



# THE DATASHEET OF MADP-007455-0287DT

### Features

- Low Loss, High Isolation Switching Diodes
- Low Distortion Attenuator Diodes
- Single and Dual Diode Configurations
- Tape & Reel Packaging
- Lead-Free Surface Mount Packages
- RoHS\* Compliant

### Description and Applications

MACOM offers silicon PIN diodes in five standard, low cost, surface mount plastic packages for use as switches and attenuators. These diodes are offered with 100% matte Sn plating. These PIN diodes feature a variety of I-region lengths resulting in lower resistance, and lower capacitance devices for various microwave control circuit applications.

The MA4P7436, and MADP-007436 series offer the lowest series resistance for best performance as low loss series switches and high isolation shunt switches.

The MA4P7433, and MADP-007433 series have the lowest capacitance and offers the highest isolation in series and series-shunt switches through 3 GHz.

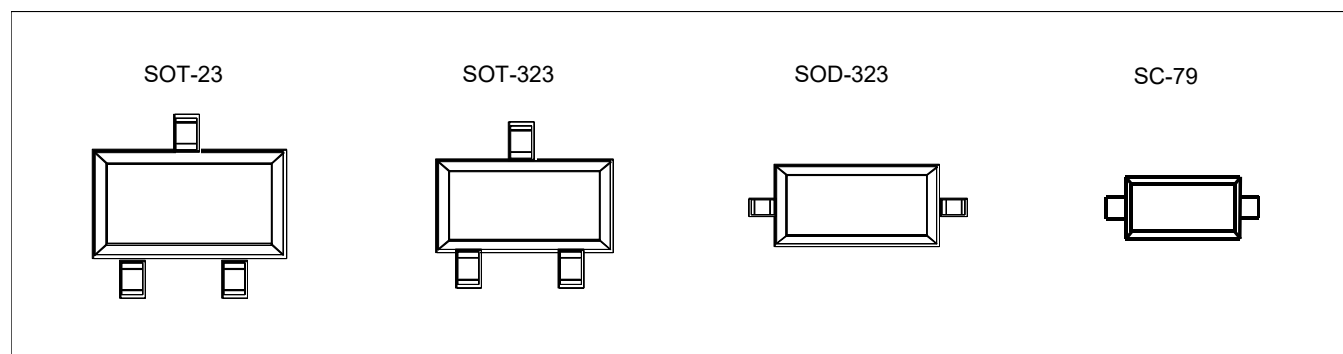
The MA4P7447, MADP-007155 series, MA4P7455, MADP-007455 series and the MADP-007448 series are general purpose PIN diodes useful as either switches or attenuators.

The MA4P7437, MADP-007437 series and MA4P7438, MADP-007438 series device have thicker intrinsic regions to provide lower distortion in attenuator circuits.

The MADP-007167 series devices have the thickest I-Region, offering the lowest distortion and highest IP3 for current controlled attenuator circuits. These devices are ideal for AGC functions for infrastructure and CATV applications.

These parts are available as single diodes, series tees (ST), series tee reverse (STR), common cathode pairs (CK), and common anode pairs (CA). MACOM's PIN diodes are available in the SOT-23 (case style 287), the SOT-323/SC-70(3L) (case style 1146), the SOD-323 (case style 1141), and the SC-79 (case style 1279) packages. These packages are supplied on tape and reel for automatic pick and place assembly. The tape and reel suffix designation is a "T" at the end of the part number.

