

### Features

- RF & Microwave Medium Barrier Silicon 8 V Schottky Diode
- Available as Single Diode, Series Pair or Unconnected Pair Configurations.
- Low Profile Surface Mount Plastic Package
- Lead Free
- RoHS\* Compliant with 260°C Reflow Capability

### Description and Applications

The MA4E1338 Series is a silicon medium barrier Schottky diode suitable for use in mixer, detector and limiter circuits. These diodes are also suitable for usage in anti-parallel, shunt power surge protection circuits for 50  $\Omega$  and 75  $\Omega$  systems.

The MA4E1338 Series of Schottky diodes is available in the SOT-23 (case style 287), SOT-323 (case style 1146), SC-79 (case style 1279) and the SOD 323, (case style 1141) plastic package. 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.

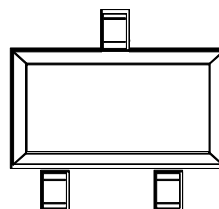
These silicon medium barrier, 8 V Schottky diodes are useful in detector, limiter, mixer, and surge protection applications for operating frequency bands from DC through 6 GHz.

### Part Numbers

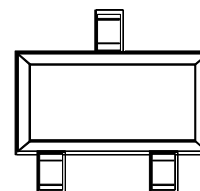
| Part Number        | Package Style |
|--------------------|---------------|
| MA4E1338A1-287T    | SOT-23        |
| MA4E1338A1-1146T   | SOT-323       |
| MA4E1338B1-287T    | SOT-23        |
| MA4E1338B1-1146T   | SOT-323       |
| MA4E1338A1-1141T   | SOD-323       |
| MADS-001338-12790T | SC-79         |

### Package Outlines

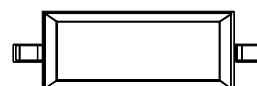
SOT-23 (287)



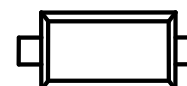
SOT-323 (1146)



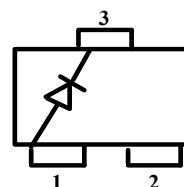
SOD-323 (1141)



SC-79 (1279)

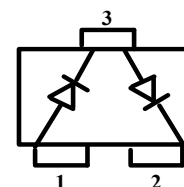


### Configurations (Top View)



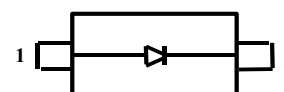
Single

MA4E1338A1-287T  
MA4E1338A1-1146T



Series Pair

MA4E1338B1-287T  
MA4E1338B1-1146T



Single

MA4E1338A1-1141T  
MADS-001338-12790T

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

### Electrical Specifications @ +25°C

| Parameter                              | Condition                                     | Specification                                                       |
|----------------------------------------|-----------------------------------------------|---------------------------------------------------------------------|
| Forward Voltage ( $V_F$ )              | $I_F = 1 \text{ mA}$<br>$I_F = 10 \text{ mA}$ | 360 mV max.<br>500 mV max.                                          |
| Delta Forward Voltage ( $\Delta V_F$ ) | $I_F = 1 \text{ mA}$                          | 20 mV max.<br>(for series pair and unconnected pair configurations) |
| Total Capacitance ( $C_T$ )            | $V_R = 0 \text{ V}$ , $F = 1 \text{ MHz}$     | 1 pF max.                                                           |
| Reverse Leakage Current ( $I_R$ )      | $V_R = 1 \text{ V}$                           | 100 nA max.                                                         |
| Reverse Voltage Breakdown ( $V_B$ )    | $I_R = 10 \text{ }\mu\text{A}$                | 8 V min.                                                            |

