

Mobile, Microwave, mm-Wave components

APRIL, 2019

V5.0

About US

We, **M3SYS**, are a leading supplier of high performance RF/microwave filters and passive products.

Our mission is to **share and achieve** our clients' goals by **providing right solutions**. We also target to accomplish our mission via faithful supports, reliable products, quality assurance, competitive price, effective process, and efficient program management.

We are highly focus on tailored products as well as COTS products in Satellite Communication, Radar, Defense, Terrestrial Communications, 5G network, Space and Industrial applications.



Reliable

Our products are trustworthy in worldwide industrial level by meeting ISO 9001 and in accordance with related standards along with growing long-term relationships with our customers.



Solutions

We endeavor to acquire your maximum satisfaction while offering a variety of solutions. Yet, we also offer a competent level of customizations as needed.



Experience

Our engineering has experienced in multiple industries, but focus on SatCom, Defense, 5G and Terrestrial Network to capture the most utilization of proven technology and its own development.



Cost-effective

Our products are committed to offer the best solutions while saving your time in development and cost on the top of diverse demands.

Business Area & Applications

Offer variety of innovative technologies and products ;

- Filters
- Duplexers/Multiplexers/Channel Filters
- Switched Filter Bank
- OMT/Feeder
- Dividers/Couplers
- Connectors/Cable Assemblies

For multiple industries and applications ;

- Satellite Communications
- Military and Defense
- Space Applications
- 5G and Terrestrial Mobile Network
- Test and Measurement



Satellite Communications

- TRF/RRF
- Duplexer/Triplexer
- OMT/Polarizer/Feeder Antenna
- VSAT, Portable Terminal, OTM/Fly-away, and Maritime Terminal Applications



Military & Defense

- Wideband BPF/LPF/HPF
- Switched Filter Bank
- Array Antenna Elements
- EW/ELINT/Radar/UAV/Airborne applications
- Wideband Receiver/Front-end applications



Space

- Channel Filters
- Multiplexers
- Antenna Feeder
- Space Payload/Transponder applications



5G/Mobile Network

- BPF/BRF
- Low PIM Filters
- Diplexers
- 5G Network applications
- Mobile Network and Digital Microwave Radio applications



Test & Measurement

- Wideband BPF/LPF/HPF
- Switched Filter Bank
- EMC Measurement and Test Equipment applications
- Lab. Purpose



Connectors/Cables

- Coaxial Connectors
- Coaxial Adapters
- Coaxial Cable Assemblies
- Up to 110GHz
- Rack mount and Test/Measurement applications

Biography

Experience : 33years +

**Specialty : Design & Operation with
RF/Microwave engineering
background**

Highlights :

- **Understanding of RF/Microwave and Related System Engineering**
- **Antenna, Filter, Passive Products Design, Development, and Production**
- **Technical Sales for Domestic Customers and Government Program**
- **Defense/Military Programs**
- **Experienced in Space-grade Products**

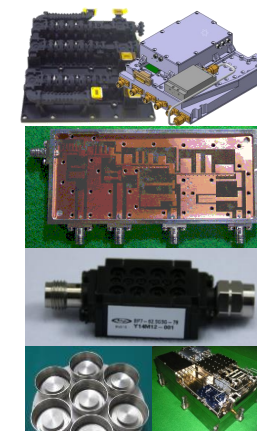
JOONSUK SUH

CEO

Joonsuk has been in RF/Microwave industry for 33 years holding senior design and development managing, operational and technical sales roles within M3sys, TelWave, and xxxxxxxx Electronics.

He established M3sys in June, 2006 for being a leading supplier of filters and passive solutions for RF Front-ends in RF/Microwave applications.

Joonsuk is a qualified electronics engineer and holds MSc degree from xxxxxx University related certifications in RF/Microwave industry.

