

## WS7803Z

<http://www.sh-willsemi.com>

### 0.1GHz – 6GHz SP3T Antenna Switch

#### Descriptions

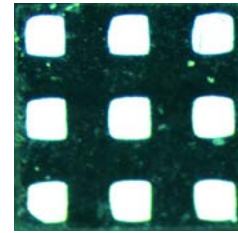
The WS7803Z is a CMOS silicon-on-insulator (SOI), single-pole, three-throw (SP3T) switch. The device is optimized for the applications of WCDMA and LTE transmit and receive, Antenna switch for multimode systems, 5.8GHz WiFi and can be used up to 6GHz applications. The high linearity performance and low insertion loss makes the device an ideal choice for WCDMA/LTE handset and data card applications. The WS7803Z switch is provided in a compact Quad Flat No-Lead (QFN) 1.1 x 1.1 mm<sup>2</sup> package.

#### Features

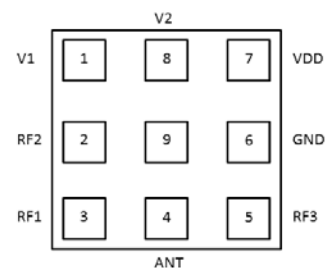
- Small, low profile package 1.1mm x 1.1mm x 0.55mm
- Working frequency up to 6GHz
- Very low insertion loss
- Excellent isolation performance
- Low power consumption
- Exceptional linearity performance for WCDMA/LTE application
- Low harmonic generation
- Wide operation voltage (2.6V to 5V)
- Very good ESD performance

#### Applications

- Cell phones
- Tablets
- Other RF front-end modules



**QFN 1.1X1.1-9L (Bottom view)**



**Pin configuration (Top view)**



ZE = Device code

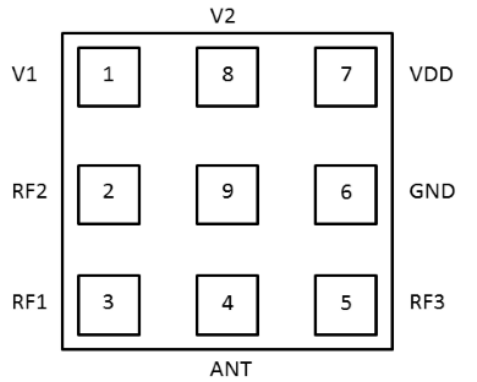
\* = Month code (A~Z)

