



SAW Components

SAW RX filter

LTE / WCDMA band III

Series/type:	B9473
Ordering code:	B39182B9473P810
Date:	June 26, 2012
Version:	2.1



Data sheet



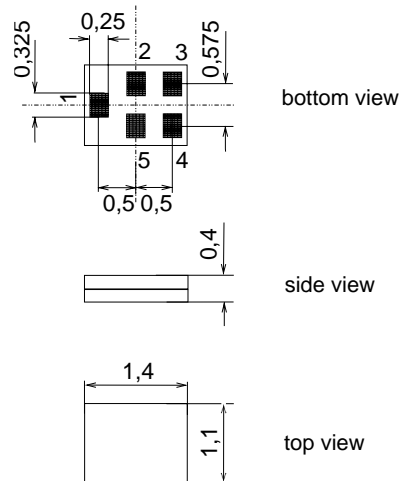
Application

- Low-loss RF filter for mobile telephone LTE and WCDMA Band III receive path (RX)
- Suitable for diversity applications
- High TX suppression
- Useable passband: 75 MHz
- Unbalanced to balanced operation
- Impedance transformation from 50 Ω to 100 Ω



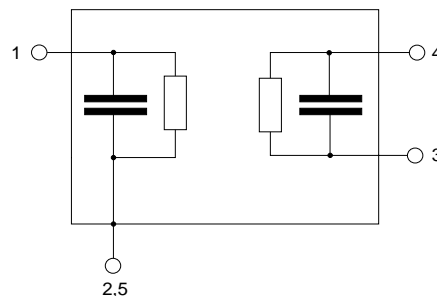
Features

- Package size 1.4 x 1.1 x 0.4 mm³
- RoHS compatible
- Approximate weight 0.002g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

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





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1842.5 MHz

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Characteristics band III performance

Temperature range for specification: T = -15 °C to +80 °C
 Terminating source impedance¹⁾: Z_S = 50 Ω || 8.2 nH (unbalanced)
 Terminating load impedance¹⁾: Z_L = 100 Ω || 11 nH + 2x2.2 pF (balanced)

		B9473			
		min.	typ. @ 25 °C	max.	
Center frequency	f _C	—	1842.5	—	MHz
Maximum insertion attenuation					
	1805.0 ... 1880.0 MHz ¹⁾	α _{CW}	2.3	3.0	dB
	1805.0 ... 1880.0 MHz ²⁾	α _{CW}	2.3	3.3	dB
@f _{Carrier Bd 3 RX}	1807.4 ... 1877.6 MHz	α _{WCDMA} ³⁾	2.1	2.6	dB
Amplitude ripple (p-p)					
	1805.0 ... 1880.0 MHz	Δα	1.0	1.9	dB
Error Vector Magnitude⁴⁾					
@f _{Carrier Bd 3 RX}	1807.4 ... 1877.6 MHz	EVM	2.5	4.0	%
Input VSWR					
	1805.0 ... 1880.0 MHz		1.5	1.9	
Output VSWR					
	1805.0 ... 1880.0 MHz		1.6	1.9	
CMRR (S₂₁-S₃₁ / S₂₁+S₃₁)					
	1805.0 ... 1880.0 MHz		23	26	dB
Attenuation		α			
	DC ... 115.0 MHz		40	120	dB
	115.0 ... 1615.0 MHz		30	50	dB
	1615.0 ... 1690.0 MHz		42	47	dB
	1690.0 ... 1710.0 MHz		30	52	dB
	1710.0 ... 1785.0 MHz		38	41	dB
@f _{Carrier Bd 3 TX}	1712.4 ... 1782.6 MHz	α _{WCDMA} ³⁾	38	42	dB
	1785.0 ... 1790.0 MHz		8	38	dB
	1920.0 ... 1965.0 MHz		15	37	dB
	1965.0 ... 3515.0 MHz		30	37	dB
	3515.0 ... 3665.0 MHz		40	52	dB
	3665.0 ... 6000.0 MHz		30	49	dB

1) Temperature range -5 °C to +80 °C
 2) Temperature range -30 °C to +95 °C
 3) Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (4).
 4) Error Vector Magnitude (EVM) for WCDMA signal based on definition given in 3GPP TS 25.141.

