DATA SHEET

SKY13316-12LF: GaAs IC SPST Non-Reflective Switch 300 kHz–2.5 GHz

Features

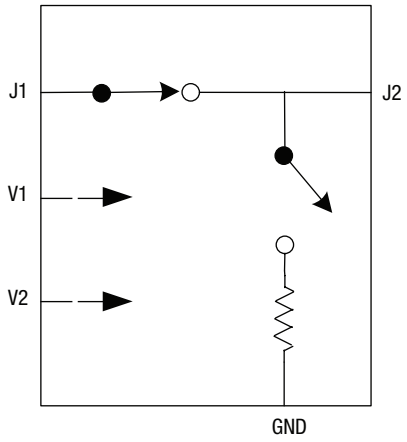
- High isolation (50 dB @ 900 MHz)
- J1 reflective (open) in isolation state
- J2 non-reflective in isolation state
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The SKY13316-12LF is a non-reflective SPST switch designed for low cost, low power commercial applications. It is ideal for use as a building block for high isolation multi-throw switches.

NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.

Functional Block Diagram



Electrical Specifications

V_{CTL} = 0 V/-5 V, T = 25 °C, P_{INPUT} = 0 dBm, Z_0 = 50 Ω, unless otherwise noted

Parameter	Frequency	Min.	Typ.	Max.	Unit
Insertion loss	300 kHz–0.5 GHz		0.5	0.9	dB
	300 kHz–1.0 GHz		0.6	1.0	dB
	300 kHz–2.5 GHz		0.75	1.2	dB
Isolation	300 kHz–0.5 GHz	53.0	59		dB
	300 kHz–1.0 GHz	45.0	48		dB
	300 kHz–2.5 GHz	29.5	30		dB
Return loss	300 kHz–0.5 GHz	15.8	21		dB
	300 kHz–1.0 GHz	12.7	16		dB
	300 kHz–2.5 GHz	10.9	13		dB
Return loss J2 port (ISO state)	300 kHz–0.5 GHz	15.8	22		dB
	300 kHz–1.0 GHz	12.7	18		dB
	300 kHz–2.5 GHz	10.1	11.5		dB

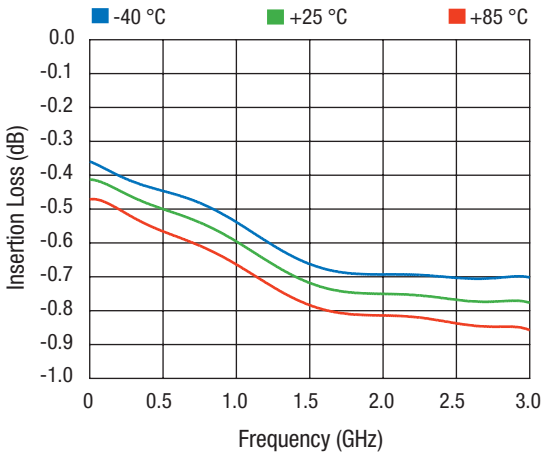
Operating Characteristics

V_{CTL} = 0 V/-5 V, T = 25 °C, P_{INPUT} = 0 dBm, Z_0 = 50 Ω, unless otherwise noted

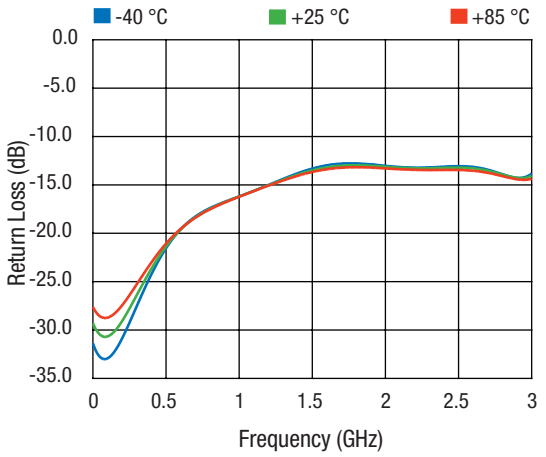
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	10% RF envelope to 90% RF envelope 90% RF envelope to 10% RF envelope			5		ns
	50% V_{CTL} to 90% RF envelope 50% V_{CTL} to 10% RF envelope			15		ns
	Video feed-through			40		mV
Input power for 1dB compression		0.05 GHz		16		dBm
		0.5 GHz–2 GHz		24		dBm
Intermodulation intercept point (IP3)	Two tone input power = 13 dBm per tone 1 MHz spacing	0.05 GHz		35		dBm
		0.5 GHz–2 GHz		46		dBm
Control voltages	V_{CTL} Low		-0.2		0	V
	V_{CTL} High		-3		-5	V
Control currents	V_{CTL} Low, V_{CTL} High			5	20	µA

