SKYWORKS®

DATA SHEET

AS225-313, AS225-313LF: PHEMT GaAs IC 1 W Low Loss 0.1–6 GHz SPDT Switch

Application

- WLAN 802.11a, b, g

Features

- Positive low voltage control (0/+3 V)
- Low insertion loss (0.6 dB, 0.1–6 GHz)
- High linearity (IIP3 = 53 dBm @ 3 V)
- Miniature QFN-6 pin plastic package (2 mm x 3 mm)
- PHEMT process
- Available lead (Pb)-free MSL-2 @ 250 °C per JEDEC J-STD-020

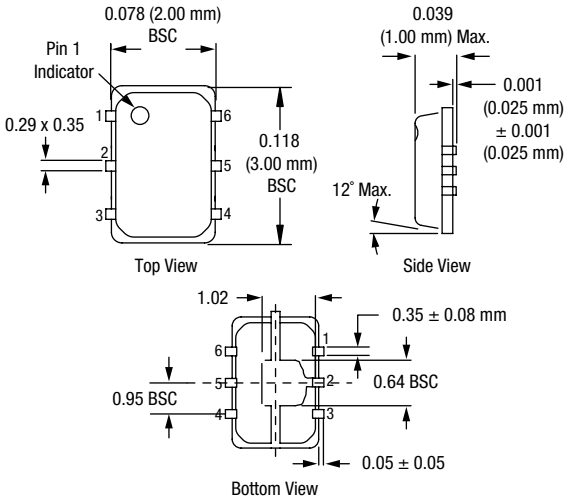
Description

The AS225-313 is a 0.1–6 GHz PHEMT GaAs IC SPDT antenna switch. Designed for WLAN applications, this device is capable of switching 1 W microwave signals with 3 V control voltage while maintaining high linearity performance. The switch covers the entire 802.11a, b and g frequency ranges. The low loss, high isolation, high linearity and low cost features make this switch ideal for Wireless LAN systems.

NEW

Skyworks offers lead (Pb)-free "environmentally friendly" packaging that is RoHS compliant (European Parliament for the Restriction of Hazardous Substances).

QFN-6



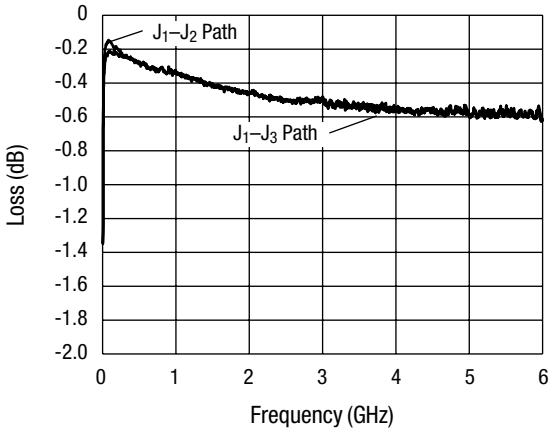
Electrical Specifications at 25 °C

Parameter	Test Condition	Frequency	Min.	Typ.	Max.	Unit
Insertion loss	J_1–J_2, J_1–J_3	0.10–6.00 GHz 2.40–2.50 GHz 5.15–5.85 GHz		0.60 0.50 0.60	0.75 0.65 0.70	dB dB dB
Isolation	J_1–J_2, J_1–J_3	0.10–6.00 GHz 2.40–2.50 GHz 5.15–5.85 GHz	18 18 19	20 20 21		dB dB dB
Return loss	J_1–J_2, J_1–J_3	0.10–6.00 GHz 2.40–2.50 GHz 5.15–5.85 GHz	18 23 21	20 25 23		dB dB dB

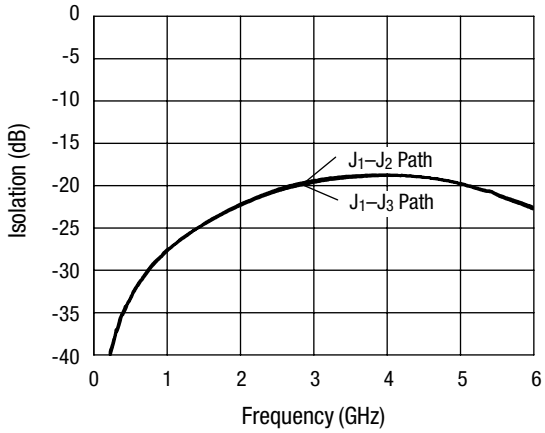
Operating Characteristics at 25 °C

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
$P_{1\ dB}$	@ 3.0 V @ 5.0 V	5200 MHz 5200 MHz		30 34		dBm dBm
2nd harmonic	P_{IN} = 22 dBm, V_C = 3 V V_C = 5 V	2450 MHz 2450 MHz		70 75		dBc dBc
3rd harmonic	P_{IN} = 22 dBm, V_C = 3 V V_C = 5 V	2450 MHz 2450 MHz		68 70		dBc dBc
Input IP3	Two-tone 15 dBm, 5 MHz spacing 0/3 V 0/5 V	 5200 MHz 5200 MHz		 53 55		 dBm dBm
Control voltage	$V_{C\ HIGH}$ $V_{C\ LOW}$		2.5	3.0 -0.25	5.0 +0.25	V V
Gate leakage	V_C = 3 V V_C = 5 V			10 15	100 200	µA µA

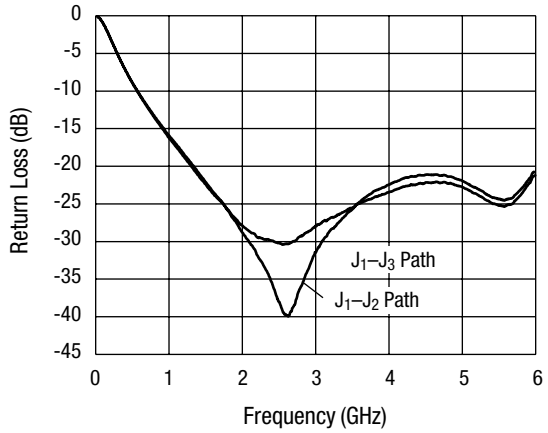
Typical Performance Data (0, +3 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



Return Loss vs. Frequency

Truth Table

V_1	V_2	J_1–J_2	J_1–J_3
0	V_{HIGH}	Isolation	Insertion loss
V_{HIGH}	0	Insertion loss	Isolation

V_{HIGH} = +2.5 to +5 V.

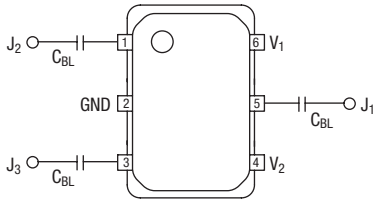
Absolute Maximum Ratings

Characteristic	Value
Max input power @ 0/3 V	32 dBm
Max input power @ 0/5 V	35 dBm
Operating voltage	+8.0 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, Electrostatic Discharge (ESD) 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.*

Pin Out (Top View)



DC blocking capacitors (C_{BL}) must be supplied externally.
C_{BL} = 15 pF.