



IF Filters for Narrowband Cellular Phones

Series/Type: B4871

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B39141B4871H310		14.06.2006	31.08.2006	30.09.2006

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SAW Components

B4871

Low Loss Filter for Mobile Communication

135,54 MHz

Data Sheet



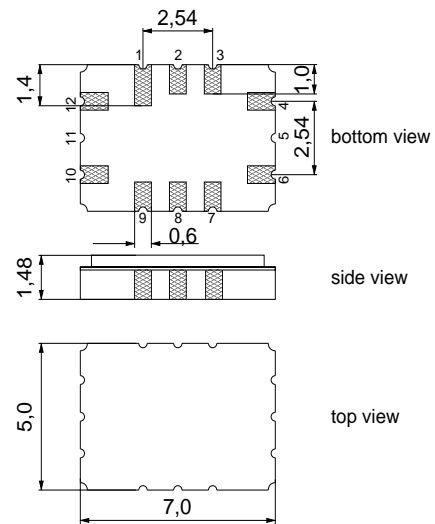
Features

- Low-loss IF filter for mobile telephone
- Channel selection in AMPS / D-AMPS systems
- Filter surface passivated
- Balanced or unbalanced operation possible
- Package for **Surface Mounted Technology (SMT)**

Terminals

- Ni, gold plated

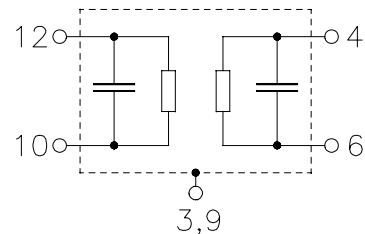
SMD ceramic package QCC12C



Dimensions in mm, approx. weight 0,25 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-H310	C61157-A7-A95	F61074-V8170-Z000

Electrostatic Sensitive Device (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



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Characteristics

Operating temperature range: $T = -30^{\circ}\text{C} \dots 85^{\circ}\text{C}$
 Terminating source impedance: $Z_S = 850 \Omega \parallel - 0,8 \text{ pF}$
 Terminating load impedance: $Z_L = 850 \Omega \parallel - 0,8 \text{ pF}$

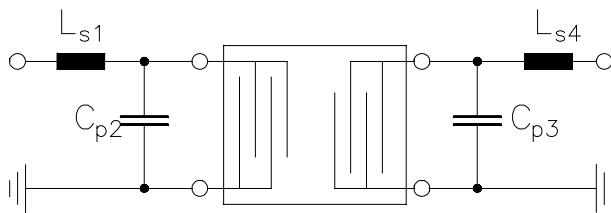
		min.	typ.	max.	
Nominal frequency	f_N	—	135,54	—	MHz
3 dB Bandwidth		—	58	—	kHz
Minimum insertion attenuation (including losses in the matching network)	α_{\min}	—	4,2	5,3	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
$f_N - 10,0 \text{ kHz} \dots f_N + 10,0 \text{ kHz}$		—	0,2	1,5	dB
$f_N - 13,0 \text{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

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



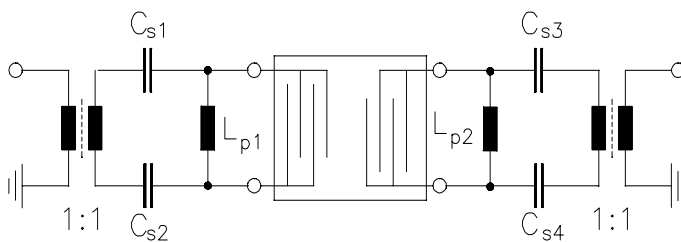
Test matching networks to 50 Ω (element values depend on pcb layout)

a) Unbalanced - unbalanced matching network



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

b) Balanced - balanced matching network



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

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.

