



SAW Components

SAW IF filter

Satellite radio

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

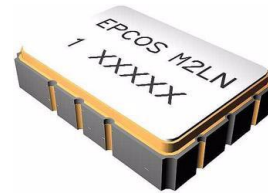


Data sheet



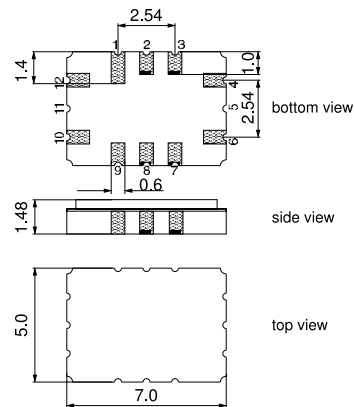
Application

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



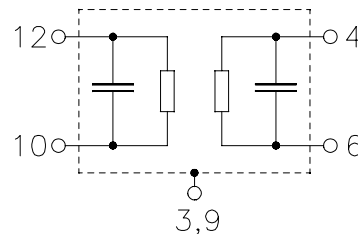
Features

- Package size 7.0 x 5.0 x 1.48 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

- 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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Characteristics

Temperature range for specification: $T = -40\text{ °C to }+105\text{ °C}$
 Terminating source impedance: $Z_S = 11\ \Omega$ and matching network
 Terminating load impedance: $Z_L = 180\ \Omega$ and matching network

		min.	typ. @ 25 °C	max.	
Nominal frequency	f_N	—	76.50	—	MHz
Minimum insertion attenuation¹⁾	α_{\min}	—	14.7	16.2	dB
Maximum voltage gain source – load (V_L/V_S)	α_{vgsI}	-9.1	-7.6	—	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 6.25\text{ MHz}$	—	1.3	1.8	dB
Pass bandwidth					
$\alpha_{\text{rel}} \leq 1.3\text{ dB}$	$B_{1.3\text{dB}}$	—	13.6	—	MHz
$\alpha_{\text{rel}} \leq 3\text{ dB}$	$B_{3\text{dB}}$	—	14.6	—	MHz
$\alpha_{\text{rel}} \leq 15\text{ dB}$	$B_{15\text{dB}}$	—	16.9	17.8	MHz
$\alpha_{\text{rel}} \leq 30\text{ dB}$	$B_{30\text{dB}}$	—	18.2	19.1	MHz
Mean attenuation (relative to α_{\min})	α_{rel}				
Upper sidelobe	86.47 ... 91.53 MHz	38.0	42.0	—	dB
Relative attenuation (relative to α_{\min})	α_{rel}				
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
Group delay ripple (p-p)	$\Delta\tau$				
Aperture 50 kHz	$f_N \pm 6.25\text{ MHz}$	—	140	—	ns
Temperature coefficient of frequency	TC_f	—	-87	—	ppm/K

¹⁾ Including losses in the matching network



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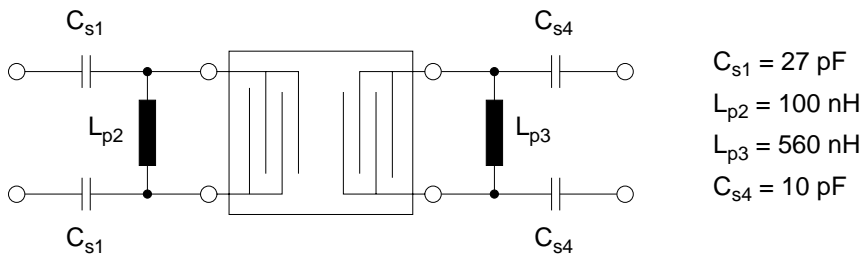
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Matching network¹⁾ (based on four port measurement, quality factors $Q_L = 40$, $Q_C = 90$)

