

SOA usage with new formalism

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- New SOA formalism

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 - Category Out Of Process
 - Category Non Functionnal
 - Category Reliability
 - Category Modeling
- SOA Filtring



- Check SOA in Framework cadence

- Allow SOA Check ELDO
- Post Processing Result Of Eldo
- Allow SOA Check SPECTRE
- Post Processing Result Of Spectre
- Allow SOA Check HSPICE



- AMSRB Tool

- AMS Results Browser NEW in 13.2
- Predefined Filter
- Predifened Filter example

- Conclusion



PART I



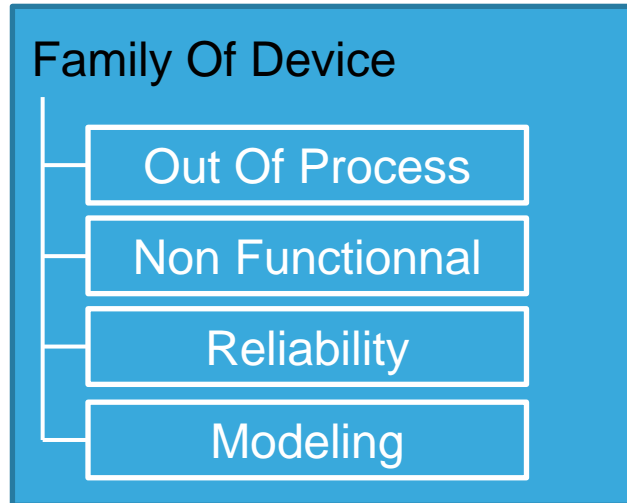
New SOA Formalism

Introduction

- SOA (Safe Operating Areas) can be defined within the simulator in order to check if the device is properly used.
- These can be viewed as rules that the simulator will evaluate during circuit simulation. If the rule check is false, a message is printed for the related component.
- The used rules are mainly based on device specification, electrical characterization and model limitation.
- Because SOA rules are numerous and concern a lot of device, soas have been classified in four categories.

New SOA formalism Structure

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- Created 4 categories of rules for every family of devices
 - **Out Of Process:** Rules related to the standard process specification of the device
 - **Non functional:** They allow to check that the device is functional during all the simulation
 - **Reliability:** We could check that the device operates within the specification and is not broken and could evaluate the circuit reliability
 - **Modeling:** The hot spot issue underlines the fact that a device could operate in a safe domain for itself but could induce damage for other neighbor component

I-Out of Process Category

- This category contains all rules related to the standard process specification of the device.
- If we consider a 1.8V Mos device, we expect that the maximal V_{gs} and V_{ds} is 1.8V. Such bias range do not rely on reliability or advanced electrical characterization and in consequence can be already defined at the device definition.

II-Non fonctionnal Category

- The rules present in these category are based on electrical characterization. They allow to check that the device is fonctionnal during all the simulation.
- The non fonctionnal limits could come from junction or device breakdown, or snap-back problem for MOS devices for example.

III-Reliability Category

- The rules here are also based on electrical tests, and mainly on the reliability program started at the maturity 10 of the device.
- With the previous categories, we could check that the device operates within the specification and is not broken. With this category, we could evaluate if the circuit is reliable for long time.

IV-Hot spots and modeling Category

- Simulation are based on a device model. The model should be as close as possible to the silicon behaviour of the device. Nevertheless, some limitations, inaccuracies could be present in some operating areas. **The rules here will list some known limitations.** In the case of HV devices or resistances for example, some models will not take into account the self-heating that is present.
- **The hot spot issue underline the fact that a device could operate in a safe domain for itself but could induce damage for other neighbour component.** Resistor self-heating for example is important for accurate modeling of the component but could also be crucial when considering that the resistor self-heating could increase the temperature in the back-end line above where electromigration is an important limitation.

SOA filtering

- Three level of filter have been created in order to address specific SOA validation.
- **At device level : instance parameter soa**
The device has an instance parameter soa. When set at 0, it switched off all the soa rules for the selected device.
- **At family level : family_soa switch**
family_soa parameter can be set within ArtistKit interface or manually in the netlist in order to switch on(1)/off(0) the soas of the related family.
- **Global level : soa outofprocess, soa nonfunctionnal, soa reliability, soa modeling**
Four global parameters (list above) related to the categories could be set in the ArtistKit interface or manually in the netlist. They allow to switch on(1)/off(0) the different rules present in each category.

