Sources with Tolerances
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1 Introduction

This document gives an overview of how a user can create a source that varies its voltage or current during the Monte Carlo Analysis in PSpice AD.

2 Detailed Explanation on a DC Voltage Source

Step by step is explained how to create your own source.

2.1 Creating a New Project

OrCAD Capture is started. No Project or Design is opened.

- File > New > Project
- Name it **My_Sources** and select **Analog or Mixed A/D**

![New Project Dialog Box]

- Click **OK**.

![Create PSpice Project Dialog Box]

- Choose **Create a blank project** and click **OK**.
• In the Project Manager right click on the .dsn > New Schematic > Name it My_DC_V_Source.

• Right-click on the new Schematic Folder > New Page > OK.

2.1.1 Designing the Equivalent Circuit Diagram

• Open the new Schematic.
• Place > PSpice Component for the DC-Source and the Resistor.
• In the Library Analog you find the Part E, or Place > PSpice Component > Source > Controlled Source > VCVS.
• Place the 0 Ground.
• Place the Hierarchical Port.

To simplify the schematic there is a current source. The voltage value will be interpreted as current value. \([V] \rightarrow [A]\). As long as the Resistor R1 is 1Ω, this works fine. At the Input of E1 will be the voltage you define.
2.1.2 Transferring Values from Symbol to Subcircuit

So that the tolerance and the voltage can be set in the schematic, in which the My_Source will be placed, it is necessary the following:

- Add from the special Library the part SUBPARAMETERS.
- Add new Properties to the Part SUBPARAMETERS and call them for example: DCVoltage and DCVTol. Add some default values to the new Properties. For better readability they are set visible.

- Double click on the source.
- Add the value @DCVoltage to the Property DC and set it to visible.
- DoubleClick on R1.
- Add the value @DCVTol to the Property TOLERANCE and set it to visible.
- Save the schematic page and close it.

**Note**

Do not create Properties with a name that is already used by the system. The percent sign % for the TOLERANCE Property shall only be placed ones from the main schematic to the subcircuit. If it is missing, or more as one time in the variable chain, you will get a similar error message:

ERROR(ORNET-1019): Pin in template not found on V5.R1

2.2 Creating the New Part

2.2.1 Creating Automatically the Symbol

- Select the schematic folder in the Project Manager.
- Click on Tools > Generate Part.
- Click on OK.
- The Split part window opens. Close it clicking on Save.
2.3 Designing the Source Symbol

The symbol that is generated automatically with the generate Part function is a square with pins. You can design it the way you like:

- Double click on the Symbol in the .olb.

- Edit the Symbol as you like.

For example:

- To change the reference Designator or the part name click on **Options > Part Properties...**
- Add the percent sign in the DCVTol Property.
- Change the settings of the Pins clicking on the pins.

- Save your new symbol.
3  Using the New Source in a Design

- File > New > Project
- Add the new .olb My_Sources:

- Create a new simulation Profile.
- Add the Library in Simulation Profile.
- Add the Monte Carlo settings with the Output Variable.

- Run the simulation.

4  AC Voltage Source

Equivalent Circuit Diagram
5 Sinus Voltage Source

Equivalent Circuit Diagram

6 DC Current Source

Equivalent Circuit Diagram

7 AC Current Source

Equivalent Circuit Diagram

8 Sinus Current Source

Equivalent Circuit Diagram
9  Reuse of the .olb

Even though you have not chosen Copy schematic to library in the Generate Part window, you can reuse the part for other designs. You just have to make sure the path for the schematic is correct in the property Implementation Path.

Note

You can use the library for other PSpice projects. After placing the part in the schematic, you should check the property Implementation Path.

When you use the part in a design that is located in the same folder as My_Sources.dsn, you may not need to modify the Implementation Path.

If you save the library (.olb) somewhere, you must check the Implementation Path, and change it if necessary.

10  Use of the Appended Files

Unzip the files to a folder called C:\Flowcad\My_Sources.

In source_test.opj you will find two simulation profiles one for the AC sources and one for the DC and sinus sources.