

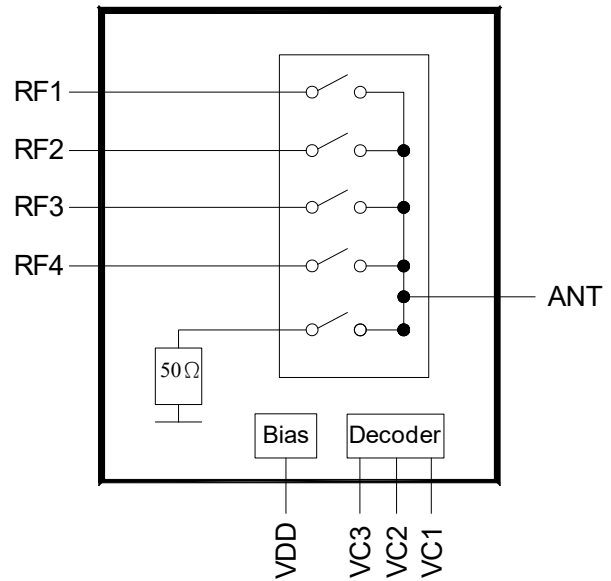
Features

- Low Insertion Loss: 0.5 dB @ 2.7 GHz
- High Isolation: 30 dB @ 2.7 GHz
- Low control voltage: 1.3 to 3.0 V
- No external DC blocking capacitors required

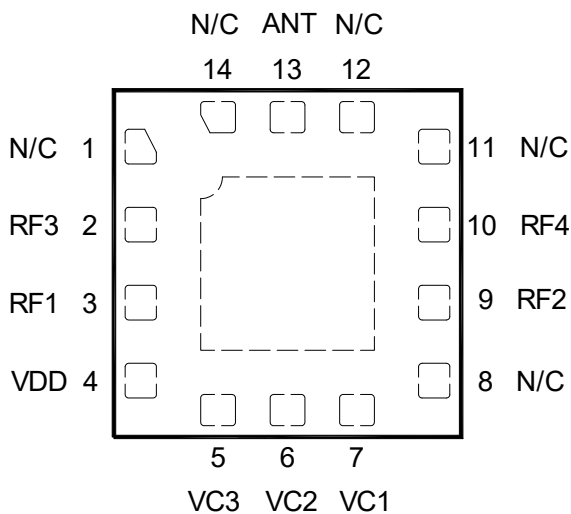
Description

The HWS554 is a SOI (Silicon On Insulator) multi ports switch operating at 0.5-3.8 GHz in a XQFN14L (2x2x0.55mm) package. The HWS554 features low insertion loss with very low DC power consumption. This switch can be used in any 2G/3G/4G antenna diversity systems for transmit/ receive or antenna diversity functions.

Functional Block Diagram



Pin Out (Top View)



Pin Names and Descriptions

Pin #	Name	Description	Pin #	Name	Description
1	N/C	Not connected	8	N/C	Not connected
2	RF3	RF output port 3	9	RF2	RF output port 2
3	RF1	RF output port 1	10	RF4	RF output port 4
4	VDD	DC power supply	11	N/C	Not connected
5	VC3	DC control voltage 3	12	N/C	Not connected
6	VC2	DC control voltage 2	13	ANT	Antenna port
7	VC1	DC control voltage 1	14	N/C	Not connected

Electrical Specifications at 25°C with VDD=2.6V, Vc=0/1.8V, Pin=0dBm

Parameter	Test Conditions	Min.	Typ.	Max.	Unit		
RF Specification							
Insertion Loss	ANT port to RF1/2/3/4 port	0.5-1.0GHz		0.45	0.55	dB	
		1.0-2.0GHz		0.45	0.60	dB	
		2.0-3.0GHz		0.50	0.70	dB	
		3.4-3.8GHz		0.75	0.95	dB	
Isolation	ANT port to RF1/2/3/4 port	0.5-1.0GHz	37	41		dB	
		1.0-2.0GHz	30	34		dB	
		2.0-3.0GHz	26	30		dB	
		3.4-3.8GHz	22	26		dB	
Return Loss	ANT port to RF1/2/3/4 port	0.5-1.0GHz		23		dB	
		1.0-2.0GHz		25		dB	
		2.0-3.0GHz		20		dB	
		3.4-3.8GHz		14		dB	
Input Power for 0.1dB Compression	ANT to RF port	0.8-3.8GHz		37.5		dBm	
2 nd Harmonics	ANT to RF port	Pin=+26dBm 0.5-3.0GHz		93		dBc	
3 rd Harmonics	ANT to RF port	Pin=+26dBm 0.5-3.0GHz		96		dBc	
2 nd Harmonics	ANT to RF port	Pin=+26dBm 3.4-3.8GHz		90		dBc	
3 rd Harmonics	ANT to RF port	Pin=+26dBm 3.4-3.8GHz		93		dBc	
3 rd Order Input Intercept Point	ANT to RF port	Pin=+26dBm, 2.0GHz $\Delta f=1\text{MHz}$		68		dBm	
50 ohm Power handling		0.5-3.8GHz			27	dBm	
DC Specification (Decoder)							
Supply Voltage	VDD		2.5	3.0	4.8	V	
Supply Current	IDD	VDD=2.5V		40		uA	
Control Voltage	Vc		High	1.3	1.8	3.0	V
			Low	0		0.3	
Control Current	Ic	Vc=1.8V		0.5	1	uA	
Shutdown Mode Supply Current	I _{off}	VDD=3V All Vc=shutdown mode		5	10	uA	
Switching Specification							
Switching Time		50% Vc to 90/10% RF		1.5		us	

Note: All measurements made in a 50 ohm system with 0/+2.6V control voltages, unless otherwise specified.

Logic Table for Switch On-Path (high=1.8V, low= 0V)
SP4T

VC1	VC2	VC3	RF1	RF2	RF3	RF4	50ohm	
0	0	0	on	off	off	off	off	
0	0	1	off	on	off	off	off	
0	1	0	off	off	on	off	off	
0	1	1	off	off	off	on	off	
1	0	0	off	off	off	off	off	
1	0	1	off	off	off	off	on	
1	1	1	Shutdown mode					

Isolation Matrix

On Port	Frequency(GHz)	Isolation (dB)			
		RF1	RF2	RF3	RF4
Antenna to Port					
RF1	1.0		41	44	38
RF1	2.0		35	33	32
RF1	2.7		32	28	29
RF1	3.8		27	23	25
RF2	1.0	41		37	45
RF2	2.0	34		31	34
RF2	2.7	31		28	29
RF2	3.8	28		25	25
RF3	1.0	43	41		39
RF3	2.0	34	35		32
RF3	2.7	30	32		29
RF3	3.8	25	28		26
RF4	1.0	41	42	38	
RF4	2.0	35	34	31	
RF4	2.7	31	30	29	
RF4	3.8	28	27	25	

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Input Power, 0.5-3.8 GHz	+37.5dBm
Supply Voltage	+5.0V
Control Voltage	+3.0V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Electrostatic Discharge HBM, Class 1C	1000V

Package Dimensions

XQFN-14L (2.0X2.0X0.55mm)

