



## **SAW Components**

### **SAW Duplexer**

LTE Band 20

<b>Series/type:</b>	<b>B7679</b>
<b>Ordering code:</b>	<b>B39851B7679A710</b>
<b>Date:</b>	<b>December 14, 2010</b>
<b>Version:</b>	<b>2.0</b>

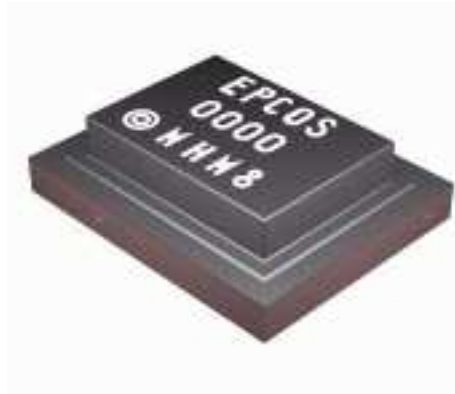


Data sheet



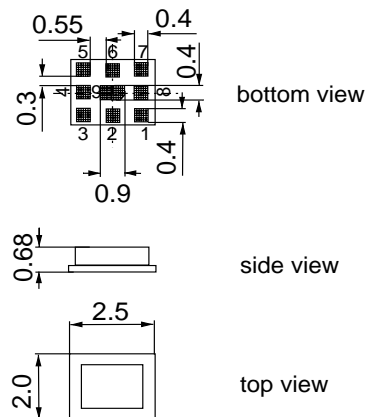
Application

- Low-loss SAW duplexer for LTE Band 20 systems
- Low insertion attenuation
- Low amplitude ripple
- 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



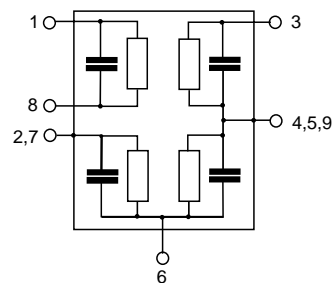
Features

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





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 || 8.2 nH  
 RX terminating impedance: Z<sub>Rx</sub> = 100 Ω (balanced) || 56 nH

Characteristics Tx-Antenna		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>c</sub>		847.0		MHz
<b>Maximum insertion attenuation</b>	α				<b>CTQ</b>
832.1 ... 861.9 MHz <sup>1)</sup>			2.7	3.0	dB
836.1 ... 857.9 MHz			2.2	2.9	dB
832.1 ... 861.9 MHz			2.7	3.4	dB
<b>Amplitude ripple (p-p)</b>	Δα				
832.1 ... 861.9 MHz <sup>2)</sup>			1.4	1.8	dB
832.1 ... 861.9 MHz			1.4	2.2	dB
<b>Error Vector Magnitude</b>	EVM				
5 MHz Channel @ f <sub>Carrier</sub> 834.6...859.4MHz <sup>3)</sup>			2.6	6.0	%
20 MHz Channel @ f <sub>Carrier</sub> 842.1...851.9MHz <sup>4)</sup>			10	16	%
<b>Input VSWR (Tx port)</b>					
832.0 ... 862.0 MHz			1.8	2.1	
<b>Output VSWR (Ant Port)</b>					
832.0 ... 862.0 MHz			1.9	2.1	

1) in 0C-60C temperature range  
 2) in 0C-60C temperature range  
 3) Computed with 4 MHz square signal  
 4) Computed with 18 MHz square signal



Data sheet



Characteristics Tx-Antenna

				min.	typ. @ 25 °C	max.	
<b>Absolute attenuation</b>							
			$\alpha$				
	0.3 ...	791.0	MHz	35	38		dB
	791.1 ...	820.0	MHz	45	52		dB
	820.0 ...	820.9	MHz	43	60		dB
	873.0 ...	875.0	MHz	15	45		dB
	875.0 ...	903.0	MHz	35	50		dB
	1560.0 ...	1590.0	MHz	30	55		dB
	1654.0 ...	1734.0	MHz	35	55		dB
	2400.0 ...	2483.0	MHz	30	40		dB
	2476.0 ...	2606.0	MHz	30	40		dB
	3298.0 ...	3478.0	MHz	30	38		dB
	4000.0 ...	4500.0	MHz	20	30		dB
	4500.0 ...	5000.0	MHz	10	20		dB
	5000.0 ...	6000.0	MHz	5	12		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 || 8.2 nH  
 RX terminating impedance: Z<sub>Rx</sub> = 100 Ω (balanced) || 56 nH

