Table 1. SKY13585-679LF Signal Descriptions

Pin	Name	Description	Pin	Name	Description
1	OUTPUT1	RF port	4	VCTL	DC control voltage
2	GND	Ground	5	INPUT	RF port
3	OUTPUT2	RF port	6	VDD	DC supply voltage

Electrical and Mechanical Specifications

The absolute maximum ratings of the SKY13585-679LF are provided in Table 2. The recommended operating conditions are specified in Table 3, and electrical specifications are provided in Table 4.

The state of the SKY13585-679LF is determined by the logic provided in Table 5. Typical performance characteristics are shown in Figures 3 through 6.

Table 2. SKY13585-679LF Absolute Maximum Ratings[1]

Parameter	Symbol	Minimum	Maximum	Units
Input power	P_{IN}		+32	dBm
Supply voltage	V_{DD}		5.5	V
Control voltage	V_{CTL}		3.7	V
Storage temperature	T_{STG}	–65	+150	°C
Operating temperature	T_{OP}	–40	+90	°C

[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.

ESD HANDLING: *Although this device is designed to be as robust as possible, electrostatic discharge (ESD) can damage this device. This device must be protected at all times from ESD when handling or transporting. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD handling precautions should be used at all times.*

Table 3. SKY13585-679LF Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Units
Operating frequency	fo	1.0		6.0	GHz
Supply voltage	V_{DD}	2.7	3.3	5	V
Control voltage: Low High	 V_{CTL_L} V_{CTL_H}	 0 1.6		 0.4 3.6	 V V
Operating temperature	T_{OP}		+25		°C

Table 4. SKY13585-679LF Electrical Specifications[1]
(V_{DD} = 3.3 V, V_{CTL} = 0 V and 1.8 V, T_{OP} = +25 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_0] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Minimum	Typical	Maximum	Units
Insertion loss	IL	1.0 to 2.5 GHz, NTC[2] 4.8 to 6.0 GHz, NTC		0.5 0.7	0.65 0.95	dB dB
Isolation (INPUT to OUTPUT1/OUTPUT2)	ISO	1.0 to 2.5 GHz, NTC 4.8 to 6.0 GHz, NTC	34 20	38 22		dB dB
Isolation (OUTPUT1 to OUTPUT2)	ISO	1.0 to 2.5 GHz, NTC 4.8 to 6.0 GHz, NTC	33 19	36 22		dB dB
Return loss	RL	1.0 to 2.5 GHz, NTC 4.8 to 6.0 GHz, NTC	14 14	17 17		dB dB
P0.1dB compression point	P0.1dB	1.0 to 6.0 GHz, NTC		+31		dBm
Harmonics	2fo	P_{IN} = +24 dBm: fo = 2.4 GHz, NTC fo = 5.8 GHz, NTC		 –48 –50	 –42 –46	 dBm dBm
	3fo	P_{IN} = +24 dBm, fo = 2.4 GHz, NTC		–48	–44	dBm
Input IP3	IP3	P_{IN} = +20 dBm/tone: fo = 2.4 GHz, NTC fo = 5.8 GHz, NTC	 +50 +46	 +56 +50		 dBm dBm
Error vector magnitude	EVM	802.11a, 54 Mbps, P_{IN} = +24 dBm 802.11g, 54 Mbps, P_{IN} = +24 dBm		–45 –42	–40 –36	dB dB
Startup time	ts	50% V_{DD} to 90% of RF		2	5	µs
Switching speed	tsw	10% RF to 90% RF		300	450	ns
Supply current	I_{DD}	NTC		5	10	µA

1 Performance is guaranteed only under the conditions listed in this table.
2 NTC = nominal test conditions

Table 5. SKY13585-679LF Truth Table[1]

VDD (Pin 6)	VCTL (Pin 4)	INPUT to OUTPUT1 Path	INPUT to OUTPUT2 Path
1	0	Isolation	Insertion loss
1	1	Insertion loss	Isolation

1 "1" indicates V_{DD} = 3 to 5 V, V_{CTL} = 1.6 to 3.6 V.
"0" indicates V_{CTL} = 0 to 0.4 V.
Any state other than described in this table places the switch into an undefined state. An undefined state will not damage the device.

