

PHEMT GaAs IC High Power SP4T Switch 0.1–2.5 GHz



AS166-300

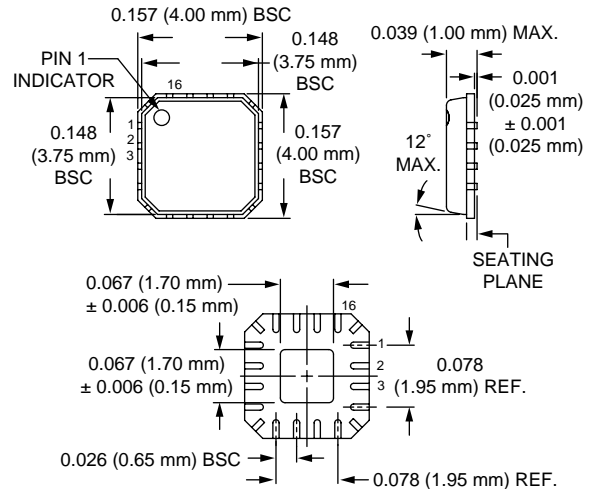
Features

- 2 T_X Paths and 2 R_X Paths
- Positive Voltage Control
- High IP3
- Excellent Harmonic Performance
- Handles GSM Power Levels
- Available in MLF-16 (4 x 4 mm) Package

Description

The AS166-300 is a reflective SP4T switch. It is an ideal switch for higher power applications. It can be used for GSM dual band handset applications where both low loss, low current and small size are critical parameters.

MLF-16 (4 x 4 mm)



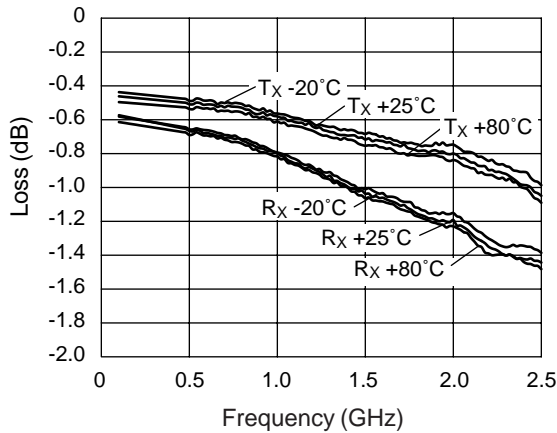
Electrical Specifications at 25°C (0, +3 V)

| Parameter | Frequency | Min. | Typ. | Max. | Unit | |
|----------------|---------------------|-------------|--------|------|------|----|
| Insertion Loss | T _X -Ant | 0.1–0.5 GHz | | 0.55 | 0.75 | dB |
| | | 0.5–1.0 GHz | | 0.55 | 0.75 | dB |
| | | 1.0–2.0 GHz | | 0.80 | 1.00 | dB |
| | | 2.0–2.5 GHz | | 1.00 | 1.20 | dB |
| | R _X -Ant | 0.1–0.5 GHz | | 0.75 | 0.95 | dB |
| | | 0.5–1.0 GHz | | 0.80 | 1.00 | dB |
| | | 1.0–2.0 GHz | | 1.20 | 1.40 | dB |
| | | 2.0–2.5 GHz | | 1.40 | 1.60 | dB |
| Isolation | T _X -Ant | 0.1–0.5 GHz | 20 | 22 | | dB |
| | | 0.5–1.0 GHz | 17 | 20 | | dB |
| | | 1.0–2.0 GHz | 14 | 16 | | dB |
| | | 2.0–2.5 GHz | 13 | 14.5 | | dB |
| | R _X -Ant | 0.1–0.5 GHz | 24 | 26 | | dB |
| | | 0.5–1.0 GHz | 23 | 25 | | dB |
| | | 1.0–2.0 GHz | 21 | 23 | | dB |
| | | 2.0–2.5 GHz | 21 | 23 | | dB |
| VSWR | 0.1–1.0 GHz | | 1.4:1 | | | |
| | 1.0–2.0 GHz | | 1.5:1 | | | |
| | 2.0–2.5 GHz | | 1.55:1 | | | |

