SW1122

0.1-2.7GHz SPDT Antenna Switch

Description

The SW1122 is a low loss, high isolation SPDT Radio-Frequency switch. Outstanding performance for ultra-low tuning-on resistance and ultra-high linearity are making its perfectly to use for antenna tuning application for no matter high band or low band switch in GSM/WCDMA/LTE handset application.

The SW1122 SPDT switch is provided in a compact DFN 1.1mm x 0.7mm x 0.45mm package.
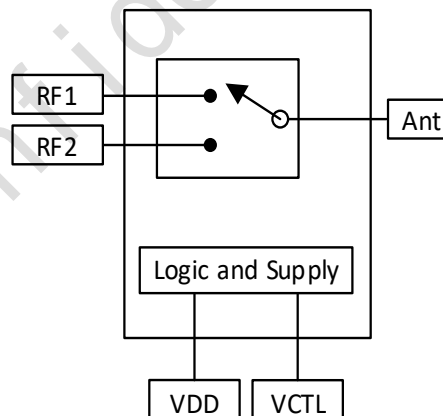
Features

- Frequency range: 0.1 to 2.7GHz

- Low insertion 0.37dB at 2.7GHz

- High isolation 25dB at 2.7GHz
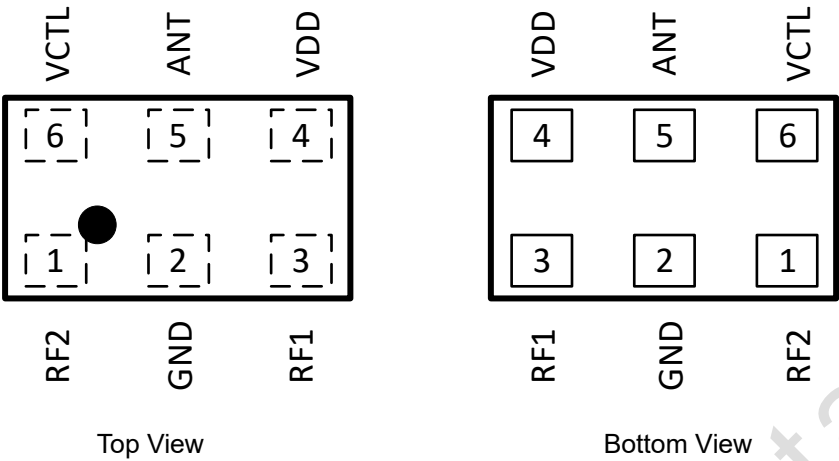
- GPIO control for SPDT

- DFN-6L package: 1.1mm x 0.7mm

Applications

- Smart phones, Tablet PCs

- GSM/WCDMA/LTE band and mode switching

- Antenna tuning switch

Block Diagram

Pin Configuration and Marking

Top View

Bottom View

Pin Description

Pin#	Name	Description	Pin#	Name	Description
1	RF2	RF2 Port	4	VDD	DC Control Voltage
2	GND	Ground	5	ANT	Antenna Port
3	RF1	RF1 Port	6	VCTL	Switch Control

Order Information

Part Number	Temperature	Package	RoHS	SPQ
SW1122	-40°C～85°C	1.1mm x 0.7mm	Yes	Tape and Reel 5000 pcs/Reel

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Absolute Maximum Ratings

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Supply Voltage	V_{DD}	1.6		3.6	V
Max Input Power	P_{INMAX}	-	-	35	dBm
Operation Temperature	T_{OP}	-40	-	85	℃
Storage Temperature	T_{STG}	-55	-	150	℃
Electrostatic Discharge, HBM	V_{ESD}			±1500	V
Electrostatic Discharge, CDM				±2000	V

HBM: ESDA/JEDEC JS-001-2017

CDM: ESDA/JEDEC JS -002-2018

DC Electrical Specifications

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Supply Voltage	V_{DD}	1.60	2.8	3.3	V
Supply Current	I_{DD}		35	60	µA
Control Voltage	V_{CTL_H}	1.20	1.80	2.85	V
	V_{CTL_L}			0.4	V
Control Current	I_{CTL}		0.5	1.0	µA
Turn-on switching time (50% of final VC to 10%/90% of final RF power)	t_{SW}		1.0		µs

