



SAW Components

SAW filter

Short range devices

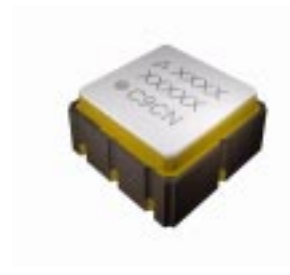
Series/type:	B3791
Ordering code:	B39431B3791Z810
Date:	December 20, 2012
Version:	2.2

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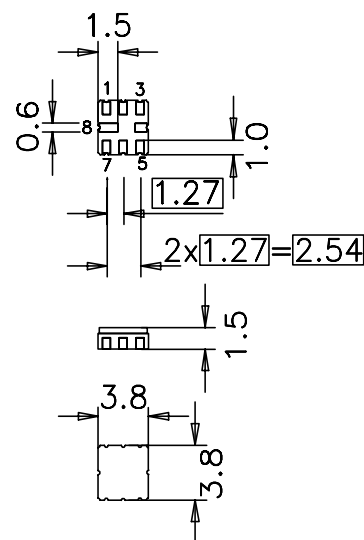
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Application

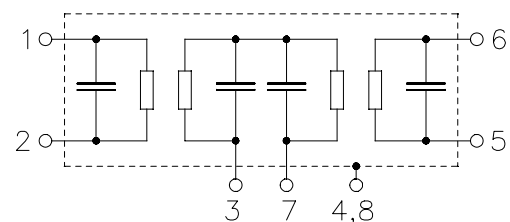
- Low-loss RF filter for remote control receivers
- Balanced and unbalanced operation possible


Features

- Package size 3.8 x 3.8 x 1.5 mm³
- Package code QCC8B
- RoHS compatible
- Approximate weight 0.07 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- Lead free soldering compatible with J - STD20C
- Passivation layer Elpas
- AEC-Q200 qualified component family
- **Electrostatic Sensitive Device (ESD)**


Pin configuration¹⁾

- 1 Input ground (recommended) or input
- 2 Input (recommended) or input ground
- 5 Output (recommended) or output ground
- 6 Output ground (recommended) or output
- 7 External coupling coil
- 4,8 Case - ground
- 3 To be grounded



1) The recommended pin configuration usually offers best suppression of electrical crosstalk. The filter characteristics refer to this configuration.

Data sheet


Characteristics

Temperature range for specification:	T = -20 °C to +80 °C
Terminating source impedance:	Z _S = 50 Ω and matching network
Terminating load impedance:	Z _L = 50 Ω and matching network

		min.	typ. @ 25 °C	max.	
Center frequency	f _C	—	433.42	—	MHz
Minimum insertion attenuation	α _{min}				
incl. loss in matching elements (Q _L = 47)		—	3.8	4.5	dB
excl. loss in matching elements		—	3.1	3.8	dB
Pass band (relative to α_{min})					
433.30 ... 433.54 MHz		—	1.0	3.0	dB
Relative attenuation (relative to α_{min})	α _{rel}				
10.00 ... 429.00 MHz		50	55	—	dB
429.00 ... 432.62 MHz		35	44	—	dB
433.92 ... 434.22 MHz		16	25	—	dB
434.22 ... 434.60 MHz		35	38	—	dB
434.60 ... 435.60 MHz		20	25	—	dB
435.60 ... 460.00 MHz		40	50	—	dB
460.00 ... 1000.00 MHz		50	58	—	dB
Impedance for pass band matching¹⁾					
Input: Z _{IN} = R _{IN} C _{IN}		—	640 1.5	—	Ω pF
Output: Z _{OUT} = R _{OUT} C _{OUT}		—	640 1.5	—	Ω pF

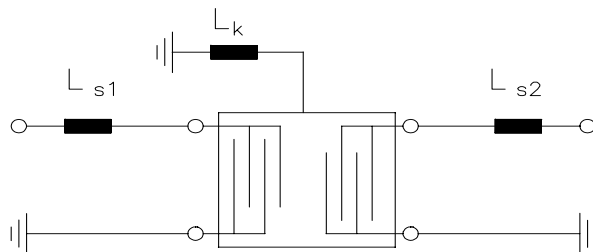
1) Impedance for passband matching bases on an ideal, perfect matching of the SAW filter to source- and to load impedance (here 50 Ohm). After removal of the SAW filter the input impedance of the input and output matching network is calculated. The conjugate complex value of these characteristic impedances are the input and output impedances for flat passband. For more details we refer to EPCOS application note #4.


