SAW Components

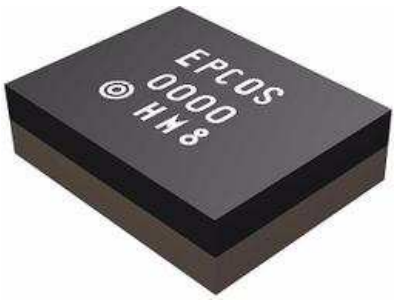
SAW Duplexer

LTE Band 13

Series/type:	**B8511**
Ordering code:	**B39781B8511P810**
Date:	April 03, 2013
Version:	2.0

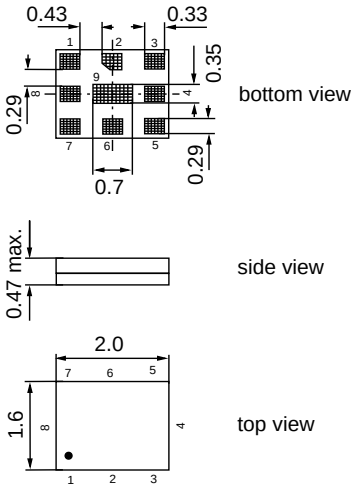
Application

- Low-loss SAW duplexer for mobile telephone LTE Band 13 systems
- Low insertion attenuation
- High isolation
- Usable passband 10 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



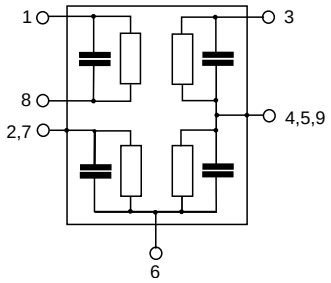
Features

- Package size 2.0 * 1.6 * 0.47 mm³
- RoHS compatible
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, Au-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- Moisture Sensitivity Level 3



Pin configuration

■	3	Tx input
■	1, 8	Rx output (balanced)
■	6	Antenna
■	2, 4, 5, 7, 9	To be grounded



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 || 15 nH
RX teminating impedance: Z_{Rx} = 100 Ω (balanced)

Characteristics Tx-Antenna		min.	typ. @ 25 ˚C	max.	
Center frequency	f_c	—	782.0	—	MHz
Maximum insertion attenuation	α				
777.0 ... 787.0 MHz		—	1.8	2.5	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
777.0 ... 787.0 MHz		—	0.6	1.5	dB
Error Vector Magnitude @ 25˚C					
@ $f_{Carrier}$ 779.4 ... 784.6 MHz	EVM[1)]	—	2.0	2.7	%
Error Vector Magnitude					
@ $f_{Carrier}$ 779.4 ... 784.6 MHz	EVM[2)]	—	2.0	4.0	%
Input VSWR (Tx port)					
777.0 ... 787.0 MHz		—	1.4	2.0	
Output VSWR (Ant Port)					
777.0 ... 787.0 MHz		—	1.5	2.0	

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

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 || 15 nH
RX teminating impedance: Z_{Rx} = 100 Ω (balanced)

Characteristics Tx-Antenna				min.	typ. @ 25 ˚C	max.	
Absolute attenuation			α				
10.0	...	716.0	MHz	35	43	—	dB
716.0	...	728.0	MHz	40	46	—	dB
728.0	...	746.0	MHz	40	47	—	dB
746.0	...	756.0	MHz	50	65	—	dB
758.0	...	767.0	MHz	35	46	—	dB
767.0	...	768.0	MHz	26	46	—	dB
768.0	...	769.0	MHz	12	46	—	dB
769.0	...	770.0	MHz	6	35	—	dB
770.0	...	771.0	MHz	3	22	—	dB
771.0	...	772.0	MHz	2.5	11	—	dB
808.0	...	869.0	MHz	20	30	—	dB
869.0	...	894.0	MHz	35	41	—	dB
1554.0	...	1565.0	MHz	45	51	—	dB
1565.0	...	1607.0	MHz	45	51	—	dB
1805.0	...	2170.0	MHz	35	54	—	dB
2331.0	...	2361.0	MHz	35	46	—	dB
2400.0	...	2484.0	MHz	40	50	—	dB
3108.0	...	3148.0	MHz	30	42	—	dB
3885.0	...	3935.0	MHz	20	28	—	dB
4662.0	...	4722.0	MHz	10	17	—	dB
5160.0	...	5845.0	MHz	10	16	—	dB

