

Surface Mount Plastic PIN Diodes

Rev. V25

Electrical Specifications @ +25°C

| Part # | Reverse Voltage ¹ (V) | Total Capacitance ² Maximum (pF) | RS @ 10 mA ³ Maximum (Ohms) | Nominal Characteristics | |
|--------------------------------|-------------------------------------|---|--|---------------------------------------|------------------------------|
| | | | | Carrier Lifetime ⁴ (µs) | I-Region Thickness (mils) |
| MA4P7436 MADP-007436 Series | 75 | 1.00 @ 20 V | 0.5 | 0.2 | 0.4 |
| MA4P7433 MADP-007433 Series | 75 | 0.35 @ 20 V | 1.5 | 0.2 | 0.4 |
| MA4P7447 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 MADP-007455 Series | 100 | 0.35 @ 50 V | 3.0 | 1.0 | 2.0 |
| MA4P7437 MADP-007437 Series | 200 | 0.35 @ 50 V | 6.0 | 2.0 | 4.0 |
| MA4P7438 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 |

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°C⁵ (Unless Otherwise Noted)

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

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

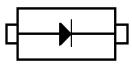
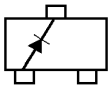
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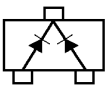
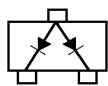
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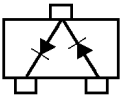
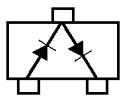
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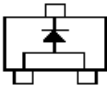
Packaging and Configurations

|  | |  | |
|---|---|---|---|
| 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 | — |

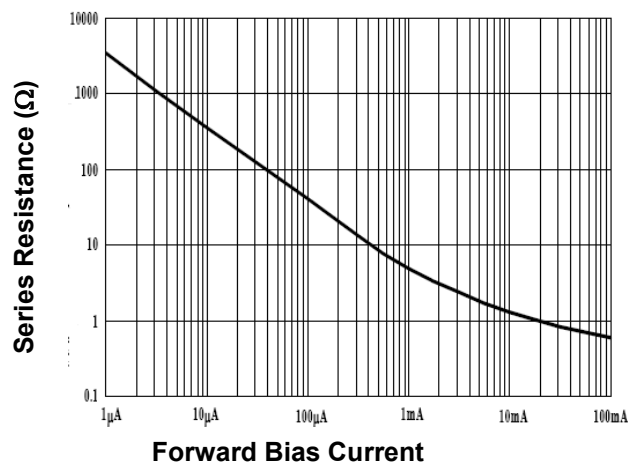
Packaging and Configurations

|  | |  | |
|---|---|---|---|
| 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 | — |

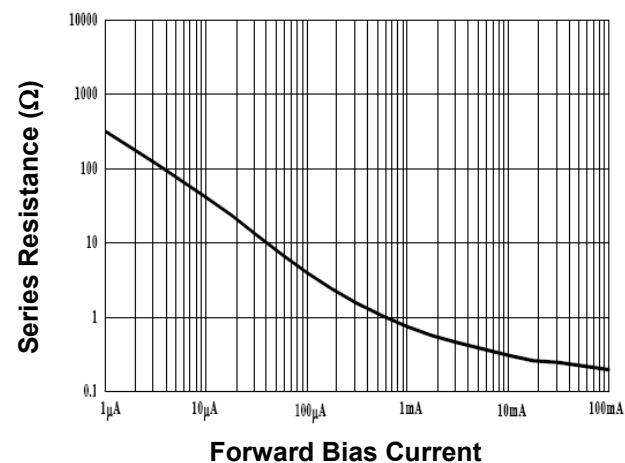
|  |
|---|
| Low Inductance |
| SOT-23 Part # |
| $L_S = 0.4 \text{ nH}, C_P = 0.12 \text{ pF}$ |
| MADP-007167-0287HT |
| MADP-007433-0287HT |

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

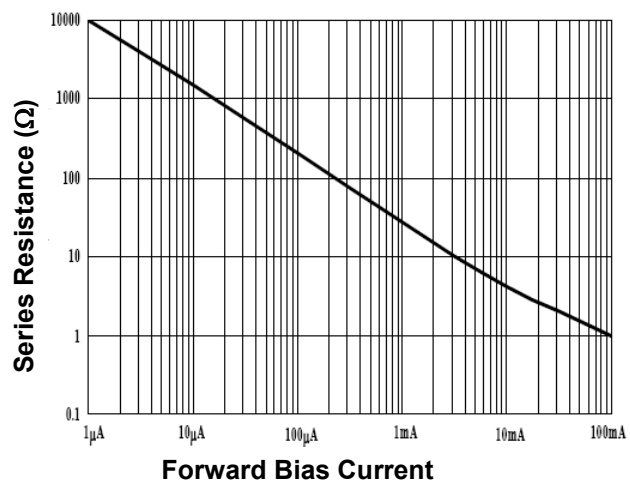
*Resistance vs. Forward Current
(MA4P7455 /MADP-007155 Series)*



