

# 018/016 Assura LVS/LPE Deck Usage

## PDKD/TSMC

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# Switch and Variable Setting

# Assura Switches(I)

- **?set (“ZERO\_NRDS”)**
  - Turn on this switch to force NRS=NRD=0.
- **?set (“extract\_dnwdio”)**
  - Turn on this switch to extract PW/DNW and DNW/PSUB diodes.
- **?set (“NW\_RING”)**
  - Turn on this switch to enable NW ring to separate the node from BULK.
- **?set (“spice\_extraction”)**
  - Turn on this switch to omit saveProperty about model name for spice extraction.
- **?set (“Skip\_Soft\_Connect\_Checks”)**
  - Turn on this switch to skip soft-connect check.
- **?set (“CAP\_1P5”) / ?set (“CAP\_2P0”)**
  - Select which capacitance will be extracted. Default is 1.0fF MIM capacitor.
- **?set (“CDL\_input”)**
  - Switch for running GDS mode.

# Assura Variables

- **scale**

- For 0.18 process, scale = 1.0 ; for 0.16 process, scale = 0.9. Scale factor can be found from spice model card.
- Scale variable relates to the scale factor in shrink process. Please do not change the default value.



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Security C

# Assura LVS/LPE Flow

# Assura LVS Flow

## ● Run LVS :

- Include “source.added” file in your source netlist for subcircuits.
  - ◆ .include source.added
- Prepare a LVS.rsrf file for Assura LVS run in batch mode.
  - ◆ avParameters(
    - ?inputLayout ( "GDS2" "top\_cell.gds" ) ; specify full path gds name
    - ?cellName "top\_cell" ; specify top cell name
    - ?rulesFile "./1p6m/extract.rul" ; specify assura deck
    - ?runName "top\_cell" ; specify run name
    - ?workingDirectory "./rundir" ; specify run directory
    - ) ; end of avParameters
    - load( "./1p6m/compare.rul" ) ; load compare.rul
    - avLVS()
  - Run Assura
    - ◆ % **assura LVS.rsrf**
    - ◆ Files top\_cell.cls, top\_cell.err and top\_cell.csm are LVS result and path check report.

# Assura LPE Flow

## ● Run LPE:

- Prepare a rcx.rsx file For Assura LPE Flow in batch mode.

```

◆ avParameters(
    ?workingDirectory "./rundir"                ; specify run directory
    ?runName "<run_name>"                        ; specify run name
    ?inputLayout ( "GDS2" "<gds_name>" )        ; specify gds name
    ?cellName "<cell_name>"                    ; specify top cell name
    ?viewName "layout"
)
rcxParameters(
    ?rcxSetupDir "."
    ?outputFormat "spice"
    ?output "<output_name>"                    ; specify output name
    ?runName "<run_name>"                      ; specify run name
    .
    .                                           ; customize RC extraction setting
)
avRCX()

```

- Run LPE

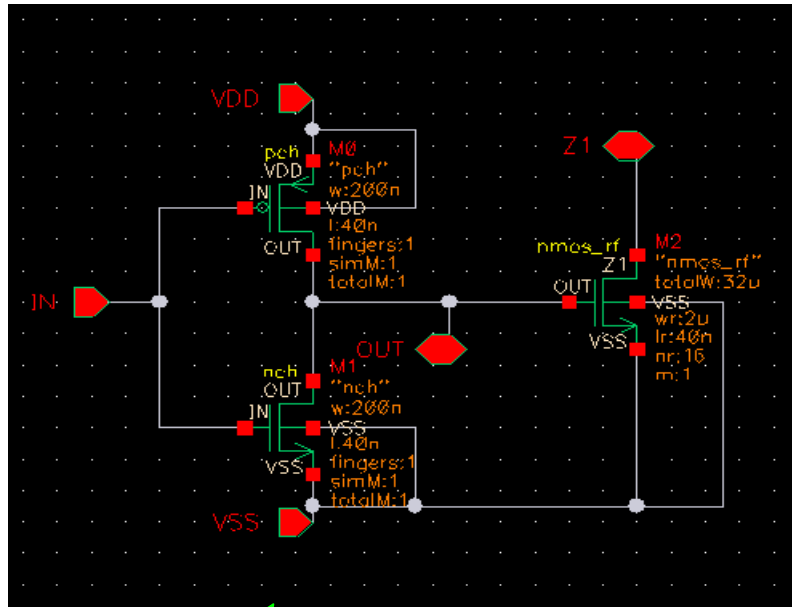
- ◆ Download (and un-tar) the LPE tech files.
- ◆ Create lvfile under LPE techdir.
- ◆ For Assura LVS/LPE flow, run Assura LVS and copy the runname.xcn file to the LPE techdir and call it lvfile.
- ◆ **% capgen.cmd**
- ◆ **% assura rcx.rsx**



