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MQA

MQA 2014_04 Hotfix Release Notes

Notice

MQA 2014.04 700.HF3 September 09, 2015

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MQA 2014.04 HF3 Release Notes

Version

700.HF3

Platform Support

Windows and Linux

Enhancements

- Model and Data loader
 - Support Spectre/ADS model with `simulator lang=spice` section
 - Enhanced loader for large size model lib
 - Enhanced MDM data loader
 - Report error on encountering special character (such as, ~) in user's working directory, as it will stop the simulation
- GUI
 - Add markers on GUI for `CompareTrend()` and `CrossCheck()` function error reporting
 - RMS summary display the maximum of MAX instead of average value of MAX
 - Support multi select project to send to Report Collector
 - Allow user to add `.icf` file in Accuracy check
 - Introduced a new feature, Export parameter, in Model Viewer

To export the parameters:

1. Load model in Model Viewer and right-click on the model name.
2. Select Export Parameters (value) or Export Parameters (Text).

3. Assign configuration file and MQA will export user-defined parameter value (or text) from the model library.

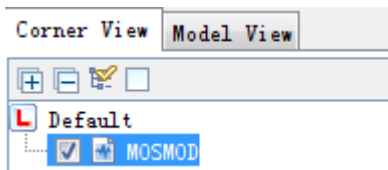
The following table shows the configuration file syntax:

#Demo Case	
#corner	TT
mqa_ndvth	
#model	nch.1
tox	
rsh	
cj	

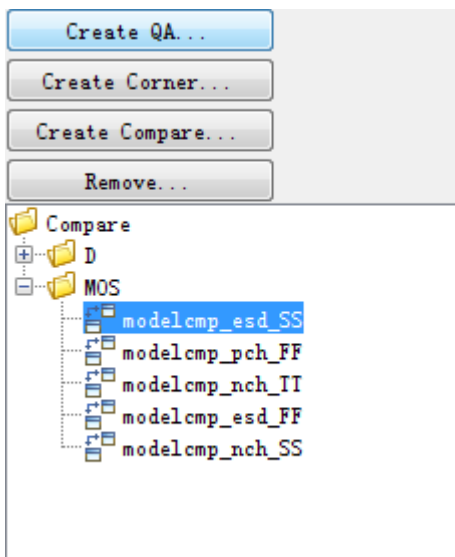
4. Output result is as follows:

#Demo Case	
#Corner	TT
mqa_ndvth	0.5
#Model	TT.nch.1
tox	7.30E-09
rsh	3.5
cj	0.001019

- Lib explorer
 - Support for the users to add simulation options before or after the `.lib` statement
 - Introduced **Add Set all** and **Unset** button in model setting panel