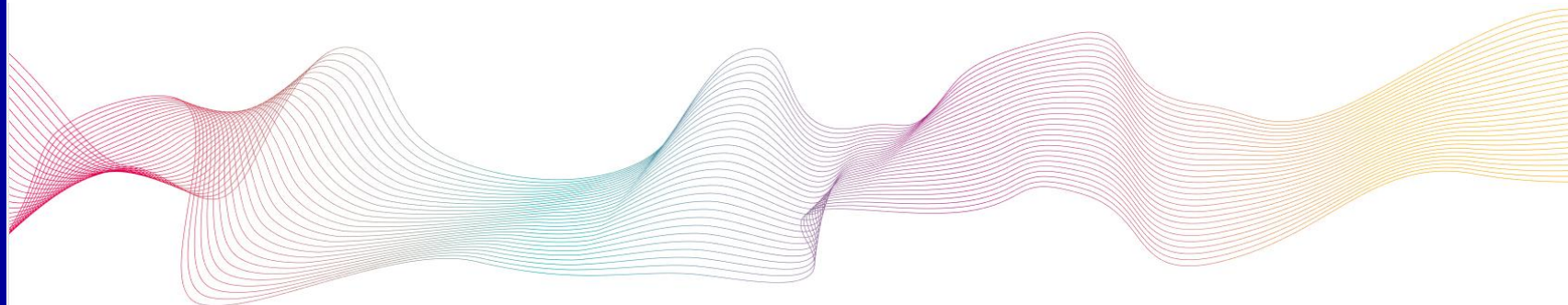


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M 3 S Y S . C O M



Company Profile & Heritages

- Company name : M3Sys Co., Ltd.
- CEO : Joon-suk Suh
- Founded : Sep. 7, 2006
- Business :
SatCom/Military/Space/Industry/
5G/Communications/Test
- Products : Filters/Passive
Products/RF Module/RF Subsystem
- Address :
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<http://www.m3sys.com>

