# SAW Components

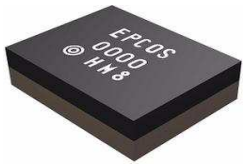
## SAW Rx filter

WCDMA Band 8 / GSM900

| | |
|---|---|
| **Series/type:** | **B8809** |
| **Ordering code:** | **B39941B8809P810** |
| Date: | October 09, 2013 |
| Version: | 2.0 |

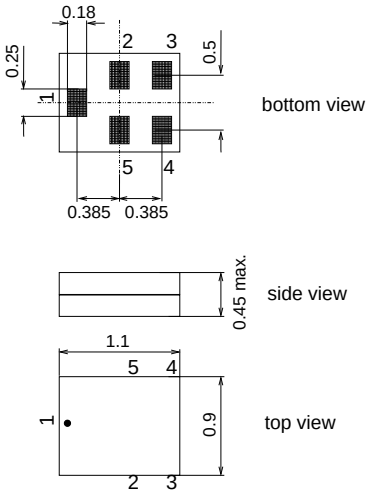
## Application

- Low-loss RF filter for mobile telephone WCDMA Band 8 and GSM900 systems, receive path (RX)
- Very high TX supression - suitable for diversity applications
- Usable passband 35 MHz
- Impedance transformation from 50 Ω to 100 Ω
- Unbalanced to balanced operation
- Suitable for GPRS class 1 to 12



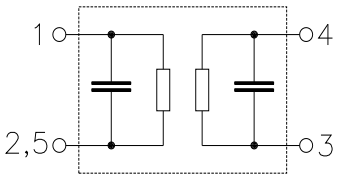

## Features

- Package size 1.1 x 0.9 mm²
- Maximum package height 0.45 mm
- RoHS compatible
- Approx. weight 0.001g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitive **L**evel 3




## Pin configuration

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



## Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Terminating source impedance: $Z_S$ = 50 Ω (unbalanced)
Terminating load impedance: $Z_L$ = 100 Ω (balanced)

| | | | B8809 | | | |
|---|---|---|---|---|---|---|
| | | | min. | typ. @ 25 ˚C | max. | |
| **Center frequency** | | $f_C$ | — | 942.5 | — | MHz |
| **Maximum insertion attenuation** | | | | | | |
| @$f_{Carrier\ B8\ RX}$ | 927.4 ... 957.6 MHz | $\alpha_{WCDMA}$ [1] | — | 2.0 | 2.2 | dB |
| | 925.0 ... 960.0 MHz | $\alpha$ | — | 2.0 | 3.7 | dB |
| **Amplitude ripple** (p-p) | | | | | | |
| | 925.0 ... 960.0 MHz | $\Delta\alpha$ | — | 1.0 | 2.7 | dB |
| **Error Vector Magnitude** [2] | | | | | | |
| | 927.4 ... 957.6 MHz | EVM | — | 3.0 | 6.0 | % |
| **Input VSWR** | | | | | | |
| | 925.0 ... 960.0 MHz | | — | 1.9 | 2.3 | |
| **Output VSWR** | | | | | | |
| | 925.0 ... 960.0 MHz | | — | 2.1 | 2.4 | |
| **CMRR** ($\lvert S_{21}-S_{31}\rvert$ / $\lvert S_{21}+S_{31}\rvert$) | | | | | | |
| | 925.0 ... 960.0 MHz | | 20 | 23 [3] | — | dB |
| **Attenuation** | | $\alpha$ | | | | |
| | 100.0 ... 880.0 MHz | | 40 | 58 | — | dB |
| @$f_{Carrier\ B8\ TX}$ | 882.4 ... 912.6 MHz | $\alpha_{WCDMA}$ [1] | 49 | 53 | — | dB |
| | 880.0 ... 915.0 MHz | $\alpha$ | 46 | 49 | — | dB |
| | 1020.0 ... 6000.0 MHz | | 40 | 51 | — | dB |

[1] Attenuation of WCDMA signal (“Powertransferfunction”). Please refer to annotation on page (4).

[2] Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

[3] A CMRR of 22.8 dB corresponds to a phase balance of 5˚ togeher an amplitude balance of 1.0 dB

