# TPGF169S6

## GaAs DC-3 GHz SPDT Switch



## Features

- Isolation: 25 dB @ 2.5 GHz
- Low Insertion Loss: 0.4 dB @ 2.5 GHz
- ESD Protection Exceeds JESD 22-A114 -2000-V Human-Body Model
- Compact package: SOT23-6

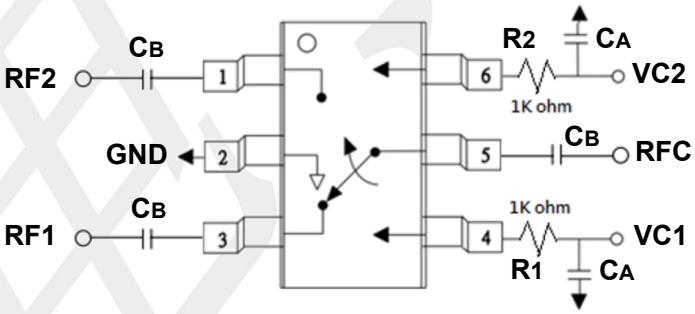
## Applications

- Industrial radio
- Smart Home
- Conventional medium power switch applications
- Applications with a transmitting and receiving system that require switching

## General Description

The is a GaAs SPDT switch operating at DC-3 GHz in a low cost SOT23-6 plastic lead (Pb) free package. The is features low insertion loss with very low DC power consumption. This switch can be used in many wireless digital communication systems like IEEE 802.11b/g WLAN and Bluetooth for transmit/receive selection or antenna diversity function.

## Pin out (top view)




DC blocking capacitors $C_B$ are required on all RF ports. $C_B$=56pF， $C_A$=1000pF for operating frequency > 500MHz.

## Logic Table for Switch On-Path

| VC1 | VC2 | RFC-RF1 | RFC-RF2 |
|---|---|---|---|
| 1 | 0 | Isolation | Insertion Loss |
| 0 | 1 | Insertion Loss | Isolation |

**‘1’ = +2.8V to +5V ； ‘0’ = -0.2V to +0.2V**

## Pin Configurations

| Pin | Name | Function |
|---|---|---|
| 1 | RF2 | RF output External connection of DC blocking capacitor is required during use |
| 2 | GND | Ground |
| 3 | RF1 | RF output External connection of DC blocking capacitor is required during use |
| 4 | VC1 | DC control voltage (ESD-HBM ±2000V) |
| 5 | RFC | RF output External connection of DC blocking capacitor is required during use |
| 6 | VC2 | DC control voltage (ESD-HBM ±2000V) |

## Absolute Maximum Ratings

| Parameter | Absolute Maximum |
|---|---|
| RF Input Power 0.5-2.5 GHz | +34 dBm |
| Control Voltage | +6V |
| Operating Temperatur | -40°C to +85°C |
| Storage Temperature | -65°C to +150°C |
| Human body model (HBM), VC1,VC2 | ±2000V |

**Note 1:** Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

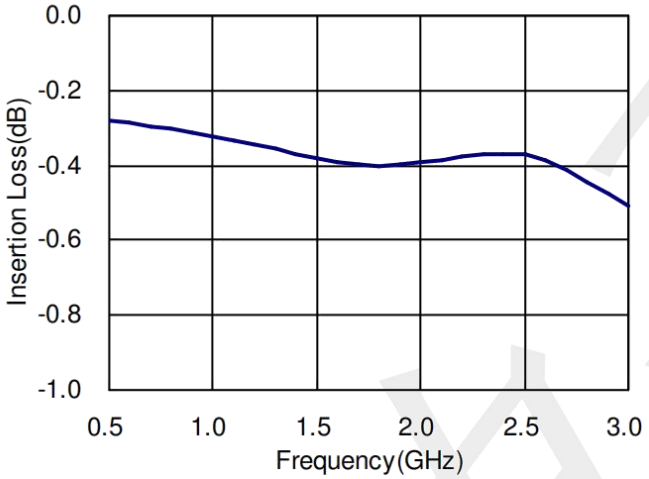
## Electrical Specifications (at 25°C with 0, +3V Control Voltages)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Insertion Loss | DC-2.5 GHz | -- | 0.4 | 0.6 | dB |
| | 2.5-3.0 GHz | -- | 0.5 | 0.7 | dB |
| Isolation | DC-2.5 GHz | 21 | 25 | -- | dB |
| | 2.5-3.0 GHz | 20 | 23 | -- | dB |
| Return Loss | DC-3.0 GHz | -- | 20 | -- | dB |
| Input Power for One dB Compression | 0.5-3.0 GHz @ 0/+3V | -- | 30 | -- | dBm |
| | 0.5-3.0 GHz @ 0/+5V | -- | 34 | -- | dBm |
| Switching Time | | -- | 50 | -- | ns |
| Control Current | | -- | 5 | 100 | uA |

