DATA SHEET

SKY5A1007: Sky5® 0.4 to 6 GHz DPDT Low Insertion Loss, High Isolation Switch

Applications

- Automotive 4G LTE/5G/CV2X/11p telematics systems
- Main/diversity antenna swapping

Features

- AEC-Q100 Grade 2 qualified
- Support for automotive PPAP
- Support for IMDS material declaration
- Independent BOM management to minimize PCN risk
- Extended operating temperature: –40 to 105 °C
- Broadband frequency range: 0.4 to 6.0 GHz
- Low insertion loss: 0.7 dB (typical) at CV2X/11p frequency (5.75 to 5.925 GHz)
- High isolation: 30 dB @ 3.8 GHz
- GSM power handling
- Small 12-pin, 1.83 x 1.83 x 0.5 mm Quad Flat No-Lead (QFN) package, MSL1, 260 °C per JEDEC J-STD-020
- For RoHS and other product compliance information, see the Skyworks Certificate of Conformance.

Description

The SKY5A1007 is a state-of-the-art CMOS, silicon-on-insulator (SOI) double-pole, double-throw (DPDT) switch. The switch provides high linearity performance, low insertion loss, and high isolation.

The switch can be used to connect either port 1 or port 2 to either port 3 or port 4 by applying the proper bias to the control pin (CTRL1).

When port 1 is connected to port 4 using a low-loss path, port 2 is connected to port 3 also with a low-loss path. When port 1 is connected to port 3 using a low-loss path, port 2 is connected to port 4 also with a low-loss path.

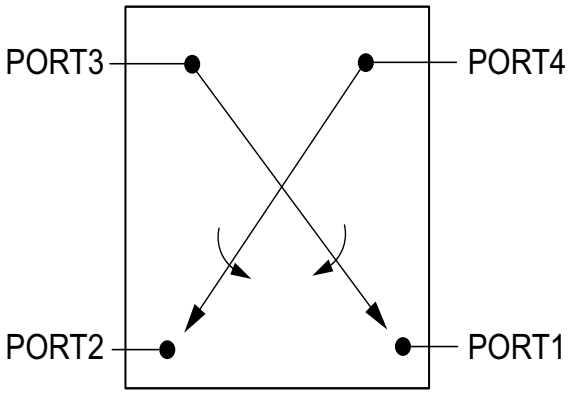


Figure 1. Functional Block Diagram

No external dc blocking capacitors are required on the RF path as long as no dc voltage is applied externally.

A functional block diagram is shown in Figure 1. The pin configuration and package are shown in Figure 2. Signal pin assignments and functional pin descriptions are provided in Table 1. The SKY5A1007 is part of our Sky5® product portfolio.

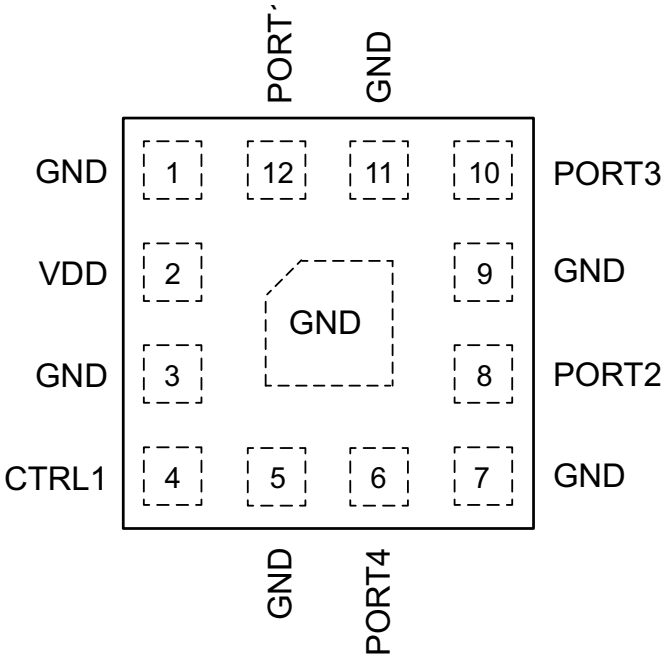


Figure 2. Pinout (Top View)

Table 1. Signal Descriptions[1]

Pin	Name	Description	Pin	Name	Description
1	GND	Ground, internally grounded	7	GND	Ground, internally grounded
2	VDD	DC power supply	8	PORT2	RF port 2
3	GND	Ground, internally grounded	9	GND	Ground, internally grounded
4	CTRL1	DC control voltage 1, see Table 4	10	PORT3	RF port 3
5	GND	Ground, internally grounded	11	GND	Ground, internally grounded
6	PORT4	RF port 4	12	PORT1	RF port 1

1. Exposed pad must be properly grounded using a low impedance path.

Electrical and Mechanical Specifications

Table 2. Absolute Maximum Ratings[1]

Parameter	Symbol	Min	Max	Units
Supply voltage	V_{DD}	–0.5	6	V
Control voltage	V_{CTL}	–0.5	3.1	V
Input power: CW, 50% dc, VSWR = 1:1, 0.4 to 0.91 GHz	P_{IN}		+39	dBm
CW, 50% dc, VSWR = 1:1, 1.71 to 2.7 GHz			+38	
CW, 50% dc, VSWR = 1:1, 2.7 to 6.0 GHz			+36	
CW, 50% dc, VSWR = 10:1, 0.4 to 6.0 GHz			+34	
LTE 10M Full RB, VSWR = 10:1, instantaneous			+31	
LTE 10M Full RB, VSWR = 8:1, 30 minutes			+31	
Storage temperature	T_{STG}	–55	+150	°C
Ambient operating temperature[2]	T_{OP}	–40	+105	°C
Electrostatic discharge: Charged Device Model (CDM), Class C3 Human Body Model (HBM), Class 2	ESD		1000 3000	V

1. Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.
2. In all cases, ambient operating temperature (T_{OP}) is specified relative to case temperature (T_C) and assumes $T_{OP} = (T_C – 10\ °C)$

ESD Handling: *Industry-standard ESD handling precautions must be adhered to at all times to avoid damage to this device.*

Table 3. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Operating frequency	fo	0.4		6	GHz
Supply voltage	V_{DD}	2.3	2.8	5.8	V
Control voltage, low	V_{CTL_L}	–0.2	0	0.4	V
Control voltage, high	V_{CTL_H}	1.35	1.8	2.8	V
Operating temperature	T_{OP}	–40	25	105	C

Table 4. DC Specifications[1]

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Supply current	I_{DD}	V_{DD} = 2.8 V, V_{CTL} = 1.8 V T = 25 °C		45	100	µA
Control current	I_{CC}	V_{DD} = 2.8 V, V_{CTL} = 1.8 V T = 25 °C		1	10	µA
Supply current	I_{DD}	V_{DD} = 2.8 V, V_{CTL} = 1.8 V T = –40 °C		45	100	µA
Control current	I_{CC}	V_{DD} = 2.8 V, V_{CTL} = 1.8 V T = –40 °C		1	10	µA
Supply current	I_{DD}	V_{DD} = 2.8V, V_{CTL} = 1.8 V T = 105 °C		45	100	µA
Control current	I_{CC}	V_{DD} = 2.8 V, V_{CTL} = 1.8V T = 105 °C		1	10	µA

1. Performance is assured only under the conditions listed in this table. Logic levels are compliant with the logic described in Table 8.

Table 5. RF Specifications[1]

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = +25 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Insertion loss	IL	**PORT1 to PORT3:**				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.32	0.5	
		2.5 to 2.7 GHz		0.39	0.56	
		3.4 to 3.8 GHz		0.64	0.85	
		5.15 to 6.0 GHz[2]		0.7	1.95	
		PORT2 to PORT4:				dB
		0.4 to 1.0 GHz		0.26	0.41	
		1.0 to 2.2 GHz		0.3	0.46	
		2.5 to 2.7 GHz		0.38	0.58	
		3.4 to 3.8 GHz		0.59	0.8	
		5.15 to 6.0 GHz[2]		0.7	2	
		PORT1 to PORT4:				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.32	0.49	
		2.5 to 2.7 GHz		0.42	0.58	
		3.4 to 3.8 GHz		0.58	0.8	
		5.15 to 6.0 GHz[2]		0.7	1.95	

Table 5. RF Specifications[1] (Continued)

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = +25 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Insertion loss	IL	**PORT2 to PORT3:**				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.3	0.45	
		2.5 to 2.7 GHz		0.35	0.55	
		3.4 to 3.8 GHz		0.55	0.8	
		5.15 to 6.0 GHz[2]		0.7	2	
Isolation: PORT1 to PORT2 or PORT3 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT3 and PORT2 to PORT4**				dB
		0.4 to 1.0 GHz	50	53		
		1.0 to 2.2 GHz	43	46		
		2.5 to 2.7 GHz	40	43		
		3.4 to 3.8 GHz	35	38		
		5.15 to 6.0 GHz	25	30		
Isolation: PORT1 to PORT2 or PORT3 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT4 and PORT2 to PORT3**				dB
		0.4 to 1.0 GHz	53	58		
		1.0 to 2.2 GHz	47	52		
		2.5 to 2.7 GHz	45	51		
		3.4 to 3.8 GHz	40	43		
		5.15 to 6.0 GHz	25	30		
Isolation PORT1 to PORT4 or PORT3 to PORT2	Iso	**Insertion loss mode: PORT1 to PORT3 and PORT2 to PORT4**				dB
		0.4 to 1.0 GHz	43	46		
		1.0 to 2.2 GHz	37	40		
		2.5 to 2.7 GHz	35	38		
		3.4 to 3.8 GHz	33	36		
		5.15 to 6.0 GHz	25	30		
Isolation PORT1 to PORT3 or PORT2 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT4 and PORT2 to PORT3**				dB
		0.4 to 1.0 GHz	40	43		
		1.0 to 2.2 GHz	33	36		
		2.5 to 2.7 GHz	32	35		
		3.4 to 3.8 GHz	30	33		
		5.15 to 6.0 GHz	25	30		
Return loss	$\|S_{11}\|$	**PORT1/PORT2 to PORT3/PORT4**				dB
		0.4 to 3.8 GHz	10	13		
		5.15 to 6.0 GHz	6	9		

Table 5. RF Specifications[1] (Continued)

