



SAW Components

Data Sheet B4846

Data Sheet

A large, stylized, 3D graphic of the word "EPCOS" in a light gray, sans-serif font. The letters are tilted and appear to be floating or emerging from a dark, textured background that resembles a globe or a complex circuit pattern.



SAW Components

B4846

Low-Loss Filter for Mobile Communication

225,0 MHz

Data Sheet



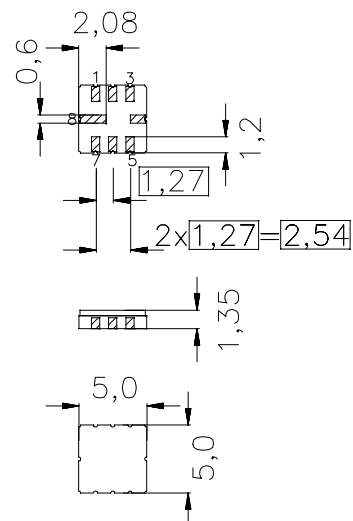
SMD Ceramic package **QCC8C**

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

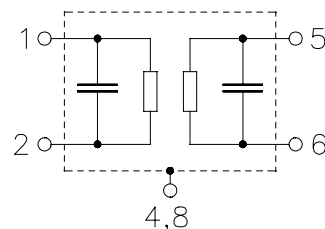
- Gold-plated Ni



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



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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.	
Nominal frequency	f_c	—	225,01	—	MHz
Minimum insertion attenuation (including loss in baluns and matching elements)	α_{\min}	3,0	3,9	4,5	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
$f_N - 67,5\text{ kHz} \dots f_N + 67,5\text{ kHz}$		—	0,6	1,6	dB
$f_N - 80,0\text{ kHz} \dots f_N + 80,0\text{ kHz}$		—	0,7	3,0	dB
Group delay ripple (p-p)	$\Delta\tau$				
$f_N - 50,0\text{ kHz} \dots f_N + 50,0\text{ kHz}$		—	0,2	1,3	μs
$f_N - 67,5\text{ kHz} \dots f_N + 67,5\text{ kHz}$		—	0,3	1,5	μs
$f_N - 80,0\text{ kHz} \dots f_N + 80,0\text{ kHz}$		—	0,6	1,8	μs
Relative attenuation (relative to α_{\min})	α_{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
Impedance within the passband					
Input: $Z_{\text{IN}} = R_{\text{IN}} \parallel C_{\text{IN}}$		—	$860 \parallel 2,0$	—	$\Omega \parallel \text{pF}$
Output: $Z_{\text{OUT}} = R_{\text{OUT}} \parallel C_{\text{OUT}}$		—	$860 \parallel 2,0$	—	$\Omega \parallel \text{pF}$
Temperature coefficient of frequency ¹⁾	TC_f	—	-0,036	—	ppm/K ²
Frequency inversion point	T_0	—	25	—	$^{\circ}\text{C}$

¹⁾ 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: $Z_L = 860\ \Omega \parallel -2,0\text{pf}$

		min.	typ.	max.	
Nominal frequency	f_N	—	225,00	—	MHz
Minimum insertion attenuation (including loss in baluns and matching elements)	α_{\min}	3,0	3,9	5,0	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
$f_N - 67,5\text{ kHz} \dots f_N + 67,5\text{ kHz}$		—	0,7	2,2	dB
$f_N - 80,0\text{ kHz} \dots f_N + 80,0\text{ kHz}$		—	0,8	3,2	dB
Group delay ripple (p-p)	$\Delta\tau$				
$f_N - 50,0\text{ kHz} \dots f_N + 50,0\text{ kHz}$		—	0,2	1,3	μs
$f_N - 67,5\text{ kHz} \dots f_N + 67,5\text{ kHz}$		—	0,4	1,6	μs
$f_N - 80,0\text{ kHz} \dots f_N + 80,0\text{ kHz}$		—	0,7	1,8	μs
Relative attenuation (relative to α_{\min})	α_{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
Impedance within the passband					
Input: $Z_{\text{IN}} = R_{\text{IN}} \parallel C_{\text{IN}}$		—	$860 \parallel 2,0$	—	$\Omega \parallel \text{pF}$
Output: $Z_{\text{OUT}} = R_{\text{OUT}} \parallel C_{\text{OUT}}$		—	$860 \parallel 2,0$	—	$\Omega \parallel \text{pF}$
Temperature coefficient of frequency ¹⁾	TC_f	—	-0,036	—	ppm/K ²
Frequency inversion point	T_0	—	25	—	$^{\circ}\text{C}$

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



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Low-Loss Filter for Mobile Communication

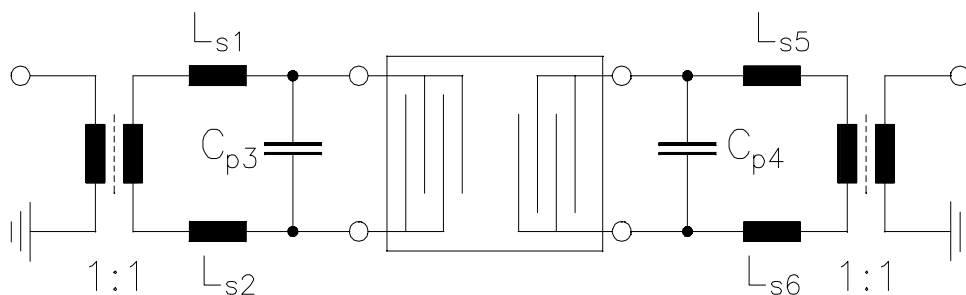
225,0 MHz

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Test matching network (element values depend on pcb layout)

