PRELIMINARY DATA SHEET

SKY13270-92LF: GaAs SPDT Switch 100 MHz–2.5 GHz

Features

- Broadband: 100 MHz–2.5 GHz
- Very low insertion loss: 0.35 dB typical @ 900 MHz
- High isolation: 24 dB typical @ 900 MHz
- $P_{0.1\ dB}$: 37 dBm typical @ 3 V
- Low current consumption: <100 µA @ 3 V
- Miniature SC-70 6-lead package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The SKY13270-92LF is a PHEMT GaAs FET IC high-linearity SPDT switch. This wideband switch has been designed for use from 100 MHz to 2.5 GHz, where extremely high linearity, low control voltage, high isolation, low insertion loss, and ultraminiature package size are required. It can be controlled with positive, negative, or a combination of both voltages. The RF signal paths within the SKY13270-92 are fully bilateral.

Some standard implementations include T/R switching and diversity switching over 3 W. The SKY13270-92LF switch can be used in many analog and digital wireless communication systems including cellular, GSM and UMTS applications.

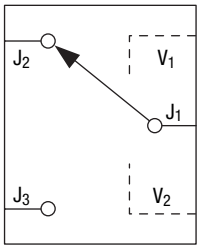
Switching is controlled via two control voltage inputs. Depending upon the voltage level applied to the control voltage pins, the common RF port (J_1) is connected to one of two RF ports (J_2 or J_3) via a low insertion loss path, while the path between J_1 and the other RF port is in its isolation state. When the control voltages are toggled, the states between J_1 and J_2, as well as J_1 and J_3, are also toggled.

This part is available in a lead (Pb)-free, 6-lead SC-70 package which is RoHS-compliant.

An evaluation board is available upon request.

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

Functional Block Diagram



Electrical Specifications

V_{CTL} = 0 V/3 V, T = 25 °C, P_{INPUT} = 0 dBm, Z_0 = 50 Ω, unless otherwise noted

Parameter	Frequency	Min.	Typ.	Max.	Unit
Insertion loss	0.1–0.5 GHz		0.30	0.4	dB
	0.5–1.0 GHz		0.35	0.5	dB
	1.0–2.0 GHz		0.45	0.6	dB
	2.0–2.5 GHz		0.55	0.7	dB
Isolation	0.1–0.5 GHz	28	30		dB
	0.5–1.0 GHz	22	24		dB
	1.0–2.0 GHz	17	19		dB
	2.0–2.5 GHz	15	17		dB
VSWR	0.1–1.0 GHz		1.2:1		
	1.0–2.5 GHz		1.3:1		

Operating Characteristics

V_{CTL} = 0 V/3 V, T = 25 °C, P_{INPUT} = 0 dBm, Z_0 = 50 Ω, unless otherwise noted

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, fall	0/90% or 90/10% RF			60		ns
On, off	50% CTL to 90/10% RF			100		ns
Video feedthru	T_{RISE} = 1 ns, BW = 500 MHz			50		mV
Input power for -0.1 dB compression		900 MHz		37		dBm
Second, third harmonics	P_{IN} = 34.5 dBm, f_{IN} = 900 MHz			-65		dBc
Thermal resistance				25		°C/W
Control voltages	V_{LOW} = 0 @ 20 µA max. V_{HIGH} = 2.5 V @ 100 µA max. to 5 V @ 200 µA max.					

Absolute Maximum Ratings

Characteristic	Value
Control voltage range	-0.2 ≤ V_C ≤ 8 V
RF input power @ 0/5 V	6 W, f > 900 MHz
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.*

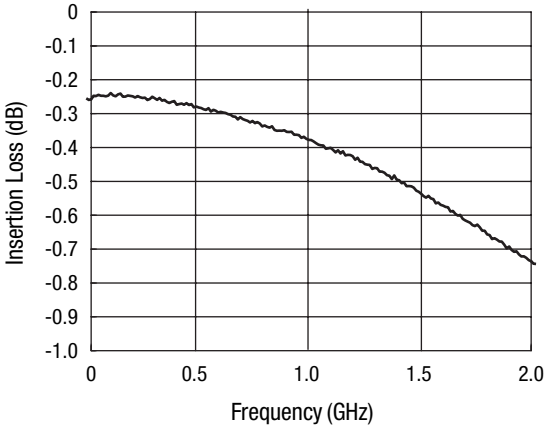
Truth Table

V_1	V_2	J_1–J_2	J_1–J_3
V_{LOW}	V_{HIGH}	Isolation	Insertion loss
V_{HIGH}	V_{LOW}	Insertion loss	Isolation

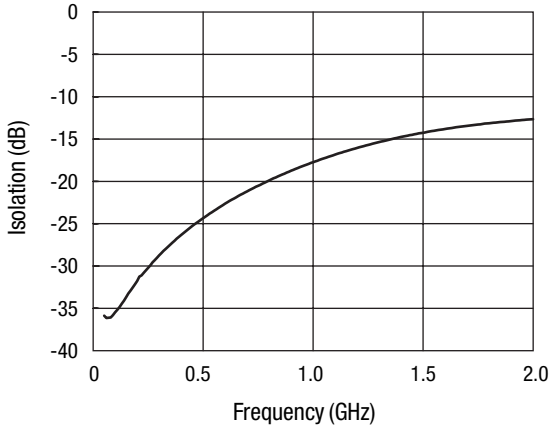
2.5 V ≤ V_{HIGH} ≤ 5 V, 0 ≤ V_{LOW} ≤ 0.2 V.
All other conditions not recommended.

