SAW Components

SAW RF low loss filter

Digital radio

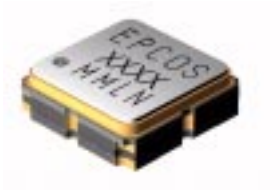
Series/type:	**B1644**
Ordering code:	**B39232-B1644-U510**
Date:	July 27, 2010
Version:	2.6

Revision History: Changes compared to previous iteration issue

ISSUE	ORIGINATOR	DETAILED SEPECIFICATION CHANGES	DATE
B1644_2.0	A. Ma	initial release	Dec 17, 2008
B1644_2.1	A. Ma	new temperature range included (-20 to 85)	Dec 09, 2009
B1644_2.2	A. Ma	typical value at 2320MHz changed from 6dB to 4dB. Min spec at output return loss removed	Jan 27, 2010
B1644_2.3	A. Ma	min output return loss added back (10.0dB), typical value change from 10dB to 15dB	Feb 04, 2010
B1644_2.4	A. Ma	typical value at 2320MHz changed back to 6dB	Feb 25, 2010
B1644_2.5	A. Ma	include human model spec and change machine model spec from 50V to 100V	Jul 16, 2010
B1644_2.6	A. Ma	include revision history page	Jul 27, 2010

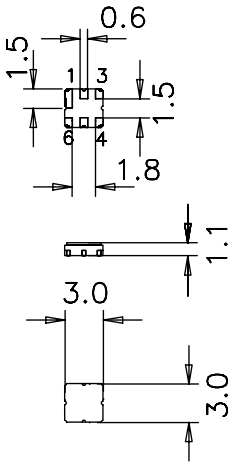
Application

- Low-loss RF filter for digital radio
- Impedance transformation from 50 Ω to 100 Ω
- Unbalanced to balanced operation
- Very low insertion attenuation
- Low amplitude ripple
- Usable passband 12.5 MHz
- no matching network required



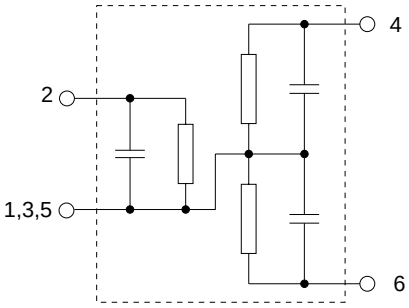
Features

- Package size 3.0 x3.0 x 1.1 mm³
- Maximum height of 1.225 mm
- Package code DCC6D
- RoHS compatible
- Approximate weight 0.037 g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- AEC-Q200 qualified component family
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)



Pin configuration

- 2 Input unbalanced
- 4,6 Output balanced
- 1,3,5 To be grounded



Characteristics

Temperature range for specification: T = –20 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 100 Ω (balanced)

		min.	typ. @ 25 ˚C	max.	
Nominal frequency	f_N	—	2338.75	—	MHz
Maximum insertion attenuation	α_{max}				
2332.5 ... 2345.0 MHz		—	2.4	3.5	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
2332.5 ... 2345.0 MHz		—	0.4	1.6	dB
Output amplitude balance ($\lvert S_{31}/S_{21}\rvert$)					
2332.5 ... 2345.0 MHz		–1.2	-0.7/0.0	1.5	dB
Output phase balance ($\phi(S_{31}) - \phi(S_{21})+180^\circ$)					
2332.5 ... 2345.0 MHz		–9.0	-7.0/-1.8	1.0	°
Input return loss		10.0	15.0	—	dB
Output return loss		10.0	15.0	—	dB
Attenuation	α				
88.0 ... 108.0 MHz		50	65	—	dB
880.0 ... 960.0 MHz		40	56	—	dB
1710.0 ... 1910.0 MHz		38	43	—	dB
2305.0 MHz		—	11	—	dB
2310.0 MHz		—	9	—	dB
2315.0 MHz		—	9	—	dB
2320.0 MHz		—	6	—	dB
2450.0 MHz		20	25	—	dB
3060.0 MHz		35	50	—	dB
Group delay ripple (p-p)					
2332.5 ... 2345.0 MHz		—	3	15	ns

