Axial Leaded Glass PIN Diodes

Multi Purpose Axial Leaded Glass PIN Diodes V6

Features

- Glass Hermetically Sealed Packages
- Large Signal Switch Design
- Available in Low Capacitance
- Passivated Chip for Low Leakage Current
- Tape and Reel Packaging Available
- Fully RoHS Compliant
- MIL-STD 19500 Screening Available

Description

M/A-COM Technology Solutions series of low and medium power glass PIN diodes are specifically designed for use in switches, duplexers, electrically tuned digital filters AGC attenuators, TR switches and RF modulators. They preform 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 ordered screened to meet MIL-STD 19500 requirements.

Absolute Maximum Ratings

T_{AMB} = +25°C (Unless Otherwise Noted) [1]

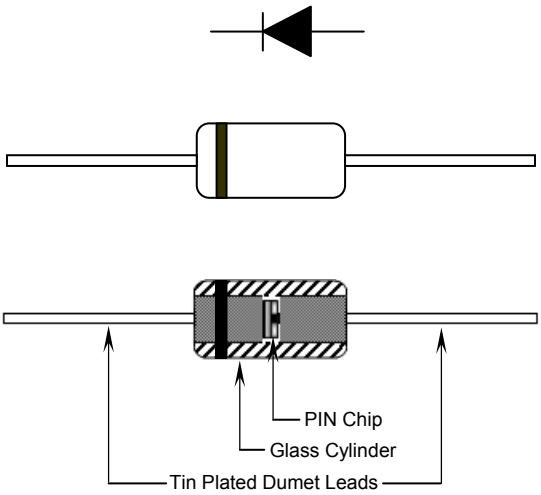
Parameter	Absolute Maximum
D.C. Reverse Voltage	(See Tables)
Operating Temperature	-55°C to +175°C
Storage Temperature	-55°C to +200°C
Installation Temperature	+280°C for 10 Seconds
Power Dissipation Listed Below Will De-Rate Linearly to 0mW at 175°C	
Case Style 54	250mW without heatsink
Case Style 139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

Notes

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

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.

M/A-COM Technology Solutions 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 M/A-COM Technology Solutions website at :
www.macomtech.com/DataSheets/packagedpindiodes.pdf

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Part Number	Package Style	Rev. Volt.[5] $V_{R<10\,\mu A}$ V_{DC}	Unless otherwise noted Max. Cap. 1MHz $C_{T\,@\,-50V}$ pF	Unless otherwise noted Max. Series Res. 100MHz $R_{S\,@\,10mA}$ Ω	Nominal Characteristics Carrier Lifetime[4] µS	Nominal Characteristics I Region Length Mils
MA47120	54	35	1.00 [1]	0.5	3.0	0.4
1N5719	54	100	0.35	1.5 [2]	1.0	2.0
MA4P203	54	100	0.25 [3]	1.5	0.1	0.8
MA47047	54	200	0.30	3.0	1.0	2.0
MA47600	54	200	0.30	6.0	2.0	4.0
MA4P404	54	250	0.30	.60 [2]	1.0	1.0

Part Number	Package Style	Rev. Volt.[5] $V_{R<10\,\mu A}$ V_{DC}	Max. Cap. 1MHz $C_{T\,@\,-50V}$ pF	Max. Series Res. 100MHz $R_{S\,@\,10mA}$ Ω	Nominal Characteristics Carrier Lifetime[4] µS	Nominal Characteristics I Region Length Mils
MA4PH151	139	100	1.20	0.6	1.0	0.8
MA47110	139	200	0.55	6.0	2.0	4.0
MA47123	139	200	0.50	3.0	1.0	2.0

Part Number	Package Style	Rev. Volt.[5] $V_{R<10\,\mu A}$ V_{DC}	Max. Cap. 1MHz $C_{T\,@\,-50V}$ pF	Max. Series Res. 100MHz $R_{S\,@\,50mA}$ Ω	Nominal Characteristics Carrier Lifetime[4] µS	Nominal Characteristics I Region Length Mils
MA47266	146	200	1.50	0.6	3.0	3.0
MA4PH301	146	200	1.10	1.0	5.0	5.0

