



RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

## SAW Components

### SAW IF filter

mobile telephone

Series/type:	B4847
Ordering code:	B39361-B4847-U310
Date:	September 11, 2009
Version:	2.1

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# SAW Components

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<b>Series/type:</b>	<b>B4847</b>
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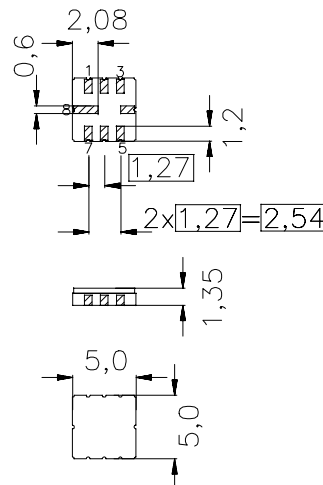
Data sheet


**Application**

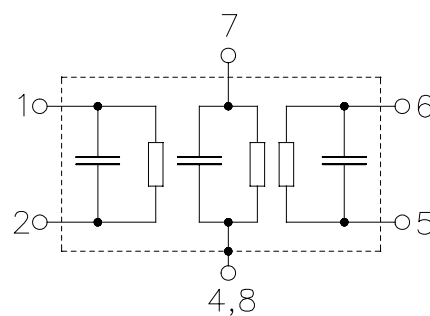
- Low-loss IF filter for mobile telephone
- Channel selection in GSM, PCN systems
- Very small size
- High close in selectivity


**Features**

- Package size 5.0 x 5.0 x 1.35 mm<sup>3</sup>
- Package code QCC8C
- RoHS compatible
- Approx. weight 0.1 g
- Package for Surface Mount Technology (SMT)
- Ni,gold-plated terminals
- Electrostatic Sensitive Device (ESD)
- Filter surface passivated


**Pin configuration**

- 1 Input or input ground
- 2 Input or balanced input
- 5 Output or output ground
- 6 Output or balanced output
- 7 External coil
- 3 To be grounded
- 4,8 Case ground



**Data sheet**

**Characteristics**

Operating temperature range:	$T = -20^{\circ}\text{C to } +75^{\circ}\text{C}$
Terminating source impedance:	$Z_S = 340\ \Omega \parallel -1.9\ \text{pF}$
Terminating load impedance:	$Z_L = 340\ \Omega \parallel -1.9\ \text{pF}$

		min.	typ.	max.	
<b>Nominal frequency</b> (center frequency between 3 dB points)	$f_N$	—	360.00	—	MHz
<b>Minimum insertion attenuation</b> (including loss in matching elements)	$\alpha_{\min}$	—	4.3	5.0	dB
<b>Amplitude ripple (p-p)</b> $f_N - 67.7\text{kHz} \dots f_N + 67.7\ \text{kHz}$	$\Delta\alpha$	—	0.6	2.0	dB
$f_N - 80.0\text{kHz} \dots f_N + 80.0\ \text{kHz}$		—	0.9	3.0	dB
<b>Passband width</b> $\alpha_{\text{rel}} \leq 3.0\ \text{dB}$	$B_{3.0\text{dB}}$	—	315	—	kHz
<b>Group delay ripple (p-p)</b> $f_N - 67.7\ \text{kHz} \dots f_N + 67.7\ \text{kHz}$	$\Delta\tau$	—	0.5	1.8	$\mu\text{s}$
<b>Relative attenuation (relative to <math>\alpha_{\min}</math>)</b> $f_N \pm 400\ \text{kHz} \dots f_N \pm 600\ \text{kHz}$	$\alpha_{\text{rel}}$	24	32	—	dB
$f_N \pm 600\ \text{kHz} \dots f_N \pm 800\ \text{kHz}$		38	48	—	dB
$f_N \pm 800\ \text{kHz} \dots f_N \pm 1.6\ \text{MHz}$		42	48	—	dB
$f_N \pm 1.6\ \text{MHz} \dots f_N \pm 5.0\ \text{MHz}$		* 52	54	—	dB
$f_N \pm 5.0\ \text{MHz} \dots f_N \pm 30.0\ \text{MHz}$		55	62	—	dB
<b>Impedance within the pass band</b> Input: $Z_{\text{IN}} = R_{\text{IN}} \parallel C_{\text{IN}}$ Output: $Z_{\text{OUT}} = R_{\text{OUT}} \parallel C_{\text{OUT}}$		—	340 $\parallel$ 1.9	—	$\Omega \parallel \text{pF}$
		—	340 $\parallel$ 1.9	—	$\Omega \parallel \text{pF}$
<b>Temperature coefficient of frequency</b> <sup>1)</sup>	$TC_f$	—	-0.036	—	ppm/K <sup>2</sup>
<b>Turnover temperature</b>	$T_0$	—	28	—	$^{\circ}\text{C}$

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

<sup>\*)</sup> In the frequency range from 362.5 MHz to 364.0 MHz there exists one spurious response. The minimum attenuation  $\alpha_{\text{rel}}$  of this spurious response is more than 48 dB.

