



## **SAW Components**

### **SAW IF filter**

Satellite radio

<b>Series/type:</b>	<b>B1707</b>
<b>Ordering code:</b>	<b>B39765B1707H310</b>
<b>Date:</b>	<b>May 16, 2006</b>
<b>Version:</b>	<b>1.1</b>



## SAW Components

B1707

### SAW IF filter

76.50 MHz

#### Data sheet



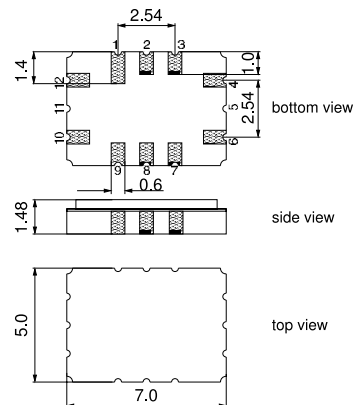
#### Application

- IF filter for digital radio
- Usable bandwidth 3.8 MHz
- Low insertion attenuation
- Constant group delay
- Unbalanced or balanced operation



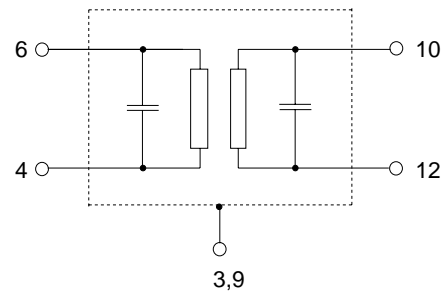
#### Features

- Package size 7.0 x 5.0 x 1.48 mm<sup>3</sup>
- Package code QCC12C
- RoHS compatible
- Approximate weight 0.20 g
- Ceramic package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



#### Pin configuration

- 4            Balanced input or input ground
- 6            Input
- 10          Balanced output or output ground
- 12          Output
- 3,9        Case – ground
- 1,2,7,8    To be grounded





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#### Characteristics

Temperature range for specification:

$T = -40\text{ °C to }(+85\text{ °C}) +105\text{ °C}$

Terminating source impedance:

$Z_S = 27\ \Omega$  and matching network

Terminating load impedance:

$Z_L = 1\text{ k}\Omega$  and matching network

		min.	typ. @ 25 °C	max.	
<b>Nominal frequency</b>	$f_N$	—	76.50	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	$\alpha_{\min}$	—	15.4	16.9	dB
<b>Maximum voltage gain source – load</b> ( $V_L/V_S$ )	$\alpha_{\text{vgsI}}$	–5.9	–4.4	—	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
$f_N \pm 1.89\text{ MHz}$		—	1.0	(1.3) 1.8	dB
<b>Pass bandwidth</b>					
$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	—	4.4	—	MHz
$\alpha_{\text{rel}} \leq 3\text{ dB}$	$B_{3\text{dB}}$	—	4.7	—	MHz
$\alpha_{\text{rel}} \leq 15\text{ dB}$	$B_{15\text{dB}}$	—	5.8	6.0	MHz
$\alpha_{\text{rel}} \leq 30\text{ dB}$	$B_{30\text{dB}}$	—	6.5	6.8	MHz
<b>Mean attenuation (relative to <math>\alpha_{\min}</math>)</b>	$\alpha_{\text{rel}}$				
Upper sidelobe 86.47 ... 91.53 MHz		48.0	54.0	—	dB
<b>Relative attenuation (relative to <math>\alpha_{\min}</math>)</b>	$\alpha_{\text{rel}}$				
Lower sidelobe 50.00 ... 65.44 MHz		40.0	45.0	—	dB
65.44 ... 70.44 MHz		34.0	38.0	—	dB
70.44 ... 72.04 MHz		32.0	36.0	—	dB
Upper sidelobe 81.26 ... 82.56 MHz		37.0	40.0	—	dB
82.56 ... 86.47 MHz		40.0	45.0	—	dB
86.47 ... 91.53 MHz		44.0	48.0	—	dB
91.53 ... 95.21 MHz		45.0	49.0	—	dB
95.21 ... 100.00 MHz		45.0	49.0	—	dB
<b>Group delay ripple (p-p)</b>	$\Delta\tau$				
Aperture 50 kHz $f_N \pm 1.89\text{ MHz}$		—	190	—	ns
<b>Temperature coefficient of frequency</b>	$TC_f$	—	–18	—	ppm/K

