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Agilent Technologies

MBP

Adding Additional Instance Parameters

Application Note

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Adding Additional Instance Parameters
Application Note

This application note describes how to add additional instance parameters in Model Builder Program (MBP). **Note**: This document was originally released for MBP V2011.1.0 in August 2011.

Introduction
MBP accepts user-defined instance parameters in both model file and measurement data. In this document, the steps required to add new instance parameters in MBP are covered. For more information go to www.agilent.com/find/eesof or contact your local Agilent office. The complete list is available at: www.agilent.com/find/contactus.

Steps
The user can follow the steps listed below to complete the process of adding additional instance parameters in MBP.

Model File
To begin, the user must first edit the model file to which the new instance parameter will be added. For example, assume the user has specified an instance parameter "*xxd*" (in this case, "xxd" has no real physical meaning) in one subcircuit model as follows:

```
.param
+xvth0 = 1e5
.subckt macromodel d g s b w=1e-6 l=1e-6 xxd=1e-6 sa=1e-6 sb=1e-6
.param
+dvth0 = 'xxd*xvth0'
m1 d g s b nmos w=w l=l xxd=xxd sa=sa sb=sb
.model nmos nmos
*** Flag Parameter ***
+level = 49 version = 3.2 binunit = 2
+vth0 = '0.7+dvth0'
.....
.ends
```

In this example, the new instance "*xxd*" is added and declared in the model file. The parameter "*dvth0"* is expressed as the product of "*xxd*" and "*xvth0.*"

Instance Configuration File
Open the file *inst.ini* under *$MBP_HOME\etc\hspice\mosfet\bsim3v3\inst_core.* Append the "*xxd*" item to the file. Here, *$MBP_HOME* is the MBP installation path.

```
m1 d g s b nmos w=<1e-6,W,1e-6,0,um> ... ps=<0,PS,1,0,u> xxd=<0,xxd,1,0,m>
```

The file *inst.ini* claims the model name and instance parameter of the certain device. MBP creates a netlist according to this file. In this example, the instance named "*xxd"* is added with the default value of "*0,*" a unit scale of "*1,*" an offset value of "*0,*" and the unit name "*m.*"

Measurement File
Next, the user must specify "*xxd"* in the measurement file. For example:

```
condition{mode=forward,type=nmos,modtype=DC}
```

Page(name=Ids_Vgs_Vbs,x=Vgs,p=Vbs,y=Ids) { Vds=0.05,W=10.0,L=0.18,NF=1.0 ,SA=4.8E-7,SB=4.8E-7,T=25.0,xxd=1e-6}
……

In this example, the new instance “xxd” is added with the value of “1e-6.”

Simulation

Finally, load the modified model into MBP. Once the user tunes “*xvth0,*” which is correlated to “*xxd,*” the change may be observed in the simulation curves, as shown in Figure 1.

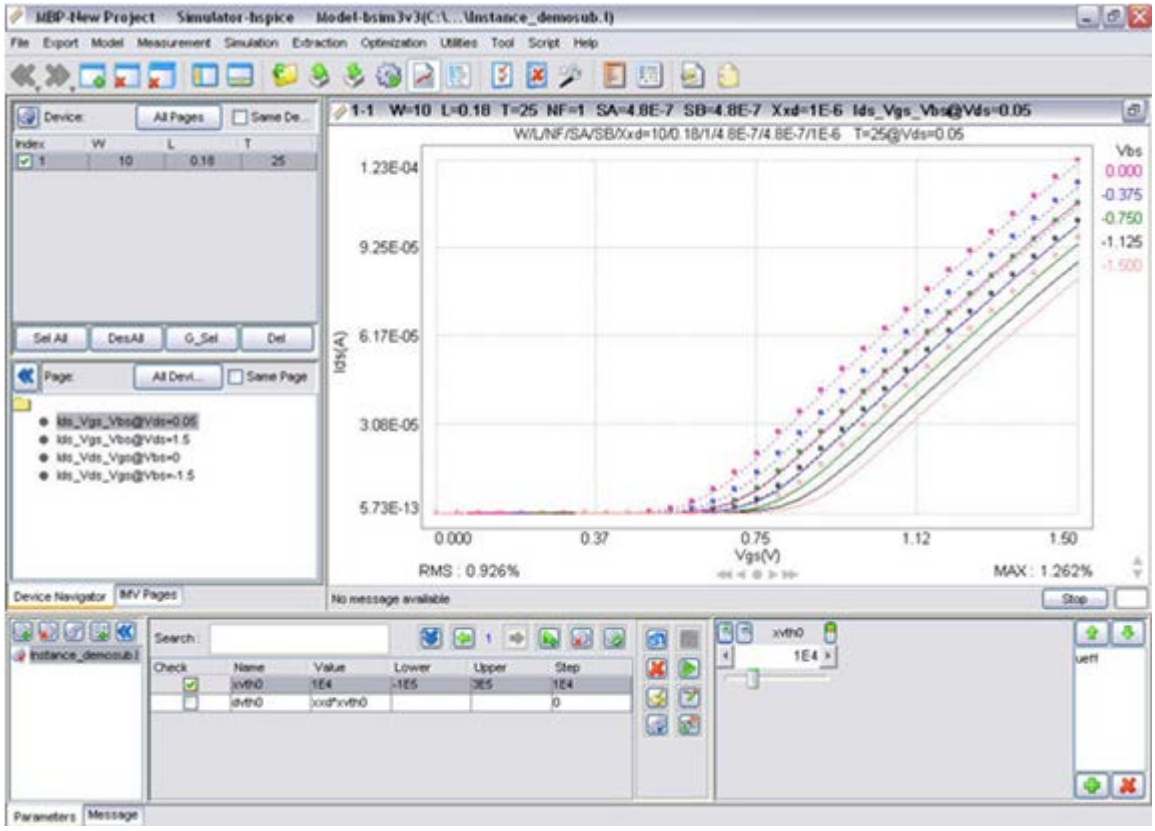

Figure 1. Add the ”xxd” instance parameter