



# SAW Components

## SAW filter

WiMAX

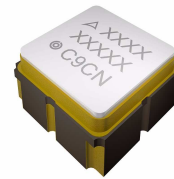
|                       |                        |
|-----------------------|------------------------|
| <b>Series/type:</b>   | <b>B5139</b>           |
| <b>Ordering code:</b> | <b>B39262B5139U410</b> |
| <b>Date:</b>          | <b>June 18, 2013</b>   |
| <b>Version:</b>       | <b>2.2</b>             |

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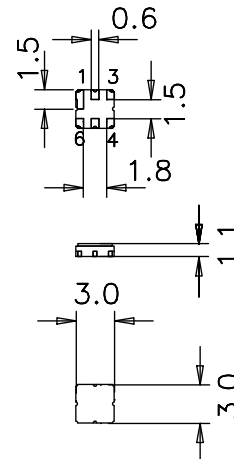
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**Application**

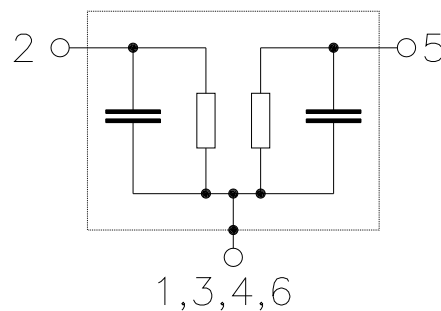
- Low-loss RF filter for WiMAX application
- Low amplitude ripple
- Matching network required for operation at 50Ω
- Usable passband 50 MHz
- Unbalanced to Unbalanced operation


**Features**

- Package size 3.0 x 3.0 x 1.1 mm<sup>3</sup>
- Package code DCC6C
- RoHS compatible
- Approximate weight 0.037 g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 1
- Filter surface passivated


**Pin configuration**

- 2 Input
- 5 Output
- 1,3,4,6 To be grounded



**Data sheet**

**Characteristics**

Temperature range for specification:  $T = -40\text{ °C to }+85\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\Omega$  with matching network  
 Terminating load impedance:  $Z_L = 50\Omega$  with matching network

|                                      |                 | min. | typ.<br>@ 25 °C | max. |     |
|--------------------------------------|-----------------|------|-----------------|------|-----|
| <b>Center frequency</b>              | $f_C$           | —    | 2593.0          | —    | MHz |
| <b>Maximum insertion attenuation</b> | $\alpha_{\max}$ |      |                 |      |     |
| 2568.0 ... 2618.0 MHz                |                 | —    | 2.4             | 3.5  | dB  |
| <b>Amplitude ripple (p-p)</b>        | $\Delta\alpha$  |      |                 |      |     |
| 2568.0 ... 2618.0 MHz                |                 | —    | 1.0             | 1.5  | dB  |
| <b>Input VSWR</b>                    |                 |      |                 |      |     |
| 2568.0 ... 2618.0 MHz                |                 | —    | 1.7             | 2.1  |     |
| <b>Output VSWR</b>                   |                 |      |                 |      |     |
| 2568.0 ... 2618.0 MHz                |                 | —    | 1.5             | 2.1  |     |
| <b>Attenuation</b>                   | $\alpha$        |      |                 |      |     |
| 10.0 ... 2450.0 MHz                  |                 | 20.0 | 30.0            | —    | dB  |
| 2450.0 ... 2500.0 MHz                |                 | 25.0 | 27.0            | —    | dB  |
| 2500.0 ... 2525.0 MHz                |                 | 11.0 | 13.0            | —    | dB  |
| 2662.0 ... 2670.0 MHz                |                 | 10.0 | 24.0            | —    | dB  |
| 2670.0 ... 2690.0 MHz                |                 | 17.0 | 31.0            | —    | dB  |
| 2690.0 ... 3500.0 MHz                |                 | 25.0 | 27.0            | —    | dB  |
| 3500.0 ... 4000.0 MHz                |                 | 25.0 | 38.0            | —    | dB  |

|                       |                   |
|-----------------------|-------------------|
| <b>SAW Components</b> | <b>B5139</b>      |
| <b>SAW filter</b>     | <b>2593.0 MHz</b> |

