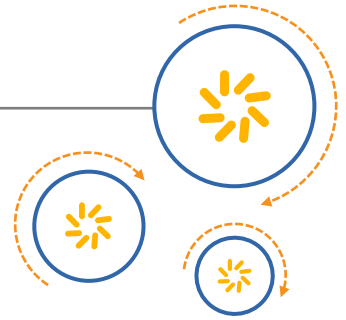




RF360 Europe GmbH

A Qualcomm – TDK Joint Venture



SAW Components

SAW Rx filter

Automotive telematics

| | |
|----------------|-------------------|
| Series/type: | B4345 |
| Ordering code: | B39741B4345P810 |
| Date: | December 22, 2015 |
| Version: | 2.0 |

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SAW Components

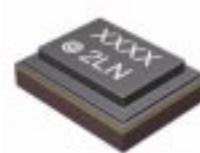
SAW Rx filter

Automotive telematics

| | |
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| Series/type: | B4345 |
| Ordering code: | B39741B4345P810 |
| Date: | December 22, 2015 |
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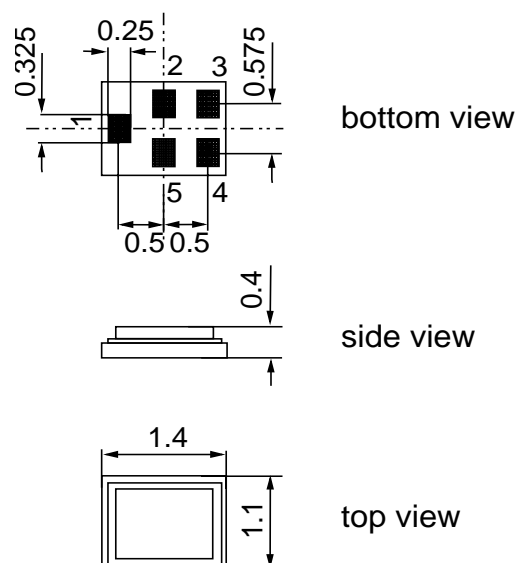
Application

- Low-loss RF filter for Band 12 system
- Usable band width 17 MHz
- Unbalanced to balanced operation



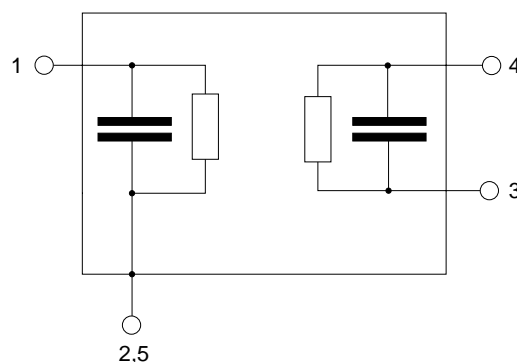
Features

- Package size 1.4 x 1.1 x 0.4 mm³
- Package code QCS5P
- RoHS compatible
- Approximate weight 0.003 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- AEC-Q200 qualified component family (operable temperature range -40°C to +85°C)
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

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



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: $Z_L = 100\ \Omega$ (balanced)

