

Silicon Medium Barrier
Schottky Diodes

MA4E1339 Series
V6

Features

- RF & Microwave Medium Barrier Silicon 20 V Schottky Diode
- Available as Single Diode, Series Pair or Unconnected Pair Configurations.
- Low Profile Surface Mount Plastic Packages
- **Lead Free (RoHS Compliant) Equivalents Available With 260 Deg. C Reflow Capability**

Description and Applications

The MA4E1339 series is a silicon medium barrier Schottky diode suitable for use in mixer, detector and limiter circuits. These diodes are also usable in anti-parallel, shunt power surge protection circuits for 50 Ω and 75 Ω systems.

These parts are offered with Sn/Pb plating, as well as with 100 % matte Sn plating on the RoHS compliant part numbers.

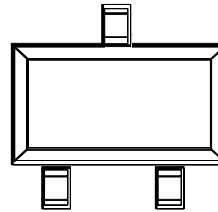
The MA4E1339 Series of Schottky diodes is available in the SOT-23 (case style 287), SOT-143 (case style 1068), SOT-323 (case style 1146), SOD 323 (case style 1141) and the SC-79 (case style 1279).

These packages are supplied on tape and reel for automatic pick and place assembly and for surface mount placement to circuit boards, as indicated by a "T" to the P/N suffix.

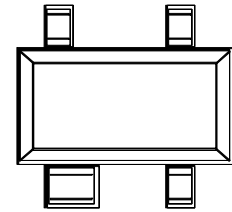
These Silicon Medium Barrier, 20 V Schottky Diodes are Useful in Detector, Limiter, Mixer, and Surge Protection Applications for Operating Frequency Bands from D.C. through 6 GHz.

Package Outlines

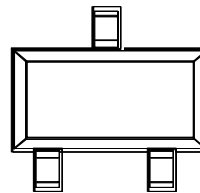
SOT-23 (287)



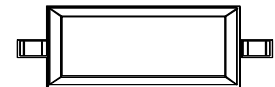
SOT-143 (1068)



SOT-323 (1146)



SOD-323 (1141)



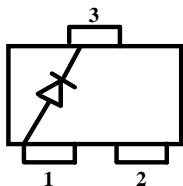
SC-79 (1279)



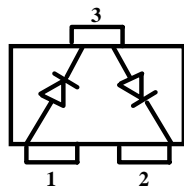
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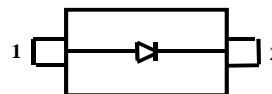
Configurations (Top View)



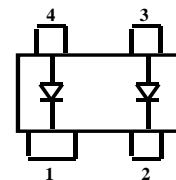
Single
MA4E1339A-287T
MA4E1339A-1146T



Series Pair
MA4E1339B-287T
MA4E1339B-1146T



Single
MA4E1339A-1141T
MADS-001339-1279OT



Unconnected Pair
MA4E1339E-1068T

Standard Part Numbers and RoHS Equivalents

| Standard Part Number | RoHS Compliant Part Number | Package Style |
|----------------------|----------------------------|---------------|
| MA4E1339A-287T | MA4E1339A1-287T | SOT-23 |
| MA4E1339A-1146T | MA4E1339A1-1146T | SOT-323 |
| MA4E1339B-287T | MA4E1339B1-287T | SOT-23 |
| MA4E1339B-1146T | MA4E1339B1-1146T | SOT-323 |
| MA4E1339A-1141T | MA4E1339A1-1141T | SOT-23 |
| N/A | MADS-001339-1279OT | SC-79 |
| MA4E1339E-1068T | MA4E1339E1-1068T | SOT-143 |

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Maximum Ratings 25 °C (unless otherwise specified)*

| Parameter | Unit | Values |
|---|------|-------------------|
| Operating Temperature | °C | -55 to +125 |
| Storage Temperature | °C | -55 to +125 |
| Total Power Dissipation (RF and D.C.) | mW | 250 |
| Continuous Forward Current | mA | 30 |
| Surge Forward Current, @ t<10 milliseC | mA | 100 |
| Reverse Voltage | V | 20 |
| Soldering Temperature (Standard Part #) | °C | +235 for 5 sec.** |
| Soldering Temperature (RoHS Compliant Part #) | °C | +260 for 5 sec.** |

* Exceeding these limits may cause permanent damage.

