



# SAW Components

Data Sheet B4846





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Low-Loss Filter for Mobile Communication

225,0 MHz

Data Sheet



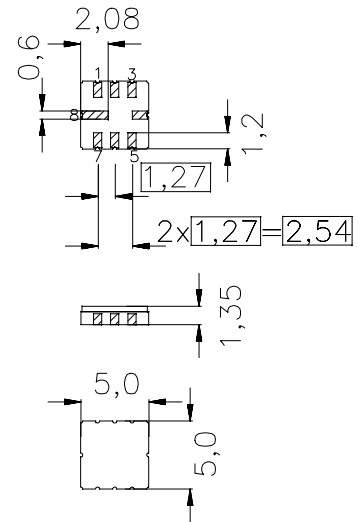
SMD Ceramic package QCC8C

**Features**

- Low-loss RF filter for mobile telephone
- Channel selection in GSM, PCN systems
- Ceramic Package for **Surface Mounted Technology (SMT)**
- Low insertion attenuation
- Low group delay ripple

**Terminals**

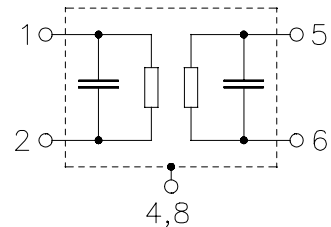
- Gold-plated Ni



Dimensions in mm, approx. weight 0,10 g

**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-A67	F61074-V8088-Z000

Electrostatic Sensitive Device (ESD)

**Maximum ratings**

Operable temperature range	$T$	- 25/+ 80	°C	Machine Model, 10 pulses
Storage temperature range	$T_{stg}$	- 40/+ 85	°C	
DC voltage	$V_{DC}$	5	V	
ESD voltage	$V_{ESD}^*$	100*	V	
Source power	$P_s$	10	dBm	

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



Data Sheet



Characteristics

Operating temperature range:  $T = 25 \text{ }^\circ\text{C}$   
 Terminating source impedance:  $Z_S = 860 \text{ } \Omega \parallel -2,0\text{pf}$   
 Terminating load impedance:  $Z_L = 860 \text{ } \Omega \parallel -2,0\text{pf}$

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

<sup>1)</sup> Temperature dependence of  $f_c$ :  $f_c(T) = f_c(T_0)(1 + TC_f(T - T_0)^2)$



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**Characteristics**

Operating temperature range:  $T = -20$  to  $+75^\circ\text{C}$   
 Terminating source impedance:  $Z_S = 860\ \Omega \parallel -2,0\text{pf}$   
 Terminating load impedance:  $Z_L = 860\ \Omega \parallel -2,0\text{pf}$

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

<sup>1)</sup> Temperature dependence of  $f_c$ :  $f_c(T) = f_c(T_0)(1 + TC_f(T - T_0)^2)$



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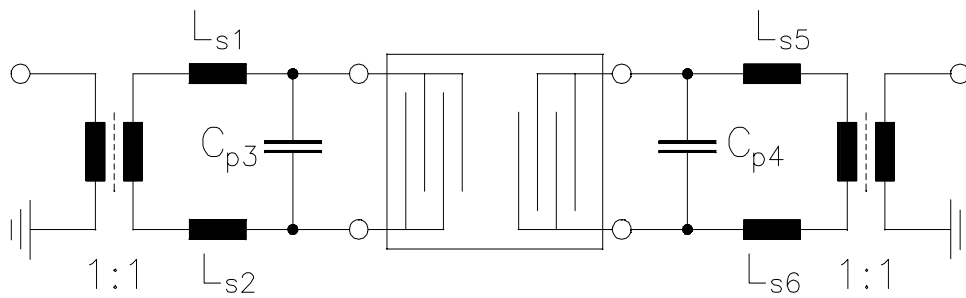
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Test matching network (element values depend on pcb layout)