### Package Outlines



\* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

## Electrical Specifications @ +25°C

| Part #                         | Reverse Voltage <sup>1</sup><br>(V) | Total Capacitance <sup>2</sup><br>Maximum<br>(pF) | RS @ 10 mA <sup>3</sup><br>Maximum<br>(Ohms) | Nominal Characteristics               |                              |
|--------------------------------|-------------------------------------|---------------------------------------------------|----------------------------------------------|---------------------------------------|------------------------------|
|                                |                                     |                                                   |                                              | Carrier Lifetime <sup>4</sup><br>(μs) | I-Region Thickness<br>(mils) |
| MA4P7436<br>MADP-007436 Series | 75                                  | 1.00 @ 20 V                                       | 0.5                                          | 0.2                                   | 0.4                          |
| MA4P7433<br>MADP-007433 Series | 75                                  | 0.35 @ 20 V                                       | 1.5                                          | 0.2                                   | 0.4                          |
| MA4P7447<br>MADP-007155 Series | 100                                 | 1.20 @ 20 V                                       | 0.6                                          | 1.0                                   | 0.8                          |
| MADP-007448 Series             | 100                                 | 0.25 @ 50 V                                       | 2.0                                          | 0.4                                   | 0.6                          |
| MA4P7455<br>MADP-007455 Series | 100                                 | 0.35 @ 50 V                                       | 3.0                                          | 1.0                                   | 2.0                          |
| MA4P7437<br>MADP-007437 Series | 200                                 | 0.35 @ 50 V                                       | 6.0                                          | 2.0                                   | 4.0                          |
| MA4P7438<br>MADP-007438 Series | 200                                 | 0.35 @ 50 V                                       | 10.0                                         | 3.0                                   | 5.0                          |
| MADP-007167                    | 200                                 | 0.30 @ 50 V                                       | 16.0                                         | 3.0                                   | 7.0                          |
| MADP-011192                    | 500                                 | 0.50 @ 50 V                                       | 2.5                                          | 1.2                                   | 1.7                          |

1. The reverse current will not exceed 10 μA at the reverse voltage rating.
2. Total capacitance is measured at 1 MHz at the indicated voltage.
3. Series resistance is measured at the specified current and a frequency of 100 MHz.
4. Nominal minority carrier lifetime is measured at  $I_F = 10$  mA,  $I_R = 6$  mA, 90% recovery.

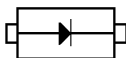
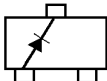
Absolute Maximum Ratings @ +25°C<sup>5</sup> (Unless Otherwise Noted)

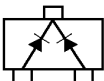
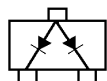
| Parameter                                                                                           | Rating          |
|-----------------------------------------------------------------------------------------------------|-----------------|
| Operating Temperature                                                                               | -65°C to +125°C |
| Storage Temperature                                                                                 | -65°C to +150°C |
| Junction Temperature                                                                                | +175°C          |
| RF CW Incident Power:                                                                               |                 |
| MA4P7447, MADP-007155 Series (θ die = 15°C/W), RF & DC Incident De-rating Coefficient = -21.3 mW/°C | 32 dBm          |
| MA4P7436, MADP-007436 Series (θ die = 25°C/W), RF & DC Incident De-rating Coefficient = -16.8 mW/°C | 31 dBm          |
| MA4P7438, MADP-007438 Series (θ die = 30°C/W), RF & DC Incident De-rating Coefficient = -13.3 mW/°C | 30 dBm          |
| MA4P7455, MADP-007455 Series (θ die = 35°C/W), RF & DC Incident De-rating Coefficient = -13.3 mW/°C | 30 dBm          |
| MA4P7437, MADP-007437 Series (θ die = 45°C/W), RF & DC Incident De-rating Coefficient = -13.3 mW/°C | 30 dBm          |
| MADP-007167 Series (θ die = 55°C/W), RF & DC Incident De-rating Coefficient = -13.3 mW/°C           | 30 dBm          |
| MA4P7433, MADP-007433 Series (θ die = 80°C/W), RF & DC Incident De-rating Coefficient = -10.7 mW/°C | 29 dBm          |
| MADP-007448 Series (θ die = 80°C/W), RF & DC Incident De-rating Coefficient = -10.7 mW/°C           | 32 dBm          |
| MADP-011192 Series (θ die = 16°C/W), RF & DC Incident De-rating Coefficient = -13.3 mW/°C           | 29 dBm          |
| Total (RF + DC) Power Dissipation:                                                                  |                 |
| (SOT-23): RF & DC Dissipated De-rating Coefficient = -33.3 mW/°C                                    | 250 mW          |
| (SOT-323, SOD-323, SC-79): RF & DC Dissipated De-rating Coefficient = -26.7 mW/°C                   | 200 mW          |
| Reverse Voltage                                                                                     | Voltage Rating  |
| Forward Current                                                                                     | 150 mA DC       |

2. 5. Operation of these devices above any one of these parameters may cause permanent damage.

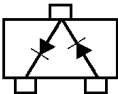
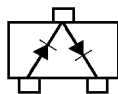
MACOM Technology Solutions Inc. (MACOM) and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.  
Visit [www.macom.com](https://www.macom.com) for additional data sheets and product information.

