

# RFSW8001

## 11b/g/n/ac WiFi SP3T Switch

The RFSW8001 is a single pole triple throw (SP3T) SOI switch in a 1.5mm x 1.5mm x 0.45mm, Pb-Free, 8-pin package. This switch is capable of switching between WiFi Rx, WiFi Tx, and Bluetooth Rx/Tx operations. The RFSW8001 can also be placed in WiFi and Bluetooth modes simultaneously with a slight increase in insertion loss. This device meets or exceeds the RF switch needs of IEEE802.11b/g/n/ac WiFi RF systems.



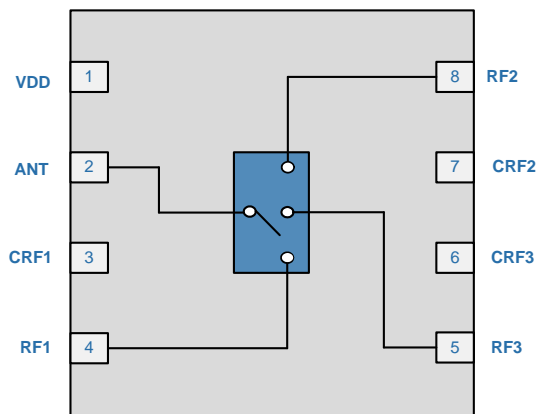
Package: DFN, 8-pin,  
1.5mm x 1.5mm x 0.45mm

### Features

- Symmetric SP3T Switch
- Switch Control Voltage 1.2V to 4.8V
- Low Insertion Loss 0.6dB (2.4GHz)
- Isolation: 27dB (2.4GHz)
- P0.1dB: 27dBm (3.6V)

### Applications

- IEEE802.11b/g/n/ac WiFi Applications
- WiFi/Bluetooth® Combination Devices
- GMSK, QPSK, DQPSK, QAM Modulation
- High Performance Communication Systems
- Wireless Backhaul
- WiBro, WiMAX, LTE



Functional Block Diagram

### Ordering Information

RFSW8001SQ	Standard 25 piece bag
RFSW8001SR	Standard 100 piece bag
RFSW8001TR7	Standard 2500 piece reel
RFSW8001PCK-410	Fully assembled evaluation board w/5 piece bag

## Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	5.0	V
ESD Human Body Model (HBM)	2000	V
ESD Charged Device Model (CDM)	1000	V
Operating Case Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C
Moisture Sensitivity Level	MSL2	



**Caution!** ESD sensitive device.



RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

## Nominal Operating Parameters

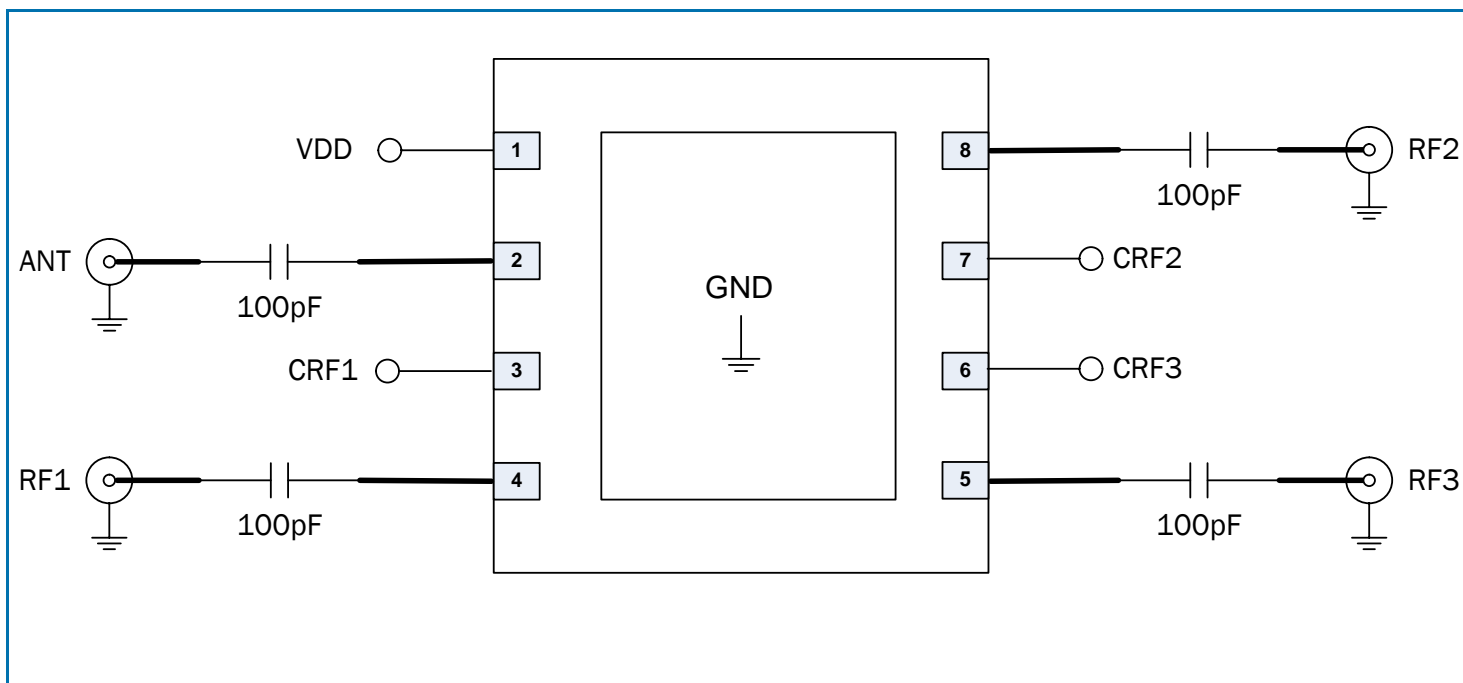
Parameter	Specification			Unit	Condition
	Min	Typ	Max		
Operating Parameters					
Frequency	100		4000	MHz	
VDD	2.7	3.6	4.8	V	
Switch Control Voltage: Low	0		0.20	V	
Switch Control Voltage: High	1.2		4.8	V	
RF1 – ANT					V <sub>DD</sub> = 3.6V; CRF1 = 1.2V to 4.8V; T = -40°C to 85°C; 2412MHz to 2484MHz; Unless otherwise noted
Insertion Loss		0.5		dB	T = 25°C
		0.5	1	dB	
Input Return Loss		20	15	dB	
Output Return Loss		20	15	dB	
RF1 to RF2 Isolation	24	27		dB	Measured ANT - RF2
	26	29		dB	Measured RF2 - RF1
RF1 to RF3 Isolation	27	30		dB	Measured ANT – RF3
	29	32		dB	Measured RF1 - RF3
RF2 – ANT					V <sub>DD</sub> = 3.6V; CRF2 = 1.2V to 4.8V; T = -40°C to 85°C; 2412MHz to 2484MHz; Unless otherwise noted
Insertion Loss		0.5		dB	T = 25°C
		0.5	1	dB	
Input Return Loss		20	15	dB	
Output Return Loss		20	15	dB	
RF2 to RF1 Isolation	25	28		dB	Measured ANT - RF1
	29	32		dB	Measured RF2 – RF1
RF2 to RF3 Isolation	28	31		dB	Measured ANT - RF3
	28	31		dB	Measured RF2 to RF3

