

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

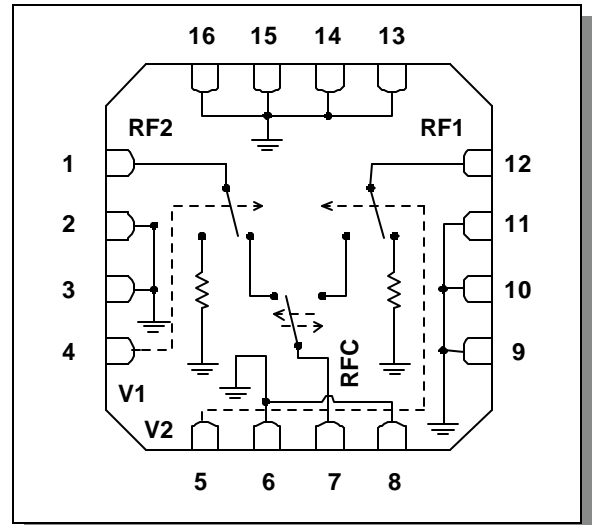
Gallium arsenide integrated circuits are ESD sensitive and can be damaged by static electricity. Use proper ESD precautions when handling these devices.

Truth Table

Mode (Control)	V1	V2	RFC - RF1	RFC - RF2
Positive ¹	0	1	ON	OFF
Negative ²	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 Ratings¹

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.

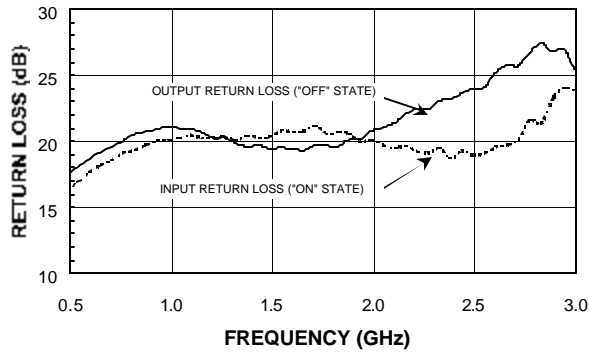
Specifications subject to change without notice.

- 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

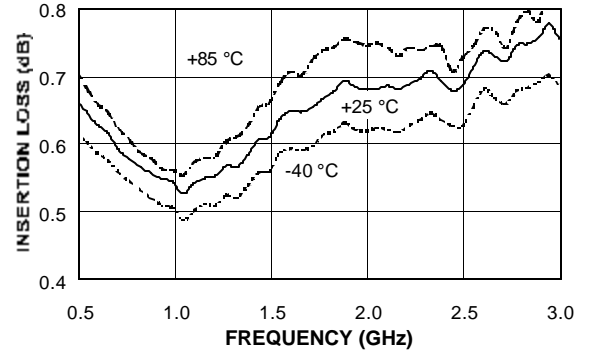
Visit www.macom.com for additional data sheets and product information.

Typical Performance Curves

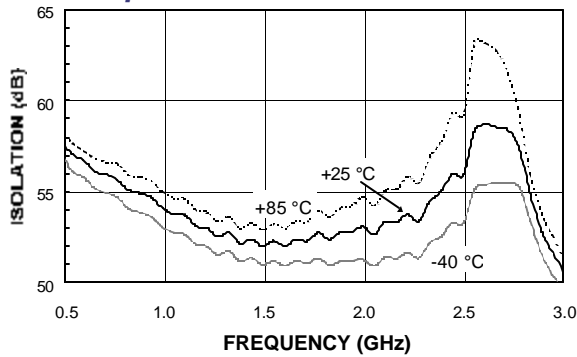
Return Loss Vs. Frequency



Insertion Loss Vs. Temperature



Isolation Vs. Frequency Over Temperature

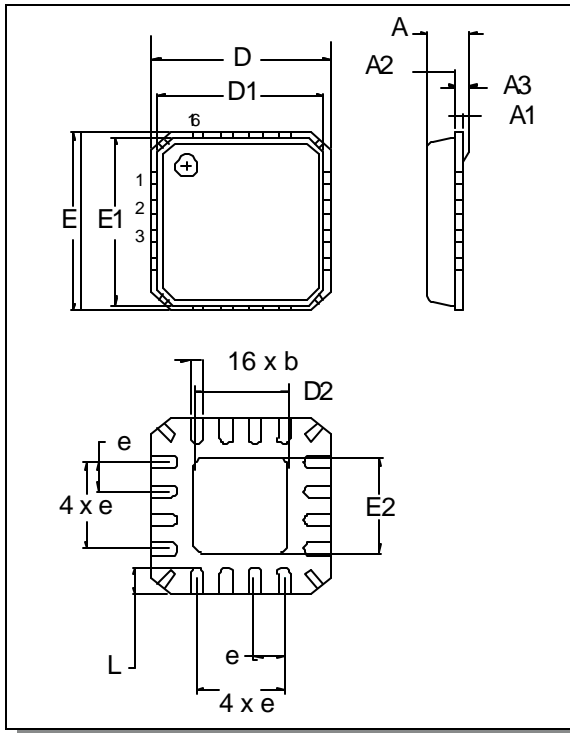


Specifications subject to change without notice.

- 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 for additional data sheets and product information.

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 ¹
SW-475TR-3000	3000 tape and reel ¹
SW-475SMB	Sample board

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

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 for additional data sheets and product information.