RELEASE NOTES

SIMETRIX 6.2

OVERVIEW

This document provides details of SIMetrix Version 6.2.

WHAT'S NEW

GUI

1. Model selection by specification. Some types of library model can now be selected from their specification such as current and power ratings. Power FETs, diodes and zener diodes are currently supported

2. Probe measurement feature. This allow you to define one or more measurements and attach them to a fixed probe. These measurements get updated automatically on new runs.

3. New fixed power probe. Attach probe to any pin of a schematic instance to incrementally plot the power in the device. Otherwise works like all fixed probes and includes the new measurement feature described above.

DVM

1. Introduction of AC Input Testplans

SIMETRIX SIMULATOR

1. Added flicker noise support for Hspice resistor model

SIMPLIS SIMULATOR

1. New register types for advanced digital components.

2. More informative error message when SIMPLIS POP analysis fails

SCRIPT LANGUAGE

1. Script language - line continuation character. Use a '+' in the same way as netlists.

2. Rename menu feature. There is a new script function to change the display name of a menu and this is used to customise the name of the **Edit Additional Parameters** context menu in the schematic editor.

MODEL LIBRARY

1. Added Analog Devices model library

GUI

MODEL SELECTION BY SPECIFICATION

See the menus **Place | Select by Specification | ...**

The dialog box below shows how this feature works. In the example a Power FET may be selected from a knowledge of the desired Rds(ON), Vdmax or Idmax or any combination of the three. A similar feature exists for schottky diodes, junction diodes and Zener diodes.
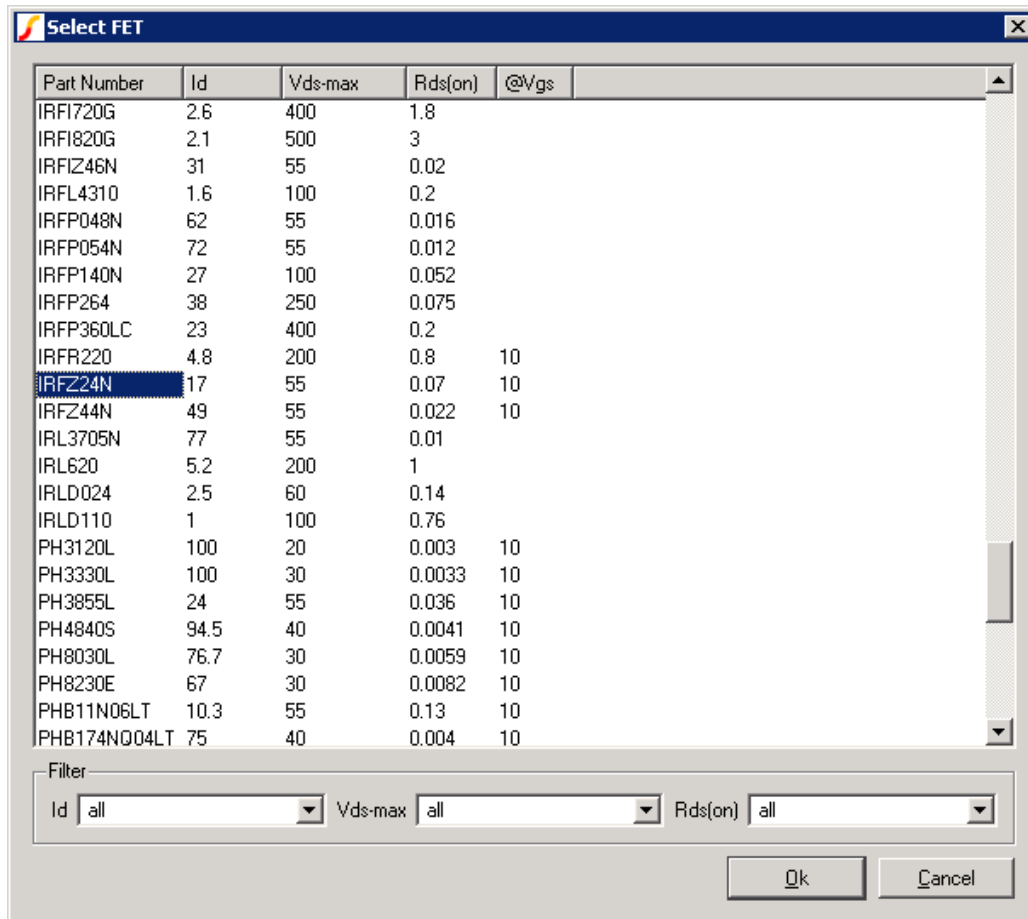

