



SAW Components

SAW IF filter

Satellite radio

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

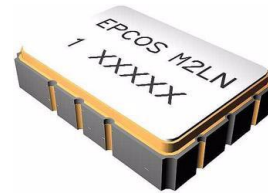


Data sheet



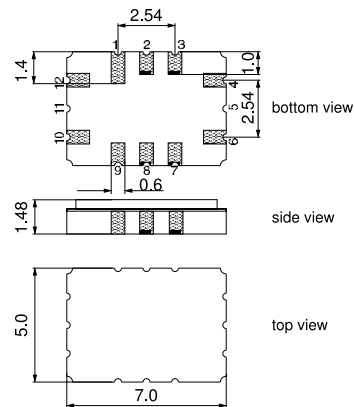
Application

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



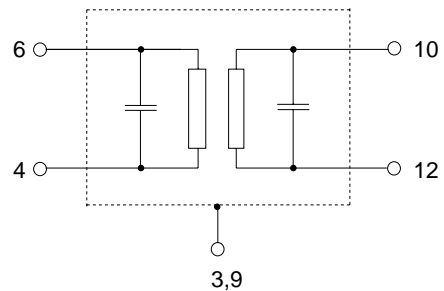
Features

- Package size 7.0 x 5.0 x 1.48 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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76.50 MHz
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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	—	76.50	—	MHz
Minimum insertion attenuation¹⁾	α_{\min}	—	15.4	16.9	dB
Maximum voltage gain source – load (V_L/V_S)	α_{vgsI}	-5.9	-4.4	—	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 1.89\text{ MHz}$	—	1.0	(1.3) 1.8	dB
Pass bandwidth					
$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	—	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
Mean attenuation (relative to α_{\min})	α_{rel}				
Upper sidelobe	86.47 ... 91.53 MHz	48.0	54.0	—	dB
Relative attenuation (relative to α_{\min})	α_{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
Group delay ripple (p-p)	$\Delta\tau$				
Aperture 50 kHz	$f_N \pm 1.89\text{ MHz}$	—	190	—	ns
Temperature coefficient of frequency	TC_f	—	-18	—	ppm/K

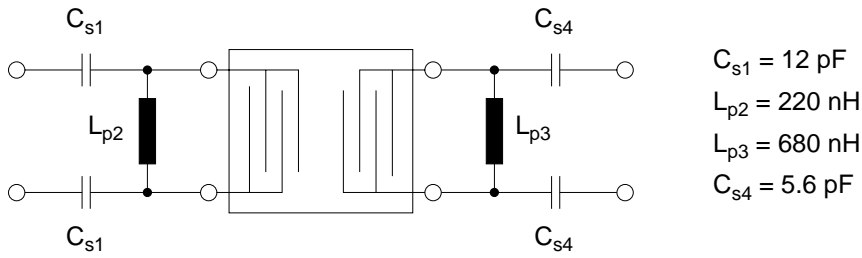
1) Including losses in the matching network



Data sheet



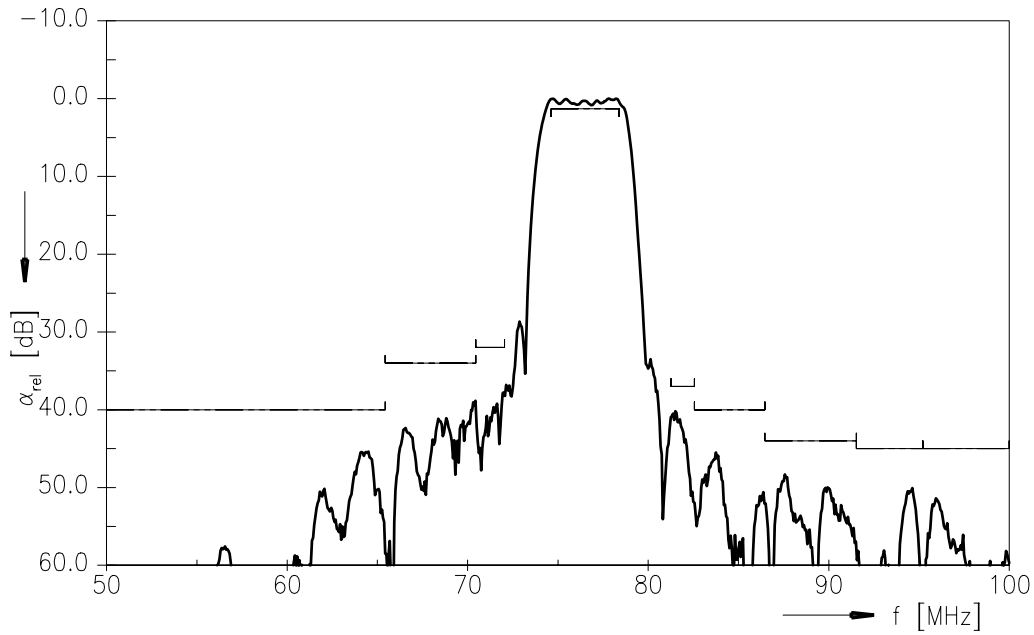
Matching network¹⁾ (based on four port measurement, quality factors $Q_L = 40$, $Q_C = 90$)



