

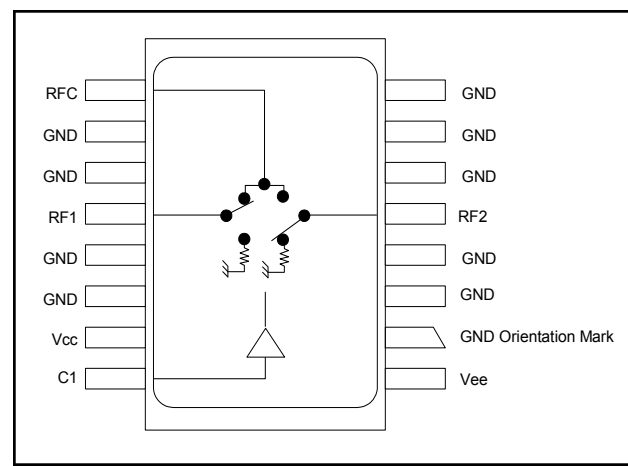
Features

- Integral TTL Driver
- Low DC Power Consumption
- Surface Mount Package
- Low Cost/High Performance
- 50 Ohm Nominal Impedance
- Lead-Free CR-9 Package
- 260°C Reflow Compatible
- RoHS* Compliant

Description

M/A-COM's SW10-0313 is a GaAs FET SPDT absorptive switch with integral silicon ASIC driver. Packaged in a 16-lead ceramic surface mount package, this device offers excellent performance and repeatability from DC to 3 GHz while maintaining low power consumption. The SW10-0313 is ideally suited for use where fast speed, low power consumption and broadband applications are required.

Functional Block Diagram



Ordering Information

Part Number	Package
SW10-0313	Bulk Packaging
SW10-0313-TB	Sample Test Board

Note: Reference Application Note M513 for reel size information.

Pin Configuration

Pin No.	Function	Pin No.	Function
1	Vee	9	RFC
2	GND	10	GND
3	GND	11	GND
4	GND	12	RF1
5	RF2	13	GND
6	GND	14	GND
7	GND	15	Vcc
8	GND	16	C1

The metal bottom of the case must be connected to RF and DC ground.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

Matched GaAs SPDT Switch, DC-3.0 GHz with TTL/CMOS Control Input

Rev. V6

Electrical Specifications: $T_A = +25^{\circ}\text{C}^{1,2}$

Parameter	Test Conditions	Frequency	Units	Min	Typ	Max
Insertion Loss	—	DC - 3000 MHz	dB	—	0.8	1.2
		DC - 2000 MHz	dB	—	0.7	1.1
		DC - 1000 MHz	dB	—	0.7	0.9
		DC - 500 MHz	dB	—	0.6	0.8
VSWR	—	DC - 3000 MHz	Ratio	—	1.2:1	1.4:1
		DC - 2000 MHz	Ratio	—	1.2:1	1.35:1
		DC - 1000 MHz	Ratio	—	1.2:1	1.35:1
		DC - 500 MHz	Ratio	—	1.1:1	1.3:1
Isolation	—	DC - 3000 MHz	dB	35	40	—
		DC - 2000 MHz	dB	45	50	—
		DC - 1000 MHz	dB	45	50	—
		DC - 500 MHz	dB	50	55	—
Trise, Tfall	10% to 90%	—	ns	—	50	—
Ton, Toff	1.3V CTL to 90% / 10%	—	ns	—	150	—
Transients	In-Band	—	mV	—	50	—
1 dB Compression	Input Power	0.05 GHz	dBm	—	+25	—
		0.5 GHz to 3 GHz	dBm	—	+30	—
IP2	Two-Tone Input Power up to +5 dBm	0.05 GHz	dBm	—	+60	—
		0.5 GHz to 3 GHz	dBm	—	+65	—
IP3	Two-Tone Input Power up to +5 dBm	0.05 GHz	dBm	—	+40	—
		0.5 GHz to 3 GHz	dBm	—	+46	—
Vin Low	0V to 0.8V	—	μA	—	—	1
Vin High	2.0V to 5.0V	—	μA	—	—	1
Vcc	+5.0V $\pm$ 10%	—	mA	—	—	1
Vee	-5.0V to -8.0V	—	mA	—	—	1

1. All specifications apply when operated with bias voltages of +5V for Vcc and -5V for Vee.
2. When DC blocks are used, a 10K ohm return to GND is required on the RFC port.