1) Please also refer to proposed matching topology on page (4).

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



Annotation for characteristics section

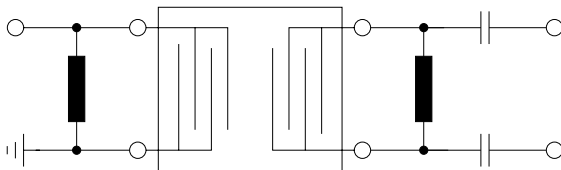
Attenuation of WCDMA signal (“Powertransferfunction”, α_{WCDMA}) is determined by

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

$f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for band III RX passband, $f_{Carrier}$ ranges from 1807.4 MHz (lowest RX channel) to 1877.6 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:

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

Matching topology proposal for improved VSWR in 50/100Ω environment



Input (ubal): $L_p=8.2nH$

Output (bal): $L_p=11nH, C_s=2.2pF$

Maximum ratings

Operable temperature range	T	-40/+85	°C	
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	50 ¹⁾	V	machine model, 10 pulses
		250 ²⁾	V	human body model, 1 pulse
		500 ³⁾	V	charged-device model, 3 pulses
Input power	P _{IN(TX)}	15	dBm	CW @55°C, 2000h, Bd III TX band
	P _{IN}	12	dBm	CW @55°C, 2000h, all other bands

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

2) acc. to JESD22-A114C (human body model), 1 negative & 1 positive pulse.

3) acc. to JESD22-C101 (charged-device model), 3 negative & 3 positive pulses.



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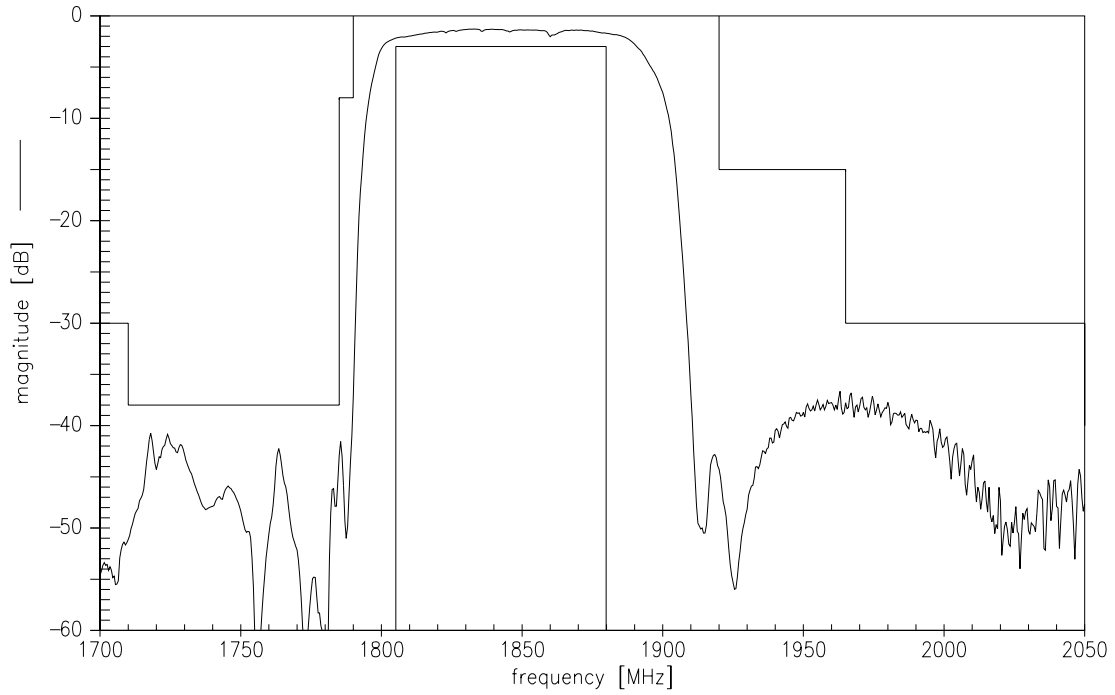
SAW RX filter

