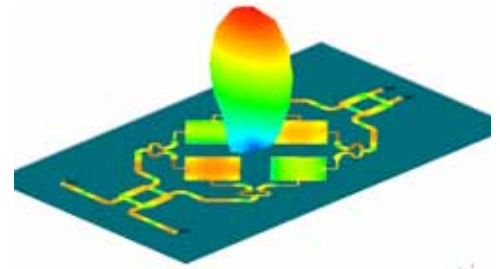


**Realize Your Product Promise™**

**ANSYS®**

**DesignerRF**



Four-element antenna array showing current distribution and far-field gain, created in DesignerRF using layout editor and solved via HFSS with Solver on Demand technology

## Solve your toughest RF design challenges with DesignerRF.

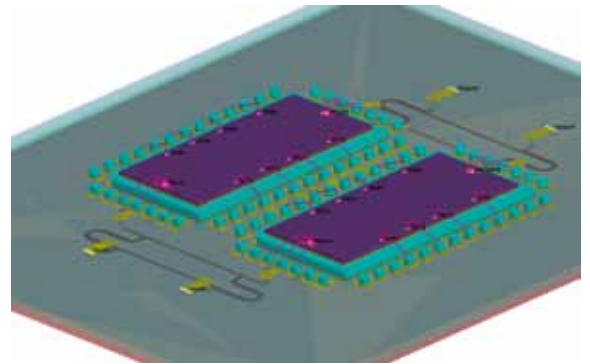
Leading-edge technology combines design management capabilities with powerful circuit and electromagnetic field simulation.



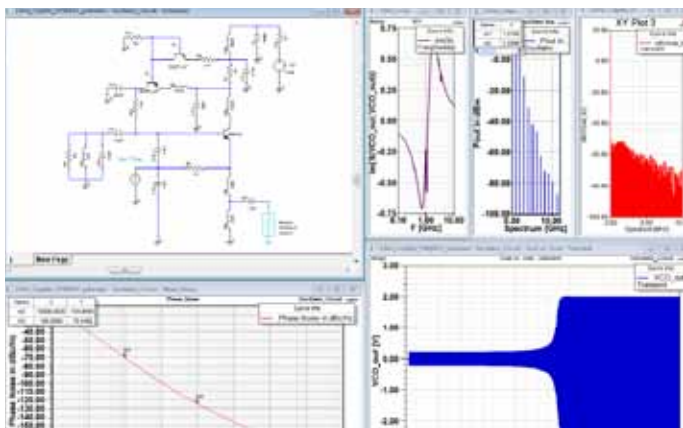
ANSYS DesignerRF™ software provides an ideal environment for designing radio frequency integrated circuits (RFICs), monolithic microwave integrated circuits (MMICs) and system-on-chip (SoC) devices. The technology utilizes advanced capabilities such as state-of-the-art harmonic balance solvers along with the ability to use either ANSYS HFSS™ or ANSYS PlanarEM directly within the user interface. This makes DesignerRF the ideal choice for developing advanced high-performance RF design. Our tools also enable engineers to design RF and microwave circuits as well as complete end-to-end wireless communication systems based on CDMA, Bluetooth®, Wi-Fi® and many other standard communications schemes.

The Solver on Demand® capability, integral and unique to DesignerRF, allows you to integrate rigorous electromagnetic analysis with system and circuit simulation in the comprehensive, easy-to-use DesignerRF user interface. With Solver on Demand, you can perform electromagnetic simulations on components in a circuit via HFSS, PlanarEM or equivalent circuit models at will. Furthermore, you can directly tie these electromagnetically analyzed components to RF or microwave circuits and simultaneously simulate the entire resulting circuit in a mixed-circuit electromagnetic solver simulation.

Solver on Demand technology allows you to choose between our leading-edge ANSYS Nexxim® solver or the HSPICE® solver from Synopsys® directly in the user interface. DesignerRF delivers the unprecedented accuracy and design flow automation needed to shorten the design cycle and to enable you to realize your product promise.



3-D rendering of RF package in DesignerRF



	DesignerRF		
	Designer	Circuit	PlanarEM
Integrated schematic and layout	•	•	•
Linear/DC analysis	•	•	•
Smith/transmission line utility	•	•	•
Dynamic links to field solvers	•	•	•
PlanarEM	•		•
System analysis	•	•	
Harmonic balance	•	•	
Oscillator	•	•	
Envelope	•	•	
Solver on Demand technology	•	•	•

Full-system simulation performed in DesignerRF of RFID system that includes transmitter, realistic channel modeled in HFSS and tag receiver circuitry. The simulation takes advantage of the dynamic link to ANSYS HFSS as well as the push excitation feature in DesignerRF.

