

GaAs SPDT 2.5 V High Power Switch DC - 3.0 GHz

Rev. V2

Features

- Low Voltage Operation: 2.5 V
- Harmonics: <-67 dBc at +34 dBm & 1 GHz
- Low Insertion Loss: 0.40 dB at 1 GHz
- High Isolation: 20 dB at 2 GHz
- 0.5 micron GaAs PHEMT Process
- Lead-Free SOT-26 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of MASWSS0006

Description

M/A-COM's MASWSS0181 is a GaAs PHEMT MMIC single pole two throw (SPDT) high power switch in a lead-free SOT-26 package. The MASWSS0181 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 GHz requiring high power at low control voltage.

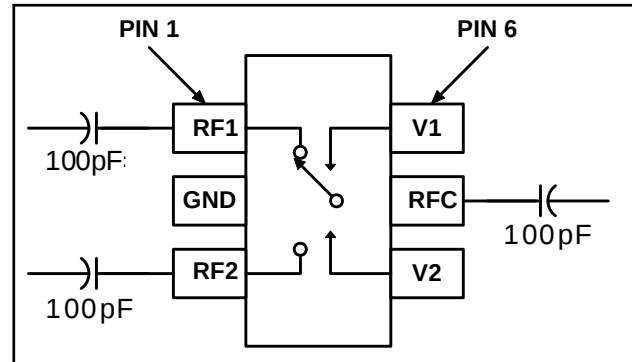
The MASWSS0181 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

Ordering Information ¹

Part Number	Package
MASWSS0181	Bulk Packaging
MASWSS0181TR	1000 piece reel
MASWSS0181TR-3000	3000 piece reel
MASWSS0181SMB	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 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

- 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.

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

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

• **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.macomtech.com for additional data sheets and product information.

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

GaAs SPDT 2.5 V High Power Switch DC - 3.0 GHz

Rev. V2

Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_c = 0 \text{ V}/2.5 \text{ V}$, $Z_0 = 50 \text{ Ohms}$ ⁴

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss ⁵	DC – 1 GHz	dB	—	0.40	0.65
	1 – 2 GHz	dB	—	0.50	—
	2 - 3 GHz	dB	—	0.75	—
Isolation	DC – 1 GHz	dB	23.0	26	—
	1 – 2 GHz	dB	—	20	—
	2 - 3 GHz	dB	—	16	—
Return Loss	DC – 2 GHz	dB	—	20	—
	2 - 3 GHz	dB	—	16	—
IP3	Two Tone, +26 dBm/tone, 5 MHz Spacing > 50 MHz	dBm	—	57	—
P0.1dB	—	dBm	—	39	—
2 nd Harmonic	1 GHz, $P_{IN} = +34 \text{ dBm}$	dBc	—	-75	—
3 rd Harmonic	1 GHz, $P_{IN} = +34 \text{ dBm}$	dBc	—	-75	-67
Trise, Tfall	10% to 90% RF, 90% to 10% RF	μS	—	0.04	—
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF	μS	—	0.06	—
Transients	In Band	mV	—	50	—
Control Current		μA	—	—	50

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

5. Insertion loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 MHz - 500 MHz, 100 pF for 0.5 GHz - 3 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.

Truth Table^{6,7}

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

6. Differential voltage, $V(\text{state } 1) - V(\text{state } 0)$, must be +2.5 V minimum and must not exceed +8 V.

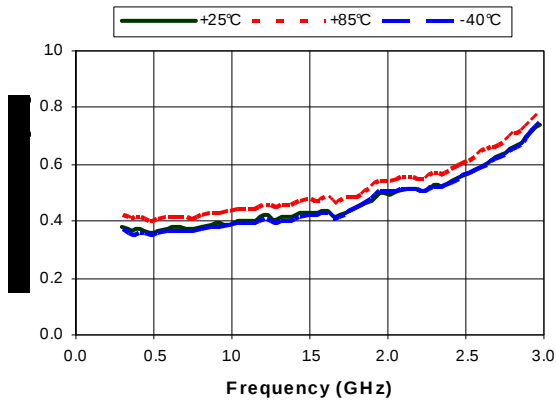
7. 0 = -5 V to 2.5 V, 1 = -2.5 V to +5 V

