MASW-008899

GaAs SPDT Switch DC - 3.0 GHz



M/A-COM Products Rev. V2

Features

- Low Insertion Loss: 0.4 dB @ 2.4 GHz
- Moderate Isolation: 27 dB @ 2.4 GHz
- Low Power Consumption: 5 μA @ +3.0 V
- Reduced Gate Lag for Fast Settling Time
- Lead-Free SC70-6LD Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- RoHS* Compliant and 260°C Reflow Compatible

Description

M/A-COM's MASW-008899 is a GaAs PHEMT MMIC SPDT switch in a lead-free SC-70 (SOT-363) surface mount plastic package. The MASW-008899 is ideally suited for applications where very small size and low cost are required.

Typical applications are transmit / receive (Tx / Rx) switching in linear systems such as WLAN 802.11b/g. Other applications include 1.9 GHz and 2.4 GHz DECT and linear systems operating up to 3.0 GHz.

The MASW-008899 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

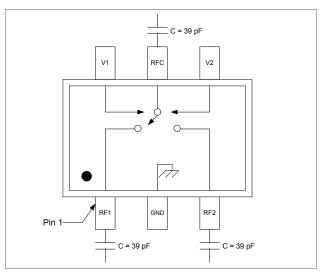
Part Number	Package	
MASW-008899-000000	Bulk packaging	
MASW-008899-TR3000	3000 piece reel	
MASW-008899-001SMB	Sample Board, DC - 3.0 GHz Tuning	

1. Reference Application Note M513 for reel size information.

2. All sample boards include 5 loose parts.

Ordering Information^{1,2}

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description	
1	RF1	RF Port 1	
2	GND	Ground	
3	RF2	RF Port 2	
4	V2	Control 2	
5	RFC	RF Input	
6	V1	Control 1	

Absolute Maximum Ratings ^{3,4}

Parameter	Absolute Maximum		
Input Power (0.5 - 3.0 GHz) 3 V Control	+30 dBm		
Voltage	-8.5 V <u><</u> Vc <u><</u> +8.5 V		
Operating Temperature	-40°C to +85°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.

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

volume is not guaranteed.

ADVANCED: Data Sheets contain information regarding a product M/A-COM 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 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

• Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300

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

¹

[•] North America Tel: 800.366.2266 / Fax: 978.366.2266

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298 Visit www.macom.com for additional data sheets and product information.



GaAs SPDT Switch DC - 3.0 GHz

M/A-COM Products Rev. V2

Electrical Specifications: $T_A = 25^{\circ}C$, $V_C = 0 V / 3 V$, $Z_0 = 50 \Omega^{5}$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss ⁶	1.0 GHz 2.4 GHz	dB dB		0.3 0.4	0.5
Isolation	1.0 GHz 2.4 GHz	dB dB	 25	24 27	—
VSWR	0.05 - 3.0 GHz	Ratio	_	1.2:1	
IP2	Two Tone, +5 dBm / Tone, 5 MHz Spacing 2.4 GHz	dBm		80	_
IP3	Two Tone, +5 dBm / Tone, 5 MHz Spacing 2.4 GHz	dBm		48	_
Linear Pout	2.5 GHz, OFDM, QAM-64,54Mbps, EVM=2.5% 3.0 V 3.3 V 5.0 V	dBm dBm dBm		22.5 24.0 28.5	
P1dB		dBm	_	28	
Trise, Tfall	10% to 90% RF and 90% to 10% RF	ns	_	35	
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	ns	_	40	
Transients	_	mV	_	10	
Current	V _C = 3.0 V	μA	—	5	10
R _{on}	t > 10 ms after OFF to ON Switching (settled)	Ω	_	1.5	2.5
Gate Lag	ΔRon between 200 μs and 10 ms after OFF to ON Switching	Ω	_	0.15	0.25

5. For positive voltage control, external DC blocking capacitors are required on all RF ports.

6. Insertion Loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 MHz - 1.0 GHz, 39 pF for 0.5 - 3.0 GHz.

Truth Table 7,8

Control V1	Control V2	RFC-RF1	RFC-RF2
0	1	On	Off
1	0	Off	On

7. Differential voltage, V (state 1) - V (state 0), must be +2.3 V minimum and must not exceed 8.5 V.

8. 0 = 0 V ± 0.2 V, 1 = +2.5 V to 5.0 V

Qualification

Qualified to M/A-COM specification REL-201, Process Flow -2.

Handling Procedures

The following precautions should be observed 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.

2

volume is not guaranteed.

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

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

ADVANCED: Data Sheets contain information regarding a product M/A-COM 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 has under develop-

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

MASW-008899

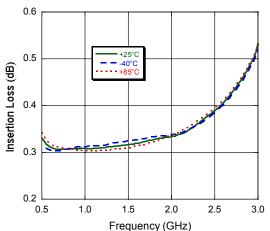
GaAs SPDT Switch DC - 3.0 GHz



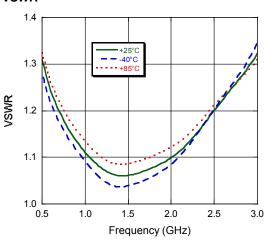
M/A-COM Products Rev. V2

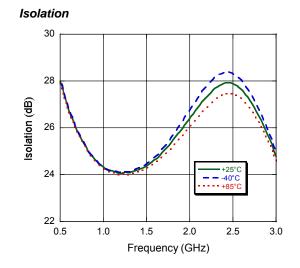
Typical Performance Curves

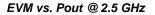


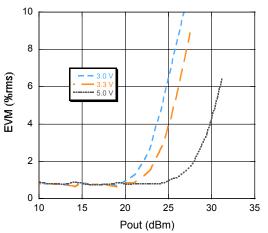












3

ADVANCED: Data Sheets contain information regarding a product M/A-COM 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 has under develop-

- 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.macom.com for additional data sheets and product information.

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

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

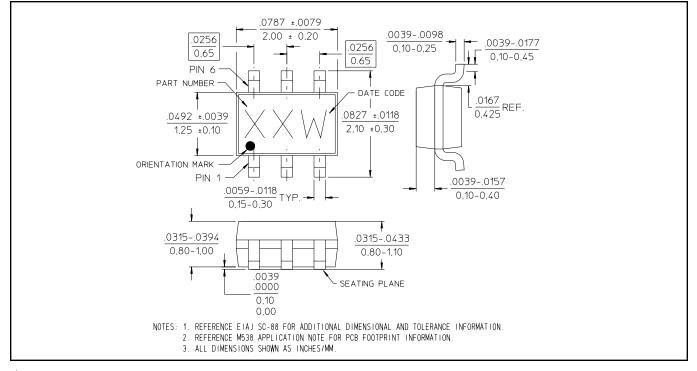
MASW-008899



GaAs SPDT Switch DC - 3.0 GHz

M/A-COM Products Rev. V2

Lead-Free SC70-6LD (SOT-363)[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations. Meets JEDEC moisture sensitivity level 1 requirements.

4

ADVANCED: Data Sheets contain information regarding a product M/A-COM is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed. **PREJ IMINARY**: Data Sheets contain information regarding a product M/A-COM has under develop and the statement of the

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

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

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

[•] North America Tel: 800.366.2266 / Fax: 978.366.2266