

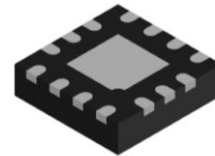
WS7806QC

0.1GHz – 3GHz SP6T Antenna Switch

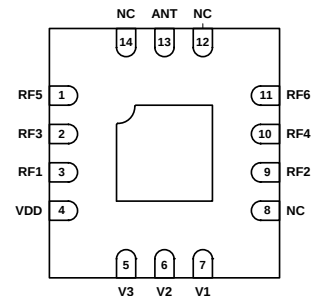
<http://www.sh-willsemi.com>

Descriptions

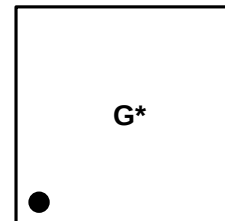
The WS7806QC is a single-pole, six-throw (SP6T) switch, consisting of a SP6T switch that has 6 identical paths, and a GPIO controller. The device is optimized for WCDMA and LTE systems and can be used up to 3GHz applications. The low current consumption makes this device very suitable for battery operated applications. The WS7806QC is manufactured in a compact 2.0mm x 2.0 mm, 14-pin QFN package.



QFN2X2-14L (Bottom view)



Pin configuration (Top view)



G = Device code

* = Month code (A~Z)

Marking(Top view)

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

Order information

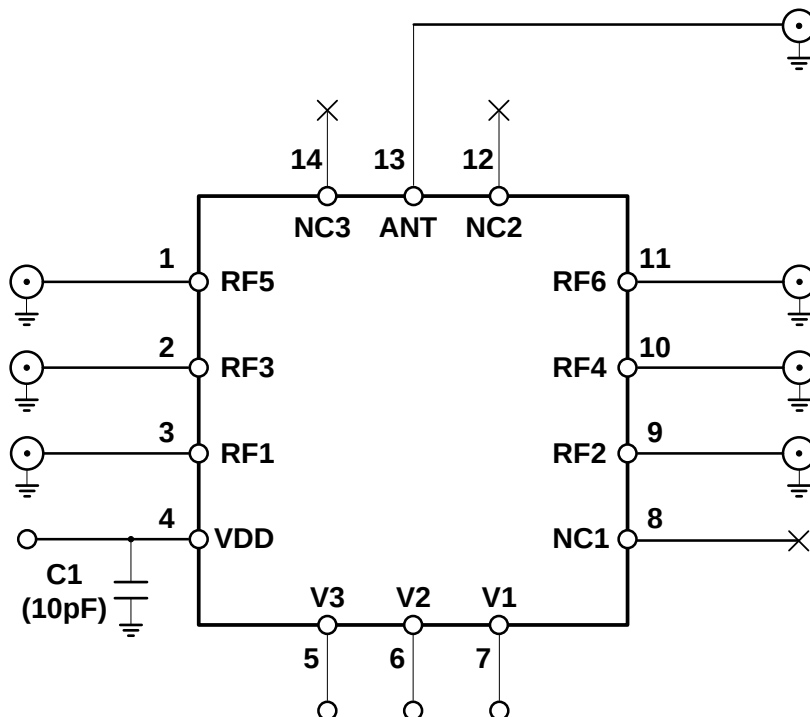
Device	Package	Shipping
WS7806QC-14/TR	QFN2X2-14L	3000/Reel &Tape

Pin 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 voltage 3	
6	V2	DC control voltage 2	
7	V1	DC control voltage 1	
8	N/C	Not connected	
9	RF2	RF I/O path 2	
10	RF4	RF I/O path 4	
11	RF6	RF I/O path 6	
12	N/C	Not connected	
13	ANT	Antenna port	
14	N/C	Not connected	

Note1: Bottom ground paddles must be connected to ground.

Application information



Note2: filter capacitor is needed on VDD

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	2.5	2.8	3.1	V
Power Supply Current	VDD≤3.0V		43	59	μA
Control Voltage					
Logic Control "Low"		0	0	0.2	V
Logic Control "High"		1.2	1.8	3.1	V
RF Impedance					
RF Port Input and Output Impedance			50		Ω
Turn-On Switching Time	50% of final control voltage to 90% of final RF power, switching between RF ports		2		μs

Note3: Logic Control "High" must be < Power Supply Voltage

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 +3.3	V
Control Voltage	-0.3 to +3.3	V
Momentary, infrequent occurrence, 50 ohms	+26	dBm
Momentary, infrequent occurrence, 6:1	+24	dBm
Continuous Operation, 50 ohms	+25	dBm
Continuous Operation, 6:1	+23	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.

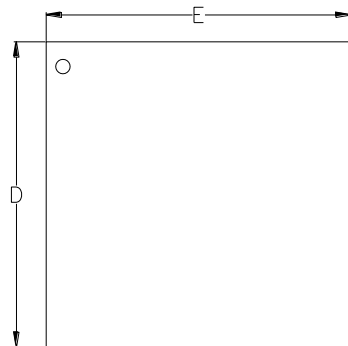
VDD=2.8V, Temp=+25°C, P_{IN}=0dBm.

Insertion loss in V1/V2/V3 = 110 state is 3 dB lower than typical insertion loss.