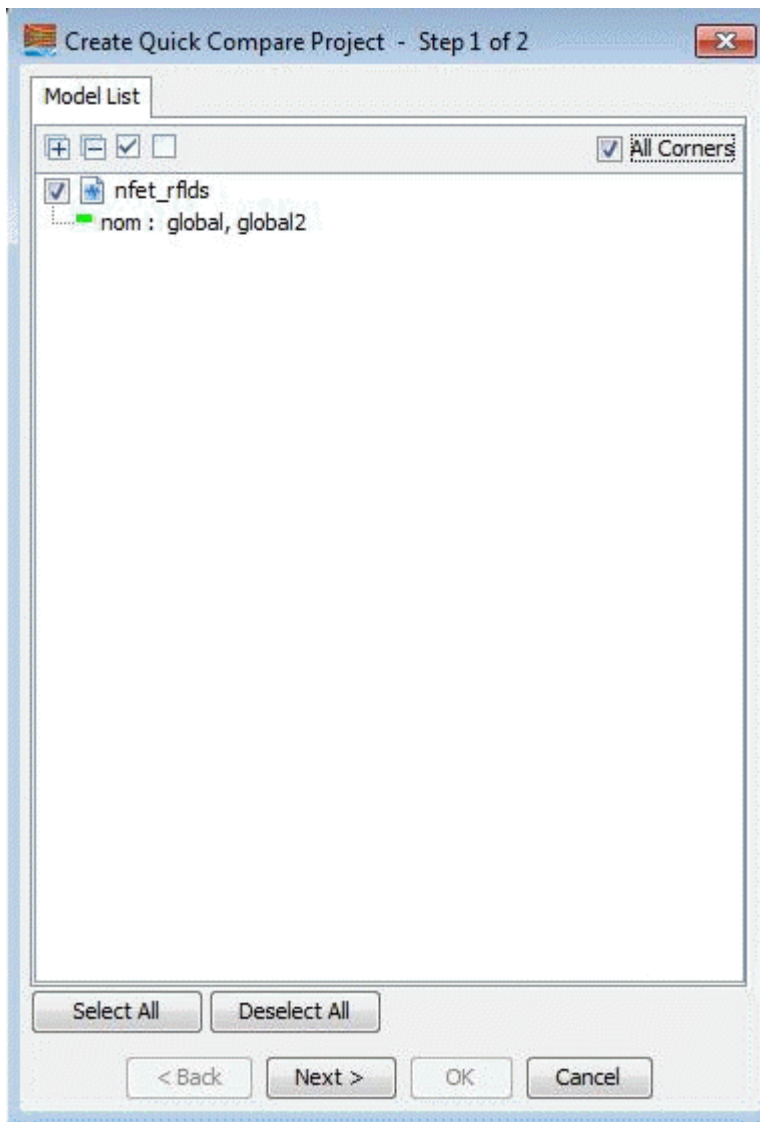
- Introduced multiple selection options (Ctrl/Shift + left click) in All project panel
- Support to display Catalogue projects by device type MOSFET/DIODE/BJT... in All project panel and Run panel



- Introduced Quick compare function.

To perform a comparison:

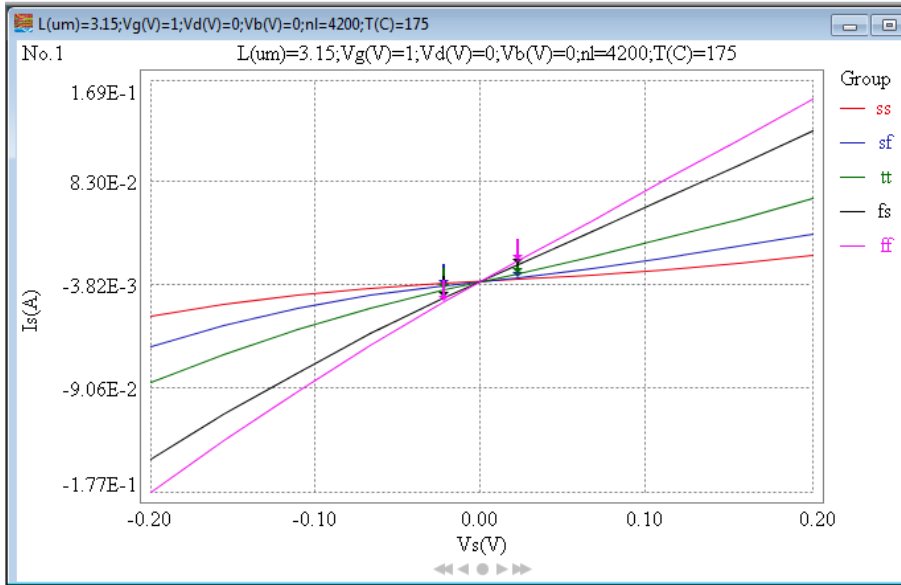
1. Load different version or simulator model library.
2. Set models to compare.
3. Click **Create Quick Compare Project**. This displays a list of all models set from different model libraries and user could select to quickly create compare projects for each model and each corner.
4. Select **All Corners** check box to create a single compare project for each model with all corners.



