



# SAW Components

## SAW duplexer

LTE & WCDMA Band VIII

<b>Series/type:</b>	<b>B8664</b>
<b>Ordering code:</b>	<b>B39941-B8664-P810</b>
<b>Date:</b>	<b>Jan 15, 2015</b>
<b>Version:</b>	<b>2.0</b>

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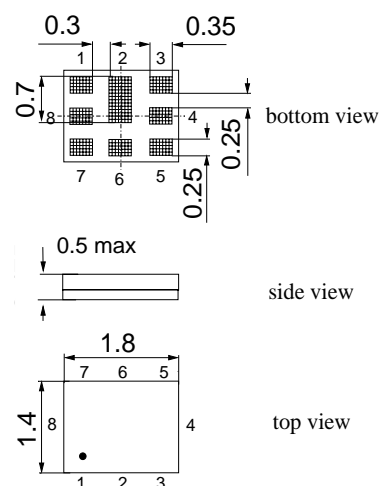
EPCOS AG is a TDK Group Company.


**Application**

- Low-loss SAW duplexer for mobile telephone LTE and WCDMA Band VIII systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 35 MHz

**Features**

- Package size 1.8 x 1.4mm<sup>2</sup>
- RoHS compatible
- Approx. weight 0.0035g
- Package for Surface Mount Technology (SMT)
- Ni, gold-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitive Level 3


**Pin configuration**

- 3 TX input
- 1 RX output
- 6 Antenna
- 2,4,5,7,8 To be grounded

**Data sheet**

**Characteristics**

Temperature range for specification:	T = -20 °C to +90 °C
ANT terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω + 1.5 nH
RX terminating impedance:	Z <sub>RX</sub> = 50 Ω + 1.0 nH

						<b>B8664</b>			
<b>Characteristics Tx - Ant</b>						<b>min.</b>	<b>typ. @ 25 °C</b>	<b>max.</b>	
<b>Center frequency</b> f <sub>C</sub>						—	897.5	—	MHz
<b>Maximum insertion attenuation</b>									
	880.24 ...	914.76	MHz	α		1.7	3.0	dB	
	880.24 ...	914.76	MHz	α <sup>1)</sup>		1.7	2.8	dB	
@f <sub>Carrier</sub>	882.4 ...	912.6	MHz	α <sub>WCDMA</sub> <sup>2)</sup>		1.3	2.5	dB	
<b>Amplitude ripple (p-p)</b>									
	880.24 ...	914.76	MHz	Δα		0.9	2.0	dB	
<b>VSWR</b>									
TX port	880.0 ...	915.0	MHz			1.5	2.0		
ANT port	880.0 ...	915.0	MHz			1.5	2.0		
<b>Attenuation</b> α									
	10.0 ...	716.0	MHz		30	42		dB	
	716.0 ...	728.0	MHz		35	42		dB	
	728.0 ...	821.0	MHz		30	42		dB	
	832.0 ...	862.0	MHz		30	42		dB	
	925.24 ...	959.76	MHz		45	55		dB	
@f <sub>Carrier</sub>	927.4 ...	957.6	MHz	α <sub>WCDMA</sub> <sup>2)</sup>	45	59		dB	
	1559.0 ...	1563.0	MHz		40	45		dB	
	1565.42 ...	1585.42	MHz		40	43		dB	
	1597.55 ...	1605.89	MHz		40	43		dB	
	1710.0 ...	1785.0	MHz		30	42		dB	
	1760.0 ...	1840.0	MHz		38	41		dB	
	1840.0 ...	1880.0	MHz		38	41		dB	
	2110.0 ...	2170.0	MHz		27	39		dB	
	2400.0 ...	2500.0	MHz		35	38		dB	
	2620.0 ...	2745.0	MHz		32	37		dB	
	3520.0 ...	3660.0	MHz		20	35		dB	
	4400.0 ...	4575.0	MHz		20	38		dB	
	4900.0 ...	5950.0	MHz		15	20		dB	

<sup>1)</sup> T = +25 °C to +90 °C

<sup>2)</sup> Attenuation of a 3.84 Mcps WCDMA signal ("Powertransferfunction"). Please refer to annotation on page(6).

