

# GaAs SPDT Switch

## DC - 3.0 GHz

V 1.00

MASWSS0115

\*\*Lead Free\*\*

### Features

- Low Insertion Loss: 0.3 dB @ 2.4 GHz
- Moderate Isolation: 22 dB @ 2.4 GHz
- Low Power Consumption: <5  $\mu$ A @ +2.3V
- Lead Free SOT-363 Package
- 100% Matte Tin Plating
- Halogen-Free Mold Compound
- 260°C Re-flow Compatible
- Lead-Free Version of SW-485

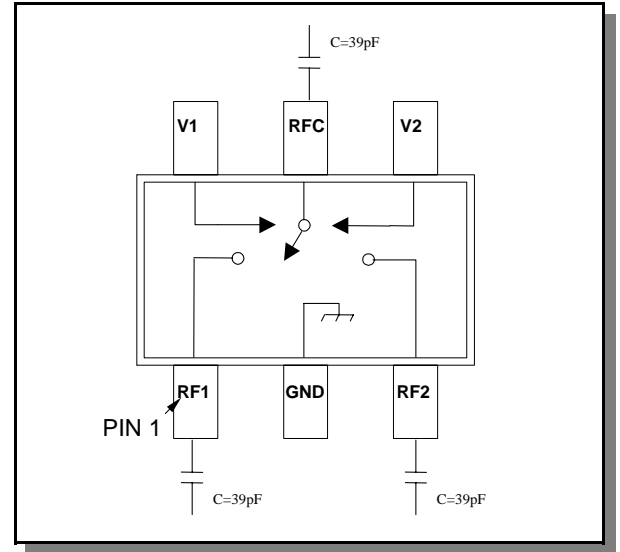
### Description

M/A-COM's MASWSS0115 is a GaAs PHEMT MMIC single pole, double throw (SPDT) switch in a low cost, lead free SC-70 (SOT-363) surface mount plastic package. The MASWSS0115 is ideally suited for applications where very small size and low cost are required.

Typical applications are dual band systems which require switching between small signal components such as filter banks, single-band LNAs, converters, etc. This part can be used for low power, low loss requirements in all systems operating up to 3 GHz, including PCS, GSM, DCS, Blue Tooth, and other receive chain applications.

The MASWSS0115 is fabricated using a 0.5 micron gate length GaAs PHEMT process. The process features full passivation for performance and reliability.

### Functional Schematic



### Electrical Specifications: $T_A = 25^\circ\text{C}$ , $V_c = 0 \text{ V}$ , $V_{2.5} = 2.5 \text{ V}$ , $Z_0 = 50 \text{ Ohms}$ <sup>1</sup>

Parameter	Test Conditions	Units	Min	Typ	Max
Insertion Loss <sup>2</sup>	DC - 1 GHz	dB	—	0.25	0.40
	1 - 3 GHz	dB	—	0.30	0.55
Isolation	DC - 1 GHz	dB	20	24	—
	1 - 3 GHz	dB	—	22	—
Return Loss	0.05 - 3 GHz	dB	—	20	—
IP2	Two Tone, +5 dBm/tone, 5 MHz Spacing, >50 MHz	dBm	—	90	—
IP3	Two Tone, +5 dBm/tone, 5 MHz Spacing, >50 MHz	dBm	—	46	—
P1dB	$V_c = 0 \text{ V}$ , $V_{2.5} = 2.5 \text{ V}$	dBm	—	21	—
	$V_c = 0 \text{ V}$ , $V_{3.0} = 3.0 \text{ V}$	dBm	—	25	—
Trise, Tfall	10% to 90% RF, 90% to 10% RF	nS	—	35	—
Ton, Toff	50% control to 90% RF, 50% control to 10% RF	nS	—	40	—
Transients	In band	mV	—	10	—
Control Current	$V_c = 2.5 \text{ V}$	$\mu$ A	—	5	20

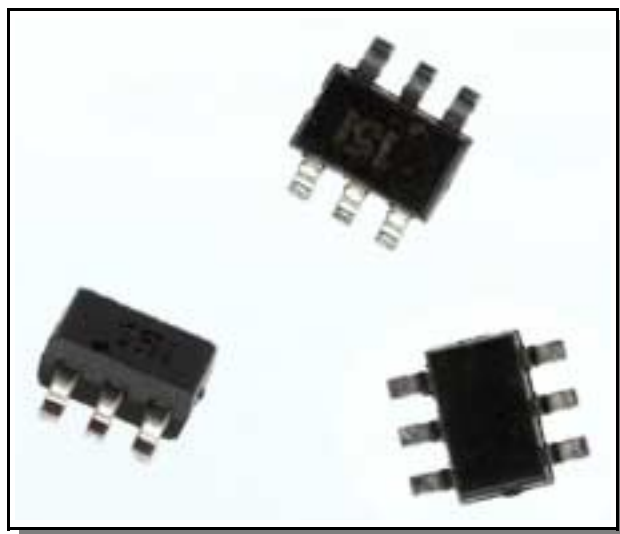
1. External DC blocking capacitors are required on all RF ports.
2. Insertion loss can be optimized by varying the DC blocking capacitor value, e.g. 1000 pF for 100 MHz - 1 GHz, 39 pF for 0.5 GHz - 3 GHz.

