SKY13472-460LF: 0.1 to 3.0 GHz SP2T Switch

Applications

- WCDMA band and mode switching
- Antenna switch for multimode systems
- 802.11a/b/g/n WLANs

Features

- Broadband frequency range: 0.1 to 3.0 GHz
- Low insertion loss: 0.45 dB @ 2.5 GHz
- High isolation: 30 dB up to 2.5 GHz
- No external DC blocking capacitors required
- Positive low voltage control: V_{CTL} = 1.65 to 3.00 V, V_{DD} = 2.5 to 4.8 V
- Small QFN (12-pin, 2 x 2 mm) package (MSL1, 260 °C per JEDEC J-STD-020)
- For RoHS and other product compliance information, see the Skyworks Certificate of Conformance

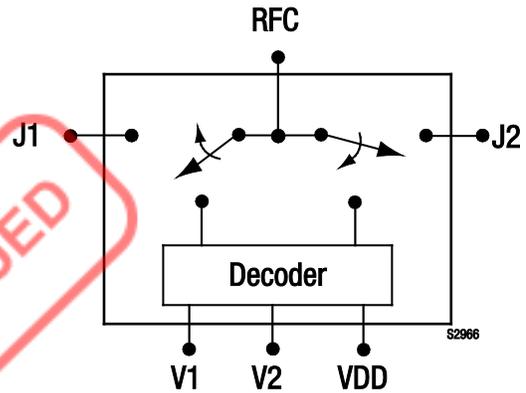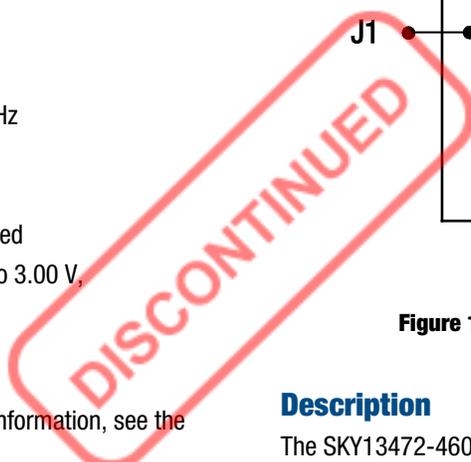**Figure 1. SKY13472-460LF Block Diagram**

Description

The SKY13472-460LF is a CMOS silicon-on-insulator (SOI), single-pole, double-throw (SP2T) switch. The high-linearity performance and low insertion loss make the device an ideal choice for WCDMA handset and data card applications.

The SKY13472-460LF SP2T switch is provided in a compact Quad Flat No-Lead (QFN) 2 x 2 mm package. 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.
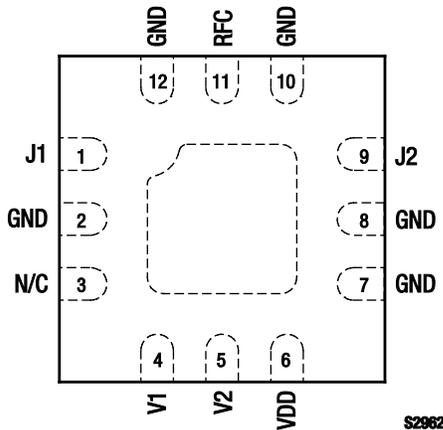

Figure 2. SKY13472-460LF Pinout (Top View)

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

201887F • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • November 21, 2025   1

Table 1. SKY13472-460LF Signal Descriptions[1]

Pin	Name	Description	Pin	Name	Description
1	J1	RF port 1.	7	GND	Ground
2	GND	Ground	8	GND	Ground
3	N/C	No connect. May be grounded with no change in performance.	9	J2	RF port 2.
4	V1	DC control voltage 1. See Table 4.	10	GND	Ground
5	V2	DC control voltage 2. See Table 4.	11	RFC	RF common (antenna) port.
6	VDD	DC power supply.	12	GND	Ground

[1] Exposed pad must be grounded.

Functional Description

The SKY13472-460LF includes an internal negative voltage generator and decoder that eliminate the need for external DC blocking capacitors on the RF ports. No external components are required for proper operation. DC decoupling capacitors may be added on the VDD and control lines if necessary.