PROBE MEASURMENT

This works with fixed voltage, current, differential and inline current fixed probes. It also works with the new fixed power probe described in the next section.

To use, select the probe then right click menu **Edit/Add Measurement...**. You will note that this is in the position of the **Edit Additional Parameters** menu. The apparent menu name change is also a new feature. See below.

You will be presented with a dialog box like this:
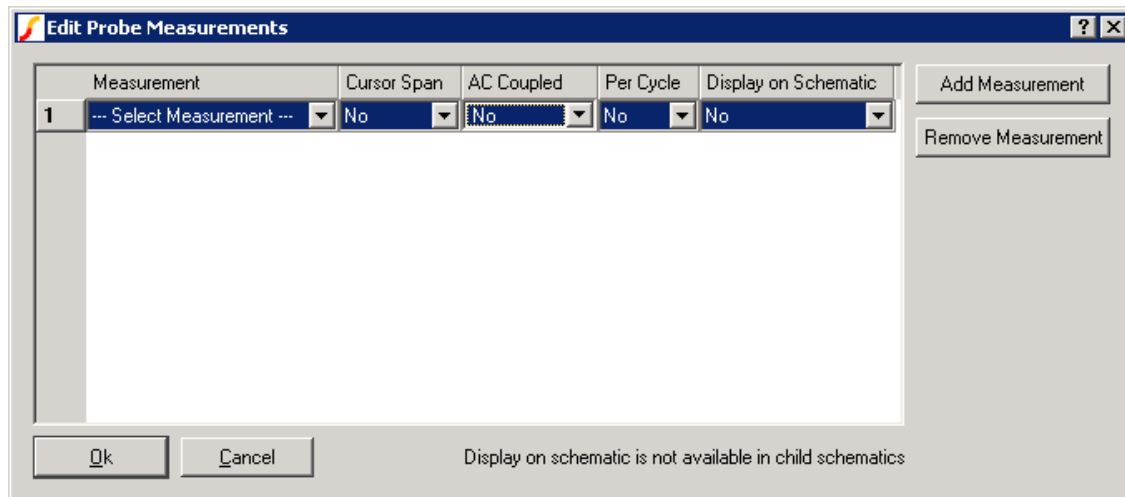
Select the measurement type from the measurement column and any of the other options as desired. **Display on Schematic** will force the measurement result to be displayed on the probe itself. If **Cursor Span** is selected but cursors are switched off, the measurement will be made over the whole analysis.

You can define more than one measurement by pressing the **Add Measurement** button. Use **Remove Measurement** to remove a measurement. To remove all measurements, there should be no lines displayed.

FIXED POWER PROBE

Use menu **Probe | Place Fixed Power Probe...** to place a probe that plot device power. The probe must be attached to a pin of the desired device; it does not matter which pin. The plotted power will be the instantaneous power developed in the whole device not just the power flow through the connected pin.

The measurement feature described above is available with this probe allowing the mean power to be displayed.

Due to the way it is netlisted and modeled in SIMPLIS, the transformers that are available for placement from the **Place | Magnetics** menu do not support the probing of pin currents or probing of power, whether it is fixed probing or random probing. So if pin current probing or power probing is desired for a transformer while the schematics is set up to use SIMPLIS as the simulator, it is suggested that the user place such a transformer in a child component schematic so that the number of pins in the child component match the number of pins in the transformer. The current probing and power probing of such a child component from the parent circuit will work when SIMPLIS is selected as the simulator.