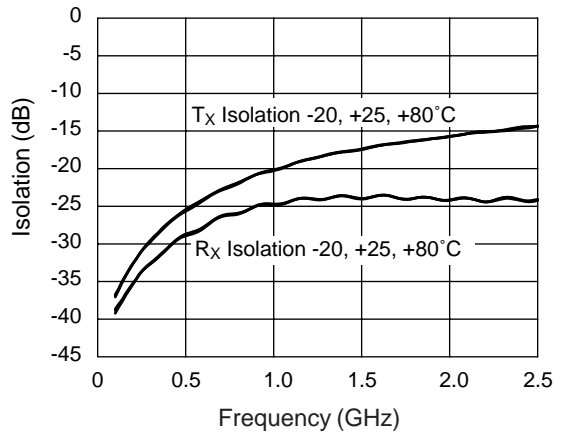
Operating Characteristics at 25°C (0, +3 V)

| Parameter | Condition | Frequency | Min. | Typ. | Max. | Unit |
|---------------------------|--|-----------|------|------|------|------|
| Switching Characteristics | Rise, Fall (10/90% or 90/10% RF) | | | 50 | | ns |
| | On, Off (50% CTL to 90/10% RF) | | | 100 | | ns |
| | Video Feedthru | | | 50 | | mV |
| IP3 | 13 dBm/Tone | | | +55 | | dBm |
| 2nd Harmonic | 34 dBm Input 900 MHz | | 65 | 70 | | dBc |
| 3rd Harmonic | 34 dBm Input 900 MHz | | 55 | 65 | | dBc |
| Control Voltages | V _{Low} = 0 V _{High} = 2.7 to 5 V @ 100 μA Max. | | | | | |

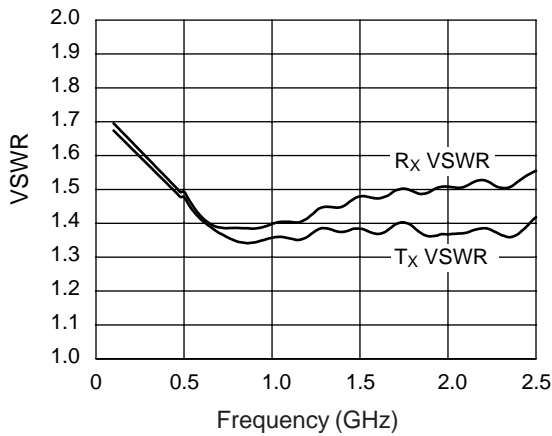
Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency

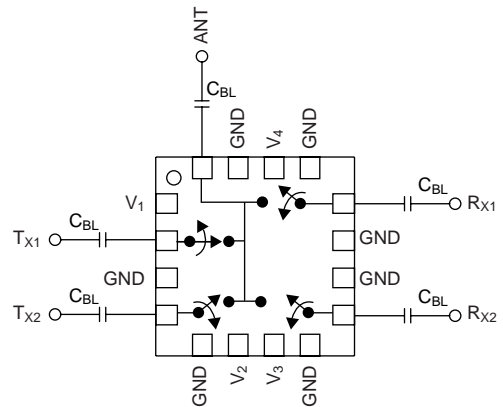


VSWR vs. Frequency

Absolute Maximum Ratings

| Characteristic | Value |
|-----------------------|---------------------------------|
| RF Input Power | 4 W > 0.5 GHz 0/+6 V Control |
| Control Voltage | +6 V |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |
| θ_{JC} | 25°C/W |

Pin Out



DC blocking capacitors (CBL) must be supplied externally.
 $C_{BL} = 47 \text{ pF}$ for operating frequencies >500 MHz.

Truth Table

| V ₁ | V ₂ | V ₃ | V ₄ | Ant-TX1 | Ant-TX2 | Ant-RX2 | Ant-RX1 |
|-------------------|-------------------|-------------------|-------------------|-----------|-----------|-----------|-----------|
| V _{High} | V _{Low} | V _{Low} | V _{Low} | Ins. Loss | Isolation | Isolation | Isolation |
| V _{Low} | V _{High} | V _{Low} | V _{Low} | Isolation | Ins. Loss | Isolation | Isolation |
| V _{Low} | V _{Low} | V _{High} | V _{Low} | Isolation | Isolation | Ins. Loss | Isolation |
| V _{Low} | V _{Low} | V _{Low} | V _{High} | Isolation | Isolation | Isolation | Ins. Loss |

V_{Low} = 0 V.
 V_{High} = 2.7 to 5 V.