Capabilities available in DesignerRF options

DesignerRF is offered as three options, each satisfying a particular industry need.

### DesignerRF

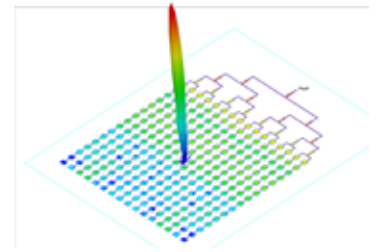
Our fully featured product suite includes a powerful and easy-to-use design management front end that enables best-in-class circuit and electromagnetic field simulation technologies, including HFSS, Nexxim, ANSYS Q3D Extractor® and ANSYS SIwave™. Integrated into the DesignerRF design management product are sophisticated schematic capture and layout tools, the PlanarEM solver, our RF system tool, design optimization, and numerous design utilities, such as filter synthesis and Smith chart matching tools. The included leading-edge circuit simulator, Nexxim, is a frequency domain circuit solver capable of linear and nonlinear circuit simulations.

### DesignerRF Circuit

This suite is for engineers who have a specific interest in designing and simulating RF circuits. DesignerRF Circuit includes the design management front end, integrated schematic capture and layout tool, RF system tool, and Nexxim frequency domain circuit solver for linear and nonlinear analysis of circuits.

### PlanarEM

This suite is geared specifically toward engineers who need to simulate electromagnetic structures using a state-of-the-art 3-D planar EM solver. You can use PlanarEM to easily analyze a variety of planar structures ranging from antennas to filters, couplers, and all other planar RF and microwave structures. The suite includes the full-wave 3-D planar electromagnetic field solver (based on method of moments), a linear and DC circuit solver, and the design management tool.



16 x 16 antenna array solved with DesignerRF's PlanarEM tool; current distribution on array elements and gain pattern

## DesignerRF delivers accuracy and flexibility in an easy-to-use interface for developing complete communication systems.

### Solver on Demand

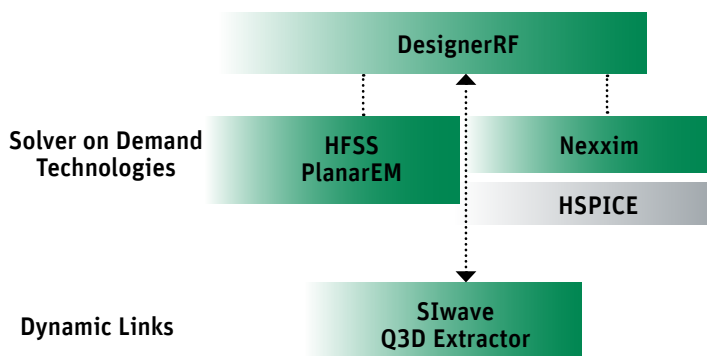
Powerful and versatile Solver on Demand technology from ANSYS enables you to create simulations comprising circuits and structures in which different solver types can be applied simultaneously to the design's various sections or structures. When analyzing such a mixed-solver circuit, DesignerRF automatically uses the selected solver for each section or piece of the design. The process delivers an overall simulation with unparalleled accuracy, as each component is analyzed with the solver most appropriate for that particular section, component or device. Engineers can choose HFSS and PlanarEM for electromagnetic simulations, as well as Nexxim and HSPICE for circuit simulation.

