



## **SAW Components**

### **SAW IF filter**

Satellite radio

<b>Series/type:</b>	<b>B1729</b>
<b>Ordering code:</b>	<b>B39805B1729H810</b>
<b>Date:</b>	<b>February 19, 2010</b>
<b>Version:</b>	<b>2.2</b>



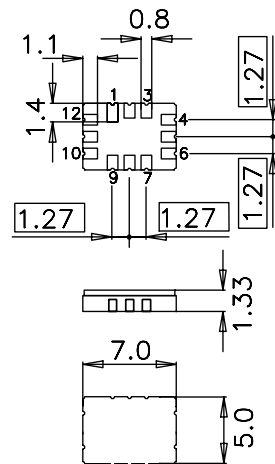
**Application**

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



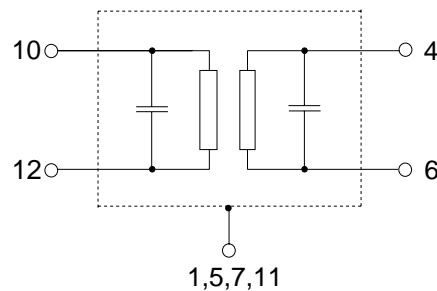
**Features**

- Package size 7.0 x 5.0 x 1.33 mm<sup>3</sup>
- Package code QCC12E
- Maximum package height 1.48 mm
- RoHS compatible
- Approximate weight 0.25 g
- Ceramic package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- AEC-Q200 qualified component family
- **Electrostatic Sensitive Device (ESD)**



**Pin configuration**

- 4 Balanced input or input ground
- 6 Input
- 10 Balanced output or output ground
- 12 Output
- 1,5,7,11 Case – ground
- 2,3,8,9 To be grounded





Data sheet



Characteristics

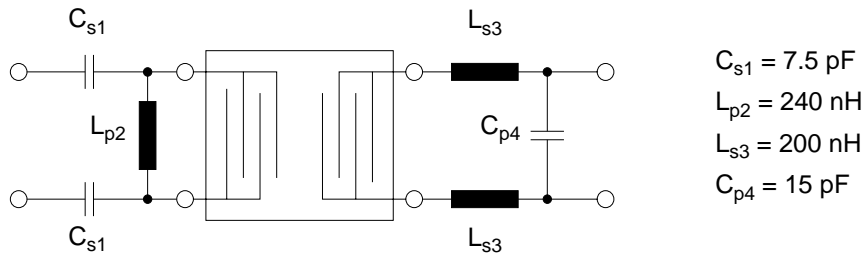
Temperature range for specification: T = -40 °C to (+85 °C) +105 °C  
 Terminating source impedance: Z<sub>S</sub> = 27 Ω and matching network  
 Terminating load impedance: Z<sub>L</sub> = 1 kΩ and matching network

		min.	typ. @ 25 °C	max.	
<b>Nominal frequency</b>	f <sub>N</sub>	—	80.46	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	α <sub>min</sub>	—	18.1	19.6	dB
<b>Maximum voltage gain source – load</b> (V <sub>L</sub> /V <sub>S</sub> )	α <sub>vgsL</sub>	-8.8	-7.3	—	dB
<b>Amplitude ripple (p-p)</b>	Δα				
	f <sub>N</sub> ± 1.84 MHz	—	0.9	(1.3) 1.8	dB
<b>Pass bandwidth</b>					
α <sub>rel</sub> ≤ 1.5 dB	B <sub>1.5dB</sub>	—	4.3	—	MHz
α <sub>rel</sub> ≤ 3 dB	B <sub>3dB</sub>	—	4.6	—	MHz
α <sub>rel</sub> ≤ 15 dB	B <sub>15dB</sub>	—	5.5	6.0	MHz
α <sub>rel</sub> ≤ 30 dB	B <sub>30dB</sub>	—	6.1	6.5	MHz
<b>Mean attenuation</b> (relative to α <sub>min</sub> )	α <sub>rel</sub>				
Upper sidelobe	86.47 ... 91.53 MHz	50.0	54.0	—	dB
<b>Relative attenuation</b> (relative to α <sub>min</sub> )	α <sub>rel</sub>				
Lower sidelobe	55.00 ... 67.00 MHz	48.0	54.0	—	dB
	67.00 ... 75.99 MHz	39.0	43.0	—	dB
Upper sidelobe	85.21 ... 86.47 MHz	40.0	49.0	—	dB
	86.47 ... 91.53 MHz	45.0	49.0	—	dB
	91.53 ... 95.21 MHz	46.0	52.0	—	dB
	95.21 ... 105.00 MHz	46.0	52.0	—	dB
<b>Group delay ripple (p-p)</b>	Δτ				
Aperture 50 kHz	f <sub>N</sub> ± 1.84 MHz	—	190	—	ns
<b>Temperature coefficient of frequency</b>	TC <sub>f</sub>	—	-18	—	ppm/K