• Rule

- Support new option NonInstanceParam to allow MQA ignore assigned instance parameters.
- Support new option to allow comparing same target from two data block. The syntax is datablock=Ids_Vgs_Vbs | Ids_Vds_Vgs.
- Support benchmark rule for GoldenGate.
- Support new capability for CompareTrend function. The new syntax is CompareTrend(x, y, "Trend=1", "TrendFlip=1", "xFlip=0", "tolerance=1.0e-4", "resolution=1.0e-8"). This new function enabled by TrendFlip=1, checks the flip of the corner trend after the flip position, which is specified by xFlip or determined automatically.

Err(12) for checking [CompareTrend(x,y, "Trend=-1", "TrendFlip=1", "xFlip=0.05", "resolution=1.0e-10", "tolerance=1.0e-4")] where [y=Is;]



• Report

- Support MS Office 2013
- Support PageBreak in order and config file. The syntax is [PageBreak: 1=Vgs, Vds]. The page break variable is forced and added to the report title and break page for different variable value.
- Introduced summary table hyperlink of error plots for PDF report
- Support new Relative Device Table with targets in other corners show relative value comparing to TT corner. User needs to set [Group:PCS_1:Title=Relative Device Table]

Device Table				NCH					PCH				
Target	Unit	W(um)	L(um)	TT	SS	FF	SF	FS	TT	SS	FF	SF	FS
Vt_gm	-	1	1	5.6949E-1	0.1005	-0.0992	0.1004	-0.099	-7.4577E-1	-0.1039	0.1038	0.0998	-0.0998
		2E2	1	5.9482E-1	0.1008	-0.0993	0.1004	-0.0989	-6.9036E-1	-0.1005	0.1005	0.0997	-0.0998
		1	20	5.6646E-1	0.1004	-0.0983	0.0998	-0.0976	-7.0432E-1	-0.1036	0.1033	0.1	-0.1
		2E2	20	5.7423E-1	0.1007	-0.0982	0.0996	-0.0971	-6.3895E-1	-0.1005	0.1006	0.1001	-0.1001
DIBL	mV	1	1	1.1087E-2	1.5E-3	-8E-4	4E-4	2E-4	-2.8802E-2	-5.3E-3	4.9E-3	6E-4	-7E-4
Id_lim	-	1	1	28.8685	-16%	12%	-6%	1%	-7.8191	-14%	16%	5%	-5%
Id_sat	-	1	1	326.331	-19%	15%	-10%	4%	-102.325	-17%	21%	9%	-8%
Ioff	nA	1	1	6.6533E-6	-1%	13%	-1%	14%	-6.6116E-6	-0%	0%	0%	-0%
SubVtSlope	-	1	1	189.504	2.102	2.082	1.58	2.477	155.363	10.678	-9.291	0.532	-0.473
Ig_inv	-	1	1	0	0%	0%	0%	0%	0	0%	0%	0%	0%
Body effect	-	1	1	3.9516E-1	-0%	0%	-0%	-0%	-2.8464E-1	-2%	-5%	-1%	1%
Isub	nA	1	1	3.3102E-6	-0%	0%	-0%	0%	-3.31E-6	0%	0%	0%	0%
Covl	-	1	1	-2.9854E-10	4%	-5%	0%	0%	-2.4228E-10	4%	-5%	0%	0%
Cj	F	1	1	0	0%	0%	0%	0%	0	0%	0%	0%	0%

