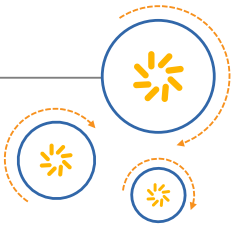
RF360 Europe GmbH

A Qualcomm – TDK Joint Venture



SAW Components

SAW RF filter

DAB

Series/type:	B1664
Ordering code:	B39152B1664U410
Date:	December 29, 2014
Version:	2.3

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RF360 Europe GmbH, Anzinger Str. 13, München, Germany

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DAB

Series/type:	**B1664**
Ordering code:	**B39152B1664U410**
Date:	December 29, 2014
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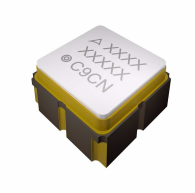
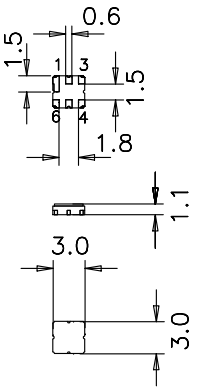
Application

- Low-loss RF filter for digital radio
- Usable passband 40.0 MHz
- Unbalanced to unbalanced operation



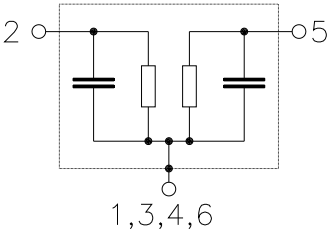
Features

- Package size 3.0 x 3.0 x 1.1 mm³
- Package code DCC6C
- RoHS compatible
- Approximate weight 0.037 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- Lead free soldering compatible with J - STD20C
- AEC-Q200 qualified component family
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



Pin configuration

- 2 Input
- 5 Output
- 1, 3, 4, 6 To be ground



Data sheet SMD

Characteristics

Temperature range for specification: T = –40 °C to +125 °C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 50 Ω

		min.	typ. @ 25 °C	max.	
Center frequency	f_C	—	1472.0	—	MHz
Maximum insertion attenuation	α_{max}				
1452.00 ... 1492.00 MHz		—	1.6	2.6[1)]	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
1452.00 ... 1492.00 MHz		—	0.8	1.6[2)]	dB
Group delay ripple (p-p)	$\Delta\tau$				
1452.00 ... 1492.00 MHz		—	15	—	ns
VSWR					
1452.00 ... 1492.00 MHz		—	1.7	2.2[3)]	
Absolute attenuation	α_{abs}				
500.00 ... 1262.00 MHz		34	39	—	dB
1262.00 ... 1382.00 MHz		25	31	—	dB
1382.00 ... 1398.00 MHz		25	35	—	dB
1398.00 ... 1414.00 MHz		27	39	—	dB
1547.00 ... 1580.00 MHz		21	25	—	dB
1580.00 ... 2200.00 MHz		25	30	—	dB
2200.00 ... 4000.00 MHz		26	31	—	dB

1) 2.4 for reduced temperature range -40 °C to +85 °C
2) 1.4 for reduced temperature range -40 °C to +85 °C
3) 2.1 for reduced temperature range -40 °C to +85 °C
2.2 for reduced temperature range -40 °C to +105 °C

Maximum ratings

Operable temperature range	T	–45/+125	˚C	
Storage temperature range	T_{stg}	–45/+125	˚C	
DC voltage	V_{DC}	6	V	
ESD voltage	V_{ESD}	125[1)]	V	Machine Model
		225[2)]	V	Human Body Model
Source power	P_{IN}			
1452.00 ... 1492.00 MHz		10	dBm	source impedance 50 Ω

1) acc. to JESD22-A115B (MM - Machine model), 1 negative & 1 positive pulses
2) acc. to JESD22-A114F (HBM - Human Body Model), 1 negative & 1 positive pulses

ESD protection of SAW filters

SAW filters are **E**lectro **S**tatic **D**ischarge sensitive devices. To reduce the probability of damages caused by ESD, special matching topologies have to be applied.
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 two figures show recommended “ESD matching” topologies.