Part Number	Package Style	Rev. Volt.[5] $V_{R<10\,\mu A}$ V_{DC}	Max. Cap. 1MHz $C_{T\,@\,-100V}$ pF	Max. Series Res. 100MHz $R_{S\,@\,100mA}$ Ω	Nominal Characteristics Carrier Lifetime[4] µS	Nominal Characteristics I Region Length Mils
MA4P504	4	500	0.35	0.60	1.0	2.0
MA4P505	4	500	0.50	0.45	2.0	2.0
MA4P506	4	500	0.85	0.30	3.0	2.0
MA4P606	4	1000	0.70	0.70	4.0	4.0

Notes:
1. Tested at V_R = 20V.
2. Tested at I_F = 50mA.
3. Tested at V_R = 10V.
4. Nominal carrier lifetime, T_L, specified at I_F = + 10mA , I_{REV} = - 6mA.
5. Minimum specified reverse voltage, V_R, is sourced and the resultant reverse leakage current, I_R, is measured to be <10µA.

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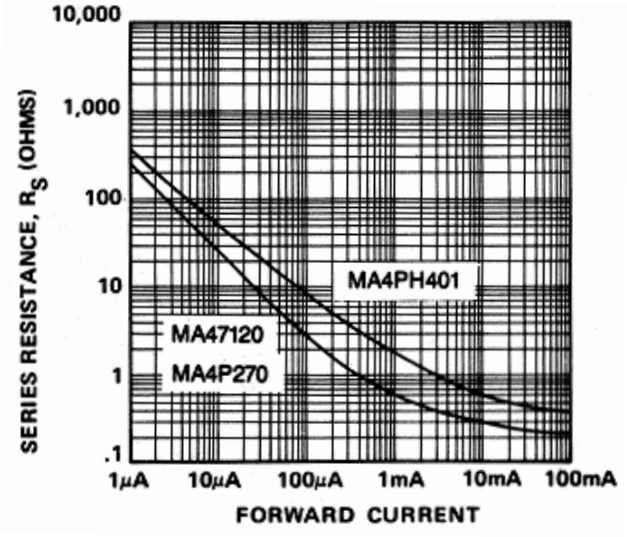
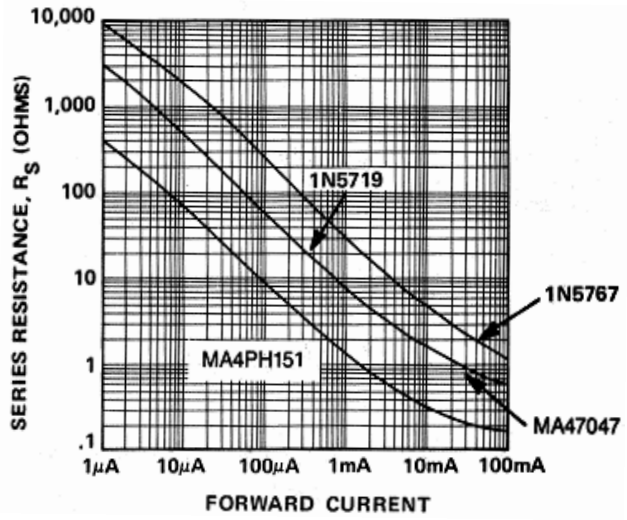
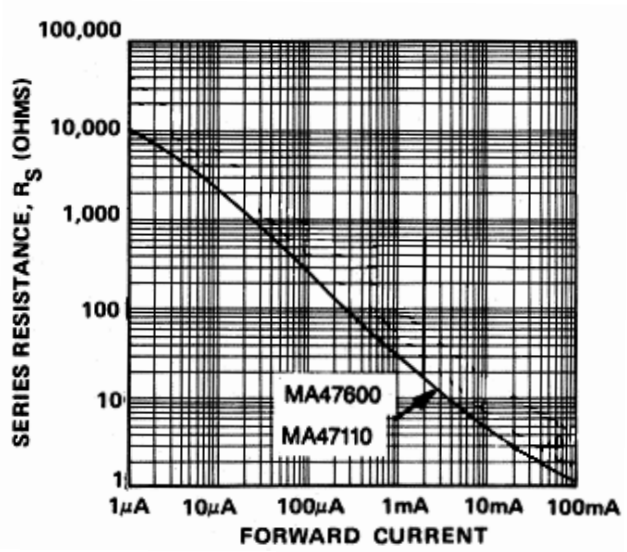
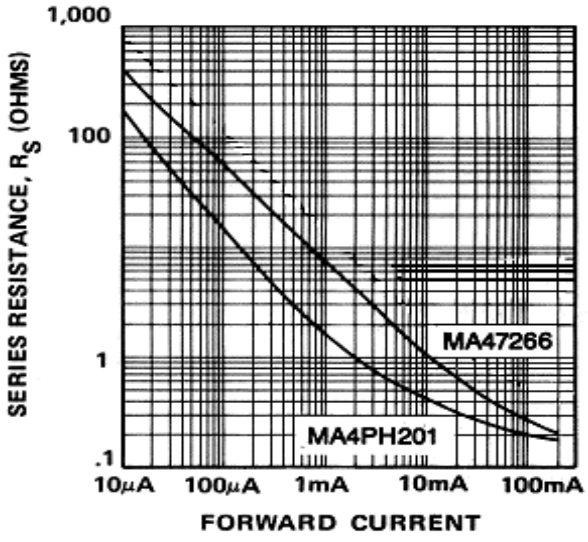
Typical R_S vs. I_F @ T_{AMB} = +25°C









