SAW Components

SAW Tx Filter

WCDMA Band VIII

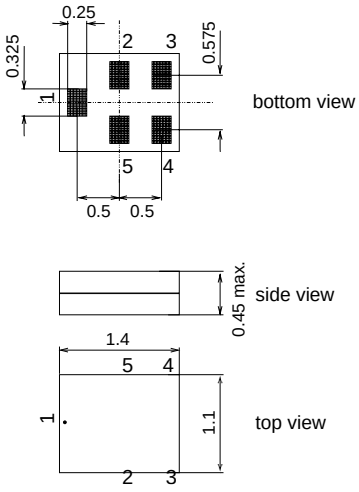
Series/type:	**B9442**
Ordering code:	**B39901B9442M410**
Date:	April 22, 2013
Version:	2.2

Application

- Low-loss RF filter for mobile telephone WCDMA 900 systems, transmit path (Tx)
- Usable passband: 35.0 MHz
- Unbalanced to unbalanced operation
- Low insertion attenuation
- Suitable for GPRS class 1 to 12

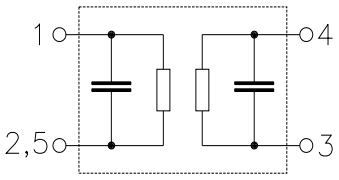
Features

- Package size 1.4 x 1.1 mm^2
- Max. Package height 0.45 mm
- RoHS compatible
- Approx. weight 0.003g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, gold-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitive **L**evel 3



Pin configuration

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



Data sheet SMD

Characteristics

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

			min.	typ. @ 25˚C	max.	
Center frequency		f_C	—	897.5	—	MHz
Maximum insertion attenuation						
	880.0 ... 915.0 MHz	α_{max}	—	2.3	3.6	dB
	882.4 ... 912.6 MHz	α_{WCDMA} [1]	—	1.8	2.6	dB
Amplitude ripple (p-p)						
	880.0 ... 915.0 MHz	$\Delta\alpha$	—	1.3	2.6	dB
	880.0 ... 915.0 MHz	α_{5MHz} [2]	—	1.0	2.0	dB
Group delay ripple						
	880.0 ... 915.0 MHz	$\Delta\tau_{5MHz}$ [2]	—	30	120	ns
Error Vector Magnitude						
@$f_{carrier}$	882.4 ... 912.6 MHz	EVM [3]	—	2.6	4.0	%
Input VSWR						
	880.0 ... 915.0 MHz		—	2.0	2.3	
Output VSWR						
	880.0 ... 915.0 MHz		—	2.0	2.3	
Attenuation						
	10.0 ... 835.0 MHz		30	37	—	dB
	835.0 ... 870.0 MHz		15	23	—	dB
	925.0 ... 960.0 MHz		15	28	—	dB
@$f_{carrier}$	927.4 ... 957.6 MHz	α_{WCDMA} [1]	25 [4]	33	—	dB
	960.0 ... 1576.5 MHz		32	35	—	dB
	1576.5 ... 2400.0 MHz		38	42	—	dB
	2400.0 ... 2640.0 MHz		35	39	—	dB
	2640.0 ... 2800.0 MHz		38	43	—	dB
	2800.0 ... 6000.0 MHz		25	38	—	dB

[1] Attenuation of WCDMA signal (“Powertransferfunction“). Please refer to annotation on the next page.
[2] Ripple determined within any 5MHz channel.
[3] Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.
[4] Minimum attenuation of 28dB in the temperature range 0˚C to +85˚C.

Annotation for characteristics section

Attenuation of WCDMA signal ("Powertransferfunction", α_{WCDMA}) is determined by

$$\int_{\infty}^{\infty} |S_{ds21}(f) H_{RRC}(f - f_{Carrier})|^2 df$$

$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for Passband, $f_{Carrier}$ ranges from 882.4 MHz (lowest Tx channel) to 912.6 MHz (highest Tx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

$$\int_{\infty}^{\infty} |H_{RRC}(f)|^2 df = 1$$

Maximum ratings

Storage temperature range	T_{stg}	–40/+85[1)]	˚C	
DC voltage	V_{DC}	5[2)]	V	
ESD voltage	V_{ESD}	100[3)]	V	Machine Model
		325[4)]	V	Human Body Model
		600[5)]	V	Charged Device Model
Input Power	P_{IN}	13	dBm	cw signal

