



SAW Components

SAW Duplexer

W-CDMA Band 1

Series/type:	B8518
Ordering code:	B39212B8518P810
Date:	July 21, 2014
Version:	2.1

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1950.0 / 2140.0 MHz

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Revision History

Changes compared to previously issued iteration

Issue	Originator	Detailed specification changes	Date
1.0	C. Math	Initial release	Mar 06, 2013
1.1	N. Fichtner	Add IMD limits	Apr 09, 2013
2.0	N. Fichtner	Add maximum ratings	Mar 28, 2014
2.1	N. Fichtner	Corr. P _{in} elsewhere	July 21, 2014

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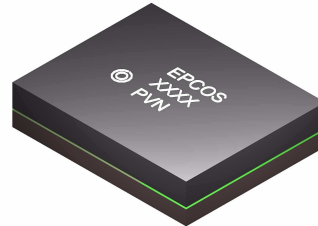
1950.0 / 2140.0 MHz

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SMD

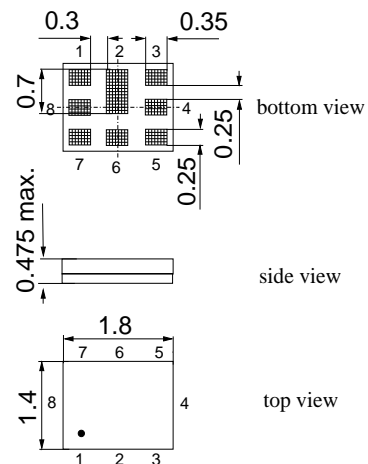
Application

- Low-loss SAW duplexer for mobile telephone W-CDMA Band 1 (UMTS) systems
- Low insertion attenuation
- Low amplitude ripple
- Usable passband 60 MHz
- High isolation between Tx and Rx
- External ANT-coil



Features

- Package size 1.8 x 1.4 mm²
- max. Package height 0.475mm
- RoHS compatible
- Approximate weight 0.005 g
- Package for **Surface Mount Technology (SMT)**
- Ni terminals, Au-plated
- **Electrostatic Sensitive Device (ESD)**
- Fully matched by integrated matching network
- **Moisture Sensitive Level 3**



Pin configuration

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

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Characteristics

Temperature range for specification: T = -30 °C to +85 °C
 TX terminating impedance: Z_{Tx} = 50 Ω
 ANT terminating impedance: Z_{Ant} = 50 Ω || 3.1nH
 RX terminating impedance: Z_{Rx} = 50 Ω || 5.7nH

Characteristics Tx-Antenna		B8518			
		min.	typ. @ 25 °C	max.	
Center frequency	f _c				MHz
Maximum insertion attenuation	α _{W-CDMA} ¹⁾				
1922.4 ... 1977.6 MHz		-	1.4	1.9	dB
Amplitude ripple (p-p)	α _{W-CDMA} ¹⁾				
1922.4 ... 1977.6 MHz		-	0.5	1.0	dB
Error Vector Magnitude	EVM ²⁾				
1922.4 ... 1977.6 MHz		-	2.1	2.9	%
TX port VSWR					
1920.0 ... 1980.0 MHz		-	1.6	2.1	
ANT port VSWR					
1920.0 ... 1980.0 MHz		-	1.5	2.1	
Attenuation	α				
10.0 ... 1574.0 MHz		32	38	-	dB
420.0 ... 494.0 MHz		45	50	-	dB
843.0 ... 894.0 MHz		35	41	-	dB
1565.42 ... 1573.374 MHz		36	41	-	dB
1573.374... 1577.466 MHz		38	41	-	dB
1577.466... 1585.42 MHz		38	42	-	dB
1597.5515... 1605.886 MHz		39	42	-	dB
1605.886... 1805.0 MHz		28	31	-	dB
1805.0 ... 1865.0 MHz		22	24	-	dB
1865.0 ... 1880.0 MHz		15	23	-	dB
2112.4 ... 2167.6 MHz	α _{W-CDMA} ¹⁾	42	46	-	dB
2400.0 ... 2500.0 MHz		31	35	-	dB
2620.0 ... 2690.0 MHz		25	31	-	dB
3830.0 ... 3970.0 MHz		19	24	-	dB
5150.0 ... 5950.0 MHz		7	12	-	dB

1) Attenuation of W-CDMA signal (Power Transfer Function). Please, refer to page 8 of this document.

2) Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141

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 RX terminating impedance: Z_{Rx} = 50 Ω || 5.7nH

Characteristics Antenna-Rx		B8518			
		min.	typ. @ 25 °C	max.	
Center frequency	f _c				MHz
Maximum insertion attenuation	α _{W-CDMA} ¹⁾				
2112.4 ... 2167.6 MHz		-	1.9	2.5	dB
Amplitude ripple (p-p)	α _{W-CDMA} ¹⁾				
2112.4 ... 2167.6 MHz		-	0.5	1.0	dB
Error Vector Magnitude	EVM ²⁾				
2112.4 ... 2167.6 MHz		-	0.8	2.0	%
ANT port VSWR					
2110.0 ... 2170.0 MHz		-	1.4	1.8	
RX port VSWR					
2110.0 ... 2170.0 MHz		-	1.5	1.9	
IMD product level limits³⁾					
at f_{TX}=1950.0 MHz, f_{RX}=2140.0 MHz					
Blocker 1	190.0 MHz	-	115		dBm
Blocker 2	1760.0 MHz	-	100		dBm
Blocker 3	4090.0 MHz	-	105		dBm

¹⁾ Attenuation of W-CDMA signal (Power Transfer Function). Please, refer to page 8 of this document.

²⁾ Error Vector Magnitude (EVM) based on definition given in 3GPP TS 25.141

³⁾ IMD product level limits for power levels P_{TX}=21.5 dBm (antenna port output power) and P_{Block-er}=-15dBm (antenna port input power)

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Characteristics Antenna-Rx	B8518			
	min.	typ. @ 25 °C	max.	
Attenuation α				
10.0 ... 1920.0 MHz	40	48	-	dB
1922.4 ... 1977.6 MHz α _{W-CDMA} ¹⁾	50	59	-	dB
1980.0 ... 2025.0 MHz	40	43	-	dB
2255.0 ... 2400.0 MHz	20	50	-	dB
2400.0 ... 2484.0 MHz	40	49	-	dB
2484.0 ... 6000.0 MHz	30	38	-	dB

¹⁾ Attenuation of W-CDMA signal (Power Transfer Function). Please, refer to page 8 of this document.



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Characteristics Tx-Rx	B8518			
	min.	typ. @ 25 °C	max.	
Isolation				
1574.0 ... 1577.0 MHz	50	64	-	dB
1922.4 ... 1977.6 MHz	51	56	-	dB
2112.4 ... 2167.6 MHz	47	57	-	dB
3830.0 ... 3970.0 MHz	30	52	-	dB
5750.0 ... 5950.0 MHz	30	48	-	dB

1) Attenuation of W-CDMA signal (Power Transfer Function). Please, refer to page 8 of this document.



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Annotation for characteristics section

Attenuation of W-CDMA signal (Power Transfer Function, α_{W-CDMA}) is determined by

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

with $f_{Carrier}$ according to 3GPP TS 25.101 (e.g. for UMTS pass band, $f_{Carrier}$ ranges from 1922.4 MHz (lowest Tx channel) to 2167.6 MHz (highest Tx channel)). Here, $H_{RRC}(f)$ is the transfer function of the root-raised cosine transmit pulse shaping filter according to 3GPP TS 25.101 with the following normalization:

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

Maximum Ratings

Storage temperature range	T_{stg}	-40/+85	°C	
DC voltage	V_{DC}	5 ¹⁾	V	
ESD voltage	V_{ESD}	50 ²⁾	V	machine model, 10 pulses
Input power at				} W-CDMA signal 50 °C, 5000h
1922.4 ... 1977.6 MHz	P_{in}	28	dBm	
elsewhere	P_{in}	10	dBm	

¹⁾ 168h damp heat steady state according to IEC 60068-2-67 cy

²⁾ According to JESD22-A115B (machine model), 10 negative and 10 positive pulses.

