SAW Components

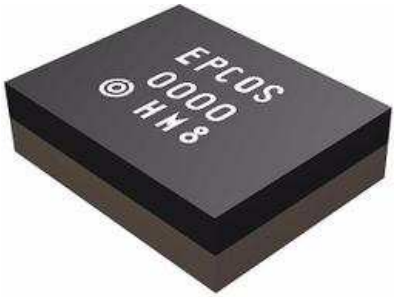
SAW Duplexer

LTE Band 20

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

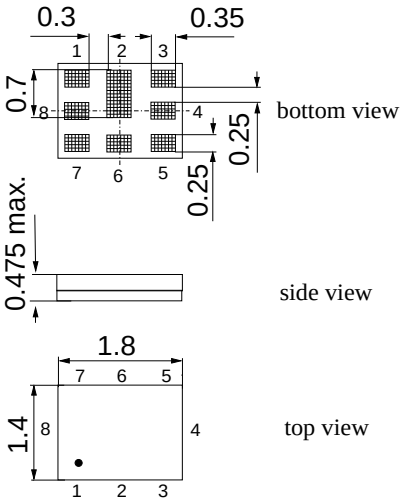
Application

- 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 **S**urface **M**ount **T**echnology (**SMT**)
- Ni, Au-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- **M**oisture **S**ensitivity **L**evel **3**



Pin configuration

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

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 teminating 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

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 teminating 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)	Δα				
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

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 teminating 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
elsewhere	P_{in}	10	dBm	55 ˚C, 50000h

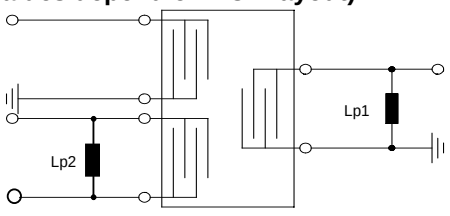
1) 168h Damp Heat Steady State acc. to IEC60068-2-67 Cy

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.

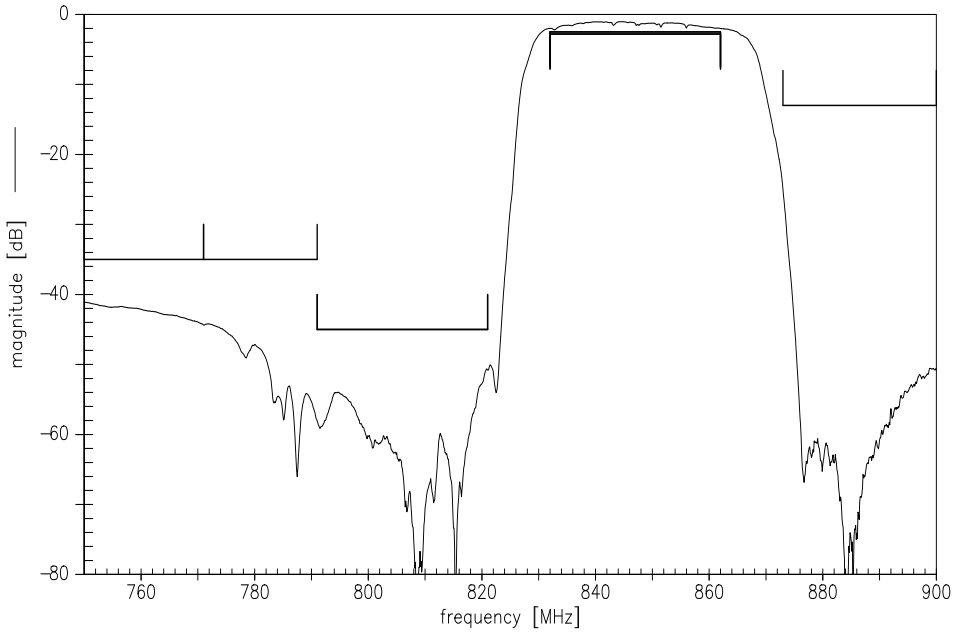
4) Acc. to JESD22-C101C (CDM - Fiel Inducted Charged Device Model), 3 negative & 3 positive pulses.

