EPCOS

SAW Components

Data Sheet B4871

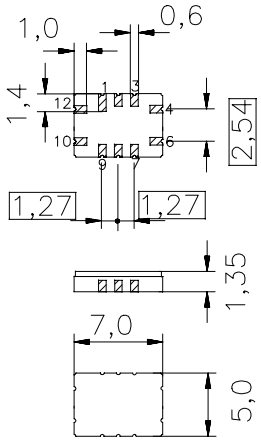
SMD ceramic package **QCC12B**

Features

- Low-loss IF filter for mobile telephone
- Channel selection in AMPS / D-AMPS systems
- Filter surface passivated
- Balanced or unbalanced operation possible
- Package for **S**urface **M**ounted **T**echnology (**SMT**)

Terminals

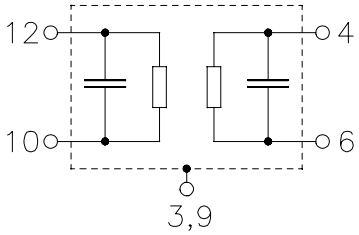
- Ni, gold plated



Dimensions in mm, approx. weight 0,2 g

Pin configuration

12	Input
6	Output
10	Balanced input or input ground
4	Balanced output or output ground
3,9	Case ground
1,2,7,8	Not connected



Type	Ordering code	Marking and Package according to	Packing according to
B4871	B39141-B4871-Z910	C61157-A7-A52	F61074-V8038-Z000

Electrostatic **S**ensitive **D**evice (**ESD**)

Maximum ratings

Operable temperature range	T	– 30/+ 85	˚C
Storage temperature range	T_{stg}	– 40/+ 85	˚C
DC voltage	V_{DC}	13	V
Source power	P_s	10	dBm

Characteristics

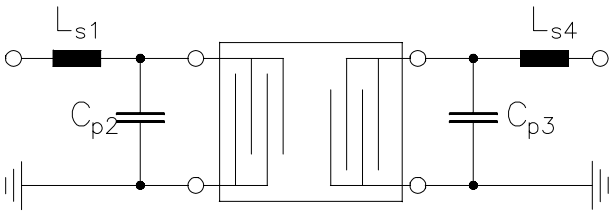
Operating temperature range: T = -30˚C ... 85˚C
Terminating source impedance: Z_S = 850 Ω || - 0,8 pF
Terminating load impedance: Z_L = 850 Ω || - 0,8 pF

		min.	typ.	max.	
Nominal frequency	f_N	—	135,54	—	MHz
3 dB Bandwidth		—	58	—	kHz
Minimum insertion attenuation (including losses in the matching network)	α_{min}	—	4,2	5,3	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
f_N – 10,0 kHz ... f_N + 10,0 kHz		—	0,2	1,5	dB
f_N – 13,0 kHz ... f_N + 13,0 kHz		—	0,5	3,0	dB
Group delay ripple (p-p)	$\Delta\tau$				
f_N – 13,0 kHz ... f_N + 13,0 kHz		—	2,0	10,0	µs
Relative attenuation (relative to α_{min})	α_{rel}				
$f_N \pm$ 60,0 kHz ... $f_N \pm$ 120,0 kHz		14	24	—	dB
$f_N \pm$ 120,0 kHz ... $f_N \pm$ 240,0 kHz		40	50	—	dB
$f_N \pm$ 240,0 kHz ... $f_N \pm$ 1000,0 kHz		50	56	—	dB
$f_N \pm$ 330,0 kHz		55	65	—	dB
$f_N \pm$ 660,0 kHz		55	70	—	dB
Impedance within the passband					
Input: $Z_{IN} = R_{IN} \parallel C_{IN}$		—	850 || 0,8	—	Ω || pF
Output: $Z_{OUT} = R_{OUT} \parallel C_{OUT}$		—	850 || 0,8	—	Ω || pF
Temperature coefficient of frequency [1]	TC_f	—	– 0,034	—	ppm/K²
Turnover temperature	T_0	—	25	—	˚C

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

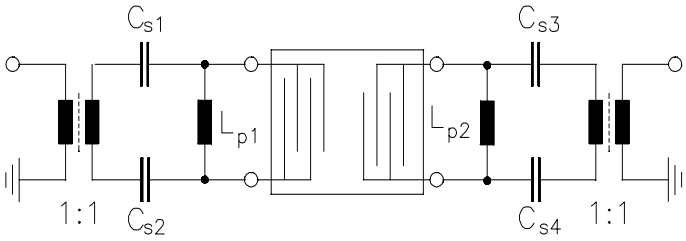
Test matching networks to 50 Ω (element values depend on pcb layout)

a) Unbalanced - unbalanced matching network



Input: Pin 12
Output: Pin 6
L_{s1} = 220 nH
C_{p2} = 3,3 pF
C_{p3} = 3,3 pF
L_{s4} = 220 nH

b) Balanced - balanced matching network



Input: Pins 12 and 10
Output: Pins 6 and 4
C_{s1} = 15 pF
C_{s2} = 12 pF
L_{p1} = 150 nH
L_{p2} = 150 nH
C_{s3} = 15 pF
C_{s4} = 12pF

