



## **SAW Components**

### **SAW Tx filter**

WCDMA Band II (PCS-Band)

|                       |                        |
|-----------------------|------------------------|
| <b>Series/type:</b>   | <b>B9428</b>           |
| <b>Ordering code:</b> | <b>B39192B9428K610</b> |
| <b>Date:</b>          | <b>March 02, 2007</b>  |
| <b>Version:</b>       | <b>1.0</b>             |



Preliminary data



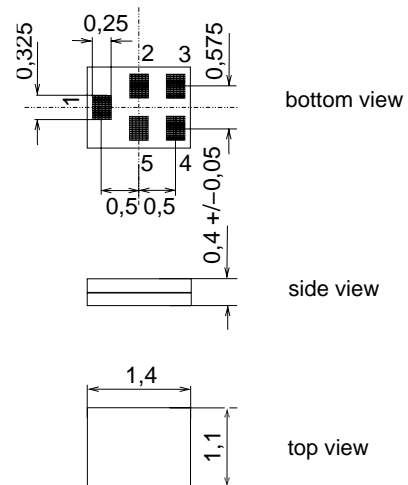
Application

- Low-loss RF filter for mobile telephone WCDMA system (Band II, PCS band), transmit path (TX)
- Usable passband 60 MHz
- Balanced to unbalanced operation
- Impedance transformation from 200 Ω to 50 Ω
- High RX suppression



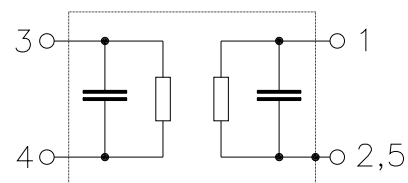
Features

- Package size 1.4 x 1.1 x 0.4 mm<sup>3</sup>
- Package code QCS5F
- RoHS compatible
- Approximate weight 0.003 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

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





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**1880.0 MHz**

**Preliminary data**



**Characteristics**

Temperature range for specification:  $T = -20\text{ °C to }+75\text{ °C}$   
 Terminating source impedance:  $Z_S = 200\ \Omega \parallel 27\text{ nH (balanced)}$   
 Terminating load impedance:  $Z_L = 50\ \Omega \text{ (unbalanced)}$

|   |                           | LP05B <sup>1)</sup> |                 |                   |     |
|---|---------------------------|---------------------|-----------------|-------------------|-----|
|   |                           | min.                | typ.<br>@ 25 °C | max.              |     |
| <b>Center frequency</b>   | $f_C$                     | —                   | 1880.0          | —                 | MHz |
| <b>Maximum insertion attenuation</b>  | $\alpha_{\max}$           |                     |                 |                   |     |
|   | 1850.625 ... 1909.375 MHz | —                   | 2.7             | 4.2 <sup>2)</sup> | dB  |
| <b>Amplitude ripple (p-p)</b>   | $\Delta\alpha$            |                     |                 |                   |     |
|   | 1850.625 ... 1909.375 MHz | —                   | 0.7             | 2.3 <sup>3)</sup> | dB  |
| <b>Input VSWR</b>   |                           |                     |                 |                   |     |
|   | 1850.625 ... 1909.375 MHz | —                   | 1.9             | 2.2               |     |
| <b>Output VSWR</b>  |                           |                     |                 |                   |     |
|   | 1850.625 ... 1909.375 MHz | —                   | 1.8             | 2.1               |     |
| <b>Input amplitude balance (<math> S_{31}/S_{21} </math>)</b>                     |                           |                     |                 |                   |     |
|   | 1850.625 ... 1909.375 MHz | -1.4                | -0.7/+0.6       | 1.4               | dB  |
| <b>Input phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^\circ</math>)</b> |                           |                     |                 |                   |     |
|   | 1850.625 ... 1909.375 MHz | -10                 | -5/+0           | 10                | °   |
| <b>Attenuation</b>  | $\alpha$                  |                     |                 |                   |     |
|   | 0.0 ... 1570.0 MHz        | 30                  | 52              | —                 | dB  |
|   | 1570.0 ... 1770.0 MHz     | 30                  | 40              | —                 | dB  |
|   | 1770.0 ... 1830.0 MHz     | 22                  | 36              | —                 | dB  |
|   | 1930.625 ... 1989.4 MHz   | 28                  | 30              | —                 | dB  |
|   | 1989.4 ... 2500.0 MHz     | 28                  | 31              | —                 | dB  |
|   | 2500.0 ... 6000.0 MHz     | 25                  | 41              | —                 | dB  |

<sup>1)</sup> Values in columns min, typ and max indicate the development status of the current version.

