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# SAW Components

Data Sheet B3731

Data Sheet

A large, stylized graphic of the EPCOS logo is superimposed on a globe. The globe is rendered in a dark, semi-transparent style, showing the outlines of continents. The EPCOS logo, including the stylized triangle and the word "EPCOS", is shown in a light, glowing white color, appearing to be part of the globe's surface.



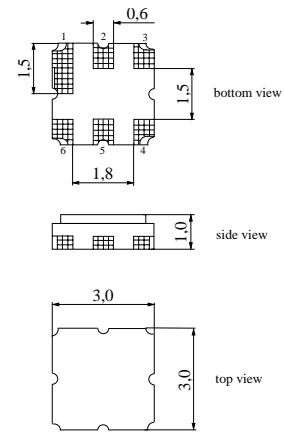
<b>SAW Components</b>	<b>B3731</b>
<b>Low-loss Filter</b>	<b>315,00 MHz</b>

Data Sheet

Features

- RF low-loss filter for remote control receivers
- Package for **Surface Mounted Technology (SMT)**
- Balanced and unbalanced operation possible
- Passivation layer: Elpas
- AEC-Q200 qualified component family
- Compliant to EU RoHs Directive (2002/95/EC)
- Lead free soldering compatible with J - STD20C

Ceramic package **DCC6E**



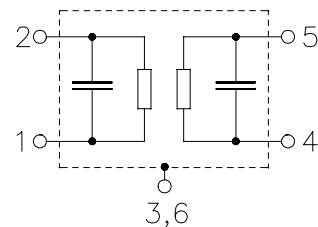
Terminals

- Ni, gold plated

typ. dimensions in mm, approx. weight 0,037 g

Pin configuration<sup>1)</sup>

- 1 Input (recommended) or Input Ground
- 2 Input Ground (recommended) or Input
- 4 Output (recommended) or Output Ground
- 5 Output Ground (recommended) or Output
- 3,6 to be grounded



Type	Ordering code	Marking and package according to	Packing according to
B3731	B39321-B3731-H110	C61157-A7-A143	F61074-V8168-Z000

Electrostatic Sensitive Device (ESD)

Maximum ratings

Operable temperature range	$T_A$	-45/+120	°C	
Storage temperature range	$T_{stg}$	-45/+120	°C	
DC voltage	$V_{DC}$	6	V	
Source power	$P_S$	10	dBm	source impedance 50 $\Omega$

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



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Data Sheet

**Characteristics**

Reference temperature:  $T_A = -45 \dots +95^\circ \text{C}$   
 Terminating source impedance:  $Z_S = 50 \Omega$  and matching network t.b.d.  
 Terminating load impedance:  $Z_L = 50 \Omega$  and matching network t.b.d.

		min.	typ.	max.	
<b>Center frequency</b> (center frequency between 3 dB points)	$f_c$	—	315,00	—	MHz
<b>Minimum insertion attenuation</b> including loss in matching elements ( $Q_L = 42$ ) excluding loss in matching elements	$\alpha_{\min}$	—	2,4 1,4	3,2 2,2	dB dB
<b>Pass band</b> (relative to $\alpha_{\min}$ )					
314,85 ... 315,15 MHz		—	0,6	2,0	dB
314,82 ... 315,18 MHz		—	0,8	3,0	dB
314,78 ... 315,22 MHz		—	1,2	6,0	dB
<b>Filter bandwidth</b>	$\alpha_{\text{rel}} \leq 3 \text{ dB}$	0,57	0,63	0,69	MHz
<b>Relative attenuation</b> (relative to $\alpha_{\min}$ )	$\alpha_{\text{rel}}$				
10,00 ... 295,00 MHz		48	53	—	dB
295,00 ... 307,00 MHz		43	48	—	dB
307,00 ... 312,00 MHz		32	36	—	dB
312,00 ... 314,00 MHz		25	29	—	dB
316,00 ... 325,00 MHz		10	14	—	dB
325,00 ... 336,00 MHz		38	43	—	dB
336,00 ... 370,00 MHz		42	46	—	dB
370,00 ... 600,00 MHz		52	57	—	dB
600,00 ... 1500,00 MHz		60	65	—	dB
1500,00 ... 2500,00 MHz		55	60	—	dB
<b>Impedance</b> for pass band matching <sup>1)</sup>					
Input: $Z_{\text{IN}} = R_{\text{IN}} \parallel C_{\text{IN}}$		—	610 $\parallel$ 2,2	—	$\Omega \parallel \text{pF}$
Output: $Z_{\text{OUT}} = R_{\text{OUT}} \parallel C_{\text{OUT}}$		—	610 $\parallel$ 2,2	—	$\Omega \parallel \text{pF}$