PART II



Check SOA in Framework Cadence

Allow SOA check (ELDO)

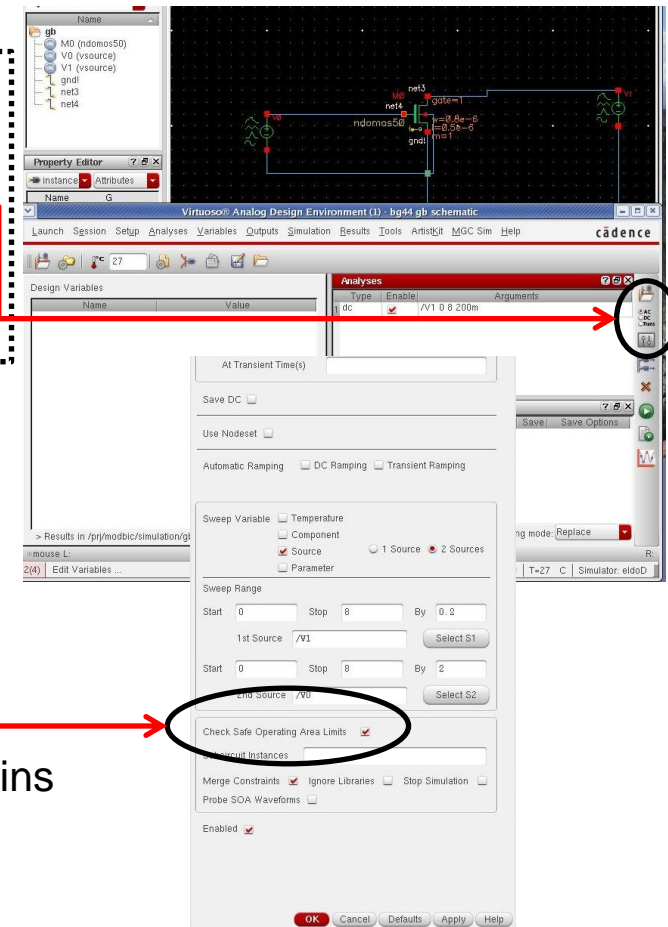
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CheckSOA Statement **enable/disable** the check soa CheckSOA
→ Default value is **disable**

How to enable/disable checksoa statment

Step 1: ADE>Choosing Analysis

Step 2: Select from the choosing analysis window «check Safe Operating area limits»



After Simulation:

- <netlist>.soa file created Under PSF directory which contains all violations results

Post Processing Result Of Eldo

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Mentor Graphics Has developed AMSRB Tool to post processing the Soa Results

Results Display

Step 1: Run the simulation

Step 2: *MGC Sim>Reports>SOA Violations>Report*

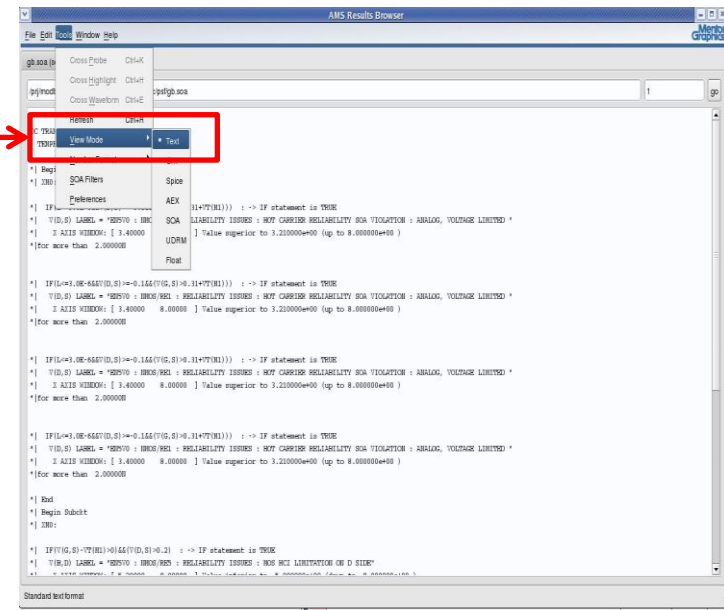
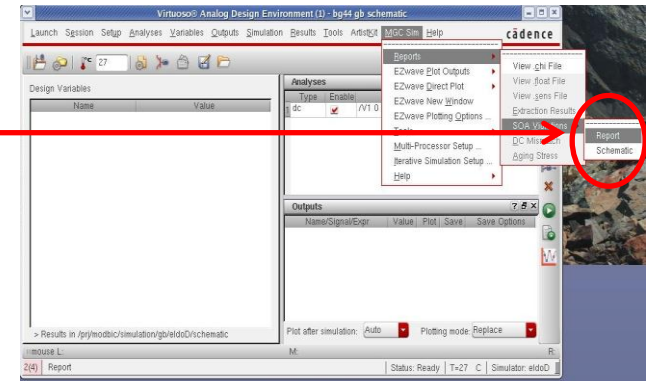
PS: (if you do not see this menu, look at the short cup next Cadence logo at the top right corner)

Step 3: AMSRB Interface **file>open><netlist>.soa**

Step 4: Choose SOA **ModeTools>ViewMode>SOA**

AMSRB is started automatically after the simulation
“to display the log file”

This tool help us to filter our results based on
Label, models name, subckt name



Allow SOA check (Spectre)

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All defined Assert statement in your models are enable by default

How to control the check

Step 1: ADE>Simulation>Options>Analog

Step 2: Simulation Options>Check tab

Step 3: dochecklimit to yes || no « enable/desable the check »

