

# Surface Mount Monolithic PIN Diode Switches

MA4SW101, 201, and 301

V 2.00

## Features

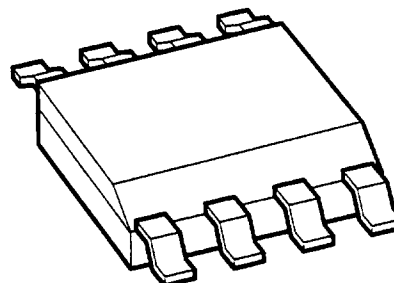
- Low Cost/High Volume
- Broadband Performance 50 MHz - 4 GHz
- Low Insertion Loss
- High Isolation
- Low Distortion
- Available in Tape & Reel

## Description

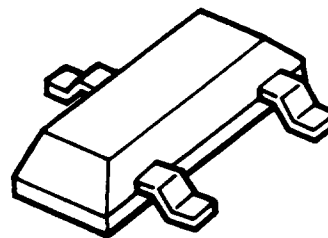
Using M/A-COM's HMIC monolithic technology, M/A-COM has developed a family of broadband PIN diode MMIC switches packaged in popular, industry standard surface mount packages. The MA4SW101 is an SPST SOT-23 packaged switch utilizing two PIN diodes in a series-shunt configuration. The MA4SW201 is an SPDT switch based on four PIN diodes in series-shunt configuration. The MA4SW301 is an SP3T switch using six PIN diodes in series-shunt configuration.

All 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.

SO-8



SOT-23



Description	Model Number	Package Type	Typical Performance at 2 GHz		
			Insertion Loss (dB)	Isolation (dB)	Input Return Loss (dB)
SPST	MA4SW101	SOT-23	0.3	36	21
SPDT	MA4SW201	SO-8	0.4	33	17
SP3T	MA4SW301	SO-8	0.6	29	13

Specifications Subject to Change Without Notice.

**M/A-COM, Inc.**

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## Electrical Specifications @ +25°C

Parameter <sup>1</sup>	Frequency	MA4SW101			MA4SW201			MA4SW301			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Insertion Loss	50 MHz	—	0.3	0.4	—	0.3	0.4	—	0.3	0.4	dB
	1 GHz	—	0.3	0.5	—	0.4	0.5	—	0.4	0.6	dB
	2 GHz	—	0.3	0.5	—	0.4	0.6	—	0.6	0.9	dB
	3 GHz	—	0.4	—	—	0.7	—	—	0.8	—	dB
	4 GHz	—	0.5	—	—	1.1	—	—	1.3	—	dB
Isolation	50 MHz	60	70	—	60	70	—	50	65	—	dB
	1 GHz	40	46	—	40	43	—	30	36	—	dB
	2 GHz	30	36	—	30	33	—	22	29	—	dB
	3 GHz	—	30	—	—	27	—	—	24	—	dB
	4 GHz	—	26	—	—	23	—	—	20	—	dB
Input Return Loss	50 MHz	25	28	—	20	30	—	20	30	—	dB
	1 GHz	20	23	—	20	27	—	12	16	—	dB
	2 GHz	17	21	—	13	17	—	10	13	—	dB
	3 GHz	—	18	—	—	14	—	—	11	—	dB
	4 GHz	—	15	—	—	11	—	—	9	—	dB
Voltage Rating <sup>2</sup>	—	50	—	—	50	—	—	50	—	—	Volts
Second Harmonic Distortion @ 0 dBm	1 GHz	—	75	—	—	75	—	—	75	—	dBc
Third Harmonic Distortion @ 0 dBm—	1 GHz	—	90	—	—	90	—	—	90	—	dBc
Switching Speed		—	50	—	—	50	—	—	50	—	nsec
Signal Compression @ 100mW	1 GHz	—	0.1	—	—	0.1	—	—	0.1	—	dB

## Notes:

- Parameters (except for voltage rating) are specified with  $\pm 20$  mA at all output ports in a 50 ohm microstrip test fixture.
- Reverse current will not exceed 10  $\mu$ A at the rated voltage.