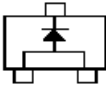
## Packaging and Configurations

|                                                                                   |                                                  |                                                                                     |                                                  |
|-----------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------|
|  |                                                  |  |                                                  |
| Single                                                                            |                                                  | Single                                                                              |                                                  |
| SC-79 Part #                                                                      | SOD-323 Part #                                   | SOT-23 Part #                                                                       | SC70 (3L) Part #                                 |
| $L_s = 0.6 \text{ nH}$ , $C_p = 0.10 \text{ pF}$                                  | $L_s = 1.3 \text{ nH}$ , $C_p = 0.11 \text{ pF}$ | $L_s = 1.4 \text{ nH}$ , $C_p = 0.12 \text{ pF}$                                    | $L_s = 1.3 \text{ nH}$ , $C_p = 0.12 \text{ pF}$ |
| MADP-007436-12790T                                                                | MA4P7436-1141T                                   | MA4P7436-287T                                                                       | MA4P7436-1146T                                   |
| MADP-007433-12790T                                                                | MA4P7433-1141T                                   | MA4P7433-287T                                                                       | —                                                |
| —                                                                                 | MA4P7447-1141T                                   | MA4P7447-287T                                                                       | —                                                |
| MADP-007448-12790T                                                                | MADP-007448-11410T                               | MADP-007448-0287AT                                                                  | —                                                |
| MADP-007455-12790T                                                                | MA4P7455-1141T                                   | MA4P7455-287T                                                                       | —                                                |
| —                                                                                 | MA4P7437-1141T                                   | MA4P7437-287T                                                                       | —                                                |
| —                                                                                 | MA4P7438-1141T                                   | MA4P7438-287T                                                                       | —                                                |
| —                                                                                 | MADP-007167-11410T                               | MADP-007167-0287AT                                                                  | —                                                |

|                                                                                     |                                                  |                                                                                       |                                                  |
|-------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------|
|  |                                                  |  |                                                  |
| Common Cathode                                                                      |                                                  | Common Anode                                                                          |                                                  |
| SOT-23 Part #                                                                       | SC70 (3L) Part #                                 | SOT-23 Part #                                                                         | SC70 (3L) Part #                                 |
| $L_s = 1.4 \text{ nH}$ , $C_p = 0.12 \text{ pF}$                                    | $L_s = 1.3 \text{ nH}$ , $C_p = 0.12 \text{ pF}$ | $L_s = 1.4 \text{ nH}$ , $C_p = 0.12 \text{ pF}$                                      | $L_s = 1.3 \text{ nH}$ , $C_p = 0.12 \text{ pF}$ |
| MA4P7436CK-287T                                                                     | MA4P7436CK-1146T                                 | MA4P7436CA-287T                                                                       | MA4P7436CA-1146T                                 |
| MA4P7433CK-287T                                                                     | MA4P7433CK-1146T                                 | MA4P7433CA-287T                                                                       | MA4P7433CA-1146T                                 |
| MA4P7447CK-287T                                                                     | —                                                | MA4P7447CA-287T                                                                       | —                                                |
| MADP-007448-0287FT                                                                  | —                                                | MADP-007448-0287GT                                                                    | MADP-007448-1146GT                               |
| MA4P7455CK-287T                                                                     | MA4P7455CK-1146T                                 | MA4P7455CA-287T                                                                       | MA4P7455CA-1146T                                 |
| MADP-007437-0287FT                                                                  | —                                                | MA4P7437CA-287T                                                                       | —                                                |
| MADP-007438-0287FT                                                                  | —                                                | MA4P7438CA-287T                                                                       | —                                                |
| MADP-007167-0287FT                                                                  | —                                                | MADP-007167-0287GT                                                                    | —                                                |

