# GaAs SP4T Terminated Switch
# DC - 2 GHz

## SW-419

### Features

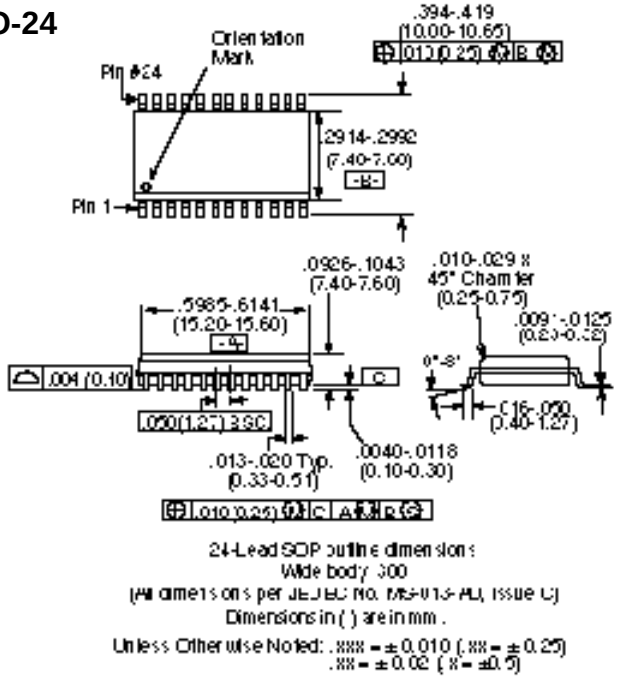
- Very Low Power Consumption: 100 µW
- Low Insertion Loss: 1 dB
- High Isolation: 25 dB up to 2 GHz
- Very High Intercept Point: 46 dBm $IP_3$
- Nanosecond Switching Speed
- Temperature Range: -40°C to +85°C
- Low Cost SOIC24 Plastic Package
- Tape and Reel Packaging Available[1]

### Description

M/A-COM's SW-419 is a GaAs MMIC SP4T terminated switch in a low cost SOIC 24-lead wide body surface mount plastic package. The SW-419 is ideally suited for use where very low power consumption is required. Typical applications include switch matrices, and filter banks in systems such as: radio and cellular equipment, PCM, GPS, fiber optic modules, and other battery powered radio equipment.

The SW-419 is fabricated with a monolithic GaAs MMIC using a mature 1-micron process. The process features full chip passivation for increased performance and reliability.

### SO-24




24-Lead SOP outline dimensions
Wide body .300
(All dimensions per JEDEC NO. MS-013-AD, Issue C)
Dimensions in ( ) are in mm.
Unless Otherwise Noted: .xxx = ±0.010 (.xx = ±0.25)
.xx = ±0.02 (.x = ±0.5)

### Ordering Information

| Part No. | Package |
|---|---|
| SW-419 PIN | SOIC 24-Lead Plastic Package |
| SW-419 TR | Forward Tape & Reel |
| SW-419 RTR | Reverse Tape & Reel |

### Electrical Specifications, $T_A$ = +25°C

| Parameter | Test Conditions[2] | | Unit | Min. | Typ. | Max |
|---|---|---|---|---|---|---|
| Insertion Loss | | DC – 0.1 GHz | dB | | 0.8 | 1.0 |
| | | DC – 0.5 GHz | dB | | 0.8 | 1.1 |
| | | DC – 1.0 GHz | dB | | 0.9 | 1.2 |
| | | DC – 2.0 GHz | dB | | 1.2 | 1.4 |
| Isolation | | DC – 0.1 GHz | dB | 54 | 60 | |
| | | DC – 0.5 GHz | dB | 46 | 51 | |
| | | DC – 1.0 GHz | dB | 36 | 39 | |
| | | DC – 2.0 GHz | dB | 20 | 24 | |
| VSWR | On | | | | 1.3:1 | |
| | Off | | | | 1.3:1 | |
| Trise, Tfall | 10% to 90% RF, 90% to 10% RF | | nS | | 8 | |
| Ton, Toff | 50% Control to 90% RF, 50% Control to 10% RF | | nS | | 16 | |
| Transients | In Band | | mV | | 15 | |
| One dB Compression | Input Power | 0.05 GHz | dBm | | 21 | |
| | Input Power | 0.5 – 2.0 GHz | dBm | | 27 | |
| $IP_2$ | Measured Relative to Input Power (for two-tone input power up to +5 dBm) | 0.05 GHz | dBm | | 45 | |
| | | 0.5 – 2.0 GHz | dBm | | 60 | |
| $IP_3$ | Measured Relative to Input Power (for two-tone input power up to +5 dBm) | 0.05 GHz | dBm | | 35 | |
| | | 0.5 – 2.0 GHz | dBm | | 46 | |