Data sheet



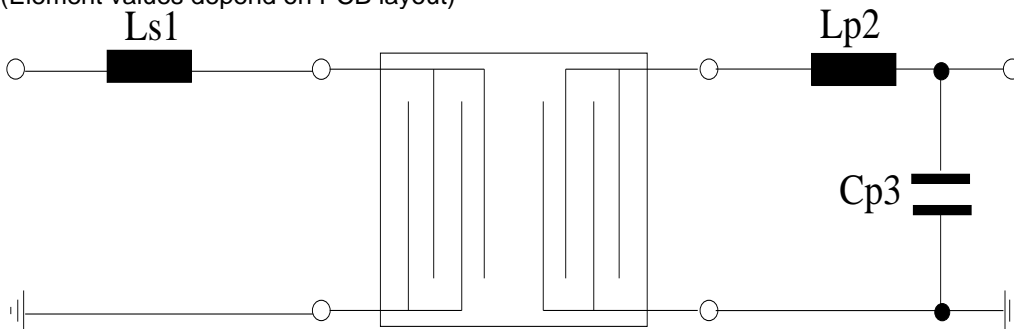
**Maximum ratings**

|                            |                  |                  |     |                          |
|----------------------------|------------------|------------------|-----|--------------------------|
| Operable temperature range | T                | -45/+125         | °C  |                          |
| Storage temperature range  | T <sub>stg</sub> | -45/+125         | °C  |                          |
| DC voltage                 | V <sub>DC</sub>  | 6                | V   |                          |
| ESD voltage                | V <sub>ESD</sub> | 50 <sup>1)</sup> | V   | machine model, 10 pulses |
| Input power                |                  |                  |     |                          |
| 2568.0 ... 2618MHz         | P <sub>IN</sub>  | 14               | dBm | CW, 10K hours, 85°C      |
|                            |                  | 13.5             | dBm | CW, 20K hours, 85°C      |
|                            |                  | 10.0             | dBm | CW, 100K hours, 85°C     |

<sup>1)</sup> acc. to JESD22-A115B (machine model), 10 negative & 10 positive pulses.

**Testing Matching Network**

(Element values depend on PCB layout)



