



SAW Components

SAW RX filter

WCDMA band VIII / GSM 900

Series/type:	B9461
Ordering code:	B39941B9461P810
Date:	January 13, 2010
Version:	2.0



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SAW RX filter

942.5 MHz

Data sheet



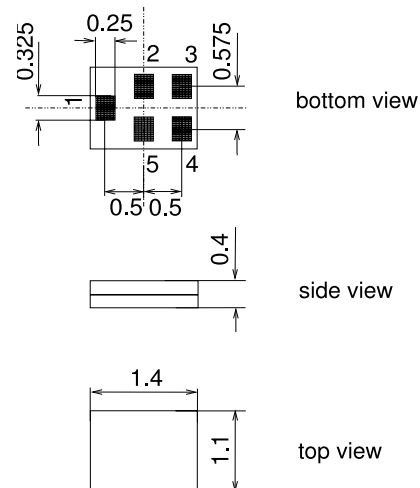
Application

- Low-loss RF filter for mobile telephone WCDMA Band VIII and GSM 900 systems, receive path (RX)
- Very high TX suppression - suitable for diversity applications
- Useable passband: 35 MHz
- Unbalanced to balanced operation
- Impedance transformation from 50 Ω to 100 Ω
- Suitable for GPRS class 1 to 12



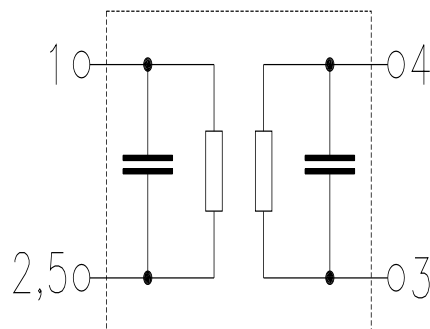
Features

- 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)**



Pin configuration

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





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Characteristics

Temperature range for specification: $T = -20\text{ °C to }+85\text{ °C}$
Terminating source impedance: $Z_S = 50\ \Omega$ (unbalanced)
Terminating load impedance: $Z_L = 100\ \Omega$ (balanced)

						B9461			
						min.	typ. @ 25 °C	max.	
Center frequency					f_C	—	942.5	—	MHz
Maximum insertion attenuation									
@ $f_{\text{Carrier Bd 8 RX}}$	927.4	...	957.6	MHz	$\alpha_{\text{WCDMA}}^{1)}$	—	2.6	3.0	dB
@ $f_{\text{Carrier Bd 8 RX}}$	925.7	...	959.3	MHz	$\alpha_{\text{LTE}}^{2)}$	—	2.7	3.6	dB
	925.0	...	960.0	MHz	α_{GSM}	—	2.8	4.0	dB
Amplitude ripple (p-p)									
	925.0	...	960.0	MHz	$\Delta\alpha$	—	1.5	2.7	dB
Error Vector Magnitude ³⁾									
@ $f_{\text{Carrier Bd 8 RX}}$	927.4	...	957.6	MHz	EVM	—	3.2	6.0	%
Input VSWR									
	925.0	...	960.0	MHz		—	2.0	2.2	
Output VSWR									
	925.0	...	960.0	MHz		—	2.1	2.3	
CMRR ($ S_{21}-S_{31} / S_{21}+S_{31} $)									
	925.0	...	960.0	MHz		21	23 ⁴⁾	—	dB
Attenuation									
	DC	...	880.0	MHz	α	40	59	—	dB
@ $f_{\text{Carrier Bd 8 TX}}$	882.4	...	912.6	MHz	$\alpha_{\text{WCDMA}}^{1)}$	50	55	—	dB
@ $f_{\text{Carrier Bd 8 TX}}$	880.7	...	914.3	MHz	$\alpha_{\text{LTE}}^{2)}$	41	52	—	dB
	880.0	...	915.0	MHz	α_{GSM}	35	51	—	dB
	980.0	...	1045.0	MHz		24	29	—	dB
	1045.0	...	1700.0	MHz		35	51	—	dB
	1700.0	...	2600.0	MHz		40	60	—	dB
	2600.0	...	2682.0	MHz		45	60	—	dB
	2682.0	...	4345.0	MHz		40	53	—	dB
	4345.0	...	4470.0	MHz		45	60	—	dB
	4470.0	...	6000.0	MHz		45	57	—	dB

¹⁾ Attenuation of WCDMA signal ("Powertransferfunction"). Please refer to annotation on page 7).

