



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



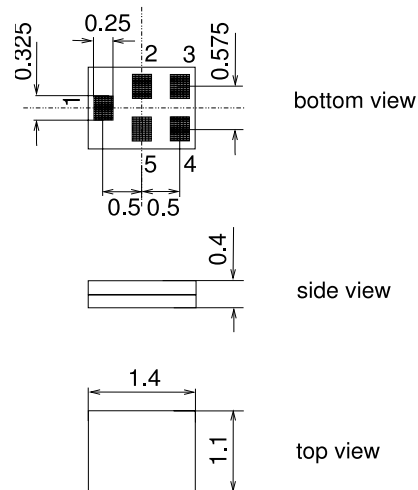
Application

- 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



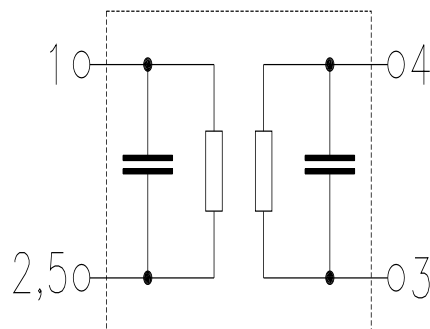
Features

- 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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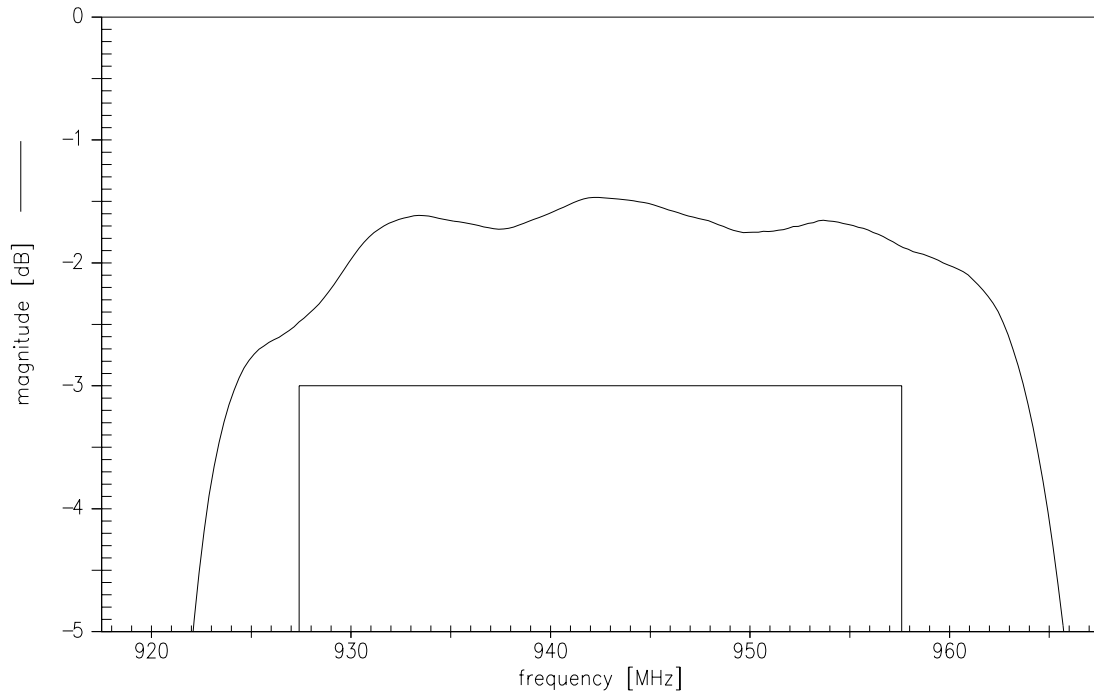
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942.5 MHz