<sup>2)</sup> 4.7 dB max. at -30 °C ... 85 °C

<sup>3)</sup> 2.8 dB max. at -30 °C ... 85 °C



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 Terminating source impedance:  $Z_S = 200\ \Omega \parallel 27\text{ nH (balanced)}$   
 Terminating load impedance:  $Z_L = 50\ \Omega \text{ (unbalanced)}$

|   |                 | LP05B <sup>1)</sup> |                 |                   |     |
|---|-----------------|---------------------|-----------------|-------------------|-----|
|   |                 | min.                | typ.<br>@ 25 °C | max.              |     |
| <b>Center frequency</b>   | $f_C$           | —                   | 1880.0          | —                 | MHz |
| <b>Maximum insertion attenuation</b>  | $\alpha_{\max}$ |                     |                 |                   |     |
| 1850.0 ... 1910.0   | MHz             | —                   | 2.8             | 4.6 <sup>2)</sup> | dB  |
| <b>Amplitude ripple (p-p)</b>   | $\Delta\alpha$  |                     |                 |                   |     |
| 1850.0 ... 1910.0   | MHz             | —                   | 0.8             | 2.7 <sup>3)</sup> | dB  |
| <b>Input VSWR</b>   |                 |                     |                 |                   |     |
| 1850.0 ... 1910.0   | MHz             | —                   | 1.9             | 2.2               |     |
| <b>Output VSWR</b>  |                 |                     |                 |                   |     |
| 1850.0 ... 1910.0   | MHz             | —                   | 1.8             | 2.1               |     |
| <b>Input amplitude balance (<math> S_{31}/S_{21} </math>)</b>                     |                 |                     |                 |                   |     |
| 1850.0 ... 1910.0   | MHz             | -1.4                | -0.7/0.6        | 1.4               | dB  |
| <b>Input phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^\circ</math>)</b> |                 |                     |                 |                   |     |
| 1850.0 ... 1910.0   | MHz             | -10                 | -5/+0           | 10                | °   |
| <b>Attenuation</b>  | $\alpha$        |                     |                 |                   |     |
| 0.0 ... 1570.0  | MHz             | 30                  | 52              | —                 | dB  |
| 1570.0 ... 1770.0   | MHz             | 30                  | 39              | —                 | dB  |
| 1770.0 ... 1830.0   | MHz             | 22                  | 36              | —                 | dB  |
| 1930.0 ... 1990.0   | MHz             | 27                  | 30              | —                 | dB  |
| 1990.0 ... 2500.0   | MHz             | 28                  | 32              | —                 | dB  |
| 2500.0 ... 6000.0   | MHz             | 25                  | 41              | —                 | dB  |

<sup>1)</sup> Values in columns min, typ and max indicate the development status of the current version.

<sup>2)</sup> 5.2 dB max. at -30 °C ... 85 °C

<sup>3)</sup> 3.3 dB max. at -30 °C ... 85 °C



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**1880.0 MHz**

Preliminary data



**Maximum ratings**

|                            |                  |                  |     |                          |
|----------------------------|------------------|------------------|-----|--------------------------|
| Operable temperature range | T                | -30/+85          | °C  |                          |
| Storage temperature range  | T <sub>stg</sub> | -40/+85          | °C  |                          |
| DC voltage                 | V <sub>DC</sub>  | 5                | V   |                          |
| ESD voltage                | V <sub>ESD</sub> | 50 <sup>1)</sup> | V   | machine model, 10 pulses |
| Input power                | P <sub>IN</sub>  | 12               | dBm | @ 55 °C ambient          |

<sup>1)</sup> acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.