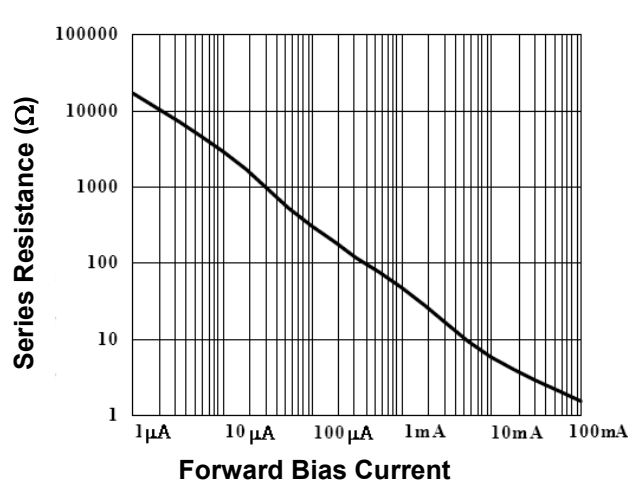
*Resistance vs. Forward Current
(MA4P7436 /MADP-007436 Series)*



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

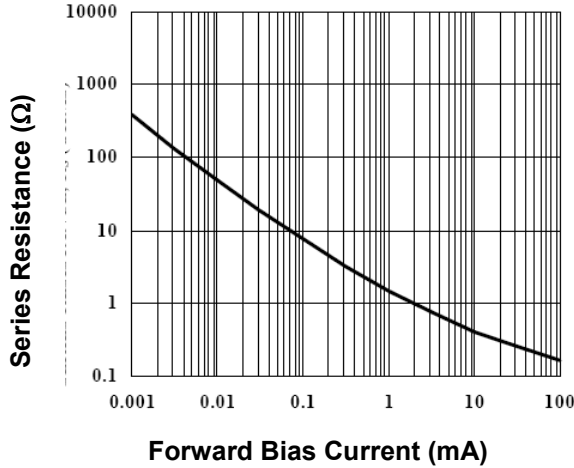


*Resistance vs. Forward Current
(MA4P7438 /MADP-007438 Series)*

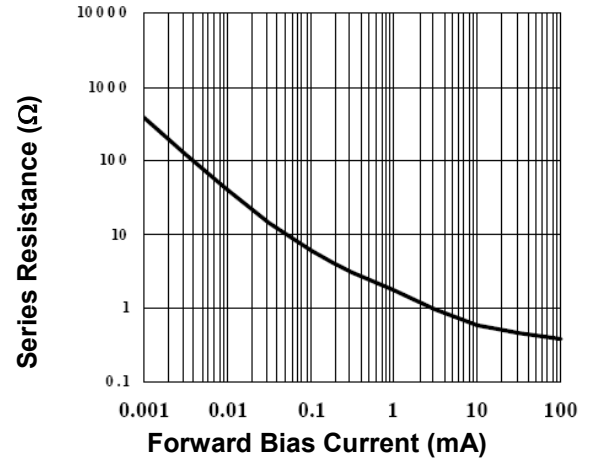


Typical Forward Resistance vs. DC Bias Current Curves @ 100 MHz

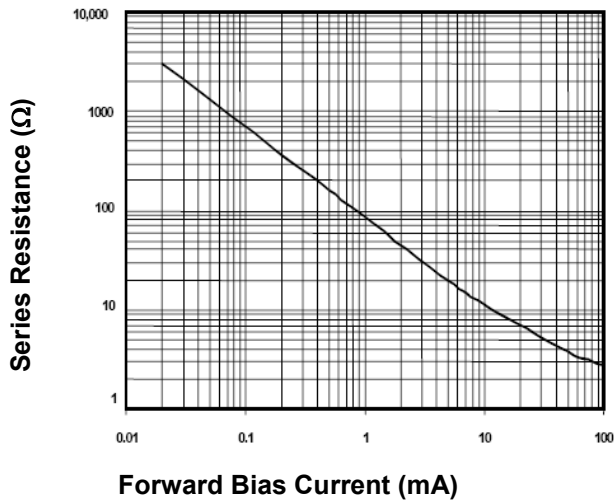
Resistance vs. Forward Current
(MA4P7447 / MADP-007155 Series)