Company History

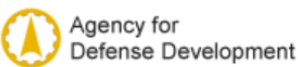


Customers

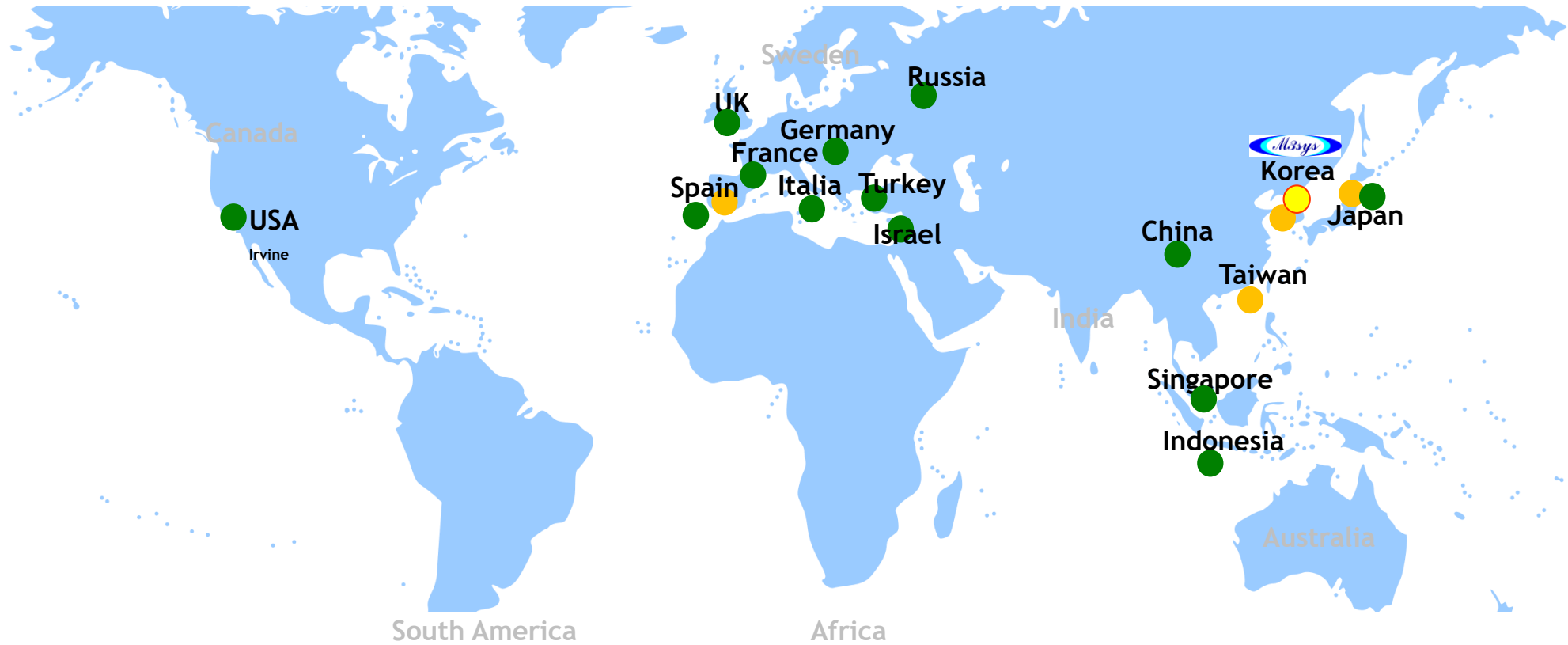
SatCom/RF



Military/Space



Overseas Sales Partners & Customers



-  M3SYS
-  Overseas Partners
-  Customers



PRODUCTS

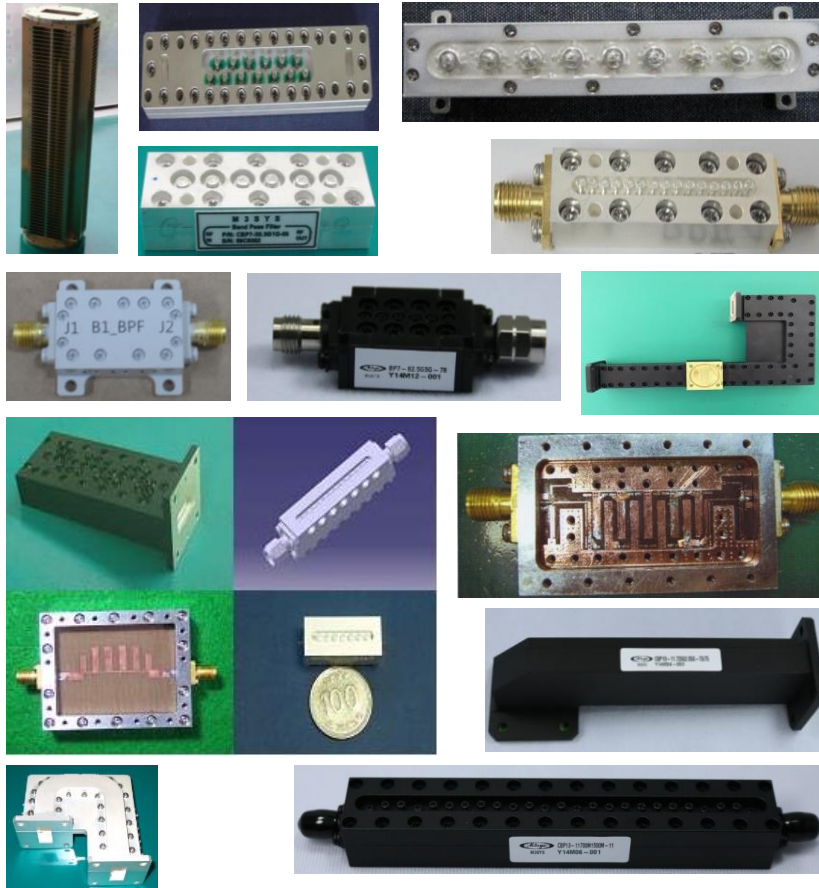
Filters

Duplexer/Multiplexer

Switched Filter Bank

Feeder/OMT/Polarizer

Dividers/Couplers Connectors/Cables



Filter Products

- Switched Filter Banks;
Up to 32ch./with Multiplexers/broadband SFBs
- Multiplexers/Channel Filters;
Up to 7ch / 2-18GHz/ up to Ka-band
2-18GHz 4ch Multiplexer/In&Out Mux.
- Filters/Duplexers;
LPF/HPF/BPF/BRF
1-18GHz Duplexer(suspended PCB)
1.2-15GHz HPF/2.4-18GHz HPF