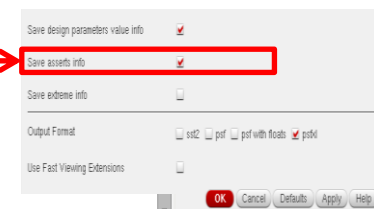
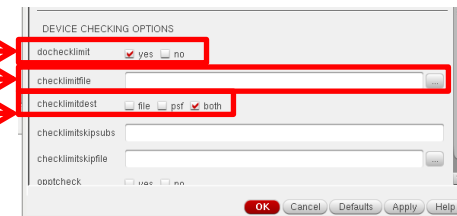
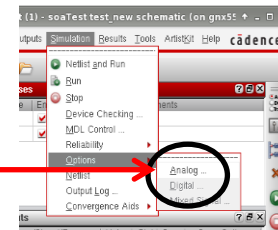
Step 4: checklimitfile To define the output file which contain all violations messages

Step 5: checklimitdest define your output destination :

- File
- Psf
- Both

Step 6: Save all assert info:

1. ADE>outputs>Save All
2. Select Save asserts info
3. Verify if assert info is added into your netlist



```
// View name: schematic
R0 (net3 Drain) resistor r=100K
V1 (net3 0) vsource dc=2.5 type=dc
V0 (Gate 0) vsource type=pulse val0=0 val1=2.5 period=10n width=3n
M0 (Drain Gate 0 0) nlvtgp v=0.135 l=0.06 nring=1 mult=1 srefirst=1 \
ngcon=1 mismatch=1 lpe=0 soa=1 rglag=0 dnu_mdev=0 dvt_mdev=0
numcos=1 numcod=1
simulatorOptions options reltol=1e-3 vabstol=1e-6 iabstol=1e-12 temp=2
tnom=27 scale=1.0 scale=1.0 gain=1e-12 rforce=1 maxnotes=5 maxvari
digits=5 cols=80 pvtrel=1e-3 sensfile=../psf/sens.output" \
checklimitdest=psf
tran tran stop=30n write="spectre.ic" writefinal="spectre.fc" \
annotate=status maxiters=5
finalTimeOP info what=oppoint where=rawfile
modelParameter info what=models where=rawfile
element info what=inst where=rawfile
outputParameter info what=output where=rawfile
designParameters info what=parameters where=rawfile
primitives info what=primitives where=rawfile
subckts info what=subckts where=rawfile
asserts info what=assert where=rawfile
saveOptions options save=allpub subcktprobelv-
```

Post Processing Result Of Spectre (1)

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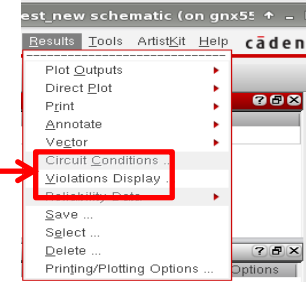


Display the assert violations results

Step 1: Run your simulation

Step 2: Launch violations display **ADE>Results>Violations Display**

Step 3: Violations display Interface



Violations Summary

	Name	Status	Subcircuit/Mod/P	Expr/Param	Min	Max	Region	Duration	Severity	Color
1	M0.soa_124	FAILED	nivtgp	expr=((v(g)-v(s))-m1:vth>0&&(v(d)-v(s))>0.2)?((v(b)-v(d))<-1.2 (v(b)-v(d))>0.2):0				0	warning	yellow
2	M0.soa_123	PASSED	nivtgp	expr=v(b)-v(s)	-2.2			2e-09	warning	yellow
3	M0.soa_121	FAILED	nivtgp	expr=((v(g)-v(b))-m1:vth<0)?((v(g)-v(b))<-1.1 (v(g)-v(b))>1.1):((v(g)-v(b))<-2.2 (v(g)-v(b))>2.2)				0	warning	yellow
4	M0.soa_122	FAILED	nivtgp	expr=v(b)-v(d)	-2.2			2e-09	warning	yellow
5	M0.soa_125	PASSED	nivtgp	expr=((v(g)-v(d))-m1:vth>0&&(v(d)-v(s))<-0.2)?((v(b)-v(s))<-1.2 (v(b)-v(s))>0.2):0				0	warning	yellow
6	M0.soa_119	FAILED	nivtgp	expr=v(g)-v(s)	-1.1	1.1		2e-09	warning	yellow
7	M0.soa_120	FAILED	nivtgp	expr=v(d)-v(s)	-1.1	1.1		2e-09	warning	yellow
8	M0.soa_118	FAILED	nivtgp	expr=v(g)-v(d)	-1.1	1.1		2e-09	warning	yellow
9	M0.soa_127	PASSED	nivtgp	expr=v(b)-v(s)		0.33		2e-09	warning	yellow
10	M0.soa_126	PASSED	nivtgp	expr=v(b)-v(d)		0.33		2e-09	warning	yellow

Buttons: Highlight, Clear, Details..., Print..., Close, Help

Post Processing Result Of Spectre(2)

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Options are available : Highlight/Print/details/save

