## Features

- Low Cost Plastic SOT-363 Package
- Low Insertion Loss $<0.3 \mathrm{~dB}$ @900 MHz
- Low Power Consumption <15 A @ $@+2.7 \mathrm{~V}$
- Positive or Negative 2.5 to 8 V Control


## Description

M/A-COM's SW-437 is a GaAs monolithic switch in a low cost SOT-363 surface mount plastic package. The SW-437 is ideally suited for applications where very low power consumption, low insertion loss, very small size and low cost are required. Typical application is in dual band systems where switching between small signal components is required such as filter banks, single band LNA's, converters etc. The SW-437 can be used in applications up to 0.25 Watts in systems such as cellular, PCS, DCS1800, GSM, CDMA, W-CDMA and other analog/digital wireless communications systems.

The SW-437 is fabricated using a mature 0.5 micron GaAs PHEMT process. The process features full passivation for increased performance and reliability.

Ordering Information

| Part Number | Package |
| :---: | :---: |
| SW-437 PIN | Bulk Packaging |
| SW-437TR-3000 | 3000 piece reel |
| SW-437SMB | Sample Test Board |

Note: Reference Application Note M513 for reel size information.

## Absolute Maximum Ratings ${ }^{1}$

| Parameter | Absolute Maximum |
| :---: | :---: |
| Input $(0.5-3.0 \mathrm{GHz})$ | +30 dBm |
| 3 V Control | +33 dBm |
| 5 V Control | +8.5 Volts |
| Operating Voltage | $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |
| Operating Temperature | $-65^{\circ} \mathrm{C}$ to $+150^{\circ} \mathrm{C}$ |
| Storage Temperature |  |

1. Exceeding any one or combination of these limits may cause permanent damage to this device.

## Functional Schematic Positive Control Voltage



Functional Schematic

## Negative Control Voltage



## Pin Configuration

| Pin No. | Function | Description |
| :---: | :---: | :---: |
| 1 | RF1 | RF in/out |
| 2 | GND | RF Ground |
| 3 | RF2 | RF in/out |
| 4 | V2 | V Control 2 |
| 5 | RFC | RF COMMON |
| 6 | V1 | V Control 1 |

Electronics

Electrical Specifications: $\mathrm{T}_{\mathrm{A}}=25^{\circ} \mathrm{C}, \mathrm{Z}_{0}=50 \Omega^{2}$

| Parameter | Test Conditions | Units | Min | Typ | Max |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Insertion Loss | $\begin{gathered} \mathrm{DC}-1 \mathrm{GHz} \\ 1-2 \mathrm{GHz} \\ 2-3 \mathrm{GHz} \end{gathered}$ | dB <br> dB <br> dB | - | $\begin{gathered} 0.3 \\ 0.4 \\ 0.55 \end{gathered}$ | $\begin{aligned} & 0.4 \\ & 0.5 \\ & 0.7 \end{aligned}$ |
| Isolation | $\begin{gathered} \mathrm{DC}-1 \mathrm{GHz} \\ 1-2 \mathrm{GHz} \\ 2-3 \mathrm{GHz} \end{gathered}$ | dB <br> dB <br> dB | $\begin{aligned} & 19 \\ & 13 \\ & 10 \end{aligned}$ | $\begin{aligned} & 21 \\ & 15 \\ & 12 \\ & \hline \end{aligned}$ | - |
| VSWR | DC-3 GHz | Ratio | - | 1.2:1 | 1.3:1 |
| $\mathrm{P}_{1 \mathrm{~dB}}$ (2.7V Supply) | $500 \mathrm{MHz}-3 \mathrm{GHz}$ | dBm | - | 24 | - |
| $\mathrm{P}_{1 \mathrm{~dB}}$ (5V Supply | $500 \mathrm{MHz}-3 \mathrm{GHz}$ | dBm | - | 27 | - |
| Input $\mathrm{IP}_{2}$ | 2-Tone 900 MHz , 5 MHz spacing (2.7V) | dBm | - | 81 | - |
| Input $\mathrm{IP}_{3}$ | 2-Tone $900 \mathrm{MHz}, 5 \mathrm{MHz}$ spacing (2.7V) | dBm | - | 55 | - |
| Trise, Tfall Ton, Toff Transients | 10\% to 90T RF, 90\% to $10 \%$ RF 50\% Control to 90\% RF, Control to 10\% RF In-Band | ns ns <br> mV | - | $\begin{aligned} & 10 \\ & 20 \\ & 10 \end{aligned}$ | - |
| Gate Leakage | $\mathrm{V}_{\text {CTRL }}=2.5 \mathrm{~V}$ | $\mu \mathrm{A}$ | - | 4 | 15 |

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

## SOT-363 Plastic Package



## Truth Table

| Mode <br> (Control) | V1 | V2 | RFC- <br> RF1 | RFC- <br> RF2 |
| :---: | :---: | :---: | :---: | :---: |
| Positive $^{3}$ | $0 \pm 0.2 \mathrm{~V}$ <br> +2.5 to +8 V | +2.5 to +8 V <br> $0 \pm 0.2 \mathrm{~V}$ | On <br> Off | Off <br> On |
| Negative $^{4}$ | $0 \pm 0.2 \mathrm{~V}$ <br> -2.5 to -8 V | -2.5 to -8 V <br> $0 \pm 0.2 \mathrm{~V}$ | Off <br> On | On <br> Off |

3. For positive voltage control, external DC blocking capacitors are required on all RF ports ( 39 pF capacitors are recommended).
4. If negative control is used, DC blocking capacitors are not required on RF ports. This switch is not meant to pass or switch a DC voltage.

## 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.

- North America Tel: 800.366.2266 / Fax: 978.366.2266
- Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macom.com for additional data sheets and product information.

## Typical Performance Curves

Isolation vs. Frequency over Temperature


Insertion Loss vs. Frequency over Temperature (Positive Control)


VSWR vs. Frequency


Insertion Loss vs. Frequency over Temperature (Negative Control)


- Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macom.com for additional data sheets and product information.

