

SAW Components

SAW filter

Automotive telematics

Series/type: B3519
Ordering code: B39162B3519U410

Date: May 08, 2014
Version: 2.2

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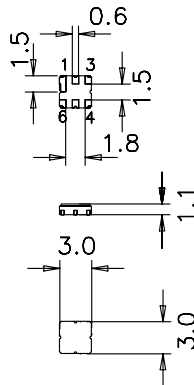
Application

- Low-loss RF filter for automotive telematics applications
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 41.0 MHz



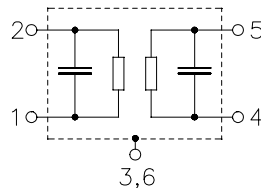
Features

- Package size 3.0 x 3.0 x 1.1 mm³
- Package code DCC6C
- RoHS compatible
- Approximate weight 0.037 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- Lead free soldering compatible with J - STD20C
- AEC-Q200 qualified component family
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

- 2 Input
- 5 Output
- 1,3,4,6 Case ground



SAW Components	B3519
SAW filter	1585.5 MHz

Data sheet



Characteristics

Temperature range for specification: $T = -40\text{ °C to }+85\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega$
 Terminating load impedance: $Z_L = 50\ \Omega$

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	1585.5	—	MHz
Maximum insertion attenuation	α_{max}	—	1.9	2.4	dB
1565.0 ... 1606.0 MHz					
Amplitude ripple (p-p)	$\Delta\alpha$	—	0.9	1.5	dB
1565.0 ... 1606.0 MHz					
Input VSWR		—	2.0	2.3	
1565.0 ... 1606.0 MHz					
Output VSWR		—	2.0	2.3	
1565.0 ... 1606.0 MHz					
Group delay ripple¹⁾ (p-p)		—	10	22	ns
1565.0 ... 1606.0 MHz					
		—	3	12	ns
Attenuation	α				
100.0 ... 1450.0 MHz		36	41	—	dB
1450.0 ... 1525.0 MHz		30	42	—	dB
1650.0 ... 2100.0 MHz		45	52	—	dB
2100.0 ... 2400.0 MHz		44	48	—	dB
2400.0 ... 2500.0 MHz		41	45	—	dB

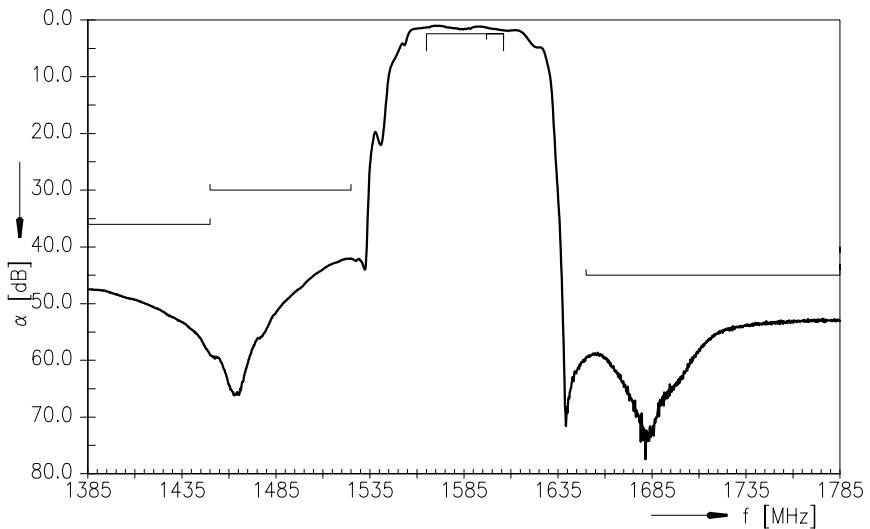
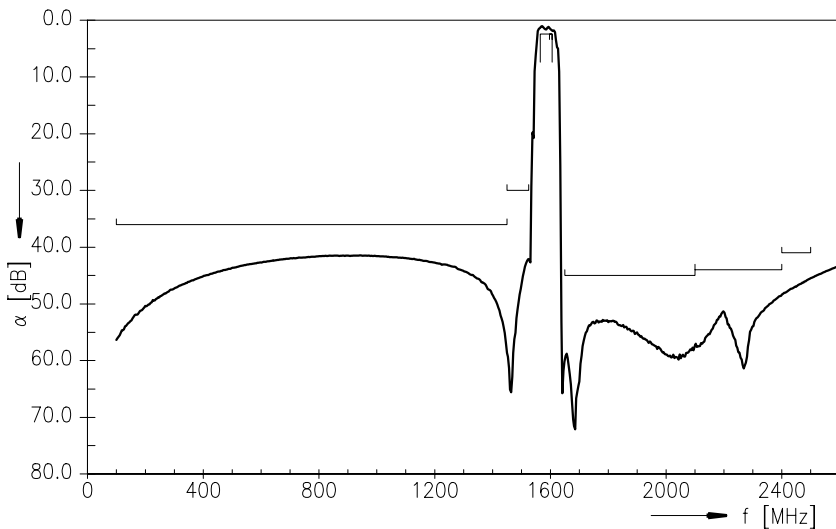
¹⁾ Averaged over 500 kHz


