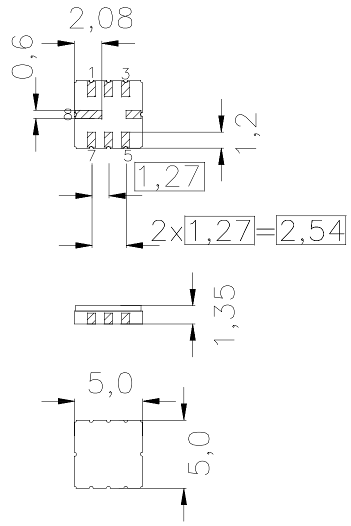
**Siemens Matsushita Components**

# SAW Components
# Low-Loss Filter

**B4846**
**225,0 MHz**

**Data Sheet**

SMD ceramic package **QCC8C**




Dimensions in mm, approx. weight 0,10 g

## Features

- Low-loss IF filter for mobile telephone
- Channel selection in GSM, PCN systems
- Ceramic SMD package

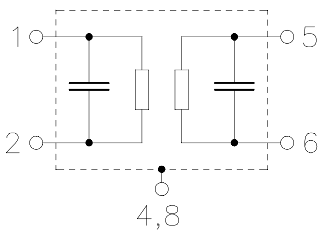
- Very small size
- Low insertion attenuation
- Low group delay ripple

## Terminals

- Gold-plated Ni

## Pin configuration

| | |
|---|---|
| 1,2 | Input, balanced |
| 5,6 | Output, balanced |
| 4,8 | Case - ground |
| 3,7 | To be grounded |




| Type | Ordering code | Marking and Package according to | Packing according to |
|---|---|---|---|
| B4846 | B39231-B4846-U310 | C61157-A7-A53 | F61074-V8070-Z000 |

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

## Maximum ratings

| | | | | |
|---|---|---|---|---|
| Operable temperature range | $T$ | – 25/+ 80 | ˚C | |
| Storage temperature range | $T_{stg}$ | – 40/+ 85 | ˚C | |
| DC voltage | $V_{DC}$ | 5 | V | |
| Source power | $P_s$ | 10 | dBm | |

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**Characteristics**

Reference temperature: $T$ = 25 ˚C
Terminating source impedance: $Z_S$ = 860 Ω || -2,0 pF
Terminating load impedance: $Z_L$ = 860 Ω || -2,0 pF

| | | | min. | typ. | max. | |
|---|---|---|---|---|---|---|
| **Nominal frequency** | | $f_N$ | — | 225,01 | — | MHz |
| **Minimum insertion attenuation** (including loss in baluns and matching elements) | | $\alpha_{min}$ | 3,0 | 3,9 | 4,5 | dB |
| **Amplitude ripple** (p-p) | | $\Delta\alpha$ | | | | |
| $f_N$ - 67,5 kHz ... | $f_N$ + 67,5 kHz | | — | 0,6 | 1,6 | dB |
| $f_N$ - 80,0 kHz ... | $f_N$ + 80,0 kHz | | — | 0,7 | 3,0 | dB |
| **Group delay ripple** (p-p) | | $\Delta\tau$ | | | | |
| $f_N$ - 50,0 kHz ... | $f_N$ + 50,0 kHz | | — | 0,2 | 1,3 | µs |
| $f_N$ - 67,5 kHz ... | $f_N$ + 67,5 kHz | | — | 0,3 | 1,5 | µs |
| $f_N$ - 80,0 kHz ... | $f_N$ + 80,0 kHz | | — | 0,6 | 1,8 | µs |
| **Relative attenuation** (relative to $\alpha_{min}$) | | $\alpha_{rel}$ | | | | |
| $f_N$ - 15,00 MHz ... | $f_N$ - 5,00 MHz | | 42 | 45 | — | dB |
| $f_N$ - 5,00 MHz ... | $f_N$ - 2,00 MHz | | 43 | 46 | — | dB |
| $f_N$ - 2,00 MHz ... | $f_N$ - 0,60 MHz | | 36 | 37 | — | dB |
| $f_N$ - 0,60 MHz ... | $f_N$ - 0,40 MHz | | 26,5 | 29 | — | dB |
| $f_N$ - 0,40 MHz ... | $f_N$ - 0,20 MHz | | 6,5 | 12 | — | dB |
| $f_N$ + 0,20 MHz ... | $f_N$ + 0,40 MHz | | 6,5 | 12 | — | dB |
| $f_N$ + 0,40 MHz ... | $f_N$ + 0,60 MHz | | 26,5 | 29 | — | dB |
| $f_N$ + 0,60 MHz ... | $f_N$ + 2,00 MHz | | 36 | 37 | — | dB |
| $f_N$ + 2,00 MHz ... | $f_N$ + 5,0 MHz | | 43 | 47 | — | dB |
| $f_N$ + 3,00 MHz ... | $f_N$ + 15,0 MHz | | 42 | 45 | — | dB |
| **Impedance** within the passband | | | | | | |
| Input: $Z_{IN}$ = $R_{IN}$ \|\| $C_{IN}$ | | | — | 860 \|\| 2,0 | — | Ω \|\| pF |
| Output: $Z_{OUT}$ = $R_{OUT}$ \|\| $C_{OUT}$ | | | — | 860 \|\| 2,0 | — | Ω \|\| pF |
| **Temperature coefficient of frequency** [1] | | $TC_f$ | — | -0,036 | — | ppm/K$^2$ |
| **Frequency inversion point** | | $T_0$ | — | 25 | — | ˚C |