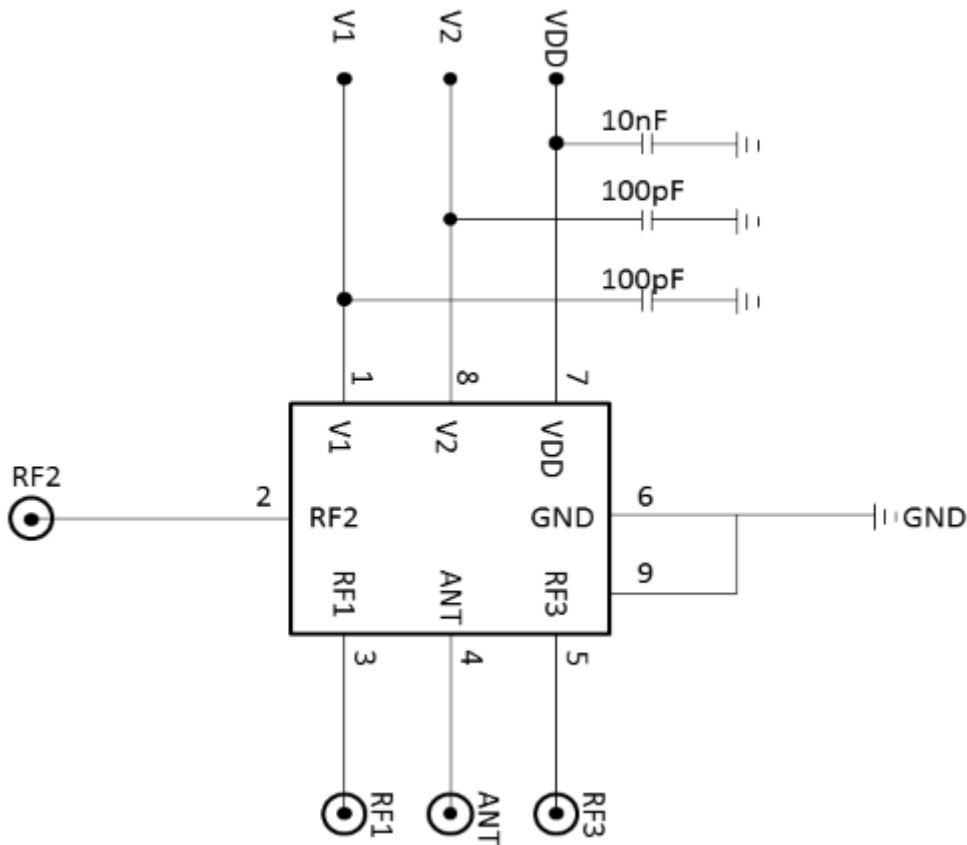
**Marking(Top view)**

#### Order information

Device	Package	Shipping
WS7803Z-9/TR	QFN1.1X1.1-9L	3000/Reel&Tape

**Pinning information**

Pin	Function	Description	Transparent top view
1	V1	DC control voltage1	
2	RF2	RF port 2	
3	RF1	RF port 1	
4	ANT	RF common (antenna) port	
5	RF3	RF port 3	
6	GND	Ground	
7	VDD	DC power supply	
8	V2	DC control voltage2	
9	GND	Ground	

**Application information**


**Recommended operating conditions**

Parameters	Conditions	Specifications			Unit
		Min.	Typ.	Max.	
<b>ESD Rating</b>					
ESD RF Pins	HBM, JESD22-A114			1000	V
	CDM, JESD22-C101C			500	V
ESD All Other Pins	HBM, JESD22-A114			1000	V
<b>Power Supply</b>					
Power Supply Voltage	Operating Voltage	2.6	2.8	5.0	V
Power Supply Current (Standby)	$V_{DD} \leq 4.2V$		7		$\mu A$
<b>Control Voltage</b>					
Logic Control "Low"		0	0	0.35	V
Logic Control "High"		1.3	1.8	3	V
<b>RF Impedance</b>					
RF Port Input and Output Impedance			50		$\Omega$

**Maximum Rating**

Items	Value	Unit
VDD Voltage	-0.3 to +6.0	V
Control Voltage	-0.3 to +3.0	V
Maximum Input Power @ RF ports	36	dBm
Output Load VSWR	20:1	
Operation Temperature	-40 to +85	Deg. C
Storage Temperature	-40 to +125	Deg. C

