epec
Engineered Technologies

CUSTOM RF PRODUCTS MANUFACTURER

Providing Excellence in High Reliability Radio Frequency Solutions

RF FILTERS FOR MILITARY SYSTEMS

AEROSPACE RF & MICROWAVE FILTERS

WIRELESS BASE STATION SYSTEMS

COMMERCIAL RF APPLICATIONS

Delivering Quality Since 1952.

FILTER TYPES

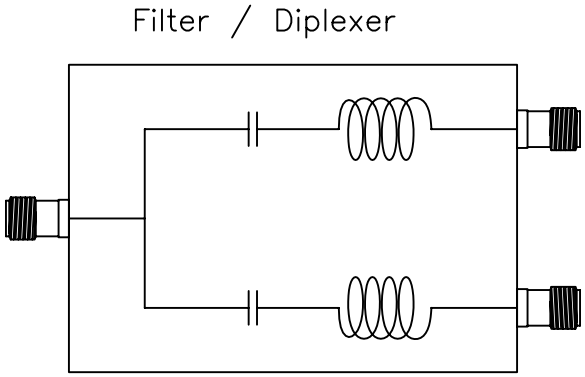
Bandpass Filters
Bandpass filters are offered with very narrow band high skirts to medium band and broad band with low loss. High power applications have a wide range of topologies such as Cavity, Combline, Interdigital, Coaxial, Suspended Substrate Stripline, Waveguide and mixed-Topologies.

Lowpass Filters
Our Lowpass filters are low loss broad band filters, providing high power applications from a wide range of topologies such as Lumped Element, Coaxial, and Suspended Substrate Stripline as well as multiple topologies. Lowpass filters are mainly designed using the Chebyshev type and for those requiring sharp cutoff the modified elliptic type is used.

Highpass Filters
Our Highpass filters are broad band filters with low loss offered in high power applications with a wide range of topologies such as Lumped Element, Suspended Stripline, and Multiple Topologies.

Notch/Bandstop Filters
Our Notch/Bandstop filters are offered with a very narrow band high rejection to medium band through broad band filters with low loss for high power applications from a wide range of topologies such as Cavity, Combline, Interdigital, Coaxial, Suspended Substrate Stripline, Waveguide and Multiple Topologies.

Diplexers & Multiplexers
Our Diplexer & Multiplexers filters are realized using a combination of Bandpass, Lowpass and Highpass filters we offer them in a combination of Multiple Topologies to best suit performance.



FILTER TOPOLOGIES

Lumped Element
Limited to frequencies up to 10GHz or lower frequencies, Lumped Element filters are mainly used to reduce package size and weight. Our filters utilize selected low parasitics capacitors and inductors and controlled process. Our designs take advantage of those parasitics to realize best performance.

Coaxial
Suited for high power applications these Coaxial filters are also excellent as Bandpass and Lowpass filters, they also offer broad stopband and high rejection. Our designs are carefully machined to control process and supporting dielectric structures are optimized for stability over wide temperature range under high power handling.

Cavity
Known for low loss and power handling capabilities, Cavity filters are realized for those demanding low loss and high power. Our filters are synthesized to reduce the number of cavities to minimize size, proper surface plating techniques to reduce loss and unique compensation for temperature stability.

Suspended Stripline
Suspended Stripline filters offer excellent design flexibility and low loss for Highpass, Lowpass, Bandpass filters and Multiplexes. Our designs are simulated to minimize VSWR thereby improving insertion loss selectivity. Via grounding is designed to improve stability over temperature.

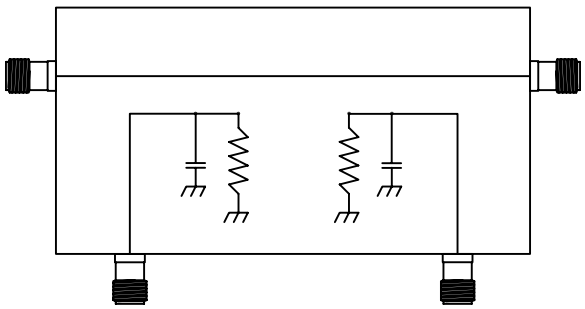
Waveguide
Waveguide filters are superior for power handling and inherent high Q if the waveguide. Our designs are low loss with power levels up to 10 kW.

