SAW Components

SAW Tx filter

Automotive Telematics

Series/type: B4343
Ordering code: B39262B4343P810
Date: April 14, 2015
Version: 2.1
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SAW Components

SAW Tx filter

Data sheet

Application

- Low-loss RF Tx filter for TD-LTE Band 38 systems
- No matching network required for operation at 50 Ω
- Usable passband 40 MHz

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

Please read cautions and warnings and important notes at the end of this document.
Characteristics

Temperature range for specification: $T = -30 \, ^\circ C$ to $+85 \, ^\circ C$
Terminating source impedance: $Z_S = 50 \, \Omega$
Terminating load impedance: $Z_L = 50 \, \Omega$

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>min.</th>
<th>typ.</th>
<th>max.</th>
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</thead>
<tbody>
<tr>
<td>Nominal frequency $f_c$</td>
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<td>2595.0</td>
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<tr>
<td>Maximum insertion attenuation $\alpha_{\text{max}}$</td>
<td></td>
<td>1.4</td>
<td>2.4</td>
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<tr>
<td>Amplitude ripple (p-p) $\Delta\alpha$</td>
<td></td>
<td>0.3</td>
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<td>VSWR</td>
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<td>Attenuation $\alpha$</td>
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## Maximum ratings

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<td>T&lt;sub&gt;stag&lt;/sub&gt;</td>
<td>-40/+85</td>
<td>°C</td>
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<td>DC voltage</td>
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<td>V</td>
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<tr>
<td>Input power</td>
<td>P&lt;sub&gt;IN&lt;/sub&gt;</td>
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<td>dBm</td>
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- CW for 5000h @ 55°C
SAW Components  
SAW Tx filter  
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**Frequency response** (narrowband)

![Frequency response (narrowband)](image_url)

**Frequency response** (wideband)

![Frequency response (wideband)](image_url)
SAW Components

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Smith chart

$S_{11}$ function

$S_{22}$ function
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

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

**Fig. 2** Suppressor diode plus ESD matching

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](http://www.epcos.com/rke). Click on “Applications Notes”.

Please read cautions and warnings and important notes at the end of this document.
## SAW Components

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### Data sheet

#### References

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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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