



SAW Components

SAW IF filter

Satellite radio

Series/type:	B1708
Ordering code:	B39725B1708H310
Date:	May 16, 2006
Version:	1.1



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SAW IF filter

72.54 MHz

Data sheet



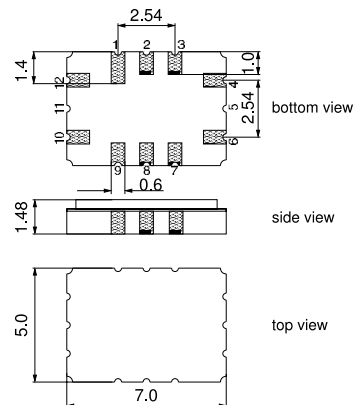
Application

- IF filter for digital radio
- Usable bandwidth 3.7 MHz
- Low insertion attenuation
- Constant group delay
- Unbalanced or balanced operation



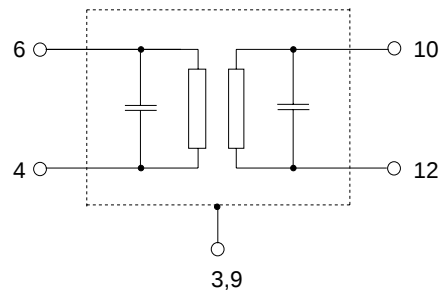
Features

- Package size 7.0 x 5.0 x 1.48 mm³
- 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.	
Nominal frequency	f_N	—	72.54	—	MHz
Minimum insertion attenuation¹⁾	$\alpha_{\min}$	—	14.5	16.0	dB
Maximum voltage gain source – load (V_L/V_S)	α_{vgsI}	–4.2	–2.7	—	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 1.85\text{ MHz}$	—	1.0	(1.3) 1.5	dB
Pass bandwidth					
$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	—	4.0	—	MHz
$\alpha_{\text{rel}} \leq 3\text{ dB}$	$B_{3\text{dB}}$	—	4.3	—	MHz
$\alpha_{\text{rel}} \leq 15\text{ dB}$	$B_{15\text{dB}}$	—	5.7	5.9	MHz
$\alpha_{\text{rel}} \leq 30\text{ dB}$	$B_{30\text{dB}}$	—	6.6	7.0	MHz
Mean attenuation (relative to $\alpha_{\min}$)	α_{rel}				
Upper sidelobe 86.47 ... 91.53 MHz		48.0	53.0	—	dB
Relative attenuation (relative to $\alpha_{\min}$)	α_{rel}				
Lower sidelobe 50.00 ... 65.00 MHz		40.0	44.0	—	dB
65.00 ... 66.48 MHz		33.0	38.0	—	dB
66.48 ... 68.08 MHz		32.0	36.0	—	dB
Upper sidelobe 77.30 ... 78.60 MHz		32.0	36.0	—	dB
78.60 ... 86.47 MHz		36.0	41.0	—	dB
86.47 ... 91.53 MHz		44.0	48.0	—	dB
91.53 ... 95.21 MHz		44.0	48.0	—	dB
95.21 ... 100.00 MHz		46.0	50.0	—	dB
Group delay ripple (p-p)	$\Delta\tau$				
Aperture 50 kHz	$f_N \pm 1.85\text{ MHz}$	—	210	—	ns
Temperature coefficient of frequency	TC_f	—	–18	—	ppm/K

¹⁾ Including losses in the matching network



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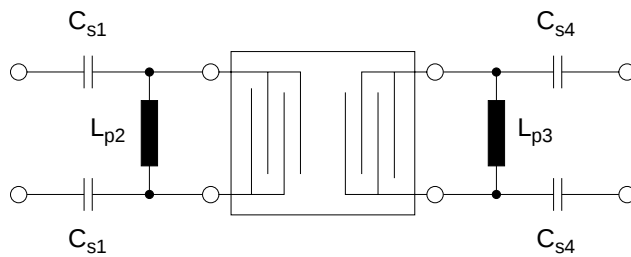
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Matching network¹⁾ (based on four port measurement, quality factors $Q_L = 40$, $Q_C = 90$)



