



## **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>



Data sheet



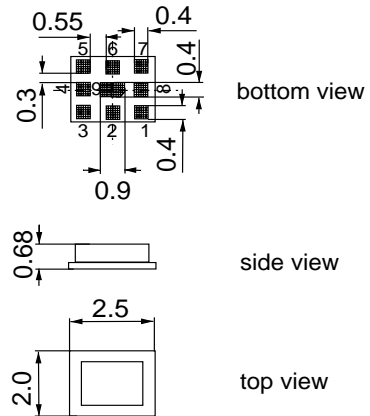
Application

- 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 Ω to 100 Ω in Antenna-Rx path
- Very small size and low height



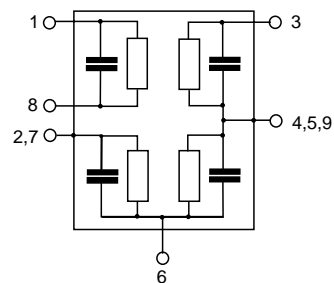
Features

- 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





**SAW Components**

**B7677**

**SAW Duplexer**

**782.0 / 751.0 MHz**

Data sheet



**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	

1) In [0 C; +85 C] temperature range  
 2) Error Vector Magnitude (EVM) based on definition in 3GPP TS 25.141



Data sheet



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 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>Absolute attenuation</b>							
			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



Data sheet



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 Antenna-Rx				min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>c</sub>				751.0		MHz
<b>Maximum insertion attenuation</b>	α	746.0 ... 756.0	MHz		1.9	2.5	dB
<b>Amplitude ripple (p-p)</b>	Δα	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>	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



Data sheet



**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-Rx				min.	typ. @ 25 °C	max.
<b>Attenuation</b>						
			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
<b>Common mode attenuation</b>						
			α			
	777.0 ... 781.0		MHz	60	64	dB
	781.0 ... 787.0		MHz	57	61	dB

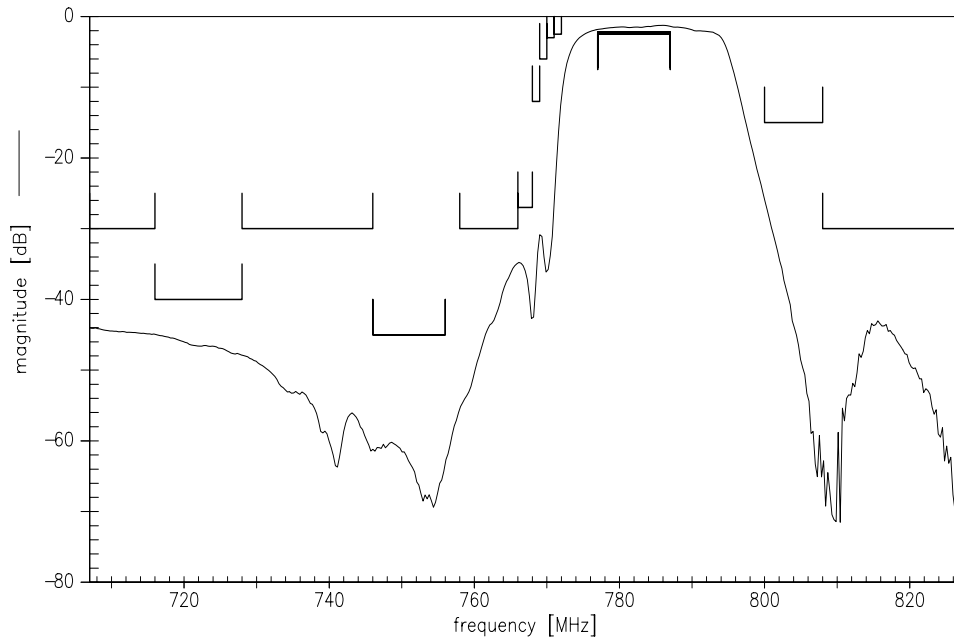
**Maximum Ratings**

Storage temperature range	T <sub>stg</sub>	-40/+85	°C	
DC voltage	V <sub>DC</sub>	5	V	
ESD voltage	V <sub>ESD</sub>	100 <sup>1)</sup>	V	machine model, 1 pulses
Input power at Tx Port				
779.5 ... 784.5.0 MHz	P <sub>in</sub>	28	dBm	} LTE uplink signal 55 °C, 50000h
elsewhere	P <sub>in</sub>	10	dBm	