Typical Performance Data (0, -5 V)

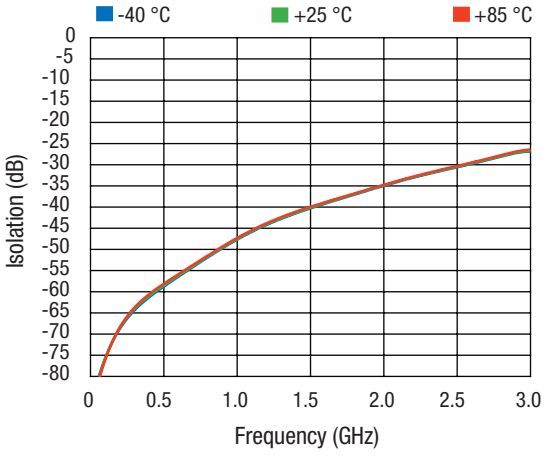
Z_0 = 50 Ω, unless otherwise noted



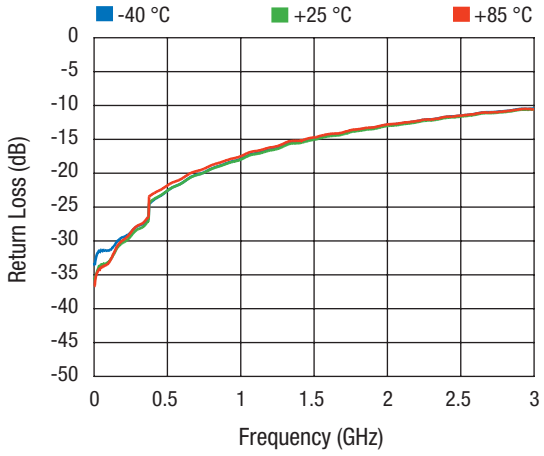
Typical Insertion Loss



Typical J1 Return Loss (Insertion Loss State)



Typical Isolation



Typical J2 Return Loss (Isolation State)

Absolute Maximum Ratings

Characteristic	Value
RF input power	30 dBm > 500 MHz 0/-5 V 27 dBm at 50 MHz 0/-5 V
Control voltage	+0.2 V, -8 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °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.

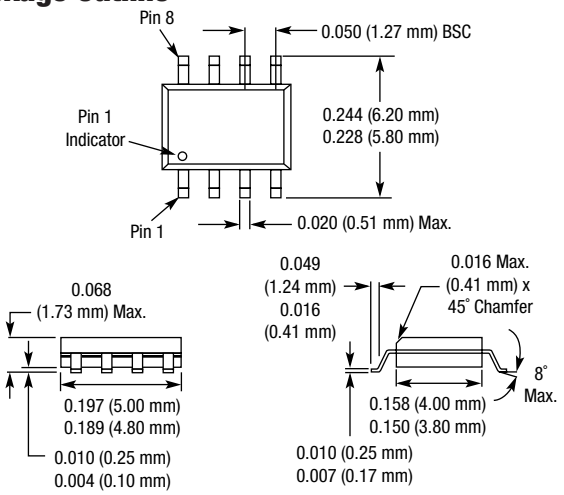
CAUTION: *Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without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

Truth Table

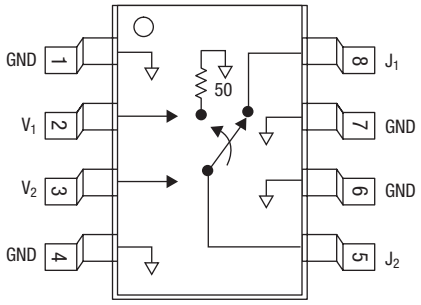
V1	V2	J1–J2
-5	0	Insertion loss
0	-5	Isolation

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

Package Outline



Pin Out



Pin Descriptions

Pin Number	Pin Name	Description
1	GND	Ground
2	V1	DC control voltage
3	V2	DC control voltage
4	GND	Ground
5	J2	RF port
6	GND	Ground
7	GND	Ground
8	J1	RF port