



# *SAW Components*

*Data Sheet B7706, Pb-Free*

Data Sheet

An abstract graphic featuring the word "EPCOS" in large, glowing, 3D letters. The letters are white with a bright, circular highlight in the center of each, giving them a three-dimensional appearance. They are set against a dark, textured background that includes a faint, glowing globe and circuitry patterns, suggesting a high-tech or electronic theme.



## SAW Components

B7706

## Low-Loss Filter for Mobile Communication

942,5 MHz

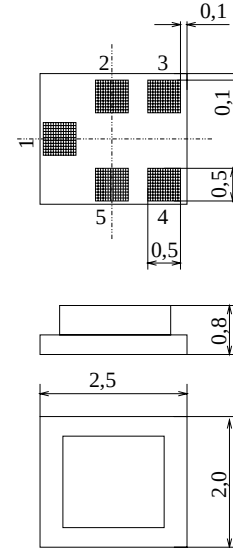
### Data Sheet



#### Features

- Low-loss RF filter for mobile telephone EGSM system, receive path
- Usable passband 35 MHz
- Unbalanced to balanced operation
- Excellent symmetry between balanced ports
- Impedance transformation from 50  $\Omega$  to 200  $\Omega$
- Suitable for GPRS class 1 to 12
- Ceramic Package for Surface Mounted Technology (SMT)
- Pb-Free

#### Chip Sized SAW Package QCS5H



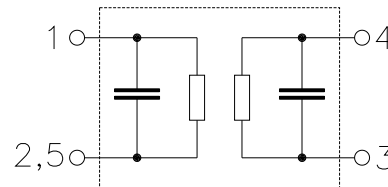
Dimensions in mm, approx. weight 0,015 g

#### Terminals

- Ni, gold-plated

#### Pin configuration

- |      |                   |
|------|-------------------|
| 1    | Input, unbalanced |
| 3, 4 | Output, balanced  |
| 2, 5 | Case ground       |



| Type  | Ordering code     | Marking and Package according to | Packing according to |
|-------|-------------------|----------------------------------|----------------------|
| B7706 | B39941-B7706-K910 | C61157-A7-A139                   | F61074-V8189-Z000    |

#### Electrostatic Sensitive Device (ESD)

#### Maximum ratings

|                                                                      |                    |             |                    |                                                                         |
|----------------------------------------------------------------------|--------------------|-------------|--------------------|-------------------------------------------------------------------------|
| Operable temperature range                                           | $T$                | - 40 / + 85 | $^{\circ}\text{C}$ | Machine Model, 10 pulses<br>peak power of GSM signal,<br>duty cycle 4:8 |
| Storage temperature range                                            | $T_{\text{stg}}$   | - 40 / + 85 | $^{\circ}\text{C}$ |                                                                         |
| DC voltage                                                           | $V_{\text{DC}}$    | 3           | V                  |                                                                         |
| ESD voltage                                                          | $V_{\text{ESD}}^*$ | 100*        | V                  |                                                                         |
| Input power at<br>GSM850, GSM900,<br>GSM1800 and GSM1900<br>Tx bands | $P_{\text{IN}}$    | 15          | dBm                |                                                                         |

\* - acc. to JESD22-A115A (Machine Model), 10 negative & 10 positive pulses



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### Characteristics

Operating temperature:

$$T = 25 \pm 2^{\circ}\text{C}$$

Terminating source impedance:

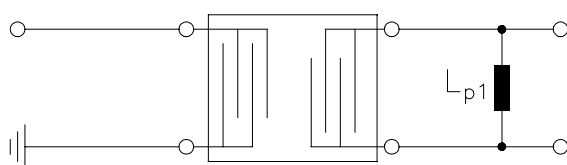
$$Z_S = 50 \Omega$$

Terminating load impedance:

