

Surface Mount Monolithic PIN Diode Switches

MA4SW101, 201, and 301

V 2.00

Features

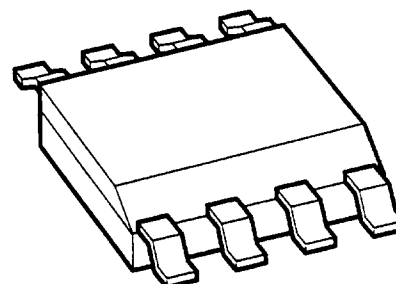
- Low Cost/High Volume
- Broadband Performance 50 MHz - 4 GHz
- Low Insertion Loss
- High Isolation
- Low Distortion
- Available in Tape & Reel

Description

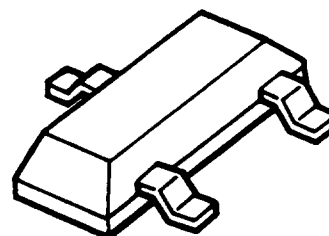
Using M/A-COM's HMIC monolithic technology, M/A-COM has developed a family of broadband PIN diode MMIC switches packaged in popular, industry standard surface mount packages. The MA4SW101 is an SPST SOT-23 packaged switch utilizing two PIN diodes in a series-shunt configuration. The MA4SW201 is an SPDT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

North America: Tel. (800) 366-2266
Fax (800) 618-8883

■ Asia/Pacific: Tel. +81 (03) 3226-1671
Fax +81 (03) 3226-1451

■ Europe: Tel. +44 (1344) 869 595
Fax +44 (1344) 300 020

15-31

Electrical Specifications @ +25°C

Parameter ¹	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 ²	—	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 ± 20 mA at all output ports in a 50 ohm microstrip test fixture.
- Reverse current will not exceed 10 μ A at the rated voltage.

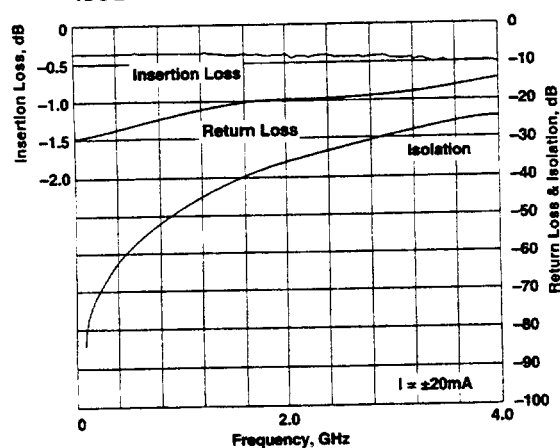
Absolute Maximum Ratings

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

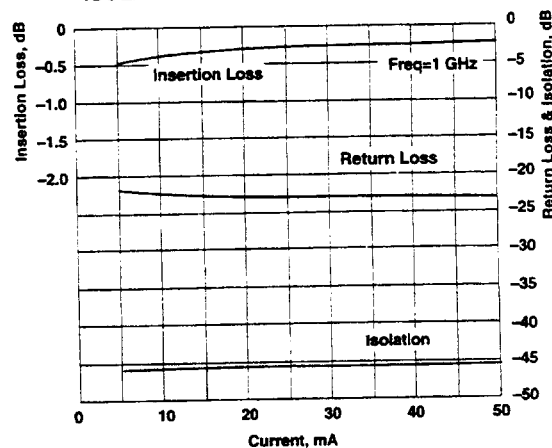
Specifications Subject to Change Without Notice.

Typical Performance Curves

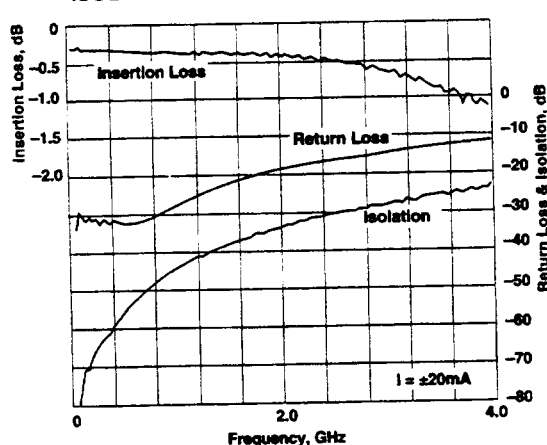
INSERTION LOSS, RETURN LOSS AND ISOLATION vs FREQUENCY (MA4SW101)



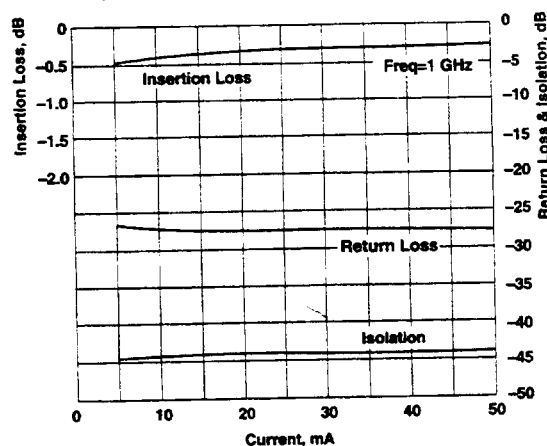
INSERTION LOSS, RETURN LOSS AND ISOLATION vs CURRENT (MA4SW101)