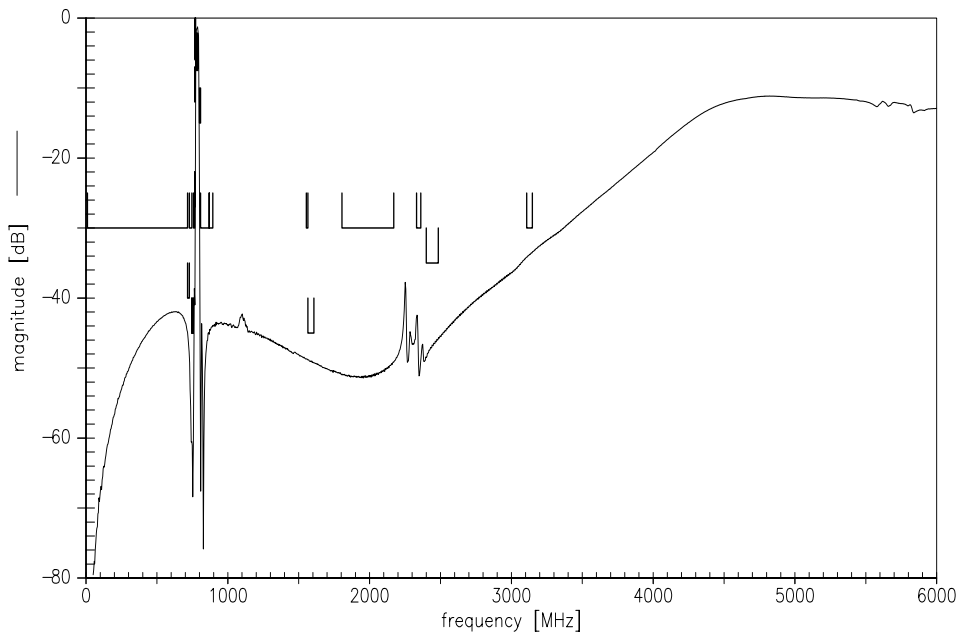
<sup>1)</sup> According to JESD22-A115A (machine model), 1 negative and 1 positive pulses.