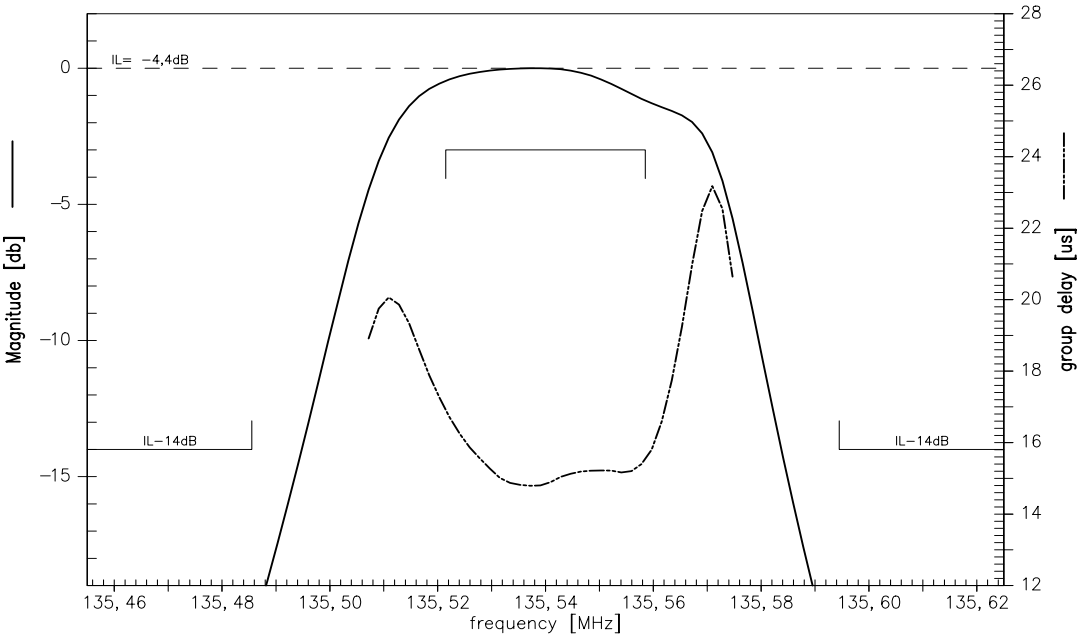
Note :

The balanced - balanced network is realized using TOKO 1:1 baluns B5FL. The insertion attenuation of each balun is 0,6 dB at f_N. The loss of the baluns is not included in the specified filter insertion attenuation. S-Parameters of the TOKO 1:1 balun B5FL are available on request.

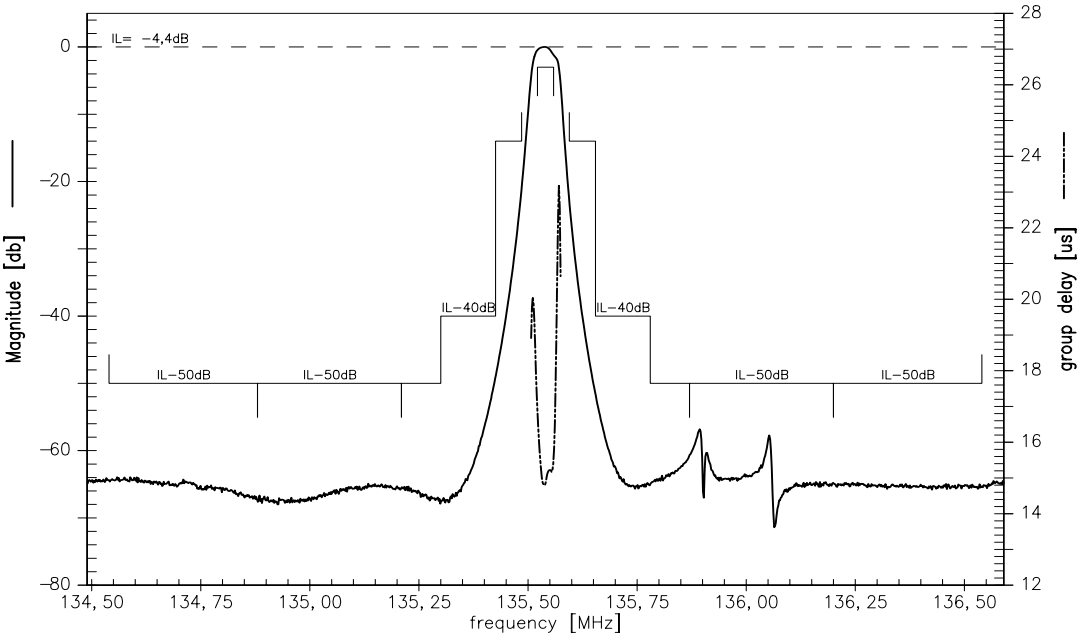
The level of ultimate suppression may be limited by electromagnetic feedthrough depending on the layout of the pcb and the arrangement of the matching components.
The above mentioned characteristics can be realized either in balanced or in unbalanced mode of operation.