Matching network (element values depend on PCB layout)

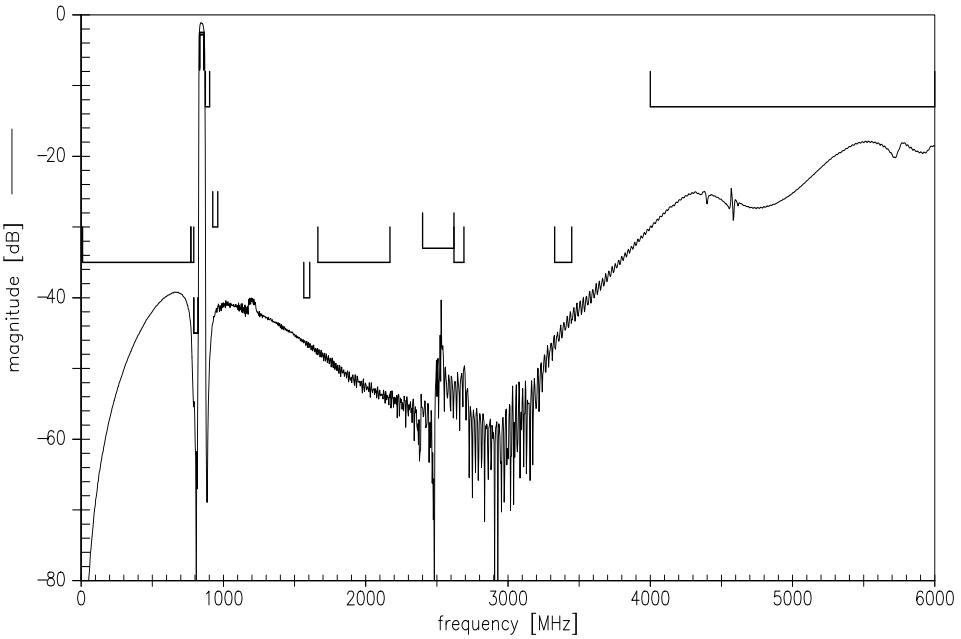


Lp1=11nH, Lp2 =47nH

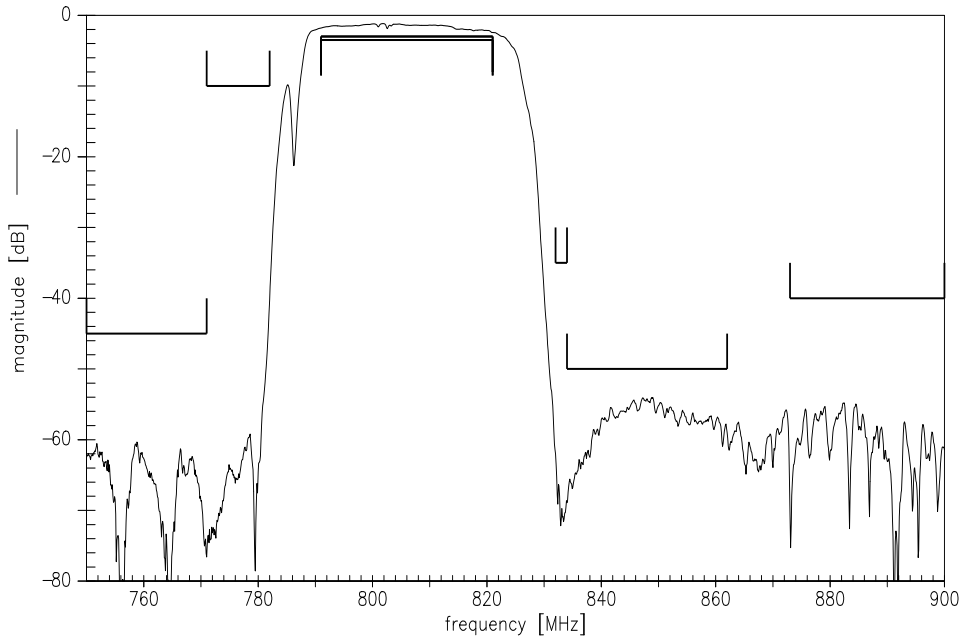
Frequency Response TX-ANT



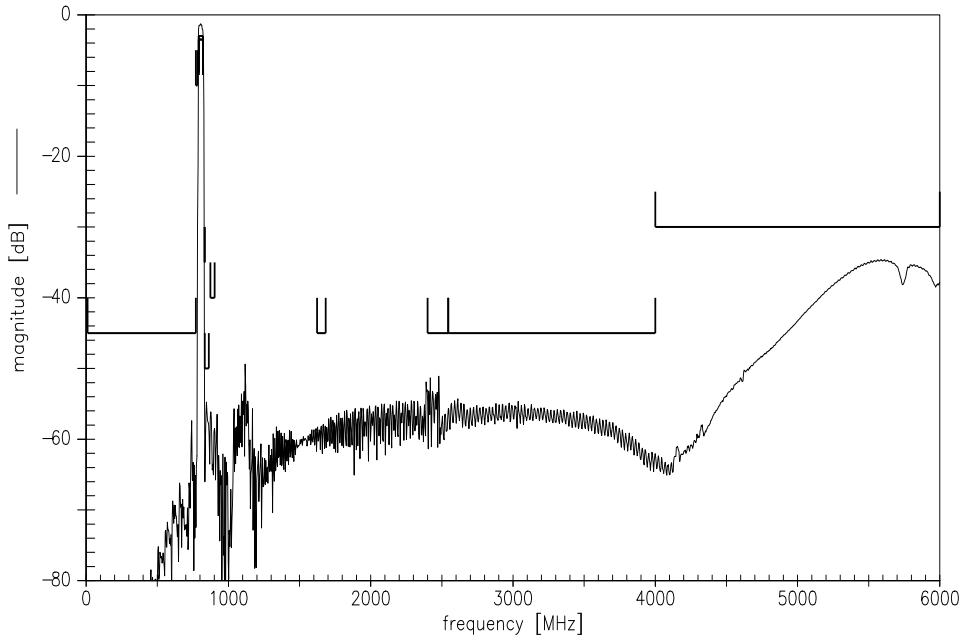
Frequency Response TX-ANT



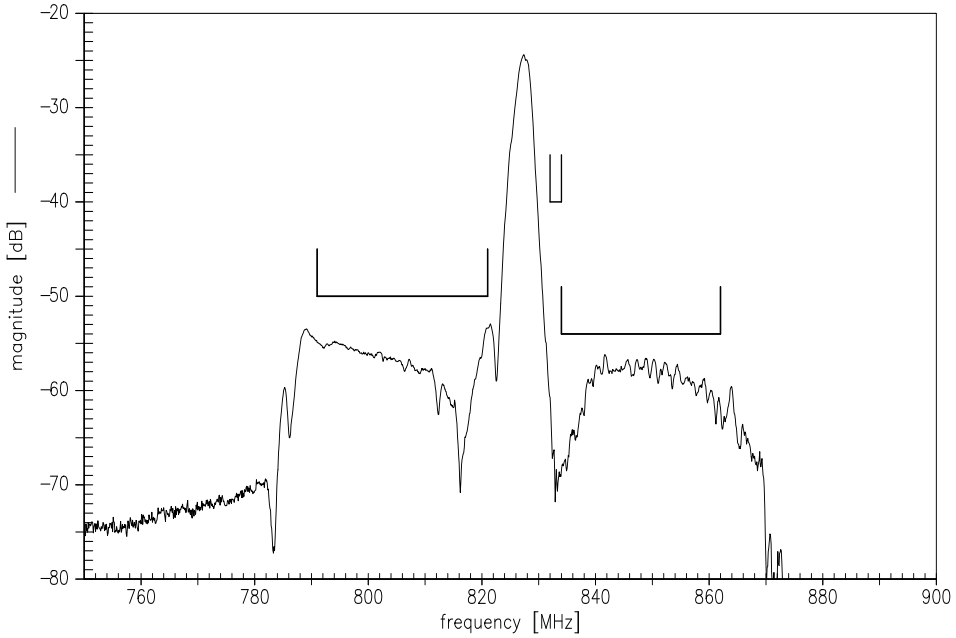
Frequency Response ANT-RX