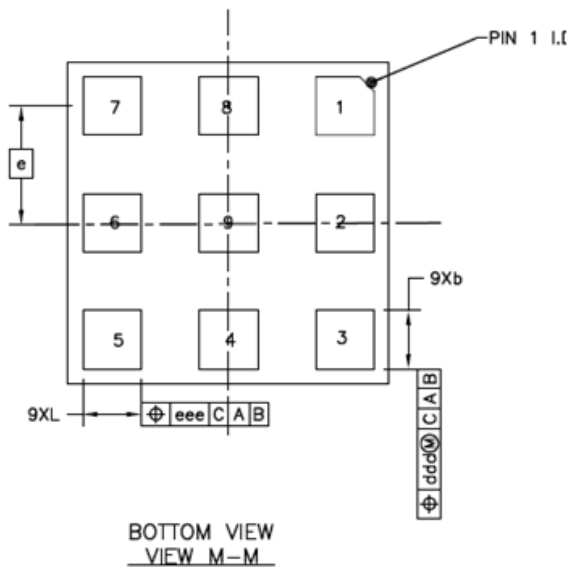
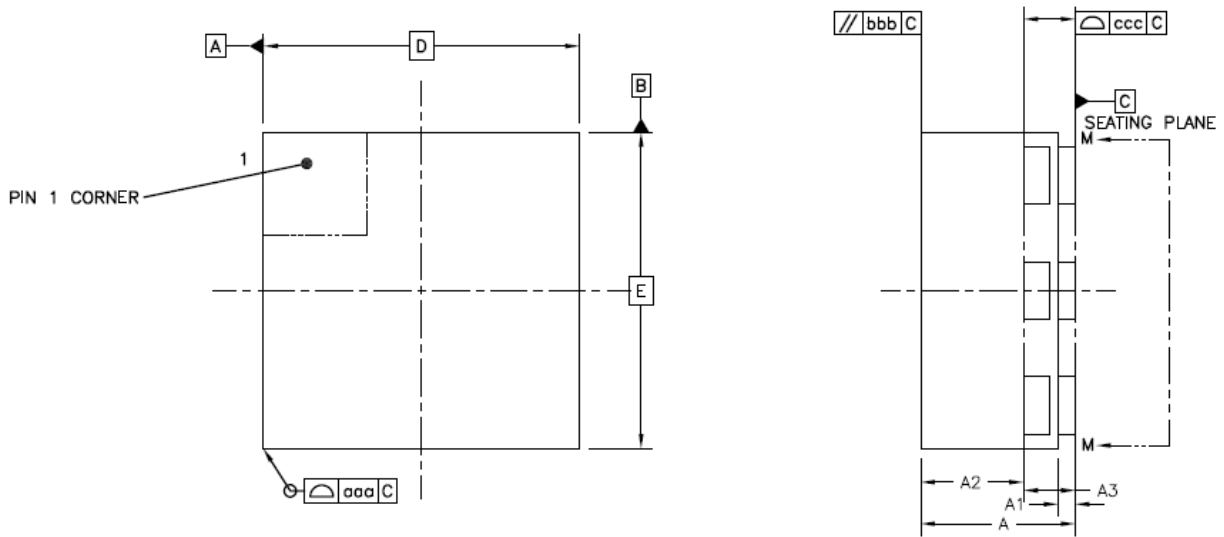
**Characteristics (RF spec)**

Normal test condition unless other-wise stated. All unused ports are 50Ω terminated.  $V_{DD}=2.8V$ ,  $Temp=+25^{\circ}C$ .

Parameters	Conditions	Specifications			Unit
		Min.	Typ.	Max.	
Insertion Loss (RF1/RF2/RF3)	0.1GHz to 1.0GHz		0.15	0.30	dB
	1.0GHz to 2.0GHz		0.25	0.35	
	2.0GHz to 2.7GHz		0.30	0.50	
Isolation (ANT to RF1/RF2/RF3)	0.1GHz to 1.0GHz	34	38		dB
	1.0GHz to 2.0GHz	25	28		
	2.0GHz to 2.7GHz	20	24		
Return Loss	0.8GHz to 2.7GHz		15		dB
Second harmonics (RF1/RF2/RF3)	PIN=+26dBm; 0.1GHz to 2.7GHz		85		dBc
Third harmonics (RF1/RF2/RF3)	PIN=+26dBm; 0.1GHz to 2.7GHz		85		dBc
0.1dB Compression Point (RF1/RF2/RF3)	0.1GHz to 2.7GHz		35		dBm
Switching on time	50% VCTL to 10/90% RF		1600		ns
Switching off time	50% VCTL to 90/10% RF		1600		ns
Startup time	Shutdown state to any RF switch state		20		μs

**Truth Table for Operation**

Mode	V1	V2
RF1	1	0
RF2	1	1
RF3	0	1
Shutdown	0	0

**Package outline dimensions**
**QFN 1.1X1.1-9L**


DESCRIPTION	SYMBOL	MILLIMETER			
		MIN	NOM	MAX	
TOTAL THICKNESS	A	0.50	0.55	0.60	
STAND OFF	A1	0.00	---	0.05	
MOLD THICKNESS	A2	0.35	0.40	0.45	
L/F THICKNESS	A3	0.150 REF			
LEAD WIDTH	b	0.10	0.20	0.30	
BODY SIZE	X	D	1.05	1.10	1.15
	Y	E	1.05	1.10	1.15
LEAD PITCH	e	0.40 BSC			
LEAD LENGTH	L	0.10	0.20	0.30	
PACKAGE EDGE TOLERANCE	ooo	0.1			
MOLD FLATNESS	bbb	0.1			
COPLANARITY	ccc	0.08			
LEAD OFFSET	ddd	0.1			
EXPOSED PAD OFFSET	eee	0.1			

**Tape reel information**