Characteristics Antenna-Rx		min.	typ. @ 25 °C	max.	
<b>Center frequency</b>	f <sub>c</sub>		806.0		MHz
<b>Maximum insertion attenuation</b>	α				<b>CTQ</b>
791.1 ... 793.0 MHz <sup>1)</sup>			2.6	4.0	dB
793.0 ... 820.9 MHz <sup>2)</sup>			2.6	3.5	dB
791.1 ... 820.9 MHz			2.6	4.0	dB
<b>Amplitude ripple</b>	α				
791.1 ... 820.9 MHz <sup>3)</sup>			1.4	2.7	dB
791.1 ... 820.9 MHz			1.4	2.7	dB
<b>Error Vector Magnitude</b>					
5 MHz Channel @ f <sub>Carrier</sub>					
793.6 ... 818.4 MHz <sup>4)</sup>			3.1	8	%
20 MHz Channel @ f <sub>Carrier</sub>					
801.1 ... 810.9 MHz <sup>5)</sup>			6.2	16	%
<b>Input VSWR (Ant port)</b>					
791.0 ... 821.0 MHz			1.7	2.1	
<b>Output VSWR (Rx Port)</b>					
791.0 ... 821.0 MHz			1.8	2.1	
<b>Common mode rejection ratio</b>					
791.0 ... 821.0 MHz		23	25		dB

1) in 0C-60C temperature range  
 2) in 0C-60C temperature range  
 3) in 0C-60C temperature range  
 4) Computed with 5 MHz square signal  
 5) Computed with 18 MHz square signal



Data sheet



Characteristics Antenna-Rx				min.	typ. @ 25 °C	max.	
<b>Absolute attenuation</b>			$\alpha$				
	0.3 ... 750.0	MHz		40	53		dB
	832.1 ... 833.0	MHz		41	50		dB
	833.0 ... 862.0	MHz		47	51		dB
	873.0 ... 903.0	MHz		41	48		dB
	1000.0 ... 3000.0	MHz		40	50		dB
	3000.0 ... 6000.0	MHz		30	45		dB

Characteristics Tx-Rx				min.	typ. @ 25 °C	max.	
<b>Differential mode isolation</b>			$\alpha$				
	791.1 ... 820.0	MHz		48	54		dB
	820.0 ... 820.9	MHz		46	58		dB
	832.1 ... 833.0	MHz		47	55		dB
	833.0 ... 861.9	MHz		49	55		dB
<b>Common mode isolation</b>			$\alpha$				
	832.1 ... 861.9	MHz		53	63		dB



**SAW Components**

**B7679**

**SAW Duplexer**

**847.0 / 806.0 MHz**

Data sheet



**Maximum Ratings**

Storage temperature range	$T_{stg}$	-40/+85	°C	
DC voltage	$V_{DC}$	5	V	
ESD voltage	$V_{ESD}$	500 <sup>1)</sup>	V	CD model, 3 pulses
ESD voltage	$V_{ESD}$	250 <sup>2)</sup>	V	HB model, 1 pulse
ESD voltage	$V_{ESD}$	100 <sup>3)</sup>	V	M model, 1 pulse
Input power at Tx Port				
834.5 ...859.5 MHz	$P_{in}$	28	dBm	} LTE uplink signal 55 °C, 50000h
elsewhere	$P_{in}$	10	dBm	

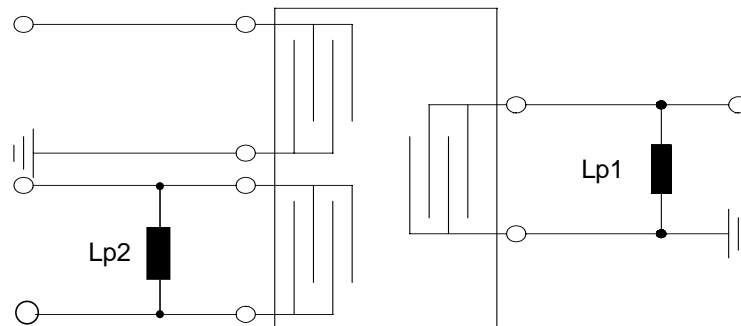
1) According to JESD22-C101 (Charged Device model), 3 negative and 3 positive pulses.