Switching is controlled by two control voltage inputs, V1 and V2. Depending on the logic voltage level applied to the control pins, the RFC (RF common) pin is connected to one of two switched RF outputs (J1 or J2) through a low insertion path, while the path between the RFC pin and the other RF pins is in a high isolation state.

Shutdown mode is enabled by connecting all control pins to logic low. This mode reduces the overall current consumption of the device to 5 μA, typical. To prevent the switch from accidentally entering shutdown mode during switching, all states must be set to logic low for at least 20 μs. When exiting shutdown mode, the switch as a 10.5 μs startup time before switching occurs.

Electrical and Mechanical Specifications

The absolute maximum ratings of the SKY13472-460LF are provided in Table 2. Electrical specifications are provided in Table 3.

The state of the SKY13472-460LF is determined by the logic provided in Table 4.

Typical performance characteristics of the SKY13472-460LF are illustrated in Figures 3 through 5.

Table 2. SKY13472-460LF Absolute Maximum Ratings[1]

Parameter	Symbol	Minimum	Maximum	Units
Supply voltage	V_{DD}	2.5	4.8	V
Control voltage[2]	V_{CTL}	1.65	3.00	V
Input power	P_{IN}		+39	dBm
Storage temperature	T_{STG}	−40	+125	°C
Operating temperature	T_{OP}	−40	+85	°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.

[2] Any bias voltage applied to the V1 or V2 pins may damage the device if there is no bias voltage also present on the VDD pin. Maximum control voltage cannot exceed V_{DD}.

***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.*

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

2   November 21, 2025 • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • 201887F

Table 3. SKY13472-460LF Electrical Specifications[1]
(V$_{DD}$ = 2.3 V to 4.8 V, V1 = V2 = 0 to 1.8 V, T$_{OP}$ = +25 °C, P$_{IN}$ = 0 dBm, Characteristic Impedance [Z$_0$] = 50 Ω, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
RF Specifications						
Insertion loss	IL	0.8 to 1.0 GHz 1.0 to 2.2 GHz 2.2 to 3.0 GHz		0.30 0.35 0.40	0.45 0.55 0.60	dB dB dB
Isolation	ISO	0.8 to 1.0 GHz 1.0 to 2.2 GHz 2.2 to 3.0 GHz	35 28 25	40 33 30		dB dB dB
Return loss	|S11|	0.8 to 3.0 GHz		22		dB
Third order input intercept point	IIP3	0.8 to 3.0 GHz, ΔF = 1 MHz, P$_{IN}$ = +20 dBm/tone	+60	+68		dBm
Input 0.1 dB compression point	P0.1dB	0.8 to 3.0 GHz, RFC to J1 and J2		+39		dBm
2nd harmonic	2fo	0.8 to 3.0 GHz, P$_{IN}$ = +26 dBm		+85		dBc
3rd harmonic	3fo	0.8 to 3.0 GHz, P$_{IN}$ = +26 dBm		+85		dBc
Switching on time		50% V$_{CTL}$ to 10/90% RF		1600		ns
Switching off time		50% V$_{CTL}$ to 90/10% RF		1600		ns
Startup time		Shutdown state to any RF switch state		20		μs
DC Specifications						

Control voltage:
  High
  Low
	V$_{CTL\_HIGH}$
	V$_{CTL\_LOW}$
			1.65
			0
				1.80	3.00[2]
					0.4
						V
						V

Supply voltage	V$_{DD}$		2.5		4.8	V
Supply current	I$_{DD}$	V$_{DD}$ = 3.5 V		60		μA
Control current	Ictl	V1 = V2 = 1.8 V		2		μA
Shutdown mode supply current	Ioff	V$_{DD}$ = 3.5 V, V1 = V2 = 0 V		5		μA

[1] Performance is guaranteed only under the conditions listed in this table.

[2] Control voltage should not exceed supply voltage.

Table 4. SKY13472-460LF Truth Table[1]

V1 (Pin 4)	V2 (Pin 5)	State
0	0	Shutdown
1	0	RFC to J2
0	1	RFC to J1

[1] 1 = 1.65 to 3.00 V; 0 = 0 to 0.4 V. Any state other than described in this Table places the switch into an undefined state.