PRODUCTS

Filters

Duplexer/Multiplexer

Switched Filter Bank

Feeder/OMT/Polarizer

Dividers/Couplers
Connectors/Cables



Duplexers/Multiplexers/Channel Filters

- OMTs/Feeder Horns;
Ku/Ka-band/Rotary Joints/Polarizer
- Technology ;
Cavity/Waveguide/PCB/LC/Interdigital/
Compline type
- Applications ;
EW/Radar/Maritime SatCom/Airborne/Space
Payload/Military Datalink/Measurement/DMR

PRODUCTS

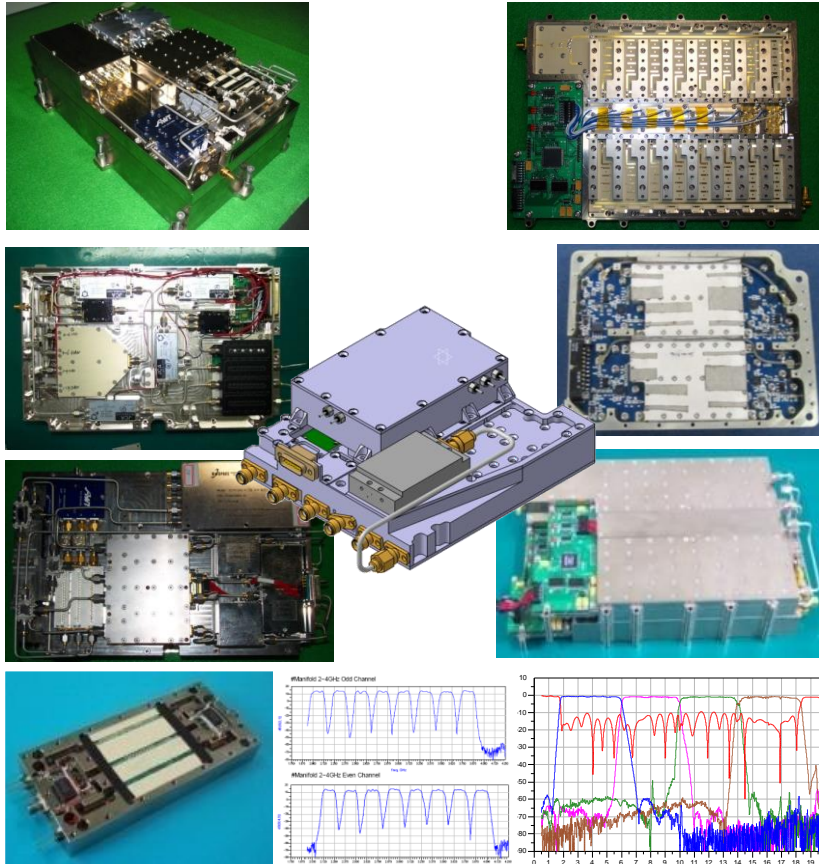
Filters

Duplexer/Multiplexer

Switched Filter Bank

Feeder/OMT/Polarizer

Dividers/Couplers
Connectors/Cables



Switched Filter Bank

- Filters/Duplexers;
LPF/HPF/BPF/BRF
1-18GHz Duplexer(suspended PCB)
1.2-15GHz HPF/2.4-18GHz HPF
- OMTs/Feeder Horns;
Ku/Ka-band/Rotary Joints/Polarizer
- Technology ;
Cavity/Waveguide/PCB/LC/Interdigital/
Compline type
- Applications ;
EW/Radar/Maritime SatCom/Airborne/Space
Payload/Military Datalink/Measurement/DMR

PRODUCTS

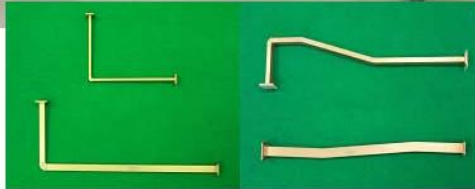
Filters

Duplexer/Multiplexer

Switched Filter Bank

Feeder/OMT/Polarizer

Dividers/Couplers
Connectors/Cables



Feeder/OMT/Polarizer

- Filters/Duplexers;
LPF/HPF/BPF/BRF
1-18GHz Duplexer(suspended PCB)
1.2-15GHz HPF/2.4-18GHz HPF
- OMTs/Feeder Horns;
Ku/Ka-band/Rotary Joints/Polarizer
- Technology ;
Cavity/Waveguide/PCB/LC/Interdigital/
Compline type
- Applications ;
EW/Radar/Maritime SatCom/Airborne/Space
Payload/Military Datalink/Measurement/DMR

