



SAW filters for GPS applications



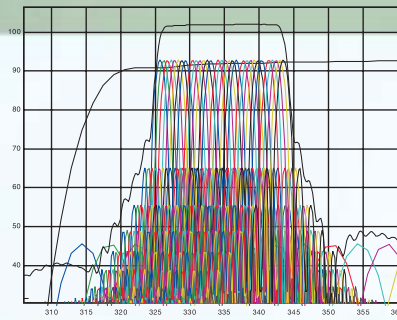
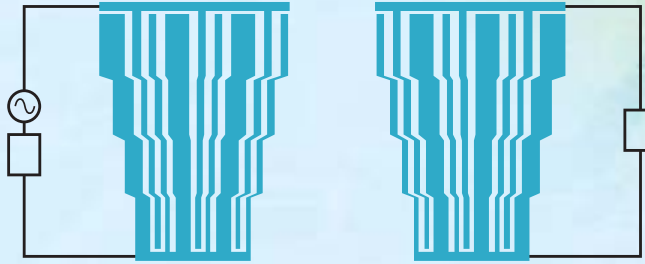
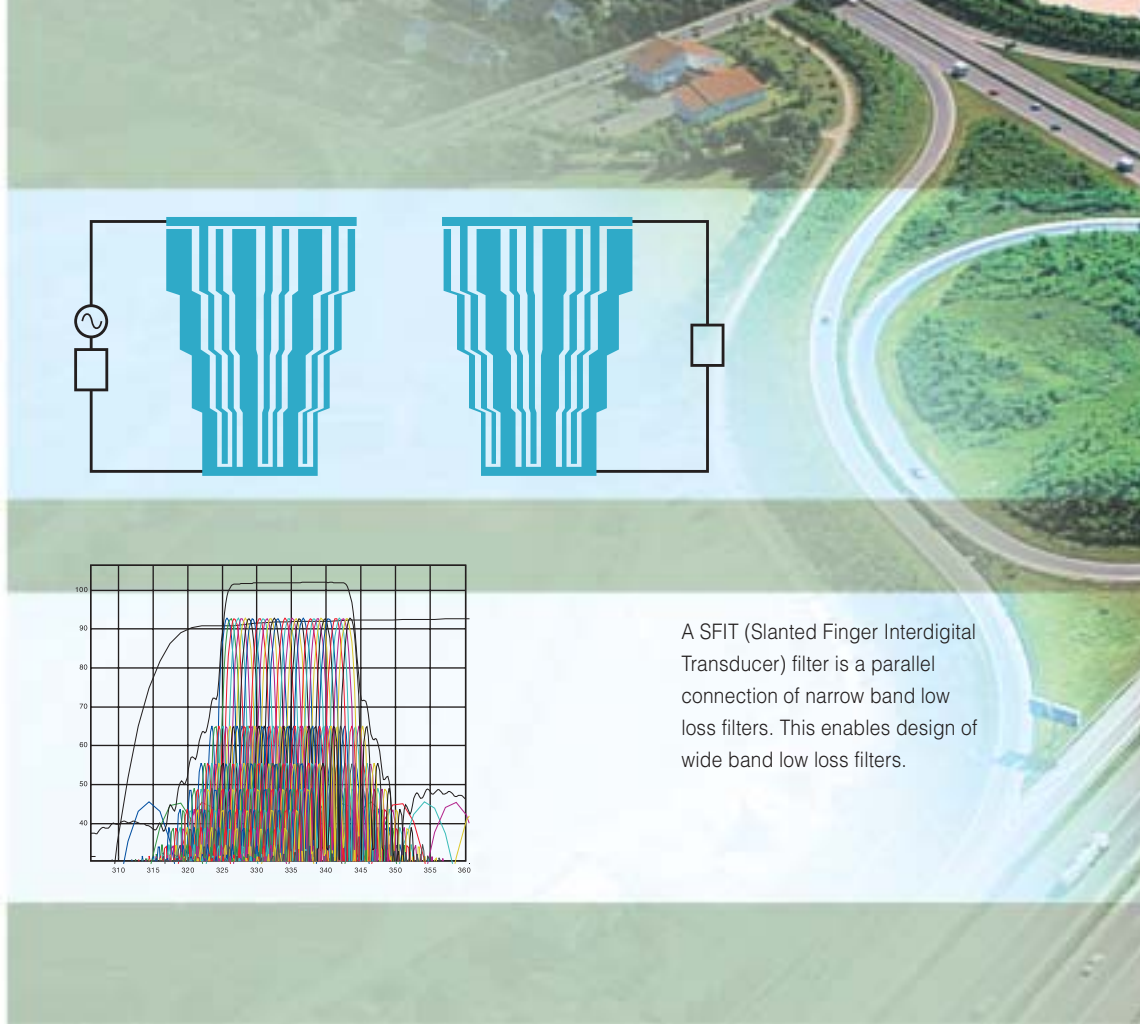
VECTRON
INTERNATIONAL

A **DOVER** COMPANY



Requirements for SAW filters for navigation applications:

- Low insertion loss
- Very low group delay and phase-ripple requirements
- Sometimes in combination with close in rejection requirements
- Single-ended to balanced operation
- special final-testing requirements



A SFIT (Slanted Finger Interdigital Transducer) filter is a parallel connection of narrow band low loss filters. This enables design of wide band low loss filters.

SAW filters for Navigation applications

VI-Telefilter utilizes SFIT (Slanted Finger Interdigital Transducer)-filters and resonant structures to achieve a low insertion loss.

