

## Features

- 500mW Power Dissipation
- General Purpose, Medium Current
- Ideally Suited for Automated Assembly Processes
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 3)**
- **"Green" Device (Note 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOD-123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Ordering Information: See Page 3
- Marking Information: See Page 3
- Weight: 0.01 grams (approximate)



Top View

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic                        | Symbol | Value | Unit |
|---------------------------------------|--------|-------|------|
| Forward Voltage @ $I_F = 10\text{mA}$ | $V_F$  | 0.9   | V    |

## Thermal Characteristics

| Characteristic  | Symbol          | Value       | Unit               |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 1) @ $T_L = 75^\circ\text{C}$ | $P_D$           | 500         | mW                 |
| Thermal Resistance, Junction to Ambient Air (Note 1)  | $R_{\theta JA}$ | 350         | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Lead (Note 2)         | $R_{\theta JL}$ | 150         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range               | $T_J, T_{STG}$  | -65 to +150 | $^\circ\text{C}$   |

- Notes:
1. Device mounted on FR-4 substrate, single-sided, PC boards, with minimum recommended pad layout.
  2. Thermal Resistance measurement obtained via infrared scan method.
  3. No purposefully added lead. Halogen and Antimony Free.
  4. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or  $\text{Sb}_2\text{O}_3$  Fire Retardants.

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

| Type Number | Type Code | Zener Voltage Range (Note 5)     |         |         | Test Current | Maximum Zener Impedance (Note 4) |                                   | Maximum Reverse Leakage Current (Note 5)   |                |
|-------------|-----------|----------------------------------|---------|---------|--------------|----------------------------------|-----------------------------------|--|----------------|
|             |           | 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> = 0.25mA | I <sub>R</sub> |
|             |           | Nom (V)                          | Min (V) | Max (V) | mA           | Ω                                |                                   | μA   | V              |
| MMSZ5221B   | C1        | 2.4                              | 2.28    | 2.52    | 20           | 30                               | 1200                              | 100  | 1.0            |
| MMSZ5223B   | C3        | 2.7                              | 2.57    | 2.84    | 20           | 30                               | 1300                              | 75   | 1.0            |
| MMSZ5225B   | C5        | 3.0                              | 2.85    | 3.15    | 20           | 30                               | 1600                              | 50   | 1.0            |
| MMSZ5226B   | G1        | 3.3                              | 3.14    | 3.47    | 20           | 28                               | 1600                              | 25   | 1.0            |
| MMSZ5227B   | G2        | 3.6                              | 3.42    | 3.78    | 20           | 24                               | 1700                              | 15   | 1.0            |
| MMSZ5228B   | G3        | 3.9                              | 3.71    | 4.10    | 20           | 23                               | 1900                              | 10   | 1.0            |
| MMSZ5229B   | G4        | 4.3                              | 4.09    | 4.52    | 20           | 22                               | 2000                              | 5.0  | 1.0            |
| MMSZ5230B   | G5        | 4.7                              | 4.47    | 4.94    | 20           | 19                               | 1900                              | 5.0  | 2.0            |
| MMSZ5231B   | E1        | 5.1                              | 4.85    | 5.36    | 20           | 17                               | 1600                              | 5.0  | 2.0            |
| MMSZ5232B   | E2        | 5.6                              | 5.32    | 5.88    | 20           | 11                               | 1600                              | 5.0  | 3.0            |
| MMSZ5233B   | E3        | 6.0                              | 5.70    | 6.30    | 20           | 7                                | 1600                              | 5.0  | 3.5            |
| MMSZ5234B   | E4        | 6.2                              | 5.89    | 6.51    | 20           | 7                                | 1000                              | 5.0  | 4.0            |
| MMSZ5235B   | E5        | 6.8                              | 6.46    | 7.14    | 20           | 5                                | 750                               | 3.0  | 5.0            |
| MMSZ5236B   | F1        | 7.5                              | 7.13    | 7.88    | 20           | 6                                | 500                               | 3.0  | 6.0            |
| MMSZ5237B   | F2        | 8.2                              | 7.79    | 8.61    | 20           | 8                                | 500                               | 3.0  | 6.5            |
| MMSZ5238B   | F3        | 8.7                              | 8.27    | 9.14    | 20           | 8                                | 600                               | 3.0  | 6.5            |
| MMSZ5239B   | F4        | 9.1                              | 8.65    | 9.56    | 20           | 10                               | 600                               | 3.0  | 7.0            |
| MMSZ5240B   | F5        | 10                               | 9.50    | 10.50   | 20           | 17                               | 600                               | 3.0  | 8.0            |
| MMSZ5241B   | H1        | 11                               | 10.45   | 11.55   | 20           | 22                               | 600                               | 2.0  | 8.4            |
| MMSZ5242B   | H2        | 12                               | 11.40   | 12.60   | 20           | 30                               | 600                               | 1.0  | 9.1            |
| MMSZ5243B   | H3        | 13                               | 12.35   | 13.65   | 9.5          | 13                               | 600                               | 0.5  | 9.9            |
| MMSZ5245B   | H5        | 15                               | 14.25   | 15.75   | 8.5          | 16                               | 600                               | 0.1  | 11             |
| MMSZ5246B   | J1        | 16                               | 15.20   | 16.80   | 7.8          | 17                               | 600                               | 0.1  | 12             |
| MMSZ5248B   | J3        | 18                               | 17.10   | 18.90   | 7.0          | 21                               | 600                               | 0.1  | 14             |
| MMSZ5250B   | J5        | 20                               | 19.00   | 21.00   | 6.2          | 25                               | 600                               | 0.1  | 15             |
| MMSZ5251B   | K1        | 22                               | 20.90   | 23.10   | 5.6          | 29                               | 600                               | 0.1  | 17             |
| MMSZ5252B   | K2        | 24                               | 22.80   | 25.20   | 5.2          | 33                               | 600                               | 0.1  | 18             |
| MMSZ5254B   | K4        | 27                               | 25.65   | 28.35   | 5.0          | 41                               | 600                               | 0.1  | 21             |
| MMSZ5255B   | K5        | 28                               | 26.60   | 29.40   | 4.5          | 44                               | 600                               | 0.1  | 21             |
| MMSZ5256B   | M1        | 30                               | 28.50   | 31.50   | 4.2          | 49                               | 600                               | 0.1  | 23             |
| MMSZ5257B   | M2        | 33                               | 31.35   | 34.65   | 3.8          | 58                               | 700                               | 0.1  | 25             |
| MMSZ5258B   | M3        | 36                               | 34.20   | 37.80   | 3.4          | 70                               | 700                               | 0.1  | 27             |
| MMSZ5259B   | M4        | 39                               | 37.05   | 40.95   | 3.2          | 80                               | 800                               | 0.1  | 30             |