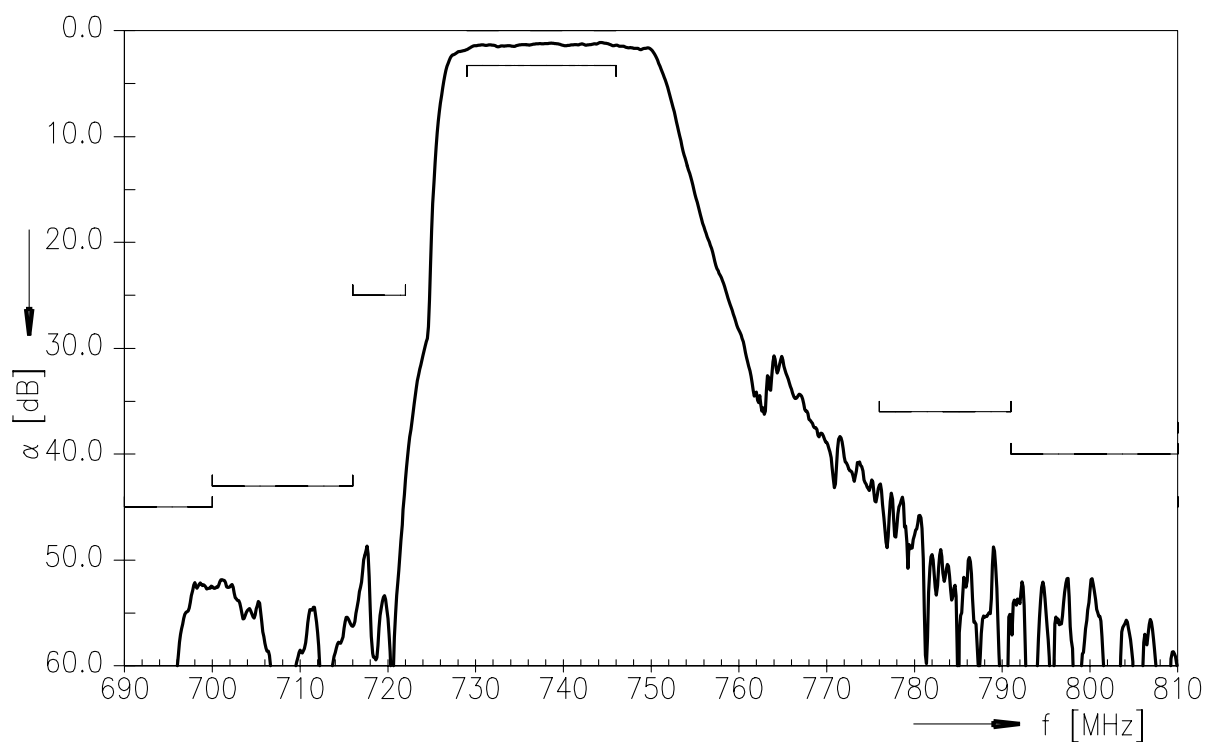
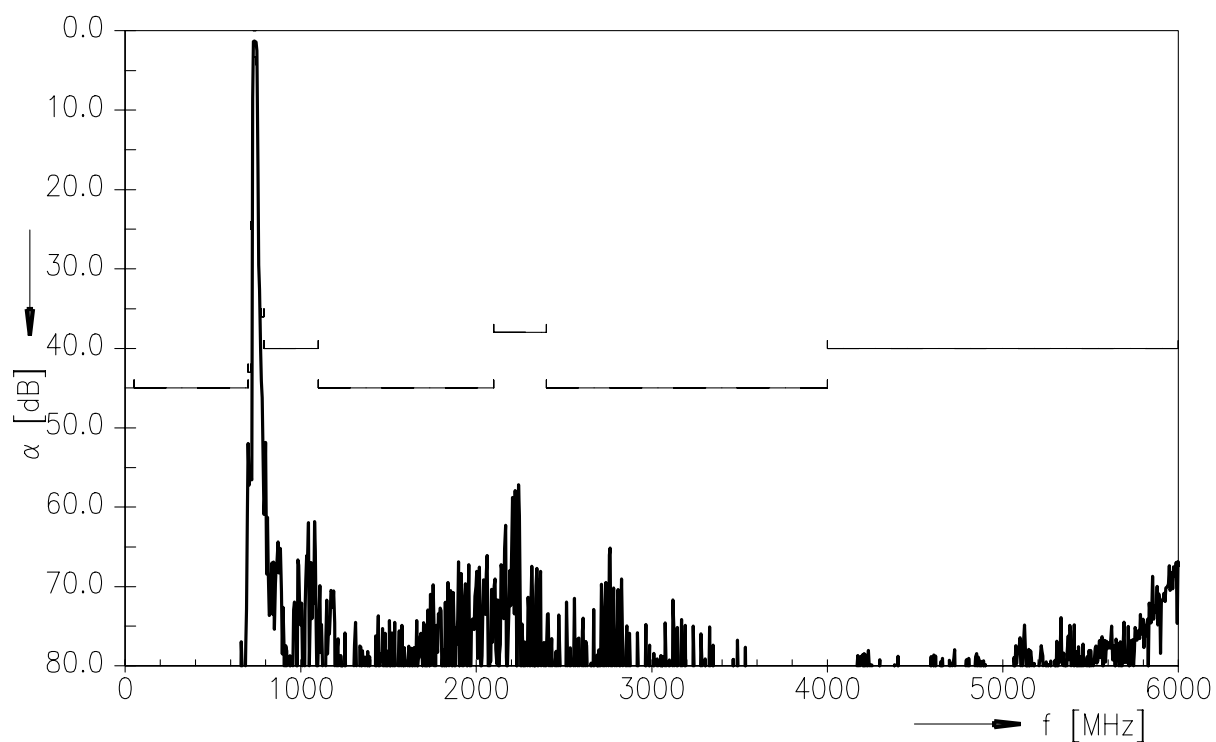
| | | min. | typ. @ 25 °C | max. | |
|--------------------------------------|-----------------|------|-----------------|-------------------|-----|
| Center frequency | f_C | — | 737.5 | — | MHz |
| Maximum insertion attenuation | α_{\max} | — | 1.9 | 3.3 ¹⁾ | dB |
| 729.0 ... 746.0 MHz | | | | | |
| Amplitude ripple (p-p) | $\Delta\alpha$ | — | 0.8 | 2.2 ²⁾ | dB |
| 729.0 ... 746.0 MHz | | | | | |
| VSWR | | — | 1.8 | 2.1 | |
| 729.0 ... 746.0 MHz | | | | | |
| Common mode rejection ratio | | 30 | 42 | — | dB |
| 729.0 ... 746.0 MHz | | | | | |
| Attenuation | α | | | | |
| 50.0 ... 700.0 MHz | | 45 | 51 | — | dB |
| 700.0 ... 716.0 MHz | | 43 | 48 | — | dB |
| 716.0 ... 722.0 MHz | | 25 | 40 | — | dB |
| 776.0 ... 791.0 MHz | | 36 | 42 | — | dB |
| 791.0 ... 1100.0 MHz | | 40 | 48 | — | dB |
| 1100.0 ... 2100.0 MHz | | 45 | 58 | — | dB |
| 2100.0 ... 2400.0 MHz | | 38 | 49 | — | dB |
| 2400.0 ... 4000.0 MHz | | 45 | 60 | — | dB |
| 4000.0 ... 6000.0 MHz | | 40 | 55 | — | dB |