$$C_{s1} = 20 \text{ pF}$$

$$L_{p2} = 220 \text{ nH}$$

$$L_{p3} = 620 \text{ nH}$$

$$C_{s4} = 3.6 \text{ pF}$$

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



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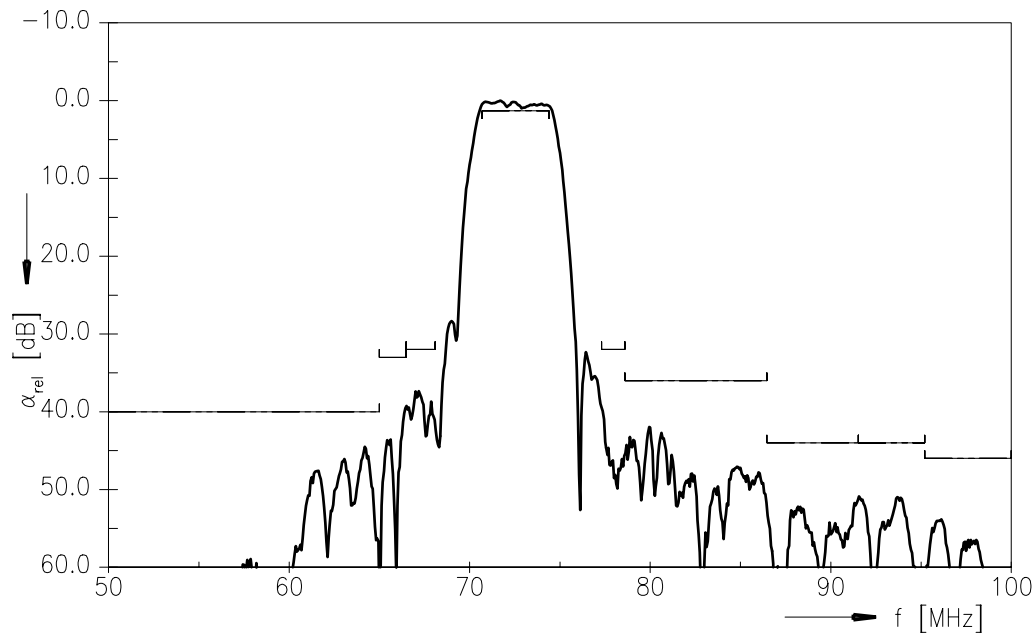
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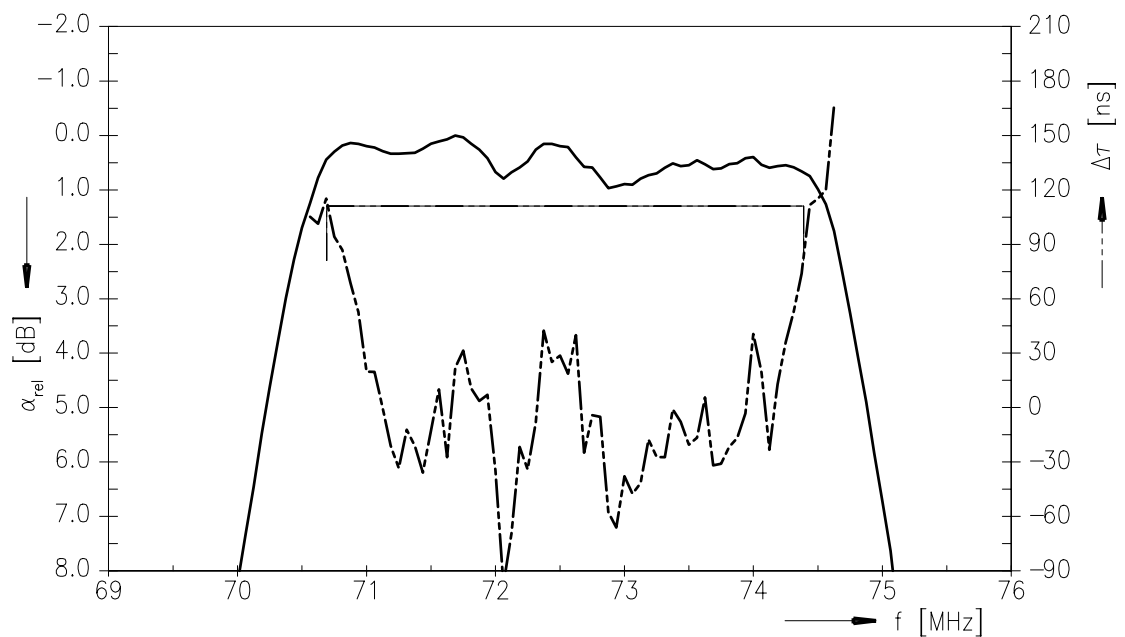
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Transfer function



