



## **SAW Components**

### **SAW Tx 2in1 Filter**

WCDMA band I / WCDMA band V

<b>Series/type:</b>	<b>B9315</b>
<b>Ordering code:</b>	<b>B39202B9315N410</b>
<b>Date:</b>	<b>June 16, 2006</b>
<b>Version:</b>	<b>2.0</b>

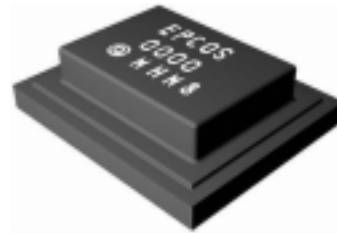


Data sheet



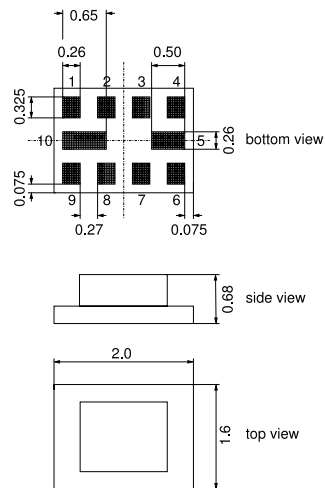
Application

- Low-loss RF dual band filter for mobile telephone WCDMA band I and band V systems, transmit path (TX)
- Usable passband:  
Filter 1 (Band V): 25 MHz  
Filter 2 (Band I): 60 MHz
- Balanced to unbalanced operation for both filters
- Impedance transformation from 100 Ω to 50 Ω both filters)



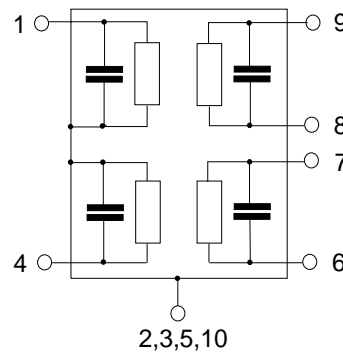
Features

- Package size 2.0 x 1.6 x 0.68 mm<sup>3</sup>
- Package code QCS10I
- RoHS compatible
- Approximate weight 0.007 g
- Package for **Surface Mount Technology (SMT)**
- Ni, gold-plated terminals
- **Electrostatic Sensitive Device (ESD)**



Pin configuration

- 1 Output unbalanced filter 1 (Band V)
- 4 Output unbalanced filter 2 (Band I)
- 6,7 Input balanced filter 2 (Band I)
- 8,9 Input balanced filter 1 (Band V)
- 2,3,5,10 Case ground





Data sheet



**Characteristics**

Temperature range for specification: T = -15 °C to +80 °C  
 Terminating source impedance: Z<sub>S</sub> = 100 Ω (balanced)  
 Terminating load impedance: Z<sub>L</sub> = 50 Ω (unbalanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>	—	836.5	—	MHz
<b>Maximum insertion attenuation</b> 824.0 ... 849.0 MHz	α <sub>max</sub>	—	1.5	2.1 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b> 824.0 ... 849.0 MHz	Δα	—	0.5	1.2	dB
<b>Amplitude ripple per 5 MHz channel (p-p)</b> 824.0 ... 849.0 MHz	Δα <sub>5MHz</sub>	—	0.5	0.7	dB
<b>Group delay ripple per 5 MHz channel (p-p)</b> 824.0 ... 849.0 MHz	Δτ	—	20	40	ns
<b>Input VSWR</b> 824.0 ... 849.0 MHz		—	1.7	2.0	
<b>Output VSWR</b> 824.0 ... 849.0 MHz		—	1.7	2.0	
<b>Input amplitude balance ( S<sub>31</sub>/S<sub>21</sub> )</b> 824.0 ... 849.0 MHz		-1.0	—	1.0	dB
<b>Input phase balance (φ(S<sub>31</sub>) - φ(S<sub>21</sub>) + 180°)</b> 824.0 ... 849.0 MHz		-10	—	10	°
<b>Attenuation</b>	α				
0.3 ... 779.0 MHz		35	43	—	dB
779.0 ... 804.0 MHz		25	32	—	dB
869.0 ... 1570.0 MHz		33	37	—	dB
1570.0 ... 1580.0 MHz		43	48	—	dB
1580.0 ... 2547.0 MHz		35	43	—	dB
2547.0 ... 6000.0 MHz		25	35	—	dB