Maximum ratings

Operable temperature range	T	-45/+125	°C	machine model, 10 pulses source 50Ω, load 50Ω
Storage temperature range	T _{stg}	-45/+125	°C	
DC voltage	V _{DC}	6	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	
Input power at				
1565.00 to 1606.00 MHz	P _{IN}	10	dBm	
700.00 to 960.00 MHz		20	dBm	
960.00 to 1525.00 MHz		20	dBm	
1710.00 to 2170.00 MHz		20	dBm	
2400.00 to 2483.50 MHz		20	dBm	

1) acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

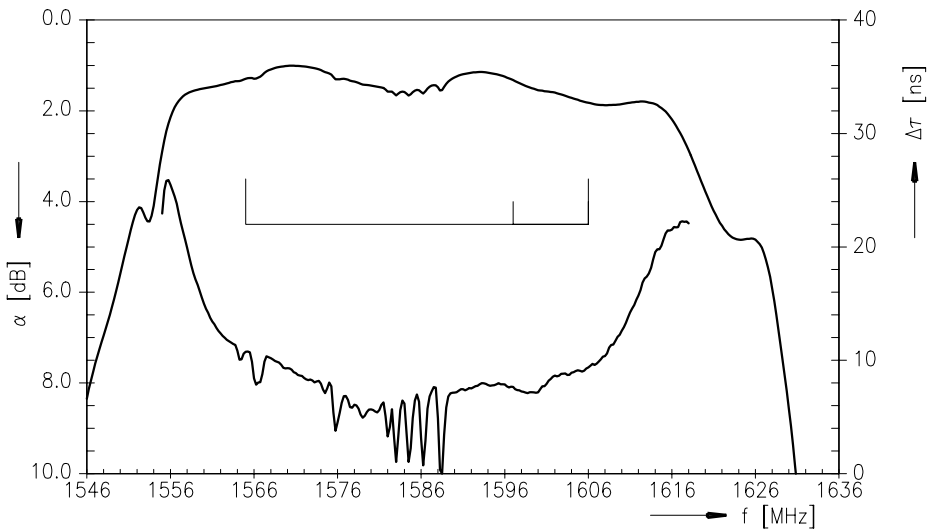
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Transfer function

Transfer function (wideband)


Data sheet



Group delay time




ESD protection of SAW filters

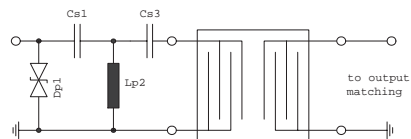
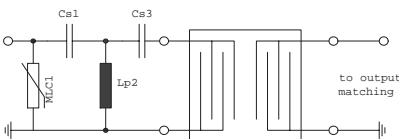
SAW filters are **Electro Static Discharge** sensitive devices. To reduce the probability of damages caused by ESD, special matching topologies have to be applied.

In general, “ESD matching” has to be ensured at that filter port, where electrostatic discharge is expected.

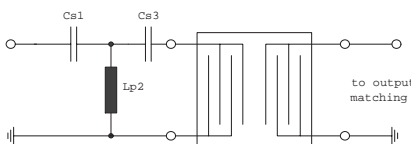
Electrostatic discharges predominantly appear at the antenna input of RF receivers. Therefore only the input matching of the SAW filter has to be designed to short circuit or to block the ESD pulse.

Below three figures show recommended “ESD matching” topologies.

For wideband filters the high-pass ESD matching structure needs to be at least of 3rd order to ensure a proper matching for any impedance value of antenna and SAW filter input. The required component values have to be determined from case to case.


Fig. 1 MLC varistor plus ESD matching
Fig. 2 Suppressor diode plus ESD matching

In cases where minor ESD occur, following simplified “ESD matching” topologies can be used alternatively.


Fig. 3 3rd order high-pass structure for basic ESD protection

In all three figures the shunt inductor Lp2 could be replaced by a shorted microstrip with proper length and width. If this configuration is possible depends on the operating frequency and available pcb space.

Effectiveness of the applied ESD protection has to be checked according to relevant industry standards or customer specific requirements

For further information, please refer to EPCOS Application report:

“**ESD protection for SAW filters**”.

This report can be found under www.epcos.com/rke. Click on “Applications Notes”.

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SAW filter	1585.5 MHz

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References

Type	B3519
Ordering code	B39162B3519U410
Marking and package	C61157-A7-A67
Packaging	F61074-V8228-Z000
Date codes	L_1126
S-parameters	B3519_NB.s2p, B3519_WB.s2p see file header for port/pin assignment table
Soldering profile	S_6001
RoHS compatible	RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8 th , 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases.
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Published by EPCOS AG
Systems, Acoustics, Waves Business Group
P.O. Box 80 17 09, 81617 Munich, GERMANY

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