

3 V GaAs SPDT Switch DC - 2.0 GHz

Rev. V7

Features

- Low Insertion Loss: <0.5 dB @ 900 MHz
- Low Power Consumption: <1.0 μ A @ 3 VDC
- Very High Intercept Point: 52 dBm IP3
- Both Positive and Negative 3 to 8 V Control
- Low Cost SOT-26 Package

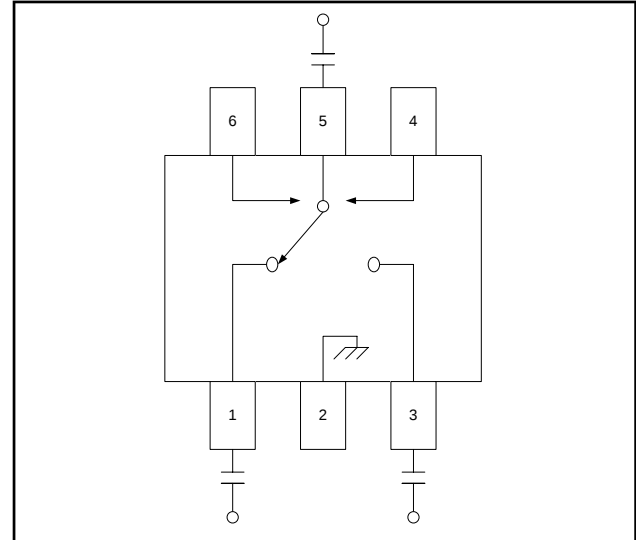
Description

The SW-395 is a GaAs single pole, double throw switch in a low cost SOT-26 surface mount plastic package. The SW-395 is ideally suited for applications where very low power consumption, low intermodulation products, very small size and low cost are required.

Typical application is an internal / external antenna select switch for portable telephones and data radios. In addition, because of its low loss, good isolation and inherent speed, the SW-395 can be used as a conventional T/R switch or as an antenna diversity switch. The SW-395 can be used in power applications up to 0.5 Watts in systems such as cellular, PCS, GSM and other analog / digital wireless communications systems.

The SW-395 is fabricated using a mature 0.5-micron gate length GaAs pHEMT process. The process features full chip passivation for increased performance and reliability.

Functional Schematic ²



2. DC blocking capacitors are not required if negative control voltage is used.

Pin Configuration

Pin No.	Function	Pin No.	Function
1	RF1	4	Control B
2	Ground	5	RF Common
3	RF2	6	Control A

Absolute Maximum Ratings ^{3,4}

Parameter	Absolute Maximum
Input Power	+33 dBm
Operating Voltage	+8.5 Volts
Storage Temperature	-65°C to +150°C
Operating Temperature	-40°C to +85°C

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. M/A-COM Technology does not recommend sustained operation near these survivability limits.

Ordering Information ¹

Part Number	Package
SW-395	Bulk Packaging
SW-395TR-3000	3000 piece reel

1. Reference Application Note M513 for reel size information.

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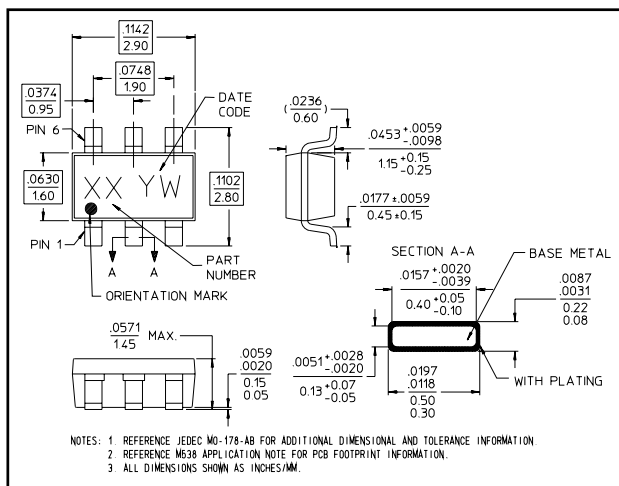
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Electrical Specifications: $T_A = +25^\circ\text{C}$, $V_C = 0\text{ V} / -3\text{ V}$, $Z_0 = 50\ \Omega$ ⁵

