

# GaAs SPDT Non-Reflective Switch

## DC–2.5 GHz



AS131-59

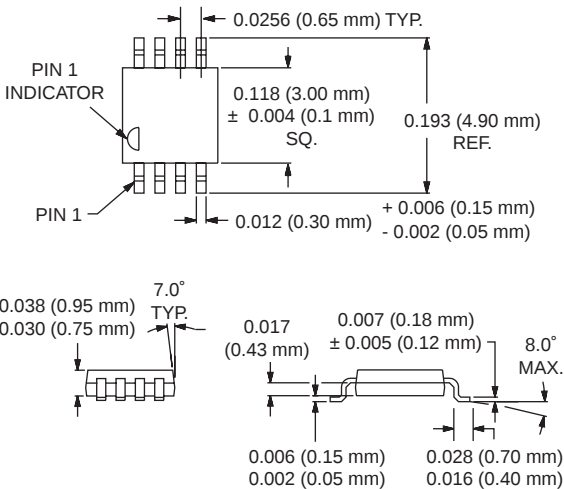
### Features

- Low DC Power Consumption
- High Isolation (45 dB @ 0.9 GHz)
- Non-Reflective

### Description

The AS131-59 is a high isolation IC FET SPDT non-reflective switch in a plastic MSOP-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.

### MSOP-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             |      | 0.8   | 1.0   | dB   |
|                             | DC–1.0 GHz             |      | 0.9   | 1.1   | dB   |
|                             | DC–2.0 GHz             |      | 1.0   | 1.2   | dB   |
|                             | DC–2.5 GHz             |      | 1.1   | 1.4   | dB   |
| Isolation                   | DC–0.5 GHz             | 45   | 55    |       | dB   |
|                             | DC–1.0 GHz             | 40   | 48    |       | dB   |
|                             | DC–2.0 GHz             | 30   | 35    |       | dB   |
|                             | DC–2.5 GHz             | 25   | 32    |       | dB   |
| VSWR <sup>4</sup>           | DC–2.5 GHz             |      | 1.6:1 | 1.8:1 |      |

### 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)                                                                                                                       |             |      | 25   |      | ns   |
|                                        | On, Off (50% CTL to 90/10% RF)                                                                                                                         |             |      | 30   |      | ns   |
|                                        | Video Feedthru                                                                                                                                         |             |      | 15   |      | mV   |
| Input Power for 1 dB Compression       |                                                                                                                                                        | 0.5–2.5 GHz |      | +26  |      | dBm  |
| Intermodulation Intercept Point        | For Two-tone Input Power +10 dBm                                                                                                                       | 0.9 GHz     |      | +44  |      | dBm  |
| Control Voltages                       | $V_{Low} = 0 \text{ to } 0.2 \text{ V @ } 20 \mu\text{A Max.}$<br>$V_{High} = -5 \text{ V @ } 50 \mu\text{A to } -8 \text{ V @ } 200 \mu\text{A Max.}$ |             |      |      |      |      |

1. All measurements made in a 50  $\Omega$  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.

| Frequency (GHz) | Insertion Loss (dB) |
|-----------------|---------------------|
| 0.0             | 0.7                 |
| 0.5             | 0.8                 |
| 1.0             | 0.9                 |
| 1.5             | 0.9                 |
| 2.0             | 0.8                 |
| 2.5             | 1.1                 |

| Frequency (GHz) | Isolation (dB) for J <sub>1</sub> -J <sub>2</sub> | Isolation (dB) for J <sub>1</sub> -J <sub>3</sub> |
|-----------------|---------------------------------------------------|---------------------------------------------------|
| 0.1             | 70                                                | 70                                                |
| 0.25            | 60                                                | 58                                                |
| 0.5             | 55                                                | 53                                                |
| 0.75            | 52                                                | 48                                                |
| 1.0             | 50                                                | 46                                                |
| 1.25            | 48                                                | 44                                                |
| 1.5             | 46                                                | 42                                                |
| 1.75            | 44                                                | 40                                                |
| 2.0             | 40                                                | 38                                                |
| 2.25            | 36                                                | 34                                                |
| 2.5             | 34                                                | 33                                                |

| Characteristic        | Value                                |
|-----------------------|--------------------------------------|
| RF Input Power        | 2 W Max. > 0.5 GHz<br>0/-8 V Control |
| Control Voltage       | +0.2 V, -8 V                         |
| Operating Temperature | -40°C to +85°C                       |
| Storage Temperature   | -65°C to +150°C                      |
| $\Theta_{JC}$         | 25°C/W                               |

| $V_1$ | $V_2$ | $J_1$ - $J_2$  | $J_1$ - $J_3$  |
|-------|-------|----------------|----------------|
| 0     | -5    | Insertion Loss | Isolation      |
| -5    | 0     | Isolation      | Insertion Loss |

| $V_1$      | $V_2$      | $J_1$ - $J_2$  | $J_1$ - $J_3$  |
|------------|------------|----------------|----------------|
| $V_{High}$ | 0          | Insertion Loss | Isolation      |
| 0          | $V_{High}$ | Isolation      | Insertion Loss |

External components shown are for positive voltage operation only.  
 $C_{BL} = 100 \text{ pF}$ ,  $C_{BP} = 1000 \text{ pF}$ . Capacitance values chosen for operation  
 $> 500 \text{ MHz}$ .