Typical Performance Characteristics

(V_{DD} = 3.3 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)

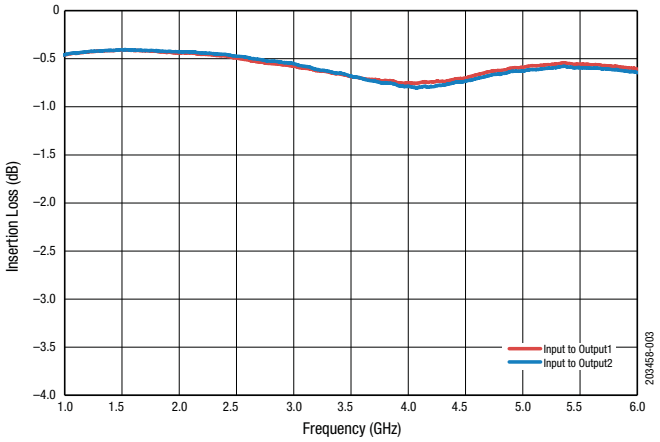


Figure 3. Typical Insertion Loss

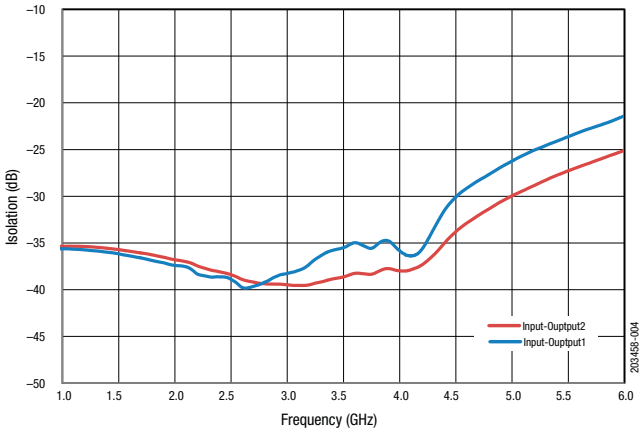


Figure 4. Typical Isolation, Input—Output

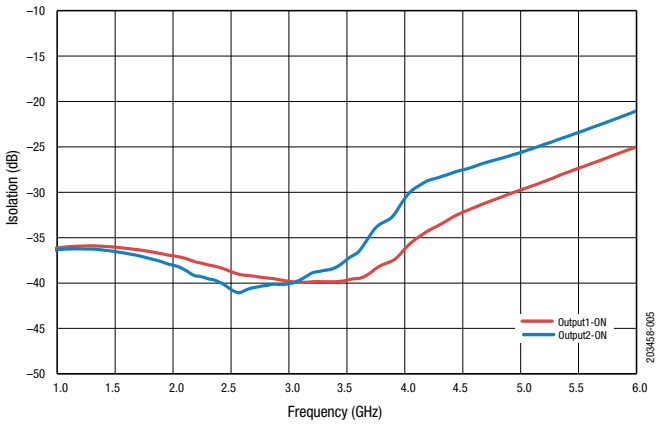


Figure 5. Typical Isolation, Output1—Output2

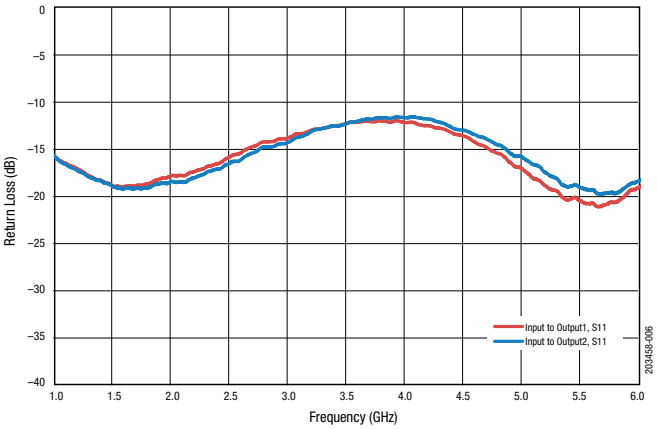


Figure 6. Typical Return Loss

Evaluation Board Description

The SKY13585-679LF Evaluation Board is used to test the performance of the SKY13585-679LF SPDT Switch. An Evaluation Board schematic diagram is provided in Figure 7. An assembly drawing for the Evaluation Board is shown in Figure 8.

Package Dimensions

The PCB layout footprint for the SKY13585-679LF is provided in Figure 9. Typical part markings are shown in Figure 10. Package dimensions are shown in Figure 11, and tape and reel dimensions are provided in Figure 12.