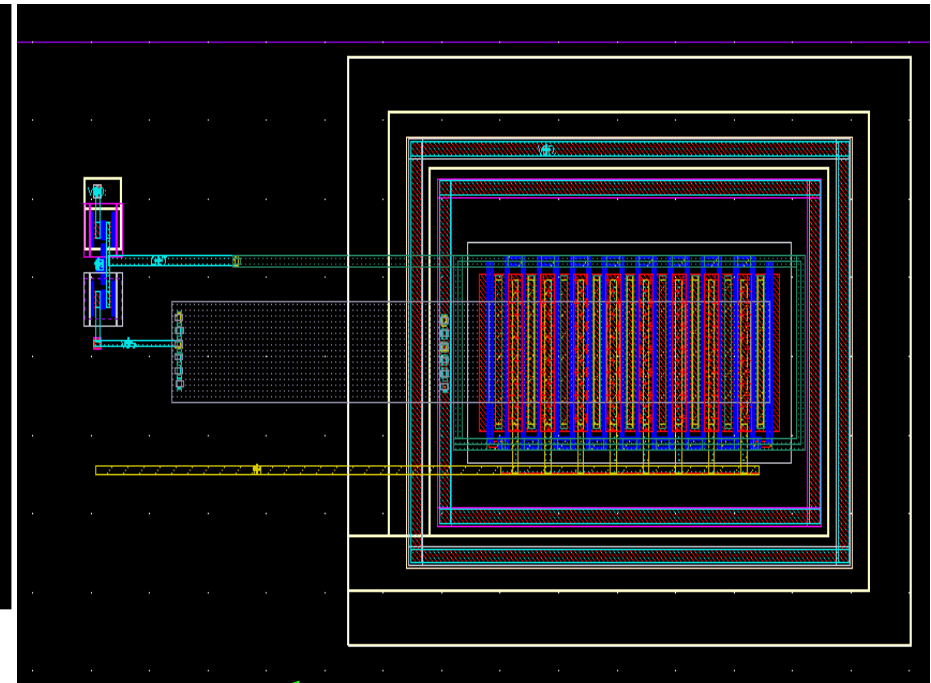
# Assura LVS/LPE GUI Flow

# Data Preparation

- The library includes schematic view and layout view.
- There are two logic mos devices and one rf device.



