



SAW Components

SAW Diversity Rx filter

WCDMA Band II

Series/type:	B9470
Ordering code:	B39192B9470M410
Date:	February 14, 2011
Version:	2.0



SAW Components

B9470

SAW RF Filter

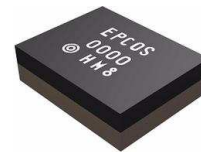
1960.0 MHz

Data Sheet

SMD

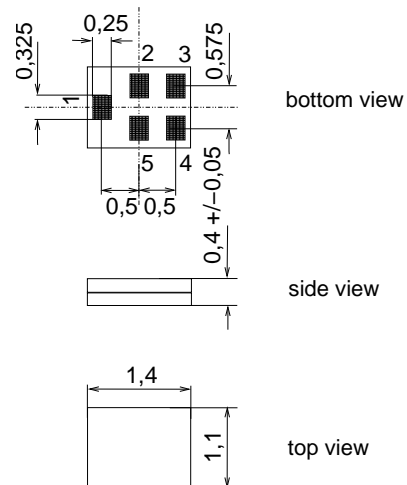
Application

- Low-loss RF filter for mobile telephone WCDMA Band II systems (diversity) receive path (RX)
- Usable for diversity application
- Usable passband 60 MHz
- Unbalanced to balanced operation (50Ω /100Ω)



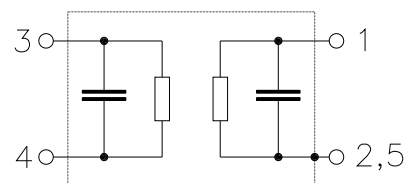
Features

- Package size 1.4 x 1.1 x 0.4 mm³
- RoHS compatible
- Approximate weight 0.003 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitive Level 3**



Pin configuration

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



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



SAW Components	B9470
SAW RF Filter	1960.0 MHz

Data Sheet **SMD**

Characteristics

Temperature range for specification: $T = -30\text{ }^{\circ}\text{C to }+85\text{ }^{\circ}\text{C}$
 Terminating source impedance: $Z_S = 50\ \Omega$ (unbalanced)
 Terminating load impedance: $Z_L = 100\ \Omega \parallel 22\ \text{nH}$ (balanced)

	min.	typ. @ 25 °C	max.	
Center frequency f_C		1960.0		MHz
Maximum insertion attenuation				
1930.0 ... 1990.0 MHz α		3.5	4.3 ¹⁾	dB
@ f_{carrier} 1932.4 ... 1987.6 MHz α_{WCDMA^2}		3.1	4.0	dB
Amplitude ripple (p-p) $\Delta\alpha$				
1930.0 ... 1990.0 MHz		1.9	2.7	dB
Error Vector Magnitude $\text{EVM}^3)$				
@ f_{carrier} 1932.4 ... 1987.6 MHz		3.0	4.5	
CMRR ($ S_{21}-S_{31} / S_{21}+S_{31} $)				
1930.0 ... 1990.0 MHz $\text{CMRR}^4)$	21	24		dB
Input VSWR				
1930.0 ... 1990.0 MHz		2.1	2.5	
Output VSWR				
1930.0 ... 1990.0 MHz		2.1	2.5	
Attenuation α				
10.0 ... 1850.0 MHz	40	53		dB
810.0 ... 849.0 MHz	50	73		dB
898.0 ... 925.0 MHz	50	72		dB
1850.0 ... 1910.0 MHz	46	48		dB
@ f_{carrier} 1852.4 ... 1907.6 MHz α_{WCDMA^2}	46	48		dB
2400.0 ... 2484.0 MHz	40	60		dB
2484.0 ... 6000.0 MHz	40	45		dB

1) 4.1 dB $T = 0^{\circ}$ to $+85^{\circ}$, 4.2 dB $T = -20^{\circ}$ to 0°
 2) Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (4).
 3) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.
 4) A combination of 5° phase balance and 1 dB amplitude balance corresponds to 23 dB CMRR



SAW Components **B9470**

SAW RF Filter **1960.0 MHz**

Data Sheet



Maximum ratings

Storage temperature range	T _{stg}	-40/+85	°C	machine model, 10 pulses
DC voltage	V _{DC}	3	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	
Input power at				
824.0 ... 849.0 MHz				
880.0 ... 915.0 MHz				
1710.0 ... 1755.0 MHz				
1920.0 ... 1980.0 MHz		15	dBm	
else where	P _{IN}	10	dBm	

¹⁾ acc. to JESD22-A115A (machine model), 10 negative & 10 positive pulses.