1842.5 MHz

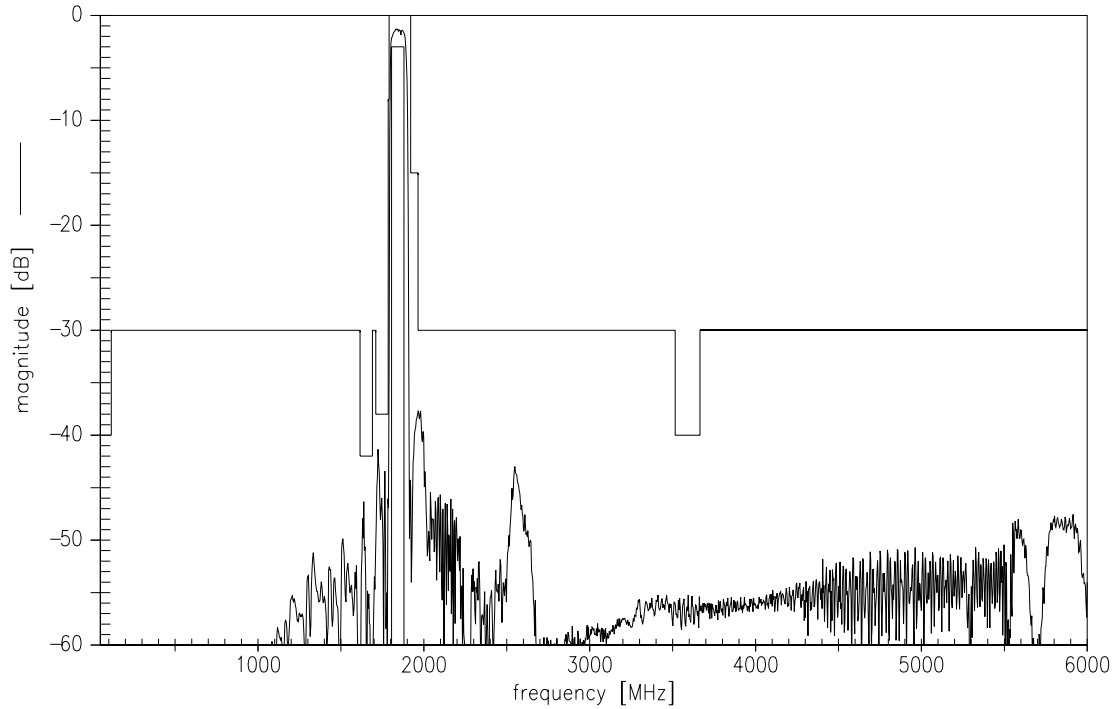
Data sheet



Transfer function



Transfer function (wideband)



