



SAW Components

SAW Duplexer

LTE Band 20

Series/type:	B8509
Ordering code:	B39851B8509P810
Date:	March 08, 2013
Version:	2.0

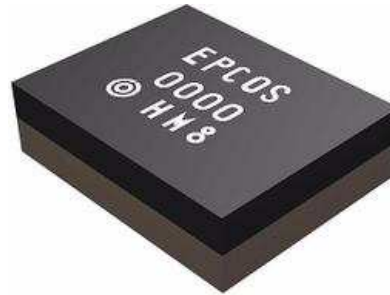
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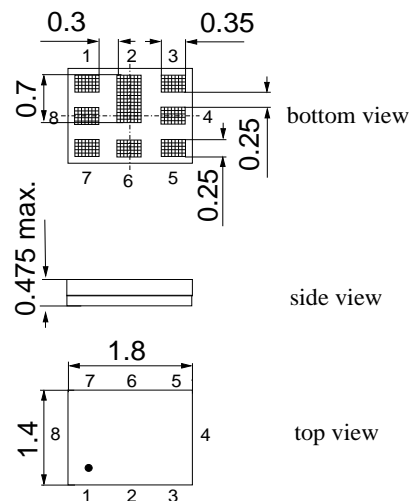
Data Sheet

**Application**

- Low-loss SAW duplexer for LTE Band 20 systems
- Very high isolation
- Usable passband 30 MHz
- Single-ended to balanced transformation in Antenna-Rx path
- Impedance transformation 50 Ω to 100 Ω in Antenna-Rx path
- Very small size and low height

**Features**

- Package size 1.8 * 1.4 mm²
- Maximum height : 0.475 mm
- RoHS compatible
- Package for **Surface Mount Technology (SMT)**
- Ni, Au-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- **Moisture Sensitivity Level 3**

**Pin configuration**

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

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



Data Sheet



Characteristics

Temperature range for specification: T = -15 °C to +85 °C
 TX terminating impedance: Z_{Tx} = 50 Ω
 ANT terminating impedance: Z_{Ant} = 50 Ω || 11 nH
 RX terminating impedance: Z_{Rx} = 100 Ω (balanced) || 47 nH

Characteristics Tx-Antenna				min.	typ. @ 25 °C	max.	
Center frequency	f _c				847.0		MHz
Maximum insertion attenuation	α						
832.0 ... 862.0	MHz			-	2.2	2.8	dB
832.0 ... 862.0	MHz			-	2.2	2.5 ¹⁾	dB
Amplitude ripple (p-p)	Δα						
832.0 ... 862.0	MHz			-	1.2	1.9	dB
Input VSWR (Tx port)							
832.0 ... 862.0	MHz			-	1.6	2.0	
Output VSWR (Ant Port)							
832.0 ... 862.0	MHz			-	1.5	2.0	
Absolute attenuation	α						
10.0 ... 771.0	MHz			35	39	-	dB
771.0 ... 791.0	MHz			35	44	-	dB
791.0 ... 821.0	MHz			45	50	-	dB
873.0 ... 903.0	MHz			13	25	-	dB
925.0 ... 960.0	MHz			30	41	-	dB
1565.0 ... 1606.0	MHz			40	46	-	dB
1664.0 ... 2170.0	MHz			35	47	-	dB
2400.0 ... 2620.0	MHz			33	39	-	dB
2620.0 ... 2690.0	MHz			35	50	-	dB
3328.0 ... 3448.0	MHz			35	43	-	dB
4000.0 ... 6000.0	MHz			13	18	-	dB

¹⁾ in +25,+55 °C temperature range



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ANT terminating impedance:	Z _{Ant} = 50 Ω 11 nH
RX terminating impedance:	Z _{Rx} = 100 Ω (balanced) 47 nH