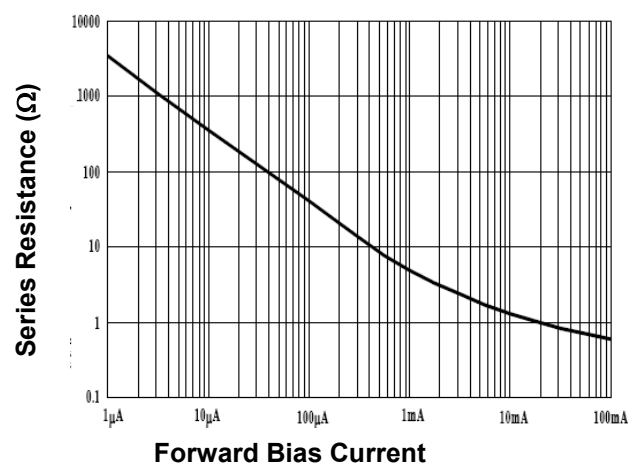
## Packaging and Configurations

|                                                                                   |                                                  |                                                                                     |                                                  |
|-----------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------|
|  |                                                  |  |                                                  |
| Series Tee                                                                        |                                                  | Series Tee Reverse                                                                  |                                                  |
| SOT-23 Part #                                                                     | SC70 (3L) Part #                                 | SOT-23 Part #                                                                       | SC70 (3L) Part #                                 |
| $L_S = 1.4 \text{ nH}$ , $C_P = 0.12 \text{ pF}$                                  | $L_S = 1.3 \text{ nH}$ , $C_P = 0.12 \text{ pF}$ | $L_S = 1.4 \text{ nH}$ , $C_P = 0.12 \text{ pF}$                                    | $L_S = 1.3 \text{ nH}$ , $C_P = 0.12 \text{ pF}$ |
| MA4P7436ST-287T                                                                   | MA4P7436ST-1146T                                 | MADP-007436-0287DT                                                                  | MADP-007436-1146DT                               |
| MA4P7433ST-287T                                                                   | MA4P7433ST-1146T                                 | MADP-007433-0287DT                                                                  | MADP-007433-1146DT                               |
| MA4P7447ST-287T                                                                   | —                                                | MADP-007155-0287DT                                                                  | —                                                |
| MADP-007448-0287BT                                                                | MADP-007448-1146BT                               | MADP-007448-0287DT                                                                  | MADP-007448-1146DT                               |
| MA4P7455ST-287T                                                                   | MA4P7455ST-1146T                                 | MADP-007455-0287DT                                                                  | MADP-007455-1146DT                               |
| MADP-007437-0287BT                                                                | —                                                | MADP-007437-0287DT                                                                  | —                                                |
| MADP-007438-0287BT                                                                | —                                                | MADP-007438-0287DT                                                                  | —                                                |
| MADP-007167-0287BT                                                                | —                                                | MADP-007167-0287DT                                                                  | —                                                |
| —                                                                                 | —                                                | MADP-011192-0287DT                                                                  | —                                                |

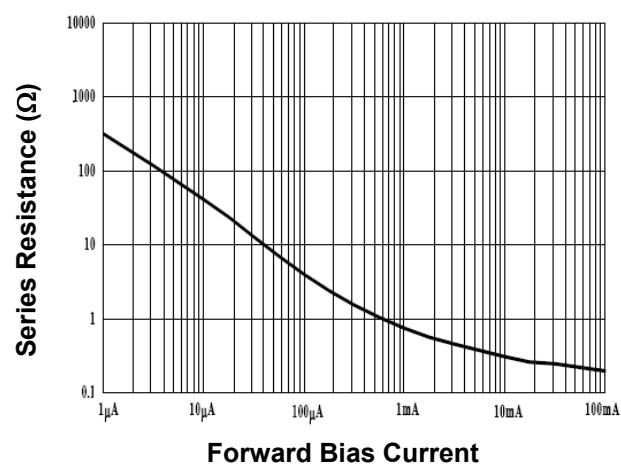
|                                                                                     |
|-------------------------------------------------------------------------------------|
|  |
| Low Inductance                                                                      |
| SOT-23 Part #                                                                       |
| $L_S = 0.4 \text{ nH}$ , $C_P = 0.12 \text{ pF}$                                    |
| MADP-007167-0287HT                                                                  |
| MADP-007433-0287HT                                                                  |

### Typical Forward Resistance vs. DC Bias Current Curves @ 100 MHz

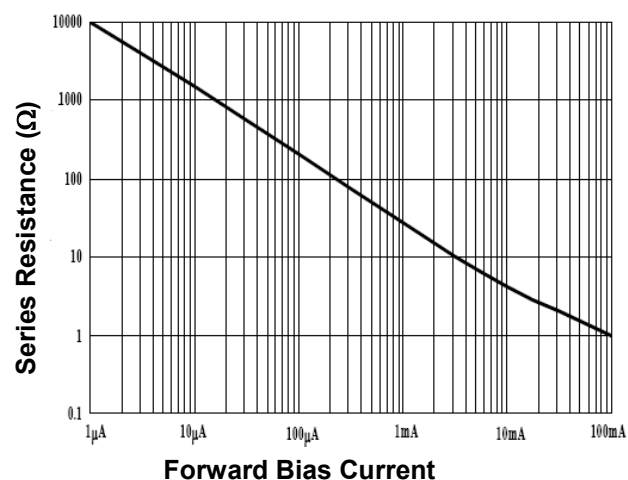
**Resistance vs. Forward Current**  
(MA4P7455 /MADP-007155 Series)



