



SPACE & MILITARY



**SAW filters
for space and
military
applications**



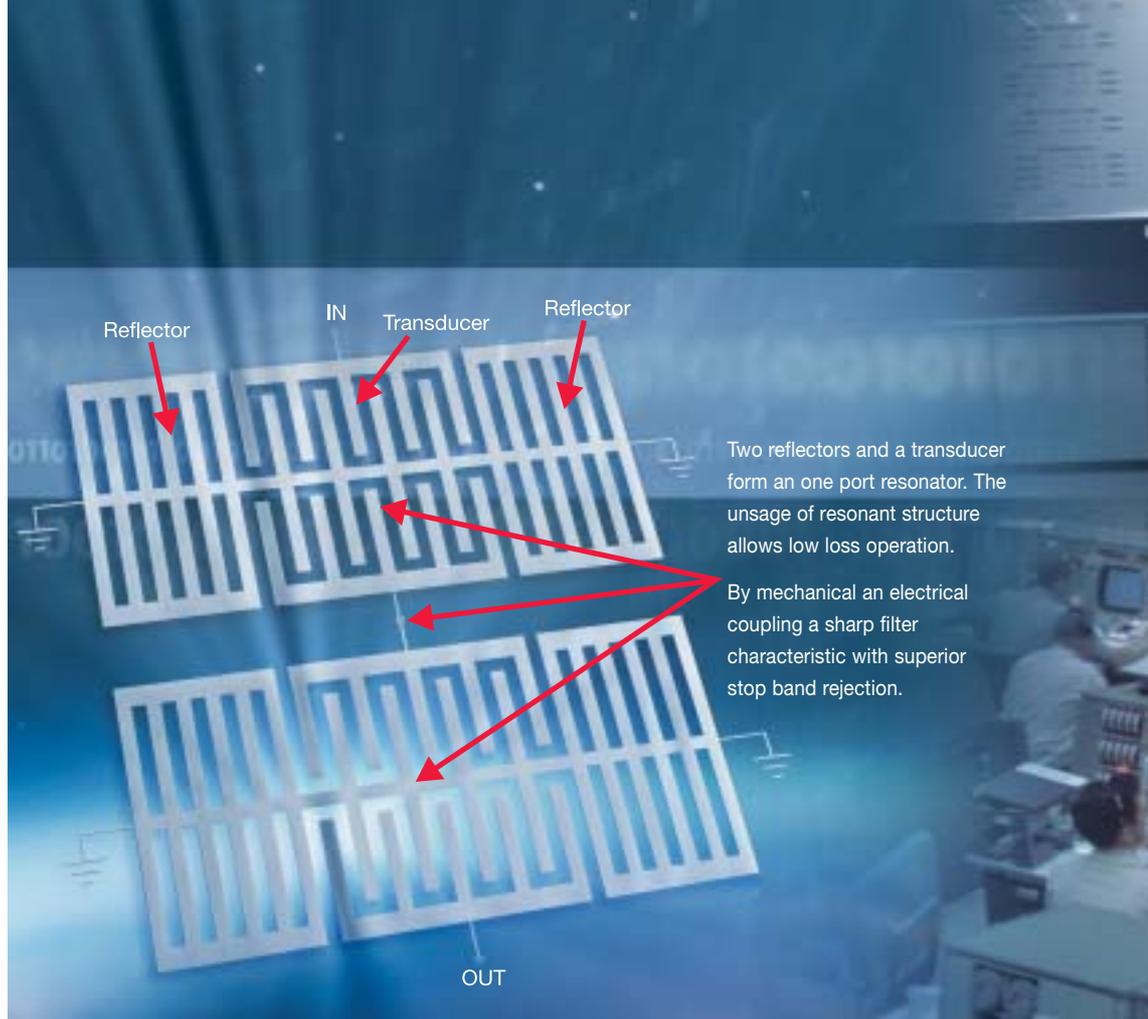
VECTRON
INTERNATIONAL

A **DOVER** COMPANY



Requirements for SAW filters for space and military applications:

- High reliability / including additional production steps
- Support provided for low quantities
- Final test at different temperatures
- Non-standard specifications



Two reflectors and a transducer form an one port resonator. The usage of resonant structure allows low loss operation.