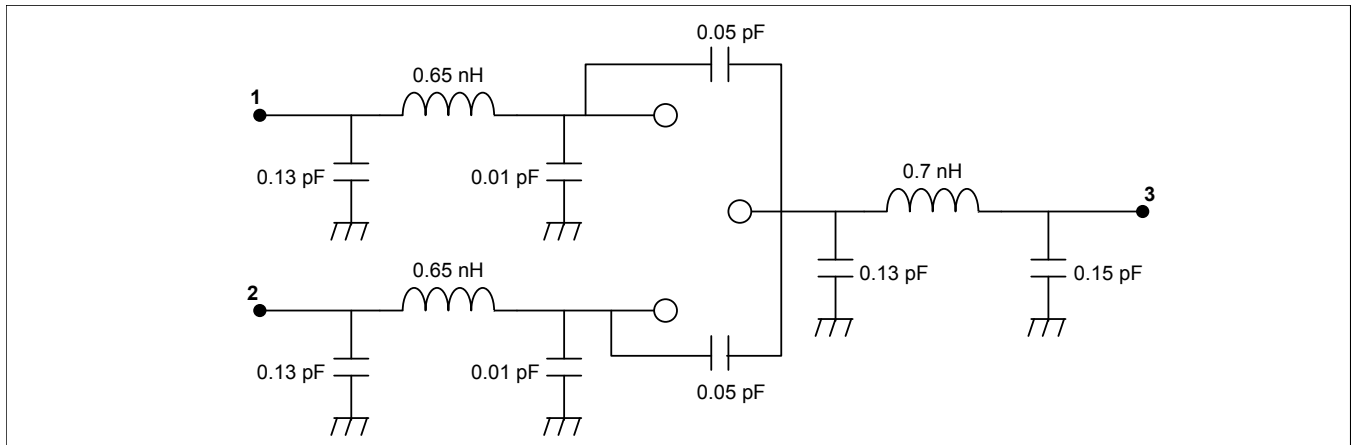
### Maximum Ratings @ 25°C (unless otherwise specified)<sup>1,2</sup>

| Parameter                                    | Values            |
|----------------------------------------------|-------------------|
| Operating Temperature                        | -55°C to +125°C   |
| Storage Temperature                          | -55 to +125       |
| Total Power Dissipation<br>(RF and DC)       | 250 mW            |
| Continuous Forward Current                   | 30 mA             |
| Surge Forward Current, @ $t < 10 \text{ ms}$ | 100 mA            |
| Reverse Voltage                              | 8 V               |
| Soldering Temperature                        | +260°C for 5 sec. |

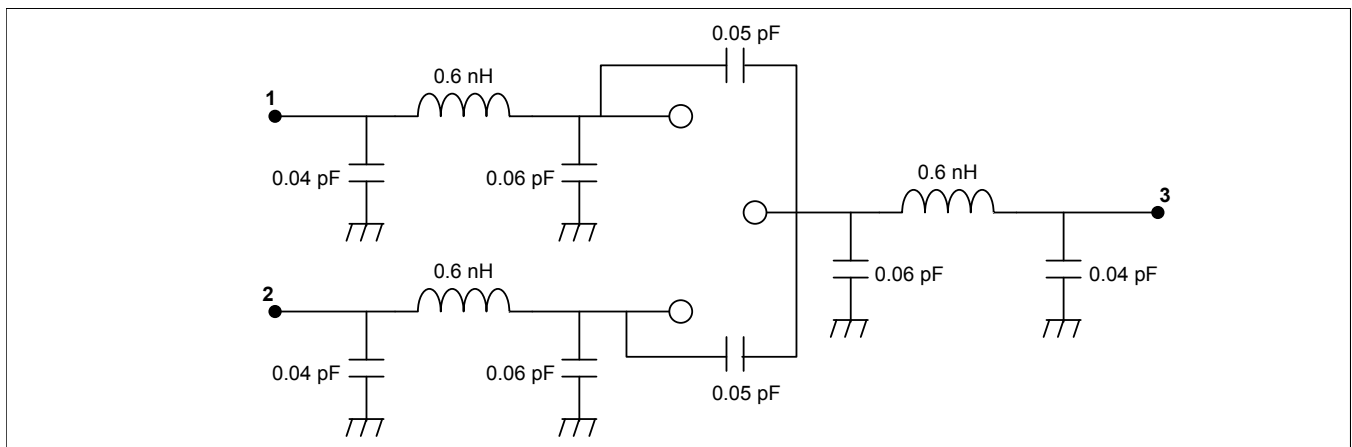
1. Operation of this device above any one of the maximum rated parameters may cause permanent damage.
2. Please refer to application note M538 for surface mounting instructions.

