

**DATA SHEET**

# AS204-80, AS204-80LF: GaAs IC SP4T Nonreflective Switch With Driver 300 kHz–3.5 GHz

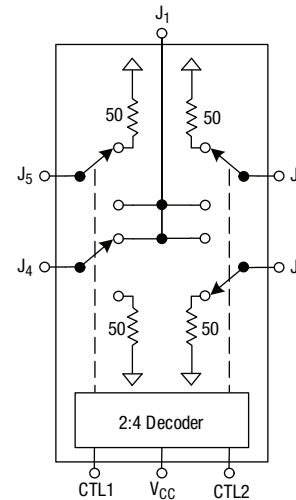
**Features**

- Integrated driver 5 V supply voltage
- High isolation (45 dB @ 0.9 GHz)
- Low insertion loss (0.5 dB @ 0.9 GHz)
- SSOP-16 plastic package
- Nonreflective all ports
- ESD rated at class 1A HBM
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020


**Description**

The AS204-80 is a high-isolation SP4T FET IC nonreflective switch with driver. The insertion loss is 0.5 dB and isolation is 45 dB at 0.9 GHz. The switch is ideal for cellular base station switch matrices.

**Simplified Block Diagram**



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



**Electrical Specifications at 25 °C**

**V<sub>CC</sub> = 5 V, Z<sub>0</sub> = 50 Ω, unless otherwise noted**

| Parameter <sup>(1)</sup>      | Frequency       | Min. | Typ.  | Max. | Unit |
|-------------------------------|-----------------|------|-------|------|------|
| Insertion loss <sup>(2)</sup> | 300 kHz–1.0 GHz |      | 0.4   | 0.6  | dB   |
|                               | 300 kHz–2.0 GHz |      | 0.6   | 0.8  | dB   |
|                               | 300 kHz–2.5 GHz |      | 0.7   | 0.9  | dB   |
|                               | 300 kHz–3.5 GHz |      | 0.9   | 1.2  | dB   |
| Isolation                     | 300 kHz–1.0 GHz | 40   | 45    |      | dB   |
|                               | 300 kHz–2.0 GHz | 30   | 38    |      | dB   |
|                               | 300 kHz–2.5 GHz | 28   | 32    |      | dB   |
|                               | 300 kHz–3.5 GHz | 22   | 25    |      | dB   |
| VSWR <sup>(3)</sup> on state  | 300 kHz–3.5 GHz |      | 1.3:1 |      |      |
| VSWR <sup>(3)</sup> off state | 0.5 GHz–3.5 GHz |      | 1.5:1 |      |      |

1. All measurements made in a 50 Ω system, unless otherwise specified.  
 2. Insertion loss changes by 0.003 dB/°C.  
 3. Input/Output.

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### Operating Characteristics at 25 °C

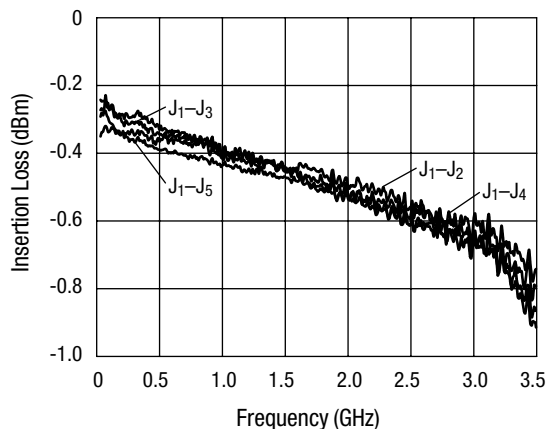
**V<sub>CC</sub> = 5 V, Z<sub>0</sub> = 50 Ω, unless otherwise noted**

| Parameter                                      | Condition                              | Frequency | Min. | Typ. | Max. | Unit |
|--|--|-----------|------|------|------|------|
| Switching characteristics                      |  |           |      |      |      |      |
| Rise, fall                                     | 10/90% or 90/10% RF                    |           |      | 75   |      | ns   |
| On, off  | 50% CTL to 90/10% RF                   |           |      | 125  |      | ns   |
| Video feedthru                                 | T <sub>RISE</sub> = 1 ns, BW = 500 MHz |           |      | 50   |      | mV   |
| Input power for 1 dB compression               |  | 0.5–2 GHz |      | 26   |      | dBm  |
| Intermodulation intercept point (IP3)          | For two-tone input power 13 dBm        | 0.5–2 GHz |      | 40   |      | dBm  |
|  |  | 0.05 GHz  |      | 29   |      | dBm  |
| Thermal resistance                             |  |           |      | 30   |      | °C/W |
| Control voltages <sup>(1)</sup>                | CTL1, 2 low                            |           | 0    |      | 0.5  | V    |
|  | CTL1, 2 high                           |           | 2.4  |      | 5.0  | V    |
| Supply voltage, V <sub>CC</sub> <sup>(1)</sup> |  |           | 4.8  |      | 5.2  |      |
| Supply current                                 | V <sub>CC</sub> = 5 V                  |           |      | 500  |      | μA   |

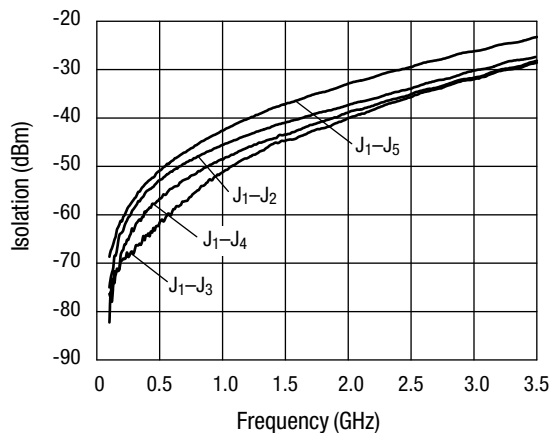
1. V<sub>CC</sub> must be powered on by a minimum of 10 ns prior to V<sub>CTL</sub>.