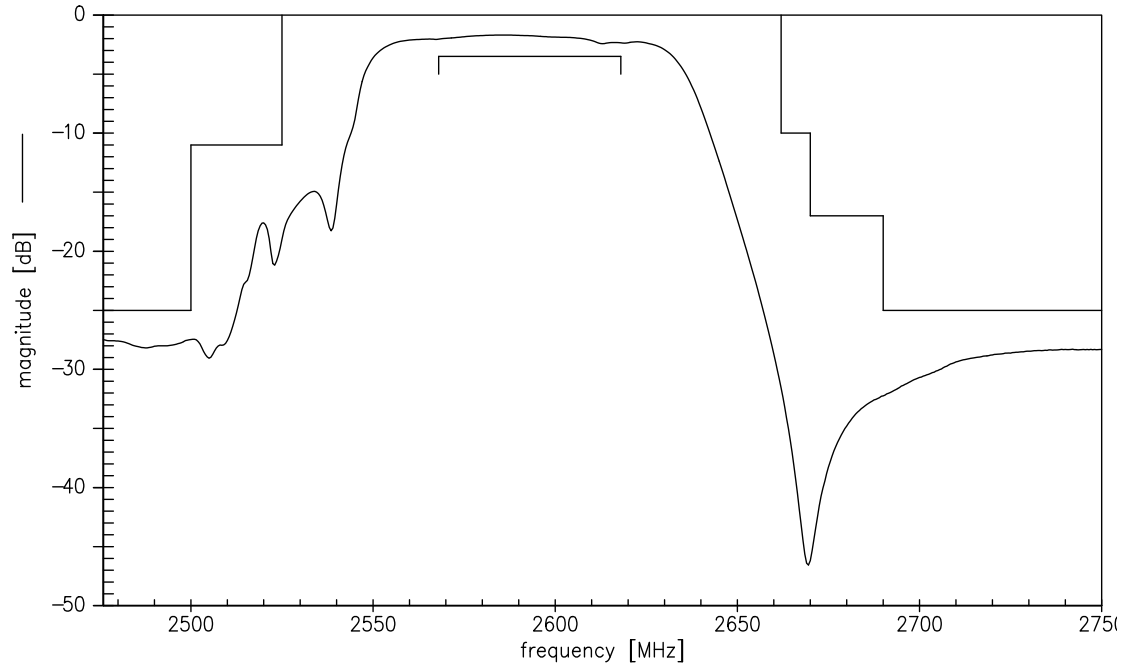
Ls1 = 1.0 nH

Lp2 = 1.0nH

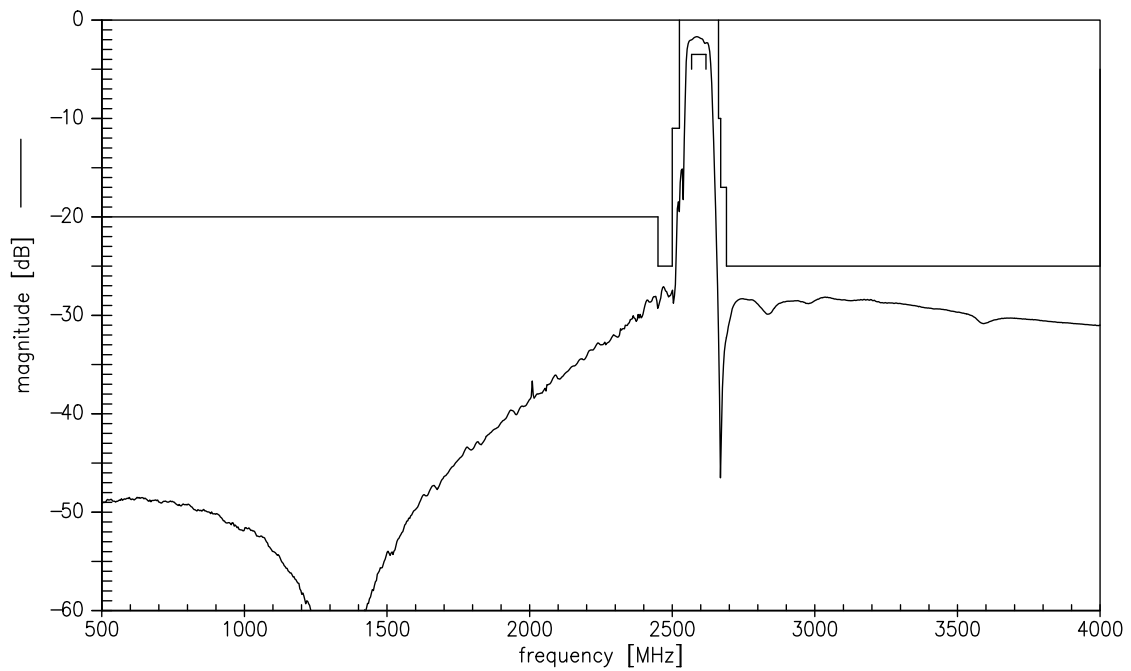
Cp3 = 1.0pF

Element values depend upon board layout.

**Transfer function**



**Transfer function (wideband)**

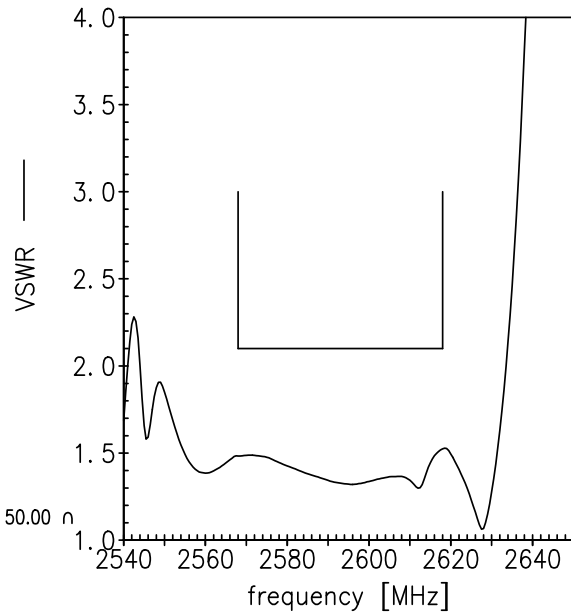
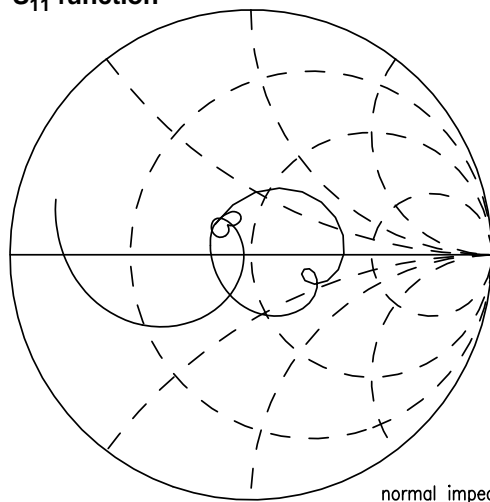