RF Electrical Specifications

Parameter		Conditions	Values			Unit
			Min.	Typ.	Max.	
Insertion Loss	ANT to RF1-2	0.1-1.0 GHz		0.30	0.50	dB
		1.0-2.2 GHz		0.35	0.55	dB
		2.2-2.7 GHz		0.37	0.60	dB
Isolation	ANT to RF1-2	0.1-1.0 GHz	30	35		dB
		1.0-2.2 GHz	28	33		dB
		2.2-2.7 GHz	20	25		dB
P0.1	ANT to RF1-2	0.8-2.7 GHz		34.5		dBm
VSWR	-	0.1-2.7 GHz		1.2	1.5	
2nd Harmonics	2f0	P_{in}=26dBm		-65	-55	dBc

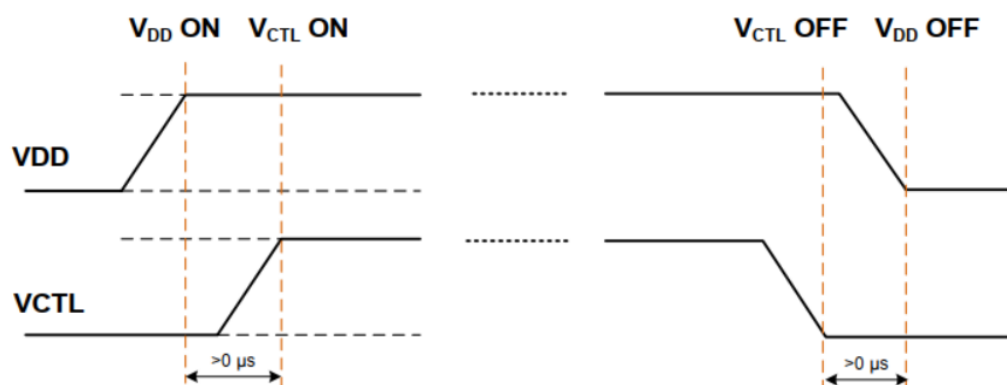## Control Logic

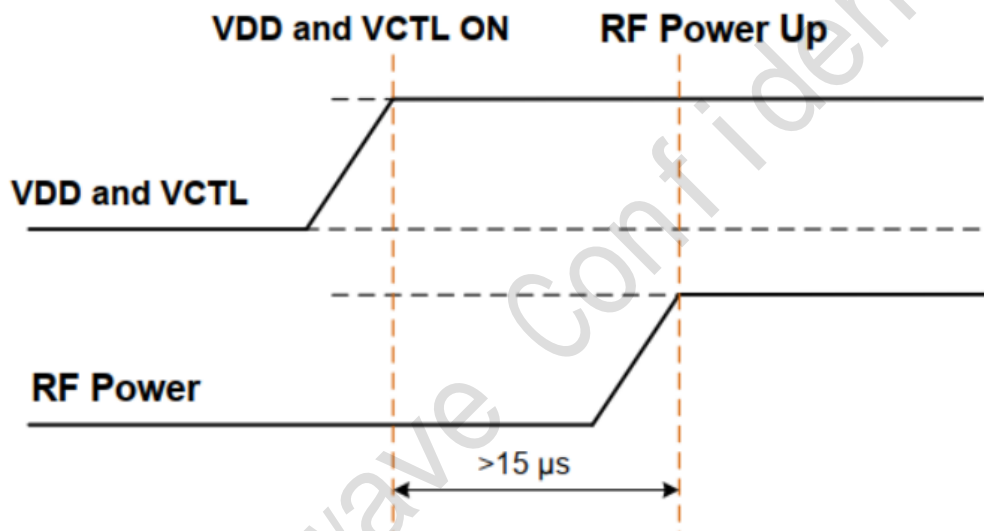| Control Pin	RF1	RF2
0	ON	OFF
1	OFF	ON

Timing Requirements

It is important that the user adheres to the correct timing sequences in order to avoid leakage power consumption.