<sup>1)</sup> Impedance for passband matching bases on an ideal, perfect matching of the SAW filter to source- and to load impedance (here 50 Ohm). After the SAW filter is removed and input impedance into the input matching / output matching network is calculated.

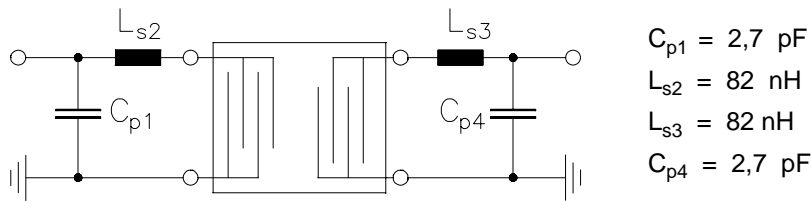
The conjugate complex value of these characteristic impedances are the input and output impedances for flat passband. For more details, we refer to EPCOS application note #4.



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



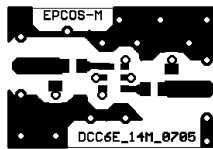
Minimising the crosstalk

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 DCC6E package, pinning 1,4 (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.

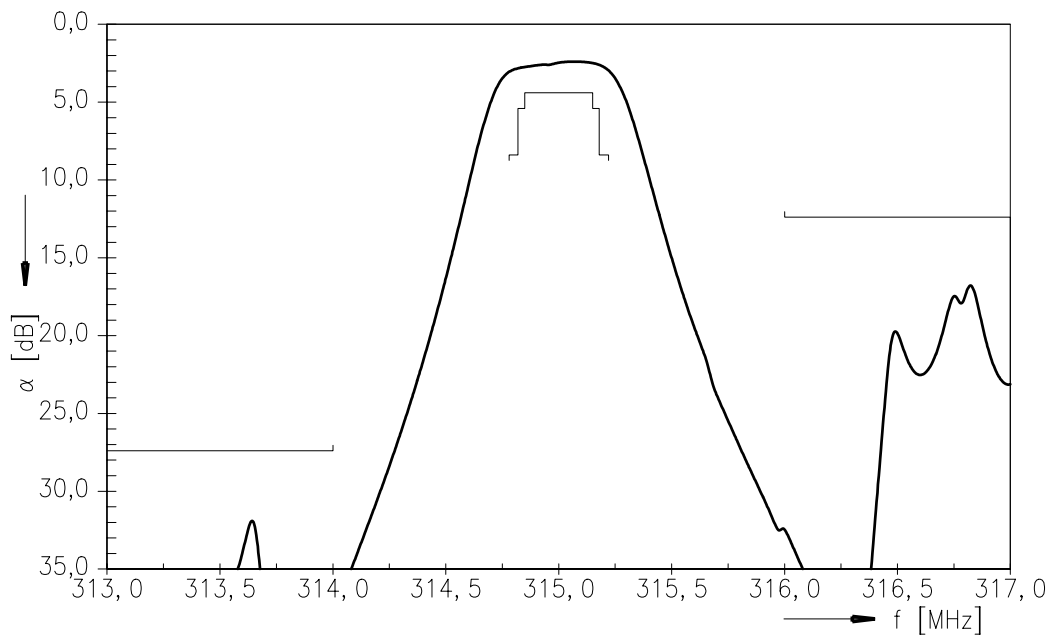
For good contact of the upper grounding area with the lower side it is necessary to place enough via holes.



