. For example:<br><br><code>get_clock_info -freq -clock /test/clk2</code> |
| <code>[-stim]</code>                      | Suboption of <code>freq -duty_cycle</code> .<br>Return frequency or duty_cycle in the specified stimulus.                                                                                                                                                                                                                              |
| <code>[-frame]</code>                     | Suboption of <code>freq -duty_cycle</code> .<br>Return frequency or duty_cycle in the specified frame.                                                                                                                                                                                                                                 |
| <code>[-power]</code>                     | Return leakage, internal, switching, total (in this sequence).<br>Ensure that <code>compute_power</code> command has been run before running this power reporting command.                                                                                                                                                             |
| <code>[-add_clkpin_power]</code>          | Suboption of <code>-power</code> .<br>Add <code>&lt;clkpin_power&gt;</code> to the return value.                                                                                                                                                                                                                                       |
| <code>[-stim]</code>                      | Suboption of <code>-power</code> .<br>Return power numbers in the specified stimulus.                                                                                                                                                                                                                                                  |


### Note:

- Multiple stim\_IDs cannot be specified with this option.
- This option will work only with the `-power` option.

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_clock\_info

---

|                                                                                                                                                      |                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-frame]</code>                                                                                                                                | Suboption of <code>-power</code> .<br>Return power numbers in the specified frame.<br>Multiple frame_IDs cannot be specified with this option.                                        |
| <code>[-inst]</code>                                                                                                                                 | Suboption of <code>-power</code> .<br>Return prorated clock power in the specified hierarchical instance.<br>Ensure that power numbers are already computed before using this option. |
| <code>[-domain_elements]</code>                                                                                                                      | Return all domain leaf instances.                                                                                                                                                     |
| <code>[-domain_seqs]</code>                                                                                                                          | Return all domain sequential leaf elements.                                                                                                                                           |
| <code>[-domain_flops]</code>                                                                                                                         | Return all domain flops.                                                                                                                                                              |
| <code>[-domain_latches]</code>                                                                                                                       | Return all domain latches.                                                                                                                                                            |
| <code>[-domain_icgcs]</code>                                                                                                                         | Return all domain ICGCs.                                                                                                                                                              |
| <div> <i>Tip</i><br/>Use after clock-gating logic insertion.</div> |                                                                                                                                                                                       |
| <code>[-count]</code>                                                                                                                                | Suboption of <code>-domain_icgcs</code> option.<br>Return count instead of list.                                                                                                      |
| <code>[-iter]</code>                                                                                                                                 | Suboption of <code>-domain_icgcs</code> option.<br>Return iterator instead of list.                                                                                                   |
| <code>[-bit_blast]</code>                                                                                                                            | Suboption of <code>-domain_icgcs</code> option.<br>Return bit-blast registers.                                                                                                        |
| <code>[-domain_area]</code>                                                                                                                          | Return the total area of clock domain elements.                                                                                                                                       |

### Example(s)

- `get_clock_info -clock /cpu_10bit/clock -freq ;# return frequency of clock /cpu_10bit/clock`
- `get_clock_info -clock /cpu_10bit/clock -sdc_name ;# return SDC name of clock /cpu_10bit/clock`
- `get_clock_info -sdc_name clock -duty_cycle ;# return duty_cycle of SDC clock clock`

## **Joules Command and Attribute Reference**

### Design Query and Navigation Commands - get\_clock\_info

---

#### **Return Value**

-1 indicates failure in execution.

#### **Related Topics**

- [Design Navigation and Power Debug](#)

## get\_clock\_trees

Return information on the specified clock tree.

### Syntax

```
get_clock_trees \
  [-clock_root <pin|port>+]
  [-sdc_name <sdc_clock_name>+]
```

### Options and Arguments

|               |                                                |
|---------------|------------------------------------------------|
| [-h]          | Displays help for all options.                 |
| [-clock_root] | List of root pins or ports for the clock tree. |
| [-sdc_name]   | List of SDC clock names.                       |

### Example(s)

- `get_clock_trees -clock_root /top/clk1 /top/clk2`
- `get_clock_trees -sdc_name clk1 clk2`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Design Navigation and Power Debug](#)

## get\_combs

Gets combinatorial gate level items.

### Syntax

```
get_combs \  
  [-inst] <inst_path>  
  [-rtl_group macro|alu|dpx|logic|pm]  
  [-rtl_type  
    add|sub|mult|div|decoder|comp|shift|mmux|buf|inv|and|nand|or|nor|xor|xnor|  
    ao|aoi|oa|oai|mux|tri|tie|pad|fadd|hadd|delay|iso|srpg|ls|els|ps]  
  [-module <module>]  
    [-levels <num>]  
  [-width num]  
    [-op eq|gt|lt|ge|le]  
  [-name <glob>]  
  [-cell <glob>]  
    [-nocase]  
    [-invert]
```

## Options and Arguments

|                           |                                                                                                                                                                                                                                               |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>         | Displays help for all options.                                                                                                                                                                                                                |
| <code>[-inst]</code>      | Return combinatorial entries inside the specified hierarchical instance.                                                                                                                                                                      |
| <code>[-rtl_group]</code> | RTL group name. Default group is logic.                                                                                                                                                                                                       |
| <code>[-rtl_type]</code>  | List of RTL types.                                                                                                                                                                                                                            |
| <code>[-module]</code>    | Return combinatorial entries in the specified module. The command searches all instances of the specified module.                                                                                                                             |
| <code>[-levels]</code>    | Suboption of <code>-module</code> . Specify the hierarchy level.                                                                                                                                                                              |
| <code>[-width]</code>     | Return combinatorial entries of the specified width.                                                                                                                                                                                          |
| <code>[-op]</code>        | Sup-option of <code>-width</code> . Return entries with width of <code>&lt;op&gt;</code> <code>&lt;num&gt;</code> . For example, to get combinatorial entries with width of less than 10, specify:<br><br><code>get_combs -width lt 10</code> |
| <code>[-name]</code>      | Return combinatorial entries with inst name matching the specified pattern.                                                                                                                                                                   |
| <code>[-cell]</code>      | Return combinatorial entries mapped to cell matching the specified pattern.                                                                                                                                                                   |
| <code>[-nocase]</code>    | Suboption of <code>-cell</code> . Perform case insensitive match.                                                                                                                                                                             |
| <code>[-invert]</code>    | Suboption of <code>-cell</code> . Filter out names that match the pattern and return those that do not.                                                                                                                                       |

## Example(s)

- `get_combs -inst /cpu_10bit/DP ;# gets combs under inst /cpu_10bit/DP`
- `get_combs -width 4 ;# gets 4-bit wide combs`

## Return Value

-1 indicates failure in execution.