- Others
 - Introduced a new command `mqa.bat -result ResultPath`, to start MQA to load a project result
 - Enhanced `modeldiff` function in command line. Syntax of this new `modeldiff` function is as follows:

```
modeldiff [-t|-v] [-s all|diff|same] [-c cornerlist ] [-m modellist ] [-o
outfile] -f spicename file1 -f spicename file2 [... -f spicename fileN ]
-t ,comparison with text. it is default value.
-v ,comparison with value
-f spicename <full path of library file>
spicename = hspice|spectre|eldo ...
-c corner1,corner2,... comparison with given corners
-m model1,model2,... comparison with given models
-s all|diff|same, represents which parameters will be shown in output log.
all : all items will be shown
diff: different items will be shown. it is default value.
same: identical items will be shown
-o outfile, full path of output result file. "comp.txt" is default name.
```

Issues Fixed

- Fixed the bug that runreport finished successfully but still hold task running
- Issues in MQA parse Eldo default rule error is fixed
- Fixed the bug that Template keywords will residue in the MQA report when plot number exceed 100
- Fixed the can't find project file issue encountered when using order/template to generate report from existing QA result
- Fixed the issue of NP correlation plot goes strange when running by batch mode
- Fixed the MQA doesn't recognize BSIM6 model for ADS issue
- Fixed the issue that MQA can't parse capacitor model type in some cases

