



SAW Components

SAW RF filter

Automotive telematics

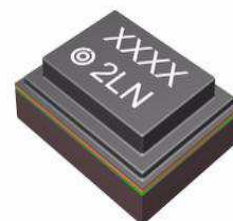
Series/type:	B4348
Ordering code:	B39162B4348P810
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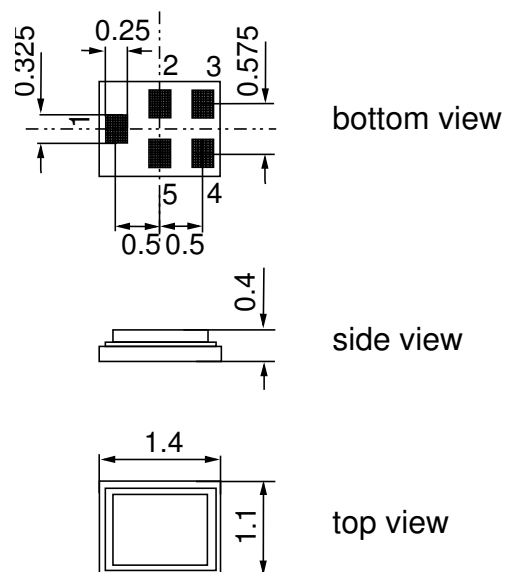
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Application

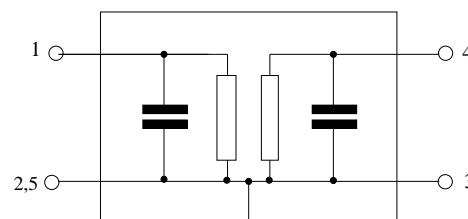
- Low-loss RF filter for GNSS application
- Low amplitude ripple
- Low group delay ripple
- Usable passband 46.8 MHz
- For Beidou, GPS, GLONASS


Features

- Package size 1.4 x 1.1 x 0.4 mm³
- Package code QCS5P
- RoHS compatible
- Approximate weight 0.003g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- AEC-Q200 qualified component family
- **Electrostatic Sensitive Device (ESD)**


Pin configuration

- 1 Input
- 4 Output
- 2,3,5 To be grounded



Data sheet

Characteristics

Temperature range for specification: $T = -40\text{ °C to }+105\text{ °C}$
 Terminating source impedance: $Z_S = 50\ \Omega$
 Terminating load impedance: $Z_L = 50\ \Omega \parallel 8.2\text{ nH}$

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	1582.47	—	MHz
Maximum insertion attenuation	α_{\max}				
1559.05 ... 1563.15 MHz		—	1.0	1.2	dB
1572.42 ... 1578.42 MHz		—	0.8	1.2	dB
1597.55 ... 1605.89 MHz		—	1.0	1.3	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1559.05 ... 1563.15 MHz		—	0.2	0.6	dB
1572.42 ... 1578.42 MHz		—	0.2	0.6	dB
1597.55 ... 1605.89 MHz		—	0.3	0.6	dB
Group delay ripple ¹⁾					
1597.55 ... 1605.89 MHz		—	7	11	ns
VSWR					
1559.05 ... 1563.15 MHz		—	1.7	2.1	
1572.42 ... 1578.42 MHz		—	1.7	2.1	
1597.55 ... 1605.89 MHz		—	1.7	2.1	
Attenuation	α				
500.00 ... 1500.00 MHz		20	27	—	dB
1710.00 ... 5900.00 MHz		20	25	—	dB

1) Averaged over 0.5 MHz

Maximum ratings

Operable temperature range	T	-40/+125	°C	source impedance 50 Ω } continuous wave T = 55 °C, 5000 h
Storage temperature range	T _{stg}	-40/+125	°C	
DC voltage	V _{DC}	0	V	
Input power	P _S			
500.00 ... 1500.00 MHz 1710.00 ... 3800.00 MHz		20	dBm	

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.

