



## **SAW Components**

### **SAW Rx Filter**

GSM 1900

|                       |                          |
|-----------------------|--------------------------|
| <b>Series/Type:</b>   | <b>B9403</b>             |
| <b>Ordering code:</b> | <b>B39202-B9403-K610</b> |
| <b>Date:</b>          | <b>Oct 21, 2005</b>      |
| <b>Version:</b>       | <b>2</b>                 |



## SAW Components

B9403

## Low-Loss Filter for Mobile Communication

1960.0 MHz

### Data Sheet



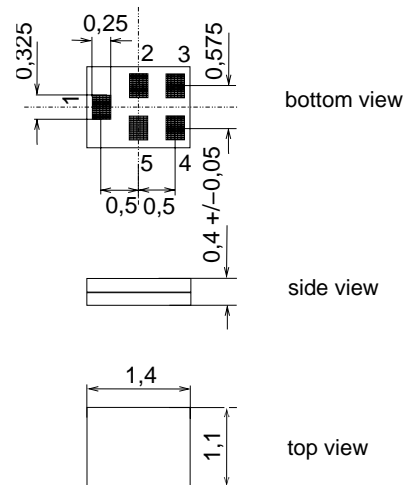
#### Application

- Low-loss RF filter for mobile telephone  
GSM 1900 systems, receive path (RX)
- Impedance transform from  $50 \Omega$  to  $150 \Omega$
- Unbalanced to balanced operation
- Very low insertion attenuation
- Low amplitude ripple
- Usable passband 60 MHz
- Suitable for GPRS class 1 to 12



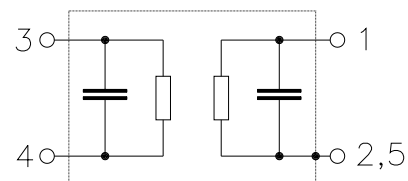
#### Features

- Package size  $1.4 \times 1.1 \times 0.4 \text{ mm}^3$
- RoHS compliant
- Approx. weight 0.003 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals



#### Pin configuration

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





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#### Characteristics

Operating temperature range:  $T = -20$  to  $+75$  °C  
Terminating source impedance:  $Z_S = 50\Omega$   
Terminating load impedance:  $Z_L = 150\Omega \parallel 18$  nH (balanced)

|  |                 | min. | typ.<br>@ 25°C | max. |     |
|--|-----------------|------|----------------|------|-----|
| <b>Center frequency</b>  | $f_C$           | —    | 1960           | —    | MHz |
| <b>Maximum insertion attenuation</b>   | $\alpha_{\max}$ | —    | 1.6            | 2.6  | dB  |
| 1930.0 ... 1990.0 MHz  |                 | —    | 1.6            | 2.6  | dB  |
| <b>Amplitude ripple (p-p)</b>  | $\Delta\alpha$  | —    | 0,7            | 1.4  | dB  |
| 1930.0 ... 1990.0 MHz  |                 | —    | 0,7            | 1.4  | dB  |
| <b>Input VSWR</b>  |                 | —    | 1.7            | 2.2  |     |
| 1930.0 ... 1990.0 MHz  |                 | —    | 1.7            | 2.2  |     |
| <b>Output VSWR</b>   |                 | —    | 1.7            | 2.2  |     |
| 1930.0 ... 1990.0 MHz  |                 | —    | 1.7            | 2.2  |     |
| <b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>                 |                 | —1.2 | -0.6/0.5       | 1.2  | dB  |
| 1930.0 ... 1990.0 MHz  |                 | —1.2 | -0.6/0.5       | 1.2  | dB  |
| <b>Output phase balance (<math>\phi(S_{31})-\phi(S_{21})+180^\circ</math>)</b> |                 | -10  | -1/+4          | 10   | °   |
| 1930.0 ... 1990.0 MHz  |                 | -10  | -1/+4          | 10   | °   |
| <b>Attenuation</b>   | $\alpha$        |      |                |      |     |
| 0.0 ... 1510.0 MHz   |                 | 40   | 46             | —    | dB  |
| 1510.0 ... 1830.0 MHz  |                 | 30   | 37             | —    | dB  |
| 1830.0 ... 1850.0 MHz  |                 | 26   | 32             | —    | dB  |
| 1850.0 ... 1890.0 MHz  |                 | 23   | 28             | —    | dB  |
| 1890.0 ... 1910.0 MHz  |                 | 12   | 18             | —    | dB  |
| 2010.0 ... 2070.0 MHz  |                 | 11.5 | 12.5           | —    | dB  |
| 2070.0 ... 2400.0 MHz  |                 | 27   | 29             | —    | dB  |
| 2400.0 ... 2500.0 MHz  |                 | 35   | 42             | —    | dB  |
| 2500.0 ... 3860.0 MHz  |                 | 28   | 33             | —    | dB  |
| 3860.0 ... 3980.0 MHz  |                 | 40   | 49             | —    | dB  |
| 3980.0 ... 5790.0 MHz  |                 | 28   | 42             | —    | dB  |
| 5790.0 ... 6000.0 MHz  |                 | 35   | 45             | —    | dB  |