Absolute Maximum Ratings^{3,4}

Parameter	Absolute Maximum
Max Input Power 50 MHz 500 - 3000 MHz	+27 dBm +34 dBm
V _{CC}	-0.5V $\leq$ V _{CC} $\leq$ +7.0V
V _{EE}	-8.5V $\leq$ V _{EE} $\leq$ +0.5V
V _{CC} - V _{EE}	-0.5V $\leq$ V _{CC} - V _{EE} $\leq$ 14.5V
Vin ⁵	-0.5V $\leq$ Vin $\leq$ V _{CC} + 0.5V
Operating Temperature	-40°C to +125°C
Storage Temperature	-65°C to +150°C

3. Exceeding any one or combination of these limits may cause permanent damage to this device.
4. M/A-COM does not recommend sustained operation near these survivability limits.
5. Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

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 • **Europe** Tel: +353.21.244.6400
 • **India** Tel: +91.80.4155721 • **China** Tel: +86.21.2407.1588
 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.

Matched GaAs SPDT Switch, DC-3.0 GHz with TTL/CMOS Control Input

Rev. V6

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.

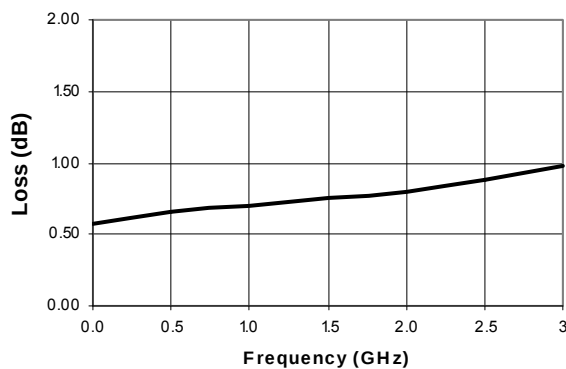
Truth Table (Switch)

