SAW Components

SAW filter

Automotive telematics

Series/type:	**B3524**
Ordering code:	**B39162B3524B710**
Date:	January 25, 2013
Version:	2.4

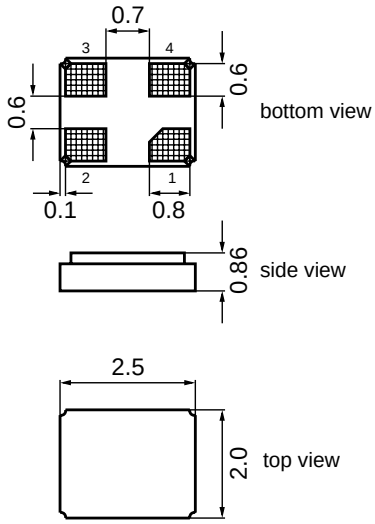
Data sheet SMD

Application

- Low-loss RF filter for Automotive telematics application
- Additional passband characteristics for Galileo

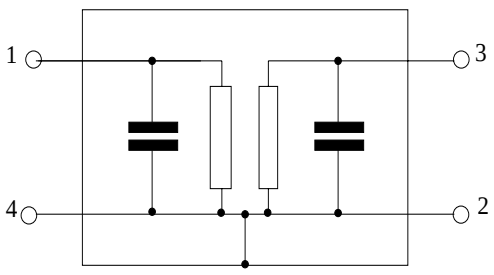
Features

- Package size 2.5 x 2.0 x 0.86 mm³
- Package code DCC4A
- RoHS compatible
- Approximate weight 0.014 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- AEC-Q200 qualified component family
- Lead free soldering compatible with J - STD20C
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



Pin configuration

■	1	Input
■	3	Output
■	2,4	Case ground



Data sheet SMD

Characteristics

Temperature range for specification: T = –40 ˚C to +95 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

		min.	typ. @ 25 ˚C	max.	
Center frequency	f_C	—	1575.42	—	MHz
Maximum insertion attenuation	α_{max}				
1574.42 ... 1576.42 MHz		—	1.2	1.6	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1574.42 ... 1576.42 MHz		—	0.2	0.7	dB
VSWR					
Input 1574.42 ... 1576.42 MHz		—	1.35	1.7	
Output 1574.42 ... 1576.42 MHz		—	1.35	1.7	
Attenuation	α				
10.00 ... 1476.00 MHz		37	41	—	dB
1476.00 ... 1526.00 MHz		28	33	—	dB
1625.00 ... 1640.00 MHz		29	41	—	dB
1640.00 ... 1850.00 MHz		42	45	—	dB
1850.00 ... 2000.00 MHz		37	40	—	dB
2000.00 ... 2250.00 MHz		33	36	—	dB
2250.00 ... 2570.00 MHz		27	30	—	dB

Additional Passband Characteristics for Galileo

Temperature range for specification: T = –40 ˚C to+105 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