Characteristics Antenna-Rx	min.	typ. @ 25 °C	max.	
Center frequency f_c		806.0		MHz
Maximum insertion attenuation α				
791.0 ... 821.0 MHz	-	2.4	3.5	dB
791.0 ... 821.0 MHz	-	2.4	3.0 ¹⁾	dB
Amplitude ripple (p-p) $\Delta\alpha$				
791.0 ... 821.0 MHz	-	1.2	2.5	dB
Input VSWR (Ant port)				
791.0 ... 821.0 MHz	-	1.6	2.0	
Output VSWR (Rx Port)				
791.0 ... 821.0 MHz	-	1.8	2.2	
Common mode rejection ratio				
791.0 ... 821.0 MHz	25	29	-	dB
Absolute attenuation α				
10.0 ... 770.0 MHz	45	56	-	dB
770.0 ... 782.0 MHz	10	40	-	dB
832.0 ... 833.5 MHz	35	60	-	dB
833.5 ... 862.0 MHz	50	54	-	dB
873.0 ... 903.0 MHz	40	54	-	dB
1623.0 ... 1683.0 MHz	45	57	-	dB
2400.0 ... 2545.0 MHz	45	51	-	dB
2545.0 ... 4000.0 MHz	45	55	-	dB
4000.0 ... 6000.0 MHz	30	35	-	dB
Absolute mean attenuation α_{mean}				
782.0 ... 790.0 MHz	4	8	-	dB
782.0 ... 790.0 MHz	6 ²⁾	8	-	dB

1) At +25 °C
2) At +25 °C



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847.0 / 806.0 MHz

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TX terminating impedance:	Z _{Tx} = 50 Ω
ANT terminating impedance:	Z _{Ant} = 50 Ω 11 nH
RX terminating impedance:	Z _{Rx} = 100 Ω (balanced) 47 nH

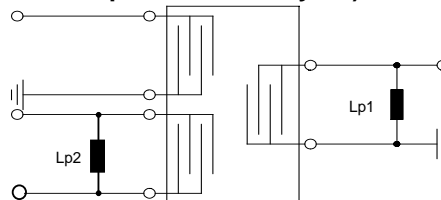
Characteristics Tx-Rx				min.	typ. @ 25 °C	max.	
Differential mode isolation							
			α				
	791.0 ... 821.0		MHz	50	54	-	dB
	832.0 ... 834.0		MHz	40	60	-	dB
	834.0 ... 862.0		MHz	54	57	-	dB
	1574.0 ... 1577.0		MHz	40	65	-	dB
	1664.0 ... 1724.0		MHz	20	64	-	dB
	2496.0 ... 2586.0		MHz	20	59	-	dB
Common mode isolation							
			α				
	832.0 ... 862.0		MHz	60	65	-	dB

Maximum Ratings

Storage temperature range	T _{stg}	-40/+85	°C	
DC voltage	V _{DC}	5 ¹⁾	V	
ESD voltage, Tx, Ant Port	V _{ESD}	100 ²⁾	V	MM Model
ESD voltage, Tx, Ant Port	V _{ESD}	300 ³⁾	V	HB Model
ESD voltage	V _{ESD}	500 ⁴⁾	V	CD Model
Input power at Tx Port				
832.0 ...862.0 MHz	P _{in}	27.5	dBm	} continuous wave 55 °C, 50000h
elsewhere	P _{in}	10	dBm	

- 1) 168h Damp Heat Steady State acc. to IEC60068-2-67 Cy
- 2) Acc. to FESD22-A115B (MM - Machine Model), 10 negative & 10 positive pulses
- 3) Acc. to JESD22-A114F (HBM - Human Body Level), 1 negative & 1 positive pulses.
- 4) Acc. to JESD22-C101C (CDM - Fiel Inducted Charged Device Model), 3 negative & 3 positive pulses.

Matching network (element values depend on PCB layout)



