



# SAW Components

Data Sheet B3575





**SAW Components**

**B3575**

**Low Loss Filter**

**433,92 MHz**

**Data Sheet**

**Features**

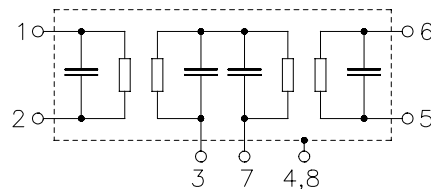
- RF low-loss filter for remote control receivers
- Package for **Surface Mounted Technology (SMT)**
- Balanced and unbalanced operation possible
- Passivation layer: Protec
- AEC-Q200 qualified component family
- Compliant to EU RoHs Directive (2002/95/EC)
- Lead free soldering compatible with J - STD20C

**Terminals**

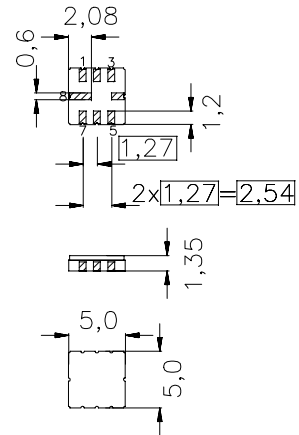
- Ni, gold plated

**Pin configuration**

- 1 Input
- 2 Input Ground or balanced input
- 5 Output
- 6 Output Ground or balanced output
- 7 External coupling coil
- 4,8 Case-Ground
- 3 to be grounded



Ceramic package **QCC8C**



typ. dimensions in mm, approx. weight 0,1 g

| Type  | Ordering code     | Marking and package according too | Packing according to |
|-------|-------------------|-----------------------------------|----------------------|
| B3575 | B39431–B3575–U310 | C61157–A7–A56                     | F61074–V8169–Z000    |

Electrostatic Sensitive Device (ESD)

**Maximum ratings**

|                            |           |           |     |  |
|----------------------------|-----------|-----------|-----|--|
| Operable temperature range | $T_A$     | – 45/+ 95 | °C  |  |
| Storage temperature range  | $T_{stg}$ | – 45/+ 95 | °C  |  |
| DC voltage                 | $V_{DC}$  | 6         | V   |  |
| Source power               | $P_S$     | 10        | dBm |  |



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**Characteristics**

Reference temperature:  $T_A = -45 \dots 95 \text{ }^\circ\text{C}$   
 Terminating source impedance:  $Z_S = 50 \text{ } \Omega$  and matching network  
 Terminating load impedance:  $Z_L = 50 \text{ } \Omega$  and matching network

|   |                       | <b>min.</b> | <b>typ.</b>              | <b>max.</b> |  |
|---|-----------------------|-------------|--------------------------|-------------|--|
| <b>Center frequency</b><br>(center frequency between 3 dB points)   | $f_C$                 | —           | 433,92                   | —           | MHz  |
| <b>Minimum insertion attenuation</b><br>433,83 ... 434,01 MHz<br>(including loss in matching coils)   | $\alpha_{\min}$       | —           | 3,4                      | 4,7         | dB   |
| <b>Amplitude ripple (p-p)</b><br>433,83 ... 434,01 MHz  |                       | —           | 0,5                      | 2,0         | dB   |
| 433,81 ... 434,03 MHz   |                       | —           | 0,7                      | 3,0         | dB   |
| <b>Relative attenuation (relative to <math>\alpha_{\min}</math>)</b>  | $\alpha_{\text{rel}}$ |             |                          |             |  |
| 10,00 ... 300,00 MHz  |                       | 60          | 70                       | —           | dB   |
| 300,00 ... 400,00 MHz   |                       | 50          | 55                       | —           | dB   |
| 400,00 ... 424,00 MHz   |                       | 60          | 65                       | —           | dB   |
| 424,00 ... 430,00 MHz   |                       | 55          | 60                       | —           | dB   |
| 430,00 ... 433,02 MHz   |                       | 40          | 45                       | —           | dB   |
| 434,92 ... 439,00 MHz   |                       | 30          | 35                       | —           | dB   |
| 439,00 ... 1000,00 MHz  |                       | 58          | 63                       | —           | dB   |
| <b>Impedance for pass band matching <sup>2)</sup></b><br>Input: $Z_{\text{IN}} = R_{\text{IN}} \parallel C_{\text{IN}}$<br>Output: $Z_{\text{OUT}} = R_{\text{OUT}} \parallel C_{\text{OUT}}$ |                       | —           | 360    2,0<br>360    2,1 | —           | $\Omega \parallel \text{pF}$<br>$\Omega \parallel \text{pF}$ |
| <b>Temperature coefficient of frequency <sup>1)</sup></b>   | $TC_f$                | —           | -0,03                    | —           | ppm/K <sup>2</sup>   |
| <b>Frequency inversion point</b>  | $T_0$                 | 10          | —                        | 40          | $^\circ\text{C}$   |