DVM

INTRODUCTION OF AC INPUT TESTPLANS FOR DVM MODULE

With the 6.20 release comes complete AC Input testing for the Design Verification Module (DVM). Targeted at AC/DC front end converters, built-in testplans and test objectives were specifically designed to speed up the testing of these challenging converters. A suite of common line disturbances can be applied in an automated fashion, with specification checking against user defined values. These line disturbances include:

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- Line Dropout
- Line Surge
- Line Sag
- Pulse Load Transients
- Line Startup
- Control Startup

In addition to the line disturbance tests, a very complete set of measurements are made on the converter in Steady State. These include Power Factor, Efficiency, THD, and a complete spectral analysis of the current drawn from the source. The measured Source Harmonic Currents are both presented as scalar values, and graphed on a spectrum plot. The user may also compare the measured harmonic currents versus the IEC-61000-3-2 specifications for Class A, Class B, Class C and Class D. Should the user wish to test versus custom specifications, any number of harmonic limit curves may be input from a spreadsheet for comparison.

Along with the new test objectives come a set of advanced AC Specific Sources. These sources are user configurable to allow a broad variety of testing in single phase and three phase applications. The new sources include:
- Fixed Frequency Sine Wave Voltage
- Dropout
- Startup
- Surge/Sag
- Quasi-Square-Wave for testing of inverter inputs
- Glitch Distortion

Finally, when the user cannot reproduce the desired waveforms with these sources, the DVM module allows the user to create sources from a file containing x-y points. The most common source of these data is from an oscilloscope waveform.

As with DC/DC DVM testing, a concise user friendly html report is generated containing links to individual test reports and graph data.

SIMETRIX SIMULATOR

HSPICE RESISTOR - FLICKER NOISE

Flicker noise is now supported in the Hspice resistor. This is governed by the parameters EF, LF, WF, AF and KF

SIMPLIS SIMULATOR

NEW REGISTER TYPES FOR ADVANCED DIGITAL COMPONENTS

Four types of registers, data registers, shift registers, multi-bit shift registers, and barrel shifters, are introduced as new advanced digital components. These registers can all be used for storing data. In addition, the shift registers allow one bit of shifting for every clock cycle, while for the multi-bit shift registers the number of bits shifted per clock cycle is controlled by a multi-bit shift-control input. The barrel shift registers are similar to the multi-bit shift registers, but their operation is a multi-bit rotation where bits shifted out of one end are shifted back in on the other end.

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MORE INFORMATIVE ERROR MESSAGE WHEN SIMPLIS POP ANALYSIS FAILS

When reporting that the Periodic Operating-Point Analysis is unable to find a periodic operating point after the maximum number of iterations, the capacitor voltages and the inductor currents that are the leading contributing factors to the non-convergence of the POP analysis are now identified. Inspecting these voltages and currents from the "POP progress output" may show clues to the non-convergence.

SCRIPT FEATURES

LANGUAGE - LINE CONTINUATION

It is now possible to spread script statements over multiple lines using the '+'line continuation character. If a line starts with a '+' then it is considered to be a continuation of the previous line. Please note the following:
1. The '+' character **must** be the first character on the line; no spaces or tabs may be placed before it.

2. '*' comment lines may not be embedded in continued lines. E.g.

```
Let table = [1, 34, 2, 67, 3, -12,
*+ 4, -15, 5, 129]
+ 4, -25, 5, 135]
```

will lead to an error. In this case the third line will be seen as a new statement.

This, however, will work as intended:
```
Let table = [1, 34, 2, 67, 3, -12,
+ ; 4, -15, 5, 129]
+ 4, -25, 5, 135]
```

RENAMING MENUS

A new script command has been introduced that changes the display name of a menu. This is used to selectively alter the **Edit Additional Parameters** schematic context menu. Add a property with name **PARAMS_MENU** to a symbol and the value of the property will define the name of the **Edit Additional Parameters** menu.

This system is implemented using two new script features:
1. New event script **on_context_menu** is called when a context menu (the right click popup menu) is displayed.

2. RenameMenu command changes the displayed name of a menu. This command only changes the displayed name not the name used to reference the menu.

MODEL LIBRARY

Most of the Analog Devices model library is now incorporated in SIMetrix. A few parts are excluded at present, but will be added in an early update.

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