Depending on the input impedance of the SAW filter and the source impedance, the needed component values have to be determined from case to case.

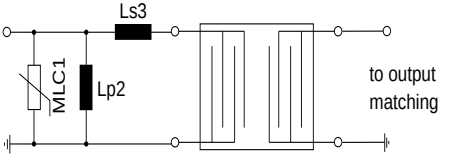


Fig. 1 MLC varistor plus ESD matching

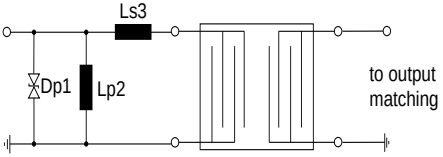


Fig. 2 Suppressor diode plus ESD matching

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

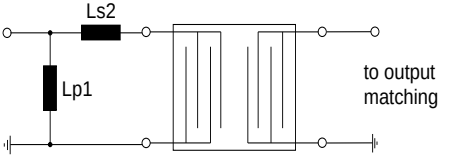


Fig. 3 shunt L – series L matching

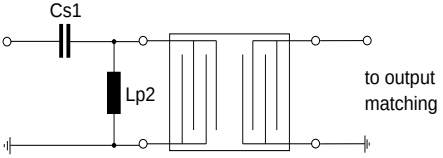
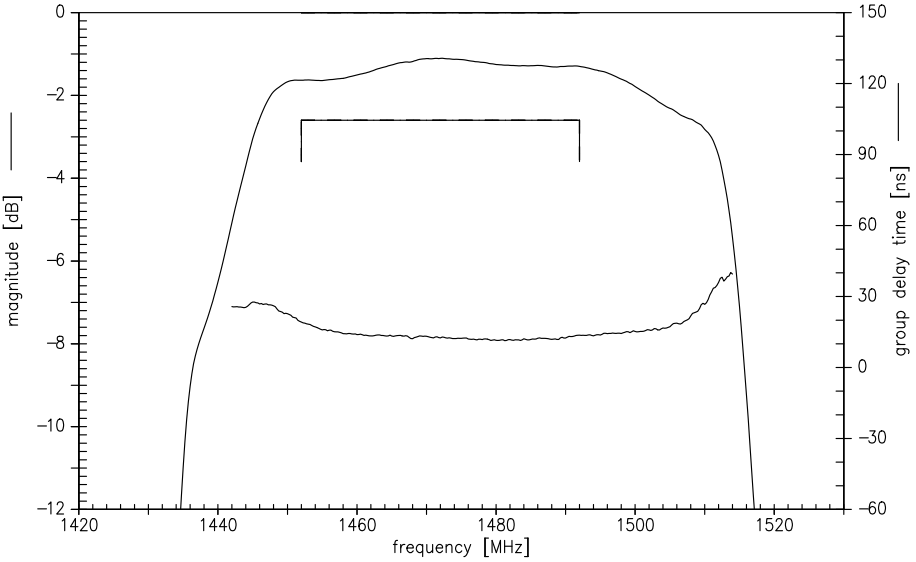


Fig. 4 series C – shunt L matching

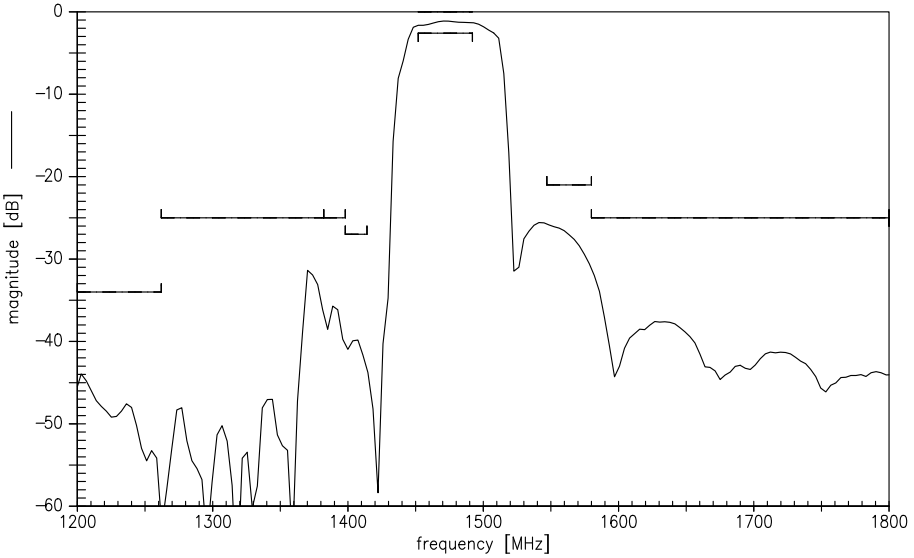
Effectiveness of the applied ESD protection has to be checked according to relevant industry standards or customer specific requirements.