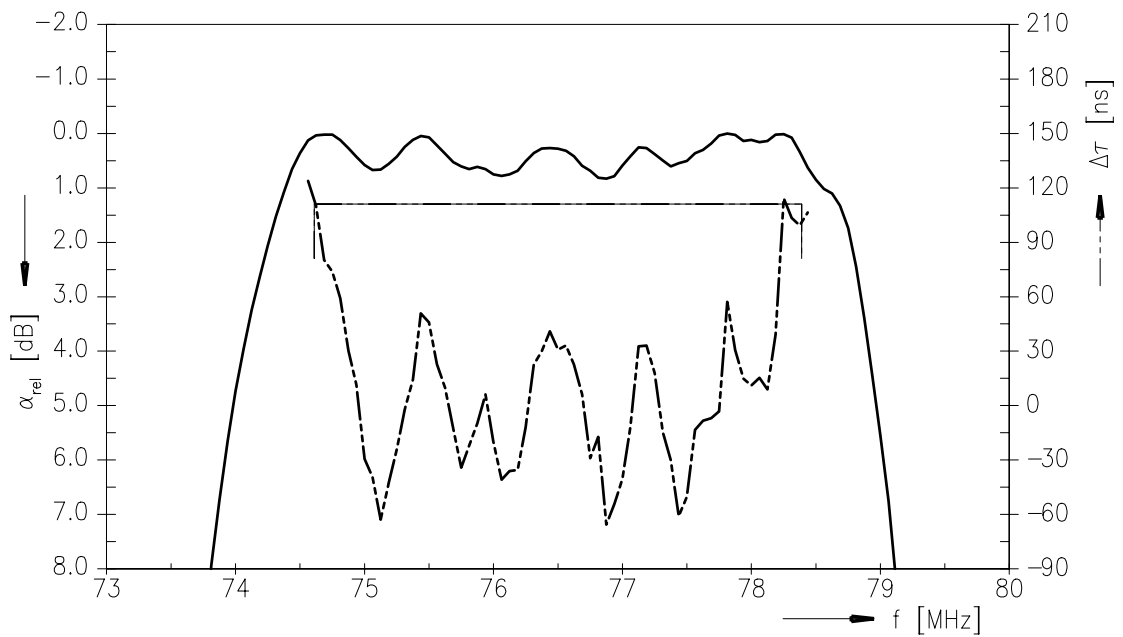
1) The input matching circuit has been designed as a power match of the filter's input port to 175Ω . In a second step it has been optimized in a narrow range in order to operate at 27Ω with optimum filter performance.



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: $Z_L = 50\ \Omega$ (single ended) and matching network

		min.	typ. @ 25 °C	max.	
Nominal frequency	f_N	—	76.50	—	MHz
Minimum insertion attenuation¹⁾	α_{\min}	—	11.3	12.8	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
	$f_N \pm 1.89\text{ MHz}$	—	1.0	1.3	dB
Pass bandwidth					
$\alpha_{\text{rel}} \leq 1.5\text{ dB}$	$B_{1.5\text{dB}}$	—	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
Mean attenuation (relative to α_{\min})	α_{rel}				
Upper sidelobe	86.47 ... 91.53 MHz	46.0	50.0	—	dB
Relative attenuation (relative to α_{\min})	α_{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
Group delay ripple (p-p)	$\Delta\tau$				
Aperture 50 kHz	$f_N \pm 1.89\text{ MHz}$	—	200	—	ns
Temperature coefficient of frequency	TC_f	—	-18	—	ppm/K

¹⁾ Including losses in the matching network



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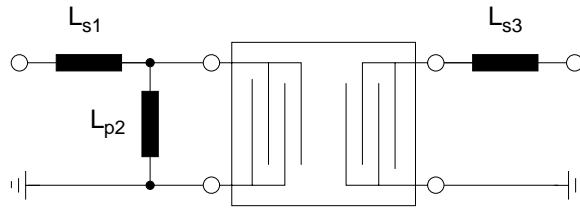
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Matching network (based on four port measurement, quality factors $Q_L = 40$, $Q_C = 90$)