²⁾ Attenuation of LTE signal ("Powertransferfunction"). Please refer to annotation on page (7).

³⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141.

⁴⁾ A CMRR of 22.8 dB corresponds to a phase balance of 5° together an amplitude balance of 1.0 dB



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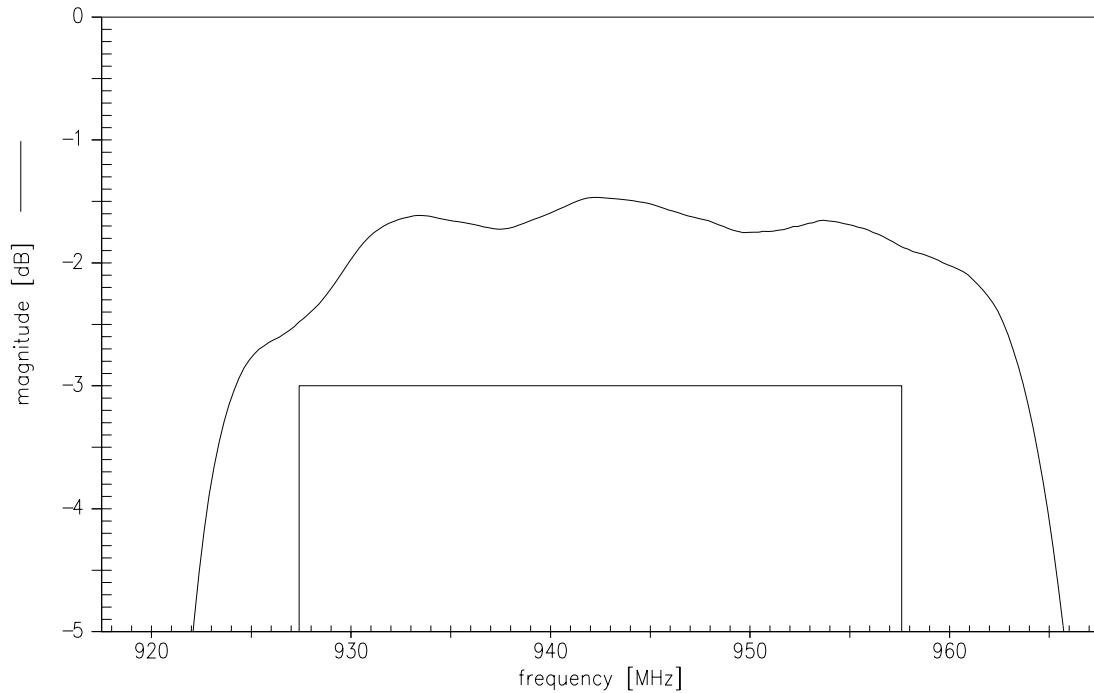
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942.5 MHz