## Absolute Maximum Ratings

Operating Temperature	-65°C to +85°C
Storage Temperature	-65°C to +125°C
Applied Voltage	50 Volts
Power Dissipation @ +25°C	50 mW maximum
Incident Power @ +25°C	100 mW

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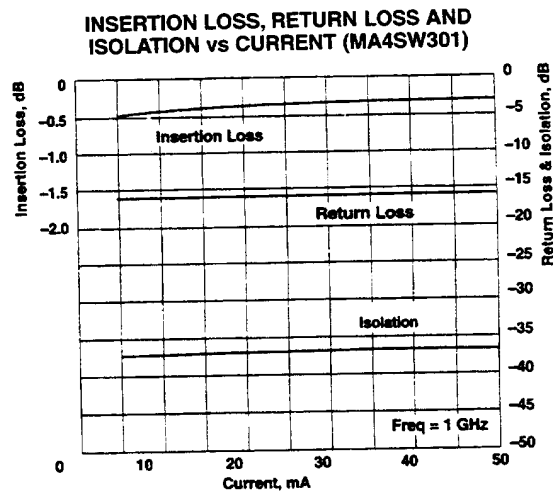
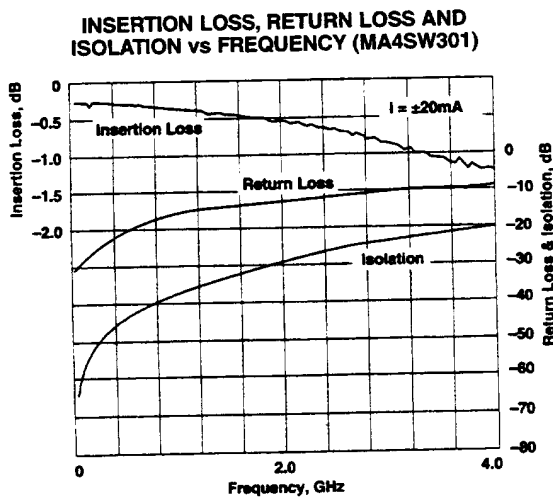
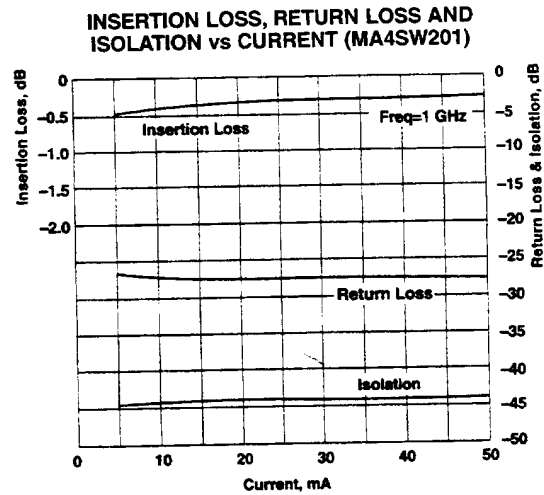
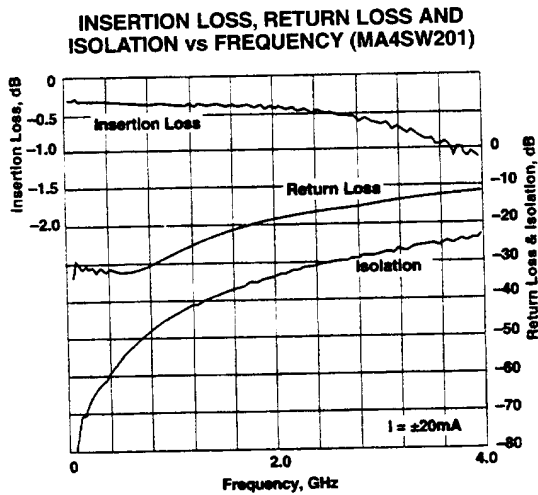
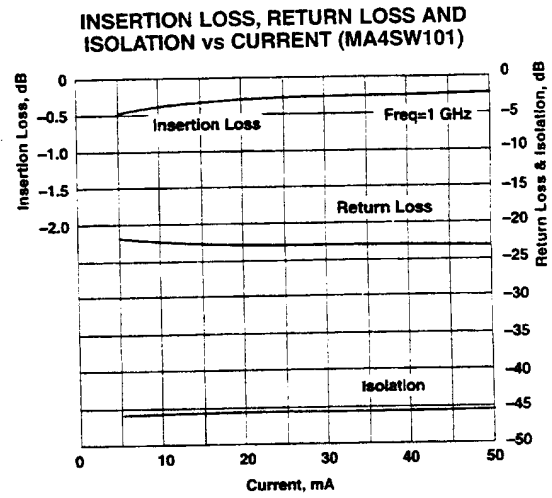
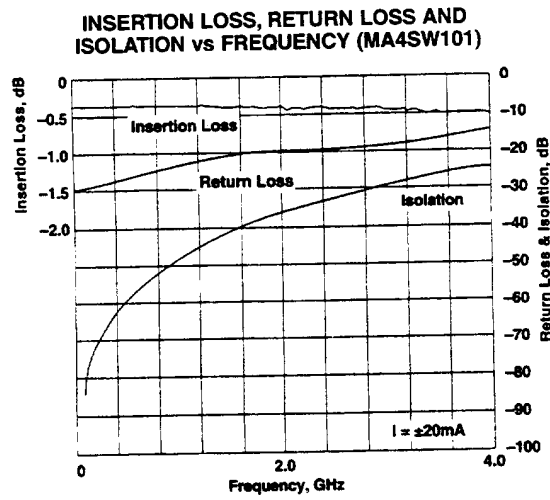
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Typical Performance Curves