DIRECTIONAL COUPLERS

Our couplers are designed to achieve optimum directivity, low loss and low VSWR by carefully selecting specific design topologies and materials. Custom designed to suit performance for the required frequency band.

Coupling Values: 3dB, 6dB, 10dB, 20dB are standard, and custom values are also offered
Frequency Range: 100MHz to 30GHz
Bandwidth: Narrow band, Octave, Multi-Octave, Ultra-Broadband
Types: Lumped Element, Coaxial, Stripline, Waveguide
Power Levels: Up to 500W (frequency dependent),

Directional Coupler



Our design topologies include from Single Section Quarter-Wave, Multi-Section Quarter Wave to Broadband Taper Couplers.

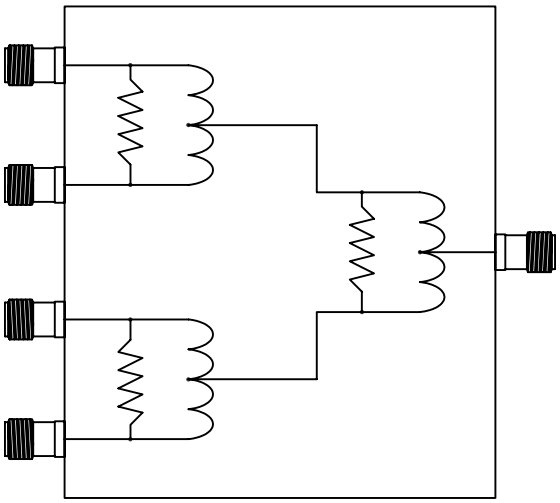
For tight coupling values two couplers connected in tandem are utilized, plus other topologies.

POWER DIVIDER/COMBINER

Power Dividers/Combiners are designed to achieve optimum isolation, low loss and low VSWR by carefully selecting design topology, materials and controlling manufacturing processes. Custom designed to suit performance for the required frequency band.

Resistive and Wilkinson Power Dividers with the following divisions:
2-Way, 3-Way, 4-Way, 6-Way, 8-Way, 10-Way, 12-Way, 16-Way, etc.

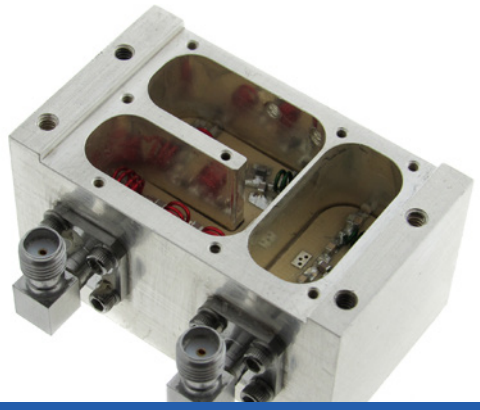
Divider



Frequency Range: 100MHz through 30 GHz
Bandwidths: Narrow band and broadband
Power Levels: Up to 500W (frequency dependent)

3dB and 180° Hybrids
3dB Quadrature Hybrids and 180° Hybrids are compact stripline designs with high isolation, low VSWR, low loss and excellent phase stability. We utilize different topologies in tandem to realize broadband performance.

Frequency Range: 100MHz through 30 GHz
Bandwidths: Narrow band and broadband
Power Levels: Up to 500W (frequency dependent)



ELECTRICAL ENGINEERING

Using the latest in electrical design software (Keysight Genesys and AWR Microwave Office) we can provide all of the following and much more.