## Related Topics

- [Clock Gating](#)



## get\_design\_clocks

Returns the list of primary clocks of the design.

### Syntax

```
get_design_clocks
  [-root <design_name>]
  [-sdc_name <sdc_name>]
  [-derivative_clocks]
  [-prim_clocks]
  [-overlapping_sets]
  [-count]
  [-sort_by
    freq|domain_area|domain_elements|domain_seqs|domain_flops|domain_latches|
    the_thatdomain_icgcs|domain_tns|domain_wns]
    [-increasing]
  [-ntop <N>]
  [-fastest_clock]
```

## Options and Arguments

|                                   |                                                                                                                                 |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                 | Displays help for all options.                                                                                                  |
| <code>[-root]</code>              | Return the list of clocks for the specified design.                                                                             |
| <code>[-sdc_name]</code>          | Return clock pin of the specified SDC clock.                                                                                    |
| <code>[-derivative_clocks]</code> | Return the list of derivative clocks. By default, this option is set to false.                                                  |
| <code>[-prim_clocks]</code>       | Skip derivative clocks and return the list of primary clocks. By default, this option is set to false.                          |
| <code>[-overlapping_sets]</code>  | Return the list of overlapping clock sets. By default, this option is set to false.                                             |
| <code>[-count]</code>             | Return the count of matching clocks.                                                                                            |
| <code>[-sort_by]</code>           | Sort the output in the specified order. By default, the output is not sorted.                                                   |
| <code>[-increasing]</code>        | Suboption of <code>-sort_by</code> . Sort the output in increasing order. By default, the output is sorted in decreasing order. |
| <code>[-ntop]</code>              | Suboption of <code>-sort_by</code> . Return the top $<N>$ sorted clocks. Default is 1.                                          |
| <code>[-fastest_clock]</code>     | Return the fastest clock by frequency. By default, this option is set to false.                                                 |

## Example(s)

- `get_design_clocks -root /cpu_10bit`
- `get_design_clocks -root /cpu_10bit -overlapping_sets`

## Return Value

-1 indicates failure in execution.

## Related Topics

- [Clock Gating](#)

## plot\_slack\_profile

Plots the slack and timing profile for the design.

### Syntax

```
plot_slack_profile \  
  [-root <root_inst>+]  
    [-levels <levels>|<min_level>:<max_level>]  
  [-leaf <leaf_inst>+]  
  [-name <glob>]  
    [-nocase]  
    [-invert]  
  [-clock_domain {<prim-clock-net>}+]  
  [-power_domain <domain-name>]  
  [-wns <V>[:<V2>]  
  [-yrange <ymin>:<ymax>]  
  [-resolution <val>]  
  [-format gnuplot|native]  
  [-png <f_png>]  
  [-tag <tag>]  
  [>|-out <f_dat>]
```

## Options and Arguments

|                              |                                                                                                                                                                              |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                               |
| <code>[-root]</code>         | List of root instances. By default, design root is considered.                                                                                                               |
| <code>[-levels]</code>       | Suboption of <code>-root</code> . Level of hierarchy to plot. The default level is -1 (entire tree below specified root(s)).                                                 |
| <code>[-leaf]</code>         | List of leaf instances.                                                                                                                                                      |
| <code>[-name]</code>         | Match names with specified pattern.                                                                                                                                          |
| <code>[-nocase]</code>       | Suboption of <code>-name</code> . Case insensitive name match.                                                                                                               |
| <code>[-invert]</code>       | Suboption of <code>-name</code> . Filter out names that match the pattern and return those that do not.                                                                      |
| <code>[-clock_domain]</code> | List of primary clock nets.                                                                                                                                                  |
| <code>[-power_domain]</code> | Name of the power domain.                                                                                                                                                    |
| <code>[-wns]</code>          | Show profile for instances with slack less than or equal to the specified value (in ps) or in the specified range.                                                           |
| <code>[-yrange]</code>       | Specify Y range for the plot. By default, it is auto determined.                                                                                                             |
| <code>[-resolution]</code>   | Slack resolution for plot. The default slack is 50 (ps).                                                                                                                     |
| <code>[-format]</code>       | Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>native</code> (default format)</li></ul> |
| <code>[-png]</code>          | Save plot in specified PNG file.                                                                                                                                             |
| <code>[-tag]</code>          | Add the specified tag to plot title.                                                                                                                                         |
| <code>[&gt; -out]</code>     | Redirect the output to the specified file. By default, the output is directed to <code>&lt;work_dir&gt;/plot_slack_profile.data</code> .                                     |

## Example(s)

■ `plot_slack_profile -clock_domain /cpu_10bit/clk`

## Return Value

0 for success, 1 indicates failure in execution.

## **Joules Command and Attribute Reference**

### Design Query and Navigation Commands - plot\_slack\_profile

---

#### **Related Topics**

- [Power Analysis and Reporting](#)

## plot\_activity\_distribution

Plots output pin activity distribution of selected leaf instances.

### Syntax

```
plot_activity_distribution \  
  [-stims {<stim_id>}+] \  
  [-frames {<frame_id>|<frame_range>}+] \  
  [-activity_types \  
    {Act_Default|Act_Computed|Act_ClkFromSDC|Act_Constant|Act_Asserted| \  
    Act_UserAsserted++}] \  
  [-root <inst>+] \  
  [-module {<module-name>}+] \  
    [-levels <levels>|all] \  
  [-clock_domain {<prim-clock-net>}+] \  
  [-power_domain {<domain_name>}+] \  
  [-rtl_type \  
    {memory|register|flop|latch|icgc|add|sub|mult|div|decoder|comp|shift| \  
    mmux|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd| \  
    hadd|delay|iso|srpg|ls|els|ps}+] \  
  [-rtl_group {seq|macro|alu|dpx|logic|pm}+] \  
  [-leaf macro|gate] \  
  [-xkey freq|toggle_cnt|toggle_ratio] \  
  [-bin_cnt <cnt>] \  
  [-title <title>] \  
  [-group_gap <val>] \  
  [-format gnuplot|native] \  
  [-png <f_png>] \  
  [>|-out <f_dat>]
```