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### 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 at             |                  |                  |     |  |
| GSM850, GSM900             | P <sub>IN</sub>  | 15               | dBm | effective power in the on-state,<br>duty cycle 4:8 |
| GSM1800, GSM1900           | P <sub>IN</sub>  | 15               | dBm |  |
| Tx bands                   |                  |                  |     |  |

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



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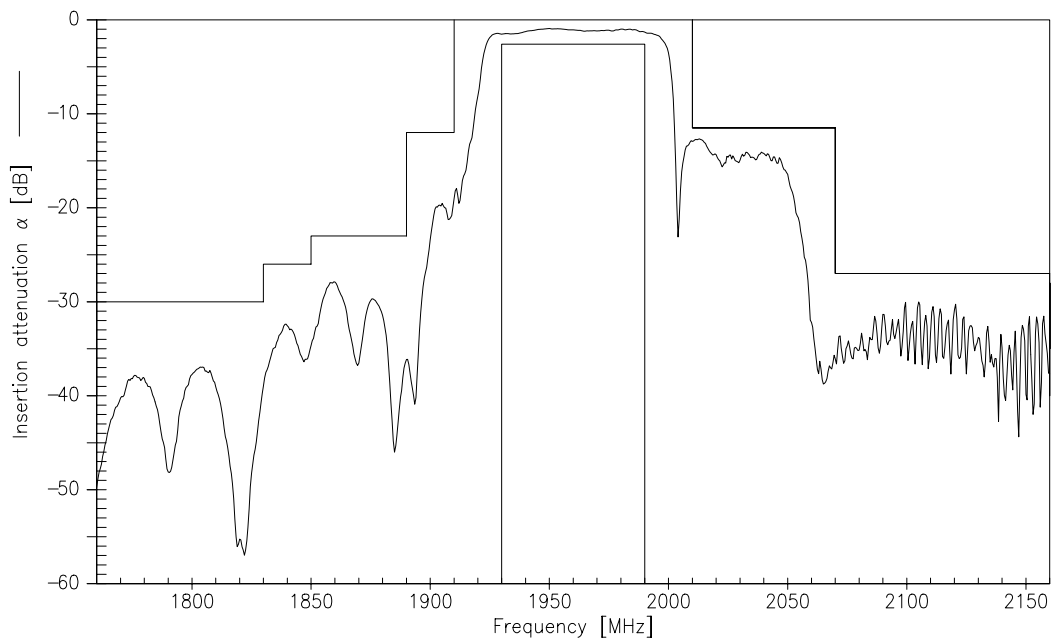
## Low-Loss Filter for Mobile Communication