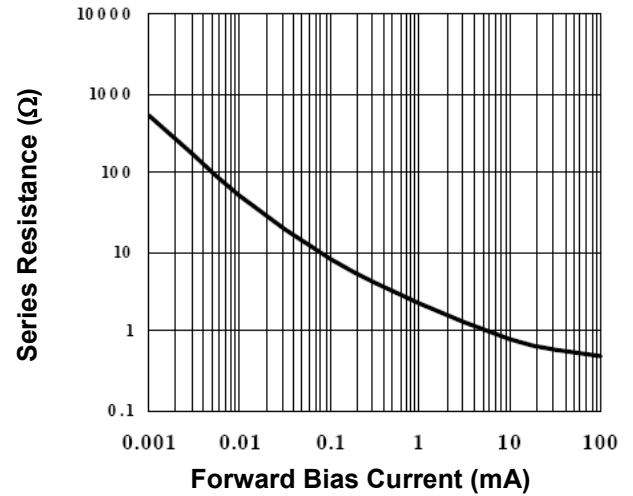
Resistance vs. Forward Current
(MA4P7433/ MADP-007433 Series)



Resistance vs. Forward Current
(MADP-007167 Series)

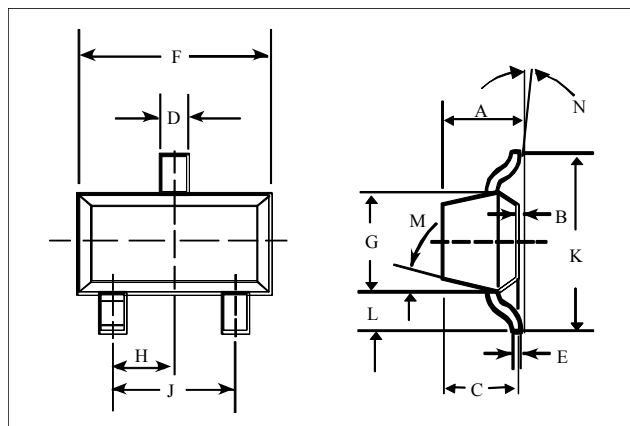


Resistance vs. Forward Current
(MADP-007448 Series)



Case Styles

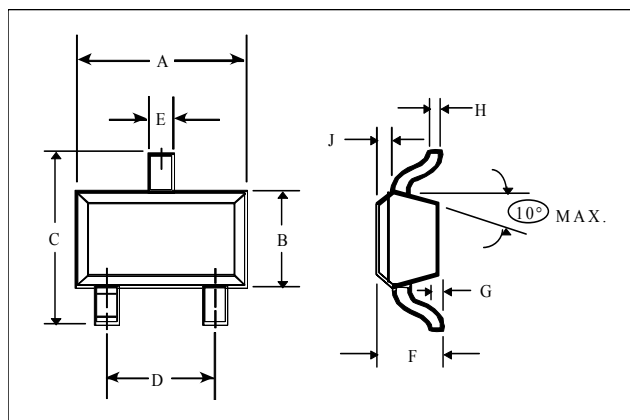
SOT-23 (Case Style 287)



| 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. ⁶ | | | |
| N | 2° . . . 30° | | | |

6. Applicable on all sides

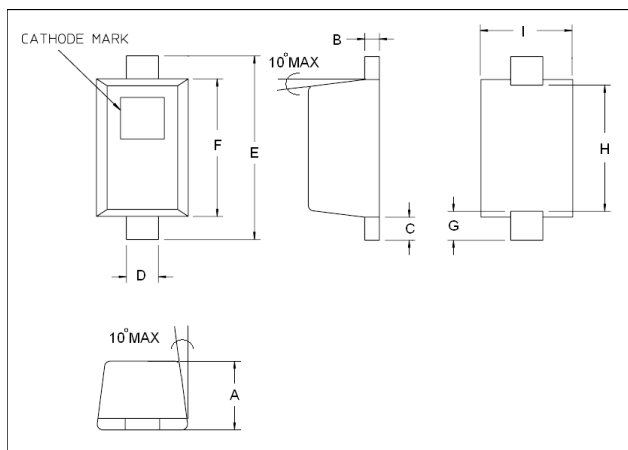
SC-70, 3 Lead (Case Style 1146)



| 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 |

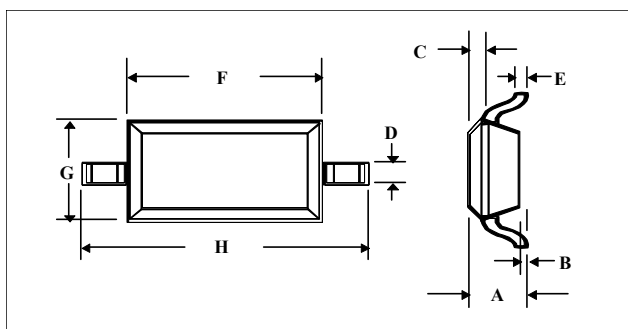
Case Styles (Cont'd)

