PRESS RELEASE

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Apsim announces Full chip power simulator

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Apsim Power Integrity (ApsimPI), is a powerful new simulator designed to simulate the impedance of power and ground grids in the frequency domain or signal/power/ground waveforms in the time domain considering the full chip power and ground grids. With speeds on chip well into the Giga Hertz range it is no longer accurate to model the voltage fluctuation on the power system using only the resistive elements. At Giga Hertz speeds it becomes necessary to consider the full LCR (inductance, capacitance, resistance) effects over a broad frequency range. ApsimPI extracts the LCR models of the power and ground nets from the LSI CAD data (LEF/DEF) considering the slow mode effect of the silicon substrate with resistivity and dielectric constant over frequency. Since the resulting LCR matrices are huge, new algorithms using a special solver were developed. This dramatically reduces the computation time and removes the limitation of the circuit size for extracting the Nport compressed parameters. The extracted Nport parameters can then be converted into concise SPICE readable models to simulate the broadband effects in the time and frequency domains. The signal transmission lines considering the silicon substrate effect can be added before or after compressing the power and ground model. The nonlinear transistor or behavioral models can be connected to the device ports of the whole model. In order to analyze waveforms in the time domain, a new coupled transmission line model and Nport frequency table model have been developed.

Applications to the program include predicting power/ground voltage fluctuation and peak currents in the time domain. Impedance between power and ground is computed for the frequency domain considering on-chip decoupling capacitors and substrate effects. Noise on the substrate can couple into sensitive areas of the IC causing timing and functional problems. ApsimPI can detect such issues and help in the analysis for corrective actions. Extensions to the program can be added to model signal nets in the presence of the power system for Signal Integrity, crosstalk and SSO noise analysis.
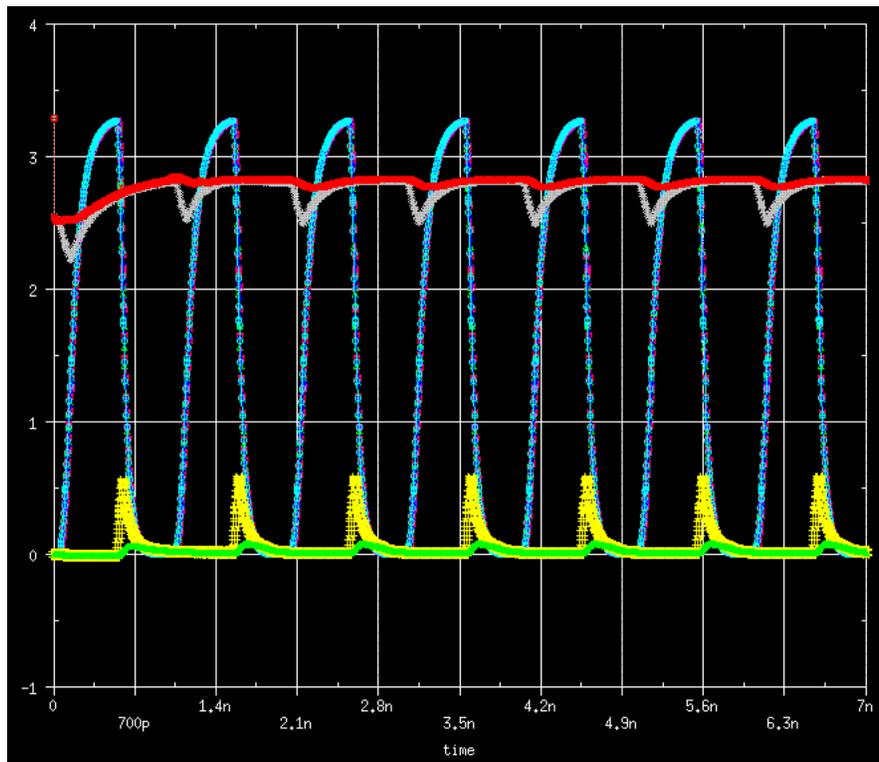
ApsimPI comes with an interface to the LEF/DEF data. A GDSII interface will be released soon. These interfaces output Apsim's standard data format AAIF, which is common to other Apsim tools used to analyze PCB and IC packaging for SI, PI and EMC considerations.

The product is available on both UNIX and Windows operating systems. For more information contact:

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LSI IC Time and Frequency Domain Plots of the Power and Ground System.

Time

Frequency