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 || 15 nH
RX teminating impedance: Z_{Rx} = 100 Ω (balanced)

Characteristics Antenna-Rx		min.	typ. @ 25 ˚C	max.	
Center frequency	f_c	—	751.0	—	MHz
Maximum insertion attenuation	α				
746.0 ... 756.0 MHz		—	1.6	2.2	dB
Amplitude ripple (p-p)	Δα				
746.0... 756.0 MHz		—	0.4	1.2	dB
Input VSWR (Ant port)					
746.0 ... 756.0 MHz		—	1.4	2.0	
Output VSWR (Rx Port)					
747.0 ... 756.0 MHz		—	1.5	2.0	
Common mode rejection ratio					
746.0 ... 756.0 MHz		25	31	—	dB
Absolute attenuation	α				
10.0 ... 650.0 MHz		50	66	—	dB
650.0 ... 730.0 MHz		35	44	—	dB
730.0 ... 736.0 MHz		30	43	—	dB
777.0 ... 787.0 MHz		55	61	—	dB
793.0 ... 805.0 MHz		40	53	—	dB
805.0 ... 2400.0 MHz		40	50	—	dB
2400.0 ... 2484.0 MHz		40	57	—	dB
2484.0 ... 4500.0 MHz		40	54	—	dB
4500.0 ... 6000.0 MHz		35	42	—	dB

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 || 15 nH
RX teminating impedance: Z_{Rx} = 100 Ω (balanced)

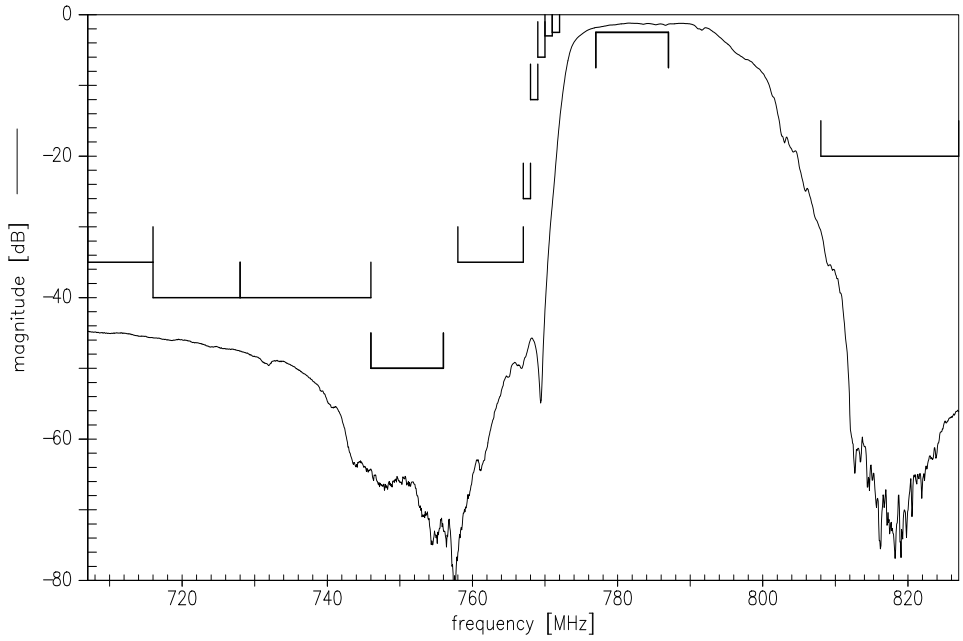
Characteristics Tx-Rx		min.	typ. @ 25 ˚C	max.	
Attenuation	α				
746.5 ... 752.0 MHz		54	59	—	dB
752.0 ... 755.5 MHz		54	59	—	dB
777.0 ... 787.0 MHz		58	63	—	dB
1552.0 ... 1574.0 MHz		30	74	—	dB
2328.0 ... 2361.0 MHz		30	67	—	dB
3104.0 ... 3148.0 MHz		30	64	—	dB
Common mode attenuation	α				
777.0 ... 787.0 MHz		60	65	—	dB