By mechanical an electrical coupling a sharp filter characteristic with superior stop band rejection.

SAW filters for space and military applications:

VI-Telefilter has installed an additional production line to support low quantities and extra quality test to guarantee high reliability products.

All plants are certified according to the TS16949 standard. Our production performs final tests at high and low temperatures.

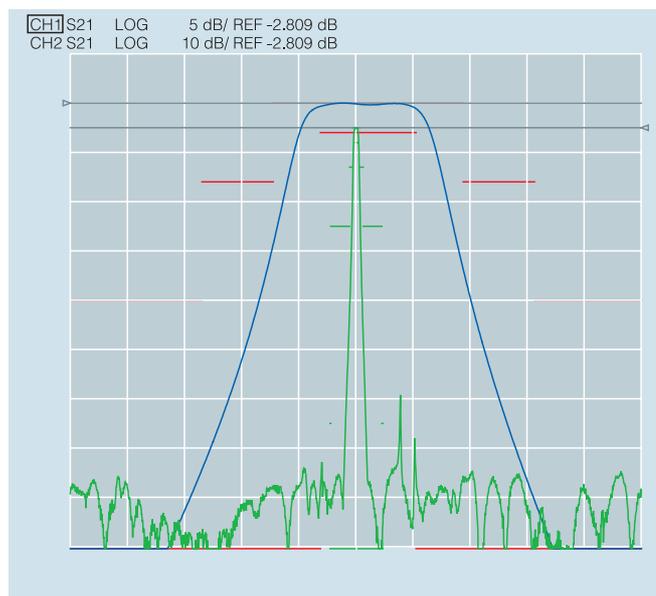
All SAW design principles are available to handle non-standard filter requirements. We are experienced in designing and manufacturing IF and RF filters and may deliver filter sets, cascaded filters, and sets of cascaded filters.

Design capabilities:

There is no special SAW-design principle used for space and military applications, however experience in all common SAW design principles is available.

A technical example is a TCRF-Design (Transversely Coupled Resonator Filter) – for a description see drawing above.

It shows that two oneport resonators build a waveguide that can guide a symmetrical mode and an unsymmetrical one. The bandwidth of the filter is determined by the difference in frequencies of these modes. Higher rejection and sharpness may be achieved by cascading such waveguides.





VI-Telefilter products for space and military applications

This filter family offers a high reliability under specific environmental conditions. But each solution is unique.

VI-Telefilter has developed a technology for matching the SAW chip internally. With this solution, we can support customer requests for solutions without matching. This has been applied for TFS70AG and TFS70AH, where high termination impedances are internally matched to 50 Ohms.

Space and military applications and VI-Telefilter

All VI-Telefilter plants are TS16949 and ISO14000 certified. Additional production and testing steps are used on a case by case basis to ensure high reliability. The focus is the definition of requirements together with the customer and their survey and report to the customer with new introduced quality tools like PPAP and APQP. Together with different preventive techniques like FMEA we ensure that the ordered parts reach the customer in best quality on time.

VI-Telefilter has several production lines that enable us to handle low-volume, medium-volume and high-volume markets. Multilayer ceramic-based, surface-mount and metal-can-pin solutions are supported.

The whole field of SAW design principles is available for customized solutions.

Final tests at minimum and maximum temperatures of operating temperature ranges may be performed. VI-Telefilter supports the delivery of filter sets, cascaded filter pairs, and sets of cascaded filter pairs.

