SAW Components

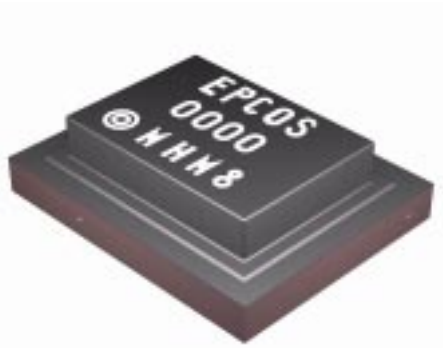
SAW Duplexer

LTE Band 13

Series/type:	**B7677**
Ordering code:	**B39781B7677A710**
Date:	March 21, 2011
Version:	2.1

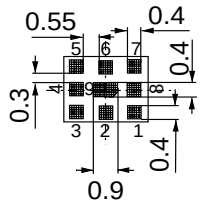
Application

- Low-loss SAW duplexer for mobile telephone W-CDMA 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

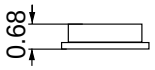


Features

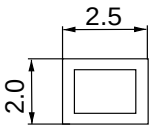
- Package size 2.5 * 2.0 * 0.68 mm^3
- RoHS compatible
- Approximate weight 0.013g
- Package for **S**urface **M**ount **T**echnology (**SMT**)
- Ni, Au-plated terminals
- **E**lectrostatic **S**ensitive **D**evice (**ESD**)
- MSL 3



bottom view



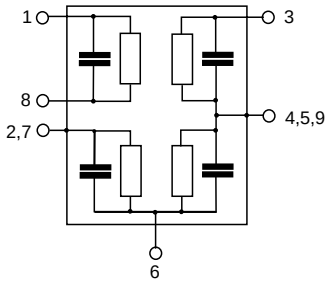
side view



top view

Pin configuration

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



Data sheet SMD

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	2.2[1)]	dB
777.0 ... 787.0 MHz			1.8	2.5	dB
Amplitude ripple (p-p)	$\Delta\alpha$				
777.0 ... 787.0 MHz			0.5	1.2	dB
Error Vector Magnitude @ 25˚ C					
@ $f_{Carrier}$ 779.4 ... 784.6 MHz	EVM[2)]		1.5	2.1	%
Error Vector Magnitude					
@ $f_{Carrier}$ 779.4 ... 784.6 MHz	EVM		1.5	3.5	%
Input VSWR (Tx port)					
777.0 ... 787.0 MHz			1.3	2.0	
Output VSWR (Ant Port)					
777.0 ... 787.0 MHz			1.5	2.0	

1) In [0 C; +85 C] temperature range
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		30	40		dB
716.0	...	728.0	MHz		40	45		dB
728.0	...	746.0	MHz		30	48		dB
746.0	...	756.0	MHz		45	60		dB
758.0	...	766.0	MHz		30	35		dB
766.0	...	768.0	MHz		27	35		dB
768.0	...	769.0	MHz		12	30		dB
769.0	...	770.0	MHz		6	30		dB
770.0	...	771.0	MHz		3	22		dB
771.0	...	772.0	MHz		2.5	9		dB
800.0	...	808.0	MHz		15	28		dB
808.0	...	869.0	MHz		30	43		dB
869.0	...	894.0	MHz		30	43		dB
1554.0	...	1565.0	MHz		30	48		dB
1565.0	...	1607.0	MHz		45	50		dB
1805.0	...	2170.0	MHz		30	47		dB
2331.0	...	2361.0	MHz		30	42		dB
2400.0	...	2484.0	MHz		35	46		dB
3108.0	...	3148.0	MHz		30	34		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			1.9	2.5	dB
Amplitude ripple (p-p)	Δα				
746.0... 756.0 MHz			0.3	1.0	dB
Input VSWR (Ant port)					
746.0 ... 756.0 MHz			1.6	2.0	
Output VSWR (Rx Port)					
746.0 ... 756.0 MHz			1.6	2.0	
Common mode rejection ratio					
746.0 ... 756.0 MHz		25	28		dB
Absolute attenuation	α				
10.0 ... 650.0 MHz		50	70		dB
650.0 ... 730.0 MHz		35	40		dB
730.0 ... 736.0 MHz		26	42		dB
769.0 ... 775.0 MHz		15	36		dB
777.0 ... 787.0 MHz		50	59		dB
793.0 ... 805.0 MHz		45	60		dB
805.0 ... 2000.0 MHz		45	57		dB
2000.0 ... 3500.0 MHz		40	47		dB
3500.0 ... 6000.0 MHz		23	27		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)