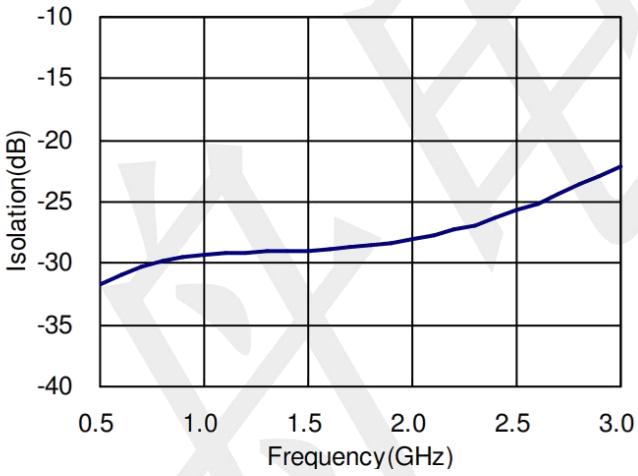
Note: All measurements made in a 50 ohm system with 0/+3V control voltages, unless otherwise specified.

## Typical Performance Data @ +25℃

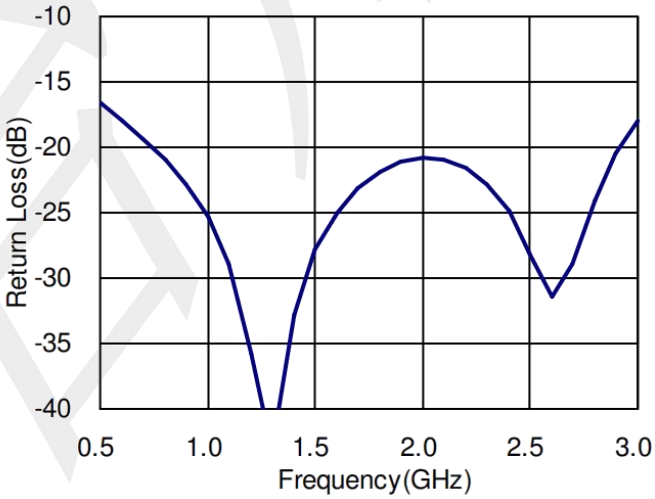
**Insertion Loss vs Frequency**



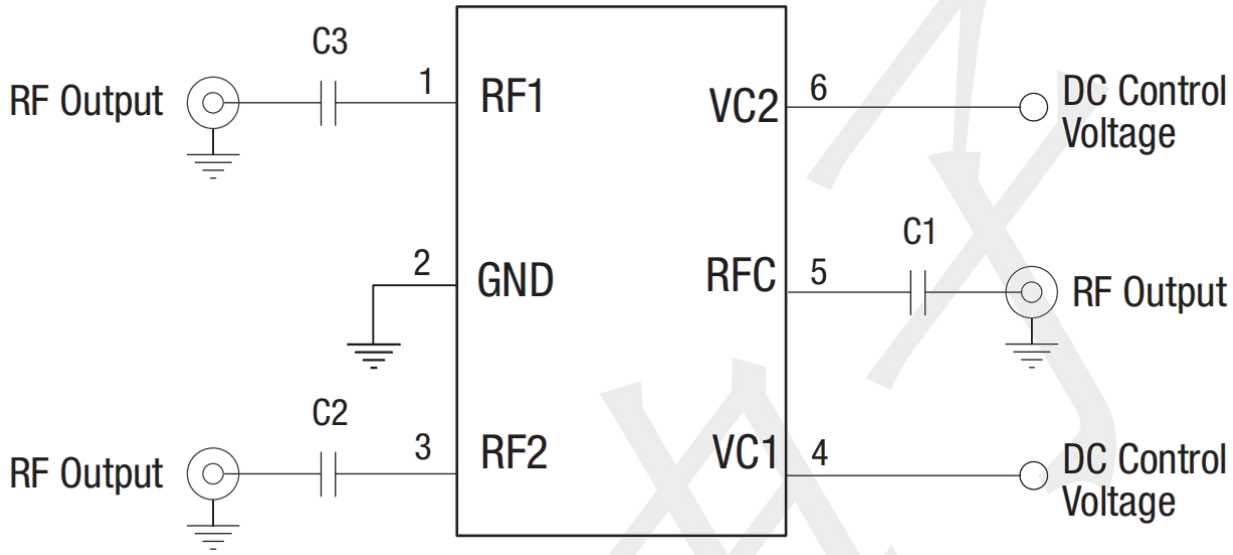