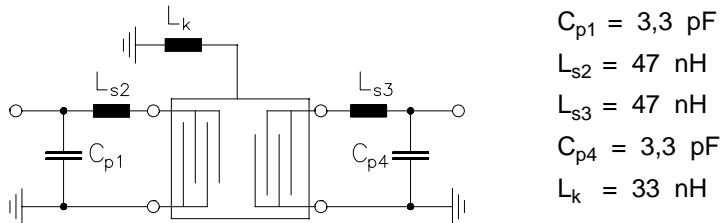
<sup>1)</sup>Temperature dependance of  $f_C$ :  $f_C(T_A) = f_C(T_0) (1 + TC_f(T_A - T_0)^2)$

<sup>2)</sup> Impedance for passband matching bases on an ideal, perfect matching of the SAW filter to source- and to load impedance (here 50 Ohm). After the SAW filter is removed and input impedance into the input matching / output matching network is calculated.

The conjugate complex value of these characteristic impedances are the input and output impedances for flat passband. For more details, we refer to EPCOS application note #4.

**Data Sheet**

**Matching network to 50  $\Omega$**  (element values depend on pcb layout and equivalent circuit)



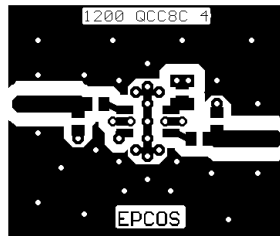
Minimising the crosstalk

For a good ultimate rejection a low crosstalk is necessary. Low crosstalk can be realised with a good RF layout. The major crosstalk mechanism is caused by the “ground-loop” problem.

Grounding loops are created if input-and output transducer GND are connected on the top-side of the PCB and fed to the system grounding plane by a common via hole. To avoid the common ground path, the ground pin of the input- and output transducer are fed to the system ground plane (bottom PCB plane) by their own via hole. The transducers’ grounding pins should be isolated from the upper grounding plane.

A common GND inductivity of 0.5nH degrades the ultimate rejection (crosstalk) by 20dB.

The optimised PCB layout, including matching network for transformation to 50 Ohm, is shown here. In this PCB layout the grounding loops are minimised to realise good ultimate rejection.



Optimised PCB layout for SAW filters in QCC8C package, pinning 1,5 (top side, scale 1:1)