Maximum Ratings

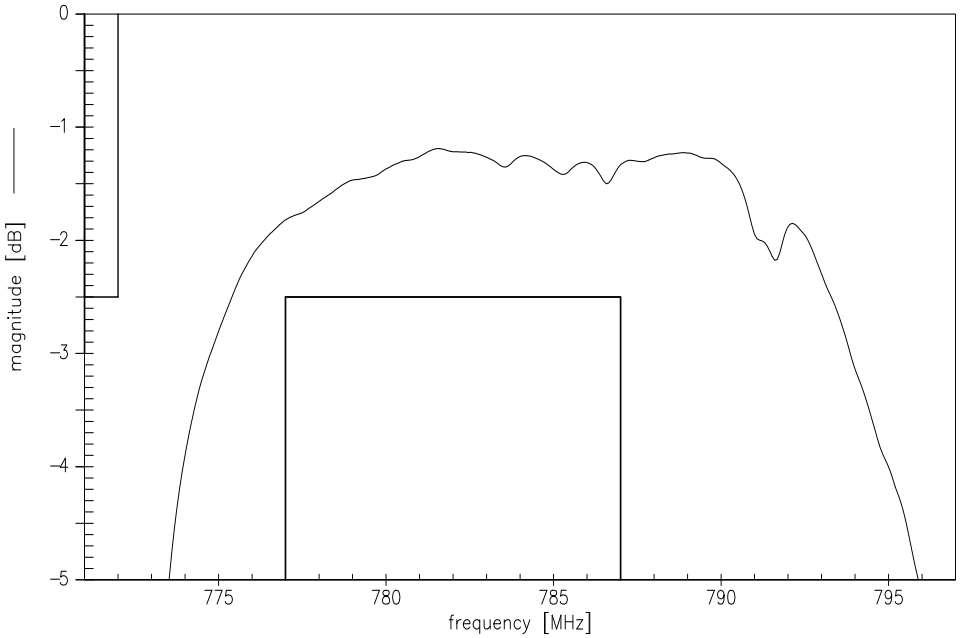
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5[1)]	V	
ESD voltage	V_{ESD}	100[2)]	V	Machine Model
ESD voltage	V_{ESD}	200[3)]	V	Human Body Model
ESD voltage	V_{ESD}	600[4)]	V	Charged Device Model
Input power at Tx Port				
777.0 ...787.0 MHz	P_{in}	29	dBm	} CW
elsewhere	P_{in}	10	dBm	} 50 ˚C, 5,000h

1) 168h Damp Heat Steady State acc. to IEC 60068-2-67 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.