**Isolation vs Frequency**



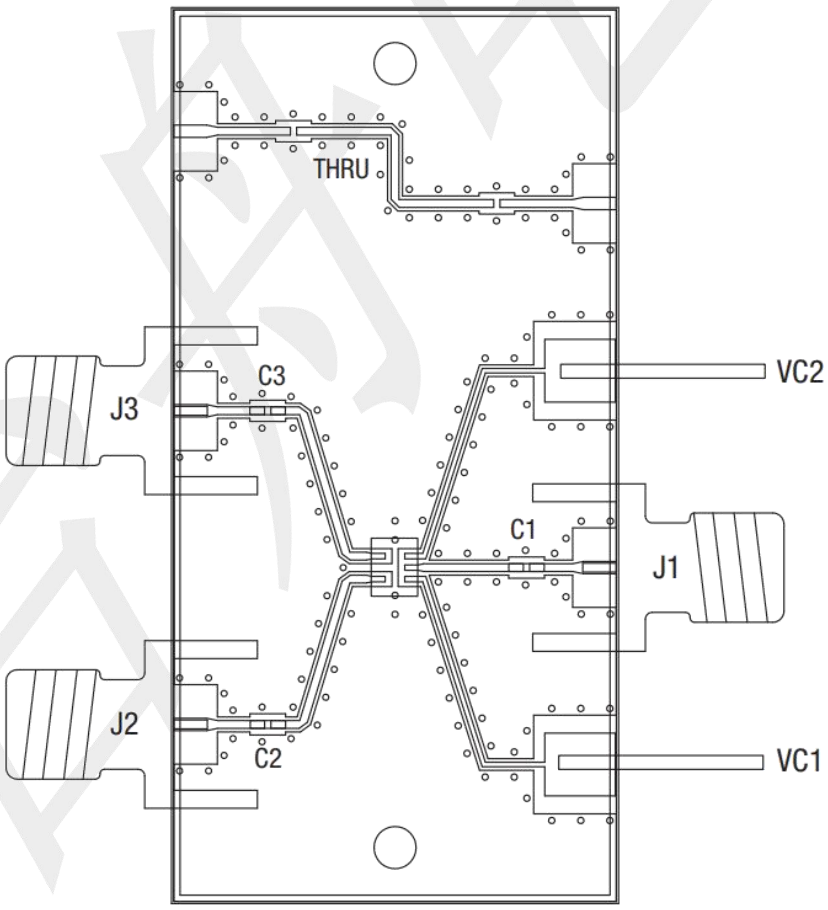

**Return Loss vs Frequency**



## Evaluation Board Schematic

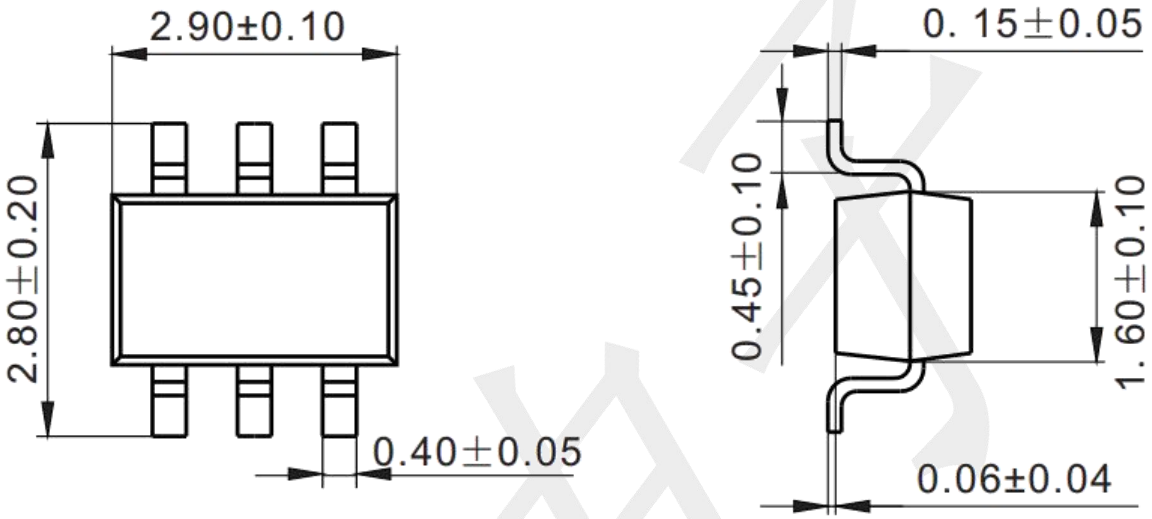


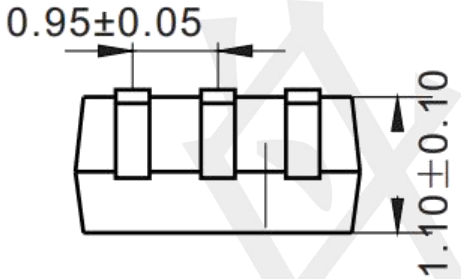

## Evaluation Board Assembly Diagram



## Package information (Unit: mm)

**SOT23-6**




## Mounting Pad Layout (unit: mm)

