WS7808Q

0.1GHz – 3GHz SP8T Antenna Switch

http//:www.sh-willsemi.com

Descriptions

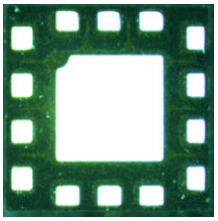
The WS7808Q is a Single Pole, Eight-Throw (SP8T) switch, consisting of a SP8T switch that has 8 identical paths, and a GPIO controller. The device is optimized for WCDMA, TD-SCDMA and LTE systems and can be used up to 3GHz applications. The low current consumption makes this device very suitable for battery operated applications. The WS7808Q is manufactured in a compact 2.0mm x 2.0 mm, 14-pin QFN package.

Features

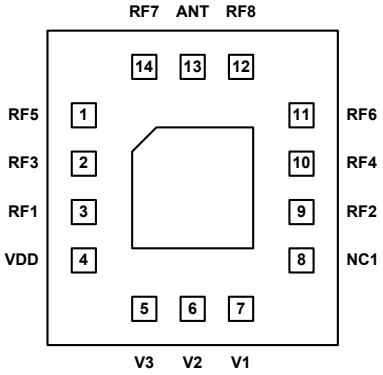
- Small, low profile package 2.0mm x 2.0mm x 0.55mm
- Working frequency up to 3GHz
- Very low insertion loss
- Excellent isolation performance
- Low power consumption
- Exceptional linearity performance for 3G/4G application
- Low harmonic generation
- Very good ESD performance

Applications

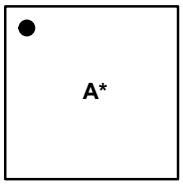
- Cell phones
- Tablets
- Other RF front-end modules



QFN2X2-14L (Bottom view)



Pin configuration (Top view)



A = Device code

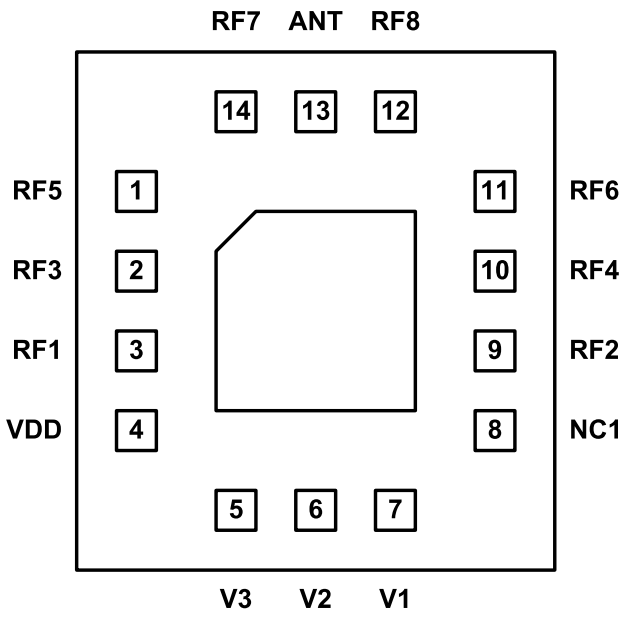
* = Month code（A~Z）

Marking(Top view)