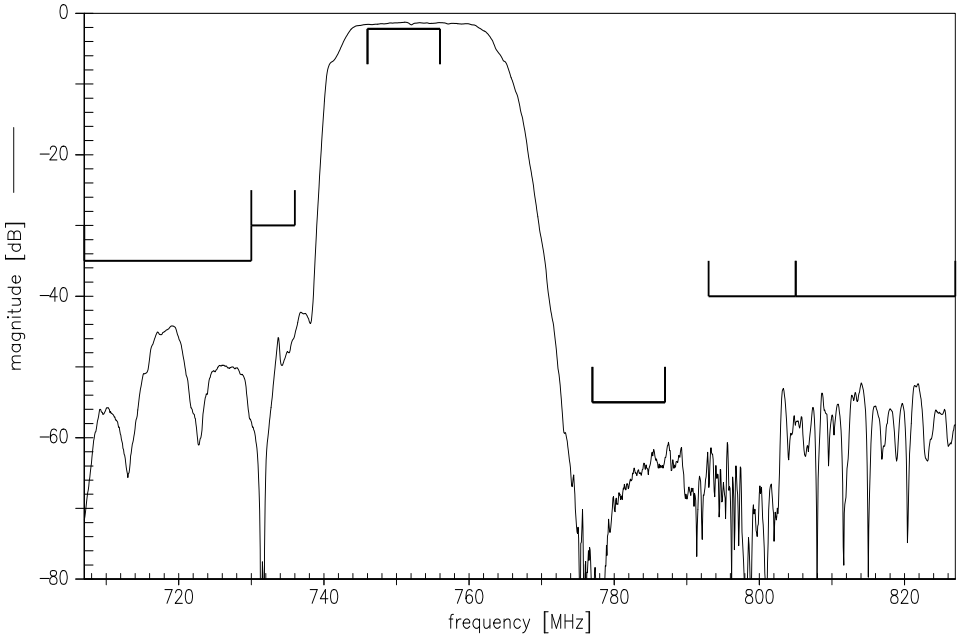
Frequency Response TX-ANT



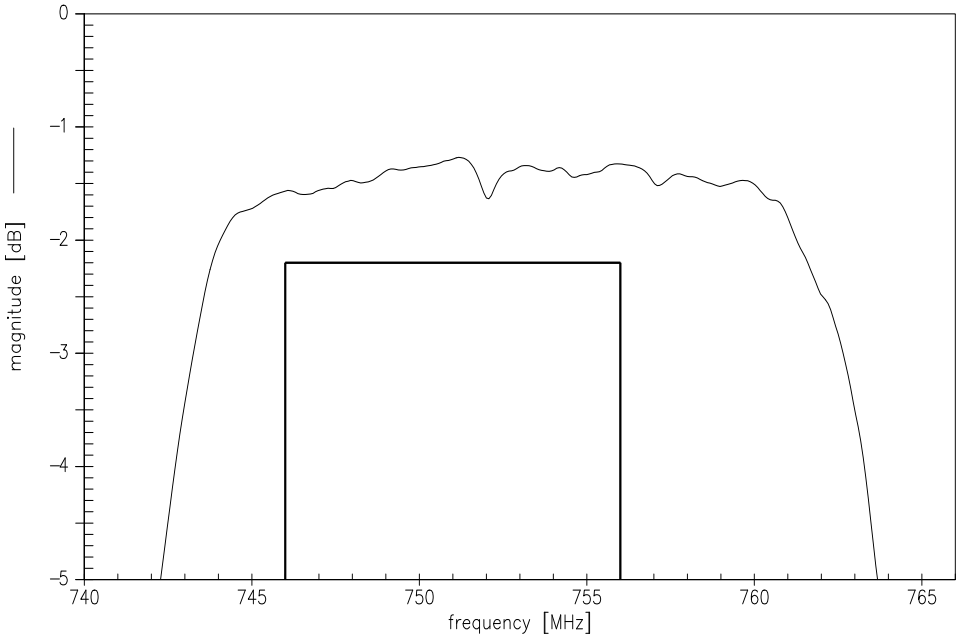
Frequency Response TX-ANT



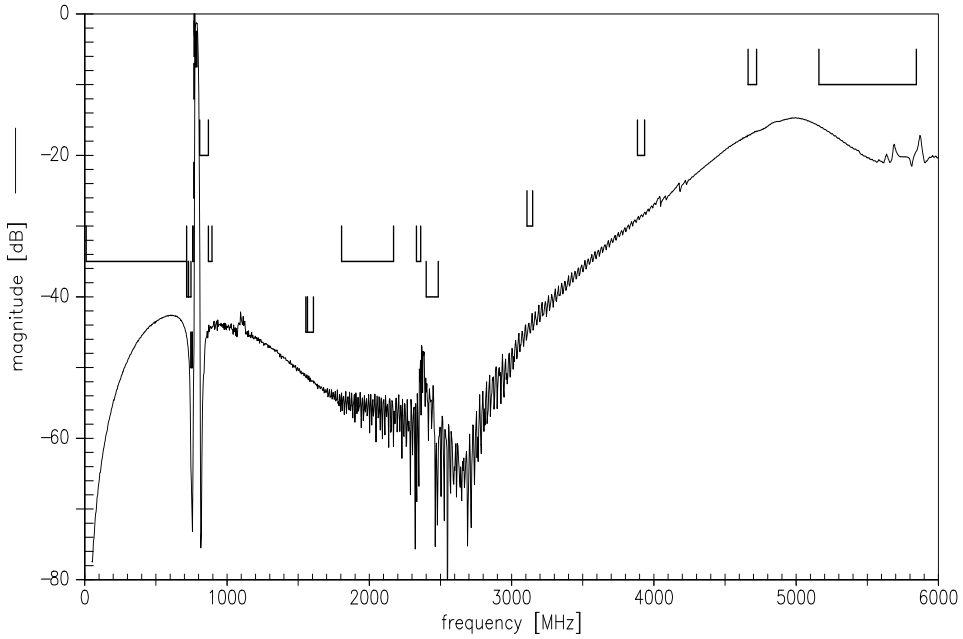
