## Features

- Isolation: 48 dB Typical at 1 GHz
- High Intercept Point Over Wide Bandwidth
- Trise, Tfall: 5 nS Typical
- DIP Package
- Integral TTL Driver (CMOS Compatible)
- 50 Ohm Nominal Impedance


## Description

M/A-COM's SW-137 is a GaAs MMIC SPDT reflective switch with an integral Silicon ASIC driver. This device is in a 14-lead DIP package. These switches offer high intercept points over a wide bandwidth of operation, while maintaining low DC power dissipation. These switches exhibit excellent performance and repeatability from 0.01 to 3.0 GHz . The SW-137 is ideally suited for RF/IF communications applications. Contact the factory for environmental screening.

## Ordering Information

| Part Number | Package |
| :---: | :---: |
| SW-137-PIN | DI-1 |

Note: Reference Application Note M513 for reel size information.
Note: Die quantity varies.

## Absolute Maximum Ratings ${ }^{2}$

| Parameter | Absolute Maximum |
| :---: | :---: |
| Max Input Power |  |
| 0.05 GHz |  |
| $0.5-3.0 \mathrm{GHz}$ | +27 dBm |
| +34 dBm |  |
| Supply Voltages |  |
| Vcc | -0.5 V to +16.5 V |
| Vee | -16.5 V to +0.5 V |
| Control Voltage | -0.5 V to $\mathrm{V}_{\mathrm{Cc}}$ to +0.5 V |
| Operating Temperature | $-55^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$ |
| Storage Temperature | $-65^{\circ} \mathrm{C}$ to $+150^{\circ} \mathrm{C}$ |

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

## Functional Block Diagram



## Truth Table

| Control Inputs | Condition of Switch <br> RF Common to each RF Port |  |
| :---: | :---: | :---: |
| C1 | RF1 | RF2 |
| Low | On | Off |
| High | Off | On |

## Current (mA)

|  | $\mathbf{\pm 9 V}$ | $\mathbf{\mathbf { 1 2 }} \mathbf{V}$ | $\mathbf{\pm 1 5} \mathrm{V}$ |
| :---: | :---: | :---: | :---: |
| Vcc | 8 | 11 | 15 |
| Vee | 4 | 7 | 9 |

[^0][^1] Visit wnw.macomtech.com for additional data sheets and product information.

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## Electrical Specifications: $\mathrm{T}_{\mathrm{A}}=-55^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}{ }^{1}$

| Parameter | Test Conditions | Frequency | Units | Min | Typ | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Reference Insertion Loss | - | $\begin{aligned} & 0.01-0.5 \mathrm{GHz} \\ & 0.01-1.0 \mathrm{GHz} \\ & 0.01-2.0 \mathrm{GHz} \\ & 0.01-3.0 \mathrm{GHz} \end{aligned}$ | dB <br> dB <br> dB <br> dB | - - - | - - - | $\begin{aligned} & 0.9 \\ & 1.0 \\ & 1.4 \\ & 1.6 \end{aligned}$ |
| Isolation | - | $\begin{aligned} & 0.01-0.5 \mathrm{GHz} \\ & 0.01-1.0 \mathrm{GHz} \\ & 0.01-2.0 \mathrm{GHz} \\ & 0.01-3.0 \mathrm{GHz} \end{aligned}$ | dB <br> dB <br> dB <br> dB | $\begin{aligned} & 48 \\ & 43 \\ & 37 \\ & 32 \end{aligned}$ | — — — | — — — |
| VSWR | - | $\begin{aligned} & 0.01-0.5 \mathrm{GHz} \\ & 0.01-1.0 \mathrm{GHz} \\ & 0.01-2.0 \mathrm{GHz} \\ & 0.01-3.0 \mathrm{GHz} \end{aligned}$ | Ratio <br> Ratio <br> Ratio <br> Ratio | - — — | - — — | $\begin{gathered} 1.25: 1 \\ 1.4: 1 \\ 1.7: 1 \\ 2.0: 1 \end{gathered}$ |
| Trise, Tfall Ton, Toff Transients | ```10% to 90% 1.3V Control to 90/10% RF In-band (peak-peak)``` | — | $\begin{aligned} & \mathrm{nS} \\ & \mathrm{nS} \\ & \mathrm{mV} \end{aligned}$ | — | $\begin{gathered} 5 \\ 22 \\ 45 \end{gathered}$ | — |
| 1 dB Compression |  | 0.01-3.0 GHz | dBm | - | +25 | - |
| Input $\mathrm{IP}_{3}$ | For two-tone Input power up to +5 dBm | 0.01 - 3.0 GHz | dBm | - | +46 | - |
| Input $\mathrm{IP}_{2}$ | For two-tone Input power up to +5 dBm | $0.01-3.0 \mathrm{GHz}$ | dBm | - | +76 | - |

1. All specifications apply when operated with bias voltages of +9 V to +15 V for Vcc and -9 to -15 V for Vee and 50 Ohm impedance at all RF ports unless otherwise specified.

Electrical Specifications: $\mathrm{T}_{\mathrm{A}}=\mathbf{2 5}^{\circ} \mathrm{C}$

| Parameter | Test Conditions | Frequency | Units | Min | Typ | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Vcc <br> Vee |  | — | $\begin{aligned} & \mathrm{V} \\ & \mathrm{~V} \end{aligned}$ | $\begin{array}{r} +9 \\ -15 \end{array}$ | $\begin{aligned} & +12 \\ & -12 \end{aligned}$ | $\begin{gathered} +15 \\ -9 \end{gathered}$ |
| Icc | $\mathrm{Vcc}=+9$ to +15 V | - | mA | - | - | 20.0 |
| lee | Vee $=-9$ to -15 V | - | mA | - | - | 15.0 |
| Vctl Vctl | Low <br> High | — | $\begin{aligned} & \mathrm{V} \\ & \mathrm{~V} \end{aligned}$ | $\begin{aligned} & 0.0 \\ & 2.0 \end{aligned}$ | — | $\begin{aligned} & 0.8 \\ & 5.0 \end{aligned}$ |
| Input Leakage Current (Low) | 0 to 0.8 V | - | $\mu \mathrm{A}$ | - | - | 1.0 |
| Input Leakage Current (High) | 2.0 to 5.0 V | - | $\mu \mathrm{A}$ | - | - | 1.0 |

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## Typical Performance Curves

Insertion Loss vs. Frequency


Isolation vs. Frequency


VSWR vs. Frequency


Functional Schematic (Top View)


ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

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[^0]:    * Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

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