

**DATA SHEET**

# AS211-334: PHEMT GaAs IC SPDT Switch LF-4 GHz

## Applications

- General-purpose switch for telecommunication applications

## Features

- $P_1$  dB 30 dBm typical @ 3 V
- IP3 43 dBm typical @ 3 V
- Low insertion loss (0.3 dB @ 0.9 GHz)
- Low DC power consumption
- 1.5 x 1.2 x 0.8 mm Land Grid Array (LGA) package
- PHEMT process
- Lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

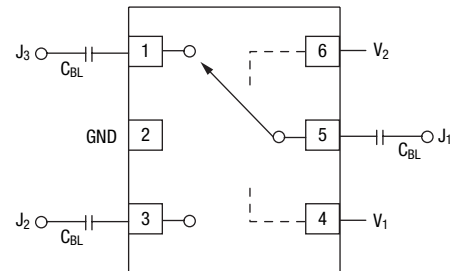
## Description

The AS211-334 is an IC FET SPDT switch in a low-cost miniature LGA package. The AS211-334 features low insertion loss and positive voltage operation with very low DC power consumption.

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



## Pin Out (Top View)



DC blocking capacitors ( $C_{BL}$ ) must be supplied externally for positive voltage operation.  $C_{BL} = 47$  pF for operation >500 MHz.

## Electrical Specifications at 25 °C (0, 3 V)

$Z_0 = 50 \Omega$ , unless otherwise noted

| Parameter      | Frequency | Min. | Typ.  | Max.  | Unit |
|----------------|-----------|------|-------|-------|------|
| Insertion loss | 0.1–1 GHz |      | 0.3   | 0.5   | dB   |
|                | 1.0–2 GHz |      | 0.4   | 0.6   | dB   |
|                | 2.0–3 GHz |      | 0.5   | 0.7   | dB   |
|                | 3.0–4 GHz |      | 0.6   | 0.8   | dB   |
| Isolation      | 0.1–1 GHz | 22   | 25    |       | dB   |
|                | 1.0–2 GHz | 20   | 22    |       | dB   |
|                | 2.0–3 GHz | 20   | 23    |       | dB   |
|                | 3.0–4 GHz | 23   | 26    |       | dB   |
| VSWR           | LF-4 GHz  |      | 1.2:1 | 1.3:1 |      |

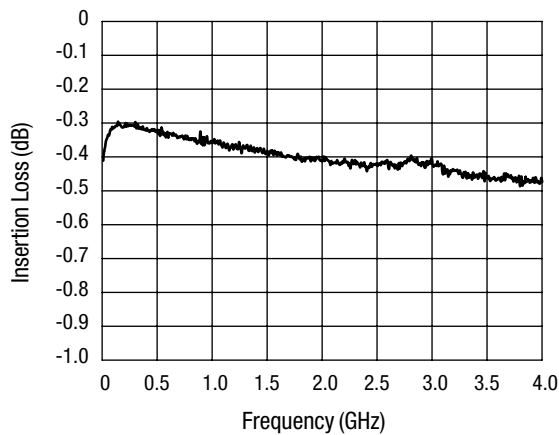
### Operating Characteristics at 25 °C (0, 3 V)

$Z_0 = 50 \Omega$ , unless otherwise noted

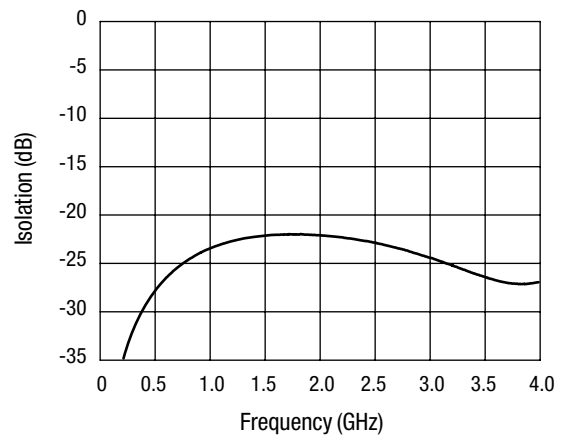
| Parameter                             | Condition  | Frequency              | Min. | Typ.     | Max. | Unit       |
|---------------------------------------|--|------------------------|------|----------|------|------------|
| Switching characteristics             |  |                        |      |          |      |            |
| Rise, fall                            | 10/90% or 90/10% RF  |                        |      | 10       |      | ns         |
| On, off                               | 50% CTL to 90/10% RF   |                        |      | 20       |      | ns         |
| Video feedthru                        | $T_{RISE} = 1 \text{ ns}$ , BW = 500 MHz   |                        |      | 25       |      | mV         |
| Input power for 1 dB compression      | 0/3 V<br>0/5 V   | 0.5–3 GHz<br>0.5–3 GHz |      | 30<br>34 |      | dBm<br>dBm |
| Intermodulation intercept point (IP3) | For two-tone input power 5 dBm<br>0/3 V<br>0/5 V   | 0.5–3 GHz<br>0.5–3 GHz |      | 43<br>50 |      | dBm<br>dBm |
| Thermal resistance                    |  |                        |      | 25       |      | °C/W       |
| Control voltages                      | $V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \mu\text{A max.}$<br>$V_{HIGH} = 3 \text{ V @ } 100 \mu\text{A max. to } 5 \text{ V @ } 200 \mu\text{A max.}$ |                        |      |          |      |            |

