

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

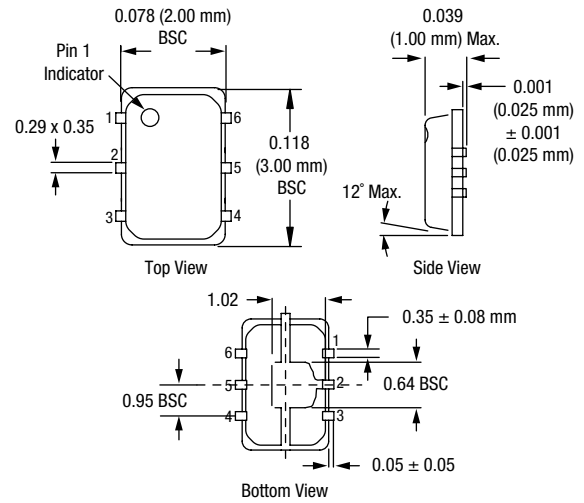
## Description

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



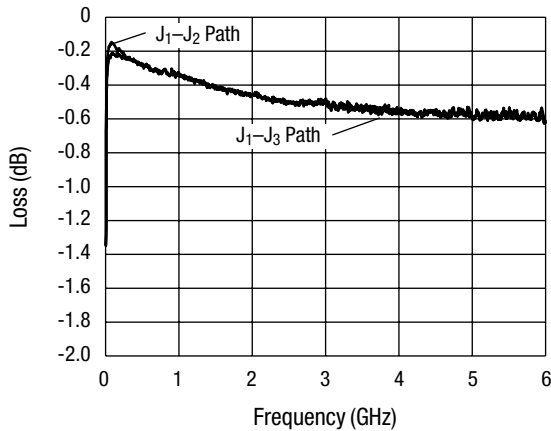
**Electrical Specifications at 25 °C**

Parameter	Test Condition	Frequency	Min.	Typ.	Max.	Unit
Insertion loss	J <sub>1</sub> -J <sub>2</sub> , J <sub>1</sub> -J <sub>3</sub>	0.10–6.00 GHz		0.60	0.75	dB
		2.40–2.50 GHz		0.50	0.65	dB
		5.15–5.85 GHz		0.60	0.70	dB
Isolation	J <sub>1</sub> -J <sub>2</sub> , J <sub>1</sub> -J <sub>3</sub>	0.10–6.00 GHz	18	20		dB
		2.40–2.50 GHz	18	20		dB
		5.15–5.85 GHz	19	21		dB
Return loss	J <sub>1</sub> -J <sub>2</sub> , J <sub>1</sub> -J <sub>3</sub>	0.10–6.00 GHz	18	20		dB
		2.40–2.50 GHz	23	25		dB
		5.15–5.85 GHz	21	23		dB

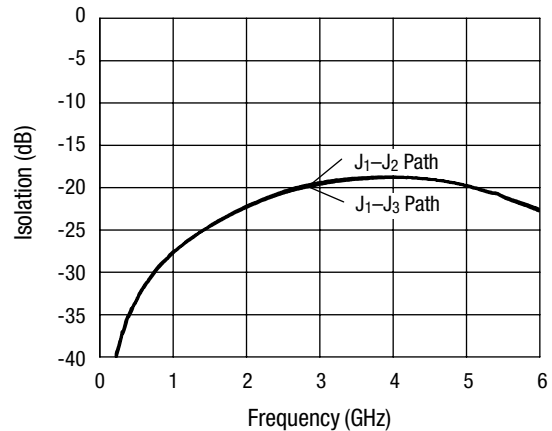
**Operating Characteristics at 25 °C**

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

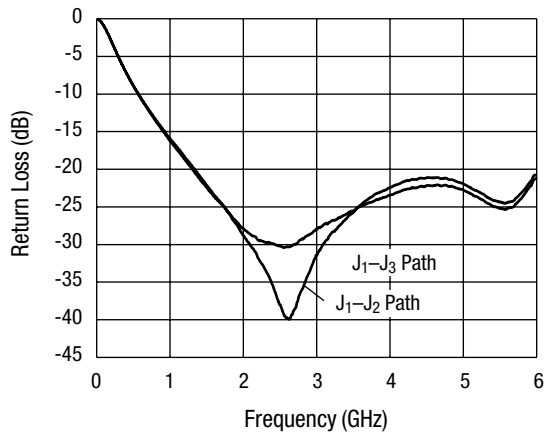
**Typical Performance Data (0, +3 V)**



**Insertion Loss vs. Frequency**



**Isolation vs. Frequency**



**Return Loss vs. Frequency**

**Truth Table**

V <sub>1</sub>	V <sub>2</sub>	J <sub>1</sub> -J <sub>2</sub>	J <sub>1</sub> -J <sub>3</sub>
0	V <sub>HIGH</sub>	Isolation	Insertion loss
V <sub>HIGH</sub>	0	Insertion loss	Isolation

V<sub>HIGH</sub> = +2.5 to +5 V.

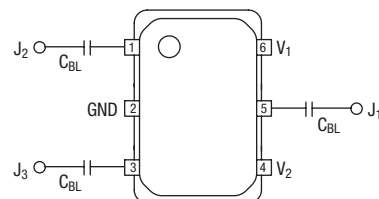
**Absolute Maximum Ratings**

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<sub>BL</sub>) must be supplied externally.  
C<sub>BL</sub> = 15 pF.