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 SKY13585-679LF 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.

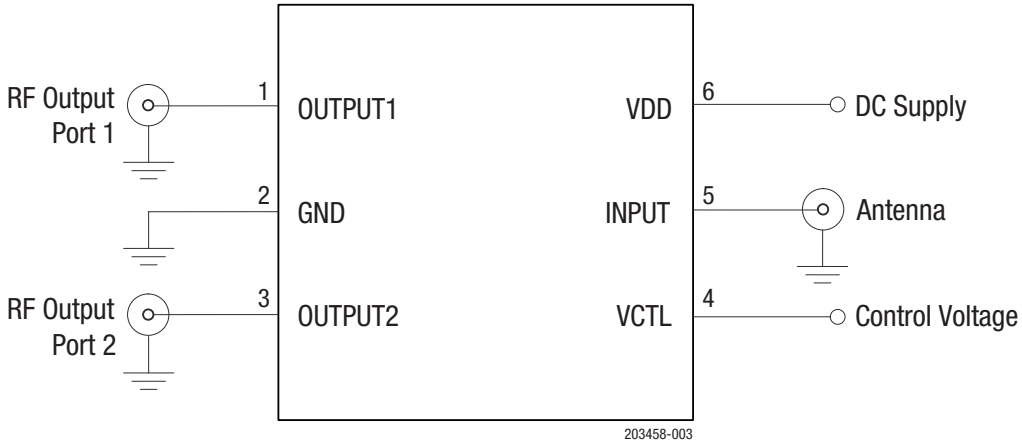


Figure 7. SKY13585-679LF Evaluation Board Schematic

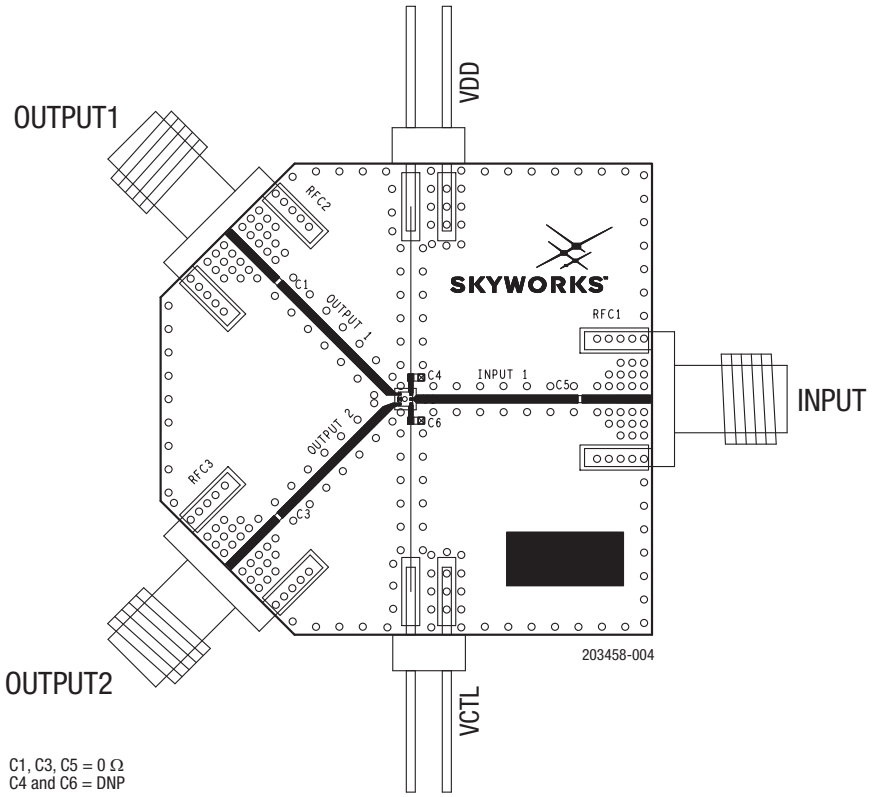