Highlight: To Highlight the Instance

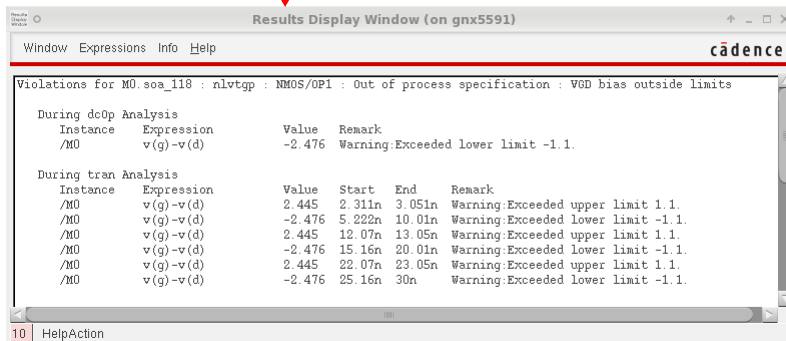
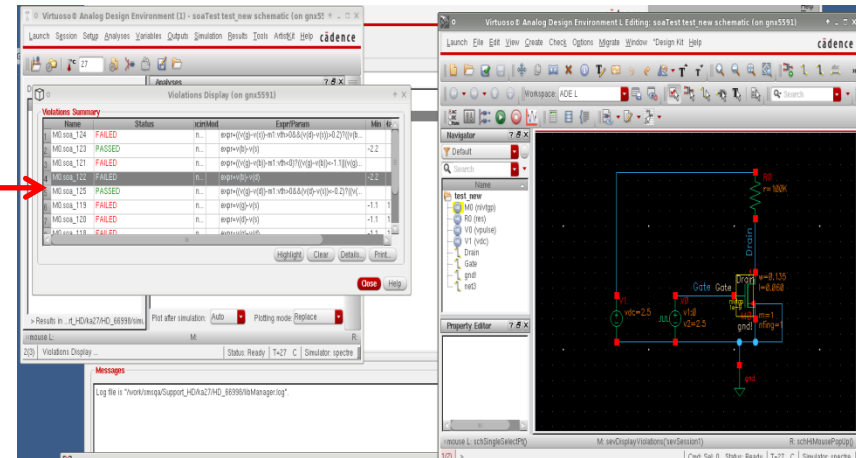
1. Select violation message
2. Click to **highlight**

Details: To have more **details** about this violation

1. Select violation message
2. Click to **details**

Print: To have **all details** about this violation

1. Select violation message
2. Click to **print**



Violation Details (on gn5591)

Check	Analysis	Instance	Value	Margin	Start	End
1 M0.soa_118	tran	/M0	2.445	1.345	2.311n	3.051n
2 M0.soa_118	tran	/M0	-2.476	1.376	5.222n	10.01n
3 M0.soa_118	tran	/M0	2.445	1.345	12.07n	13.05n
4 M0.soa_118	tran	/M0	-2.476	1.376	15.16n	20.01n
5 M0.soa_118	tran	/M0	2.445	1.345	22.07n	23.05n
6 M0.soa_118	tran	/M0	-2.476	1.376	25.16n	30n

Allow SOA check (Hspice)

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SYNOPSYS

All defined Biaschk statement in your models are enable by default

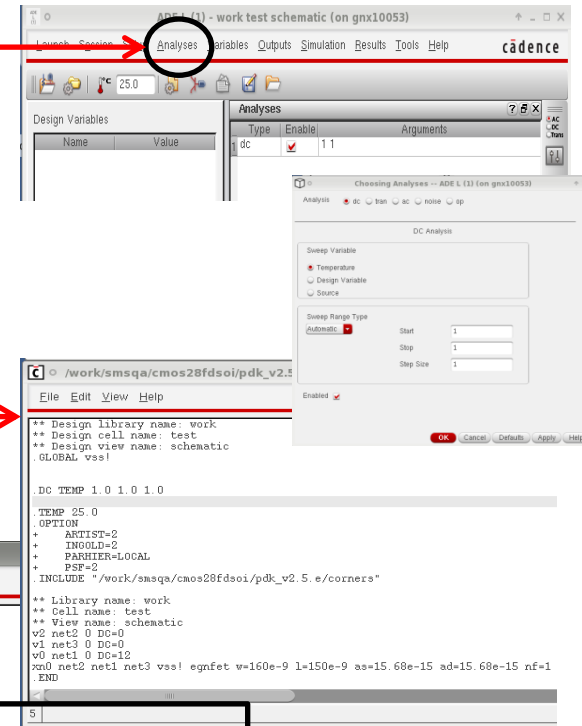
Results Display: Log file contains all biaschk results