1) Including losses in the matching network

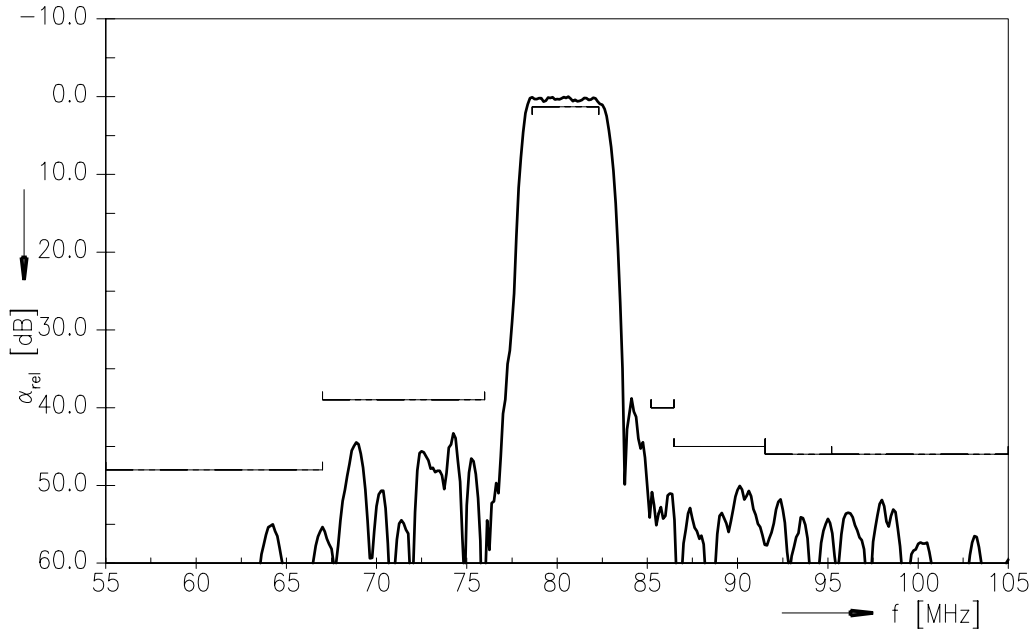


Matching network<sup>1)</sup> ((based on four port measurement, quality factors  $Q_L = 40$ ,  $Q_C = 90$ )