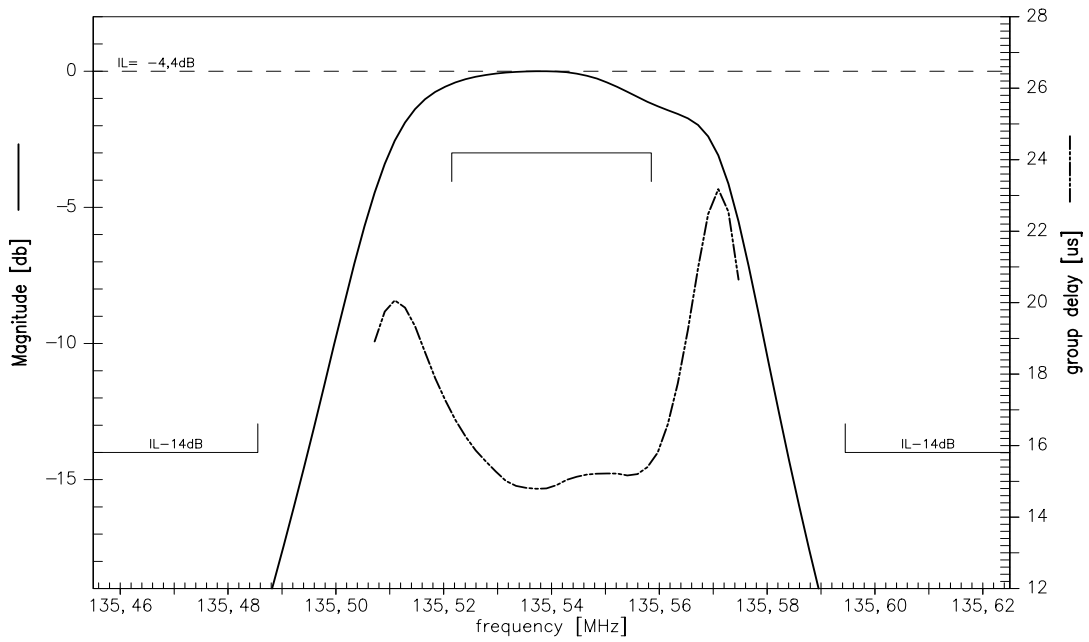
The level of ultimate suppression may be limited by electromagnetic feedthrough depending on the layout of the pcb and the arrangement of the matching components.

The above mentioned characteristics can be realized either in balanced or in unbalanced mode of operation.

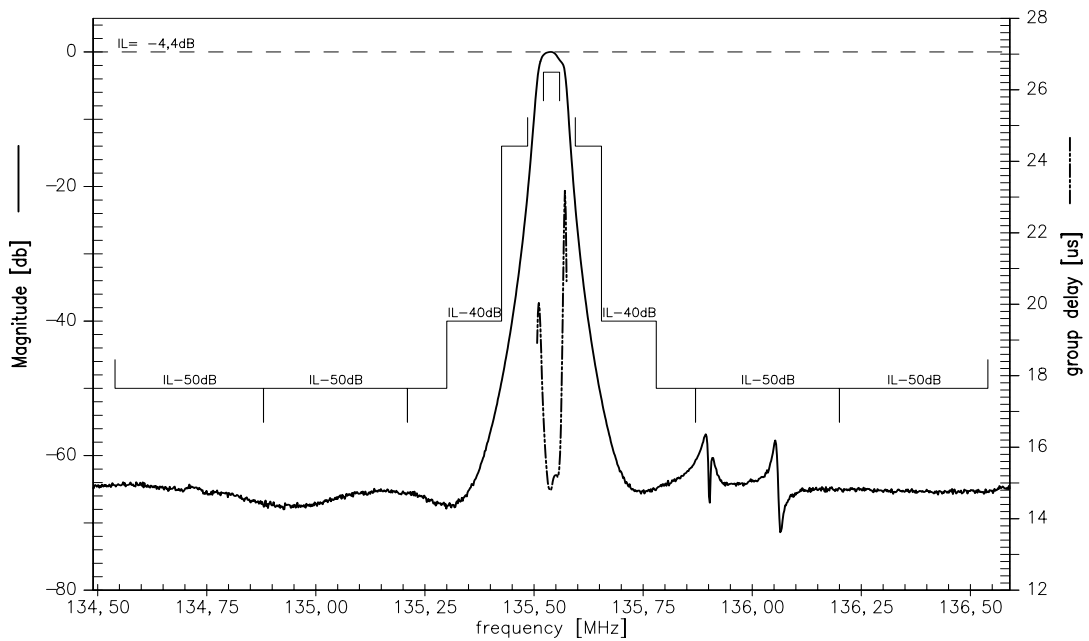
For more details see our application note *PCB Layout for Highly Selective IF Filters*.