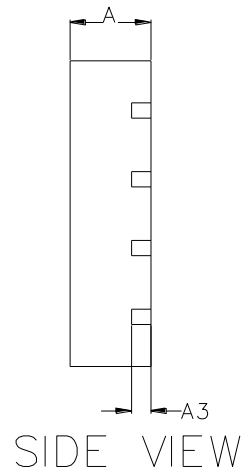
Parameters	Conditions	Specifications			Unit
		Min.	Typ.	Max.	
Insertion Loss (RFX)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		0.32 0.35 0.40	0.60 0.65 0.70	dB
Isolation (ANT to RFX RFXm to RFXn)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz	25 18 14	30 23 19		dB
Second Harmonics (ANT to RFX)	0.7GHz to 1.0GHz, P _{IN} =+25dBm 1.0GHz to 2.0GHz, P _{IN} =+25dBm 2.0GHz to 2.7GHz, P _{IN} =+25dBm		95 93 91		dBc
Third Harmonics (ANT to RFX)	0.7GHz to 1.0GHz, P _{IN} =+25dBm 1.0GHz to 2.0GHz, P _{IN} =+25dBm 2.0GHz to 2.7GHz, P _{IN} =+25dBm		81 78 75		dBc
0.1dB Compression Point (ANT to RFX)	0.7GHz to 2.7GHz		25		dBm
3 rd Order Input Intercept Point (ANT to RFX)	0.7GHz to 2.7GHz P _{IN} =+25dBm Δf =1MHz		60		dBm

Truth Table for Operation

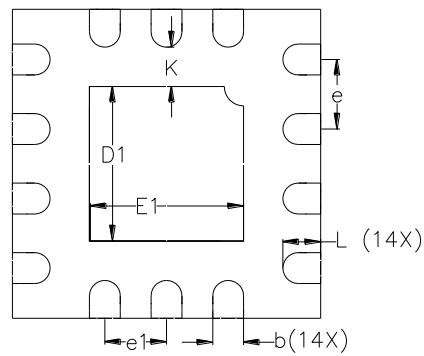
SP6T Mode	V1	V2	V3
RF1	0	0	0
RF2	0	0	1
RF3	0	1	0
RF4	0	1	1
RF5	1	0	0
RF6	1	0	1
RF3/RF5	1	1	0
ISO	1	1	1

Package outline dimensions
QFN2x2-14L


TOP VIEW



SIDE VIEW

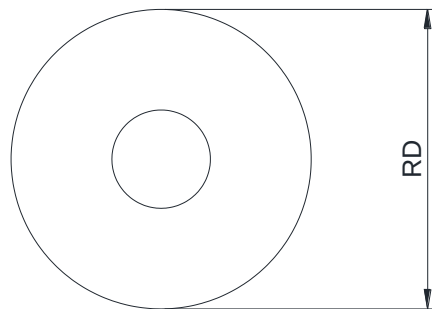


BOTTOM VIEW

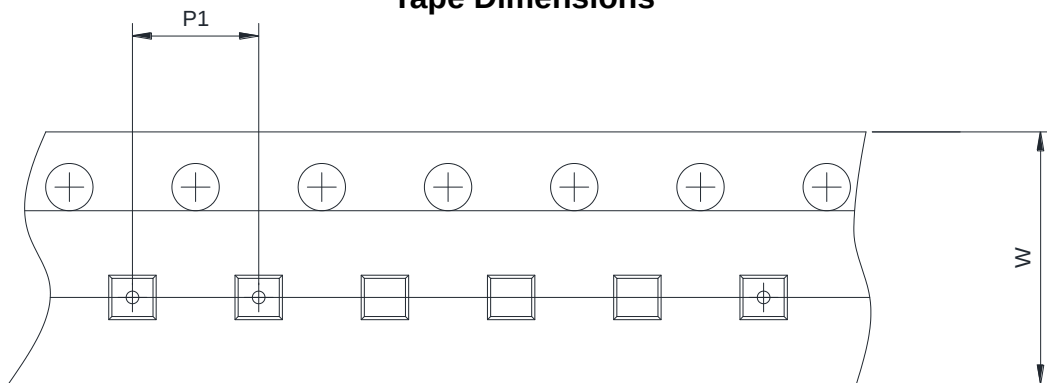
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.52	0.55	0.58
A3	0.13 Ref.		
b	0.15	0.20	0.25
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D1	0.95	1.00	1.05
E1	0.95	1.00	1.05
e	0.45 BSC		
e1	0.40 BSC		
K	0.20	0.25	0.31
L	0.19	0.24	0.30

Tape and Reel Information

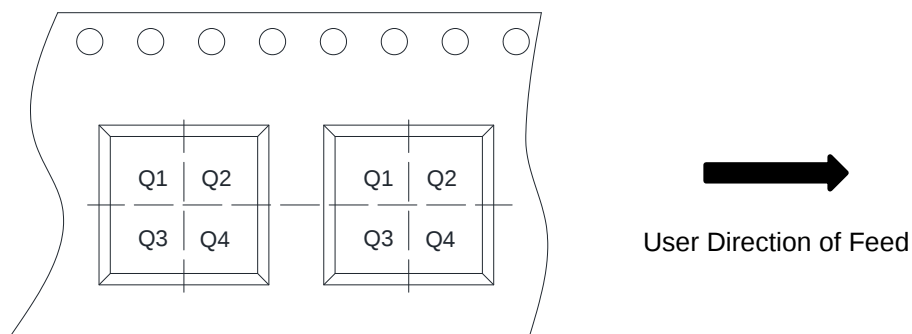
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☒ 7inch	☐ 13inch
W	Overall width of the carrier tape	☒ 8mm	☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm	☒ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☒ Q1	☐ Q2 ☐ Q3 ☐ Q4