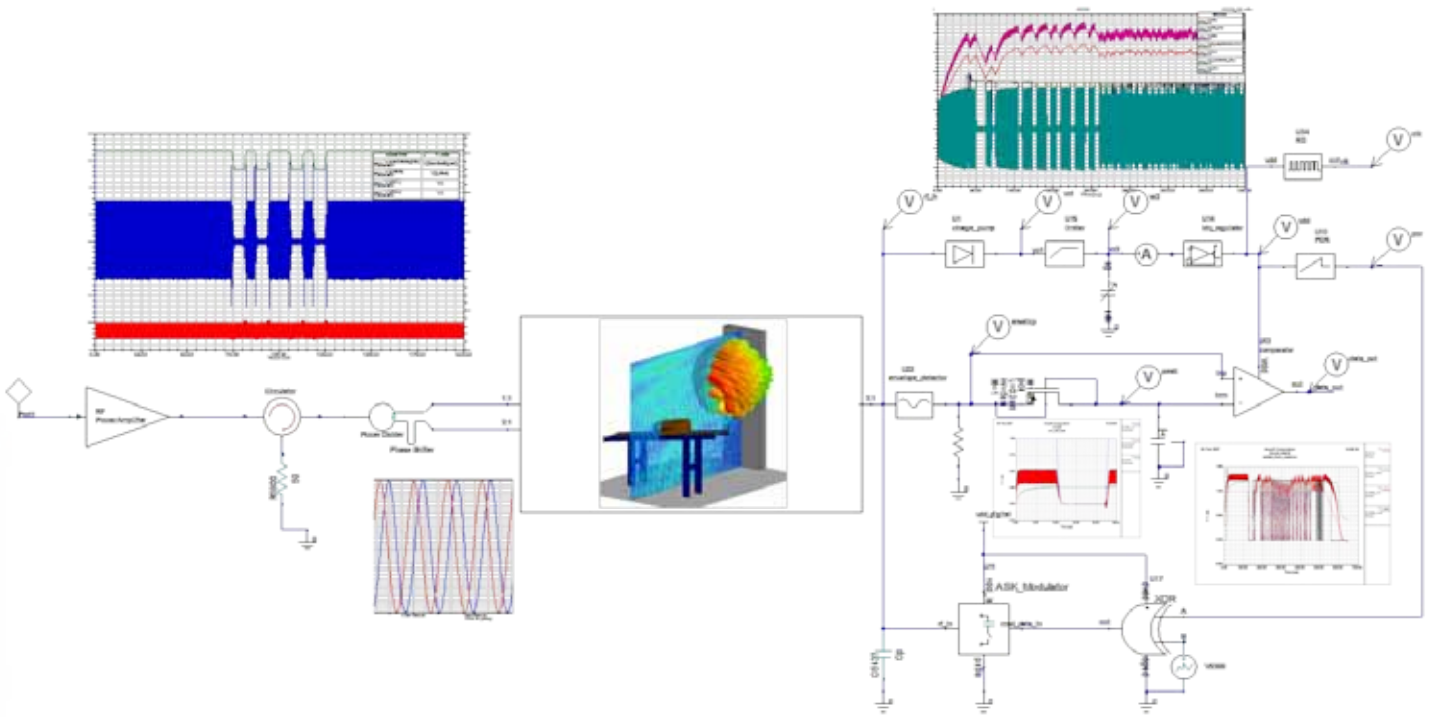
Engineers choose the desired solver while directly creating the circuit within the stackup-based layout interface. This intuitive interface is ideal for electrical CAD (ECAD) import, drawing and parameterization of electromagnetic designs.

Together, the integrated stackup design tool, Solver on Demand capability and support for traditional ECAD primitives — such as padstacks, traces, wirebonds and solderballs — ensure that digital and RF engineers can easily set up designs for simulation and extraction, ultimately realizing their product promise.

### Dynamic Links

DesignerRF and DesignerRF Circuit provide dynamic links to widely used PCB and IC package design tools from ANSYS, SIwave and Q3D Extractor. With this process, you can easily incorporate output directly into the design flow and circuit simulation. Dynamic links provide an easy way to link field solver solutions into the Designer interface and DesignerRF simulation capabilities.

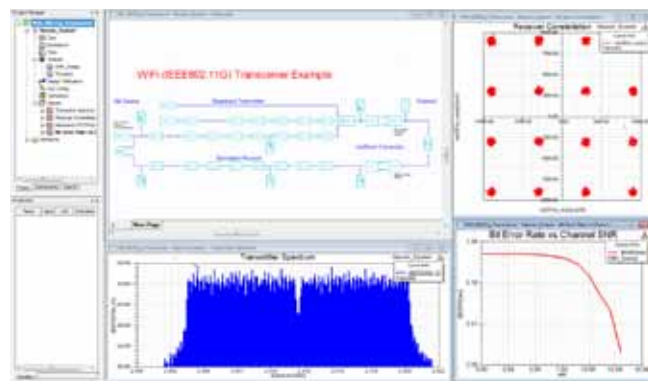




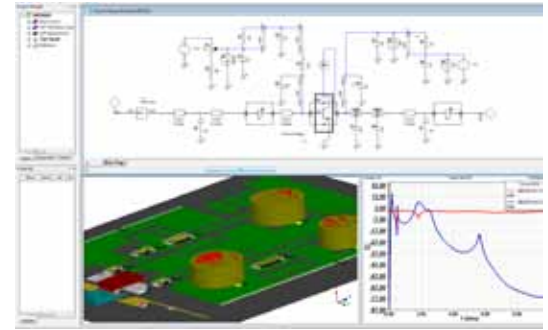
Full-system simulation performed in DesignerRF of RFID system that includes transmitter, realistic channel modeled in HFSS and tag receiver circuitry. The simulation takes advantage of the dynamic link between DesignerRF and HFSS as well as the push excitation feature in DesignerRF.