MQA 2014.04 HF2 Release Notes

Version

700.HF2

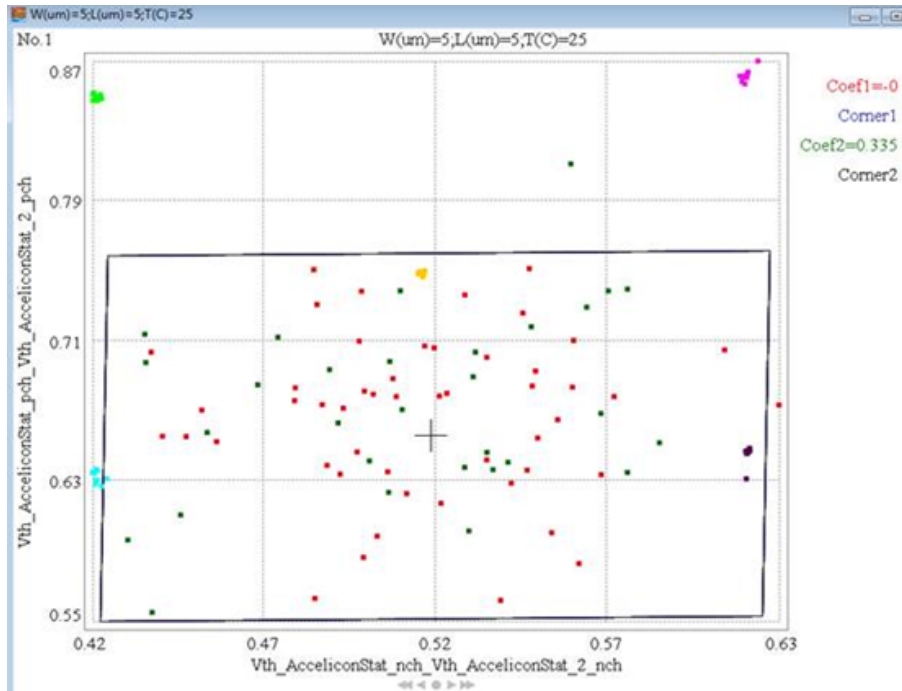
Platform Support

Windows and Linux

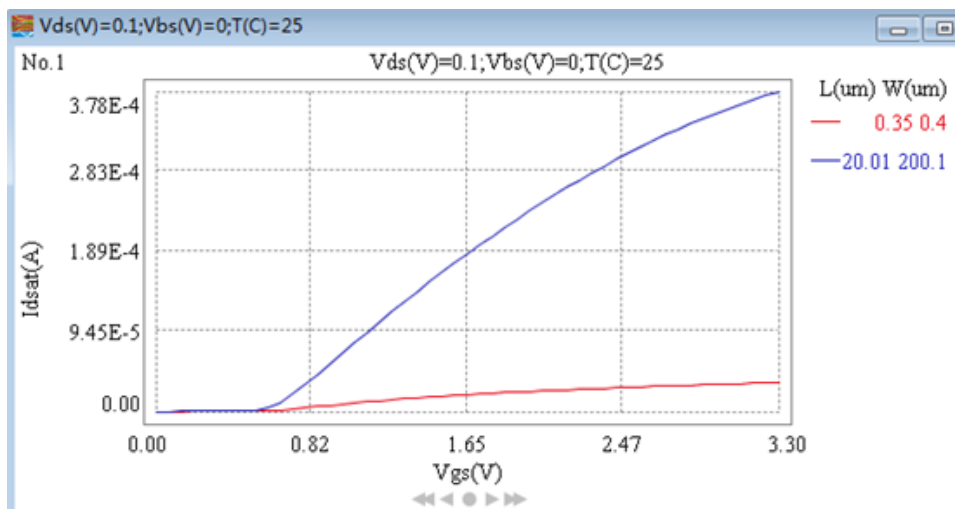
Enhancements

- Improve GoldenGate support
 - Support benchmark rule
 - Support OP output
- Improve report order function to support user-defined report title

- Improve ET + Corner + Monte carlo plot display
 - Support Corner1 + Corner2 + ET
 - Support Corner1 + Corner2 + MC
 - Support Corner1 + Corner2 + MC1 + MC2
 - Support Corner1 + Corner2 + ET + MC
 - Support Corner1 + Corner2 + ET + MC1 + MC2



- Improve MQA P axis display from one value(e.g. T) to group value (T and W)



Issues Fixed

- Netlist is not correctly generated for R3 model
- Use wrong text editor for rule editor when create and run project from Project menu

- ADS check fails in GUI but pass in command line
- Document link is wrong for release note
- ADS Hisim model is parsed as passive
- Spaces in equation affect model comparison result in ModelDiff

Known Issues

MBP/MQA Fails

When MBP/MQA fails, the following error message is displayed:

```
Exception in thread "main" java.lang.UnsatisfiedLinkError: /home/zz/Agilent
/MBP_2014_04_HF2/libSpiceEngine.so: /home/zz/Agilent/MBP_2014_04_HF2/libstdc++.so.6:
version `GLIBCXX_3.4.9' not found
```

Solution:

1. Download libstdc++.so.6.0.13 (RHEL5 and RHEL6 need libstdc++.so.6.0.13, RHEL4 need libstdc++.so.6.0.10) from web.
2. Save it at */usr/lib* folder.
Only users logged in as Administrator can save.
3. Link libstdc++.so.6.0.13 to libstdc++.so.6, as depicted below. By default, it is linked to libstdc++.so.6.0.8.

```
[zz@condor lib]$ pwd
/usr/lib
[zz@condor lib]$ ll libstdc++.so.6*
lrwxrwxrwx 1 root root    19 Mar 18 16:38 libstdc++.so.6 -> libstdc++.so.6.0.13
-rwxr-xr-x 1 root root 950392 Mar 18 16:32 libstdc++.so.6.0.10
-rwxr-xr-x 1 root root 975012 Mar 18 16:40 libstdc++.so.6.0.13
-rwxr-xr-x 1 root root 936908 Sep 18 2014 libstdc++.so.6.0.8
[zz@condor lib]$
```

Sample libstdc++.so.6.0.13 file

```
[zz@condor so]$ ls
libstdc++6_4.4.5-8_amd64.deb  libstdc++6_4.4.5-8_i386.deb
[zz@condor so]$ ar -x libstdc++6_4.4.5-8_amd64.deb
[zz@condor so]$ ls
control.tar.gz  debian-binary  libstdc++6_4.4.5-8_i386.deb
data.tar.gz    libstdc++6_4.4.5-8_amd64.deb
[zz@condor so]$ tar -xvf data.tar.gz
./
./usr/
./usr/share/
./usr/share/doc/
./usr/lib/
./usr/lib/libstdc++.so.6.0.13
./usr/share/doc/libstdc++6
./usr/lib/libstdc++.so.6
[zz@condor so]$ cd ./usr/lib/
[zz@condor lib]$ ls
libstdc++.so.6  libstdc++.so.6.0.13
[zz@condor lib]$
```

The sample file (above) highlights the unzip command in red that you can use to extract the contents. If the extracted file is not compatible with your system, please download it from web.