PRODUCTS

Filters

Duplexer/Multiplexer

Switched Filter Bank

Feeder/OMT/Polarizer

**Dividers/Couplers
Connectors/Cables**



Connector/Adapter/Cable Assembly Products

- Technology ;
Cavity/Waveguide/PCB/LC/Interdigital/
Compline type
- Applications ;
EW/Radar/Maritime SatCom/Airborne/Space
Payload/Military Datalink/Measurement/DMR

CAPABILITIES

Process/Capability

Cavity/Waveguide

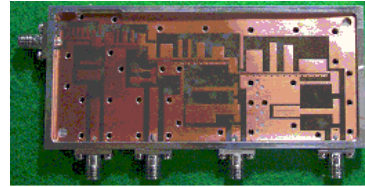
Suspended Substrate

Combine/Interdigital

Lumped/Ceramic/
Thin-film

Process

- QMS / ISO9001 qualified
- Assembly
- Test
- Inspection
- Quality Control
- High Reliability
- MTBF Prediction
- 3D Structure Analysis
- Thermal Analysis and Mechanical Design



일부 사진 필요



Capability

- ISO9001 Certified
- Specialties in cavity/waveguide filters/multiplexers/switched filter banks/broadband
- Capability up to W-band
- Highly educated and well experienced design engineers
- Well trained and skilled operators/technicians for assembly, tune and test

CAPABILITIES

Process/Capability

Cavity/Waveguide

Suspended Substrate

Combine/Interdigital

Lumped/Ceramic/
Thin-film

All Metal Filters

Filtronic Broadband has extensive expertise of machined and cast metal cavity filters. Traditionally supporting the wireless infrastructure business, where typical demands include low loss, tight rejection specifications, high power and low passive intermodulation.

Typical products include, band pass and band stop filters, cross-band and in-band combiners for antenna sharing, multiplexers and tunable filters, either factory tuned or field reconfigurable.

All designs are fully modelled prior to release using the latest electrical, mechanical and thermal modelling tools ensuring designs remain compliant over severe temperature ranges.

All filters are 100% tested using Filtronic's in-house fully automated test suite; recording all RF parameters.

IMAGES
Top: Cavity filter with cast in resonators
Below: TE balanced filter
Examples of ceramic resonators

Waveguide

Filtronic offer waveguide products such as filters, diplexers and OMTs; typical frequency ranges are from 6GHz to 110GHz.

Waveguide products offer high "Q" and low insertion loss, making them suitable for high power applications.

Filtronic manufacture waveguide products in conventional flanged designs or bespoke form factors, including surface mountable.

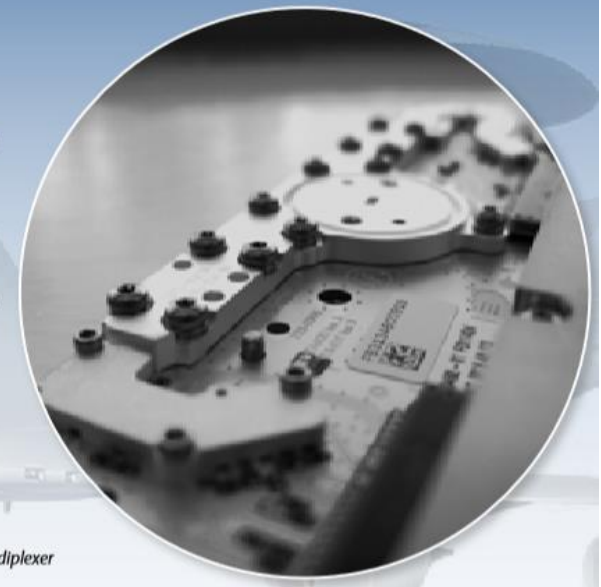


IMAGE
Surface mounted E-band diplexer

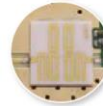
Filter Capability



Filtronic has extensive knowledge and expertise in the design, development and production of microwave filters that dates back to 1977.