Typical Performance Characteristics
(V_{DD} = 2.3 V to 4.8 V, V1 = V2 = 0 to 1.8 V, T_{OP} = +25 °C, P_{IN} = 0 dBm, Characteristic Impedance [Z_0] = 50 Ω, Unless Otherwise Noted)
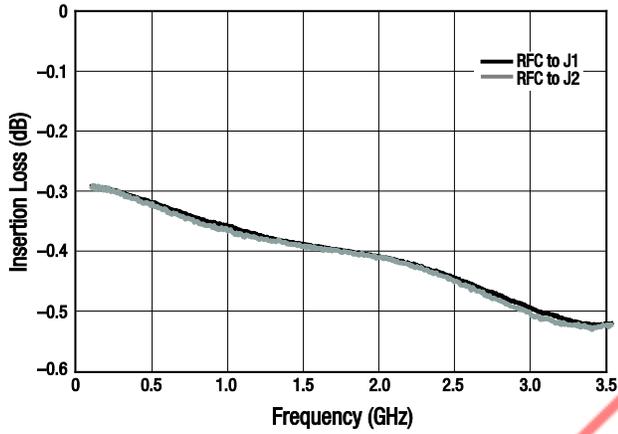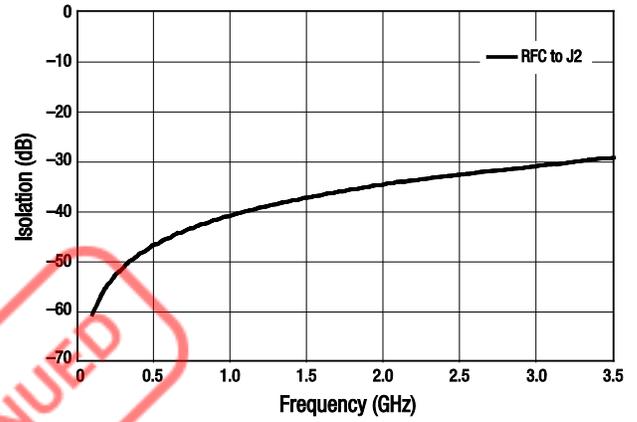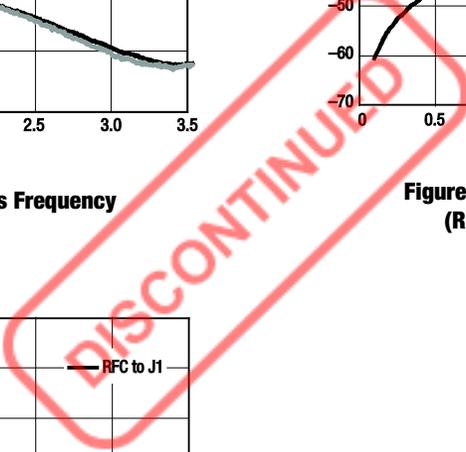

Figure 3. Typical Insertion Loss vs Frequency

Figure 4. Typical Isolation vs Frequency
(RFC to J1 Insertion Loss State)

Figure 5. Typical Isolation vs Frequency
(RFC to J2 Insertion Loss State)

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

4   November 21, 2025 • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • 201887F

Evaluation Board Description

The SKY13472-460LF Evaluation Board is used to test the performance of the SKY13472-460LF SP2T Switch. The board is made from a two-layer construction with ½ oz. copper cladding on top and bottom. The first layer material is 12-mil Rogers 4003C. The second layer material is 49-mil of FR4 for a total board thickness of about 62 mils. The impedance of all RF traces is 50 Ω.

An Evaluation Board schematic diagram is provided in Figure 6. An assembly drawing for the Evaluation Board is shown in Figure 7.

