Single-Pole Double-Throw Switch 2.0-20.0 GHz

Preliminary Information

MASWGM0002-DIE

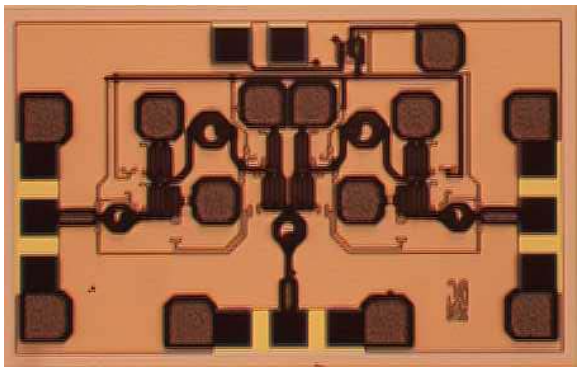
Features

- 2.0-20.0 GHz Operation
- 3 dB Insertion Loss
- TTL Control Inputs
- Excellent Match on Off Port
- Self-Aligned Gate (MSAG®) MESFET Process.

Primary Applications

- Test Equipment and Instrumentation
- Electronic Warfare
- Weather and Military Radar
- Point to Point Communications
- VSAT

2.0-20.0 GHz GaAs MMIC Switch



Description

The MASWGM0002-Die is a single pole double throw switch that is fully matched to 50 ohms on both the input and output.

Each device is 100% RF tested on wafer to ensure performance compliance. The part is fabricated using M/A-COM's repeatable, high performance and highly reliable GaAs Multifunction Self-Aligned Gate (MSAG®) MESFET Process.

Electrical Characteristics: T_B = 40°C[1], Z_0 = 50Ω, V_{EE} = -5V

Parameter	Symbol	Typical	Units
Bandwidth	f	2.0-20.0	GHz
Insertion Loss @ 10 GHz	IL	3	dB
Insertion Loss @ 20 GHz	IL	4.3	dB
Isolation @ 10 GHz	ISO	50	dB
Isolation @ 20 GHz	ISO	35	dB
Input VSWR (On)	VSWR	1.4:1	
Output VSWR (On)	VSWR	1.4:1	
Output VSWR (Off)	VSWR	1.2:1	
Input Third Order Intercept	ITOI	29	dBm
Input 1-dB Compression Point	P1dB	26	dBm

1. T_B = MMIC Base Temperature

Maximum Operating Conditions [1]

Parameter	Symbol	Absolute Maximum	Units
Input Power	P_{IN}	31	dBm
Digital Driver Voltage	V_{EE}	-6.0	V
Junction Temperature	T_J	180	°C
Storage Temperature	T_{STG}	-55 to +150	°C

1. Operation outside of these ranges may reduce product reliability. Operation at other than the typical values may result in performance outside the guaranteed limits.

Recommended Operating Conditions

Characteristic	Symbol	Min	Typ	Max	Unit
Digital Driver Voltage	V_{EE}	-5.2	-5	-4.8	V
Digital Driver Current	I_{EE}	3	5	10	mA

Operating Instructions

This device is static and light sensitive. Digital circuitry operation can be impaired under high intensity light, e.g. microscope light. Please handle with care. To operate the device, follow these steps.

1. Power Up: Apply V_{EE} = -5 V.
2. Apply Logic Voltages to control Circuits as listed in Recommended Operating Conditions
3. Power Down: Set V_{EE} = 0

ATTENTION
Static-Sensitive Devices
Handling Precautions Required

Customer Service: Tel. (888)-563-3949

Email: macom_adbu_ics@tycoelectronics.com

- **North America:** Tel. (800) 366-2266
- **Asia/Pacific:** Tel.+81-44-844-8296, Fax +81-44-844-8298
- **Europe:** Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

