



## SAW Components

SAW IF filter

WiMAX

|                       |                          |
|-----------------------|--------------------------|
| <b>Series/type:</b>   | <b>B5040</b>             |
| <b>Ordering code:</b> | <b>B39471-B5040-H810</b> |
| Date:                 | Mar 16, 2006             |
| Version:              | 2.1                      |

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468.0 MHz

Data Sheet

SMD

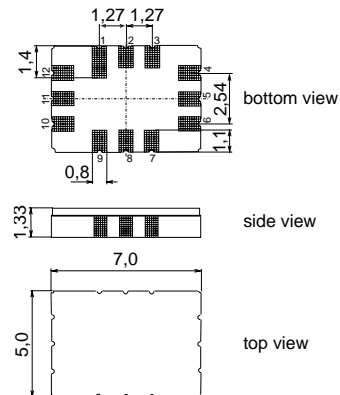
### Application

- Low-loss IF filter for WiMAX
- Usable passband 4.5 MHz



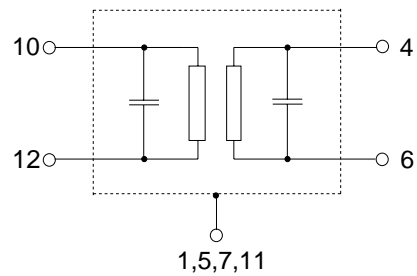
### Features

- Package size 7.0 x 5.0 x 1.33 mm<sup>3</sup>
- Package code QCC12E
- RoHS compatible
- Approx. weight 0.2 g
- Ceramic package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



### Pin configuration

- 10 Input
- 12 Input ground
- 4 Output
- 6 Output ground
- 2, 3, 8, 9 To be grounded
- 1, 5, 7, 11 Case ground



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


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**Characteristics**

|                               |   |
|-------------------------------|---|
| Operating temperature range:  | $T = -40$ to $85$ °C                                |
| Terminating source impedance: | $Z_S = 50 \Omega$ single ended and matching network |
| Terminating load impedance:   | $Z_L = 50 \Omega$ single ended and matching network |

|  |                                       | min. | typ.<br>@ 25 °C | max. |                    |
|--|---------------------------------------|------|-----------------|------|--------------------|
| <b>Nominal frequency</b>   | $f_N$                                 | —    | 468.0           | —    | MHz                |
| <b>Minimum insertion attenuation</b><br>(including matching network) | $\alpha_{\min}$                       | —    | 11.2            | 13.0 | dB                 |
| <b>Amplitude ripple (p-p)</b>  | $\Delta\alpha$                        |      |                 |      |                    |
|  | $f_N \pm 2.25$ MHz                    | —    | 0.6             | 1.2  | dB                 |
|  | $f_N \pm 2.50$ MHz                    | —    | 1.3             | 2.0  | dB                 |
| <b>Group delay ripple (p-p)</b>                                      | $\Delta\tau$                          |      |                 |      |                    |
|  | $f_N \pm 2.25$ MHz                    | —    | 120             | 250  | ns                 |
| <b>Absolute group delay</b>  |                                       |      |                 |      |                    |
|  | $f_N \pm 2.50$ MHz                    | —    | 0.5             | 1.5  | $\mu$ s            |
| <b>Relative attenuation</b> (relative to $\alpha_{\min}$ )           | $\alpha_{\text{rel}}$                 |      |                 |      |                    |
|  | $f_N \pm 3.5$ ... $f_N \pm 5.0$ MHz   | 10   | 15              | —    | dB                 |
|  | $f_N \pm 5.0$ ... $f_N \pm 10.0$ MHz  | 35   | 42              | —    | dB                 |
|  | $f_N \pm 10.0$ ... $f_N \pm 20.0$ MHz | 40   | 48              | —    | dB                 |
|  | 30.0 MHz ... $f_N - 20.0$ MHz         | 50   | 57              | —    | dB                 |
|  | $f_N + 20.0$ MHz ... $f_N + 24.0$ MHz | 45   | 52              | —    | dB                 |
|  | $f_N + 24.0$ MHz ... 1000 MHz         | 50   | 55              | —    | dB                 |
| <b>Return loss, input</b>  | $f_N \pm 2.25$ MHz                    | 8    | 12              | —    | dB                 |
| <b>Return loss, output</b>   | $f_N \pm 2.25$ MHz                    | 8    | 20              | —    | dB                 |
| <b>Temperature coefficient of frequency<sup>1)</sup></b>             | $TC_f$                                | —    | -0.036          | —    | ppm/K <sup>2</sup> |
| <b>Turnover temperature</b>  | $T_0$                                 | —    | 20              | —    | °C                 |

<sup>1)</sup> Temperature dependence of  $f_c$ :  $f_c(T_A) = f_c(T_0) (1 + TC_f(T_A - T_0)^2)$



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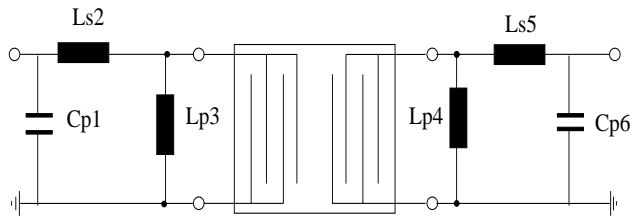
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468.0 MHz

