GCG

GOWANDA

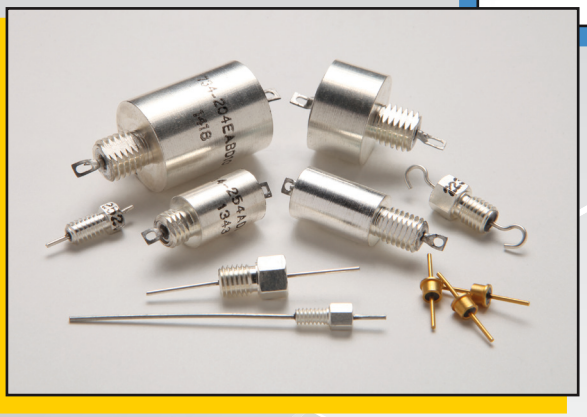
COMPONENTS GROUP

Filters Division

TTE

FILTER SPECIALIST SINCE 1956

MICROWAVE CIRCUITS



instec FILTERS

www.GowandaComponentsGroup.com

GCG Filters Division

The Gowanda Components Group Filters Division consists of TTE Filters, Microwave Circuits and Instec Filters. TTE Filters and Microwave Circuits are leaders in the design and manufacturer of both Standard and Custom Passive Radio Frequency and Microwave Filters with complementary expertise ranging from 50 Hz to 40 GHz. Instec Filters takes pride in manufacturing Standard and Custom-Designed Electromagnetic Interference & Radio Frequency Interference (EMI/RFI) Filters with quick turnaround.

Applications:
Applications for RF and Microwave Filters exist wherever there is a need to manipulate frequency bands in cellular, data acquisition (ADC/DAC), electronic support, radar, satellite, seismic, sonar, telecommunication, telemetry, test and measurement and wireless communication. EMI/RFI Filters are used to suppress conducted interference that would be present on a signal or power line. Industries utilizing GCG's filter lines include commercial, industrial, medical, military/defense and space.

Support:
GCG's Filters Division is a leader in customer service and engineering support with many decades of engineering and sales experience. Vertically integrated, the company maintains a large inventory of standard materials ensuring that many filter products can ship within 2 weeks. Expedited lead times as short as 3 to 5 days are also available on many Lumped Element Filters. TTE's line of Bias Tees and LC9S Lowpass Filters are also available from stock in prototype quantities. TTE's 315P series of Combline/Cavity Filters available to ship starting in 2 weeks. Additional Combline/Cavity Filters and other designs available to ship starting in 6 to 7 weeks. Instec Filters are typically delivered in as few as 1 to 2 weeks. All of GCG's Filters Division products are proudly manufactured in the USA and include a limited warranty.

Passive RF & Microwave Filters – Design Capabilities & Typical Frequencies

	Lumped Element	Combline/ Cavity	Ceramic	Microstrip	Helical	Waveguide
Bandpass	500 Hz - 5 GHz	400 MHz - 40 GHz	400 MHz - 3 GHz	3 GHz - 26 GHz	300 MHz - 500 MHz	8 GHz - 40 GHz
Lowpass	100 Hz - 10 GHz	-----	-----	3 GHz - 26 GHz	-----	-----
Highpass	100 Hz - 10 GHz	-----	-----	3 GHz - 26 GHz	-----	-----
Band Rejection	50 Hz - 1 GHz	400 MHz - 8 GHz	-----	-----	-----	-----

Designs:
Standard RF and Microwave **Filter designs** include Lumped Element, Combline/Cavity, Ceramic Resonator, Microstrip, Helical and Waveguide. **Filter types** include Bandpass, Lowpass, Highpass and Band Rejection (Notch). **Topologies** include Bessel, Butterworth, Chebyshev, Elliptical Function (Anti-Aliasing), Gaussian and TTE-specific designs. GCG's Filters Division also manufactures a line of Custom Diplexers, Duplexers, Triplexers, Quadraplexers, Quintaplexers and Multiplexers, as well as Bias Tees and Amplitude Equalizers. EMI/RFI Filter styles include Bolt-Style Resin-Sealed Filters, Bolt-Style Hermetic Filters, Solder-In Filters, Filter Assemblies and Customer-Specific Designs.

- ***Standard connector options include SMA, BNC, Type N, Waveguide, Surface Mount, PCB, GPO, 2.92MM, and others depending on type of filter, frequency, power and other factors.***
- ***High power versions are also available with power handling capabilities to 600 CW, 1kW pulsed typically. Please contact GCG for assistance.***
- ***RoHS-compliant equivalents are available for most filter products. Please contact GCG for additional details.***

Thousands of filters have been specified, designed and built for our customers over the years. In addition to standard product lines, additional application-specific or custom designs are feasible. Please contact GCG for assistance with your filter requirements.

