



# **SAW Components**

## **SAW Duplexer**

LTE Band 13

<b>Series/type:</b>	<b>B7677</b>
<b>Ordering code:</b>	<b>B39781B7677A710</b>
<b>Date:</b>	<b>March 21, 2011</b>
<b>Version:</b>	<b>2.1</b>



## SAW Components

B7677

### SAW Duplexer

782.0 / 751.0 MHz

#### Data sheet



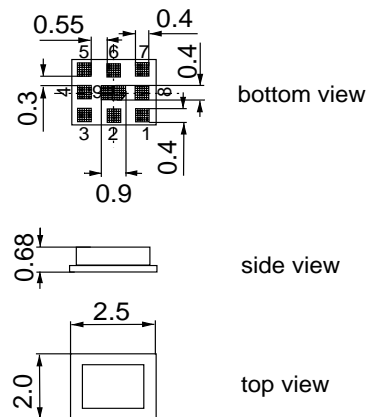
#### Application

- 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  $\Omega$  to 100  $\Omega$  in Antenna-Rx path
- Very small size and low height



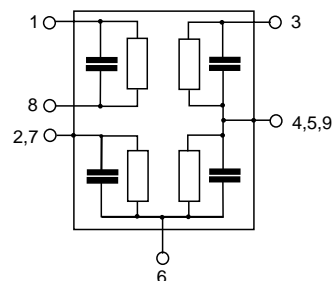
#### Features

- Package size 2.5 \* 2.0 \* 0.68 mm<sup>3</sup>
- RoHS compatible
- Approximate weight 0.013g
- Package for **Surface Mount Technology (SMT)**
- Ni, Au-plated terminals
- **Electrostatic Sensitive Device (ESD)**
- MSL 3



#### Pin configuration

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





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#### Characteristics

Temperature range for specification:	T = -30 °C to +85 °C
TX terminating impedance:	Z <sub>Tx</sub> = 50 Ω
ANT terminating impedance:	Z <sub>Ant</sub> = 50 Ω    15 nH
RX terminating impedance:	Z <sub>Rx</sub> = 100 Ω (balanced)

Characteristics Tx-Antenna				min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>c</sub>				782.0		MHz
<b>Maximum insertion attenuation</b>	α						
777.0 ... 787.0 MHz					1.8	2.2 <sup>1)</sup>	dB
777.0 ... 787.0 MHz					1.8	2.5	dB
<b>Amplitude ripple (p-p)</b>	Δα						
777.0 ... 787.0 MHz					0.5	1.2	dB
<b>Error Vector Magnitude @ 25° C</b>							
@ f <sub>Carrier</sub> 779.4 ... 784.6 MHz	EVM <sup>2)</sup>				1.5	2.1	%
<b>Error Vector Magnitude</b>							
@ f <sub>Carrier</sub> 779.4 ... 784.6 MHz	EVM				1.5	3.5	%
<b>Input VSWR (Tx port)</b>							
777.0 ... 787.0 MHz					1.3	2.0	
<b>Output VSWR (Ant Port)</b>							
777.0 ... 787.0 MHz					1.5	2.0	

<sup>1)</sup> In [0 °C; +85 °C] temperature range

<sup>2)</sup> Error Vector Magnitude (EVM) based on definition in 3GPP TS 25.141



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ANT terminating impedance:	Z <sub>Ant</sub> = 50 Ω    15 nH
RX terminating impedance:	Z <sub>Rx</sub> = 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



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ANT terminating impedance:	Z <sub>Ant</sub> = 50 Ω    15 nH
RX terminating impedance:	Z <sub>Rx</sub> = 100 Ω (balanced)

Characteristics Antenna-Rx	min.	typ. @ 25 °C	max.	
<b>Center frequency</b> $f_c$		751.0		MHz
<b>Maximum insertion attenuation</b> $\alpha$ 746.0 ... 756.0 MHz		1.9	2.5	dB
<b>Amplitude ripple (p-p)</b> $\Delta\alpha$ 746.0... 756.0 MHz		0.3	1.0	dB
<b>Input VSWR (Ant port)</b> 746.0 ... 756.0 MHz		1.6	2.0	
<b>Output VSWR (Rx Port)</b> 746.0 ... 756.0 MHz		1.6	2.0	
<b>Common mode rejection ratio</b> 746.0 ... 756.0 MHz	25	28		dB
<b>Absolute attenuation</b> $\alpha$ 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