Frequency Response TX-ANT

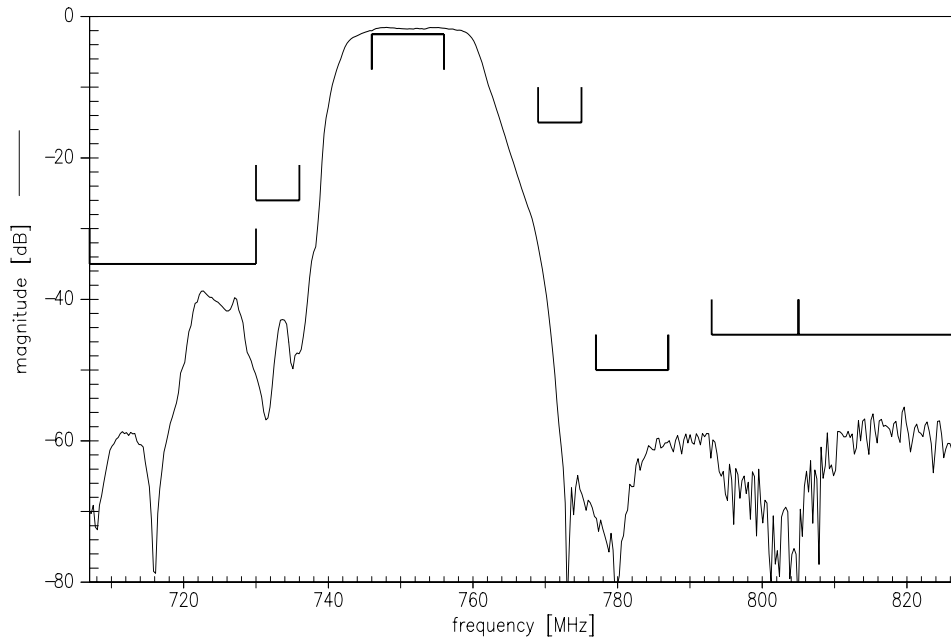


Frequency Response TX-ANT

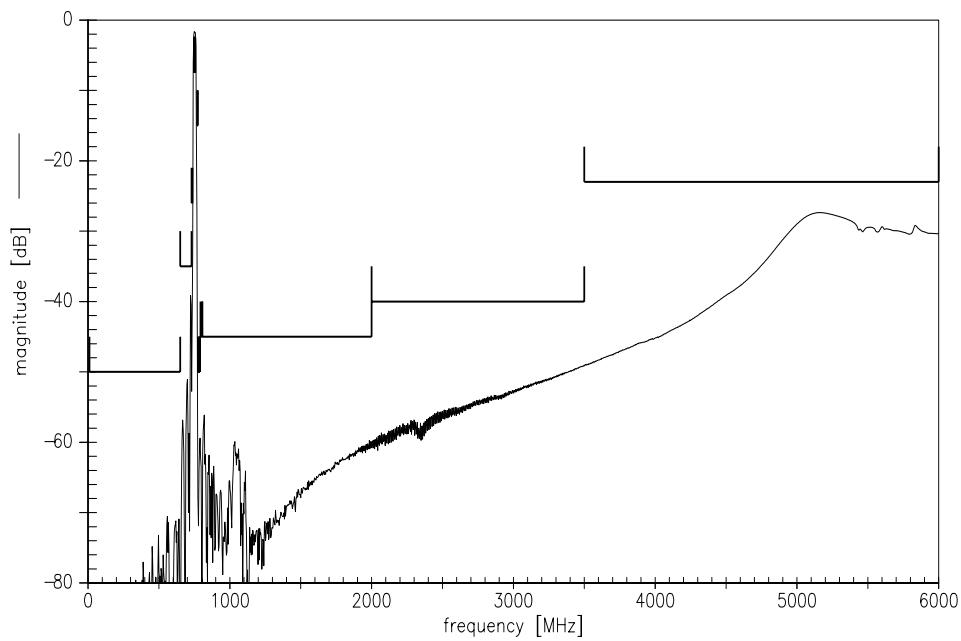




Frequency Response ANT-RX



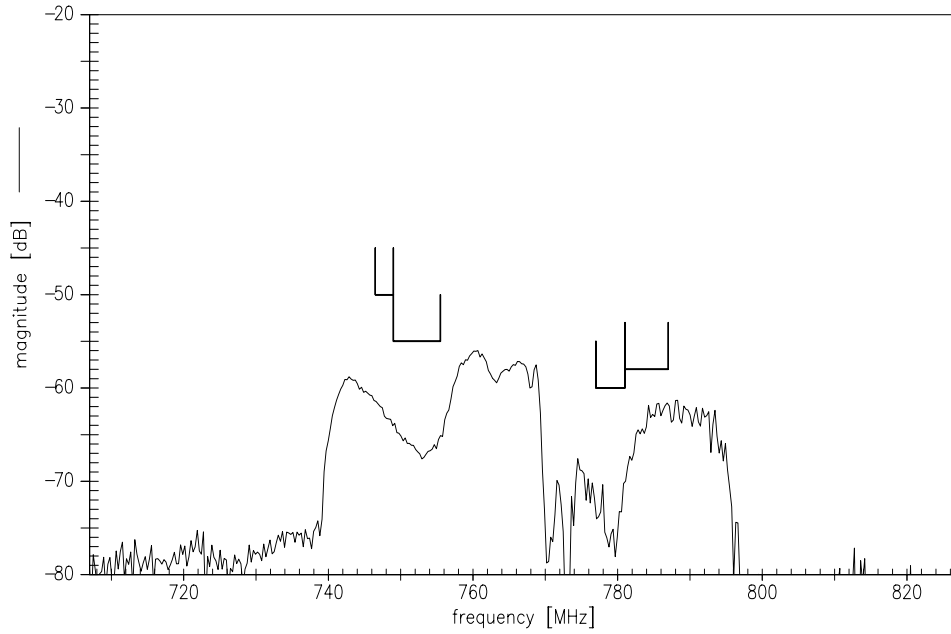
Frequency Response ANT-RX



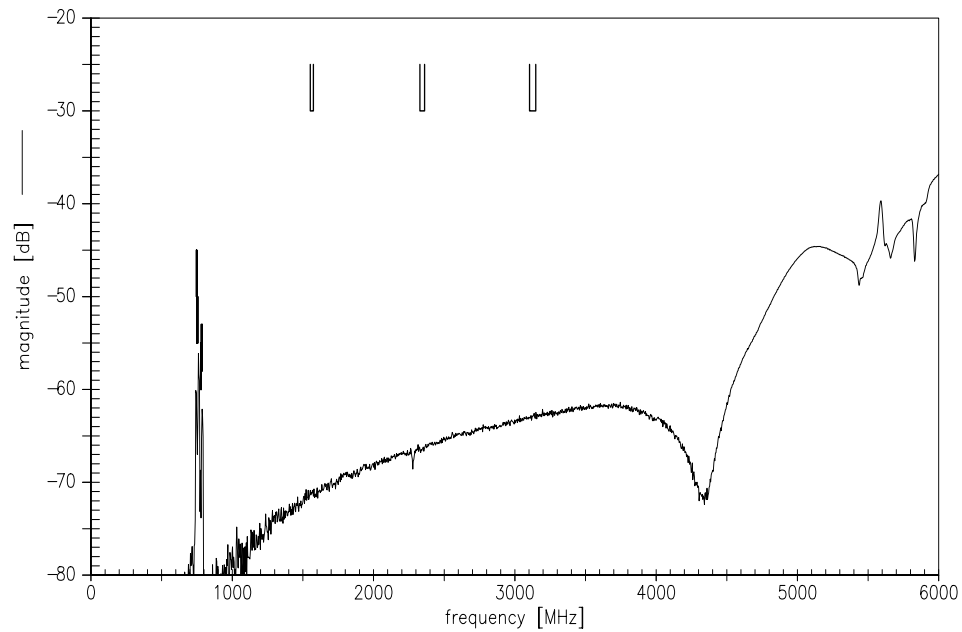




Frequency Response TX-RX



Frequency Response TX-RX

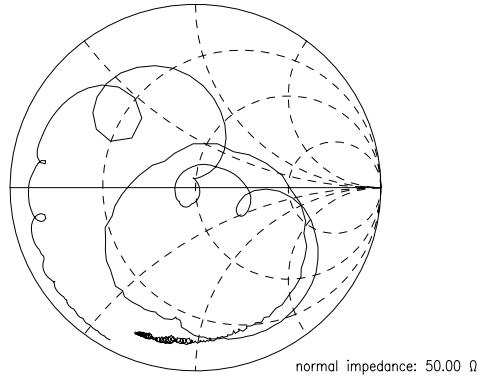
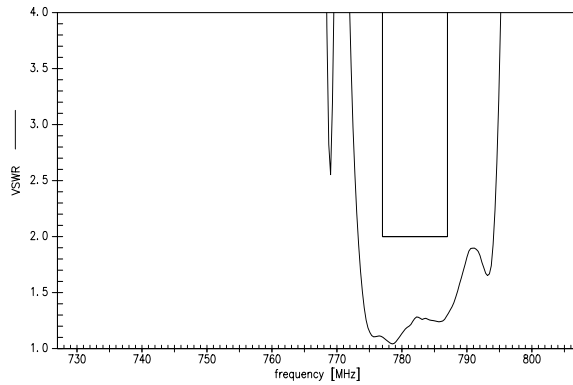




Data sheet

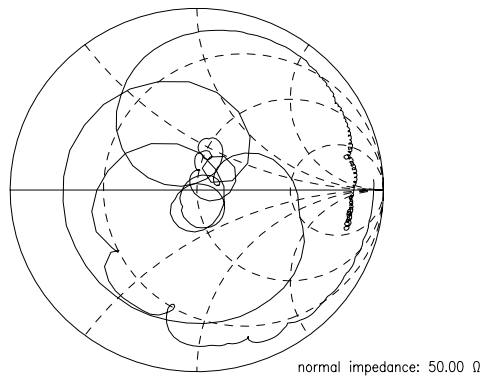