Lp1=11nH, Lp2 =47nH

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



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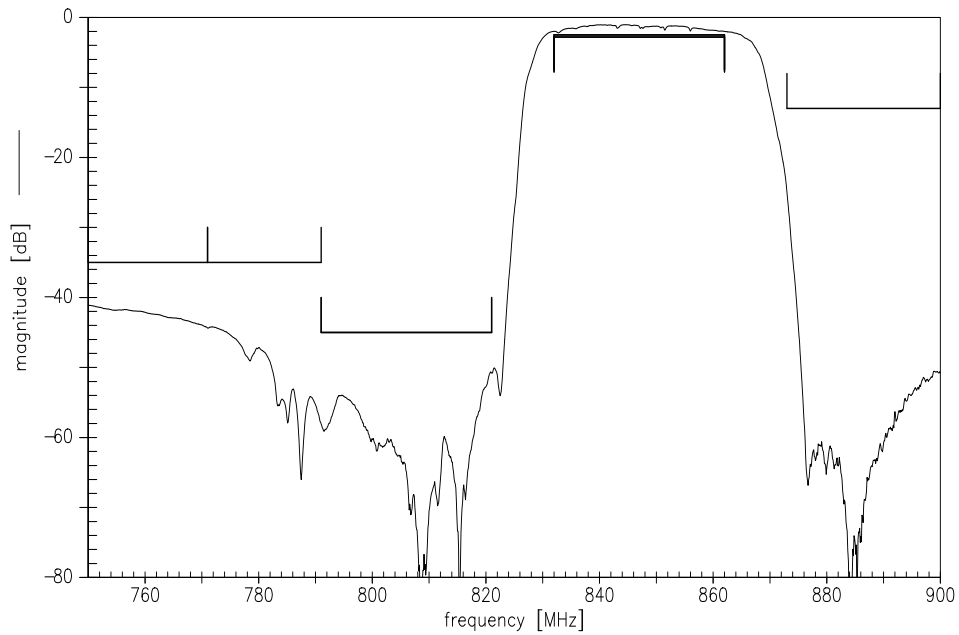
SAW Duplexer

847.0 / 806.0 MHz

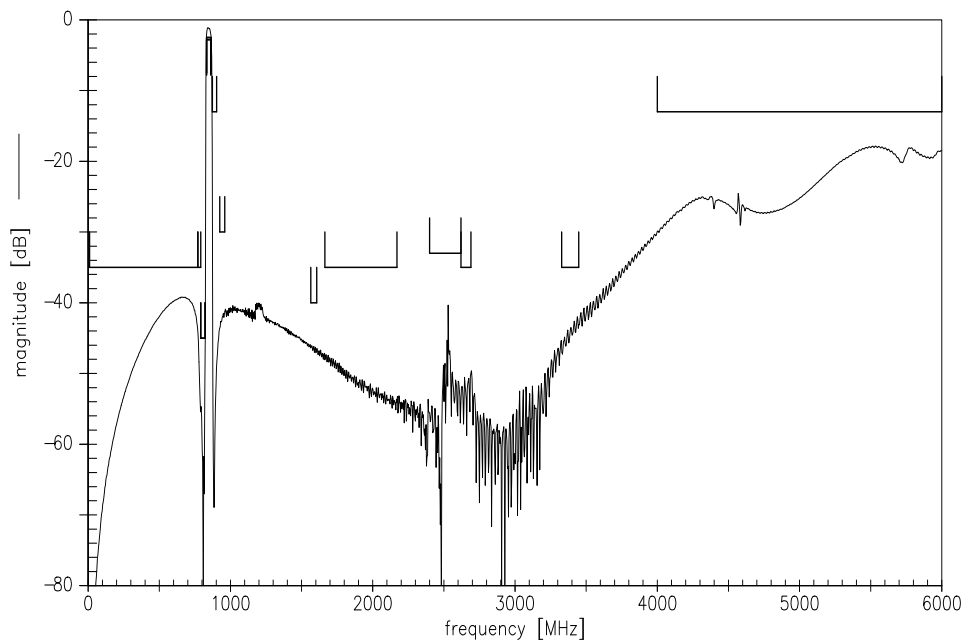
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Frequency Response TX-ANT