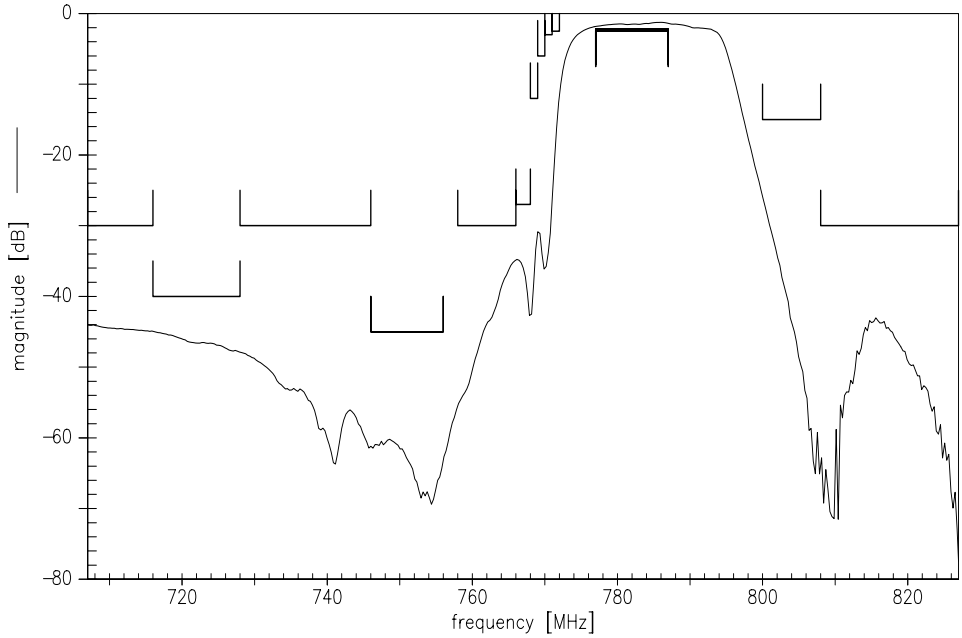
Characteristics Tx-Rx				min.	typ. @ 25 ˚C	max.	
Attenuation			α				
746.5	...	749.0	MHz	50	61		dB
749.0	...	755.5	MHz	55	64		dB
777.0	...	781.0	MHz	60	68		dB
781.0	...	787.0	MHz	58	61		dB
1552.0	...	1574.0	MHz	30	70		dB
2328.0	...	2361.0	MHz	30	65		dB
3104.0	...	3148.0	MHz	30	60		dB
Common mode attenuation			α				
777.0	...	781.0	MHz	60	64		dB
781.0	...	787.0	MHz	57	61		dB

Maximum Ratings

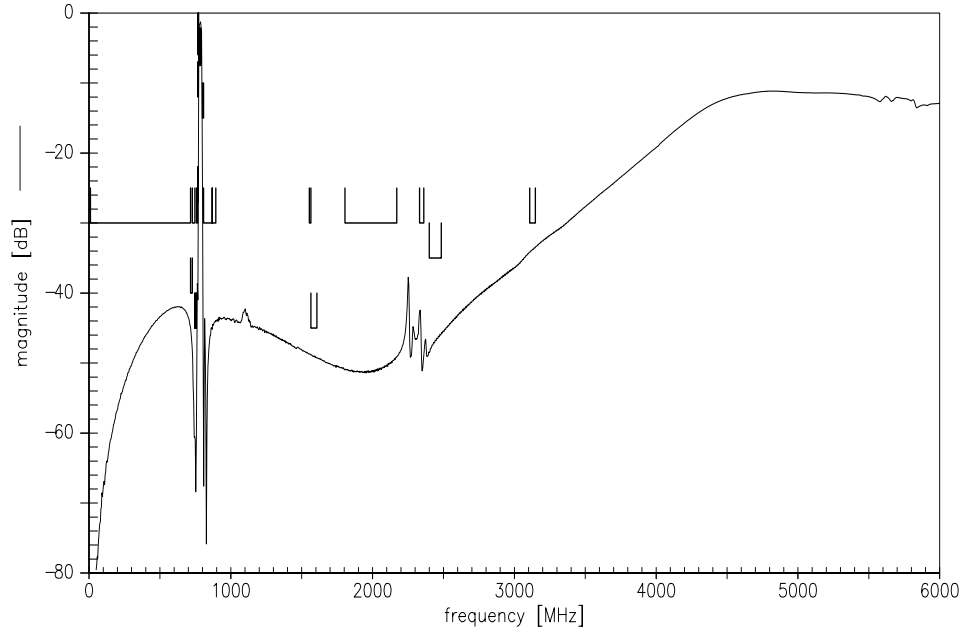
Storage temperature range	T_{stg}	–40/+85	˚C	
DC voltage	V_{DC}	5	V	
ESD voltage	V_{ESD}	100[1)]	V	machine model, 1 pulses
Input power at Tx Port				
779.5 ...784.5.0 MHz	P_{in}	28	dBm	} LTE uplink signal
elsewhere	P_{in}	10	dBm	} 55 ˚C, 50000h