Parameter	Specification			Unit	Condition
	Min	Typ	Max		
<b>RF3 – ANT</b>					<b>V<sub>DD</sub> = 3.6V; CRF3 = 1.2V to 4.8V; T = -40°C to 85°C; 2412MHz to 2484MHz; Unless otherwise noted</b>
Insertion Loss		0.5		dB	T = 25°C
		0.5	1	dB	
Input Return Loss		20	15	dB	
Output Return Loss		20	15	dB	
RF3 to RF1 Isolation	24	27		dB	Measured ANT – RF1
	29	32		dB	Measured RF3 - RF1
RF3 to RF2 Isolation	25	28		dB	Measured ANT – RF2
	25	28		dB	Measured RF3 - RF2
<b>General Parameters</b>					<b>All Modes = CRF1 or CRF2 or CRF3; T = -40°C to 85°C; Unless otherwise noted</b>
Passband Ripple	-0.2		0.2	dB	
IP0.1dB; CW	25			dBm	All Modes; VDD = 2.7V; CW
	27			dBm	All Modes; VDD ≥ 3.6V; CW
Switch Total Current (IDD)		50	100	uA	All Modes; VDD 2.7-4.8V; Control voltage 1.2 to 4.8V; T = 25°C
Switch Control Current; High State		0.05	0.1	uA	All Modes; Control voltage 1.2 to 4.8V; T = 25°C
Switch Control Current; Low State		0.005	0.01	uA	All Modes; Control voltage ≤ 0.2V; T = 25°C
Switch Time, 50% CTL to 90% RF		180	300	ns	All Modes; Switch Control = 1.2V to 4.8V
Switch Time, 50% CTL to 10% RF		180	300	ns	
<b>300MHz to 450MHz Operation</b>					<b>V<sub>DD</sub> = 3.6V; CRF1 = 1.2V to 4.8V; T = -40°C to 85°C; Unless otherwise noted</b>
Insertion Loss		0.3		dB	T = 25°C
		0.3	0.5	dB	
Input Return Loss		24	18	dB	
Output Return Loss		24	18	dB	
Port to ANT Isolation	43	46		dB	
Port to Port Isolation	44	47		dB	