Frequency Response TX-ANT



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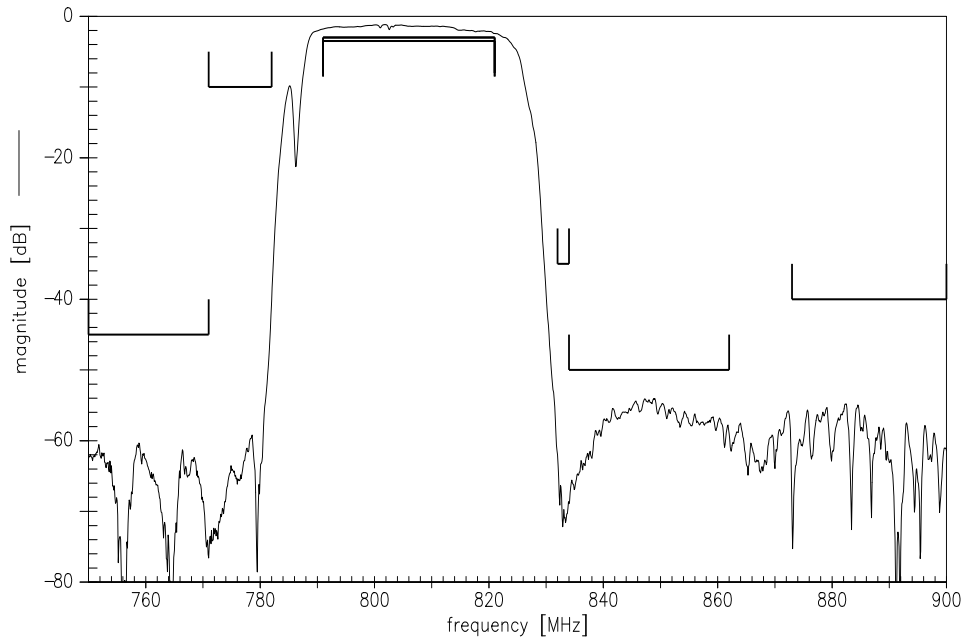
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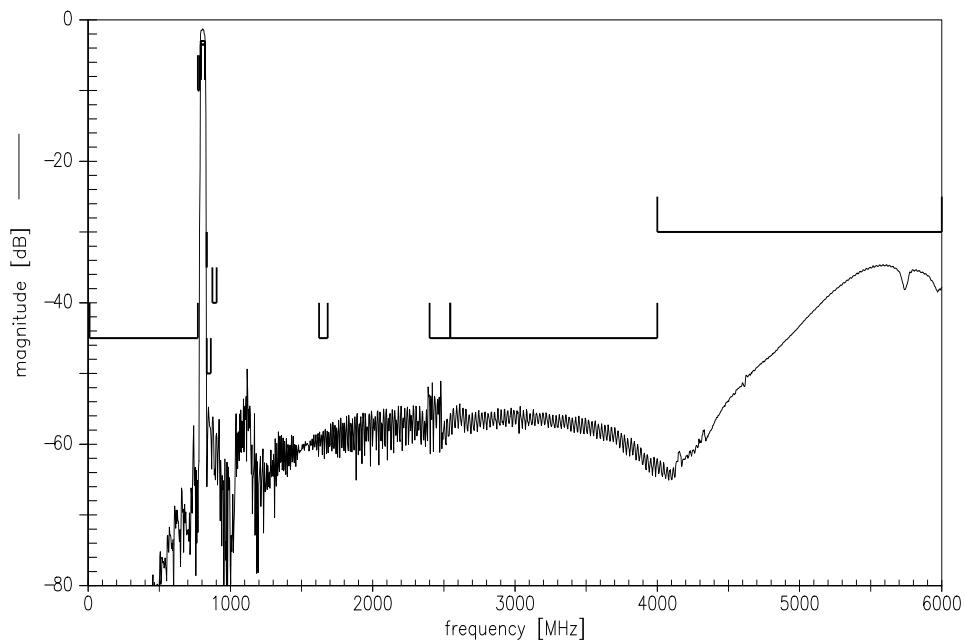
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Frequency Response ANT-RX