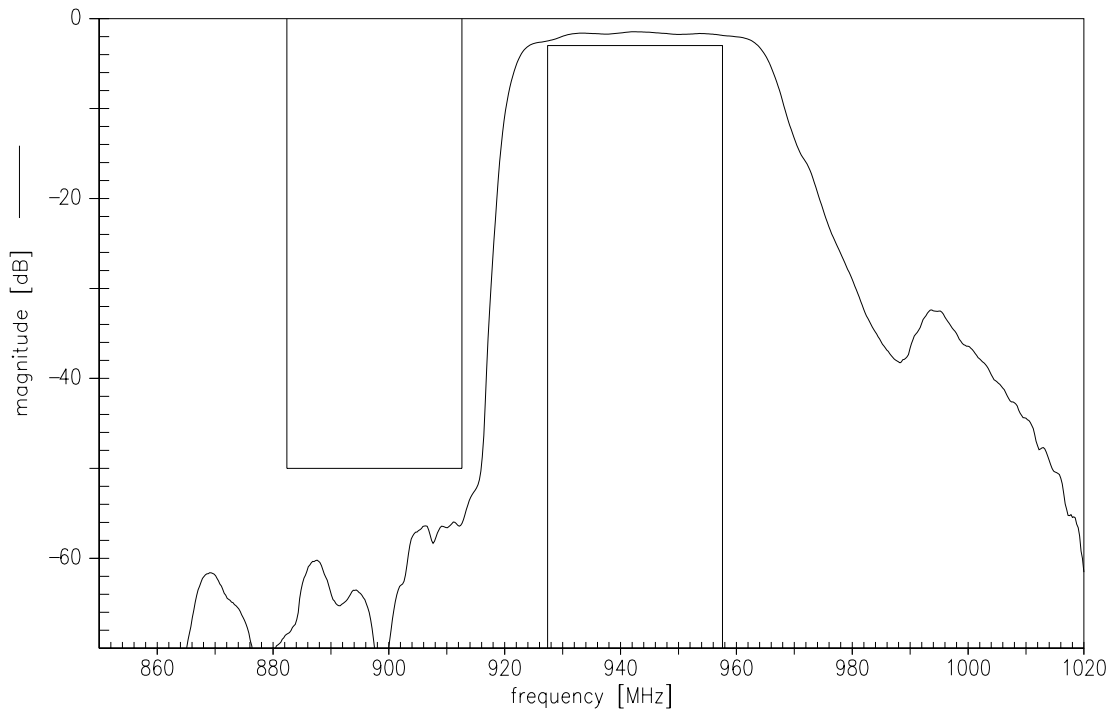
Data sheet



Transfer function for WCDMA signals (Powertransferfunction vs. carrier frequency)



Transfer function for WCDMA signals (Powertransferfunction vs. carrier frequency)



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



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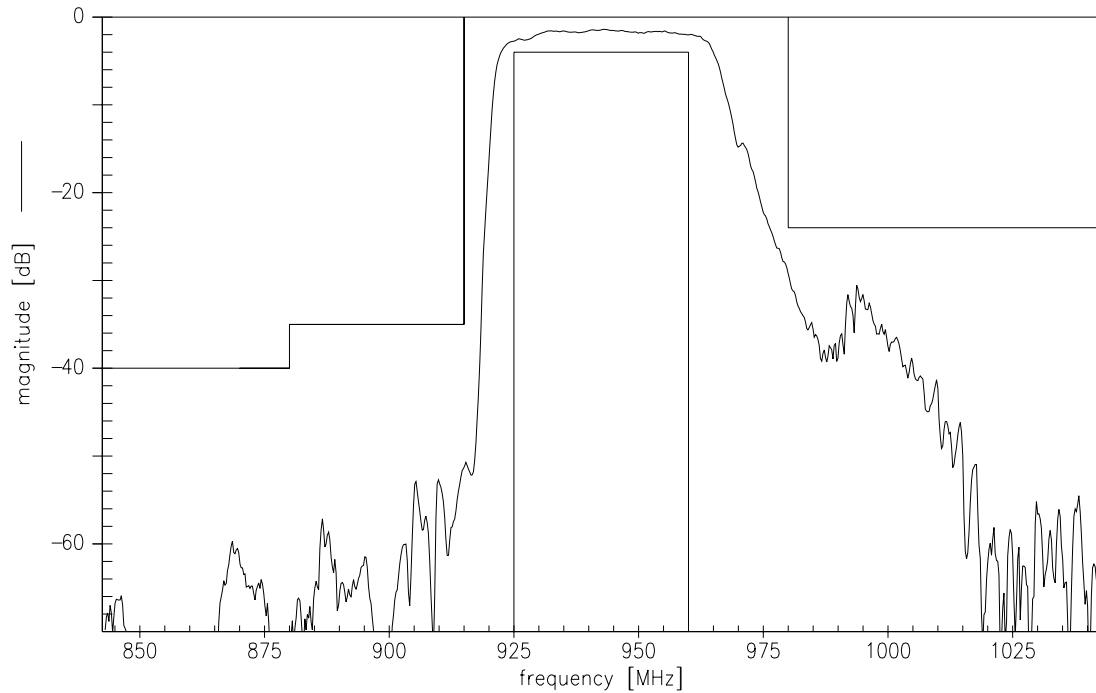
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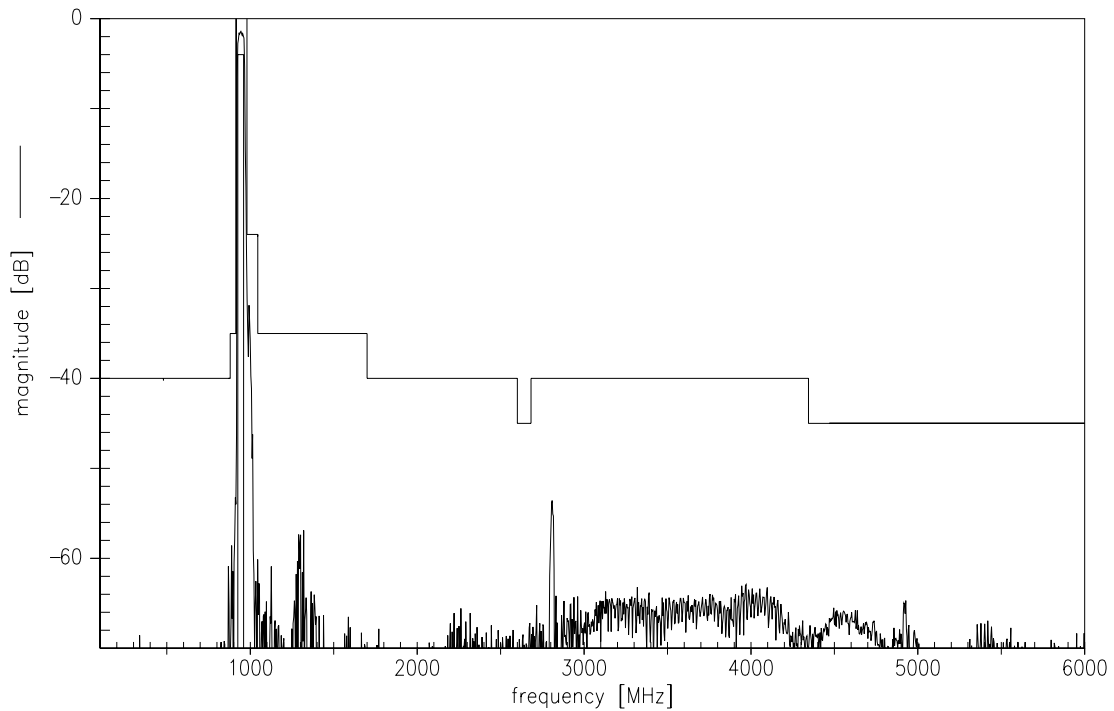
Data sheet