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 |

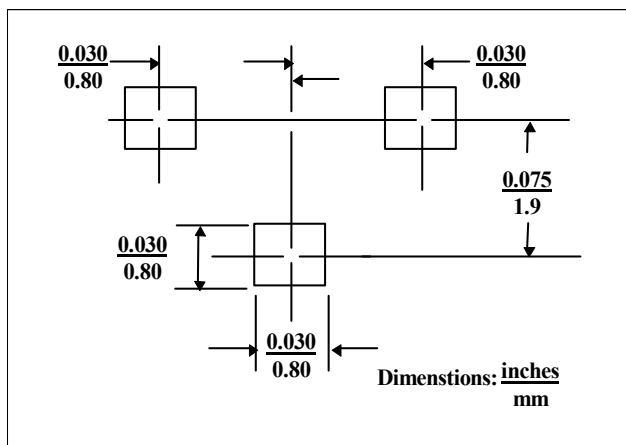
Mounting Information

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.

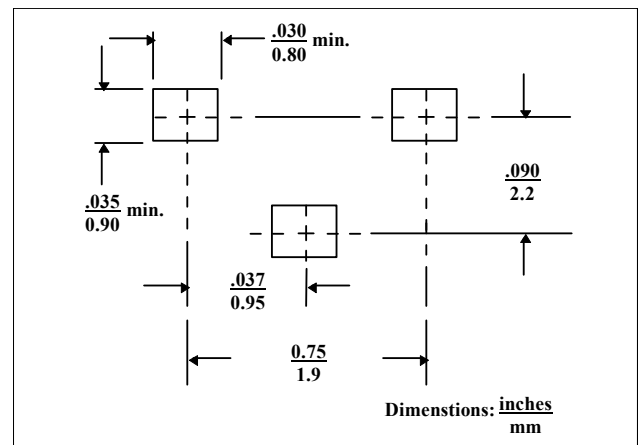
Permanent attachment is performed by a reflow soldering procedure during which the tab temperature does not exceed +275°C and the body temperature does not exceed +250°C, for standard models and +260°C for the RoHS compliant devices.

Please refer to Application Note M538 for surface mounting instructions.

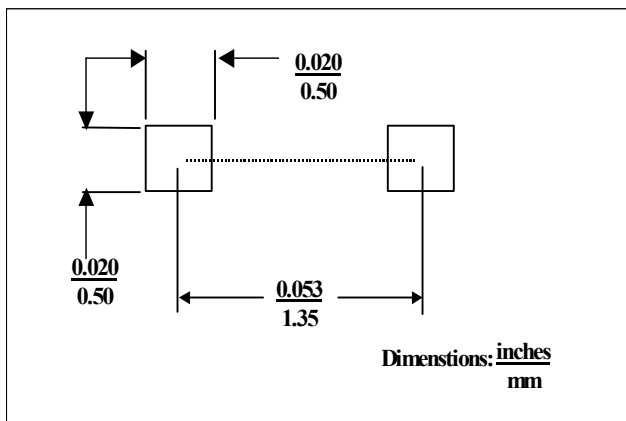
SOT-323



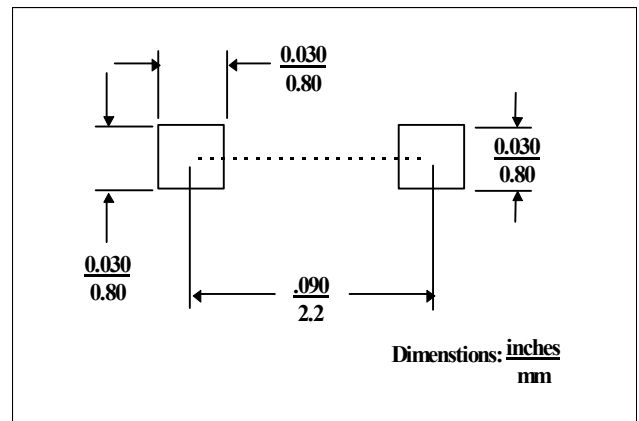
SOT-23



SC-79



SOD-323



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