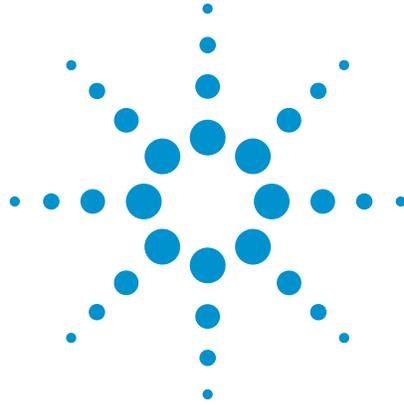


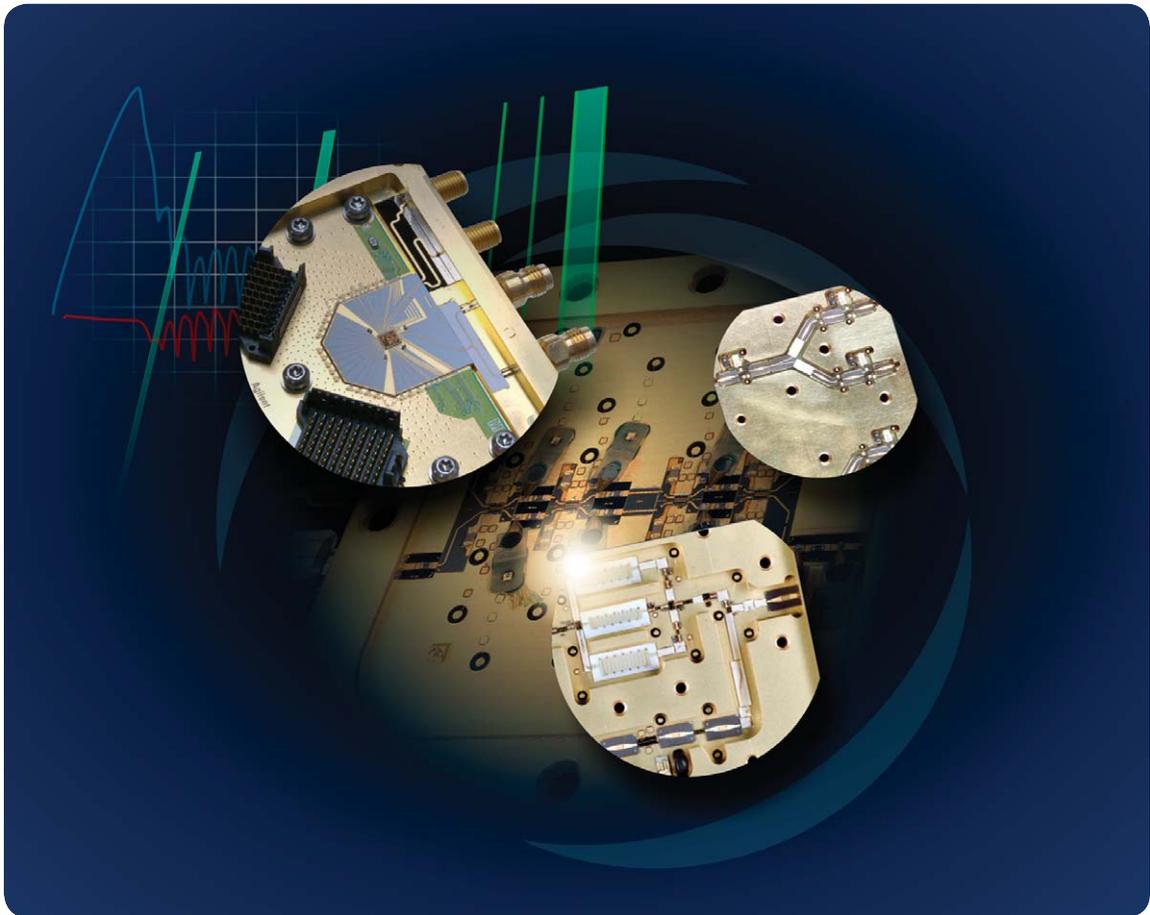
Agilent EEsof EDA

# GENESYS

RF and Microwave Design Software



System Architecture  
Design  
Synthesis  
Circuit Simulation  
Layout  
EM Simulation  
Test Interface



**Agilent Technologies**

# GENESYS

## A Seamless Design Flow with Outstanding Price and Performance

- System Architecture Design
  - Synthesis
- Circuit Simulation
  - Layout
- EM Simulation
- Test Interface

At a time when fewer designers are required to produce more complicated products and get those products to market faster, GENESYS provides a complete, easy-to-use design environment that is fast, powerful and accurate, and now works with Agilent's Advanced Design System (ADS) software.