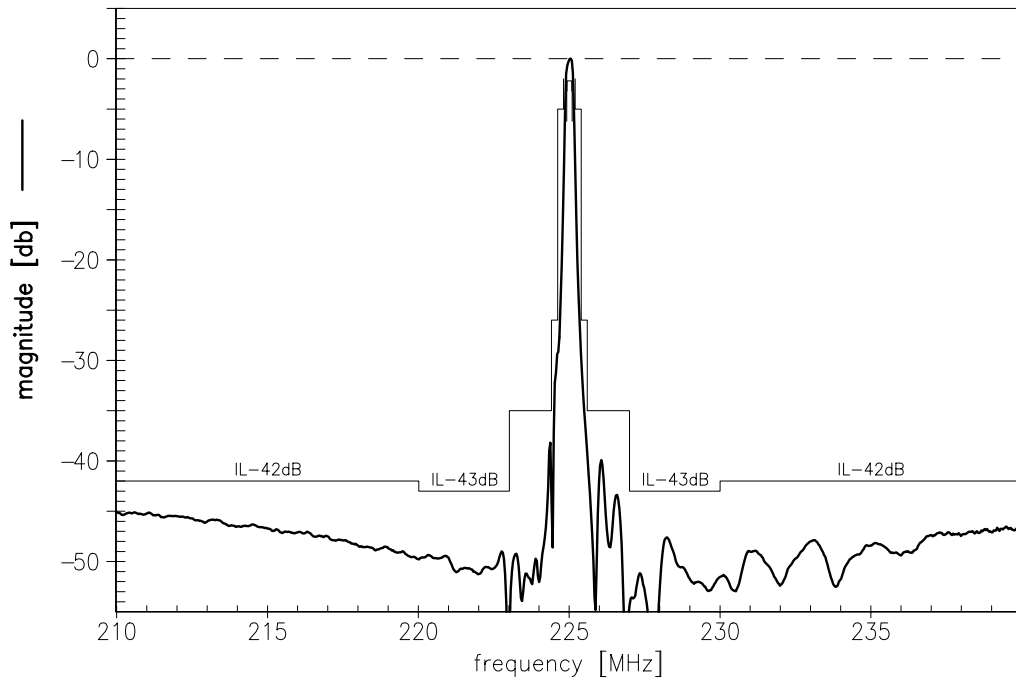
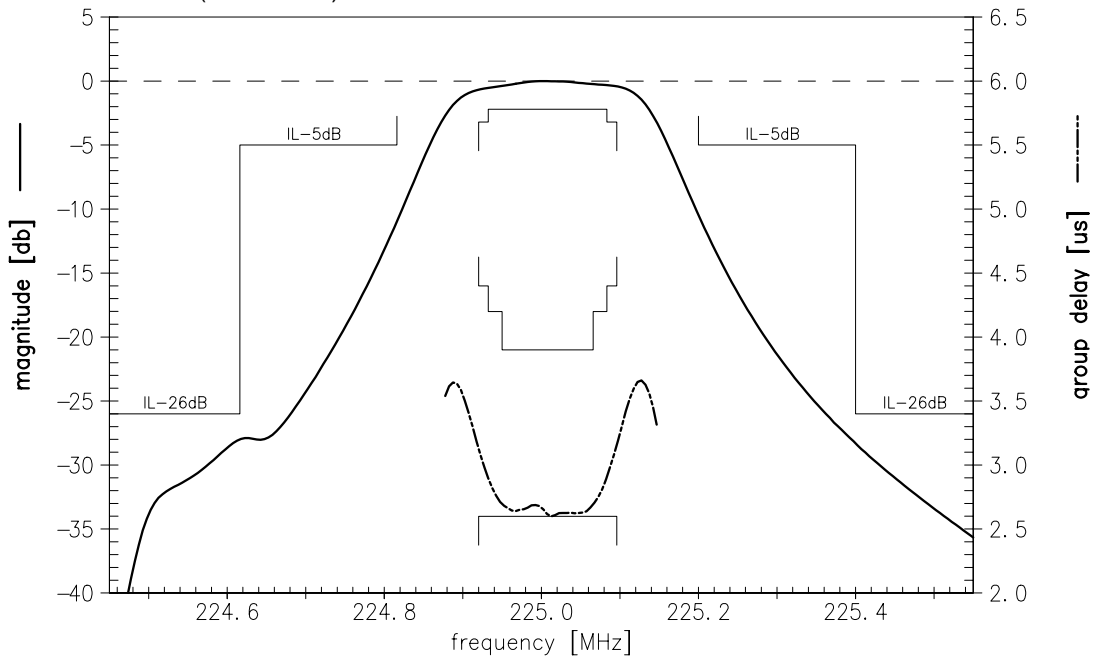
Source impedance  $Z_S=50 \Omega$ , load impedance  $Z_L=50 \Omega$



$$\begin{aligned}L_{s1} &= L_{s2} = 47 \text{ nH} \\L_{s5} &= L_{s6} = 47 \text{ nH} \\C_{p3} &= C_{p4} = 1,2 \text{ pF}\end{aligned}$$



Transfer function(normalized):





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