### Annotation for characteristics section

Attenuation of WCDMA signal ("Powertransferfunction", $\alpha_{WCDMA}$) is determined by

$$\int_{\infty}^{\infty} |S_{ds21}(f) H_{RRC}(f - f_{Carrier})|^2 df$$

$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for band 8 RX passband, $f_{Carrier}$ ranges from 927.4 MHz (lowest Rx channel) to 957.6 MHz (highest Rx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

$$\int_{\infty}^{\infty} |H_{RRC}(f)|^2 df = 1$$

**Maximum ratings**

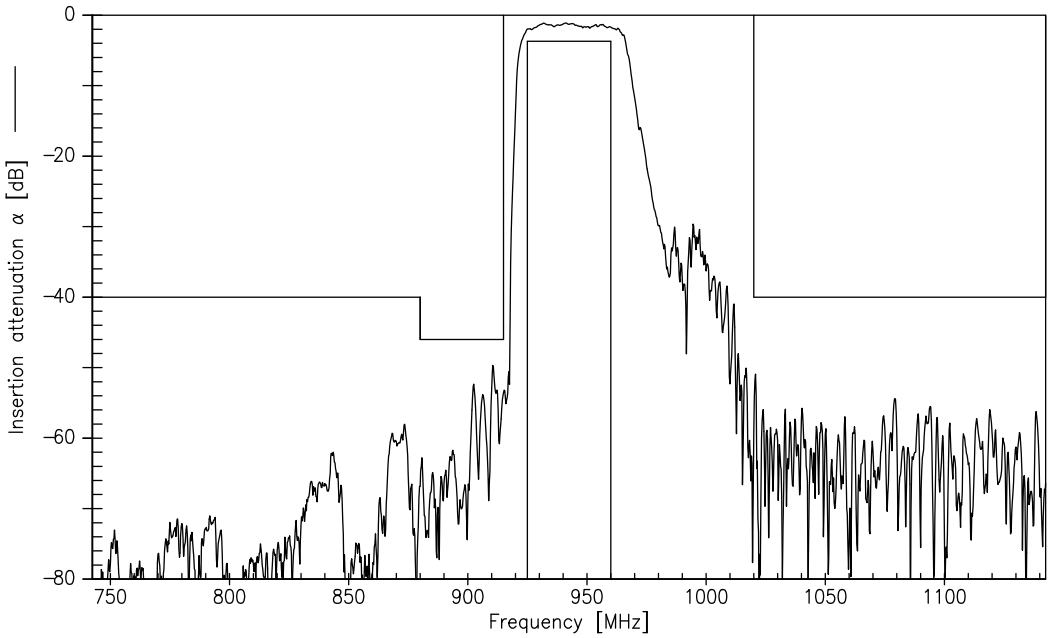
| | | | | |
|---|---|---|---|---|
| Storage temperature range | $T_{stg}$ | –40/+85[1)] | °C | |
| DC voltage | $V_{DC}$ | 5[2)] | V | |
| ESD voltage | $V_{ESD}$ | 100[3)] | V | Machine Model |
| Input power at 880.0 ... 915.0MHz | $P_{IN}$ | 17 | dBm | Continuous Wave @ 55°C 2000h |

1) extended upperlimit: 168h@125°C acc. to IEC 60068-2-2 Bb

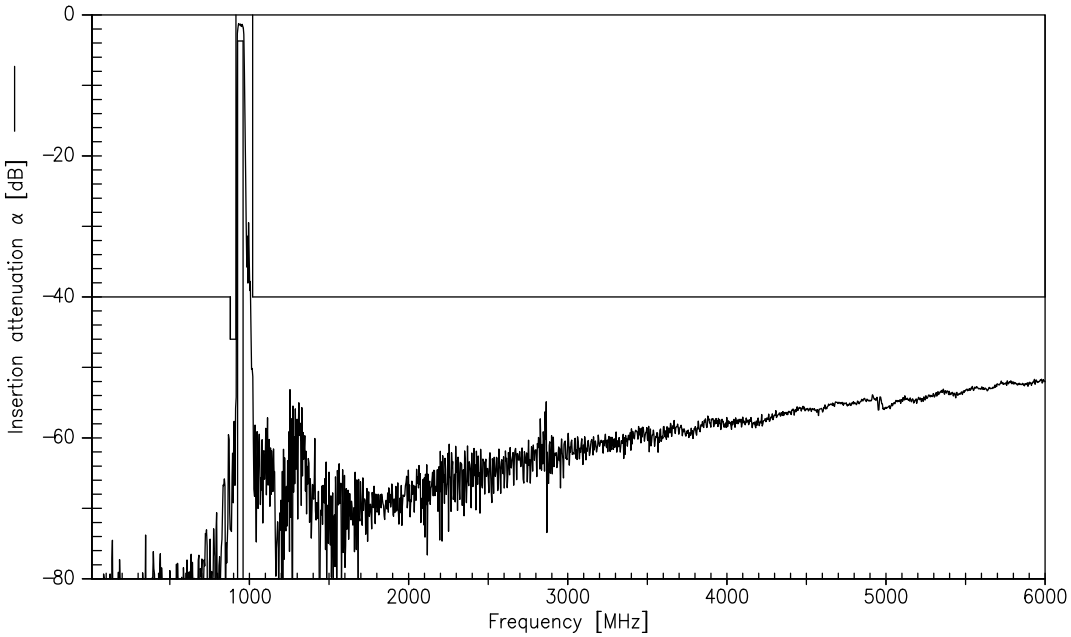
2) 168h Damp Heat Steady State acc. to IEC 60068-2-67 Cy

3) acc. to JESD22-A115B (MM - Machine Model), 10 negative & 10 positive pulses.