- Notes: 4. f = 1KHz.  
5. Short duration pulse test used to minimize self-heating effect.

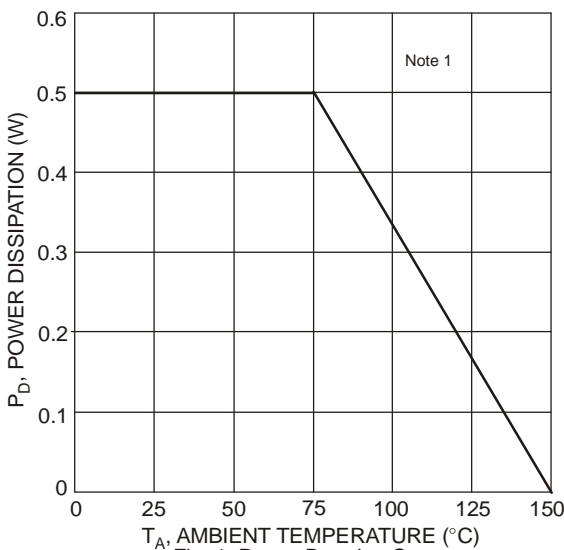


Fig. 1 Power Derating Curve

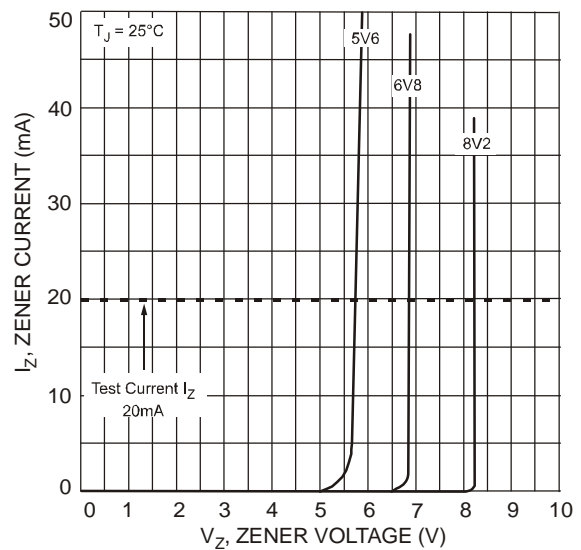


Fig. 2 Typical Zener Breakdown Characteristics

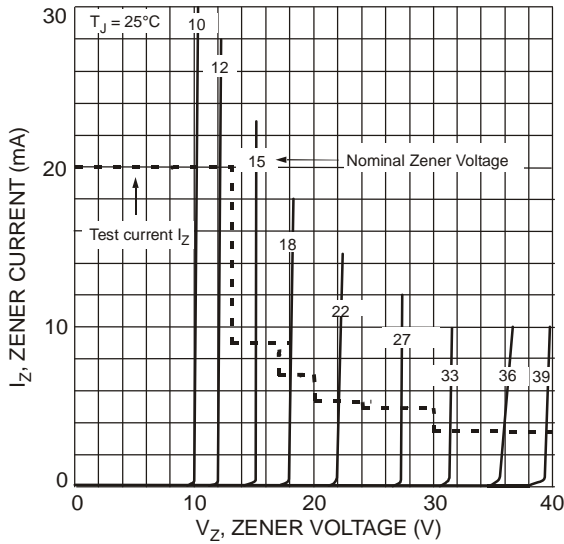


Fig. 3 Typical Zener Breakdown Characteristics

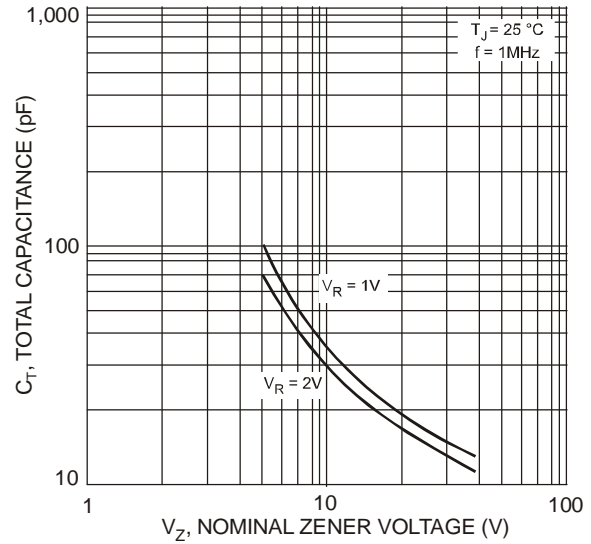


Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

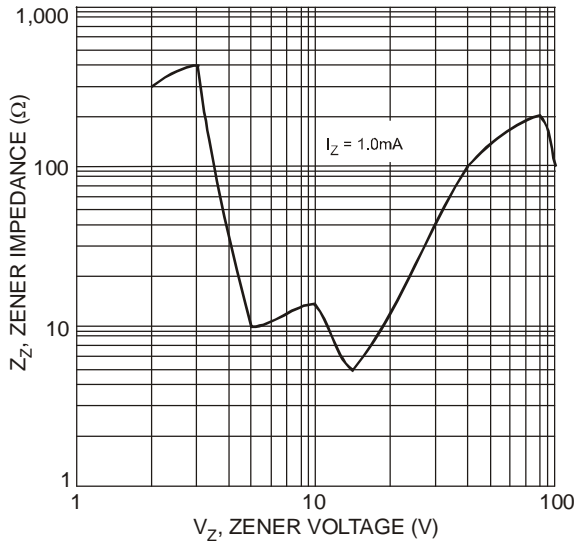


Fig. 5 Typical Zener Impedance Characteristics

### Ordering Information (Note 6)

| Part Number<br>(Type Number)-7-F* | Case<br>SOD-123 | Packaging<br>3000/Tape & Reel |
|-----------------------------------|-----------------|-------------------------------|
|-----------------------------------|-----------------|-------------------------------|

\*Add "-7-F" to the appropriate type number in Electrical Characteristics Table. Example: 6.2V Zener = MMSZ5234B-7-F.

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information

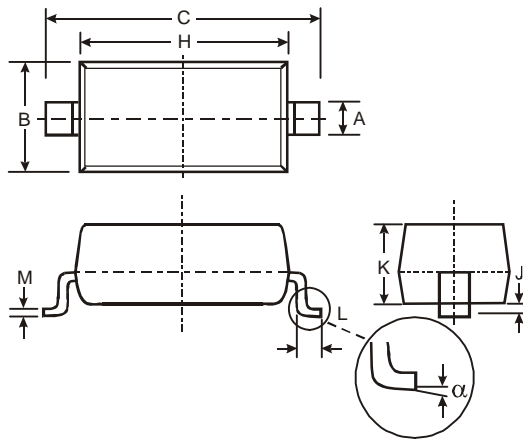


xx = Product Type Marking Code  
(See Electrical Characteristics Table)  
YM = Date Code Marking  
Y = Year (ex: N = 2002)  
M = Month (ex: 9 = September)

#### Date Code Key

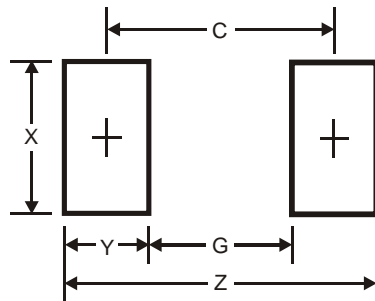
| Year  | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code  | J    | K    | L    | M    | N    | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    | A    | B    | C    |
| Month | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |      |      |      |      |      |      |
| Code  | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | O    | N    | D    |      |      |      |      |      |      |

**Package Outline Dimensions**



| SOD-123              |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | 0.55 Typ |      |
| B                    | 1.40     | 1.70 |
| C                    | 3.55     | 3.85 |
| H                    | 2.55     | 2.85 |
| J                    | 0.00     | 0.10 |
| K                    | 1.00     | 1.35 |
| L                    | 0.25     | 0.40 |
| M                    | 0.10     | 0.15 |
| α                    | 0        | 8°   |
| All Dimensions in mm |          |      |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 4.9           |
| G          | 2.5           |
| X          | 0.7           |
| Y          | 1.2           |
| C          | 3.7           |

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