

# GaAs IC SPDT Switch

## Non-Reflective DC–2.5 GHz



**AS338-12**

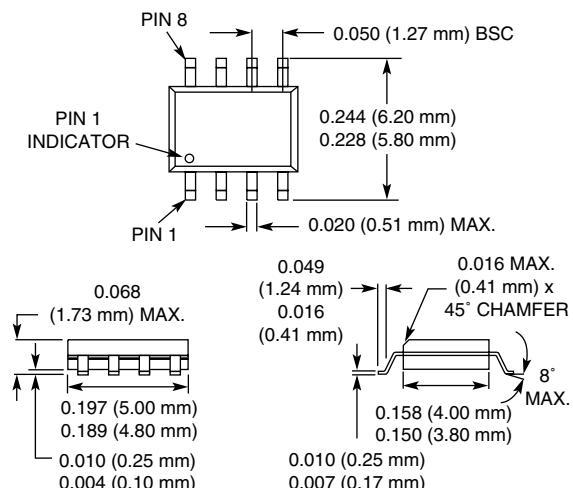
### Features

- Low DC Power Consumption
- High Isolation (40 dB @ 0.9 GHz)
- Non-Reflective

### Description

The AS338-12 is a low cost IC FET SPDT non-reflective switch in a plastic SOIC-8 package for commercial applications. 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 <sup>1</sup>      | Frequency <sup>2</sup>                               | Min.                 | Typ.                     | Max.                     | Unit |
|-----------------------------|--|----------------------|--------------------------|--------------------------|------|
| Insertion Loss <sup>3</sup> | DC–0.5 GHz<br>DC–1.0 GHz<br>DC–2.0 GHz<br>DC–2.5 GHz |                      | 0.5<br>0.6<br>0.7<br>1.2 | 0.7<br>0.8<br>0.9<br>1.4 | dB   |
| Isolation                   | DC–0.5 GHz<br>DC–1.0 GHz<br>DC–2.0 GHz<br>DC–2.5 GHz | 43<br>36<br>27<br>23 | 46<br>39<br>30<br>26     |                          | dB   |
| VSWR <sup>4</sup>           | DC–0.5 GHz<br>DC–1.0 GHz<br>DC–2.5 GHz               |                      | 1.2:1<br>1.2:1<br>1.3:1  | 1.3:1<br>1.4:1<br>1.5:1  |      |

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

| Parameter                              | Condition   | Frequency                | Min. | Typ.          | Max. | Unit           |
|--|---|--------------------------|------|---------------|------|----------------|
| Switching Characteristics <sup>5</sup> | Rise, Fall (10/90% or 90/10% RF)<br>On, Off (50% CTL to 90/10% RF)<br>Video Feedthru                  |                          |      | 8<br>30<br>25 |      | ns<br>ns<br>mV |
| Input Power For 1 dB Compression       |   | 0.50–2.5 GHz<br>0.05 GHz |      | +28<br>+23    |      | dBm<br>dBm     |
| Intermodulation Intercept Point        | For Two-tone Input Power +5 dBm   | 0.50–2.5 GHz<br>0.05 GHz |      | +46<br>+40    |      | dBm<br>dBm     |
| Control Voltages                       | $V_{Low} = 0$ to 0.2 V @ 20 $\mu$ A Max.<br>$V_{High} = -5$ V @ 50 $\mu$ A to -8 V @ 200 $\mu$ A Max. |                          |      |               |      |                |

1. All measurements made in a 50  $\Omega$  system, unless otherwise specified.

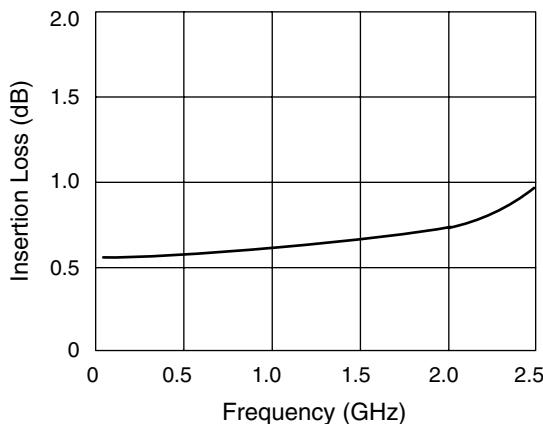
2. DC = 300 kHz.