Order information

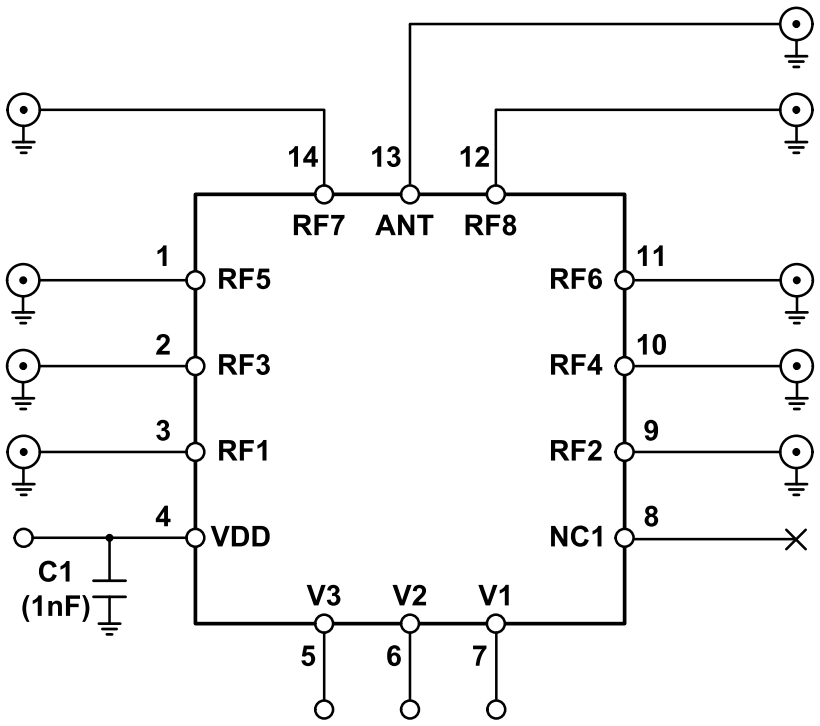
Device	Package	Shipping
WS7808Q-14/TR	QFN2X2-14L	3000/Reel&Tape

Pinning information

Pin	Function	Description	Transparent top view
1	RF5	RF I/O path 5	
2	RF3	RF I/O path 3	
3	RF1	RF I/O path 1	
4	VDD	DC power supply	
5	V3	DC control voltage3	
6	V2	DC control voltage2	
7	V1	DC control voltage1	
8	NC	Not connected	
9	RF2	RF I/O path 2	
10	RF4	RF I/O path 4	
11	RF6	RF I/O path 6	
12	RF8	RF I/O path 8	
13	ANT	Antenna port	
14	RF7	RF I/O path 7	

Note: Bottom ground paddles must be connected to 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	80	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	31@0.7GHz, 33@2.7GHz	dBm
Operation Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C

Characteristics (RF spec)

Nominal 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/RF4/ RF5/RF6/ RF7/RF8)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		0.45 0.55 1.00	0.60 0.70 1.25	dB
Isolation (ANT to RF1/RF2/RF3/RF4/ RF5/RF6 RF7/RF8)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz	32 24 17			dB
Return Loss (ANT/ RF1/RF2/RF3/RF4/ RF5/RF6 RF7/RF8)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz	24 20 13			dB
Second Harmonics (RF1/RF2/RF3/RF4/ RF5/RF6/RF7/RF8)	P_{IN}=+26dBm@0.88G		83		dBc
Third Harmonics (RF1/RF2/RF3/RF4/ RF5/RF6/RF7/RF8)	P_{IN}=+26dBm@0.88G		88		dBc
0.1dB Compression Point (RF1/RF2/RF3/RF4/ RF5/RF6 RF7/RF8)	@0.7GHz @2.7GHz		30 32		dBm
3rd Order Input Intercept Point (RF1/RF2/RF3/RF4/ RF5/RF6 RF7/RF8)	P_2= +20dBm, P_1= -15dBm, Note 1		64		dBm