C1	Condition of Switch	
	RF Common to Each RF Port	
	RF1	RF2
0	On	Off
1	Off	On

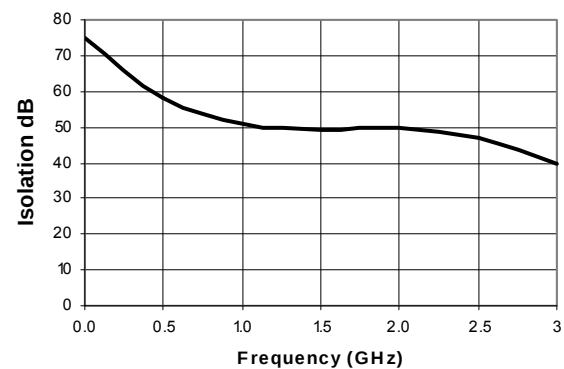
0 = TTL Low; 1 = TTL High

Typical Performance Curves

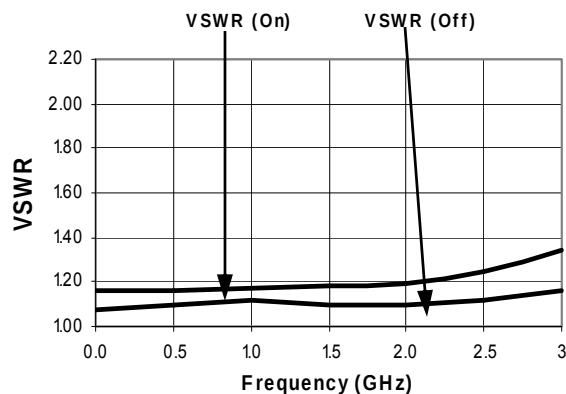
Insertion Loss vs. Frequency



Isolation vs. Frequency



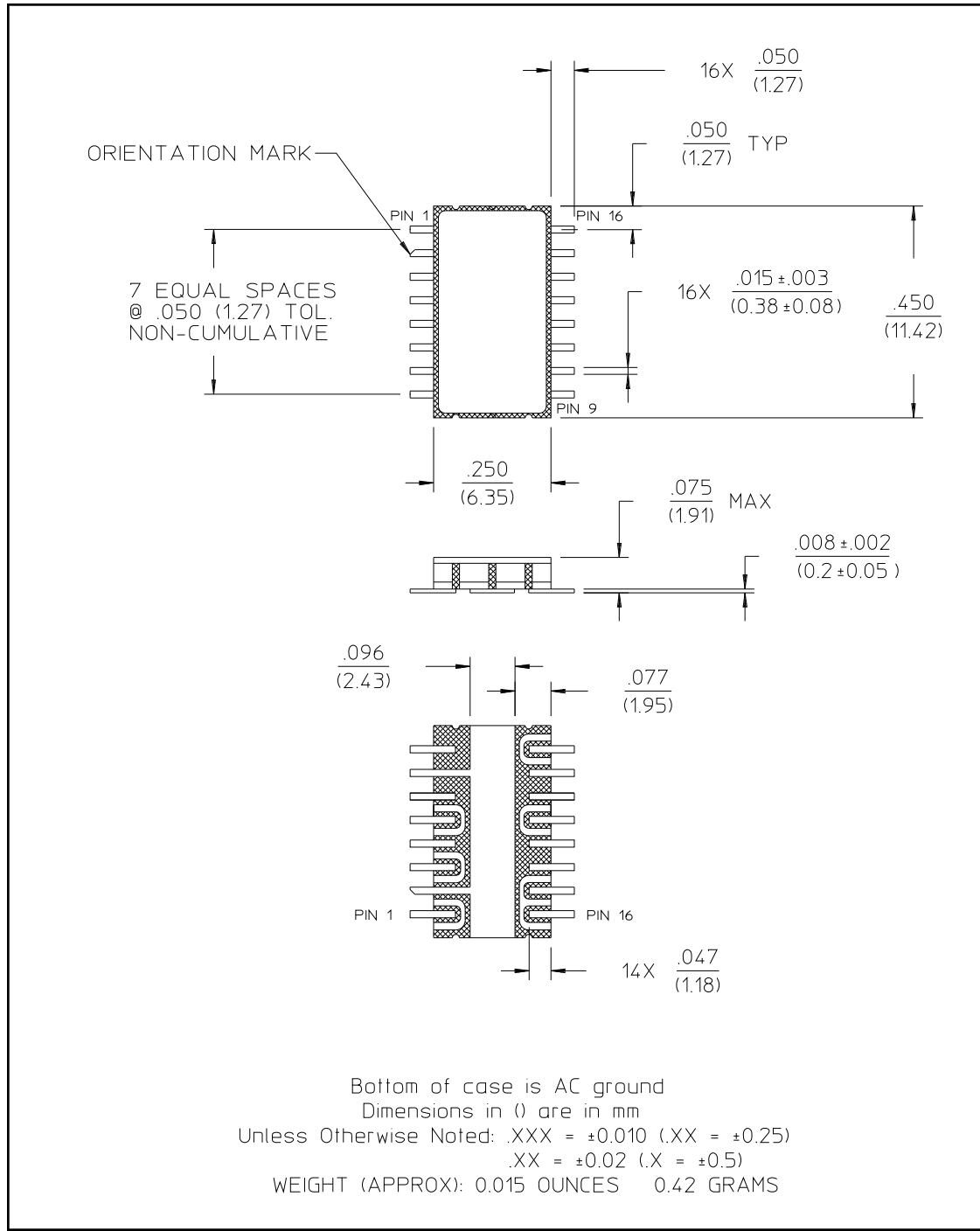
VSWR vs. Frequency



Matched GaAs SPDT Switch, DC-3.0 GHz with TTL/CMOS Control Input

Rev. V6

Lead-Free, CR-9 Ceramic Package[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.