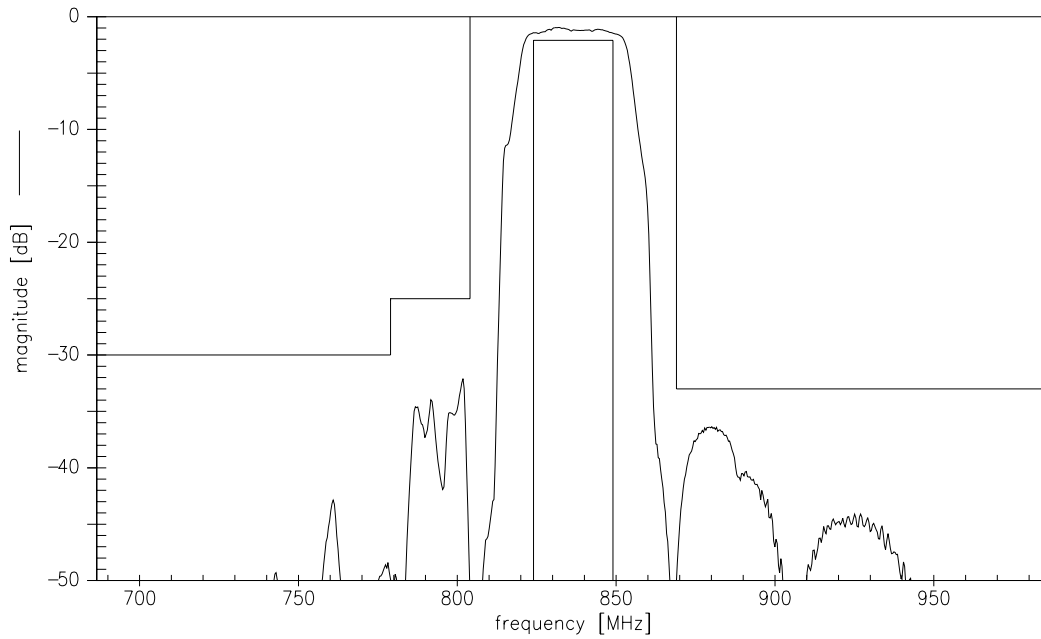
<sup>1)</sup> 2.3 dB for T = -30 °C to +85 °C



