Axial Leaded Glass PIN Diodes

Multi Purpose Axial Leaded Glass PIN Diodes

Rev. V7

Features

- Glass Hermetically Sealed Packages
- Large Signal Switch Design
- Available in Low Capacitance
- Devices Usable up to 2GHz
- Passivated Chip for Low Leakage Current
- Tape and Reel Packaging Available
- MIL-STD -19500 Screening Available
- RoHS* Compliant

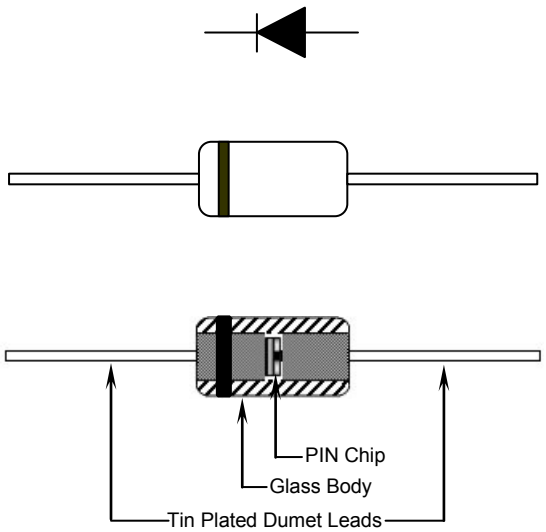
Description

The axial leaded glass PIN diode series of low and medium power are specifically designed for use in switches, duplexers, electrically tuned digital filters AGC attenuators, TR switches and RF modulators. They perform particularly well in distortion sensitive environments from HF through S-Band.

These hermetically sealed axial leaded PIN diodes are designed for use in the harshest commercial and military applications where their inherent ruggedness makes them an ideal choice. They may be ordered screened to meet MIL-STD-19500 requirements.

Glass Package Styles

ODS 4, 54, 139, 146



Design Recommendations

The axial leaded, glass, PIN diode series is available in four glass package styles. The ODS 54 is the most suitable to meet low power, low capacitance requirements for high isolation in a series connected switch at VHF frequencies. The ODS 4, 139 and 146 are most suited for moderate power applications requiring low package inductance.

MACOMs silicon PIN diode chips are also available in a wide variety of alternative package styles besides glass. For case style options, availability and electrical specifications, please refer to the "Packaged PIN Diode Datasheet" located on the MACOM website.

* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

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Electrical Specifications:

Part Number[6]	Package Style	Rev. Volt.[5] V_R < 10 µA (V_{DC})	Max. Cap. 1 MHz C_T @ -50 V (pF)	Max. Series Res. 100 MHz R_S @ 10 mA (Ω)	Nominal Characteristics	
					Carrier Lifetime[4] (µs)	I Region (Mils)
MA47120-54T	54	35	1.00[1]	0.5	3.0	0.4
MA4PH401-54T	54	50	0.30[1]	1.5	1.0	2.0
1N5719-54	54	100	0.35	1.5[2]	1.0	2.0
MA4P203-54	54	100	0.25[3]	1.5	0.1	0.8
MA47047-54	54	200	0.30	3.0	1.0	2.0
MA47600-54	54	200	0.30	6.0	2.0	4.0
MA4P404-54	54	250	0.30	0.7[3]	1.0	1.0
Part Number[6]	**Package Style**	**Rev. Volt.[5] V_R < 10 µA (V_{DC})**	**Max. Cap. 1 MHz C_T @ -50 V (pF)**	**Max. Series Res. 100 MHz R_S @ 10 mA (Ω)**	***Nominal Characteristics***	
					Carrier Lifetime[4] (µs)	**I Region (Mils)**
MA4PH151-139T	139	100	1.20	0.6	1.0	0.8
MA47110-139T	139	200	0.55	6.0	2.5	4.0
MA47123-139	139	200	0.50	3.0	1.0	2.0
Part Number[6]	**Package Style**	**Rev. Volt.[5] V_R < 10 µA (V_{DC})**	**Max. Cap. 1 MHz C_T @ -50 V (pF)**	**Max. Series Res. 100 MHz R_S @ 50 mA (Ω)**	***Nominal Characteristics***	
					Carrier Lifetime[4] (µs)	**I Region (Mils)**
MA47266-146	146	200	1.50	0.6	4.0	3.0
MA4PH301	146	200	1.10	1.0	4.0	3.0
Part Number[6]	**Package Style**	**Rev. Volt.[5] V_R < 10 µA (V_{DC})**	**Max. Cap. 1 MHz C_T @ -100 V (pF)**	**Max. Series Res. 100 MHz R_S @ 100 mA (Ω)**	***Nominal Characteristics***	
					Carrier Lifetime[4] (µs)	**I Region (Mils)**
MA4P504-4	4	500	0.35	0.60	1.0	2.0
MA4P505-4	4	500	0.50	0.45	2.0	2.0
MA4P506-4	4	500	0.85	0.30	2.5	2.0
MA4P606-4	4	1000	0.70	0.70	4.0	4.0

1. Tested at V_R = 20 V.
2. Tested at I_F = 50 mA.
3. Tested at V_R = 10 V.
4. Nominal carrier lifetime, TL, specified at I_F = + 10 mA , I_{REV} = -6 mA.
5. Minimum specified reverse voltage, V_R, is sourced and the resultant reverse leakage current, I_R, is measured to be <10 µA.
6. Contact factory for tape and reel part numbers and availability.