GaAs SPDT 2.5 V High Power Switch DC - 3.0 GHz

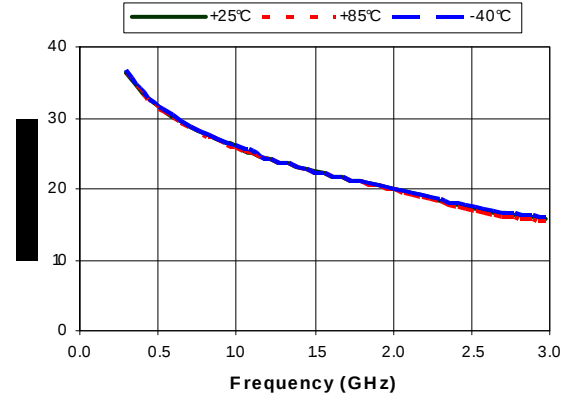
Rev. V2

Typical Performance Curves vs. Temperature, 100 pF blocking capacitors

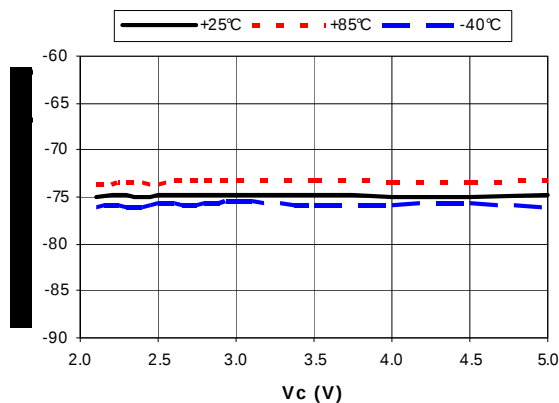
Insertion Loss vs. Frequency



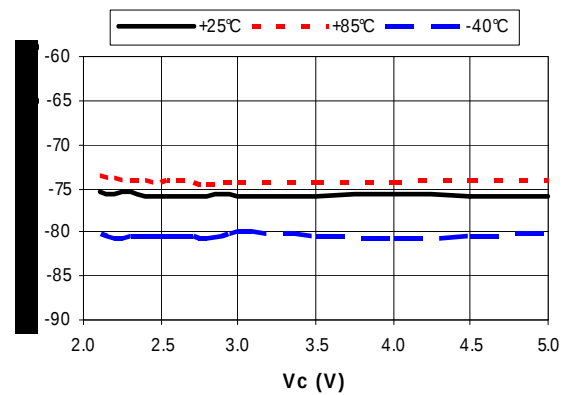
Isolation vs. Frequency



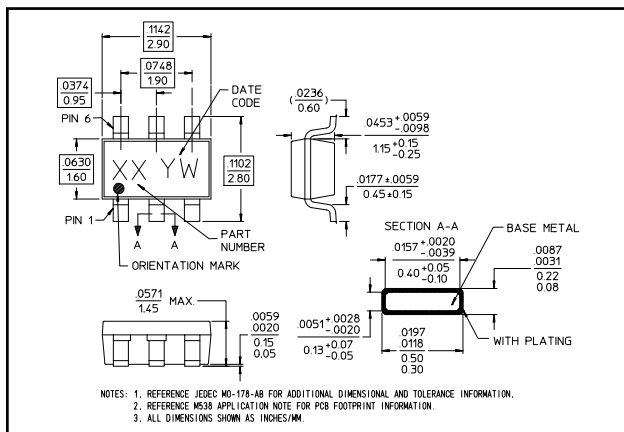
2nd Harmonic vs. Control Voltage,
Pin = 34 dBm CW, 1 GHz



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



Lead-Free SOT-26 Plastic Package[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.

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

• **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.macomtech.com for additional data sheets and product information.

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



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331