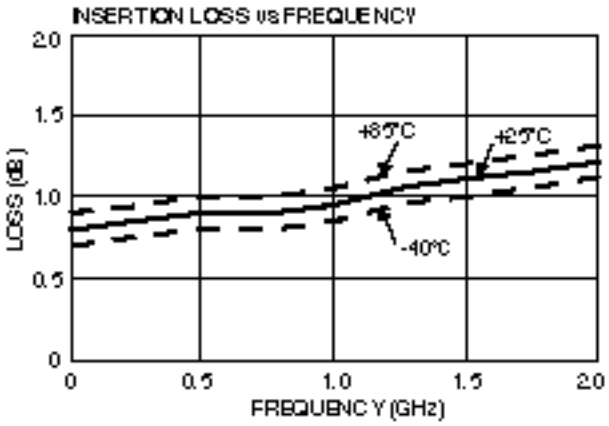
1. Refer to "Tape and Reel Packaging" Section, or contact factory.
2. All measurements with 0, -5 V control voltages at 1 GHz in a 50Ω system, unless otherwise specified.

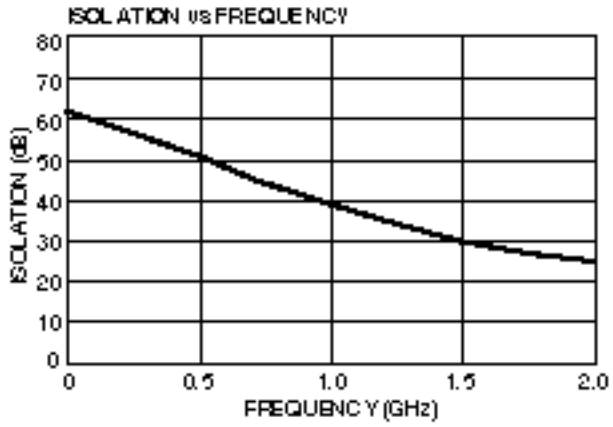
## Absolute Maximum Ratings[1]

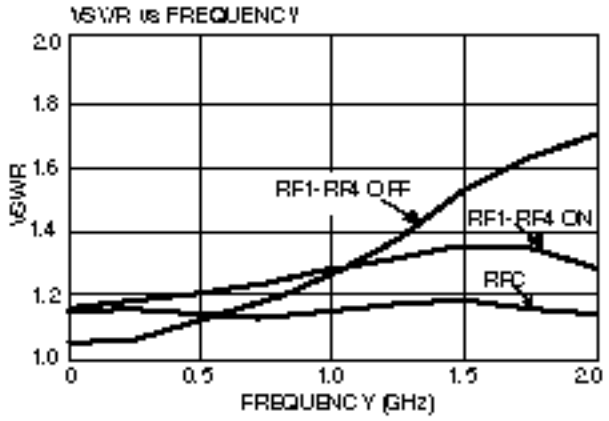
| Parameter | Absolute Maximum |
|---|---|
| Max. Input Power | |
| Below 500 MHz | +27 dBm |
| Above 500 MHz | +30 dBm |
| Control Voltage | +5 V, – 8.5 V |
| Storage Temperature | -65° to +150°C |

1.Operation of this device above any one of these parameters may cause permanent damage.

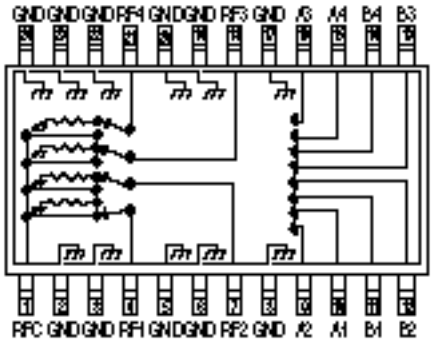
## Typical Performance




## Functional Schematic




## Pin Configuration

| Pin No. | Description | Pin No. | Description |
|---|---|---|---|
| 1 | RF Common | 13 | B3 |
| 2 | GND | 14 | B4 |
| 3 | GND | 15 | A4 |
| 4 | RF1 | 16 | A3 |
| 5 | GND | 17 | GND |
| 6 | GND | 18 | RF3 |
| 7 | RF2 | 19 | GND |
| 8 | GND | 20 | GND |
| 9 | A2 | 21 | RF4 |
| 10 | A1 | 22 | GND |
| 11 | B1 | 23 | GND |
| 12 | B2 | 24 | GND |

## Truth Table

| Control Input | | | | | | | | Condition Of Switch RF Common to Each RF Port | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | B1 | A2 | B2 | A3 | B3 | A4 | B4 | RF1 | RF2 | RF3 | RF4 |
| 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | On | Off | Off | Off |
| 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | Off | On | Off | Off |
| 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | Off | Off | On | Off |
| 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | Off | Off | Off | On |

"0" – 0 – -0.2 V @ 20 µA max
"1" – -5 V @ 20 µA Typ to -8 V @ 300 µA max.

## Electrical Schematic