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### Characteristics

Temperature range for specification:	$T = -30\text{ °C to }+85\text{ °C}$
TX terminating impedance:	$Z_{Tx} = 50\ \Omega$
ANT terminating impedance:	$Z_{Ant} = 50\ \Omega \parallel 15\text{ nH}$
RX terminating impedance:	$Z_{Rx} = 100\ \Omega\text{ (balanced)}$

Characteristics Tx-Rx				min.	typ. @ 25 °C	max.
<b>Attenuation</b>						
			$\alpha$			
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
<b>Common mode attenuation</b>						
			$\alpha$			
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	machine model, 1 pulses
DC voltage	$V_{DC}$	5	V	
ESD voltage	$V_{ESD}$	100 <sup>1)</sup>	V	
Input power at Tx Port				} LTE uplink signal 55 °C, 50000h
779.5 ... 784.5.0 MHz	$P_{in}$	28	dBm	
elsewhere	$P_{in}$	10	dBm	

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



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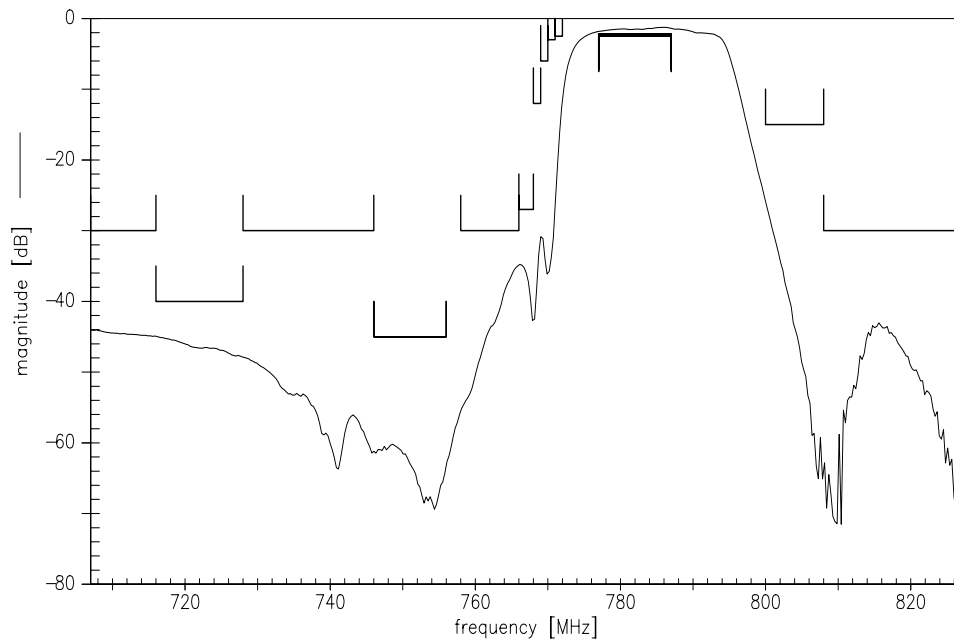
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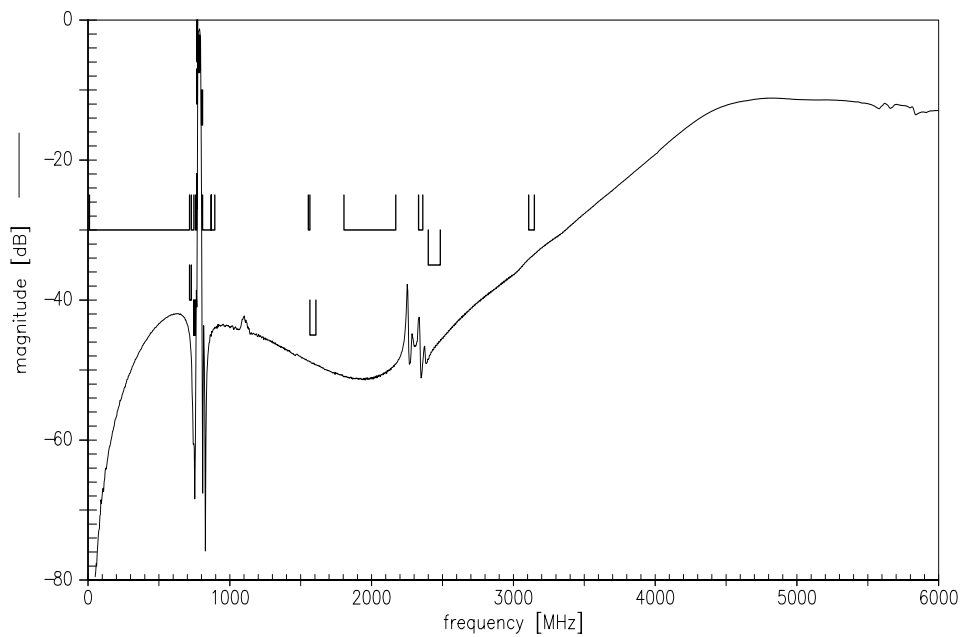
Data sheet



