

GaAs IC Transfer Switch DC–2 GHz

AS127-59

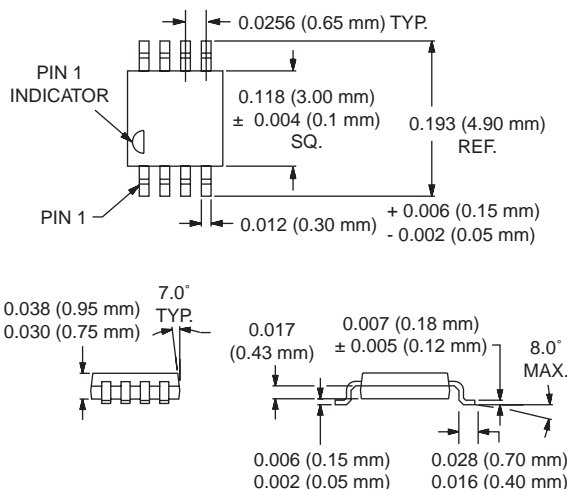
Features

- High Linearity (+45 dBm IP3 @ 0.9 GHz)
- Small MSOP-8 Plastic Package
- Low Insertion Loss (0.4 dB @ 0.9 GHz)
- Simultaneous T/R Switching

Description

The AS127-59 is a 4 port switch designed to combine T/R and antenna changeover switching capability within one device. This switch has two 5 V controls and is ideal for applications requiring low power consumption. The AS127-59 has excellent performance to 2 GHz making it suitable for dual-band handset designs.

MSOP-8



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

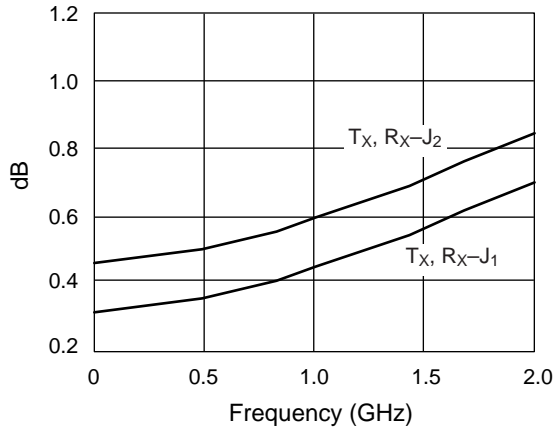
| Parameter ¹ | Frequency ² | T _X -J ₁ or R _X -J ₁ | | | T _X -J ₂ or R _X -J ₂ | | | Unit |
|-----------------------------|------------------------|--|-------|-------|--|-------|-------|------|
| | | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| Insertion Loss ³ | DC–0.5 GHz | | 0.35 | 0.5 | | 0.5 | 0.7 | dB |
| | DC–1.0 GHz | | 0.45 | 0.7 | | 0.6 | 0.9 | dB |
| | DC–2.0 GHz | | 0.7 | 1.0 | | 0.85 | 1.3 | dB |
| Isolation | DC–0.5 GHz | 20 | 25 | | 25 | 28 | | dB |
| | DC–1.0 GHz | 13 | 15 | | 17 | 20 | | dB |
| | DC–2.0 GHz | 10 | 13 | | 14 | 16 | | dB |
| VSWR ⁴ | DC–1.0 GHz | | 1.2:1 | 1.5:1 | | 1.2:1 | 1.5:1 | |
| | DC–2.0 GHz | | 1.3:1 | 1.8:1 | | 1.3:1 | 1.8:1 | |

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

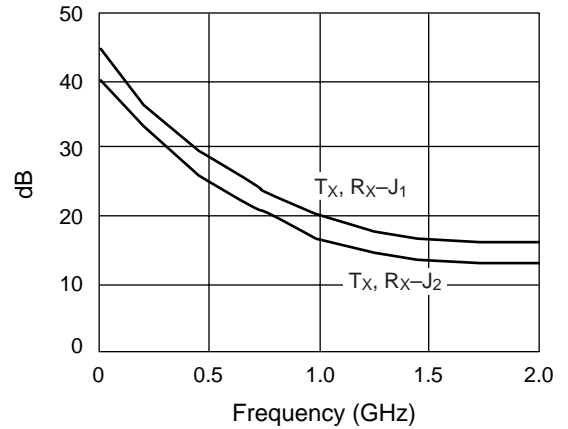
| Parameter | Condition | Frequency | Min. | Typ. | Max. | Unit |
|--|---|-------------|------|------|------|------|
| Switching Characteristics ⁵ | Rise, Fall (10/90% or 90/10% RF) | | | 20 | | ns |
| | On, Off (50% CTL to 90/10% RF) | | | 40 | | ns |
| | Video Feedthru | | | 50 | | mV |
| Input Power for 1 dB Compression (T _X) | | 0.5–2.0 GHz | | +33 | | dBm |
| Intermodulation Intercept Point (IP3) | For Two-tone Input Power +0 dBm | 0.5–2.0 GHz | | +45 | | dBm |
| Control Voltages | V _{Low} = 0 to -0.2 V @ 20 μA Max. V _{High} = -5 V @ 25 μA to -8 V @ 100 μA 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. Insertion loss state.
5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

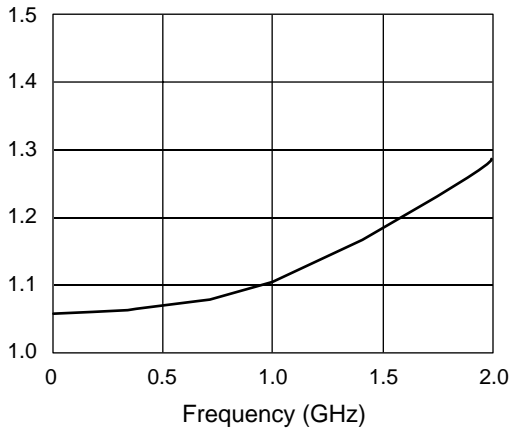
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

Negative Operation

| V ₁ | V ₂ | T _X -J ₂ , R _X -J ₁ | T _X -J ₁ , R _X -J ₂ |
|----------------|----------------|---|---|
| 0 | -5 | Insertion Loss | Isolation |
| -5 | 0 | Isolation | Insertion Loss |

Positive Operation

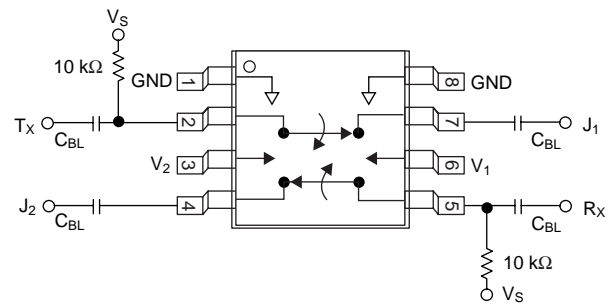
| V ₁ | V ₂ | T _X -J ₂ , R _X -J ₁ | T _X -J ₁ , R _X -J ₂ |
|-------------------|-------------------|---|---|
| V _{High} | 0 | Insertion Loss | Isolation |
| 0 | V _{High} | Isolation | Insertion Loss |

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

Absolute Maximum Ratings

| Characteristic | Value |
|-----------------------|----------------------------------|
| RF Input Power | 4 W > 0.5 GHz, 0/-5 V Control |
| 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 |

Pin Out



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