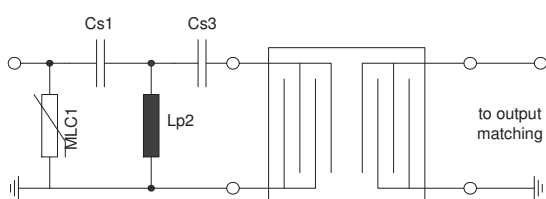


Fig. 1 MLC varistor plus ESD matching

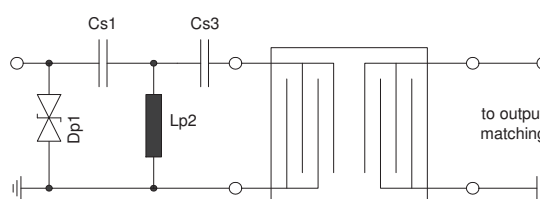


Fig. 2 Suppressor diode plus ESD matching

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

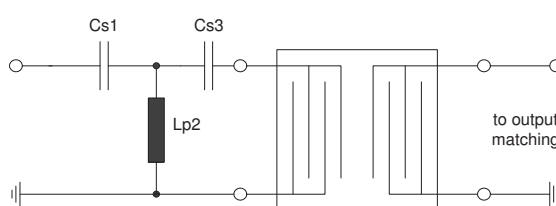


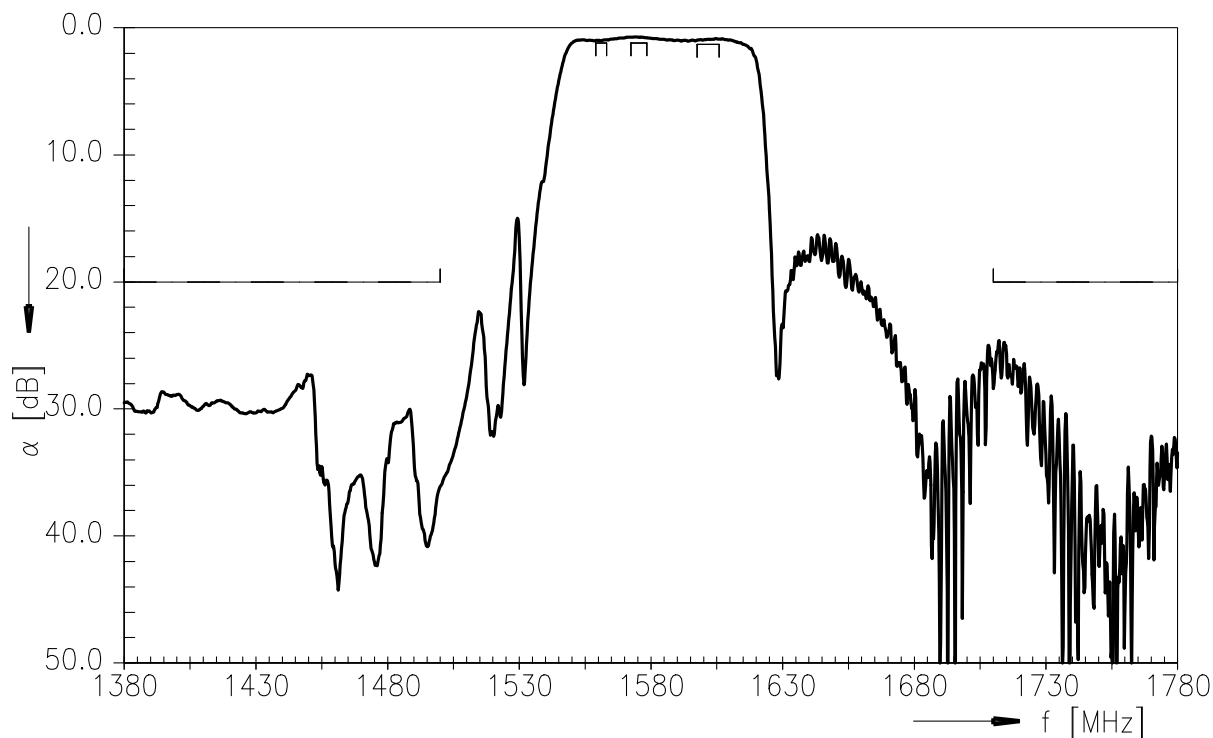
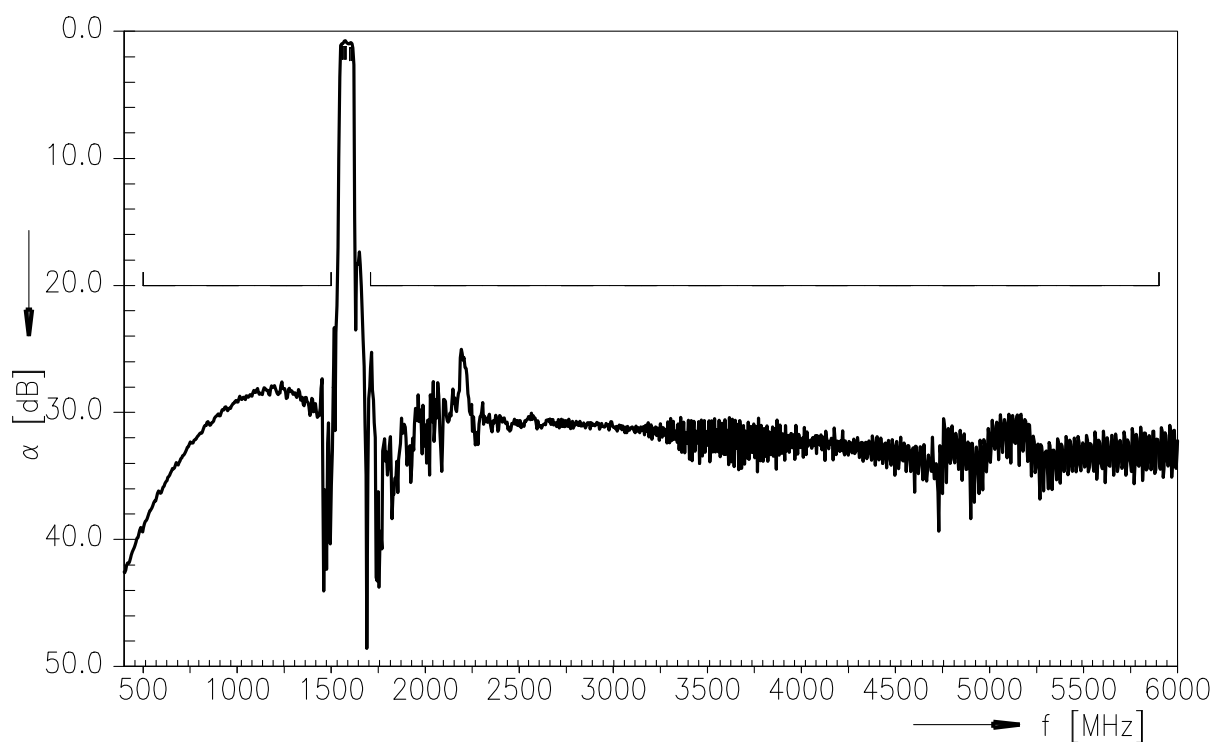
Fig. 3 3rd order high-pass structure for basic ESD protection

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 “Application Notes”.

Data sheet

Transfer function

Transfer function (wideband)


Data sheet



References

Type	B4348
Ordering code	B39162B4348P810
Marking and package	C61157-A8-A9
Packaging	F61074-V8237-Z000
Date codes	L_1126
S-parameters	B4348_NB_UN.s2p, B4348_WB_UN.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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