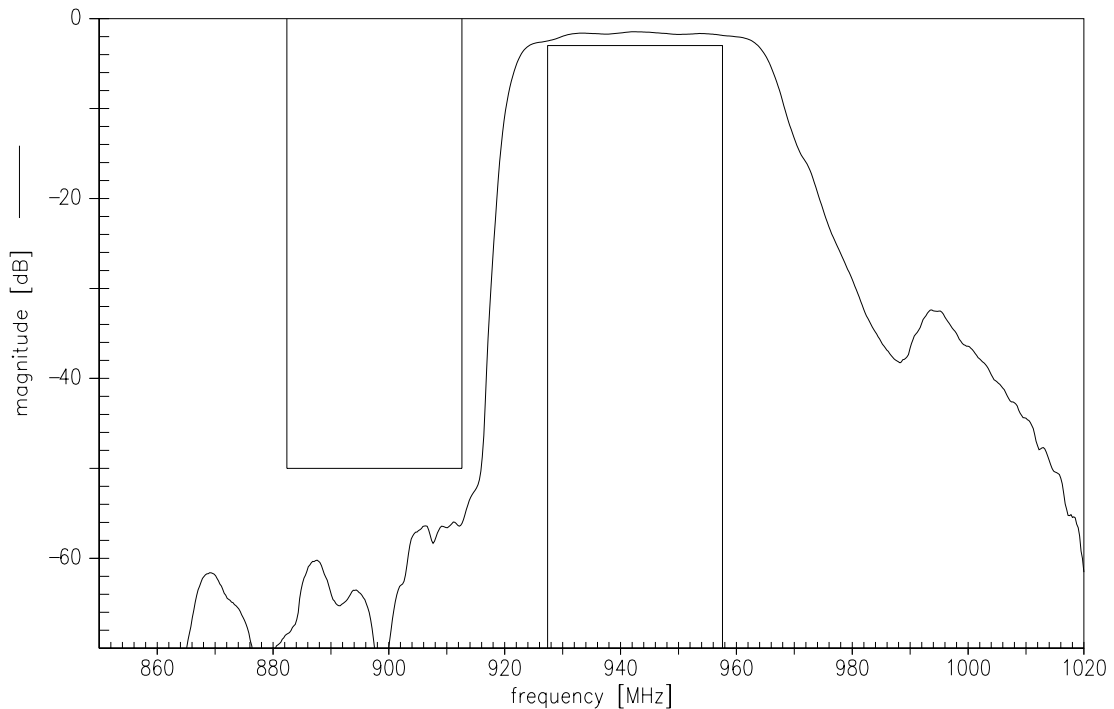
Data sheet



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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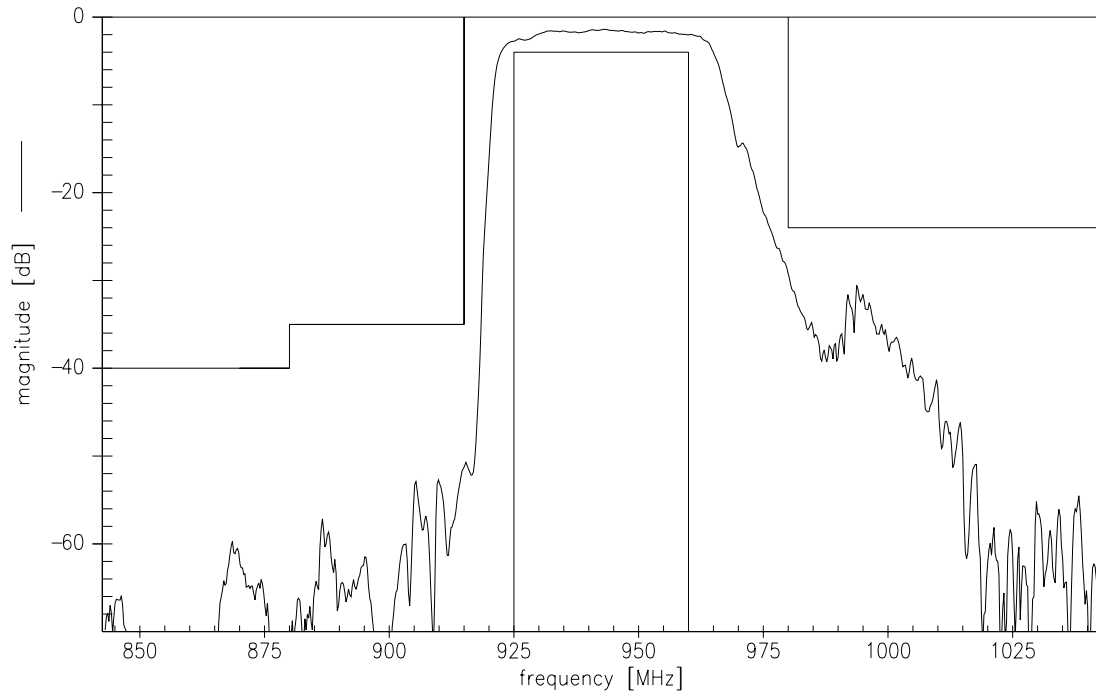
SAW RX filter