Data sheet SMD

Characteristics

Temperature range for specification: T = –40 ˚C to+105 ˚C
Terminating source impedance: Z_S = 50 Ω
Terminating load impedance: Z_L = 100 Ω (balanced)

		min.	typ. @ 25 ˚C	max.	
Nominal frequency	f_N	—	2338.75	—	MHz
Maximum insertion attenuation	α_{max}				
2332.5 ... 2345.0 MHz		—	2.4	4.8	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
2332.5 ... 2345.0 MHz		—	0.4	2.9	dB
Output amplitude balance ($\lvert S_{31}/S_{21}\rvert$)					
2332.5 ... 2345.0 MHz		–5.0	-0.7/0.0	3.5	dB
Output phase balance ($\phi(S_{31}) - \phi(S_{21})+180^\circ$)					
2332.5 ... 2345.0 MHz		–12.0	-7.0/-1.8	8.0	°
Input return loss		10.0	15.0	—	dB
Output return loss		10.0	15.0	—	dB
Attenuation	α				
88.0 ... 108.0 MHz		50	65	—	dB
880.0 ... 960.0 MHz		40	56	—	dB
1710.0 ... 1910.0 MHz		38	43	—	dB
2305.0 MHz		—	11	—	dB
2310.0 MHz		—	9	—	dB
2315.0 MHz		—	9	—	dB
2320.0 MHz		—	6	—	dB
2450.0 MHz		20	25	—	dB
3060.0 MHz		35	50	—	dB
Group delay ripple (p-p)					
2332.5 ... 2345.0 MHz		—	3	20	ns

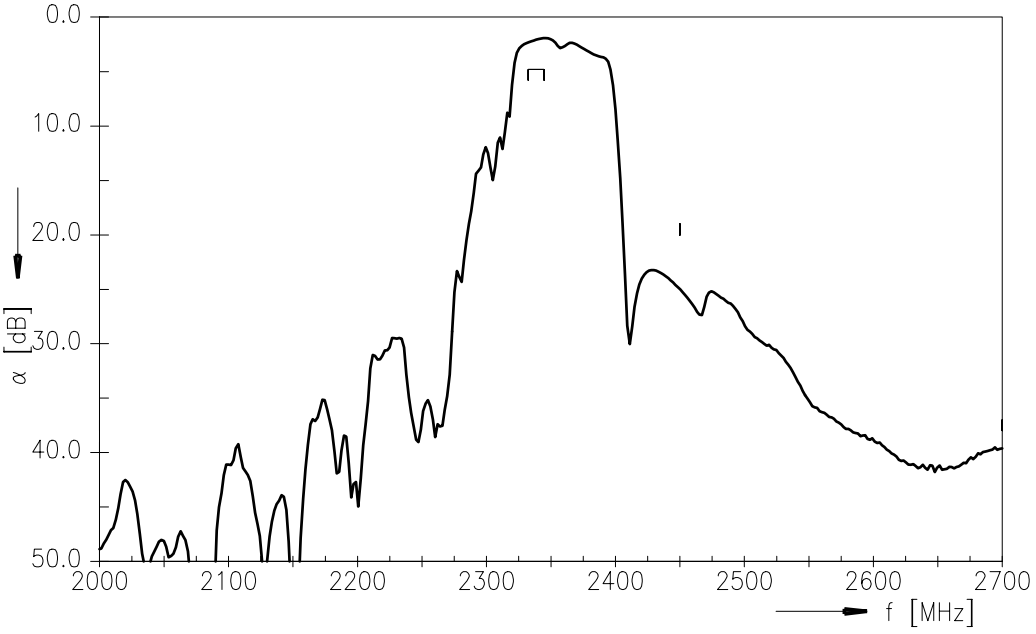
Maximum ratings

Operable temperature range	T	–40/+105	°C	
Storage temperature range	T_{stg}	–40/+125	°C	
DC voltage	V_{DC}	0	V	
ESD voltage	V_{ESD}	100[1)]	V	machine model, 1 pulse
	V_{ESD}	200[2)]	V	human body model, 1 pulse
Input power at				
2332.5 MHz...2345.0 MHz	P_{IN}	0	dBm	source impedance 50 Ω