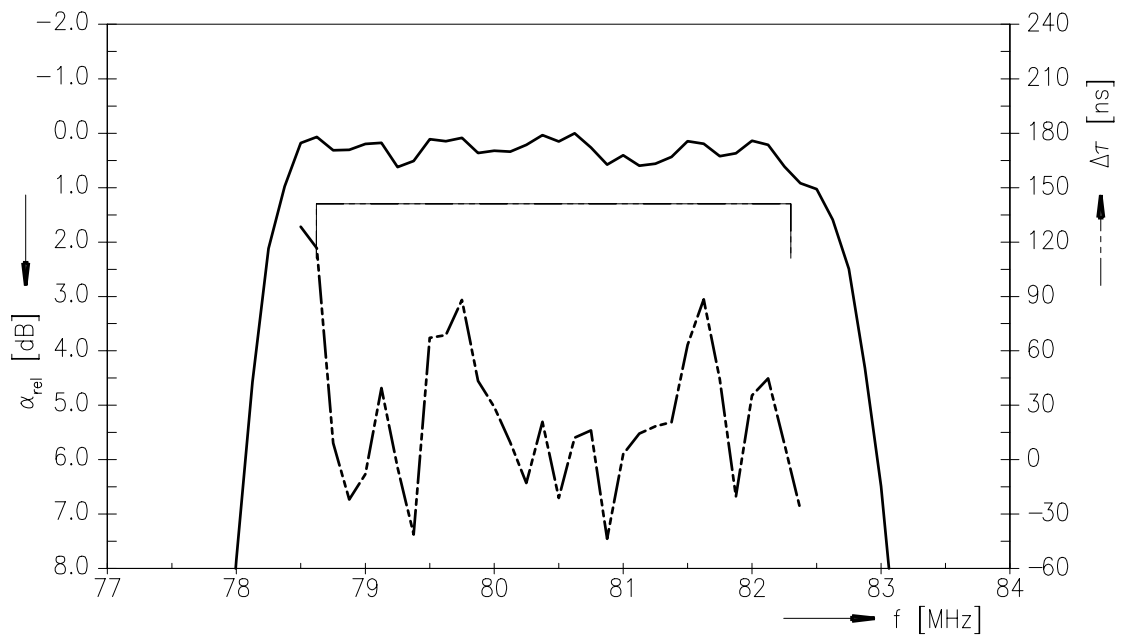


1) The input matching circuit has been designed as a power match of the filter's input port to 175  $\Omega$ . In a second step it has been optimized in a narrow range in order to operate at 27  $\Omega$  with optimum filter performance.

Transfer function



Transfer function (pass band)





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**80.46 MHz**

Data sheet



**Characteristics**

Temperature range for specification: T = -40 °C to +85 °C  
 Terminating source impedance: Z<sub>S</sub> = 50 Ω (single ended) and matching network  
 Terminating load impedance: Z<sub>L</sub> = 50 Ω (single ended) and matching network

		min.	typ. @ 25 °C	max.	
<b>Nominal frequency</b>	f <sub>N</sub>	—	80.46	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	α <sub>min</sub>	—	15.3	16.8	dB
<b>Amplitude ripple (p-p)</b>	Δα				
	f <sub>N</sub> ± 1.84 MHz	—	1.1	1.5	dB
<b>Pass bandwidth</b>					
α <sub>rel</sub> ≤ 1.5 dB	B <sub>1.5dB</sub>	—	4.3	—	MHz
α <sub>rel</sub> ≤ 3 dB	B <sub>3dB</sub>	—	4.6	—	MHz
α <sub>rel</sub> ≤ 15 dB	B <sub>15dB</sub>	—	5.5	6.0	MHz
α <sub>rel</sub> ≤ 30 dB	B <sub>30dB</sub>	—	6.2	6.6	MHz
<b>Mean attenuation (relative to α<sub>min</sub>)</b>	α <sub>rel</sub>				
Upper sidelobe	86.47 ... 91.53 MHz	46.0	48.0	—	dB
<b>Relative attenuation (relative to α<sub>min</sub>)</b>	α <sub>rel</sub>				
Lower sidelobe	55.00 ... 67.00 MHz	44.0	48.0	—	dB
	67.00 ... 75.99 MHz	34.0	37.0	—	dB
Upper sidelobe	85.21 ... 86.47 MHz	37.0	42.0	—	dB
	86.47 ... 91.53 MHz	40.0	44.0	—	dB
	91.53 ... 95.21 MHz	44.0	47.0	—	dB
	95.21 ... 105.00 MHz	45.0	48.0	—	dB
<b>Group delay ripple (p-p)</b>	Δτ				
Aperture 50 kHz	f <sub>N</sub> ± 1.84 MHz	—	180	—	ns
<b>Temperature coefficient of frequency</b>	TC <sub>f</sub>	—	-18	—	ppm/K

