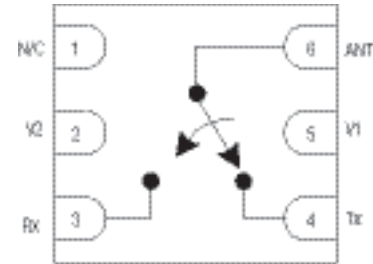


DATA SHEET

SKY13314-374LF: PHEMT GaAs IC SP2T Switch 0.1–6.0 GHz

Features

- Positive low voltage control (0/3.3 V)
- Low insertion loss (0.45 dB to 2.5 GHz), (0.6 dB to 6 GHz)
- Excellent linearity performance ($P_{1\text{ dB}} = 31\text{ dBm}$)
- Miniature ultra thin MLPD6 pin plastic package (1.5 x 1.5 x 0.45 mm)
- Advanced pHEMT process
- Packaged lead (Pb)-free, RoHS-compliant and Green™

Functional Diagram

Description

The SKY13314-374LF is a PHEMT GaAs IC SP2T antenna switch operating in the 0.1–6 GHz frequency range. Switching between the antenna and Tx/Rx ports is accomplished with 2 control voltages. The low loss, high isolation, high linearity, small size and low cost features make this switch ideal for all dual-band WLAN systems operating in the 2.4–2.5 GHz and 4.9–5.9 GHz bands.

NEW


Skyworks Green™ products are RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, are halogen free according to IEC-61249-2-21, and contain <1,000 ppm antimony trioxide in polymeric materials.

Electrical Specifications

$V_{\text{CTL}} = 0\text{ V}/3.3\text{ V}$, $T = 25\text{ °C}$, $P_{\text{INPUT}} = 0\text{ dBm}$, $Z_0 = 50\text{ }\Omega$, unless otherwise noted

Parameter	Frequency	Min.	Typ.	Max.	Unit
Insertion loss Ant-Tx, Rx	2.40–2.50 GHz		0.45	0.65	dB
	0.10–3.00 GHz		0.5	0.7	dB
	3.00–6.00 GHz		0.6	0.85	dB
Isolation Ant-Tx, Rx	2.40–2.50 GHz	19	22		dB
	0.10–3.00 GHz	18	21		dB
	3.00–6.00 GHz	18	21		dB
Return loss Ant-Tx, Rx (Insertion loss state)	2.40–2.50 GHz	14	21		dB
	0.10–3.00 GHz	12	18		dB
	3.00–6.00 GHz	12	15		dB

Operating Characteristics

$V_{CTL} = 0\text{ V}/3.3\text{ V}$, $T = 25\text{ }^{\circ}\text{C}$, $P_{INPUT} = 0\text{ dBm}$, $Z_0 = 50\text{ }\Omega$, unless otherwise noted

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise/fall time	10/90% or 90/10% RF			15		ns
On/off time	50% V_{CTL} to 90/10% RF			30		ns
Video feedthru	$T_{RISE} = 1\text{ ns}$, $BW = 500\text{ MHz}$			50		mV
Input power for 1 dB compression	$V_{CTL} = 0/3.3\text{ V}$	2.40–2.50 GHz 4.9–5.9 GHz		+31 +31		dBm dBm
Intermodulation intercept point (IP3)	For two tone input power 17 dbm/tone 1 MHz spacing $V_{CTL} = 0/3.3\text{ V}$	2.40–2.50 GHz		+47		dBm
Control voltage	$V_{CTL\text{ HIGH}}$ $V_{CTL\text{ LOW}}$		2.7	3.3 0	5.00 0.25	V V
Leakage current	$V_{CTL\text{ LOW}}$, $V_{CTL\text{ HIGH}}$			5	50	μA

Absolute Maximum Ratings

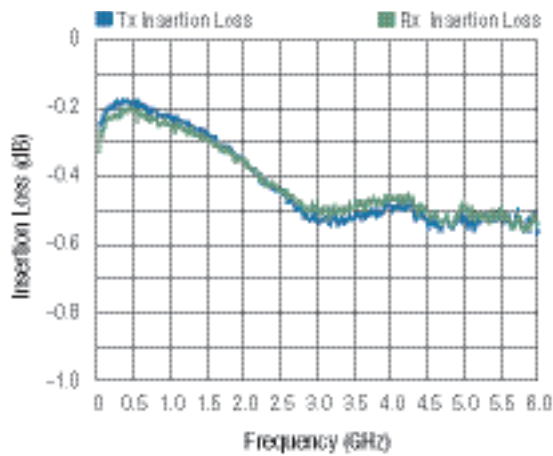
Characteristic	Value
Max input power @ 0/3V	33 dBm
Max input power @ 0/5V	35 dBm
Operating voltage	6.0 V
Operating temperature	-40 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$
Storage temperature	-65 $^{\circ}\text{C}$ to +150 $^{\circ}\text{C}$