$$Z_L = 200 \Omega \text{ including matching network}$$

|                                                                             |                 | min. | typ.  | max. |        |
|-----------------------------------------------------------------------------|-----------------|------|-------|------|--------|
| <b>Center frequency</b>                                                     | $f_C$           | —    | 942,5 | —    | MHz    |
| <b>Maximum insertion attenuation</b>                                        | $\alpha_{\max}$ | —    | 2,6   | 3,2  | dB     |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Amplitude ripple (p-p)</b>                                               | $\Delta\alpha$  | —    | 1,3   | 1,9  | dB     |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Output phase balance</b> ( $\phi(S_{31}) - \phi(S_{21}) + 180^{\circ}$ ) |                 | -4   | 0     | 4    | degree |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Output amplitude balance</b> ( $ S_{31}/S_{21} $ )                       |                 | -0,3 | 0     | 0,3  | dB     |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Input VSWR</b>                                                           |                 | —    | 1,8   | 2,3  |        |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Output VSWR</b>                                                          |                 | —    | 1,8   | 2,3  |        |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Attenuation</b>                                                          | $\alpha$        |      |       |      |        |
| 0,0 ... 880,0 MHz                                                           |                 | 50   | 60    | —    | dB     |
| 880,0 ... 905,0 MHz                                                         |                 | 30   | 40    | —    | dB     |
| 905,0 ... 915,0 MHz                                                         |                 | 20   | 27    | —    | dB     |
| 980,0 ... 1050,0 MHz                                                        |                 | 22   | 24    | —    | dB     |
| 1050,0 ... 6000,0 MHz                                                       |                 | 50   | 65    | —    | dB     |

### Test matching network



$L_{p1} = 100 \text{ nH}$   
(20% tolerance,  $Q = 30$ )



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### Data Sheet

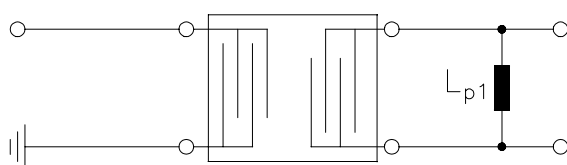


### Characteristics

Operating temperature range:  $T = -10$  to  $+80$  °C  
Terminating source impedance:  $Z_S = 50$   $\Omega$   
Terminating load impedance:  $Z_L = 200$   $\Omega$  including matching network

|                                                                           |                 | min. | typ.  | max. |        |
|---------------------------------------------------------------------------|-----------------|------|-------|------|--------|
| <b>Center frequency</b>                                                   | $f_C$           | —    | 942,5 | —    | MHz    |
| <b>Maximum insertion attenuation</b>                                      | $\alpha_{\max}$ | —    | 2,7   | 3,5  | dB     |
| 925,0 ... 960,0 MHz                                                       |                 |      |       |      |        |
| <b>Amplitude ripple (p-p)</b>                                             | $\Delta\alpha$  | —    | 1,4   | 2,2  | dB     |
| 925,0 ... 960,0 MHz                                                       |                 |      |       |      |        |
| <b>Output phase balance</b> ( $\phi(S_{31}) - \phi(S_{21}) + 180^\circ$ ) |                 | -4   | 0     | 4    | degree |
| 925,0 ... 960,0 MHz                                                       |                 |      |       |      |        |
| <b>Output amplitude balance</b> ( $ S_{31}/S_{21} $ )                     |                 | -0,3 | 0     | 0,3  | dB     |
| 925,0 ... 960,0 MHz                                                       |                 |      |       |      |        |
| <b>Input VSWR</b>                                                         |                 | —    | 1,8   | 2,3  |        |
| 925,0 ... 960,0 MHz                                                       |                 |      |       |      |        |
| <b>Output VSWR</b>                                                        |                 | —    | 1,8   | 2,3  |        |
| 925,0 ... 960,0 MHz                                                       |                 |      |       |      |        |
| <b>Attenuation</b>                                                        | $\alpha$        |      |       |      | dB     |
| 0,0 ... 880,0 MHz                                                         |                 | 50   | 60    | —    |        |
| 880,0 ... 905,0 MHz                                                       |                 | 30   | 40    | —    |        |
| 905,0 ... 915,0 MHz                                                       |                 | 20   | 27    | —    |        |
| 980,0 ... 1050,0 MHz                                                      |                 | 22   | 23    | —    |        |
| 1050,0 ... 6000,0 MHz                                                     |                 | 50   | 65    | —    |        |