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

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

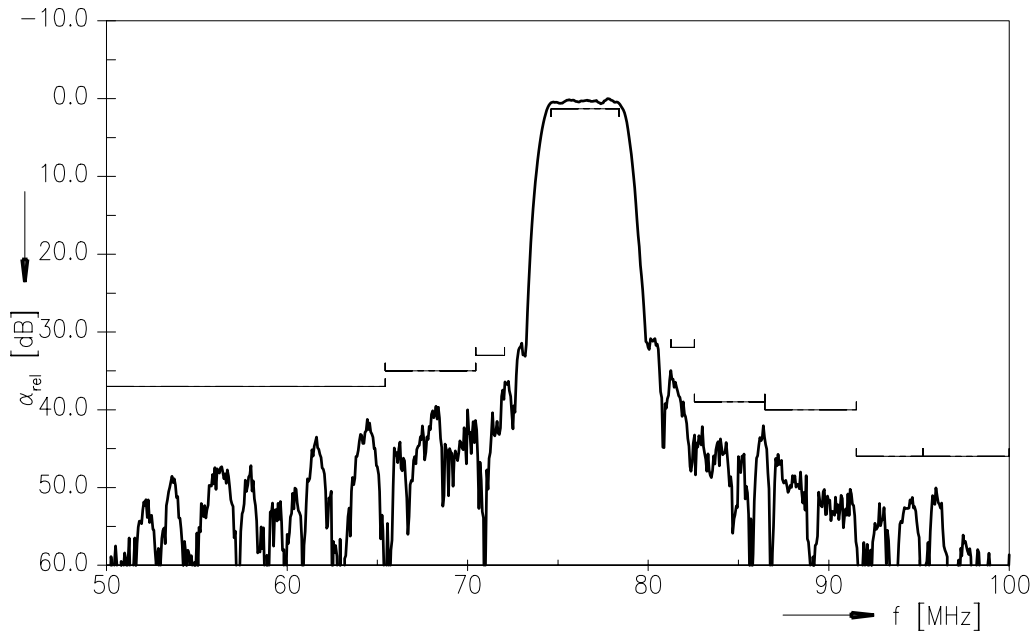
$$L_{s3} = 560 \text{ nH}$$

Maximum ratings

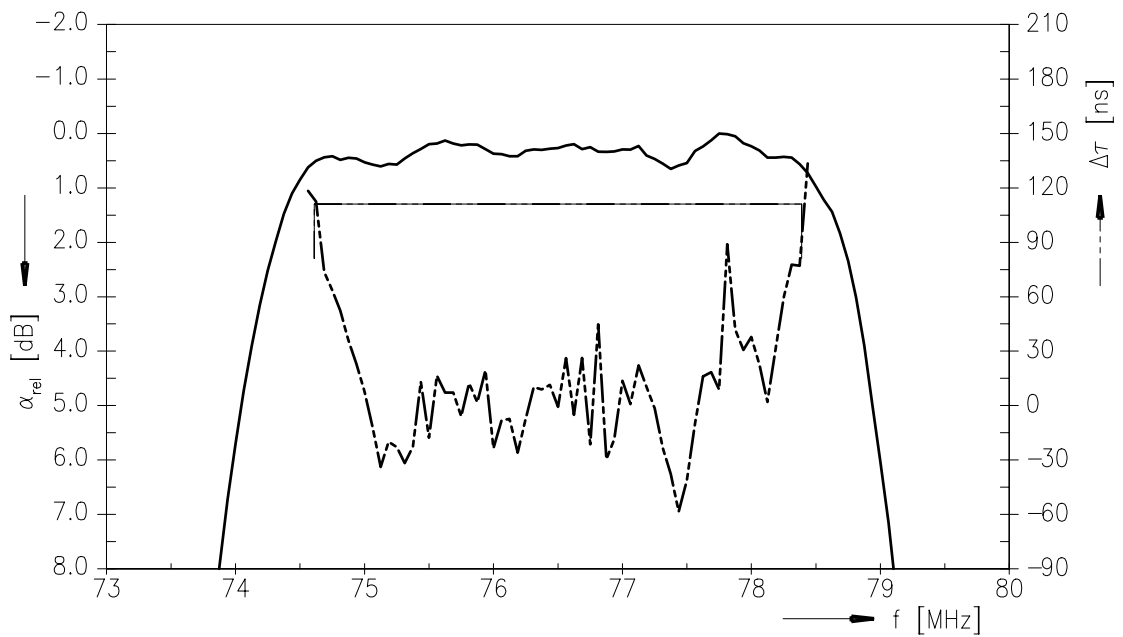
Operable temperature range	T	-40 / +105	°C	
Storage temperature range	T _{stg}	-40 / +105	°C	
DC voltage	V _{DC}	0	V	
Source power	P _S	10	dBm	source impedance 50 Ω



Transfer function



Transfer function (pass band)





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References

Type	B1707
Ordering code	B39765B1707H310
Marking and package	C61157-A7-A95
Packaging	F61074-V8170-Z000
Date codes	L_1126
S-parameters	B1707_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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