

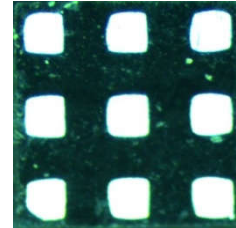
WS7803F

0.1GHz – 3GHz SP3T Antenna Switch

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

Descriptions

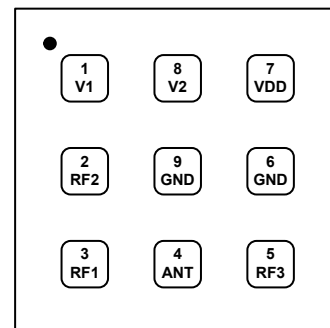
The WS7803F is a CMOS silicon-on-insulator (SOI), single-pole, three-throw (SP3T) switch. The device is optimized for the applications of WCDMA/LTE receiver and antenna switch for multimode systems. The high linearity performance and low insertion loss make the device an ideal choice for WCDMA/LTE handset and data card applications. The WS7803F switch is provided in a compact Land Grid Array (LGA) 1.15 x 1.15 mm² package.



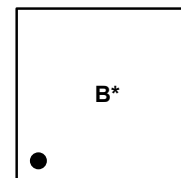
LGA 1.15X1.15-9L (Bottom view)

Features

- Small, low profile package 1.15mm x 1.15mm x 0.45mm
- Working frequency up to 3GHz
- Very low insertion loss
- Excellent isolation performance
- Low power consumption
- Exceptional linearity performance for WCDMA/LTE application
- Low harmonic generation
- Very good ESD performance



Pin configuration (Top view)



B = Device code

* = Month code (A~Z)

Marking(Top view)

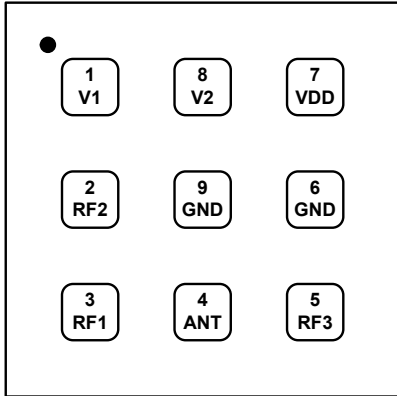
Applications

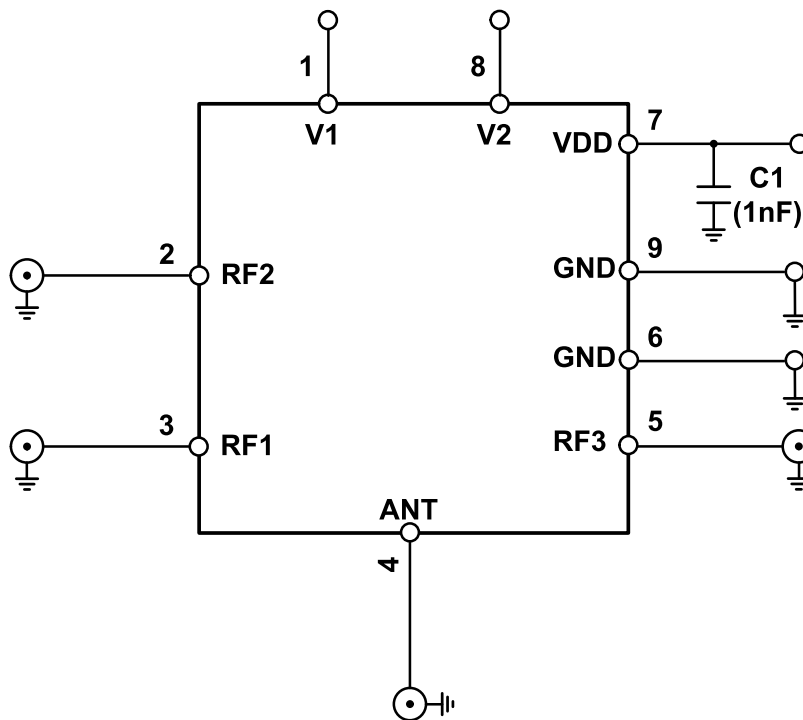
- Cell phones
- Tablets
- Other RF front-end modules

Order information

Device	Package	Shipping
WS7803F-9/TR	LGA 1.15X1.15-9L	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.	
ESD Rating					
ESD All Pins	HBM, JESD22-A114			1000	V
Power Supply					
Power Supply Voltage	Operating Voltage	2.4	2.8	3.0	V
Power Supply Current	VDD≤3.0V	20	28	40	μA
Control Voltage					
Logic Control "Low"		0	0	0.3	V
Logic Control "High"		1.2	1.8	2.7	V
RF Impedance					
RF Port Input and Output Impedance			50		Ω

Absolute maximum ratings

Maximum ratings are absolute ratings, exceeding only one of these values may cause irreversible damage to the integrated circuit.

