



## SAW Components

### SAW Diversity Rx filter

WCDMA Band II

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

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SAW RF Filter

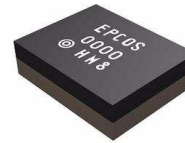
1960.0 MHz

Data Sheet

SMD

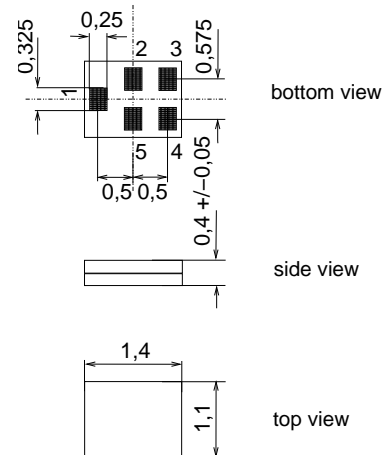
### Application

- 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 ( $50\Omega / 100\Omega$ )



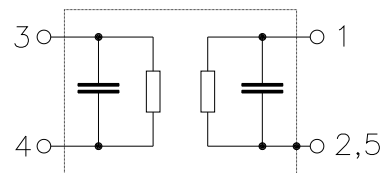
### Features

- Package size  $1.4 \times 1.1 \times 0.4 \text{ mm}^3$
- 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



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**Characteristics**

Temperature range for specification: T = -30 °C to +85 °C  
 Terminating source impedance: Z<sub>S</sub> = 50 Ω (unbalanced)  
 Terminating load impedance: Z<sub>L</sub> = 100 Ω || 22 nH (balanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>		1960.0		MHz
<b>Maximum insertion attenuation</b>					
	1930.0 ... 1990.0 MHz α		3.5	4.3 <sup>1)</sup>	dB
@f <sub>carrier</sub>	1932.4 ... 1987.6 MHz α <sub>WCDMA</sub> <sup>2)</sup>		3.1	4.0	dB
<b>Amplitude ripple (p-p)</b>	Δα				
	1930.0 ... 1990.0 MHz		1.9	2.7	dB
<b>Error Vector Magnitude</b>	EVM <sup>3)</sup>				
@f <sub>carrier</sub>	1932.4 ... 1987.6 MHz		3.0	4.5	
<b>CMRR</b> ( S <sub>21</sub> -S <sub>31</sub>   /  S <sub>21</sub> +S <sub>31</sub>  )					
	1930.0 ... 1990.0 MHz CMRR <sup>4)</sup>	21	24		dB
<b>Input VSWR</b>					
	1930.0 ... 1990.0 MHz		2.1	2.5	
<b>Output VSWR</b>					
	1930.0 ... 1990.0 MHz		2.1	2.5	
<b>Attenuation</b>	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 <sub>carrier</sub>	1852.4 ... 1907.6 MHz α <sub>WCDMA</sub> <sup>2)</sup>	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



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**Maximum ratings**

Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	3	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	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 <sub>IN</sub>	10	dBm	

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

**Annotation for characteristics section**

Attenuation of WCDMA signal (“Powertransferfunction”, α<sub>WCDMA</sub>) is determined by

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

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

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

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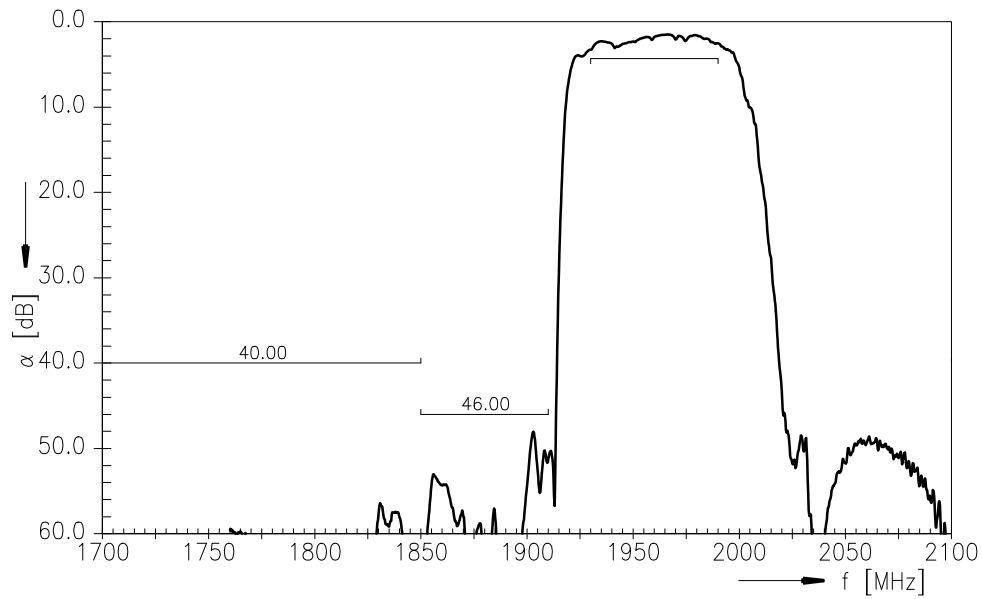
SAW RF Filter

