

Surface Mount Monolithic PIN Diode Switches 50 MHz-4 GHz

M/A-COM Products
Final Release - Rev. 2.01

Features

- Low Cost/High Volume
- Broadband Performance 50 MHz - 4 GHz
- Low Insertion Loss/ High Isolation
- Low Distortion
- Available in Tape & Reel

Description

Using M/A-COM's HMIC monolithic technology, M/ACOM has developed a family of broadband PIN diode MMIC switches packaged in popular, industry standard surface mount packages. The MA4SW101-287T is an SPST SOT-23 packaged switch utilizing two PIN diodes in a series-shunt configuration.

These switches offer broadband (50 MHz-4 GHz) performance, fast switching speed and low distortion. The switches have been designed for low cost, high volume applications. These switches are available for tape and reel insertion.

Ordering Information

Part Number	Package
MA4SW101-287T	Plastic SOT-23

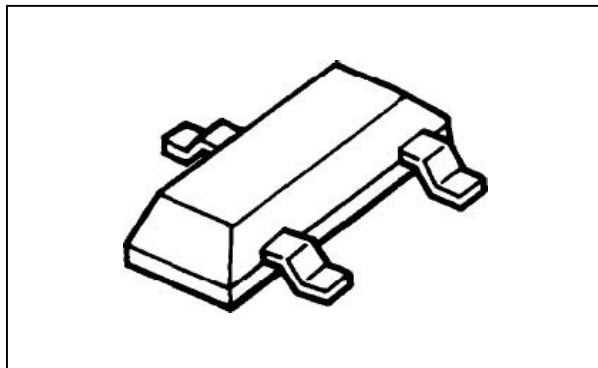
Typical Performance: $Z_0 = 50\Omega$, $I_{bias} = \pm 20\text{mA}$

Parameter	Units	Typical
		25°C
Frequency	MHz	2000
Insertion Loss	dB	0.30
Isolation	dB	36
Return Loss	dB	21

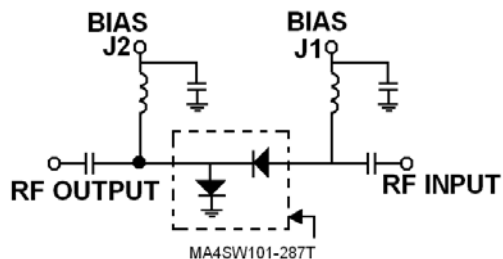
Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temperature	-65°C to +85°C
Storage Temperature	-65°C to +125°C
Applied DC Voltage	50V
Power Dissipation @+25°C	50 mW max
Incident Power @+25°C	100 mW max

Product Image



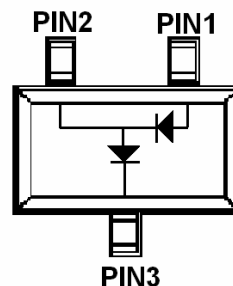
Schematic and Bias Connections



Truth Table

Control Level (DC Current) at	Condition of Switch
J2	RF in to RF out
- 20 mA	Loss State
+20 mA	Isolation

TOP View



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PRELIMINARY: Data Sheets contain information regarding a product M/A-COM 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

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Electrical Specifications at +25°C

Parameter ¹	Frequency	MA4SW101-287T			
		Min.	Typ.	Max	Units
Insertion Loss	50MHz	-	0.3	0.4	dB
	1 GHz	-	0.3	0.5	dB
	2 GHz	-	0.3	0.5	dB
	3 GHz	-	0.4	-	dB
	4 GHz	-	0.5	-	dB
Isolation	50MHz	60	70	-	dB
	1 GHz	40	46	-	dB
	2 GHz	30	36	-	dB
	3 GHz	-	30	-	dB
	4 GHz	-	26	-	dB
Input Return Loss	50MHz	25	28	-	dB
	1 GHz	20	23	-	dB
	2 GHz	17	21	-	dB
	3 GHz	-	18	-	dB
	4 GHz	-	15	-	dB
Voltage Rating ²	-	50	-	-	Volts
Second Harmonic Distortion @ 0dBm	1 GHz	-	75	-	dBc
Third Harmonic Distortion @ 0dBm	1 GHz	-	90	-	dBc
Switching Speed		-	50	-	nsec
Signal Compression @ 100mW	1 GHz	-	0.1	-	dB

Notes:

- Parameters (except for voltage rating) are specified with +/-20mA at all output ports in 50 Ω microstrip test fixture.
- Reverse current will not exceed 10 μA at the rated voltage.