## Options and Arguments

|                                |                                                                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>              | Displays help for all options.                                                                                                                                               |
| <code>[-stims]</code>          | List of stim IDs. By default, the first SDB stim is considered.                                                                                                              |
| <code>[-frames]</code>         | Frame ID or a range of frames.                                                                                                                                               |
| <code>[-activity_types]</code> | List of activity types to plot.<br><br><b>Note:</b> This option is mutually exclusive to <code>-leaf</code> .                                                                |
| <code>[-root]</code>           | List of roots to search. By default, design root is considered.                                                                                                              |
| <code>[-module]</code>         | List of modules to search for plotting.                                                                                                                                      |
| <code>[-levels]</code>         | Suboption of <code>-module</code> . Search the specified levels of module hierarchy.                                                                                         |
| <code>[-clock_domain]</code>   | List of primary clock nets.                                                                                                                                                  |
| <code>[-power_domain]</code>   | List of power domains.                                                                                                                                                       |
| <code>[-rtl_type]</code>       | List of RTL types. The default type is flop.                                                                                                                                 |
| <code>[-rtl_group]</code>      | List of RTL groups.                                                                                                                                                          |
| <code>[-leaf]</code>           | Treat the specified object as leaf. The default object is gate.<br><br><b>Note:</b> This option is mutually exclusive to <code>-activity_types</code> .                      |
| <code>[-xkey]</code>           | Show the specified value on X axis. By default, X axis displays frequency.                                                                                                   |
| <code>[-bin_cnt]</code>        | Specify the number of bins for the plot.                                                                                                                                     |
| <code>[-title]</code>          | Specify the title for the plot output.                                                                                                                                       |
| <code>[-group_gap]</code>      | Gap between data groups in the plot. The default gap is 1.                                                                                                                   |
| <code>[-format]</code>         | Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>Native</code> (default format)</li></ul> |
| <code>[-png]</code>            | Save plot output in the specified PNG file.                                                                                                                                  |
| <code>[&gt; -out]</code>       | Save the output in the specified file.<br><br>By default, the output is directed to <code>&lt;work_dir&gt;/plot_activity_distribution.data</code>                            |

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - plot\_activity\_distribution

---

#### Example(s)

- `plot_activity_distribution -frames /stim#1/frame#1 {/stim#1/frame#[7:9]}`
- `plot_activity_distribution -rtl_type mult flop icgc`

#### Return Value

0 for success, 1 indicates failure in execution.

#### Related Topics

- [Power Analysis and Reporting](#)



## get\_icg\_info

Returns information about the specified ICGC.

### Syntax

```
get_icg_info [-inst] <icgc>
  [-frames <frame_id>+
  [-power_mode <power_mode>]
  [-power_rail <power_rail>]
  [-type]
  [-cell]
  [-clock_pin]
  [-clock_net]
  [-clock_freq in|out]
  [-clock_domain]
  [-enable_pin]
  [-enable_net]
  [-enable_duty]
  [-enable_toggles]
  [-enable_freq]
  [-enable_eff]
  [-cum_enable_eff]
  [-enable_expr]
  [-flops all|direct|indirect]
  [-data_freq in|out]
  [-fanout all|direct|indirect)
  [-downstream_cgs]
  [-downstream_memories]
  [-downstream_latches]
  [-downstream_power]
  [-downstream_clkpin_power]
  [-downstream_clkpin_cap]
  [-clock_power]
  [-impact]
  [-level]
  [-term_analysis]
  [-max_ops_count]
  [-rtl_info]
```

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_icg\_info

---

#### Options and Arguments

|                                     |                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                   | Displays help for all options.                                                                                    |
| <code>[-inst]</code>                | Instance name for which ICGC information is required.                                                             |
| <code>[-frames]</code>              | List of frame IDs for which ICGC information is required. By default, average over all SDB frames are considered. |
| <code>[-power_mode]</code>          | Power mode information. Default is don't care.                                                                    |
| <code>[-power_rail]</code>          | Power rail information. Default is don't care.                                                                    |
| <code>[-type]</code>                | Specify the ICGC type - RTL or synthesis.                                                                         |
| <code>[-cell]</code>                | Name of the mapped cell.                                                                                          |
| <code>[-clock_pin]</code>           | Name of the CG clock pin.                                                                                         |
| <code>[-clock_net]</code>           | Net associated with the clock pin.                                                                                |
| <code>[-clock_freq]</code>          | Input clock frequency.                                                                                            |
| <code>[-clock_domain]</code>        | Primary clock domain(s).                                                                                          |
| <code>[-enable_pin]</code>          | Name of the CG-enable pin.                                                                                        |
| <code>[-enable_net]</code>          | Net associated with the enable pin.                                                                               |
| <code>[-enable_duty]</code>         | Enable duty cycle.                                                                                                |
| <code>[-enable_toggles]</code>      | Enable toggles.                                                                                                   |
| <code>[-enable_freq]</code>         | Enable frequency.                                                                                                 |
| <code>[-enable_eff]</code>          | Enable efficiency.                                                                                                |
| <code>[-cum_enable_eff]</code>      | Cumulative enable efficiency.                                                                                     |
| <code>[-enable_expr]</code>         | Enable expression.                                                                                                |
| <code>[-flops]</code>               | Downstream flops.                                                                                                 |
| <code>[-data_freq]</code>           | Average frequency of D or Q pins of all driven flops.                                                             |
| <code>[-fanout]</code>              | Suboption of <code>-data_freq</code> . Flop fanout. By default, all downstream flops are considered.              |
| <code>[-downstream_cgs]</code>      | Return downstream ICGCs.                                                                                          |
| <code>[-downstream_memories]</code> | Return downstream memories.                                                                                       |
| <code>[-downstream_latches]</code>  | Return downstream latches.                                                                                        |
| <code>[-downstream_power]</code>    | Power of downstream cone.                                                                                         |