Data Sheet



Matching network to 50 Ω



$C_{p1}$  = not used  
 $L_{s2}$  = 47.0 nH  
 $L_{p3}$  = 22.0 nH  
 $L_{p4}$  = not used  
 $L_{s5}$  = 18.0 nH  
 $C_{p6}$  = 18.0 pF

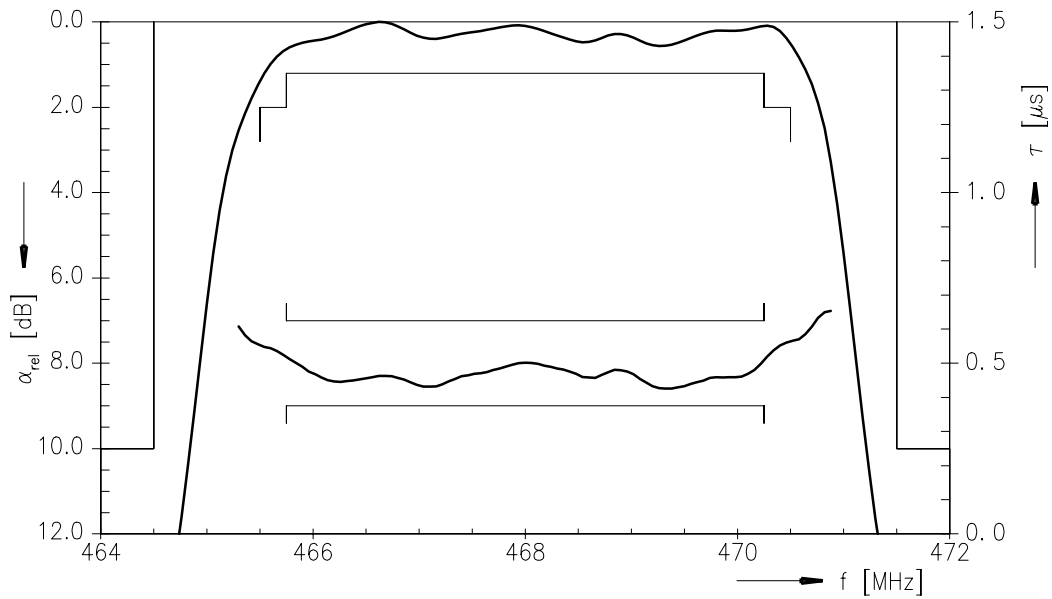
Maximum ratings

|                            |                  |                   |     |                  |
|----------------------------|------------------|-------------------|-----|------------------|
| Operable temperature range | T                | -40/+85           | °C  | HBM; 5 pulse +/- |
| Storage temperature range  | T <sub>sta</sub> | -40/+85           | °C  |                  |
| DC voltage                 | V <sub>DC</sub>  | 0                 | V   |                  |
| ESD voltage                | V <sub>ESD</sub> | 500 <sup>1)</sup> | V   |                  |
| Input power (average)      | P <sub>IN</sub>  | 5                 | dBm |                  |
| Input power (peak)         | P <sub>IN</sub>  | 15                | dBm |                  |

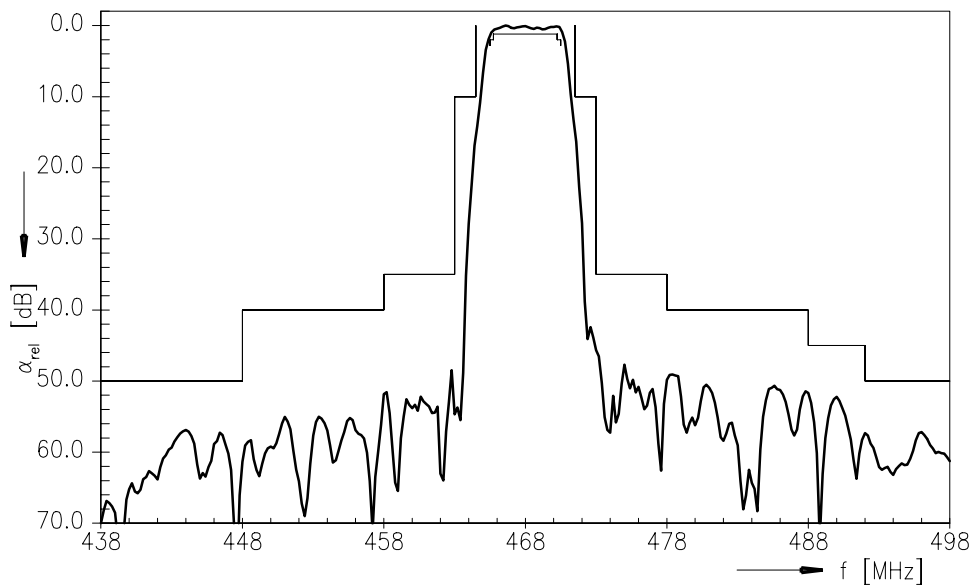
1) acc. to JESD22A-A114-B (Human body model, 5 pulses +/-).



Transfer function



Transfer function (wideband)



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



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## References

|                            |  |
|----------------------------|--|
| <b>Type</b>                | B5040  |
| <b>Ordering code</b>       | B39471-B5040-H810  |
| <b>Marking and package</b> | C61157-A7-A103   |
| <b>Packaging</b>           | F61074-V8170-Z000  |
| <b>Date codes</b>          | L_1126   |
| <b>S-parameters</b>        |  |
| <b>Soldering profile</b>   | S_6001   |
| <b>RoHS compatible</b>     | defined as compatible with the following documents:<br>"DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment." |

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