Our team of highly experienced engineers work with customers to ascertain optimum technologies dependent upon specific filter requirements, e.g. size, response, power handling, insertion loss and rejection.



Core competencies available include metal cavity filters, ceramic, combine, interdigital, lumped element, suspended substrate, waveguide and thin-film.

CAPABILITIES

Process/Capability

Cavity/Waveguide

Suspended Substrate

Combine/Interdigital

Lumped/Ceramic/
Thin-film

Suspended Substrate Stripline

Suspended Substrate Stripline (SSS) is traditionally a printed circuit technology that can be used for both broadband and narrowband filters; typical frequency range 500MHz to 26GHz.

The wide range of realizable impedance values makes this medium particularly suitable for high pass and low pass filters that can be cascaded together to form broadband band pass filters and multiplexers.

Generalised Chebychev filter prototype designs result in highly selective band edges with low passband loss and high stopband attenuation.

As suspended substrate is a printed technology it exhibits very repeatable performance, and devices can be made with very tight amplitude and phase tracking.

For some higher power applications, rather than use a substrate, solid metal bars are suspended in air forming low PIM filter structures.

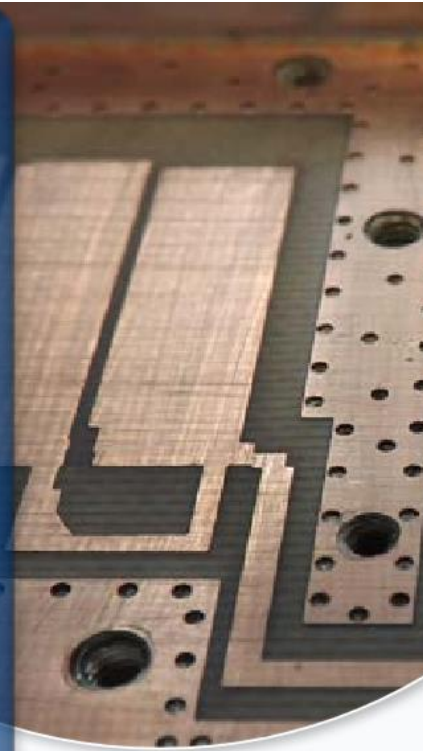


IMAGE
Middle section of SSS multiplexer

CAPABILITIES

Process/Capability

Cavity/Waveguide

Suspended Substrate

Comblne/Interdigital

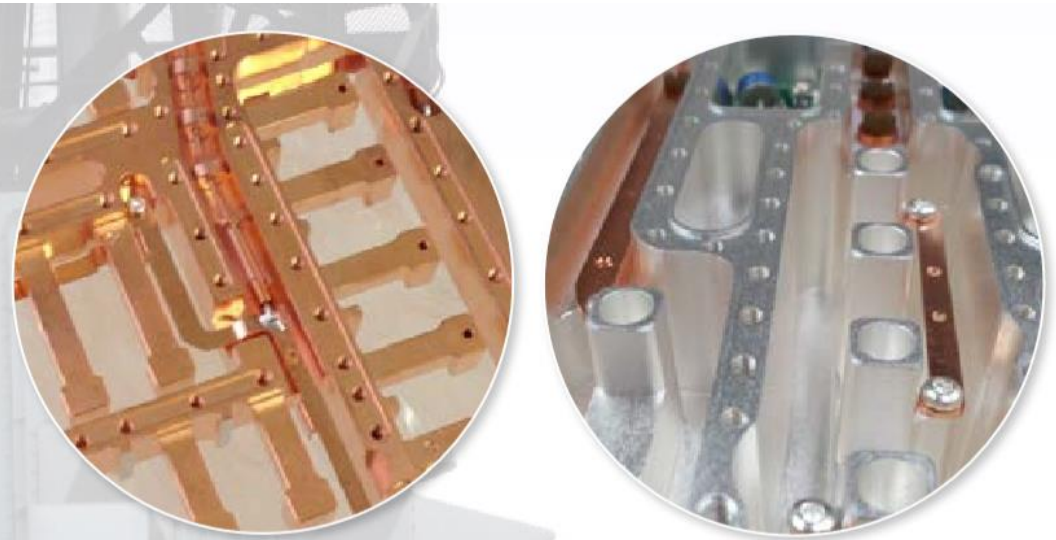
Lumped/Ceramic/
Thin-film

Comblne / Interdigital

Although very similar to cavity filters, comblne filters can be designed to have bandwidths of 1% to 50% of the centre frequency. Centre frequencies in the range of 100MHz to 20GHz are possible with stopbands extending to 5 times f_0 . Wider stopbands are achievable with appropriate resonator loading.