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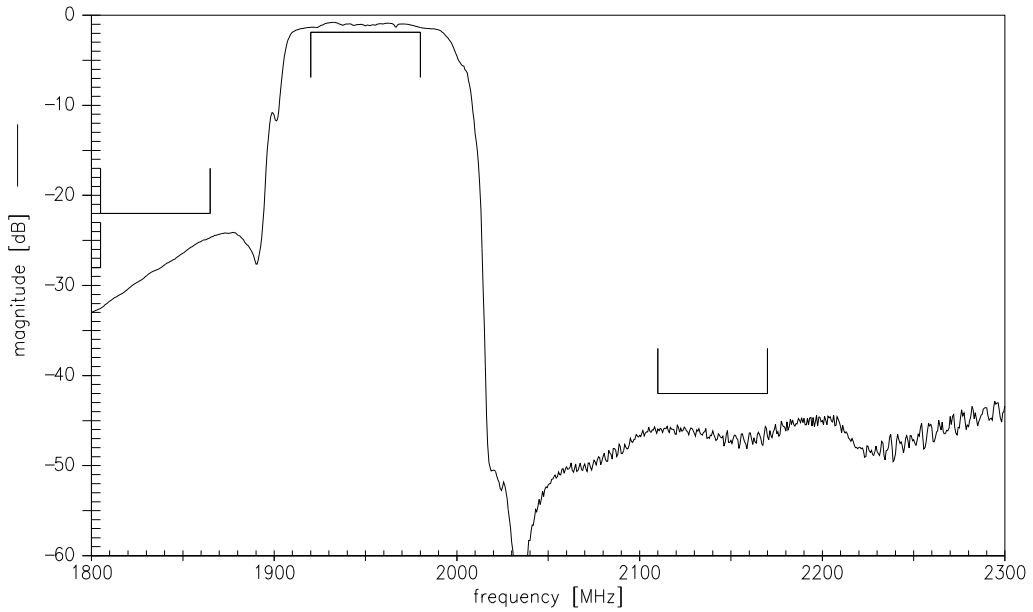
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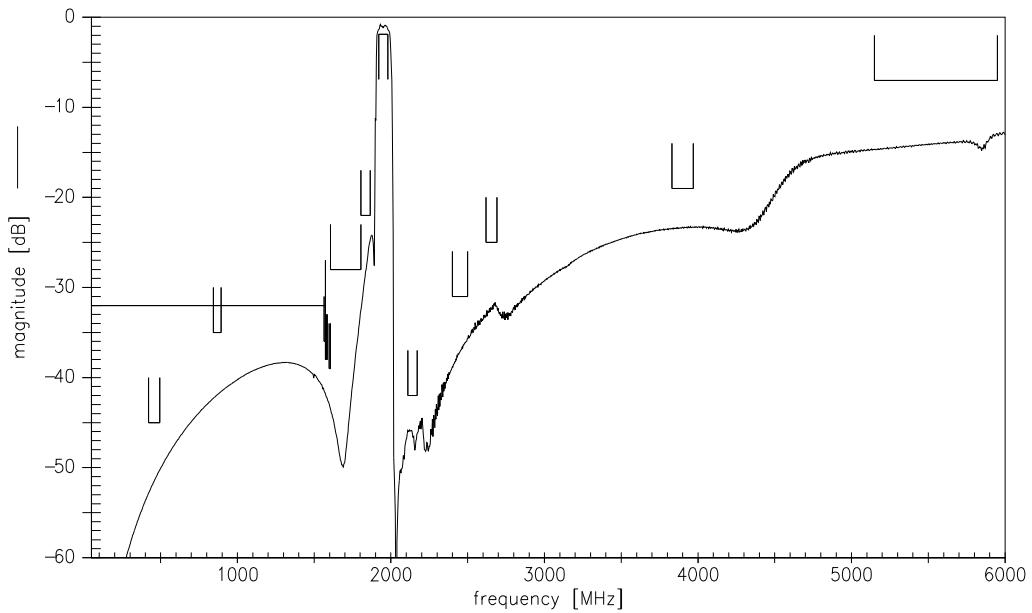
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Frequency Response TX-ANT (CW signal)



Frequency Response TX-ANT (wideband)



