EPCOS

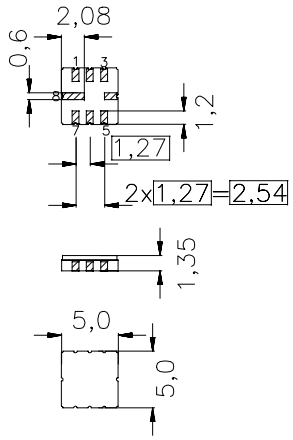
# *SAW Components*

*Data Sheet B3573*

Ceramic package **QCC8C**

### Features

- RF low-loss filter for remote control receivers
- Package for **S**urface **M**ounted **T**echnology (**SMT**)



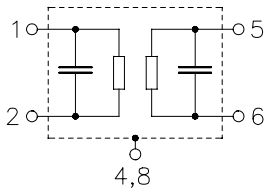

### Terminals

- Ni, gold plated

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

### Pin configuration

| | |
|---|---|
| 1 | Input |
| 2,7 | Input Ground |
| 5 | Output |
| 3,6 | Output Ground |
| 4,8 | Case - Ground |




| Type | Ordering code | Marking and package according to | Packing according to |
|---|---|---|---|
| B3573 | B39871-B3573-U310 | C61157-A7-A56 | F61074-V8070-Z000 |

**E**lectrostactic **S**ensitive **D**evice (**ESD**)

### Maximum ratings

| | | | | |
|---|---|---|---|---|
| Operable temperature range | $T_A$ | –45/+90 | ˚C | |
| Storage temperature range | $T_{stg}$ | –45/+90 | ˚C | |
| DC voltage | $V_{DC}$ | 0 | V | |
| Source power | $P_S$ | 0 | dBm | source impedance 50 Ω |

## Characteristics

Reference temperature: $T_A$ = 25 °C
Terminating source impedance: $Z_S$ = 50 Ω and matching network
Terminating load impedance: $Z_L$ = 50 Ω and matching network

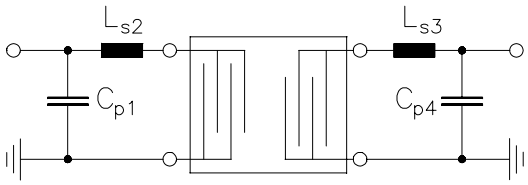
| | | min. | typ. | max. | |
|---|---|---|---|---|---|
| **Center frequency** (center frequency between 3 dB points) | $f_C$ | — | 869,69 | — | MHz |
| **Minimum insertion attenuation** | $\alpha_{min}$ | | | | |
| 869,20 ... 870,18 MHz | | — | 2,8 | 4,3 | dB |
| **Pass band** (relative to $\alpha_{min}$) | | | | | |
| 869,20 ... 870,18 MHz | | — | 1,2 | 3,0 | dB |
| 869,12 ... 870,26 MHz | | — | 1,8 | 6,0 | dB |
| **Relative attenuation** (relative to $\alpha_{min}$) | $\alpha_{rel}$ | | | | |
| 10,00 ... 700,00 MHz | | 50 | 55 | — | dB |
| 700,00 ... 843,00 MHz | | 35 | 40 | — | dB |
| 843,00 ... 865,20 MHz | | 28 | 33 | — | dB |
| 865,20 ... 867,00 MHz | | 8 | 13 | — | dB |
| 871,69 ... 872,50 MHz | | 8 | 13 | — | dB |
| 872,50 ... 880,00 MHz | | 15 | 20 | — | dB |
| 880,00 ... 910,00 MHz | | 24 | 29 | — | dB |
| 910,00 ...1000,00 MHz | | 35 | 40 | — | dB |
| **Impedance** for pass band matching [2] | | | | | |
| Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ | | — | 232 ‖ 2,10 | — | Ω ‖ pF |
| Output: $Z_{OUT} = R_{OUT} \parallel C_{OUT}$ | | — | 243 ‖ 2,10 | — | Ω ‖ pF |
| **Temperature coefficient of frequency** [1] | $TC_f$ | — | –0,03 | — | ppm/K² |
| **Frequency inversion point** | $T_0$ | — | 25 | — | °C |

[1] Temperature dependence of $f_C$: $f_C(T_A) = f_C(T_0)\ (1 + TC_f(T_A - T_0)^2)$

[2] 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.

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




$C_{p1}$ = 3,3 pF
$L_{s2}$ = 12 nH
$L_{s3}$ = 12 nH
$C_{p4}$ = 3,3 pF

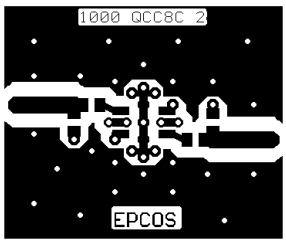
Minimising the crosstalk

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.