### Circuit Models

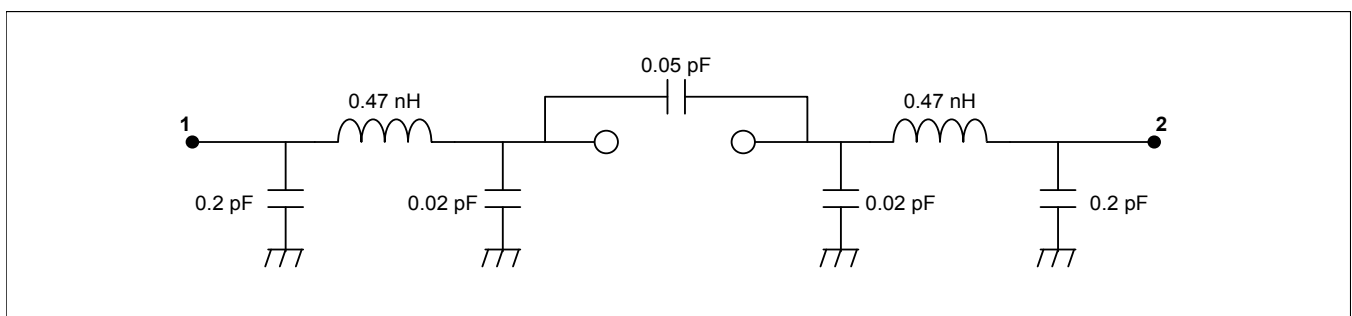
#### SOT-23



#### SOT-323

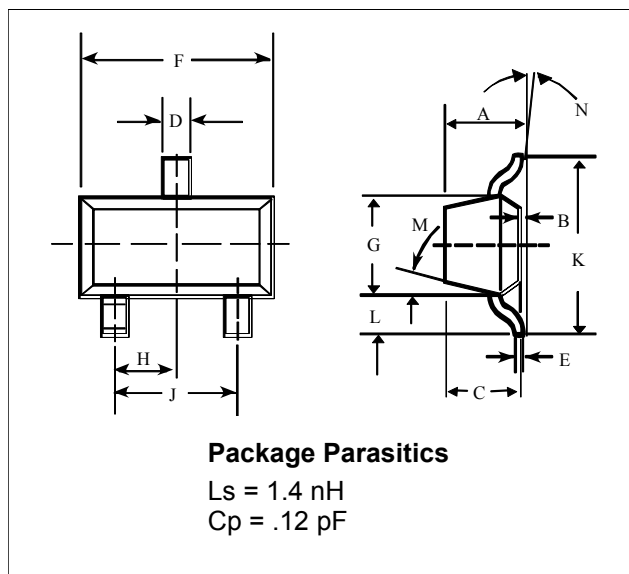


#### SOD-323



### Case Styles

#### SOT-23

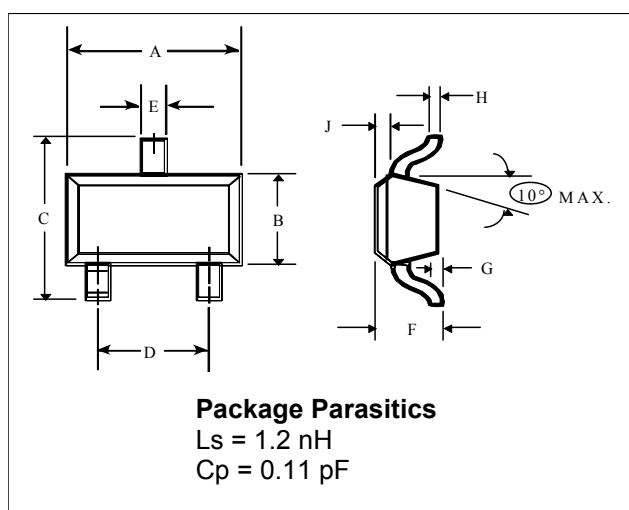


#### SOT-23 (Case Style 287)

| 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>3</sup> |       |              |      |
| N    | 2° . . .30°           |       |              |      |

