MASWSS0006



GaAs SPDT 2.5 V High Power Switch DC - 3.0 GHz

Features

- Low Voltage Operation: 2.5 V
- Excellent Harmonics: <-67 dBc at +34 dBm & 1.0 GHz
- Low Insertion Loss: 0.40 dB at 1.0 GHz
- High Isolation: 20 dB at 2.0 GHz
- SOT-26 Package
- 0.5 micron GaAs PHEMT Process

Description

M/A-COM's MASWSS0006 is a GaAs PHEMT MMIC single pole double throw (SPDT) high power switch in a low cost SOT-26 package. The MASWSS0006 is ideally suited for applications where high power, low control voltage, low insertion loss, high isolation, small size and low cost are required.

Typical applications are for GSM and DCS handset systems that connect separate transmit and 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 3.0 GHz requiring high power at low control voltage.

The MASWSS0006 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

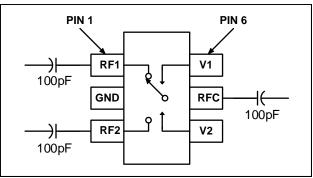
Ordering Information¹

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Part Number	Package		
MASWSS0006	Bulk Packaging		
MASWSS0006TR	1000 piece reel		
MASWSS0006TR-3000	3000 piece reel		
MASWSS0006SMB	Sample Test Board		

1. Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

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

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum		
Input Power (0.5 - 3.0 GHz, 2.5 V Control)	+38 dBm		
Voltage	±8.5 volts		
Operating Temperature	-40°C to +85°C		
Storage Temperature	-65°C to +150°C		

2. 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.

Truth Table 4,5

V1	V2	ANT-RF1	ANT - RF2
1	0	On	Off
0	1	Off	On

 Differential voltage, V (state 1) - V (State 0), must be +2.5 V minimum.

5. 0 = -5 V to 2.5 V, 1 = -2.5 V to +5 V.

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Rev. V4

[•] Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298

MASWSS0006



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Rev. V4

Electrical Specifications: $T_A = 25^{\circ}C$, $V_C = 0 V / 2.5 V$, $Z_0 = 50 \Omega^6$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss ⁷	DC – 1.0 GHz 1.0 – 2.0 GHz 2.0 - 3.0 GHz	dB dB dB		0.40 0.50 0.75	0.65 0.75
Isolation	DC – 1.0 GHz 1.0 – 2.0 GHz 2.0 - 3.0 GHz	dB dB dB	23.0 17.5 —	26 20 16	
Return Loss	DC – 2.0 GHz 2.0 - 3.0 GHz	dB dB	_	20 16	_
IP3	Two Tone, +26 dBm / tone, 5 MHz Spacing > 50 MHz	dBm	_	57	
P0.1dB	-	dBm	—	39	_
2 nd Harmonic	1.0 GHz, P _{IN} = +34 dBm	dBc	_	-75	-67
3 rd Harmonic	1.0 GHz, P _{IN} = +34 dBm	dBc	_	-75	-67
Trise, Tfall	10% to 90% RF, 90% to 10% RF	uS	_	0.04	_
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF	uS	_	0.06	_
Transients	In Band	mV	—	50	_
Gate Leakage		uA	_	_	50

6. External DC blocking capacitors are required on all RF ports.

7. Insertion Loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 - 500 MHz, 100 pF for 0.5 - 3.0 GHz.

Qualification

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

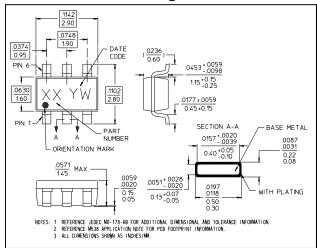
Handling Procedures

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.

SOT-26 Plastic Package[†]



† Meets JEDEC moisture sensitivity level 1 requirements

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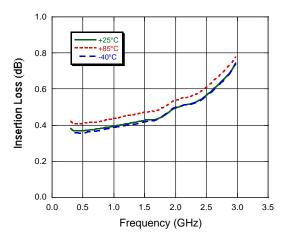


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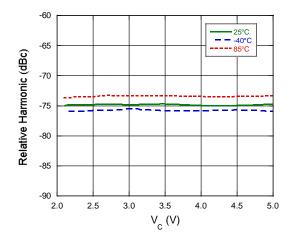
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Typical Performance Curves vs. Temperature, 100 pF blocking capacitors

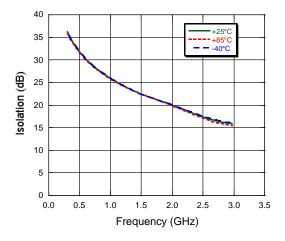
Insertion Loss vs. Frequency



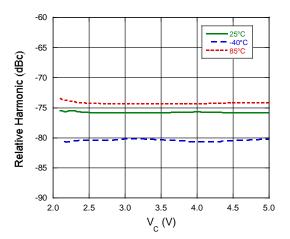
2nd Harmonic vs. Control Voltage, Pin = 34 dBm CW, 1 GHz



Isolation vs. Frequency



3rd Harmonic vs. Control Voltage, Pin = 34 dBm CW, 1 GHz



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