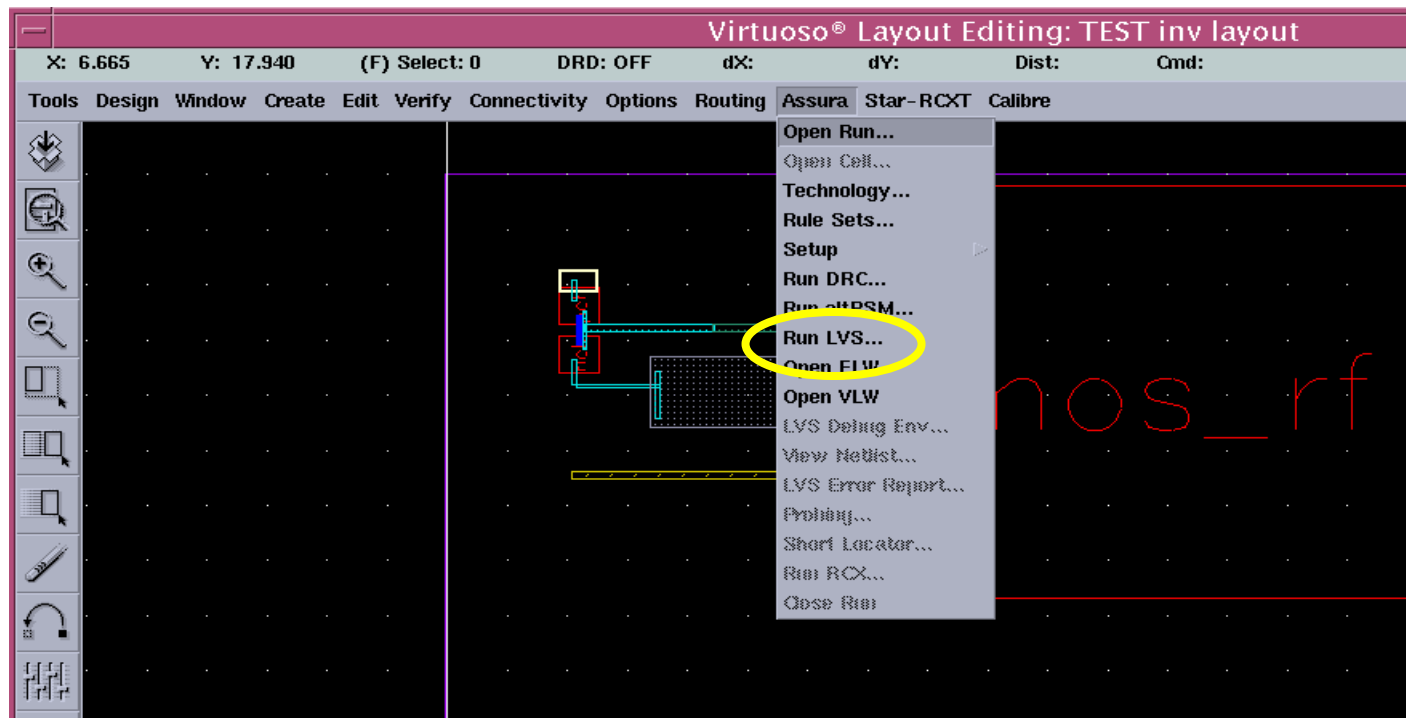
**Schematic  
view**



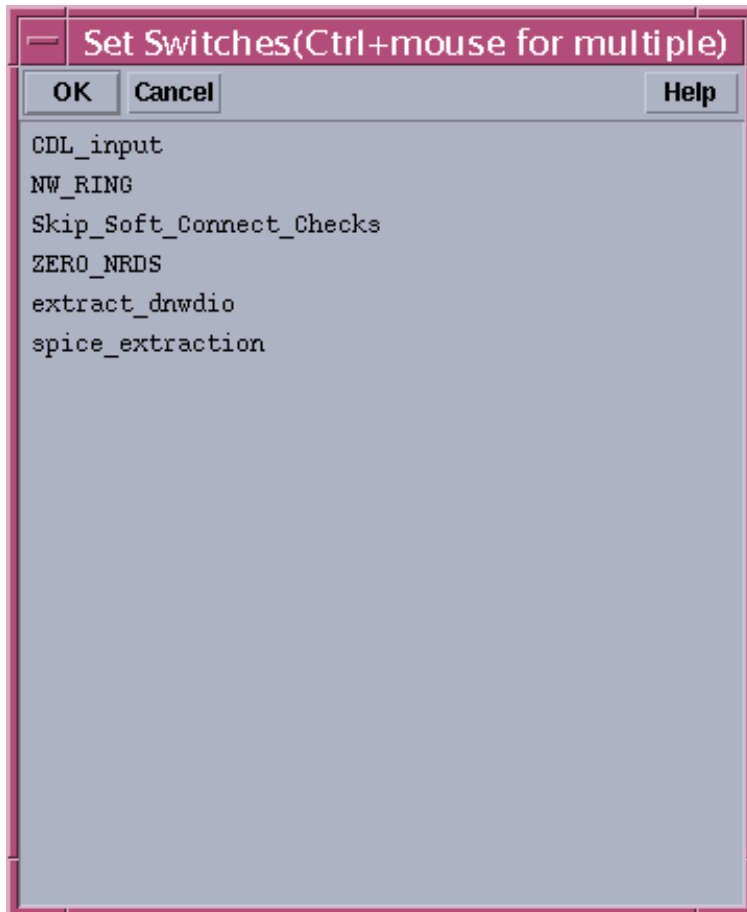
**Layout  
view**

# Assura LVS GUI Flow(I)

- Trigger the “Run LVS” in the Assura pull down manual.