S2963
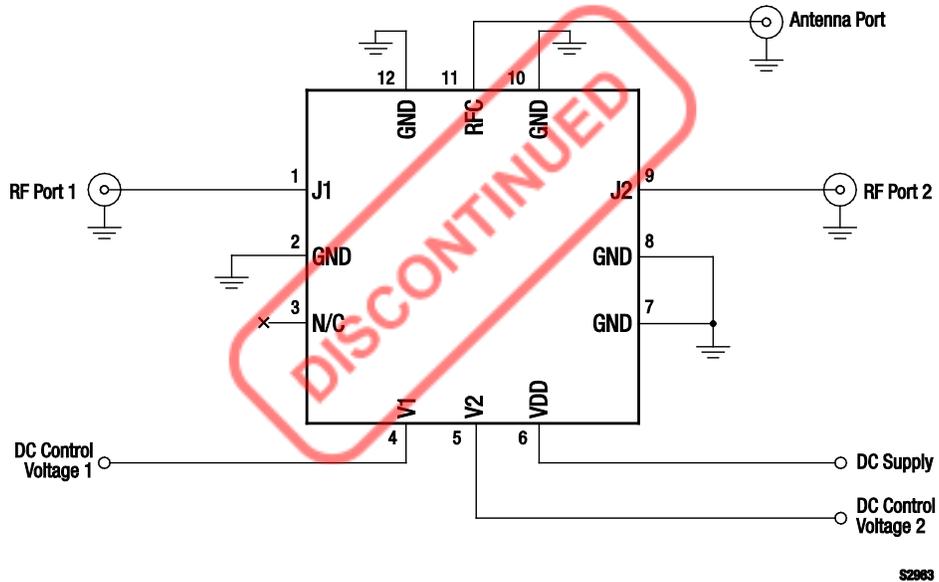
Figure 6. SKY13472-460LF Evaluation Board Schematic

RFC

J1

J2

1

6

GND

V1

V2

VDD

GND

GND

S2193a
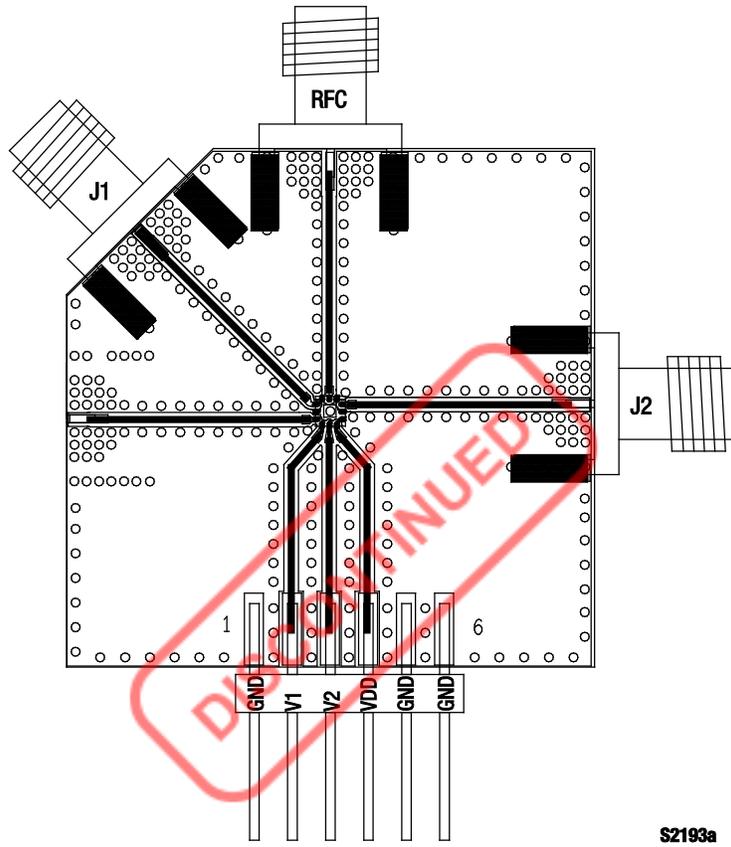
Figure 7. SKY13472-460LF Evaluation Board Assembly Diagram

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

6   November 21, 2025 • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • 201887F

Package Dimensions

The PCB layout footprint for the SKY13472-460LF is provided in Figure 8. Typical part markings are shown in Figure 9. Package dimensions are shown in Figure 10, and tape and reel dimensions are provided in Figure 11.

