

Nuhertz®

The BEST in Filter Design

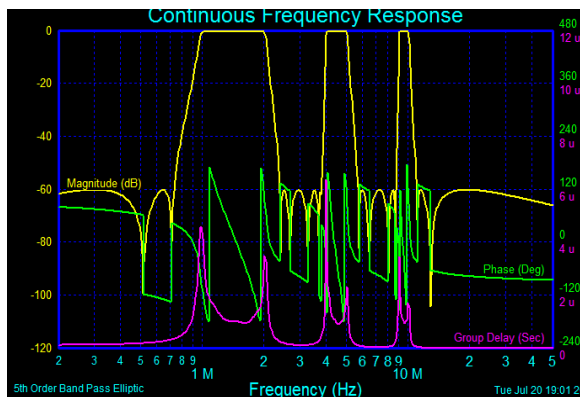
Nuhertz Technologies is the creator of *FilterSolutions*,® the most comprehensive Software suite in the industry for synthesis of filter structures. The suite is also available in its constituent sub-modules: Distributed Element, Lumped Element, Active circuit, Digital circuit and Switched Capacitor resonator filters.

Features of *FilterSolutions* are also available as *FilterLight*,® and *QuickFilter*,® which are lower cost versions of the full program with somewhat reduced and simplified feature sets.

FilterSolutions and *FilterLight* are available with node locked or networkable licenses.

Filter Synthesis

Using *FilterSolutions*, the designer can choose from numerous filter topologies, or arbitrarily customize filter designs by adding or moving poles and zeros.



FilterSolutions® Multi-Band Filter

Users can synthesize Cross-Coupled resonator structures of 10th order or more with a minimum possible number of couplings.

“Multi-Band” filters can be created with multiple passbands and stopbands in a single passive LC, active or digital IIR filter.

Using Nuhertz’s “Automated General Parameter Synthesis” (AGPS) feature, users can directly manipulate the zero characteristics of the filter’s transfer function to tune and restore maximally flat equiripple Bandpass response. The resultant recalculation will directly move stopband zeros while creating a design that minimizes the number of Inductors and Capacitors in the circuit.

Using *FilterSolutions*, constricted passband ripple response can be held to a user defined percentage of the passband in order to increase filter cutoff attenuation.

In the distributed design mode, one can instantly compute Microstrip or Stripline geometries to build distributed element networks from user-defined S or G transfer functions.

www.nuhertz.com

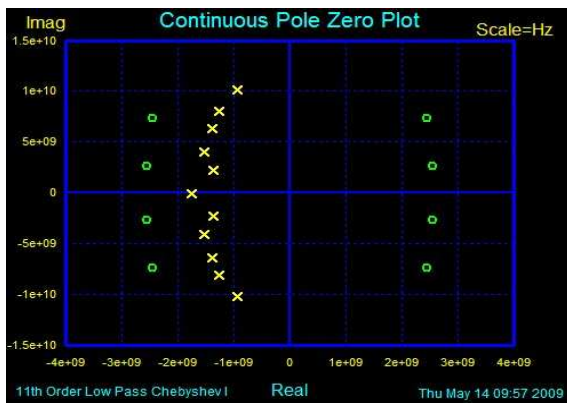
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Filter Analysis

FilterSolutions provides a variety of analysis tools to account for custom modifications and real world parasitic effects such as:

- Conductor resistivity
- Dielectric losses
- Element value error
- Finite Inductor Q
- Geometry errors
- User selected parts
- Op Amp Gain & BW
- Element Parasitics
- Lumped complex load and source impedance
- Element Sensitivity Analysis

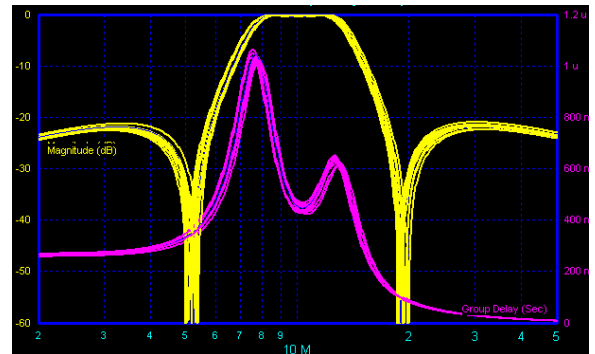


FilterSolutions Pole-Zero Plot

Monte Carlo Analysis

Analysis for random errors in element values is easy, Just select the elements to vary, and the size and nature of the distributions.

FilterSolutions does the rest with easy-to-study analysis traces for each simulation run.



FilterSolutions Monte Carlo Graph

Distributed Designs

FilterSolutions supports a variety of distributed line filter geometries including combline, hairpin and interdigital, in microstrip, stripline or suspended substrate media.

The software tool supports integration of lumped elements and parallel edge-coupled and shunt stub resonators.

Use FilterSolutions to place radial, delta or butterfly stubs.

Output Data

Output functions vs. time or frequency

Rectilinear, Polar or Smith Chart formats

CSV data, Spice network lists, DXF format, and Touchstone data

Importation into Sonnet em simulation tools and AWR circuit simulators

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Filter Topologies

Among the filter network topologies supported by FilterSolutions are:

- Bessel
- Butterworth
- Chebyshev
- Delay
- Elliptic
- Gaussian
- Hourglass
- Legendre
- Matched
- Raised Cosine
- Tubular
- Minimum Inductor ZigZags (odd or even order)
- Various Coupled Resonator and Cross-Coupled Resonator designs

Integration with Third Party Tools



Nuhertz is a Sonnet Software EDA Partner. Nuhertz synthesis provides filter geometries in Sonnet Project Format, enabling high frequency EM analysis in Sonnet Lite and other Sonnet suites.

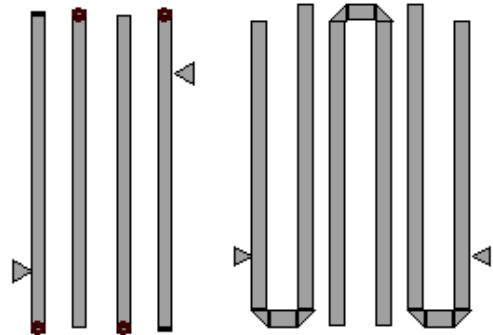
Using the new Co-calibrated™ port feature available in Sonnet Software programs, FilterSolutions now incorporates a co-simulation electromagnetic tuning technique with exportable results for circuit analysis. (www.sonnetsoftware.com)



FilterSolutions can be integrated into Microwave Office® software created by AWR Corporation. The power of Nuhertz synthesis and AWR analysis combine to provide an industry unparalleled capability for filter network design.

Using the co-simulation electromagnetic tuning technique described earlier, electromagnetically tuned filter circuits can be imported into AWR's simulation tools for circuit analysis, Integration and layout.

(www.awrcorp.com)



Exportable Tapped Interdigital & Hairpin Designs

Licensing

FilterSolutions and FilterLight, or their various modules are available in node-locked license form for single computer use. The user can elect to have the license node locked to a USB configured “dongle” as an option.

Network server licenses are available for the programs or their modules. Standard Parts list configuration control can be maintained by an Administrator having access to the network server.

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