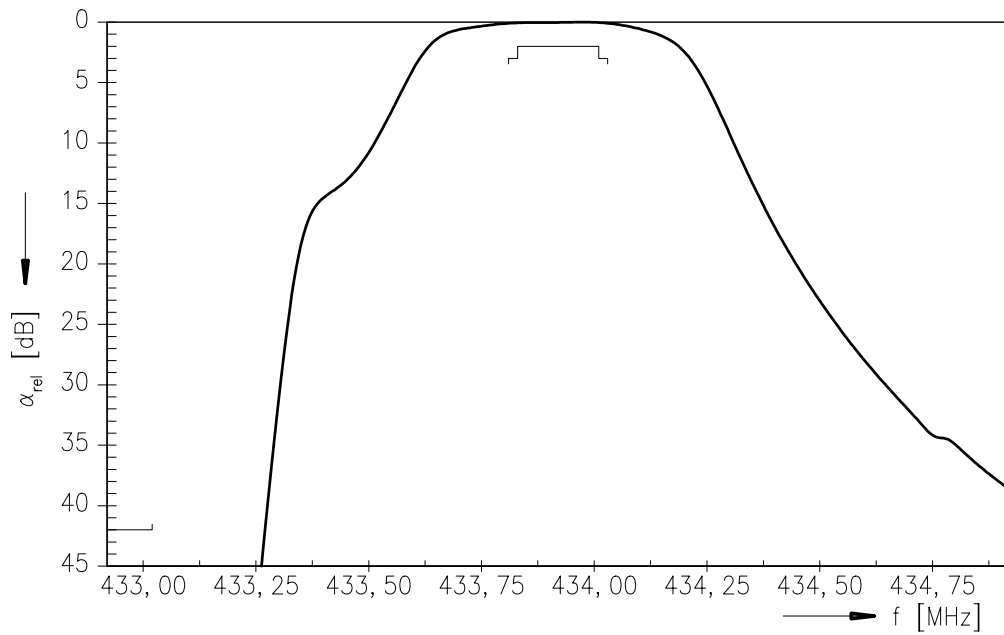
The bottom side is a copper plane (system ground area). The input and output grounding pins are isolated and connected to the common ground by separated via holes.

For good contact of the upper grounding area with the lower side it is necessary to place enough via holes.

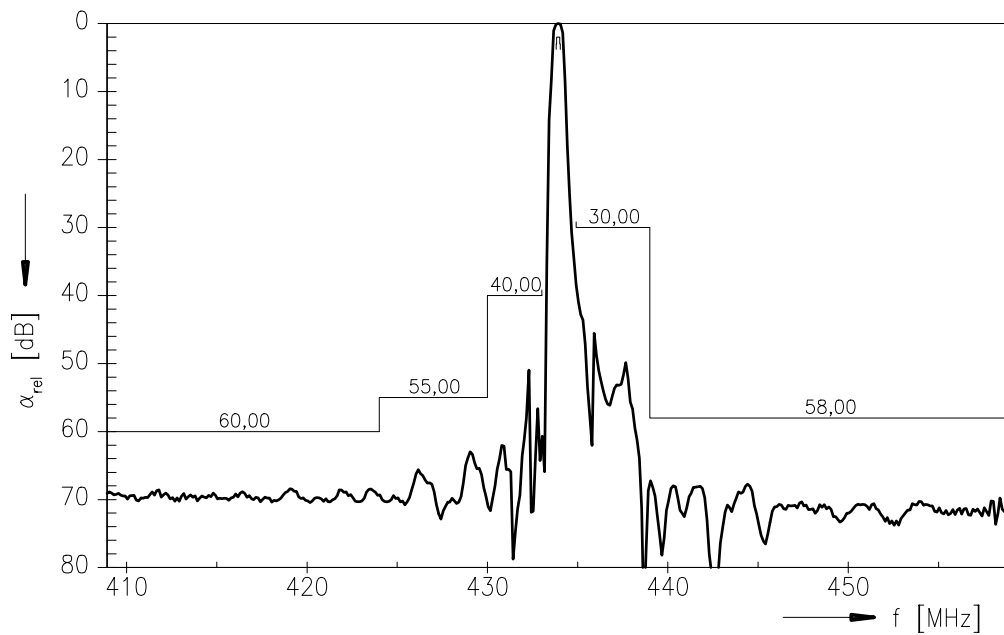


Data Sheet

Normalized frequency response



Normalized frequency response (wideband)





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