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = +25 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Third order input intercept point	IIP3	P_{IN} = +20 dBm, Interferer = –15 dBm 0.4 to 3.8 GHz	65	75		dBm
Second harmonic	2fo	P_{IN} = +26 dBm, 0.4 to 3.8 GHz				dBm
		VSWR = 1:1		–77	–74	
		VSWR = 6:1		–73	–65	
Third harmonic	3fo	P_{IN} = +26 dBm, 0.4 to 3.8 GHz				dBm
		VSWR = 1:1		–75	–68	
		VSWR = 6:1		–69	–58	
Second harmonic (5 GHz)	2fo	P_{IN} = +26 dBm, 5.15 to 6.0 GHz				dBm
		VSWR = 1:1		–76	–62	
		VSWR = 4:1		–69	–60	
Third harmonic (5 GHz)	3fo	P_{IN} = +26 dBm, 5.15 to 6.0 GHz				dBm
		VSWR = 1:1		–72	–60	
		VSWR = 4:1		–59	–50	
Band 13 second harmonic	2fo_B13	f = 786.5 MHz, P_{IN} = +25 dBm		–88	–78	dBm
Band 17 third harmonic	3fo_B17	f = 710 MHz, P_{IN} = +25 dBm		–91	–84	dBm
GSM harmonics: low band	2fo	fo = 824 to 915 MHz P_{IN} = +35 dBm, 50 Ω		–59	–54	dBm
	3fo			–54	–49	
	2fo	fo = 824 to 915 MHz P_{IN} = +35 dBm, 6:1 VSWR, all phases		–56	–50	
	3fo			–45	–39	
GSM harmonics: high band	2fo	fo = 1710 to 1910 MHz P_{IN} = +33 dBm, 50 Ω		–70	–64	dBm
	3fo			–62	–56	
	2fo	fo = 1710 to 1910 MHz P_{IN} = +33 dBm, 6:1 VSWR, all phases		–62	–57	
	3fo			–51	–43	
0.1 dB input compression point	IP0.1dB	0.4 to 2.7 GHz		39.7		dBm
		3.4 to 3.8 GHz		38		
		5.15 to 6.0 GHz		36		
Second order intermodulation distortion	IMD2	f1 > 800 MHz @ +20 dBm, f2 > 2.5 GHz @ –15 dBm		–115	–110	dBm
Third order intermodulation distortion	IMD3			–110	–105	
DC supply turn-on/turn-off time	tON	Measured from 50% of final V_{DD} supply voltage to 90% of final RF power		2.5	10	µs
Switching speed	tSW	Measured from 50% of final CTRL1 voltage to 90% of final RF power		2.5	10	µs

1. Performance is assured only under the conditions listed in this table.
2. External matching required.

Table 6. RF Specifications[1]

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = –40 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Insertion loss	IL	**PORT1 to PORT3**				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.32	0.47	
		2.5 to 2.7 GHz		0.39	0.55	
		3.4 to 3.8 GHz		0.64	0.85	
		5.15 to 6.0 GHz[2]		0.7	1.8	
		PORT2 to PORT4				dB
		0.4 to 1.0 GHz		0.26	0.41	
		1.0 to 2.2 GHz		0.3	0.45	
		2.5 to 2.7 GHz		0.38	0.53	
		3.4 to 3.8 GHz		0.59	0.8	
		5.15 to 6.0 GHz[2]		0.7	1.8	
		PORT1 to PORT4				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.32	0.47	
		2.5 to 2.7 GHz		0.42	0.57	
		3.4 to 3.8 GHz		0.58	0.8	
		5.15 to 6.0 GHz[2]		0.7	1.8	
		PORT2 to PORT3				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.3	0.45	
		2.5 to 2.7 GHz		0.35	0.5	
		3.4 to 3.8 GHz		0.55	0.8	
		5.15 to 6.0 GHz[2]		0.7	1.8	
Isolation: PORT1 to PORT2 or PORT3 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT3 and PORT2 to PORT4**				dB
		0.4 to 1.0 GHz	50	53		
		1.0 to 2.2 GHz	43	46		
		2.5 to 2.7 GHz	40	43		
		3.4 to 3.8 GHz	35	38		
		5.15 to 6.0 GHz	25	30		

Table 6. RF Specifications[1] (Continued)

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = –40 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Isolation: PORT1 to PORT2 or PORT3 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT4 and PORT2 to PORT3**				dB
		0.4 to 1.0 GHz	54	58		
		1.0 to 2.2 GHz	47	52		
		2.5 to 2.7 GHz	45	51		
		3.4 to 3.8 GHz	40	43		
		5.15 to 6.0 GHz	25	30		
Isolation PORT1 to PORT4 or PORT3 to PORT2	Iso	**Insertion loss mode: PORT1 to PORT3 and PORT2 to PORT4**				dB
		0.4 to 1.0 GHz	43	46		
		1.0 to 2.2 GHz	37	40		
		2.5 to 2.7 GHz	35	38		
		3.4 to 3.8 GHz	33	36		
		5.15 to 6.0 GHz	25	30		
Isolation PORT1 to PORT3 or PORT2 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT4 and PORT2 to PORT3**				dB
		0.4 to 1.0 GHz	40	43		
		1.0 to 2.2 GHz	33	36		
		2.5 to 2.7 GHz	32	35		
		3.4 to 3.8 GHz	30	33		
		5.15 to 6.0 GHz	25	30		
Return loss	$\|S_{11}\|$	**PORT1/PORT2 to PORT3/PORT4**				dB
		0.4 to 3.8 GHz	10	13		
		5.15 to 6.0 GHz	5	9		
Third order input intercept point	IIP3	P_{IN} = +20 dBm, Interferer = –15 dBm 0.4 to 3.8 GHz	65	75		dBm
Second harmonic	2fo	P_{IN} = +26 dBm, 0.4 to 3.8 GHz				dBm
		VSWR = 1:1		–77	–74	
		VSWR = 6:1		–73	–68	
Third harmonic	3fo	P_{IN} = +26 dBm, 0.4 to 3.8 GHz				dBm
		VSWR = 1:1		–75	–70	
		VSWR = 6:1		–69	–57	
Second harmonic (5 GHz)	2fo	P_{IN} = +26 dBm, 5.15 to 6.0 GHz				dBm
		VSWR = 1:1		–76	–62	
		VSWR = 4:1		–69	–60	
Third harmonic (5 GHz)	3fo	P_{IN} = +26 dBm, 5.15 to 6.0 GHz				dBm
		VSWR = 1:1		–72	–60	
		VSWR = 4:1		–59	–48	