RHEL 6-64 Bit Machine Issues

When running MBP/MQA on RHEL 6-64 bit machine, you might encounter either of the following issues:

The messages displayed in the below issues are of MQA and would vary for MBP.

1. Cannot found "libstdc++.so.6".

```
[regress@eagle autotest]$ ldd ~/Agilent/MQA_2014_04_HF2/bin/libacclib.so
linux-gate.so.1 => (0x00b0c000)
libstdc++.so.6 => not found
libdl.so.2 => /lib/libdl.so.2 (0x00ea3000)
libpthread.so.0 => /lib/libpthread.so.0 (0x008e5000)
libm.so.6 => /lib/libm.so.6 (0x00413000)
libgcc_s.so.1 => /lib/libgcc_s.so.1 (0x00c08000)
libc.so.6 => /lib/libc.so.6 (0x00140000)
/lib/ld-linux.so.2 (0x004e5000)
```

Solution:

Set the value of LD_LIBRARY_PATH to ~/\$MQAHOME/bin, as depicted below:

```
LD_LIBRARY_PATH=/usr/lib:$MQAHOME/bin
export LD_LIBRARY_PATH
```

By default, libstdc++.so.6 is installed at /usr/lib64 location. And MQA being a 32-bit application cannot use 64-bit libraries.

2. Missing ksh.

Error Message:

```
[regress@eagle ~]$ mqa
/home/regress/.mqa_set/recentpath.ini does not exist!
sh: /home/regress/Agilent/MQA_2014_04_HF2/bin/aglmwizard: /bin/ksh: bad interpreter: No such file or directory
```

Solution:

create a link between ksh and bash, using ln -n bash ksh command, as depicted below:

```
[root@eagle bin]# pwd
/bin
[root@eagle bin]# ln -s bash ksh
```

3. Missing libraries - "libz.so.1" "libXext.so.6" "libXtst.so.6" "libfreetype.so.6", "libGL.so.1", "libXrender.so.1", "libfontconfig.so.1" "libSM.so.6".

Error Message:

```
[regress@eagle ~]$ qa -v
*(R) MQA
*(R) Keysight Technologies Inc.
aglacclk.exe: error while loading shared libraries: libz.so.1: cannot open shared
object file: No such file or directory
#Err:Failed to check out license
#Errmsg=
#Err:Failed to apply license for MQA!
[regress@eagle ~]$ mqa
Exception in thread "main" java.lang.UnsatisfiedLinkError: /home/regress/Agilent
/MQA_2014_04_HF2/jdk1.6.0_33/jre/lib/i386/xawt/libmawt.so: libXext.so.6: cannot
open shared object file: No such file or directory
    at java.lang.ClassLoader$NativeLibrary.load(Native Method)
    at java.lang.ClassLoader.loadLibrary0(ClassLoader.java:1807)

[regress@eagle ~]$ mqa
/home/regress/.mqa_set/recentpath.ini does not exist!
aglmwizard_exe: error while loading shared libraries: libfreetype.so.6: cannot o
pen shared object file: No such file or directory
[regress@eagle ~]$ mqa
/home/regress/.mqa_set/recentpath.ini does not exist!
aglmwizard_exe: error while loading shared libraries: libGL.so.1: cannot open sh
ared object file: No such file or directory
[regress@eagle ~]$ mqa
/home/regress/.mqa_set/recentpath.ini does not exist!
aglmwizard_exe: error while loading shared libraries: libXrender.so.1: cannot op
en shared object file: No such file or directory
[regress@eagle ~]$ mqa
/home/regress/.mqa_set/recentpath.ini does not exist!
aglmwizard_exe: error while loading shared libraries: libfontconfig.so.1: cannot
open shared object file: No such file or directory
[regress@eagle ~]$ mqa
/home/regress/.mqa_set/recentpath.ini does not exist!
aglmwizard_exe: error while loading shared libraries: libSM.so.6: cannot open sh
ared object file: No such file or directory
```