Data sheet

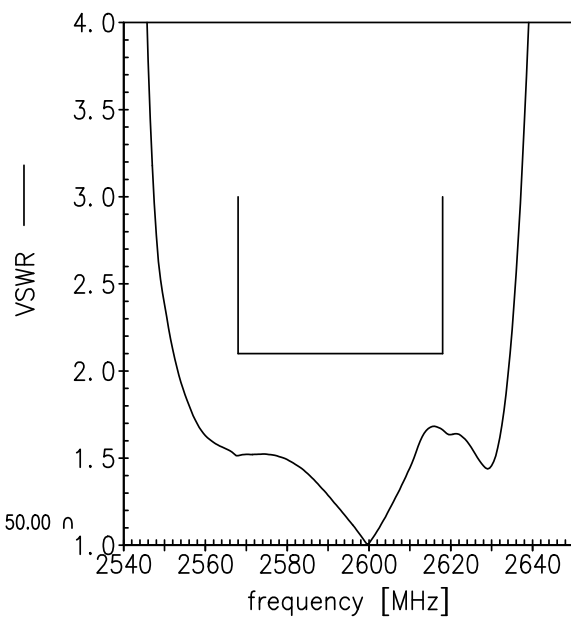
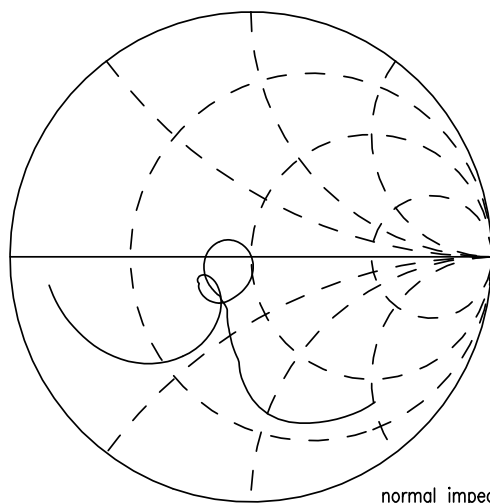
**SMD**

Smith charts

**S<sub>11</sub> function**



**S<sub>22</sub> function**



|                       |                   |
|-----------------------|-------------------|
| <b>SAW Components</b> | <b>B5139</b>      |
| <b>SAW filter</b>     | <b>2593.0 MHz</b> |

Data sheet



#### References

|                            |  |
|----------------------------|--|
| <b>Type</b>                | B5139  |
| <b>Ordering code</b>       | B39262B5139U410  |
| <b>Marking and package</b> | C61157-A8-A67  |
| <b>Packaging</b>           | F61074-V8168-Z000  |
| <b>Date codes</b>          | L_1126   |
| <b>S-parameters</b>        | B5139_NB.s2p B5139_WB.s2p<br>see file header for port/pin assignment table   |
| <b>Soldering profile</b>   | S_6001   |
| <b>RoHS compatible</b>     | 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. |
| <b>Matching coils</b>      | See Inductor pdf-catalog<br><a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a><br>and Data Library for circuit simulation<br><a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a><br>for a large variety of matching coils.  |

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**Published by EPCOS AG**  
**Surface Acoustic Wave Components Division**  
**P.O. Box 80 17 09, 81617 Munich, GERMANY**

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