### Absolute Maximum Ratings <sup>3</sup>

Parameter	Absolute Maximum
Max Input Power (0.5 - 3.0 GHz)	+27 dBm
2.5 V Control	+34 dBm
5 V Control	±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.

### SC-70 (SOT-363) Plastic Package



### Pin Configuration

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

### Truth Table <sup>4,5</sup>

Control V1	Control V2	RFC-RF1	RFC-RF2
0	1	On	Off
1	0	Off	On

4. Differential voltage,  $V(\text{state } 1) - V(\text{state } 0)$ , must be +2.3 V minimum.  
 5. 0 = 0 V  $\pm$  0.2 V, 1 = +2.3 V to 5.0 V

### Qualification

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

### Handling Procedures

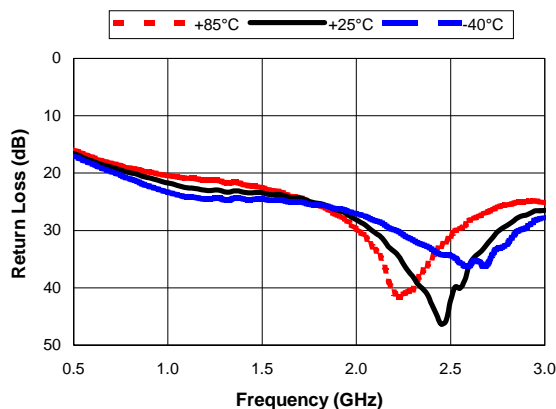
The following precautions should be observed to avoid damage:

### Static Sensitivity

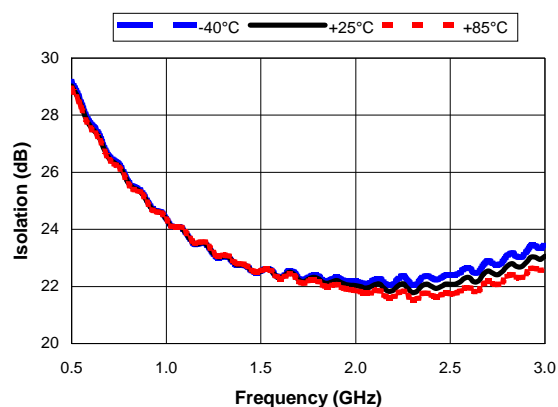
Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

## Typical Performance Curves

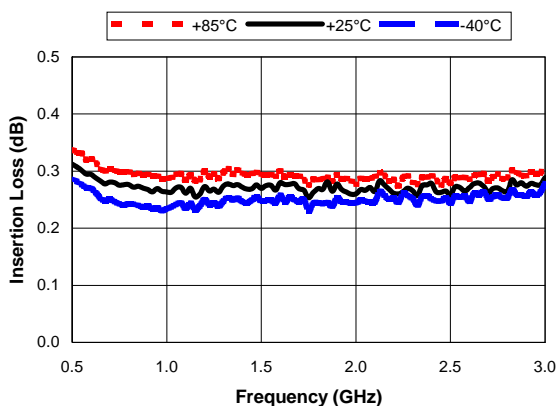
### Return Loss vs. Frequency



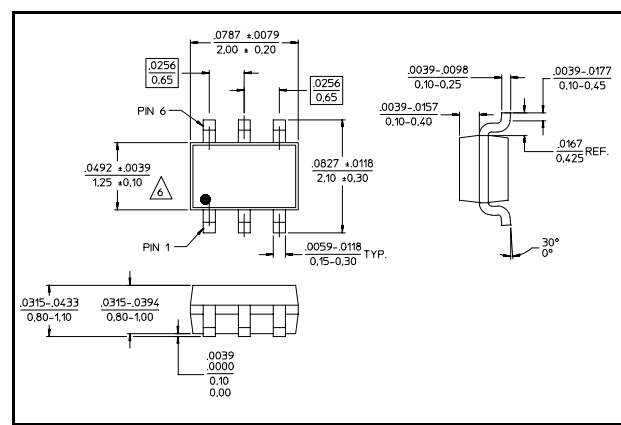
## Isolation vs. Frequency



### Insertion Loss vs. Frequency



## SC-70 (SOT-363) Plastic Package<sup>6</sup>



6. All dimensions are JEDEC MO-203-AB Issue A.

## Ordering Information

Part Number	Package
MASWSS0115	Bulk packaging
MASWSS0115TR-3000	3000 piece reel
MASWSS0115SMB	Sample Board

Note: Reference Application Note M513 for reel size information.

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