MASWSS0040

GaAs DPDT Diversity Switch
0.5 - 3.0 GHz

Rev. V5

Features

- Low Insertion Loss 0.7 dB at 2.4 GHz
- Low Cost 3 mm 12-Lead PQFN Package
- Ideal for WLAN IEEE 802.11b
- 0.5 micron GaAs PHEMT Process

Description

M/A-COM's MASWSS0040 is a GaAs pHEMT MMIC DPDT diversity switch in a low cost miniature 3 mm 12-lead PQFN package. The MASWSS0040 is ideally suited for applications where very small size and low cost are required.

Typical applications are for WLAN IEEE 802.11b/g systems that employ two antennas for transmit and receive diversity. This part is designed for low insertion loss and allows for independent control and selection of each switch path. This part can be used in all systems operating up to 3.0 GHz requiring moderate power and diversity switching.

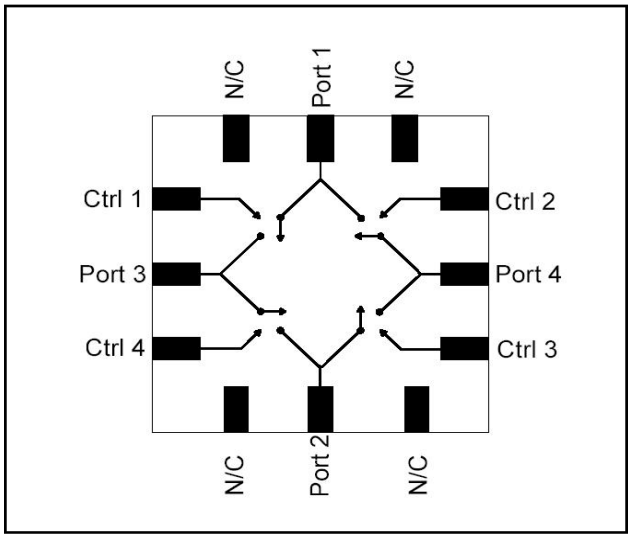
The MASWSS0040 is fabricated using a 0.5 micron gate length GaAs pHEMT process. The process features full passivation for performance and reliability.

Ordering Information [1,2]

Part Number	Package
MASWSS0040	Bulk Packaging
MASWSS0040TR	1000 piece reel
MASWSS0040TR-3000	3000 piece reel
MASWSS0040SMB	Sample Test Board 0.5 - 3.0 GHz Tuning

1. Reference Application Note M513 for reel size information.
2. All sample boards include 5 loose parts.

Functional Schematic



Pin Configuration

Pin No.	Pin Name	Description
1	Ctrl 1	Control 1
2	Port 3	RF Port 3
3	Ctrl 4	Control 4
4	N/C	No Connection
5	Port 2	RF Port 2
6	N/C	No Connection
7	Ctrl 3	Control 3
8	Port 4	RF Port 4
9	Ctrl 2	Control 2
10	N/C	No Connection
11	Port 1	RF Port 1
12	N/C	No Connection
Pad	Paddle[3]	No Connection

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

- **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.

Electrical Specifications: T_A = 25°C, V_C = 3 V, P_{IN} = 10 dBm, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss[4]	0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 2.5 GHz 2.5 - 3.0 GHz	dB dB dB dB	— — — —	0.5 0.6 0.7 0.8	1.2 1.2 1.2 1.2
Isolation[5]	0.5 - 1.0 GHz 1.0 - 2.0 GHz 2.0 - 2.5 GHz 2.5 - 3.0 GHz	dB dB dB dB	17.0 17.0 17.0 17.0	28.0 21.0 19.0 18.0	— — — —
Return Loss	0.5 - 3.0 GHz	dB	—	20	—
IP3	Two Tone +5 dBm, 5 MHz Spacing, > 50 MHz V_C = 0.2 V / 2.3 V V_C = 0.2 V / 3.0 V	 dBm dBm	 — —	 47 52	 — —
P1dB	V_C = 0.2 V / 2.3 V V_C = 0.2 V / 3.0 V	dBm dBm	— —	26 31	— —
2nd Harmonic	2.4 GHz, P_{IN} = 20 dBm, V_C = 0.2 V / 2.5 V	dBc	—	70	—
3rd Harmonic	2.4 GHz, P_{IN} = 20 dBm, V_C = 0.2 V / 2.5 V	dBc	—	60	—
Trise, Tfall	10% to 90% RF and 90% to 10% RF	ns	—	12/20	—
Ton, Toff	50% Control to 90% RF 50% Control to 10% RF	ns ns	— —	35 40	— —
Control Current	$\|V_C\|$ = 3V	µA	—	5	25