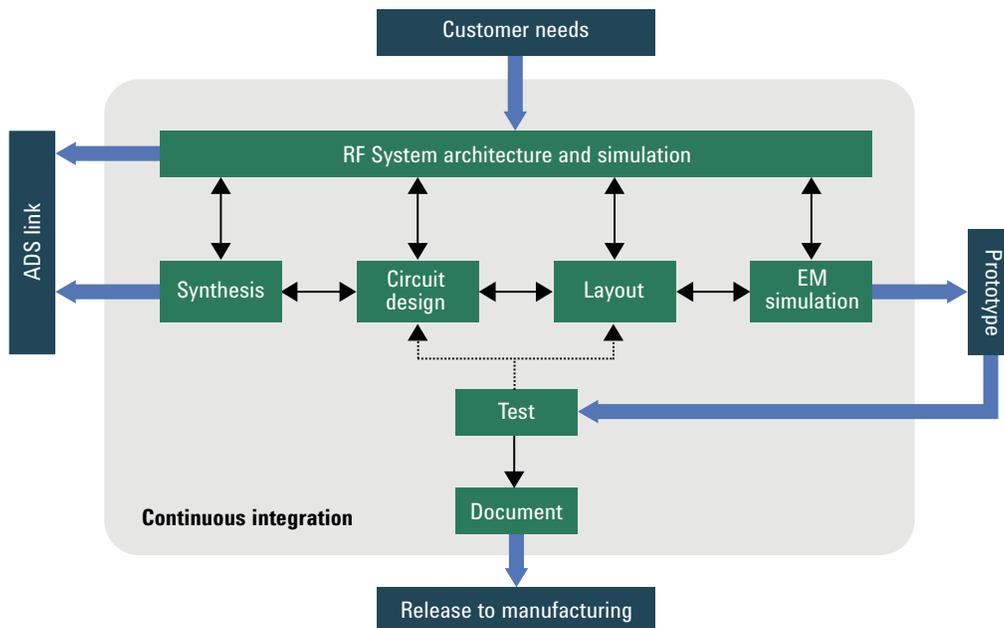
Whether you are designing complex systems or single components – using silicon, GaAs, PC board, or microwave hybrid technologies, GENESYS is a powerful tool that helps you design better products in less time.

The GENESYS design flow takes your ideas from system architecture to synthesis, to circuit design to layout and electromagnetic (EM) simulation. Use it as a complete, stand-alone tool or easily transfer work to ADS to take designs to the next level.

GENESYS is available in a variety of configurations to meet the needs of every user, including system architecture, circuit synthesis, signal integrity, linear, non-linear, time-domain, and EM analysis. Whatever the need, GENESYS is flexible and delivers the right solution at the right price.

GENESYS stands apart from the competition by offering an RF architecture tool and a complete range of synthesis tools to reduce design turns and increase efficiency. Because we've worked closely with designers to understand their design flow and incorporate their suggestions, the broad range of synthesis, circuit analysis, and EM simulation tools make GENESYS the best PC-based price and performance option for designing RF and microwave circuits. Call us today to discover how GENESYS will speed your own design process.

# GENESYS Design Flow



Agilent's Eagleware products have what today's designers need: an integrated environment that takes your design from specification through documentation.

The GENESYS design flow starts with customer specifications, which are used to develop a system architecture. Synthesis tools then convert each block in the system into a circuit representation. The circuit is refined using linear, nonlinear, and transient circuit simulators. Layout is created and EM simulation – including co-simulation with the circuit simulators – verifies the design. You can be confident that what you simulate is what you'll get in terms of design performance.

But simulation is not the end. A PCB is made using GERBER, DXF or GDSII formats exported from the layout. The prototype is built and measured. The measured data is read directly into the GENESYS environment using TESTLINK. If the design meets specifications, it is documented and released to production. If not, the measured data is used to refine the design. Finally, the completed design is sent to a corporate archive or transferred to other members of the manufacturing team; it's easy with GENESYS.