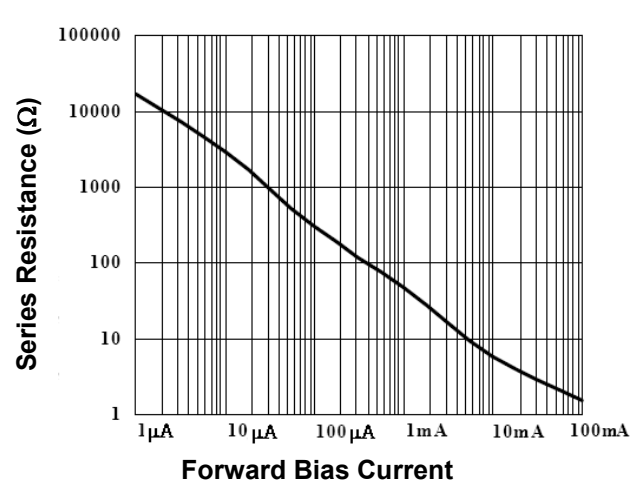
**Resistance vs. Forward Current**  
(MA4P7436 /MADP-007436 Series)



**Resistance vs. Forward Current**  
(MA4P7437 /MADP-007437 Series)

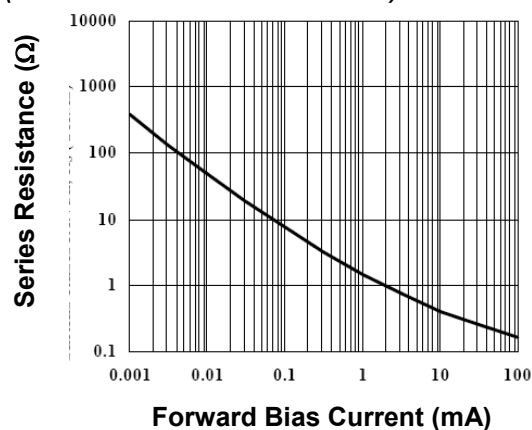


**Resistance vs. Forward Current**  
(MA4P7438 /MADP-007438 Series)

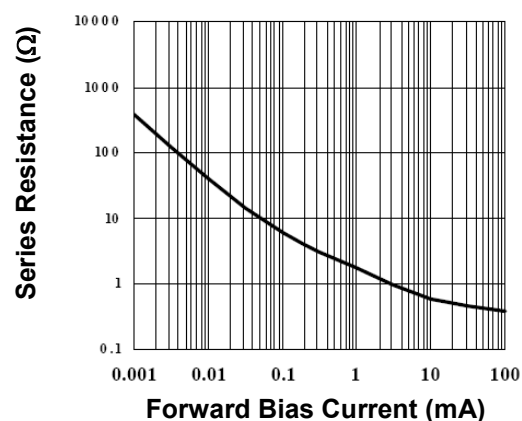


### Typical Forward Resistance vs. DC Bias Current Curves @ 100 MHz

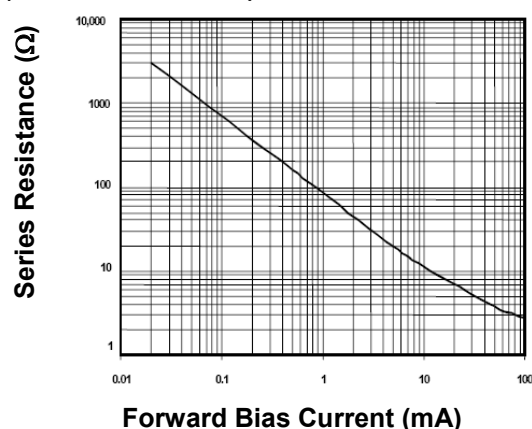
**Resistance vs. Forward Current**  
(MA4P7447 / MADP-007155 Series)