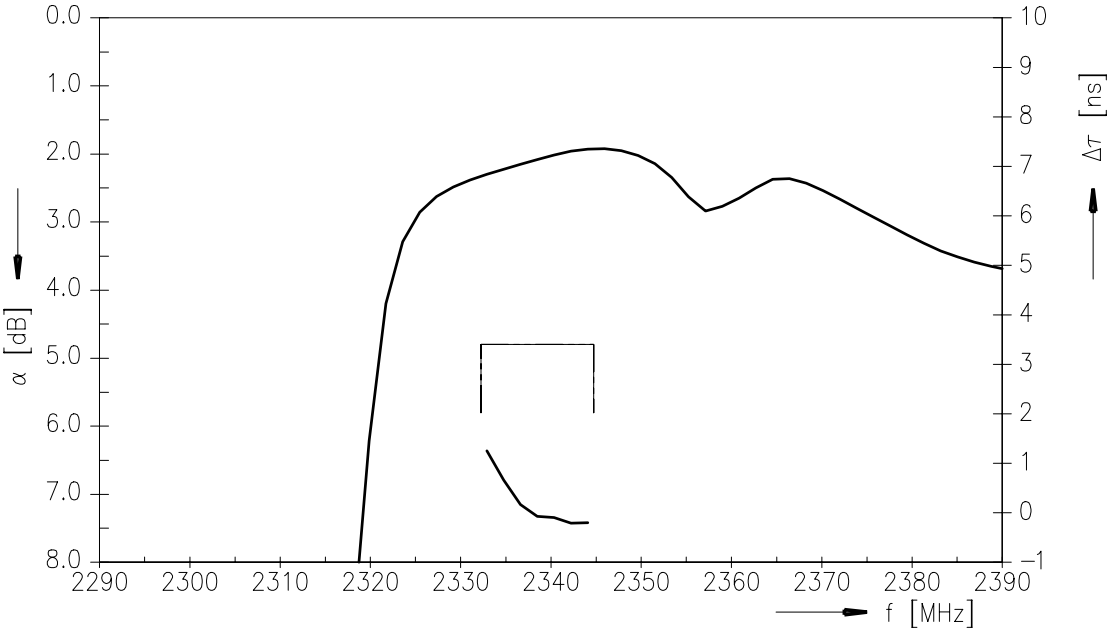
1) according to JESD22-A115A (machine model), 1 negative & 1 positive pulse.

2) acc. to JESD22-A114F (human body model), 1 negative & 1 positive pulse.

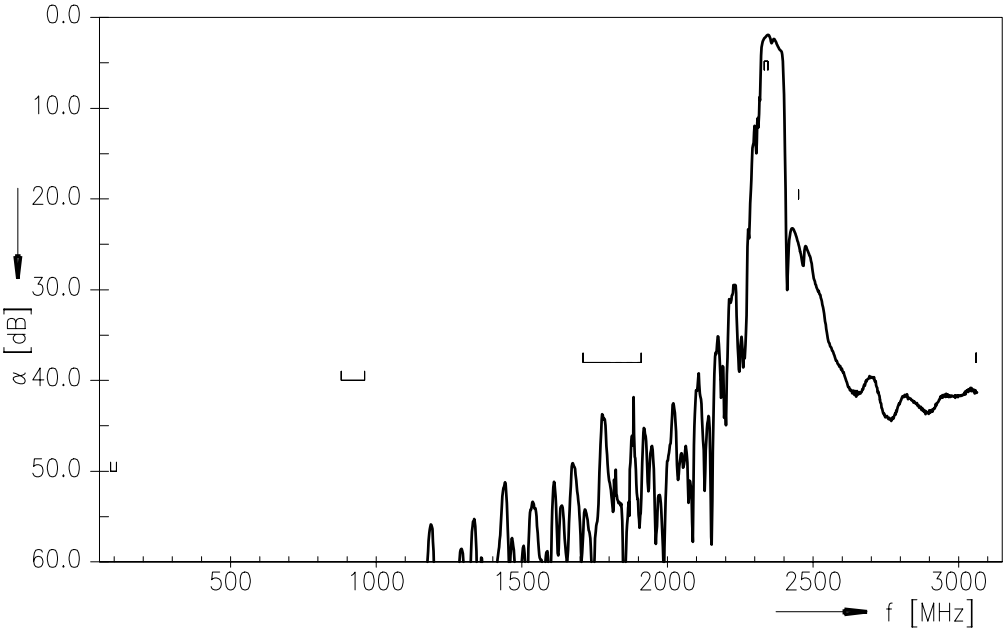
Transfer function



Transfer function (passband)



Transfer function (wideband)



References

Type	B1644
Ordering code	B39232-B1644-U510
Marking and package	C61157-A7-A68
Packaging	F61074-V8168-Z000
Date codes	L_1126
S-parameters	B1644_NB.s3p See file header for port/pin assignment table.
Soldering profile	S_6001
RoHS compatible	defined as compatible with the following documents: "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. 2005/618/EC from April 18th, 2005, amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment."

For further information please contact your local EPCOS sales office or visit our webpage at www.epcos.com .

Published by EPCOS AG
Surface Acoustic Wave Components Division
P.O. Box 80 17 09, 81617 Munich, GERMANY

For questions on technology, prices and delivery please contact the Sales Offices of EPCOS AG or the international Representatives.

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our Sales Offices.

Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application.** As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.
   We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.
7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FormFit, MiniBlue, MiniCell, MKD, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.