3. Applicable on all sides

#### SOT-323

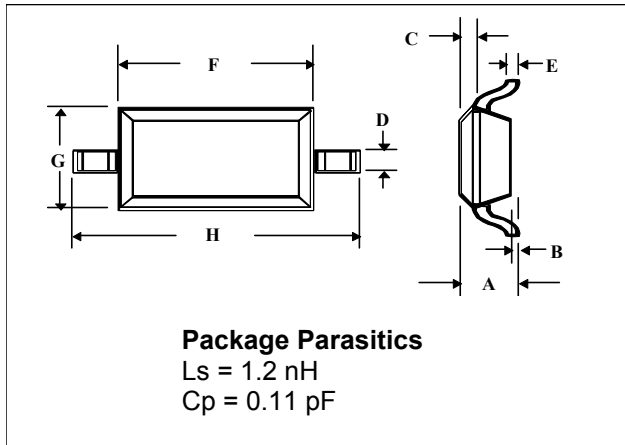


#### SOT-323 (Case Style 1146)

| 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        | 0.15 |
| J    | 0.004  | 0.010 | 0.1         | 0.25 |

### Case Styles (Cont'd)

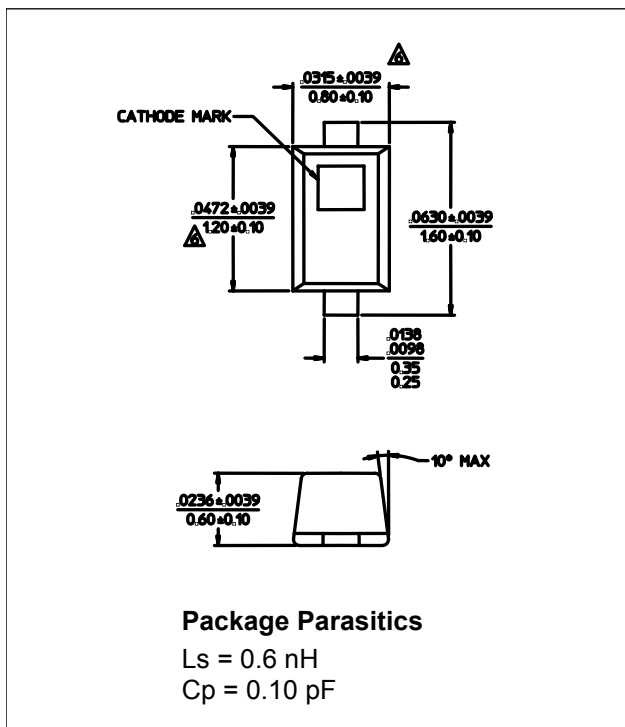
#### SOD-323



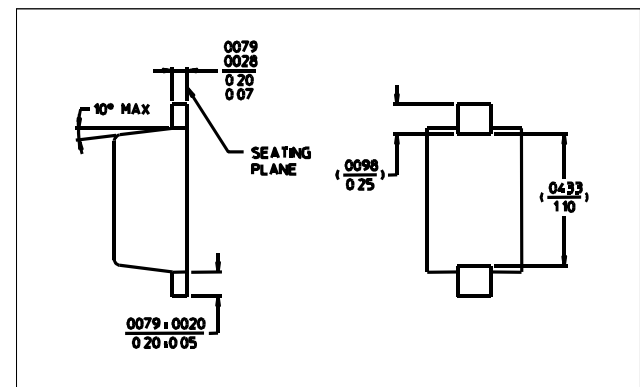
#### SOD-323 (Case Style 1141)

| 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  |

#### SC-79



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



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