Figure 8. SKY13585-679LF Evaluation Board Assembly Diagram

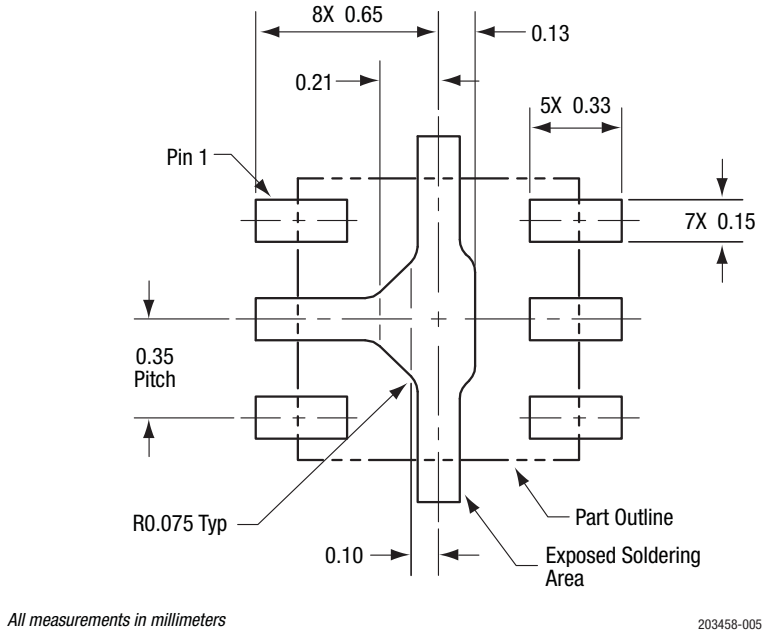


Figure 9. SKY13585-679LF PCB Layout Footprint (Top View)

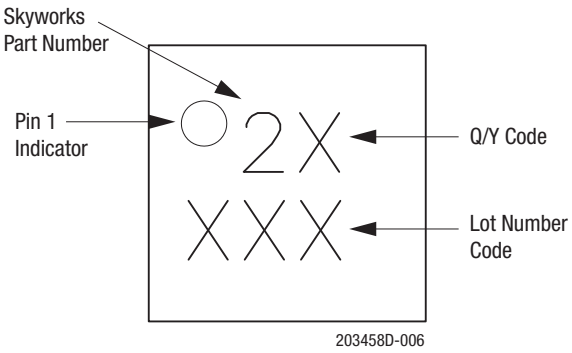
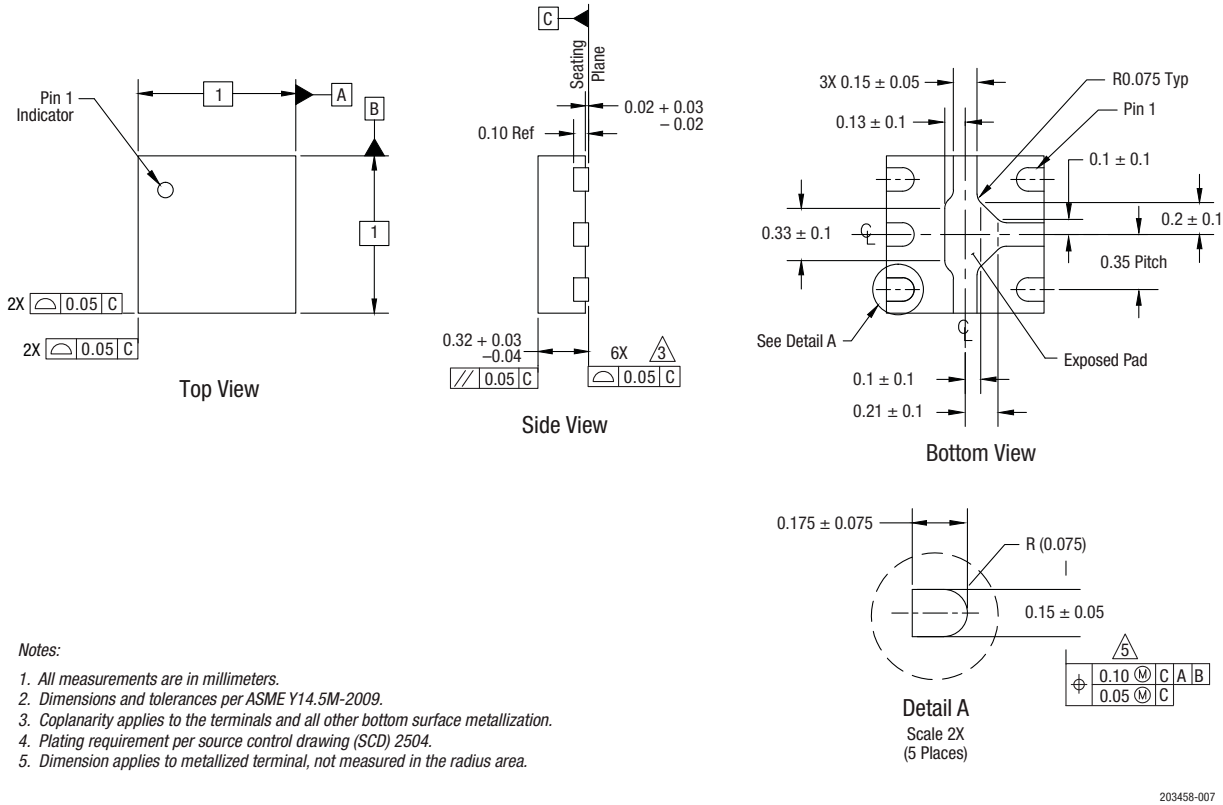


