DIGITAL INDUSTRIES SOFTWARE

Xpedition AMS

Innovative Circuit Simulation and Analysis

Benefits

- Virtual environment for circuit design and analysis
- Multi-language modeling support including SPICE, VHDL-AMS, and C/C++
- Extensive library of SPICE and VHDL-AMS simulation models for AMS circuit design
- Intuitive modeling tools automate model generation from multiple data sources
- Easily link simulation data to legacy PCB schematics
- Standard time- and frequency-domain analyses quantify nominal circuit performance

Powerful PCB Simulation and Analysis

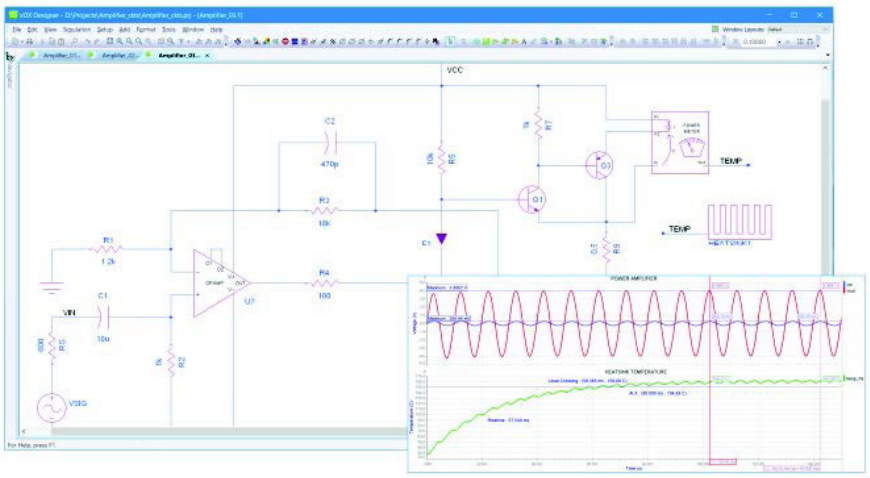
Design your board to specification using standard time and frequency domain analyses and extensive model libraries. Examine performance sensitivities, analyze statistical behavior and manufacturability, determine worst case performance, and calculate component stresses using advanced design analyses. Build virtual prototypes of your board designs and test them with a model of the end system.

Single Schematic Drives Simulation and Layout

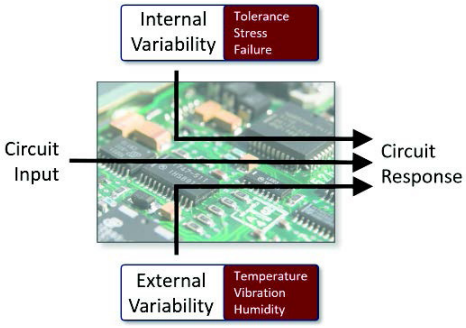
AMS simulation is tightly integrated with Xpedition Designer. The schematic you create for simulation is the same schematic you use to drive board layout. No more drawing a schematic in a simulation tool, then redrawing the same schematic in a PCB schematic tool. Get to a real board faster with fewer errors.

Benefits continued

- Advanced parametric analyses verify design performance beyond nominal conditions
- Full-featured data measurements and waveform calculations quantify performance metrics
- Modeling electro-mechanical and other multi-discipline components enables design verification in the broader system context



Xpedition AMS extends electronic circuit simulation beyond standard time and frequency domain analyses to include advanced performance simulations and virtual in-system verification in the Xpedition PCB design flow.