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

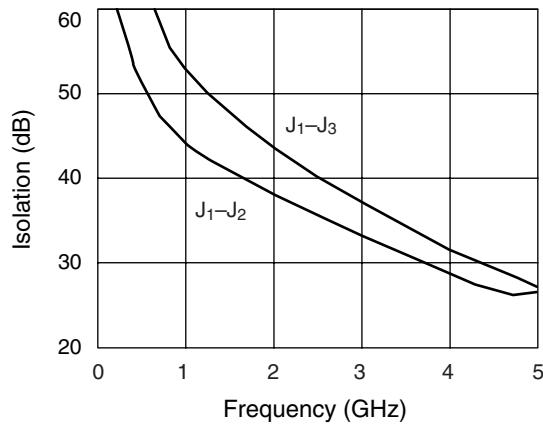
4. Input/output.

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

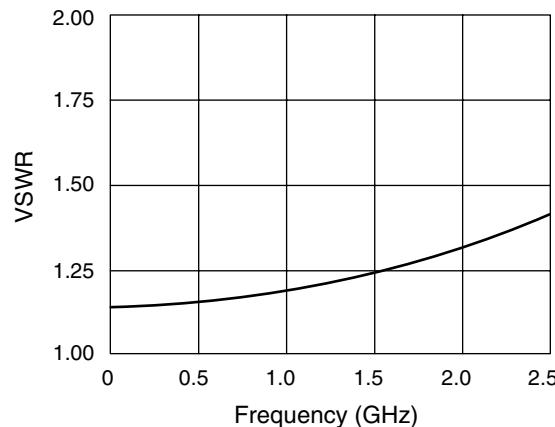
## Typical Performance Data (0, -5 V)



**Insertion Loss vs. Frequency**



**Isolation vs. Frequency**



**VSWR vs. Frequency**

## Truth Table

### Negative Operation

| V <sub>1</sub> | V <sub>2</sub> | J <sub>1</sub> –J <sub>2</sub> | J <sub>1</sub> –J <sub>3</sub> |
|----------------|----------------|--------------------------------|--------------------------------|
| 0              | -5             | Insertion Loss                 | Isolation                      |
| -5             | 0              | Isolation                      | Insertion Loss                 |

### Positive Operation<sup>1</sup>

| 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> | 0                 | Insertion Loss                 | Isolation                      |
| 0                 | V <sub>High</sub> | Isolation                      | Insertion Loss                 |

V<sub>High</sub> = +5 to +8 V (V<sub>S</sub> = V<sub>High</sub> ± 0.2 V).

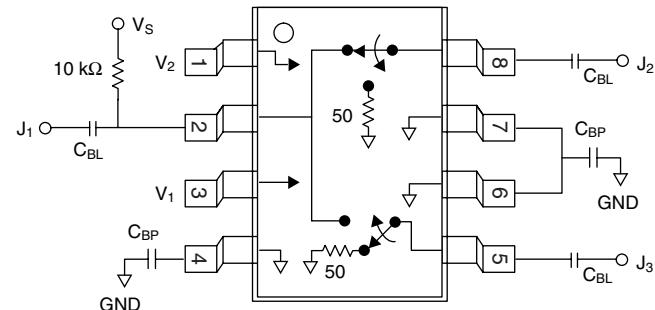
1. Refer to Application Notes for further information.

## Absolute Maximum Ratings

| Characteristic        | Value   |
|-----------------------|---|
| RF Input Power        | 2 W > 500 MHz 0/-8 V<br>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 <sub>JC</sub>       | 25°C/W  |

Note: Exceeding these parameters may cause irreversible damage.

## Pin Out



External components shown are for positive voltage operation only.  
C<sub>BL</sub> = 100 pF, C<sub>BP</sub> = 1000 pF for operation >500 MHz.