1960.0 MHz

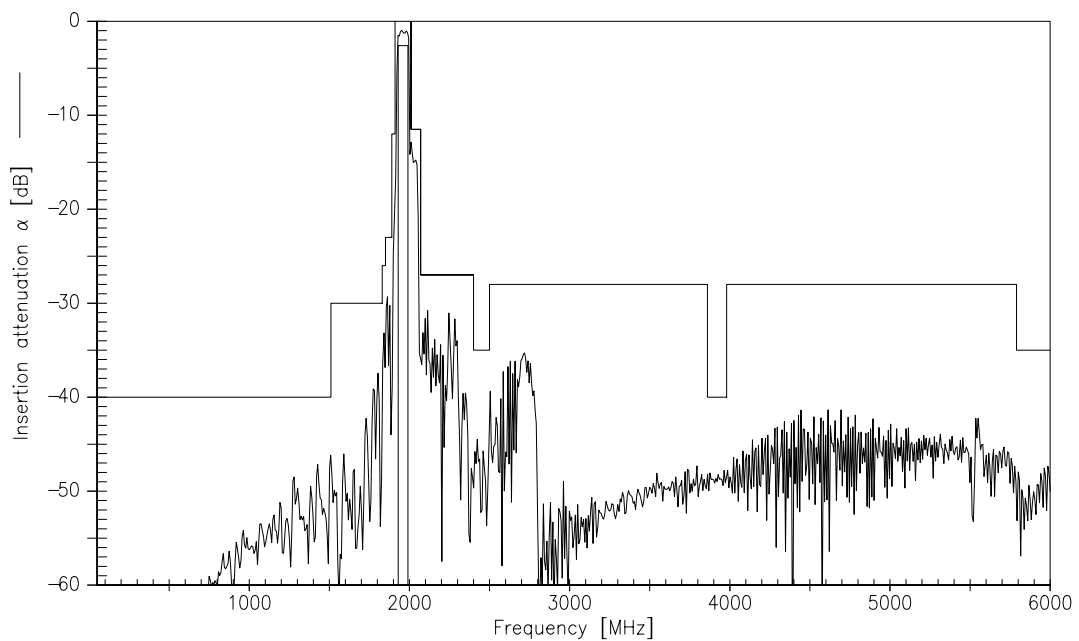
### Data Sheet



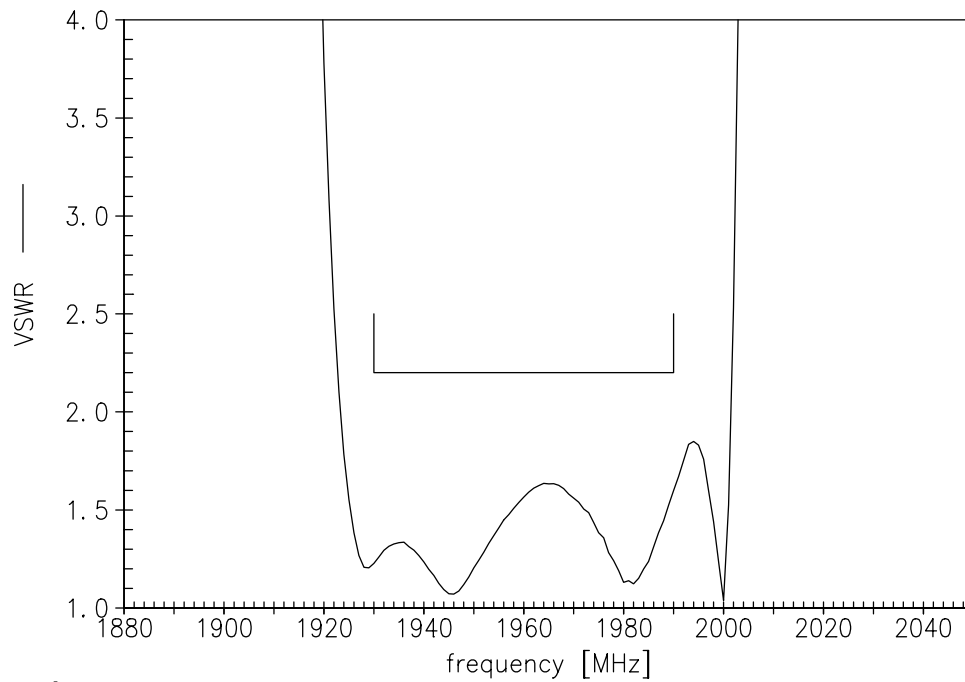
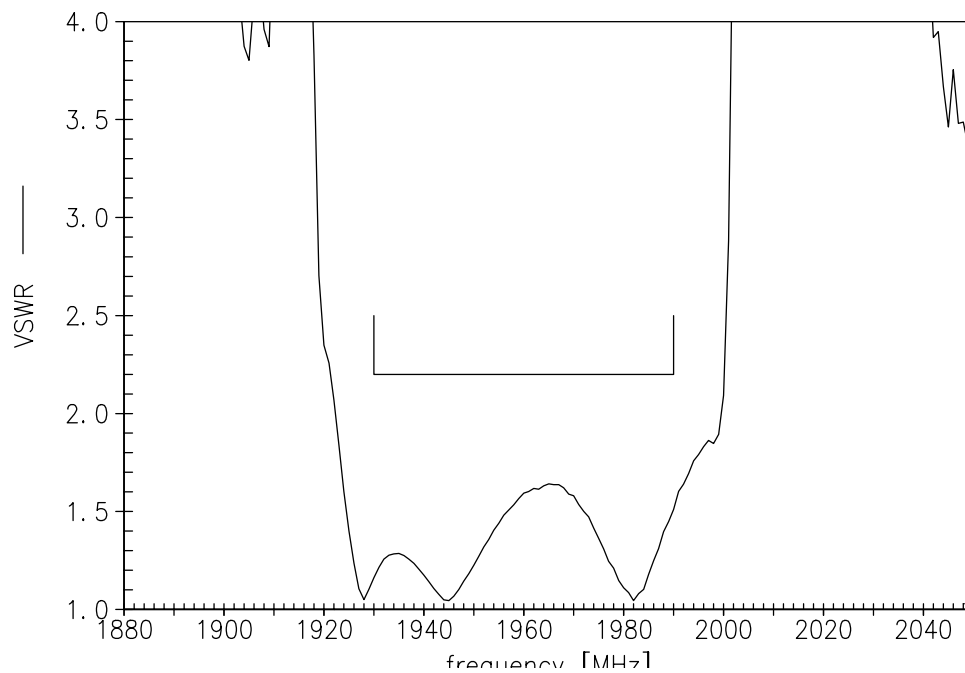
### Transfer function



### Transfer function



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

**SAW Components****B9403****Low-Loss Filter for Mobile Communication****1960.0 MHz****Data Sheet****Matching** **$S_{11}$  function** **$S_{22}$  function**

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

**SAW Components****B9403****Low-Loss Filter for Mobile Communication****1960.0 MHz**

Data Sheet



|                            |                              |  |
|----------------------------|------------------------------|--|
| <b>Type</b>                | B9403                        |  |
| <b>Ordering code</b>       | B39202-B9403-K610            |  |
| <b>Marking and Package</b> | C61157-A8-A1                 |  |
| <b>Packaging</b>           | F61074-V8212-Z000            |  |
| <b>Date Codes</b>          | L_1126                       |  |
| <b>S-Parameters</b>        | B9403_NB.s3p<br>B9403_WB.s3p |  |
| <b>Soldering profile</b>   | S_6001                       |  |

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