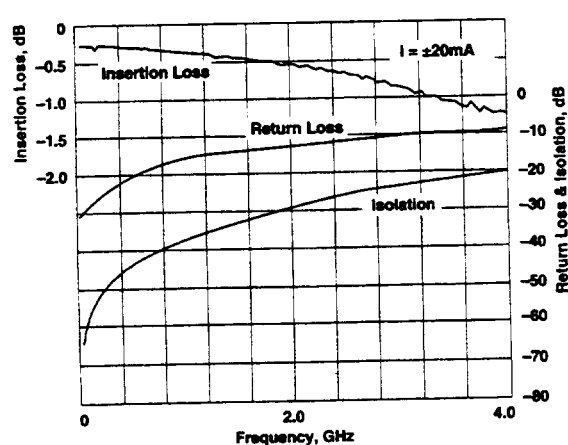
INSERTION LOSS, RETURN LOSS AND ISOLATION vs FREQUENCY (MA4SW201)



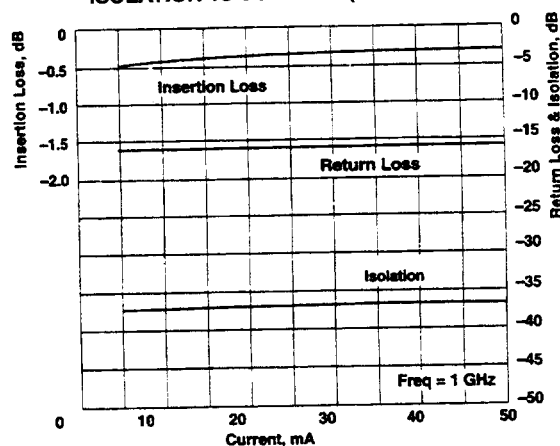
INSERTION LOSS, RETURN LOSS AND ISOLATION vs CURRENT (MA4SW201)



INSERTION LOSS, RETURN LOSS AND ISOLATION vs FREQUENCY (MA4SW301)



INSERTION LOSS, RETURN LOSS AND ISOLATION vs CURRENT (MA4SW301)



Specifications Subject to Change Without Notice.

M/A-COM, Inc.

North America: Tel. (800) 366-2266
Fax (800) 618-8883

■ Asia/Pacific: Tel. +81 (03) 3226-1671
Fax +81 (03) 3226-1451

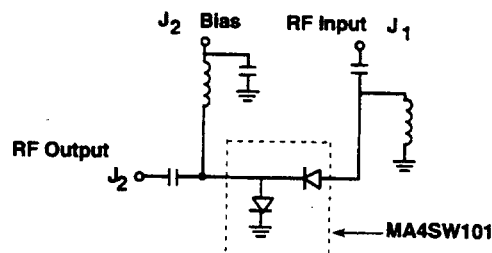
■ Europe: Tel. +44 (1344) 869 595
Fax +44 (1344) 300 020

Driver Connections

SPST (MA4SW101)

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

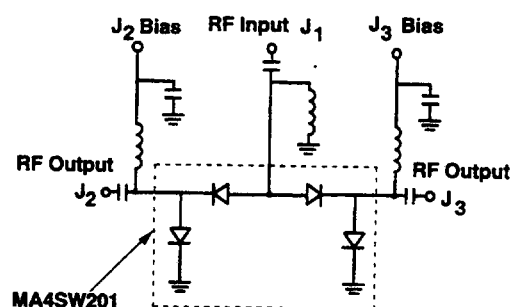
SPST and Bias Connection



SPDT (MA4SW201)

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

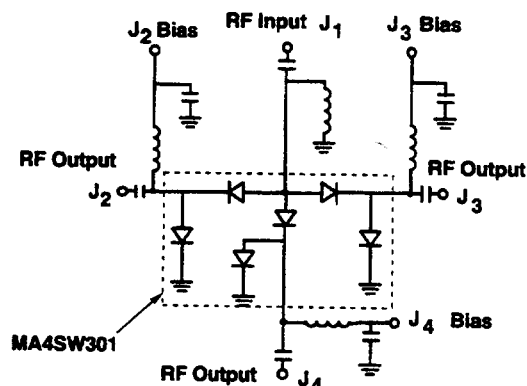
SPDT and Bias Connection



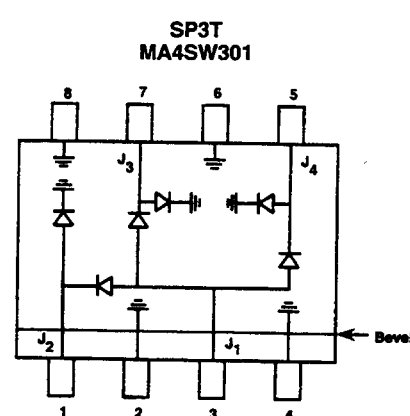
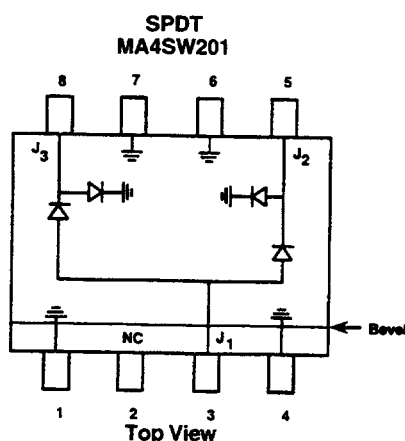
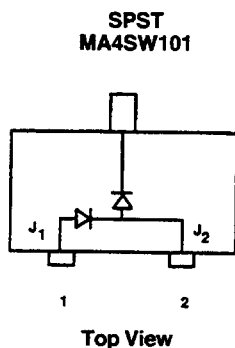
SP3T (MA4SW301)

Control Level (DC Current) at			Condition of RF Output	Condition of RF Output	Condition of RF Output
J ₂	J ₃	J ₄	J ₁ -J ₂	J ₁ -J ₃	J ₁ -J ₄
-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.