Table 6. RF Specifications[1] (Continued)

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = –40 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Band 13 second harmonic	2fo_B13	f = 786.5 MHz, P_{IN} = +25 dBm		–88	–80	dBm
Band 17 third harmonic	3fo_B17	f = 710 MHz, P_{IN} = +25 dBm		–91	–84	dBm
GSM harmonics: low band	2fo	fo = 824 to 915 MHz P_{IN} = +35 dBm, 50 Ω		–59	–54	dBm
	3fo			–54	–49	
	2fo	fo = 824 to 915 MHz P_{IN} = +35 dBm, 6:1 VSWR, all phases		–56	–50	
	3fo			–45	–40	
GSM harmonics: high band	2fo	fo = 1710 to 1910 MHz P_{IN} = +33 dBm, 50 Ω		–70	–65	dBm
	3fo			–62	–55	
	2fo	fo = 1710 to 1910 MHz P_{IN} = +33 dBm, 6:1 VSWR, all phases		–62	–57	
	3fo			–51	–42	
0.1dB input compression point	IP0.1dB	0.4 to 2.7 GHz		39.7		dBm
		3.4 to 3.8 GHz		38		
		5.15 to 6.0 GHz		36		
Second order intermodulation distortion	IMD2	f1 > 800 MHz @ +20 dBm, f2 > 2.5 GHz @ –15dBm		–115	–110	dBm
Third order intermodulation distortion	IMD3			–110	–105	
DC supply turn-on/turn-off time	tON	Measured from 50% of final V_{DD} supply voltage to 90% of final RF power		2.5	10	µs
Switching speed	tSW	Measured from 50% of final CTRL1 voltage to 90% of final RF power		2.5	10	µs

1. Performance is assured only under the conditions listed in this table.
2. External matching required.

Table 7. RF Specifications[1]

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = +105 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Insertion loss	IL	**PORT1 to PORT3**				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.32	0.54	
		2.5 to 2.7 GHz		0.39	0.6	
		3.4 to 3.8 GHz		0.64	0.85	
		5.15 to 6.0 GHz[2]		0.7	2.2	
		PORT2 to PORT4				dB
		0.4 to 1.0 GHz		0.26	0.41	
		1.0 to 2.2 GHz		0.3	0.51	
		2.5 to 2.7 GHz		0.38	0.63	
		3.4 to 3.8 GHz		0.59	0.8	
		5.15 to 6.0 GHz[2]		0.7	2.2	
		PORT1 to PORT4				dB
		0.4 to 1.0 GHz		0.27	0.43	
		1.0 to 2.2 GHz		0.32	0.54	
		2.5 to 2.7 GHz		0.42	0.64	
		3.4 to 3.8 GHz		0.58	0.8	
		5.15 to 6.0 GHz[2]		0.7	2	
		PORT2 to PORT3				dB
		0.4 to 1.0 GHz		0.27	0.42	
		1.0 to 2.2 GHz		0.3	0.51	
		2.5 to 2.7 GHz		0.35	0.59	
		3.4 to 3.8 GHz		0.55	0.8	
		5.15 to 6.0 GHz[2]		0.7	2.2	
Isolation: PORT1 to PORT2 or PORT3 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT3 and PORT2 to PORT4**				dB
		0.4 to 1.0 GHz	50	53		
		1.0 to 2.2 GHz	43	46		
		2.5 to 2.7 GHz	40	43		
		3.4 to 3.8 GHz	35	38		
		5.15 to 6.0 GHz	25	30		

Table 7. RF Specifications[1] (Continued)

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = +105 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Isolation: PORT1 to PORT2 or PORT3 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT4 and PORT2 to PORT3**				dB
		0.4 to 1.0 GHz	53	58		
		1.0 to 2.2 GHz	47	52		
		2.5 to 2.7 GHz	45	51		
		3.4 to 3.8 GHz	38	43		
		5.15 to 6.0 GHz	25	30		
Isolation PORT1 to PORT4 or PORT3 to PORT2	Iso	**Insertion loss mode: PORT1 to PORT3 and PORT2 to PORT4**				dB
		0.4 to 1.0 GHz	43	46		
		1.0 to 2.2 GHz	37	40		
		2.5 to 2.7 GHz	35	38		
		3.4 to 3.8 GHz	33	36		
		5.15 to 6.0 GHz	25	30		
Isolation PORT1 to PORT3 or PORT2 to PORT4	Iso	**Insertion loss mode: PORT1 to PORT4 and PORT2 to PORT3**				dB
		0.4 to 1.0 GHz	40	43		
		1.0 to 2.2 GHz	33	36		
		2.5 to 2.7 GHz	32	35		
		3.4 to 3.8 GHz	30	33		
		5.15 to 6.0 GHz	25	30		
Return loss	$\lvert S_{11} \rvert$	**PORT1/PORT2 to PORT3/PORT4**				dB
		0.4 to 3.8 GHz	10	13		
		5.15 to 6.0 GHz	6	9		
Third order input intercept point	IIP3	P_{IN} = +20 dBm, Interferer = –15 dBm 0.4 to 3.8 GHz	65	75		dBm
Second harmonic	2fo	P_{IN} = +26 dBm, 0.4 to 3.8 GHz				dBm
		VSWR = 1:1		–77	–74	
		VSWR = 6:1		–73	–68	
Third harmonic	3fo	P_{IN} = +26 dBm, 0.4 to 3.8 GHz				dBm
		VSWR = 1:1		–75	–70	
		VSWR = 6:1		–69	–58	
Second harmonic (5 GHz)	2fo	P_{IN} = +26 dBm, 5.15 to 6.0 GHz				dBm
		VSWR = 1:1		–76	–62	
		VSWR = 4:1		–69	–60	
Third harmonic (5 GHz)	3fo	P_{IN} = +26 dBm, 5.15 to 6.0 GHz				dBm
		VSWR = 1:1		–72	–60	
		VSWR = 4:1		–59	–50	