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



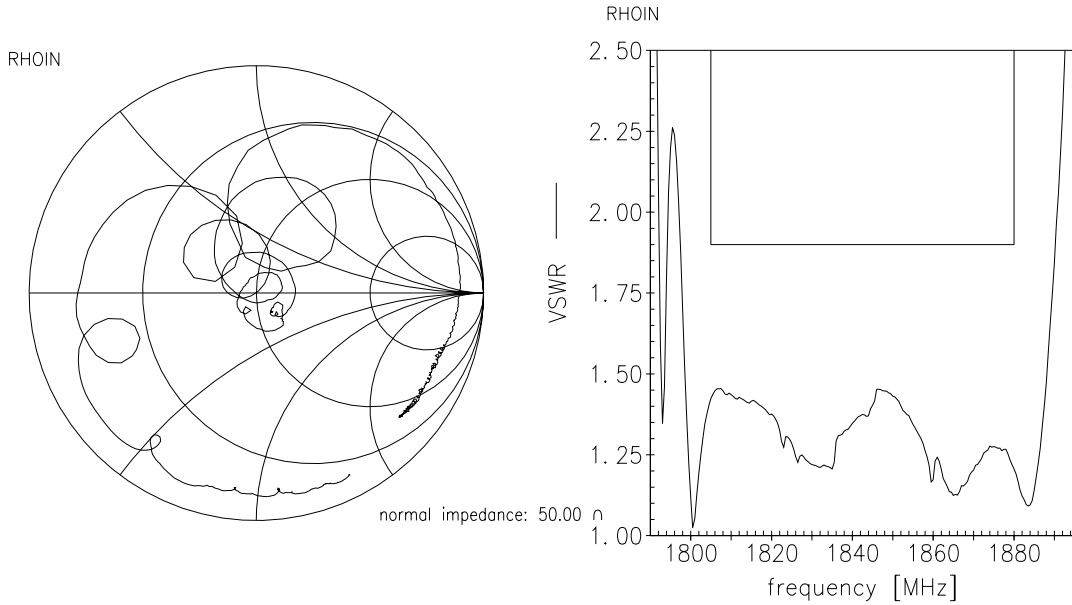
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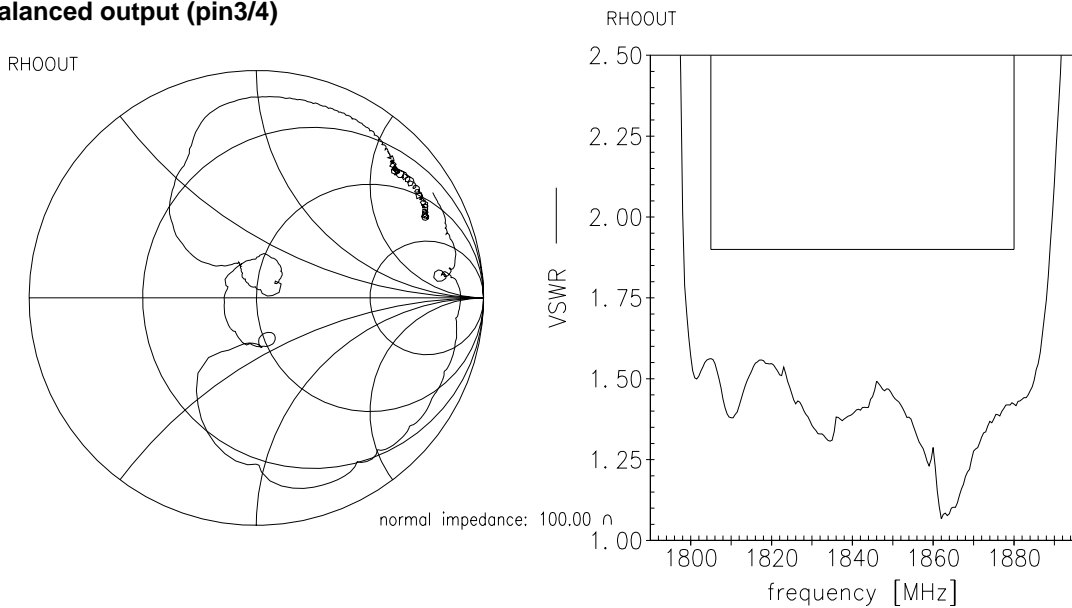
Smith charts

(matching topology acc. to page 4)

Unbalanced input (pin1)



Balanced output (pin3/4)



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Data sheet	

References

Type	B9473
Ordering code	B39182B9473P810
Marking and package	C61157-A8-A3
Packaging	F61074-V8237-Z000
Date codes	L_1126
S-parameters	B9473_NB.s2p B9473_WB.s2p 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."
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

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