WS7803F

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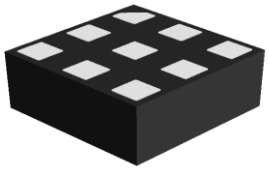
0.1GHz – 3GHz SP3T Antenna Switch

Descriptions

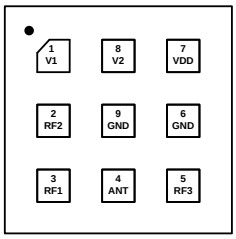
The WS7803F is a single-pole, three-throw (SP3T) switch. The device is optimized for 3G/4G routing and diversity applications. The high linearity performance and low insertion loss make the device an ideal choice for WCDMA/LTE handset and data card applications. The WS7803F is provided in a compact Quad Flat No-lead Package (QFN) 1.1 x 1.1 mm^2 package.



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

Features

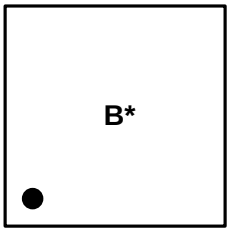
- Small, low profile package 1.1mm x 1.1mm x 0.55mm
- Working frequency up to 3GHz
- Very low insertion loss
- Excellent isolation performance
- Low power consumption
- Exceptional linearity performance for WCDMA/LTE application
- Low harmonic generation
- Very good ESD performance



Pin configuration (Top view)

Applications

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



B = Device code

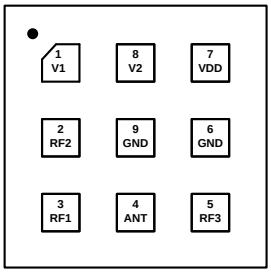
* = Month code（A~Z）

Marking(Top view)

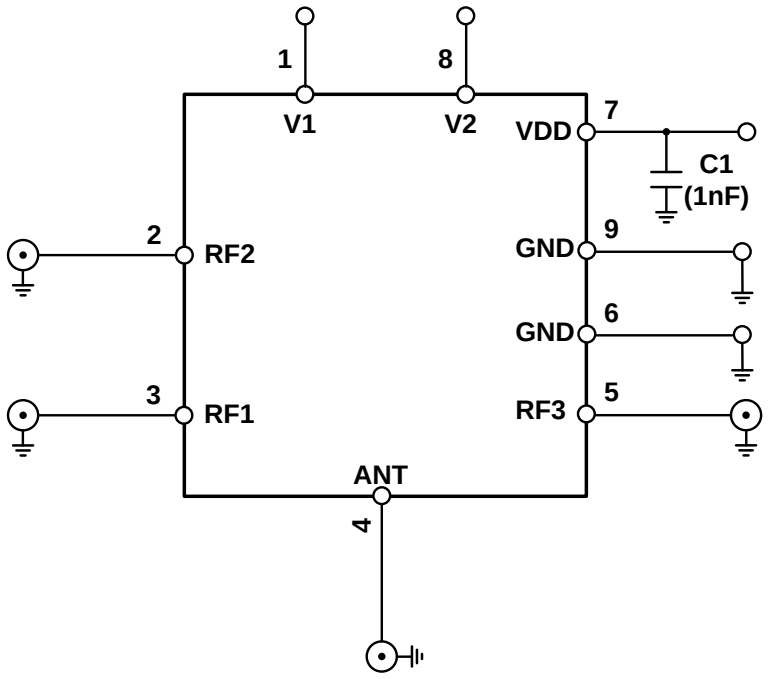
Order information

Device	Package	Shipping
WS7803F-9/TR	QFN 1.1X1.1-9L	3000/Reel&Tape

Pinning information

Pin	Function	Description	Transparent top view
1	V1	DC control voltage 1	
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 voltage 2	
9	GND	Ground	

Application information



Recommended operating conditions

Parameters	Conditions	Specifications			Unit
		Min.	Typ.	Max.	
ESD Rating					
ESD All Pins	HBM, JESD22-A114			1500	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 50Ω, CW, +25°C	29@0.7GHz to 1.0GHz 30@1.0GHz to 2.0GHz 31@2.0GHz to 2.7GHz	dBm
Operation Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C

Characteristics (RF spec)

Normal test condition unless otherwise 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 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		0.40 0.45 0.50	0.55 0.60 0.65	dB
Isolation (ANT to RF1/RF2/RF3)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz	30 25 21	33 28 24		dB
Input Return Loss (ANT to RF1/RF2/RF3)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz	25 19 18	28 22 23		dB
Second Harmonics (RF1/RF2/RF3)	0.7GHz to 1.0GHz, P_{IN}=+26dBm 1.0GHz to 2.0GHz, P_{IN}=+26dBm 2.0GHz to 2.7GHz, P_{IN}=+26dBm		82 84 85		dBc
Third Harmonics (RF1/RF2/RF3)	0.7GHz to 1.0GHz, P_{IN}=+26dBm 1.0GHz to 2.0GHz, P_{IN}=+26dBm 2.0GHz to 2.7GHz, P_{IN}=+26dBm		72 75 76		dBc
0.1dB Compression Point (RF1/RF2/RF3)	0.7GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		29 30 31		dBm
3^{rd} Order Input Intercept Point (RF1/RF2/RF3)	0.7GHz to 2.7GHz P_{IN}=+26dBm Δf =1MHz		55		dBm

