

## Features

- Planar Die Construction
- Small Surface Mount Package
- General Purpose
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOD323
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208 ③
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe). Polarity: Cathode Band
- Weight: 0.004 grams (approximate)



Top View

## Ordering Information (Note 4)

| Part Number                  | Case    | Packaging         |
|------------------------------|---------|-------------------|
| (Type Number)-7-F*           | SOD-323 | 3000/Tape & Reel  |
| (Type Number)-13-F* (Note 5) | SOD-323 | 10000/Tape & Reel |

\* For (Type Number), please see the Electrical Characteristics Table. Example: 6.2V Zener = MMSZ5234BS-7-F.

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>
  5. Devices are readily available on 13" reels for select voltages only. For other voltages, devices can be made available on 13" reels upon request. Please contact your Diodes Inc. sales representative for additional details.

## Marking Information



XX = Product Type Marking Code  
(See Electrical Characteristics Table)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                      | Symbol         | Value | Unit |
|---|----------------|-------|------|
| Forward Voltage (Note 6)<br>@ I <sub>F</sub> = 10mA | V <sub>F</sub> | 0.9   | V    |

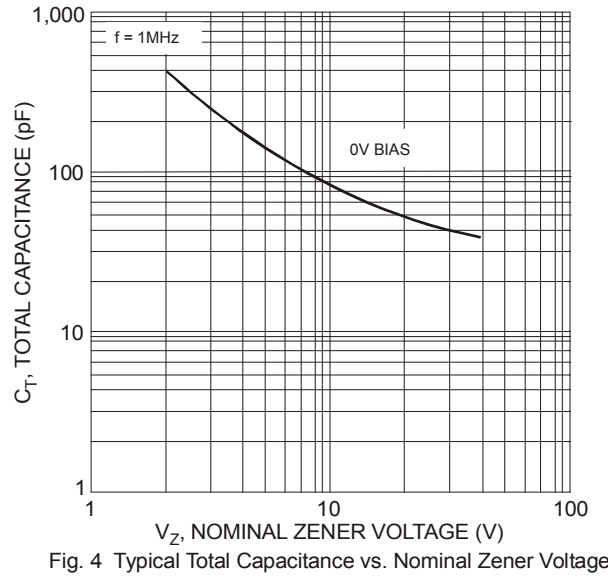
**Thermal Characteristics**

| Characteristic                                       | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 7)                           | P <sub>D</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 7) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