tyco / Electronics MACOM

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

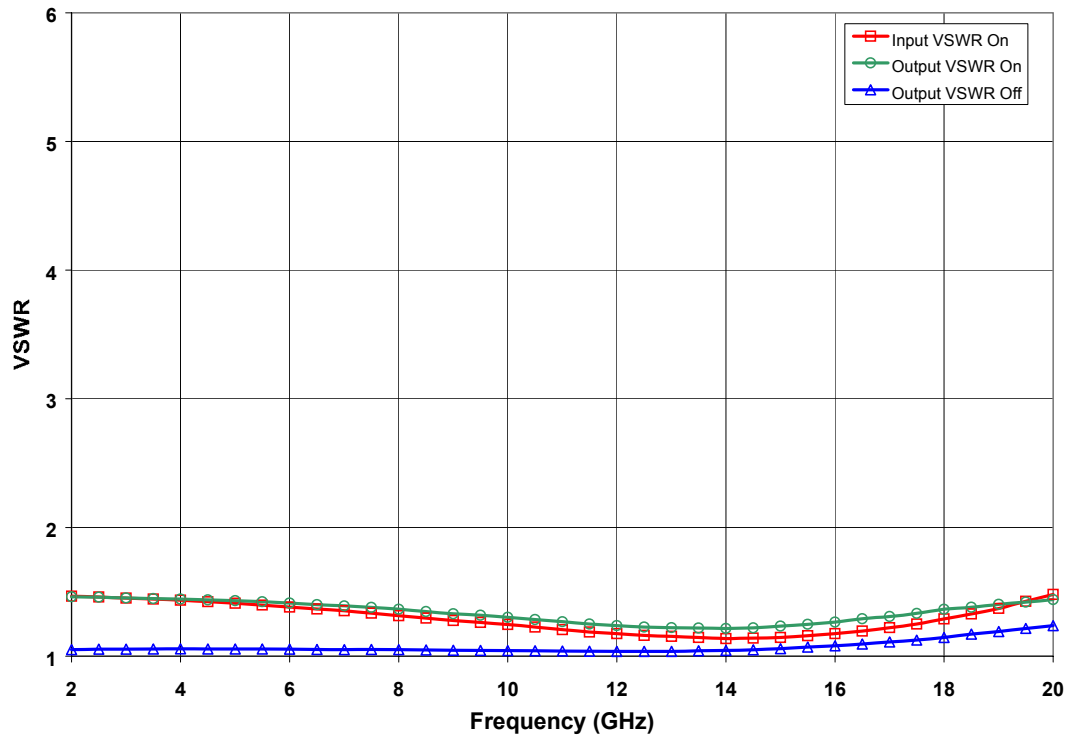


Figure 1. Input and Output VSWR vs. Frequency

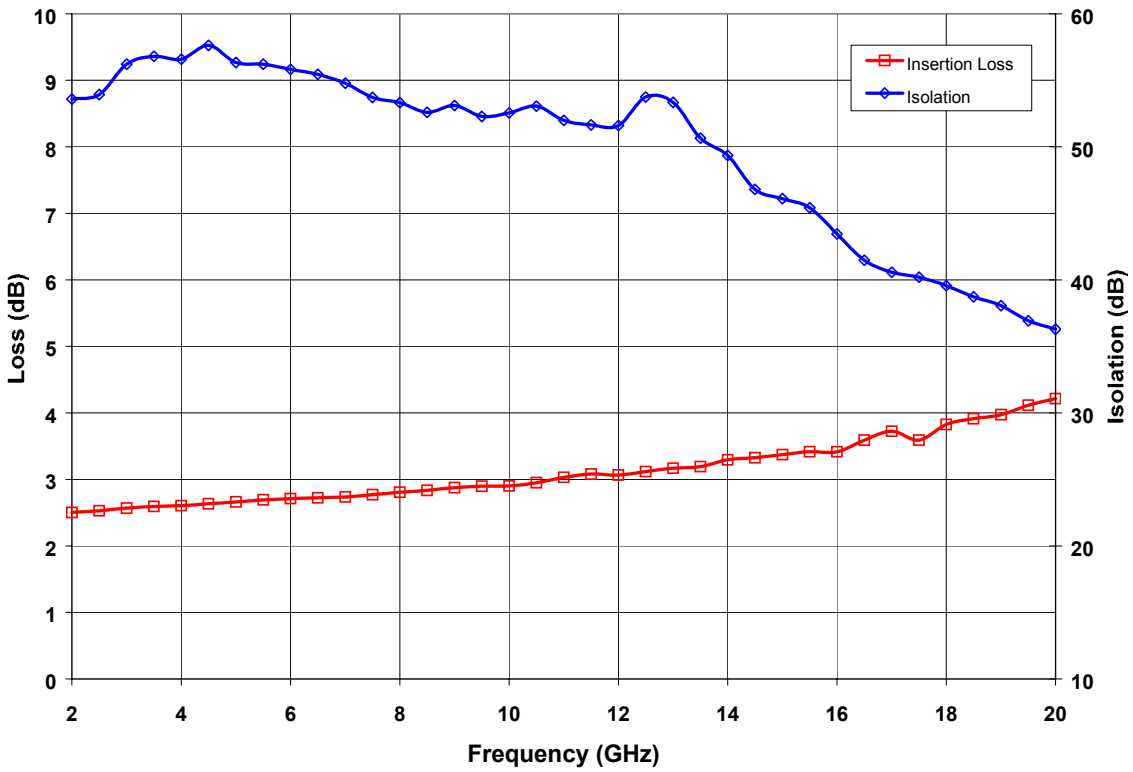


Figure 2. Insertion Loss and Isolation vs. Frequency

Mechanical Information

Chip Size: 2.054 x 1.284 x 0.075 mm (81 x 51 x 3 mils)