4. Insertion Loss can be optimized by varying the DC Blocking Capacitor value, i.e. 1000 pF for 100 MHz - 1.0 GHz, 27 pF for 0.5 - 3.0 GHz.
5. Isolation of two paths on either side of the selected path.

Absolute Maximum Ratings [6,7]

Parameter	Absolute Maximum
Input Power 3V Control	+32 dBm
Input Power 5V Control	+34 dBm
Operating Voltage	+8.5 volts
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

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

Handling Procedures

Please observe the following precautions to avoid damage:

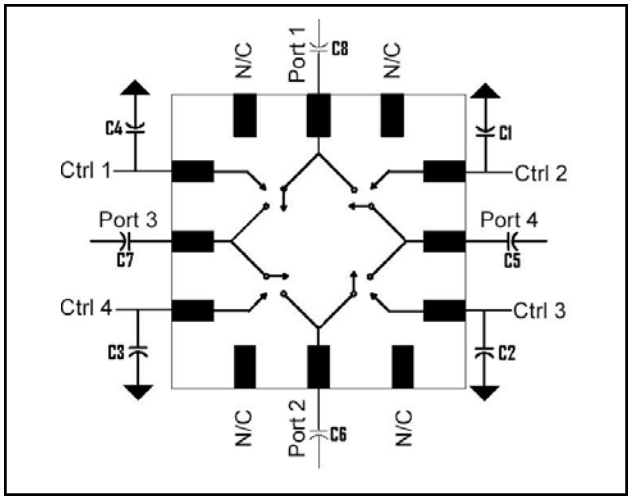
Static Sensitivity

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.

- **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.

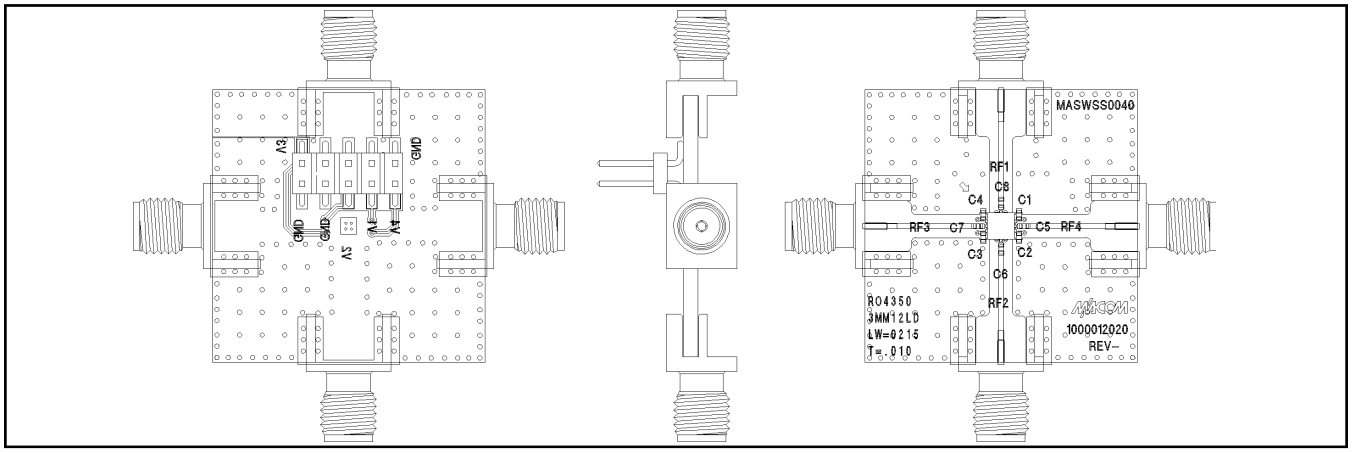
Circuit Block Diagram



Parts List

Part	Description
C1 – C4	27 pF Decoupling Capacitor
C5 – C8	27 pF DC Blocking Capacitor
RF1 – RF4	RF connector
Item 3	10-pin solder connector