### Test matching network



$L_{p1} = 100$  nH  
(20% tolerance,  $Q = 30$ )



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942,5 MHz

### Data Sheet

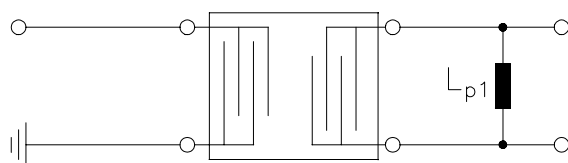


### Characteristics

|                               |                                                        |
|-------------------------------|--------------------------------------------------------|
| Operating temperature range:  | $T = -30 \text{ to } +85 \text{ }^{\circ}\text{C}$     |
| Terminating source impedance: | $Z_S = 50 \text{ } \Omega$                             |
| Terminating load impedance:   | $Z_L = 200 \text{ } \Omega$ including matching network |

|                                                                             |                 | min. | typ.  | max. |        |
|-----------------------------------------------------------------------------|-----------------|------|-------|------|--------|
| <b>Center frequency</b>                                                     | $f_C$           | —    | 942,5 | —    | MHz    |
| <b>Maximum insertion attenuation</b>                                        | $\alpha_{\max}$ | —    | 2,8   | 3,6  | dB     |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Amplitude ripple (p-p)</b>                                               | $\Delta\alpha$  | —    | 1,5   | 2,3  | dB     |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Output phase balance</b> ( $\phi(S_{31}) - \phi(S_{21}) + 180^{\circ}$ ) |                 | -10  | 0     | 10   | degree |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Output amplitude balance</b> ( $ S_{31}/S_{21} $ )                       |                 | -1   | 0     | 1    | dB     |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Input VSWR</b>                                                           |                 | —    | 2,0   | —    |        |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Output VSWR</b>                                                          |                 | —    | 2,0   | —    |        |
| 925,0 ... 960,0 MHz                                                         |                 |      |       |      |        |
| <b>Attenuation</b>                                                          | $\alpha$        |      |       |      | dB     |
| 0,0 ... 880,0 MHz                                                           |                 | 50   | 60    | —    |        |
| 880,0 ... 905,0 MHz                                                         |                 | 30   | 40    | —    |        |
| 905,0 ... 915,0 MHz                                                         |                 | 16   | 20    | —    |        |
| 980,0 ... 1050,0 MHz                                                        |                 | 20   | 22    | —    |        |
| 1050,0 ... 6000,0 MHz                                                       |                 | 50   | 65    | —    |        |

### Test matching network



$L_{p1} = 100 \text{ nH}$   
(20% tolerance,  $Q = 30$ )



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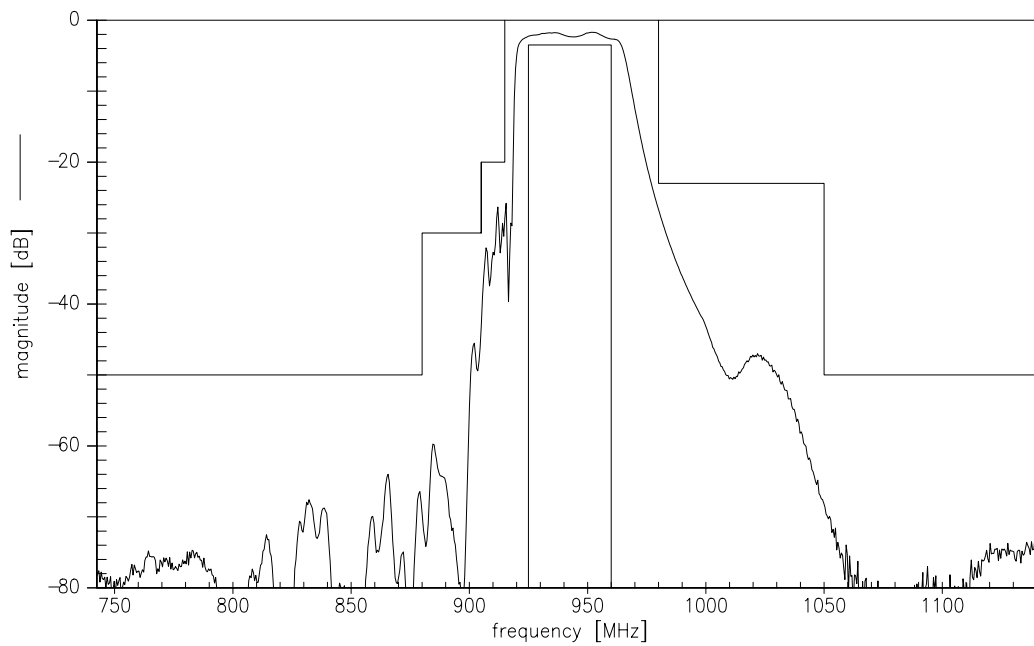
Low-Loss Filter for Mobile Communication