[1] Temperature dependence of $f_c$: $f_c(T) = f_c(T_0)(1 + TC_f(T - T_0)^2)$

## Characteristics

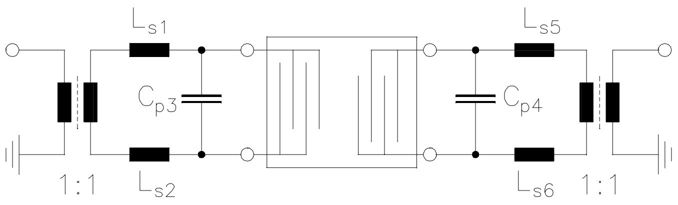
| | | |
|---|---|---|
| Operating temperature range: | $T$ | = -20 to +70 ˚C |
| Terminating source impedance: | $Z_S$ | = 860 Ω \|\| -2,0 pF |
| Terminating load impedance: | $Z_L$ | = 860 Ω \|\| -2,0 pF |

| | | min. | typ. | max. | |
|---|---|---|---|---|---|
| **Nominal frequency** | $f_N$ | — | 225,00 | — | MHz |
| **Minimum insertion attenuation** (including loss in baluns and matching elements) | $\alpha_{min}$ | 3,0 | 3,9 | 5,0 | dB |
| **Amplitude ripple** (p-p) | $\Delta\alpha$ | | | | |
| $f_N$ - 67,5 kHz ... $f_N$ + 67,5 kHz | | — | 0,7 | 2,2 | dB |
| $f_N$ - 80,0 kHz ... $f_N$ + 80,0 kHz | | — | 0,8 | 3,2 | dB |
| **Group delay ripple** (p-p) | $\Delta\tau$ | | | | |
| $f_N$ - 50,0 kHz ... $f_N$ + 50,0 kHz | | — | 0,2 | 1,3 | µs |
| $f_N$ - 67,5 kHz ... $f_N$ + 67,5 kHz | | — | 0,4 | 1,6 | µs |
| $f_N$ - 80,0 kHz ... $f_N$ + 80,0 kHz | | — | 0,7 | 1,8 | µs |
| **Relative attenuation** (relative to $\alpha_{min}$) | $\alpha_{rel}$ | | | | |
| $f_N$ - 15,00 MHz ... $f_N$ - 5,00 MHz | | 42 | 45 | — | dB |
| $f_N$ - 5,00 MHz ... $f_N$ - 2,00 MHz | | 43 | 46 | — | dB |
| $f_N$ - 2,00 MHz ... $f_N$ - 0,60 MHz | | 35 | 37 | — | dB |
| $f_N$ - 0,60 MHz ... $f_N$ - 0,40 MHz | | 26 | 29 | — | dB |
| $f_N$ - 0,40 MHz ... $f_N$ - 0,20 MHz | | 5 | 13 | — | dB |
| $f_N$ + 0,20 MHz ... $f_N$ + 0,40 MHz | | 5 | 11 | — | dB |
| $f_N$ + 0,40 MHz ... $f_N$ + 0,60 MHz | | 26 | 29 | — | dB |
| $f_N$ + 0,60 MHz ... $f_N$ + 2,00 MHz | | 35 | 37 | — | dB |
| $f_N$ + 2,00 MHz ... $f_N$ + 5,00 MHz | | 43 | 47 | — | dB |
| $f_N$ + 5,00 MHz ... $f_N$ + 15,00 MHz | | 42 | 45 | — | dB |
| **Impedance** within the passband | | | | | |
| Input: $Z_{IN} = R_{IN} \parallel C_{IN}$ | | — | 860 \|\| 2,0 | — | Ω \|\| pF |
| Output: $Z_{OUT} = R_{OUT} \parallel C_{OUT}$ | | — | 860 \|\| 2,0 | — | Ω \|\| pF |
| **Temperature coefficient of frequency** [1] | $TC_f$ | — | -0,036 | — | ppm/K² |
| **Frequency inversion point** | $T_0$ | — | 25 | — | ˚C |

[1] Temperature dependence of $f_c$: $f_c(T) = f_c(T_0)(1 + TC_f(T - T_0)^2)$

**Test matching network** (element values depend on pcb layout)

Source impedance $Z_S$=50 Ω, load impedance $Z_L$=50 Ω




$L_{s1}$ = $L_{s2}$ = 47 nH
$L_{s5}$ = $L_{s6}$ = 47 nH
$C_{p3}$ = $C_{p4}$ = 1,2 pF

**Data Sheet**

**Transfer function** (normalized)