# *SAW Components*

*Data Sheet B3802*

Data Sheet

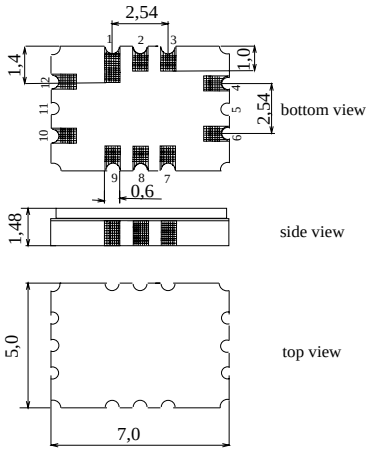
**Ceramic package QCC12C**

### Features

- Low-loss IF filter
- Balanced or unbalanced operation
- Ceramic package for **S**urface **M**ounted **T**echnology **(SMT)**

### Terminals

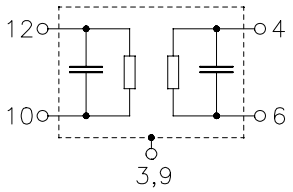
- Ni, Gold-plated




Dimensions in mm, approx. weight 0,25

### Pin configuration

| | |
|---|---|
| 12 | Input |
| 10 | Balance input or input ground |
| 4 | Output |
| 6 | Balance output or output ground |
| 1, 2, 7, 8 | Ground |
| 3, 9 | Case ground |




| Type | Ordering code | Marking and Package according to | Packing according to |
|---|---|---|---|
| B3802 | B39111-B3802-H310 | C61157-A7-A95 | F61074-V8170-Z000 |

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

### Maximum ratings

| | | | | |
|---|---|---|---|---|
| Operable temperature range | $T$ | – 40/+ 85 | ˚C | |
| Storage temperature range | $T_{stg}$ | – 40/+ 85 | ˚C | |
| DC voltage | $V_{DC}$ | 0 | V | |
| Source power | $P_S$ | 10 | dBm | |

## Characteristics

Operating temperature: T = 25 ˚C
Terminating source impedance: $Z_S$ = 50 Ω and matching network
Terminating load impedance: $Z_L$ = 50 Ω and matching network

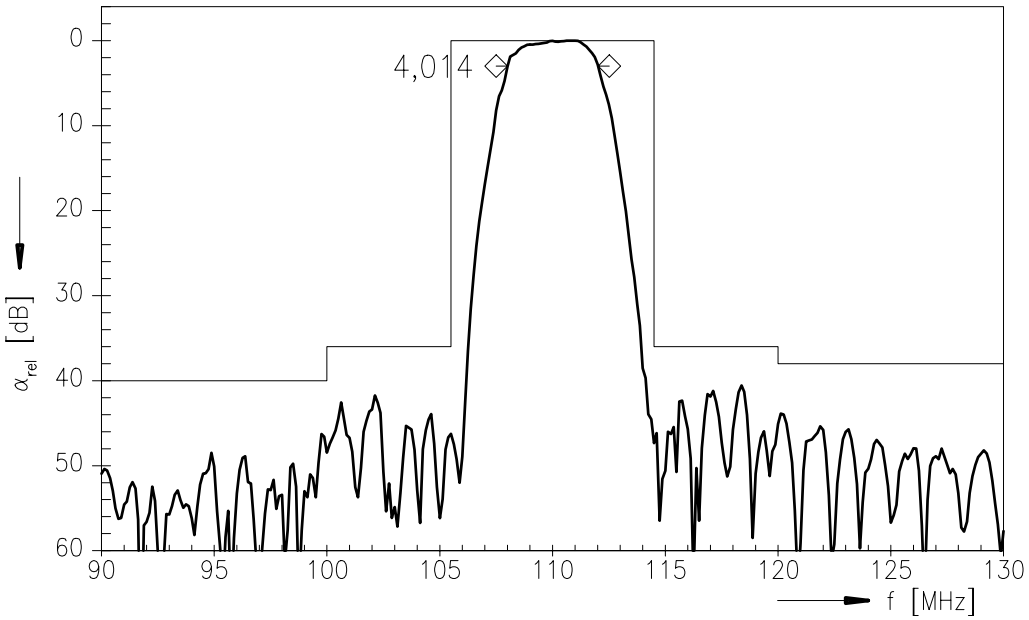
| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Center frequency** | | $f_C$ | 109,9 | 110,0 | 110,1 | MHz |
| **Minimum insertion attenuation** | | $\alpha_{min}$ | — | 6,8 | 10,0 | dB |
| **Pass bandwidth** | $\alpha_{rel}$ ≤3,0 dB | $B_{3dB}$ | 3,75 | 4,0 | — | MHz |
| | $\alpha_{rel}$ ≤1,0 dB | $B_{1dB}$ | — | 3,1 | — | MHz |
| **Amplitude ripple** (max peak to adjacent valley) | | $\Delta\alpha$ | | | | |
| | $f_C \pm 1{,}6$ MHz | | — | 0,5 | — | dB |
| **Group delay ripple** | | $\Delta\tau$ | | | | |
| | $f_C \pm 1{,}6$ MHz | | — | 45 | 80 | ns |
| **Relative attenuation** (relative to $\alpha_{min}$) | | $\alpha_{rel}$ | | | | |
| 60,0 MHz ... 100,0 MHz | | | 40 | 42 | — | dB |
| 100,0 MHz ... 105,5 MHz | | | 36 | 41 | — | dB |
| 114,5 MHz ... 120,0 MHz | | | 36 | 41 | — | dB |
| 120,0 MHz ... 160,0 MHz | | | 38 | 43 | — | dB |
| **Temperature coefficient of frequency** | | $TC_f$ | — | –18 | — | ppm/K |

