SAW Components

SAW RF filter

GPS + COMPASS + GLONASS

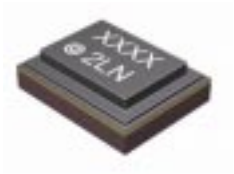
Series/type:	**B4327**
Ordering code:	**B39162B4327P810**
Date:	June 27, 2013
Version:	2.0

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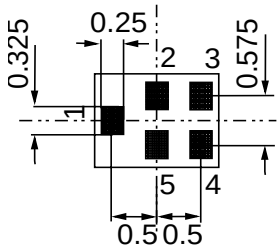
Application

- Low-loss RF GPS + COMPASS + Galileo + GLONASS filter
- Simultaneous usages of GPS, COMPASS, Galileo and GLONASS
- Usable passband: 2.0 MHz for GPS, 4.092 MHz for COMPASS, 4.092 MHz for Galileo and 7.88MHz for-GLONASS
- Very low insertion attenuation
- High out of band selectivity
- Low amplitude ripple
- Filter impedance 50 Ω
- No matching network required for operation at 50 Ω

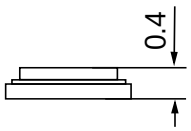


Features

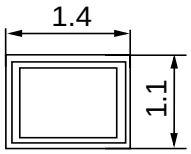
- Package size 1.4 x1.1 x 0.4 mm³
- Package code QCS5P
- RoHS compatible
- Approximate weight 0.003 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- AEC-Q200 qualified component family (operable temperature range -40˚C to +85˚C)
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



bottom view



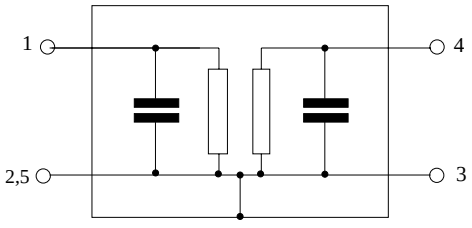
side view



top view

Pin configuration

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



Data sheet SMD

Characteristics

Temperature range for specification: T = –40 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

		min.	typ. @ 25 ˚C	max.	
Center frequency	f_C	—	1582.4	—	MHz
Maximum insertion attenuation	α_{max}				
1574.42 ... 1576.42 MHz		—	1.0	1.4	dB
1559.05 ... 1563.15 MHz		—	1.4	2.0	dB
1573.37 ... 1577.47 MHz		—	1.0	2.0	dB
1597.78 ... 1605.66 MHz		—	1.4	2.0	dB
VSWR					
1574.42 ... 1576.42 MHz		—	1.4	2.0	
1559.05 ... 1563.15 MHz		—	1.5	2.0	
1573.37 ... 1577.47 MHz		—	1.5	2.0	
1597.78 ... 1605.66 MHz		—	1.5	2.0	
Group delay ripple [1)]					
1597.78 ... 1605.66 MHz		—	4	14	ns
Attenuation	α				
50.0 ... 824.0 MHz		40	44	—	dB
824.0 ... 925.0 MHz		39	43	—	dB
1427.0 ... 1453.0 MHz		43	47	—	dB
1710.0 ... 1785.0 MHz		34	48	—	dB
1850.0 ... 1910.0 MHz		38	46	—	dB
1920.0 ... 1980.0 MHz		39	46	—	dB
2400.0 ... 2500.0 MHz		43	46	—	dB
2500.0 ... 2570.0 MHz		38	43	—	dB
2600.0 ... 3000.0 MHz		34	39	—	dB