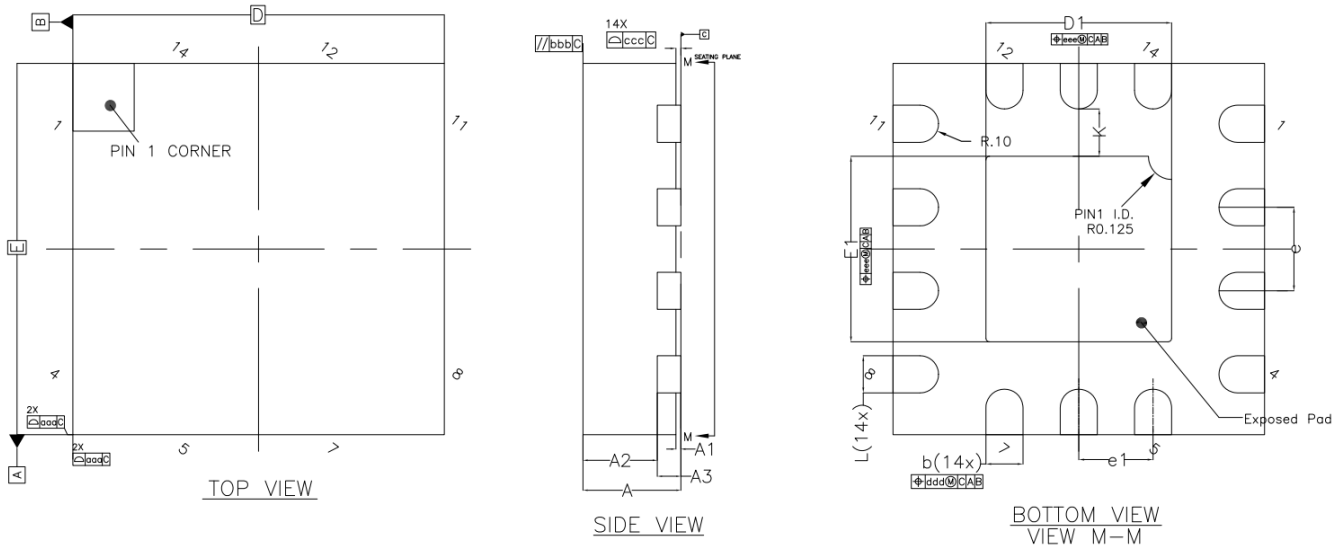
Note 1: f_2=836.5MHz, f_1=791.5MHz, f_{IMD3}=881.5MHz

