

SUMMARY



Abstract:

In this Support Kit, we will show you how to create a model using the Datasheet Curve Modeler.

We have provided you with a lab guide, sample reference plot image and Designer project.

The lab will guide you through the process of VHDL-AMS model creation by creating a free hand model over a datasheet image using the Datasheet Curve Modeler.

Estimated time to complete: 15 – 30 minutes

Version Information: X-ENTP VX.2.10

DETAILS

Creating a Model Using Datasheet Curve Modeler:

Download Datasheet_Curve_Modeler.zip to your **Desktop**

1. Unzip the file to your Desktop
2. Open ReferencePlot.png found in the Datasheet_Curve_Modeler folder
3. Type AMS into the Search Bar, open your version of AMS flow (This lab is using Xpedition AMS VX.2.13)
4. Once open, select File > Open > Project
5. Navigate to DCM.prj under the Datasheet_Curve_Modeler folder
6. **Simulation > Model and Symbol Wizard**
7. Under the **Select Source tab**, select **Datasheet** then click **Next**
8. Under the **Select/Create Model tab**, select **Datasheet Curves** in the dropdown menu
9. Click **Launch** to open the **Datasheet Curve Modeler**
10. Start the image capture tool from **File > Capture Image**

- a. An alternative way is to go to **File > Open > Existing Image** and navigate to ReferencePlot.png found in the Datasheet_Curve_Modeler folder (image is a .png type)
11. Click **Capture** in the Image Capture window
12. Drag capture tool over open datasheet image
13. Resize capture tool to enclose image
14. Click Save As
15. Enter DMS_res_plot and save to "Desktop\Datasheet_Curve_Modeler" as a jpeg image
16. Open Data Ranges from **Edit > Set Data Range**
17. Enter range and type for x-axis data, in this case x-min = -50 and x-max = 100.
18. Select Linear for datatype
19. Enter range and type for y-axis data, in this case y-min = 100 and y-max = 1100
20. Select Linear for datatype
21. Confirm form entries
22. Select Bound Box Mode from **Edit > Set Bounding Box**
23. Confirm bounding box instructions
24. Define graph bounding box
25. Click on upper-most (xmin, ymax) value
26. Click on origin (xmin, ymin) value
27. Click on right-most (xmax, ymin) value
 - a. Blue box appears bounding the graph area
28. Select Add Data Points mode from **Edit < Add Data Points**
 - a. Digitize waveform.
 - i. Click left-to-right along waveform to place data points
 - ii. Data points must be within blue data boundary
 - iii. Data table is automatically filled-in with data point coordinates
 - iv. Points must be monotonically increasing along x-axis
 - b. Edit data points
 - i. Click and drag data points.
 - ii. Edit values in the data table.
 - iii. Add data points by right clicking on one datapoint and selecting "Add datapoint" in the menu

NOTE: If you have more than one curve, go to **Configure > Number of Curves > Curve Number**. You will go from left to right along the waveform but now there will be multiple datapoints every time you click on the curve.

NOTE: Restriction of x-axis or y-axis movement of datapoints can be implemented through **Configure > Lock Datapoint X or Y Movement**

29. **File > Create Model and Save the Data File**

30. Choose model type

- a. For this example, select the resistor as a function of voltage under the **Passive** tab

31. Confirm the Save data to file window

- a. Respond to generator prompts
 - i. Click OK to open Save As form
 - ii. Enter text res_vs_volt and save to "Desktop\Designer_Curve_Modler\DMS\hml"
 - iii. Click Save to save text file and generate model/symbol
 - iv. Click OK to close model confirmation form
- b. Close the Datasheet Curve

32. Verify Model Details in the Wizard

- a. VHDL-AMS file name
 - i. **RES_VS_VOLT.vhd**
- b. Model Entity
 - i. Defines model parameters and ports, select **RES_VS_VOLT**
- c. Model Architecture
 - i. Describes device behavior, select **IDEAL**
- d. Click Next

Model and Symbol Wizard

Select Source
Select/Create Model
Select/Create Symbol
Select Pins
Map Symbol Pins To Model Ports
Set/Map Parameters
IBIS Model
IBIS Stimulus

You chose to create a model using datasheet information. You now have the option to use datasheet parameter tables, or datasheet performance curves, as the data source for your model. In either case, the result will be a VHDL-AMS model characterized to the datasheet information, and a symbol for your schematics. Choose one of the following options:

- Select Datasheet Parameters in the Create From field, then click the Launch button to start the Datasheet Model Builder tool. This tool helps you use datasheet parameter tables to create models for several common electronic

Create: Datasheet Curves [Launch ...]