Table 7. RF Specifications[1] (Continued)

(V_{DD} = 2.8 V, V_{CTL} = 0 V and +1.8 V, T_{OP} = +105 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_O] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Band 13 second harmonic	2fo_B13	f = 786.5 MHz, P_{IN} = +25 dBm		–88	–76	dBm
Band 17 third harmonic	3fo_B17	f = 710 MHz, P_{IN} = +25 dBm		–91	–83	dBm
GSM harmonics: low band	2fo	fo = 824 to 915 MHz P_{IN} = +35 dBm, 50 Ω		–59	–51	dBm
	3fo			–54	–49	
	2fo	fo = 824 to 915 MHz P_{IN} = +35 dBm, 6:1 VSWR, all phases		–56	–46	dBm
	3fo			–45	–37	
GSM harmonics: high band	2fo	fo = 1710 to 1910 MHz P_{IN} = +33 dBm, 50 Ω		–70	–60	dBm
	3fo			–62	–56	
	2fo	fo = 1710 to 1910 MHz P_{IN} = +33 dBm, 6:1 VSWR, all phases		–62	–56	dBm
	3fo			–51	–43	
0.1dB input compression point	IP0.1dB	0.4 to 2.7 GHz		39.7		dBm
		3.4 to 3.8 GHz		38		
		5.15 to 6.0 GHz		36		
Second order intermodulation distortion	IMD2	f1 > 800 MHz @ +20 dBm, f2 > 2.5 GHz @ –15 dBm		–115	–110	dBm
Third order intermodulation distortion	IMD3			–110	–105	
DC supply turn-on/turn-off time	t_{ON}	Measured from 50% of final V_{DD} supply voltage to 90% of final RF power		2.5	10	µs
Switching speed	t_{SW}	Measured from 50% of final CTRL1 voltage to 90% of final RF power		2.5	10	µs

1. Performance is assured only under the conditions listed in this table.
2. External matching required.

Table 8. Truth Table[1]

CTRL1	State
1	PORT3 to PORT1, PORT4 to PORT2
0	PORT3 to PORT2, PORT4 to PORT1

1. 1 = 1.35 to 2.8 V, 0 = –0.2 to +0.4 V. Any state other than described in this table places the switch into an undefined state.

Evaluation Board Description

An evaluation board (EVB) is used to test the performance of the SKY5A1007 DPDT switch. An EVB schematic is provided in Figure 3. Figure 4 shows a recommended ESD protection circuit. An assembly drawing for the evaluation board is shown in Figure 5.