### Typical Performance Data

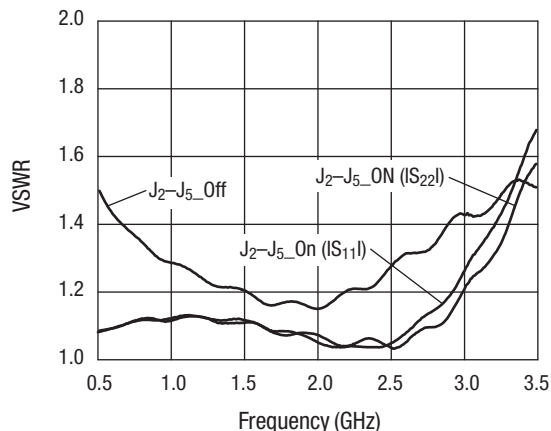
**V<sub>CC</sub> = 5 V, Z<sub>0</sub> = 50 Ω, unless otherwise noted**



**Insertion Loss vs. Frequency**

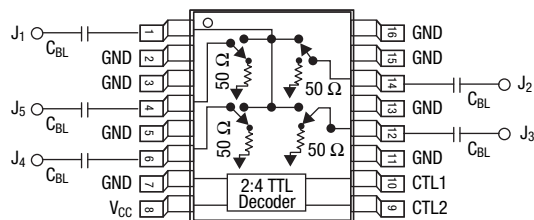


**Isolation vs. Frequency**



**VSWR vs. Frequency**

### Pin Out



DC blocking capacitors (C<sub>BL</sub>) required for positive voltage operation.  
C<sub>BL</sub> = 47 pF for operation frequency >500 MHz.

### Absolute Maximum Ratings

| Characteristic        | Value                             |
|-----------------------|-----------------------------------|
| RF input power        | 0.8 W > 500 MHz<br>0.2 W @ 50 MHz |
| Supply voltage        | 6 V                               |
| Control voltage       | -0.2 V, +6 V                      |
| Operating temperature | -40 °C to +85 °C                  |
| Storage temperature   | -65 °C to +150 °C                 |
| ESD human body model  | Class 1A                          |

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.

### Recommended Solder Reflow Profiles

Refer to the [“Recommended Solder Reflow Profile”](#) Application Note.

### Tape and Reel Information

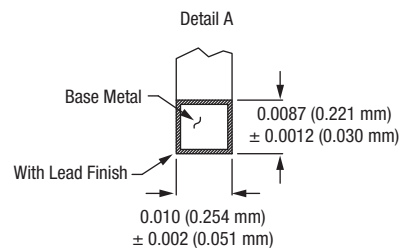
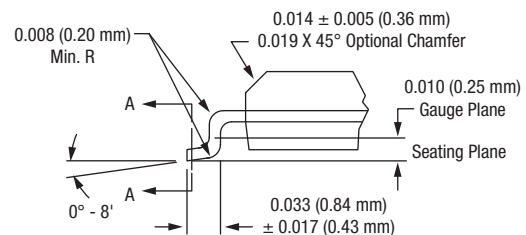
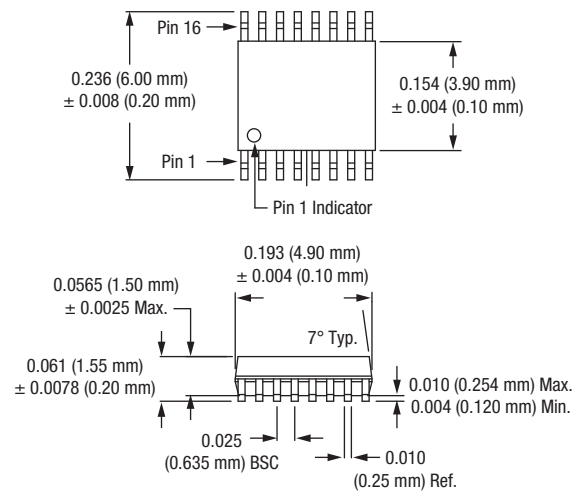
Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

### Truth Table

| Insertion Loss Path J <sub>1</sub> to: | Control Input |      |
|--|---------------|------|
|  | CTL1          | CTL2 |
| J <sub>2</sub>                         | 0             | 0    |
| J <sub>3</sub>                         | 1             | 0    |
| J <sub>4</sub>                         | 0             | 1    |
| J <sub>5</sub>                         | 1             | 1    |

“0” = 0 to 0.5 V.  
“1” = 2.4 to 5 V.

### SSOP-16 (-80)



Section A-A

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