

# SPDT High Isolation Terminated Switch

## 0.5 - 3.0 GHz

SW-475

### Features

- Positive Voltage Control (0 / +5 V)
- High Isolation (53 dB typ. @ 0.9 GHz, 50 dB typ @ 1.9 GHz)
- 50-Ohm Internal Terminations
- Low Insertion Loss (0.6 dB typ. @ 0.9 GHz, 0.7 dB typ. @ 1.9 GHz)
- 4 mm QFP-N 16-Lead Package

### Description

The M/A-COM SW-475 GaAs monolithic switch provides high isolation in a low-cost, plastic surface mount package. The SW-475 is ideal for applications across a broad range of frequencies including synthesizer switching, transmit / receive switching, switch matrices and filter banks in systems such as radio and cellular equipment, PCS, GPS, and fiber optic modules.

M/A-COM fabricates the SW-475 using an 0.5-micron gate length MESFET process. The process features full chip passivation for performance and reliability.

### Handling Procedures

The following precautions should be observed to avoid damage:

#### Static Sensitivity

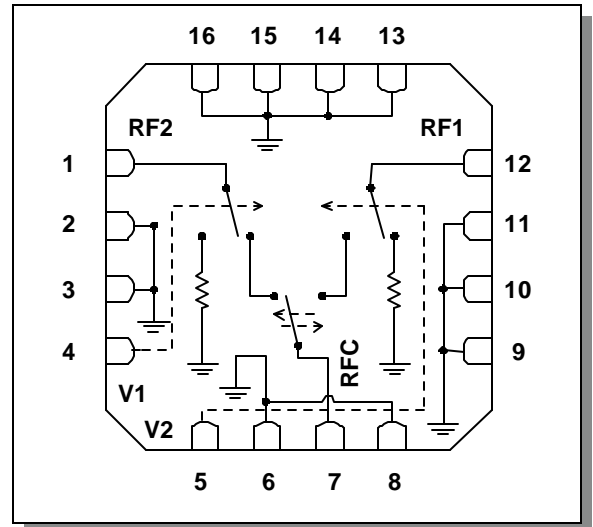
Gallium arsenide integrated circuits are ESD sensitive and can be damaged by static electricity. Use proper ESD precautions when handling these devices.

### Truth Table

Mode (Control)	V1	V2	RFC - RF1	RFC - RF2
Positive <sup>1</sup>	0	1	ON	OFF
Negative <sup>2</sup>	1	0	OFF	ON

1. External DC blocking capacitors required on all RF ports. We recommend 47 pF.
2.  $3.0\text{ V} \leq V_C \leq 8.0\text{ V}$ .

### Functional Schematic



### PIN Configuration

Pin	Function	Description	Pin	Function	Description
—	—	—	17	GND	RF ground (pad)
1	RF2	RF port	16	GND	RF ground
2	GND	RF ground	15	GND	RF ground
3	GND	RF ground	14	GND	RF ground
4	V1	Control 1	13	GND	RF ground
5	V2	Control 2	12	RF1	RF port
6	GND	RF ground	11	GND	RF ground
7	RFC	RF port	10	GND	RF ground
8	GND	RF ground	9	GND	RF ground

Logic Level	Voltage Level
$V_{LO}$ "0" =	$0 \pm 0.2\text{ V}$
$V_{HIGH}$ "1" =	$V_C \pm 0.2\text{ V}$

**Electrical Specifications:**  $T_A = 25\text{ }^\circ\text{C}$ ,  $V_{CTL} = 0, 5.0\text{ V}$  (unless otherwise specified)

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	0.5- 1 GHz	dB		0.6	0.7
	1.0 - 2.0 GHz	dB		0.7	0.8
	2.0 - 3.0 GHz	dB		0.75	0.9
Isolation	0.5 - 1 GHz	dB	51	54	
	1.0 - 2.0 GHz	dB	48	52	
	2.0 - 3.0 GHz	dB	45	50	
Return Loss	0.5 - 1 GHz	dB	15	20	
	1.0 - 2.0 GHz	dB	15	20	
	2.0 - 3.0 GHz	dB	15	20	
Input $IP_2$	2-Tone 900 MHz, 5 MHz spacing ( $V_C = 5.0\text{ V}$ )	dBm		83	
Input $IP_3$	2-Tone 900 MHz, 5 MHz spacing ( $V_C = 5.0\text{ V}$ )	dBm		43	
TRISE, TFALL	10% to 90% RF & 90% to 10% RF	nS		24	
TON, TOFF	50% of $V_C$ to 10 % / 90% RF	nS		15	
Transients	$V_C = 5.0\text{ V}$ square wave, in-band	mV		12	

1. DC blocking capacitors requires on all RF ports.

**Absolute Maximum Ratings<sup>1</sup>**

Parameter	Absolute Maximum
Max Input Power (0.5 - 3.0 GHz)	
3 V Control	+30 dBm
5 V Control	+33 dBm
Operating Voltage	+8.5 volts
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C

1. Exceeding any one or combination of these limits may cause permanent damage.

Specifications subject to change without notice.