Launch a simulation with biaschk

Step1: ADE>Analysis Choose your analysis

Step2: Create netlist and Run simulation

Step3: All violations appears into log file



```
File Edit View Help
/work/smsqa/cmos28fdsoi/pdk_v2.5.e/simulation/test/hspiceD/schematic/psf/hspice.out (on gnx10053)

File=/work/smsqa/cmos28fdsoi/pdk_v2.5.e/simulation/test/hspiceD/schematic/psf/input.pa0

**info** rebuilding matrix with pivot option
**info** rebuilding matrix without pivot option

Biaschk output during dc sweep:
type terminals sweep_param_1 Val_chk method model-name element-name subckt-name Biaschk_name
expression (v(g)-v(d)) 1.000e+00 1.200e+01 max ---- egnfet : rmos/op1 : out of process specification : vgd bias outside limits
expression (v(g)-v(s)) 1.000e+00 1.200e+01 max ---- egnfet : rmos/op2 : out of process specification : vgs bias outside limits

Element that have biaschk out of limit during the dc sweep simulation:
type terminals Number Counted model-name element-name subckt-name Biaschk_name
expression (v(g)-v(d)) 1 ---- egnfet : rmos/op1 : out of process specification : vgd bias outside limits
expression (v(g)-v(s)) 1 ---- egnfet : rmos/op2 : out of process specification : vgs bias outside limits

***** job concluded
1***** HSPICE -- J-2014.09 64-BIT (Aug 22 2014) RHEL64 *****
*****
** generated for: hspiced
***** job statistics summary tnom= 25.000 temp= 25.000 *****
```

PART III



AMS Result Browser « AMSRB »

AMS Results Browser : NEW in 13.2

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- ❑ SOA Mode : New SOA window “look and feel”
 - New columns : Instance | Model | Analysis | Alter | Limit | Label | Relative duration | MC Run | Alter | Temperature | Parameters
 - New Filters selection with user-defined expressions

The screenshot shows the AMS Results Browser window. The top menu bar includes File, Edit, Tools, Window, and Help. The main window displays a table of simulation results. A red box highlights the 'Filters' section on the left, showing a tree view with 'New Filter Collection', 'Filter1', 'Filter2', and 'Filter3'. Another red box highlights the 'Condition' column in the table, which contains logical expressions like '(MC Run is "1") AND (Label contains "R1") AND (Alter contains "test1")'. A third red box highlights the 'Expression' column, which contains power-related expressions like 'POW(Q1)'. A fourth red box highlights the 'Limit' column, which contains numerical values like '> 800u'. A fifth red box highlights the 'Label' column, which contains text labels like 'Q1 POWER'. A sixth red box highlights the 'Relative Duration' column, which contains percentage values like '11.176% of 40us'. A seventh red box highlights the 'MC Run' column, which contains numerical values like '1'. A eighth red box highlights the 'Model' column, which contains text labels like 'N'. A ninth red box highlights the 'Alter' column, which contains text labels like 'Test1'. A tenth red box highlights the 'Temperature' column, which contains numerical values like '27'. A eleventh red box highlights the 'Param VDD' column, which contains numerical values like '4.8'. A twelfth red box highlights the 'Param RL' column, which contains numerical values like '100'.

Instance	Analysis	Expression	Limit	Max Violation	Label	Time	Duration	Relative Duration	Condition	MC Run	Model	Alter	Temperature	Param VDD	Param RL
Q1	TRANSIENT	POW(Q1)	> 800u	36.6995m	Q1 POWER	28.7727u	4.47021u	11.176% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	36.6995m	NPN POWER OR IB	27.4168u	5.82605u	14.565% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	36.6995m	Q1 POWER OR IB OR...	27.4168u	5.82605u	14.565% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	190.287m	NPN POWER OR IB	37.2429u	760.68n	1.902% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	190.287m	Q1 POWER OR IB OR...	37.2429u	760.68n	1.902% of 40us	V(C)>V(B) & (...	1	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 800u	35.3583m	Q1 POWER	28.775u	4.46786u	11.170% of 40us	V(C)>V(B)	2	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	35.3583m	NPN POWER OR IB	27.4183u	5.8246u	14.562% of 40us	V(C)>V(B)	2	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	35.3583m	Q1 POWER OR IB OR...	27.4183u	5.8246u	14.562% of 40us	V(C)>V(B)	2	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	195.205m	NPN POWER OR IB	37.2429u	756.06n	1.890% of 40us	V(C)>V(B)	2	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	195.205m	Q1 POWER OR IB OR...	37.2429u	756.06n	1.890% of 40us	V(C)>V(B) & (...	2	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 800u	34.1228m	Q1 POWER	28.7772u	4.4657u	11.164% of 40us	V(C)>V(B)	3	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	34.1228m	NPN POWER OR IB	27.4196u	5.82327u	14.558% of 40us	V(C)>V(B)	3	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	34.1228m	Q1 POWER OR IB OR...	27.4196u	5.82327u	14.558% of 40us	V(C)>V(B)	3	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	198.468m	NPN POWER OR IB	37.2429u	752.99n	1.882% of 40us	V(C)>V(B)	3	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	198.468m	Q1 POWER OR IB OR...	37.2429u	752.99n	1.882% of 40us	V(C)>V(B) & (...	3	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 800u	35.7433m	Q1 POWER	28.7743u	4.46853u	11.171% of 40us	V(C)>V(B)	4	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	35.7433m	NPN POWER OR IB	27.4179u	5.82502u	14.563% of 40us	V(C)>V(B)	4	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 500u	35.7433m	Q1 POWER OR IB OR...	27.4179u	5.82502u	14.563% of 40us	V(C)>V(B)	4	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	193.971m	NPN POWER OR IB	37.2429u	757.22n	1.893% of 40us	V(C)>V(B)	4	N	Test1	27	4.8	100
Q1	TRANSIENT	IB(Q1)	< 1	193.971m	Q1 POWER OR IB OR...	37.2429u	757.22n	1.893% of 40us	V(C)>V(B) & (...	4	N	Test1	27	4.8	100
Q1	TRANSIENT	POW(Q1)	> 800u	577.881u	Q1 POWER	28.8802u	4.36269u	10.907% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	1k
Q1	TRANSIENT	POW(Q1)	> 500u	577.881u	NPN POWER OR IB	27.4831u	5.75981u	14.400% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	1k
Q1	TRANSIENT	POW(Q1)	> 500u	577.881u	Q1 POWER OR IB OR...	27.4831u	5.75981u	14.400% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	1k
Q1	TRANSIENT	IB(Q1)	< 1	1.65465m	NPN POWER OR IB	33.2429u	4.73595u	11.840% of 40us	V(C)>V(B)	1	N	Test1	27	4.8	1k
Q1	TRANSIENT	V(C)	< 50m	44.7958m	Q1 POWER OR IB OR...	33.2429u	4.00011u	10.000% of 40us	V(C)>V(B) & (...	1	N	Test1	27	4.8	1k
Q1	TRANSIENT	IB(Q1)	< 1	216.615m	Q1 POWER OR IB OR...	37.2429u	735.94n	1.840% of 40us	V(C)>V(B) & (...	1	N	Test1	27	4.8	1k