### Easy Design Entry

The DesignerRF product suites support direct, synchronized schematic and layout design entry with sophisticated data visualization and analysis tools for enhanced productivity. Users can easily import IC macro-cell netlists and GDSII or DXF layouts.



DesignerRF system simulation of 80211.g transceiver system showing system schematic and constellation plot, SNR vs. channel noise and transmitter spectrum



Test board circuit simulated in DesignerRF; circuit schematic and associated 3-D layout with components and S-parameter results for amplifier

## Leverage DesignerRF capabilities with the comprehensive ANSYS suite to solve your most complex design problems.



ANSYS DesignerRF and related electromagnetics tools are one part of our suite that delivers cutting-edge functionality — depth, breadth, a plethora of advanced capabilities and integrated multiphysics — providing confidence that your simulation results reflect real-world outcomes. The comprehensive range of solutions provides access to virtually any field of engineering simulation that a design process requires. Organizations around the world trust ANSYS to help them realize their product promises.

### Design Exploration

DesignerRF links with ANSYS DesignXplorer™ to help in performing statistical yield analysis as well as design of experiment studies for six sigma analysis.

### Flexibility for Importing Geometry

With the addition of AnsoftLinks™ for ECAD, DesignerRF imports geometry from layout design tools such as Cadence®, Mentor Graphics®, Sigroty®, Altium and Zuken™.

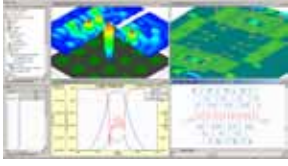
### Systems-Level Integration

DesignerRF forms an integral part of a system solution that involves circuits and components. It serves as the environment for combining various physics-based solutions and circuit solutions into a larger system-level simulation.



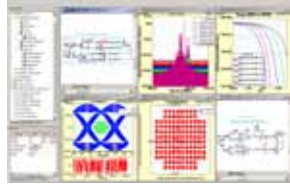
## ANSYS DesignerRF

### Design Management



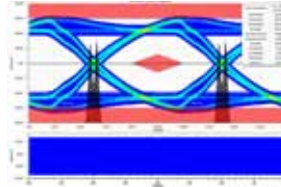
Complete design management front end for best-in-class circuit and electromagnetic field simulation

### Design Entry



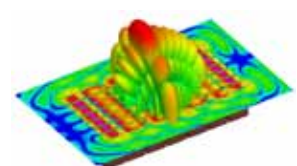
Direct synchronized schematic and layout design entry

### RF Circuit Simulation



Nexxim offers integrated circuit and system analysis and consistent simulation across time and frequency domains.

### Links to EM Analysis



True electromagnetic-based design flow for RF and microwave design via HFSS, SIwave and Q3D Extractor

## Pre-Processing

## Simulation

## Post-Processing

## Archive

## Other ANSYS Engineering Simulation Capabilities

### ECAD



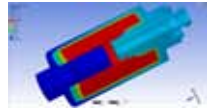
The ANSYS suite provides modeling and geometry creation functions as well as tools for importing ECAD data from various sources. In addition, we collaborate with leading ECAD developers to ensure an efficient workflow.

### Integration



ANSYS Workbench is the framework for the industry's broadest and deepest suite of advanced engineering simulation technology. It delivers unprecedented productivity, enabling Simulation-Driven Product Development™.

### Multiphysics



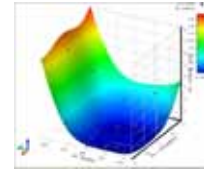
To help ensure a successful product, R&D teams must accurately predict how complex products will behave in a real-world environment. The ANSYS suite captures the interaction of multiple physics: structural, fluid dynamics, electromechanics and systems interactions. A single, unified platform harnesses the core physics and enables their interoperability.

### HPC



High-performance computing enables creation of large, high-fidelity models that yield accurate and detailed insight. ANSYS offers scalable solutions and partners with hardware vendors to ensure that you get the power and speed you need.

### Design Optimization



Good design starts with identifying the relationship between performance and design variables. ANSYS design exploration tools enable engineers to perform design of experiments (DOE) analyses, investigate response surfaces and analyze input constraints in pursuit of optimal design candidates.

### Data Management



ANSYS EKM™ addresses critical issues associated with simulation data, including backup and archival, traceability and audit trail, process automation, collaboration and capture of engineering expertise, and IP protection.

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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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