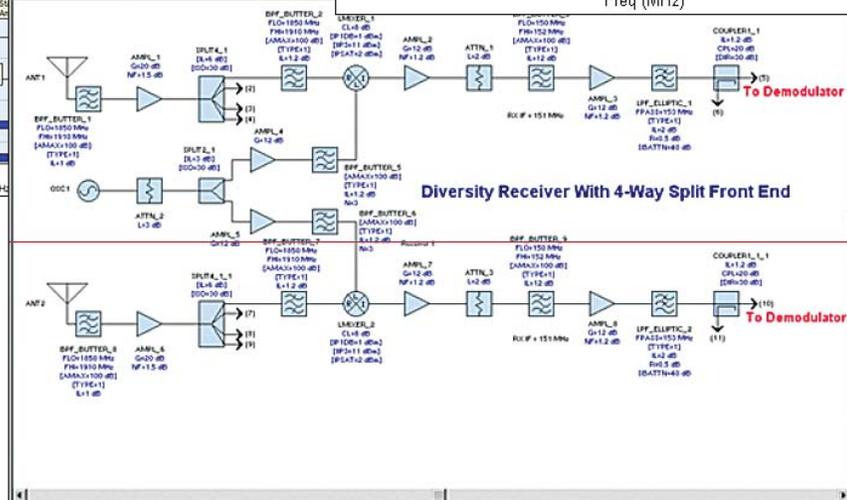
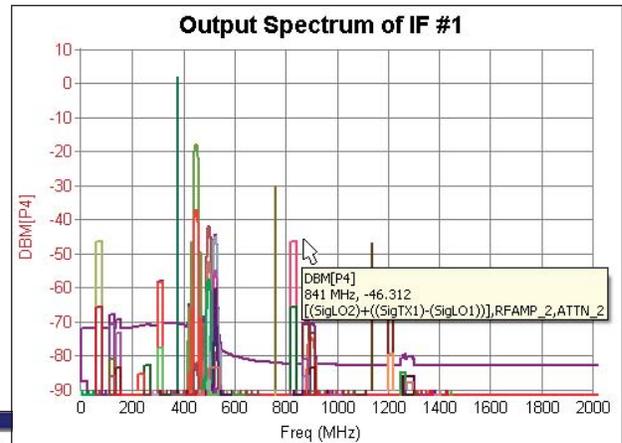
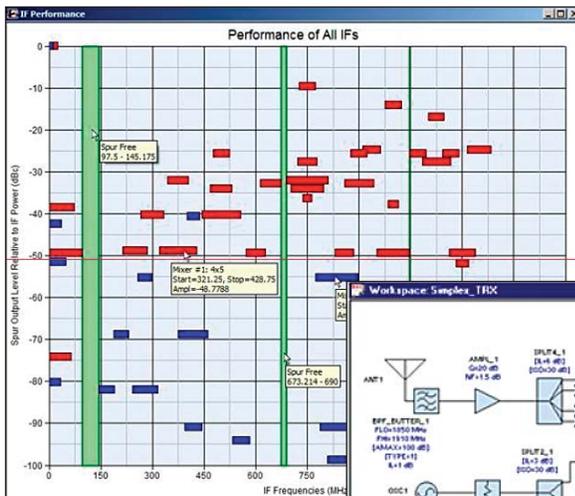
Anywhere along the way, you can export designs to ADS. Use GENESYS to synthesize circuits, optimize RF architectures, or go all the way and fabricate a prototype. Need the power and unsurpassed capability of ADS or is a UNIX platform the right tool for the job? No problem. Transfer GENESYS files to ADS to take the design to the next level.

## Continuous integration

Throughout this process, the performance of each circuit is fed back to the system design. As each more detailed design representation is created, more detailed performance characteristics can be included in the overall system simulation. For example, you can see how the reentry of a microstrip filter allows unwanted harmonics to convert into the desired passband. Or, you can insert the measured S-parameters of a coupler to examine the effects of imperfect directivity on spurious signals. You can choose block-by-block to use a system-level behavioral model, a circuit model, an EM model, or even test data to model your overall system. This concept of *continuous integration* saves you time and catches system errors early. At any time in this process, the engineer can substitute the more detailed model

for the behavioral model. The model can be your own design or that of another engineer. From specification through documentation, you can share a common design tool across the design team, so partitioning the work and verifying the completed design at a system level is easy.

Continuous integration benefits the designer because it saves system design turns—the most expensive part of the design cycle. Continuous integration does this by identifying block interaction issues before prototyping. In addition, the integrated environment reduces errors that result from poor communication among design team members.



## Design the system architecture

The GENESYS design flow starts with customer specifications, which are used to develop a system architecture. The first step is to use WhatIF to find a spur-free intermediate frequency. Next, enter the architecture using a wide range of behavioral models such as amplifiers, mixers, splitters, couplers, and filters. You can also include circuit components such as capacitors, inductors, and transformers. Once the architecture is in place, simulate the system performance along each signal path. Since SPECTRASYS is an incredibly fast full-spectrum simulator, you can examine the complete spectrum at each node of the design.