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

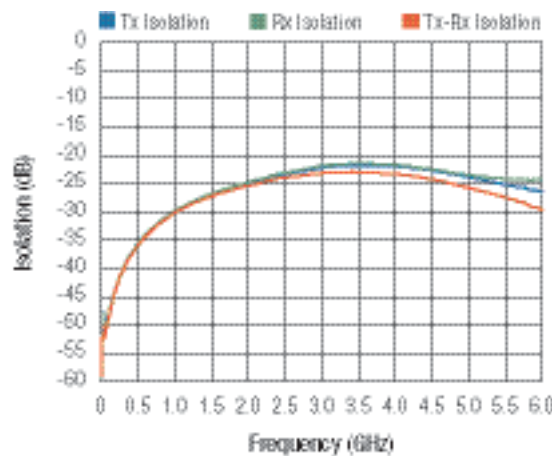
CAUTION: Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without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

Typical Performance Data

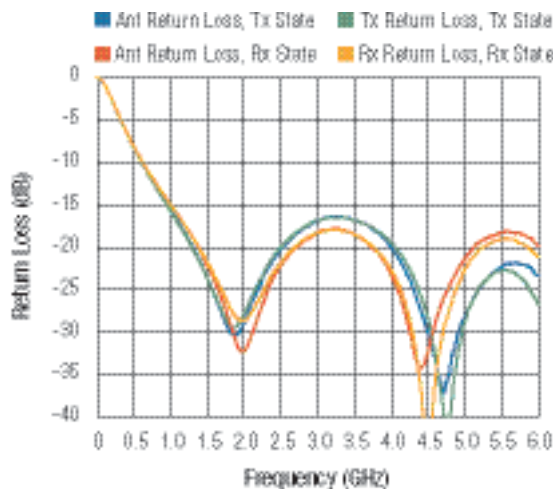
V_{CTL} = 0 V/3.3 V, T = 25 °C, P_{INPUT} = 0 dBm, Z₀ = 50 Ω, C_{BLK} = 15 pF, unless otherwise noted



Typical Insertion Loss



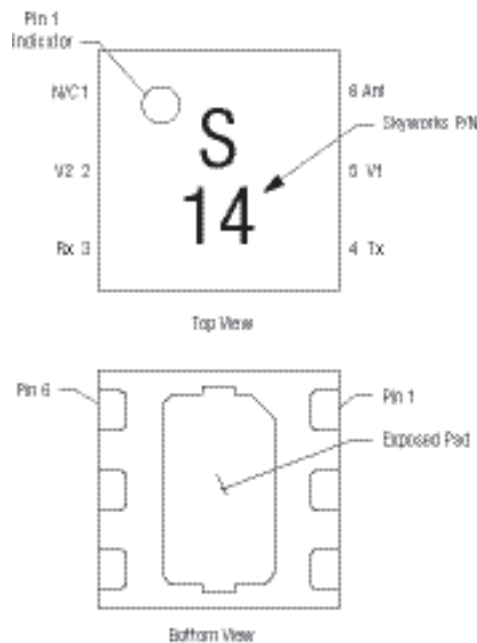
Typical Isolation



Typical Return Loss

Note: Low frequency return loss is limited by value of DC blocking capacitors (15 pF).

