

GaAs IC SPDT Switch Non-Reflective DC–2.5 GHz



AS002M2-12

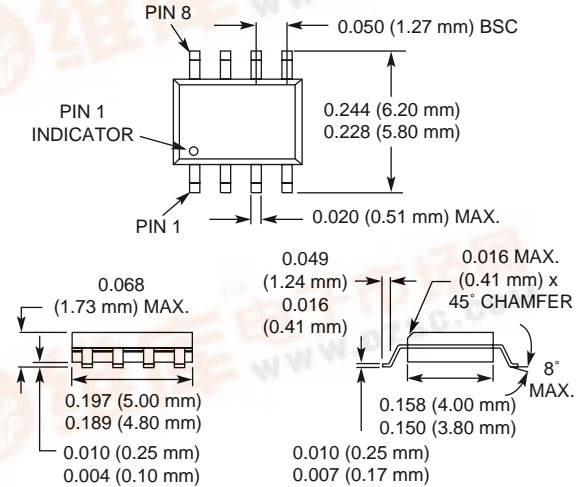
Features

- Low DC Power Consumption
- Non-Reflective
- High Isolation (40 dB @ 1 GHz)

Description

The AS002M2-12 is a low cost IC FET SPDT non-reflective switch in a plastic SOIC-8 package. The switch operates with -5, 0 V or 0, +5 V when 'floated' as shown on the following page. This general purpose SPDT switch is used in various telecommunications applications.

SOIC-8



Electrical Specifications at 25°C (0, -5 V)

| Parameter ¹ | Frequency ² | Min. | Typ. | Max. | Unit |
|-----------------------------|------------------------|------|-------|-------|------|
| Insertion Loss ³ | DC–0.5 GHz | | 0.7 | 0.8 | dB |
| | DC–1.0 GHz | | 0.8 | 0.9 | dB |
| | DC–2.0 GHz | | 1.1 | 1.2 | dB |
| | DC–2.5 GHz | | 1.3 | 1.4 | dB |
| Isolation | DC–0.5 GHz | 42 | 46 | | dB |
| | DC–1.0 GHz | 36 | 40 | | dB |
| | DC–2.0 GHz | 27 | 30 | | dB |
| | DC–2.5 GHz | 23 | 20 | | dB |
| VSWR ⁴ | DC–0.5 GHz | | 1.3:1 | 1.4:1 | |
| | DC–2.0 GHz | | 1.5:1 | 1.6:1 | |
| | DC–2.5 GHz | | 1.6:1 | 1.8:1 | |

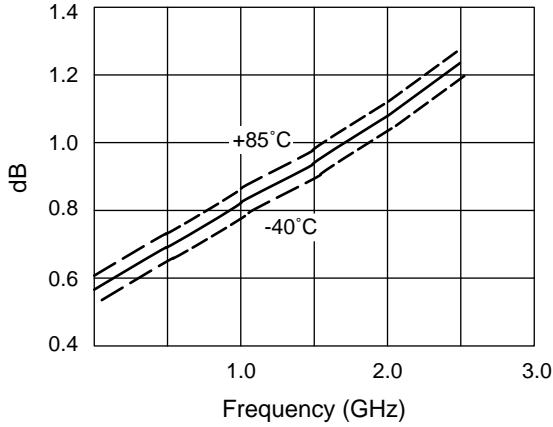
Operating Characteristics at 25°C (0, -5 V)

| Parameter ¹ | Condition | Frequency | Min. | Typ. | Max. | Unit |
|--|---|--------------|------|------|------|------|
| Switching Characteristics ⁵ | Rise, Fall (10/90% or 90/10% RF) | | | 3 | | ns |
| | On, Off (50% CTL to 90/10% RF) | | | 6 | | ns |
| | Video Feedthru | | | 15 | | mV |
| Input Power for 1 dB Compression | | 0.50–2.0 GHz | | +24 | | dBm |
| | | 0.05 GHz | | +16 | | dBm |
| Intermodulation Intercept Point | For Two-tone Input Power +13 dBm | 0.50–2.0 GHz | | +46 | | dBm |
| Control Voltages | $V_{Low} = 0 \text{ to } -0.2 \text{ V @ } 20 \mu\text{A Max.}$ $V_{High} = -5 \text{ V @ } 50 \mu\text{A to } -8 \text{ V @ } 200 \mu\text{A Max.}$ | | | | | |