Transfer function for CW signals



Transfer function for CW signals (wideband)



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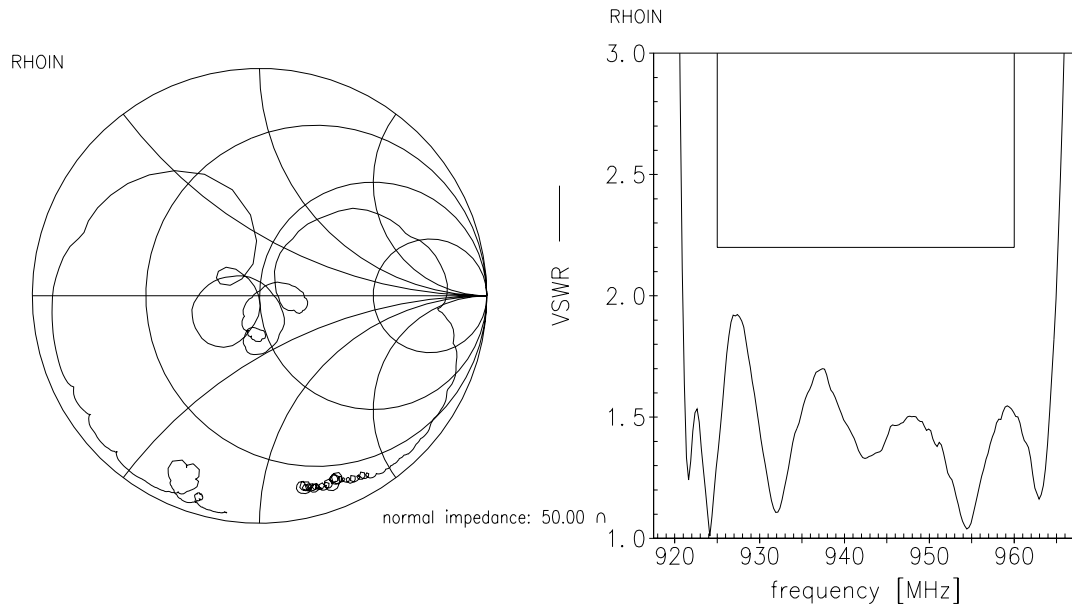
942.5 MHz