Truth Table for Operation

SP8T Mode	V1	V2	V3
RF1	0	0	0
RF2	0	0	1
RF3	0	1	0
RF4	0	1	1
RF5	1	0	0
RF6	1	0	1
RF7	1	1	0
RF8	1	1	1

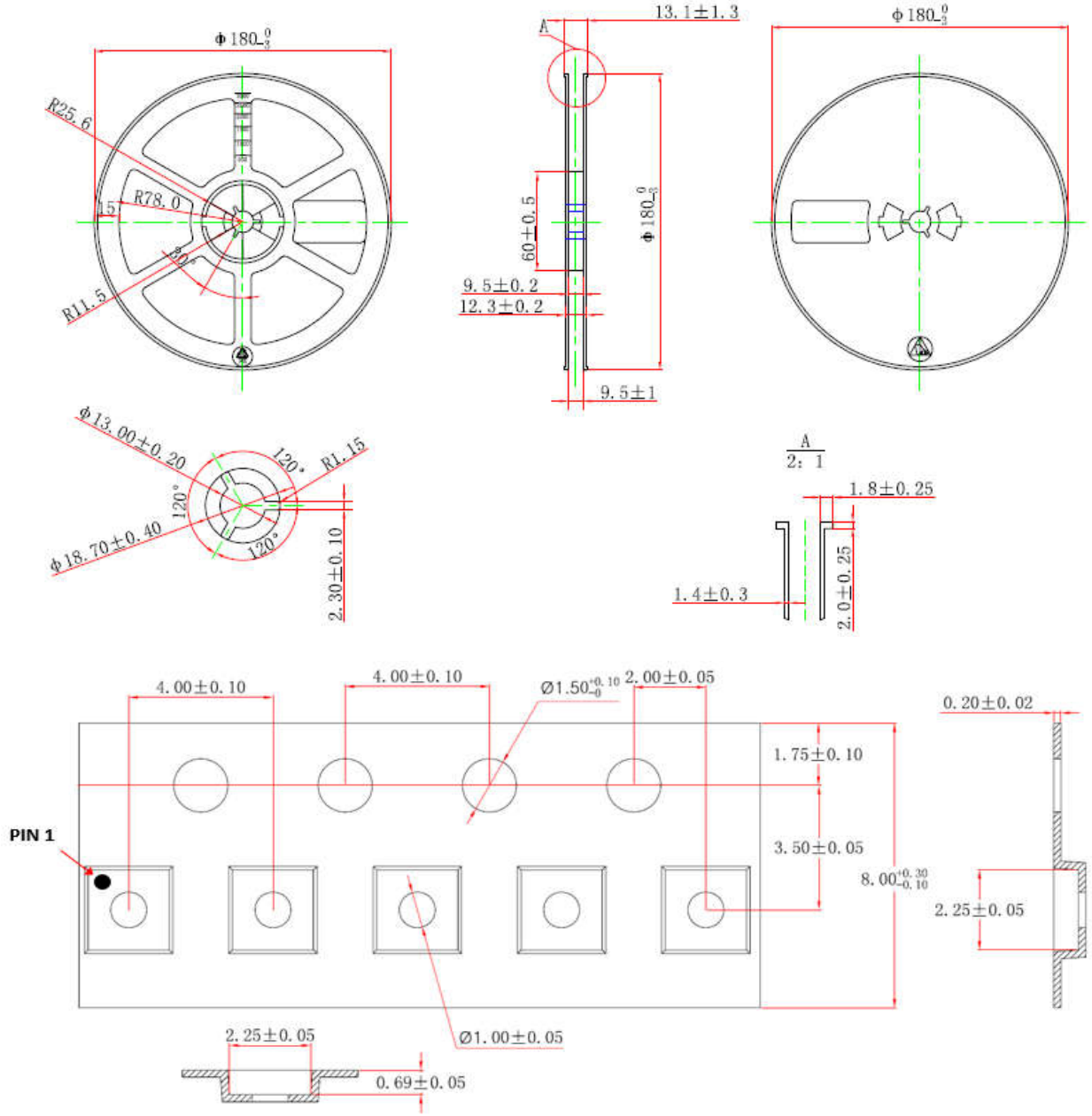
Package outline dimensions

QFN 2X2-14L



DESCRIPTION		SYMBOL	MILLIMETER		
			MIN	NOM	MAX
TOTAL THICKNESS		A	0.477	0.527	0.577
STAND OFF		A1	0.00	0.02	0.05
MOLD THICKNESS		A2	0.35	0.40	0.45
L/F THICKNESS		A3	0.127 REF		
LEAD WIDTH		b	0.15	0.20	0.25
BODY SIZE	X	D	1.95	2.00	2.05
	Y	E	1.95	2.00	2.05
LEAD PITCH		e	0.45 BSC		
LEAD PITCH		e1	0.40 BSC		
LEAD LENGTH		L	0.195	0.245	0.295
EP SIZE	X	D1	0.95	1.00	1.05
	Y	E1	0.95	1.00	1.05
LEAD TO PAD SPACE		K	0.205	0.255	0.305
Tolerance of form and position					
PACKAGE EDGE TOLERANCE		aaa	0.1		
MOLD FLATNESS		bbb	0.1		
LEAD COPLANARITY		ccc	0.08		
LEAD POSITION OFFSET		ddd	0.1		
EXPOSED PAD OFFSET		eee	0.1		

Tape and Reel Information



Note:

1. CARRIER TAPE COLOR IS BLACK.
2. COVER TAPE WIDTH: 9.50±0.1.
3. COVER TAPE COLOR IS WHITE.
4. ESD-SURFACE RESISTIVITY MEET EIA/JEDEC TNR SPECIFICATION.
5. ALL DEMENSIONS ARE IN MILLIMETER.