1. VDD and VCTL cannot be powered on and off independently from one another. During power on sequence, the user must power up VDD first, then power up VCTL. During power off sequence, the user must power off VCTL first, then power off VDD.

In the state of VDD=OFF(0 V) and VCTL=ON(1.8V), it may cause leakage power consumption as ESD protection circuit inside the switch.
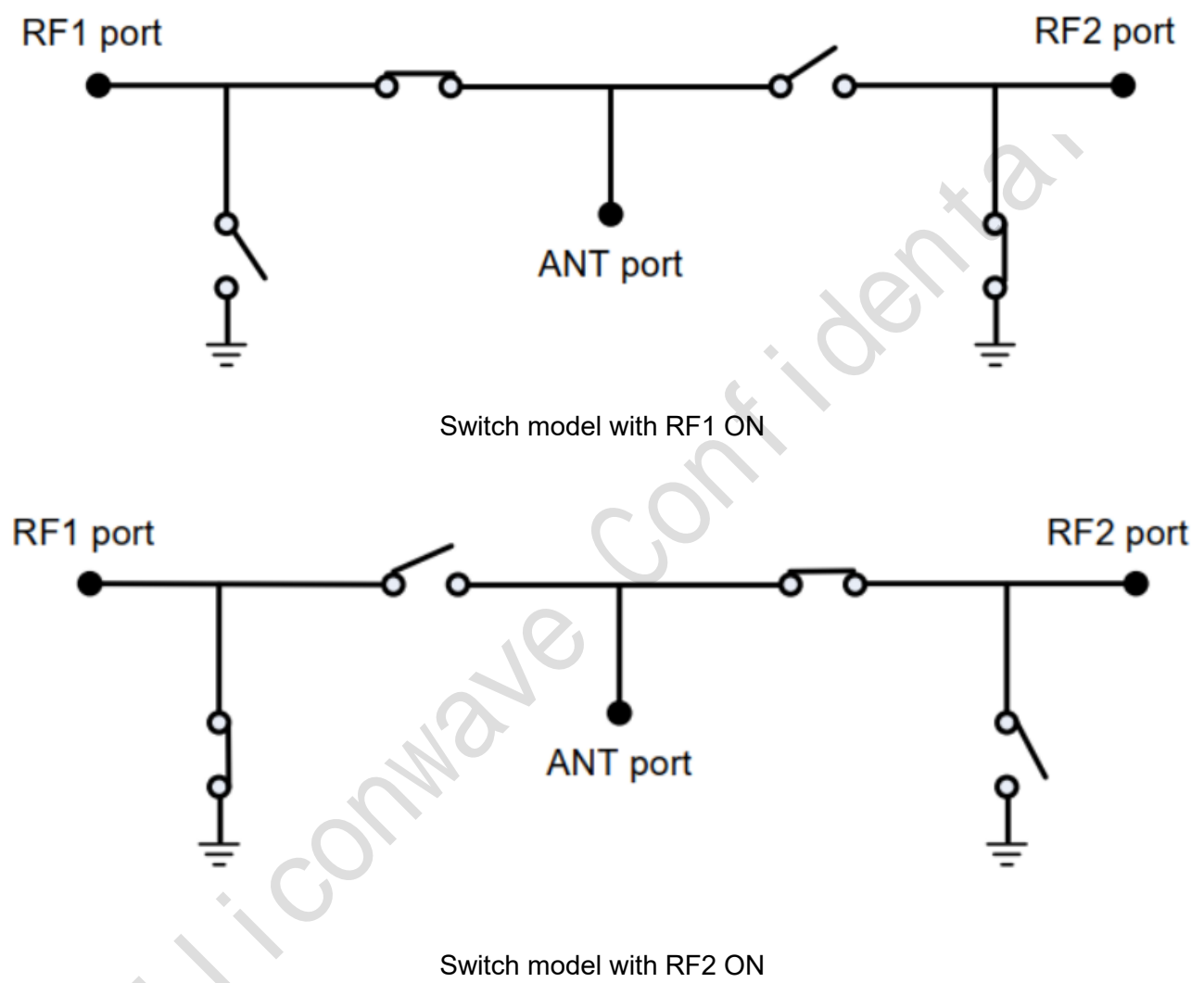
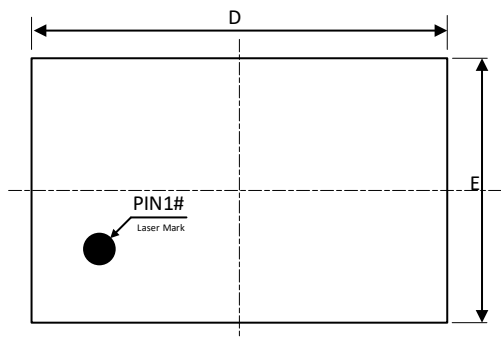2. VDD and VCTL must be on for a minimum of 15us before applying RF power.
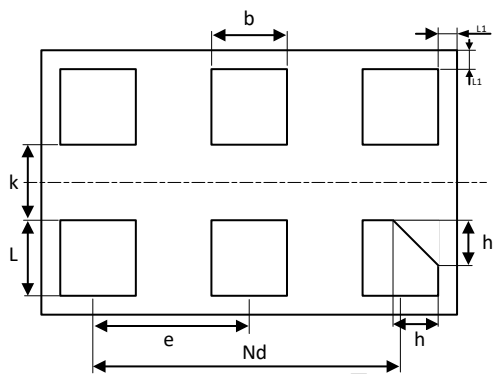
Switch Model for RF ON/OFF state

