



# SAW Components

## SAW TX Filter

PCS / WCDMA Band II

<b>Series/type:</b>	<b>B9459</b>
<b>Ordering code:</b>	<b>B39192B9459P810</b>
<b>Date:</b>	<b>November 13, 2009</b>
<b>Version:</b>	<b>2.0</b>

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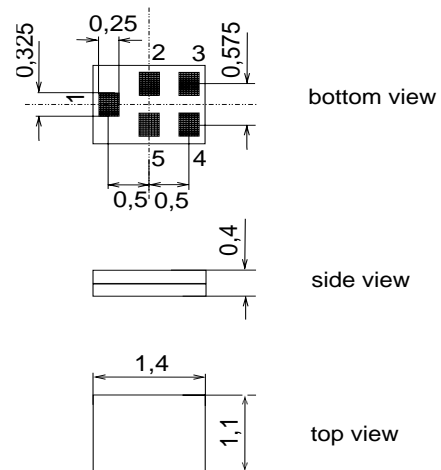
Data sheet


**Application**

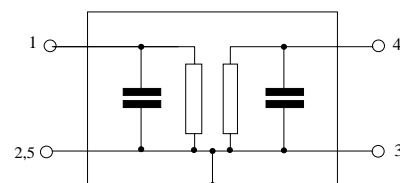
- Low-loss RF filter for mobile telephone PCS and WCDMA systems, transmit path (TX)
- High selectivity
- Usable passband 60 MHz
- Impedance at input and output 50 Ω
- Unbalanced to unbalanced operation


**Features**

- Package size 1.4 x 1.1 x 0.4 mm<sup>3</sup>
- Package code QCS5U
- 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
- 4 Output unbalanced
- 2,3,5 To be grounded



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**B9459**
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**1880.0 MHz**

Data sheet


**Characteristics**

Temperature range for specification:  $T = -30\text{ °C to }+85\text{ °C}$   
 Terminating source impedance:  $Z_S = 50\ \Omega$   
 Terminating load impedance:  $Z_L = 50\ \Omega$

		B9459			
		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	1880.0	—	MHz
<b>Maximum insertion attenuation</b>					
	1850.625...1909.375 MHz $\alpha_{\max}$	—	2.6	3.8 <sup>1)</sup>	dB
@ $f_{\text{Carrier}}$	1852.4 ...1907.6 MHz $\alpha_{\text{WCDMA}}^{2)}$	—	2.5	3.5	dB
<b>Amplitude ripple (p-p)</b>					
	1850.625...1909.375 MHz $\Delta\alpha$	—	1.3	2.9	dB
<b>Error Vector Magnitude<sup>3)</sup></b>					
@ $f_{\text{Carrier}}$	1852.4 ...1907.6 MHz EVM	—	1.5	4.5	%
<b>Input VSWR</b>	1850.625...1909.375 MHz	—	1.9	2.2	
<b>Output VSWR</b>	1850.625...1909.375 MHz	—	1.9	2.2	
<b>Attenuation</b>	$\alpha$				
	0.0 ...1550.0 MHz	32	36	—	dB
	1550.0 ...1580.0 MHz	35	37	—	dB
	1580.0 ...1770.0 MHz	30	35	—	dB
	1770.0 ...1830.0 MHz	14	18	—	dB
	1930.625...1990.0 MHz	33 <sup>4)</sup>	36	—	dB
@ $f_{\text{Carrier}}$	1932.4 ...1987.6 MHz $\alpha_{\text{WCDMA}}^{2)}$	34	37	—	dB
	1990.0 ...2032.0 MHz	35	38	—	dB
	2032.0 ...2500.0 MHz	35	38	—	dB
	2500.0 ...3700.0 MHz	30	35	—	dB
	3700.0 ...3820.0 MHz	35	47	—	dB
	3820.0 ...6000.0 MHz	25	35	—	dB

1) Valid in temperature range -20°C to +75°C. Specified for +85°C: 4.2dB

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) Valid in temperature range -20°C to +85°C. Specified for -30°C: 30dB


**Annotation for characteristics section**

Attenuation of WCDMA signal ("Powertransferfunction",  $\alpha_{\text{WCDMA}}$ ) is determined by