** Please refer to Application Note M538 for surface mounting instructions.

Electrical Specifications @ T_A = +25 °C

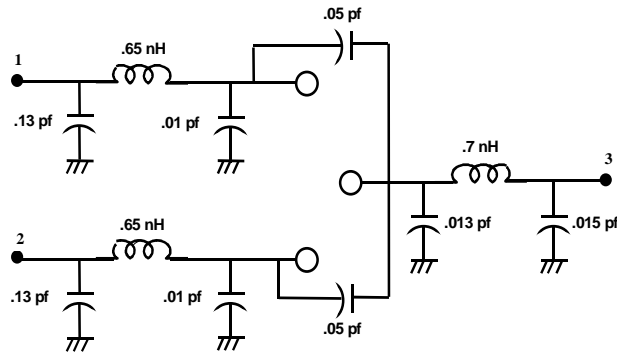
| Parameter | Condition | Symbol | Specification |
|---------------------------|-----------------------------------|------------------|---|
| Forward Voltage | I _F = 1 mA | V _F | 410 mV max. |
| Delta Forward Current | I _F = 1 mA | Δ V _F | 20 mV max. For series pair and unconnected pair configurations |
| Forward Voltage | I _F = 10 mA | V _F | 1.0 V max. |
| Total Capacitance | V _R = 0 V F = 1 MHz | C _T | 1.2 pF max. |
| Reverse Leakage Current | V _R = 15 V | I _R | 200 nA max. |
| Reverse Voltage Breakdown | I _R = 10 μA | V _B | 20 V min. |

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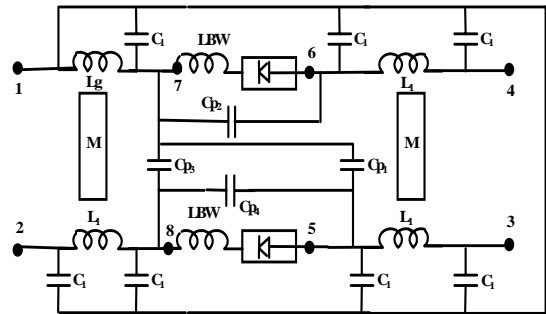
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Circuit Models

SOT-23

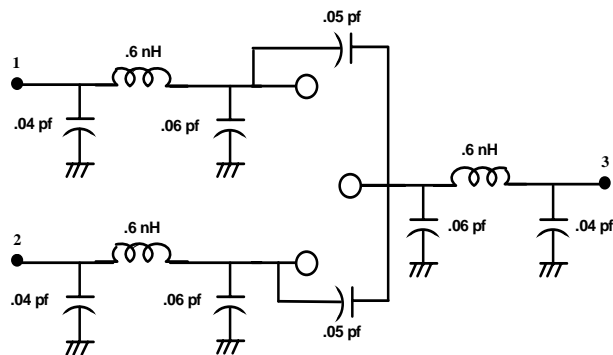


SOT-143

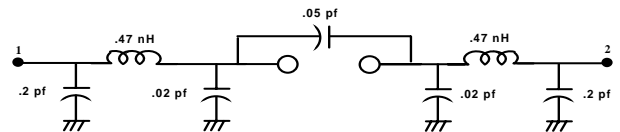


LBW = 0.08nH, Lg = 0.36nH, L1 = 0.31nH, M = 0.12nH, C1 = 0.01pF,
Cp1 = 0.05pF, Cp2 = 0.10pF, Cp3 = 0.05pF, Cp4 = 0.03pF

SOT-323



SOD-323

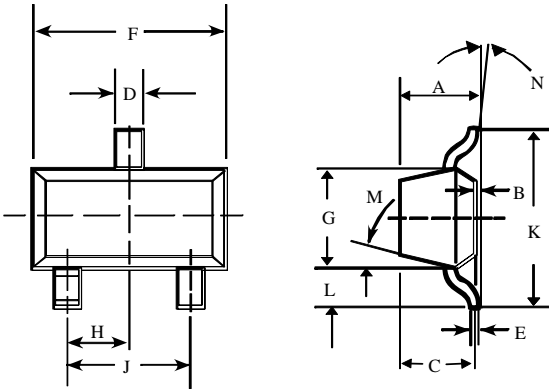


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Case Styles

SOT-23



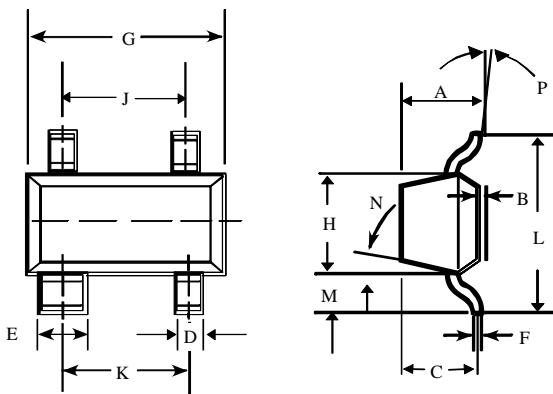
Package Parasitics
Ls = 1.4 nH
Cp = .12 pF

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. ¹ | | | |
| N | 2° ... 30° | | | |