Please note that Switch model for RF1 ON and RF2 ON as the following.

Refer to the Figure , when RF1 ON, RF1 port and ANT port will be connected directly in short circuit, while RF2 port will be connected to the Ground through internal switch, so it should avoid DC level applied on RF2 port.
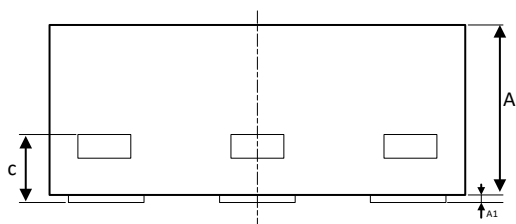
Switch model with RF1 ON

Switch model with RF2 ON

Package Dimension

Top View

Bottom View

Side View

Dimensional References in Millimeters:

Ref.	Min	Normal	Max	Ref.	Min	Normal	Max
A	0.40	0.45	0.50	C	0.152REF		
A1	0.00	0.02	0.05	L	0.15	0.20	0.25
b	0.15	0.20	0.25	L1	0.00	0.05	0.10
D	1.05	1.10	1.15	h	0.12REF		
E	0.65	0.70	0.75	K	0.20REF		
e	0.40 BCS						
Nd	0.80 BCS						

Recommended Solder Temperature

Reflow

Peak Temp
@230~250℃

More than 230℃
for 10~30sec

30~70sec

Preheat
120~180℃

60~130sec

Heating up ratio
1~3℃/sec

Recommended Temperature Sn95.5 Ag4.0 Cu0.5

RoHS Compliant

The product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE), and are therefore considered RoHS compliant.

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Revision History

Version	Release Date	Change Record
V0.95	2021.04.21	Beta
V1.0	2022.02.16	Updated Package Dimension
V1.1	2022.04.11	Updated Package Dimension
V1.2	2023.04.24	Updated LOGO、SPQ、Features Description、Package Dimension
V1.3	2023.05.08	Updated VDD Voltage Max Value、ESD

Important Notes

- All data or information contained herein are subject to change without prior notice. Please contact SILICONWAVE for further details of product specification.

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