Items	Value	Unit
VDD Voltage	-0.3 to +3.0	V
Control Voltage	-0.3 to +2.7	V
Maximum Input Power @ RF ports	26@0.88GHz, 32@2.0GHz	dBm
Operation Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C

Characteristics (RF spec)

Normal test condition unless other-wise stated. All unused ports are 50Ω terminated. VDD=2.8V, Temp=+25°C. P_{IN}=0dBm.

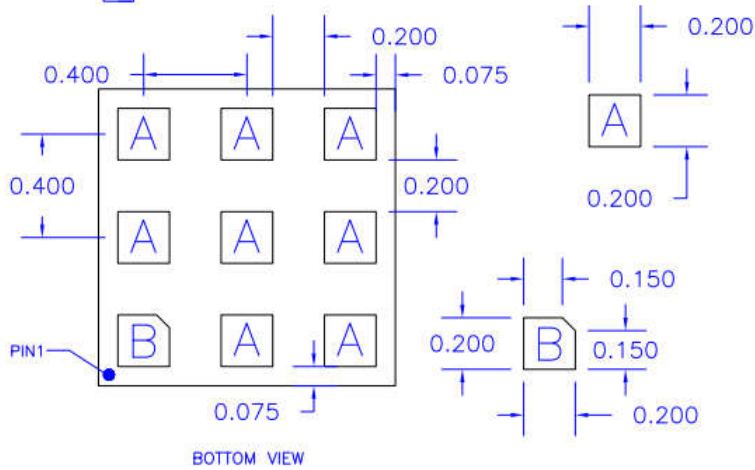
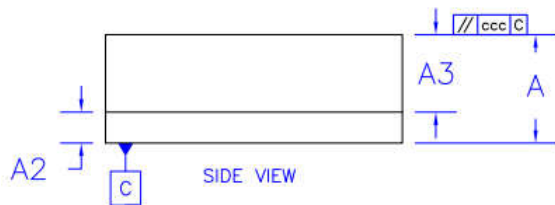
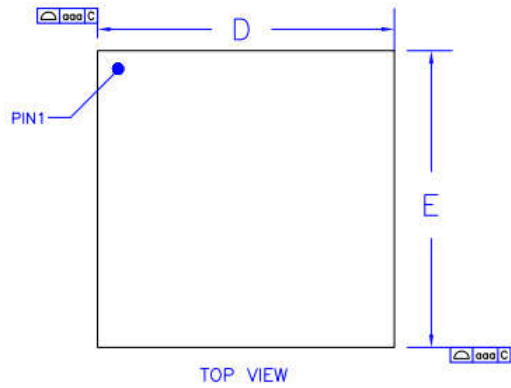
Parameters	Conditions	Specifications			Unit
		Min.	Typ.	Max.	
Insertion Loss (RF1/RF2/RF3)	0.1GHz to 1.0GHz		0.40	0.55	dB
	1.0GHz to 2.0GHz		0.45	0.60	
	2.0GHz to 2.7GHz		0.50	0.65	
Isolation (ANT to RF1/RF2/RF3)	0.1GHz to 1.0GHz	32			dB
	1.0GHz to 2.0GHz	25			
	2.0GHz to 2.7GHz	20			
Return Loss (ANT/RF1/RF2/RF3)	0.1GHz to 1.0GHz	24			dB
	1.0GHz to 2.0GHz	20			
	2.0GHz to 2.7GHz	18			
Second Harmonics (RF1/RF2/RF3)	P _{IN} =+26dBm@0.88G		80		dBc
Third Harmonics (RF1/RF2/RF3)	P _{IN} =+26dBm@0.88G		66		dBc
0.1dB Compression Point (RF1/RF2/RF3)	@0.88GHz		24		dBm
	@2.00GHz		30		
3 rd Order Input Intercept Point (RF1/RF2/RF3)	P ₂ = +20dBm, P ₁ = -15dBm, Note 1		55		dBm

Note 1: $f_2=836.5\text{MHz}$, $f_1=791.5\text{MHz}$, $f_{\text{IMD3}}=881.5\text{MHz}$