Multiplexers can be formed by coupling band pass filters together at a common transformer junction. Both contiguous and non-contiguous types are available. Diplexers, for example, are often used in applications such as Tx/Rx communications systems, where a common antenna is shared.

In some applications requiring wider bandwidths and where flatter group delay is important, we can use interdigital structures. The electrical and mechanical characteristics are similar to comblne but the resonators are longer and are alternately inverted. The longer resonators result in a lower upper stopband frequency.



IMAGES

Left: Planar comblne filter Right: Comblne band pass filter with cross couplings

CAPABILITIES

Process/Capability

Cavity/Waveguide

Suspended Substrate

Combine/Interdigital

Lumped/Ceramic/
Thin-film

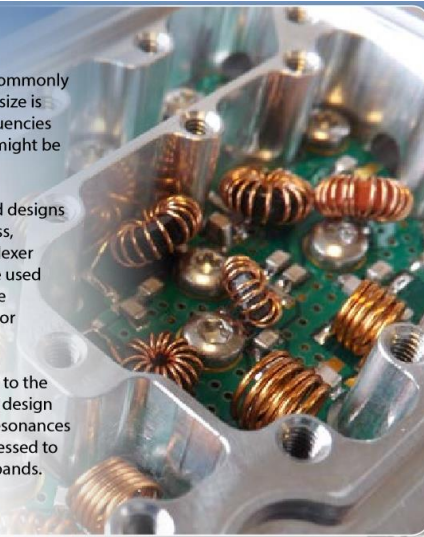
Lumped Element

Lumped element technology is commonly used in applications where small size is required, especially at lower frequencies where transmission line devices might be excessively large.

Both narrowband and broadband designs are available in high pass, low pass, band pass, band stop and multiplexer form. Various filter prototypes are used combining capacitive or inductive coupling to produce asymmetric or symmetric responses.

Filtronic pays particular attention to the selection of components and the design of the housing so that parasitic resonances and waveguide modes are suppressed to ensure broad, spurious free stopbands.

IMAGE
800MHz section of multiplexer



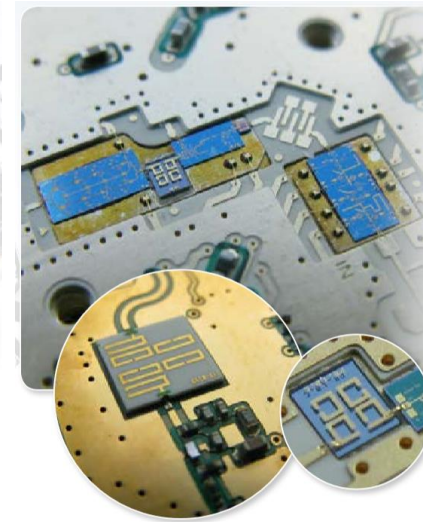
Ceramic

Filtronic's unique in-house ceramic facility offers a rapid turn around, ideal for prototyping and proof-of-concept for new designs.

Filter capability includes TE, TEM, TM, Quasi-TM, ceramic combine etc. dependent upon the required filter performance and size.

Metallisation of ceramic parts allow different modes of operation to be achieved, e.g. TEM and TM.

New material development, pressing, machining, firing, grinding and metallisation are processes available to meet the demanding requirements of new ceramic filters.



Thin Film

Surface mountable thin film filters are available in band pass, band stop, high pass and low pass configurations.

High dielectric constant, low loss substrate enables significant size reduction for space critical applications.

Frequency range suitable from 3GHz to 110GHz.

IMAGES
Main: 84GHz band pass on quartz, 11GHz band pass on LCP and 5GHz low pass on LCP
Large Circle: 10GHz band pass on alumina
Small Circle: 71 - 76GHz band pass on quartz



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as your partner



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M 3 S Y S . C O M