SAW Components

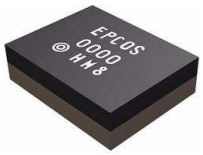
SAW Diversity Rx filter

WCDMA Band II

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

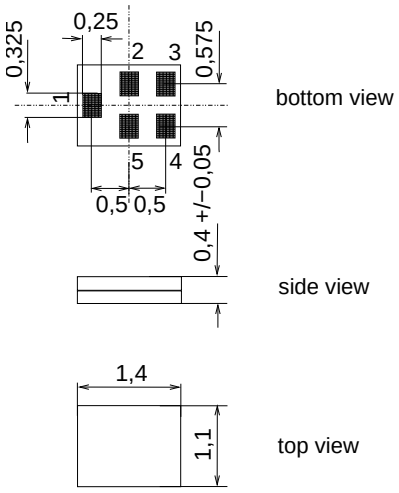
Application

- 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)



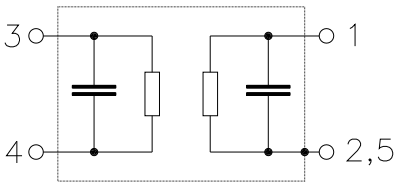
Features

- Package size 1.4 x 1.1 x 0.4 mm³
- RoHS compatible
- Approximate weight 0.003 g
- Package for **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
- 3,4 Output, balanced
- 2,5 To be grounded



Characteristics

Temperature range for specification: T = –30 ˚C to +85 ˚C
Terminating source impedance: Z_S = 50 Ω (unbalanced)
Terminating load impedance: Z_L = 100 Ω || 22 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)		Δα				
1930.0 ... 1990.0	MHz			1.9	2.7	dB
Error Vector Magnitude		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	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˚ to +85˚, 4.2 dB T = -20˚ 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

Maximum ratings

Storage temperature range	T_{stg}	–40/+85	°C	
DC voltage	V_{DC}	3	V	
ESD voltage	V_{ESD}	50[1)]	V	machine model, 10 pulses
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

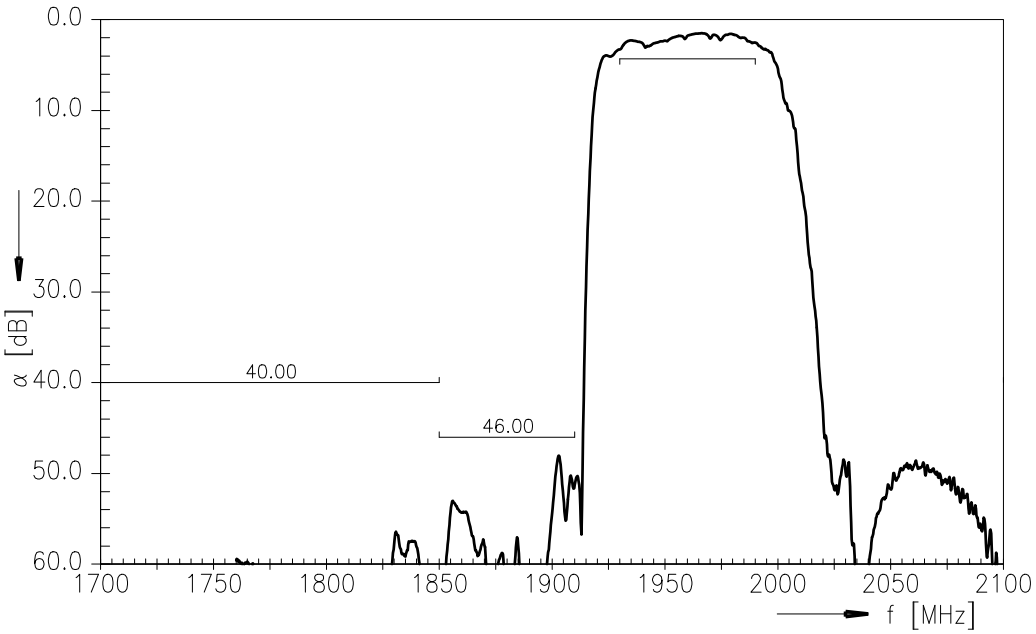
Attenuation of WCDMA signal (“Powertransferfunction”, α_{WCDMA}) is determined by