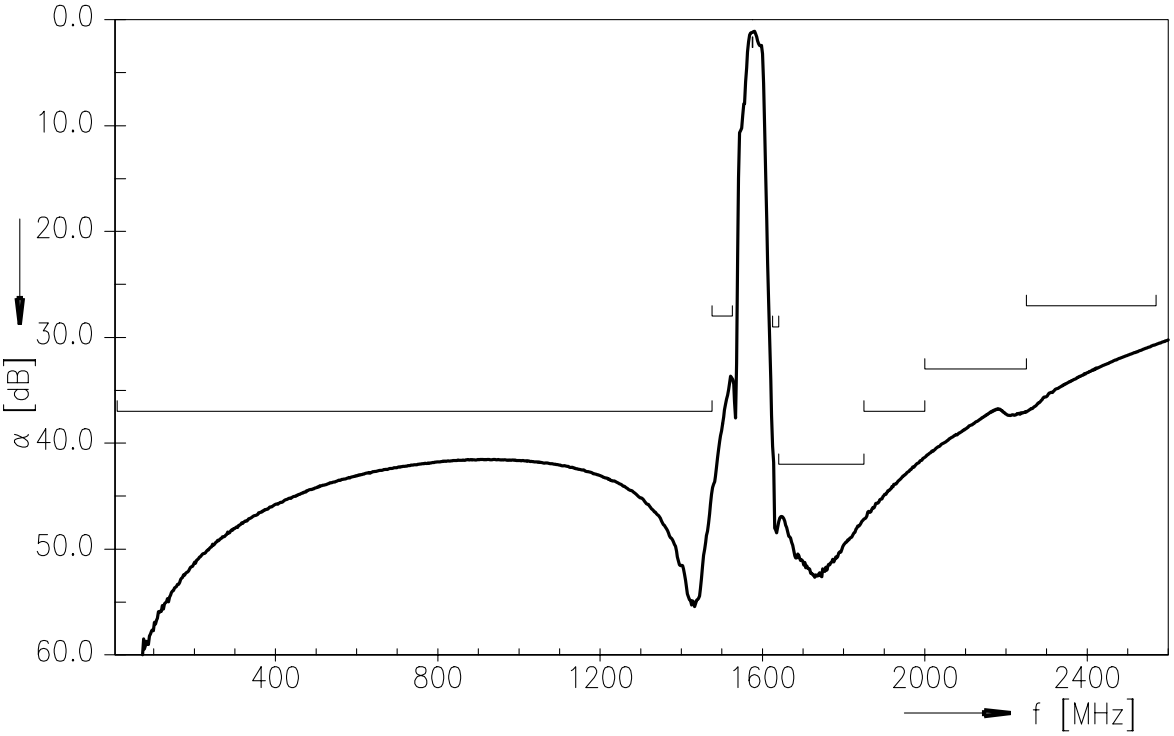
		min.	typ. @ 25 ˚C	max.	
Center frequency	f_C	—	1575.42	—	MHz
Maximum insertion attenuation	α_{max}				
1572.42 ... 1578.42 MHz		—	1.4	2.4	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1572.42 ... 1578.42 MHz		—	0.4	1.5	dB
VSWR					
1572.42 ... 1578.42 MHz		—	1.4	2.1	

Maximum ratings

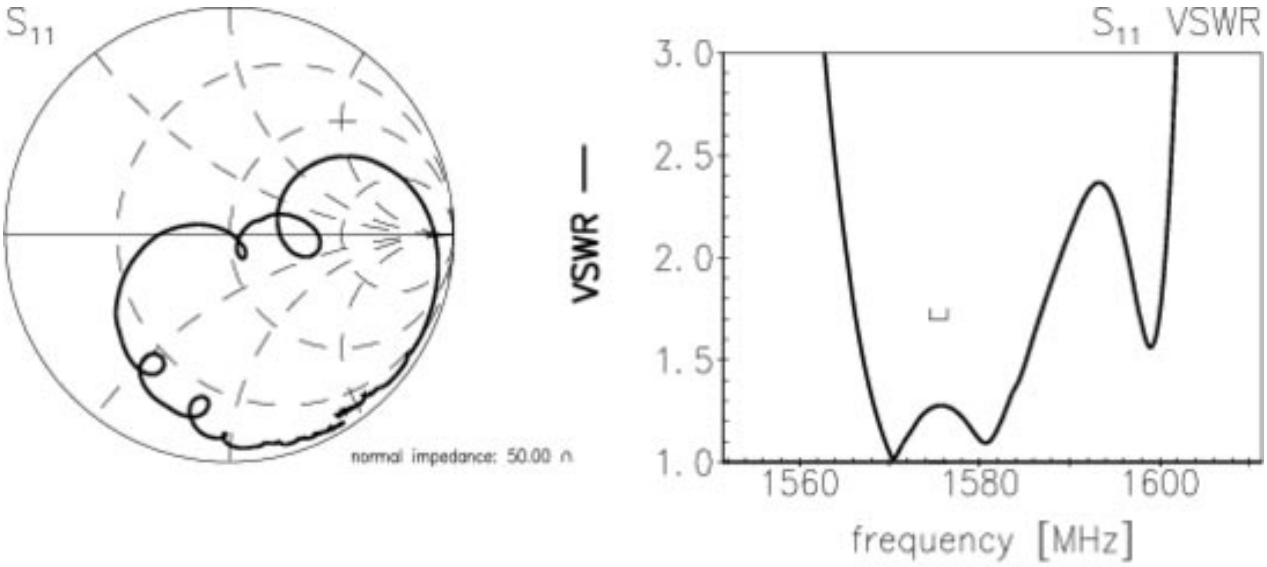
Operable temperature range	T	–45/+125	˚C	
Storage temperature range	T_{stg}	–45/+125	˚C	
DC voltage	V_{DC}	6	V	
Source power	P_S	10	dBm	source impedance 50 Ω
		20	dBm	824 MHz to 915 MHz, 1710 MHz to1785 MHz