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 UMTS-Passband, f_{Carrier} ranges from 1932.4 MHz (lowest Rx channel) to 1987.6 MHz (highest Rx 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:

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



SAW Components

B9470

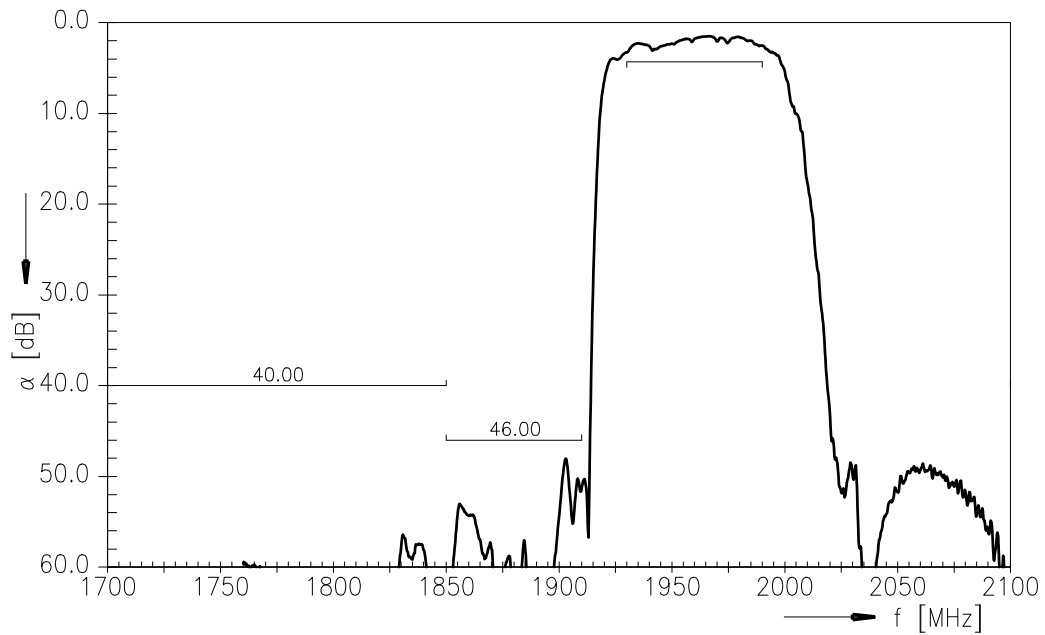
SAW RF Filter

1960.0 MHz

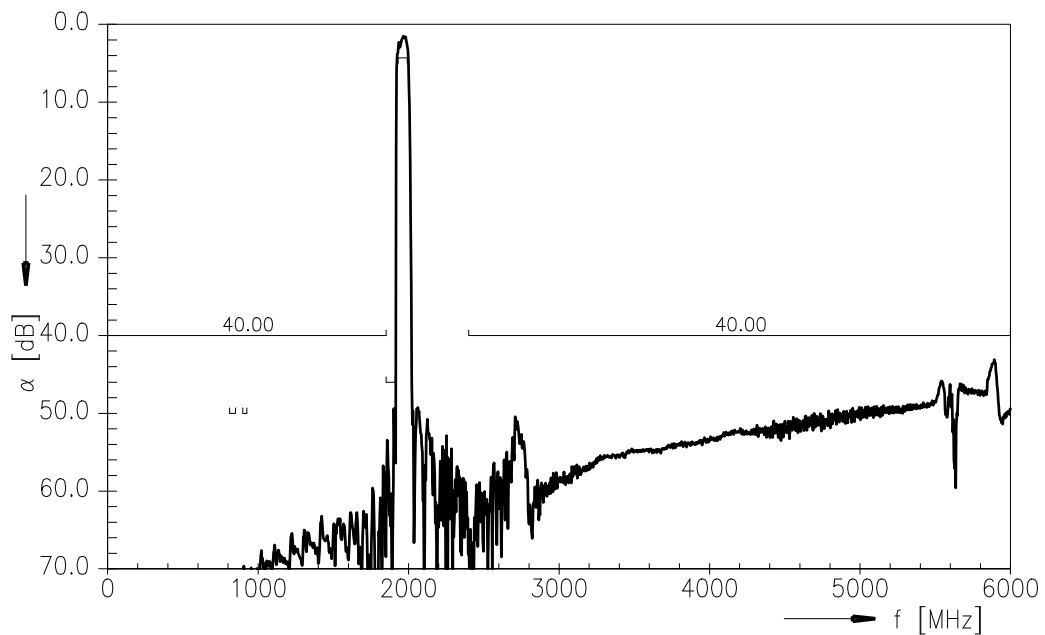
Data Sheet

SMD

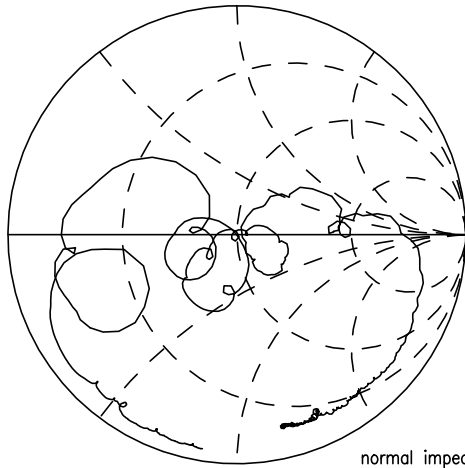
Transfer function



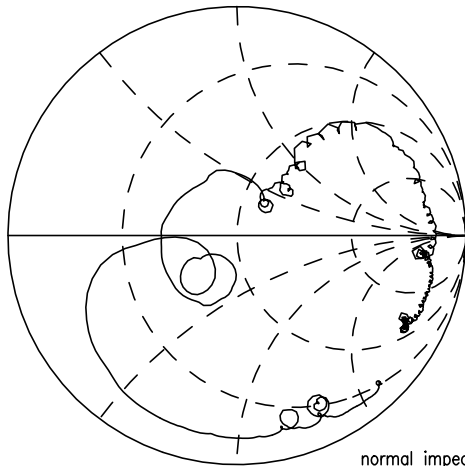
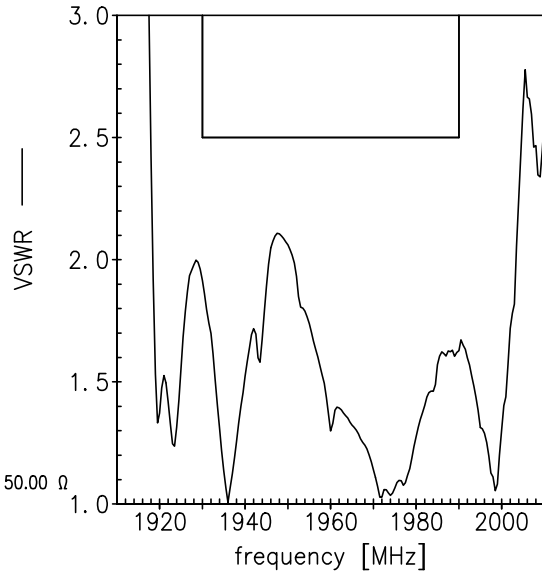
Transfer function (wideband)



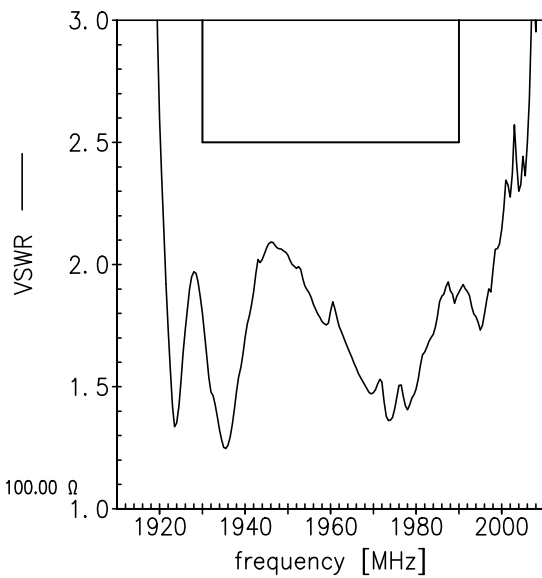
Please read *cautions and warnings* and *important notes* at the end of this document.



normal impedance: 50.00 Ω



normal impedance: 100.00 Ω





SAW Components	B9470
SAW RF Filter	1960.0 MHz
Data Sheet	SMD

References

Type	B9470
Ordering code	B39192B9470M410
Marking and package	C61157-A8-A3
Packaging	F61074-V8237-Z000
Date codes	L_1126
S-parameters	B9470_UN_NB.s3p, B9470_UN_WB.s3p See file header for port/pin assignment table.
Soldering profile	S_6001
RoHS compatible	defined as compatible with the following documents: CTIVE 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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office
Matching coils	See http://www.tdk.co.jp/tefe02/coil.htm#aname1 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
Surface Acoustic Wave Components Division
P.O. Box 80 17 09, 81617 Munich, GERMANY

© EPCOS AG 2010. This brochure replaces the previous edition.

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.

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



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.