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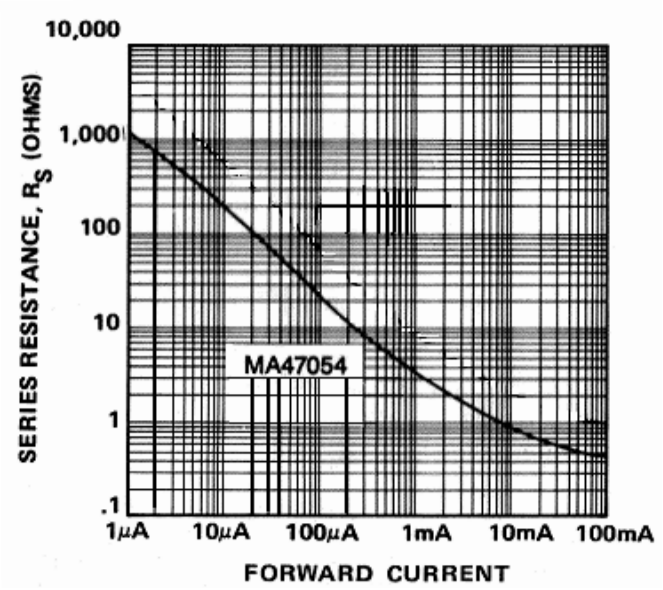

