

SPDT Switch with Integral CMOS Driver 800 - 2000 MHz

Rev. V5

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

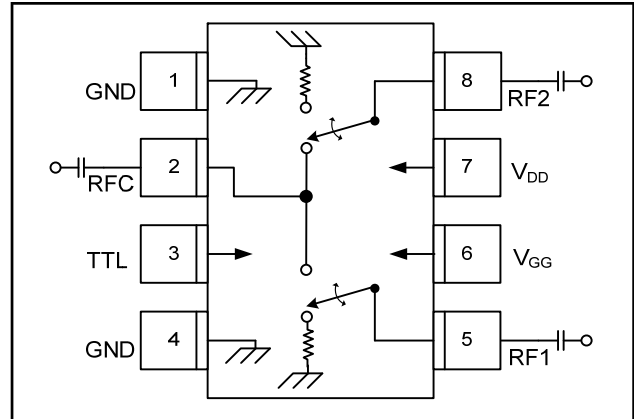
1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

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

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

3. Logic 0 = 0 to 1 V
4. Logic 1 = 3.5 to 5 V, 10 μ A typical.
5. V_{DD} = 5 \pm 0.5 V @ < 1.5 mA typical.
6. V_{GG} = -5 \pm 0.25 V @ < 1.5 mA

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
Max. Control Voltages	
V _{DD}	+6 VDC
V _{GG}	-6 VDC
V _{CTL} Maximum	+6 VDC
V _{CTL} Minimum	-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.
8. M/A-COM does not recommend sustained operation near these survivability limits.

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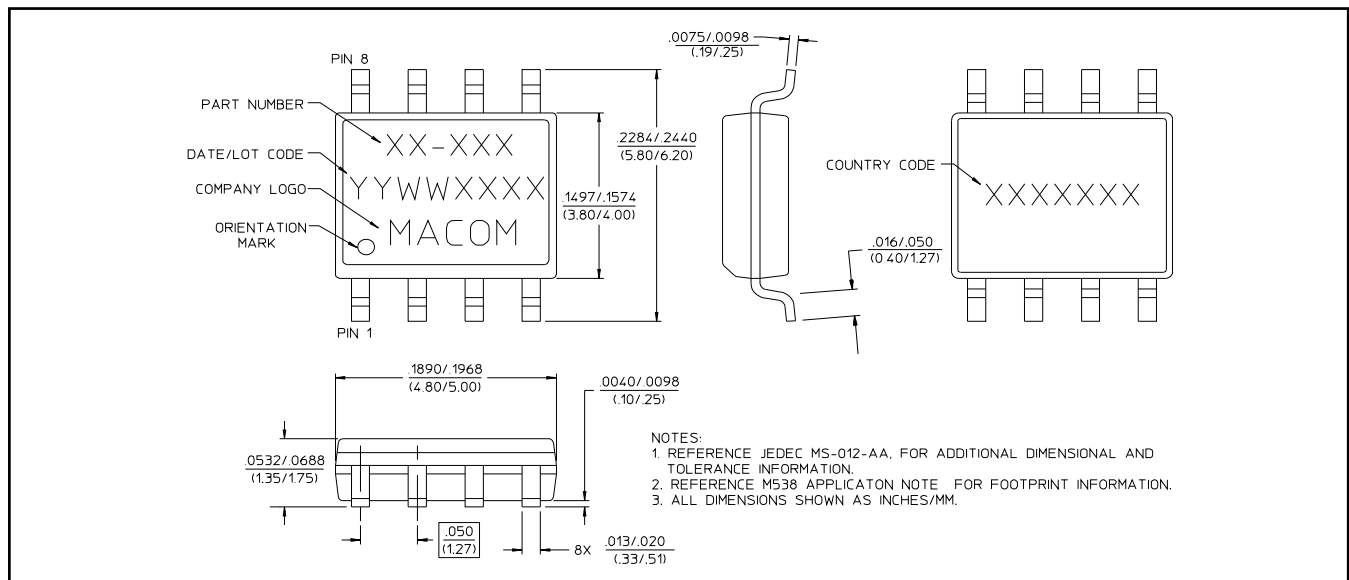
Electrical Specifications ^{9,10}: $T_A = +25^\circ\text{C}$, $V_{DD} = 5.0\text{ V}$, $V_{GG} = -5.0\text{ V}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	800-2000 MHz	dB	—	0.9	1.1
Isolation	800-1000 MHz	dB	35	45	—
	1000-1500 MHz	dB	35	38	—
	1500-2000 MHz	dB	30	32	—
VSWR	800-1000 MHz	Ratio Ratio	—	1.2:1	1.3:1
	1000-2000 MHz		—	1.2:1	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	—	75	—
		ns	—	200	—
		mV	—	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	$V_{DD} @ 5.0\text{ V}$	mA	—	1.1	1.5
	$V_{GG} @ -5.0\text{ V}$	mA	—	-0.8	-1.5
	$V_{CTL} @ 0\text{ V}$	μA	—	-5	-10
	$V_{CTL} @ 5.0\text{ V}$	μA	—	10	20