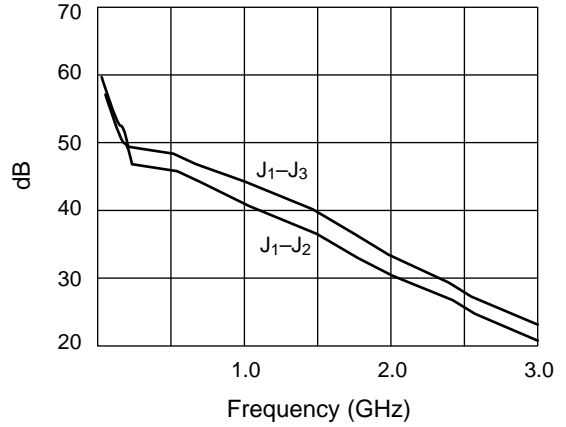
1. All measurements made in a 50 Ω system, unless otherwise specified.
 2. DC = 300 kHz.
 3. Insertion loss changes by 0.003 dB/°C.
 4. Input/output.
 5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.



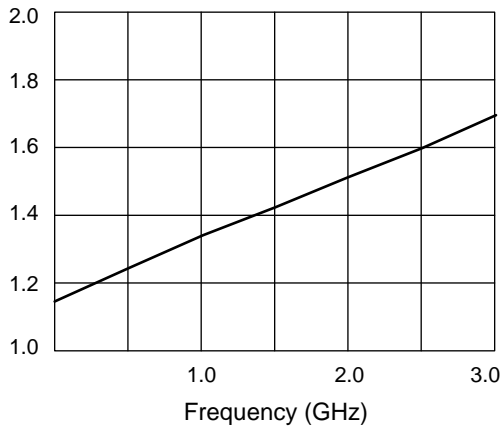
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

Negative Operation

| V ₁ | V ₂ | J ₁ -J ₂ | J ₁ -J ₃ |
|----------------|----------------|--------------------------------|--------------------------------|
| 0 | -5 | Insertion Loss | Isolation |
| -5 | 0 | Isolation | Insertion Loss |

Positive Operation

| V ₁ | V ₂ | J ₁ -J ₂ | J ₁ -J ₃ |
|-------------------|-------------------|--------------------------------|--------------------------------|
| V _{High} | 0 | Insertion Loss | Isolation |
| 0 | V _{High} | Isolation | Insertion Loss |

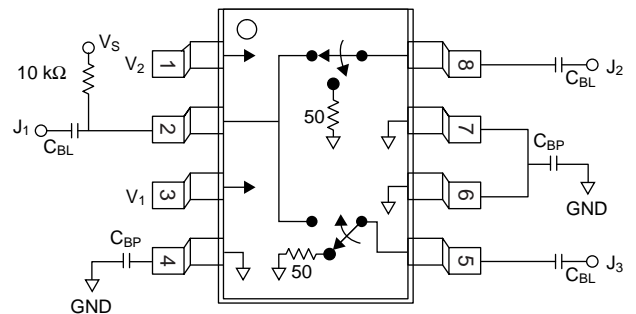
V_{High} = +5 to +8 V (V_S = V_{High} ± 0.2 V).

Absolute Maximum Ratings

| Characteristic | Value |
|-----------------------|---|
| RF Input Power | 2 W > 500 MHz 0/-8 V 0.5 W @ 50 MHz 0/-8 V |
| Control Voltage | +0.2 V, -8 V |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |
| θ _{JC} | 25°C/W |

Note: Exceeding these parameters may cause irreversible damage.

Pin Out



External components shown are for positive voltage operation only. C_{BL} = 100 pF, C_{BP} = 1000 pF for operation >500 MHz.