1) 3.0 dB for reduced temperature range $-30\text{ °C to }+85\text{ °C}$

2) 1.9 dB for reduced temperature range $-30\text{ °C to }+85\text{ °C}$

Maximum ratings

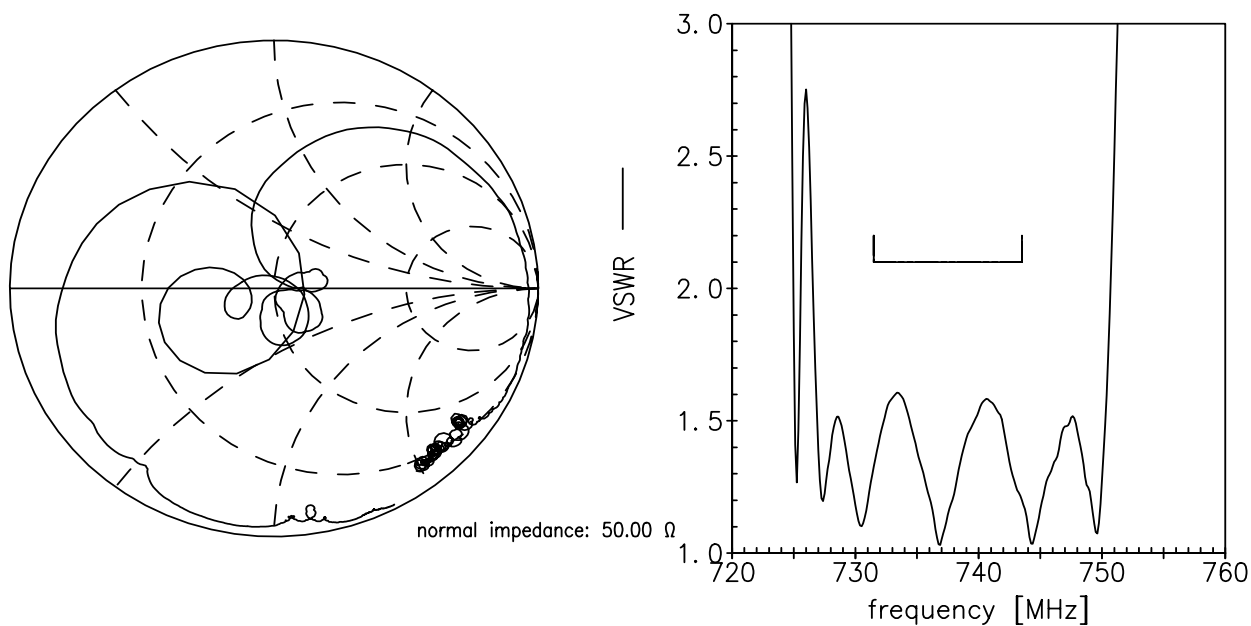
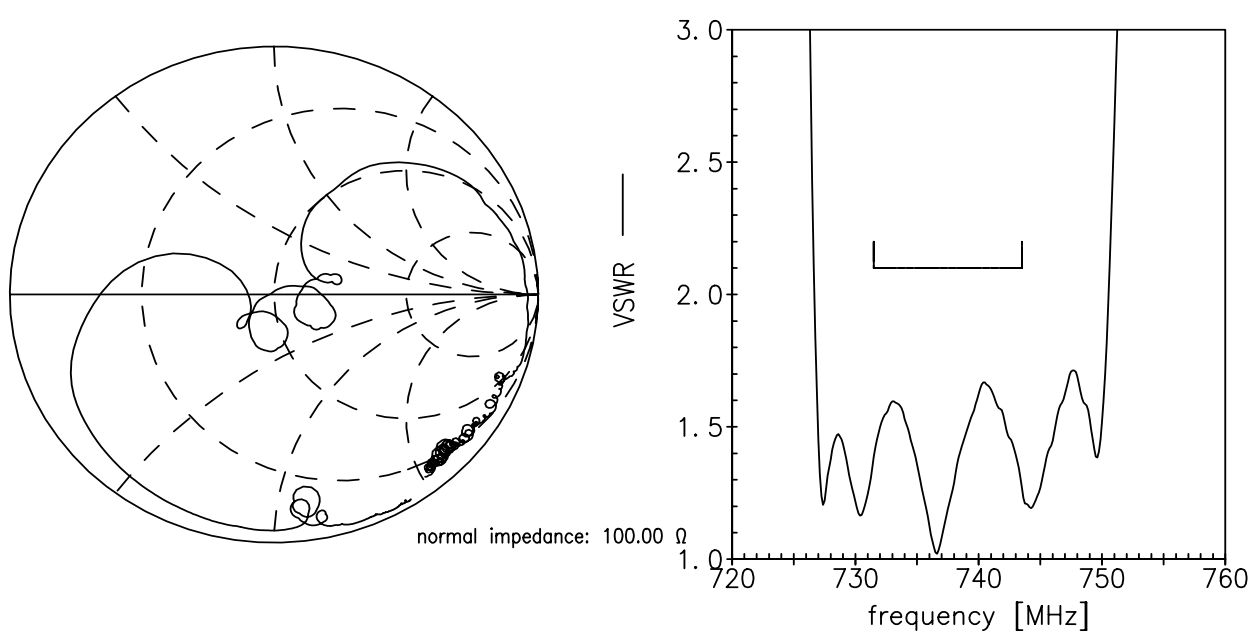
| | | | | |
|----------------------------|------------------|---------|-----|--|
| Operable temperature range | T | −40/+85 | °C | |
| Storage temperature range | T _{stg} | −40/+85 | °C | |
| DC voltage | V _{DC} | 0 | V | |
| Input power | P _{IN} | 10 | dBm | Continuous wave for 100000 h @ 85 C |
| Input power | P _{IN} | 13 | dBm | Continuous wave for 100000 h @ 55 C |