1960.0 MHz

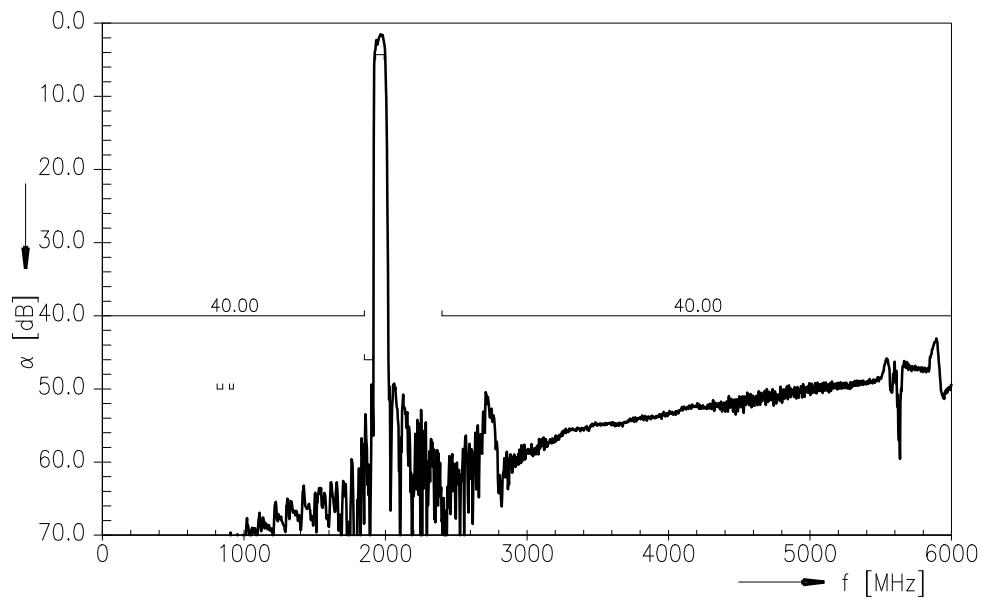
Data Sheet

SMD

Transfer function



Transfer function (wideband)



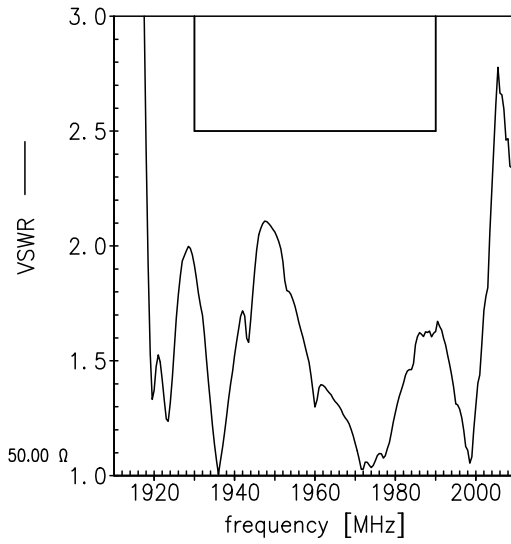
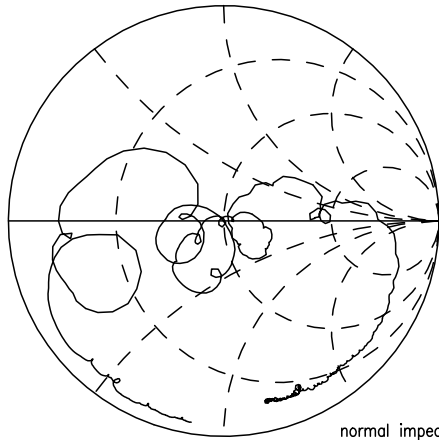
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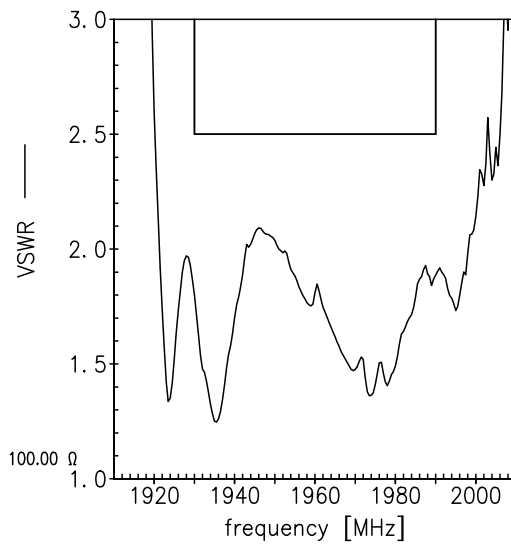
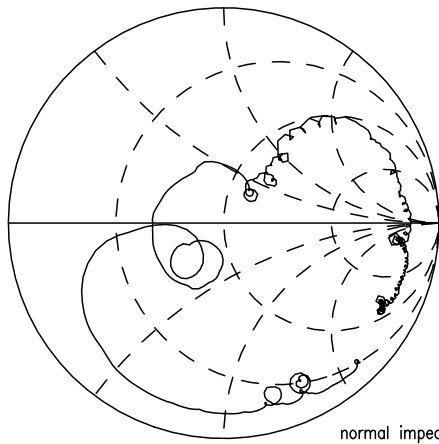
**SMD**

Smith chart

**S<sub>11</sub> function**



**S<sub>22</sub> function**



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**References**

<b>Type</b>	B9470
<b>Ordering code</b>	B39192B9470M410
<b>Marking and package</b>	C61157-A8-A3
<b>Packaging</b>	F61074-V8237-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B9470_UN_NB.s3p, B9470_UN_WB.s3p See file header for port/pin assignment table.
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	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."
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