

RoHS Compliant



MASW-008566 V1

GaAs SP4T 2.5 V High Power Switch DC - 3.0 GHz

Features

- Low Voltage Operation: 2.5 V
- Low Harmonics: < -65 dBc at +34 dBm & 1 GHz
- Low Insertion Loss: 0.65 dB at 1 GHz
- High Isolation: 23 dB at 2 GHz
- 0.5 micron GaAs PHEMT Process
- Lead-Free 4x4 mm PQFN Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of MASWSS0118

Description

M/A-COM's MASW-008566 is a GaAs PHEMT MMIC single pole four throw (SP4T) high power switch in a low cost 4 mm 16-lead PQFN package. The MASW-008566 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 handset and related applications. This part can be used in all systems operating up to 3.0 GHz requiring high power at low control voltage.

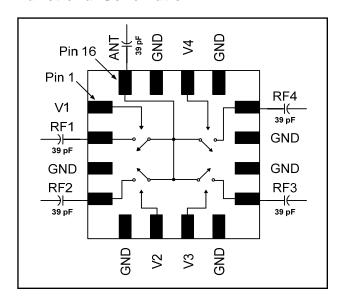
The MASW-008566 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information

Part Number	Package		
MASW-008566-TR3000	3000 piece reel		

1. Reference Application Note M513 for reel size information

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description		
1	V1	Control 1		
2	RF1	RF Port 1		
3	GND	RF Ground		
4	RF2	RF Port 2		
5	GND	RF Ground		
6	V2	Control 2		
7	V3	Control 3		
8	GND	RF Ground		
9	RF3	RF Port 3		
10	GND	RF Ground		
11	GND	RF Ground		
12	RF4	RF Port 4		
13	GND	RF Ground		
14	V4	Control 4		
15	GND	RF Ground		
16	ANT	Antenna Port		
17	Paddle ²	RF Ground		

The exposed pad centered on the package bottom must be connected to RF and DC ground.

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

[•] 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



RoHS Compliant



MASW-008566 V1

GaAs SP4T 2.5 V High Power Switch DC - 3.0 GHz

Electrical Specifications: $T_A = 25^{\circ}C$, $Z_0 = 50 \Omega^3$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Insertion Loss ⁴	DC – 1 GHz 1 – 2 GHz 2 - 3 GHz	dB dB dB		0.65 0.80 1.00	0.85 1.00 —
Isolation	DC – 1 GHz 1 – 2 GHz 2 - 3 GHz	dB dB dB	27 21 —	29.0 23.0 18.5	
Return Loss	DC – 3 GHz	dB	_	20	_
IP3	Two Tone +26 dBm, 5 MHz Spacing, > 50 MHz V_C = 0 V / 2.5 V	dBm	_	57	_
IP2	Two Tone +26 dBm, 5 MHz Spacing, > 50 MHz $V_C = 0 \ V / 2.5 \ V$	dBm	_	81	_
P.1dB	V _C = 0 V / 2.5 V	dBm	_	38	_
2 nd Harmonic	1 GHz, $P_{IN} = +34$ dBm, $V_C = 0 \text{ V} / 2.5 \text{ V}$	dBc	_	-80	-71
3 rd Harmonic	1 GHz, P_{IN} = +34 dBm, V_C = 0 V / 2.5 V		_	-68	-65
Trise, Tfall	10% RF to 90% RF, 90% to 10% RF, V_C = 0 V / 2.5 V		_	0.2	_
Ton, Toff	50% control to 90% RF, 50% control to 10% RF, $V_C = 0 \text{ V} / 2.5 \text{ V}$	μS	_	0.2	_
Transients		mV	_	35	_
Control Current	$V_C = 0 \text{ V} / 2.5 \text{ V}, 34 \text{ dBm}$	μA	_	10	50

- 3. External DC blocking capacitors are required on all RF ports.
- 4. Insertion Loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 500 MHz, 39 pF for 0.5 3 GHz.

Absolute Maximum Ratings 5,6

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		

- 5. 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.

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.

Truth Table 7,8

V1	V2	V3	V4	ANT- RF1	ANT- RF2	ANT- RF3	ANT- RF4
1	0	0	0	On	Off	Off	Off
0	1	0	0	Off	On	Off	Off
0	0	1	0	Off	Off	On	Off
0	0	0	1	Off	Off	Off	On

- Differential voltage, V (state 1) -V (state 2), must be 2.5 V minimum.
- 8. 0 = -5 V to +2.5 V, 1 = -2.5 V to +5 V

²

[•] Europe Tel: 44.1908.574.200 / Fax: 44.1908.574.300

Asia/Pacific Tel: 81.44.844.8296 / Fax: 81.44.844.8298



RoHS Compliant

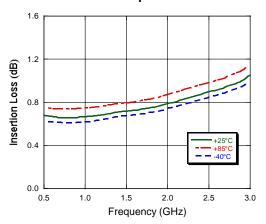


MASW-008566 V1

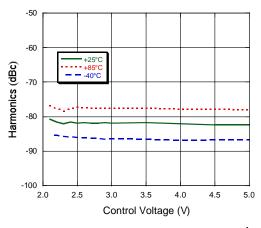
GaAs SP4T 2.5 V High Power Switch DC - 3.0 GHz

Typical Performance Curves

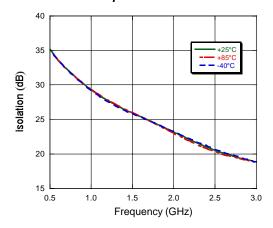
Insertion Loss vs. Temperature



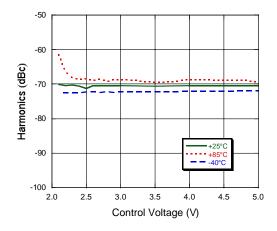
1 GHz 2nd Harmonic Rejection



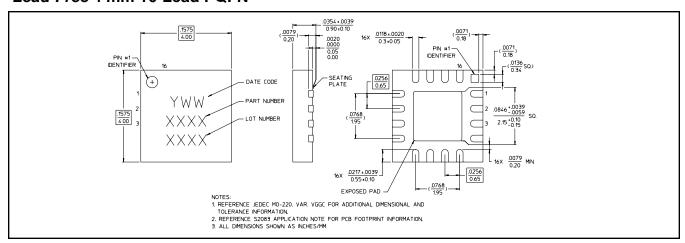
Isolation vs. Temperature



1 GHz 3rd Harmonic Rejection



Lead-Free 4 mm 16-Lead PQFN[†]



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

information.

M/A-COM Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice. M/A-COM makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does M/A-COM assume any liability whatsoever arising out of the use or application of any product(s) or

[•] 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