Maximum ratings

Operable temperature range	T	-20/+80	°C	
Storage temperature range	T _{stg}	-45/+125	°C	
DC voltage	V _{DC}	6	V	
Source power	P _S	5	dBm	source impedance 50 Ω



Matching network to 50 Ω (element values depend on pcb layout and equivalent circuit)



$$L_{s1} = 56 \text{ nH}$$

$$L_{s2} = 56 \text{ nH}$$

$$L_k = 47 \text{ nH}$$

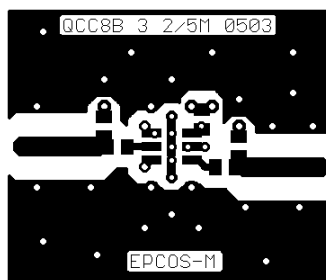
Minimising the crosstalk

For a good ultimate rejection a low crosstalk is necessary. Low crosstalk can be realised with a good RF layout. The major crosstalk mechanism is caused by the “ground-loop” problem.

Grounding loops are created if input-and output transducer GND are connected on the top-side of the PCB and fed to the system grounding plane by a common via hole. To avoid the common ground path, the ground pin of the input- and output transducer are fed to the system ground plane (bottom PCB plane) by their own via hole. The transducers’ grounding pins should be isolated from the upper grounding plane.

A common GND inductivity of 0.5nH degrades the ultimate rejection (crosstalk) by 20dB.

The optimised PCB layout, including matching network for transformation to 50 Ohm, is shown here. In this PCB layout the grounding loops are minimised to realise good ultimate rejection



Optimised PCB layout for SAW filters in QCC8B package, pinning 2,5 (top side, scale 1:1)

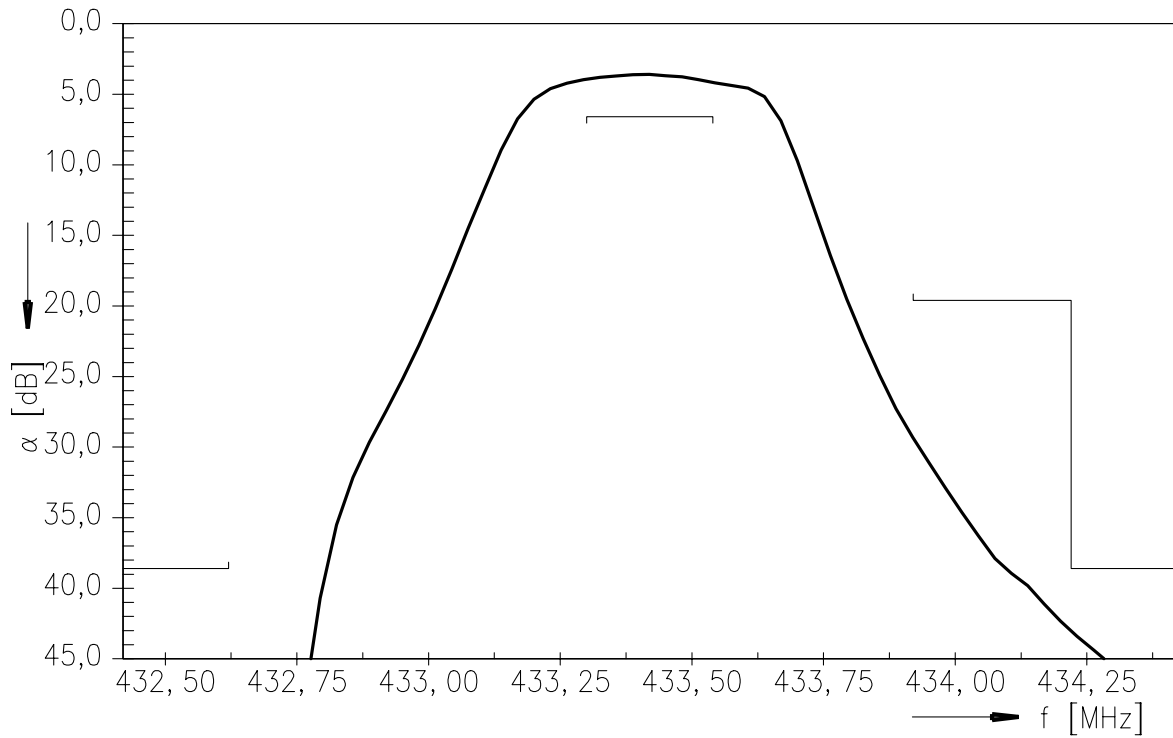
The bottom side is a copper plane (system ground area). The input and output grounding pins are isolated and connected to the common ground by separated via holes.