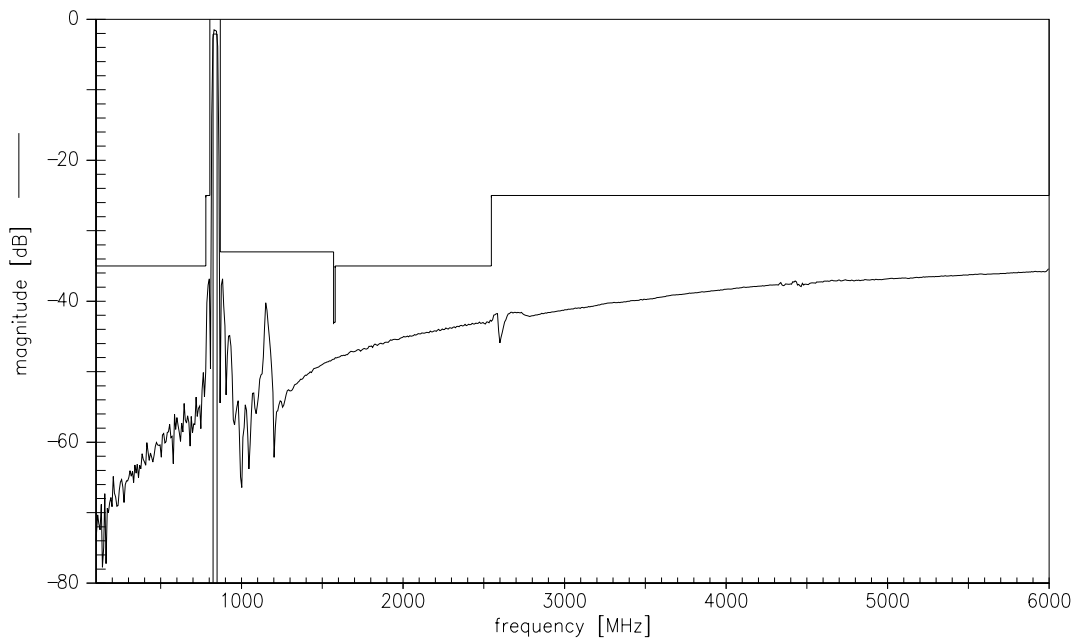
Data sheet



Transfer function



Transfer function (wideband)



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

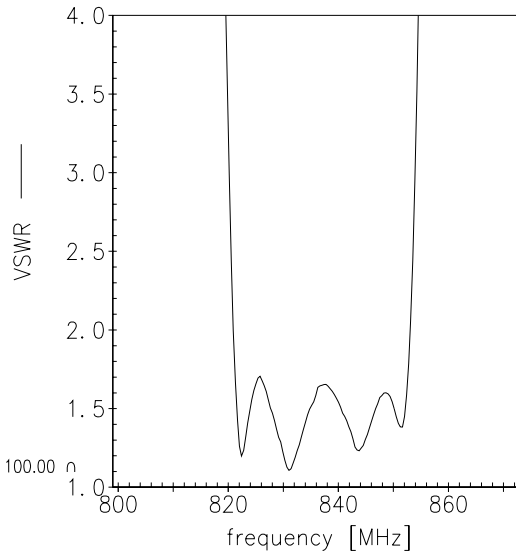
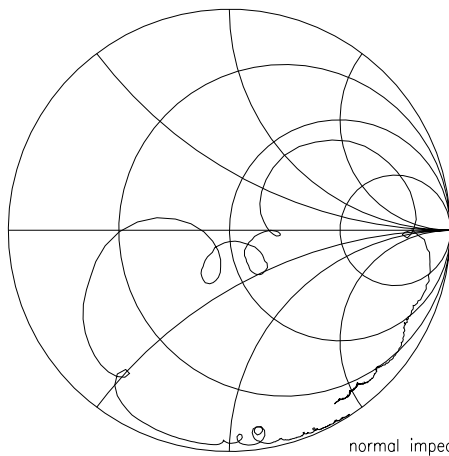


Data sheet

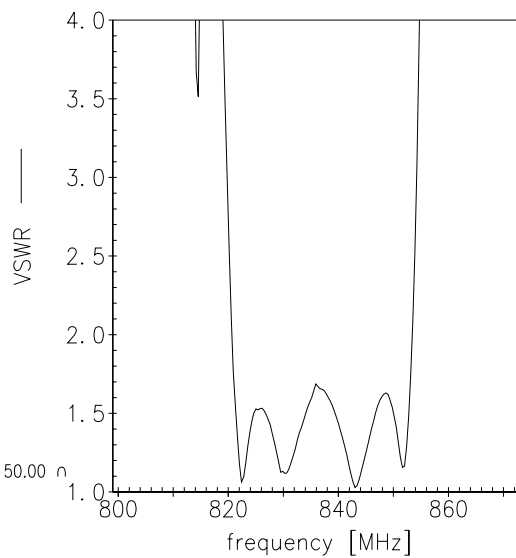
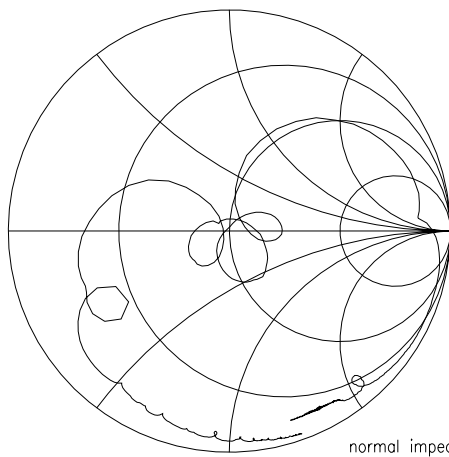