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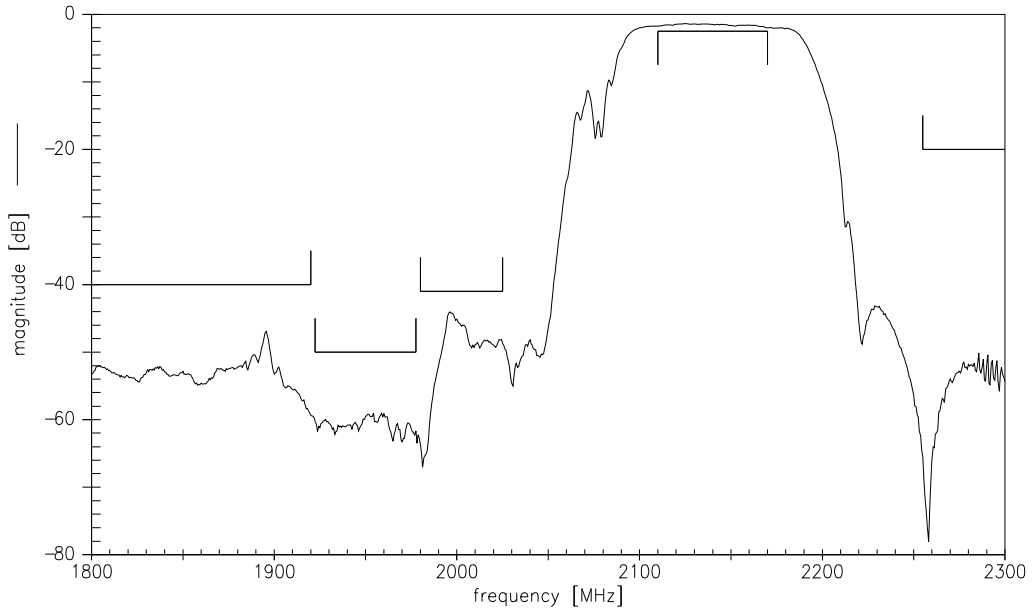
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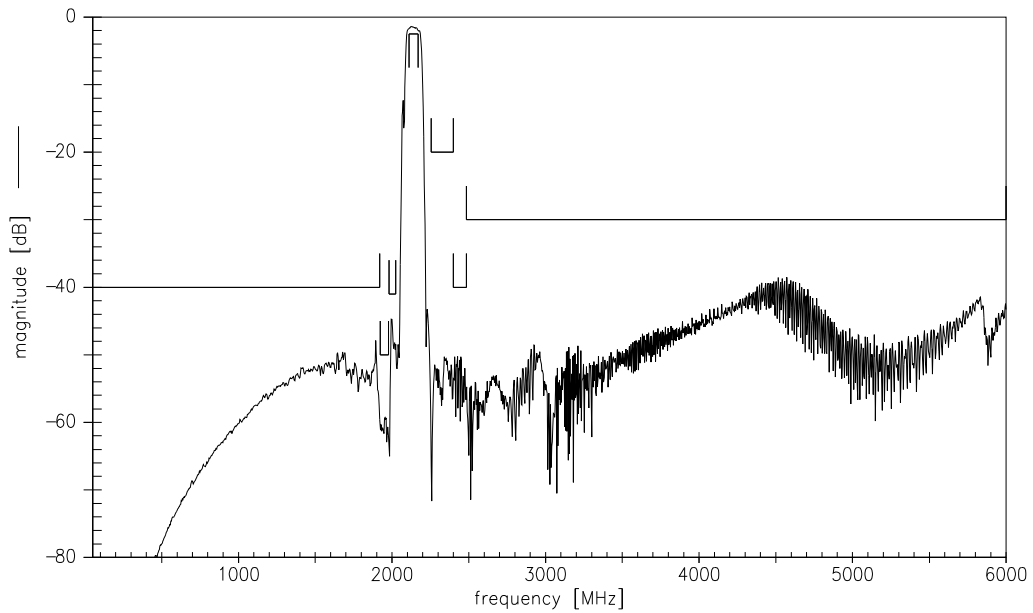
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Frequency Response RX-ANT (CW signal)



Frequency Response RX-ANT (wideband)



