## Features

- Low Insertion Loss: $<0.5 \mathrm{~dB} @ 900 \mathrm{MHz}$
- Low Power Consumption: <10 $\mu \mathrm{A}$ @ 3 VDC
- Very High Intercept Point: 52 dBm IP3
- Both Positive and Negative 3 to 8 V Control
- Low Cost SOT-26 Package


## Description

M/A-COM's 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.

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.

Absolute Maximum Ratings ${ }^{2,3}$

| Parameter | Absolute Maximum |
| :---: | :---: |
| Input Power | +33 dBm |
| Operating Voltage | +8.5 Volts |
| Storage Temperature | $-65^{\circ} \mathrm{C}$ to $+150^{\circ} \mathrm{C}$ |
| Operating Temperature | $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |

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

## Functional Schematic ${ }^{4}$


4. 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 |

Truth Table ${ }^{5,6,7}$

| Control A | Control B | RFC to RF1 | RFC to RF2 |
| :---: | :---: | :---: | :---: |
| 0 | 1 | Off | On |
| 1 | 0 | On | Off |

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

Electronics

Electrical Specifications: $\mathrm{T}_{\mathrm{A}}=+25^{\circ} \mathrm{C}, \mathrm{V}_{\mathrm{C}}=0 \mathrm{~V} /-3 \mathrm{~V}, \mathrm{Z}_{0}=50 \Omega^{8}$

| Parameter | Test Conditions | Units | Min. | Typ. | Max. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Insertion Loss | $\begin{aligned} & \mathrm{DC}-1.0 \mathrm{GHz} \\ & 1.0-2.0 \mathrm{GHz} \end{aligned}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | 二 | $\begin{aligned} & 0.5 \\ & 0.6 \end{aligned}$ | $\begin{aligned} & 0.7 \\ & 0.8 \end{aligned}$ |
| Isolation | $\begin{aligned} & \mathrm{DC}-1.0 \mathrm{GHz} \\ & 1.0-2.0 \mathrm{GHz} \end{aligned}$ | $\begin{aligned} & \mathrm{dB} \\ & \mathrm{~dB} \end{aligned}$ | $\begin{aligned} & 25 \\ & 19 \end{aligned}$ | $\begin{aligned} & 28 \\ & 22 \end{aligned}$ | - |
| 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 <br> dBm <br> dBm <br> dBm | $\begin{aligned} & - \\ & - \\ & - \end{aligned}$ | $\begin{aligned} & 26 \\ & 30 \\ & 16 \\ & 16 \end{aligned}$ | 二 |
| Trise, Tfall | 10\% to 90\% RF, $90 \%$ to $10 \%$ RF | $\mu \mathrm{S}$ | - | 5 | - |
| Ton, Toff | 50\% Control to 90\% RF, 50\% Control to 10\% RF | $\mu \mathrm{S}$ | - | 3 | - |
| Transients | In-Band | mV | - | 15 | - |
| Input $\mathrm{PP}_{2}$ | 2-Tone, 5 MHz spacing, 3 V Control, +10 dBm each $\begin{gathered} 0.05 \mathrm{GHz} \\ 0.5 \mathrm{GHz} \end{gathered}$ | dBm dBm | - | $\begin{aligned} & 69 \\ & 80 \end{aligned}$ | - |
| Input $\mathrm{PP}_{3}$ | 2-Tone, 5 MHz spacing, 3 V Control, +10 dBm each 0.05 GHz 0.5 GHz | dBm dBm | - | $\begin{aligned} & 48 \\ & 52 \end{aligned}$ | - |
| Control Current | $\left\|\mathrm{V}_{\mathrm{c}}\right\|=3 \mathrm{~V}$ | $\mu \mathrm{A}$ | - | 1 | 10 |

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

SOT-26


NOTES: 1. REFERENCE JEDEC MO-178-AB FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.
2. REFERENCE M538 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.
3. ALL DIMENSIONS SHOWN AS INCHES/MM.

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- North America Tel: 800.366.2266 / Fax: 978.366.2266
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- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298

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## Typical Performance Curves



## Isolation



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