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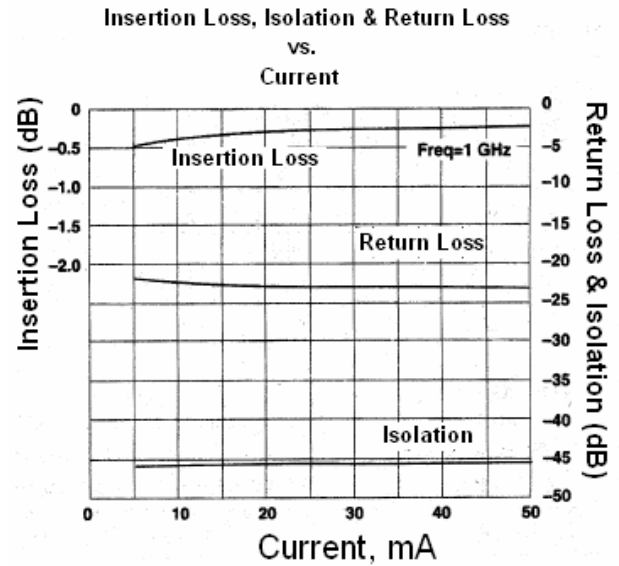
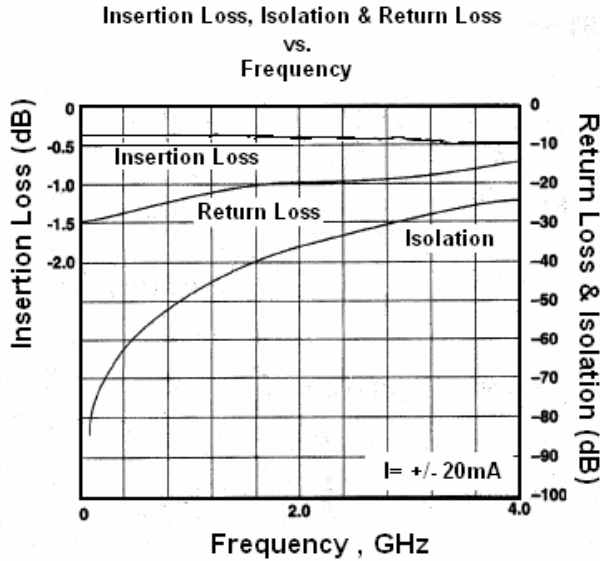
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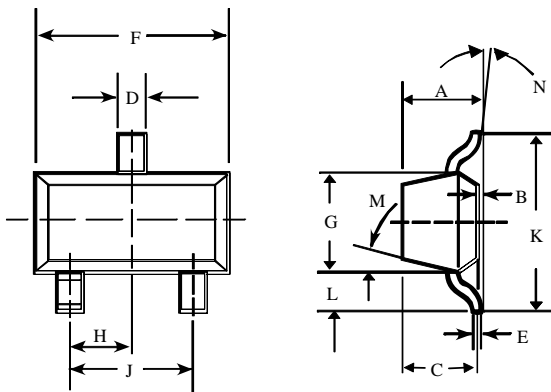
Typical Performance Curves at +25°C



Case Styles

SOT-23

Case Style 287



SOT-23 (Case Style 287)

DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	—	0.048	—	1.22
B	—	0.008	—	0.20
C	—	0.040	—	1.00
D	0.013	0.020	0.35	0.50
E	0.003	0.006	0.08	0.15
F	0.110	0.119	2.80	3.00
G	0.047	0.056	1.20	1.40
H	0.037 typical		0.95 typical	
J	0.075 typical		1.90 typical	
K	—	0.103	—	2.60
L	—	0.024	—	0.60
DIM.	GRADIENT			
M	10° max. ¹			
N	2° . . . 30°			

Note: 1. Applicable on all sides

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Mounting Information

The illustration indicates the recommended mounting pad configuration for the SOT-23 package. Solder paste containing flux should be screened onto the pads to a thickness of 0.005- 0.007 inches. The plastic package is placed in position, firmly adhering to the solder paste.

Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275 °C and the body temperature does not exceed +250 °C.

Please refer to Application Note M538 for surface mounting instructions.

SOT-23