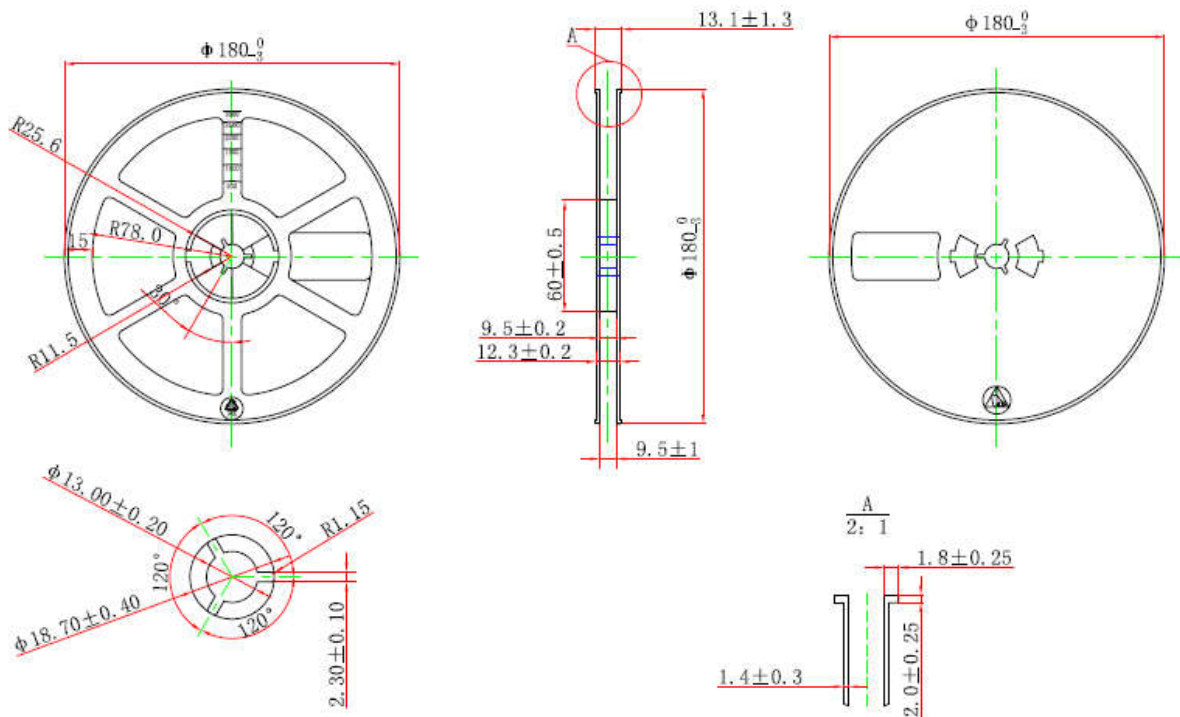
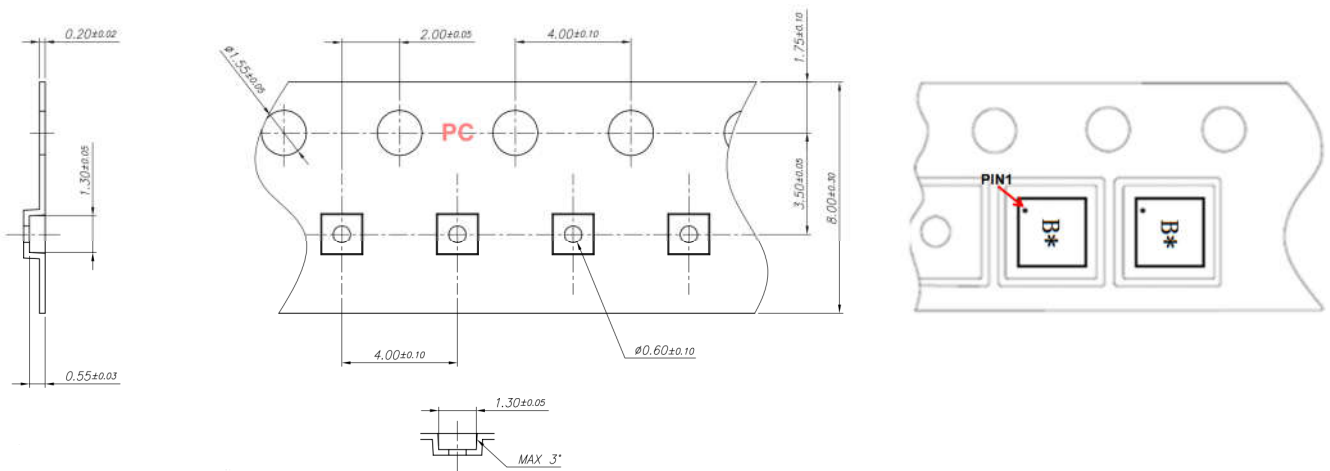
Truth Table for Operation

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

Note: Any state other than that described in this Table places the switch into an undefined state. An undefined state will not damage the device.

Package outline dimensions
LGA 1.15X1.15-9L


SYMBOL	MILLIMETER		
	MIN	NOR	MAX
A	0.40	0.45	0.50
A2	0.09	0.12	0.15
A3	0.31	0.33	0.35
D	1.10	1.15	1.20
E	1.10	1.15	1.20
aaa	0.10		
ccc	0.05		

Tape reel information

Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2
2. Camber not to exceed 1mm in 250mm
3. Material: PolyCarbonate
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
6. Pocket center and pocket hole center must be same position.
7. ESD: 10E5~10E9