Simulate Legacy Designs

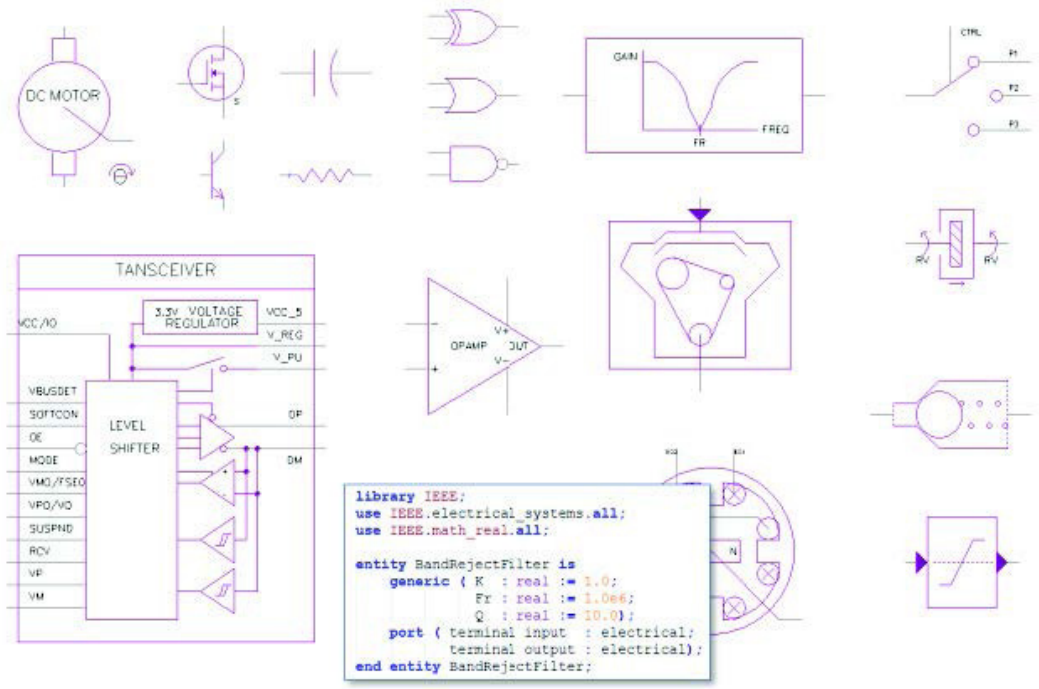
Every electronics design company has them – legacy schematics that need updating to meet new requirements or revisions, but have no simulation data. Setting up legacy schematics for simulation requires linking simulation models to schematic symbols. Xpedition automates this process, using an intuitive setup wizard, to quickly prepare even the most complex designs for simulation.

SPICE (+ PSpice) Model Support

SPICE models are widely available for a variety of electronic components. Many of these models are in the popular PSpice format. Xpedition supports standard SPICE models directly, and PSpice models through a fast and simple conversion process. Use SPICE models from the large installed library, or download vendor models and use them in your projects.

Beyond SPICE Modeling with VHDL-AMS

Beyond standard SPICE modeling, the IEEE standard VHDL-AMS modeling language is supported for added flexibility in modeling and analyzing component and design behavior. VHDL-AMS supports analog and event-driven behavior for modeling and analyzing analog, digital, and mixed-signal designs. The language goes beyond the electrical domain into other design technologies so you can model your circuit's target system, then do in-system verification using virtual prototypes. And because VHDL-AMS is an IEEE standard, you can share your models with design teams using other tools.



Models Direct from Datasheets

A datasheet curve modeler extracts device data from performance curves, then uses the data to create a piecewise linear model of the component. Easily generate models from any curve you can display on your computer monitor, or draw your own graphs to create custom model functions. Datasheet performance tables are turned into a simulation model. Its simple user interface looks like a datasheet table, so it's easy to transfer information from a datasheet to the tool. Along with nominal values, you can enter minimum and maximum values to create advanced models supporting statistical analyses.

Comprehensive Stress Analysis

Component stress levels are measureable from the moment power is applied to a circuit. The stress level may be high or low, and circuit reliability and robustness are dependent on how well these stresses are understood and managed. Stress information can be calculated for any performance metric, and measurements are reported in Microsoft Excel as a percent of rated value for viewing, analysis, and derating to help you understand your circuit's stress profile.