For good contact of the upper grounding area with the lower side it is necessary to place enough via holes.

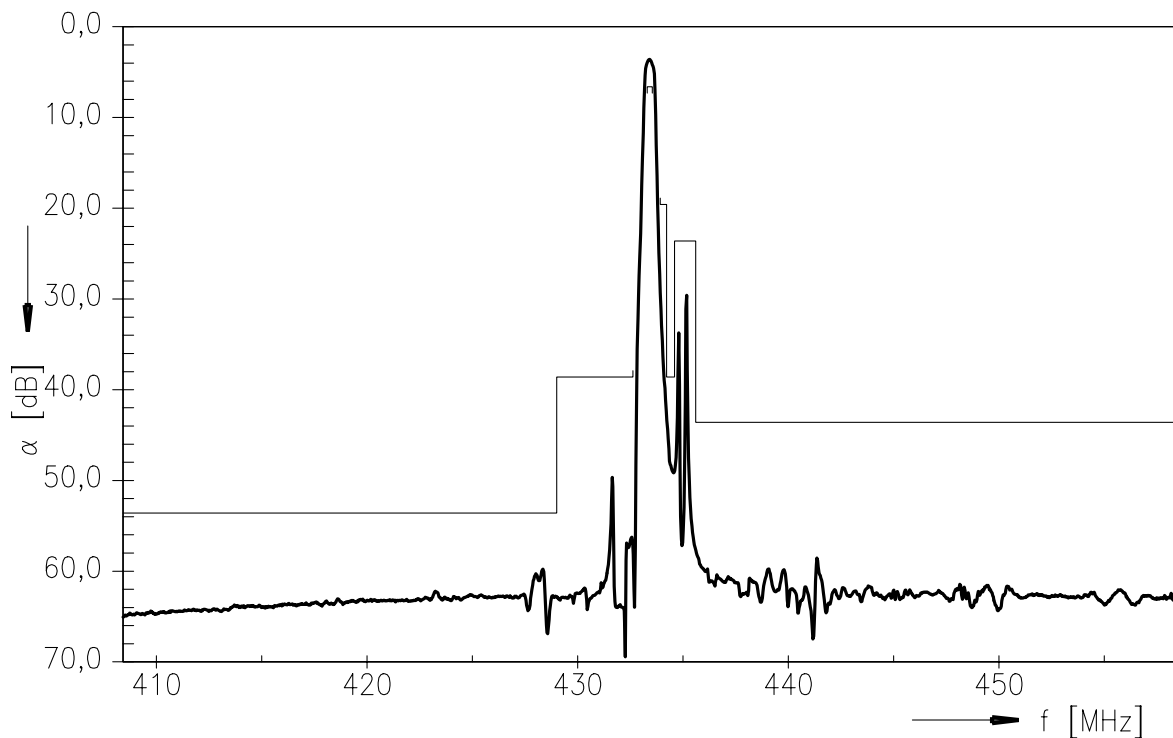
Data sheet



Transfer function



Transfer function (wideband)




References

Type	B3791
Ordering code	B39431B3791Z810
Marking and package	C61157-A7-A46
Packaging	F61074-V8167-Z000
Date codes	L_1126
S-parameters	B3791_NB.s2p B3791_WB.s2p See file header for port/pin assignment table
Soldering profile	S_6001
RoHS compatible	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 th , 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.
Matching coils	See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm

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