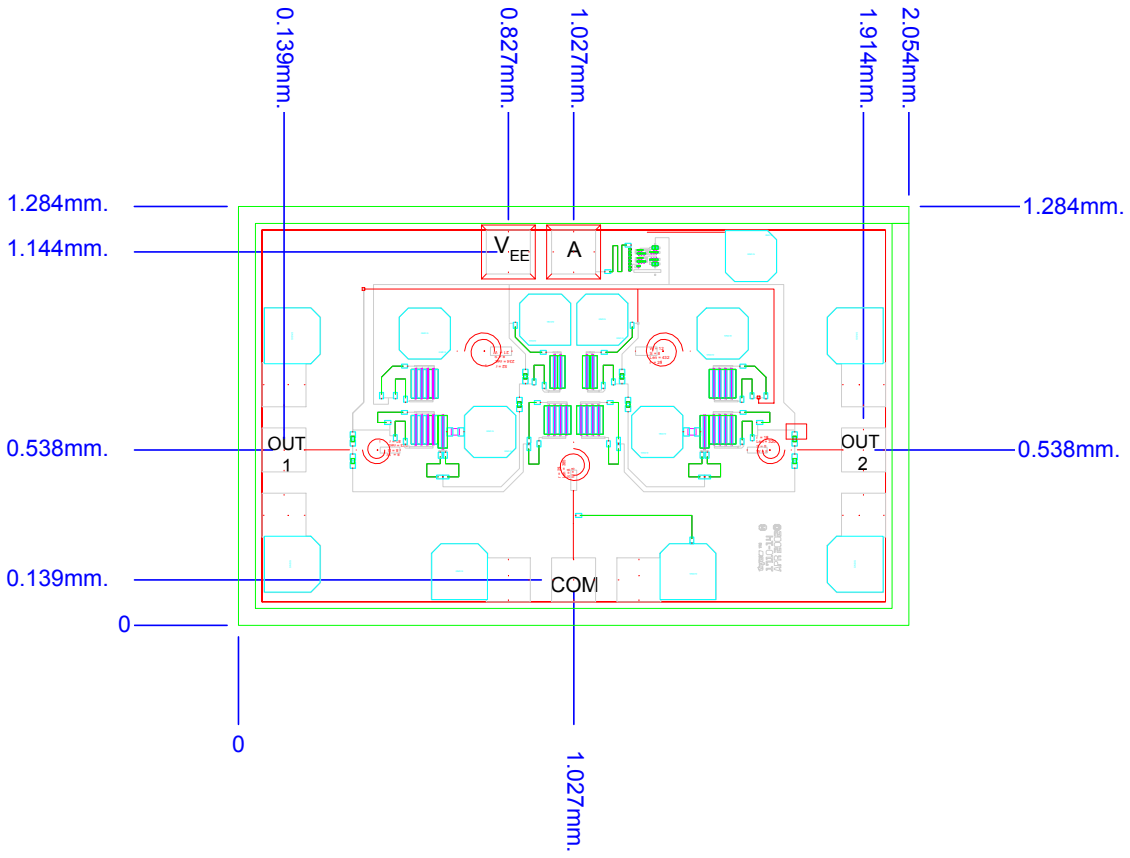


Figure . Die Layout

Bond Pad Dimensions

Pad	Size (µm)	Size (mils)
RF: COMMON, OUT1, OUT2	125 x 125	5 x 5
Digital Driver Voltage V_{EE}	125 x 125	5 x 5
A (TTL Control)	125 x 125	5 x 5

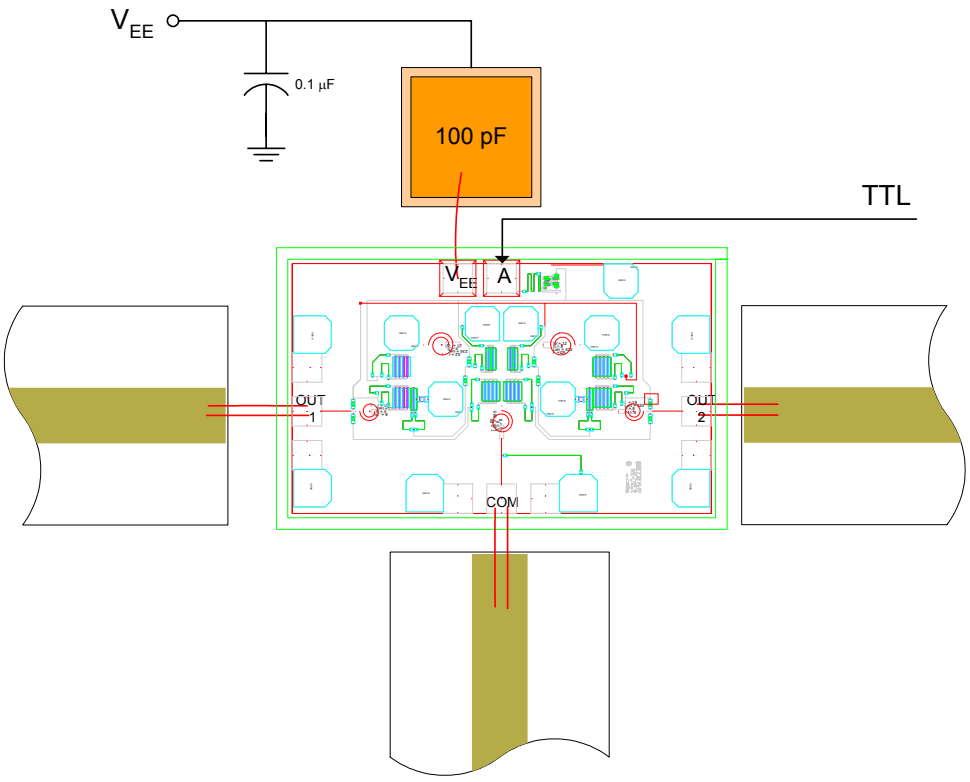


Figure 4. Recommended bonding diagram for pedestal mount.
Support circuitry typical of MMIC characterization.

Assembly Instructions:

Die attach: Low thermal conductivity silver epoxies are acceptable for die attach of this MMIC. Follow the manufacturer's instructions. If solder is employed , use AuSn (80/20) 1-2 mil preform solder. Limit time @ 300 °C to less than 5 minutes.

Wirebonding: Bond @ 160 °C using standard ball or thermal compression wedge bond techniques. For DC and RF pad connections, use either ball or wedge bonds. For best performance, especially above 10 GHz, wedge bonds of shortest length employed on the RF interconnects is preferred over ball bonds.

Biasing Note: Must apply negative bias to V_{EE} before applying positive bias to Control Pads.