



## **SAW Components**

### **SAW IF filter**

Satellite radio

<b>Series/type:</b>	<b>B1710</b>
<b>Ordering code:</b>	<b>B39765B1710H310</b>
<b>Date:</b>	<b>May 15, 2006</b>
<b>Version:</b>	<b>1.1</b>



Data sheet



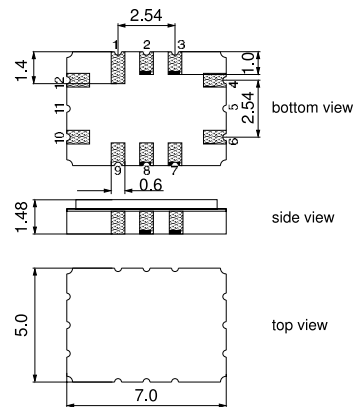
Application

- IF filter for digital radio
- Usable bandwidth 12.5 MHz
- Low insertion attenuation
- Constant group delay
- Unbalanced or balanced operation



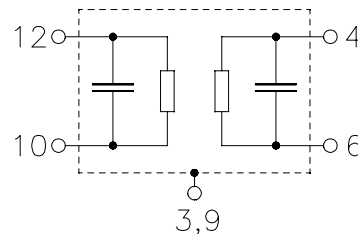
Features

- 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

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




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**B1710**
**SAW IF filter**
**76.50 MHz**
**Data sheet**

**Characteristics**

Temperature range for specification:	T = -40 °C to +105 °C
Terminating source impedance:	Z <sub>S</sub> = 11 Ω and matching network
Terminating load impedance:	Z <sub>L</sub> = 180 Ω and matching network

		min.	typ. @ 25 °C	max.	
<b>Nominal frequency</b>	f <sub>N</sub>	—	76.50	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	α <sub>min</sub>	—	14.7	16.2	dB
<b>Maximum voltage gain source – load</b> (V <sub>L</sub> /V <sub>S</sub> )	α <sub>vgsl</sub>	-9.1	-7.6	—	dB
<b>Amplitude ripple (p-p)</b>	Δα				
	f <sub>N</sub> ± 6.25 MHz	—	1.3	1.8	dB
<b>Pass bandwidth</b>					
α <sub>rel</sub> ≤ 1.3 dB	B <sub>1.3dB</sub>	—	13.6	—	MHz
α <sub>rel</sub> ≤ 3 dB	B <sub>3dB</sub>	—	14.6	—	MHz
α <sub>rel</sub> ≤ 15 dB	B <sub>15dB</sub>	—	16.9	17.8	MHz
α <sub>rel</sub> ≤ 30 dB	B <sub>30dB</sub>	—	18.2	19.1	MHz
<b>Mean attenuation (relative to α<sub>min</sub>)</b>	α <sub>rel</sub>				
Upper sidelobe	86.47 ... 91.53 MHz	38.0	42.0	—	dB
<b>Relative attenuation (relative to α<sub>min</sub>)</b>	α <sub>rel</sub>				
Lower sidelobe	50.00 ... 64.44 MHz	45.0	52.0	—	dB
	64.44 ... 66.94 MHz	40.0	44.0	—	dB
Upper sidelobe	86.47 ... 91.53 MHz	27.0	32.0	—	dB
	91.53 ... 95.21 MHz	44.0	50.0	—	dB
	95.21 ... 100.00 MHz	45.0	50.0	—	dB
<b>Group delay ripple (p-p)</b>	Δτ				
Aperture 50 kHz	f <sub>N</sub> ± 6.25 MHz	—	140	—	ns
<b>Temperature coefficient of frequency</b>	TC <sub>f</sub>	—	-87	—	ppm/K