# Assura LVS GUI Flow(II)



- There is a pop-up manual when the “set Switches” is triggered.
- Switch description
  - **NW\_RING**: The NWELL ring could isolate the psub.
  - **Skip\_Soft\_Connect\_Checks**: It will not do the soft-connect check.
  - **ZERO\_NRDS**: The NRS/NRD will set to zero which it will take care by the RC extraction.
  - **extract\_dnw dio**: Extract PW/DNW, DNW/PSUB diode.
  - **spice\_extraction**: When do the spice extraction, this option has to turn on.
  - **CDL\_input**: Switch for running GDS mode.

# Assura LVS GUI Flow(III)

**Run Assura LVS**

OK Cancel Apply Defaults Load State Save State View RSF Help

Schematic Design Source **DFII** Use Existing Netlist ☐ Netlisting Options...

Library **TEST** Cell **inv** View **schematic** Browse...

Layout Design Source **DFII** Use Existing Extracted Netlist ☐

Library **TEST** Cell **inv** View **layout** Browse...

Run Name **l** Run Directory **./Intel\_rund** ...

Run Location **local**

View Rules Files ☒ Technology **assura\_tech** Rule Set **default**

☐ Extract Rules **a/PDK\_NEW/N45RF/Assura/lvs\_rcx/extract.rul** View... Reload

☐ Compare Rules **c/kmliua/PDK\_NEW/N45RF/Assura/lvs\_rcx/compare.rul** View...

Switch Names **l** Set Switches

☐ Binding File(s) **156b/kmliua/PDK\_NEW/N45RF/Assura/lvs\_rcx/bind.rul** View...

☐ RSF Include **l** View...

Variable Value Default Description

**None** **l** **l** **l**

View avParameters ☒ Modify avParameters... 4 avParameters are set.

**?joinPins top**  
**?keepOriginal t**  
**?preserveCells ( file(\"/.../tsmc156/root/home/tsmc156b/kmliua/PDK\_NEW/N45RF/A...**

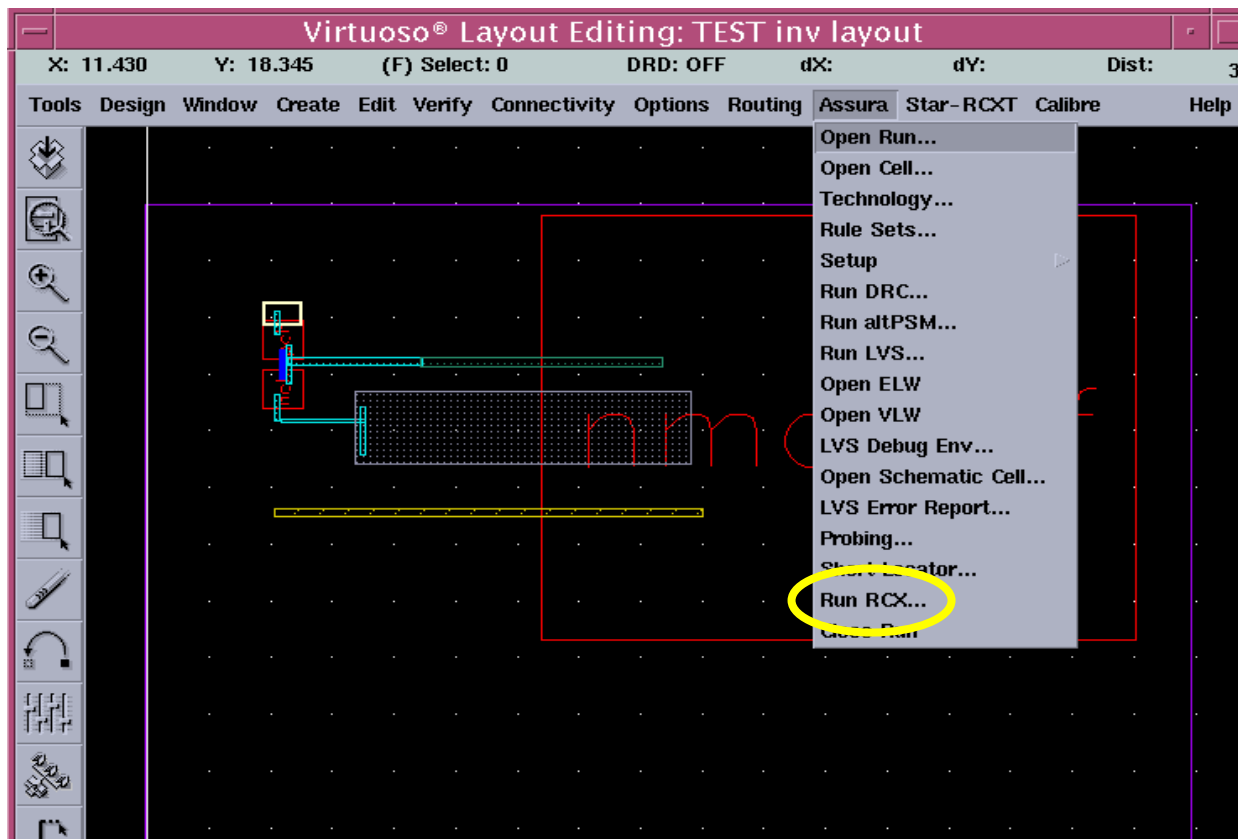
View avCompareRules ☐ Modify avCompareRules... No avCompare rules are set.

