

RF360 Europe GmbH

A Qualcomm – TDK Joint Venture

## **SAW Components**

SAW filter

Short range devices

Series/type:B3713Ordering code:B39311B3713U410

Date:December 17, 2012Version:2.3

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# **SAW Components**

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### Series/type: Ordering code:

Date: Version: B3713 B39311B3713U410

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TDK

**B3713** 

313.85 MHz

### SAW Components

### SAW filter

Data sheet

SMD

### Application

- Low-loss RF filter for remote control application
- No matching network required for operation at 50 Ω

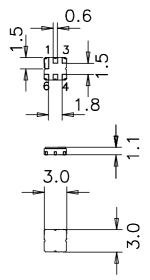


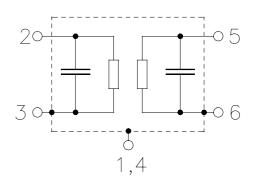
### Features

- Package size 3.0 x 3.0 x 1.1 mm<sup>3</sup>
- Package code DCC6C
- RoHS compatible
- Approximate weight 0.037 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)



- 2 Input
- 5 Output
- 1,3,4,6 Ground





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

Please read *cautions and warnings and important notes* at the end of this document.

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SAW Components

### SAW filter

Data sheet

### Characteristics

Temperature range for specification:	T = $-40$ °C to $+85$ °C
Terminating source impedance:	$Z_{S} = 50 \Omega$
Terminating load impedance:	$Z_{L} = 50 \Omega$

		min.	typ. @ 25 °C	max.	
Center frequency	f <sub>C</sub>		313.85		MHz
Maximum insertion attenuation	$\alpha_{max}$				
313.55 314.15 MH:	Z	_	1.7	2.5	dB
Amplitude ripple					
313.55 314.15 MH:	Z	_	0.4	1.2	dB
Relative attenuation (relative to $\alpha_{max}$ )	$lpha_{\text{rel}}$				
270.00 286.00 MH	Z	55	60		dB
291.85 292.75 MH	Z	53	58	—	dB
302.85 303.45 MH;	z	48	53		dB
324.25 324.85 MH;	z	28	35		dB
334.95 335.85 MH;	Z	50	55	_	dB
356.35 357.55 MHz	z	50	55	_	dB

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### SMD

# **②TDK**

313.85 MHz

SAW Components SAW filter

Data sheet

### Characteristics

Temperature range for specification:	$T = -30 \degree C \text{ to}+110 \degree C$
Terminating source impedance:	$Z_{S} = 50 \Omega$
Terminating load impedance:	$Z_L = 50 \Omega$

		min.	typ. @ 25 °C	max.	
Center frequency	f <sub>C</sub>		313.85		MHz
Maximum insertion attenuation	$\alpha_{max}$				
313.55 314.15 MHz			1.7	3.5	dB
Amplitude ripple					
313.55 314.15 MHz	2		0.4	2.2	dB
Relative attenuation (relative to $\alpha_{\text{max}}$ )					
270.00 286.00 MHz	<u></u>	55	60	—	dB
291.85 292.75 MHz	2	53	58	—	dB
302.85 303.45 MHz	2	48	53		dB
324.25 324.85 MHz	<u>_</u>	28	35		dB
334.95 335.85 MHz	2	50	55	_	dB
356.35 357.55 MHz	2	50	55		dB

SMD

### Maximum ratings

Operable temperature range	Т	-45/+125	°C	
Storage temperature range	T <sub>stg</sub>	-45/+125	°C	
DC voltage	V <sub>DC</sub>	0	V	
Source power	Ps	10	dBm	source impedance 50 $\Omega$

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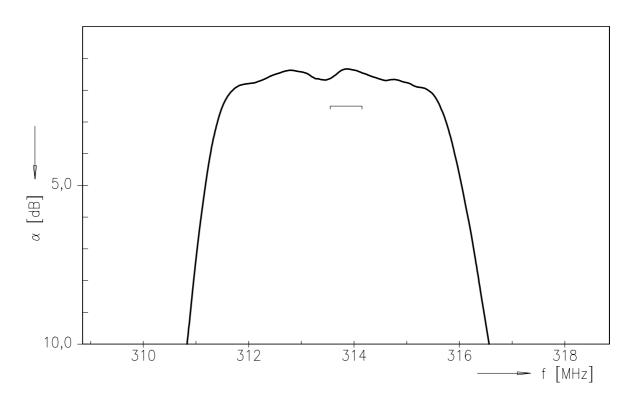
313.85 MHz

# 公TDK

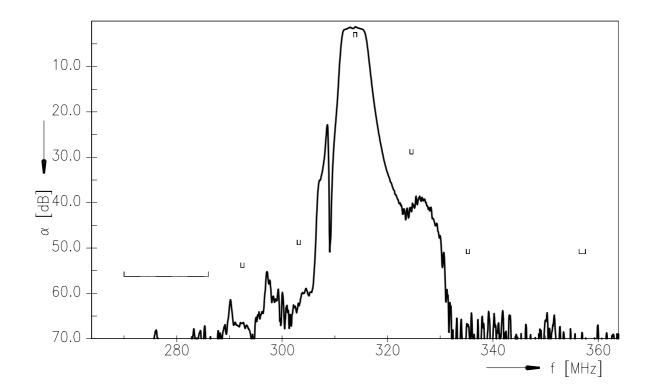
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**Data sheet** 

#### **Transfer function**



### Transfer function (wideband)



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313.85 MHz

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### **SAW Components**

### **SAW** filter

Data sheet

### ESD protection of SAW filters

SAW filters are Electro Static Discharge sensitive devices. To reduce the probability of damages caused by ESD, special matching topologies have to be applied.

SMD

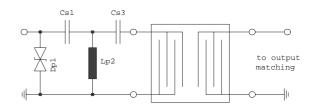
In general, "ESD matching" has to be ensured at that filter port, where electrostatic discharge is expected.

Electrostatic discharges predominantly appear at the antenna input of RF receivers. Therefore only the input matching of the SAW filter has to be designed to short circuit or to block the ESD pulse.

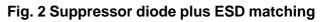
Below three figures show recommended "ESD matching" topologies.

For wideband filters the high-pass ESD matching structure needs to be at least of 3<sup>rd</sup> order to ensure a proper matching for any impedance value of antenna and SAW filter input. The required component values have to be determined from case to case.

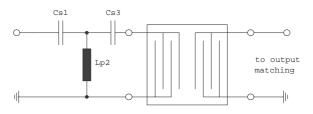




### Fig. 1 MLC varistor plus ESD matching



In cases where minor ESD occur, following simplified "ESD matching" topologies can be used alternatively.



### Fig. 3 3<sup>rd</sup> order high-pass structure for basic ESD protection

In all three figures the shunt inductor Lp2 could be replaced by a shorted microstrip with proper length and width. If this configuration is possible depends on the operating frequency and available pcb space.

Effectiveness of the applied ESD protection has to be checked according to relevant industry standards or customer specific requirements

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For further information, please refer to EPCOS Application report:

#### "ESD protection for SAW filters".

This report can be found under www.epcos.com/rke.Click on "Applications Notes".

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#### References

Туре	B3713
Ordering code	B39311B3713U410
Marking and package	C61157-A7-A67
Packaging	F61074-V8168-Z000
Date codes	L_1126
S-parameters	B3713_NB.s2p B3713_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 <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.
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
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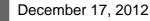
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313.85 MHz



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