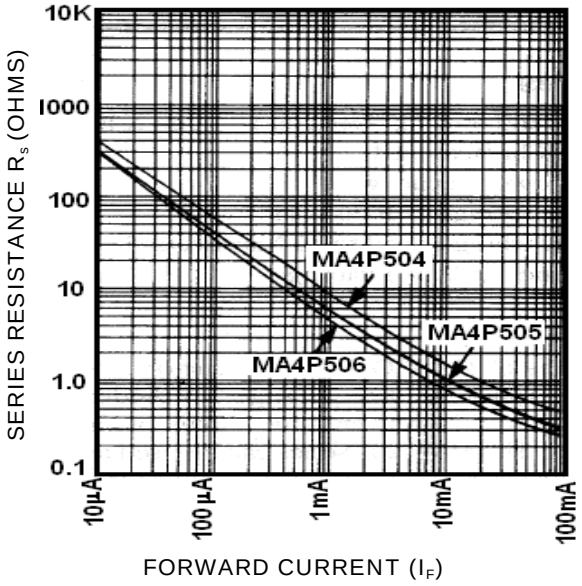

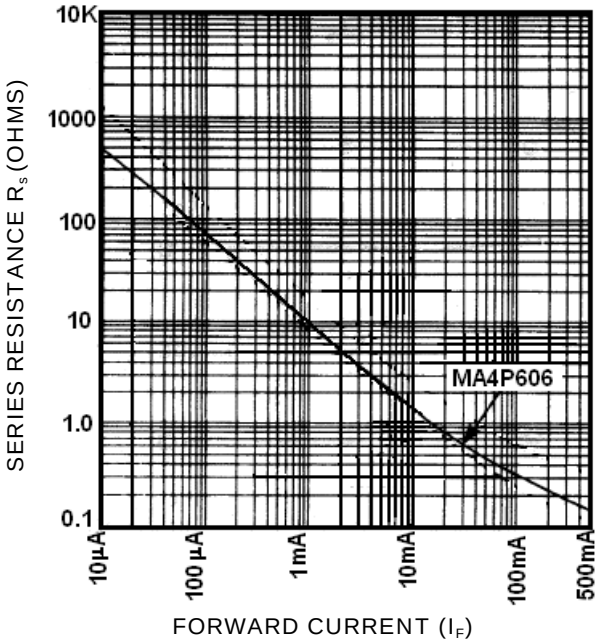

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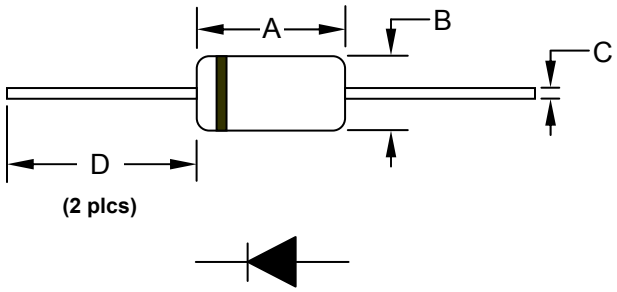
Package Outline Dimensions



Package Style	Dimension A		Dimension B		Dimension C		Dimension D (Min.)	
	Mils	mm	Mils	mm	Mils	mm	Mils	mm
4	265 ± 35	7.33 ± .89	96 ± 11	2.44 ± .28	20 ± 2	.51 ± .05	1000	25.4
54	155 ± 10	3.94 ± .25	71 ± 3	1.8 ± .08	15 ± 1	.38 ± .03	1000	25.4
139	150 ± 15	3.81 ± .38	60 ± 10	1.52 ± .25	20 ± 3	.51 ± .08	1000	25.4
146	220 ± 20	5.59 ± .51	95 ± 10	2.41 ± .25	30 ± 3	.51 ± .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, 50μM, thick to ensure an optimum connection.
- For recommended Sn/Pb and RoHS soldering profiles See Application Note M538 on the M/A-COM Technology Solutions website.

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Environmental Ratings

M/A-COM Technology Solutions axially leaded glass PIN diodes are designed to meet most environmental and electrical requirements and may be ordered screened 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	85°C, 85% Relative Humidity
High Temperature Storage	1031	+175°C
HTRB	1038	80% of rated V_R, 50°C
Temperature Cycling	1051	-65°C to +175°C, 20 Cycles
Shock	2016	500 g's
Vibration	2056	15 g's
Solderability	2026	IPC/JDEC J-STD-02
Constant Acceleration	2006	20,000 g's
Fine Leak	1071	H
Gross Leak	1071	C or E

Ordering Information

M/A-COM Technology Solutions glass PIN diodes are tape and reeled in 1000 piece quantities. The various base part numbers are only available in the case styles as shown in the tables on page 2. To order, indicate the base part number followed by a dash and the indicated package style. Also add a "T" at the end for tape and reel

For example: The MA4P504-4T is the MA4P504 chip in case style 4, tape and reeled.

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