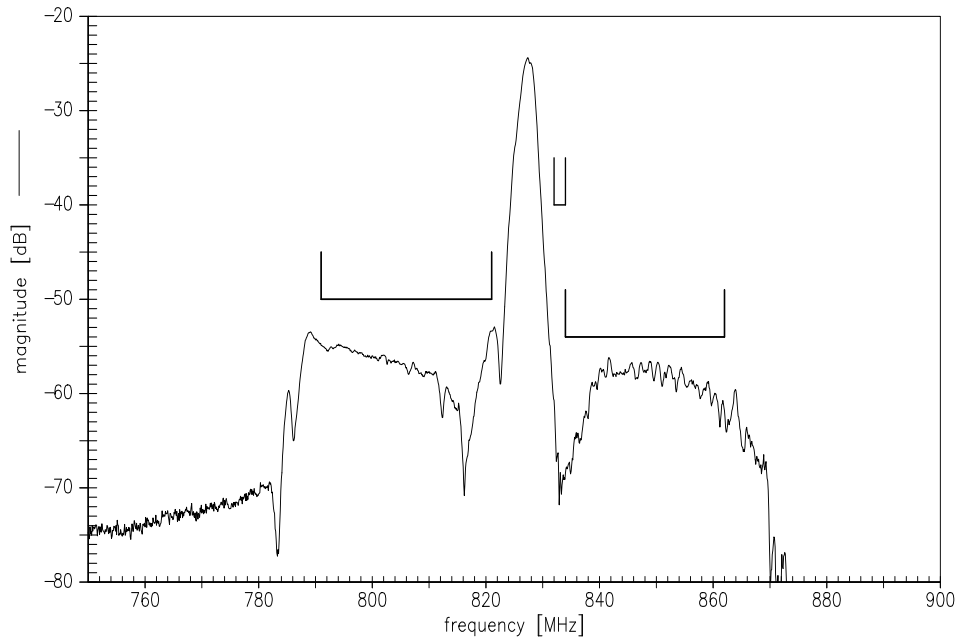
Frequency Response ANT-RX



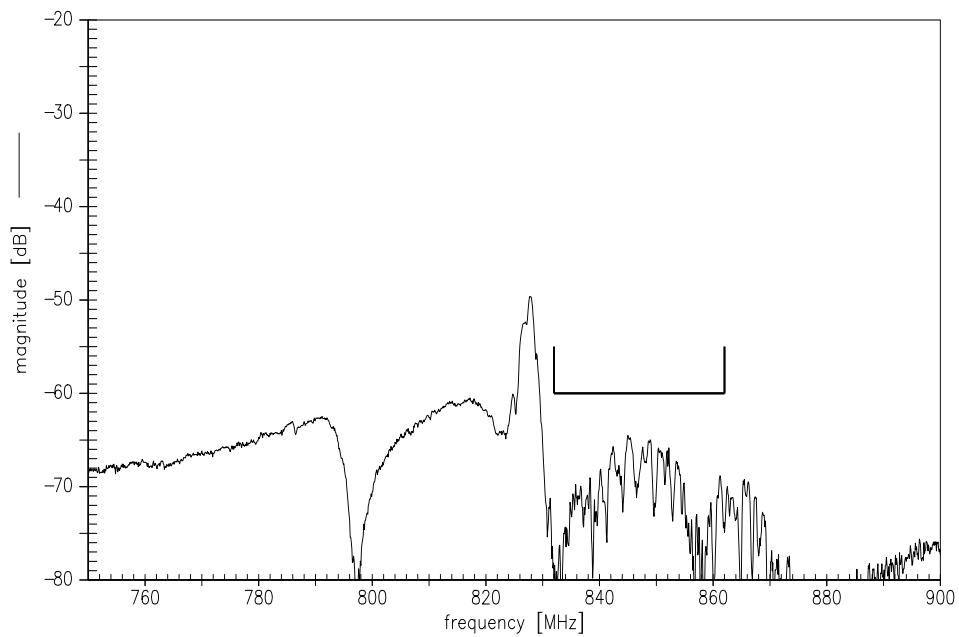
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Frequency Response TX-RX (ISOLATION)