<sup>1)</sup> Including losses in the matching network



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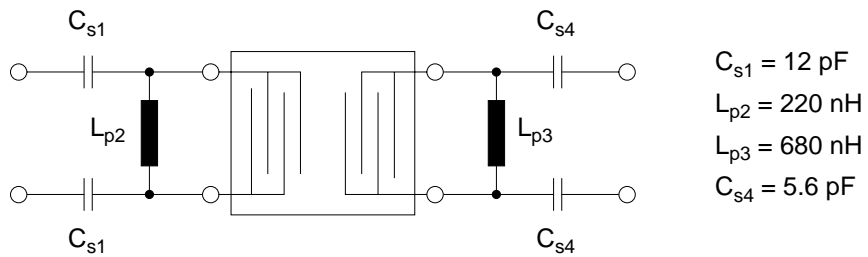
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**Matching network<sup>1)</sup>** (based on four port measurement, quality factors  $Q_L = 40$ ,  $Q_C = 90$ )



1) The input matching circuit has been designed as a power match of the filter's input port to  $175 \Omega$ . In a second step it has been optimized in a narrow range in order to operate at  $27 \Omega$  with optimum filter performance.



SAW Components

B1707

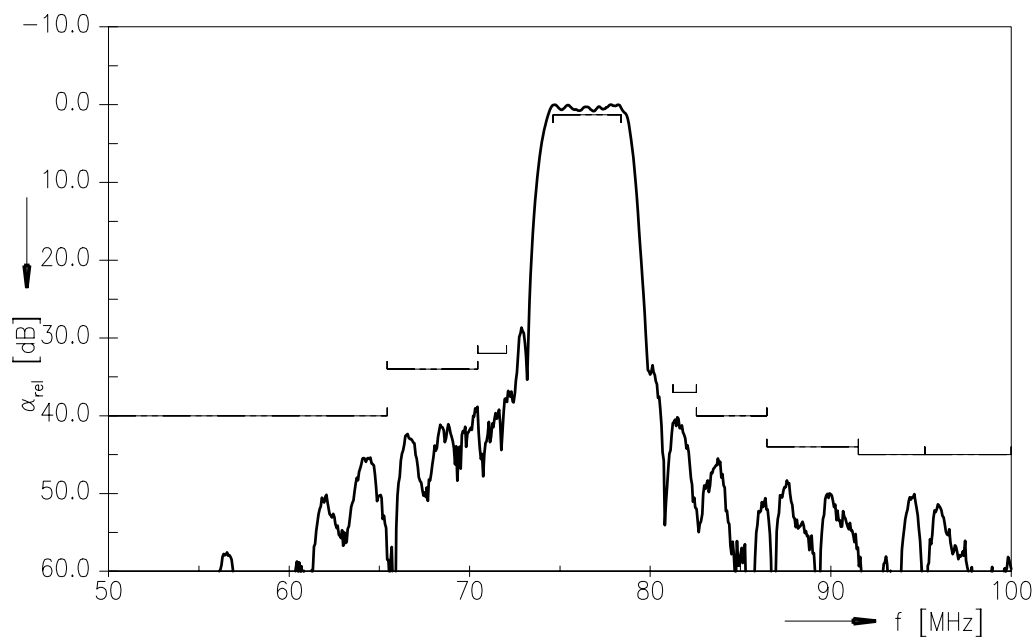
SAW IF filter

76.50 MHz

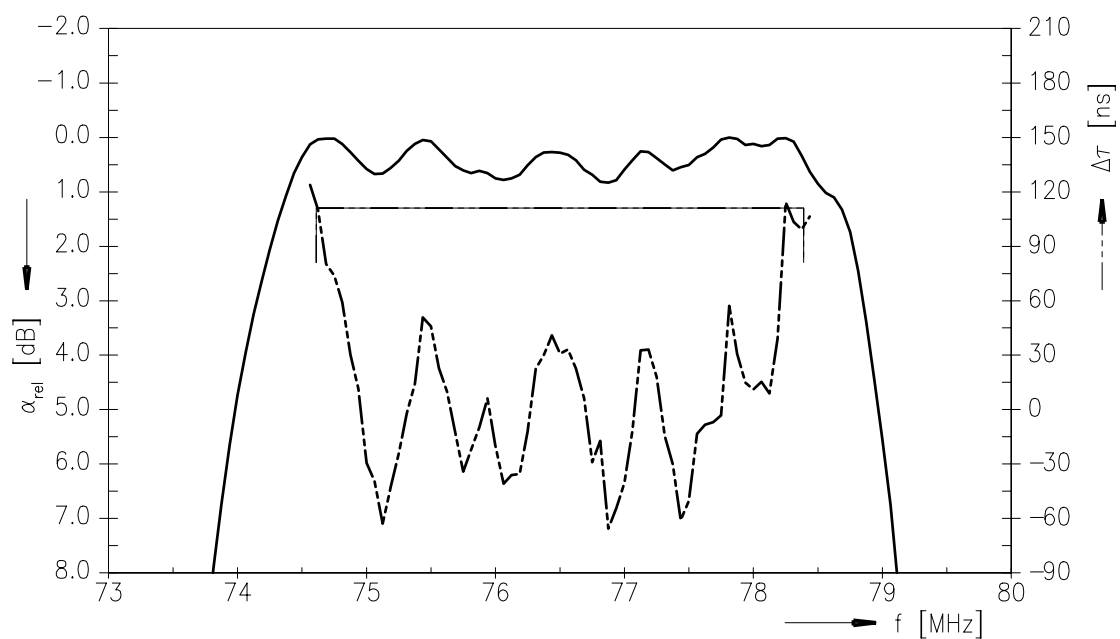
Data sheet

SMD

## Transfer function



## Transfer function (pass band)



Please read *cautions and warnings* and *important notes* at the end of this document.



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<b>SAW IF filter</b>	<b>76.50 MHz</b>

Data sheet



### Characteristics

Temperature range for specification:	$T = -40\text{ °C to }+85\text{ °C}$
Terminating source impedance:	$Z_S = 50\ \Omega$ (single ended) and matching network
Terminating load impedance:	$Z_L = 50\ \Omega$ (single ended) and matching network

		min.	typ. @ 25 °C	max.	
<b>Nominal frequency</b>	$f_N$	—	76.50	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	$\alpha_{\min}$	—	11.3	12.8	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
	$f_N \pm 1.89\text{ MHz}$	—	1.0	1.3	dB
<b>Pass bandwidth</b>					
$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	—	4.3	—	MHz