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



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B1710

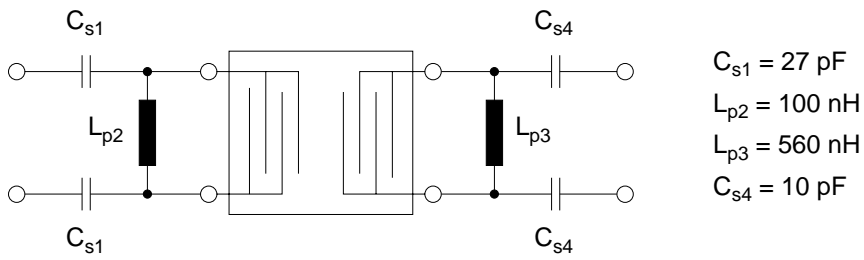
SAW IF filter

76.50 MHz

Data sheet



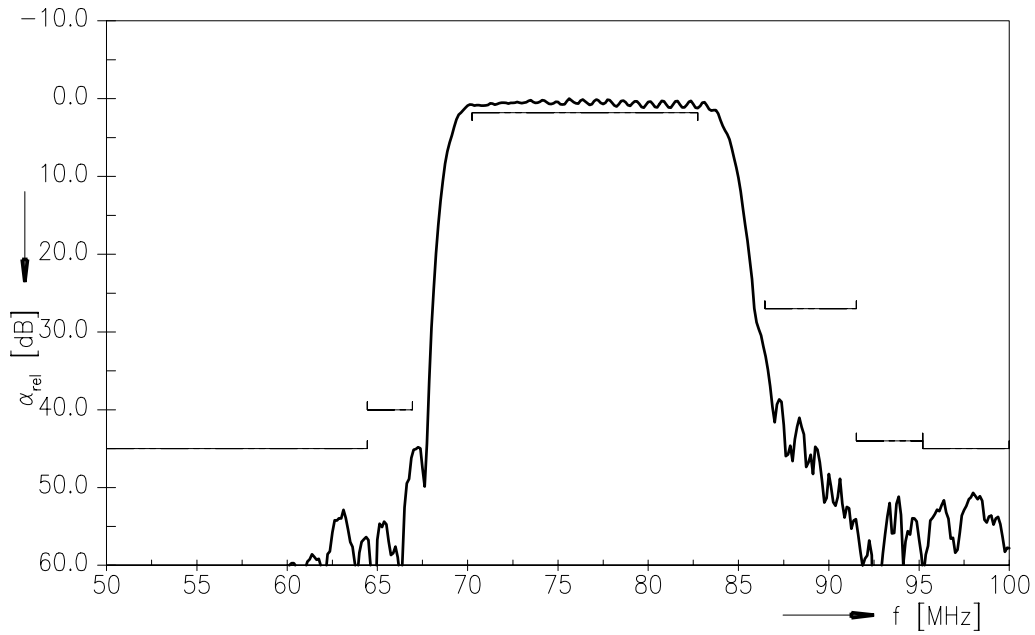
Matching network<sup>1)</sup> (based on four port measurement, quality factors  $Q_L = 40$ ,  $Q_C = 90$ )



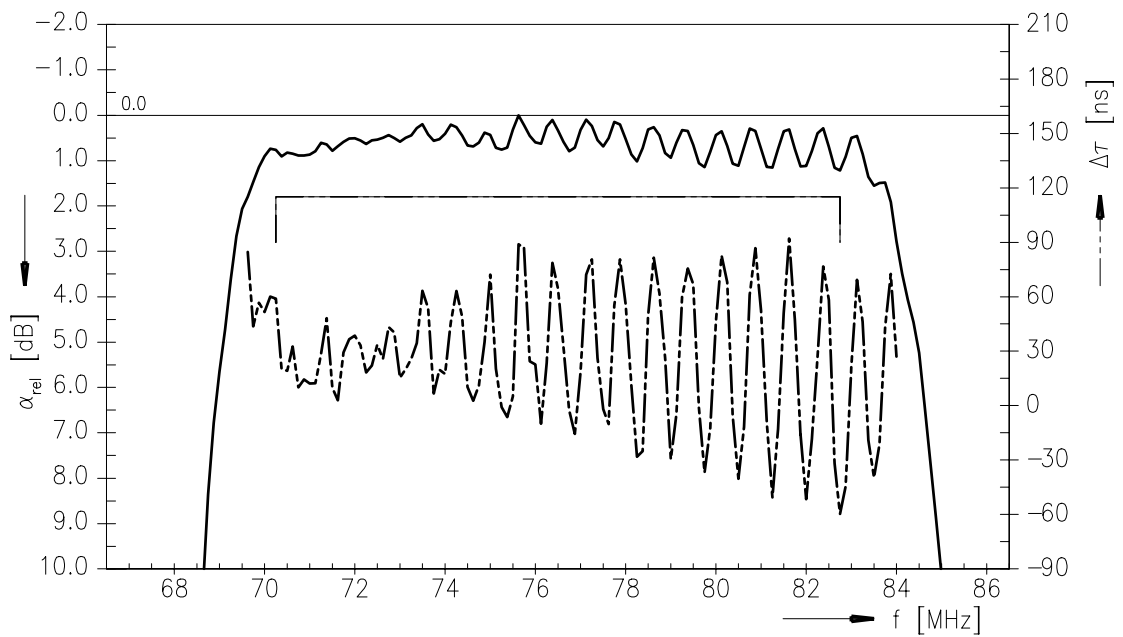
1) The input matching circuit has been designed as a power match of the filter's input port to  $175 \Omega$ . In a second step it has been optimized in a narrow range in order to operate at  $27 \Omega$  with optimum filter performance.