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_icg\_info

---

|                                         |                                                                                                                                  |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <code>[-downstream_clkpin_power]</code> | Power of downstream clock pins.                                                                                                  |
| <code>[-downstream_clkpin_cap]</code>   | Cap of downstream clock pins.                                                                                                    |
| <code>[-clock_power]</code>             | Downstream clock power.                                                                                                          |
| <code>[-impact]</code>                  | Calculated as <code>clock_power/enable_eff</code> .                                                                              |
| <code>[-level]</code>                   | Level of hierarchy of the design.                                                                                                |
| <code>[-term_analysis]</code>           | Performs the analysis of terms.                                                                                                  |
| <code>[-max_ops_count]</code>           | Sub-option of <code>-term_analysis</code> .<br>Specify the limit on number of operators in enable expression. The default is 50. |
| <code>[-rtl_info]</code>                | The <code>&lt;source file&gt;:&lt;line&gt;</code> information.                                                                   |

### Example(s)

- `set icgc /cpu_10bit/FSM/RC_CG_HIER_INST8/RC_CGIC_INST`
- `get_icg_info -inst $icgc -clock_domain all`
- `get_icg_info -inst $icgc -enable_net`
- `get_icg_info $icgc -downstream_power`

### Return Value

-1 indicates failure in execution.

### Related Topics

- [Clock Gating](#)

## get\_flop\_info

Returns information about the specified flop(s).

### Syntax

```
get_flop_info [-inst] <flop>  
  [-cg_status]  
  [-feedback_path]  
  [-pins]  
  [-cell]  
  [-freq (data|clock|out|reset)+]  
  [-is_async]  
  [-is_mbc1]  
  [-data_width]  
  [-clock_domain]  
  [-icgc_all|direct|indirect]  
  [-level]  
  [-downstream_flops all|direct|indirect]  
  [-level]  
  [-clock_pin_power]  
  [-frames]  
  [-rtl_info])
```

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_flop\_info

---

#### Options and Arguments

|                                  |                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                | Displays help for all options.                                                                                                                                                                                                                                                                                        |
| <code>[-inst]</code>             | Instance name for which information is required.                                                                                                                                                                                                                                                                      |
| <code>[-cg_status]</code>        | Return the clock gating status of the flop.<br><br>0 depicts ungated and 1 depicts gated status.                                                                                                                                                                                                                      |
| <code>[-feedback_path]</code>    | Specify whether there is a feedback path from Q to D of the flop.<br><br>If there is a feedback path and the CG status is ungated, it means there is a probability of clock gating and either Joules did not do this clock gating or settings were not correct (for example, not a proper cell, or min/max bit width) |
| <code>[-pins]</code>             | Return all pins of the specified flop.                                                                                                                                                                                                                                                                                |
| <code>[-cell]</code>             | Name of the mapped cell.                                                                                                                                                                                                                                                                                              |
| <code>[-freq]</code>             | Return frequency of D, Q, clock or reset pins for the flop. Default is the sum of frequencies of all pins.                                                                                                                                                                                                            |
| <code>[-is_async]</code>         | Specify whether the flop is an async flop.<br><br>0 depicts false and 1 depicts true                                                                                                                                                                                                                                  |
| <code>[-is_mbc]</code>           | Specify whether the flop is an MBCI cell.<br><br>0 depicts false and 1 depicts true                                                                                                                                                                                                                                   |
| <code>[-data_width]</code>       | In case of MBCI cell, specify data width.                                                                                                                                                                                                                                                                             |
| <code>[-clock_domain]</code>     | Primary clock domain(s).                                                                                                                                                                                                                                                                                              |
| <code>[-icgc]</code>             | Specify the driving ICGC for gated flops.                                                                                                                                                                                                                                                                             |
| <code>[-level]</code>            | Sub-option of <code>-icgc</code> . Extract information till the specified level of gates for <code>-icgc</code> <code>all</code> or <code>indirect</code> .                                                                                                                                                           |
| <code>[-downstream_flops]</code> | Specify the downstream flops.                                                                                                                                                                                                                                                                                         |
| <code>[-level]</code>            | Sub-option of <code>-downstream_flops</code> . Extract information till the specified level of flops.                                                                                                                                                                                                                 |
| <code>[-clock_pin_power]</code>  | Return clock pin power for the specified flop.                                                                                                                                                                                                                                                                        |
| <code>[-frames]</code>           | List of frame IDs for which flop information is required. By default, average over all SDB frames are considered.                                                                                                                                                                                                     |
| <code>[-rtl_info]</code>         | The <code>&lt;source file&gt;: &lt;line&gt;</code> information.                                                                                                                                                                                                                                                       |

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - get\_flop\_info

---

#### Example(s)

- `set flop {/cpu_10bit/FSM/pst_reg[0]}`
- `get_flop_info -inst $flop -clock_domain`
- `get_flop_info -inst $flop -is_mbc_i`
- `get_flop_info $flop -icgc all`

#### Return Value

-1 indicates failure in execution.

#### Related Topics

- [Clock Gating](#)

## report\_icg\_efficiency

Reports the clock gating efficiency report in a tabular format, with a line for each ICGC. It is recommended to run this command when stimulus has already been read in and the power numbers have been generated through the `compute_power` command.

### Syntax

```
report_icg_efficiency
  [-inst {<inst-path>}+]
  [-module {<module-name>}+]
    [-levels <levels>|all]
  [-fanout <transitive|endpoint>]
  [-clock_domain {<prim-clock-net>}+]
  [-power_domain {<domain-name>}+]
  [-cg_list $icgc_list]
  [-cg_wrapper {<module>[:<enable_pin>]}+]
  [-stims {<stim_id>}+]
  [-frame <frame_id>+]
    [-collate]
  [-power_mode <power_mode>]
  [-power_rail <power_rail>]
  [-cols
    {flops|direct_flops|data_freq_in|data_freq_out|enable_duty|enable_freq|
    enable_eff|cum_enable_eff|impact|clock_power|clock_freq|gated_clock_freq|
    downstream_power|downstream_dynamic_power|downstream_clkpin_power|
    downstream_clkpin_cap|cell|type|annot|power_delta_per_pct_enable_eff|
    hier_level|level|enable_expr|edge|clock_net|group|constant}+]
    (impact = clock_power/enable_eff)
  [-sort_by clock_power|downstream_power|enable_eff|impact]
  [-header]
  [>|-out report_filename]
  [-append]
    [-csv]
  [-help|-h]
```

