

Stripline PIN Diode Switch Modules

V1

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/ACOM semiconductor products is hermetically sealed strip-line package PIN diode designed to drop into a 50 ohm strip-line circuit without external matching. The MA4P504-144 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 MA4P504-144 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

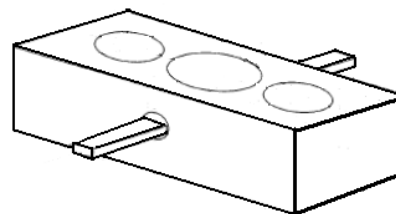
The MA4P504-144 broadband shunt-mounted PIN diode features a shunt-mounted PIN chip with an appropriate series inductance to produce a matched low pass filter structure at zero or reverse bias condition. By applying +10mA to +100mA to center conductor the diode's impedance changes to a low-impedance 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= $\frac{150^{\circ}\text{C}-T_{\text{ambient}}}{\text{Thermal Resistance}}$

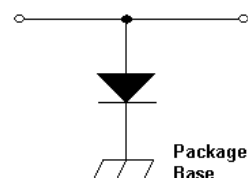
1. Operation of this device above any one of these parameters may cause permanent damage.

Stripline Packages



ODS-144

Internal Wiring Diagram



Specifications subject to change without prior notification.

1

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Specifications @ Tambient = + 25°C

Part Number ¹	Typical Frequency (GHz)	Typical Insertion ² Loss @ V _R (dB)	Typical 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
MA4P504-144	4-8 ²	0.50dB @0V	20dB @ 100mA	500	20	150	30

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

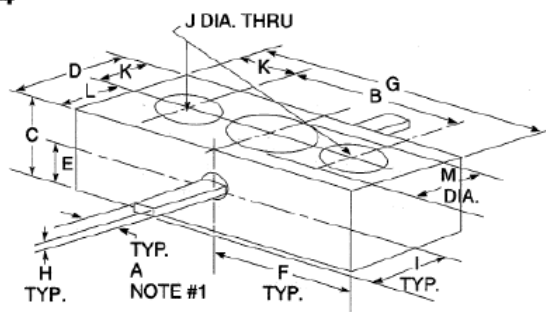
Outline Drawing

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

144



DIM.	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.022 NOMINAL	0.022 NOMINAL	0.590 NOMINAL	0.590 NOMINAL
B	0.250 NOMINAL	0.250 NOMINAL	6.350 NOMINAL	6.350 NOMINAL
C	0.125 NOMINAL	0.125 NOMINAL	3.180 NOMINAL	3.180 NOMINAL
D	0.155	0.165	3.940	4.190
E	0.065 NOMINAL	0.065 NOMINAL	1.65 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	0.096 NOMINAL	2.440 NOMINAL	2.440 NOMINAL
K	0.075	0.085	1.910	2.160
L	0.080 NOMINAL	0.080 NOMINAL	2.030 NOMINAL	2.030 NOMINAL
M	0.125 NOMINAL	0.125 NOMINAL	3.180 NOMINAL	3.180 NOMINAL

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