MASW-011036

Ka-Band High Power Terminated SPDT PIN Switch, 26-40 GHz

Rev. V2

Features

- Broadband Performance, 26 to 40 GHz
- Low Loss <1 dB
- High Isolation >38 dB
- Up to 13 W CW Power, +85°C
- Die with G-S-G RF Pads and DC Bias Pads
- Includes DC Blocks and RF Bias Networks
- 23 dBm power handling in terminated port

Description

The MASW-011036 is a high power SPDT with 50 Ω terminated RF ports. This broadband, high linearity, SPDT switch was developed for Ka–Band applications that require up to 13 W of power handling while maintaining low insertion loss and high isolation.

The SPDT MMIC utilizes MACOM's proven AlGaAs PIN diode technology. The switch is fully passivated with silicon nitride and has an added polymer layer for scratch protection. The protective coating prevents damage to the junction and the anode air-bridge during handling and assembly. The die has backside metallization to facilitate an epoxy die attach process.

Ordering Information[1]

Part Number	Package
MASW-011036-1413WF	Separated Die on Metal Frame[1]
MASW-011036-14130G	Die in Gel Pack[1]

1. Die quantity varies.

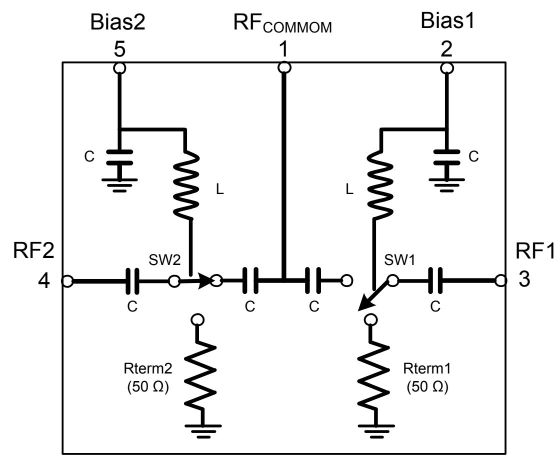
Handling Procedures

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 HBM class 1A devices.

Functional Diagram

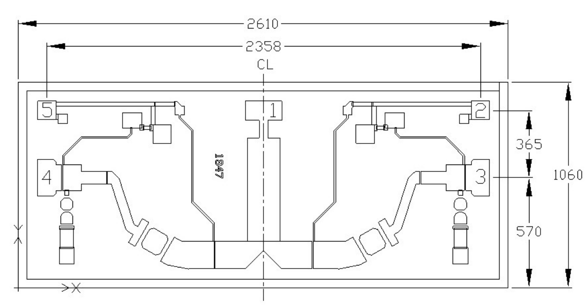


Pin Configuration:

(Back Metal is RF, D.C., and Thermal Ground)

Pin	Function
1	RF_{COMMON}
2	BIAS 1
3	RF1
4	RF2
5	BIAS 2

Die Outline



Dimensions indicated in µm.
Die Thickness : 100 µm
RF Pads (1, 3, 4) are 100 x 200 µm.
DC Bias Pads (2 & 5) are 100 x 100 µm.
Meets JEDEC moisture sensitivity level 1 requirements.

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

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.
Visit www.macomtech.com for additional data sheets and product information.

- **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

Ka-Band High Power Terminated SPDT PIN Switch, 26-40 GHz

Rev. V2

Electrical Specifications:
Freq. = 28 - 30 GHz, T_A = +25°C, +4.0 V @ +25 mA / -15 V @ 0 mA, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	26 - 28 GHz 28 - 32 GHz 32 - 36 GHz 36 - 40 GHz	dB	—	0.80 0.70 0.70 1.5	— 1.0 — —
Isolation[2]	26 - 28 GHz 28 - 32 GHz 32 - 36 GHz 36 - 40 GHz	dB	— 34 — —	38 40 40 40	—
Input / Output Return Loss On state	26 - 28 GHz 28 - 32 GHz 32 - 36 GHz 36 - 40 GHz	dB	— 13 — —	20 20 20 12	—
RF1, 2 Return Loss, Off state	26 - 28 GHz 28 - 32 GHz 32 - 36 GHz 36 - 40 GHz	dB	— 7.5 — —	8 10 18 18	—
Switching Speed-Ton	50% DC to 90% RF	ns	—	30	—
Switching Speed-Toff	50% DC to 10% RF	ns	—	21	—
Rise Time -Tr	10% to 90% RF	ns	—	10	—
Fall Time - Tf	90% to 10% RF	ns	—	8	—
CW Input Power[3]	-25 V @ +85°C	dBm	—	41.2	—
Reverse Bias Voltage[3]	—	V	-32	-15	-5
Reverse Bias Current[3]	-15 V	nA	—	25	—
Forward Bias Current[4]	+4 V	mA	—	25	—

2. Isolation defined with 1 port in low loss state.
3. Reverse bias voltage should be determined based on working conditions. For example, -25 V @ 41.2 dBm input power. For lower power applications, a less negative voltage can be used.
4. Forward bias voltage should be determined based on working conditions.

