

DATA SHEET

AS213-92, AS213-92LF: PHEMT GaAs IC SPDT Switch 0.1–3 GHz

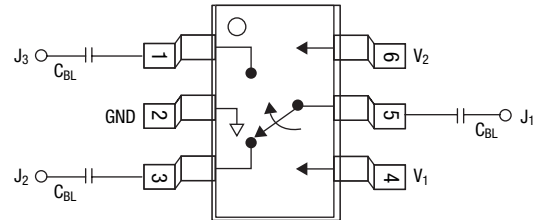
Applications

- T/R switch in WLANs, Bluetooth and medium-power telecommunication applications

Features

- Low insertion loss (0.4 dB @ 2.4 GHz)
- Isolation 22 dB @ 2.4 GHz
- Low DC power consumption
- PHEMT process
- Operates with 1.8 V control voltage
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Pin Out




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

Description

The AS213-92 is a medium-power IC FET SPDT switch in a low-cost miniature SC-70 6-lead plastic package. The AS213-92 features low insertion loss and positive voltage operation with very low DC power consumption. This general-purpose switch can be used in a variety of telecommunications applications.

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



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

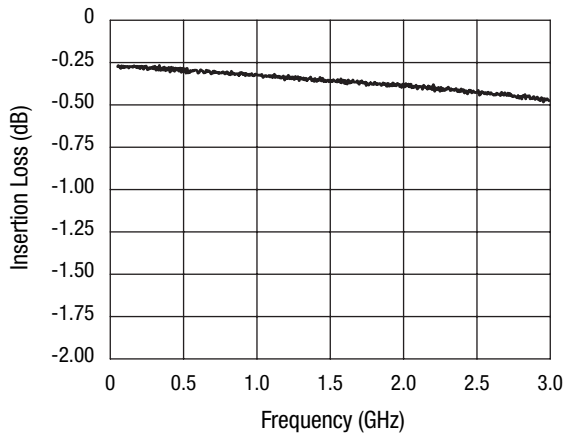
| Parameter ⁽¹⁾ | Frequency | Min. | Typ. | Max. | Unit |
|-------------------------------|-------------|------|-------|------|------|
| Insertion loss ⁽²⁾ | 0.1–1.0 GHz | | 0.3 | 0.5 | dB |
| | 1.0–2.0 GHz | | 0.4 | 0.6 | dB |
| | 2.0–3.0 GHz | | 0.5 | 0.7 | dB |
| Isolation | 0.1–1.0 GHz | 24 | 27 | | dB |
| | 1.0–2.0 GHz | 20 | 23 | | dB |
| | 2.0–3.0 GHz | 16 | 19 | | dB |
| VSWR ⁽³⁾ | 0.1–1.0 GHz | | 1.3:1 | | |
| | 1.0–3.0 GHz | | 1.4:1 | | |

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

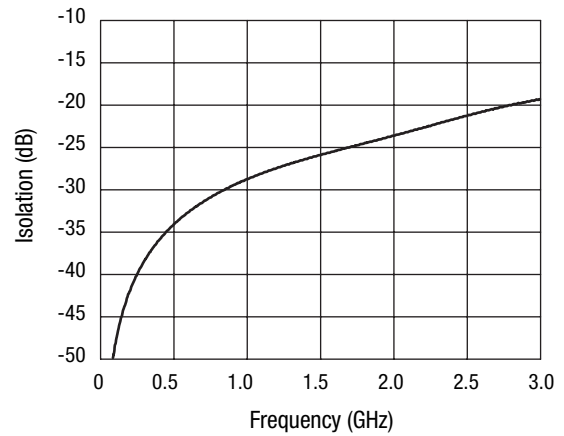
Operating Characteristics at 25 °C (0, 3 V)

| 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 ns, BW = 500 MHz | | | 25 | | mV |
| Input power for 1 dB compression | 0/1.8 V | 0.5–3 GHz | | 20 | | dBm |
| | 0/3 V | 0.5–3 GHz | | 27 | | dBm |
| Intermodulation intercept point (IP3) | For two-tone input power 5 dBm | | | 40 | | dBm |
| | 0/3 V | 0.5–3 GHz | | | | |
| Thermal resistance | | | | 25 | | °C/W |
| Control voltages | V _{LOW} = 0 to 0.2 V @ 20 μA max. V _{HIGH} = 1.8 V @ 100 μA max. to 5 V @ 200 μA max. | | | | | |

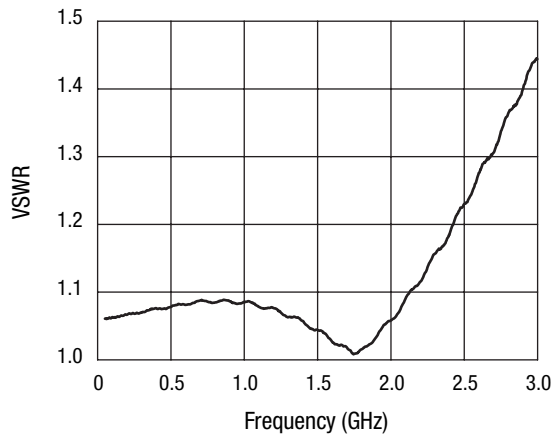
Simulated Performance Data (0, 3 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

| Characteristic | Value |
|-----------------------|---|
| RF input power | 2 W max. for $f > 500$ MHz 500 mW for $f < 500$ MHz $V_{CTL} = 0/8$ V |
| Supply voltage | 8 V |
| 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.

Recommended Solder Reflow Profiles

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

Tape and Reel Information

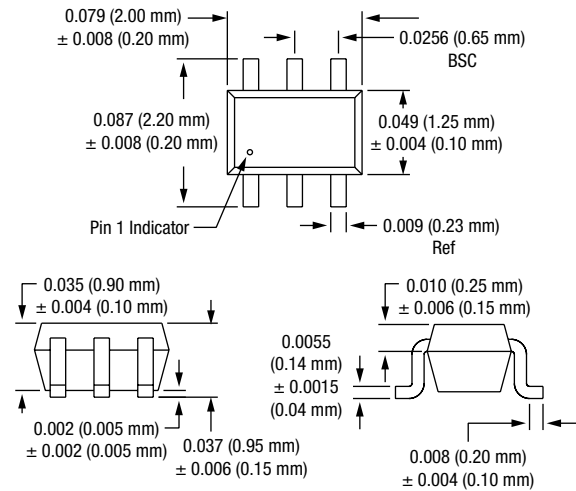
Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

Truth Table

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

Any state other than described in the truth table will put the device in an undefined state. An undefined state will not damage the device.
 $V_{HIGH} = 1.8$ to 5 V.

SC-70 6 Lead



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