942.5 MHz

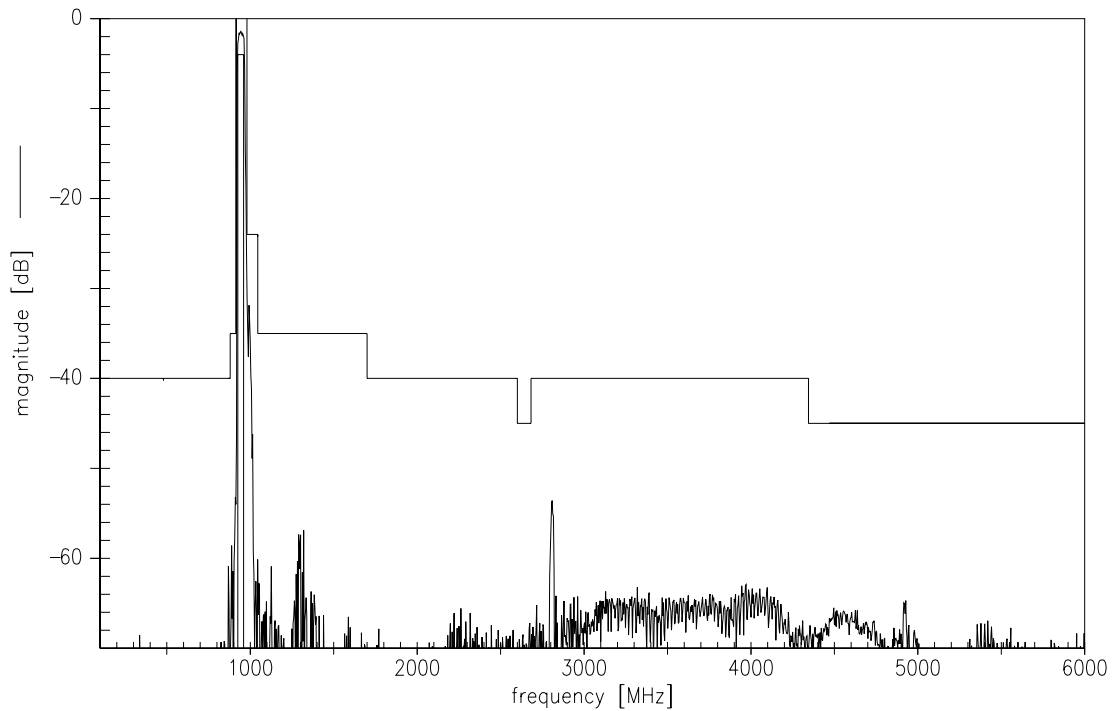
Data sheet



Transfer function for CW signals



Transfer function for CW signals (wideband)