## Frequency Response TX-ANT



## Frequency Response TX-ANT



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



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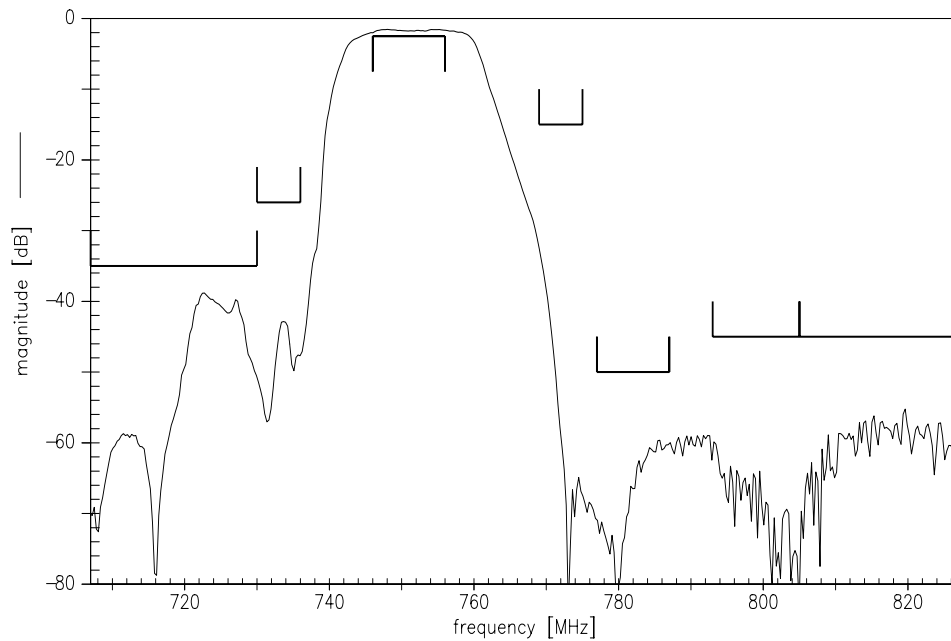
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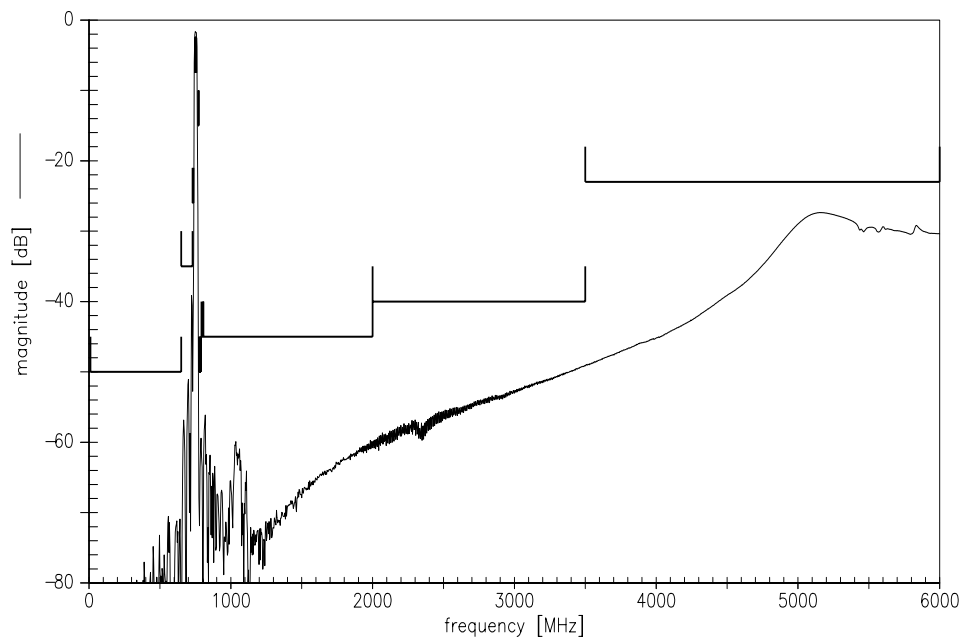
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### Frequency Response ANT-RX