Frequency Response Common Mode Isolation



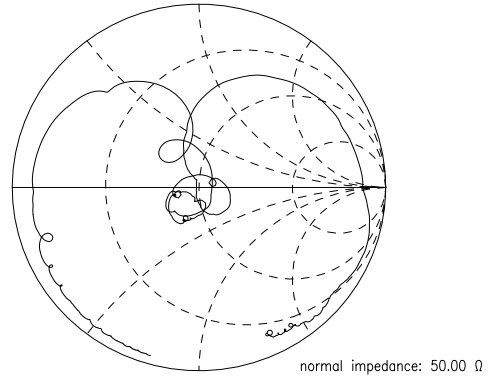
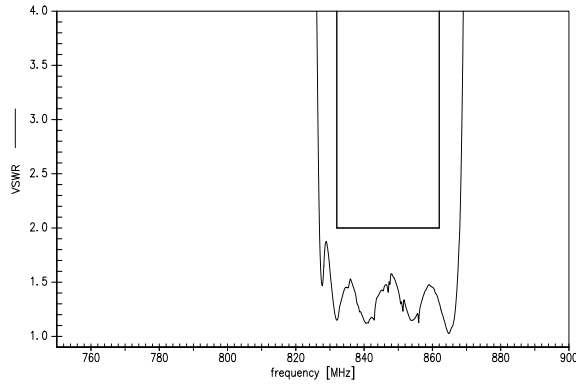
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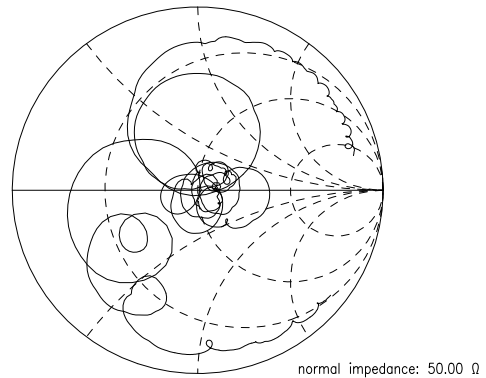
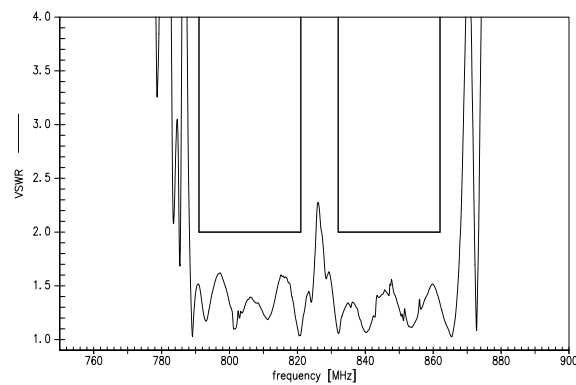
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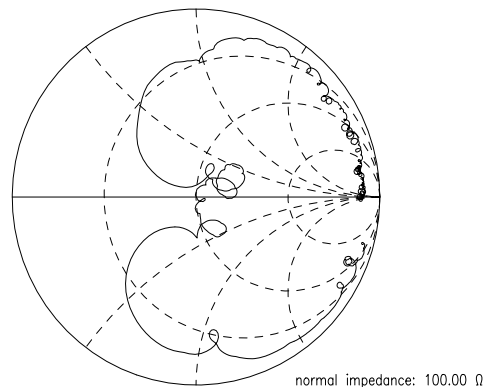
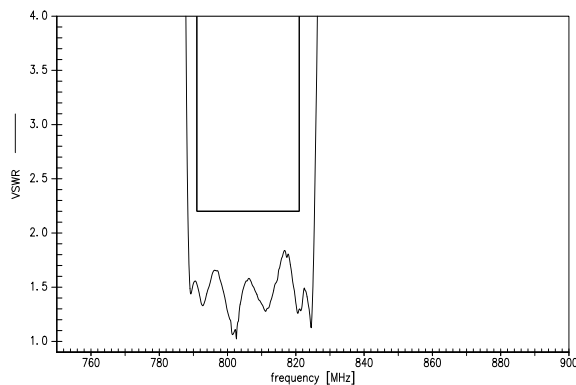
S11 VSWR (TX)



S22 VSWR (ANT)



S33 VSWR (RX)



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References

Type	B8509
Ordering code	B39851B8509P810
Marking and package	C61157-A8-A68
Packaging	F61074-V8259-Z000
Date codes	L_1126
S-parameters	B8509_NB_UN.s4p, B8509_WB_UN.s4p See file header for port/pin assignment table.
Soldering profile	S_6001
RoHS compatible	RoHS-compatible means that products are compatible with the requirements according to Art. 4 (substance restrictions) of Directive 2011/65/EU of the European Parliament and of the Council of June 8 th , 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("Directive") with due regard to the application of exemptions as per Annex III of the Directive in certain cases.
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

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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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10 March 08, 2013



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