### Typical Performance Data (3 V, $C_{BL} = 47 \text{ pF}$ )

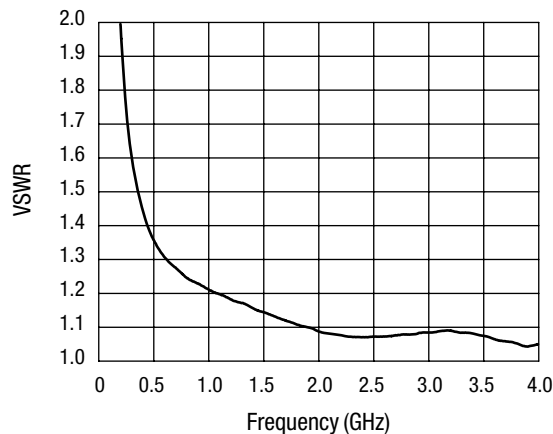
$Z_0 = 50 \Omega$ , unless otherwise noted



**Insertion Loss vs. Frequency**



**Isolation vs. Frequency**



**VSWR vs. Frequency**

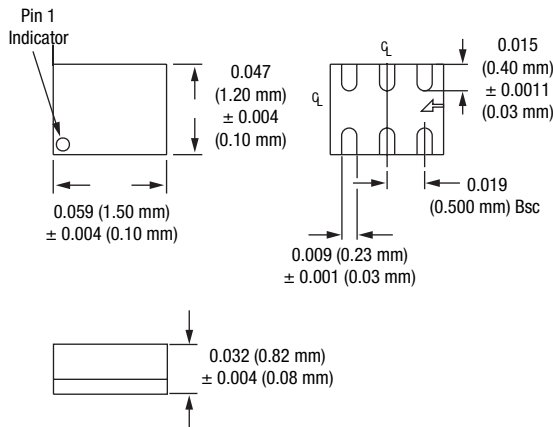
### Absolute Maximum Ratings

| Characteristic        | Value                          |
|-----------------------|--------------------------------|
| RF input power        | 6 W > 500 MHz<br>0/7 V control |
| 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.

### LGA-6 (1.5 x 1.2 mm)

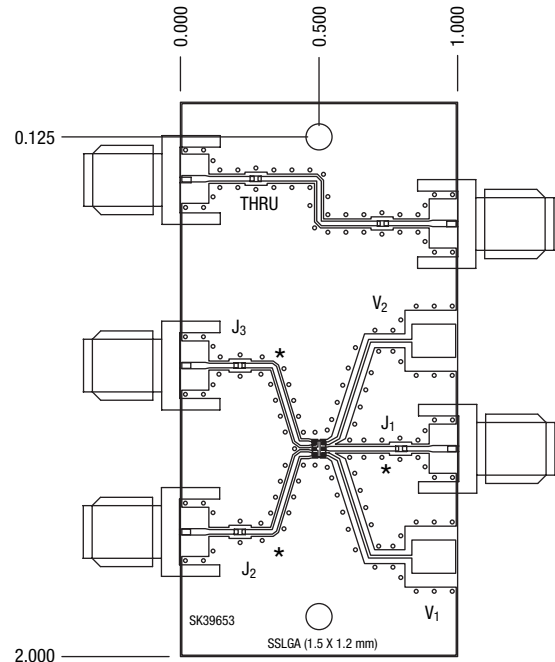


### Truth Table

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

All other states not recommended.  
V<sub>LOW</sub> = 0 to 0.2 V.  
V<sub>HIGH</sub> = 3 to 5 V.

### Test Board



### 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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