## Characteristics

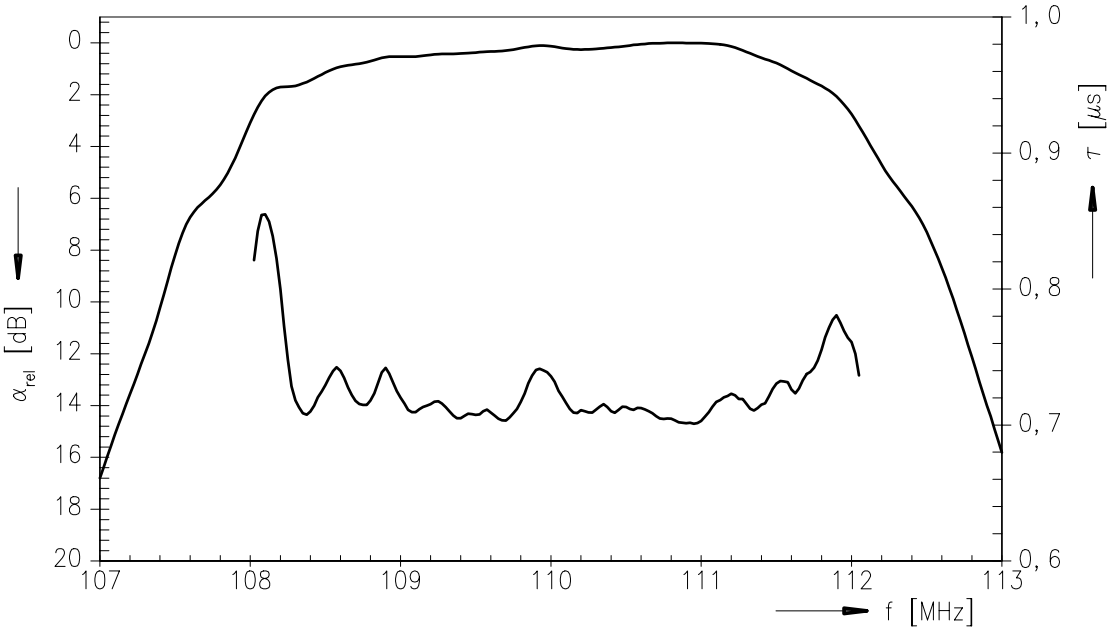
Operating temperature: T = -10 ... 70 °C
Terminating source impedance: $Z_S$ = 50 Ω and matching network
Terminating load impedance: $Z_L$ = 50 Ω and matching network

| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Center frequency** | | $f_C$ | 109,8 | 110,0 | 110,18 | MHz |
| **Minimum insertion attenuation** | | $\alpha_{min}$ | — | 6,8 | 10,0 | dB |
| **Pass bandwidth** | $\alpha_{rel}$ ≤3,0 dB | $B_{3dB}$ | 3,75 | 4,0 | — | MHz |
| | $\alpha_{rel}$ ≤1,0 dB | $B_{1dB}$ | — | 3,1 | — | MHz |
| **Amplitude ripple** (max peak to adjacent valley) | | $\Delta\alpha$ | | | | |
| | $f_C \pm 1{,}6$ MHz | | — | 0,5 | — | dB |
| **Group delay ripple** | | $\Delta\tau$ | | | | |
| | $f_C \pm 1{,}6$ MHz | | — | 45 | 80 | ns |
| **Relative attenuation** (relative to $\alpha_{min}$) | | $\alpha_{rel}$ | | | | |
| 60,0 MHz ... 100,0 MHz | | | 40 | 42 | — | dB |
| 100,0 MHz ... 105,5 MHz | | | 36 | 41 | — | dB |
| 114,5 MHz ... 120,0 MHz | | | 36 | 41 | — | dB |
| 120,0 MHz ... 160,0 MHz | | | 38 | 43 | — | dB |
| **Temperature coefficient of frequency** | | $TC_f$ | — | –18 | — | ppm/K |

**Normalized frequency response**

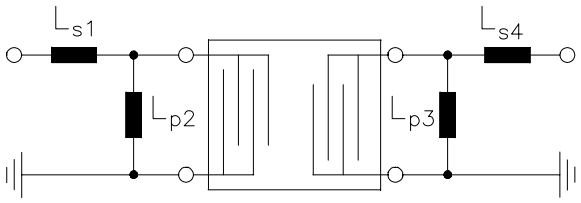



**Normalized frequency response (pass band)**



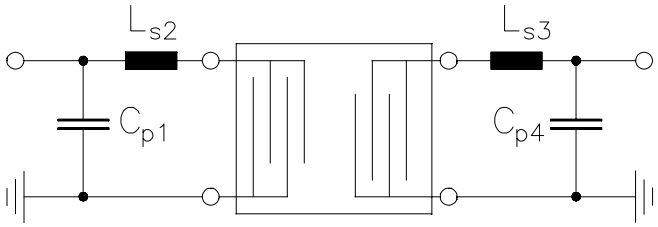
**Matching network** (element values may depend on pcb layout)

**50 Ω unbalanced:**




$L_{s1}$ = 82 nH
$L_{p2}$ = 47 nH
$L_{p3}$ = 33 nH
$L_{s4}$ = 12 nH

**50 Ω unbalanced :** (higher IL, but more attenuation in the upper stopband)




$C_{p1}$ = 100 nF
$L_{s2}$ = 56 nH
$L_{s3}$ = 56 nH
$C_{p4}$ = 68 nF

**Published by EPCOS AG**
**Surface Acoustic Wave Components Division, SAW MC WT**
**P.O. Box 80 17 09, 81617 Munich, GERMANY**



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