1) extended upperlimit: 168h@125˚C acc. to IEC 60068-2-2 Bb

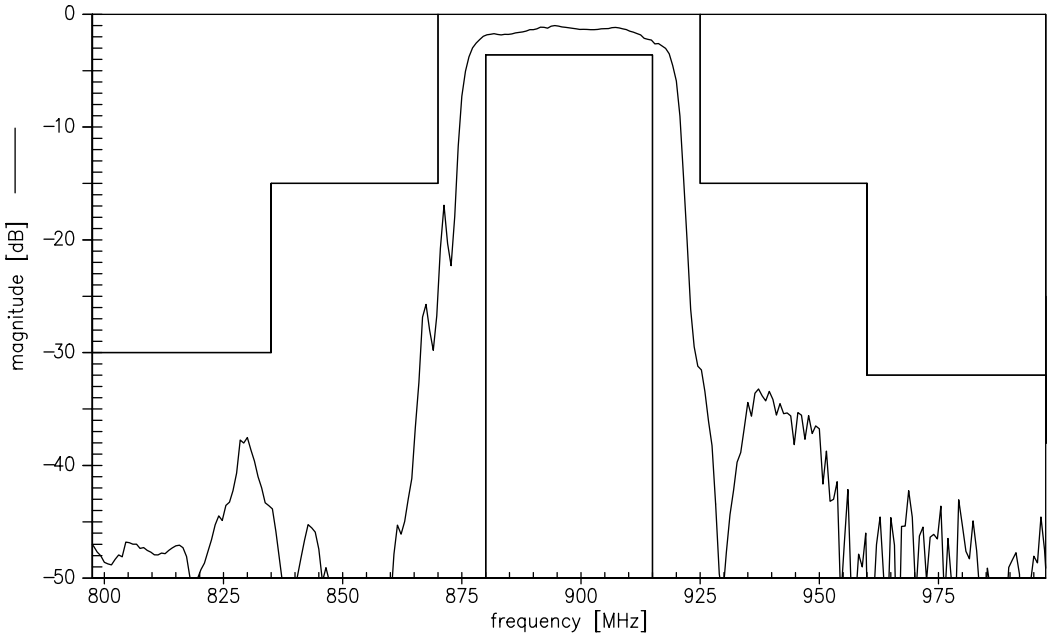
2) 168h Damp Heat Steady State acc. to IEC 60068-2-67 Cy

3) acc. to JESD22-A115B (MM - Machine Model), 10 negative & 10 positive pulses

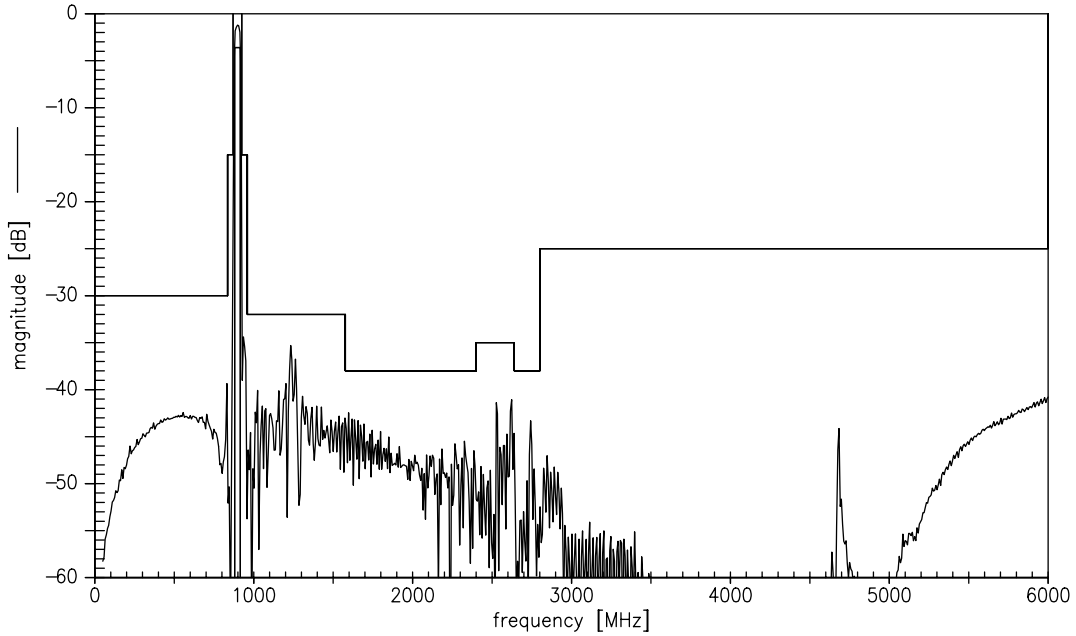
4) acc. to JESD22-A114F (HBM - Human Body Model), 1 negative & 1 positive pulses