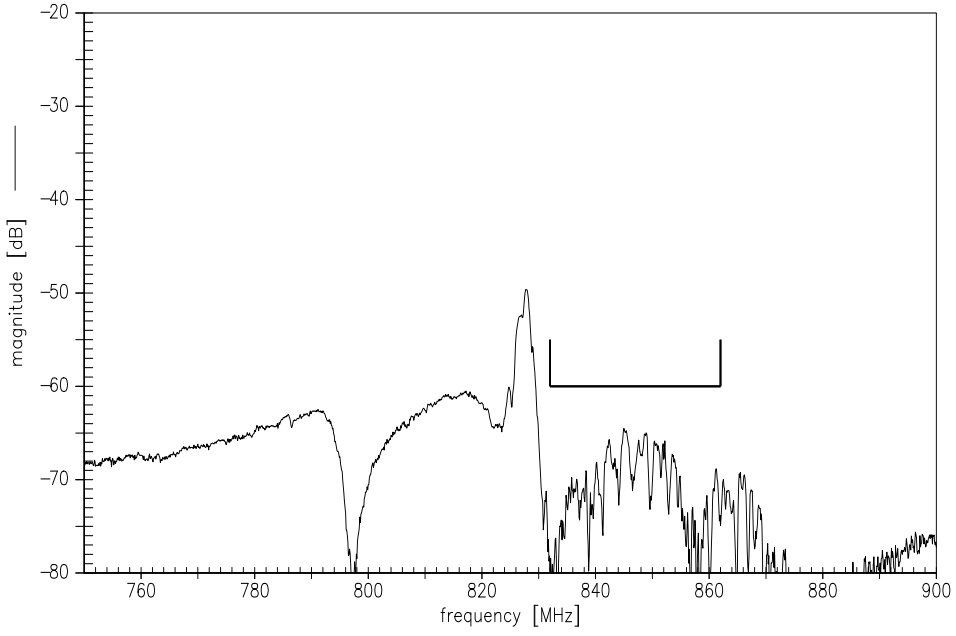
Frequency Response ANT-RX



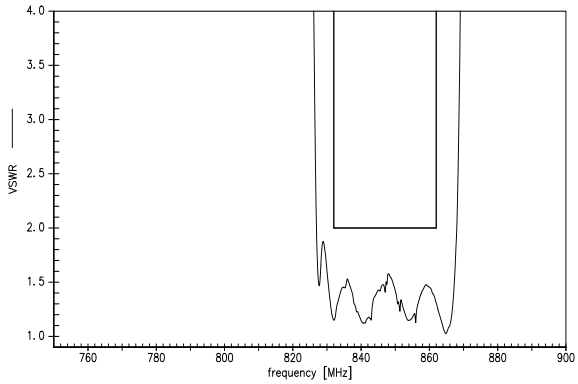
Frequency Response TX-RX (ISOLATION)

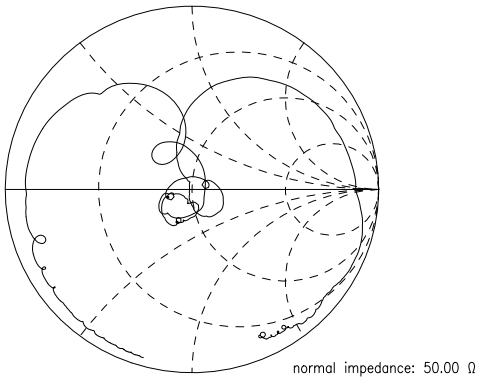


Frequency Response Common Mode Isolation

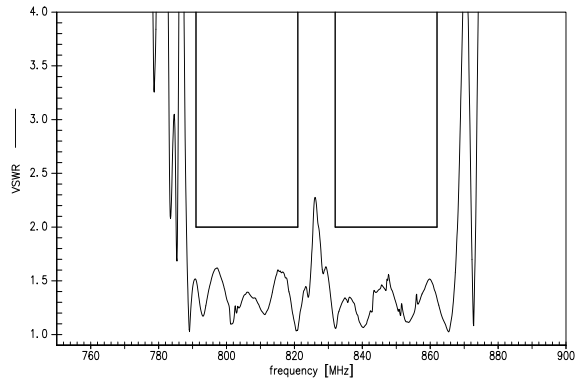


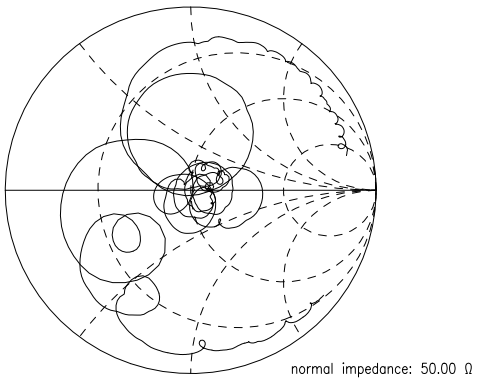