1) According to JESD22-A115A (machine model), 1 negative and 1 positive pulses.

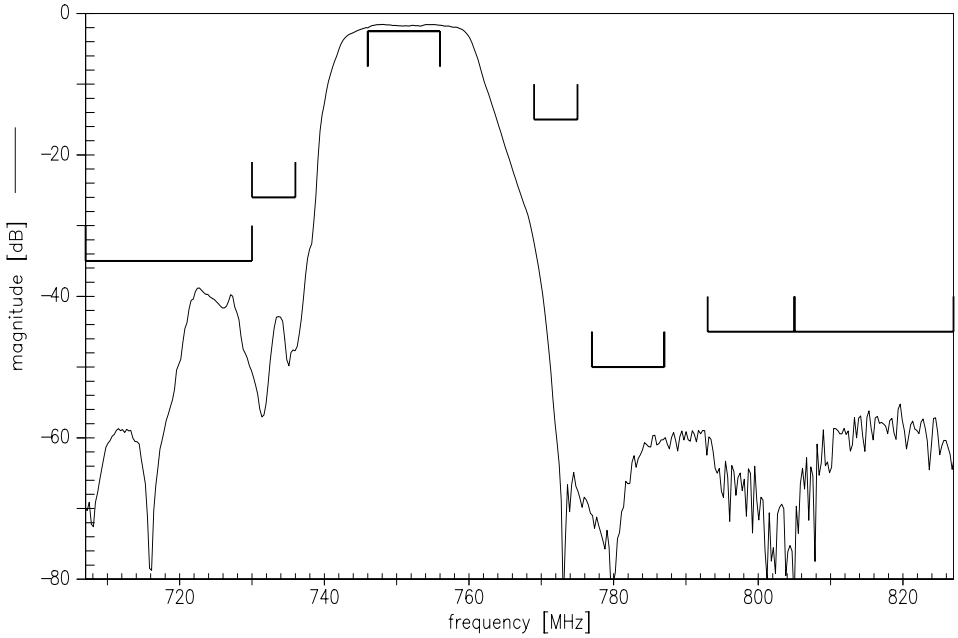
Frequency Response TX-ANT



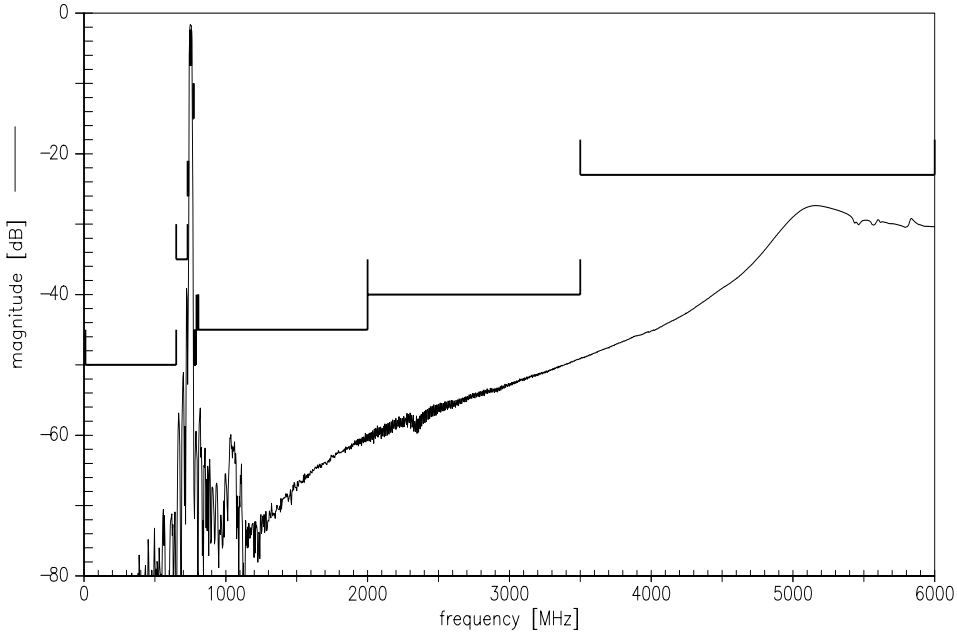
Frequency Response TX-ANT



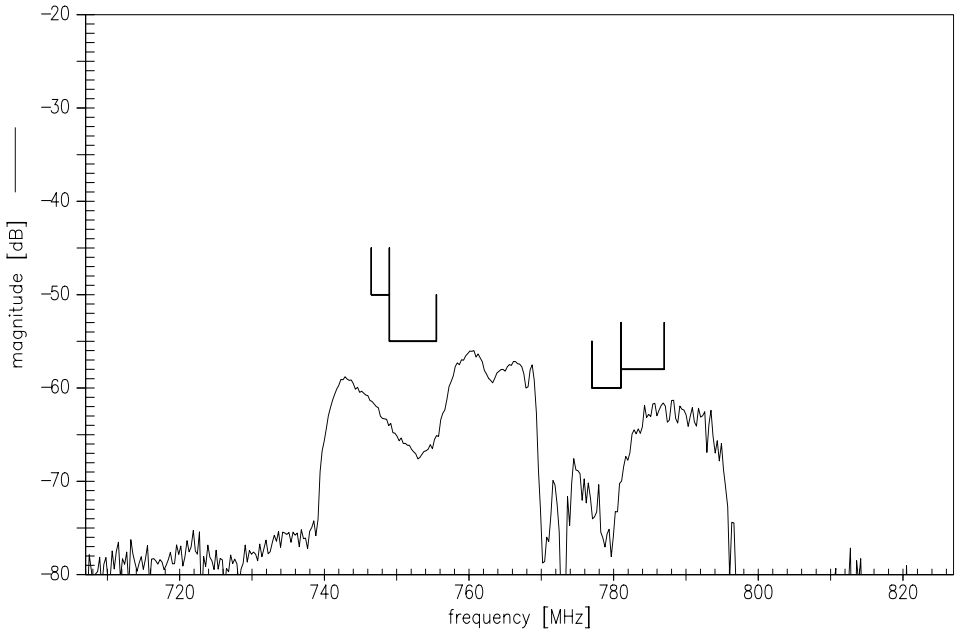
Frequency Response ANT-RX



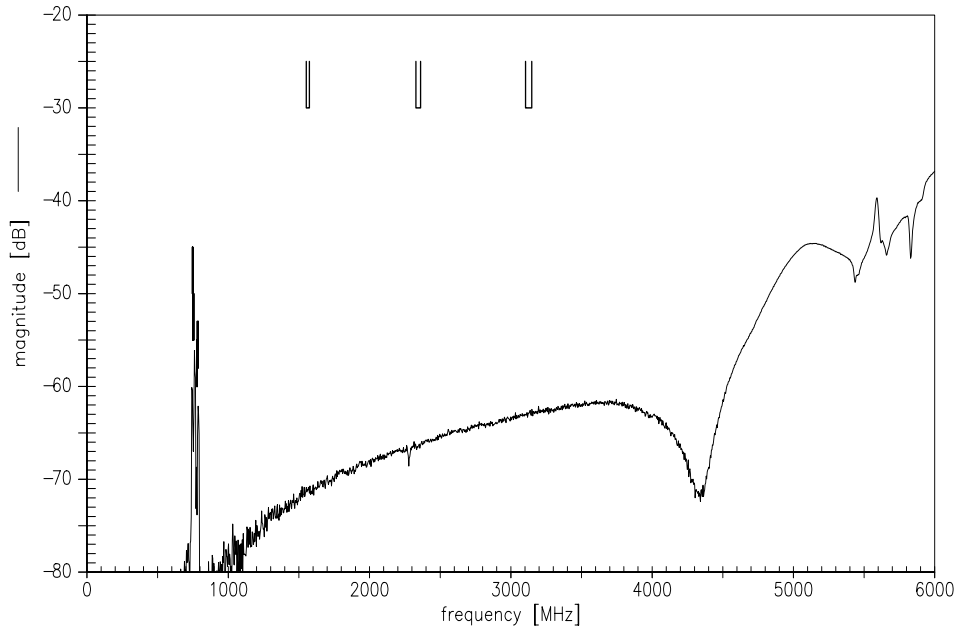
Frequency Response ANT-RX