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 “data sheets” and then “Applications” under category “Further information”.

Transfer function (narrowband)

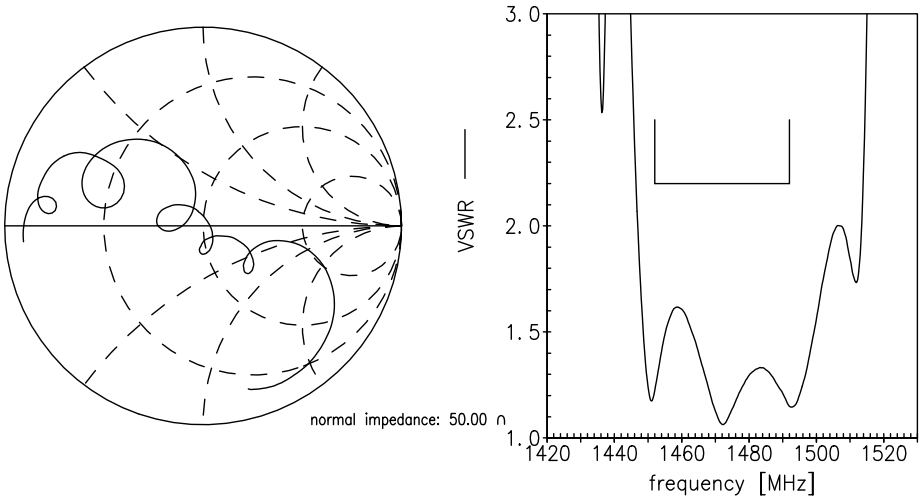


Transfer function (wideband)

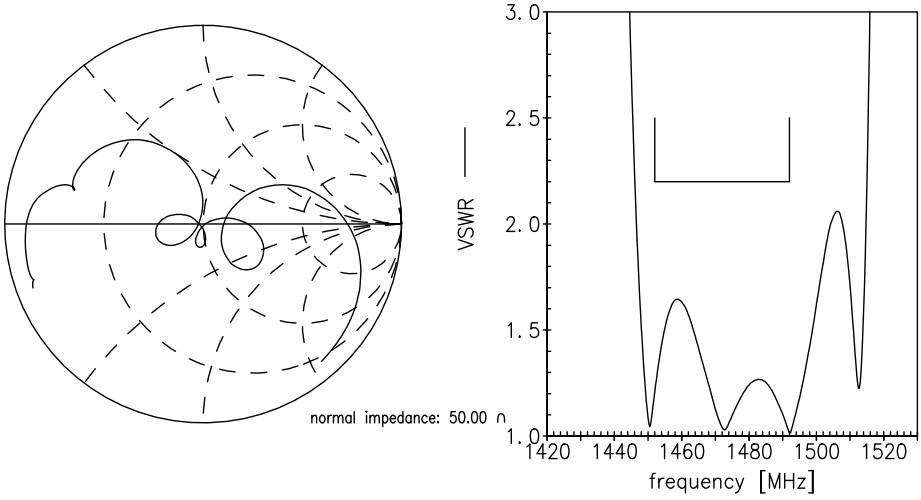


Smith charts

S_{11} function



S_{22} function



References

Type	B1664
Ordering code	B39152B1664U410
Marking and package	C61157-A7-A67
Packaging	F61074-V8168-Z000
Date codes	L_1126
S-parameters	B1664_NB.s2p, B1664_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 8th, 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 for a large variety of matching coils.

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