2) According to JESD22-A114E (Human Body model), 1 negative and 1 positive pulses.

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

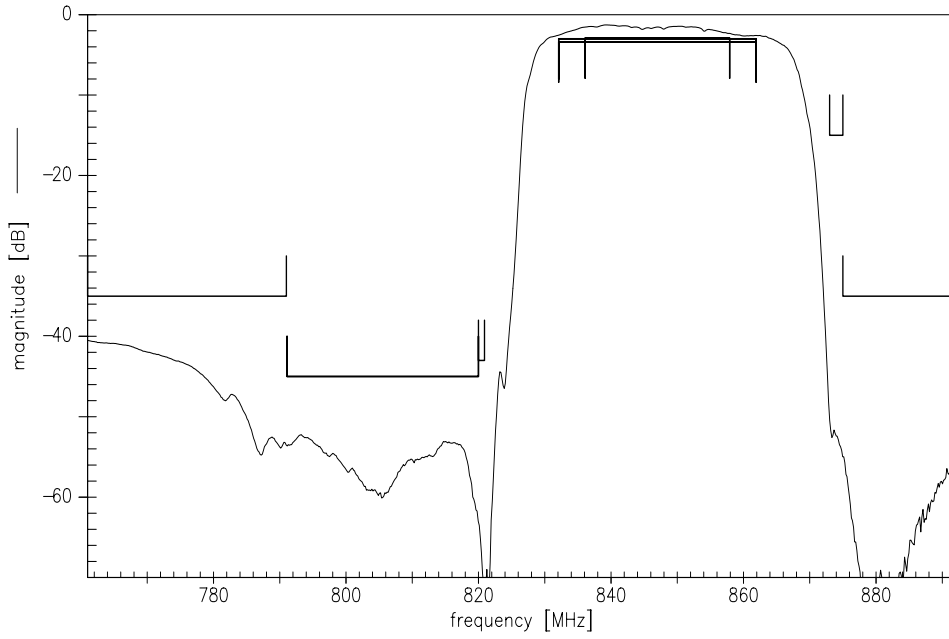
**Matching network (element values depend on PCB layout)**

