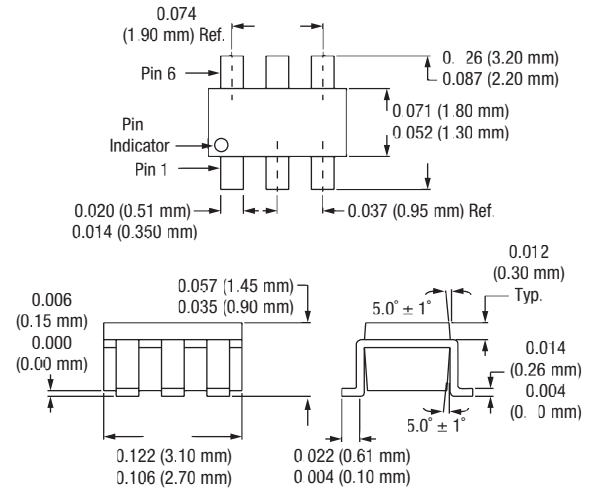


### Features

- High Linearity (+50 dBm IP3 @ 0.9 GHz) @ 3 V
- Low Insertion Loss (0.4 dB @ 0.9 GHz)
- Isolation (20 dB @ 0.9 GHz)
- Simultaneous T/R Switching

### SOT-6



### Description

The AS172-73 is a PHEMT GaAs IC 4 port switch designed to combine T/R and antenna changeover switching capability within one device. This switch has two controls and is ideal for applications requiring low power consumption. The AS172-73 has excellent performance to 2 GHz making it suitable for dual-band handset designs.

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

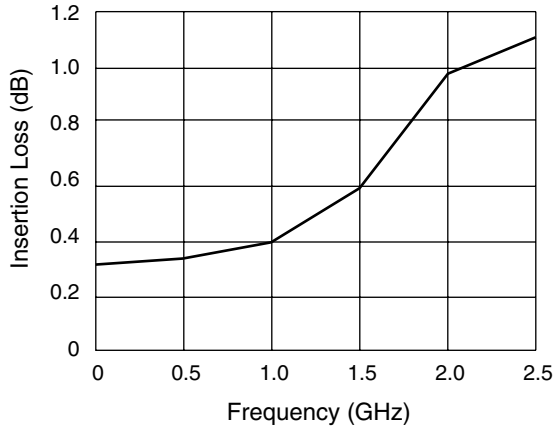
| Parameter <sup>1</sup>      | Frequency <sup>2</sup> | T <sub>X</sub> -J <sub>1</sub> or R <sub>X</sub> -J <sub>1</sub> |       |      | Unit |
|-----------------------------|------------------------|--|-------|------|------|
|                             |                        | Min.   | Typ.  | Max. |      |
| Insertion Loss <sup>3</sup> | DC–0.5 GHz             |  | 0.30  | 0.40 | dB   |
|                             | DC–1.0 GHz             |  | 0.40  | 0.50 | dB   |
|                             | DC–2.0 GHz             |  | 0.95  | 1.20 | dB   |
| Isolation                   | DC–0.5 GHz             | 23   | 25    |      | dB   |
|                             | DC–1.0 GHz             | 16   | 18    |      | dB   |
|                             | DC–2.0 GHz             | 11   | 13    |      | dB   |
| VSWR <sup>4</sup>           | DC–1.0 GHz             |  | 1.1:1 |      |      |
|                             | DC–2.0 GHz             |  | 1.4:1 |      |      |