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	DC - 1.0 GHz 1.0 - 2.0 GHz	dB	— —	0.5 0.6	0.7 0.8
Isolation	DC - 1.0 GHz 1.0 - 2.0 GHz	dB	25 19	28 22	— —
VSWR	DC - 2.0 GHz	Ratio	—	1.3:1	—
1 dB Compression	0.5 GHz, Input Power (3 V Control) 0.5 GHz, Input Power (5 V Control) 0.05 GHz, Input Power (3 V Control) 0.05 GHz, Input Power (5 V Control)	dBm	— — — —	26 30 16 16	— — — —
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns	—	3	—
Ton, Toff	50% Control to 90% RF, 50% Control to 10% RF	ns	—	5	—
Transients	In-Band	mV	—	15	—
Input IP_2	2-Tone, 5 MHz spacing, 3 V Control, +10 dBm each 0.05 GHz 0.5 GHz	dBm	— —	69 80	— —
Input IP_3	2-Tone, 5 MHz spacing, 3 V Control, +10 dBm each 0.05 GHz 0.5 GHz	dBm	— —	48 52	— —
Control Current	$ V_C = 3\text{ V}$	mA	—	1	10

5. For positive voltage control, external DC blocking capacitors are required on all RF ports.

SOT-26[†]



[†] Meets JEDEC moisture sensitivity level 1 requirements.
Plating is 100% matte tin over copper.

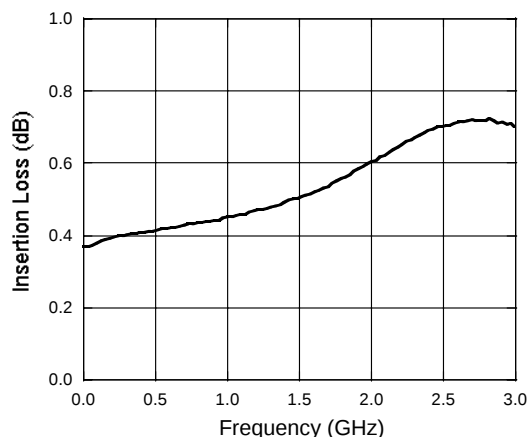
Truth Table ^{6,7,8}

Control A	Control B	RFC to RF1	RFC to RF2
0	1	Off	On
1	0	On	Off

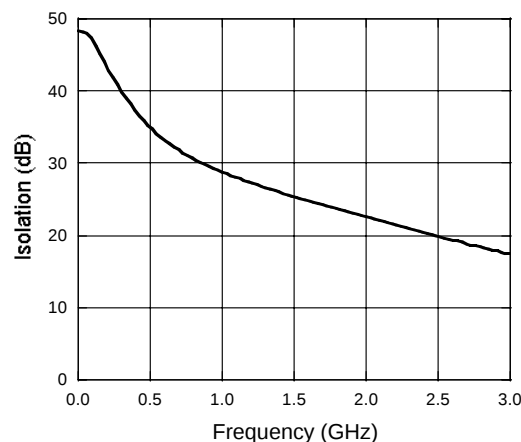
6. For positive voltage control, external DC blocking capacitors are required on all RF ports.
7. 0 = -8 V to 0 V, 1 = 0 V to +8 V.
8. Differential voltage, V (state 1) - V (state 0), must be +2.8 V minimum and must not exceed +8 V.

Typical Performance Curves

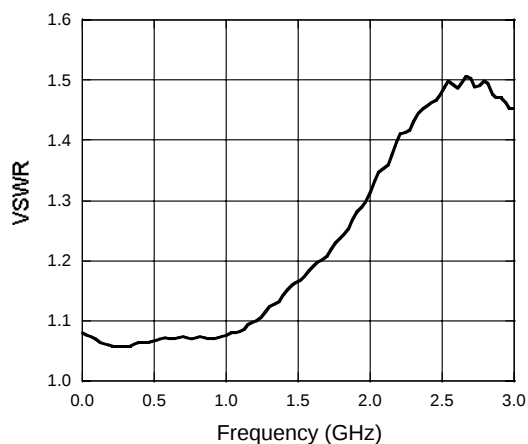
Insertion Loss



Isolation



VSWR



Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.