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

$f_{\text{Carrier}}$  according to 3GPP TS 25.101 (e.g. for Passband,  $f_{\text{Carrier}}$  ranges from 1852.4 MHz (lowest Tx channel) to 1907.6 MHz (highest Tx channel)).  $H_{\text{RRC}}(f)$  is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

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

**Maximum ratings**

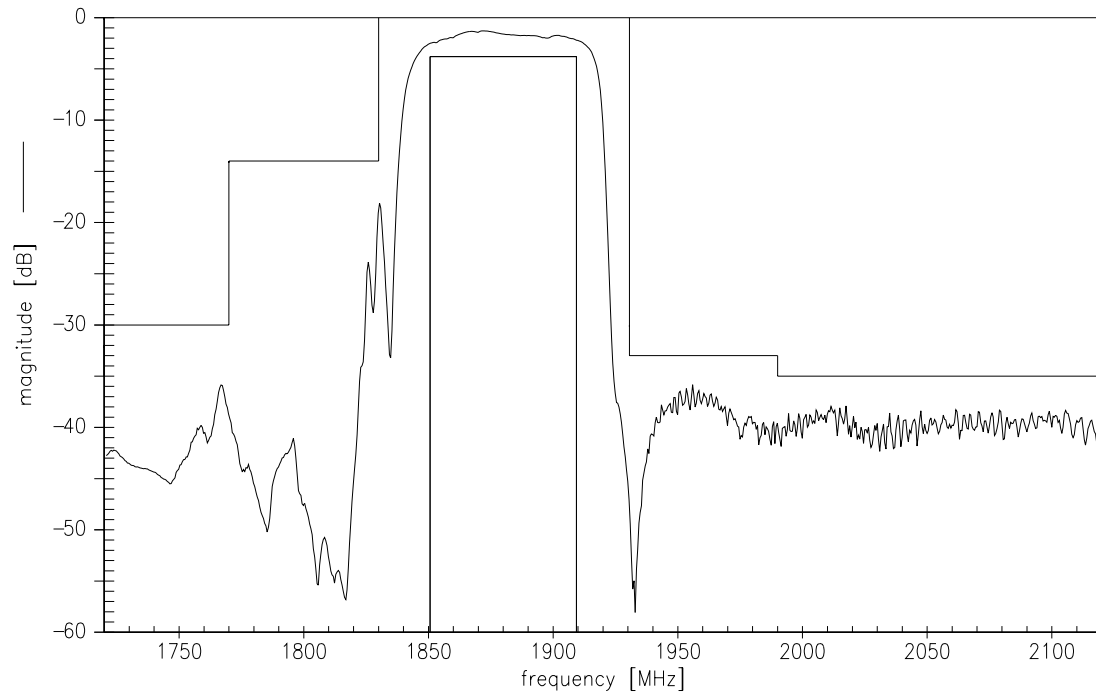
Operable temperature range	T	-40/+85	°C	
Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	50 <sup>1)</sup>	V	machine model, 10 pulses
Input power	P <sub>IN</sub>	15	dBm	WCDMA-Signal