Transfer function



Transfer function (pass band)




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**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:  $Z_L = 200\ \Omega$  (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>	$\alpha_{\min}$	—	11.0	12.5	dB
<b>Amplitude ripple (p-p)</b>	$\Delta\alpha$				
	$f_N \pm 6.25\text{ MHz}$	—	1.5	1.8	dB
<b>Pass bandwidth</b>					
$\alpha_{\text{rel}} \leq 1.3\text{ dB}$	$B_{1.3\text{dB}}$	—	13.3	—	MHz
$\alpha_{\text{rel}} \leq 3\text{ dB}$	$B_{3\text{dB}}$	—	14.6	—	MHz
$\alpha_{\text{rel}} \leq 15\text{ dB}$	$B_{15\text{dB}}$	—	16.7	17.6	MHz
$\alpha_{\text{rel}} \leq 30\text{ dB}$	$B_{30\text{dB}}$	—	18.0	18.9	MHz
<b>Mean attenuation (relative to <math>\alpha_{\min}</math>)</b>	$\alpha_{\text{rel}}$				
Upper sidelobe	86.47 ... 91.53 MHz	38.0	41.0	—	dB
<b>Relative attenuation (relative to <math>\alpha_{\min}</math>)</b>	$\alpha_{\text{rel}}$				
Lower sidelobe	50.00 ... 64.44 MHz	44.0	50.0	—	dB
	64.44 ... 66.94 MHz	36.0	42.0	—	dB
Upper sidelobe	86.47 ... 91.53 MHz	26.0	29.0	—	dB
	91.53 ... 95.21 MHz	40.0	45.0	—	dB
	95.21 ... 100.00 MHz	40.0	46.0	—	dB
<b>Group delay ripple (p-p)</b>	$\Delta\tau$				
Aperture 50 kHz	$f_N \pm 6.25\text{ MHz}$	—	110	—	ns
<b>Temperature coefficient of frequency</b>	$TC_f$	—	-87	—	ppm/K