### Frequency Response ANT-RX



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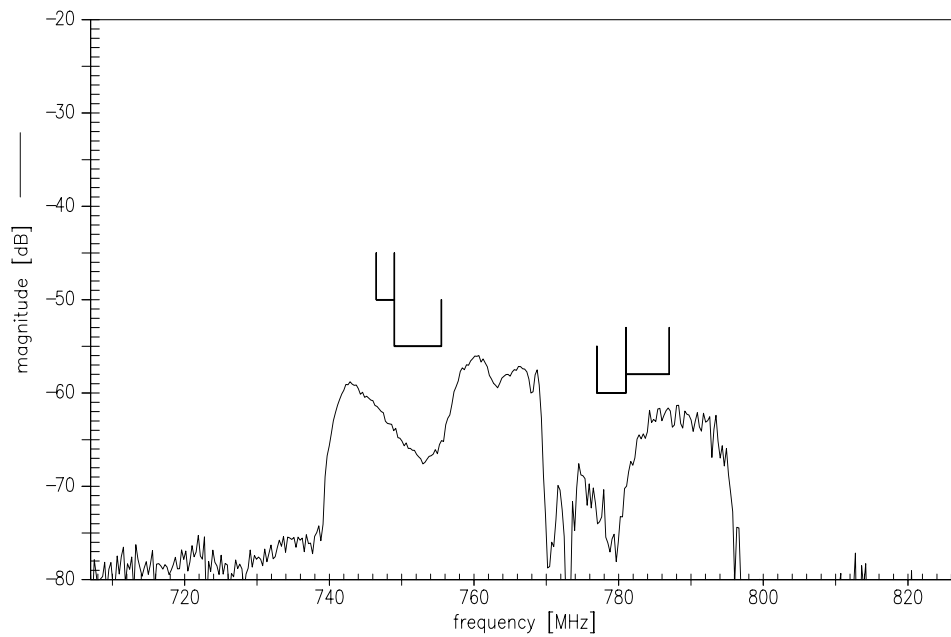
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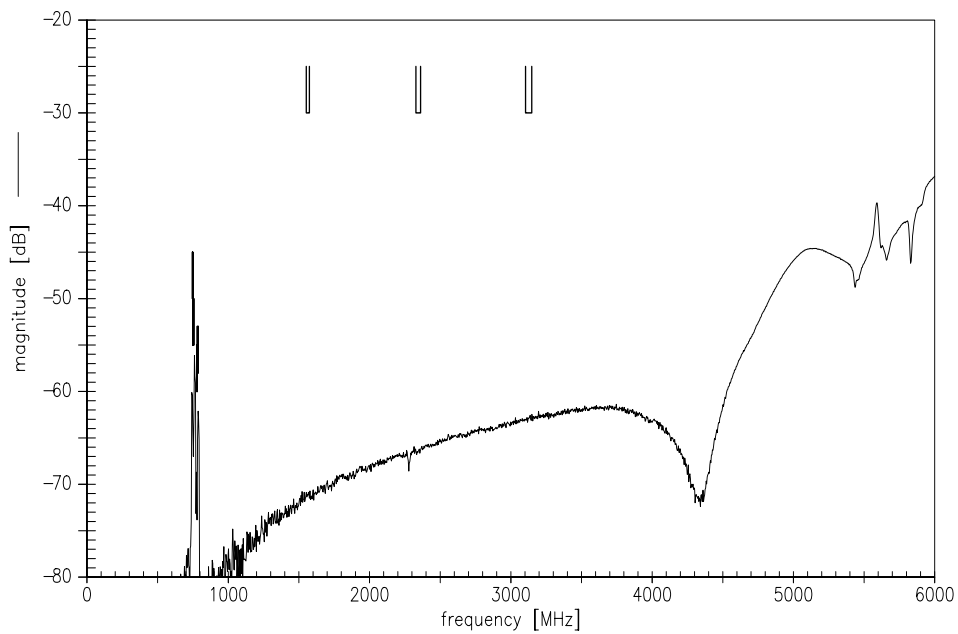
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## Frequency Response TX-RX



