



# *SAW Components*

*Data Sheet B9301*

Data Sheet

An abstract, grayscale graphic featuring a globe with a grid pattern, overlaid with a large, stylized, and slightly blurred "EPCOS" logo. The logo is rendered in a light gray, almost white, color, giving it a three-dimensional appearance as if it's floating or attached to the globe. The background is dark and textured, with some light streaks and a sense of motion or depth.

EPCOS



## SAW Components

B9301

## Low-Loss Dual Band Filter for Mobile Communication

881,5 / 942,5 MHz

### Data Sheet



### Chip Sized Saw Package QCS10H

#### Features

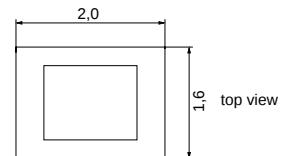
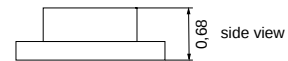
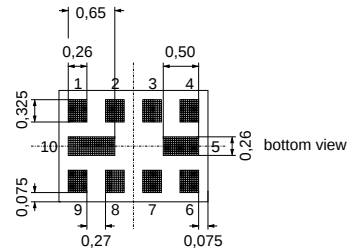
- Low-loss 2in1 RF filter for mobile telephone GSM850/900 systems, receive path
- Usable passband:  
Filter 1 (GSM900): 35 MHz  
Filter 2 (GSM850): 25 MHz
- Unbalanced to balanced operation of both filters
- Impedance transformation from 50  $\Omega$  to 150  $\Omega$  for both filters
- Suitable for GPRS Class 1 to 12
- Ceramic package for Surface Mounted Technology (SMT)

#### Terminals

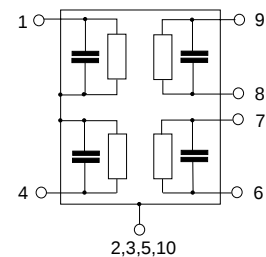
- Ni, gold-plated

#### Pin configuration

|            |                               |
|------------|-------------------------------|
| 1          | Input [ Filter 1 ]            |
| 4          | Input [ Filter 2 ]            |
| 6, 7       | Output, balanced [ Filter 2 ] |
| 8, 9       | Output, balanced [ Filter 1 ] |
| 2, 3, 5,10 | Case ground                   |



Dimensions in mm, approx. weight 8mg



| Type  | Ordering code     | Marking and Package according to | Packing according to |
|-------|-------------------|----------------------------------|----------------------|
| B9301 | B39941-B9301-G110 | C61157-A7-A141                   | F61074-V8152-Z000    |

#### Electrostatic Sensitive Device (ESD)

#### Maximum ratings

|                                                                    |                    |             |                    |                                                    |
|--------------------------------------------------------------------|--------------------|-------------|--------------------|----------------------------------------------------|
| Operable temperature range                                         | $T$                | - 40 / + 85 | $^{\circ}\text{C}$ | Machine Model, 10 pulses                           |
| Storage temperature range                                          | $T_{\text{stg}}$   | - 40 / + 85 | $^{\circ}\text{C}$ |                                                    |
| DC voltage                                                         | $V_{\text{DC}}$    | 5           | V                  |                                                    |
| ESD voltage                                                        | $V_{\text{ESD}}^*$ | 100         | V                  |                                                    |
| Input power at<br>GSM850, GSM900,<br>GSM1800, GSM1900<br>Tx bands: |                    |             |                    |                                                    |
| Filter 1 (GSM900-Rx)                                               | $P_{\text{IN}}$    | 15          | dBm                | effective power in the on-state,<br>duty cycle 4:8 |
| Filter 2 (GSM850-Rx)                                               | $P_{\text{IN}}$    | 15          | dBm                |                                                    |

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



# SAW Components

B9301

## Low-Loss Dual Band Filter for Mobile Communication

881,5 / 942,5 MHz

### Data Sheet



#### Characteristics Filter 1 ( GSM900 )

Operating temperature range:

$T = -20$  to  $+85^{\circ}\text{C}$

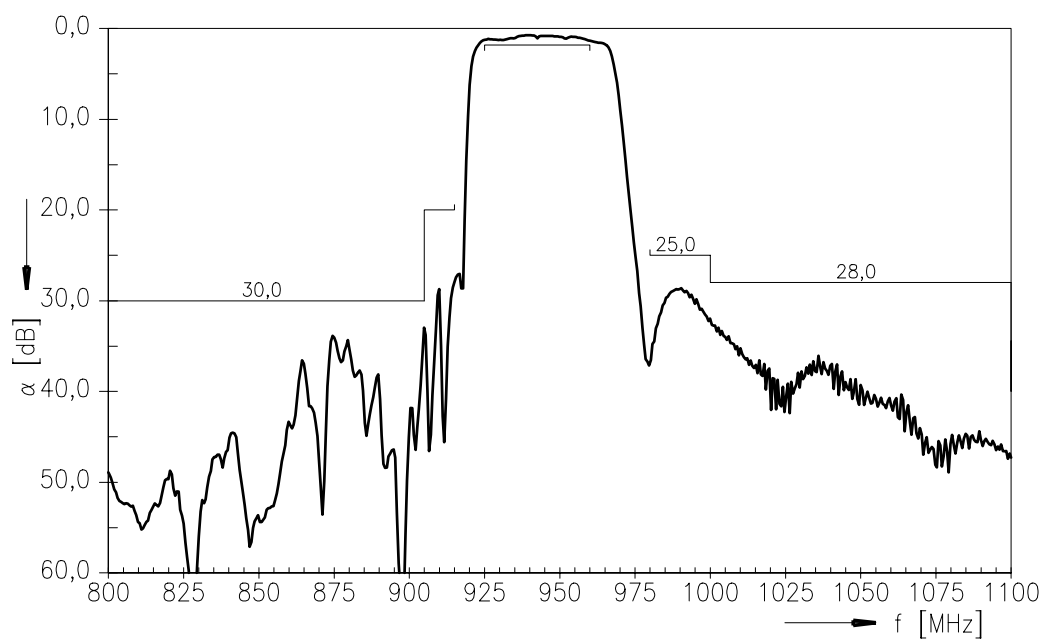
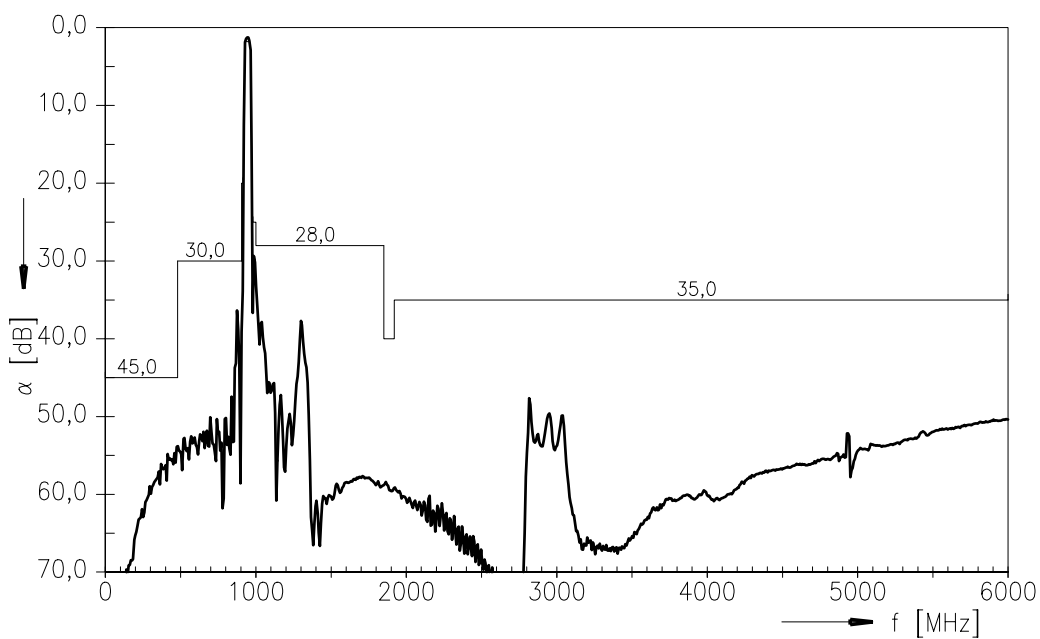
Terminating source impedance:

$Z_S = 50\ \Omega$  (unbalanced)

Terminating load impedance:

$Z_L = 150\ \Omega$  (balanced)  $\parallel 82\text{nH}$

|                                                                                  |                 |  | min. | typ.      | max. |        |
|----------------------------------------------------------------------------------|-----------------|--|------|-----------|------|--------|
| <b>Center frequency</b>                                                          | $f_c$           |  | —    | 942,5     | —    | MHz    |
| <b>Maximum insertion attenuation</b>                                             | $\alpha_{\max}$ |  |      |           |      |        |
| 925,0 ... 960,0 MHz                                                              |                 |  | —    | 1,6       | 2,1  | dB     |
| <b>Amplitude ripple (p-p)</b>                                                    | $\Delta\alpha$  |  |      |           |      |        |
| 925,0 ... 960,0 MHz                                                              |                 |  | —    | 0,9       | 1,4  | dB     |
| <b>Input VSWR</b>                                                                |                 |  |      |           |      |        |
| 925,0 ... 960,0 MHz                                                              |                 |  | —    | 1,8       | 2,1  |        |
| <b>Output VSWR</b>                                                               |                 |  |      |           |      |        |
| 925,0 ... 960,0 MHz                                                              |                 |  | —    | 1,9       | 2,2  |        |
| <b>Output amplitude balance (<math> S_{31} / S_{21} </math>)</b>                 |                 |  |      |           |      |        |
| 925,0 ... 960,0 MHz                                                              |                 |  | -1,1 | -0,6/+0,6 | 1,1  | dB     |
| <b>Output phase balance (<math>\phi(S_{31})-\phi(S_{21})+180^{\circ}</math>)</b> |                 |  |      |           |      |        |
| 925,0 ... 960,0 MHz                                                              |                 |  | -10  | -2/+1     | 10   | degree |
| <b>Attenuation</b>                                                               | $\alpha_{\min}$ |  |      |           |      |        |
| 10,0 ... 480,0 MHz                                                               |                 |  | 45   | 54        | —    | dB     |
| 480,0 ... 905,0 MHz                                                              |                 |  | 30   | 33        | —    | dB     |
| 905,0 ... 915,0 MHz                                                              |                 |  | 20   | 27        | —    | dB     |
| 980,0 ... 1000,0 MHz                                                             |                 |  | 25   | 28        | —    | dB     |
| 1000,0 ... 1850,0 MHz                                                            |                 |  | 28   | 32        | —    | dB     |
| 1850,0 ... 1920,0 MHz                                                            |                 |  | 40   | 58        | —    | dB     |
| 1920,0 ... 6000,0 MHz                                                            |                 |  | 35   | 47        | —    | dB     |

**Transfer function Filter 1 ( GSM900 )****Transfer function Filter 1 ( GSM900 ) - wideband**



# SAW Components

B9301

## Low-Loss Dual Band Filter for Mobile Communication

881,5 / 942,5 MHz

### Data Sheet



#### Characteristics Filter 2 ( GSM850 )

Operating temperature range:

$T = -20$  to  $+85^{\circ}\text{C}$

Terminating source impedance:

$Z_S = 50\ \Omega$  (unbalanced)

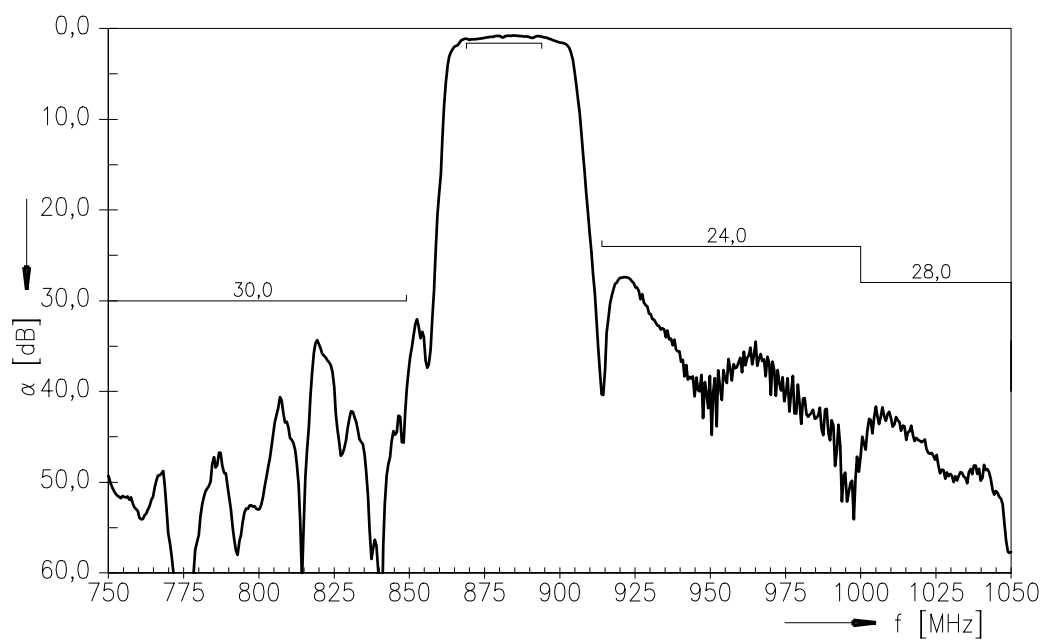
Terminating load impedance:

$Z_L = 150\ \Omega$  (balanced)  $\parallel 82\text{nH}$

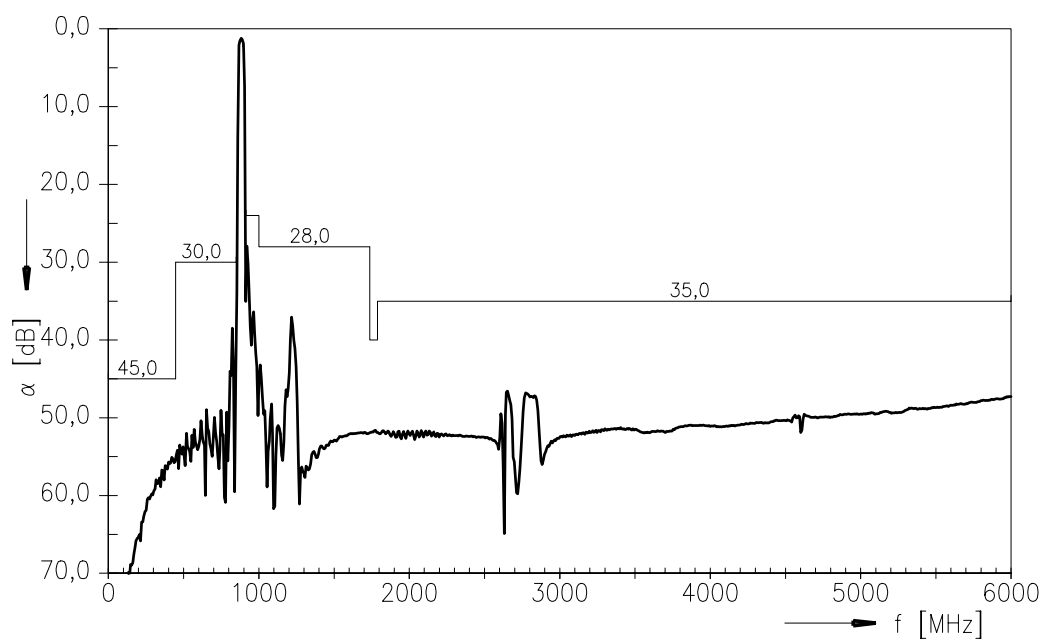
|                                                                                  |                 | min. | typ.      | max. |        |
|----------------------------------------------------------------------------------|-----------------|------|-----------|------|--------|
| <b>Center frequency</b>                                                          | $f_c$           | —    | 881,5     | —    | MHz    |
| <b>Maximum insertion attenuation</b>                                             | $\alpha_{\max}$ |      |           |      |        |
| 869,0 ... 894,0 MHz                                                              |                 | —    | 1,2       | 1,8  | dB     |
| <b>Amplitude ripple (p-p)</b>                                                    | $\Delta\alpha$  |      |           |      |        |
| 869,0 ... 894,0 MHz                                                              |                 | —    | 0,5       | 1,0  | dB     |
| <b>Input VSWR</b>                                                                |                 |      |           |      |        |
| 869,0 ... 894,0 MHz                                                              |                 | —    | 1,8       | 2,1  |        |
| <b>Output VSWR</b>                                                               |                 |      |           |      |        |
| 869,0 ... 894,0 MHz                                                              |                 | —    | 1,7       | 2,0  |        |
| <b>Output amplitude balance (<math> S_{31}/S_{21} </math>)</b>                   |                 |      |           |      |        |
| 869,0 ... 894,0 MHz                                                              |                 | -1,0 | -0,5/+0,2 | 1,0  | dB     |
| <b>Output phase balance (<math>\phi(S_{31})-\phi(S_{21})+180^{\circ}</math>)</b> |                 |      |           |      |        |
| 869,0 ... 894,0 MHz                                                              |                 | -10  | -3/+4     | 10   | degree |
| <b>Attenuation</b>                                                               | $\alpha_{\min}$ |      |           |      |        |
| 10,0 ... 447,0 MHz                                                               |                 | 45   | 55        | —    | dB     |
| 447,0 ... 849,0 MHz                                                              |                 | 30   | 34        | —    | dB     |
| 914,0 ... 1000,0 MHz                                                             |                 | 24   | 27        | —    | dB     |
| 1000,0 ... 1738,0 MHz                                                            |                 | 28   | 37        | —    | dB     |
| 1738,0 ... 1788,0 MHz                                                            |                 | 40   | 52        | —    | dB     |
| 1788,0 ... 6000,0 MHz                                                            |                 | 35   | 46        | —    | dB     |



## Transfer function Filter 2 ( GSM850 )



## Transfer function Filter 2 ( GSM850 ) - wideband





|                                                    |                                                                                                             |                   |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------|
| SAW Components                                     |                                                                                                             | B9301             |
| Low-Loss Dual Band Filter for Mobile Communication |                                                                                                             | 881,5 / 942,5 MHz |
| Data Sheet                                         | The SMD logo is a stylized, bold, sans-serif font with a horizontal line through the middle of the letters. |                   |

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