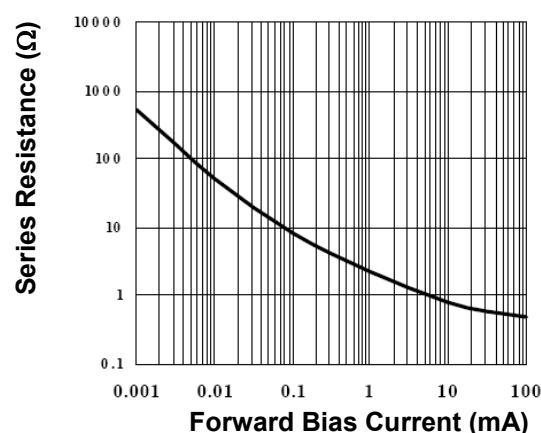
**Resistance vs. Forward Current**  
(MA4P7433/ MADP-007433 Series)



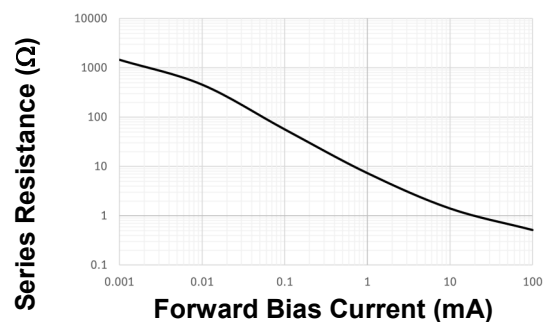
**Resistance vs. Forward Current**  
(MADP-007167 Series)



**Resistance vs. Forward Current**  
(MADP-007448 Series)

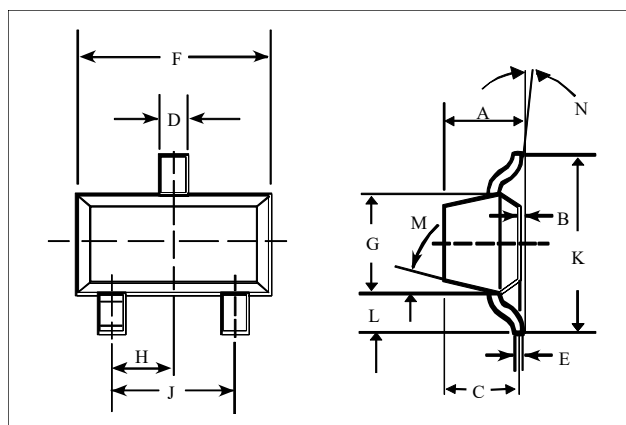


**Resistance vs. Forward Current**  
(MADP-011192 Series)



### Case Styles

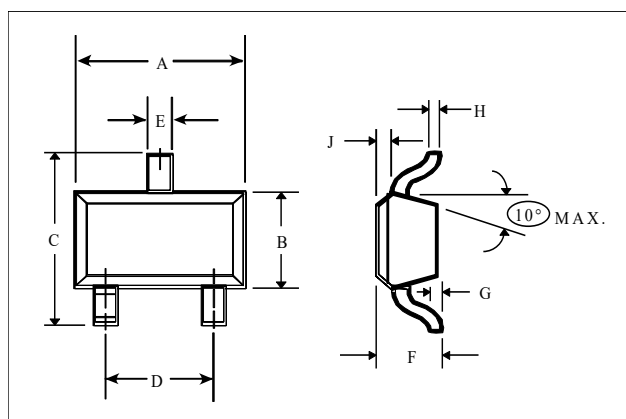
#### SOT-23 (Case Style 287)



| DIM. | INCHES                |       | MILLIMETERS  |      |
|------|-----------------------|-------|--------------|------|
|      | MIN.                  | MAX.  | MIN.         | MAX. |
| A    | —                     | 0.048 | —            | 1.22 |
| B    | —                     | 0.008 | —            | 0.20 |
| C    | —                     | 0.040 | —            | 1.00 |
| D    | 0.013                 | 0.020 | 0.35         | 0.50 |
| E    | 0.003                 | 0.006 | 0.08         | 0.15 |
| F    | 0.110                 | 0.119 | 2.80         | 3.00 |
| G    | 0.047                 | 0.056 | 1.20         | 1.40 |
| H    | 0.037 typical         |       | 0.95 typical |      |
| J    | 0.075 typical         |       | 1.90 typical |      |
| K    | —                     | 0.103 | —            | 2.60 |
| L    | —                     | 0.024 | —            | 0.60 |
| DIM. | GRADIENT              |       |              |      |
| M    | 10° max. <sup>6</sup> |       |              |      |
| N    | 2° . . . 30°          |       |              |      |