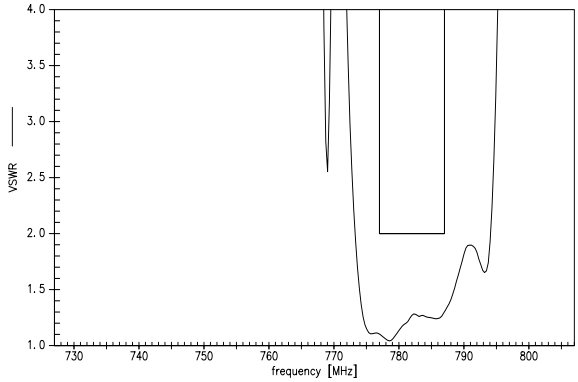
Frequency Response TX-RX

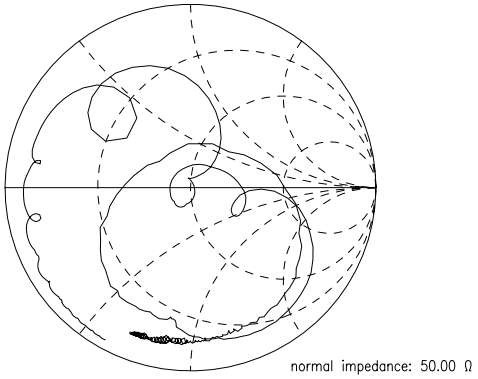


Frequency Response TX-RX

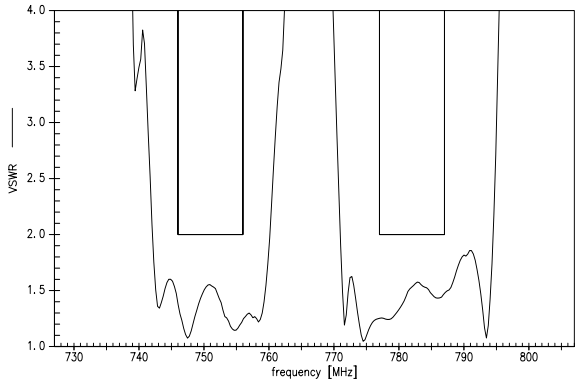


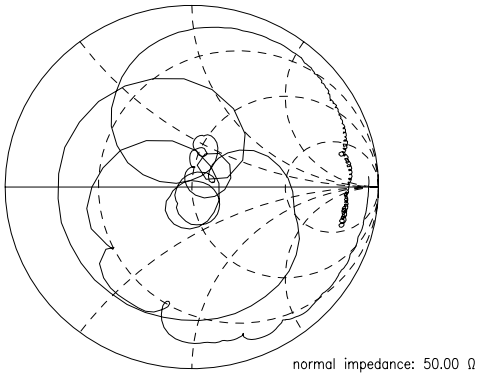
S11 VSWR (TX)



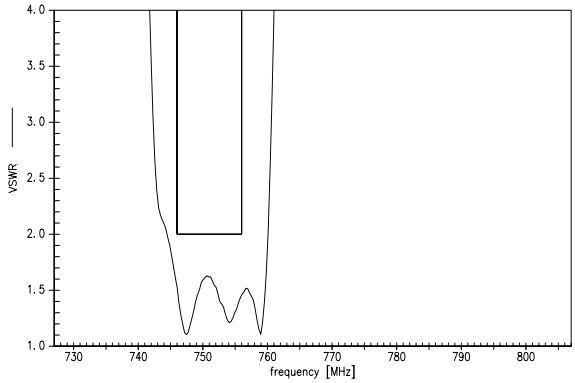


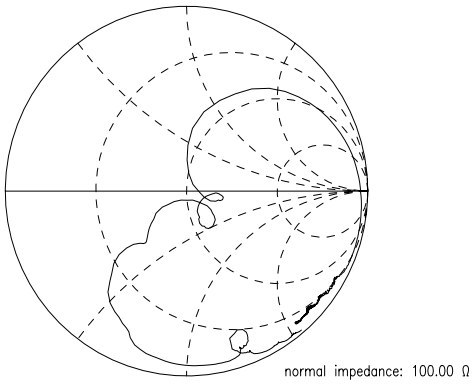
S22 VSWR (ANT)





S33 VSWR (RX)





References

Type	B7677
Ordering code	B39781B7677A710
Marking and package	C61157-A3-A61
Packaging	F611074-V8153-Z000
Date codes	L_1126
S-parameters	B7677_NB.S4P, B7677_WB.S4P
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."
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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