

Electronics

GaAs SP3T 2.5 V Switch DC - 3.0 GHz



MASWSS0028 V2

Features

- Low Voltage Operation: 2.5V
- Low Insertion Loss: 0.3 dB at 1 GHz
- 2mm 8-Lead PQFN Package
- 0.5 micron GaAs PHEMT Process

Description

M/A-COM's MASWSS0028 is a GaAs PHEMT MMIC single pole three throw (SP3T) switch in a low cost 2mm 8-Lead PQFN package. The MASWSS0028 is ideally suited for applications where low control voltage, low insertion loss, high isolation, small size and low cost are required.

Typical applications are for filter and antenna switching in handset systems that connect separate receive functions to a common antenna, as well as other related handset and general purpose applications. This part can be used in all systems operating up to 3 GHz requiring low control voltage.

The MASWSS0028 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information¹

Part Number	Package		
MASWSS0028	Bulk Packaging		
MASWSS0028TR	1000 piece reel		
MASWSS0028TR-3000	3000 piece reel		
MASWSS0028SMB	Sample Board		

1. Reference Application Note M513 for reel size information.

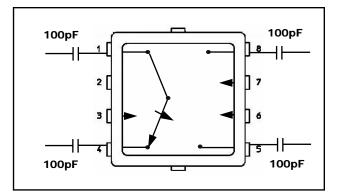
Truth Table²

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V1	V2	V3	RFC - RF1	RFC - RF2	RFC - RF3
0	1	0	On	Off	Off
1	0	0	Off	On	Off
0	0	1	Off	Off	On

2. $0 = 0 \vee \pm 0.2 \vee, 1 = \pm 2.5 \vee \text{to} \pm 5 \vee.$

Functional Schematic



Pin Configuration

Pin No.	Function	Description		
1	RFC	RF In/Out		
2	GND	RF Ground		
3	V1	Control 1		
4	RF1	RF In/Out		
5	RF2	RF In/Out		
6	V2	Control 2		
7	V3	Control 3		
8	RF3	RF In/Out		

Absolute Maximum Ratings ^{3,4}

Parameter	Absolute Maximum		
Max Input Power (0.5 - 3 GHz, 2.5V Control)	+32 dBm		
Voltage	±8.5 volts		
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.

 M/A-COM does not recommend sustained operation near these survivability limits.

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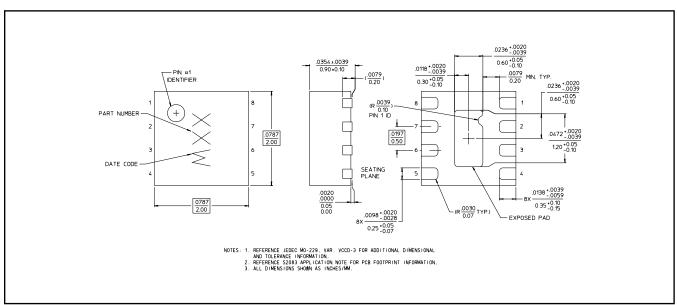
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Electrical Specifications: T_A = 25°C, V_C = 0 V / 2.5 V, Z₀ = 50 Ω ⁵

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss ⁶	DC - 1 GHz 1 - 2 GHz 2 - 3 GHz	dB dB dB		0.3 0.5 0.75	0.4 0.6 1.0
Isolation	DC - 1 GHz 1 - 2 GHz 2 - 3 GHz	dB dB dB	19 13 10	24 18 14	
Return Loss	DC - 2.5 GHz 2.5 - 3 GHz	dB dB	_	25 20	_
IP3	Two Tone, +0 dBm/tone, 1 MHz Spacing, > 50 MHz	dBm	_	50	_
P1dB	_	dBm	—	21	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	13	—
Ton, Toff	50% control to 90% RF and 50% control to 10% RF	nS	—	15	_
Transients	In Band	mV	—	30	—
Control Current	V _C = 2.5V	μA	—	1	10

5. 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. 100 pF for 100 - 500 MHz, 39 pF for 0.5 - 3 GHz.



2mm 8-Lead PQFN[†]

[†]Meets JEDEC moisture sensitivity level 1 requirements.

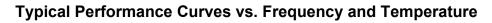
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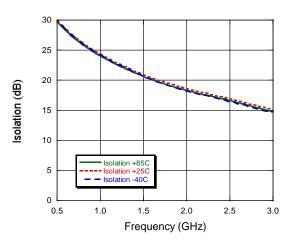
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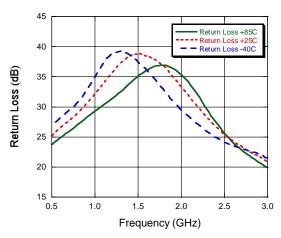




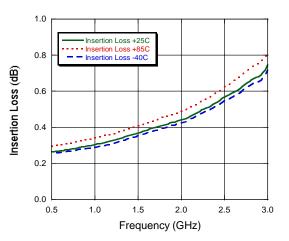
Isolation



Return Loss



Insertion Loss



Qualification

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

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.

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