Pin Out

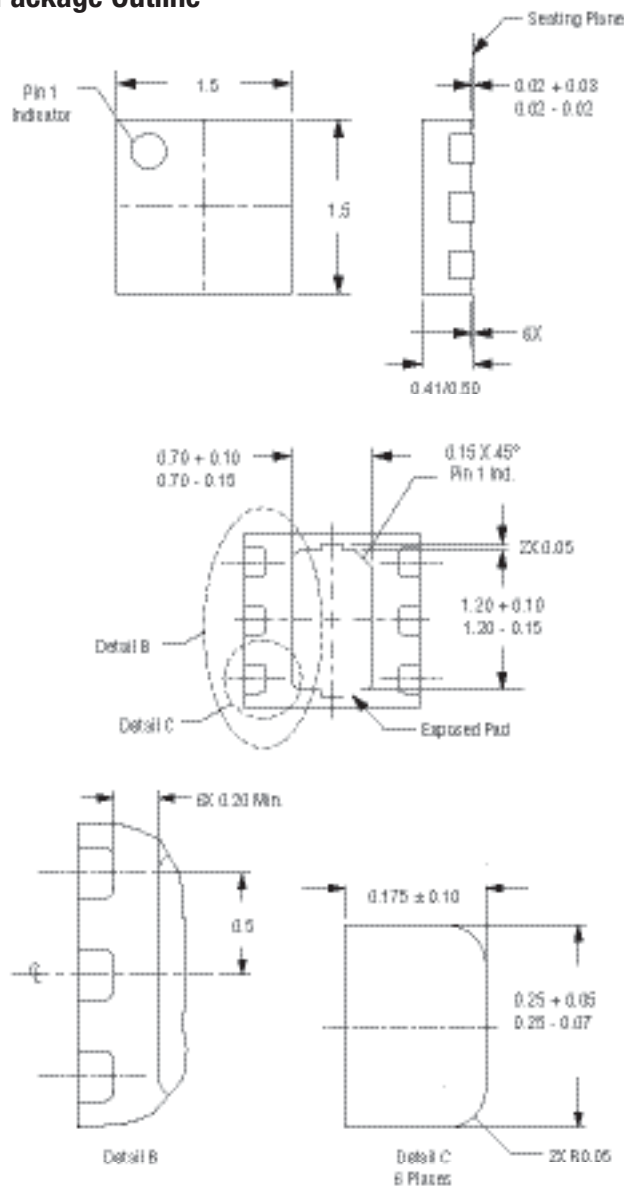


Pin Descriptions

Pin Number	Pin Name	Description
1	N/C	No connect
2	V2	DC control voltage
3	Rx	RF port (must be DC blocked)
4	Tx	RF port (must be DC blocked)
5	V1	DC control voltage
6	Ant	RF common port (must be DC blocked)
Exposed pad	GND	Ground

DC blocks are required on Ant, Tx, Rx.
C_{BLK} = 15 pF for > 2 GHz operation.
For lower frequency operation use larger value caps.
Ground exposed pad on bottom of package.
Tx and Rx pins can be used interchangeably.

Package Outline



1. Dimensioning and tolerancing per ASME Y14.5M - 1994.
2. Dimensions are in millimeters.
3. Coplanarity applies to the exposed heat sink slug as well as the terminals.
4. Plating requirement per source control drawing (sch 2504).
5. Dimension applies to metallized terminal and is measured between 0.15 mm and 0.30 mm from terminal tip.

Truth Table

V1	V2	Ant-Rx	Ant-Tx
High	Low	Insertion loss	Isolation
Low	High	Isolation	Insertion loss

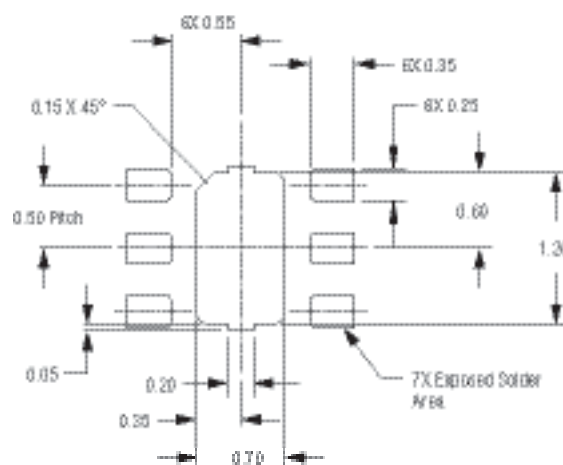
Low = 0 to 0.25 V.

High = 2.7 to 5 V.

Any state other than described in the truth table will put the device in an undefined state.

An undefined state will not damage the device.

Land Pattern



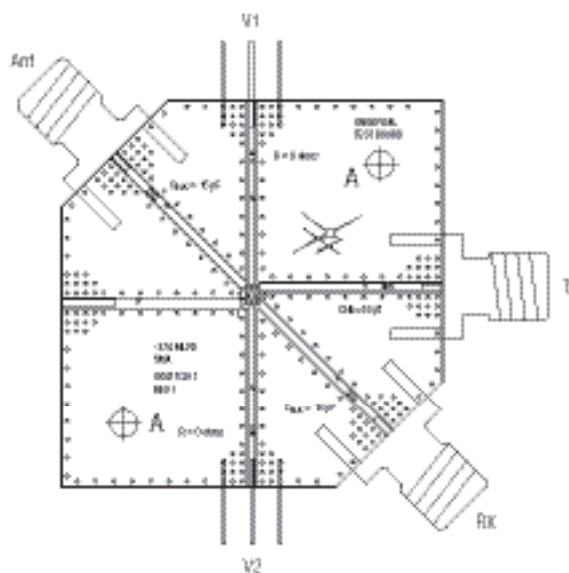
Recommended Solder Reflow Profiles

Refer to the ["Recommended Solder Reflow Profile"](#) Application Note.

Tape and Reel Information

Refer to the ["Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation"](#) Application Note.

Evaluation Board



R = 0 Ω (0402 size) 2 places
C_{TRK} = 15 pF (0402 size) 3 places

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