Absolute Maximum Ratings[5,6]

Parameter	Absolute Maximum
Reverse Bias Voltage	-50 V
Forward Bias Current	40 mA
CW Incident Power	43 dBm
CW Incident Power (Terminated Port)	26 dBm
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.
6. M/ACOM does not recommend sustained operation near these survivability limits.

Truth Table[3,4]

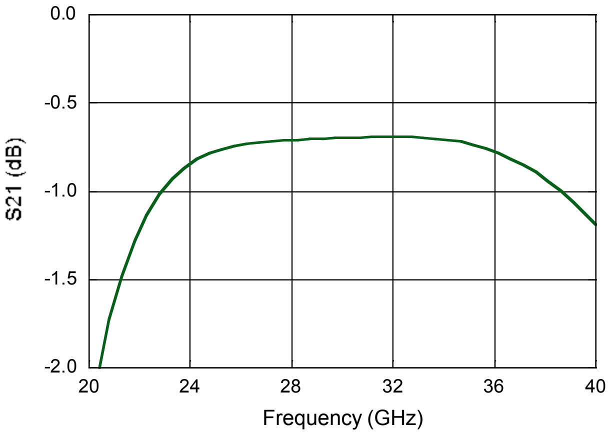
RF_{COMMOM} Path	Bias 1	Bias 2
RF1 Insertion Loss RF2 Isolation	-15 V	4 V
RF2 Insertion Loss RF1 Isolation	4 V	-15 V

M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.
Visit www.macomtech.com for additional data sheets and product information.

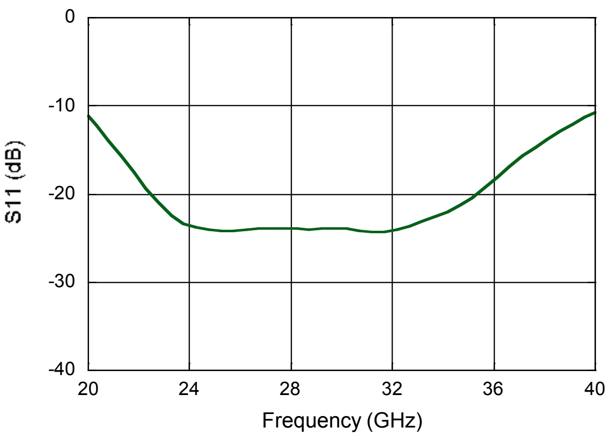
- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Typical Performance @ 25°C

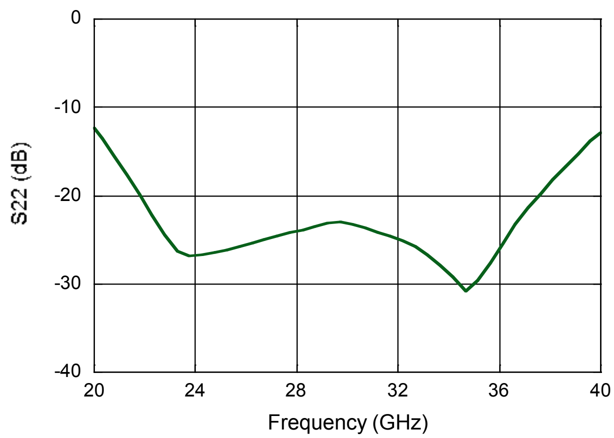
Insertion Loss (On State)



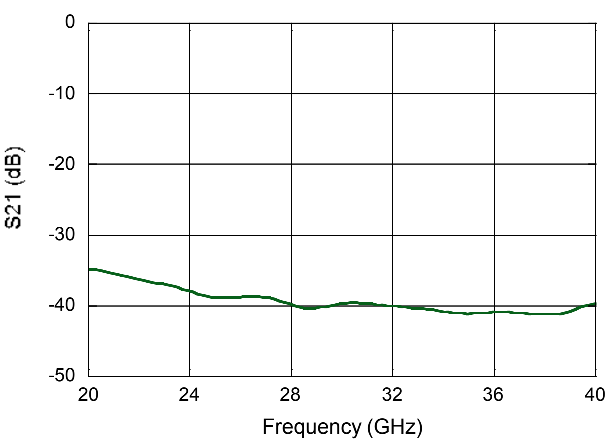
RF_{COMMON} Return Loss (On State)



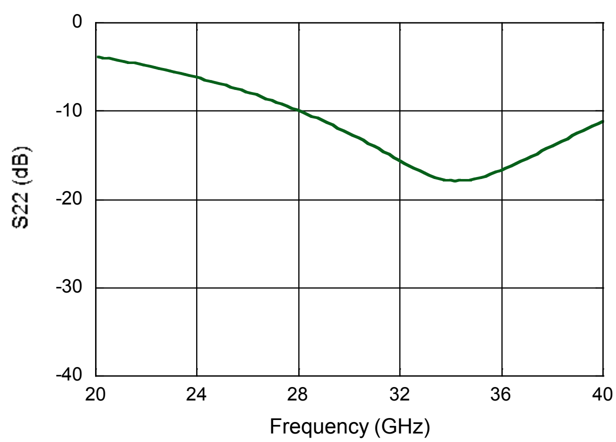
RF1, 2 Return Loss (On State)



Isolation (Off State)



RF1, 2 Return Loss (Off State)



M/A-COM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.
Visit www.macomtech.com for additional data sheets and product information.

- **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