Smith charts

S<sub>11</sub> function



S<sub>22</sub> function





**SAW Components**

**B9315**

**SAW Tx 2in1 Filter**

**1950.0 / 836.5 MHz**

Data sheet



**Maximum ratings**

Operable temperature range	T	-30/+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 at WCDMA Band V	P <sub>IN</sub>	10	dBm	continuous wave @ +55°C ambient
Tx band				

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



Data sheet



Characteristics

Temperature range for specification:  $T = -15\text{ °C to }+80\text{ °C}$   
 Terminating source impedance:  $Z_S = 100\ \Omega$  (balanced) || 33 nH  
 Terminating load impedance:  $Z_L = 50\ \Omega$  (unbalanced)

		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	$f_C$	—	1950.0	—	MHz
<b>Maximum insertion attenuation</b> 1920.0 ... 1980.0 MHz	$\alpha_{max}$	—	1.9	2.5 <sup>1)</sup>	dB
<b>Amplitude ripple (p-p)</b> 1920.0 ... 1980.0 MHz	$\Delta\alpha$	—	0.9	1.5	dB
<b>Amplitude ripple per 5 MHz channel (p-p)</b> 1920.0 ... 1980.0 MHz	$\Delta\alpha_{5MHz}$	—	0.4	0.6	dB
<b>Group delay ripple per 5 MHz channel (p-p)</b> 1920.0 ... 1980.0 MHz	$\Delta\tau$	—	10	20	ns
<b>Input VSWR</b> 1920.0 ... 1980.0 MHz		—	1.7	2.2	
<b>Output VSWR</b> 1920.0 ... 1980.0 MHz		—	1.7	2.2	
<b>Input amplitude balance (<math> S_{31}/S_{21} </math>)</b> 1920.0 ... 1980.0 MHz		-1.0	—	1.2	dB
<b>Input phase balance (<math>\phi(S_{31}) - \phi(S_{21}) + 180^\circ</math>)</b> 1920.0 ... 1980.0 MHz		-10	—	10	°
<b>Attenuation</b>	$\alpha$				
0.3 ... 1570.0 MHz		24	45	—	dB
1570.0 ... 1580.0 MHz		40	45	—	dB
1730.0 ... 1790.0 MHz		35	45	—	dB
2110.0 ... 2170.0 MHz		33	40	—	dB
2250.0 ... 2400.0 MHz		30	40	—	dB
2400.0 ... 2500.0 MHz		35	46	—	dB
2500.0 ... 6000.0 MHz		30	38	—	dB