View Additional Functions ☐ No additional functions are set.

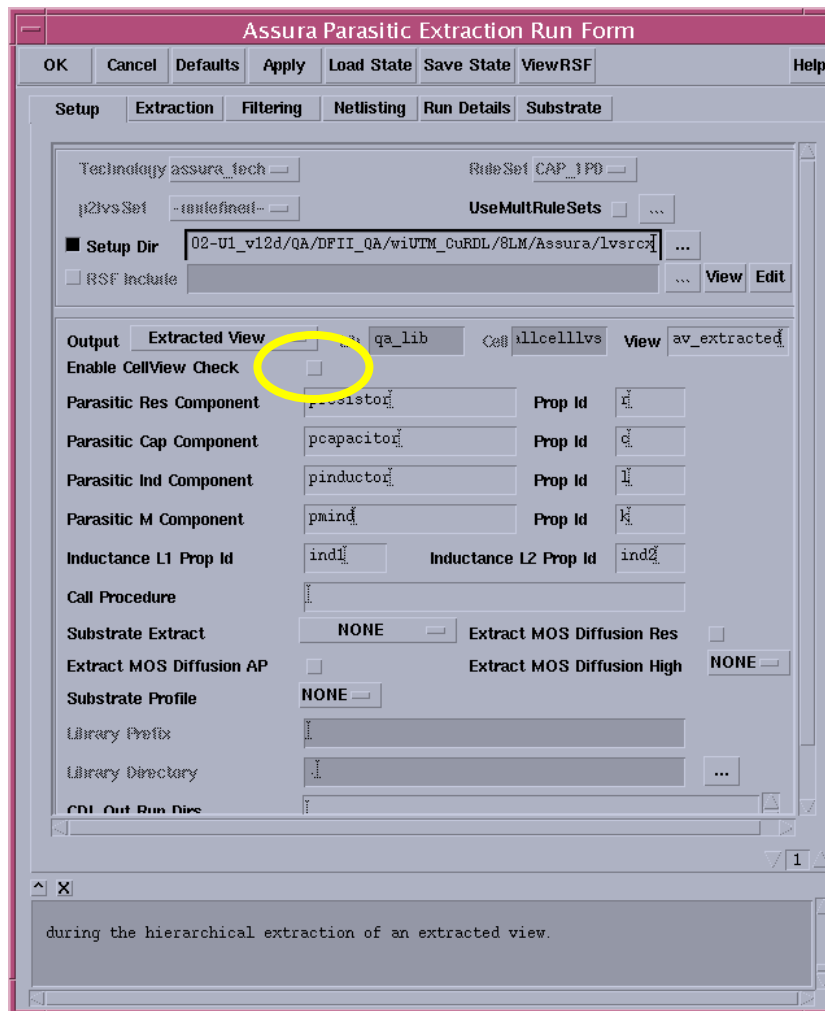
- Turn on “Modify avParameters”.
- The option “?joinPins” means to turn on virtual connect.
- Please check “run\_name.cls”, “run\_name.err”, and “run\_name.csm” files after the LVS check.

# Assura LPE GUI Flow(I)

- Trigger the “Run RCX” in the Assura pull down manual.