**Data sheet**

**Characteristics**

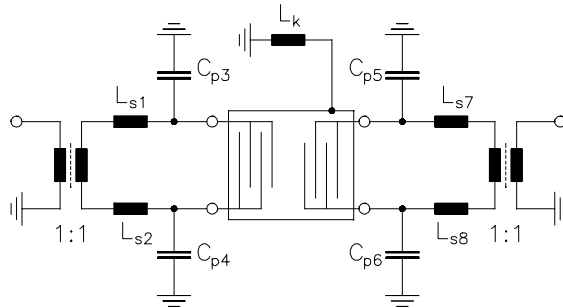
Operating temperature range:	T = -30 °C to +85 °C
Terminating source impedance:	Z <sub>S</sub> = 340 Ω    -1.9 pF
Terminating load impedance:	Z <sub>L</sub> = 340 Ω    -1.9 pF

		min.	typ.	max.	
<b>Nominal frequency</b> (center frequency between 3 dB points)	f <sub>N</sub>	—	360.00	—	MHz
<b>Minimum insertion attenuation</b> (including loss in matching elements)	α <sub>min</sub>	—	4.3	5.0	dB
<b>Amplitude ripple (p-p)</b> f <sub>N</sub> -67.7kHz .. f <sub>N</sub> +67.7 kHz	Δα	—	0.6	3.0	dB
f <sub>N</sub> -80.0kHz .. f <sub>N</sub> +80.0 kHz		—	0.9	4.5	dB
<b>Passband width</b> α <sub>rel</sub> ≤ 3.0 dB	B <sub>3.0dB</sub>	—	315	—	kHz
<b>Group delay ripple (p-p)</b> f <sub>N</sub> -67.7 kHz .. f <sub>N</sub> +67.7 kHz	Δτ	—	0.5	1.8	μs
<b>Relative attenuation (relative to α<sub>min</sub>)</b> f <sub>N</sub> ± 400 kHz ... f <sub>N</sub> ± 600 kHz	α <sub>rel</sub>	24	32	—	dB
f <sub>N</sub> ± 600 kHz ... f <sub>N</sub> ± 800 kHz		38	48	—	dB
f <sub>N</sub> ± 800 kHz ... f <sub>N</sub> ± 1.6 MHz		42	48	—	dB
f <sub>N</sub> ± 1.6 MHz ... f <sub>N</sub> ± 5.0 MHz		* 52	54	—	dB
f <sub>N</sub> ± 5.0 MHz ... f <sub>N</sub> ± 30.0 MHz		55	62	—	dB
<b>Impedance within the pass band</b> Input: Z <sub>IN</sub> = R <sub>IN</sub>    C <sub>IN</sub> Output: Z <sub>OUT</sub> = R <sub>OUT</sub>    C <sub>OUT</sub>		—	340    1.9	—	Ω    pF
		—	340    1.9	—	Ω    pF
<b>Temperature coefficient of frequency</b> <sup>1)</sup>	TC <sub>f</sub>	—	-0.036	—	ppm/K <sup>2</sup>
<b>Turnover temperature</b>	T <sub>0</sub>	—	28	—	°C

<sup>1)</sup> Temperature dependence of f<sub>c</sub>: f<sub>c</sub>(T) = f<sub>c</sub>(T<sub>0</sub>)(1 + TC<sub>f</sub>(T - T<sub>0</sub>)<sup>2</sup>)

<sup>\*</sup>) In the frequency range from 362.5 MHz to 364.0 MHz there exists one spurious response. The minimum attenuation α<sub>rel</sub> of this spurious response is more than 48 dB.