- Find unwanted component interactions well ahead of the system prototype, saving time and design turns.
- Identify “sneak” paths where signals flow in undesired directions causing interference at sensitive terminals such as antennas.
- Verify that the design meets regulatory compliance levels.

System architecture is the foundation of any communications product design. If you start with a bad foundation you’ll waste time and money trying to recover. Or, in the worst case, you may never recover and fail to make it to market. If you start with the right tools you can create and build on a great architecture. WhatIF and SPECTRASYS are the right tools.

## Synthesize the design

Synthesis is design automation at its best. Take your design specification and enter it into one of the GENESYS synthesis tools, or simply “push down” from the block diagram to synthesize a circuit and push the resulting circuit back up. Synthesis provides first-pass designs that are ready for refinement.

## Create a schematic or netlist

Once you have selected a topology and initial values, capture the design for simulation and layout. In GENESYS, capture the design just the way you want:

- Create schematics from synthesis tools
- Manually enter schematics

GENESYS comes with a wide range of lumped and distributed component models to accurately represent your circuit. Microstrip, stripline, slabline, coax, and waveguide models are all built in. For unusual applications, you can add your own nonlinear models using a Verilog A compiler. Using EMPOWER/ML EM simulation, even the layout can be used as a model because its properties—dielectric loss, fringing, and cover effects—can be used just like any S-parameters. GENESYS is designed to adapt to your personal design methods.

## Refine the circuit using linear, nonlinear, and time-domain simulation

After you’ve entered a design, simulate it to optimize its performance. A wide range of parameters can be simulated, including S, Y, H, and Z parameters, noise parameters, and stability factors. You can also perform DC, harmonic balance, and time-domain analysis to get information about power compression, biasing, output power, and transient responses. The simulation engines are so tightly interwoven that you can perform all simulations and optimizations within a single workspace.

Achieve high yields using statistical analysis tools. Yield optimization and design centering automatically adjust component parameters to maximize yield. Sensitivity analysis helps you find those components most responsible for performance degradation, and Monte Carlo analysis lets you see the effects of variations in manufacturing processes and component values. Your better understanding of the design leads to better end products.

## Lay out the circuit

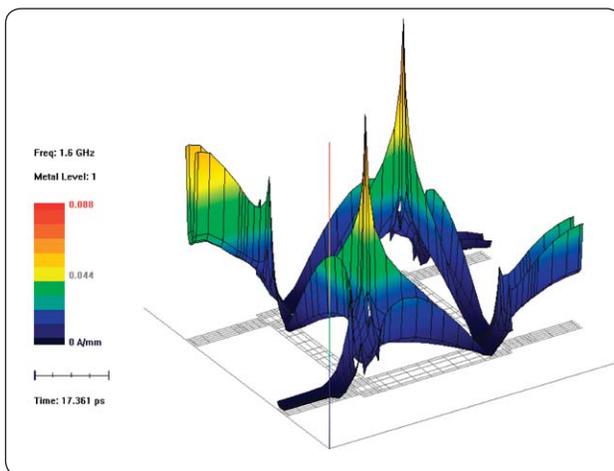
In RF design, the layout often is the design. With the integrated layout module in GENESYS, you can automatically create the layout from the schematic or manually create it through interactive design. Either way, complete layouts are created on up to 128 layers, including metalization, silk screen, solder mask, solder paste, and assembly layers.

In schematic-driven layout, each component has a corresponding footprint. The footprints are placed into the layout window and connected by rubber-band lines. Components are arranged, connecting traces replace the rubber-band lines, and targets are added to complete the layout.

When designed manually, the layout is created using lines, arcs, and polygons. GENESYS comes with footprint libraries and can import layouts from DXF files.

## Verify with electromagnetic simulation

For ultimate accuracy, the metal in the circuit can be analyzed using EM simulation. Problems with secondary coupling will be caught before the circuits are built. Using EMPOWER circuit co-simulation, lumped components such as transistors and capacitors are simulated together with the metal but without any additional effort. You can see how current flows through the circuit using the animated viewer. As you'd expect, EM results are automatically fed back so system and circuit models are updated with even more accurate values.



