Best in Filter Designs

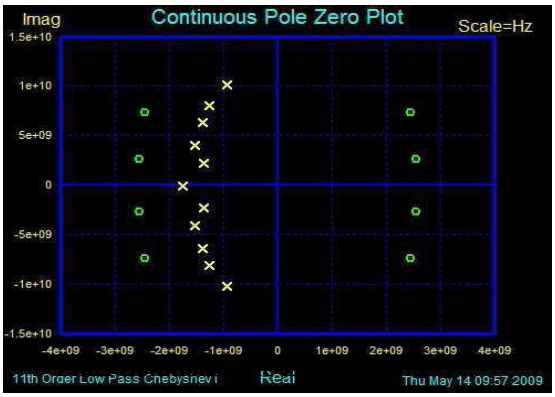
Nuhertz Technologies is the creator of *FilterSolutions*,® the most comprehensive software suite for the synthesis of filter structures. The software comprises six individual modules: Distributed Element; Lumped Element; Active Element; Digital Circuit; Impedance Matching, and Switched Capacitor Resonator filters. The modules can each be purchased separately.

The core features of *FilterSolutions* are echoed in *FilterQuick*, with a simplified interface that is included within the program.

Filter Synthesis

Using *FilterSolutions*, the designer can choose from numerous filter topologies, or can arbitrarily customize filter designs by adding or moving poles and zeros, including automated pass band restoration

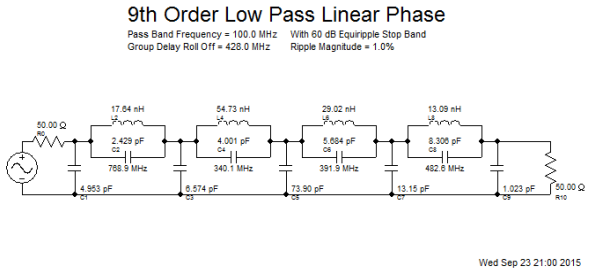
.



Users are able to synthesize Cross-Coupled resonator structures of 10th, or greater, order with the minimum possible number of cross-couplings. Space-saving "folded", cross-coupled filters can be designed and optimized to minimize PC board space.

Using the programs' "Automated Parameter Synthesis" (APS) feature, users can directly manipulate the pole/zero characteristics of the filter's transfer function to tune and restore maximally flat, equiripple, or constricted ripple bandpass response, or automatically synthesize many useful and unique topologies not found elsewhere.

A new feature has been created that allow the synthesis of group delay equalized wide band pass filters with equiripple or single-point ripple stop bands.



Filter Analyses

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
Vendor S-parameters	Element Sensitivity

EM Optimization (with 3rd party tools)

Use of measurement based scalable models and vendor S-parameters, using 3rd party tools

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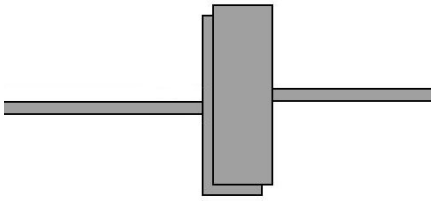
Distributed Line Designs

FilterSolutions supports a variety of distributed element filter geometries including combline, hairpin and interdigital, in microstrip, stripline, or suspended substrate media. The programs support integration of lumped elements and parallel edge-coupled and shunt stub resonators.

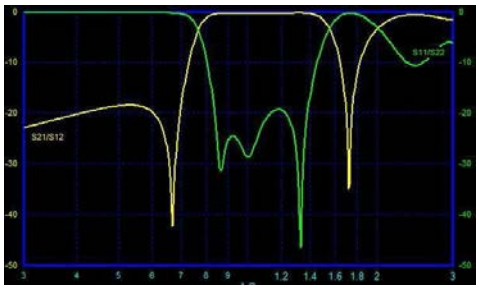
FilterSolutions can be used to place space-saving radial, delta or butterfly stubs.

Suspended Substrate Filters

FilterSolutions can design suspended substrate filters, replacing series capacitors with broadside coupled lines. The graphic renders the feature as a layout representation, with the simulated response of the wideband filter shown beneath it.



Overlay Capacitor



Wide Band Bandpass Filter Response

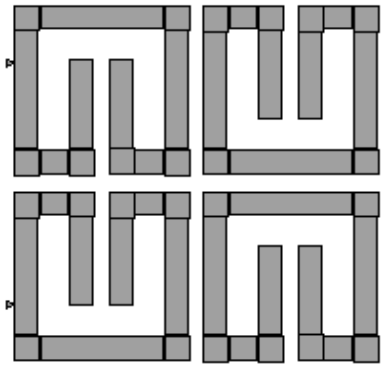
Output Data

Output functions vs. time or frequency; Rectilinear, Polar or Smith Chart formats; CSV data; Spice network lists; DXF format; Touchstone data; Importation into Sonnet ***em***® simulation program, NI-AWR or CST's circuit and electromagnetic simulation tools.

Filter Topologies

Among the filter topologies supported by FilterSolutions are:

- Bessel
- Butterworth
- Chebyshev
- Delay
- Elliptic
- Gaussian
- Hourglass
- Legendre
- Matched
- Raised Cosine
- Tubular
- Zigzag
- Coupled Resonator and Cross-Coupled Folded Resonator (pictured below)



FilterSolutions Folded Hairpin Design

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Integration with 3rd Party Tools

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

Using the Co-calibrated™ port feature available in Sonnet Software, *FilterSolutions* provides a co-simulated electromagnetic tuning technique with exportable results for circuit analysis.

www.sonnetsoftware.com

In partnership with CST, FilterSolutions provides the ability to integrate filter synthesis directly into CST's Design Studio® software. This tool is an electromagnetic analysis tool forming part of CST's STUDIO SUITE®.

www.cst.com

FilterSolutions can be integrated with Microwave Office®, the software created by NI-AWR. The power of Nuhertz synthesis and AWR analysis provides unparalleled capabilities for filter design.

Using co-simulation tuning techniques, electromagnetically tuned filters can be imported into AWR's simulation tools for analysis, electromagnetic optimization, circuit integration and layout.

www.awrcorp.com

Nuhertz Technologies provides the ability to optimize filter circuits with the use of Modelithics® models in AWR's Microwave Office. Modelithics CLR models are scalable, measurement-based models in a huge library with proven accuracy. For further information, contact Nuhertz or Modelithics directly at their website:

www.modelithics.com

Best in Filter Designs

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