Solution:

- a. Locate the package containing *libz.so.1*, using `yum whatprovides libz.so.1` command. The command execution, displays the following depicted results.

```
[regress@eagle Desktop]$ yum whatprovides libz.so.1
Loaded plugins: fastestmirror, refresh-packagekit
Determining fastest mirrors
base | 3.7 kB | 00:00
extras | 3.4 kB | 00:00
update | 3.4 kB | 00:00
http://centos.ustc.edu.cn/centos/6/updates/x86_64/repodata/31c4944c6f4e64395d2a0
e12cd6de23cae7da4612aeebd9cfab12241a2e338ea-primary.sqlite.bz2: [Errno 14] PYCURL
ERROR 22 - "The requested URL returned error: 404 Not Found"
Trying other mirror.
zlib-1.2.3-29.el6.i686 : The zlib compression and decompression library
Repo : base
Matched from:
Other : libz.so.1
```


1. Install 32bit zlib, using yum install zlib-1.2.3-29.el6.i686 or yum install -y zlib-1.2.3-29.el6.i686 commands as Administrator.

```
[root@eagle ~]# yum install zlib-1.2.3-29.el6.i686
Loaded plugins: fastestmirror, refresh-packagekit
Setting up Install Process
Loading mirror speeds from cached hostfile
Resolving Dependencies
--> Running transaction check
```