Evaluation Board MASWSS0040



Truth Table [8,9]

Control V1	Control V2	Control V3	Control V4	Port 1 - Port 3	Port 1 - Port 4	Port 2 - Port 4	Port 2 - Port 3
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
1	0	1	0	On	Off	On	Off
0	1	0	1	Off	On	Off	On

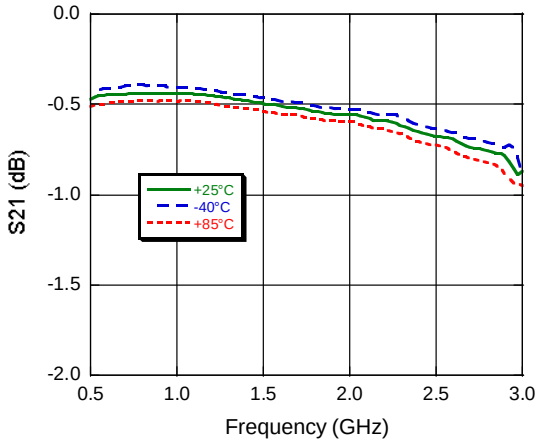
8. External DC blocking capacitors are required on all RF ports.
9. 0 = 0 V ± 0.2 V, 1 = +2.3 V to 5.0 V

- **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

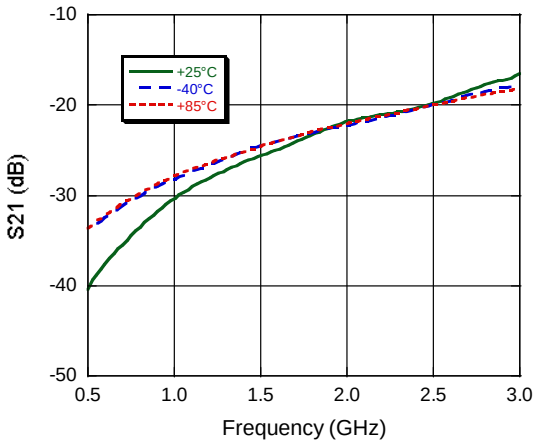
Visit www.macomtech.com for additional data sheets and product information.

