

Surface Mount Monolithic PIN Diode Switches 50 MHz - 4 GHz

Rev. V3

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/A-COM 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:

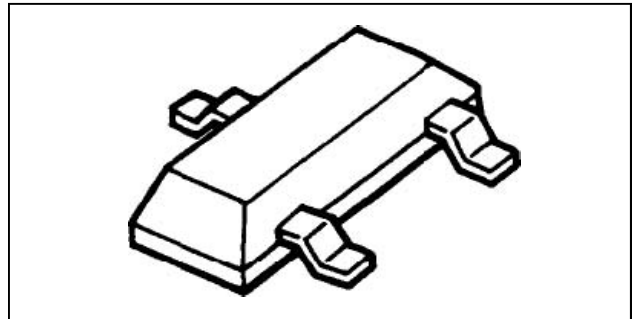
$Z_0 = 50\Omega$, $I_{bias} = \pm 20\text{mA}$

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

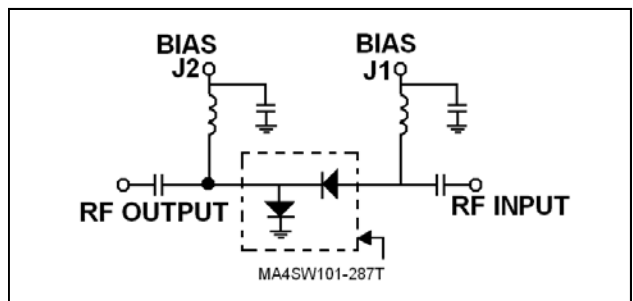
Absolute Maximum Ratings

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



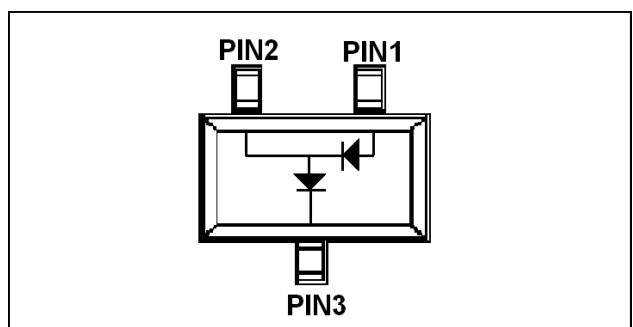
Schematic and Bias Connections



Truth Table

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

TOP View



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Electrical Specifications at +25°C

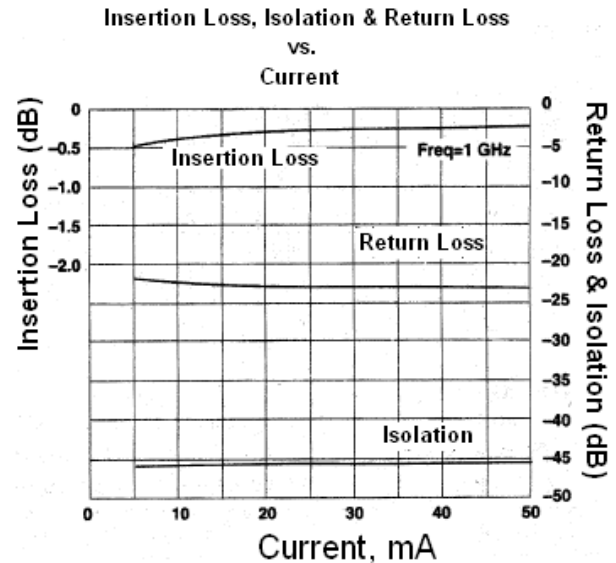
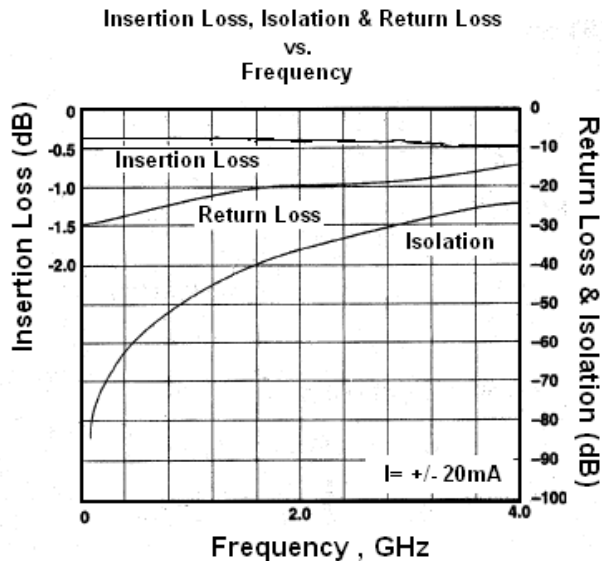
Parameter ¹	Frequency	Units	Min.	Typ.	Max
Insertion Loss	50 MHz	dB	—	0.3	0.4
	1 GHz	dB	—	0.3	0.5
	2 GHz	dB	—	0.3	0.5
	3 GHz	dB	—	0.4	—
	4 GHz	dB	—	0.5	—
Isolation	50 MHz	dB	60	70	—
	1 GHz	dB	40	46	—
	2 GHz	dB	30	36	—
	3 GHz	dB	—	30	—
	4 GHz	dB	—	26	—
Input Return Loss	50 MHz	dB	25	28	—
	1 GHz	dB	20	23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

- 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 μ A at the rated voltage.

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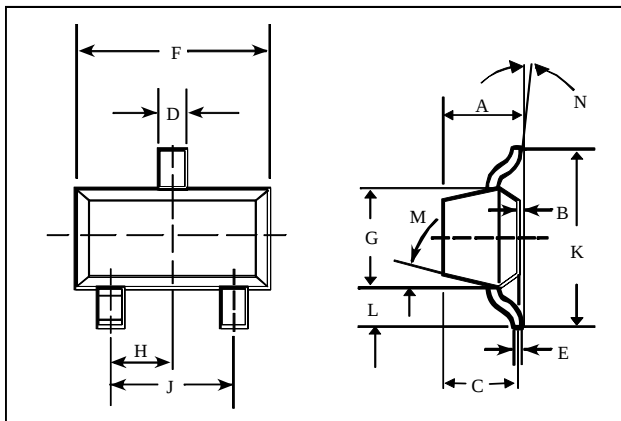
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Typical Performance Curves at +25°C



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. ³			
N	2° . . . 30°			

3. 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