## Options and Arguments

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <code>[-inst]</code>         | List of hierarchy instances for the ICGC efficiency report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <code>[-module]</code>       | List of modules for the ICGC efficiency report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[-levels]</code>       | Suboption of <code>-module</code> . Specify the level(s) to report. The default is 0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-fanout]</code>       | Specify ICGC downstream stop point. Default: transitive.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <code>[-clock_domain]</code> | List of clock domains for the ICGC efficiency report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-power_domain]</code> | List of power domains for the ICGC efficiency report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>[-cg_list]</code>      | List the ICGCs whose efficiency needs to be analyzed.<br><br>By default, all ICGCs are reported.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-cg_wrapper]</code>   | This option can be queried on leaf ICG instance.<br><br>List of ICGC wrapper modules and, optionally, <code>enable_pin</code> entries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <code>[-stims]</code>        | List of stim IDs for the ICGC efficiency report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <code>[-frame]</code>        | List of frame IDs for which ICGC efficiency needs to be displayed.<br><br>This option is applicable if stimulus is read in and also divided into frames.<br><br>By default, average of all frames is reported.<br><br>Frame ID for each stimulus can be found out using <code>get_sdb_frame -stim &lt;stim_id&gt;</code> command.<br><br>If both <code>-stim</code> and <code>-frame</code> are specified, then the command will first print the required information for all the valid frames that are specified with the <code>-frame</code> option. Then, the command will display the information for both frames irrespective of whether <code>/stim#2</code> is mentioned with <code>-stim</code> or not, as shown in the following example:<br><br><pre>report_icg_efficiency -stim /stim#2 -frame /stim#1/frame#4 /stim#2/frame#17</pre> |



## Joules Command and Attribute Reference

### Design Query and Navigation Commands - report\_icg\_efficiency

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|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-collate]</code>    | Suboption of <code>-frame</code> . Collate the efficiency across specified stims/frames. Default is false.                                                                                                                                                                                                                                                                                                                                                                              |
| <code>[-power_mode]</code> | Power mode for which ICGC efficiency needs to be analyzed.<br><br>By default, its value is dont-care.<br><br>You cannot specify a list of power modes for this option.                                                                                                                                                                                                                                                                                                                  |
| <code>[-power_rail]</code> | Power rail for which ICGC efficiency needs to be analyzed.<br><br>By default, its value is dont care.<br><br>You cannot specify a list of power rails for this option.                                                                                                                                                                                                                                                                                                                  |
| <code>[-cols]</code>       | Flag information in the user-specified column.<br><br>By default, the information is reported in the columns<br><br><code>enable_duty clock_freq gated_clock_freq</code><br><code>enable_eff</code><br><br>It is recommended to read stimulus and run <code>compute_power</code> before running the <code>report_icg_efficiency</code> command. However, there are few options such as <code>flop</code> , <code>direct_flops</code> , <code>cell</code> , which are not stim specific. |
| <code>[-sort_by]</code>    | Sort the output based on the specified parameter, in case of multiple ICGCs.<br><br>If you specify multiple values for this option, the output will not be sorted at all.                                                                                                                                                                                                                                                                                                               |
| <code>[-header]</code>     | Display report header.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <code>[&gt; -out]</code>   | If specified, redirect the output of the command in the specified file.<br><br>If the specified file needs to be created in some other directory, ensure that the directory exists.                                                                                                                                                                                                                                                                                                     |
| <code>[-append]</code>     | Append to the file specified with <code>-out</code> option.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>[-csv]</code>        | Suboption of <code>-out</code> . Generate Excel style (Comma Separated Values) report.                                                                                                                                                                                                                                                                                                                                                                                                  |

### Example(s)

```
■ set cg_list [get_icgcs -clock /cpu_10bit/clk]
```

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - report\_icg\_efficiency

---

- `report_icg_efficiency -cg_wrapper cg_wrapper1 -sort_by clock_power -out cpu_10bit_icgc_efficiency.rpt -cg_list $cg_list`
- `report_icg_efficiency -inst /top/block1 #report ICGC efficiency for ICGCs under /top/block1`

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Clock Gating](#)

## report\_icg\_scrub

Identifies and reports lint errors in a design.

### Syntax

```
report_icg_scrub  
  [-stims <stim_id>+]  
  [-frames <frame_id>+]  
  [-root <root_inst>+]  
  [-double_icgcs]  
  [-help|-h]
```

### Options and Arguments

|                              |                                                                                                                                  |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                                   |
| <code>[-stims]</code>        | Specify the stim ID(s) for which lint errors are to be reported. By default, all SDB stims are considered.                       |
| <code>[-frames]</code>       | Specify the frame ID(s) for which lint errors are to be reported. By default, Frame#0 of all specified SDB stims are considered. |
| <code>[-root]</code>         | Specify the hierarchy for reporting the lint errors. By default, design root is used.                                            |
| <code>[-double_icgcs]</code> | Specify this option to report lint errors of type double ICGCs.                                                                  |

### Example(s)

```
report_icg_scrub -double_icgcs
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Clock Gating](#)

## plot\_net\_distribution

Plots net distribution histogram for fanout, load (capacitance), or resistance.

### Syntax