Data sheet

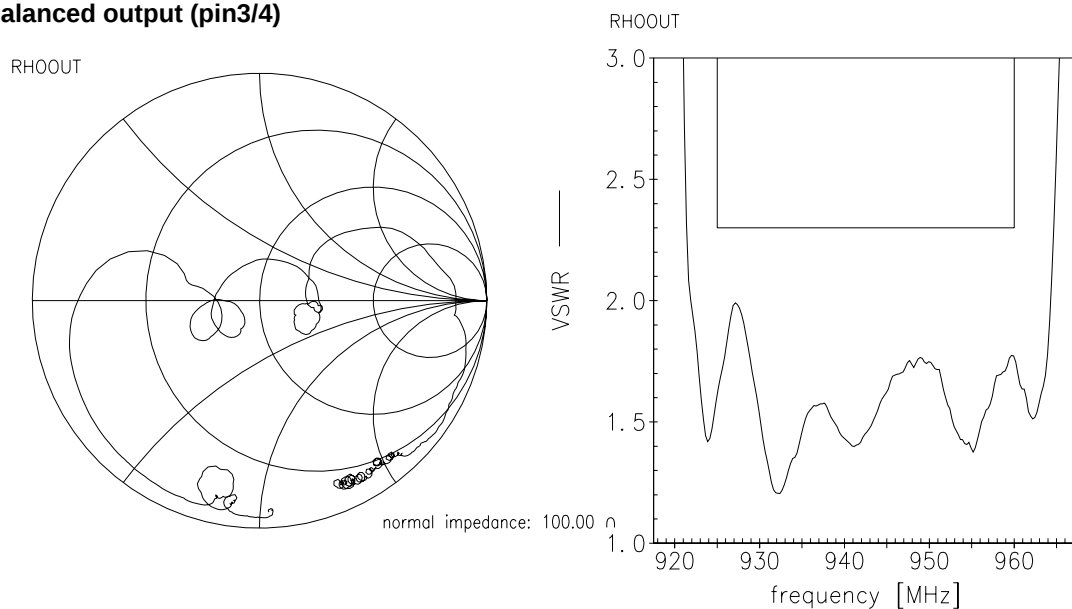


Smith charts

Unbalanced input (pin1)



Balanced output (pin3/4)





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Annotation for characteristics section

Attenuation of WCDMA and LTE signal ("Powertransferfunction", α_{WCDMA} , α_{LTE}) are determined by

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

$H_{\text{RRC}}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

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

f_{Carrier} of WCDMA signal according to 3GPP TS 25.101 (e.g. for band VIII RX passband, f_{Carrier} ranges from 927.4 MHz (f_{C} of lowest Rx channel) to 957.6 MHz (f_{C} of highest Rx channel)).

f_{Carrier} of LTE signal according to 3GPP TS 36.101 with a channel band width of 1.08 MHz (equals 6 Resource Blocks) and a guard band of 0.16 MHz (e.g. for band VIII RX passband, f_{Carrier} ranges from 925.7 MHz (f_{C} of lowest Rx channel) to 959.3 MHz (f_{C} of highest Rx channel)).

Maximum ratings

Operable temperature range	T	-40/+85	°C	machine model, 10 pulses 10000h @ 55°C
Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5	V	
ESD voltage	V _{ESD}	100 ¹⁾	V	
Input power	P _{IN}	17	dBm	

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

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**References**

Type	B9461
Ordering code	B39941B9461P810
Marking and package	C61157-A8-A3
Packaging	F61074-V8237-Z000
Date codes	L_1126
S-parameters	B9461_NB.s3p B9461_WB.s3p 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."

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

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8 January 13, 2010



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