AMS Results Browser : NEW in 13.2

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Mentor
Graphics®

- ❑ SOA Mode : New SOA grouping capability
 - User can now configure the display of SOA violation results by grouping several SOA data into the same column.
 - Allow users to classify SOA violations based on their requirements (Hierarchical representation)

The screenshot displays the AMS Results Browser interface. The main window shows a table of SOA violations for the test 'SOA_test_2.soa'. The table has columns for Max Violation, Expression, Limit, Label, Time, Duration, Relative Duration, and Mod. A red box highlights a specific violation entry under the 'XMO_HCI_40V' analysis.

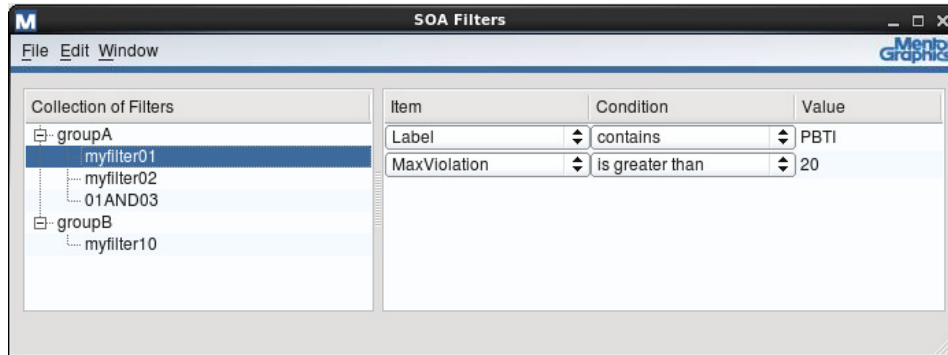
SOA Column Grouping dialog:

Grouped Columns	Normal Columns
Instance	Max Violation
Analysis	Expression
	SOA Code
	Limit
	Label
	Time
	Duration
	Relative Duration
	Condition
	MC Run
	Model

AMS Results Browser : NEW in 13.2

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- ❑ SOA Mode : New SOA filtering
 - New SOA Filters setup window
 - Filters can now be grouped as a “collection” to allow better classification (PVT conditions / Projects / etc..)
 - New capability to use combination between filters (AND/OR)



AMS Results Browser : NEW in 13.2

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❑ SOA Mode : New “Accumulated mode”

➤ SOAs can now be displayed in 2 ways :

- “Accumulated mode” : all violations on the same device are added to show up the “Total Relative Duration” Vs Total Transient simulation time.
- “Non-Accumulated View” : Default display just like in previous releases.

The screenshot shows the AMS Results Browser window with a table of simulation results. A red box highlights the 'Total Duration' and 'Total Relative Duration' columns. A right-click context menu is open over the table, with 'Accumulated Mode' selected and circled in red. Other menu options include 'Expand All', 'Collapse All', 'Copy Cell', 'Select All', and 'AutoFit Column Width'.