SAW Components

B9428

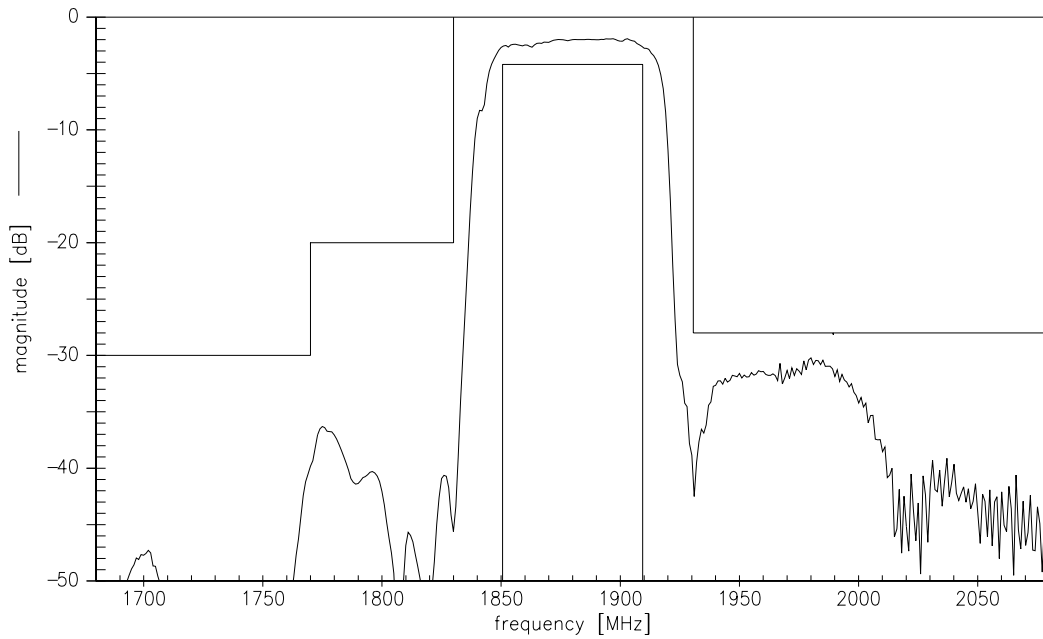
SAW Tx filter

1880.0 MHz

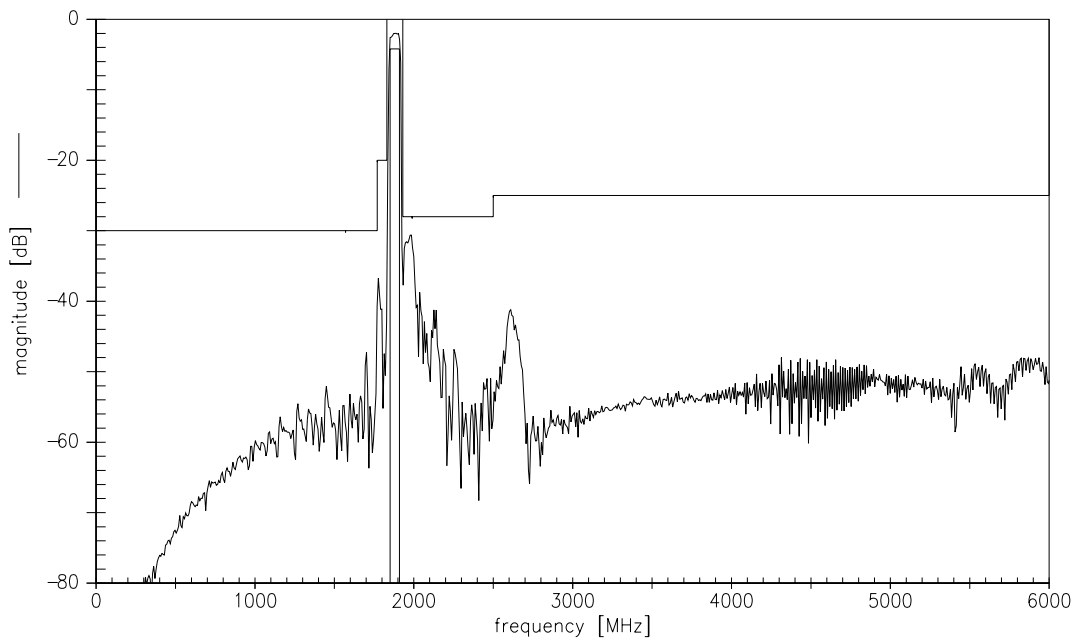
Preliminary data



Transfer function



Transfer function (wideband)