Lp1 = 8.2 nH, Lp2 = 56 nH

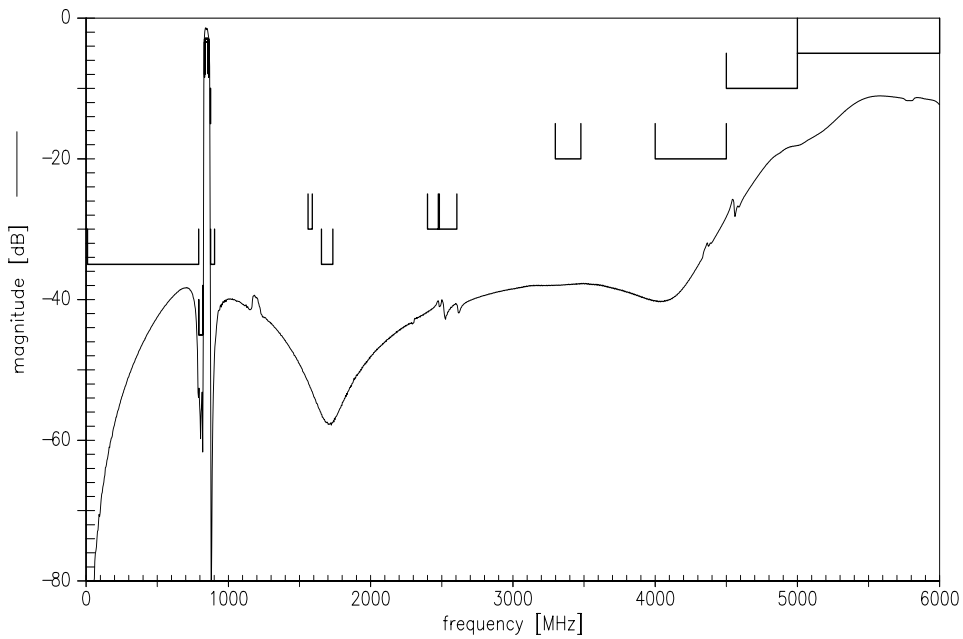




Frequency Response TX-ANT

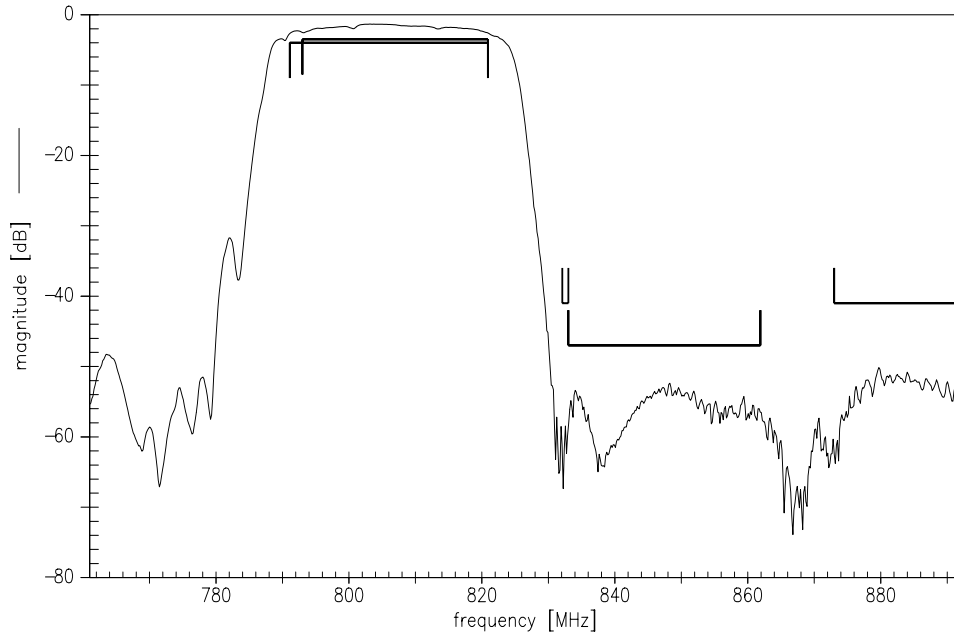


Frequency Response TX-ANT

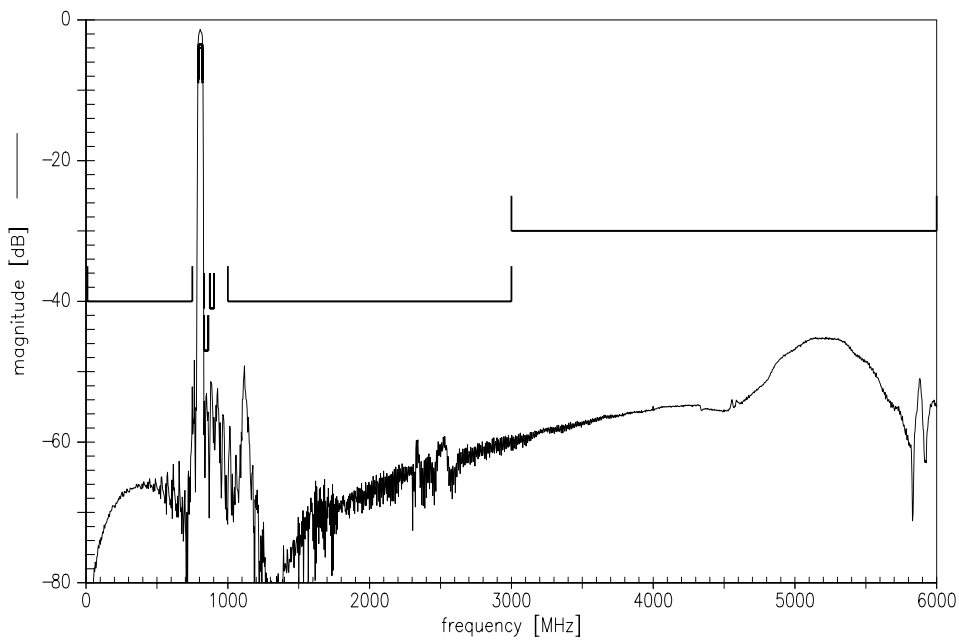




Frequency Response ANT-RX

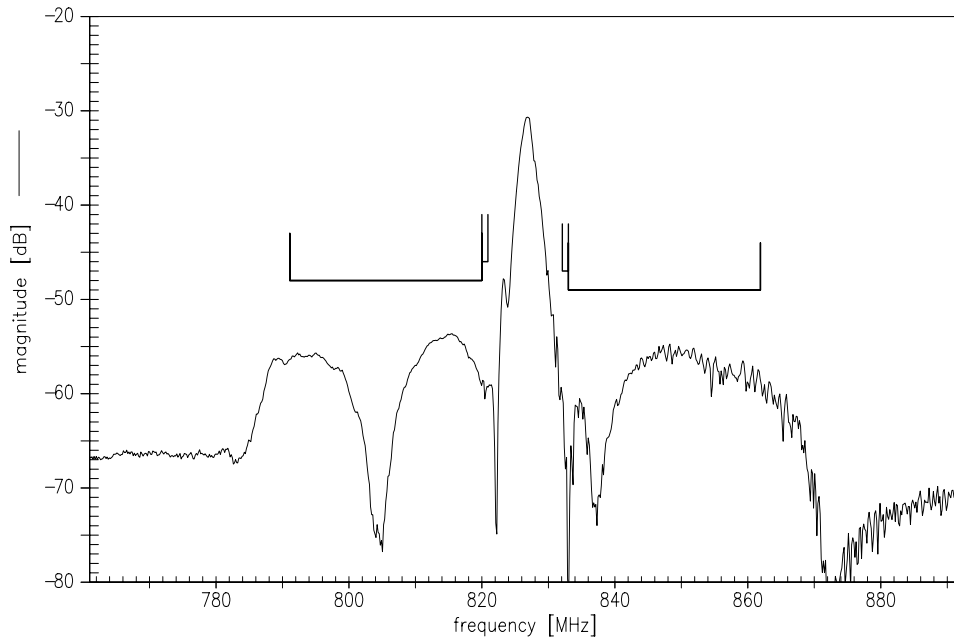


Frequency Response ANT-RX

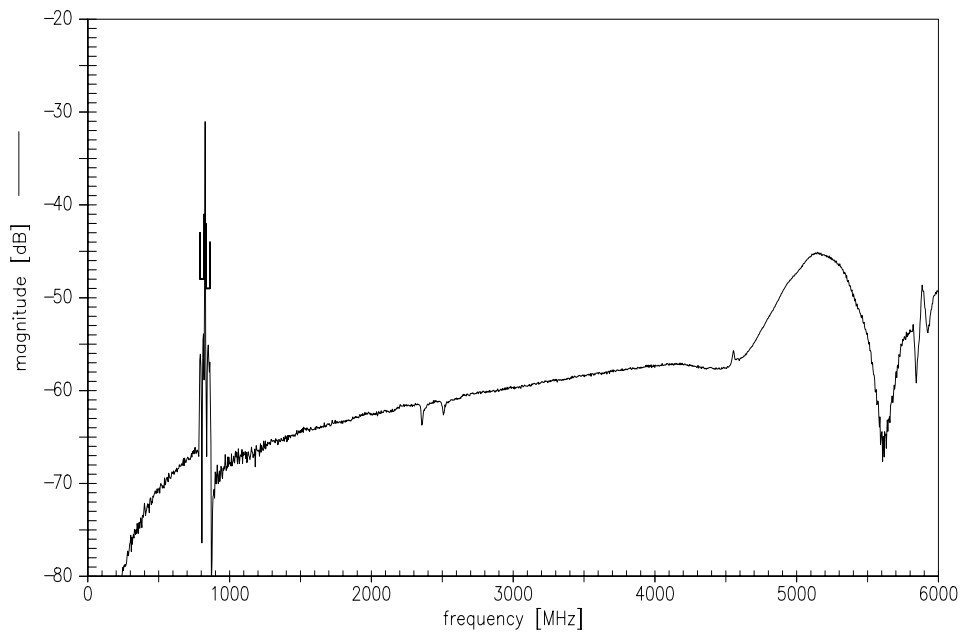




Frequency Response TX-RX



Frequency Response TX-RX

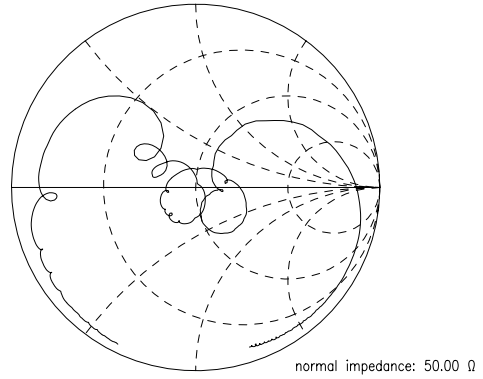
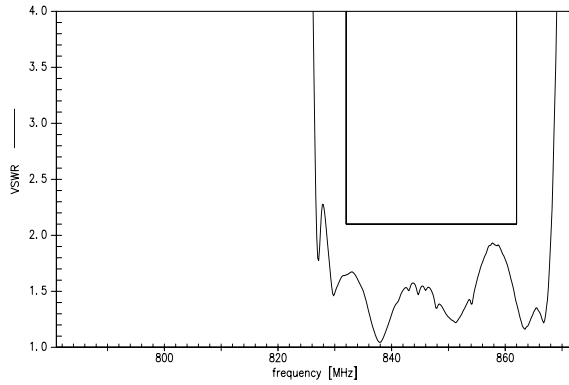