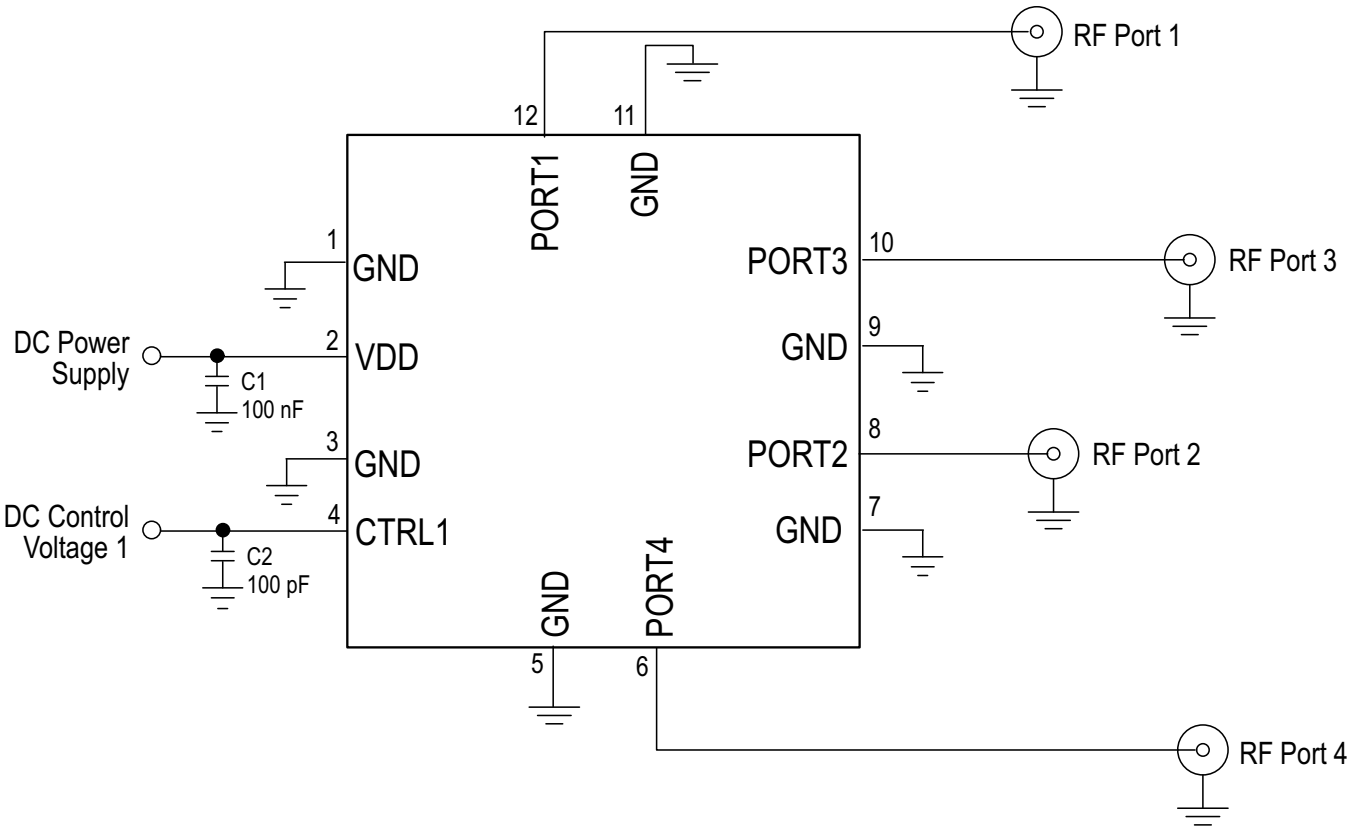


Figure 3. Evaluation Board Schematic

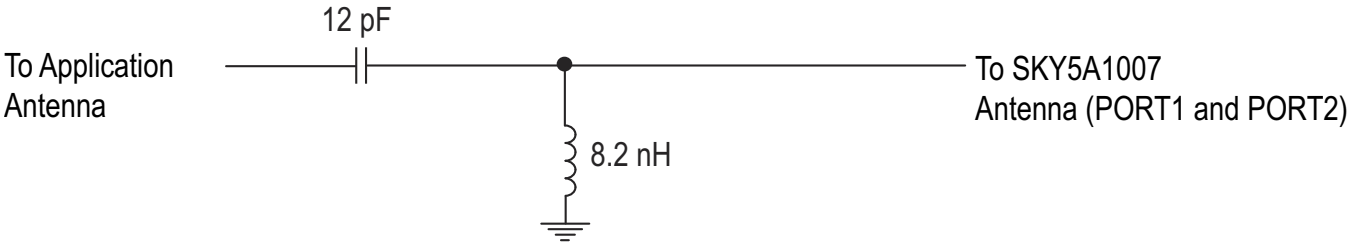


Figure 4. Recommended ESD Protection Circuit

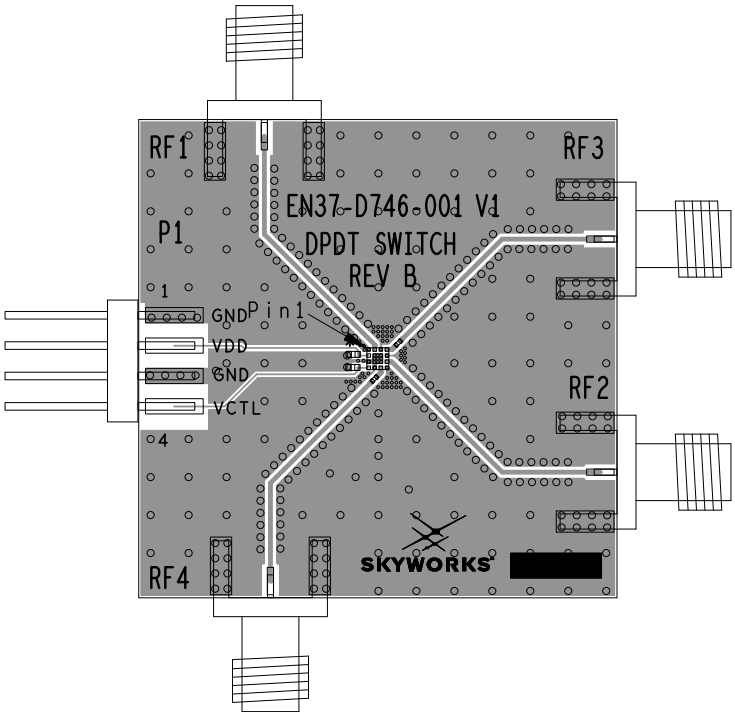


Figure 5. Evaluation Board Assembly Diagram

Package and Handling Information

Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

The SKY5A1007 is rated to Moisture Sensitivity Level 1 (MSL1) at 260 °C. It can be used for lead or lead-free soldering. For additional information, refer to the Skyworks Application Note, “Solder Reflow Information,” document number 200164.

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format.

