

## SURFACE MOUNT SILICON ZENER DIODES

**VOLTAGE** 2.4 to 39 Volts **POWER** 500 mWatts

### FEATURES

- Planar Die construction
- 500mW Power Dissipation
- Zener Voltages from 2.4V - 39V
- Ideally Suited for Automated Assembly Processes

### MECHANICAL DATA

- Case: SOD-123, Molded Plastic
- Terminals: Solderable per MIL-STD-202, Method 208
- Polarity: See Diagram Below
- Approx. Weight: 0.008 grams
- Mounting Position: Any



### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

| Parameter                                                                                                   | Symbol    | Value       | Units |
|-------------------------------------------------------------------------------------------------------------|-----------|-------------|-------|
| Power Dissipation (Notes A) at 75°C                                                                         | $P_D$     | 500         | mW    |
| Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC method) (Notes B) | $I_{FSM}$ | 4.0         | Amps  |
| Operating Junction and Storage Temperature Range                                                            | $T_J$     | -55 to +150 | °C    |

#### NOTES:

A. Mounted on 5.0mm<sup>2</sup>(.013mm thick) land areas.

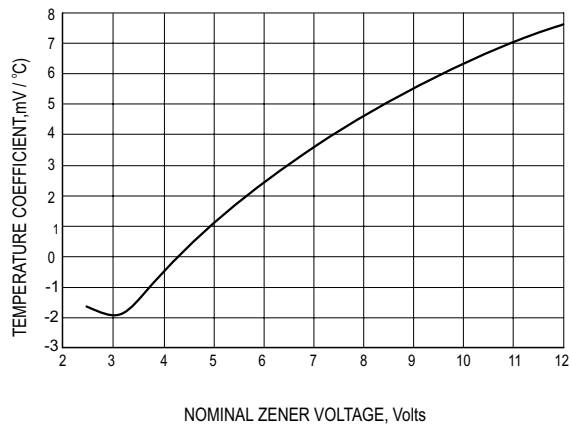
B. Measured on 8.3ms, single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted) V<sub>F</sub>=1.2V max, I<sub>F</sub>=100mA for all types.