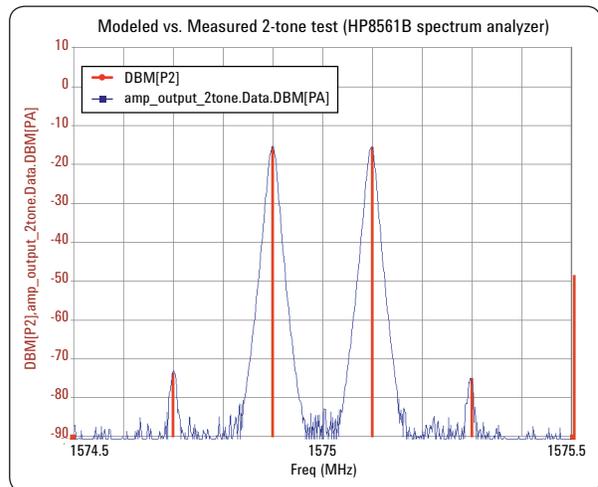
EMPOWER results can be used by the optimizer. Together, they can adjust component values to compensate for layout parasitics.

## Output to manufacturing

Once the design is complete, manufacturing outputs are generated by GENESYS. Built-in Gerber, GDSII and DXF writers make transferring designs to manufacturing a breeze. For rapid prototyping, link to prototype milling machines such as those offered by T-Tech and LPKF.

## Test the design

The ultimate step in the design process is to test the design. Integrated into the GENESYS environment, TEST LINK reads data from network analyzers, spectrum analyzers, oscilloscopes, and noise figure meters into the workspace through GPIB, LAN, or RS-232. This data can be used to compare measured results to simulation, or it can be used directly as a model or as a stimulus to the design.



# GENESYS 2005 Suite Configurations

	Product number	GENESYS Complete Plus W1414	GENESYS Premier Plus W1413	GENESYS RF Architect Plus W1412	GENESYS Designer Plus W1411
<b>Base packages</b>					
GENESYS Core	W1401L	✓	✓	✓	✓
<b>Synthesis</b>					
S/FILTER <sup>1</sup>	W1503L	✓	✓	✓	✓
A/FILTER	W1504L	✓	✓	✓	✓
EQUALIZE	W1505L	✓	✓	✓	✓
MATCH	W1506L	✓	✓	✓	✓
OSCILLATOR	W1507L	✓	✓	✓	✓
Advanced T/LINE	W1508L	✓	✓	✓	✓
PLL	W1509L	✓	✓	✓	✓
SIGNAL CONTROL	W1510L	✓	✓	✓	✓
MIXER	W1511L	✓	✓	✓	✓
<b>Simulation</b>					
Linear <sup>2</sup>		✓	✓	✓	✓
SPECTRASYS	W1601L	✓	✓	✓	–
HARBEC	W1602L	✓	✓	–	–
EMPOWER	W1603L	✓	✓	–	–
CAYENNE	W1604L	✓	–	–	–
WhatIF	W1605L	✓	✓	✓	–
<b>Libraries</b>					
Advanced modeling kit	W1606L	✓			
<b>Interfaces</b>					
TESTLINK	W1701L	✓	✓	–	–
Sonnet	W1709L	✓	✓	✓	✓
IFF <sup>2</sup> (Intermediate File Format)		✓	✓	✓	✓

1. S/FILTER includes FILTER (passive lumped) and M/FILTER (microwave).

2. GENESYS Core (W1401L) includes Linear analysis, layout, schematic capture and IFF (for schematic only, not layout).

The above configurations and product numbers are subjected to change. Please consult your Agilent Technologies sales engineer for the latest configuration.

# Getting the most from GENESYS with support and training

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## World-class support

Agilent EEsof EDA products, including Eagleware GENESYS products, are backed by a world-class team of experienced and dedicated application and technical support engineers. We are dedicated to providing the right software, support and consulting solutions to increase your engineering productivity and advance your long-term success. Whether you are a novice or experienced user, Agilent EEsof EDA's customer support offerings are designed to help you every step of the way. They include software and user manual updates via download or on CD-ROM, and worldwide, local-language technical support via telephone, fax, e-mail, and the world-wide web.

## Training

Because a hallmark of our software is its ease-of-use, GENESYS documentation and technical support are all you need to be efficient quickly. However, if you want personal instruction or have a group of engineers who could benefit from learning GENESYS together, you can participate in a three-day training class. If you have a larger group you can arrange to have a training class provided at your site.

For course descriptions and class schedules, visit [www.agilent.com/find/eesof-class](http://www.agilent.com/find/eesof-class).

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[www.agilent.com/find/contactus](http://www.agilent.com/find/contactus)

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