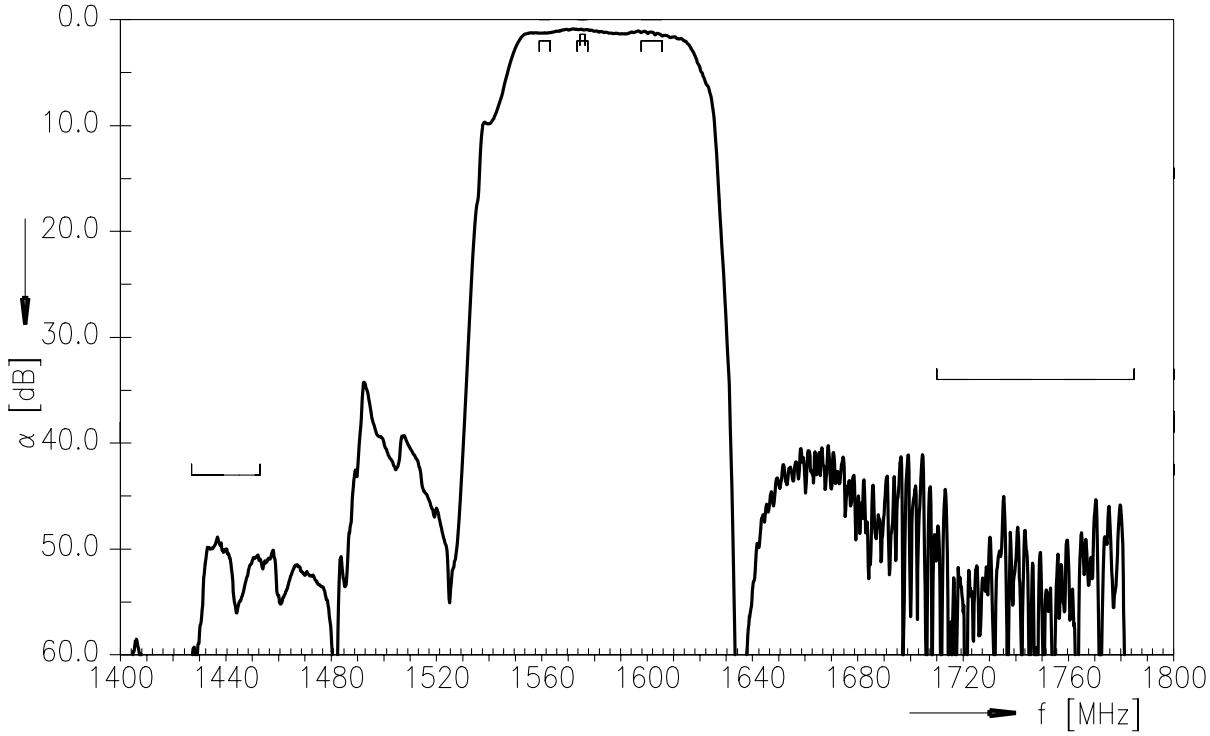
[1)] Averaged over 2 MHz

Maximum ratings

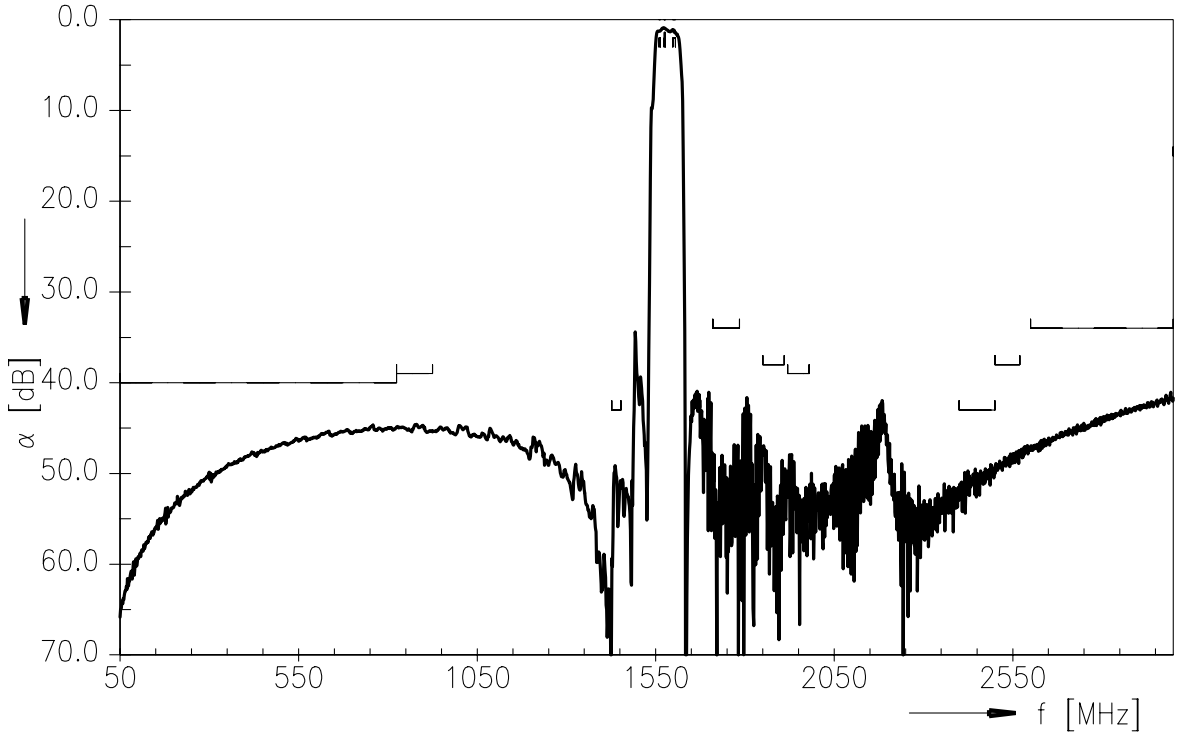
Operable temperature range	T	–40/+85	˚C	
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	0	V	
Input power at				source/load impedance 50Ω /50Ω
915 .0 MHz	P_{IN}	23[1)]	dBm	1/8 duty cycle
1453.0 MHz	P_{IN}	15	dBm	cw
1710.0 MHz	P_{IN}	15	dBm	cw

1) >5000 h at Ta = 50˚C

Transfer function



Transfer function (wideband)



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.

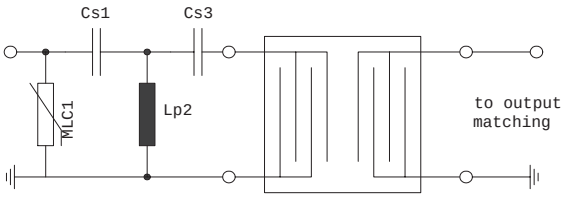


Fig. 1 MLC varistor plus ESD matching

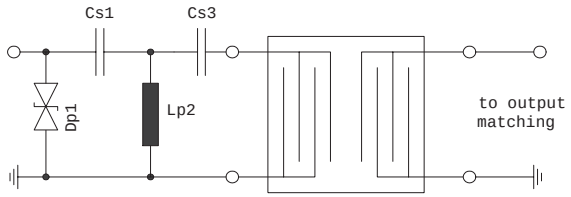


Fig. 2 Suppressor diode plus ESD matching

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

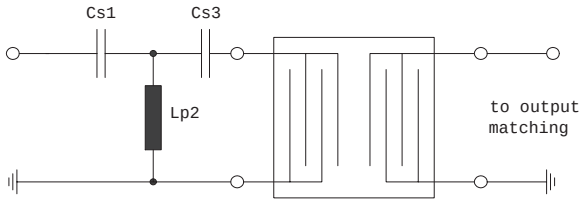


Fig. 3 3rd order high-pass structure for basic ESD protection

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	B4327
Ordering code	B39162B4327P810
Marking and package	C61157-A8-A9
Packaging	F61074-V8212-Z000
Date codes	L_1126
S-parameters	B4327_NB.s2p, B4327_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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