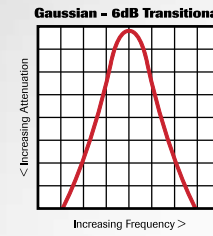
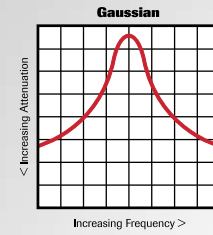
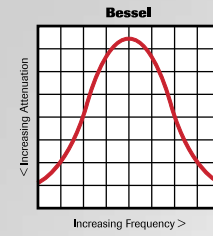
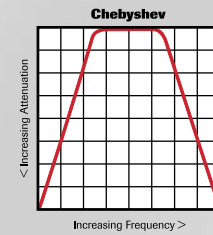
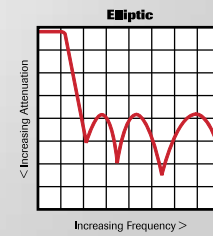


Filter Shape Factors

Transfer Function	Frequency Domain Characteristics	Time Domain Characteristics	General
Elliptic	Steep out of band rejection	Poor	Phase and group delay characteristics degraded by steep selectivity Most apparent near band edge
Chebyshev <i>Standard Catalog Response</i>	Very good, though not as steep roll-off as Elliptic	Better performance than Elliptic but still degraded phase and group delay characteristics	Most frequent choice Provides best compromise between rejection, phase and group delay
Bessel	Shallow amplitude roll-off to stopband	Good phase and group delay characteristics	Good choice when phase linearity is more important than rejection
Gaussian	Poor rejection characteristics	Excellent phase and group delay performance	Good choice when phase, group delay and impulse response are important
Gaussian - 6dB Transitional Filter	Rejection begins increasing abruptly outside the passband (-6dB)	Excellent in the passband to -6dB Attenuation more steep in transition to the reject band than a pure Gaussian response	Usually chosen when good time delay and rejection cannot be sacrificed Generally more expensive to produce

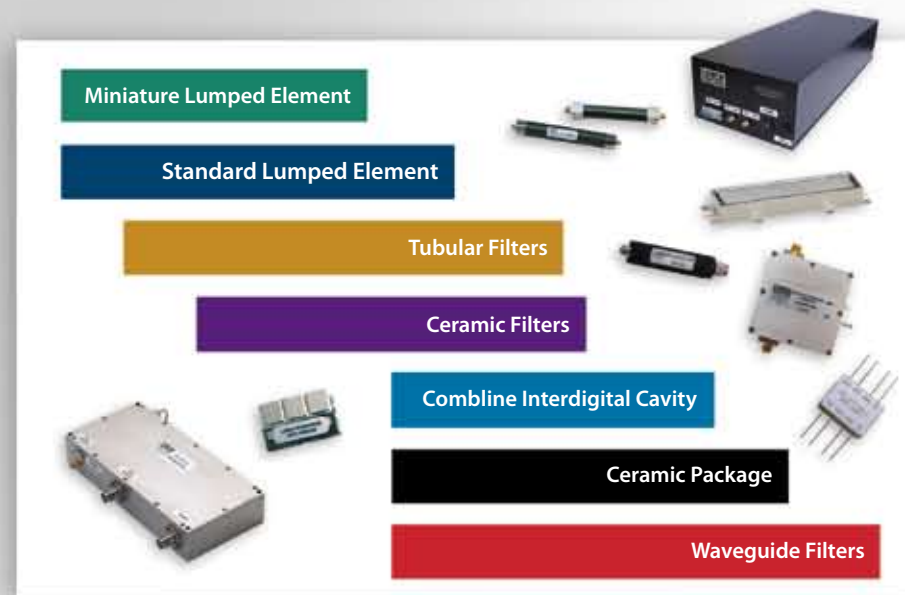


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Discrete - Lumped Element Filters

5 MHz to 2.0 GHz
Bandwidth 3–100%

Similar to microminiature filters in terms of circuitry, however, package size is larger, making higher “Q” performance available at lower frequencies. Bandpass, lowpass, highpass and band-reject models are available with a low ripple Chebyshev transfer function as standard. Elliptical, Bessel and Gaussian may be specified. These units are most cost effective when space is not at a premium and low frequency operation is a requirement. Units are available with RF pins or connectors.



Discrete Micro-Miniature Filters

5 MHz to 7.5 GHz
Bandwidth 3–100%

These devices are designed for optimum performance in small miniature packages where space is at a premium. All designs are computer generated and available in lowpass, bandpass, highpass and band-reject models. The units are available in connectorized or RF pin configurations and may be designed to satisfy the most rugged environmental conditions. A low ripple Chebyshev design is standard, however, elliptical, Bessel and Gaussian transfer functions are available. Superior performance is achieved through the use of high “Q” components and computer modeling.



Cavity Filters

30 MHz to 26 GHz
Bandwidth 0.5–66%

Best suited when low insertion loss and sharp selectivity are a requirement and space is available to accommodate the larger package size required. Chebyshev transfer function is standard and bandpass models are available in helical, combine and interdigital construction. All units are custom engineered and computer modeled to exact specifications and supplied in machined silver plated housings for best electrical performance.



Ceramic Filters

400 MHz to 3 GHz
Bandwidth 0.5–5%

Ceramic Filters are manufactured in two basic styles serving two distinctly different markets. The high volume, low cost units in open frame, non-hermetic packages are most often used in commercial applications. The lower volume, custom designed hermetic packages are most often used in military applications. Both styles are available in various mounting configurations. In both instances the same high “Q” coaxial resonators are used which yield low insertion loss and excellent stability over temperature. A low ripple Chebyshev transfer function is standard with bandpass filters and duplexers available.

Tubular Filters

50 MHz to 20 GHz
Bandwidth 3–50%

Tubular filters are manufactured in lowpass and bandpass configurations. Units are available in diameters of 0.25, 0.50, 0.75 and 1.25 inches. Length is determined by the number of individual sections required to meet specific rejection requirements. A low ripple Chebyshev transfer function is standard. Units are available in SMA, Type N, BNC and RF Pin connectors. These units are ideal for applications where space is not a premium, with low cost and quick delivery a requirement. These units are typically available in three weeks or less.



Tunable Filters

24 MHz to 3000 MHz
Bandwidth 1–5% Nominal

Tunable filters are manufactured in bandpass and band-reject configurations. Standard units are manually tuned and each unit covers a complete octave. For specific applications units may be customized to meet requirements such as digitally controlled or diplexed. Digitally controlled models use a microprocessor-based system. Available control logic options are RS-232; RS-422, IEEE-488 and BCD.



Waveguide Filters

4 GHz to 40 GHz
Bandwidth 0.5–5%

Waveguide filters are used most often at higher frequencies when very low insertion loss is required and also whenever extremely high power handling may be a requirement. Units are available in bandpass, band-reject and diplexer configuration with a Chebyshev transfer function as standard. Units may be custom designed for high volume commercial applications or low volume high performance military applications.



RF Signal Processing Components

A complete line of custom engineered specialty components is available. These include phase shifters (manual, voltage controlled or digital), phase comparators and attenuators (manual or voltage controlled), mixers, couplers and power dividers.



Integrated Assemblies

1 MHz to 18 GHz

Switched filter banks, filter amplifiers, diplexer/LNA assemblies RF distribution networks. Filters may be micro-miniature, cavity or ceramic and are custom designed to your specifications. With product integration done at the factory, smaller size and lighter weight configurations may be realized.