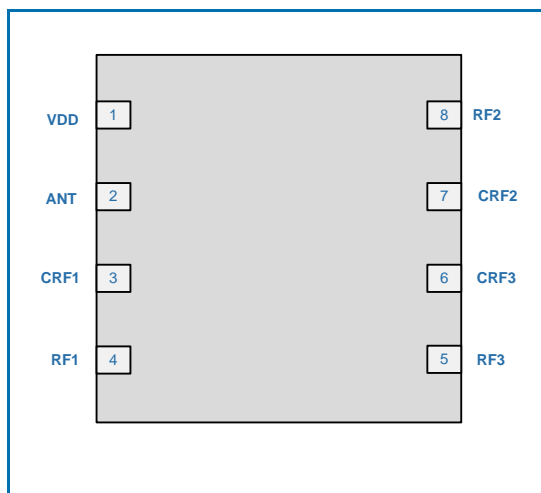
## Switch Control Logic Table

Mode	CRF1	CRF2	CRF3	Condition
RF1	1	0	0	RF1 to ANT
RF2	0	1	0	RF2 to ANT
RF3	0	0	1	RF3 to ANT
RF2/RF3	0	1	1	RF2/RF3 Coexistence

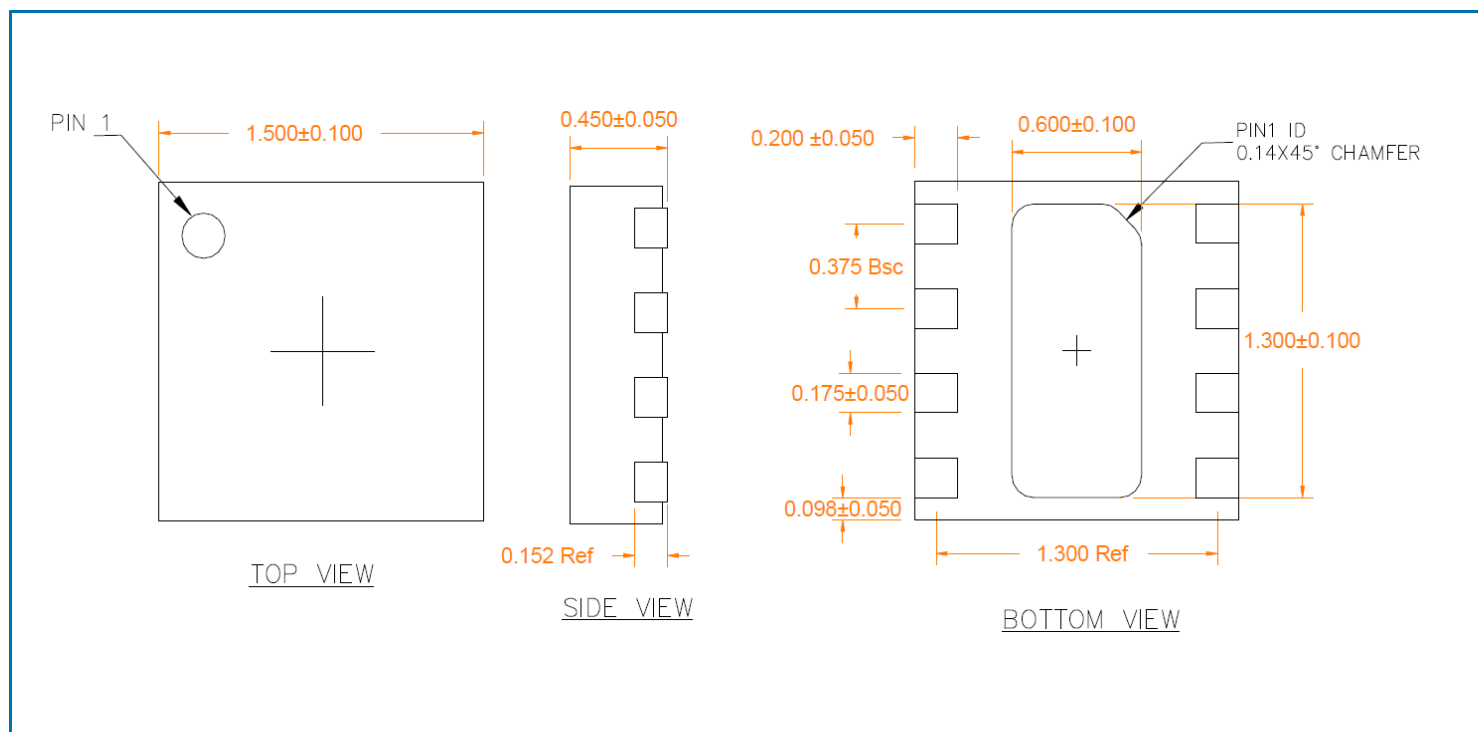
## Application Schematic



## Pin Out



## Package Drawing



## Pin Names and Descriptions

Pin	Name	Description
1	VDD	Drain Voltage Supply
2	ANT	Antenna RF Port.. External DC block required.
3	CRF1	Switch control to enable RF1 to ANT
4	RF1	RF port1. External DC block required.
5	RF3	RF port3. External DC block required.
6	CRF3	Switch control to enable RF3 to ANT
7	CRF2	Switch control to enable RF2 to ANT
8	RF2	RF port2. External DC block required.