Stress Analysis Report

Power Amplifier

Reference designator	Part Type	Stress Type	Rating	Derating Factor	Derated Rating	Maximum	Stress
Q4	BJT	pow	1.5	1	1.5	3.789254017	252.62%
Q3	BJT	pow	1.5	1	1.5	3.754235797	250.28%
R10	Resistor	pow	0.25	1	0.25	0.138672617	55.47%
R9	Resistor	pow	0.25	1	0.25	0.124880723	49.95%
U1	IC	pow	0.25	1	0.25	0.056671534	22.67%
Q2	BJT	pow	1.5	1	1.5	0.171240573	11.42%
R5	Resistor	pow	0.25	1	0.25	0.025605781	10.24%
R6	Resistor	pow	0.25	1	0.25	0.024830301	09.93%
Q1	BJT	pow	1.5	1	1.5	0.118292567	07.89%
R8	Resistor	pow	0.25	1	0.25	0.001490413	00.60%
R7	Resistor	pow	0.25	1	0.25	0.001483078	00.59%
R3	Resistor	pow	0.25	1	0.25	8.66E-04	00.35%
R4	Resistor	pow	0.25	1	0.25	1.19E-04	00.05%
R2	Resistor	pow	0.25	1	0.25	6.99E-05	00.03%
R1	Resistor	pow	0.25	1	0.25	5.78E-05	00.02%
RS	Others	pow	0.25	1	0.25	4.19E-05	00.02%

Worst-Case Scenario Exploration

A standard worst-case analysis reports valuable design performance information, but is often limited to parameter dependencies built into the design. A worst case explorer considers built-in parameters, but also lets you define and control special effects such as high and low thermal exposure and aging. These special effects are toggled on and off with user-defined parameters, and can be combined to create custom worst-case scenarios. The explorer runs each scenario with the defined parameter set, uses the selected measurements to quantify circuit performance, then reports the results in Microsoft® Excel® for evaluation and analysis.

Detailed Design Experiments

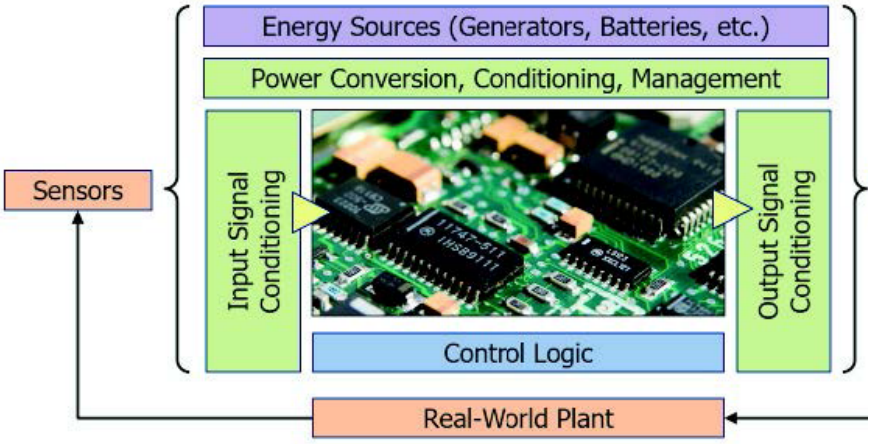
Running design experiments is an efficient method for evaluating and mproving circuit performance as design parameters change. A Microsoft® Excel® based experiment manager can be used for defining and automating design experiments. Each test defines what parameters to exercise, the command sequences for the simulation, and which measurements to run. Experiments are defined in Excel, run in the Xpedition environment, and results are reported back to Excel for analysis and further processing.

High-Performance Distributed Computing

Access distributed computing resources, either on your local intranet or the cloud. Distributed computing sessions are managed from your desktop, taking advantage of powerful remote computing resources to run your simulations, then returns results to your local computer for analysis.