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



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B1710

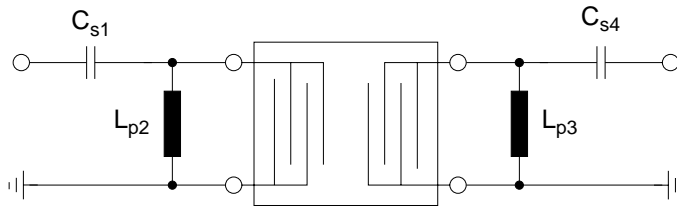
SAW IF filter

76.50 MHz

Data sheet



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



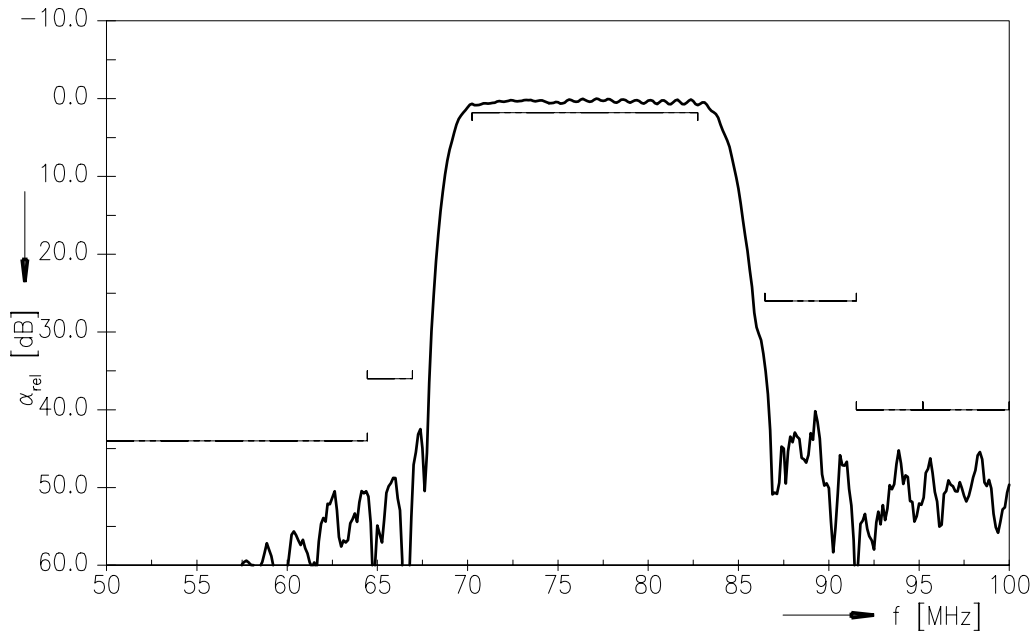
$C_{s1} = 15 \text{ pF}$   
 $L_{p2} = 100 \text{ nH}$   
 $L_{p3} = 470 \text{ nH}$   
 $C_{s4} = 4.7 \text{ pF}$

**Maximum ratings**

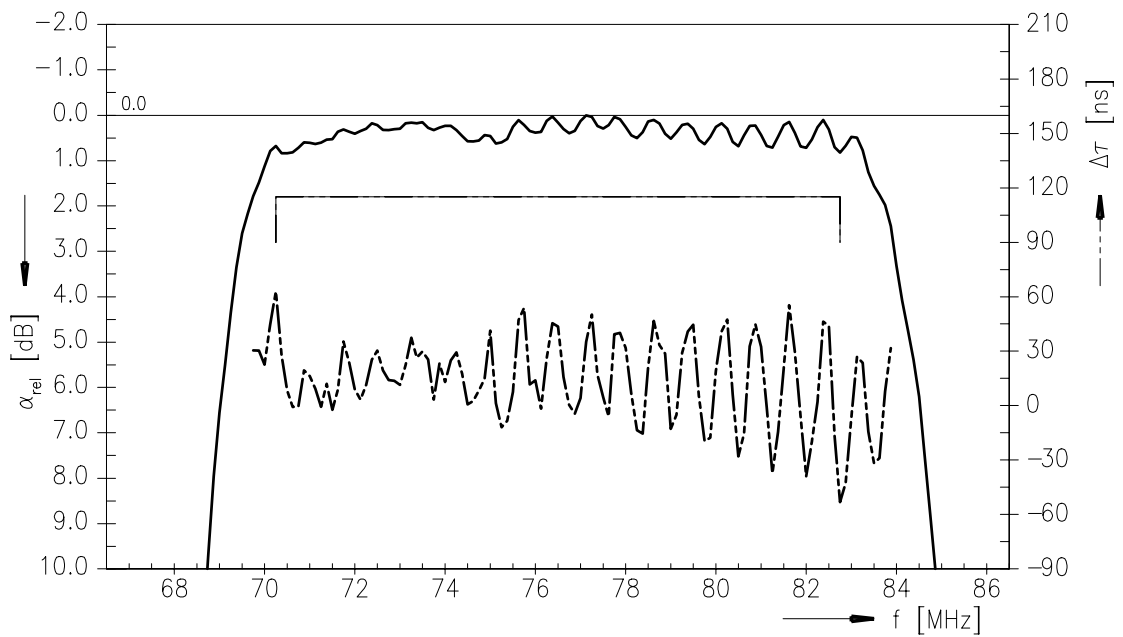
Operable temperature range	T	-40 / +105	°C	
Storage temperature range	T <sub>stg</sub>	-40 / +105	°C	
DC voltage	V <sub>DC</sub>	0	V	
Source power	P <sub>S</sub>	10	dBm	source impedance 50 Ω



Transfer function



Transfer function (pass band)







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<b>Type</b>	B1710
<b>Ordering code</b>	B39765B1710H310
<b>Marking and package</b>	C61157-A7-A95
<b>Packaging</b>	F61074-V8170-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B1710_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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