**SAW Components**
**B8664**
**SAW duplexer**
**897.5 / 942.5 MHz**

Data sheet


**Characteristics**

Temperature range for specification:	T = -20 °C to +90 °C
ANT terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω+ 1.5 nH
RX terminating impedance:	Z <sub>RX</sub> = 50 Ω+ 1.0 nH

Charcteristics Rx - Ant		B8664			
		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>C</sub>	—	942.5	—	MHz
<b>Maximum insertion attenuation</b>					
@f <sub>Carrier</sub>	927.4 ... 957.6 MHz		1.7	3.0	dB
	925.24 ... 959.76 MHz		2.0	3.0	dB
<b>Amplitude ripple (p-p)</b>					
	925.24 ... 959.76 MHz		0.9	2.0	dB
<b>VSWR</b>					
RX port	925.0 ... 960.0 MHz		1.7	2.0	
ANT port	925.0 ... 960.0 MHz		1.7	2.0	
<b>Attenuation</b>					
	10.0 ... 880.0 MHz	45	60		dB
	880.24 ... 914.76 MHz	45	57		dB
	1045.0 ... 4625.0 MHz	40	48		dB
	4625.0 ... 6000.0 MHz	30	35		dB

1) Attenuation of a 3.84 Mcps WCDMA signal ("Powertransferfunction"). Please refer to annotation on page(6).

Data sheet


**Characteristics**

Temperature range for specification:	T = -20 °C to +90 °C
ANT terminating impedance:	Z <sub>ANT</sub> = 50 Ω    8.2 nH
TX terminating impedance:	Z <sub>TX</sub> = 50 Ω + 1.5 nH
RX terminating impedance:	Z <sub>RX</sub> = 50 Ω + 1.0 nH

Charcteristics Tx - Rx				B8664		
				min.	typ. @ 25 °C	max.
<b>Isolation</b>	880.24 ... 914.76 MHz	α	55	57		
	@f <sub>Carrier</sub> 882.4 ... 912.6 MHz	α <sub>WCDMA</sub> <sup>1)</sup>	55	59		dB
	925.24 ... 959.76 MHz	α	50	60		dB
	925.24 ... 959.76 MHz	α <sup>2)</sup>	55	60		dB
	@f <sub>Carrier</sub> 927.4 ... 957.6 MHz	α <sub>WCDMA</sub> <sup>1)</sup>	55	61		dB

1) Attenuation of a 3.84 Mcps WCDMA signal ("Powertransferfunction"). Please refer to annotation on page (6).

2) T = +20°C to +90°C


**Maximum ratings**

Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	0 <sup>1)</sup>	V	
ESD voltage	V <sub>ESD</sub>	100 <sup>2)</sup>	V	Machine Model
ESD voltage	V <sub>ESD</sub>	100 <sup>3)</sup>	V	Human Body Model
ESD voltage	V <sub>ESD</sub>	500 <sup>4)</sup>	V	Charge Device Model
Input power at 880.24 ... 914.76 MHz	P <sub>IN</sub>	29	dBm	5MHz LTE uplink signal 50 °C, 5000 h

1) DC resistance at RX output might be less than 100MΩ at elevated temperatures. Hence, we recommend usage of blocking capacitors.

2) acc. to JESD22-A115B (machine model), 10 negative & 10 positive pulses.

3) target, acc. to JESD22-A114F (human body model), 1 negative & 1 positive pulses.

4) target, acc. to JESD22-C101C (charge device model), 3 negative & 3 positive pulses.