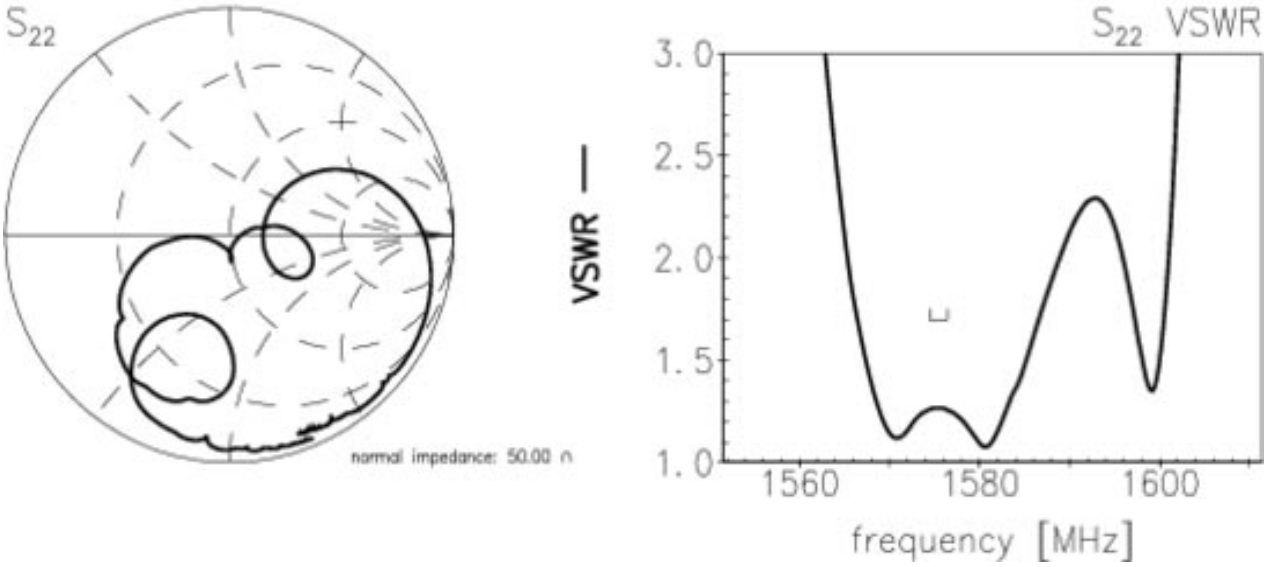
Transfer function

Transfer function (wideband)



Smith chart / VSWR





ESD protection of SAW filters

SAW filters are **E**lectro **S**tatic **D**ischarge 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.

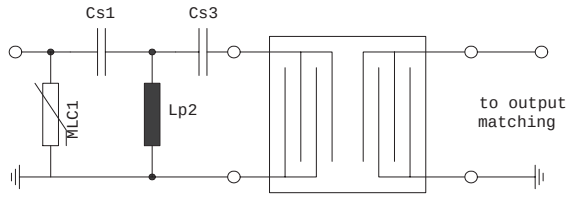


Fig. 1 MLC varistor plus ESD matching

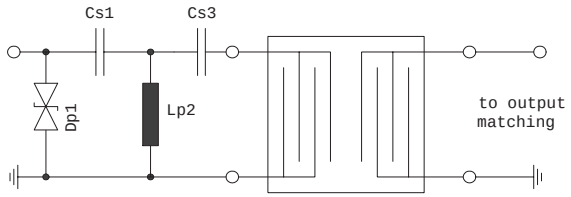


Fig. 2 Suppressor diode plus ESD matching

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

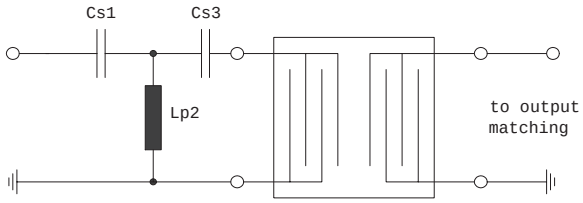


Fig. 3 3rd order high-pass structure for basic ESD protection

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”.

References

Type	B3524
Ordering code	B39162B3524B710
Marking and package	C61157-A7-A168
Packaging	F61074-V8239-Z000
Date codes	L_1126
S-parameters	B3524_NB.s2p, B3524_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 8th, 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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