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

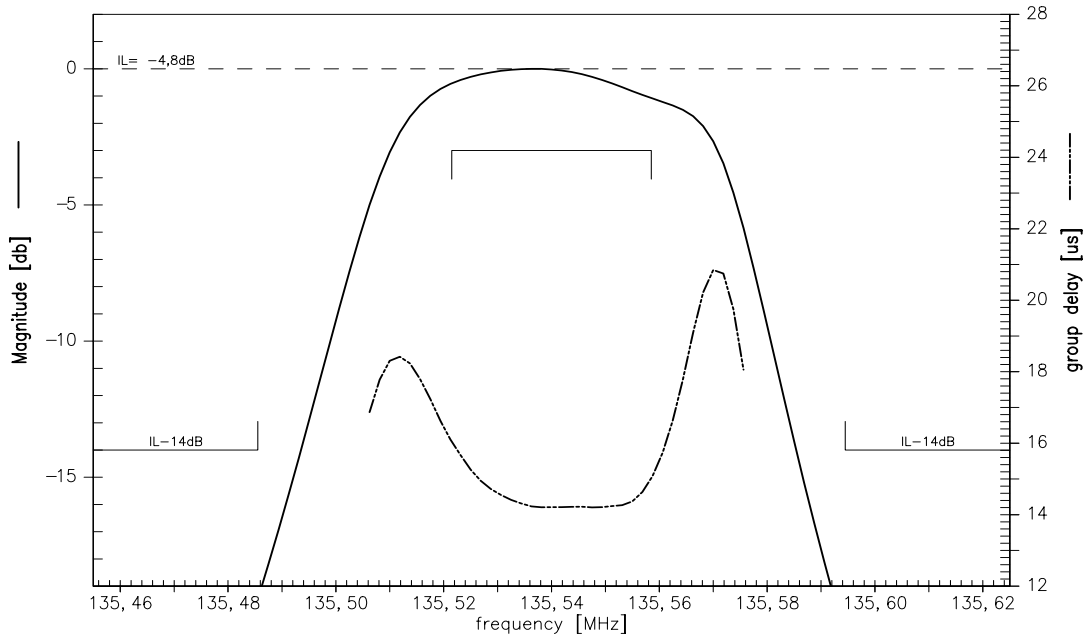


Normalized transfer function wideband (measured single ended - single ended)

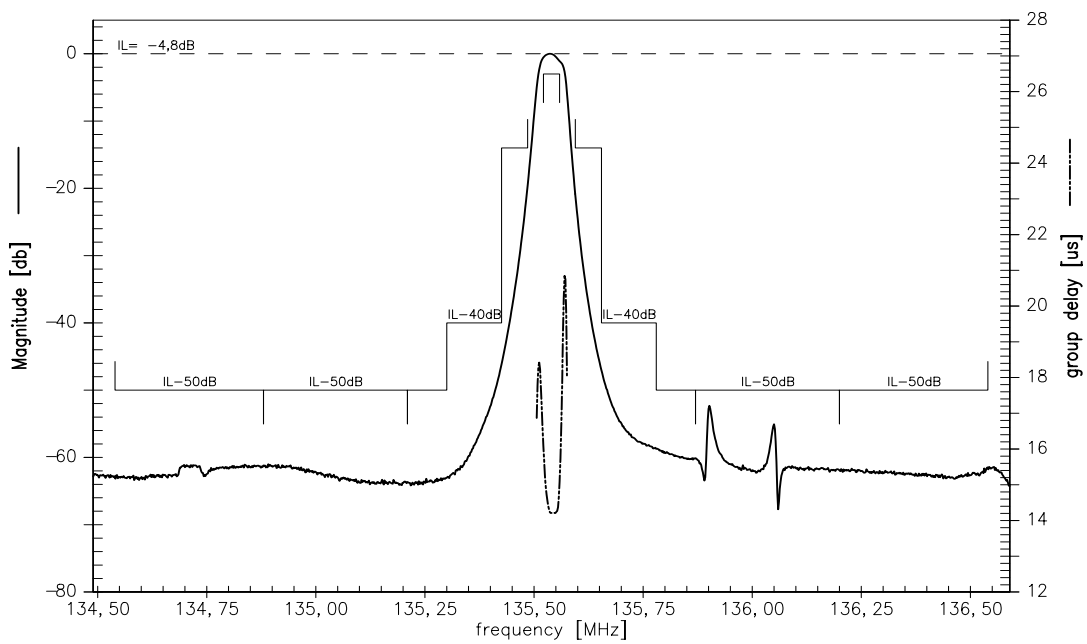




Normalized transfer function passband (measured balanced - balanced)



Normalized transfer function wideband (measured balanced - balanced)





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