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 SKY13472-460LF 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.
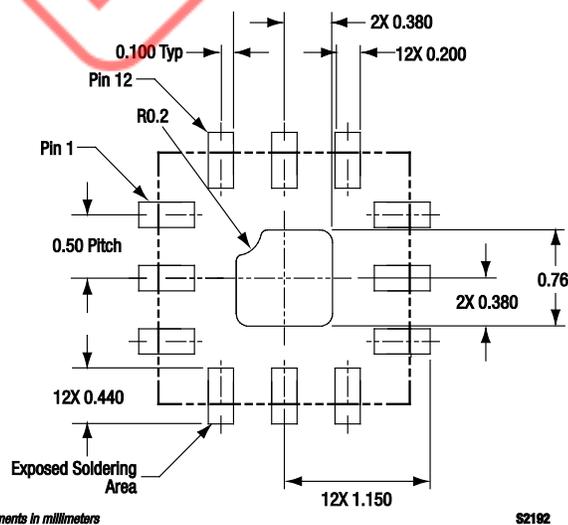
**Figure 8. SKY13472-460LF PCB Layout Footprint
(Top View)**

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

201887F • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • November 21, 2025   7
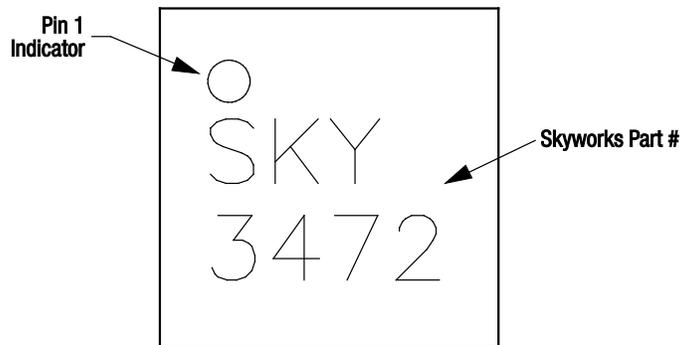
**Figure 9. Typical Part Markings
(Top View)**
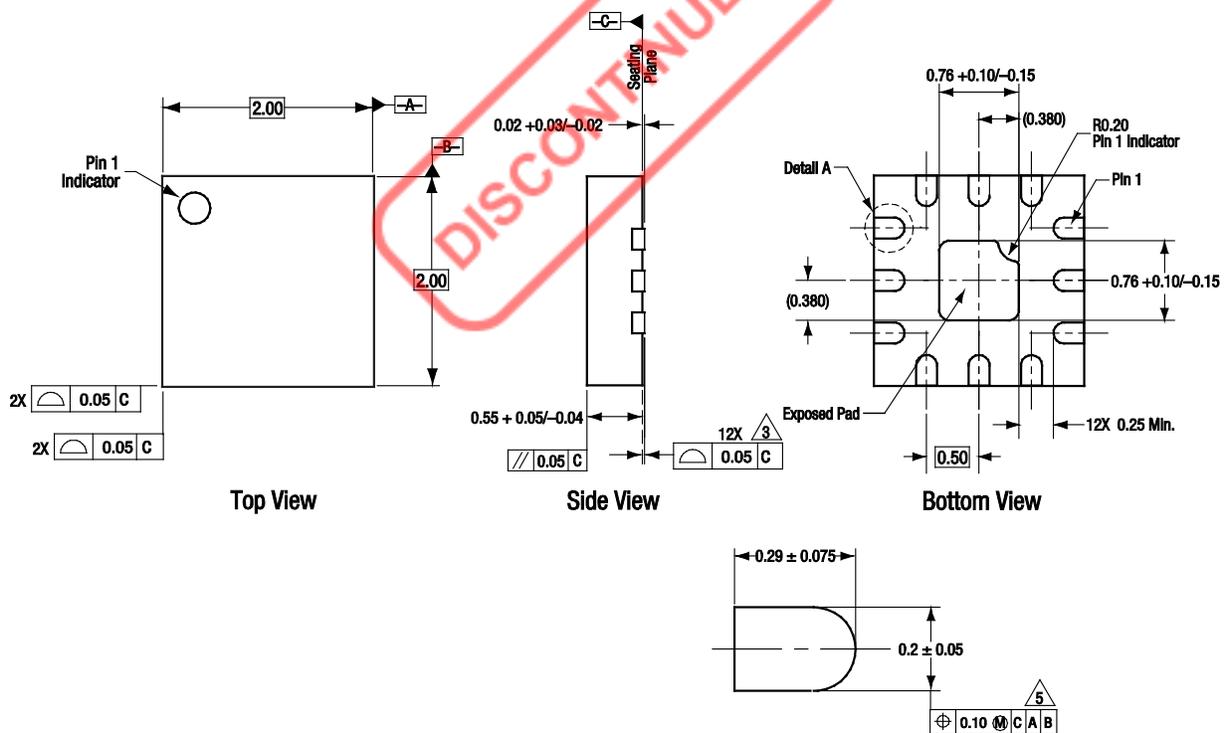
*All measurements are in millimeters.
Dimensioning and tolerancing according to ASME Y14.5M-1994.
Coplanarity applies to the terminals and all other bottom surface metalization.
Dimension applies to metalized terminal. If the terminal has a radius on its end,
   the width dimension should not be measured in that radius area.*