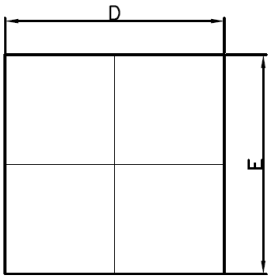
Truth Table for Operation

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

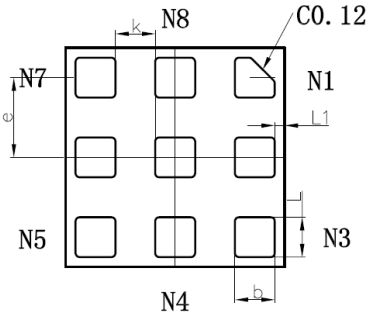
Note: Any state other than that described in this Table places the switch into an undefined state. An undefined state will not damage the device.

Package outline dimensions

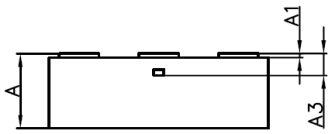
QFN1.1X1.1-9L



TOP VIEW



BOTTOM VIEW

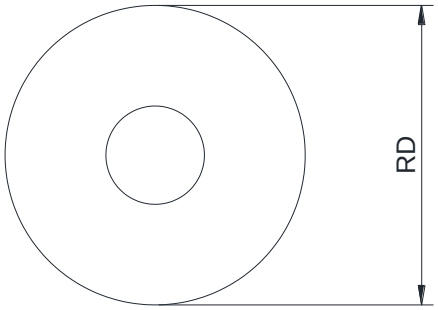


SIDE VIEW

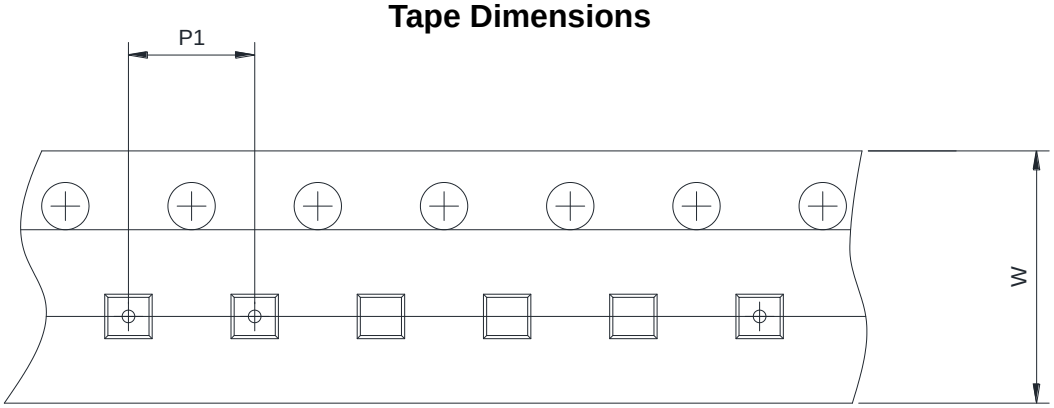
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.500	0.600	0.020	0.024
A1	-0.004	0.046	0.000	0.002
A3	0.110REF.		0.004REF.	
D	1.000	1.200	0.039	0.047
E	1.000	1.200	0.039	0.047
k	0.200REF.		0.008REF.	
b	0.150	0.250	0.006	0.010
e	0.400BSC.		0.016BSC.	
L	0.150	0.250	0.006	0.010
L1	0.050REF.		0.002REF.	

Tape and reel information

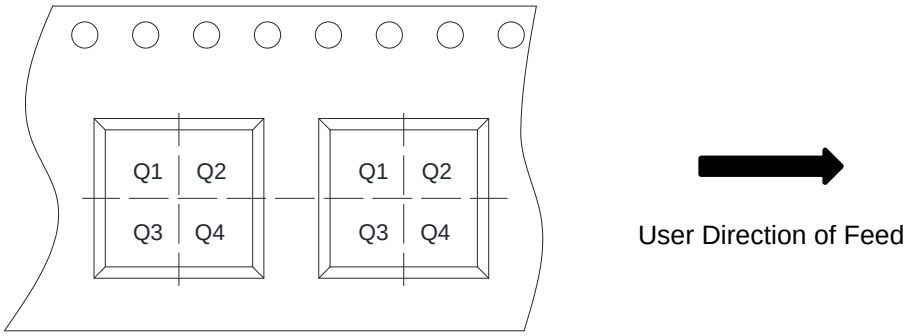
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm		
P1	Pitch between successive cavity centers	☐ 2mm	☑ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☑ Q1	☐ Q2	☐ Q3	☐ Q4

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