$\alpha_{\text{rel}} \leq 3\text{ dB}$	$B_{3\text{dB}}$	—	4.6	—	MHz
$\alpha_{\text{rel}} \leq 15\text{ dB}$	$B_{15\text{dB}}$	—	5.8	6.0	MHz
$\alpha_{\text{rel}} \leq 30\text{ dB}$	$B_{30\text{dB}}$	—	6.6	6.9	MHz
<b>Mean attenuation (relative to <math>\alpha_{\min}</math>)</b>	$\alpha_{\text{rel}}$				
Upper sidelobe 86.47 ... 91.53 MHz		46.0	50.0	—	dB
<b>Relative attenuation (relative to <math>\alpha_{\min}</math>)</b>	$\alpha_{\text{rel}}$				
Lower sidelobe 50.00 ... 65.44 MHz		37.0	41.0	—	dB
65.44 ... 70.44 MHz		35.0	39.0	—	dB
70.44 ... 72.04 MHz		33.0	36.0	—	dB
Upper sidelobe 81.26 ... 82.56 MHz		32.0	35.0	—	dB
82.56 ... 86.47 MHz		39.0	42.0	—	dB
86.47 ... 91.53 MHz		40.0	42.0	—	dB
91.53 ... 95.21 MHz		46.0	50.0	—	dB
95.21 ... 100.00 MHz		46.0	50.0	—	dB
<b>Group delay ripple (p-p)</b>	$\Delta\tau$				
Aperture 50 kHz $f_N \pm 1.89\text{ MHz}$		—	200	—	ns
<b>Temperature coefficient of frequency</b>	$TC_f$	—	-18	—	ppm/K

<sup>1)</sup> Including losses in the matching network



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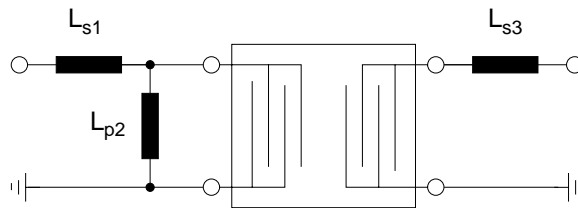
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**Matching network** (based on four port measurement, quality factors  $Q_L = 40$ ,  $Q_C = 90$ )



$$L_{s1} = 430 \text{ nH}$$

$$L_{p2} = 820 \text{ nH}$$

$$L_{s3} = 560 \text{ nH}$$

#### Maximum ratings

Operable temperature range	T	-40 / +105	°C	
Storage temperature range	T <sub>stg</sub>	-40 / +105	°C	
DC voltage	V <sub>DC</sub>	0	V	
Source power	P <sub>S</sub>	10	dBm	source impedance 50 Ω