Figure 10. SKY13472-460LF Package Dimensions

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

8   November 21, 2025 • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • 201887F

2.00 ± 0.05

4.00 ± 0.10

0.23 ± 0.05

ø1.50 + 0.10/–0.00

Pin 1

1.75 ± 0.10

7°

2.25 ± 0.05

A

A

3.50 ± 0.05

8.00 ± 0.20

0.70 ± 0.05 (Ko)

4.00 ± 0.10

B   B

Section A

7°

2.25 ± 0.05

Section B
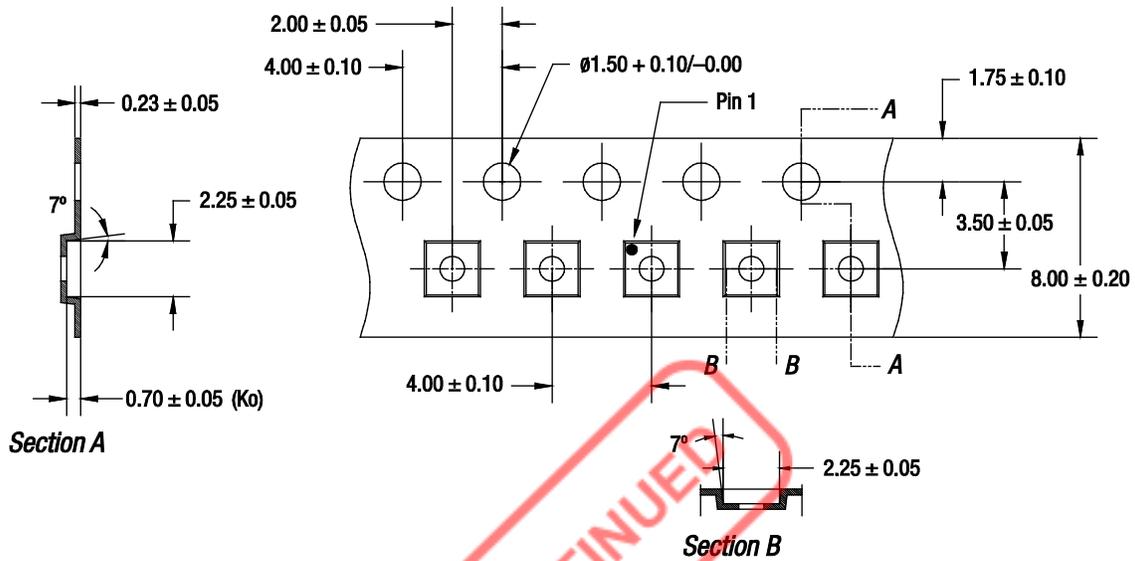
Notes:

1. Carrier tape must meet all requirements of Skyworks GP01-D232 procurement spec for tape and reel shipping.
2. Carrier tape shall be black conductive polycarbonate bakeable material at 125 °C temperature.
3. Cover tape shall be transparent conductive with 5.40 mm width.
4. ESD-surface resistivity must meet all ESD requirements of Skyworks specified on GP01-D232.
5. All measurements are in millimeters.

ts737

Figure 11. SKY13472-460LF Tape and Reel Dimensions

Ordering Information

Product Description	Product Part Number	Evaluation Board Part Number
SKY13472-460LF: SP2T Switch	SKY13472-460LF	SKY13472-460EK1

Skyworks Solutions, Inc. • Phone [949] 231-3000 • sales@skyworksinc.com • www.skyworksinc.com

10   November 21, 2025 • Skyworks Proprietary Information • Products and Product Information are Subject to Change Without Notice • 201887F