942,5 MHz

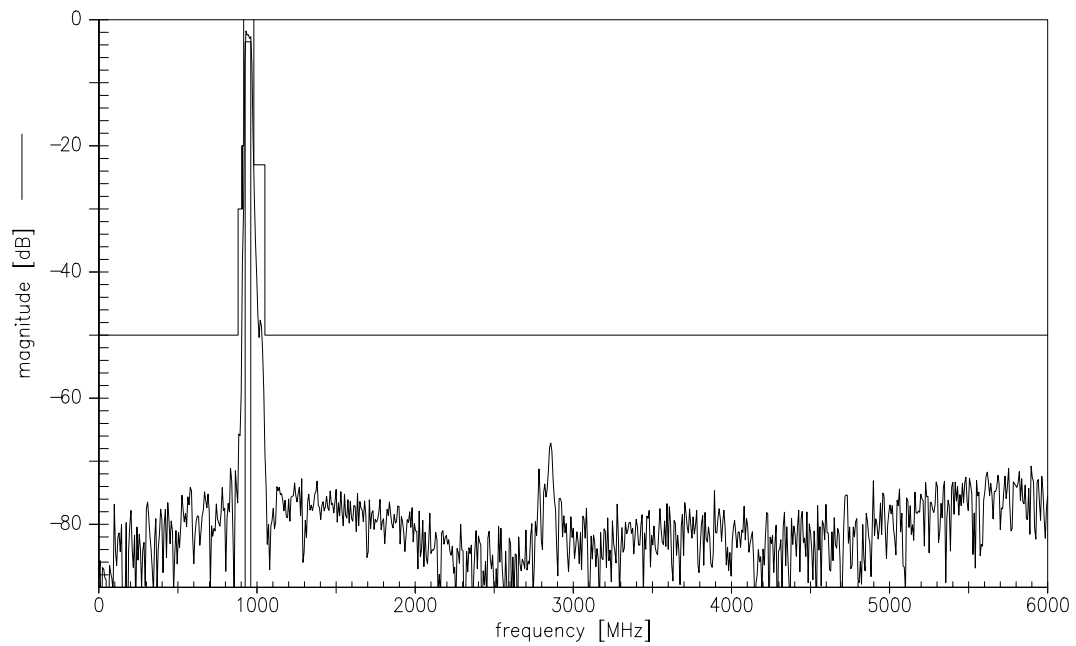
Data Sheet



Transfer function



Transfer function (wideband)





