

RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

## SAW Components

### SAW IF filter

Satellite radio

Series/type:	B1728
Ordering code:	B39725B1728H810
Date:	December 19, 2012
Version:	2.2

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## SAW IF filter

Satellite radio

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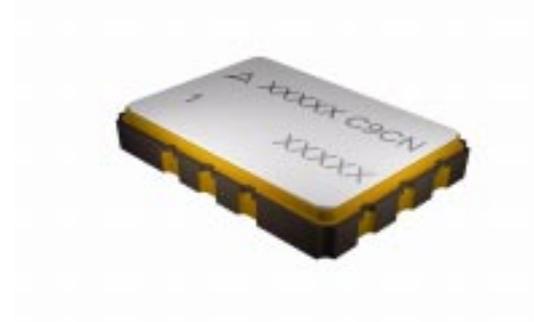
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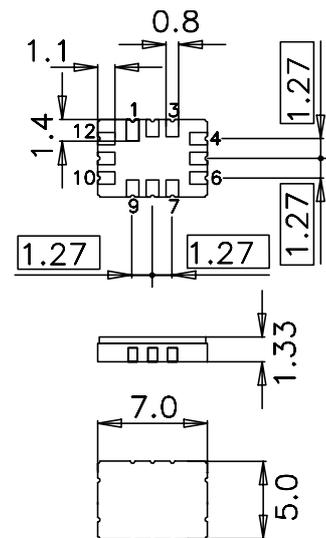
Data sheet


**Application**

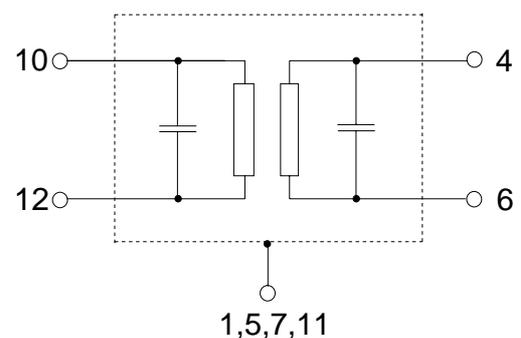
- IF filter for digital radio
- Usable bandwidth 3.7 MHz
- Low insertion attenuation
- Constant group delay
- Unbalanced or balanced operation


**Features**

- Package size 7.0 x 5.0 x 1.33 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**

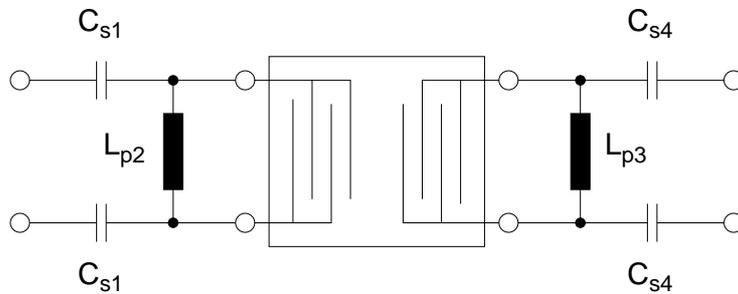
**Characteristics**

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>	—	72.54	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	α <sub>min</sub>	—	14.5	16.0	dB
<b>Maximum voltage gain source – load</b> (V <sub>L</sub> /V <sub>S</sub> )	α <sub>vgsL</sub>	-4.2	-2.7	—	dB
<b>Amplitude ripple (p-p)</b>	Δα				
	f <sub>N</sub> ± 1.85 MHz	—	1.0	(1.3) 1.5	dB
<b>Pass bandwidth</b>					
α <sub>rel</sub> ≤ 1.5 dB	B <sub>1.5dB</sub>	—	4.0	—	MHz
α <sub>rel</sub> ≤ 3 dB	B <sub>3dB</sub>	—	4.3	—	MHz
α <sub>rel</sub> ≤ 15 dB	B <sub>15dB</sub>	—	5.7	5.9	MHz
α <sub>rel</sub> ≤ 30 dB	B <sub>30dB</sub>	—	6.6	7.0	MHz
<b>Mean attenuation</b> (relative to α <sub>min</sub> )	α <sub>rel</sub>				
Upper sidelobe	86.47 ... 91.53 MHz	48.0	53.0	—	dB
<b>Relative attenuation</b> (relative to α <sub>min</sub> )	α <sub>rel</sub>				
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
<b>Group delay ripple (p-p)</b>	Δτ				
Aperture 50 kHz	f <sub>N</sub> ± 1.85 MHz	—	210	—	ns
<b>Temperature coefficient of frequency</b>	TC <sub>f</sub>	—	-18	—	ppm/K