6. Applicable on all sides

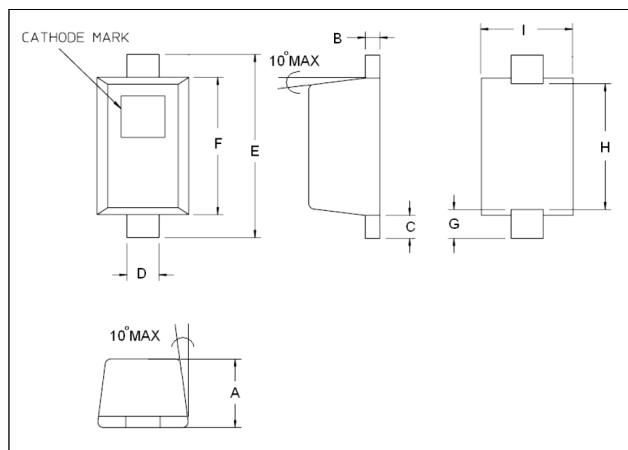
#### SC-70, 3 Lead (Case Style 1146)



| DIM. | INCHES |       | MILLIMETERS |      |
|------|--------|-------|-------------|------|
|      | MIN.   | MAX.  | MIN.        | MAX. |
| A    | 0.071  | 0.087 | 1.80        | 2.21 |
| B    | 0.045  | 0.053 | 1.14        | 1.35 |
| C    | 0.071  | 0.094 | 1.80        | 2.39 |
| D    | 0.047  | 0.057 | 1.19        | 1.45 |
| E    | 0.010  | 0.016 | 0.25        | 0.41 |
| F    | 0.031  | 0.039 | 0.79        | 1.00 |
| G    | 0.000  | 0.004 | 0.00        | 0.10 |
| H    | 0.004  | 0.007 | 0.10        | 0.18 |
| J    | 0.004  | 0.010 | 0.10        | 0.25 |

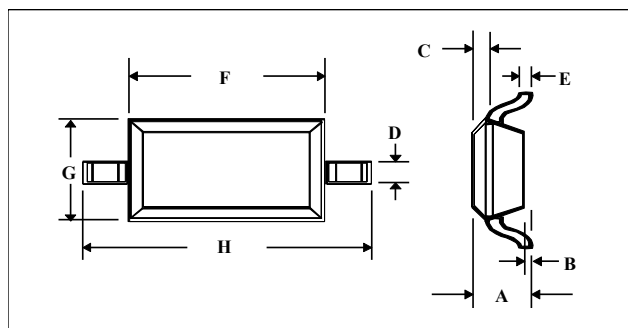
### Case Styles (Cont'd)

#### SC-79 (Case Style 1279)



| DIM. | INCHES         |        | MILLIMETERS   |      |
|------|----------------|--------|---------------|------|
|      | MIN.           | MAX.   | MIN.          | MAX. |
| A    | 0.0197         | 0.0276 | 0.50          | 0.70 |
| B    | 0.003          | 0.008  | 0.07          | 0.20 |
| C    | 0.006          | 0.010  | 0.15          | 0.25 |
| D    | 0.010          | 0.014  | 0.25          | 0.35 |
| E    | 0.059          | 0.067  | 1.50          | 1.70 |
| F    | 0.043          | 0.051  | 1.09          | 1.30 |
| G    | 0.0098 nominal |        | 0.250 nominal |      |
| H    | 0.0433 nominal |        | 1.10 nominal  |      |
| I    | 0.027          | 0.035  | 0.68          | 0.89 |

#### SOD-323 (Case Style 1141)



| DIM. | INCHES |       | MILLIMETERS |      |
|------|--------|-------|-------------|------|
|      | MIN.   | MAX.  | MIN.        | MAX. |
| A    | —      | 0.043 | —           | 1.1  |
| B    | —      | 0.004 | —           | 0.1  |
| C    | —      | 0.008 | —           | 0.2  |
| D    | 0.010  | 0.016 | 0.25        | 0.41 |
| E    | 0.003  | 0.006 | 0.07        | 0.15 |
| F    | 0.063  | 0.075 | 1.6         | 1.9  |
| G    | 0.045  | 0.057 | 1.14        | 1.45 |
| H    | 0.091  | 0.106 | 2.3         | 2.7  |