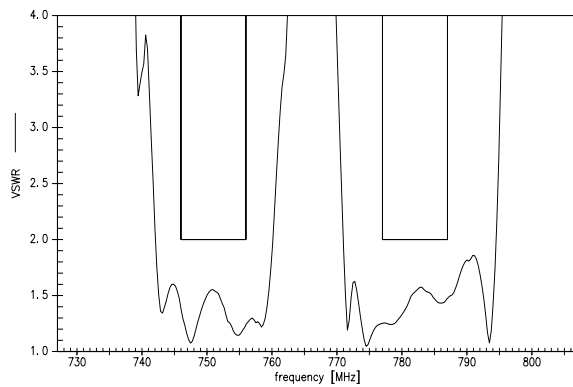


S11 VSWR (TX)



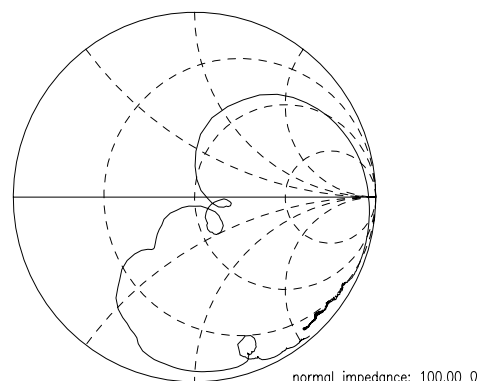
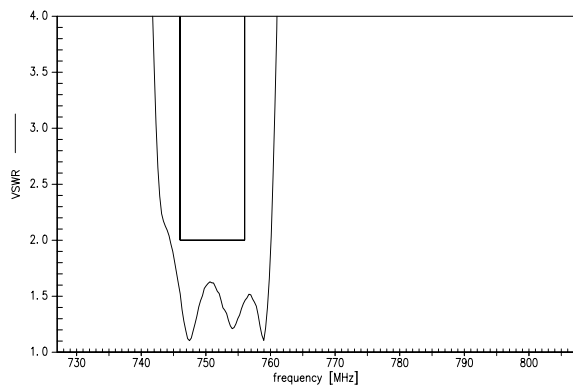
normal impedance: 50.00 Ω

S22 VSWR (ANT)



normal impedance: 50.00 Ω

S33 VSWR (RX)



normal impedance: 100.00 Ω

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

**SAW Components****B7677****SAW Duplexer****782.0 / 751.0 MHz**

Data sheet



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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