Transfer function (pass band)



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



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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.	
Nominal frequency	f_N	—	72.54	—	MHz
Minimum insertion attenuation¹⁾	$\alpha_{\min}$	—	12.9	14.4	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 1.85\text{ MHz}$	—	1.2	1.5	dB
Pass bandwidth					
$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	—	4.0	—	MHz
$\alpha_{\text{rel}} \leq 3\text{ dB}$	$B_{3\text{dB}}$	—	4.4	—	MHz
$\alpha_{\text{rel}} \leq 15\text{ dB}$	$B_{15\text{dB}}$	—	5.8	6.0	MHz
$\alpha_{\text{rel}} \leq 30\text{ dB}$	$B_{30\text{dB}}$	—	6.7	7.0	MHz
Mean attenuation (relative to $\alpha_{\min}$)	α_{rel}				
Upper sidelobe 86.47 ... 91.53 MHz		48.0	52.0	—	dB
Relative attenuation (relative to $\alpha_{\min}$)	α_{rel}				
Lower sidelobe 50.00 ... 65.00 MHz		34.0	38.0	—	dB
65.00 ... 66.48 MHz		36.0	42.0	—	dB
66.48 ... 68.08 MHz		34.0	38.0	—	dB
Upper sidelobe 77.30 ... 78.60 MHz		28.0	32.0	—	dB
78.60 ... 86.47 MHz		34.0	39.0	—	dB
86.47 ... 91.53 MHz		42.0	46.0	—	dB
91.53 ... 95.21 MHz		44.0	48.0	—	dB
95.21 ... 100.00 MHz		48.0	53.0	—	dB
Group delay ripple (p-p)	$\Delta\tau$				
Aperture 50 kHz $f_N \pm 1.85\text{ MHz}$		—	190	—	ns
Temperature coefficient of frequency	TC_f	—	-18	—	ppm/K

¹⁾ Including losses in the matching network

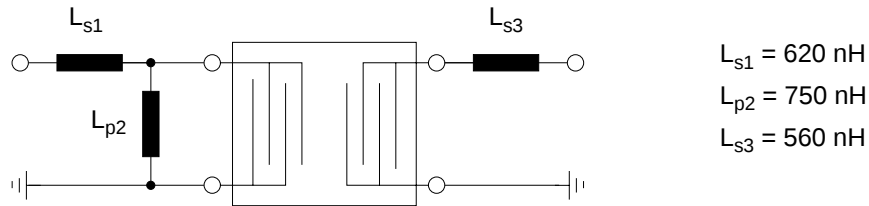


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Matching network (based on four port measurement, quality factors $Q_L = 40$, $Q_C = 90$)



Maximum ratings

Operable temperature range	T	-40 / +105	°C	
Storage temperature range	T _{stg}	-40 / +105	°C	
DC voltage	V _{DC}	0	V	
Source power	P _S	10	dBm	source impedance 50 Ω