**Annotation for characteristics section**

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

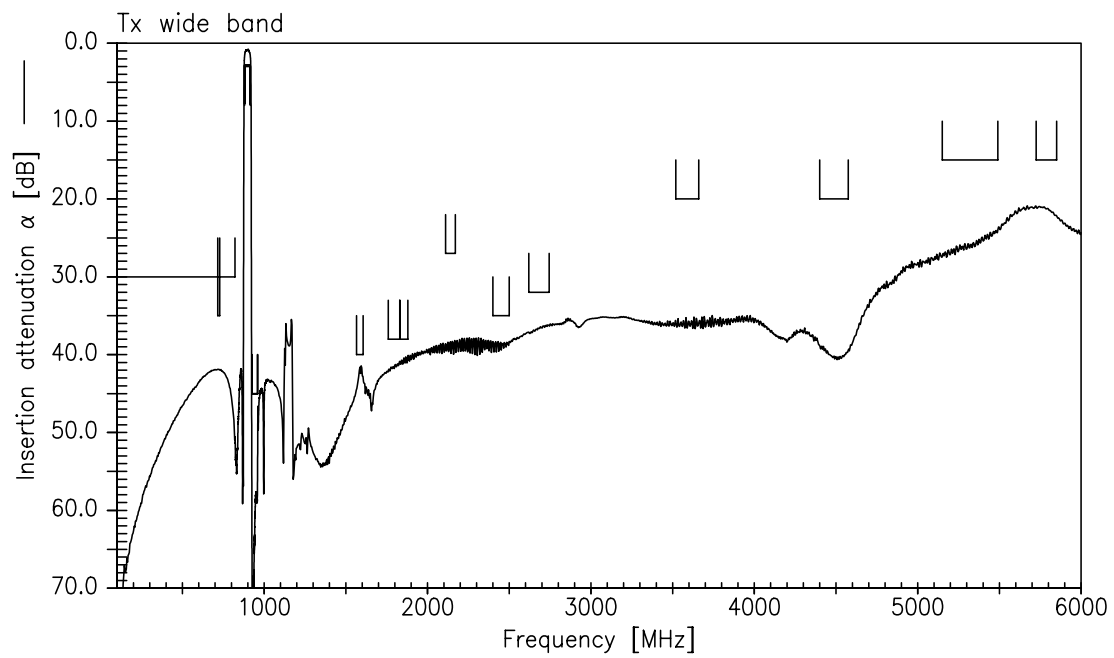
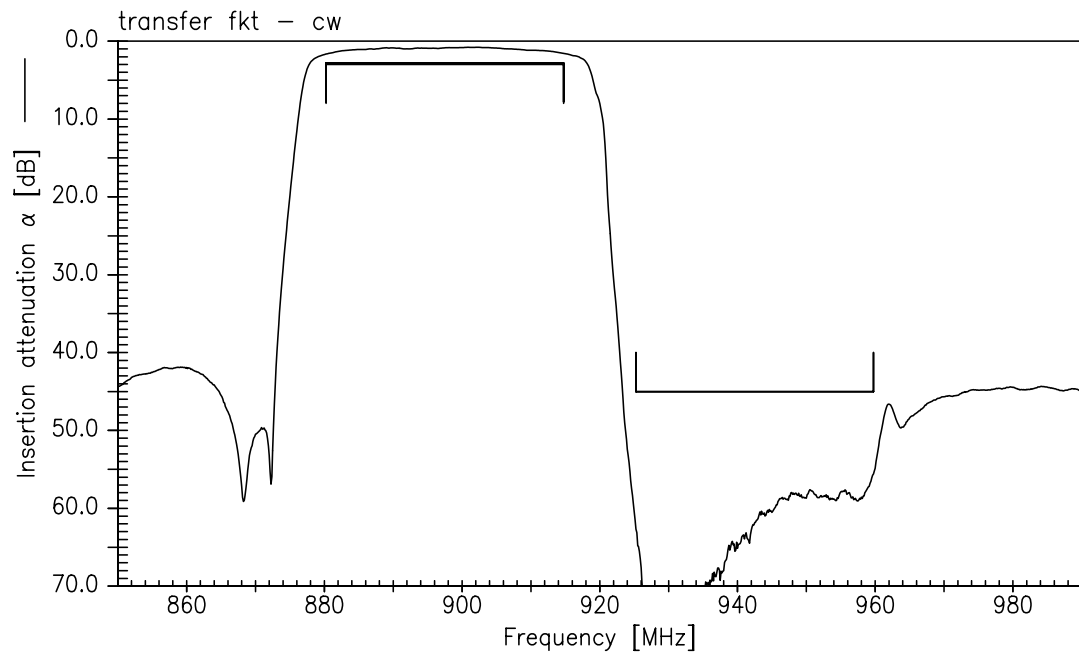
$$\int_{-\infty}^{\infty} |S_{\text{ds21}}(f) H_{\text{RRC}}(f - f_{\text{Carrier}})|^2 df$$