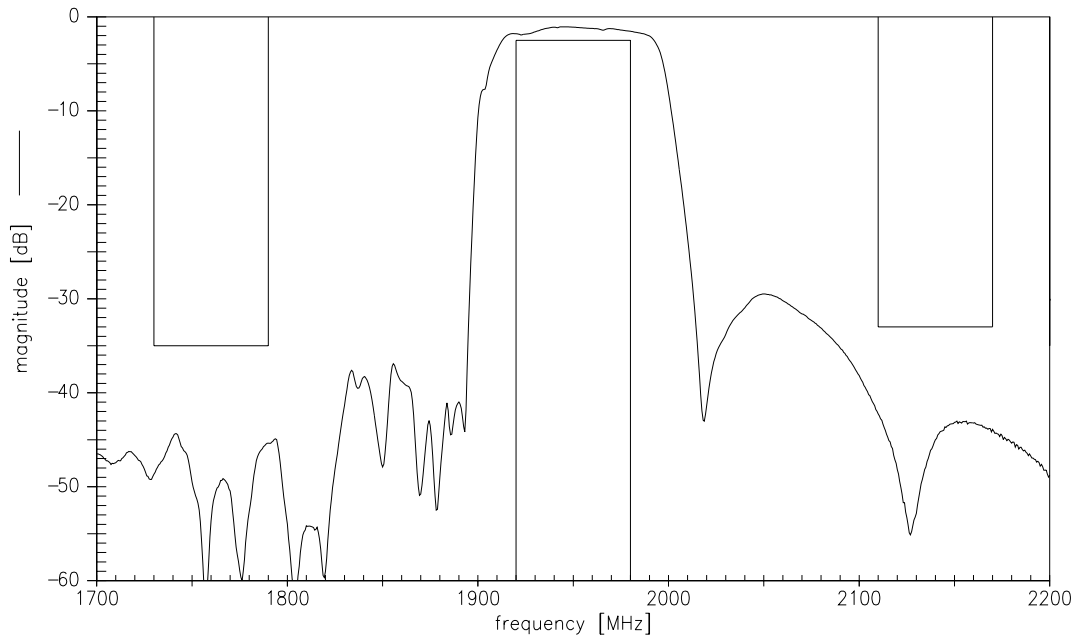
<sup>1)</sup> 2.7 dB for  $T = -30\text{ °C to }+85\text{ °C}$



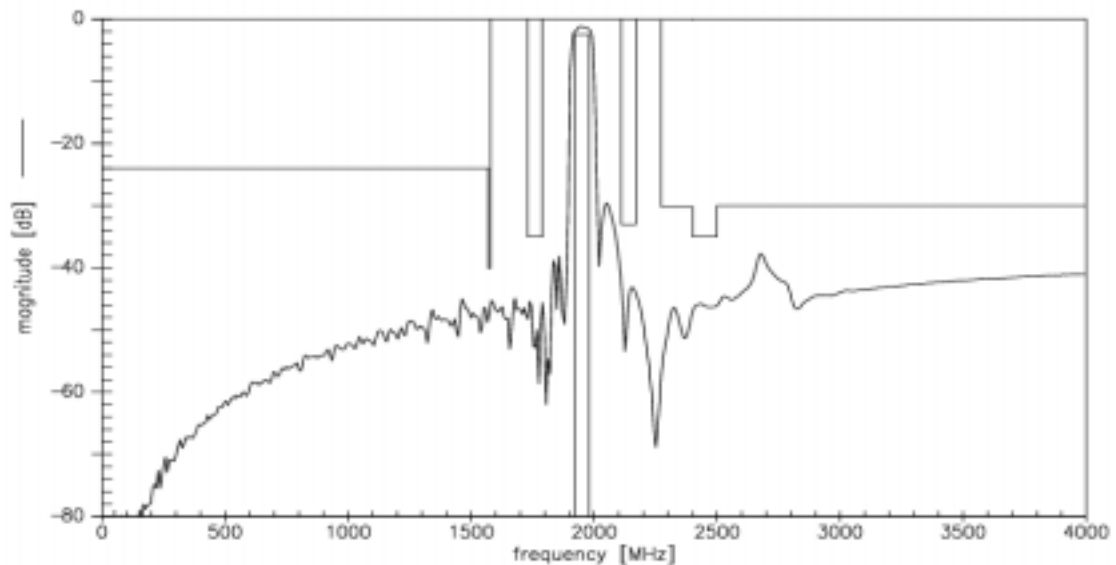
Data sheet



Transfer function



Transfer function (wideband)