Our Capabilities Include:

- Designing microstrip circuits, along with impedance matching.
- Microstrip filters, hybrids, directional couplers, diplexers, etc.
- RF lineup analysis, including transmit upconverters, receive downconverters, cascaded noise figure, gain, and IP3 calculations.
- 2.5 or 3D simulation, such as HFSS, Axiem (AWR), or Momentum.
- Knowledge of digital communication schemes such as BPSK, QPSK, GMSK, PCM/FM, etc.

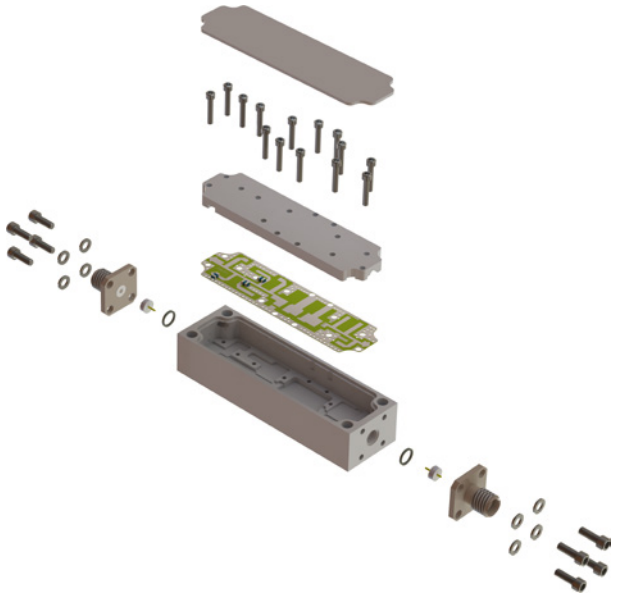
MECHANICAL ENGINEERING

Epec's experienced mechanical design team utilizes SolidWorks to help ensure the mechanical design is optimized to fit within the smallest possible footprints across the most demanding, size constrained designs.

Miniaturization, including size, weight and power is critical in many military applications and our team uses world class tools to meet even the strictest specification.

Many of these RF designs will be subject to harsh environments. Epec's mechanical design team will coordinate the specifics of a shock and vibration study prior to hardware being designed. They will also spearhead the RF thermal and shielding analysis to ensure that our design meets whatever combination of specifications that we are faced with.

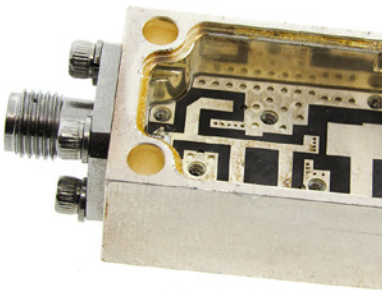
All of these tools allow us to transform a customer's concept into a production ready, cost effective end product that is delivered quickly and reliably.



ENVIRONMENTAL FACTORS FOR RADIO FREQUENCY PRODUCTS

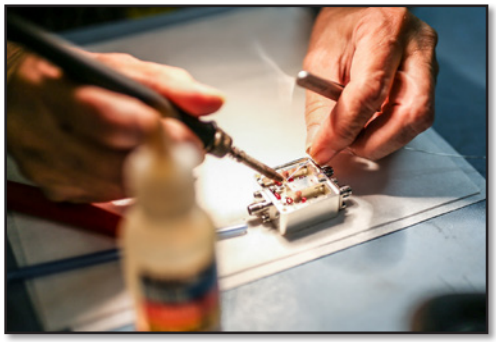
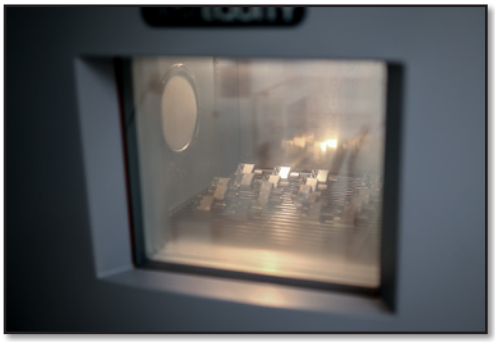
Environmental requirements are always a concern, especially for the military and aerospace industries. RF Products that are exposed to moisture, dust/dirt, extreme temperatures, shock and vibration need to be evaluated to ensure they function in the field. Failure is not an option in all scenarios.