Note: 1. Applicable on all sides

SOT-143



Package Parasitics
Ls = 1.2 nH
Cp = .14 pF

SOT-143 (Case Style 1068)

| DIM. | INCHES | | MILLIMETERS | |
|------|-----------------------|-------|--------------|------|
| | MIN. | MAX. | MIN. | MAX. |
| A | - | 0.044 | - | 1.10 |
| B | - | 0.044 | - | 1.10 |
| C | - | 0.040 | - | 1.00 |
| D | 0.030 | 0.035 | 0.75 | 0.90 |
| E | 0.013 | 0.020 | 0.35 | 0.50 |
| F | 0.003 | 0.006 | 0.08 | 0.15 |
| G | 0.110 | 0.119 | 2.80 | 3.00 |
| H | 0.047 | 0.056 | 1.20 | 1.40 |
| J | 0.075 typical | | 1.90 typical | |
| K | 0.075 typical | | 1.90 typical | |
| L | - | 0.103 | - | 2.6 |
| M | - | 0.024 | - | 0.6 |
| DIM. | GRADIENT | | | |
| N | 10° max. ¹ | | | |
| P | 2° ... 30° | | | |

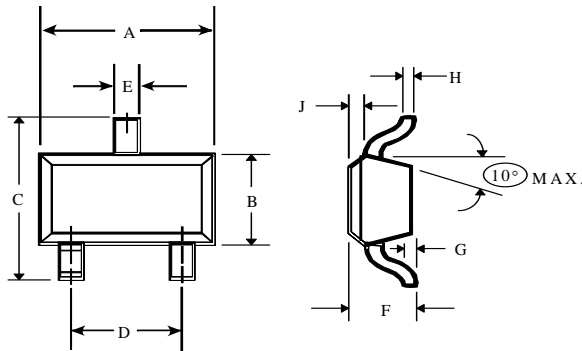
Note: 1. Applicable on all sides

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Case Styles

SOT-323



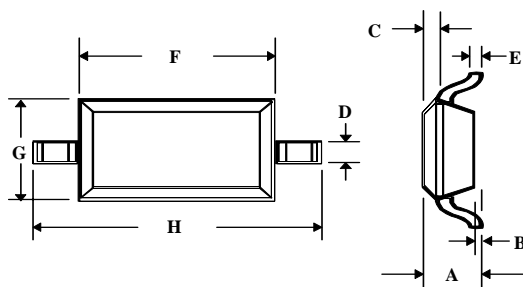
SOT-323 (Case Style 1146)

| DIM. | INCHES | | MILLIMETERS | |
|------|--------|-------|--------------|------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.063 | 0.087 | 1.6 | 2.2 |
| B | 0.045 | 0.053 | 1.15 | 1.35 |
| C | 0.079 | 0.087 | 2.0 | 2.2 |
| D | 0.047 | 0.055 | 1.2 | 1.4 |
| E | 0.008 | 0.016 | 0.2 | 0.4 |
| F | 0.031 | 0.039 | 0.8 | 1.0 |
| G | - | 0.004 | - | 0.1 |
| H | 0.003 | 0.006 | 0.08 typical | 0.15 |
| J | 0.004 | 0.010 | 0.1 | 0.25 |

Package Parasitics

Ls = 1.2 nH
Cp = .11 pF

SOD-323



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 | 0.4 |
| E | 0.003 | 0.006 | 0.08 | 0.15 |
| F | 0.063 | 0.075 | 1.6 | 1.9 |
| G | 0.045 | 0.057 | 1.15 | 1.45 |
| H | 0.091 | 0.106 | 2.3 | 2.7 |

Package Parasitics

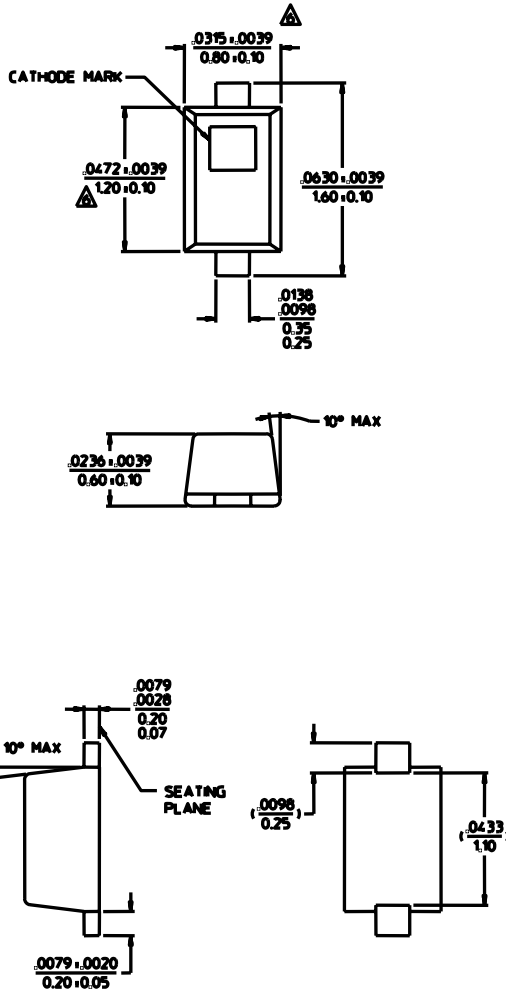
Ls = 1.2 nH
Cp = .11 pF

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Case Styles

ODS-1279



Package Parasitics

Ls = .6 nH
Cp = .10 pF