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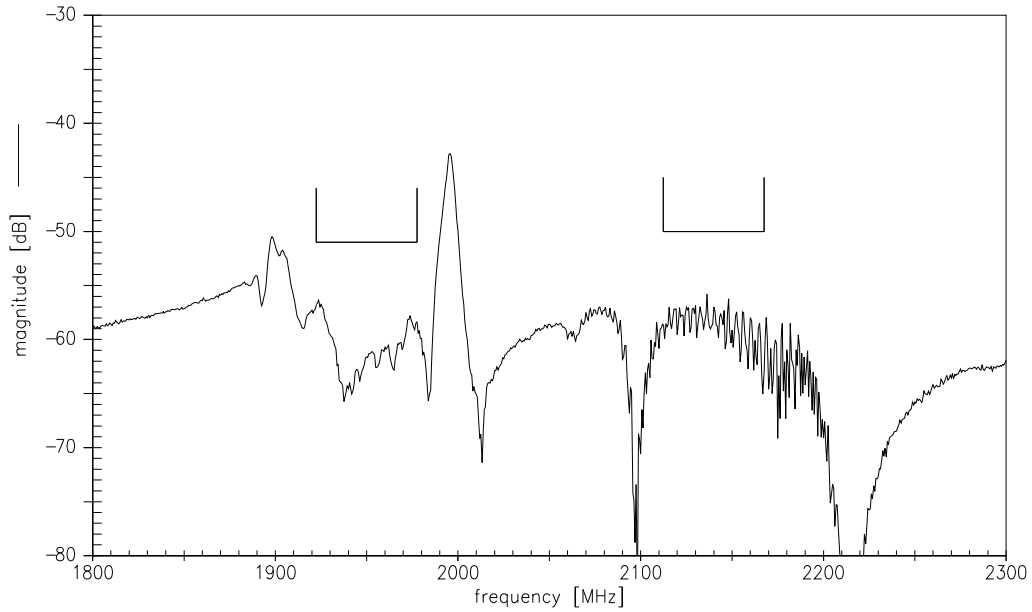
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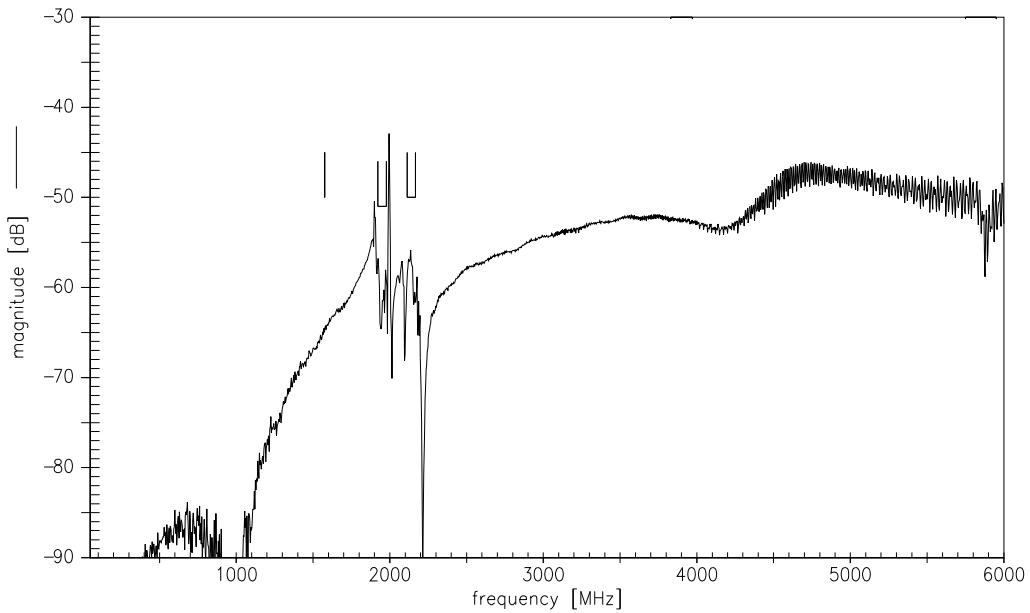
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Frequency Response TX-RX (CW signal)



Frequency Response TX-RX (wideband)