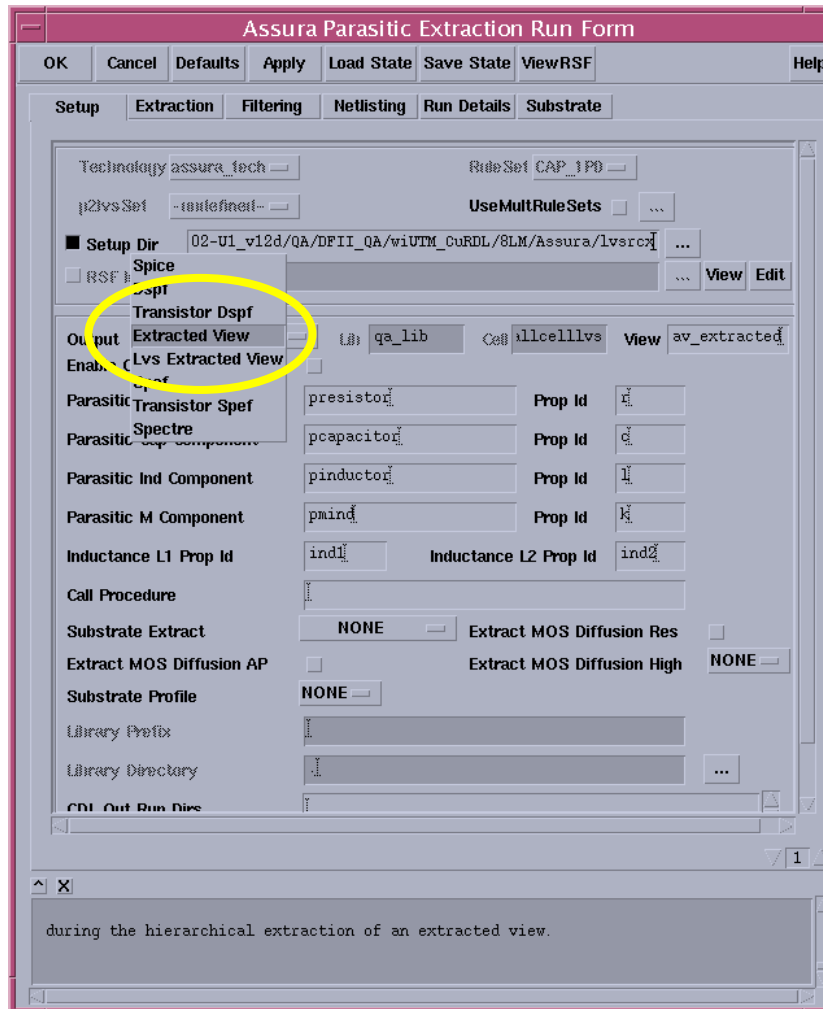


# Assura LPE GUI Flow(II)



- Please turn off the “enable CellView Check” when do the LPE extraction in the “setup” folder.

# Assura LPE GUI Flow(III)



- Select “Output” to “Extracted View” in “setup” folder of Assura Parasitic Extraction window to output extract result to “av\_extracted” view.



# Assura LPE GUI Flow(IV)

- Please specify the extraction mode in the Extraction folder.

Assura Parasitic Extraction Run Form

OK Cancel Defaults Apply Load State Save State ViewRSF Help

Setup Extraction Filtering Netlisting Run Details Substrate

Extraction Mode **C Only** Name Space Schematic Names

Max fracture length: infinite microns Temperature 25.0 C

Cap Extraction Mode Decoupled Ref Node VSS

Mult Factor 1.0 Region Limit 200 Max num of Signals 1000

PEEC Mode ☐ Ladder Network ☐ Global Frequency 0 MHz

Select... User Region View... Edit...

Extraction Mode Full Chip All Nets RCXFS Extraction Mode NONE

Exclude Via Capacitance ☐ RCXFS High ☐

From File ☐ SelfFromSch

Frequency File View Edit

Enable HRCX ☐ Split Pins ☐ Split Pin Distance 5 Microns

Enter HRCX Cells: From File ☐

HRCX Cells: Specify a list of cells which appear in the output hierarchy, requires cell name, with optional view and lib names (cell, view, lib).

# Assura av\_extract view

- RC av\_extract view in the library.