**Transfer function** (narrowband)

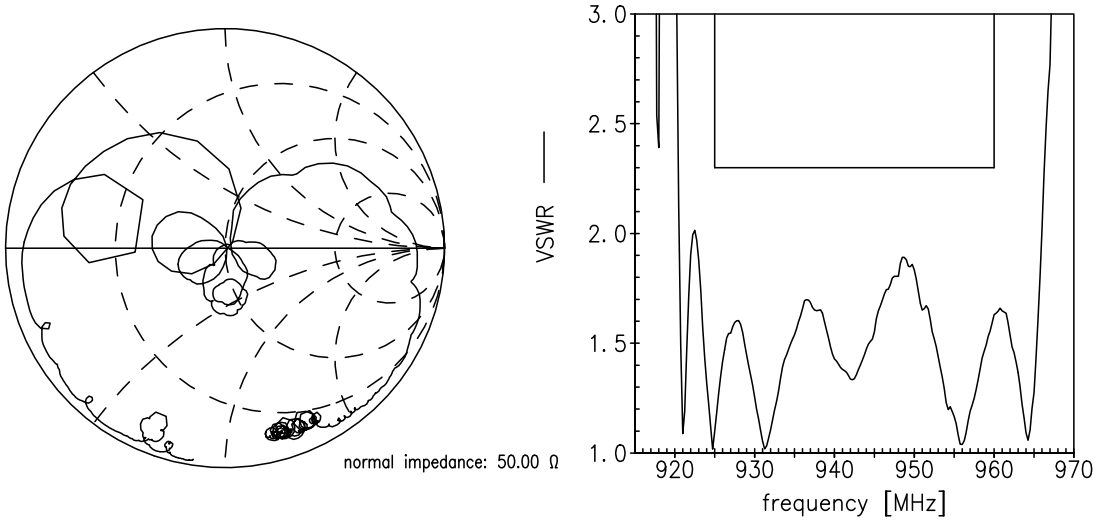



**Transfer function** (wideband)

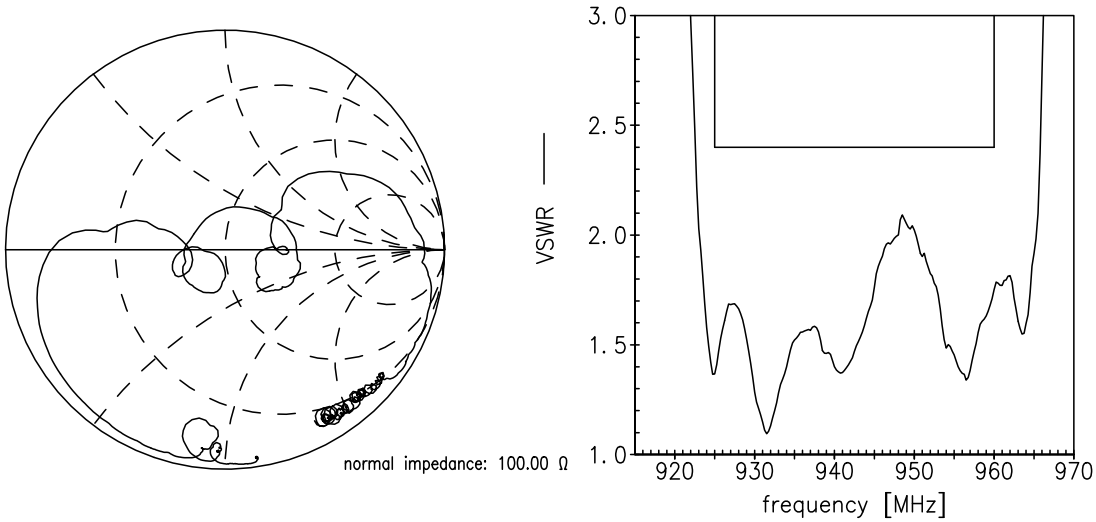


**Smith chart**

**$S_{11}$ function**




**$S_{22}$ function**



## References

| | |
|---|---|
| **Type** | B8809 |
| **Ordering code** | B39941B8809P810 |
| **Marking and package** | C61157-A8-A56 |
| **Packaging** | F61074-V8255-Z000 |
| **Date codes** | L_1126 |
| **S-parameters** | B8809_NB.s3p, B8809_WB.s3p<br>See file header for port/pin assignment table. |
| **Soldering profile** | S_6001 |
| **RoHS compatible** | 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. |
| **Moldability** | Before using in overmolding environment, please contact your EPCOS sales office. |
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