$f_{\text{Carrier}}$  according to 3GPP TS 25.101 (e.g. for UMTS-Passband,  $f_{\text{Carrier}}$  ranges from 2112.4 MHz (lowest Rx channel) to 2167.6 MHz (highest Rx 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:

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

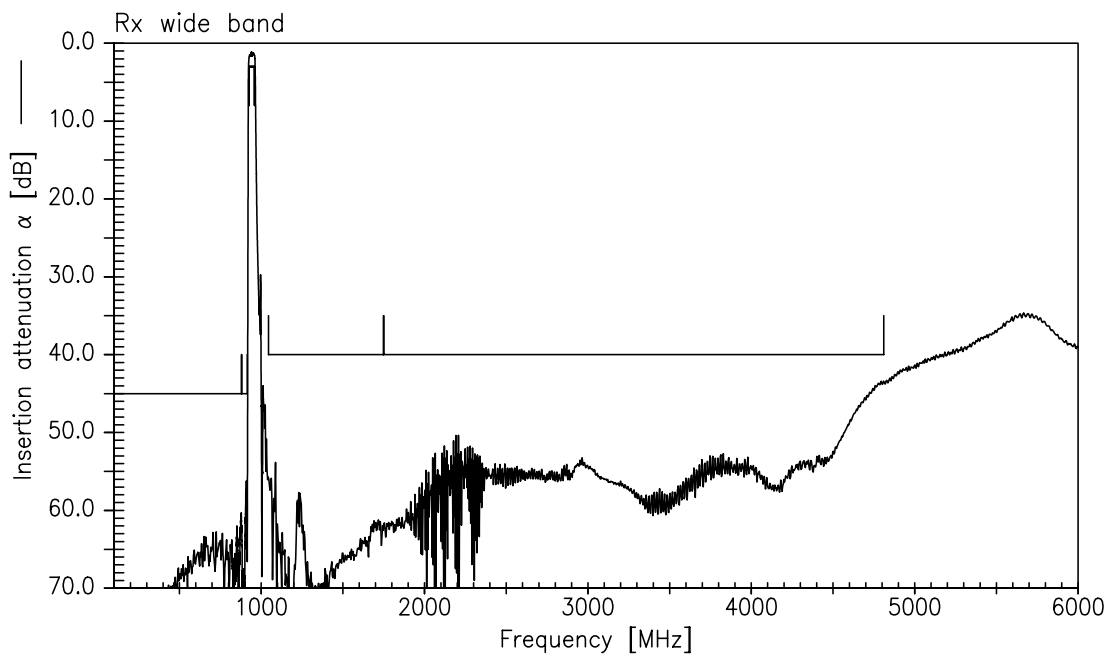
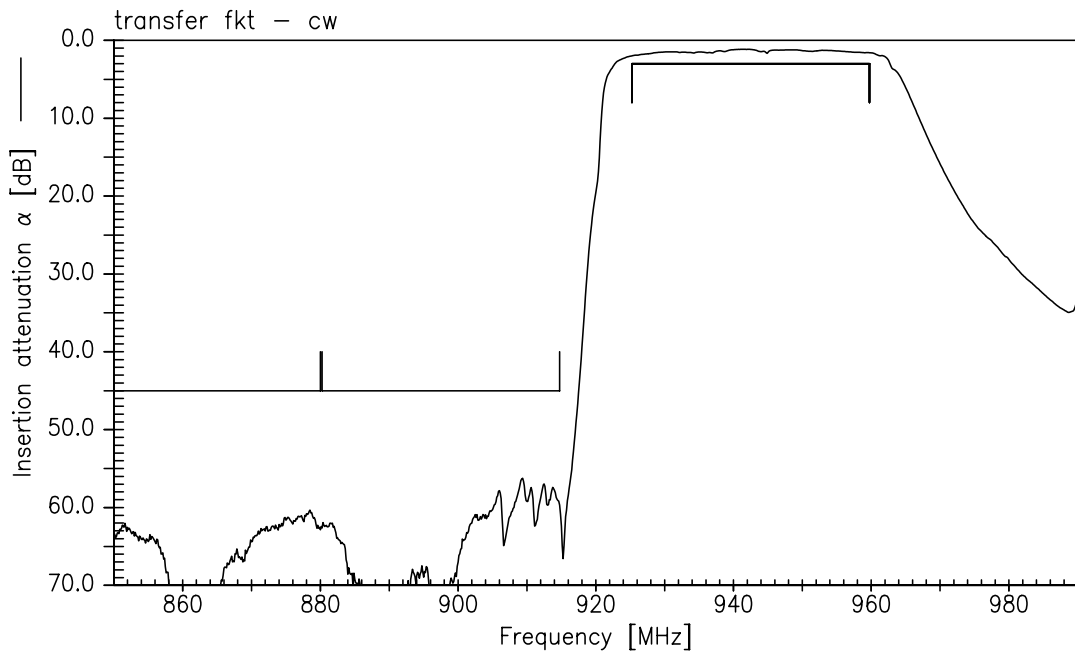