Entity: RES_VS_VOLT Architecture: IDEAL

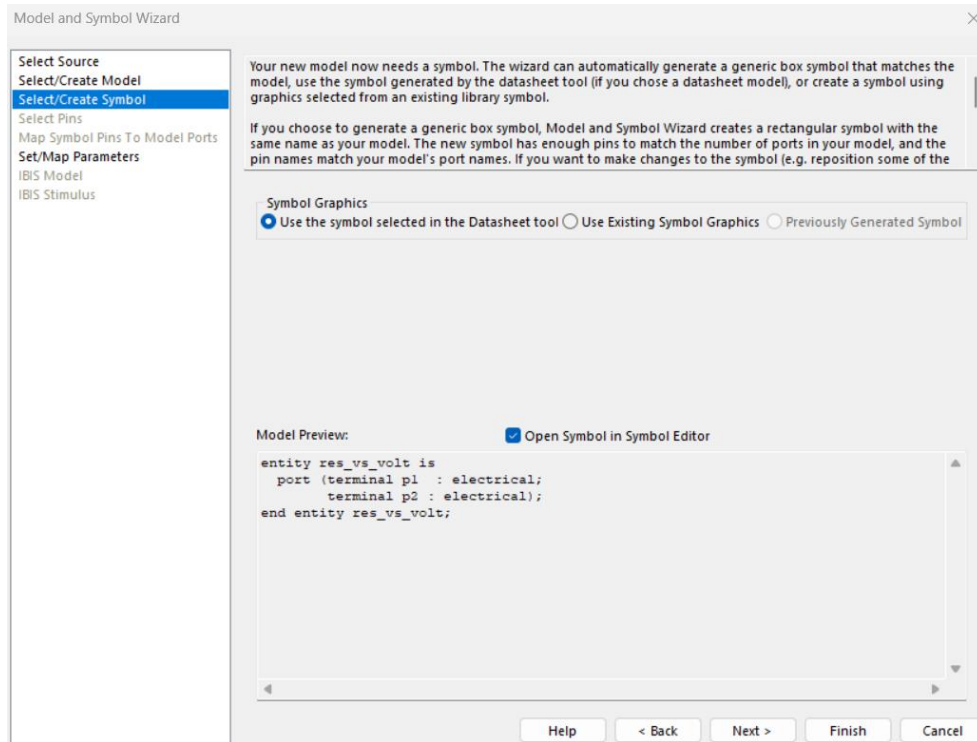
VHDL-AMS File Name: RES_VS_VOLT.VHD

Status: A model has been created successfully. Click Next to proceed with the wizard.

Help < Back Next > Finish Cancel

33. Select/Create Symbol Window

- a. Review model source code
- b. Select the source for symbol graphics
 - i. Default: **Use the symbol selected in the Datasheet tool**
- c. Click Next



34. Verify Set/Map Parameters Details

- a. Review the parameter table.
 - i. If needed, change information in the Value column
 - ii. Table may be grey if no parameters in the model can be changed
 - iii. In this example, the table will be **blank**
- b. Click **Finish**