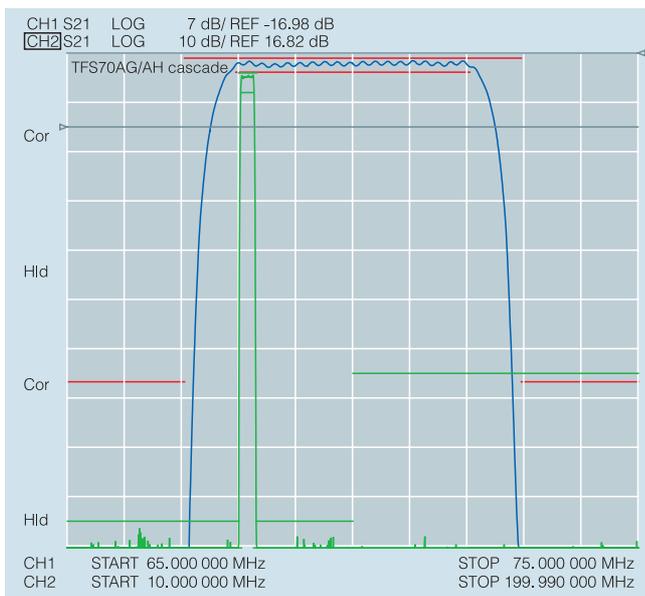
Customized solutions may include an internal matching of the filter to 50 Ohms.



Solutions for space and military applications

- Full set of SAW design principles for customized products
- Low volumes supported
- High reliability
- Internal matching possible

Type	Frequency MHz	Bandwidth MHz	Insertion Loss dB	Package mm
TFS35A	35.42	1.70	14.8	13.6x6.8
TFS35B	35.42	1.70	14.8	13.6x6.8
TFS35C	35.42	1.70	14.8	13.6x6.8
TFS70AG	70.00	4.00	16.0	35.0x20.5
TFS70AH	70.00	4.00	16.0	35.0x20.5
TFS140E	140.455	0.05	3.2	11.6x5.2





Vectron International- Telefilter – Germany

Employees: 170

Turnover: \$28 Mio (2004)

Products:

SAW Filters, SAW Resonators and
Monolithic Crystal Filters (MCF)

Experienced SAW design team,
supported by a worldwide sales
organization

75% of product portfolio less
than 2 years old

Technological expertise on
materials, front-end and back-end

Fully automated assembly process

Vectron Frequency Devices – Switzerland

High-end Nikon stepper
for high resolution (0.35µm)
and high throughput

Products:

High-performance RF-filters,
High volume low cost RF-filters
up to 3 GHz



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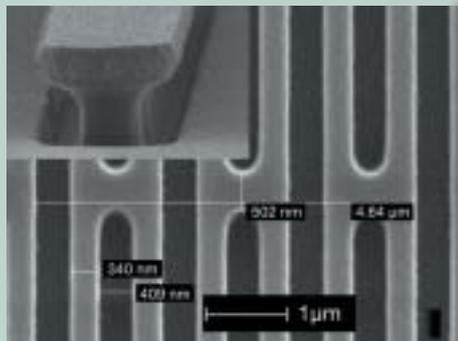
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Vectron International-Telefilter is always a good address

Vectron International-Telefilter (VI-Telefilter) is particularly successful in the development of passive electronic components like SAW filters, SAW resonators, and monolithic crystal filters (MCF). Our corporate policy is strictly customer-oriented, and our customers opt for us because we reliably deliver high-quality components always according to the individual customer requirements in terms of performance, costs, and technology modification.

Due to its flexible design capacities and thoroughly cost-optimized production facilities VI-Telefilter has gained a leading role among the suppliers of electronic components for the mass market as well as in the high-performance segment.



A true partner – with the reliability of an international group

VI-Telefilter is 100%-owned by Vectron International and is thus a member of the international Dover Corporation. Dover Corporation is NYSE-traded (DOV) and listed at Fortune 500. Dover Corporation has a broad customer base throughout the world, in over 100 countries and sales close to \$5 Billion.

According to the Dover corporate policy each individual group member company operates independently on the very sound financial background of a strong international group. VI is one of the largest suppliers of Frequency Control Products with worldwide annual sales of over \$200 Million and a growth rate that is clearly above average.

As a group member within the VI group VI-Telefilter is located in Teltow/Berlin and operates on a global level.