

## 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.

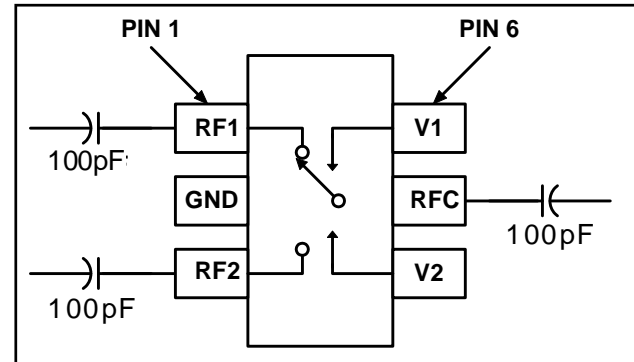
The MASWSS0181 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

## Ordering Information <sup>1</sup>

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 <sup>2,3</sup>

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

2. Exceeding any one or combination of these limits may cause permanent damage to this device.
3. M/A-COM does not recommend sustained operation near these survivability limits.

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

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

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss <sup>5</sup>	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 <sup>nd</sup> Harmonic	1 GHz, $P_{IN} = +34\text{ dBm}$	dBc	—	-75	—
3 <sup>rd</sup> Harmonic	1 GHz, $P_{IN} = +34\text{ dBm}$	dBc	—	-75	-67
Trise, Tfall	10% to 90% RF, 90% to 10% RF	$\mu\text{S}$	—	0.04	—
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF	$\mu\text{S}$	—	0.06	—
Transients	In Band	mV	—	50	—
Control Current		$\mu\text{A}$	—	—	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<sup>6,7</sup>

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

### Typical Performance Curves vs. Temperature, 100 pF blocking capacitors

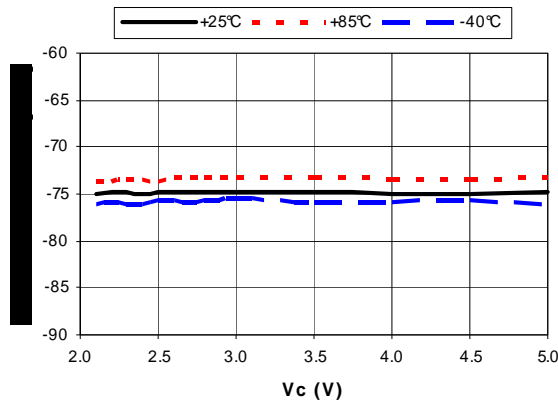
**Insertion Loss vs. Frequency**



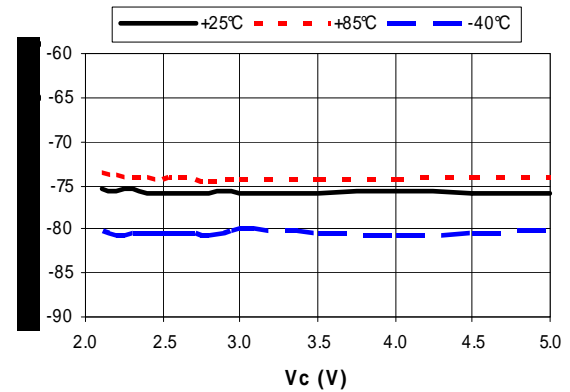
**Isolation vs. Frequency**



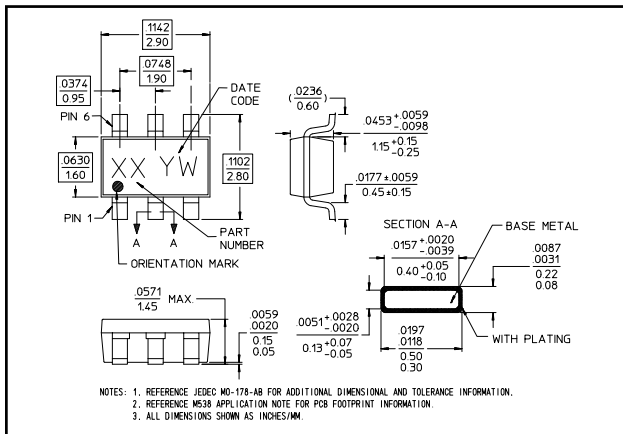
**2nd Harmonic vs. Control Voltage,  
Pin = 34 dBm CW, 1 GHz**



**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](http://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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.