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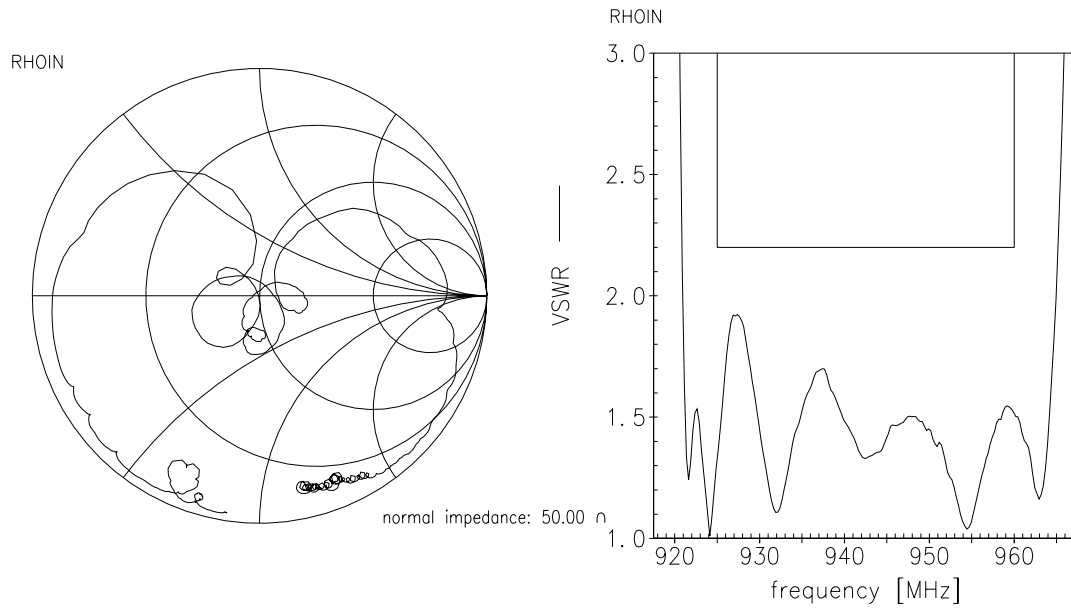
942.5 MHz

Data sheet

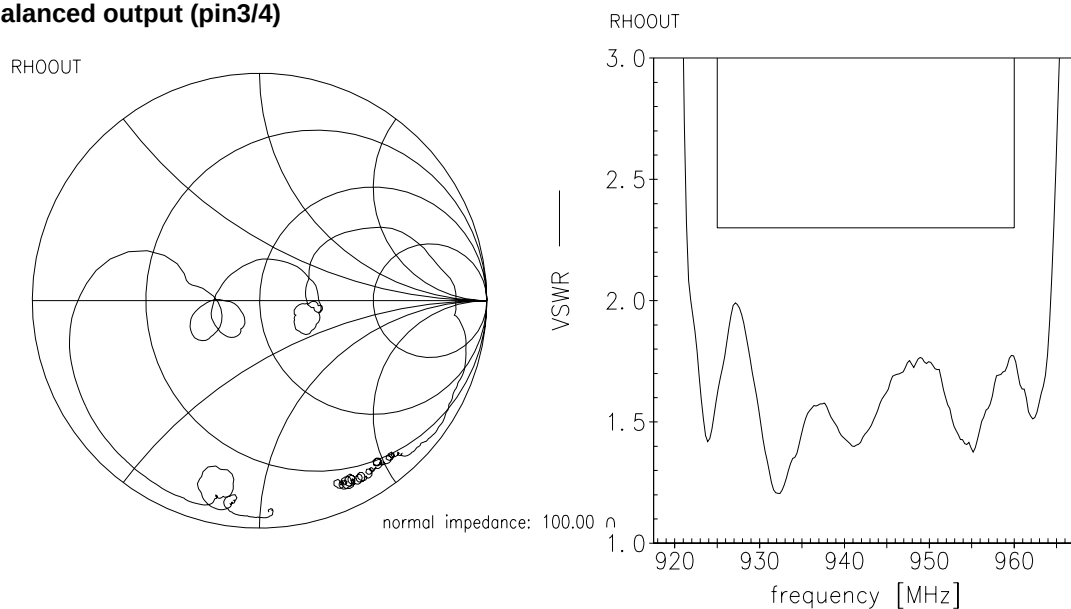


Smith charts

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."

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Surface Acoustic Wave Components Division

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

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