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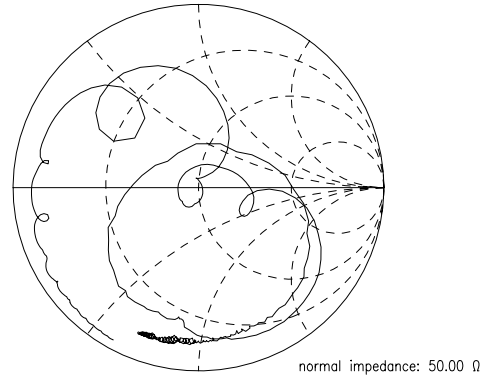
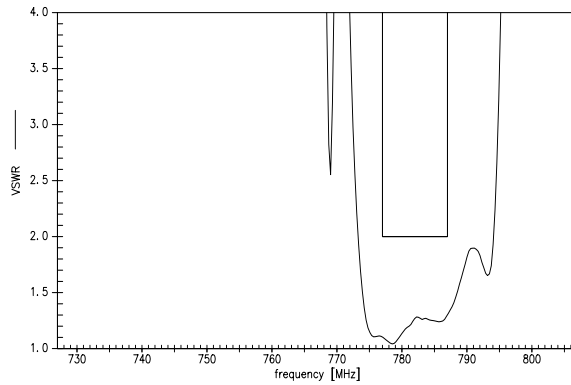
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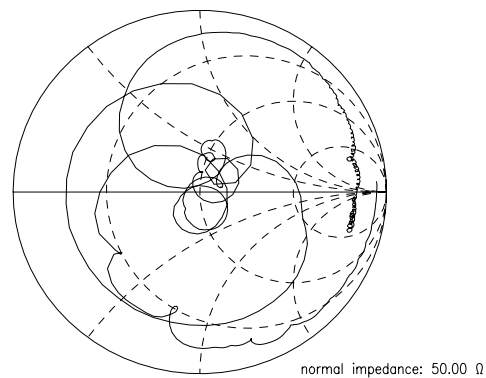
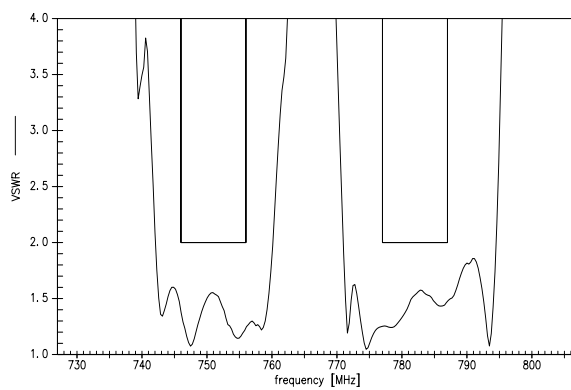
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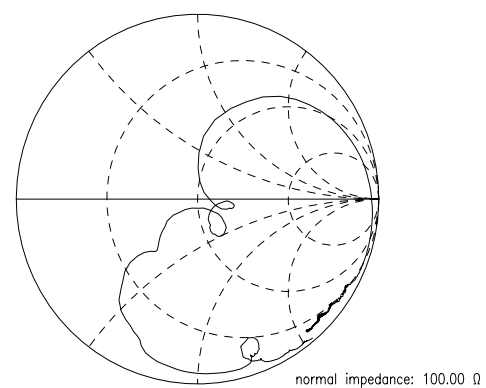
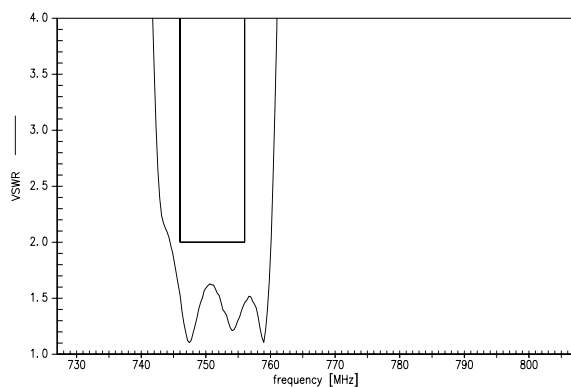
### S11 VSWR (TX)



### S22 VSWR (ANT)



### S33 VSWR (RX)



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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 <a href="http://www.tdk.co.jp/tefe02/coil.htm#aname1">http://www.tdk.co.jp/tefe02/coil.htm#aname1</a> and Data Library for circuit simulation <a href="http://www.tdk.co.jp/etvcl/index.htm">http://www.tdk.co.jp/etvcl/index.htm</a>

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