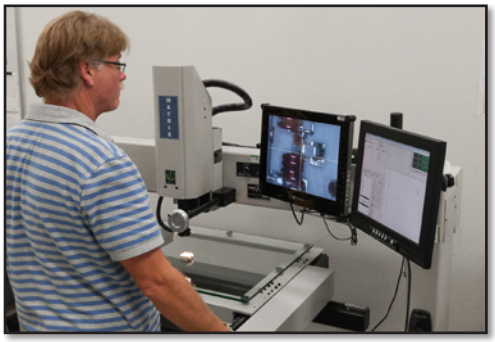
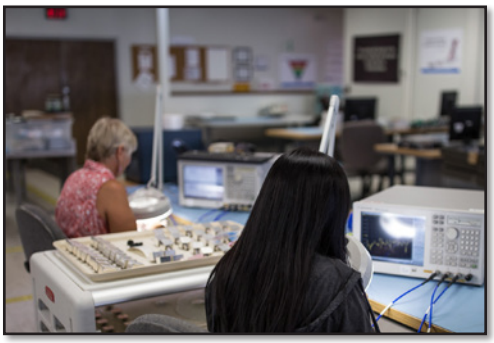
If necessary we can also adapt to established mechanical and electrical requirements yet still provide smart, innovative solutions. Knowing these concerns ahead of time allows our engineering team to design the proper solution for your needs.



VALUE ADDED SERVICES

Epec Engineered Technologies not only provides you with the highest quality products, we also offer a number of value-added services to make your custom built electronics buying experience as convenient as possible. We offer comprehensive services that can give your business a competitive edge by focusing on providing solutions based upon your production requirements. These services add value to your business by reducing labor and purchasing costs, while keeping your inventory costs in check.


Our Solutions Provide A Cost Savings, Technical Resource Or Delivery Advantage For Our Customers.

INVENTORY STOCKING

Epec Engineered Technologies has long been recognized as a market leader for customized electronic product solutions. Since 2001, Epec has developed world-class capabilities in the areas of sourcing, supply chain, manufacturing and inspection. These have enabled us to provide market-leading, independent electronic supply chain and logistics services.

With this breadth of capabilities Epec is uniquely placed to drive down your real acquisition and operating costs, reduce lead times, and provide a leading edge on technology products.

Kanban Programs
At our facility, we can manufacture and store inventories that can be available on a just in time (JIT) basis. We can accept releases via phone or email.

Blanket Orders
Epec can manufacture and inventory your products at our facility to fulfill your manufacturing scheduling requirements.

Consignment Stock
Epec can manufacture your products on a consignment basis. Inventory may be stocked at either your facility or at our warehouse.

Climate Controlled Storage Facilities

AMERICA'S OLDEST. A HISTORY OF INNOVATION.

Since 1952 Epec has been connected to the development of the PCB and the electronics industry.

Epec was formed through the merger of Electralab and Printed Electronics Corp (EPEC), who were proudly two of the five founding members of the IPC, the 2,900 member trade association supporting the $1.5 trillion global electronics industry.

From pioneering innovation in the PCB industry with R&D, training and setting professional core values, the legacy of Epec has now passed to a new generation of very bright young people, and continues the great tradition of imagination.

CERTIFICATIONS

We are very proud of the high quality products we manufacture. Over the years, we have received an impressive collection of quality awards from customers both large and small.

ISO9001 Certified

ITAR International Traffic in Arms Regulations Compliant

RoHS3

CONTACT US

Our knowledgeable staff has many years of experience in the industry. We welcome the opportunity to put our skills to work for you! Please contact us with any questions or requests.

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