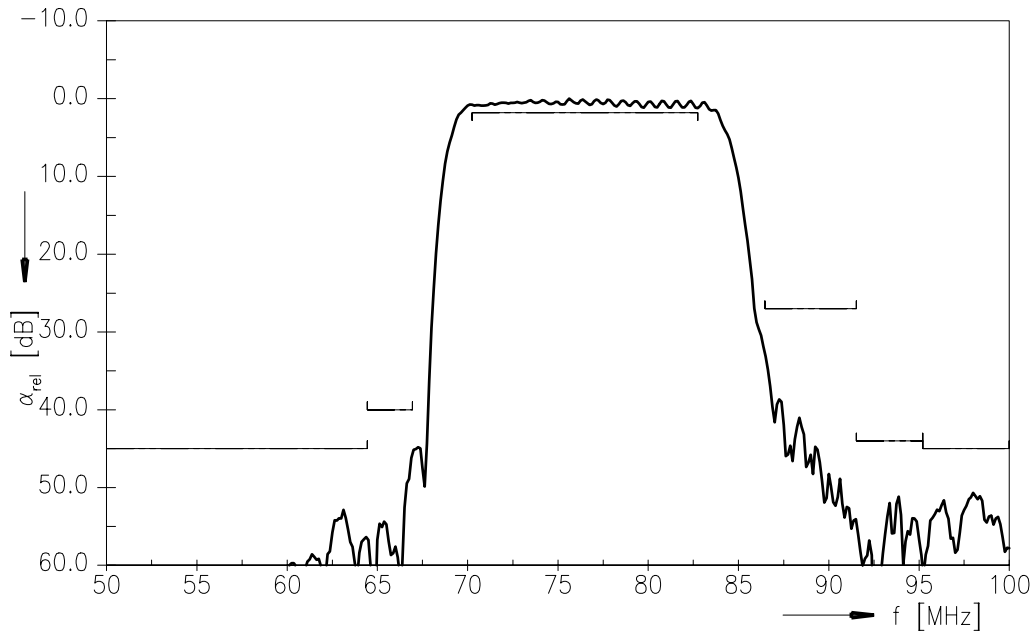


1) The input matching circuit has been designed as a power match of the filter's input port to 175Ω . In a second step it has been optimized in a narrow range in order to operate at 27Ω with optimum filter performance.

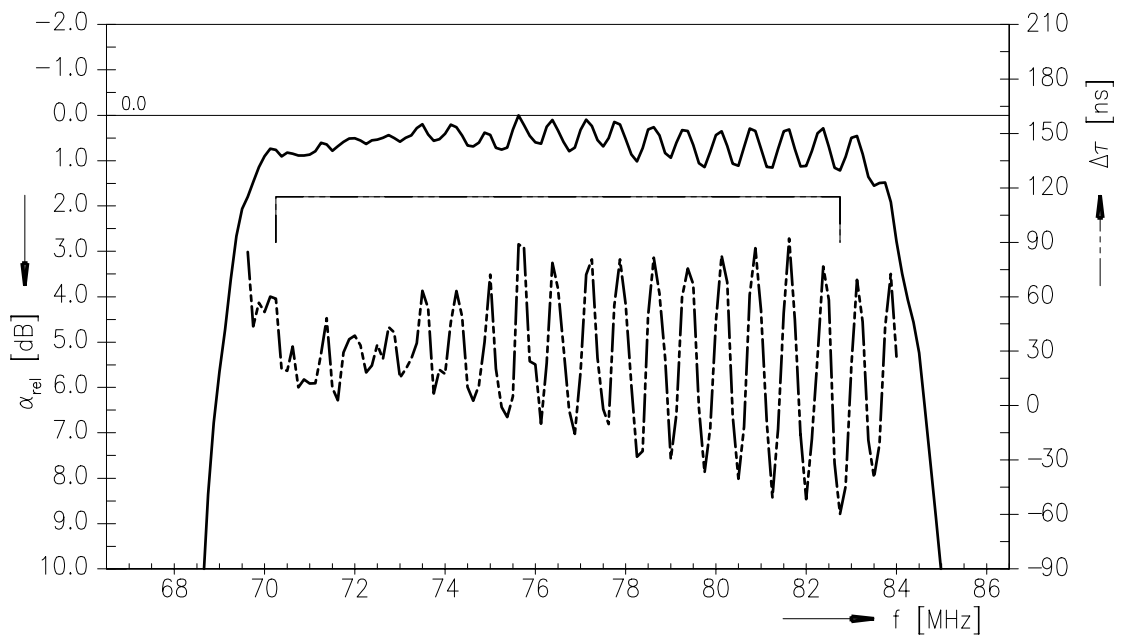
Please read *cautions and warnings and important notes* at the end of this document.



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.	
Nominal frequency	f_N	—	76.50	—	MHz
Minimum insertion attenuation¹⁾	α_{\min}	—	11.0	12.5	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 6.25\text{ MHz}$	—	1.5	1.8	dB
Pass bandwidth					
$\alpha_{\text{rel}} \leq 1.3\text{ dB}$	$B_{1.3\text{dB}}$	—	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
Mean attenuation (relative to α_{\min})	α_{rel}				
Upper sidelobe	86.47 ... 91.53 MHz	38.0	41.0	—	dB
Relative attenuation (relative to α_{\min})	α_{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
Group delay ripple (p-p)	$\Delta\tau$				
Aperture 50 kHz	$f_N \pm 6.25\text{ MHz}$	—	110	—	ns
Temperature coefficient of frequency	TC_f	—	-87	—	ppm/K

¹⁾ Including losses in the matching network



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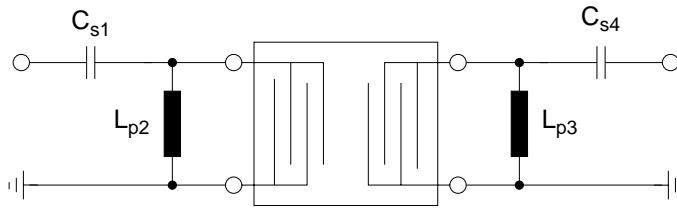
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Matching network (based on four port measurement, quality factors $Q_L = 40$, $Q_C = 90$)