Frequency Response RX-ANT



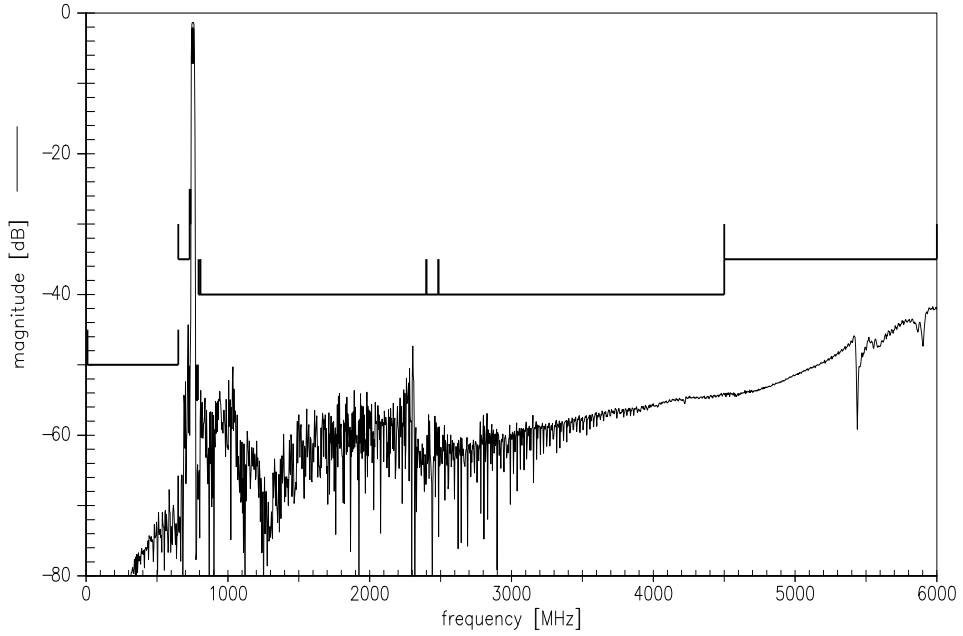
Frequency Response RX-ANT



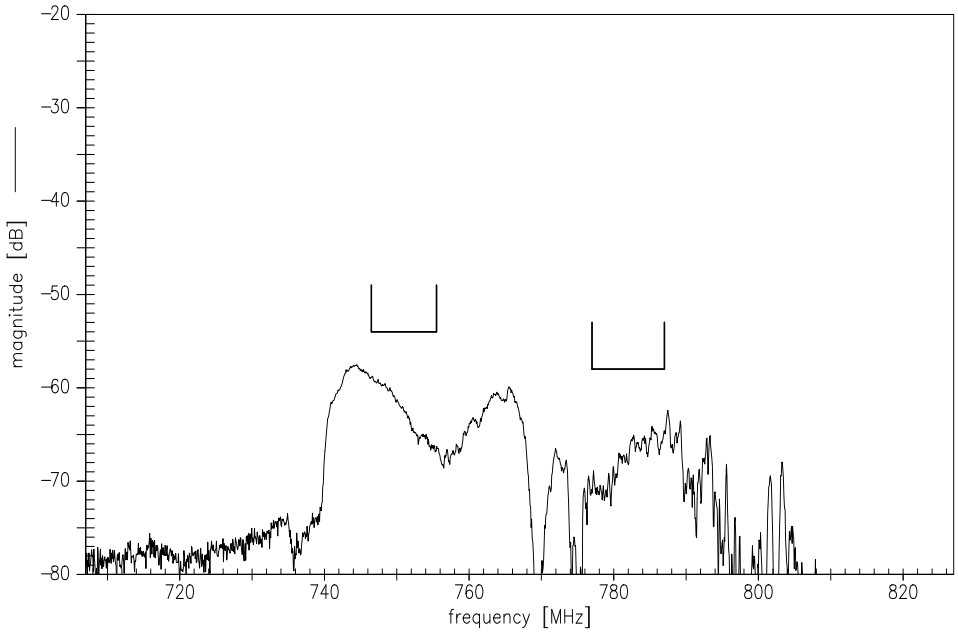