Transfer function

Transfer function (wideband)


Data sheet



Smith chart

 S_{11} function

 S_{22} function


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.

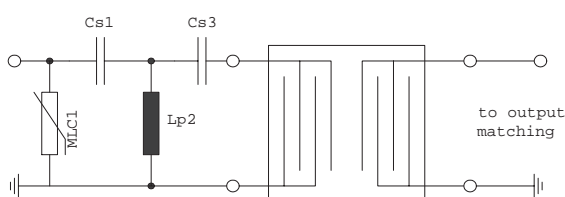


Fig. 1 MLC varistor plus ESD matching

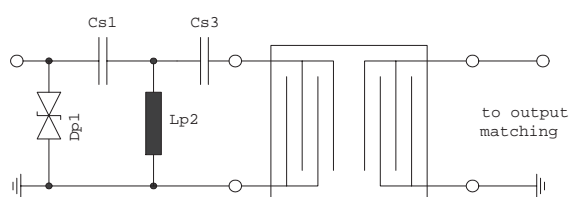


Fig. 2 Suppressor diode plus ESD matching

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

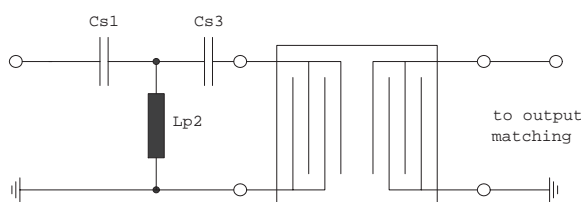


Fig. 3 3rd order high-pass structure for basic ESD protection

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 | B4345 |
| Ordering code | B39741B4345P810 |
| Marking and package | C61157-A8-A9 |
| Packaging | F61074-V8237-Z000 |
| Date codes | L_1126 |
| S-parameters | B4345_NB.s3p, B4345_WB.s3p 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. |
| Moldability | Before using in overmolding environment, please contact your EPCOS sales office. |
| Matching coils | See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm for a large variety of matching coils. |

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