For more details see our application note *PCB Layout for Highly Selective IF Filters*.

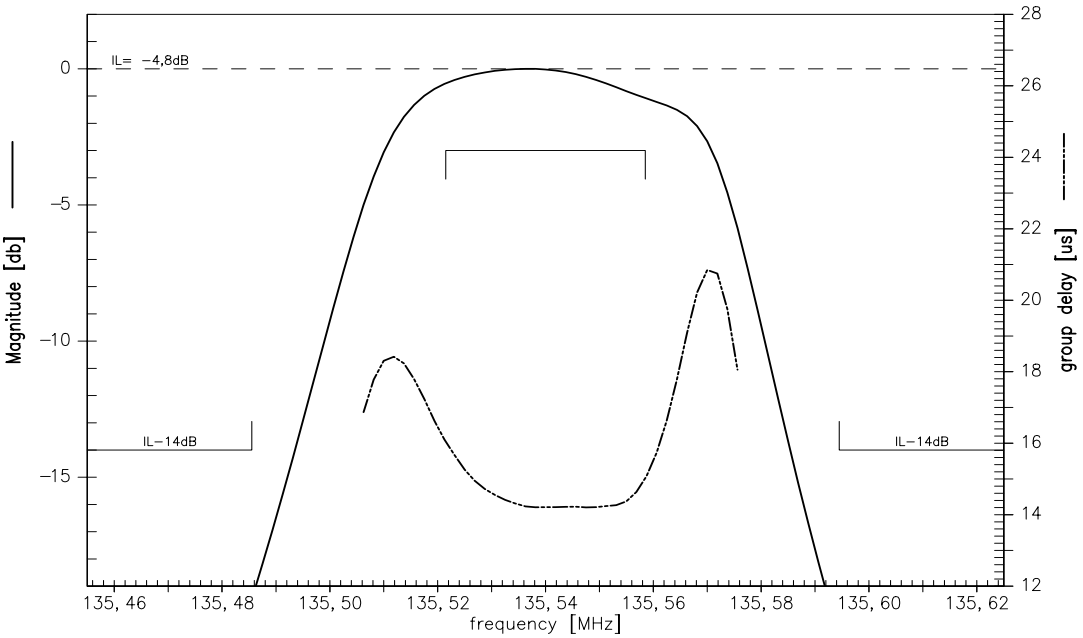
Normalized transfer function passband (measured single ended - single ended)



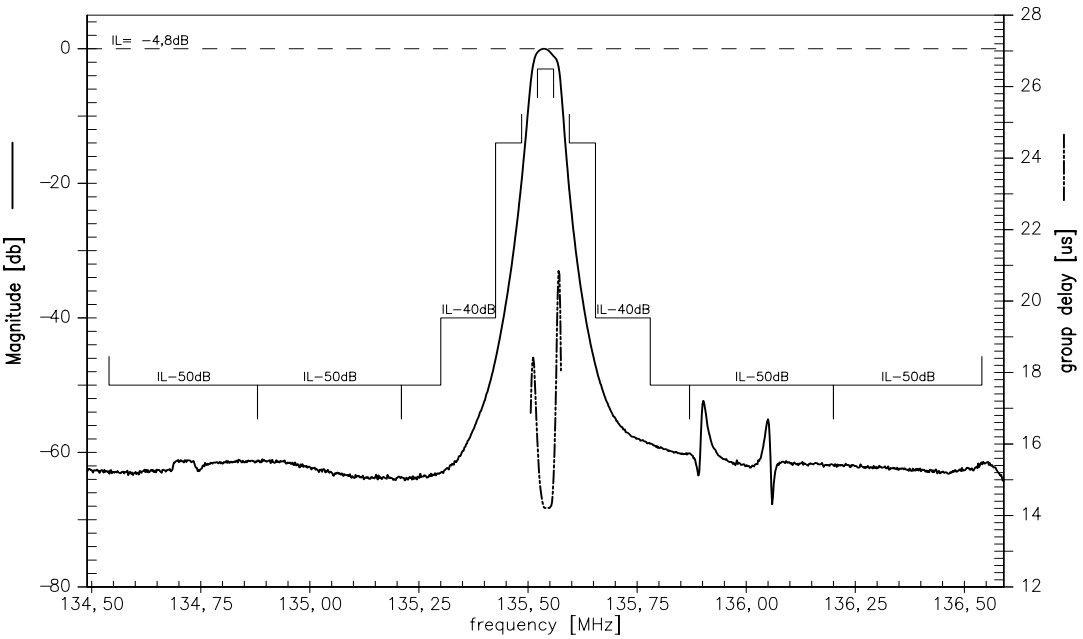
Normalized transfer function wideband (measured single ended - single ended)



Normalized transfer function passband (measured balanced - balanced)



Normalized transfer function wideband (measured balanced - balanced)



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