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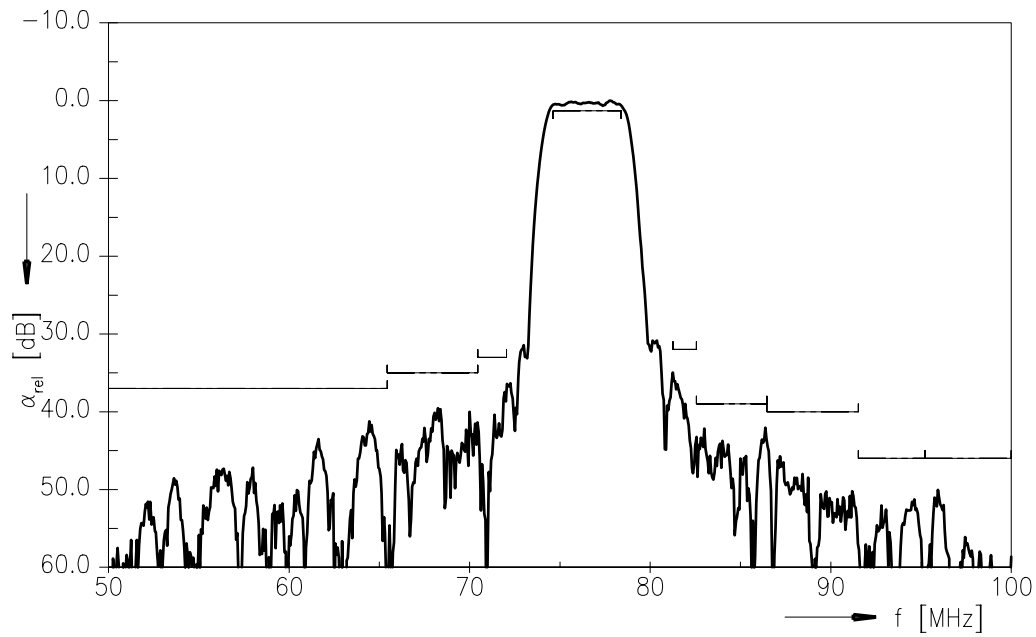
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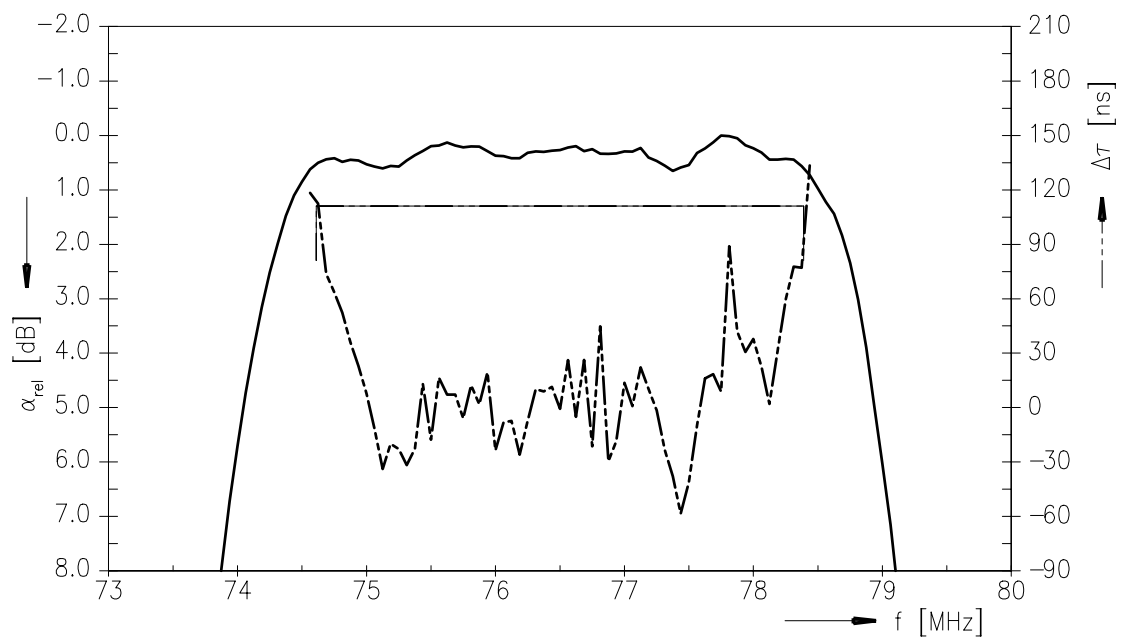
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SMD

### Transfer function



### Transfer function (pass band)



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**References**

<b>Type</b>	B1707
<b>Ordering code</b>	B39765B1707H310
<b>Marking and package</b>	C61157-A7-A95
<b>Packaging</b>	F61074-V8170-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B1707_NB_UN.s4p
<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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