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



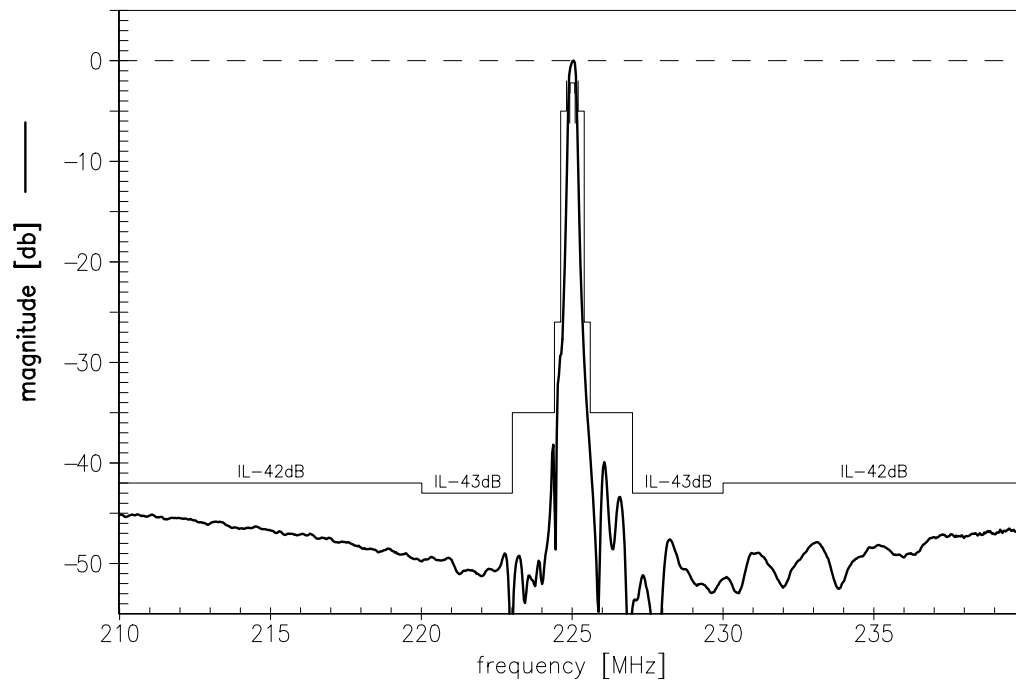
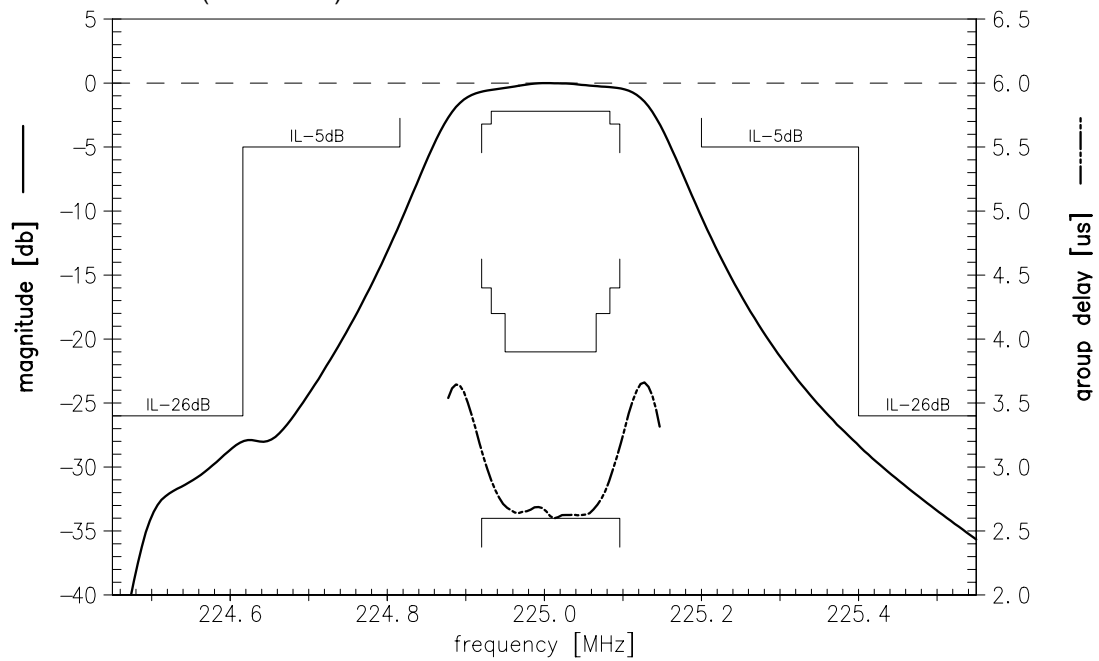
$$L_{s1} = L_{s2} = 47\ \text{nH}$$

$$L_{s5} = L_{s6} = 47\ \text{nH}$$

$$C_{p3} = C_{p4} = 1,2\ \text{pF}$$



Transfer function(normalized):





SAW Components	B4846
Low-Loss Filter for Mobile Communication	225,0 MHz
Data Sheet	SMD

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