Frequency response TX - ANT





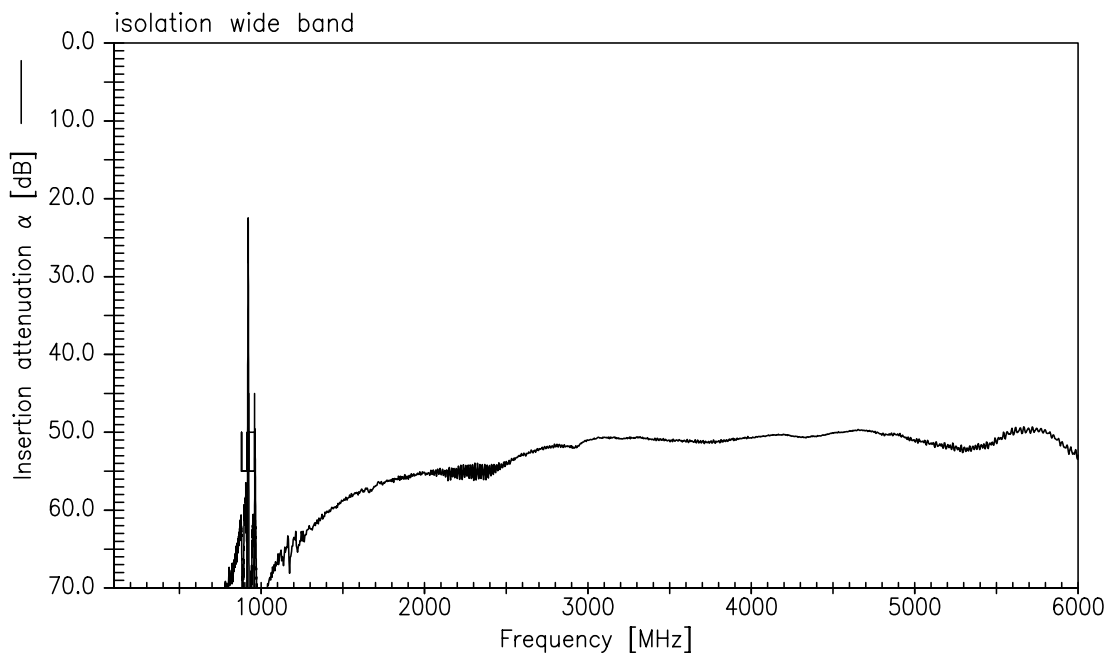
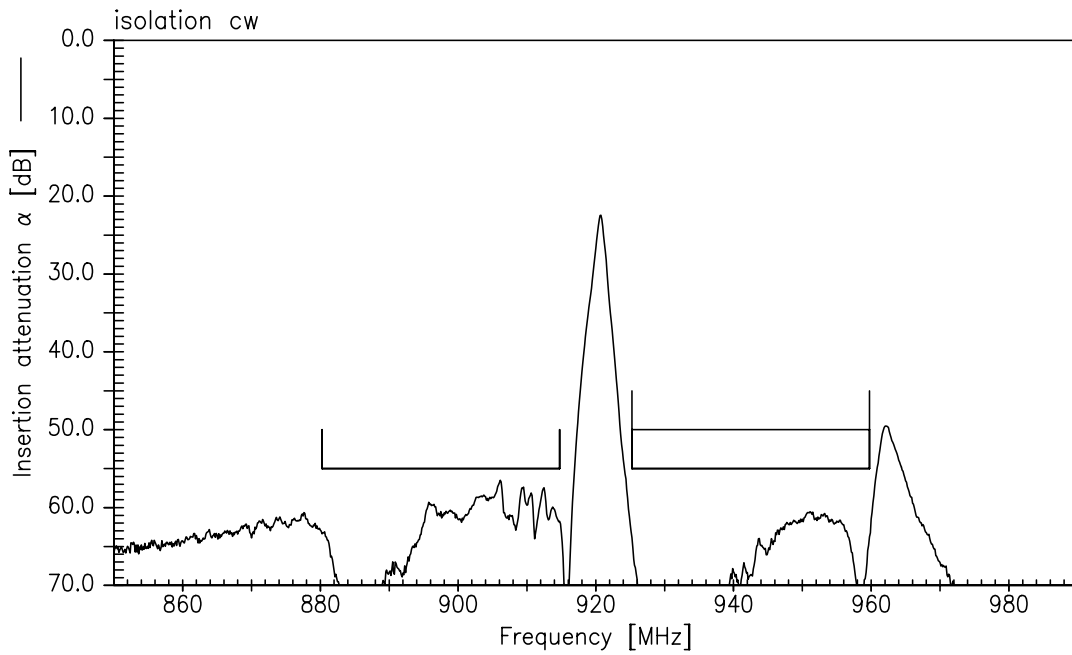
**Frequency response RX - ANT**