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

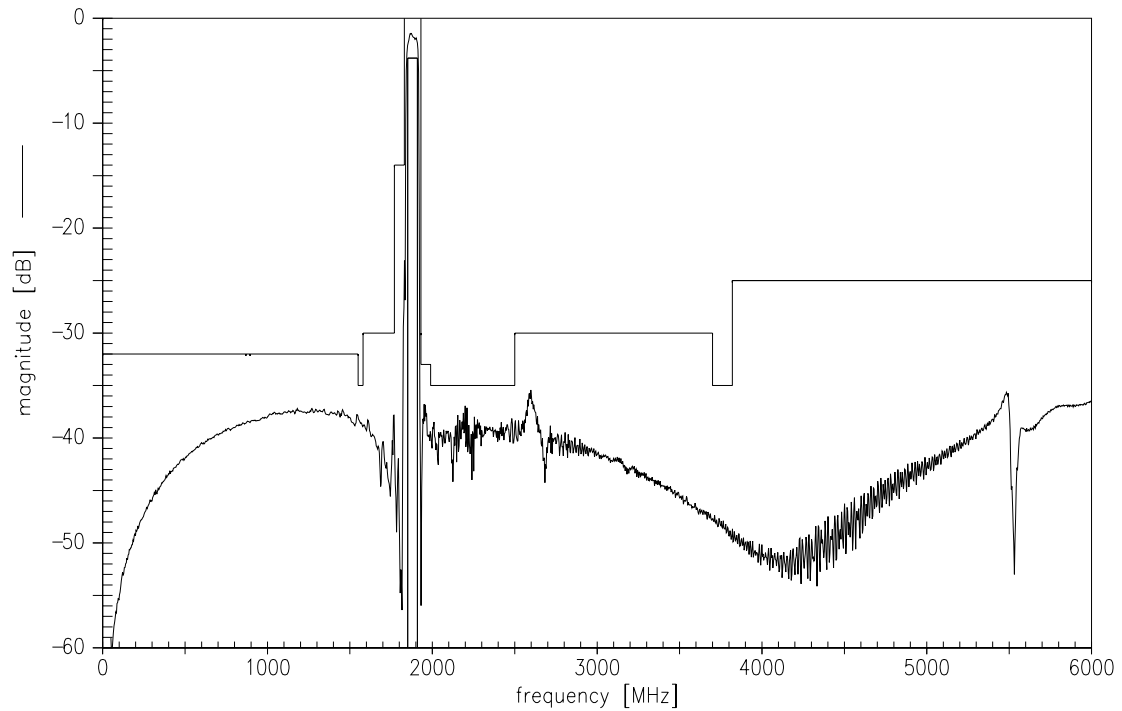
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Transfer function for CW signals



Transfer function (wideband)



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

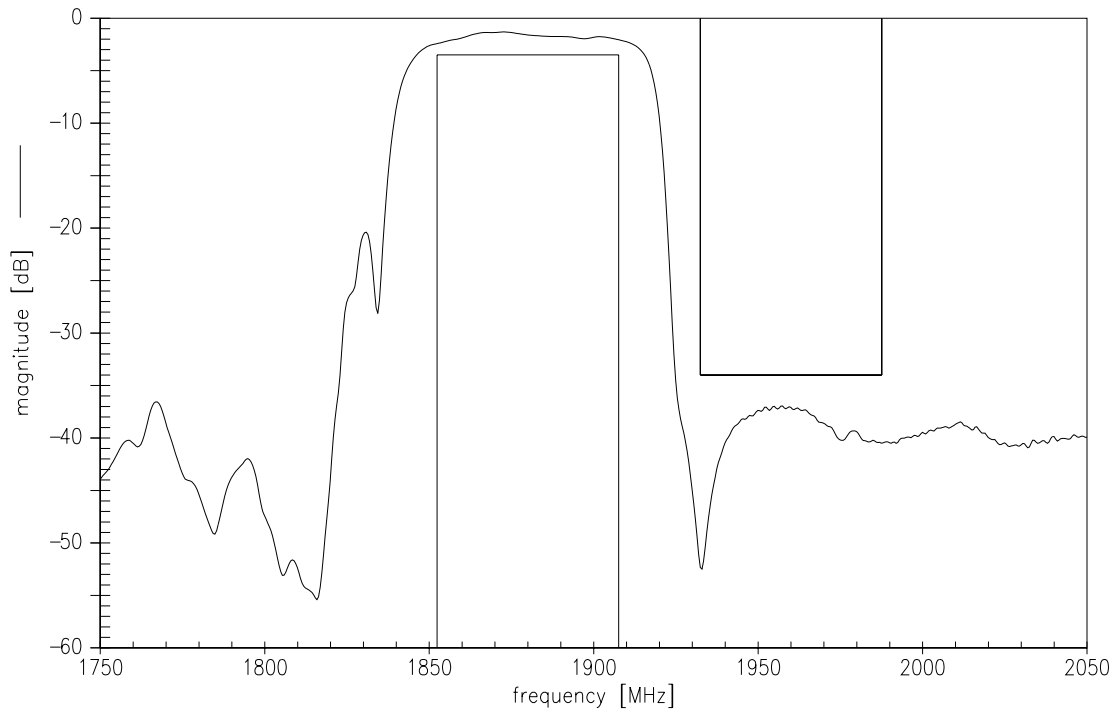
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Transfer function for WCDMA signals (Powertransferfunction vs. carrier frequency)