9. All measurements are in a 50 Ω system.

10. DC Blocks required on RF ports.

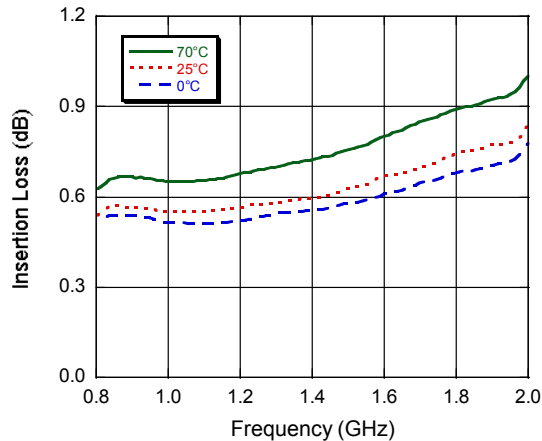
SOIC-8[†]



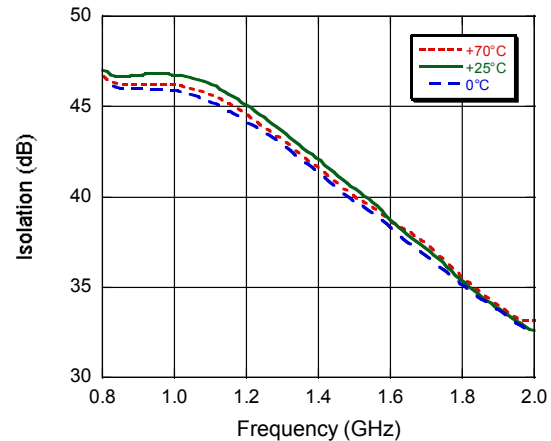
[†]Meets JEDEC moisture sensitivity level 1 requirements.

Typical Performance Curves

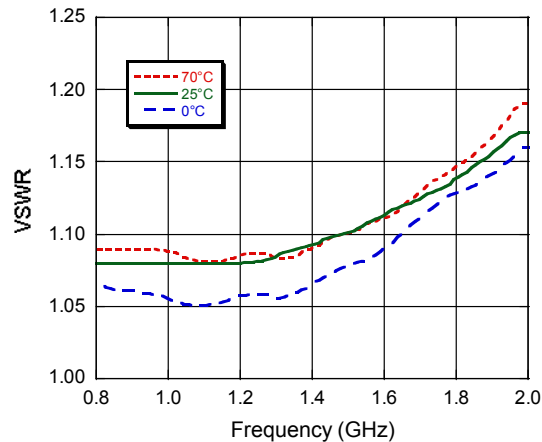
Insertion Loss



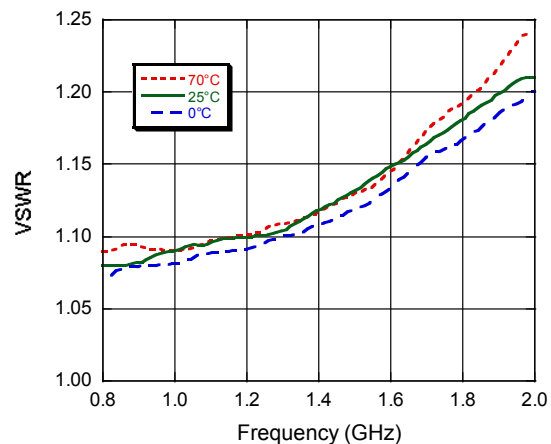
Isolation



Output VSWR ("ON" State) vs. Frequency



Input VSWR 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.