Experiment Report

PARAMETERS				MEASUREMENTS			
RES A	RES B	CAP A	CAP B	Stopband (Hz)	Maximum (dB)	Minimum (dB)	Delta (dB)
3.20E+03	3.20E+03	4.70E-09	4.70E-09	11.46E+03	3.52E+00	-27.65E+00	31.17E+00
3.30E+03	3.30E+03	4.70E-09	4.70E-09	10.71E+03	3.52E+00	-34.08E+00	37.60E+00
3.40E+03	3.40E+03	4.70E-09	4.70E-09	10.03E+03	3.52E+00	-48.20E+00	51.72E+00
3.50E+03	3.50E+03	4.70E-09	4.70E-09	9.41E+03	3.52E+00	-32.17E+00	35.69E+00
3.60E+03	3.60E+03	4.70E-09	4.70E-09	8.84E+03	3.53E+00	-26.51E+00	30.04E+00
3.40E+03	3.40E+03	4.50E-09	4.50E-09	10.41E+03	3.52E+00	-29.43E+00	32.95E+00
3.40E+03	3.40E+03	4.60E-09	4.60E-09	10.22E+03	3.52E+00	-34.71E+00	38.23E+00
3.40E+03	3.40E+03	4.70E-09	4.70E-09	10.03E+03	3.52E+00	-48.20E+00	51.72E+00
3.40E+03	3.40E+03	4.80E-09	4.80E-09	9.86E+03	3.52E+00	-37.03E+00	40.55E+00
3.40E+03	3.40E+03	4.90E-09	4.90E-09	9.70E+03	3.52E+00	-30.49E+00	34.01E+00
2.88E+03	2.88E+03	4.23E-09	4.23E-09	15.50E+03	3.52E+00	-28.83E+00	32.35E+00
2.97E+03	2.97E+03	4.23E-09	4.23E-09	14.56E+03	3.52E+00	-35.17E+00	38.69E+00
3.06E+03	3.06E+03	4.23E-09	4.23E-09	13.69E+03	3.52E+00	-52.27E+00	55.79E+00
3.15E+03	3.15E+03	4.23E-09	4.23E-09	12.89E+03	3.52E+00	-33.64E+00	37.16E+00
3.24E+03	3.24E+03	4.23E-09	4.23E-09	12.15E+03	3.52E+00	-27.94E+00	31.46E+00
3.06E+03	3.06E+03	4.05E-09	4.05E-09	14.18E+03	3.52E+00	-30.83E+00	34.35E+00
3.06E+03	3.06E+03	4.14E-09	4.14E-09	13.93E+03	3.52E+00	-36.26E+00	39.78E+00
3.06E+03	3.06E+03	4.23E-09	4.23E-09	13.69E+03	3.52E+00	-52.27E+00	55.79E+00
3.06E+03	3.06E+03	4.32E-09	4.32E-09	13.46E+03	3.52E+00	-38.34E+00	41.86E+00
3.06E+03	3.06E+03	4.41E-09	4.41E-09	13.25E+03	3.52E+00	-31.72E+00	35.24E+00



Virtual In-System Verification

When your circuit design is complete, verify its performance using a virtual prototype of the target system. Build the virtual prototype using models for electrical and electro-mechanical drivers and loads. Run more extensive tests faster. Reduce the cost of re-spinning hardware prototypes. Reach production in less time.

Innovative Data Analysis

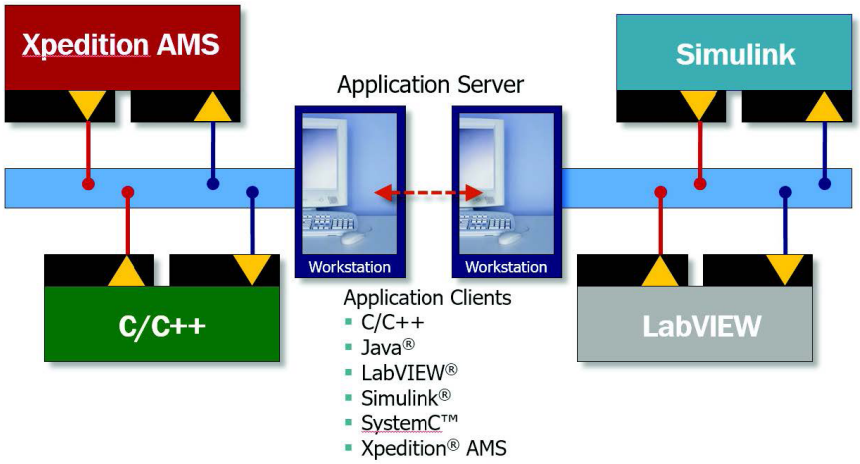
A waveform analyzer supports a variety of data analysis options. Display complex simulation data in clear, easily understood graphs. Use 45+ waveform measurements, and a waveform calculator with advanced data calculation and transformation options, to quantify your circuit's performance. Measurements and calculations can be saved and later run on the same or a new data file. Graph windows and templates can be saved and later used to automate simulation data analysis.

Integration with Industry Leading Tools

Connect multiple tools in an integrated simulation session, joining best-in-class modeling, analysis, and test capabilities in a single development environment. Other analysis tools, such as Simulink® and LabVIEW™ can be linked, and processes written in language such as C/C++, Java, and SystemC, to analyze complex systems and connect design teams from the beginning to the end of the development flow.

System Requirements

Operating Systems: Windows 7, Windows 10



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