

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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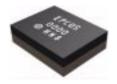
SAW RX filter 942.5 MHz

Data sheet



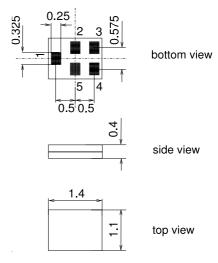
Application

- Low-loss RF filter for mobile telephone WCDMA Band VIII and GSM 900 systems, receive path (RX)
- Very high TX supression 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



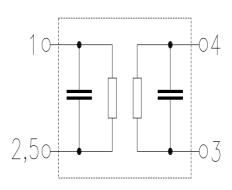
Features

- Package size 1.4 x1.1 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

T = -20 °C to +85 °C Temperature range for specification: Terminating source impedance: $Z_S = 50 \Omega$ (unbalanced) Terminating load impedance: $Z_1 = 100 \Omega$ (balanced)

-							B9461		
						min.	typ.	max.	
							@ 25 °C		
Center freque	ency				f _C		942.5	_	MHz
Maximum ins	ertion a	tten	uation						
@f _{Carrier Bd 8 RX}	927.4		957.6	MHz	$\alpha_{\text{WCDMA}}^{1)}$	_	2.6	3.0	dB
@f _{Carrier Bd 8 RX}	925.7		959.3	MHz	$\alpha_{LTE}^{2)}$		2.7	3.6	dB
	925.0		960.0	MHz	α_{GSM}	_	2.8	4.0	dB
Amplitude rip	Amplitude ripple (p-p)								
	925.0		960.0	MHz	Δα	_	1.5	2.7	dB
Error Vector	Magnitu	de³)							
@f _{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 VSWF	Output VSWR								
	925.0		960.0	MHz		_	2.1	2.3	
CMRR $(S_{21}-S_{31} / S_{21}+S_{31})$									
	925.0	-		MHz		21	234)	_	dB
Attenuation					α				
	DC		880.0	MHz		40	59	_	dB
@f _{Carrier Bd 8 TX}	882.4		912.6	MHz	$\alpha_{\text{WCDMA}}^{1)}$	50	55	_	dB
@f _{Carrier Bd 8 TX}	880.7		914.3	MHz	$\alpha_{LTE}^{2)}$	41	52	_	dB
	0.088		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° togeher an amplitude balance of 1.0

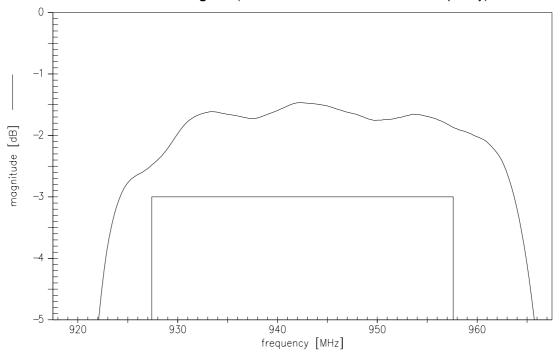


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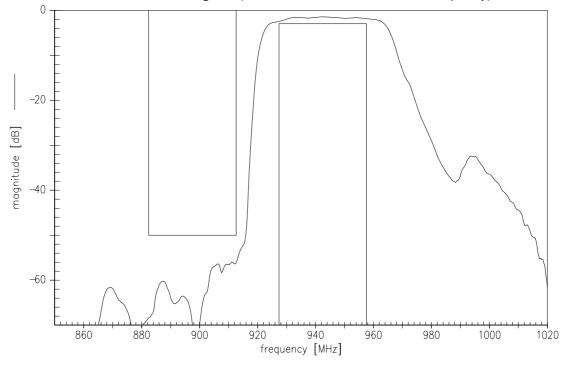
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Transfer function for WCDMA signals (Powertransferfunction vs. carrier frequency)



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

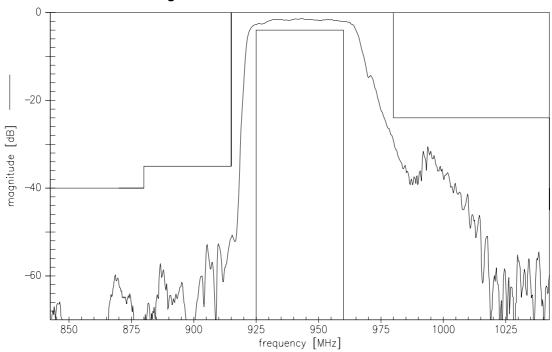




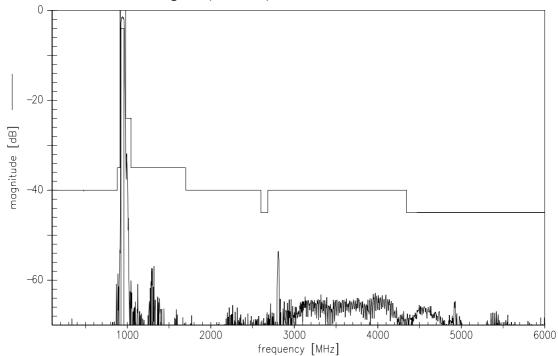
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Transfer function for CW signals



Transfer function for CW signals (wideband)





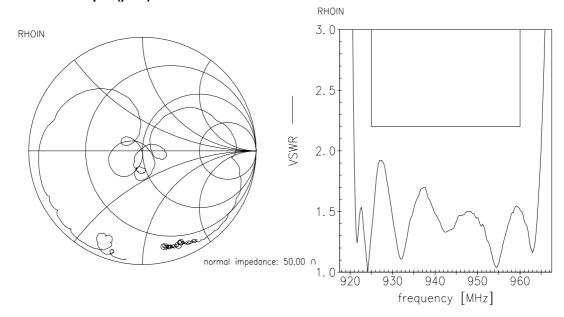
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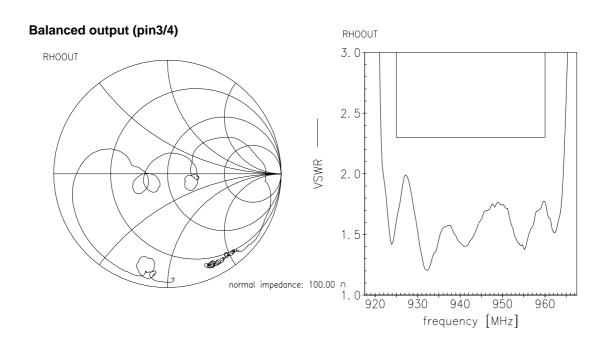
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Smith charts

Unbalanced input (pin1)







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Annotation for characteristics section

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

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

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:

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

 $f_{Carrier}$ 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	Т	-40/+85	°C	
Storage temperature range	T_{stg}	-40/+85	°C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100 ¹⁾	V	machine model, 10 pulses
Input power	P_{IN}	17	dBm	10000h @ 55°C

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



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References

Туре	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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