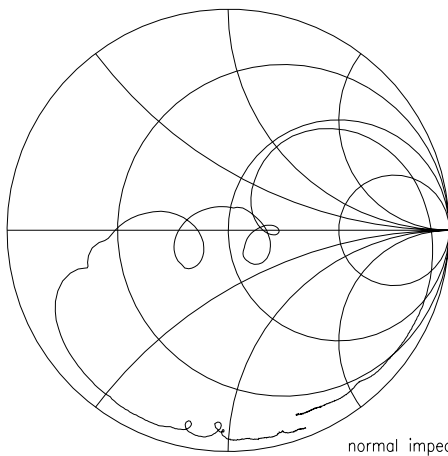


Data sheet

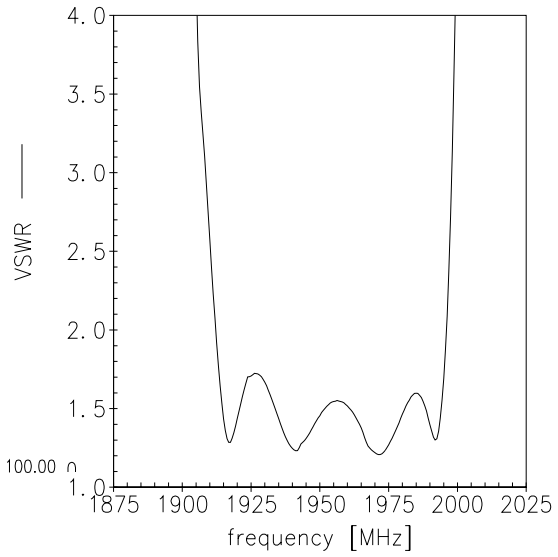


Smith charts

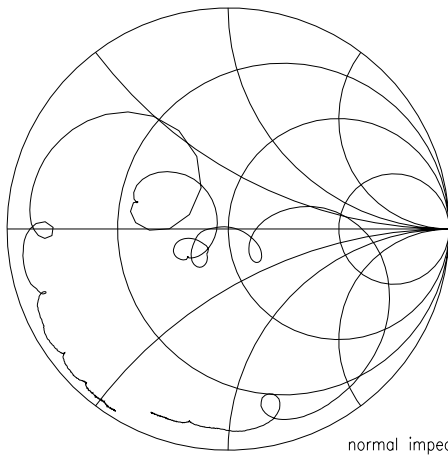
S<sub>11</sub> function



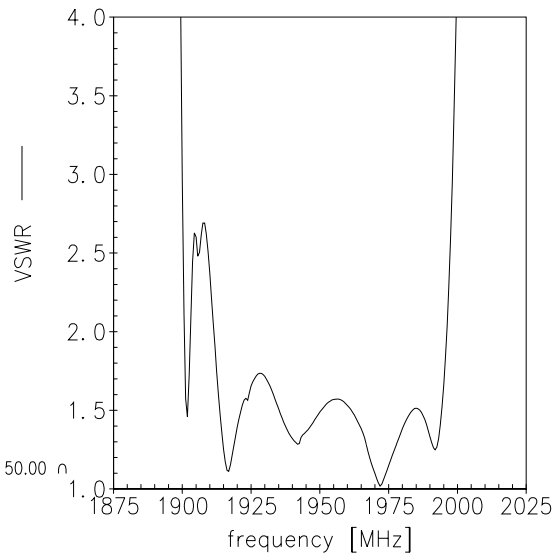
normal impedance: 100.00  $\Omega$



S<sub>22</sub> function



normal impedance: 50.00  $\Omega$





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## References

Type	B9315
Ordering code	B39202B9315N410
Marking and package	C61157-A7-A1
Packaging	F61074-V8152-Z000
Date codes	L_1126
S-parameters	B9315_LB_NB.s3p B9315_LB_WB.s3p B9315_UB_NB.s3p B9315_UB_WB.s3p
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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