

Stripline PIN Diode Switch Modules

Rev. V3

Features

- Broadband 50 Ohms Design Through X Band
- High Power Capacity
- Voltage Ratings to 1000V
- Fast Switching Speeds
- Hermetically Sealed Package
- RoHS Compliant

Description

This series of M/A-COM semiconductor products is hermetically sealed strip-line package PIN diode designed to drop into a 50 ohm strip-line circuit without external matching. The MA47200 series can be used as SPST reflective switches and are useful in applications from VHF through X Band. Several modules are provided with different power and switching speed capability.

This series of strip-line switch modules consist of shunt mounted passivated PIN diodes in hermetic strip-line packages. These modules are optimized for 50 ohm micro-strip and strip-line circuits. The MA47200 series modules maybe operated as a switch by applying the appropriate forward and reverse DC excitation. They can also be used as attenuators by varying the forward DC current.

Applications

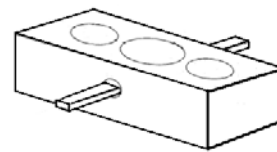
The MA47200 series of broadband shunt-mounted PIN diodes features a shunt-mounted PIN chip with an appropriate series inductance to produce a matched low pass filter structure at zero or reverse bias condition. By applying +10mA to +100mA to center conductor the diode's impedance changes to a low-impedance inductive short causing the diode to reflect RF power. The forward bias current (+10mA to +100mA) must be applied in order to achieve high isolation.

Absolute Maximum Ratings¹ @ T_A = +25°C (unless otherwise specified)

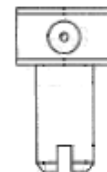
Parameter	Absolution Max.
Voltage	Voltage Rating
Operating Temperature	- 65°C to +150°C
Storage Temperature	-65°C to +175°C
Power Dissipation	Pdiss= $\frac{150^{\circ}\text{C}-T_{\text{ambient}}}{\text{Thermal Resistance}}$

1. Operation of this device above any one of these parameters may cause permanent damage.

Stripline Packages

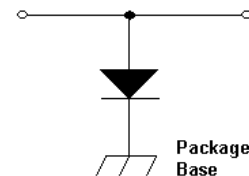


ODS-144



ODS-114

Internal Wiring Diagram



1 Specifications subject to change without prior notification.

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Environmental Ratings (Per MIL-STD 750)

The following table is recommended for Group B and C testing for TX, TXV level screening.

Inspection	Method	Condition
Storage Temperature	1031	See Maximum Ratings
Operating Temperature	—	See Maximum Ratings
Temperature Cycling	1051	5 cycles - 65° to + 150°C
Shock	2016	500 g's
Vibration	2056	15 g's
Constant Acceleration	2006	20,000 g's
Humidity	1021	10 days

Screened Diodes (Per MIL-STD 750)

Suggested 100% preconditioning and screening program for TX level and TXV level screening.

Inspection	Method	Condition
Internal Visual and / or X-Ray	2072,2076	See Note 1
High Temp. Storage	1032	48 hours minimum @ max. storage temp.
Thermal Shock	1051	10 Cycles
Constant Acceleration	2006	20,000 g's, Y1
Fine Leak	1071	H
Gross Leak	1071	C or E
Electrical	—	See Note
Burn-In	1038	See Note

1. Internal Visual on TXV screening programs only. X-Ray is optional for any screening plan.
2. Conditions and details of test depend on specific model number. Information available upon request.

Specifications @ Tambient = + 25°C

Part Number ¹	Test Frequency (GHz)	Maximum Insertion ³ Loss @ V _R (dB)	Minimum Isolation @ I _F (dB)	Minimum Reverse Voltage ⁴ V _R (Volts)	Maximum Thermal Resistance (°C/W)	Nominal Switching Speed (nS)	
						RF Off to RF On	RF On to RF Off
MA47208	1	0.25@20V	30dB @ 25mA	1000	10	300	150
MA47222	8	0.50dB @0V	20dB @ 100mA	150	20	100	30
MA47223	4-8 ²	0.50dB @0V	20dB @ 100mA	500	20	150	30

1. All models have cathode heatsink
2. Swept frequency measurement
3. Maximum SWR is 1.5:1 at specified insertion loss condition.
4. Maximum reverse current is 10μA at specified voltage rating.

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2

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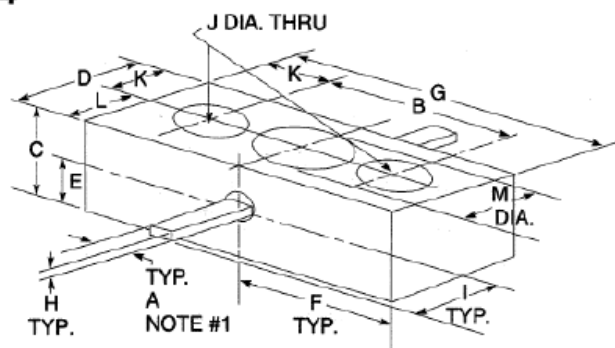
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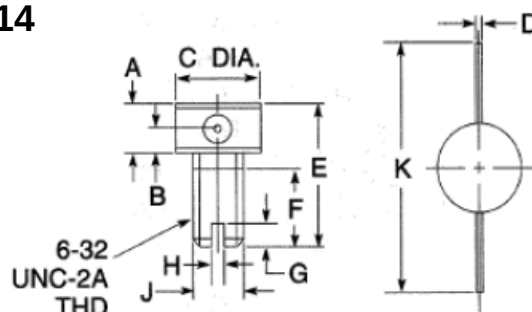
Outline Drawing

144



DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.022 NOMINAL		0.590 NOMINAL	
B	0.250 NOMINAL		6.350 NOMINAL	
C	0.125 NOMINAL		3.180 NOMINAL	
D	0.155	0.165	3.940	4.190
E	0.065 NOMINAL		1.65 NOMINAL	
F	0.195	0.215	4.950	5.460
G	0.405	0.415	10.290	10.540
H	0.003	—	0.070	—
I	0.120	—	3.040	—
J	0.096 NOMINAL		2.440 NOMINAL	
K	0.075	0.085	1.910	2.160
L	0.080 NOMINAL		2.030 NOMINAL	
M	0.125 NOMINAL		3.180 NOMINAL	

114



DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.120	0.140	3.040	3.550
B	0.058	0.072	1.470	1.820
C	—	0.255	—	6.470
D	0.011	0.013	0.270	0.330
E	0.380	0.400	9.650	10.160
F	0.205	—	5.200	—
G	0.060 NOMINAL		1.520 NOMINAL	
H	0.030 NOMINAL		0.760 NOMINAL	
J	0.1312	0.1372	3.330	3.480
K	0.670 NOMINAL		17.000 NOMINAL	

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