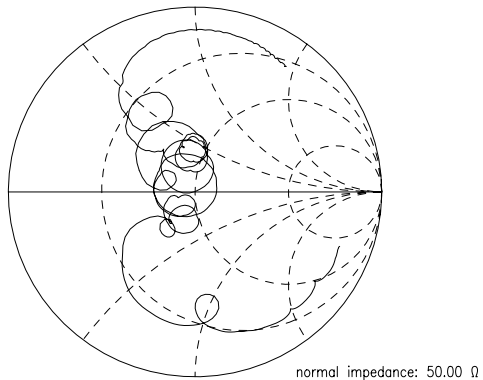
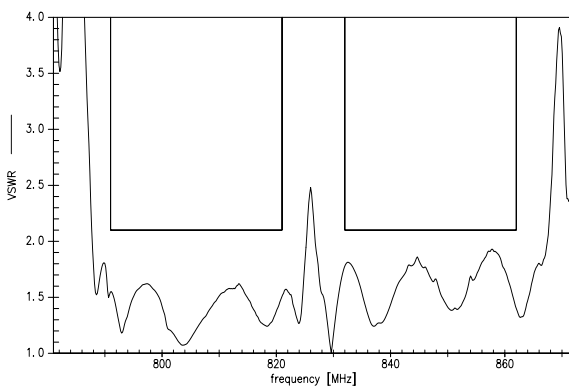
Data sheet



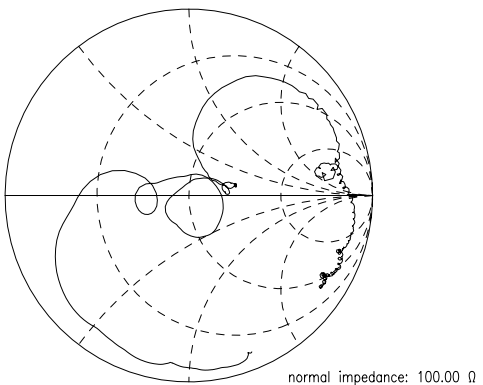
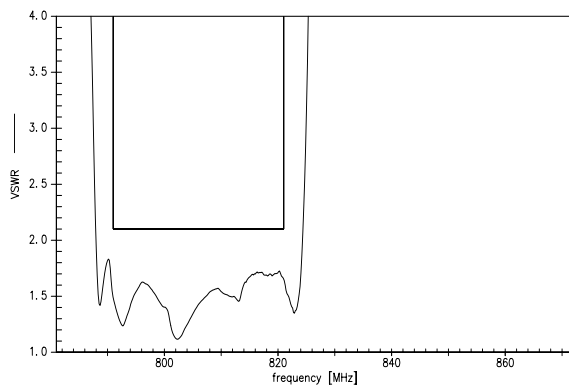
**S11 VSWR (TX)**



**S22 VSWR (ANT)**



**S33 VSWR (RX)**



**SAW Components****B7679****SAW Duplexer****847.0 / 806.0 MHz**

Data sheet



References

<b>Type</b>	B7679
<b>Ordering code</b>	B39851B7679A710
<b>Marking and package</b>	C61157-A3-A61
<b>Packaging</b>	F611074-V8153-Z000
<b>Date codes</b>	L_1126
<b>S-parameters</b>	B7679_NB.S4P B7679_WB.S4P
<b>Soldering profile</b>	S_6001
<b>RoHS compatible</b>	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."
<b>Matching coils</b>	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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**Published by EPCOS AG**  
**Surface Acoustic Wave Components Division**  
**P.O. Box 80 17 09, 81617 Munich, GERMANY**

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