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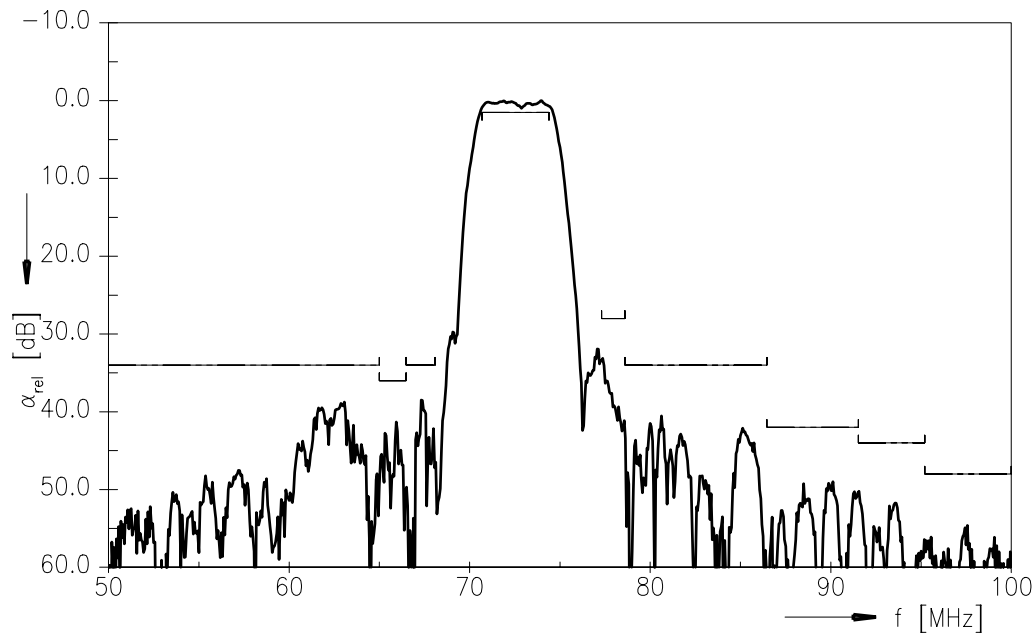
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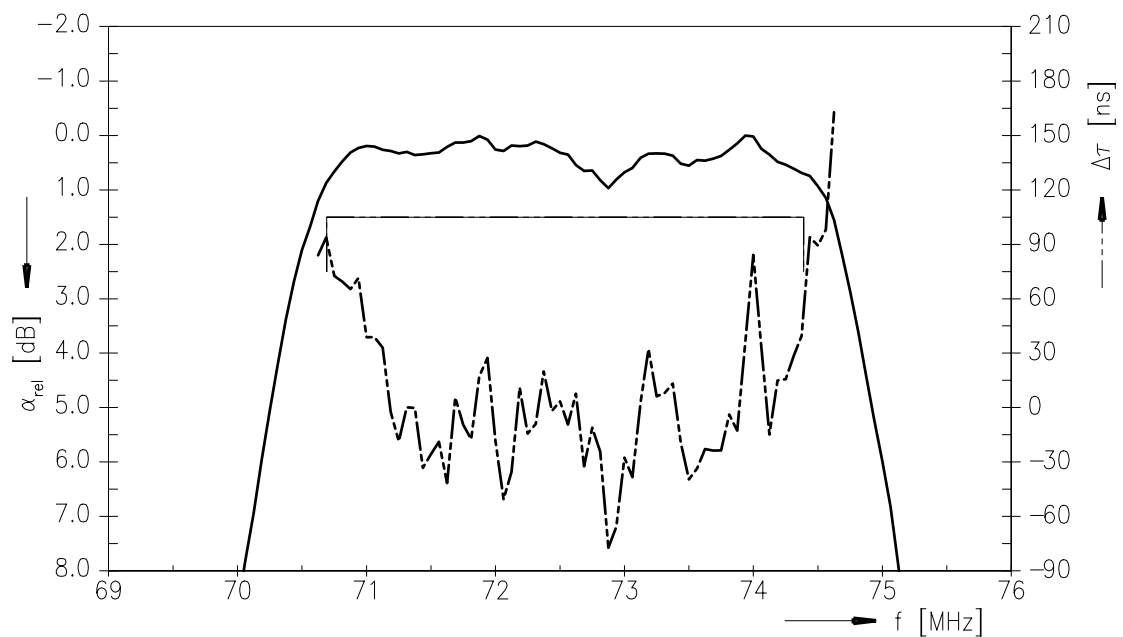
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Transfer function (pass band)



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**References**

Type	B1708
Ordering code	B39725B1708H310
Marking and package	C61157-A7-A95
Packaging	F61074-V8170-Z000
Date codes	L_1126
S-parameters	B1708_NB_UN.s4p
Soldering profile	S_6001
RoHS compatible	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."

For further information please contact your local EPCOS sales office or visit our webpage at www.epcos.com.

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