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

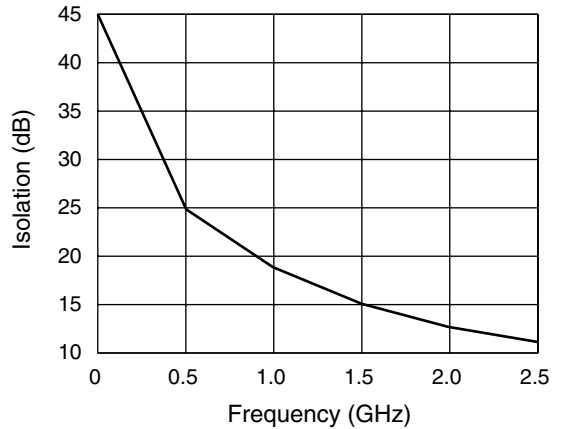
| Parameter                              | Condition  | Frequency   | Min. | Typ. | Max. | Unit |
|--|--|-------------|------|------|------|------|
| Switching Characteristics <sup>5</sup> | Rise, Fall (10/90% or 90/10% RF)   |             |      | 50   |      | ns   |
|  | On, Off (50% CTL to 90/10% RF)   |             |      | 100  |      | ns   |
|  | Video Feedthru   |             |      | 50   |      | mV   |
| Input Power for 1 dB Compression       | 0/+3 V   | 0.5–2.0 GHz |      | +34  |      | dBm  |
| Intermodulation Intercept Point (IP3)  | For Two-tone Input Power +15 dBm<br>0/+3 V   | 0.5–2.0 GHz |      | +50  |      | dBm  |
| 2nd Harmonic                           | 30 dBm   | 1.0 GHz     |      | +72  |      | dBc  |
| 3rd Harmonic                           | 30 dBm   | 1.0 GHz     |      | +65  |      | dBc  |
| Control Voltages                       | V <sub>Low</sub> = 0 to 0.2 V @ 20 μA Max.<br>V <sub>High</sub> = +3 V @ 100 μA Max. to +5 V @ 200 μA Max.<br>V <sub>S</sub> = V <sub>High</sub> ± 0.2 V |             |      |      |      |      |

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

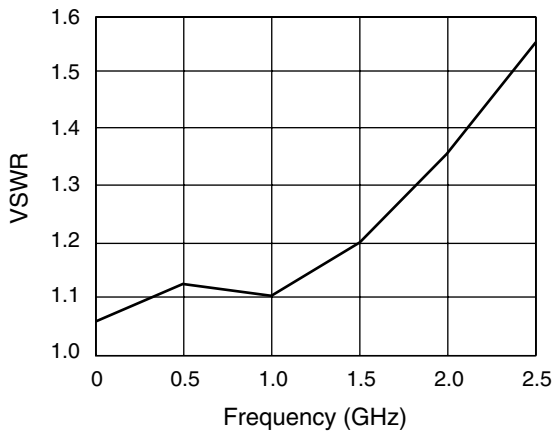
### Typical Performance Data (0, +3 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

### Absolute Maximum Ratings

| Characteristic        | Value                           |
|-----------------------|---------------------------------|
| RF Input Power        | 2 W > 500 MHz<br>0/+7 V Control |
| Control Voltage       | -0.2 V, +8 V                    |
| Operating Temperature | -40°C to +85°C                  |
| Storage Temperature   | -50°C to +150°C                 |
| $\theta_{JC}$         | 25°C/W                          |

### Truth Table

#### Negative Operation

| V <sub>1</sub> | V <sub>2</sub> | T <sub>X-J2</sub> , R <sub>X-J1</sub> | T <sub>X-J1</sub> , R <sub>X-J2</sub> |
|----------------|----------------|---------------------------------------|---------------------------------------|
| 0              | -3             | Insertion Loss                        | Isolation                             |
| -3             | 0              | Isolation                             | Insertion Loss                        |

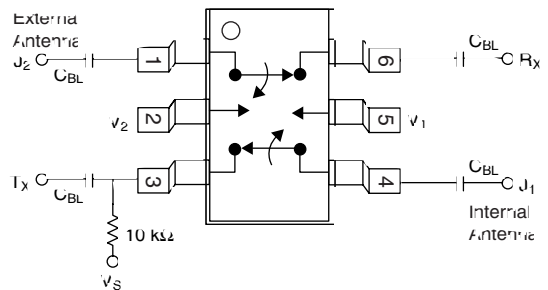
#### Positive Operation

| V <sub>1</sub>    | V <sub>2</sub>    | T <sub>X-J2</sub> , R <sub>X-J1</sub> | T <sub>X-J1</sub> , R <sub>X-J2</sub> |
|-------------------|-------------------|---------------------------------------|---------------------------------------|
| V <sub>High</sub> | 0                 | Insertion Loss                        | Isolation                             |
| 0                 | V <sub>High</sub> | Isolation                             | Insertion Loss                        |

V<sub>High</sub> = +3 to +8 V (V<sub>S</sub> = V<sub>High</sub> ± 0.2 V).

### Pin Out

#### Positive Operation



DC blocking capacitors (C<sub>BL</sub>) and biasing resistor must be supplied externally for positive voltage operation.  
C<sub>BL</sub> = 100 pF for operation >500 MHz.