Analysis	Expression	Instance	Label	Total Duration	Total Relative Duration	Model
TRANSIENT	V(G,S)	XM3	MPDR18VTKBL - MOV VIOLATION	6.225u	31.125% of 20us	MPDR18VTKBL
TRANSIENT	V(G,S)	XMM4	MP5V - MOV VIOLATION	6.225u	31.125% of 20us	MP5V
TRANSIENT	V(G,S)	XM1_X1	MPHVDR60VTKBL - MOV VIOLATION	6.225u	31.125% of 20us	MPHVDR60VTKBL
TRANSIENT	V(G,S)	XM0	MPHVDR60VTKBL - MOV VIOLATION	6.225u	31.125% of 20us	MPHVDR60VTKBL
TRANSIENT	V(D,S)	XM9_HCL_18V	MNDR18VTKBLID - MOV VIOLATION	6.14616u	30.731% of 20us	MNDR18VTKBLID
TRANSIENT	V(G,D)	XMM4	MP5V - MOV VIOLATION	5.975u	29.875% of 20us	MP5V
TRANSIENT	V(G,S)	XM5	MPHVDR60VTKBL - MOV VIOLATION	5.30668u	26.533% of 20us	MPHVDR60VTKBL
TRANSIENT	V(G,S)	XMM2_1P8	PLL MOS4 - MOV VIOLATION	4.08u	20.400% of 20us	PLL MOS4
TRANSIENT	V(G,D)	XMM2_1P8	PLL MOS4 - MOV VIOLATION	3.28u	16.400% of 20us	PLL MOS4
TRANSIENT	V(D,S)	XM1_HCL_40V	MNDR40VTKBL - MOV VIOLATION	2.97448u	14.872% of 20us	MNDR40VTKBL
TRANSIENT	V(D,S)	XM0_HCL_40V	MNDR40VTKBL - MOV VIOLATION	2.97448u	14.872% of 20us	MNDR40VTKBL
TRANSIENT	V(G,S)	XM3	MPDR18VTKBL - AMR VIOLATION	2.475u	12.375% of 20us	MPDR18VTKBL
TRANSIENT	V(G,S)	XMM4	MP5V - AMR VIOLATION	2.475u	12.375% of 20us	MP5V
TRANSIENT	V(G,S)	XM1_X1	MPHVDR60VTKBL - AMR VIOLATION	2.475u	12.375% of 20us	MPHVDR60VTKBL
TRANSIENT	V(G,S)	XM0	MPHVDR60VTKBL - AMR VIOLATION	2.475u	12.375% of 20us	MPHVDR60VTKBL
TRANSIENT	V(G,D)	XMM4	MP5V - AMR VIOLATION	2.225u	11.125% of 20us	MP5V
TRANSIENT	V(D,S)	XM3	MPDR18VTKBL - MOV VIOLATION	1.99u	9.950% of 20us	MPDR18VTKBL
TRANSIENT	V(B,D)	XM3	MPDR18VTKBL - MOV VIOLATION	1.99u	9.950% of 20us	MPDR18VTKBL
TRANSIENT	V(D,S)	XM3	MPDR18VTKBL - AMR VIOLATION	1.99u	9.950% of 20us	MPDR18VTKBL
TRANSIENT	V(B,D)	XM3	MPDR18VTKBL - AMR VIOLATION	1.99u	9.950% of 20us	MPDR18VTKBL
TRANSIENT	V(D,S)	XM10_HCL_60V	MNDR60VTKBL - MOV VIOLATION	1.81515u	9.076% of 20us	MNDR60VTKBL

Predefined Filter

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In terms to help designers we created a predefined filters :

- Format Xml
- Name soafilters.xml
- Since ams13.2a is loaded automaticly with AMSRB
- Possibility to Filter violations message by categories or families