5) acc. to JESD22-C101C (CDM - Field Induced Charged Device Model), 3 negative & 3 positive pulses

Transfer function (narrowband)

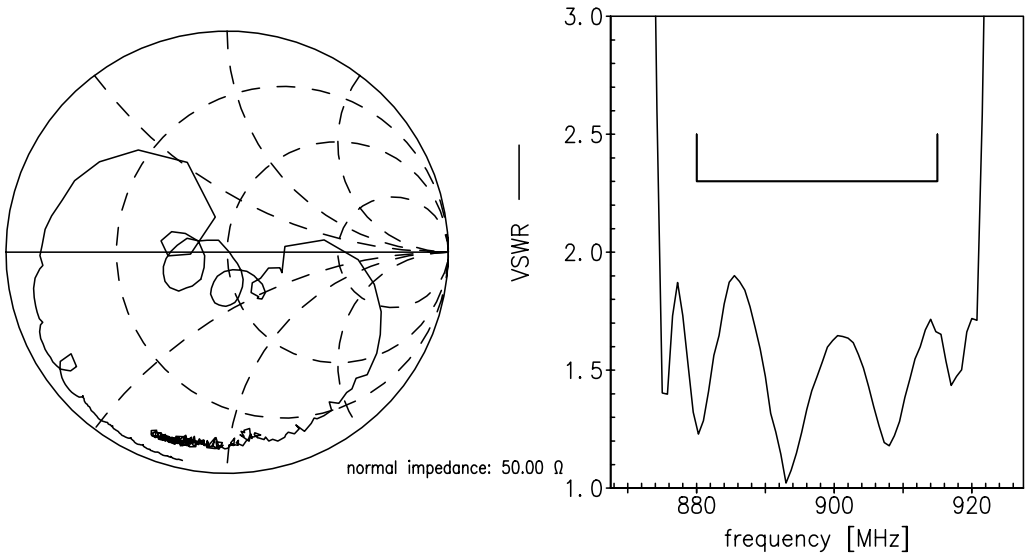


Transfer function (wideband)

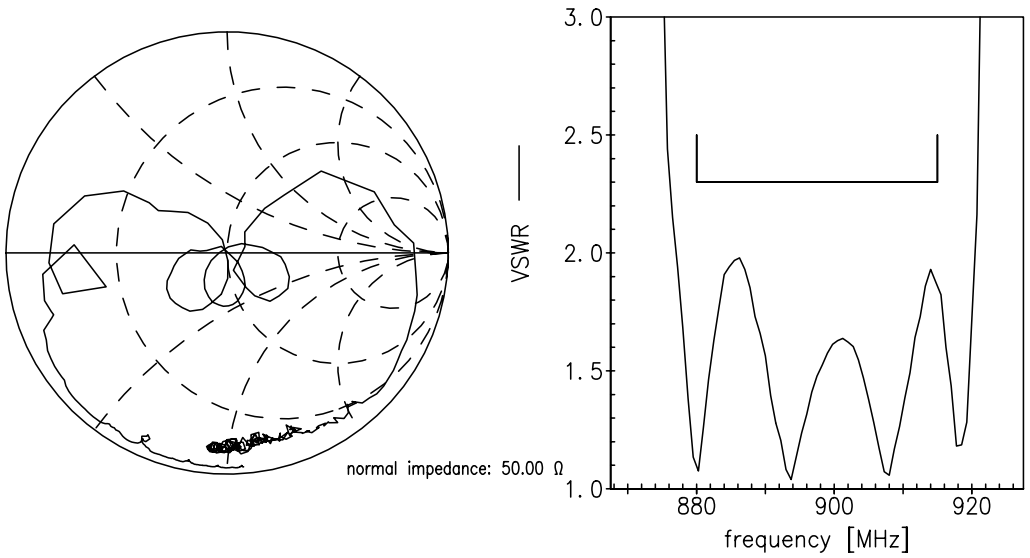


Smith Charts

S_{11} function



S_{22} function



References

Type	B9442
Ordering code	B39901B9442M410
Marking and package	C61157-A8-A3
Packaging	F61074-V8237-Z000
Date codes	L_1126
S-parameters	B9442_NB.s2p, B9442_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.
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
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.

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

Published by EPCOS AG
Systems, Acoustics, Waves Business Group
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, CeraLink, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FilterCap, 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.