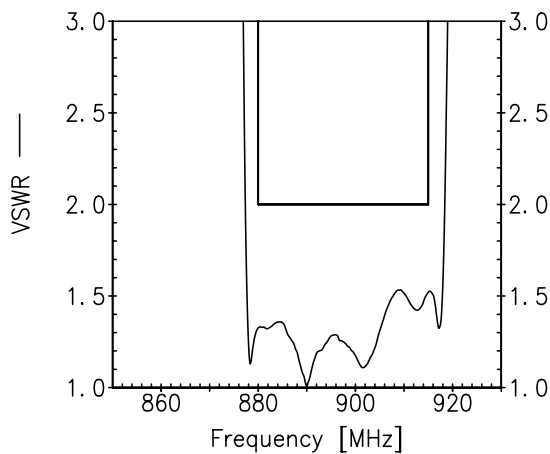


Frequency response TX - RX isolation

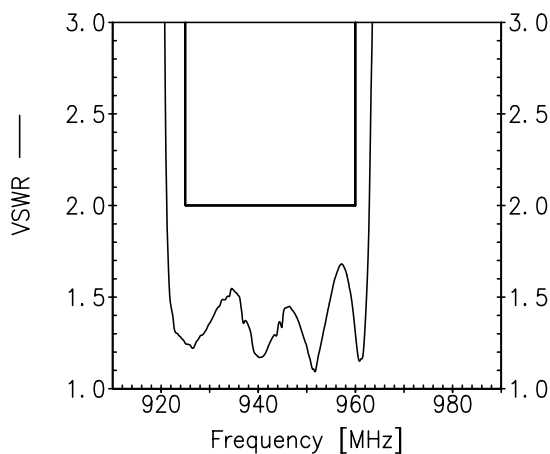
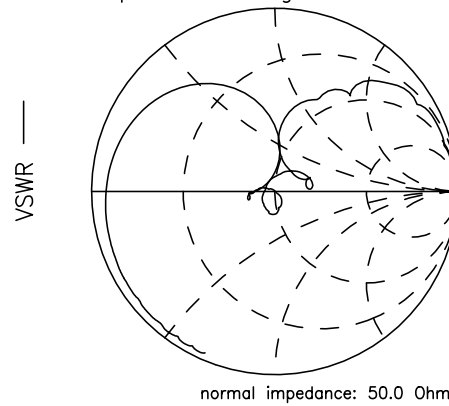




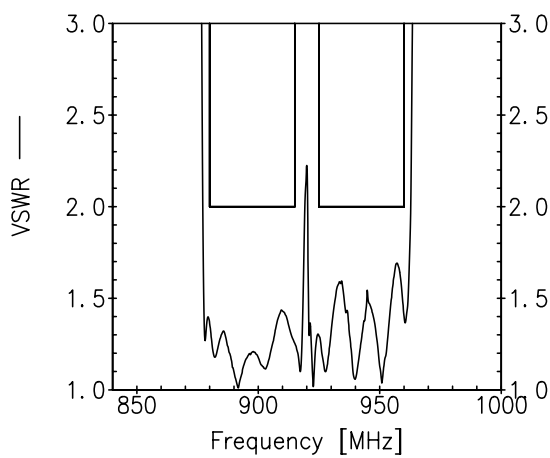
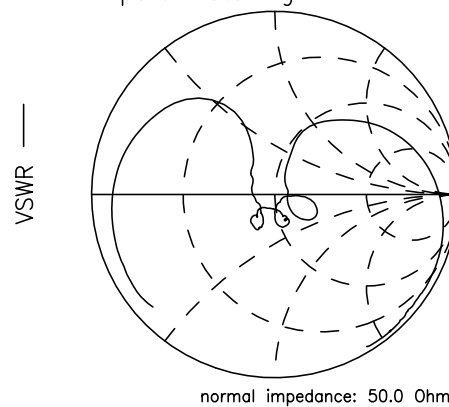
**VSWRs at TX, RX and Antenna**



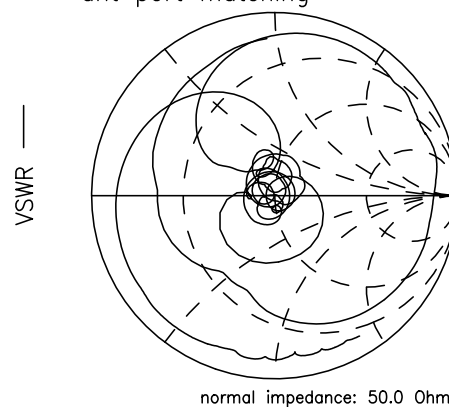
tx port matching



rx port matching



ant port matching




**References**

<b>Type</b>	B8664
<b>Ordering code</b>	B39941-B8664-P810
<b>Marking and package</b>	C61157-A8-A97
<b>Packaging</b>	F61074-V8259-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B8664_NB.s4p (narrow band) B8664_WB.s4p (wide band)
<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."
<b>Moldability</b>	Before using in overmolding environment, please contact your EPCOS sales office.
<b>Matching coils</b>	See Inductor pdf-catalog <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a>

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**Published by EPCOS AG**  
**Systems, Acoustics, Waves Business Group**  
**P.O. Box 80 17 09, 81617 Munich, GERMANY**

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