Typical Performance Data

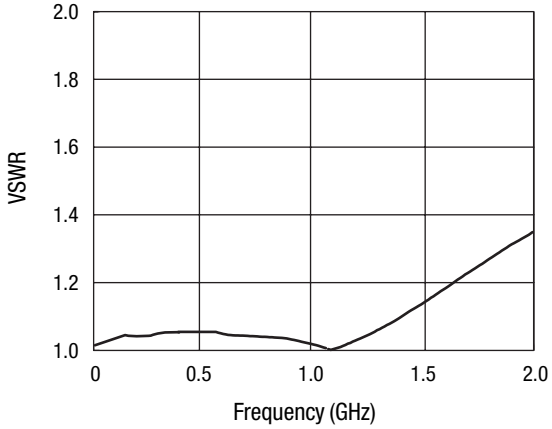
T = 25 °C, Z_0 = 50 Ω, unless otherwise noted



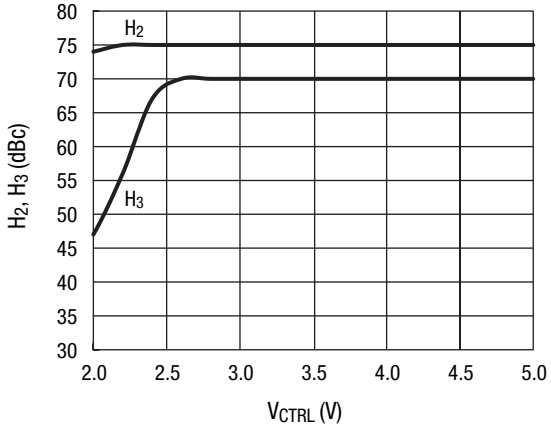
Insertion Loss vs. Frequency



Isolation vs. Frequency

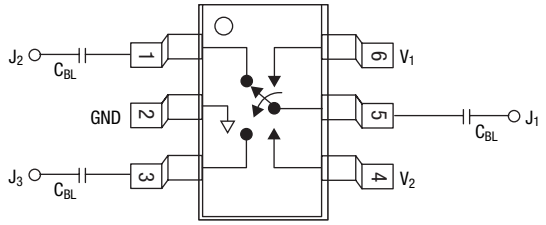


VSWR vs. Frequency



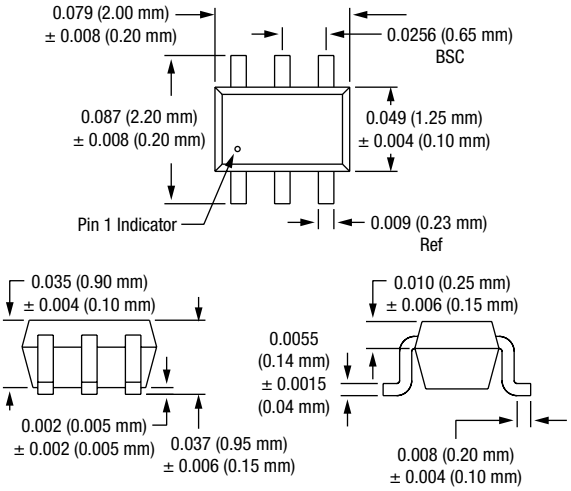
Second and Third Harmonics vs. Control Voltage
f_{IN} = 900 MHz, P_{IN} = 34.5 dBm, GSM Signal

Pin Out



DC blocking capacitors (C_{BL}) must be supplied externally.
C_{BL} = 100 pF for operating frequency >500 MHz.

SC-70 Package Outline



Pin Descriptions

Pin Number	Pin Name	Description
1	J_2	RF Input/Output – RF input/output port which is either connected to J_1 via a low insertion loss path or isolated from J_1, according to the logic voltage levels applied to V_1 and V_2
2	GND	Equipotential Point – Internal circuit common, which must be connected to the pcb ground or common via the lowest possible impedance
3	J_3	RF Input/Output – RF input/output port which is either connected to J_1 via a low insertion loss path or isolated from J_1, according to the logic voltage levels applied to V_1 and V_2
4	V_2	Control Voltage 2 – Control voltage input #2. The logic voltage level applied to this pin, along with the voltage level applied to V_1 (pin 6), determines the states of the RF paths between J_1–J_2 and J_1–J_3
5	J_1	RF Common Input/Output – RF common input/output port which is either connected to J_2 or to J_3 via a low insertion loss and isolated from the other RF port, according to the logic voltage levels applied to V_1 and V_2
6	V_1	Control Voltage 1 – Control voltage input #1. The logic voltage level applied to this pin, along with the voltage level applied to V_2 (pin 4), determines the states of the RF paths between J_1–J_2 and J_1–J_3

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.

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Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

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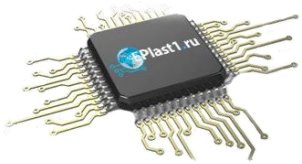
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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