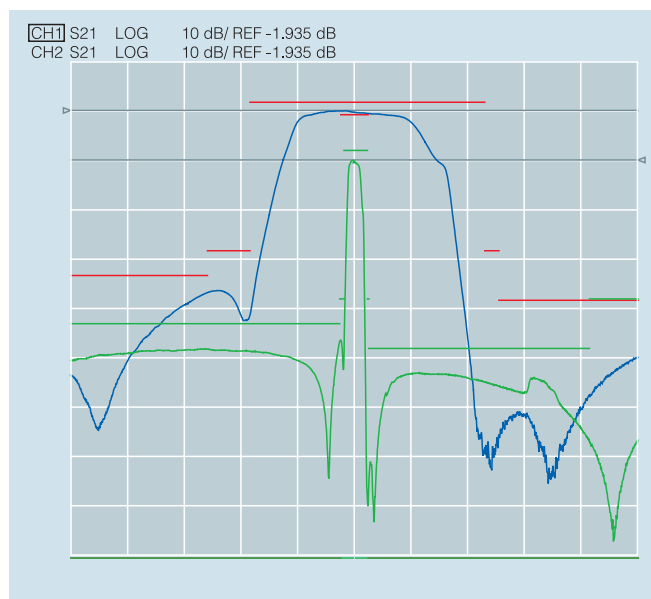
Several design methods like SFIT / IEF / LCRF, and a combination of IEF-LCRF for single ended / balanced operations may be used for SAW filters for navigation applications. To reduce the insertion loss (ohmic losses) we use parallel and serial connections of IEF-LCRF structures.

For wide-band, low-loss filters, we take advantage of different cuts of substrate materials (LiNbO3 (IF)/ LiTaO3 (RF)).

Design capabilities

SFIT (IF) filters are parallel connections of a high number of narrow-band, low-loss filters. This allows an effective generation of SAW for each frequency in the pass band. VI-Telefilter has generated sophisticated design tools to achieve a low group delay ripple, suppressing reflections including the triple transit signal.

As a service for customers, we offer non-standard final test routines, supporting special specifications. As an example, we can work with several measurement techniques on fixed golden samples, and may remove cubic trends from differential characteristics for ripple measurements.





Type	Frequency MHz	Bandwidth MHz	Insertion Loss dB	Package mm
TFS140Y	140.16	20	13.0	13.6x6.8
TFS1227	1227.60	20	2.6	3 sq
TFS1237	1237.00	40	2.0	3 sq
TFS1575	1575.42	2.4	1.5	3 sq
TFS1575A	1575.42	2.4	1.5	2.5x2
TFS1575C	1575.42	2.4	1.5	3 sq
TFS1575D	1575.42	20	3.5	3 sq
TFS1575E	1575.42	2.4	1.5	2.5x2
TFS1590	1590.00	48	2.2	3 sq

VI-Telefilter products for GPS

VI-Telefilter has developed a family of RF filters for navigation applications. This means that even for one frequency and one chipset, several filters are available to offer the customer the best compromise between group delay and phase ripple, insertion loss, close-in rejection and package size. Solutions for single ended to single ended, and single ended to balanced operations are supported.

IF filters for GPS are available as well. Additional codes are under development.

GPS and VI-Telefilter

All VI-Telefilter plants are TS16949 and ISO14000 certified.

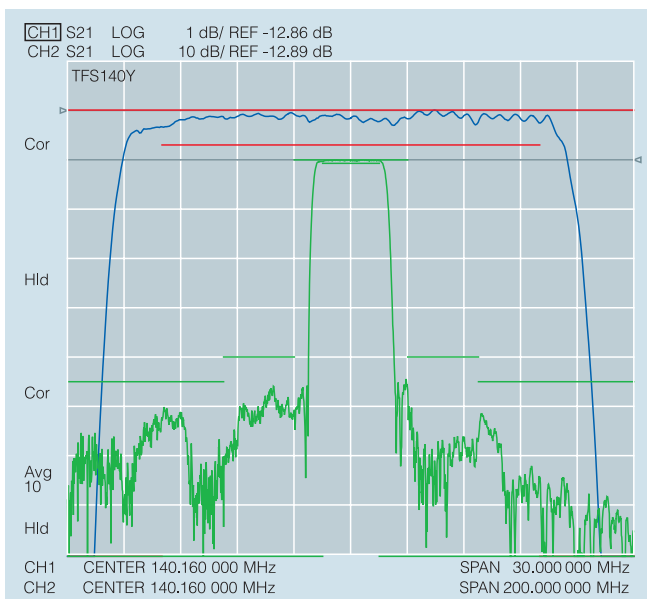
VI-Telefilter does have a long experience with RF and IF SAW filters. This allows to handle current requests for GPS RF and IF filters.

VI-Telefilter is well known for its capabilities in customized product developments. Here we may implement non-standard requests into specifications, as we do for GPS IF filters.



Solutions for navigation applications

- Customized front end and IF filters
- Low group delay and phase ripple
- Low insertion loss





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



Vectron International-Telefilter

Potsdamer Straße 18
D-14513 Teltow
Germany

Phone: +49 (0) 3328 4784 17
Fax: +49 (0) 3328 4784 30

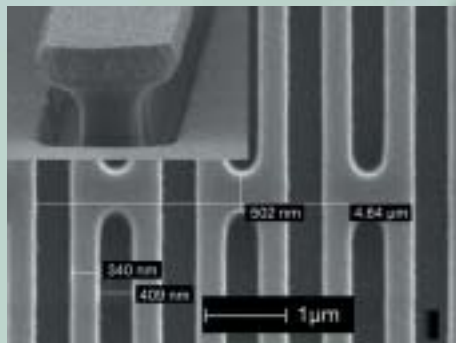
telefilter@vectron.com
www.vectron.com



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.