1) Including losses in the matching network

Data sheet


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


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

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

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

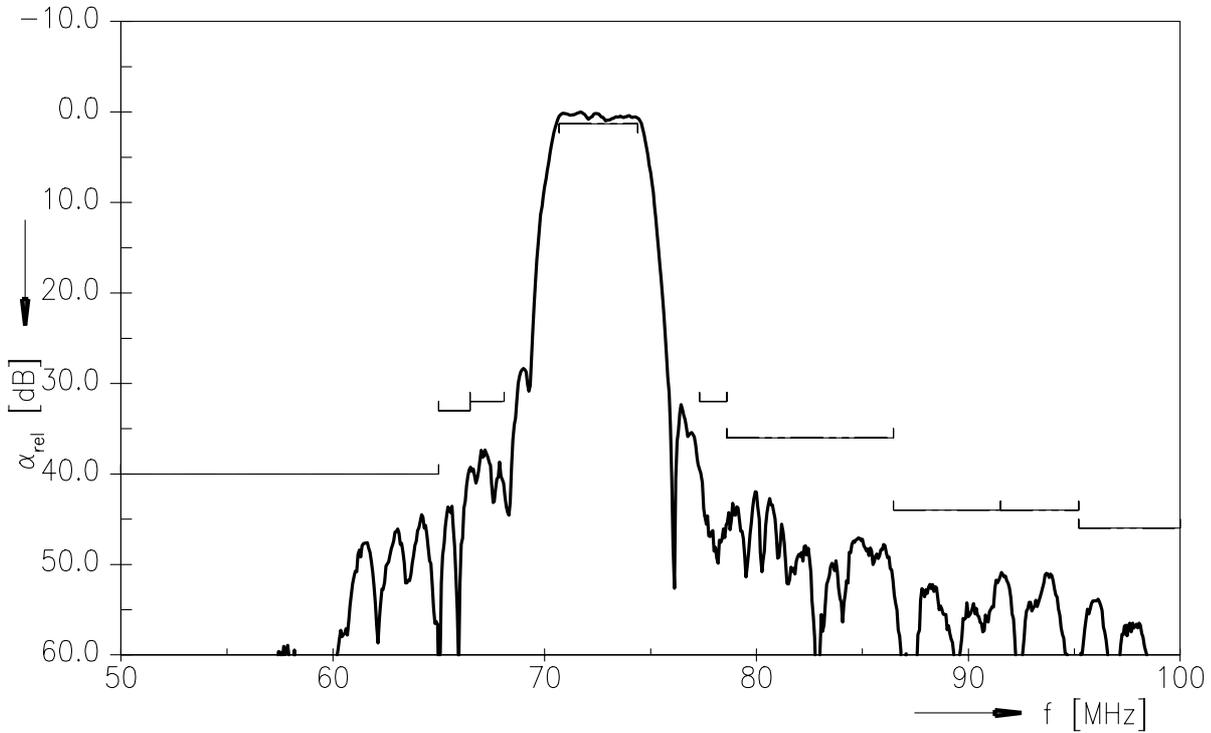
$$C_{s4} = 3.6 \text{ pF}$$

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

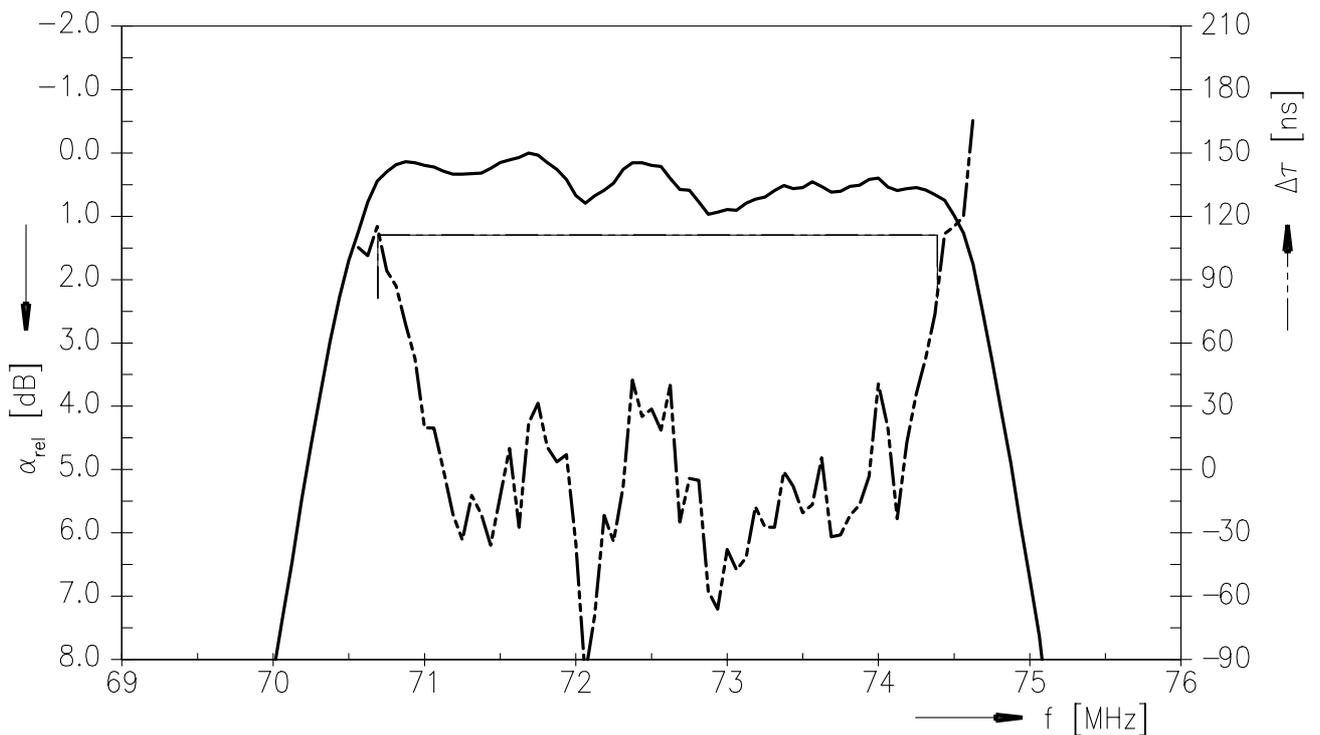
Data sheet



**Transfer function**



**Transfer function (pass band)**



Data sheet

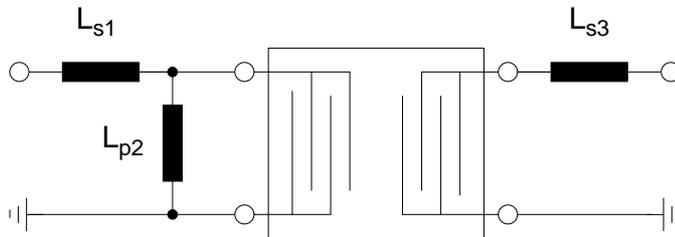

**Characteristics**

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>	—	72.54	—	MHz