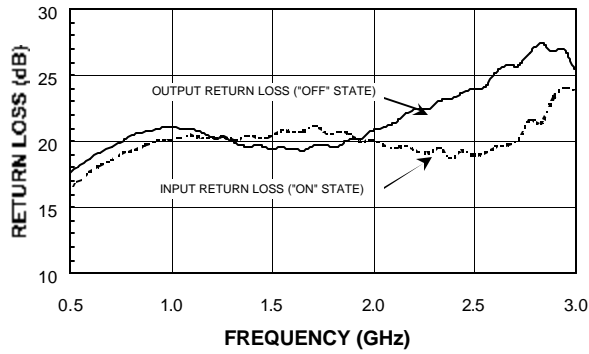
- North America: Tel. (800) 366-2266, Fax (800) 618-8883
- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
- Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

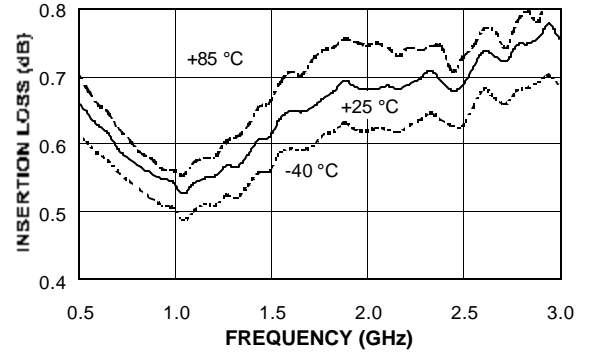


Typical Performance Curves

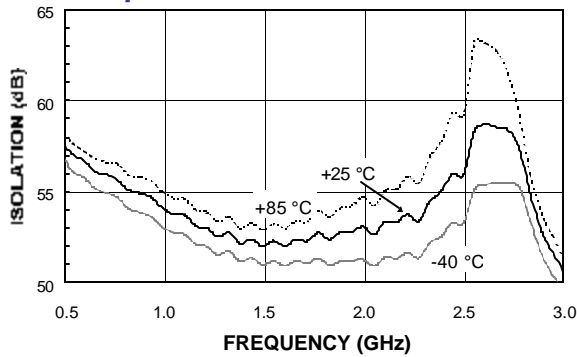
Return Loss Vs. Frequency



Insertion Loss Vs. Temperature



Isolation Vs. Frequency Over Temperature

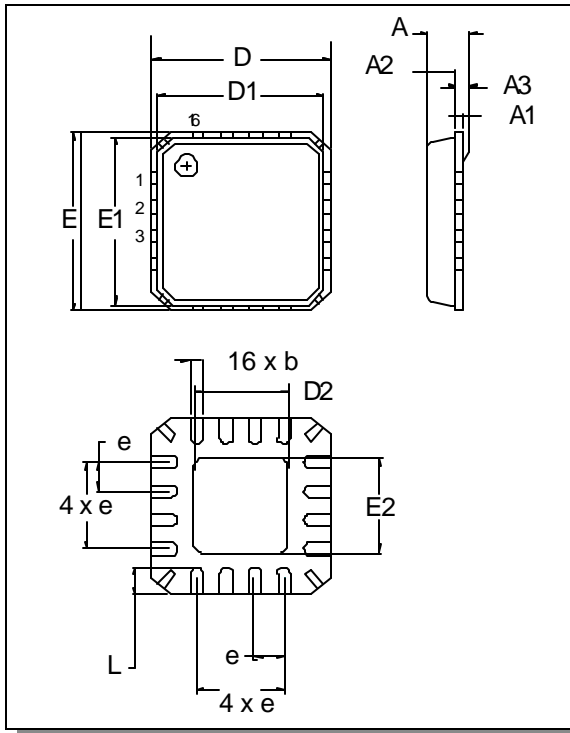


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4-mm FQFP-N, 16-Lead (MLP)  
Package



Dim	Measurement (mm)		
	Min.	Nom.	Max.
A	0.80	0.90	1.00
A1	0	0.02	0.05
A2	0.70	0.65	1.00
A3		0.20 ref.	
b	0.23	0.28-	0.35
D	-	4.00 basic	-
D1	-	3.75 basic	-
D2	0.75	1.70	2.25
e		0.65 basic	
E	-	4.00 basic	-
E1	-	3.75 basic	-
E2	0.75	1.70	2.25
L	0.50 typ.	0.60 typ.	0.75 typ.

**Note:** See JEDEC MO-220A VGGC for additional dimensional and tolerance information.

Ordering Information

Part Number	Package
SW-475 PIN	4-mm FQFP-N 16-lead Plastic Package
SW-475TR	Forward tape and reel <sup>1</sup>
SW-475TR-3000	3000 tape and reel <sup>1</sup>
SW-475SMB	Sample board

1. If you need a specific reel size, please consult the factory for part number.

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