```
plot_net_distribution \  
  [-inst <inst>+]  
  [-module {<module-name>}+]  
  [-spef_annotated_nets]  
  [-category <macro(memory+bbox)|memory|bbox|register|latch|logic|clock>]  
  [-f_net_rpt <f_rpt>]  
  [-xkey fanout|wire_cap|sink_cap|load_cap|wire_res]  
  [-xrange <min>:<max>]  
  [-yrange <min>:<max>]  
  [-bin_cnt <cnt>]  
  [-bin_size {abs|pct}:<val>]  
  [-title <title>]  
  [-png <f_png>]  
  [>|-out|-f_net_data <f_net_data>]
```

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - plot\_net\_distribution

---

#### Options and Arguments

|                                      |                                                                                                                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                    | Displays help for all options.                                                                                                                                    |
| <code>[-inst]</code>                 | Specify the list of root instances for search. By default, the design root is considered.                                                                         |
| <code>[-module]</code>               | Specify the list of module names for search.                                                                                                                      |
| <code>[-spef_annotated_nets]</code>  | Suboption of <code>-module</code> .<br><br>Specify whether to display distribution of SPEF annotated nets in the plot output. Default is false.                   |
| <code>[-category]</code>             | If specified, plots net distribution for the specified category. Default is all                                                                                   |
| <code>[-f_net_rpt]</code>            | Use the specified report file generated using <code>report_net_switching</code> command.                                                                          |
| <code>[-xkey]</code>                 | Specify the data key to display on X axis. See the command syntax for the list of valid values.<br><br>By default fanout values are displayed on X axis.          |
| <code>[-xrange]</code>               | Specify the range of values for X axis. By default, the entire range of X values are plotted.                                                                     |
| <code>[-yrange]</code>               | Specify the range of values for Y axis. By default, the entire range of Y values are plotted.                                                                     |
| <code>[-bin_cnt]</code>              | Specify the number of bins for the plot.                                                                                                                          |
| <code>[-bin_size]</code>             | Specify the size of the bin in absolute or percentage value.<br><br><b>Note:</b> <code>-bin_cnt</code> and <code>-bin_size</code> are mutually exclusive options. |
| <code>[-title]</code>                | Specify the title for the plot output.                                                                                                                            |
| <code>[-png]</code>                  | Save plot in specified PNG file.                                                                                                                                  |
| <code>[&gt; -out -f_net_data]</code> | Save the output in the specified file.<br><br>By default, the output is directed to <code>&lt;work_dir&gt;/plot_net_distribution.data</code> .                    |

#### Example(s)

■ `plot_net_distribution ;# plot net fanout distribution histogram of entire`

## Joules Command and Attribute Reference

### Design Query and Navigation Commands - plot\_net\_distribution

---

design

- `plot_net_distribution -inst /cpu_10bit/DP/ALU -xkey wire_cap`

#### Return Value

0 for success, 1 indicates failure in execution.

#### Related Topics

- [Power Analysis and Reporting](#)

## plot\_inst\_distribution

Plots distribution of design objects by specified object type (-xkey).

### Syntax

```
plot_inst_distribution \  
  [-root <inst>+]  
  [-module {<module-name>}+]  
    [-levels <levels>|all]  
  [-clock_domain {<prim-clock-net>}+]  
  [-power_domain {<domain_name>}+]  
  [-rtl_type  
    {memory|register|flop|latch|icgc|add|sub|mult|div|decoder|comp|shift|  
    mmux|buf|inv|and|nand|or|nor|xor|xnor|ao|aoi|oa|oai|mux|tri|tie|pad|fadd|  
    hadd|delay|iso|srpg|ls|els|ps}+]  
  [-rtl_group {seq|macro|alu|dpx|logic|pm}+]  
  [-leaf macro|gate]  
  [-xkey bit_width|drive_strength|cell|lib|func]  
  [-ykey count|pct|area]  
  [-xrange <min>:<max>]  
  [-yrange <min>:<max>]  
  [-format gnuplot|native]  
  [-png <f_png>]  
  [-title <title_string>]
```

## Options and Arguments

|                              |                                                                                                                   |
|------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <code>[-h]</code>            | Displays help for all options.                                                                                    |
| <code>[-root]</code>         | List of roots for search.<br><br>Default is design root.                                                          |
| <code>[-module]</code>       | List of modules for search.                                                                                       |
| <code>[-levels]</code>       | Suboption of <code>-module</code> .<br><br>Specify the levels for module search.<br><br>Default level is 0.       |
| <code>[-clock_domain]</code> | Specify the list of primary clock domains for search.                                                             |
| <code>[-power_domain]</code> | Specify the list of domain names for search.                                                                      |
| <code>[-rtl_type]</code>     | List of RTL types (applies only to hierarchical insts).<br><br>Default is any.                                    |
| <code>[-rtl_group]</code>    | List of RTL groups (applies only to hierarchical insts).<br><br>Default is any.                                   |
| <code>[-leaf]</code>         | Treat the specified object as leaf.<br><br>Default is auto determined.                                            |
| <code>[-xkey]</code>         | Specify the type of value to display on X axis.<br><br>By default, X axis displays <code>drive_strength</code> .  |
| <code>[-ykey]</code>         | Specify whether to display count, percentage, or area on Y axis.<br><br>By default, count is displayed on Y axis. |
| <code>[-xrange]</code>       | Specify the range of values to display on X axis.<br><br>Default is entire range of X values.                     |
| <code>[-yrange]</code>       | Specify the range of values to display on Y axis.<br><br>Default is entire range of Y values.                     |



## Joules Command and Attribute Reference

### Design Query and Navigation Commands - plot\_inst\_distribution

---

|                        |                                                                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>[-format]</code> | Specify the plotting program to use. Valid values are: <ul style="list-style-type: none"><li>■ <code>gnuplot</code></li><li>■ <code>native</code> (default format)</li></ul> |
| <code>[-png]</code>    | Save plot in the specified PNG file.                                                                                                                                         |
| <code>[-title]</code>  | Specify the title for the plot.                                                                                                                                              |

### Example(s)

- `plot_inst_distribution -xkey drive_strength`
- `plot_inst_distribution -rtl_type register -xkey bit_width`
- `plot_inst_distribution -root /cpu_10bit/DP -xkey cell`
- `plot_inst_distribution -root /cpu_10bit/DP/ALU -xkey func`

### Return Value

0 for success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## report\_area

### Reports:

- Total count of cells mapped against the hierarchical blocks in the current design
- Combined cell area in each of the blocks and the top level design (hierarchical breakup)
  - Cell Area numbers are based on the cell implementations taken from the technology library after mapping.
  - Net Area refers to the estimated post-route net area and is only meaningful if you read in the LEF libraries.
- The wireload model adopted for each of the blocks

**Note:** The units used in the report depend on the units used in the library.

### Syntax