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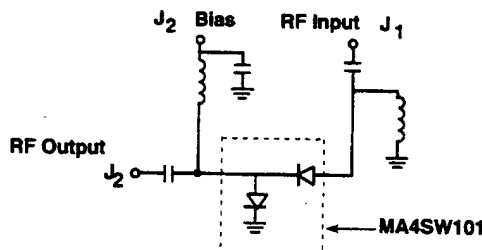
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Driver Connections

SPST (MA4SW101)

Control Level (DC Current) at	Condition of RF Output
J <sub>2</sub>	J <sub>1</sub> -J <sub>2</sub>
-20 mA	Low Loss
+20 mA	Isolation

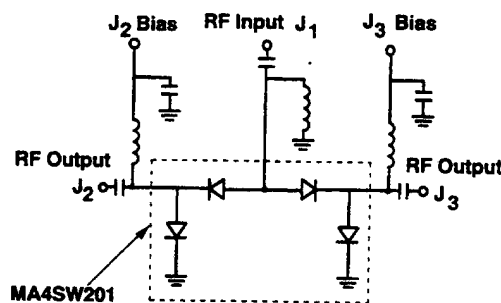
SPST and Bias Connection



SPDT (MA4SW201)

Control Level (DC Current) at		Condition of RF Output	Condition of RF Output
J <sub>2</sub>	J <sub>3</sub>	J <sub>1</sub> -J <sub>2</sub>	J <sub>1</sub> -J <sub>3</sub>
-20 mA	+20 mA	Low Loss	Isolation
+20 mA	-20 mA	Isolation	Low Loss

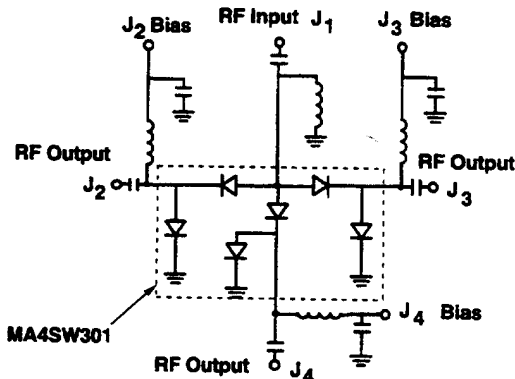
SPDT and Bias Connection



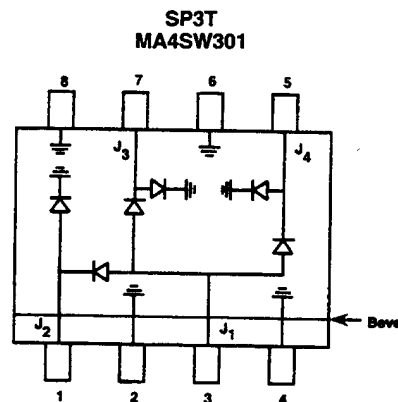
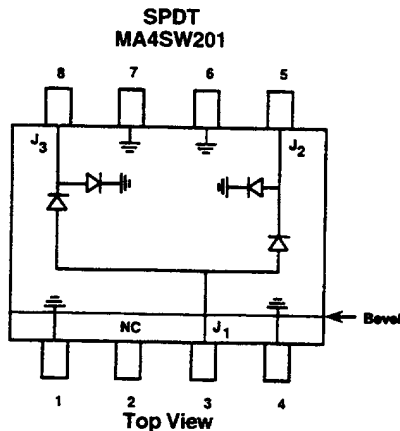
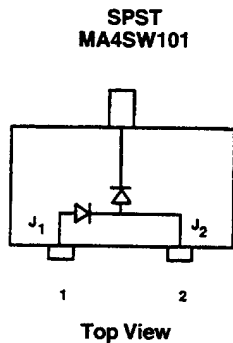
SP3T (MA4SW301)

Control Level (DC Current) at			Condition of RF Output	Condition of RF Output	Condition of RF Output
J <sub>2</sub>	J <sub>3</sub>	J <sub>4</sub>	J <sub>1</sub> -J <sub>2</sub>	J <sub>1</sub> -J <sub>3</sub>	J <sub>1</sub> -J <sub>4</sub>
-20 mA	+20 mA	+20 mA	Low Loss	Isolation	Isolation
+20 mA	-20 mA	+20 mA	Isolation	Low Loss	Isolation
+20 mA	+20 mA	-20 mA	Isolation	Isolation	Low Loss

SP3T and Bias Connection



Schematics



Specifications Subject to Change Without Notice.