Frequency Response ANT-TX



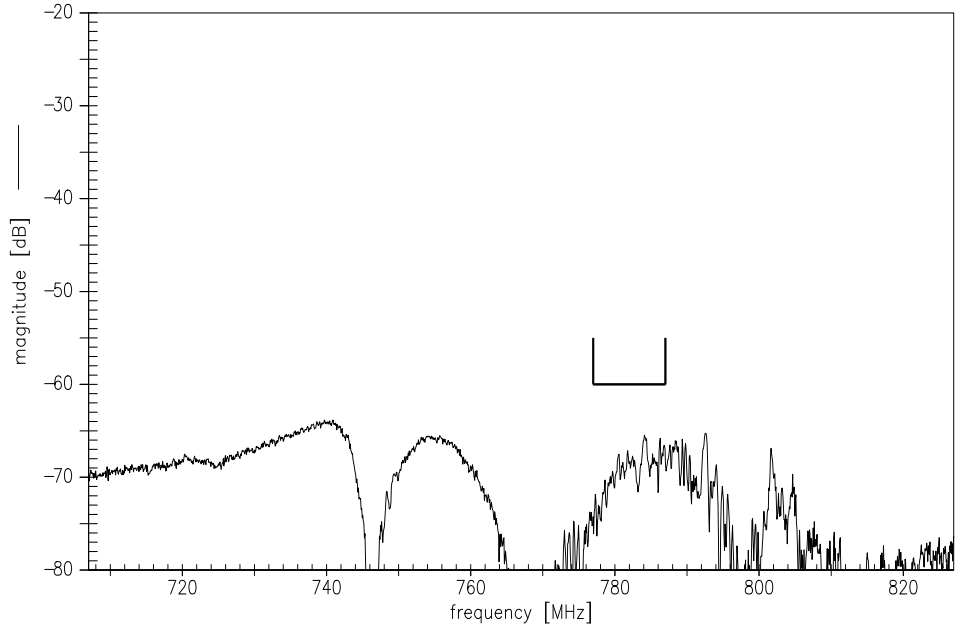
Frequency Response ANT-RX



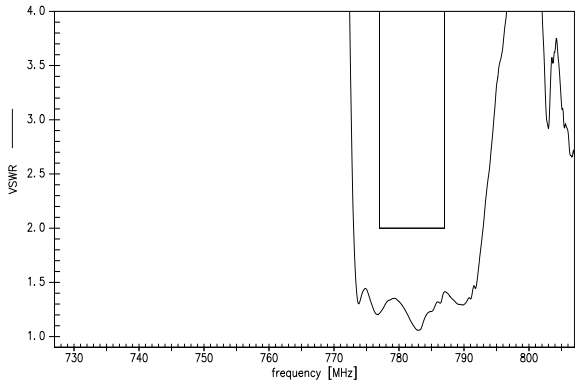
Frequency Response TX-RX (Isolation)