```
report area \  
  [-summary]  
  [-depth <integer>]  
  [-min_count <integer>]  
  [-physical]  
  [-hinst <object>]  
  [-gates]  
  [-normalize_with_gate <object>]  
  [-show_leaf_cells]  
  [-skip_modules_logical_hier_false]  
  [<object>+]  
  [> file]
```

## Options and Arguments

|                                                 |                                                                                                    |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <code>[-h]</code>                               | Displays help for all options.                                                                     |
| <code>[-summary]</code>                         | Reports the area summary.                                                                          |
| <code>[-depth]</code>                           | Reports the number of levels of recursion.                                                         |
| <code>[-min_count]</code>                       | Reports minimum instance count per block.                                                          |
| <code>[-physical]</code>                        | Specify this option to use LEF height and width values for area computation.                       |
| <code>[-hinst]</code>                           | Specify this option to print leaf instances with area under the specified hierarchy.               |
| <code>[-gates]</code>                           | Specify this option to print the area of all combinational, sequential, and hierarchical cells.    |
| <code>[-normalize_with_gate]</code>             | Specify this option to normalize the area number with area of the specified cell.                  |
| <code>[-show_leaf_cells]</code>                 | Specify this option to print leaf instances at design level in the report.                         |
| <code>[-skip_modules_logical_hier_false]</code> | Specify this option to skip reporting the modules with attribute <code>logical_hier false</code> . |
| <code>[-object]</code>                          | Specify the design to report on.                                                                   |
| <code>[-file]</code>                            | Specify the name of the file to which to write the report.                                         |

## Return Value

0 for success, 1 indicates failure in execution.

## Related Topics

- [Power Analysis and Reporting](#)

## report\_design\_stats

Reports various statistics for a design.

### Syntax

```
report_design_stats \  
  [-out <output-file-name>]  
  [-append]
```

### Options and Arguments

|           |                                                     |
|-----------|-----------------------------------------------------|
| [-h]      | Displays help for all options.                      |
| [-out]    | Report the design statistics in the specified file. |
| [-append] | Append to the file specified with -out option.      |

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## tag\_icgc

Tags the specified ICGC instance(s) as arch or inferred. This command only works for leaf instances.

### Syntax

```
tag_icgc  
  [-inst_name <inst_name>+]  
  [-lib_cell <libcell>+]  
  [-inferred|arch]
```

### Options and Arguments

|                  |                                                                                                                |
|------------------|----------------------------------------------------------------------------------------------------------------|
| [-h]             | Displays help for all options.                                                                                 |
| [-inst_name]     | Tag the specified ICGC instance(s). This option is mutually exclusive with -lib_cell.                          |
| [-lib_cell]      | Tag all ICGC instances instantiated from this library cell. This option is mutually exclusive with -inst_name. |
| [-inferred arch] | Tag the specified instance(s) as arch or inferred. By default, the ICGCs are tagged as inferred.               |

### Example(s)

```
■ tag_icgc -inst_name /cpu_10bit/abc -inferred
```

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## report\_naming\_rules

Reports the rules applied for naming design components.

### Syntax

```
report_naming_rules \  
  [-out <output-file-name>]  
  [-append]
```

### Options and Arguments

|           |                                                |
|-----------|------------------------------------------------|
| [-h]      | Displays help for all options.                 |
| [-out]    | Report the naming rules in the specified file. |
| [-append] | Append to the file specified with -out option. |

### Return Value

0 indicates success, 1 indicates failure in execution.

### Related Topics

- [Power Analysis and Reporting](#)

## report\_design\_info

### Syntax

```
report_design_info \  
  [-tech_node <tech_node_value>]  
  [-detail ]  
  [-out <file> ]
```

### Options and Arguments

|              |                                             |
|--------------|---------------------------------------------|
| [-tech_node] | Provide technology node value of design.    |
| [-detail]    | Generate detailed design report.            |
| [-out]       | Save the output data in the specified file. |

### Examples

- report\_design\_info
- report\_design\_info -detail -tech\_node 7nm

## report\_enable\_expression

Reports the enable expression of the flops.

### Syntax

```
report_enable_expression \  
  [-flops flop_list]  
  [-max_ops_count num]  
  [-full_path]
```

### Options and Arguments

|                  |                                                                               |
|------------------|-------------------------------------------------------------------------------|
| [-h]             | Displays help for all options.                                                |
| [-flops]         | Report the enable expression of each flop.                                    |
| [-max_ops_count] | Specify the limit on number of operators in enable expression.<br>Default: 50 |
| [-full_path]     | Specify to display the full path.                                             |

### Example

- `report_enable_expression -flops [vfind / -inst F1]`
- `report_enable_expression -flops [vfind / -inst F1] [vfind / -inst F2] -full_path`
- `report_enable_expression -flops [vfind / -inst F1] -max_ops_count 5`



---

## Joules Attributes

---

Joules supports most of the attributes used in Genus. This chapter provides information on attributes that are specific to Joules. Refer to *Genus Attribute Reference* for information on Genus attributes.

- [ignore\\_instance\\_pattern\\_for\\_annotation\\_summary](#)
- [power\\_format](#)
- [power\\_unit](#)
- [redn\\_scrub\\_strict\\_clock\\_check](#)
- [skip\\_assertion](#)
- [stim\\_auto\\_mapping](#)
- [stim\\_leaf\\_modules](#)
- [stim\\_name\\_map\\_file](#)
- [stim\\_phy\\_connection\\_timeout](#)
- [stim\\_phy\\_host\\_setup](#)
- [stim\\_phy\\_thread\\_count](#)
- [stim\\_resim\\_consider\\_user\\_const\\_as\\_asserted](#)
- [xedebug\\_executable](#)

### ***Related Topics***

[Genus Attribute Reference](#)

## ignore\_instance\_pattern\_for\_annotation\_summary

### Name

ignore\_instance\_pattern\_for\_annotation\_summary

### Syntax

```
ignore_instance_pattern_for_annotation_summary list_of_instance_regex_pattern
```

### Default

None

### Description

Read-write root attribute. Specify the instance leaf name patterns whose matching instances need to be ignored in annotation summary report.

For example: `set_db / .ignore_instance_pattern_for_annotation_summary { .*DFT.*  
.*MBIST.* }`

This will exclude all instances having DFT and MBIST in their leaf name from annotation summary.

### ***Related Commands***

- [read\\_stimulus](#)
- [report\\_sdb\\_annotation](#)
- [xreplay](#)

## **power\_format**

### **Name**

power\_format

### **Syntax**

`power_format string`

### **Default**

`%.5e`

### **Description**

Read-write root attribute. Sets default power format for Joules `report_power` command.

### ***Related Commands***

`report_power`

## Joules Command and Attribute Reference

### Joules Attributes - power\_unit

---

#### power\_unit

##### Name

power\_unit

##### Syntax

```
power_unit {pW pw nW nw uW uw mW mw W w}
```

##### Default

W

##### Description

Read-write root attribute. Sets default power unit for Joules `report_power` command.

##### *Related Commands*

`report_power`

## **redn\_scrub\_strict\_clock\_check**

### **Name**

redn\_scrub\_strict\_clock\_check

### **Syntax**