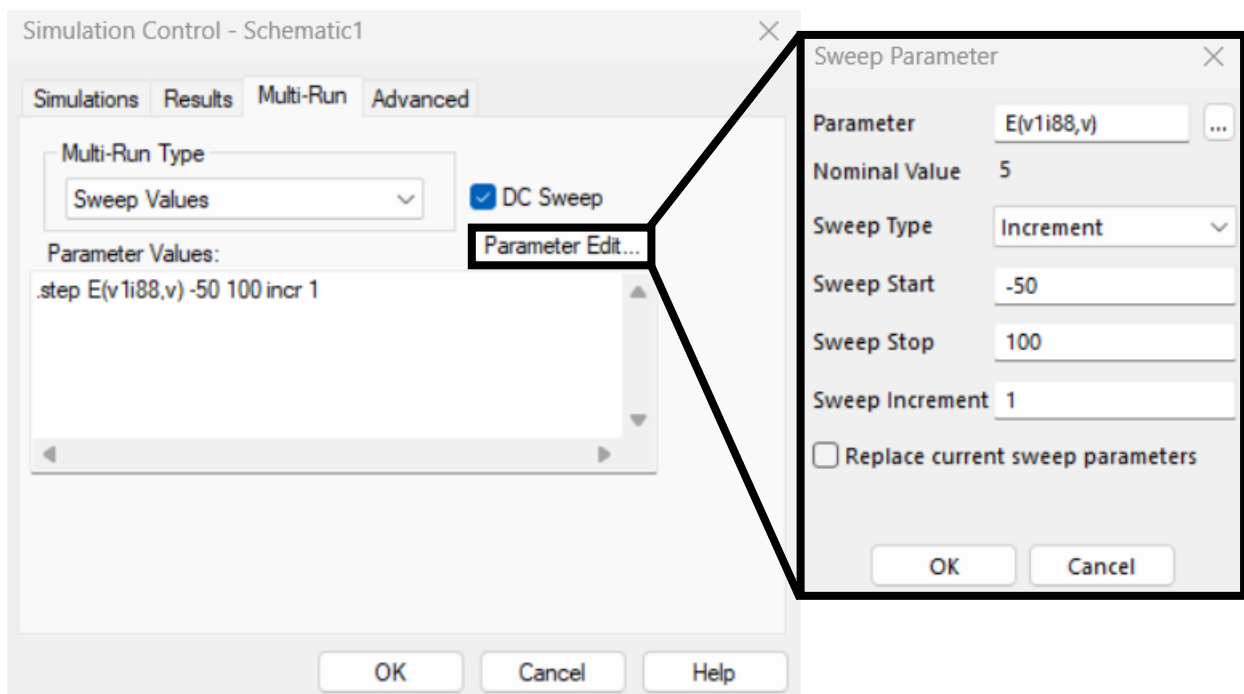
35. Choose Model Library

- a. Select **Local Library** to save the model into. Other options include:
 - i. Local Project
 - ii. Default shared library
 - iii. User defined libraries
- b. Click OK to save the model and close the Model and Symbol Wizard
 - i. Model is now available in the **Simulation > Search/Place Symbol** or DataBook library browsers

36. A window with the symbol will pop up, this can be closed to return to the schematic.

37. Delete the placeholder resistor

38. Open **Simulation > Search/Place Symbol**
39. Click the + sign on (Current Project)
40. Click the + sign on (DMS)
41. Select and place res_vs_volt
42. Close **Search/Place Symbol**
43. Place res_vs_volt symbol where placeholder resistor used to be
44. Select **Simulation > Simulate**
45. Click on the Multi-Run tab
 - a. Select "**Sweep Values**" under Multi-Run Tab
 - b. Check "**DC Sweep**"
 - c. Click Parameter Edit
 - i. Parameter: Select value seen (should match ID of voltage source)
 - ii. Sweep Type: Increment
 - iii. Sweep Start: -50
 - iv. Sweep Stop: 100
 - v. Sweep Increment: 1
 - vi. Click Ok



46. Under the **Results** tab, select "**All Waveforms**" in the drop-down menu under **DC Waveforms**. This will give the waveform for the new resistor that was just placed.
47. Under the **Simulations** tab, neither Time-Domain or Frequency Analysis should be enabled
48. Click Ok

49. Simulation will perform 151 runs; progress can be seen in the bottom left of the Xpediton tool.
50. Waveform Analyzer will open once simulation is complete.
51. Click the + next to **y1<yournumber>** in the Waveform List
52. Double click the wave **res**
53. The waveform will match the one taken in the Datasheet Curve Modeler