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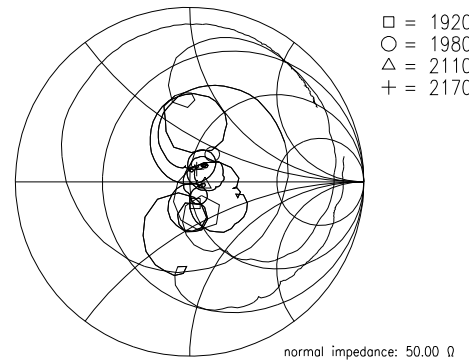
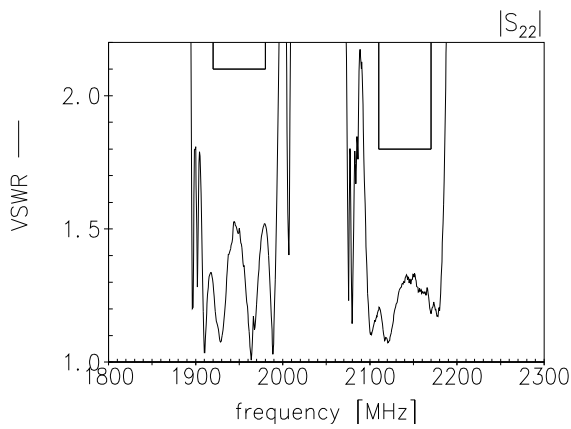
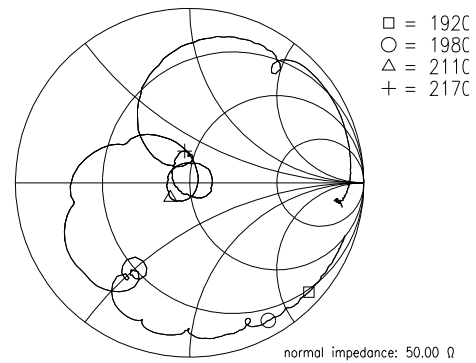
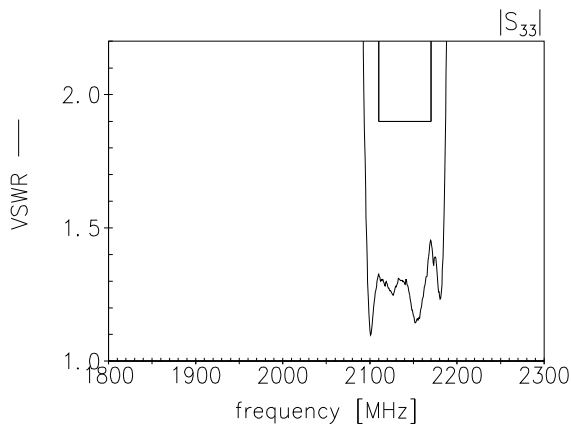
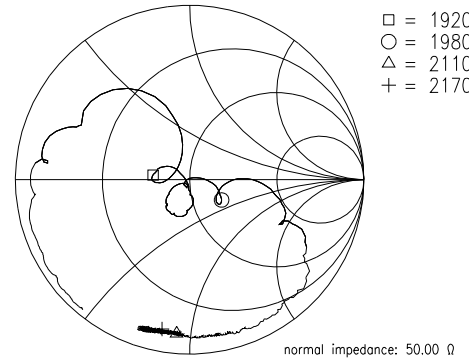
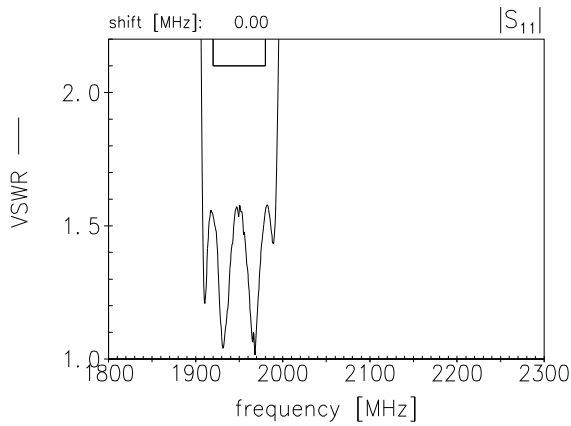


Return Loss

S_{11} TX-port

S_{22} ANT-port

S_{33} RX-port



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References

Type	B8518
Ordering code	B39212B8518P810
Marking and package	
Packaging	
Date codes	L_1126
S-parameters	
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."
Moldability	Before using in overmolding environment, please contact your EPCOS sales office.
Matching coils	See Inductor pdf-catalog http://www.tdk.co.jp/tefe02/coil.htm#aname1 and Data Library for circuit simulation http://www.tdk.co.jp/etvcl/index.htm for a large variety of matching coils.

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