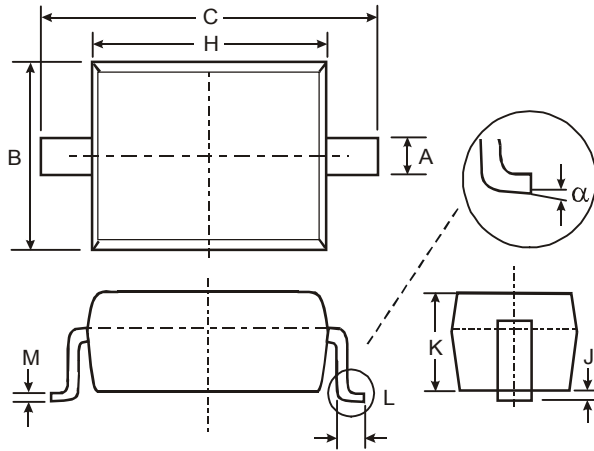
| Type Number | Marking Code | Zener Voltage Range (Note 8)     |         |         | Test Current | Maximum Zener Impedance (Note 9) |                                   | Maximum Reverse Leakage Current (Note 8)      |                |
|-------------|--------------|----------------------------------|---------|---------|--------------|----------------------------------|-----------------------------------|---|----------------|
|             |              | V <sub>Z</sub> @ I <sub>ZT</sub> |         |         |              | I <sub>ZT</sub>                  | Z <sub>ZT</sub> @ I <sub>ZT</sub> | Z <sub>ZK</sub> @ I <sub>ZK</sub><br>= 0.25mA | I <sub>R</sub> |
|             |              | Nom (V)                          | Min (V) | Max (V) | mA           |                                  |                                   |   |                |
| MMSZ5221BS  | C1           | 2.4                              | 2.28    | 2.52    | 20           | 30                               | 1200                              | 100   | 1.0            |
| MMSZ5223BS  | C3           | 2.7                              | 2.57    | 2.84    | 20           | 30                               | 1300                              | 75  | 1.0            |
| MMSZ5225BS  | C5           | 3.0                              | 2.85    | 3.15    | 20           | 30                               | 1600                              | 50  | 1.0            |
| MMSZ5226BS  | G1           | 3.3                              | 3.14    | 3.47    | 20           | 28                               | 1600                              | 25  | 1.0            |
| MMSZ5227BS  | G2           | 3.6                              | 3.42    | 3.78    | 20           | 24                               | 1700                              | 15  | 1.0            |
| MMSZ5228BS  | G3           | 3.9                              | 3.71    | 4.10    | 20           | 23                               | 1900                              | 10  | 1.0            |
| MMSZ5229BS  | G4           | 4.3                              | 4.09    | 4.52    | 20           | 22                               | 2000                              | 5.0   | 1.0            |
| MMSZ5230BS  | G5           | 4.7                              | 4.47    | 4.94    | 20           | 19                               | 1900                              | 5.0   | 2.0            |
| MMSZ5231BS  | E1           | 5.1                              | 4.85    | 5.36    | 20           | 17                               | 1600                              | 5.0   | 2.0            |
| MMSZ5232BS  | E2           | 5.6                              | 5.32    | 5.88    | 20           | 11                               | 1600                              | 5.0   | 3.0            |
| MMSZ5233BS  | E3           | 6.0                              | 5.70    | 6.30    | 20           | 7                                | 1600                              | 5.0   | 3.5            |
| MMSZ5234BS  | E4           | 6.2                              | 5.89    | 6.51    | 20           | 7                                | 1000                              | 5.0   | 4.0            |
| MMSZ5235BS  | E5           | 6.8                              | 6.46    | 7.14    | 20           | 5                                | 750                               | 3.0   | 5.0            |
| MMSZ5236BS  | F1           | 7.5                              | 7.13    | 7.88    | 20           | 6                                | 500                               | 3.0   | 6.0            |
| MMSZ5237BS  | F2           | 8.2                              | 7.79    | 8.61    | 20           | 8                                | 500                               | 3.0   | 6.5            |
| MMSZ5238BS  | F3           | 8.7                              | 8.27    | 9.14    | 20           | 8                                | 600                               | 3.0   | 6.5            |
| MMSZ5239BS  | F4           | 9.1                              | 8.65    | 9.56    | 20           | 10                               | 600                               | 3.0   | 7.0            |
| MMSZ5240BS  | F5           | 10                               | 9.50    | 10.50   | 20           | 17                               | 600                               | 3.0   | 8.0            |
| MMSZ5241BS  | H1           | 11                               | 10.45   | 11.55   | 20           | 22                               | 600                               | 2.0   | 8.4            |
| MMSZ5242BS  | H2           | 12                               | 11.40   | 12.60   | 20           | 30                               | 600                               | 1.0   | 9.1            |
| MMSZ5243BS  | H3           | 13                               | 12.35   | 13.65   | 9.5          | 13                               | 600                               | 0.5   | 9.9            |
| MMSZ5245BS  | H5           | 15                               | 14.25   | 15.75   | 8.5          | 16                               | 600                               | 0.1   | 11             |
| MMSZ5246BS  | J1           | 16                               | 15.20   | 16.80   | 7.8          | 17                               | 600                               | 0.1   | 12             |
| MMSZ5248BS  | J3           | 18                               | 17.10   | 18.90   | 7.0          | 21                               | 600                               | 0.1   | 14             |
| MMSZ5250BS  | J5           | 20                               | 19.00   | 21.00   | 6.2          | 25                               | 600                               | 0.1   | 15             |
| MMSZ5251BS  | K1           | 22                               | 20.90   | 23.10   | 5.6          | 29                               | 600                               | 0.1   | 17             |
| MMSZ5252BS  | K2           | 24                               | 22.80   | 25.20   | 5.2          | 33                               | 600                               | 0.1   | 18             |
| MMSZ5254BS  | K4           | 27                               | 25.65   | 28.35   | 5.0          | 41                               | 600                               | 0.1   | 21             |
| MMSZ5255BS  | K5           | 28                               | 26.60   | 29.40   | 4.5          | 44                               | 600                               | 0.1   | 21             |
| MMSZ5256BS  | M1           | 30                               | 28.50   | 31.50   | 4.2          | 49                               | 600                               | 0.1   | 23             |
| MMSZ5257BS  | M2           | 33                               | 31.35   | 34.65   | 3.8          | 58                               | 700                               | 0.1   | 25             |
| MMSZ5258BS  | M3           | 36                               | 34.20   | 37.80   | 3.4          | 70                               | 700                               | 0.1   | 27             |
| MMSZ5259BS  | M4           | 39                               | 37.05   | 40.95   | 3.2          | 80                               | 800                               | 0.1   | 30             |

- Notes:
6. Short duration pulse test used to minimize self-heating effect.
  7. Part mounted on FR-4 PC board with recommended pad layout, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>
  8. Short duration pulse test used to minimize self-heating effect.
  9. f = 1KHz.



## Package Outline Dimensions

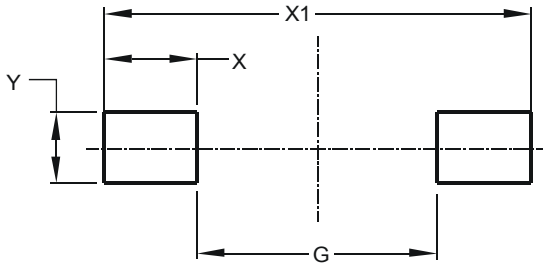
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOD323               |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 0.25 | 0.35 |
| B                    | 1.20 | 1.40 |
| C                    | 2.30 | 2.70 |
| H                    | 1.60 | 1.80 |
| J                    | 0.00 | 0.10 |
| K                    | 1.0  | 1.1  |
| L                    | 0.20 | 0.40 |
| M                    | 0.10 | 0.15 |
| $\alpha$             | 0°   | 8°   |
| All Dimensions in mm |      |      |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 1.520         |
| X          | 0.590         |
| X1         | 2.700         |
| Y          | 0.450         |

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