**Data sheet**

**Matching network to 50 Ω (element values depend on PCB layout)**


$$L_{s1} = L_{s2} = 18 \text{ nH}$$

$$C_{p3} = C_{p4} = 1.2 \text{ pF}$$

$$C_{p5} = C_{p6} = 1.2 \text{ pF}$$

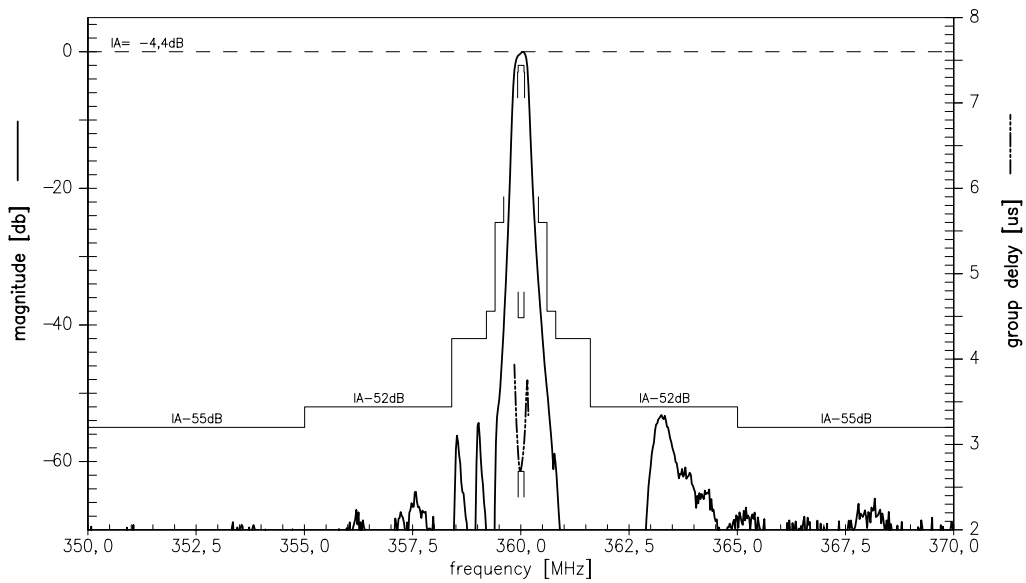
$$L_{s7} = L_{s8} = 18 \text{ nH}$$

$$L_k = 68 \text{ nH}$$
**Maximum ratings**

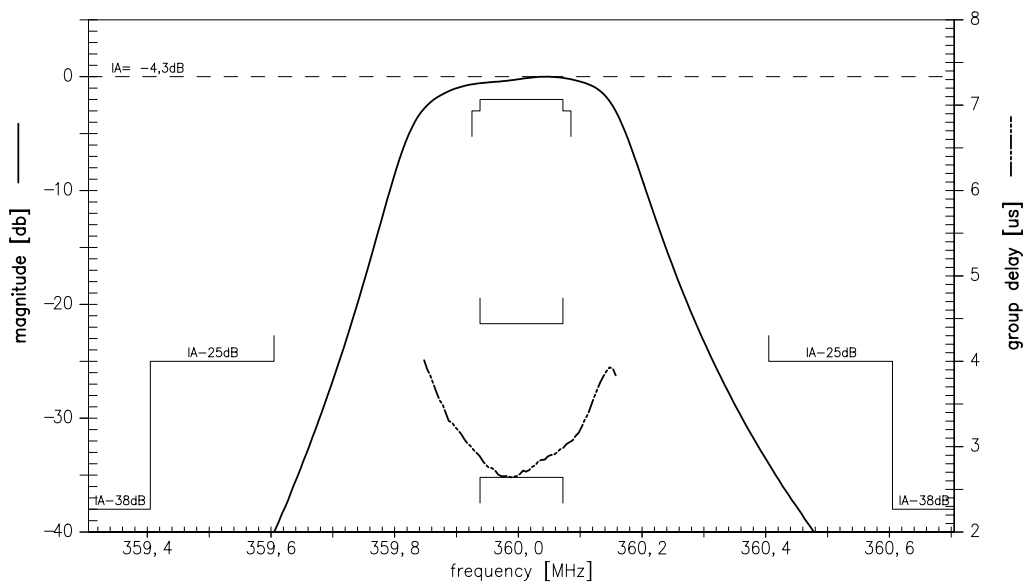
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	3	V	
Input Power at	P <sub>IN</sub>	10	dBm	



Transfer function



Transfer function (passband)





<b>SAW Components</b>	<b>B4847</b>
<b>SAW IF filter</b>	<b>360.00 MHz</b>

Data sheet



## References

<b>Type</b>	B4847
<b>Ordering code</b>	B39361-B4847-U310
<b>Marking and package</b>	C61157-A7 A56
<b>Packaging</b>	F61074-V8169-Z000
<b>Date codes</b>	L_1126
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."

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