

SPDT Switch with Integral CMOS Driver 800 - 2000 MHz

Features

- Low Cost Plastic SOIC-8 Package
- Integral TTL / CMOS Compatible Driver
- Matched Input and Output
- Low Distortion: > 40 dBm IP₃ @ 900 MHz and > 62 dBm IP₂ @ 900 MHz
- Low DC Current: < 1.5 mA Typical Per Supply

Description

M/A-COM's SW-335 is a terminated GaAs MMIC SPDT with an on-chip TTL / CMOS driver in a low-cost, SOIC 8-lead plastic package. The SW-335 is ideally suited for use in applications where low power consumption and small size are required.

Typical applications include switch matrices, filter banks, and general switching applications, in systems such as cellular, PCN / PCS, GPS and 900 MHz ISM band applications.

The SW-335 is fabricated using a monolithic GaAs MMIC using a mature 1 micron process. The process features full passivation for increased performance and reliability.

Ordering Information¹

Part Number	Package
SW-335-PIN	SOIC-8 Lead Package
SW-335TR	Forward Tape and Reel
SW-335SMB	Sample Test Board

1. Reference Application Note M513 for reel size information.

2. All sample boards include 5 loose parts.

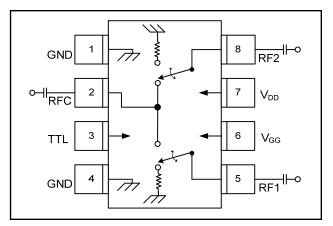
Truth Table^{3,4,5,6}

Control Inputs				
TTL/CMOS	IOS RFC-RF1 RFC-RF2			
1	Off	On		
0	On	Off		

3. Logic 0 = 0 to 1 V

1

Functional Schematic



Pin Configuration

Pin No.	Function	Description		
1	GND	RF Ground		
2	RFC	RF In/Out		
3	TTL	Transistor Logic		
4	GND	RF Ground		
5	RF1	RF In/Out		
6	V_{GG}	Gate Voltage		
7	V _{DD}	Drain Voltage		
8	RF2	RF In/Out		

Absolute Maximum Ratings 7,8

Parameter	Absolute Maximum
RF Input Power	+31 dBm
$\begin{array}{c} \text{Max. Control Voltages} \\ V_{\text{DD}} \\ V_{\text{GG}} \\ V_{\text{CTL}} \text{Maximum} \\ V_{\text{CTL}} \text{Minimum} \end{array}$	+6 VDC -6 VDC +6 VDC -1 VDC
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

 M/A-COM does not recommend sustained operation near these survivability limits.

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. PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed. • 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.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

Rev. V5

^{4.} Logic 1 = 3.5 to 5 V, 10 μ A typical.

^{5.} V_{DD} = 5 <u>+</u> 0.5 V @ <1.5 mA typical.

^{6.} $V_{GG} = -5 \pm 0.25 \text{ V} @ < 1.5 \text{ mÅ}$



SPDT Switch with Integral CMOS Driver 800 - 2000 MHz

Rev. V5

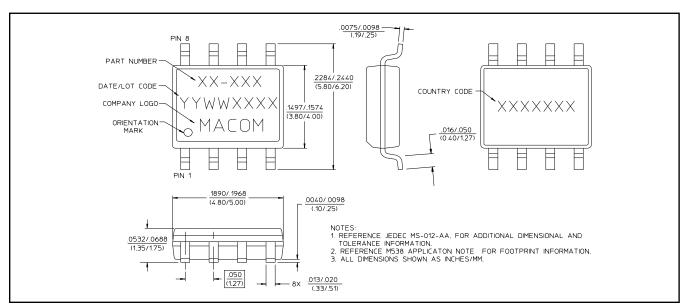
Electrical Specifications ^{9,10}: $T_A = +25^{\circ}C$, $V_{DD} = 5.0 V$, $V_{GG} = -5.0 V$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss	800-2000 MHz	dB	_	0.9	1.1
Isolation	800-1000 MHz 1000-1500 MHz 1500-2000 MHz	dB dB dB	35 35 30	45 38 32	
VSWR	800-1000 MHz 1000-2000 MHz		-	1.2:1 1.2:1	1.3:1 1.3:1
1 dB Compression	900 MHz	dBm		29	_
T _{RISE} , T _{FALL} T _{ON} , T _{OFF} Transients	10% to 90% RF, 90% to 10% RF 50% Control to 90% RF, Control to 10% RF In-Band	ns ns mV		75 200 20	
Input IP ₂	2-tone, 10 dBm (13 dBm total) 900 MHz	dBm	40	45	
Input IP ₃	2-tone, 10 dBm (13 dBm total) 900 MHz	dBm	62	70	
Current	V _{DD} @ 5.0 V V _{GG} @ -5.0 V V _{CTL} @ 0 V V _{CTL} @ 5.0 V	mA mA μA μA		1.1 -0.8 -5 10	1.5 -1.5 -10 20

9. All measurements are in a 50 Ω system.

10. DC Blocks required on RF ports.

SOIC-8[†]



[†]Meets JEDEC moisture sensitivity level 1 requirements.

2

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. **PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

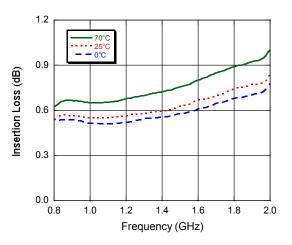
- North America Tel: 800.366.2266 / Fax: 978.366.2266
- Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298
 Visit www.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

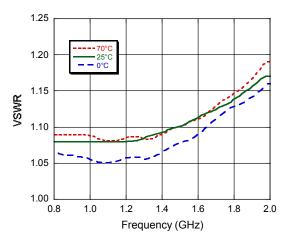
SPDT Switch with Integral CMOS Driver 800 - 2000 MHz

Typical Performance Curves

Insertion Loss



Output VSWR ("ON" State) vs. Frequency



Handling Procedures

Please observe the following precautions to avoid damage:

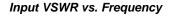
Static Sensitivity

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.

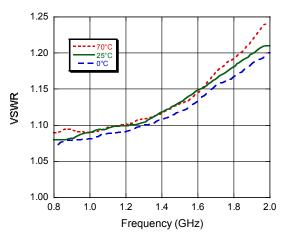
3

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. **PRELIMINARY:** Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

50 --+70°0 +25°C -- 0°C 45 Isolation (dB) 40 35 30 0.8 1.0 1.2 1.4 1.6 1.8 2.0 Frequency (GHz)



Isolation



• 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.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