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Absolute Maximum Ratings[7]: T_A = +25°C (unless otherwise specified)

Parameter	Absolute Maximum
D.C. Reverse Voltage	(See Tables)
Operating Temperature	-55°C to +175°C
Storage Temperature	-55°C to +200°C
Installation Temperature	+280°C for 10 Seconds
Power Dissipation Listed Below Will De-Rate Linearly to 0 mW at 175°C	
Case Style 54	250 mW without Heatsink
Case Style 139	500 mW without Heatsink
Case Style 4 & 146	1000 mW without Heatsink

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

Environmental Ratings

These axial leaded glass PIN diodes are designed to meet most environmental and electrical requirements and may be ordered to MIL-STD-19500. Examples of the methods and conditions are described in the table below.

Test	Method MIL-STD 750	Description / Conditions
Moisture Resistance	1021	- - - - - - -
High Temperature Storage	1031	+175°C
HTRB	1038	80% of rated V_R, 50°C
Temperature Cycling	1051	-55°C to +175°C, 20 Cycles
Shock	2016	500 g's, 0.5mS
Vibration	2056	20g's
Solderability	2026	J-STD-002
Constant Acceleration	2006	20,000 g's
Fine Leak	1071	H
Gross Leak	1071	C or E

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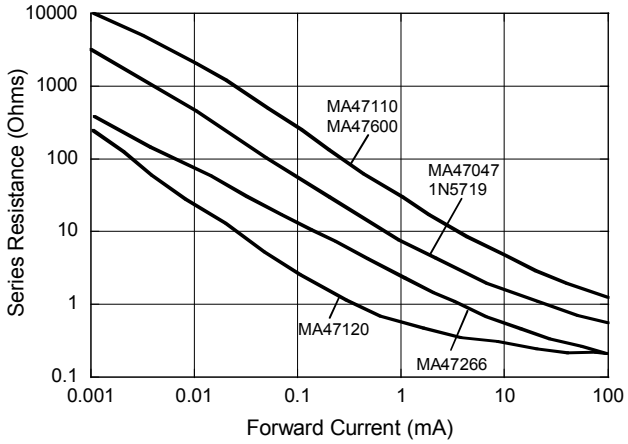
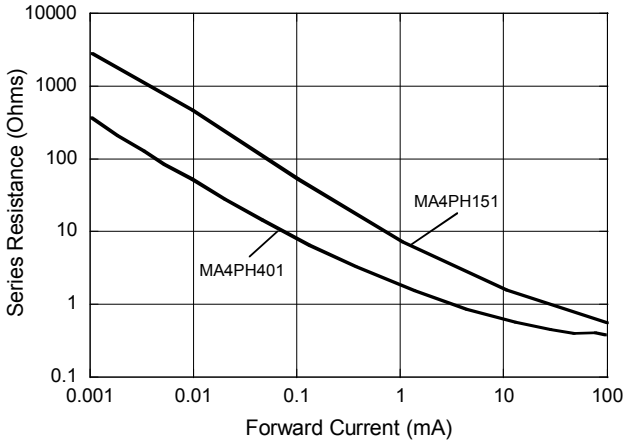
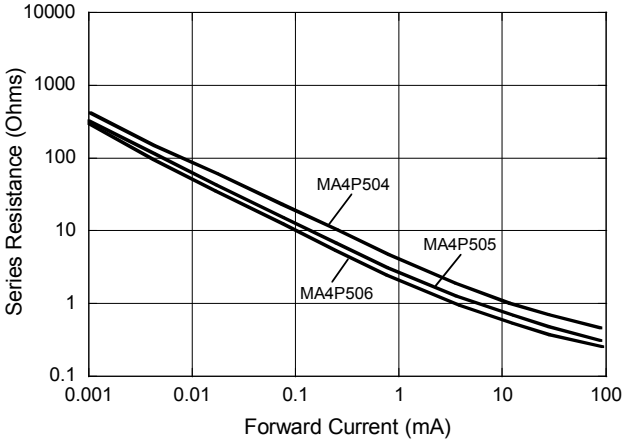
Typical Performance Curves: R_S vs. I_F @ T_A = +25°C







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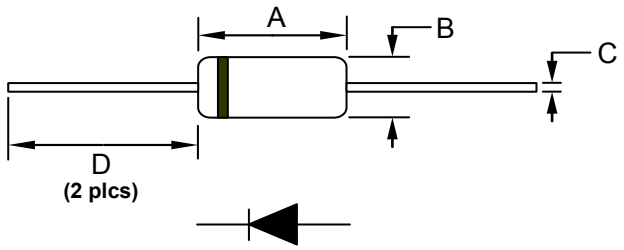
Package Outline Dimensions



Package Style	Dimension A		Dimension B		Dimension C		Dimension D (Min.)	
	Mils	mm	Mils	mm	Mils	mm	Mils	mm
4	265 ± 35	7.33 ± 0.89	96 ± 11	2.44 ± 0.28	20 ± 2	0.51 ± 0.05	1000	25.4
54	155 ± 10	3.94 ± 0.25	71 ± 3	1.80 ± 0.08	15 ± 1	0.38 ± 0.03	1000	25.4
139	150 ± 15	3.81 ± 0.38	60 ± 10	1.52 ± 0.25	20 ± 3	0.51 ± 0.08	1000	25.4
146	220 ± 20	5.59 ± 0.51	95 ± 10	2.41 ± 0.25	30 ± 3	0.51 ± 0.08	1000	25.4

Assembly Recommendations

- Leads on axial leaded devices must be formed while being held firm. Bending the leads too close to the body of the part may cause internal damage to the device. Bends <0.060" from body are not recommended. Appropriate fixturing should be used.
- Devices may be soldered using standard 60/40, Sn/Pb or RoHS compliant solders. Axial leads are tin plated, 50 µM, thick to ensure an optimum connection.
- For recommended Sn/Pb and RoHS soldering profiles See Application Note M538 on the MACOM website.

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