MQA 2014.04 HF1 Release Notes

Version

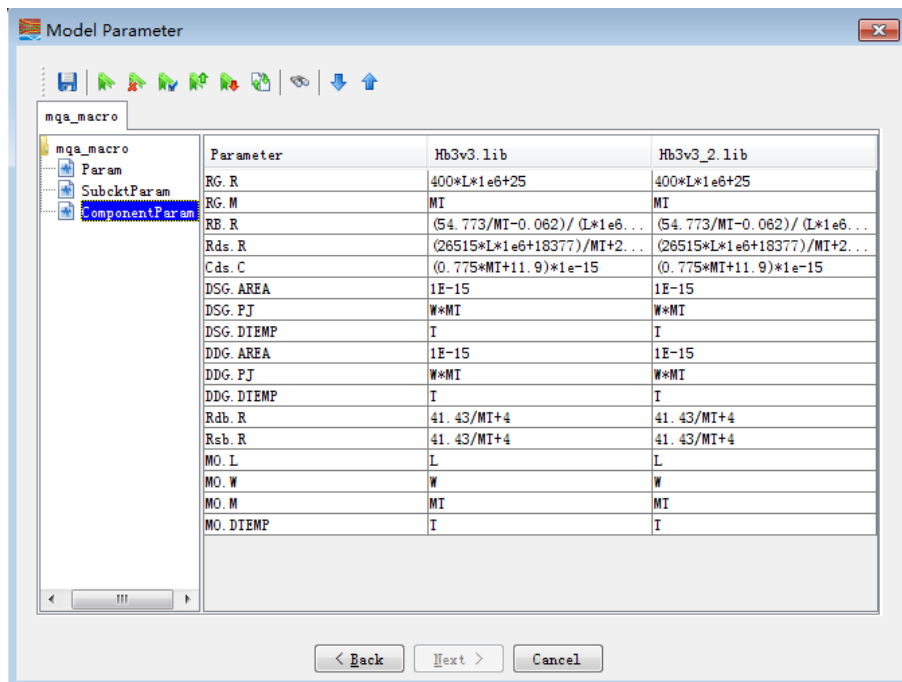
700.HF1

Platform Support

Windows and Linux

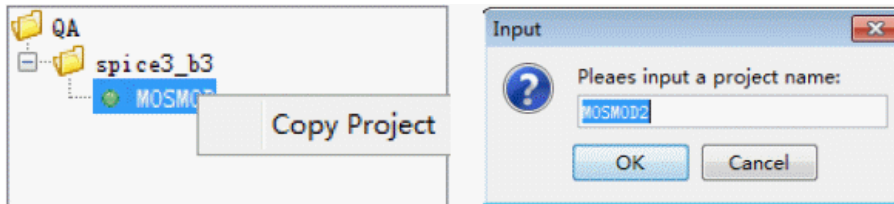
Enhancements

- MQA support subckt parameter comparison in Model Diff
 - Only text comparison is supported
 - Three nodes under subckt model comparison: Param shows user-defined parameters, SubcktParam shows subckt instance followed by subckt statement, and ComponentParam shows all component parameters in the subckt model naming by *ComponentName.InstanceName*.

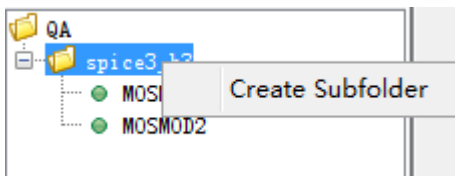


- Lib explorer enhancement

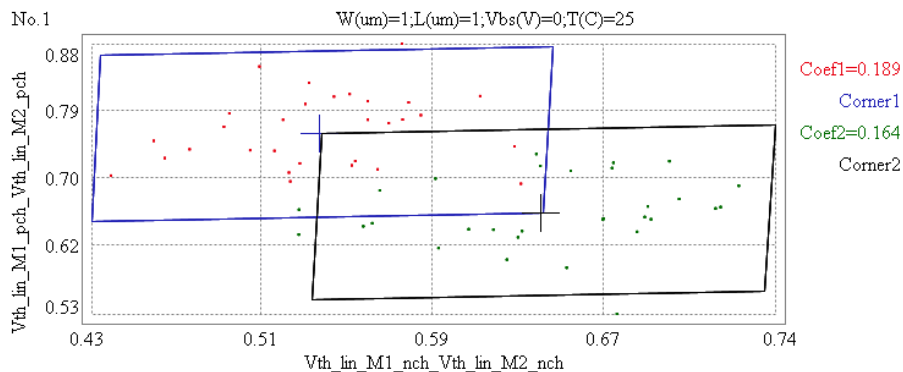
- Support copy projects: Right-click on the project and select Copy Project. Enter the new project name in the popup window.



- Support create subfolders on project list and group projects: Right-click on the model lib level and select Create Subfolder



- Support drag project to change order or move in/out to subfolders
- Known Issue: All projects are created in the model lib level and user can only drag project to groups but not create directly under group.
- Support two models - NP correlation comparison of Monte-Carlos + Corners



- Support parse Spectre model with "simulator lang=spice" section

- Known Issue: Only support subckt model and manually selecting device type may be required

- Add rule name as a comment at the top of MQA auto-created netlist files

- Enable MQA to choose variable from [loops] as Y axis, and [Target] as X axis

- Known Issue: Only SavePage() and CompPlot() supports this function and CompPlot() won't show RMS /MAX calculation

- Show error information in Project level when loading results of multiple projects



Defect fixed

- Isub definition error in icf file for BSIM3 Spectre model
- MQA can not recognize struct parameters in BJT spectre model
- "Dec" is not working in [benchmark] rule, cannot detect the Dec number from .mdm data file
- "Oct" is not working in [benchmark] rule, cannot detect the Oct number from .mdm data file
- MQA treats PMOS as NMOS if model has ADS wrapper over spectre model