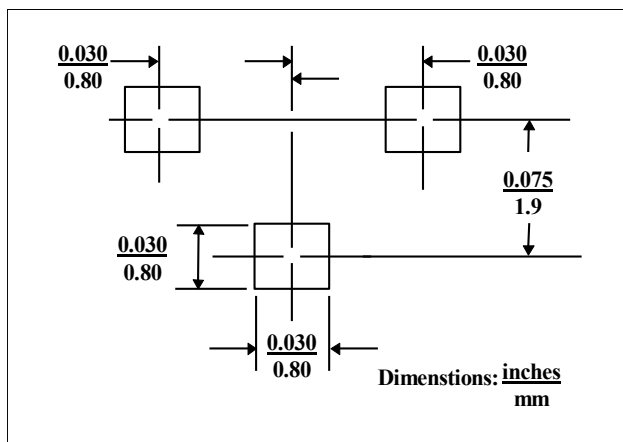
### Mounting Information

The illustration indicates the recommended mounting pad configuration for the SOT-23, SOT-323, SOD-323, and SC-79 packages. Solder paste containing flux should be screened onto the pads to a thickness of 0.005- 0.007 inches. The plastic package is placed in position, firmly adhering to the solder paste.

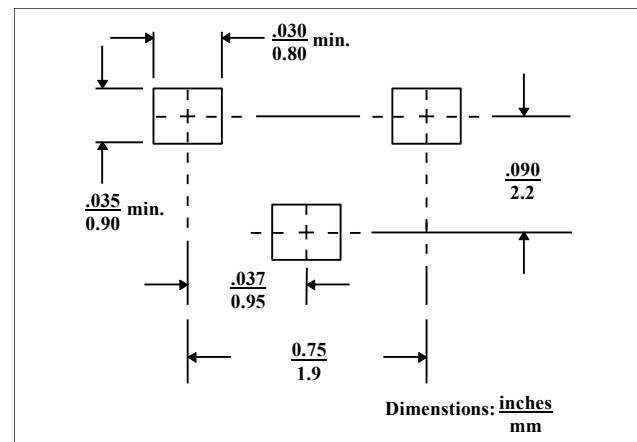
Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275°C and the body temperature does not exceed +250°C, for standard models and +260°C for the RoHS compliant devices.

Please refer to Application Note M538 for surface mounting instructions.

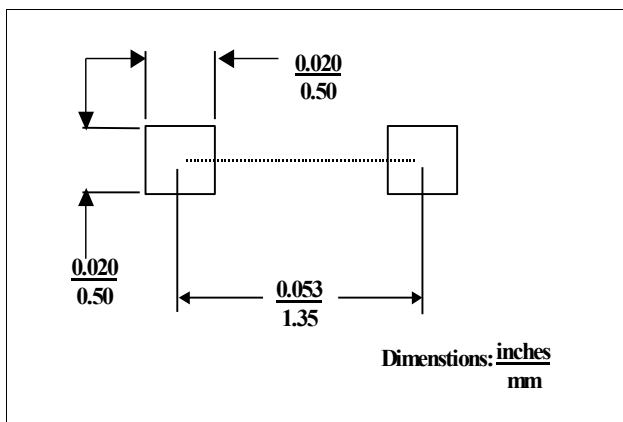
### SOT-323



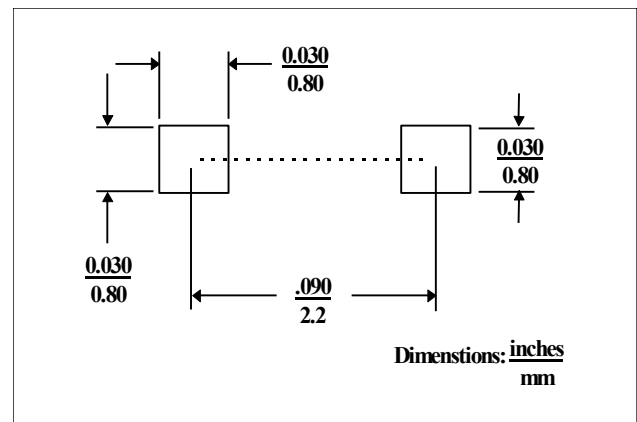
### SOT-23



### SC-79



### SOD-323



MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.

These materials are provided in connection with MACOM's products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- ⊖ View [MADP-007455-0287DT](#) on WIN SOURCE
- ⊖ [M/A-Com Technology Solutions](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management