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



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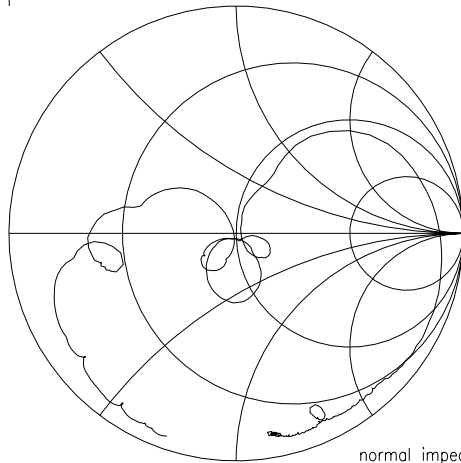
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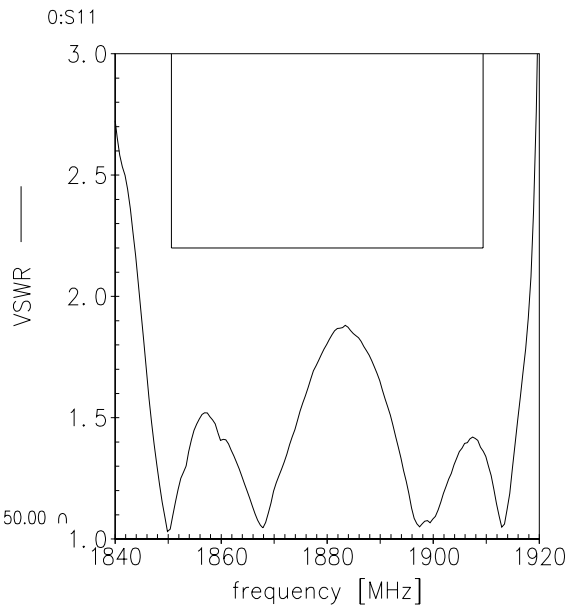
Smith charts

**Unbalanced input (pin1)**

S11

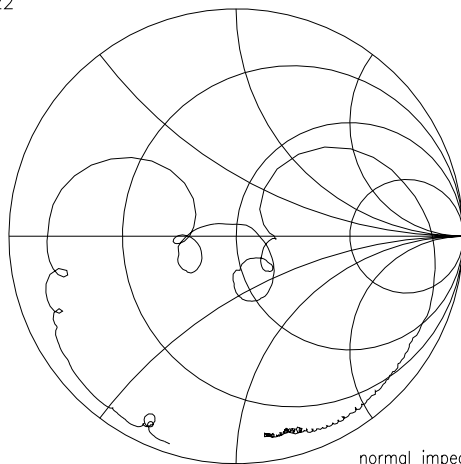


normal impedance: 50.00  $\Omega$

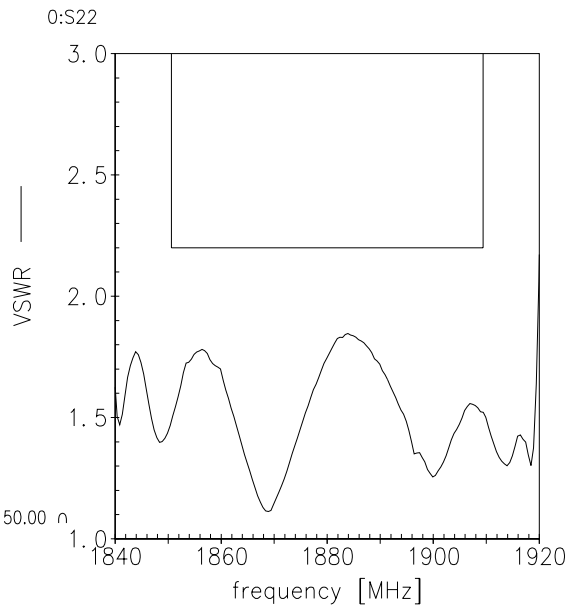


**Unbalanced output (pin4)**

S22



normal impedance: 50.00  $\Omega$



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**1880.0 MHz**

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**References**

<b>Type</b>	B9459
<b>Ordering code</b>	B39192B9459P810
<b>Marking and package</b>	C61157-A8-A14
<b>Packaging</b>	F61074-V8237-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B9459_NB.s2p B9459_WB.s2p 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: "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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