```
redn_scrub_strict_clock_check <true | false>
```

### **Default**

false

### **Description**

Read-write root attribute. Implements strict clock check for ODC/STB.

## **skip\_assertion**

### **Name**

skip\_assertion

### **Syntax**

```
skip_assertion <true | false>
```

### **Default**

false

### **Description**

Read-write pin/port attribute. Ignores assertions in stimulus activity.

### ***Related Commands***

reset skip\_assertion

## stim\_auto\_mapping

### Name

stim\_auto\_mapping

### Syntax

```
stim_auto_mapping integer
```

### Default

0

### Description

Read-write root attribute. Automatically maps the names between stimulus and mapped netlist rather than explicitly giving the rules for mapping in `rtlstim2gate`.

This attribute has the following possible values:

- 0 - Disabled
- 1 - Name matching is case sensitive and is applied on state points (used for Verilog designs)
- 2 - Name matching is case in-sensitive and is applied on state points (for VHDL designs)
- 3 - Name matching is case sensitive and is applied on hierarchical pins and state points. Apply only if the functionality of subports are same.
- 4 - Name matching is case in-sensitive and is applied on hierarchical pins and state points. Apply only if the functionality of subports are same.

### ***Related Commands***

[read\\_stimulus](#)

## **stim\_leaf\_modules**

### **Name**

stim\_leaf\_modules

### **Syntax**

```
stim_leaf_modules string
```

### **Default**

None

### **Description**

Read-write root attribute. Returns list of leaf level modules in simulation which have hierarchies in synthesis.



## Joules Command and Attribute Reference

### Joules Attributes - stim\_name\_map\_file

---

#### stim\_name\_map\_file

##### Name

stim\_name\_map\_file

##### Syntax

```
stim_name_map_file string
```

##### Default

None

##### Description

Read-write root attribute. Specify the file name for dumping mapping between stim and netlist names using `read_stimulus -export_map_file_data`.

##### ***Related Commands***

[read\\_stimulus](#)

## **stim\_phy\_connection\_timeout**

### **Name**

stim\_phy\_connection\_timeout

### **Syntax**

```
stim_phy_connection_timeout integer
```

### **Default**

100

### **Description**

Read-write root attribute. Sets maximum wait time (in seconds) for xeDebug to connect with xeDebug session launched on another CPU in a multi-CPU scenario for PHY in Joules.

## Joules Command and Attribute Reference

### Joules Attributes - stim\_phy\_host\_setup

---

#### stim\_phy\_host\_setup

##### Name

stim\_phy\_host\_setup

##### Syntax

```
stim_phy_host_setup string
```

##### Default

None

##### Description

Read-write root attribute. Sets multi-host environment for PHY in Joules.

## Joules Command and Attribute Reference

### Joules Attributes - stim\_phy\_thread\_count

---

## stim\_phy\_thread\_count

### Name

stim\_phy\_thread\_count

### Syntax

```
stim_phy_thread_count integer
```

### Default

8

### Description

Read-write root attribute. Sets multi-thread environment for PHY in Joules.

## **stim\_resim\_consider\_user\_const\_as\_asserted**

### **Name**

stim\_resim\_consider\_user\_const\_as\_asserted

### **Syntax**

```
stim_resim_consider_user_const_as_asserted <true | false>
```

### **Default**

false

### **Description**

Read-write root attribute. Applies Toggle Data value for user constant nets in the resim flow.

This helps in re-simulating ICGCs with user constant nets in the clock/enable path.

## Joules Command and Attribute Reference

### Joules Attributes - xedebug\_executable

---

#### xedebug\_executable

##### Name

xedebug\_executable

##### Syntax

xedebug\_executable *string*

##### Default

None

##### Description

Read-write root attribute. Sets the path of xeDebug to run `read_stimulus` with which the PHY being used as an input was generated.

---

## Stylus Common UI Support

---

This chapter includes information about Stylus common UI support in Joules.

### Legacy Commands Renamed for Stylus Common UI

**Legacy command**

apply\_drc\_rules  
collate\_power  
dump\_activity\_profile  
dump\_power\_profile  
estimate\_data\_buffers  
gen\_clock\_tree  
gen\_power\_critical\_signals  
get\_ctg\_info  
get\_icgc\_info  
get\_libcells  
infer\_clock\_buffers  
infer\_memory\_cells  
infer\_x1\_cell  
plot\_piechart  
power\_map  
replay\_rtlstim2gate  
report\_icgc\_efficiency

**Common UI command**

commit\_drc\_rules  
report\_power\_collate  
write\_activity\_profile  
write\_power\_profile  
add\_data\_buffers  
create\_clock\_tree  
write\_power\_critical\_signals  
get\_clock\_tree\_info  
get\_icg\_info  
get\_library\_cells  
report\_clock\_buffers  
report\_joules\_memory\_cells  
report\_x1\_drive\_cell  
plot\_pie\_chart  
syn\_power  
replay\_rtl\_stim\_to\_gate  
report\_icg\_efficiency

## Joules Command and Attribute Reference

### Stylus Common UI Support

---

#### Legacy command

report\_icgc\_scrub  
rtlstim2gate  
set\_mbc\_i\_controls  
show\_cell\_info  
show\_cell\_tables  
show\_lib\_params  
sweep\_power  
tag\_clock\_tree\_for\_power  
tag\_memory  
track\_power  
tune\_ple\_from\_spef  
write\_fsai\_f

#### Common UI command

report\_icg\_scrub  
set\_rtl\_stim\_to\_gate\_config  
set\_multibit\_controls  
report\_cell\_info  
report\_cell\_tables  
report\_lib\_params  
report\_power\_sweep  
set\_clock\_tree\_for\_power  
set\_memory\_cell  
report\_power\_regress  
scale\_ple\_from\_spef  
write\_forward\_saif

## Tool Startup when using Common User Interface

In Stylus common UI mode, Joules uses the same startup scheme as the other Cadence tools that use the common UI (Innovus and Tempus).

Joules looks for the `joules_startup.tcl` initialization file for setup information in the following directories (in the given search order):

- Installation root directory
- The `.cadence` directory in your home directory
- The `.cadence` directory in the current directory
- The current design directory (contains a project-specific setup)