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

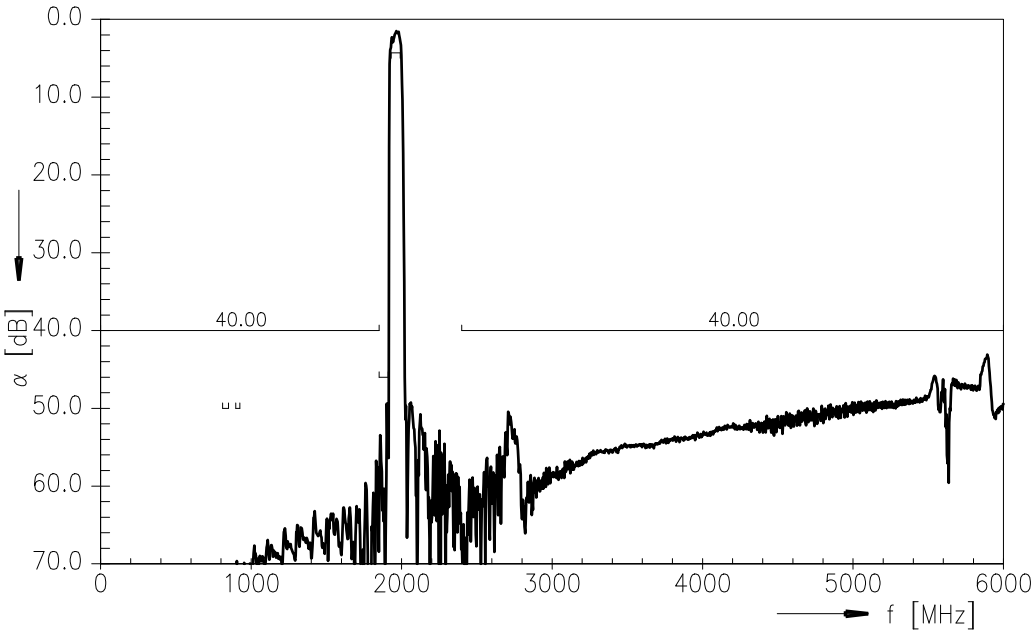
$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for UMTS-Passband, $f_{Carrier}$ ranges from 1932.4 MHz (lowest Rx channel) to 1987.6 MHz (highest Rx channel)). $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

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

Transfer function

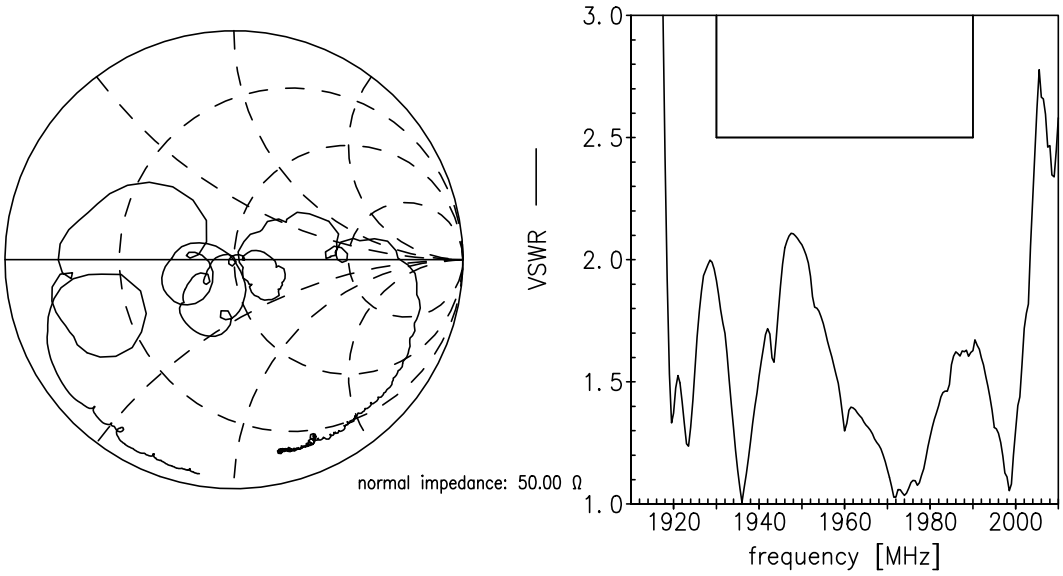


Transfer function (wideband)

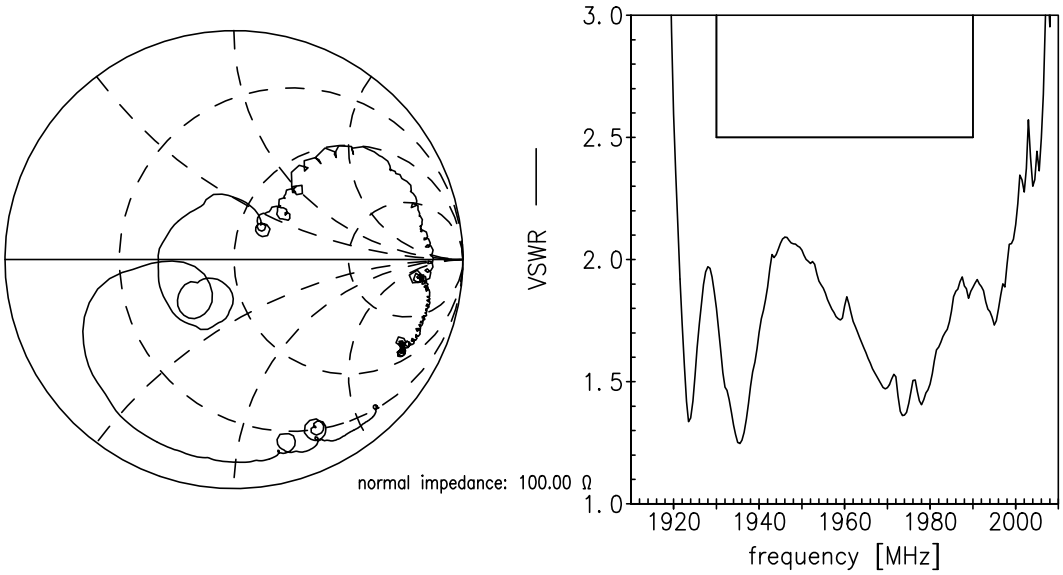


Smith chart

S_{11} function



S_{22} function



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 enviroment, 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 .

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