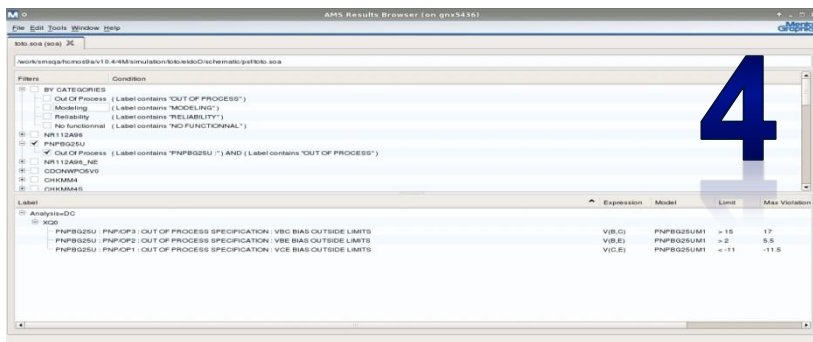
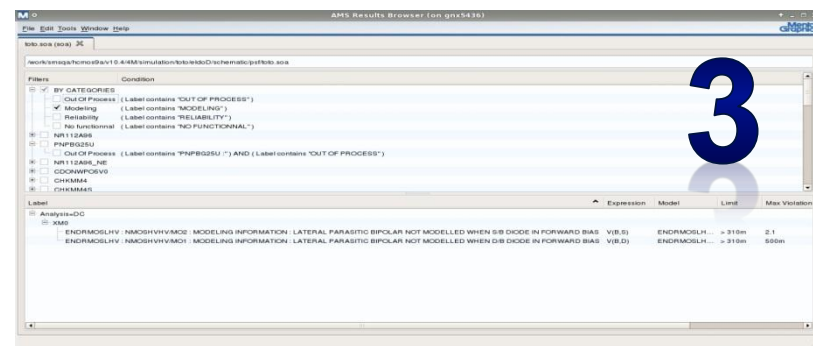
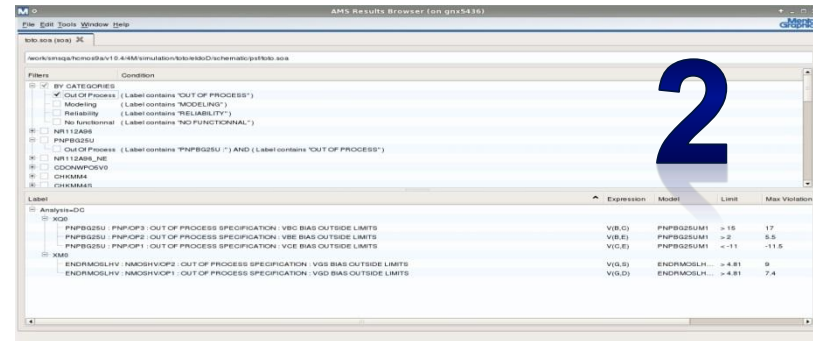
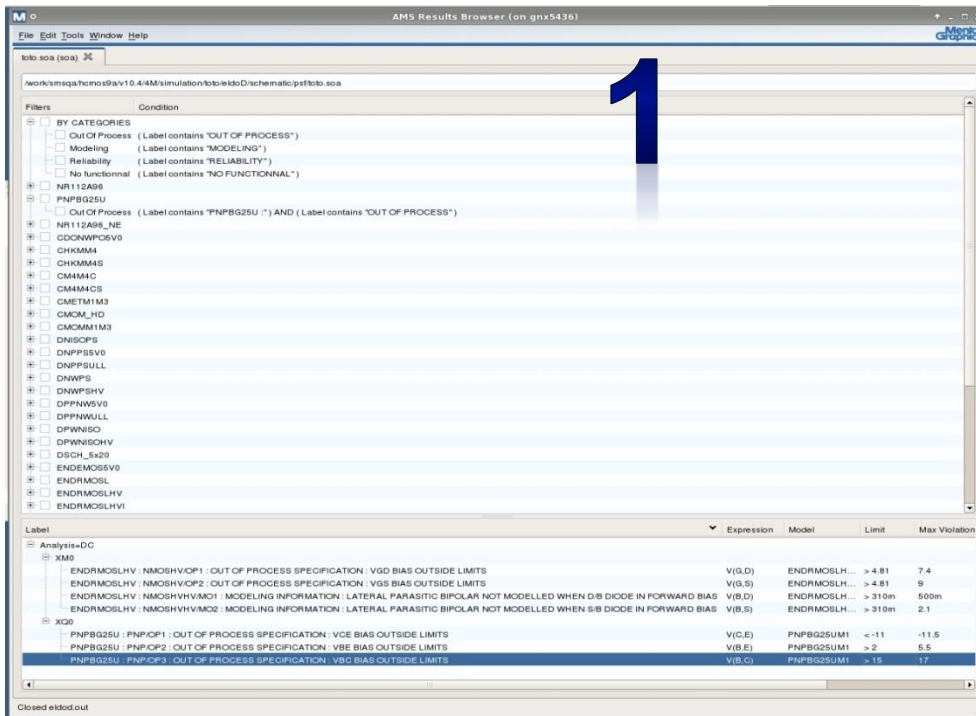
Categories

families

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE AMSResultsBrowser>
<AMSResultsBrowser Version="2.0">
  <SOACollectionList>
    <Collection>
      <Name> BY CATEGORIES </Name>
      <SOAFilterList>
        <Filter>
          <Name>Out Of Process</Name>
          <ExpressionList Type="AND">
            <Expression Element="Label" Operator="contains" Value="OUT OF PROCESS"/>
          </ExpressionList>
        </Filter>
        <Filter>
          <Name>Modeling</Name>
          <ExpressionList Type="AND">
            <Expression Element="Label" Operator="contains" Value="MODELING"/>
          </ExpressionList>
        </Filter>
        <Filter>
          <Name>Reliability</Name>
          <ExpressionList Type="AND">
            <Expression Element="Label" Operator="contains" Value="RELIABILITY"/>
          </ExpressionList>
        </Filter>
        <Filter>
          <Name>No fonctionnal</Name>
          <ExpressionList Type="AND">
            <Expression Element="Label" Operator="contains" Value="NO FUNCTIONNAL"/>
          </ExpressionList>
        </Filter>
      </SOAFilterList>
    </Collection>
    <Collection>
      <Name> NR112A96 </Name>
      <SOAFilterList>
        <Filter>
          <Name>Out Of Process</Name>
          <ExpressionList Type="AND">
            <Expression Element="Label" Operator="contains" Value="NR112A96 :"/>
            <Expression Element="Label" Operator="contains" Value="OUT OF PROCESS"/>
          </ExpressionList>
        </Filter>
      </SOAFilterList>
    </Collection>
    <Collection>
      <Name> PNPBG25U </Name>
      <SOAFilterList>
        <Filter>
          <Name>Out Of Process</Name>
```

Pre-defined Filter example

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- Pic1:** AMSRb interface with pre-defined filter
- Pic2:** Select Out of process Category
- Pic3:** Select Modeling category
- Pic4:** Select the PNPBG25U family

Conclusion

- To have more information on the rules implemented, look at the documentation (soa_documentation.pdf) usually present in the DK documentation directory