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

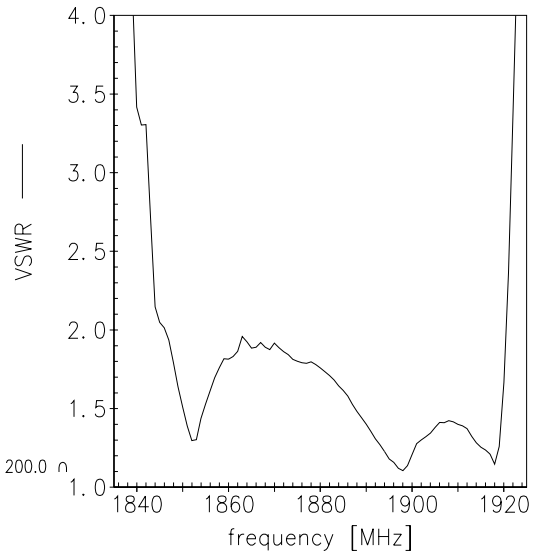
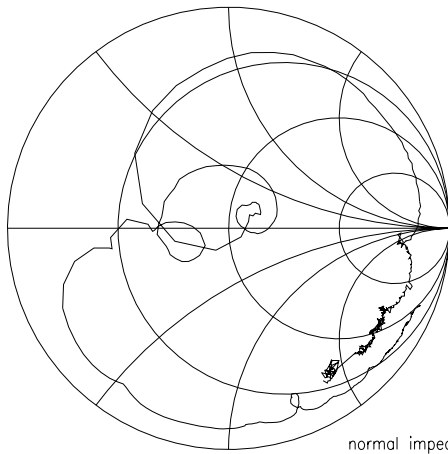


Preliminary data

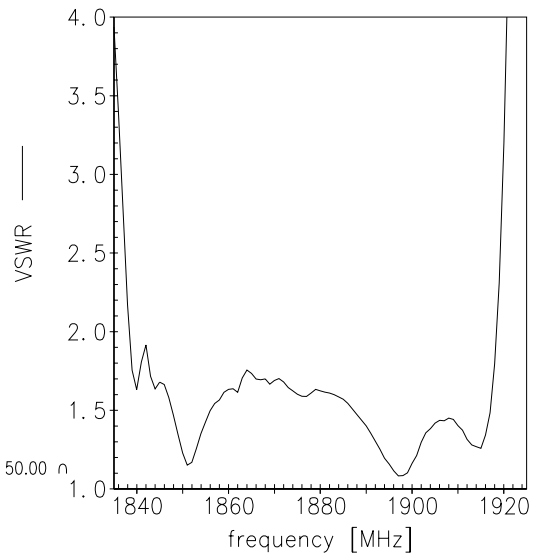
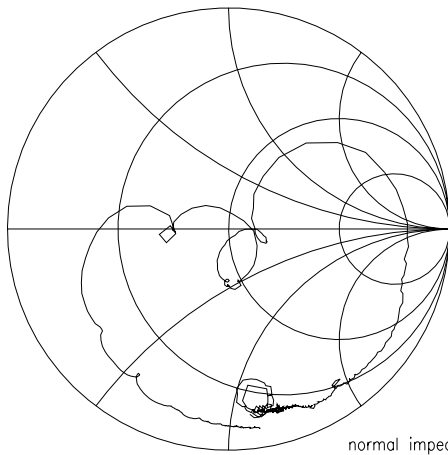


Smith charts

S<sub>11</sub> function



S<sub>22</sub> function





|                         |                   |
|-------------------------|-------------------|
| <b>SAW Components</b>   | <b>B9428</b>      |
| <b>SAW Tx filter</b>    | <b>1880.0 MHz</b> |
| <b>Preliminary data</b> | <b>SMD</b>        |

## References

|                            |  |
|----------------------------|--|
| <b>Type</b>                | B9428  |
| <b>Ordering code</b>       |  |
| <b>Marking and package</b> | C61157-A8-A1   |
| <b>Packaging</b>           | F61074-V8212-Z000  |
| <b>Date codes</b>          | L_1126   |
| <b>S-parameters</b>        | B9428_NB.s3p<br>B9428_WB.s3p   |
| <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." |
| <b>Moldability</b>         | Before using in overmolding environment, please contact your EPCOS sales office.   |

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