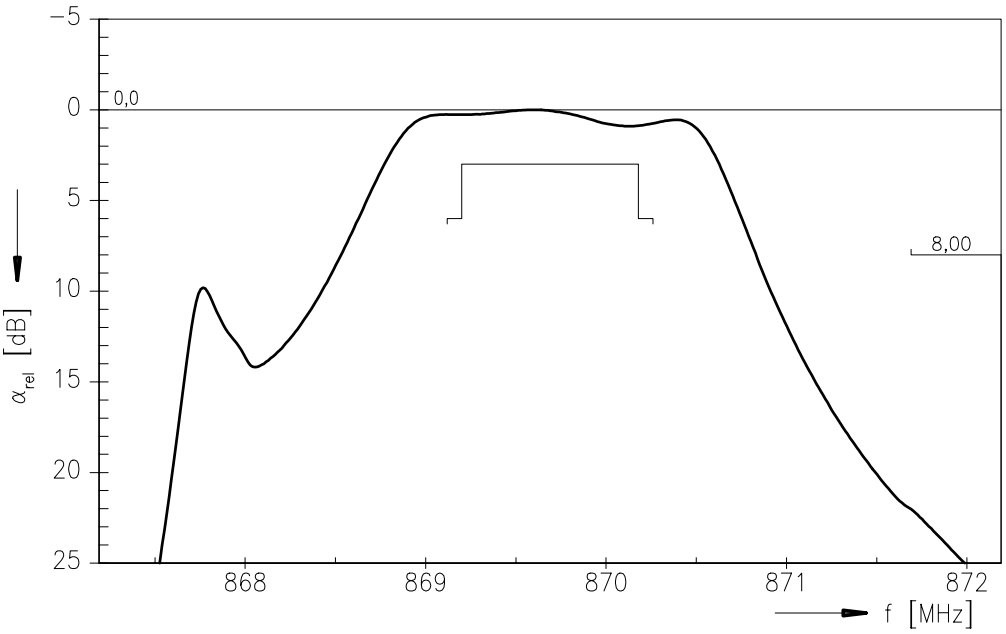



Optimised PCB layout for SAW filters in QCC8 package, pinning 1,5 (top side, scale 1:1)

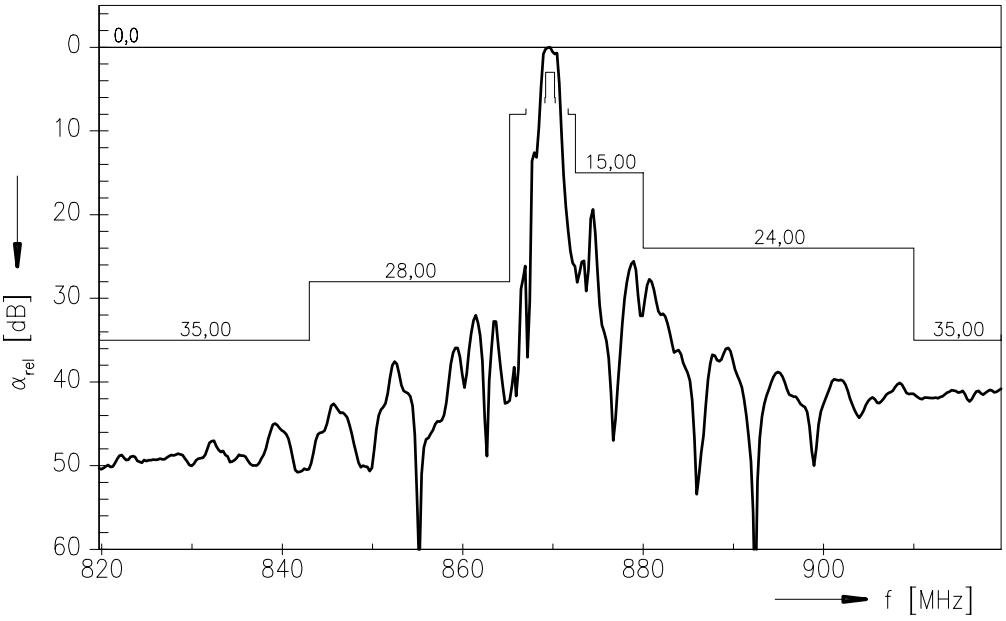
The bottom side is a copper plane (system ground area). The input and output grounding pins are isolated and connected to the common ground by separated via holes.

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

**Normalized frequency response**




**Normalized frequency response** (wideband)



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