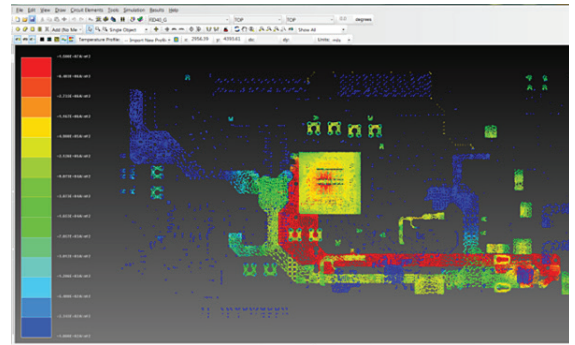


Realize Your Product Promise™

**ANSYS**®

**SIwave-DC**



SIwave-DC accurately identifies excessive current in the layout.

## ANSYS SIwave-DC outfits you to confidently predict DC power and voltage loss for chip–package–systems.

ANSYS SIwave-DC™ analyzes entire printed circuit boards (PCBs) and integrated circuit (IC) packages prevalent in modern electronic products. SIwave-DC accurately predicts failure risks within a design, such as DC voltage drop and power loss per layer, along with DC resistance of power planes, ground planes and signal traces. These capabilities make it an effective tool to perform pre-layout power distribution network analysis and reduce post-layout power delivery problems.

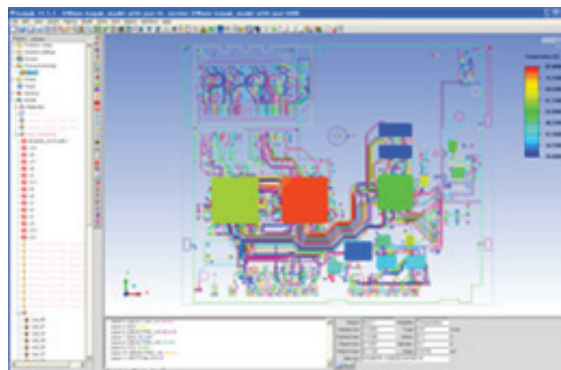
### DC Analysis

SIwave-DC employs a specialized 3-D finite element field solver with adaptive meshing to compute DC currents and voltages on PCBs and PKGs — including 3-D simulation of vias, wirebonds, solderballs and solderbumps. Power loss is calculated per layer along with a resistive network that can be used to make quick design

### SIwave-DC Capabilities

- DC voltage drop (voltage) for all nets including GND and Vdd
- DC current direction (amps/area2) that includes return paths
- DC current magnitude (amps) into and out of vias
- Automatic adaptive meshing for accuracy
- Power density (w/area2) and power loss (Watts) per layer
- Bidirectional coupling to ANSYS Icepak to include thermal losses (Joule heating)
- Automated reports for user-defined pass–fail criteria

tradeoffs. These predictive simulations ensure that the power distribution network (PDN) can source enough current to ICs within the PCB or PKG.



The bidirectional link between SIwave-DC and Icepak delivers insight into the effect Joule heating has on PCB and package design.

### Automatic Adaptive Meshing

Automatic adaptive meshing allows users to benefit from the highly accurate finite element method without having to build and refine a mesh. The user specifies only the geometry, material properties and desired output. This proven technology eliminates the meshing process and makes advanced numerical analysis practical for all levels of your organization.

### Parametric Studies

Using SIwave-DC, engineers can perform what-if topology studies to determine proper copper weighting and placement of power/ground planes, via location, via plating thickness and wirebond sizes to ensure an optimal power delivery system.

## SIwave-DC Third-Party ECAD Support

Vendor	ECAD Layout Tool	Versions Actively Supported
Altium®	Designer using ODB++	R10 and higher
Cadence®	Allegro	v15.7 & higher
	APD	v15.7 & higher
	SiP	v15.7 & higher
	OrCAD using ODB++	V16.3 & higher
Mentor Graphics®	Expedition using ODB++	EE7.9.1 & higher
	PADS using ODB++	v9.4 & higher
	BoardStation Classic	v2007 - v2007.7 (uses HKP design flow)
Zuken™	CR5000	v9 & higher
	CR8000	v2013 & higher
	CADSTAR using ODB++	v12.1 & higher
Other Formats	.anf, .xfl, .dxf & .gds	

### Thermal Analysis

A bidirectional link between SIwave-DC and ANSYS Icepak® creates a comprehensive thermal integrity design flow. This improves overall system accuracy by incorporating ohmic losses that result in Joule heating.

### Automated Pass Fail Reports

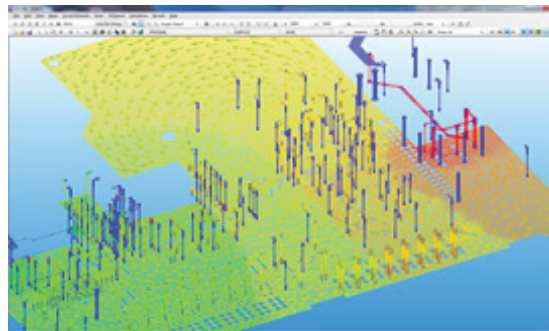
SIwave-DC automatically produces pass—fail reports that help engineers make package and PCB design decisions prior to fabrication.

### Easy Layout Extraction

Our technology can extract complete designs (including multiple, arbitrarily shaped power/ground layers, vias, signal traces and circuit elements) with unprecedented accuracy and speed, without requiring manual, often laborious layout partitioning. Multiple layout topologies are supported: PoP, SoC, SiP, PKG on PCB. SIwave-DC integrates electrical CAD (ECAD) translation, enabling simple and seamless geometry translation from popular third-party ECAD vendors.

### Foundation for Systems Analysis

SIwave-DC provides the fundamental building block for entry into more complicated predictive system analyses— power integrity, signal integrity and EMI/EMC analysis. No matter the complexity of your design, our solutions can help you to solve even more difficult system-wide challenges.



The bidirectional link between SIwave-DC and Icepak delivers insight into the effect Joule heating has on PCB and package design.

### ANSYS Systems Analysis Capabilities

Functionality	SIwave-DC	SIwave-PI	SIwave
ECAD translation	•	•	•
ANSYS SIwave & 3-D layout GUI	•	•	•
I2R DC solver	•	•	•
Plane resonance solver		•	•
ANSYS PI Advisor solver		•	•
SYZ solver		•	•
Frequency sweep solver		•	•
Near-field solver			•
Far-field solver			•
Signal net analyzer			•
ANSYS DesignerSI™ Circuit			•
<b>Add-on Options</b>			
ANSYS Electronics HPC	•	•	•
ANSYS HFSS™ solver	•	•	•
ANSYS Q3D Extractor 3-D® solver	•	•	•
ANSYS SIwave PSI solver	•	•	•
ANSYS Icepak	•	•	•
ANSYS SI option		•	•
ANSYS RF option		•	•

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ANSYS is dedicated exclusively to developing engineering simulation software that fosters rapid and innovative product design. Our technology enables you to predict with confidence that your product will thrive in the real world. For more than 40 years, customers in the most demanding markets have trusted our solutions to help ensure the integrity of their products and drive business success through innovation.

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