Additional Passive Product Capabilities

LC9S Series Lowpass Filters Available from Stock:
- 9-pole Chebyshev design; 12 unique part numbers
- -3dBc passband frequencies from 30 MHz to 6 GHz
- SMA female connectors
- Available for immediate shipment

Bias Tees Available from Stock:
- High Current (BTHC) series to 7 Amp from 20 MHz to 6 GHz
- Standard (BTS) series from 10 MHz to 18 GHz
- High Frequency (BTHF) series from 10 MHz to 40 GHz*
- Available for immediate shipment

** 67 GHz High Frequency Bias Tee currently under development*

Diplexers, Duplexers, Triplexers, Quadraplexers, Quintaplexers, Multiplexers:
- Application-specific designs from 1 MHz to 20 GHz
- Wide assortment of existing designs available including specifications and plotted data
- Shipments as soon as 6 – 8 weeks
- Some existing designs (models) may be available from stock

Amplitude Equalizers:
- Application-specific designs from 1 GHz to 26 GHz
- Wide assortment of existing designs available including specifications and plotted data
- Shipments as soon as 6 – 8 weeks
- Some existing designs (models) may be available from stock

EMI/RFI Filters:
- Solder-In Filters for high frequency/microwave applications
- Bolt-Style Hermetic Filters for harsh environments
- Bolt-Style Resin-Sealed Filters for demanding applications
- Specialists in custom solutions
- Pb and Pb-free designs
- Upscreening to MIL-PRF-15733 or MIL-PRF-28861*

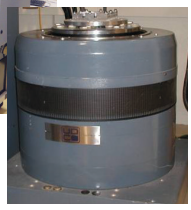
**QPL pending*

TESTIMONIAL

"Passband performance was impressive. Often times with wideband Bias Tees you'll see a "suckout" meaning that there's a notch or null in the frequency band of interest that is caused by some resonance. No evidence of that in TTE's unit", said Robert R., an RF Engineer regarding the performance of TTE's wide band Bias Tees.

Environmental Lab Testing

GCG has a comprehensive DLA Land and Maritime Approved* "in-house" Environmental Laboratory Testing facility including temperature, thermal shock and vibration, life test, salt spray, humidity and mechanical capabilities including altitude, gross leak, X-ray, solderability and terminal strength. Such testing may be required for filter products utilized in aerospace, military and space sectors, depending on the specific application. If so, GCG's Filters Division can perform environmental tests to meet those needs and applications.



**In support of internal product qualifications*

Space Applications

RF and Microwave Filters for Space:
TTE's LT9 series Bessel Lowpass Filters were specified, designed, built and have been environmentally tested for use in connection with the GEDI program and will be flown on the International Space Station (ISS) scheduled for space flight and deployment in May 2019. These filters will be used as part of a High Resolution Laser Ranging of Earth's Topography and Forests system.

EMI/RFI Filters for Space:
Instec successfully manufactured and upscreened an EMI feed-through filter to meet the US Department of Defense specification MIL-PRF-28861 (Class S, Space). The bolt style, resin sealed, C-circuit filter from the company's 640 Series will be used for a US government space program where it will help suppress electromagnetic interference.

GCG Filters Division

TTE
FILTER SPECIALIST SINCE 1956

- RF and microwave filters to 40 GHz
- Bias Tee Filters to 40 GHz from Stock
- Lowpass LC9S Series from Stock
- Experts in Application-Specific Designs
- Bandpass, Bandreject, Highpass,
- Lowpass, High Power Lowpass and Bias Tees
- Bessel, Butterworth, Chebyshev, Elliptical Function, Gaussian
- Diplexers, Triplexers, Multiplexers and other Networks

www.tte.com

sales@tte.com

MICROWAVE CIRCUITS

- RF and microwave filters to 40 GHz
- Bandpass, Highpass, Lowpass Notch
- Bessel, Butterworth, Chebyshev, Elliptical Function, Gaussian
- Diplexers, Triplexers, Multiplexers
- Delay Equalizers
- Experts in Application-Specific Designs

www.diplexers.com

sales@diplexers.com

instec FILTERS

- EMI/RFI Filters
- Low Frequency Power to Microwave Communication Applications
- Solder-In Feedthru's
- Bolt-Style Hermetic and Resin Sealed
- Power Filters, Assemblies, Custom Designs
- Experts in Application-Specific Designs

www.instec-filters.com

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Gowanda Components Group – through its **Filters Division** and **Magnetics Division** - designs and manufactures reliable, robust, high-performance electronic components and subassemblies for use in demanding applications in military, aerospace, medical and communication systems around the world. GCG has a unique combination of product breadth, custom-design capabilities, in-house environmental testing and multiple facilities, all located in the United States. **Vertical integration** helps GCG to streamline and control its operations, thereby reducing time to market for its customers.

The Magnetics Division includes Gowanda Electronics, DYCO Electronics, Butler Winding, Communication Coil and HiSonic. That division manufactures standard and custom magnetics for RF and power applications for the global marketplace. Products include inductors, chokes, coils, conicals, planars, toroids, transformers, and electronic assemblies.

For general inquiries to the Magnetics Division, please email GCGmagnetics@gowanda.com. For the Filters Division, please email GCGfilters@gowanda.com.

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GOWANDA ELECTRONICS · DYCO ELECTRONICS · BUTLER WINDING · Communication Coil Custom Power & RF Magnetics · hi-sonic

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