<b>Minimum insertion attenuation<sup>1)</sup></b>	α <sub>min</sub>	—	12.9	14.4	dB
<b>Amplitude ripple (p-p)</b>	Δα				
	f <sub>N</sub> ± 1.85 MHz	—	1.2	1.5	dB
<b>Pass bandwidth</b>					
α <sub>rel</sub> ≤ 1.5 dB	B <sub>1.5dB</sub>	—	4.0	—	MHz
α <sub>rel</sub> ≤ 3 dB	B <sub>3dB</sub>	—	4.4	—	MHz
α <sub>rel</sub> ≤ 15 dB	B <sub>15dB</sub>	—	5.8	6.0	MHz
α <sub>rel</sub> ≤ 30 dB	B <sub>30dB</sub>	—	6.7	7.0	MHz
<b>Mean attenuation (relative to α<sub>min</sub>)</b>	α <sub>rel</sub>				
Upper sidelobe	86.47 ... 91.53 MHz	48.0	52.0	—	dB
<b>Relative attenuation (relative to α<sub>min</sub>)</b>	α <sub>rel</sub>				
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
<b>Group delay ripple (p-p)</b>	Δτ				
Aperture 50 kHz	f <sub>N</sub> ± 1.85 MHz	—	190	—	ns
<b>Temperature coefficient of frequency</b>	TC <sub>f</sub>	—	-18	—	ppm/K

1) Including losses in the matching network

Data sheet


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


$$L_{s1} = 620 \text{ nH}$$

$$L_{p2} = 750 \text{ nH}$$

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

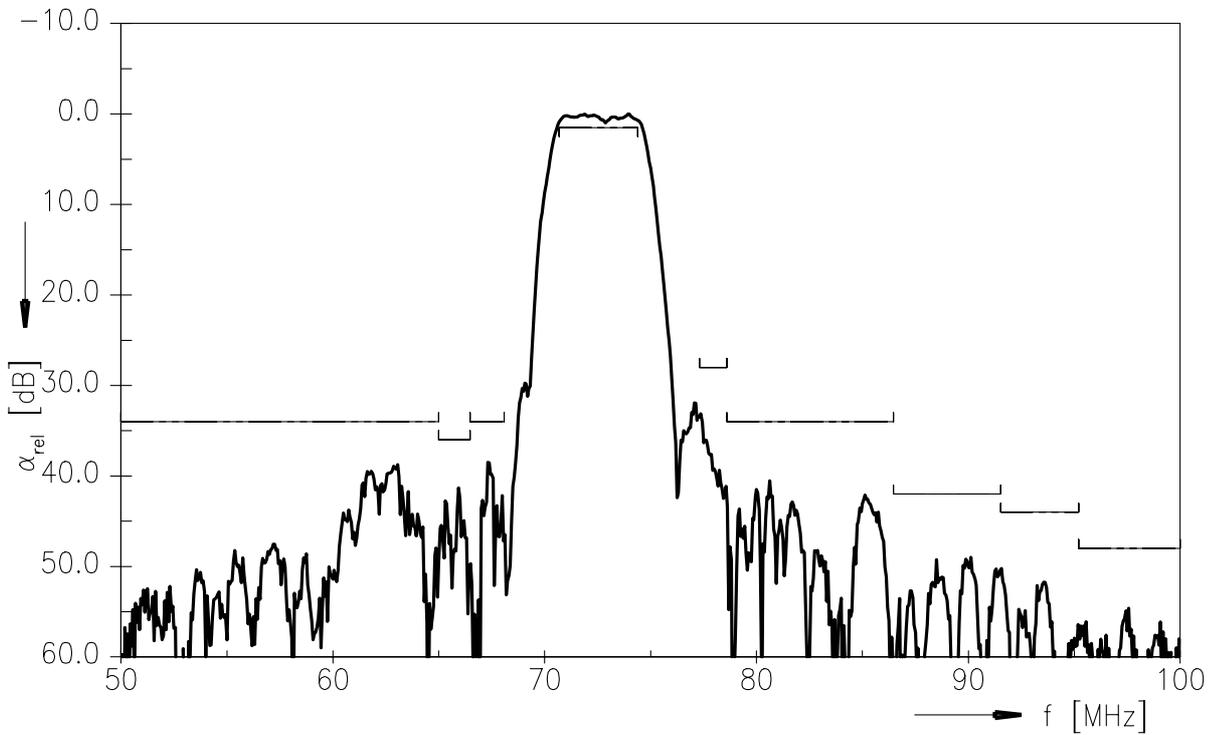
**Maximum ratings**

Operable temperature range	T	-40 / +105	°C	
Storage temperature range	$T_{stg}$	-40 / +105	°C	
DC voltage	$V_{DC}$	6	V	
Source power	$P_S$	10	dBm	source impedance 50 $\Omega$