S11 VSWR (TX)



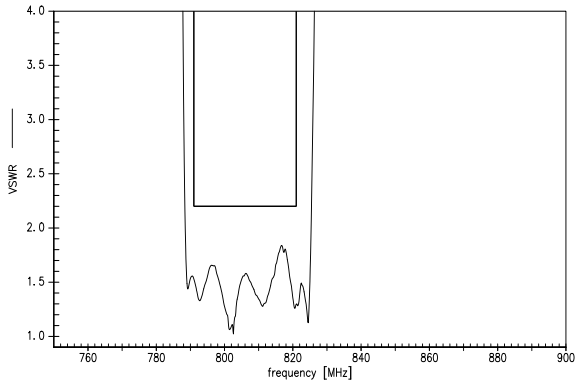


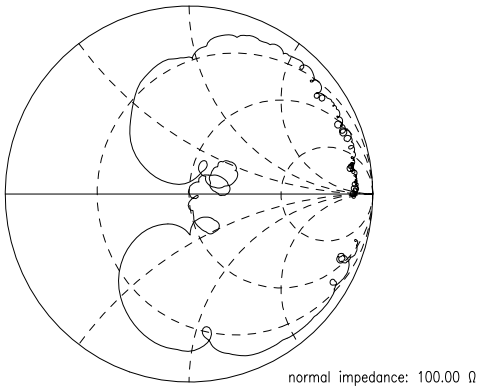
S22 VSWR (ANT)





S33 VSWR (RX)





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 8th, 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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