1) Including losses in the matching network



SAW Components

B1729

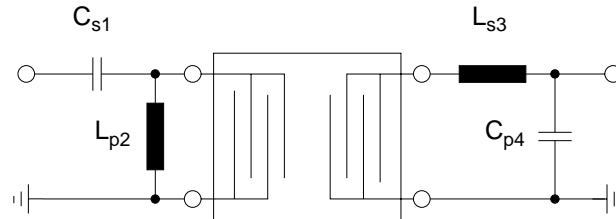
SAW IF filter

80.46 MHz

Data sheet



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



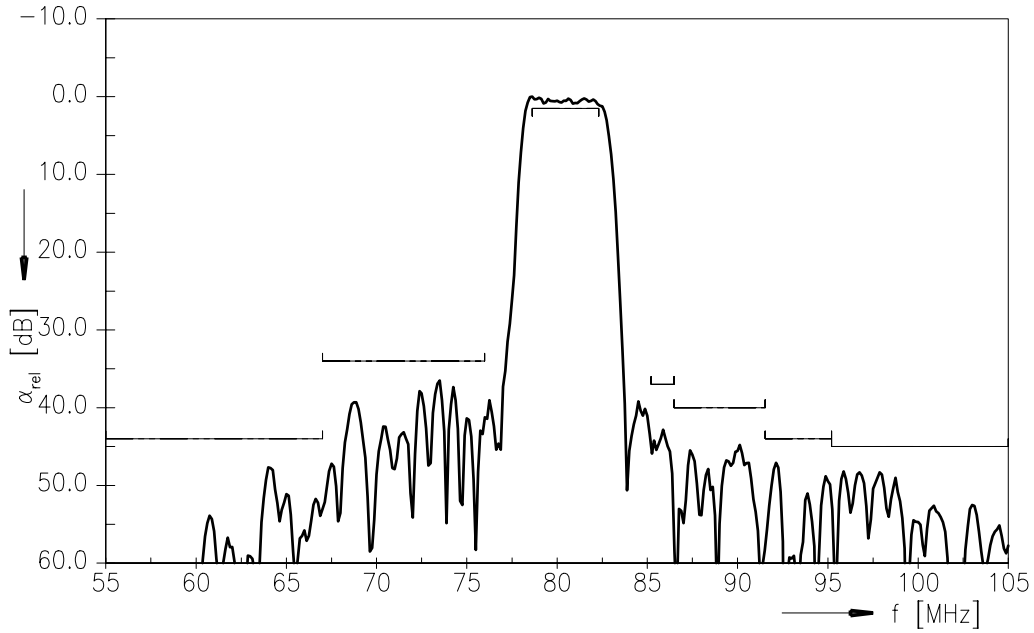
$C_{s1} = 3.9 \text{ pF}$   
 $L_{p2} = 220 \text{ nH}$   
 $L_{s3} = 200 \text{ nH}$   
 $C_{p4} = 56 \text{ pF}$

**Maximum ratings**

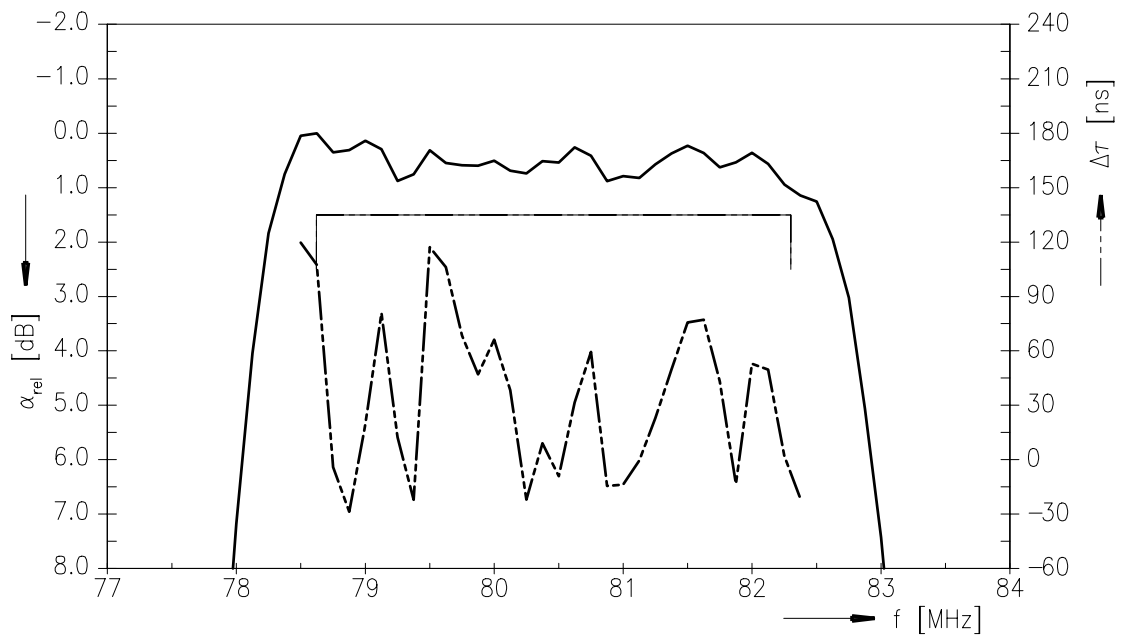
Operable temperature range	T	-40 / +105	°C	
Storage temperature range	T <sub>stg</sub>	-40 / +105	°C	
DC voltage	V <sub>DC</sub>	0	V	
Source power	P <sub>S</sub>	10	dBm	source impedance 50 Ω



Transfer function



Transfer function (pass band)





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## References

Type	B1729
Ordering code	B39805B1729H810
Marking and package	C61157-A7-A103
Packaging	F61074-V8170-Z000
Date codes	L_1126
S-parameters	B1729_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."

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