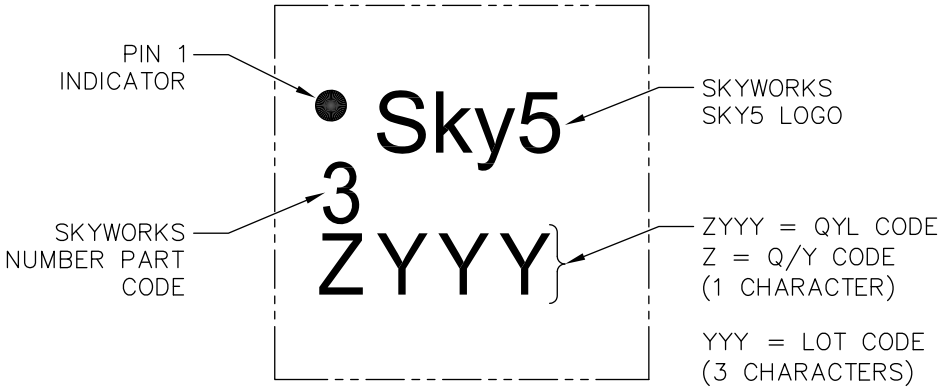


Figure 6. Typical Part Marking

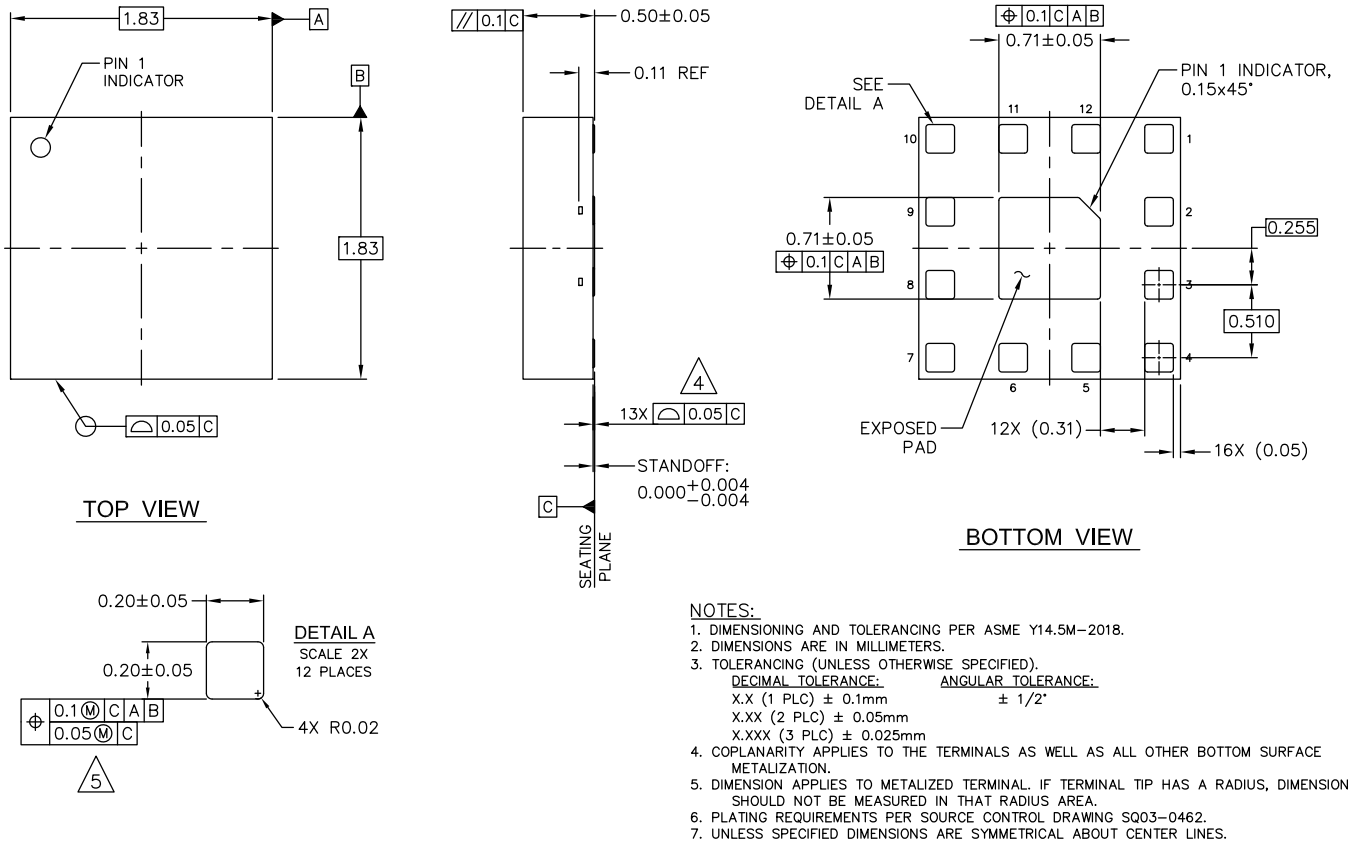
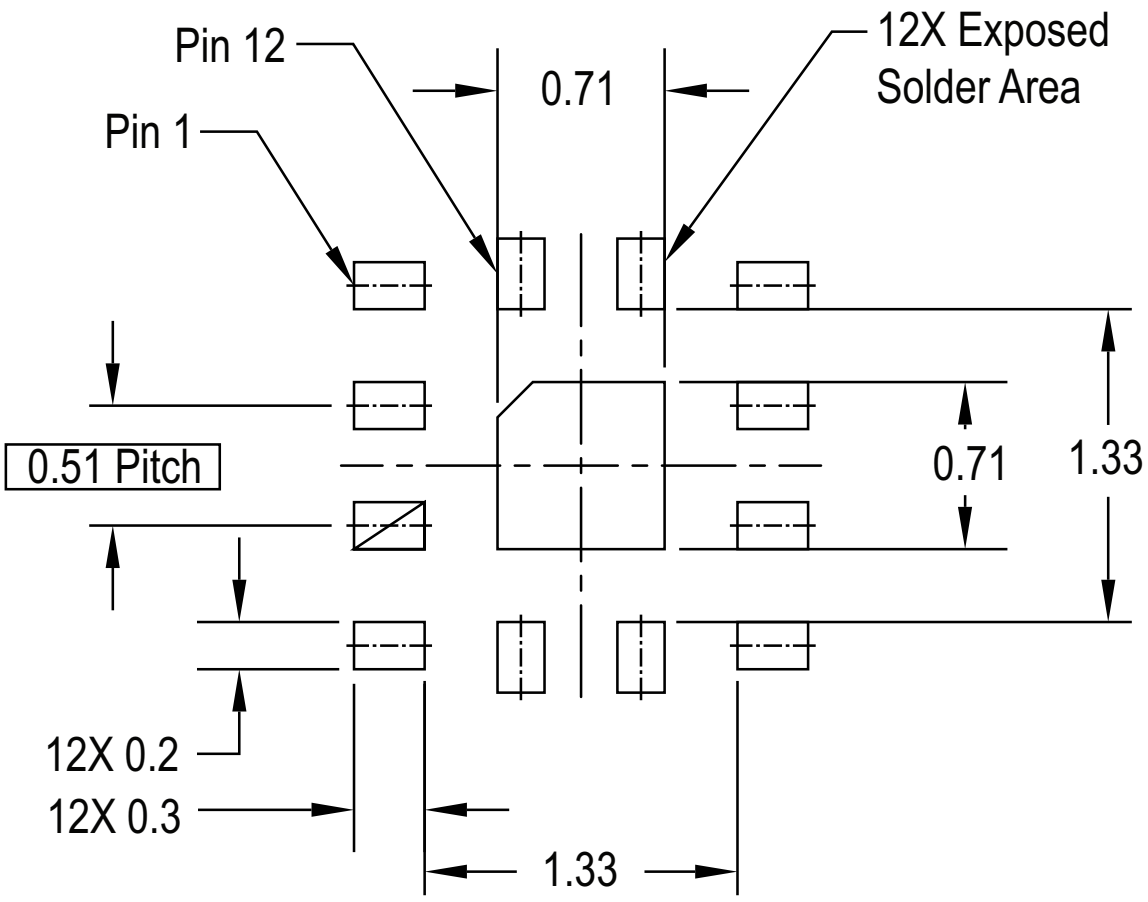
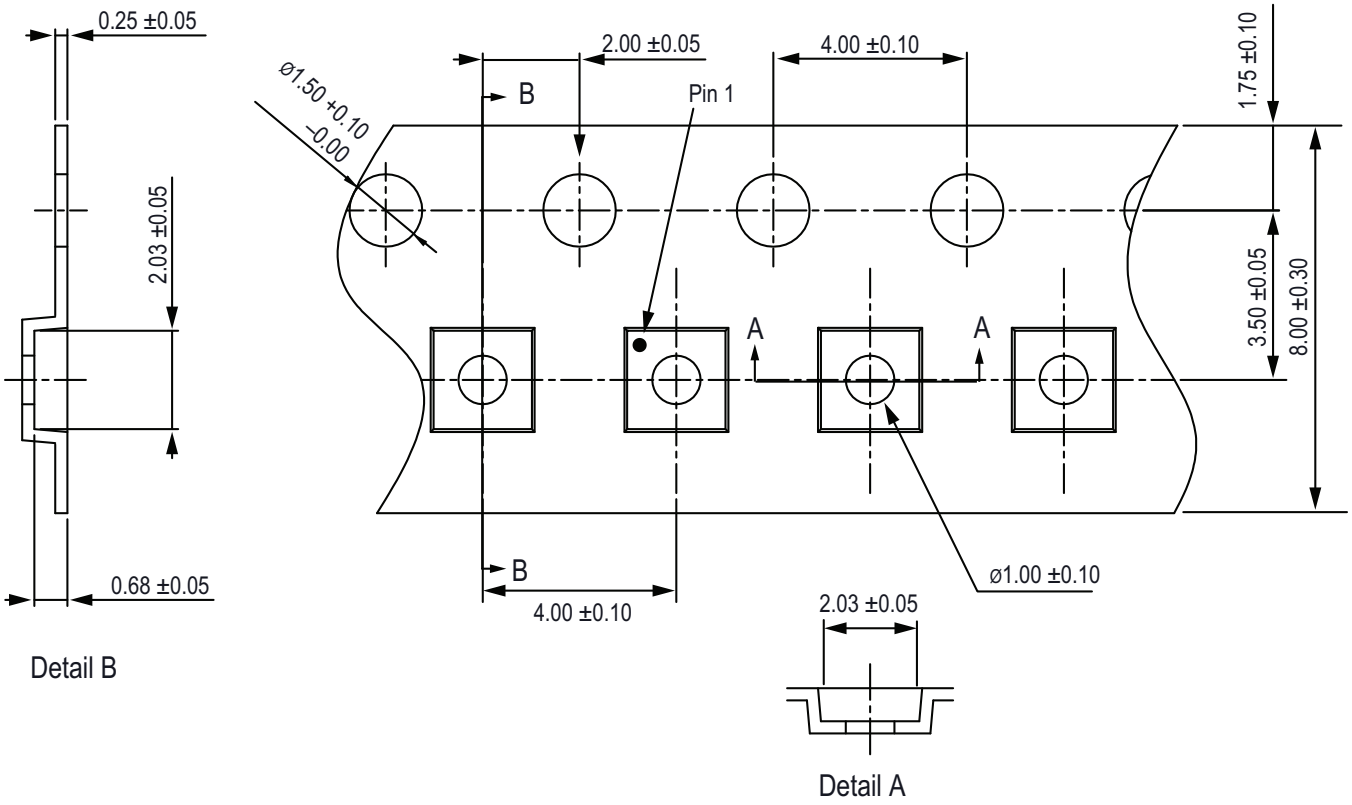


Figure 7. Package Dimensions



Note: All dimensions are in millimeters.

Figure 8. PCB Layout Footprint



Notes:
10-sprocket hole pitch cumulative tolerance: ±0.2 mm.
Ao and Bo measured on plane 0.30 mm above the bottom of the pocket.
Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
All dimensions are in millimeters.

Figure 9. Tape and Reel Information

Ordering Information

Part Number	Description	Evaluation Board Part Number
SKY5A1007	Sky5® 0.4 to 6 GHz DPDT Low Insertion Loss, High Isolation Switch	SKY5A1007EK1