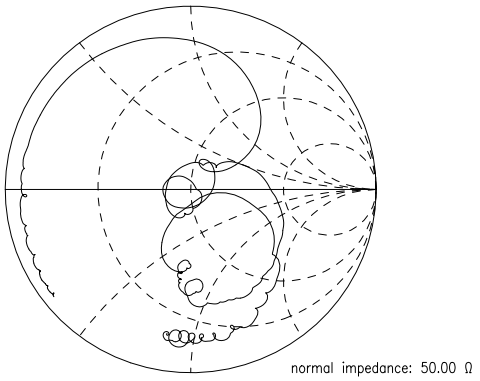


Frequency Response Common Mode Isolation

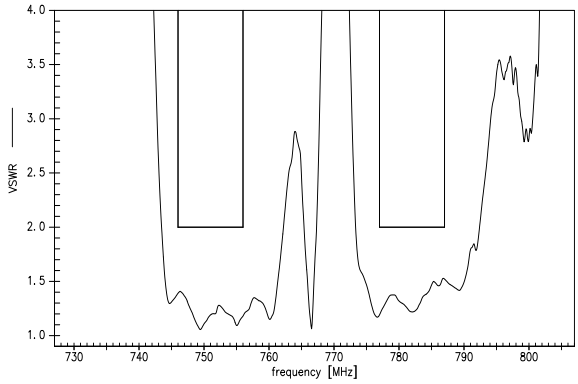


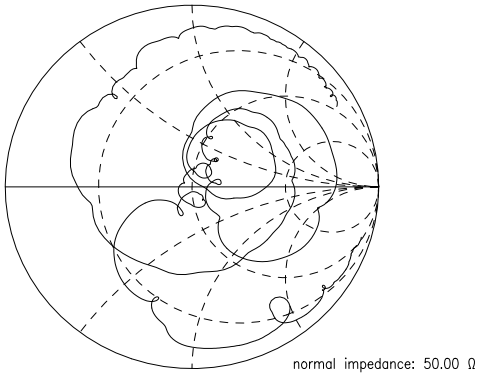
S11 VSWR (TX)



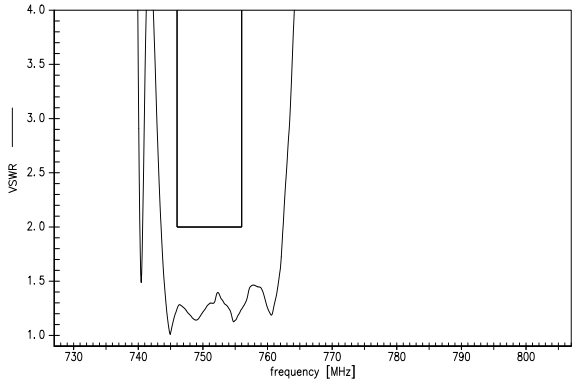


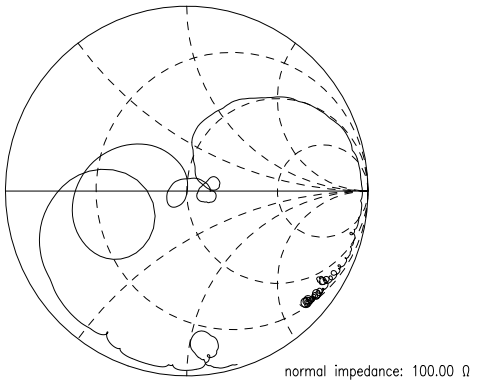
S22 VSWR (ANT)





S33 VSWR (RX)





References

Type	B8511
Ordering code	B39781B8511P810
Marking and package	C61157-A8-A77
Packaging	F61074-V8247-Z000
Date codes	L_1126
S-parameters	B8511_NB_UN.s4p, B8511_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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