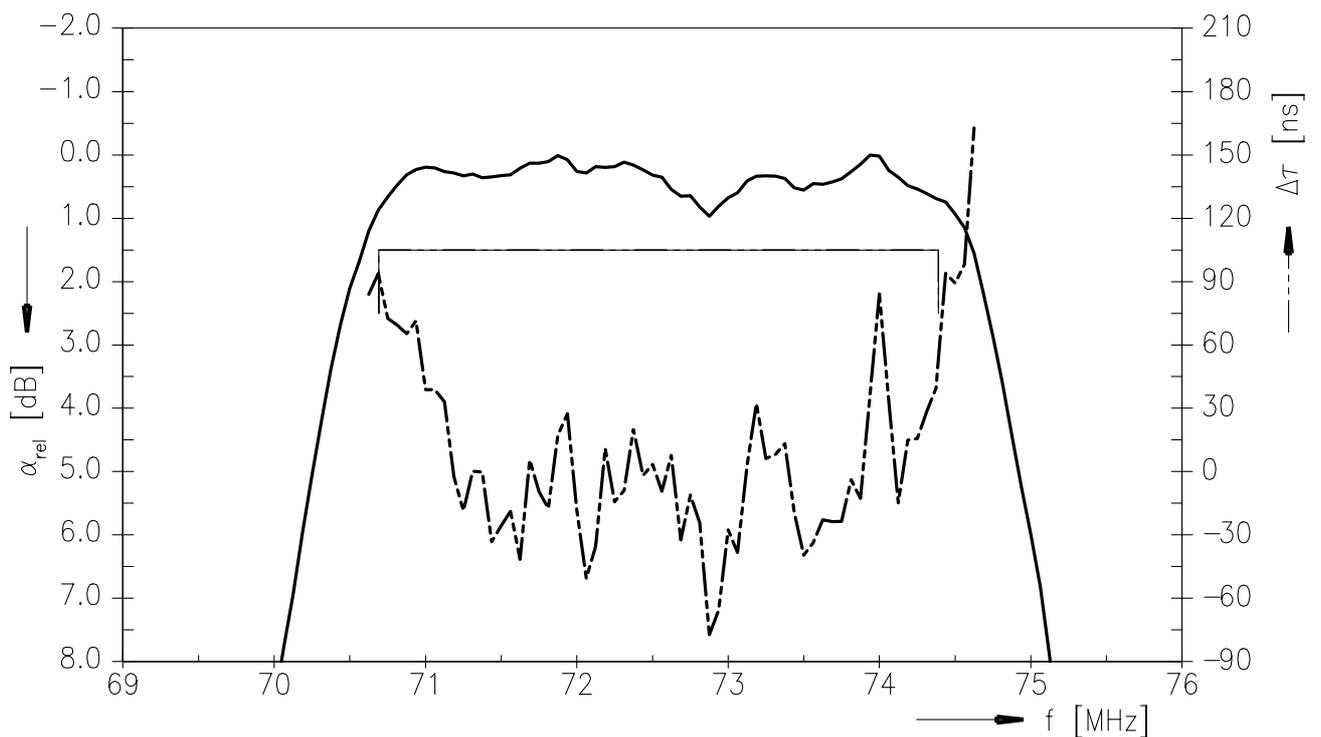
Data sheet



**Transfer function**



**Transfer function (pass band)**




**References**

<b>Type</b>	B1728
<b>Ordering code</b>	B39725B1728H810
<b>Marking and package</b>	C61157-A7-A103
<b>Packaging</b>	F61074-V8170-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B1728_NB_UN.s4p See file header for port/pin assignment table.
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8 <sup>th</sup> , 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases.
<b>Matching coils</b>	See Inductor pdf-catalog <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a> for a large variety of matching coils.

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