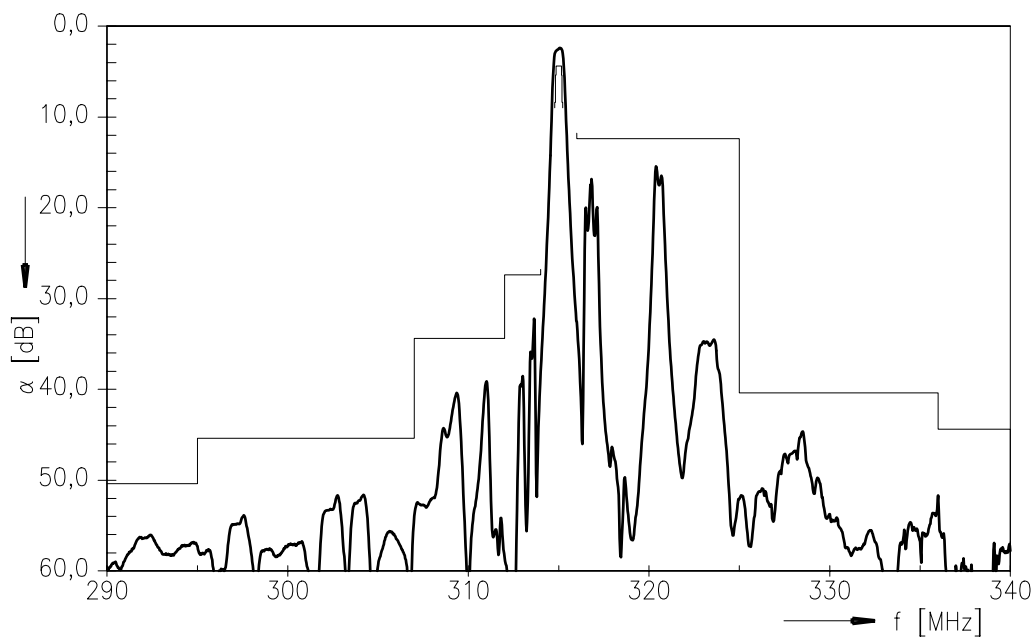
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Data Sheet

Frequency response



Frequency response (wideband)

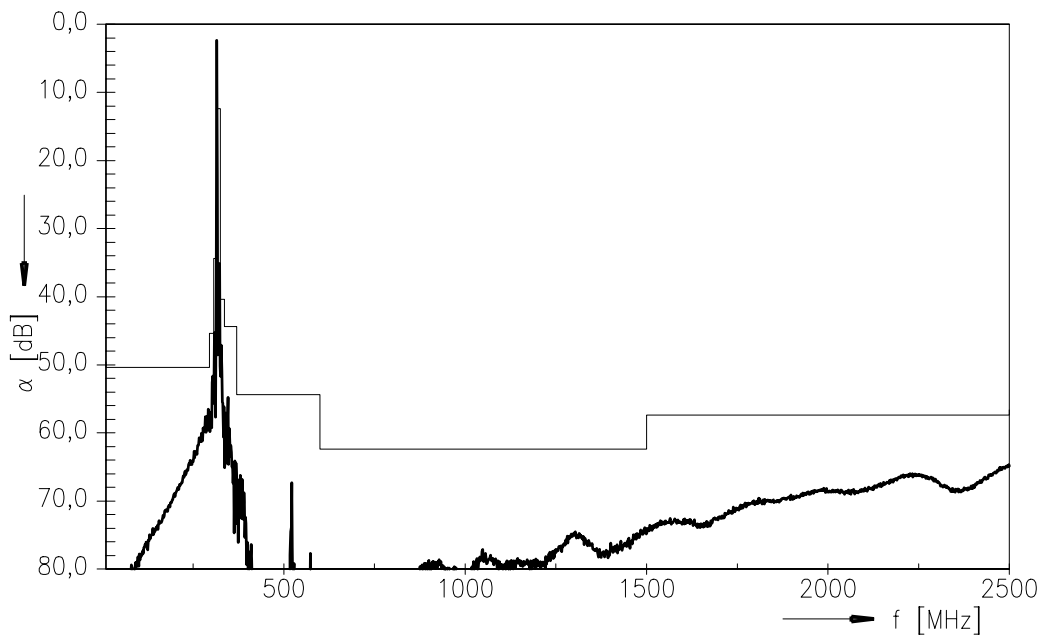




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Frequency response (ultimate rejection)



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