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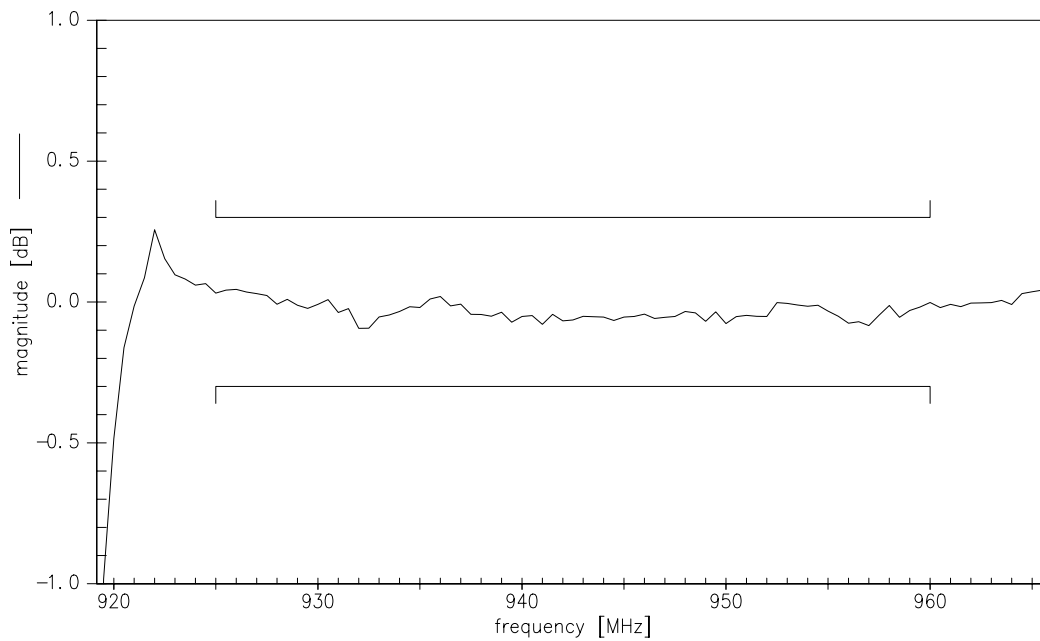
Low-Loss Filter for Mobile Communication

942,5 MHz

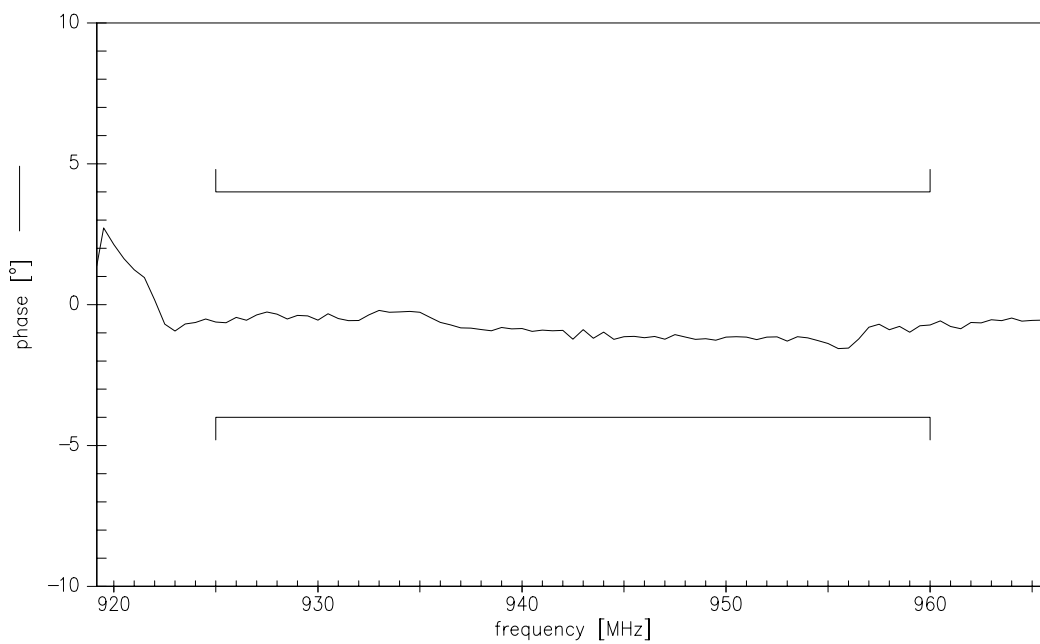
Data Sheet



Output amplitude balance ( $|S_{31}|/|S_{21}|$ )



Output phase balance ( $\phi(S_{31}) - \phi(S_{21}) + 180^\circ$ )





|                                                 |                  |
|-------------------------------------------------|------------------|
| <b>SAW Components</b>                           | <b>B7706</b>     |
| <b>Low-Loss Filter for Mobile Communication</b> | <b>942,5 MHz</b> |
| <b>Data Sheet</b>                               | <b>SMD</b>       |

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