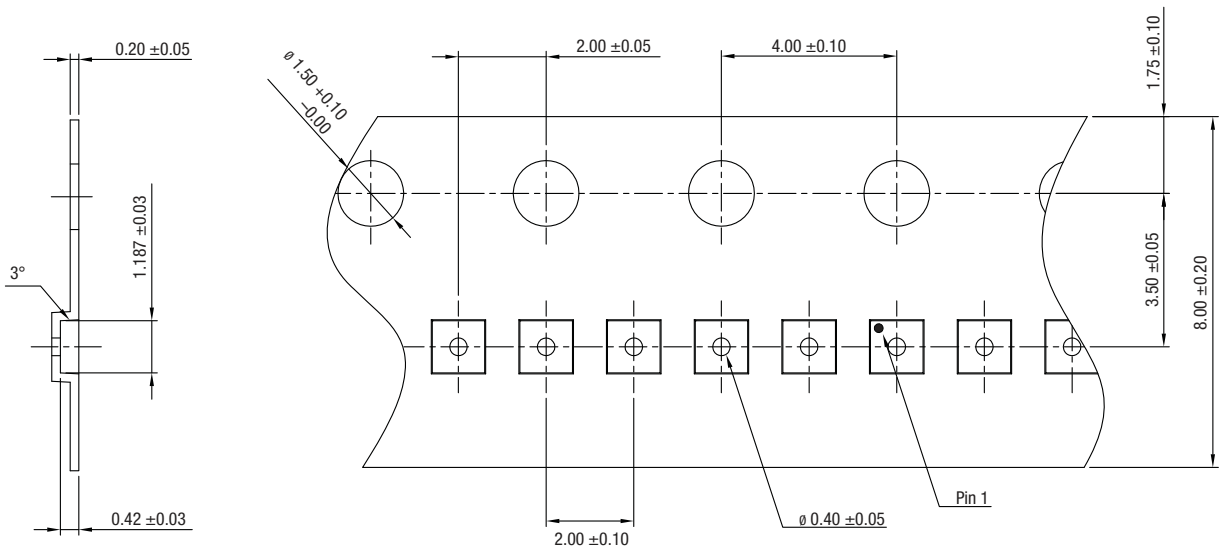
Figure 10. Typical Part Markings (Top View)



Notes:

1. *All measurements are in millimeters.*
2. *Dimensions and tolerances per ASME Y14.5M-2009.*
3. *Coplanarity applies to the terminals and all other bottom surface metallization.*
4. *Plating requirement per source control drawing (SCD) 2504.*
5. *Dimension applies to metallized terminal, not measured in the radius area.*

Figure 11. SKY13585-679LF Package Dimensions



Notes:

1. *10-sprocket hole pitch cumulative tolerance: ±0.2 mm.*
2. *Camber not to exceed 1 mm in 250 mm.*
3. *Carrier tape: black conductive polystyrene.*
4. *Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.*
5. *Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.*
6. *Pocket center and pocket hole center must be the same position.*
7. *All dimensions are in millimeters.*

Figure 12. SKY13585-679LF Tape and Reel Dimensions

Ordering Information

Model Name	Manufacturing Part Number	Evaluation Board Part Number
SKY13585-679LF: 1.0 to 6.0 GHz SPDT Switch	SKY13585-679LF	SKY13585-679LF-EVB