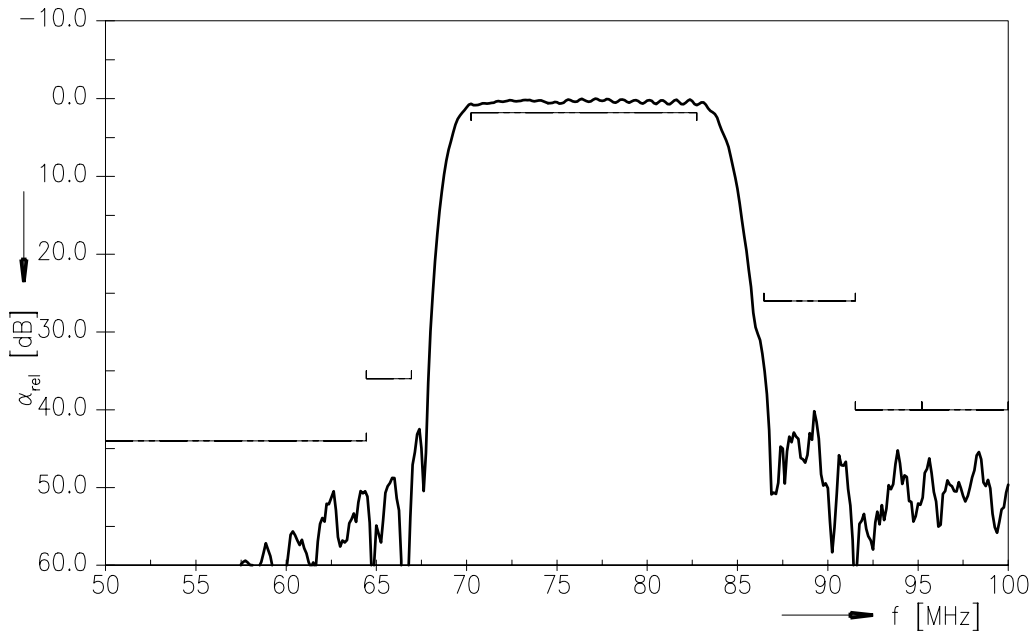
$C_{s1} = 15 \text{ pF}$
 $L_{p2} = 100 \text{ nH}$
 $L_{p3} = 470 \text{ nH}$
 $C_{s4} = 4.7 \text{ pF}$

Maximum ratings

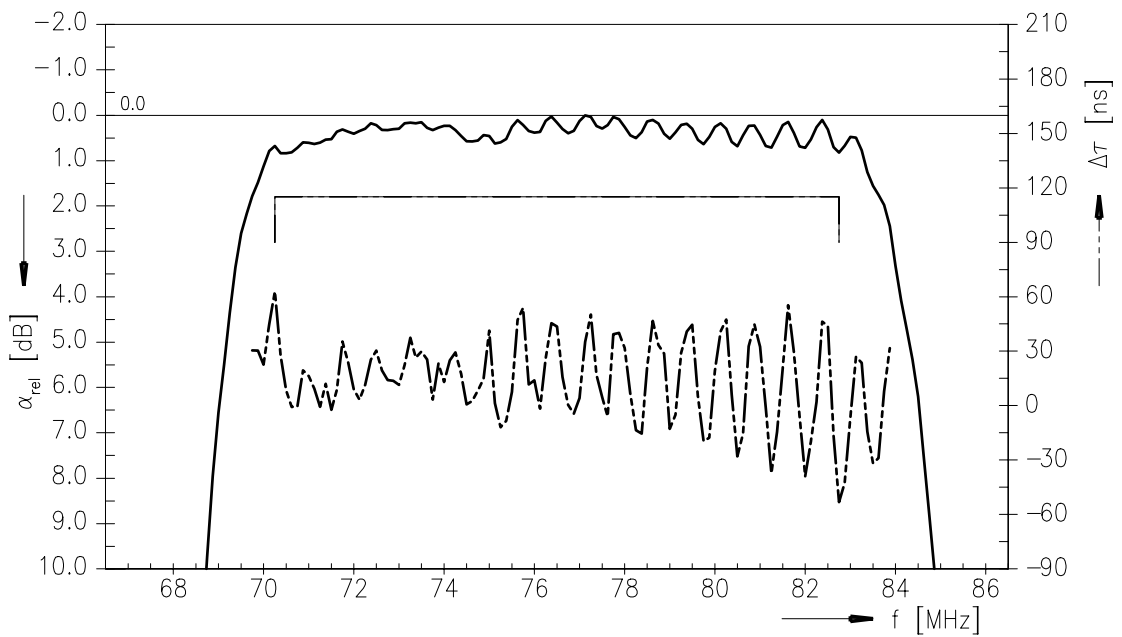
Operable temperature range	T	-40 / +105	°C	
Storage temperature range	T _{stg}	-40 / +105	°C	
DC voltage	V _{DC}	0	V	
Source power	P _S	10	dBm	source impedance 50 Ω



Transfer function



Transfer function (pass band)





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References

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