

GaAs IC SP4T Non-Reflective Switch With Integral Driver DC–3 GHz



AK002M4-47

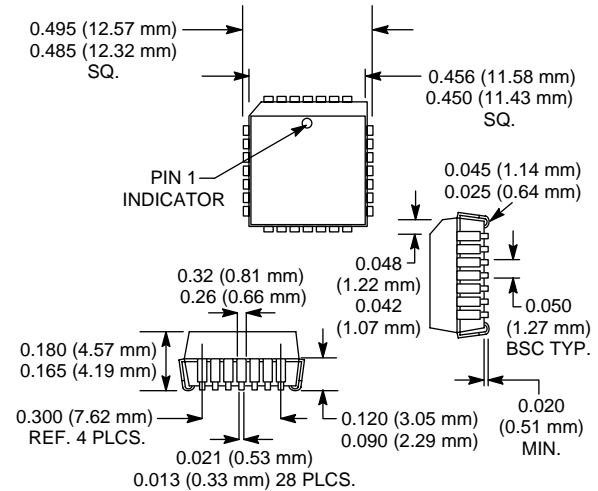
Features

- Integral Driver ± 5 V Supply Voltages
- PLCC-28 Plastic Package
- Single Voltage Control for Each Port
- Non-Reflective on All Ports
- Base Station Switch Matrix Applications

Description

The AK002M4-47 is a SP4T non-reflective FET IC switch. The switch consists of a GaAs SP4T chip and an integral driver. This unit is ideal for cellular base station switch matrices.

PLCC-28



Electrical Specifications at 25°C (+5, -5 V)

| Parameter ¹ | Frequency ² | Min. | Typ. | Max. | Unit |
|-----------------------------|------------------------|------|-------|-------|------|
| Insertion Loss ³ | DC–0.5 GHz | | 0.8 | 1.1 | dB |
| | DC–1.0 GHz | | 1.0 | 1.4 | dB |
| | DC–2.0 GHz | | 1.3 | 1.6 | dB |
| | DC–3.0 GHz | | 1.8 | 2.1 | dB |
| Isolation | DC–0.5 GHz | 48 | 51 | | dB |
| | DC–1.0 GHz | 40 | 42 | | dB |
| | DC–2.0 GHz | 29 | 33 | | dB |
| | DC–3.0 GHz | 25 | 28 | | dB |
| VSWR ⁴ | DC–0.5 GHz | | 1.3:1 | 1.5:1 | |
| | DC–1.0 GHz | | 1.5:1 | 1.7:1 | |
| | DC–3.0 GHz | | 1.7:1 | 1.9:1 | |

Operating Characteristics at 25°C (+5, -5 V)

| Parameter | Condition | Frequency | Min. | Typ. | Max. | Unit |
|--|---|--------------------------|------|------------|------|------------|
| Switching Characteristics ⁵ | Rise, Fall (10/90% or 90/10% RF) | | | 15 | | ns |
| | On, Off (50% CTL to 90/10% RF) | | | 35 | | ns |
| | Video Feedthru | | | 30 | | mV |
| Input Power for 1 dB Compression | | 0.50–3.0 GHz 0.05 GHz | | +24 +16 | | dBm dBm |
| Intermodulation Intercept Point (IP3) | For Two-tone Input Power +13 dBm | 0.50–3.0 GHz 0.05 GHz | | +40 +29 | | dBm dBm |
| Control Voltages | V_{Low} | | 0.0 | | 0.2 | V |
| | V_{High} | | 4.5 | | 5.0 | V |
| Supply Voltages | +5 V \pm 0.2 V @ 3 mA Typ. -5 V \pm 0.20 V @ 16 mA Typ. ^{6,7} | | | | | |

1. All measurements made in a 50 Ω system, unless otherwise specified.

2. DC = 300 kHz.

3. Insertion loss changes by 0.003 dB/°C.

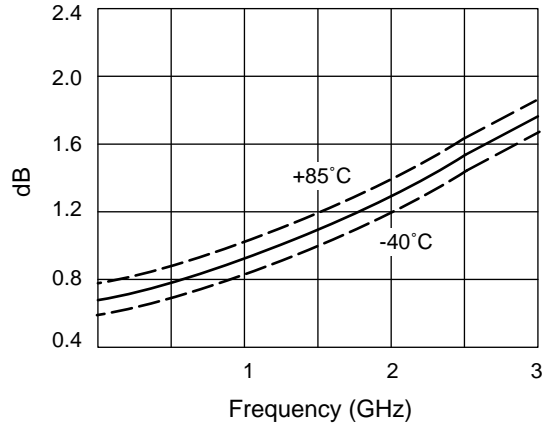
4. Input/Output.

5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

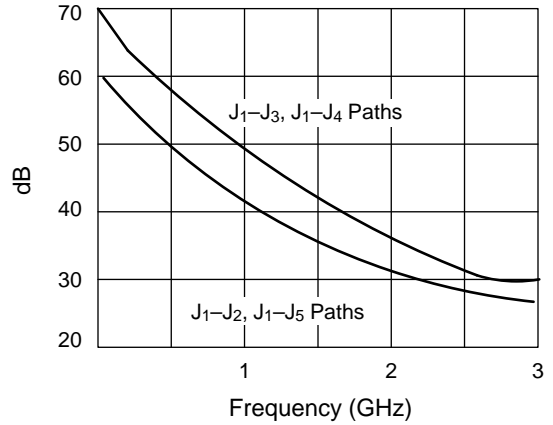
6. Supply voltage and ground must be connected before control voltage is applied to avoid irreversible damage to the device.

7. Current increases from 16 mA to 20 mA @ +85°C.

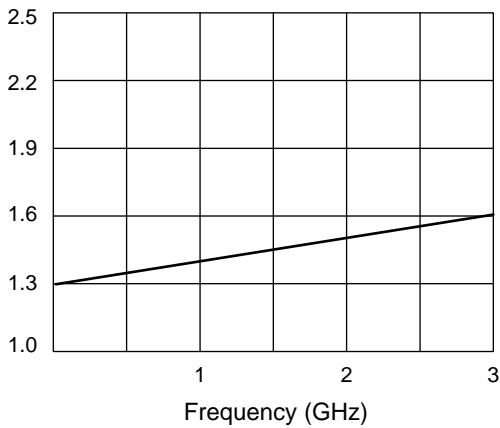
Typical Performance Data (+5, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

| Characteristic | Value |
|-----------------------|-----------------------------------|
| RF Input Power | 0.8 W > 500 MHz 0.2 W @ 50 MHz |
| Supply Voltage | +7.0 V, -7 V |
| Control Voltage | -0.2 V, +7.0 V |
| Operating Temperature | 0°C to +70°C |
| Storage Temperature | -65°C to +150°C |
| θ_{JC} | 30°C/W |

Truth Table

| Insertion Loss Path J ₁ to: | J ₂ | J ₃ | J ₄ | J ₅ |
|--|----------------|----------------|----------------|----------------|
| | C ₂ | C ₃ | C ₄ | C ₅ |
| J ₂ | 0 | 1 | 1 | 1 |
| J ₃ | 1 | 0 | 1 | 1 |
| J ₄ | 1 | 1 | 0 | 1 |
| J ₅ | 1 | 1 | 1 | 0 |

"0" = 0.0 to 0.2 V, "1" = 4.5 to 5.0 V.

Pin Out