Typical Performance Curves

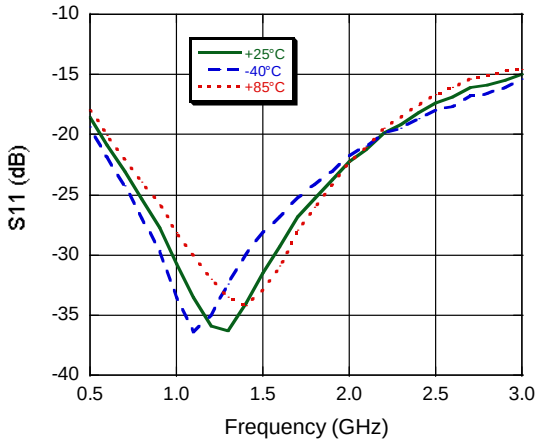
Insertion Loss, 27 pF



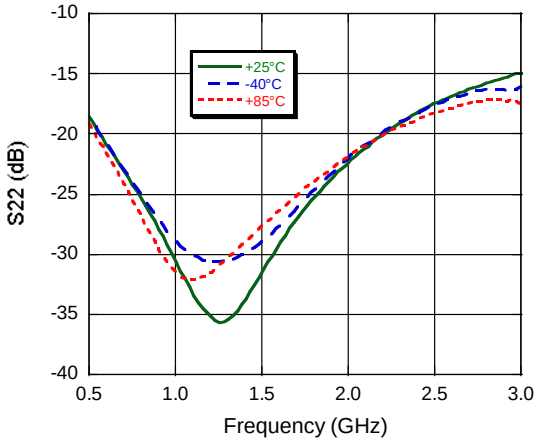
Isolation, 27 pF



Input Return Loss



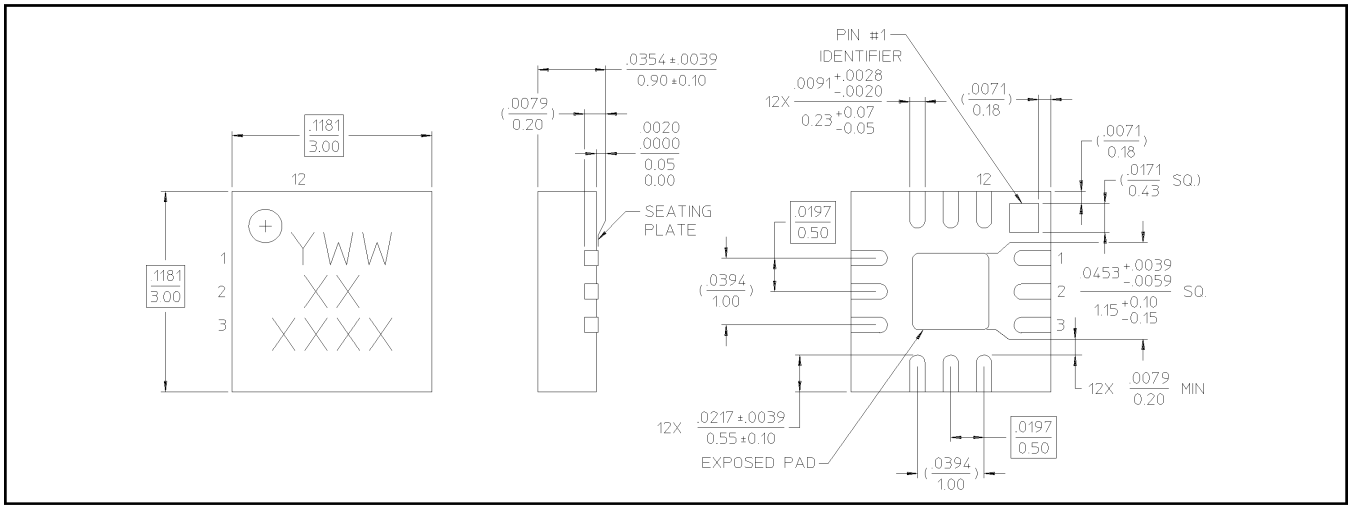
Output Return Loss



- **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.

3 mm 12-Lead PQFN†



† Meets JEDEC moisture sensitivity level 1 requirements

- **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.

LifeElectronics
Живое партнерство

ООО «ЛайфЭлектроникс» **“LifeElectronics” LLC**

ИНН 7805602321 КПП 780501001 Р/С 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 30101810900000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- *Конкурентоспособные цены и скидки постоянным клиентам.*
- *Специальные условия для постоянных клиентов.*
- *Подбор аналогов.*
- *Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.*

- *Приемлемые сроки поставки, возможна ускоренная поставка.*
- *Доставку товара в любую точку России и стран СНГ.*
- *Комплексную поставку.*
- *Работу по проектам и поставку образцов.*
- *Формирование склада под заказчика.*

- *Сертификаты соответствия на поставляемую продукцию (по желанию клиента).*
- *Тестирование поставляемой продукции.*
- *Поставку компонентов, требующих военную и космическую приемку.*
- *Входной контроль качества.*
- *Наличие сертификата ISO.*

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- *Регистрацию проекта у производителя компонентов.*
- *Техническую поддержку проекта.*
- *Защиту от снятия компонента с производства.*
- *Оценку стоимости проекта по компонентам.*
- *Изготовление тестовой платы монтаж и пусконаладочные работы.*

Тел: +7 (812) 336 43 04 (многоканальный)
Email: org@lifeelectronics.ru

www.lifeelectronics.ru