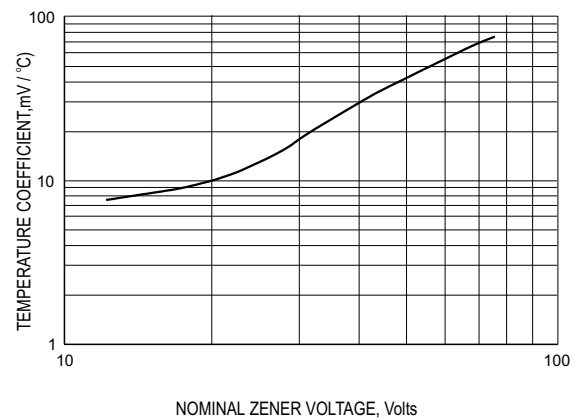
| Part Number             | Nominal Zener Voltage            |        |        | Max. Zener Impedance              |     |                                   |      | Max Reverse Leakage Current     |     | Max. Zener Current              | Package |
|-------------------------|----------------------------------|--------|--------|-----------------------------------|-----|-----------------------------------|------|---------------------------------|-----|---------------------------------|---------|
|                         | V <sub>Z</sub> @ I <sub>ZT</sub> |        |        | Z <sub>ZT</sub> @ I <sub>ZT</sub> |     | Z <sub>ZK</sub> @ I <sub>ZK</sub> |      | I <sub>R</sub> @ V <sub>R</sub> |     | I <sub>ZM</sub> @T <sub>a</sub> |         |
|                         | Nom. V                           | Min. V | Max. V | Ω                                 | mA  | Ω                                 | mA   | nA                              | V   | mA                              |         |
| 500 mWatts Zener Diodes |                                  |        |        |                                   |     |                                   |      |                                 |     |                                 |         |
| MMSZ5221B               | 2.4                              | 2.28   | 2.52   | 30                                | 20  | 1200                              | 0.25 | 100                             | 1.0 | 188                             | SOD-123 |
| MMSZ5222B               | 2.5                              | 2.38   | 2.63   | 30                                | 20  | 1250                              | 0.25 | 100                             | 1.0 | 180                             | SOD-123 |
| MMSZ5223B               | 2.7                              | 2.57   | 2.84   | 30                                | 20  | 1300                              | 0.25 | 75                              | 1.0 | 167                             | SOD-123 |
| MMSZ5225B               | 3                                | 2.85   | 3.15   | 30                                | 20  | 1600                              | 0.25 | 50                              | 1.0 | 150                             | SOD-123 |
| MMSZ5226B               | 3.3                              | 3.14   | 3.47   | 28                                | 20  | 1600                              | 0.25 | 25                              | 1.0 | 138                             | SOD-123 |
| MMSZ5227B               | 3.6                              | 3.42   | 3.78   | 24                                | 20  | 1700                              | 0.25 | 15                              | 1.0 | 126                             | SOD-123 |
| MMSZ5228B               | 3.9                              | 3.71   | 4.1    | 23                                | 20  | 1900                              | 0.25 | 10                              | 1.0 | 115                             | SOD-123 |
| MMSZ5229B               | 4.3                              | 4.09   | 4.52   | 22                                | 20  | 2000                              | 0.25 | 5.0                             | 1.0 | 106                             | SOD-123 |
| MMSZ5230B               | 4.7                              | 4.47   | 4.94   | 19                                | 20  | 1900                              | 0.25 | 5.0                             | 2.0 | 97                              | SOD-123 |
| MMSZ5231B               | 5.1                              | 4.85   | 5.36   | 17                                | 20  | 1600                              | 0.25 | 5.0                             | 2.0 | 89                              | SOD-123 |
| MMSZ5232B               | 5.6                              | 5.32   | 5.88   | 11                                | 20  | 1600                              | 0.25 | 5.0                             | 3.0 | 81                              | SOD-123 |
| MMSZ5234B               | 6.2                              | 5.89   | 6.51   | 7.0                               | 20  | 1000                              | 0.25 | 5.0                             | 4.0 | 73                              | SOD-123 |
| MMSZ5235B               | 6.8                              | 6.46   | 7.14   | 5.0                               | 20  | 750                               | 0.25 | 3.0                             | 5.0 | 67                              | SOD-123 |
| MMSZ5236B               | 7.5                              | 7.13   | 7.88   | 6.0                               | 20  | 500                               | 0.25 | 3.0                             | 6.0 | 61                              | SOD-123 |
| MMSZ5237B               | 8.2                              | 7.79   | 8.61   | 8.0                               | 20  | 500                               | 0.25 | 3.0                             | 6.0 | 55                              | SOD-123 |
| MMSZ5239B               | 9.1                              | 8.65   | 9.56   | 10                                | 20  | 600                               | 0.25 | 3.0                             | 6.5 | 50                              | SOD-123 |
| MMSZ5240B               | 10                               | 9.5    | 10.5   | 17                                | 20  | 600                               | 0.25 | 3.0                             | 8   | 45                              | SOD-123 |
| MMSZ5241B               | 11                               | 10.45  | 11.55  | 22                                | 20  | 600                               | 0.25 | 3.0                             | 8.4 | 41                              | SOD-123 |
| MMSZ5242B               | 12                               | 11.4   | 12.6   | 30                                | 20  | 600                               | 0.25 | 2.0                             | 9.1 | 38                              | SOD-123 |
| MMSZ5243B               | 13                               | 12.35  | 13.65  | 13                                | 9.5 | 600                               | 0.25 | 1.0                             | 9.9 | 35                              | SOD-123 |
| MMSZ5245B               | 15                               | 14.25  | 15.75  | 16                                | 8.5 | 600                               | 0.25 | 0.5                             | 11  | 30                              | SOD-123 |
| MMSZ5246B               | 16                               | 15.2   | 16.8   | 17                                | 7.8 | 600                               | 0.25 | 0.1                             | 12  | 28                              | SOD-123 |
| MMSZ5248B               | 18                               | 17.1   | 18.9   | 21                                | 7   | 600                               | 0.25 | 0.1                             | 14  | 25                              | SOD-123 |
| MMSZ5250B               | 20                               | 19     | 21     | 25                                | 6.2 | 600                               | 0.25 | 0.1                             | 15  | 23                              | SOD-123 |
| MMSZ5251B               | 22                               | 20.9   | 23.1   | 29                                | 5.6 | 600                               | 0.25 | 0.1                             | 17  | 21                              | SOD-123 |
| MMSZ5252B               | 24                               | 22.8   | 25.2   | 33                                | 5.2 | 600                               | 0.25 | 0.1                             | 18  | 19.1                            | SOD-123 |
| MMSZ5254B               | 27                               | 25.65  | 28.35  | 41                                | 5   | 600                               | 0.25 | 0.1                             | 21  | 16.8                            | SOD-123 |
| MMSZ5255B               | 28                               | 26.6   | 29.4   | 44                                | 4.5 | 600                               | 0.25 | 0.1                             | 21  | 16.2                            | SOD-123 |
| MMSZ5256B               | 30                               | 28.5   | 31.5   | 49                                | 4.2 | 600                               | 0.25 | 0.1                             | 23  | 15.1                            | SOD-123 |
| MMSZ5257B               | 33                               | 31.35  | 34.65  | 58                                | 3.8 | 700                               | 0.25 | 0.1                             | 25  | 13.8                            | SOD-123 |
| MMSZ5258B               | 36                               | 34.2   | 37.8   | 70                                | 3.4 | 700                               | 0.25 | 0.1                             | 27  | 12.6                            | SOD-123 |
| MMSZ5259B               | 39                               | 37.05  | 40.95  | 80                                | 3.2 | 800                               | 0.25 | 0.1                             | 30  | 11.6                            | SOD-123 |

NOTE:

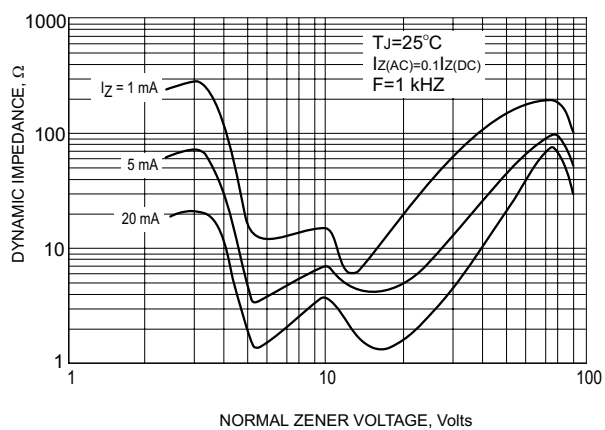
1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of ±5%.
2. Specials Available Include:
  - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
  - B. Matched sets.
3. Zener Voltage (V<sub>Z</sub>) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature (T<sub>L</sub>) at 30°C, from the diode body.
4. Zener Impedance (Z<sub>Z</sub>) Derivation. The zener impedance is derived from the 60 cycle ac voltage, which results when an AC current having an rms value equal to 10% of the dc zener current (I<sub>ZT</sub> or I<sub>zK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>zK</sub>.
5. Surge Current (I<sub>R</sub>) Non-Repetitive. The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, I<sub>ZT</sub>, per JEDEC registration; however, actual device capability is as described in Figure 5.



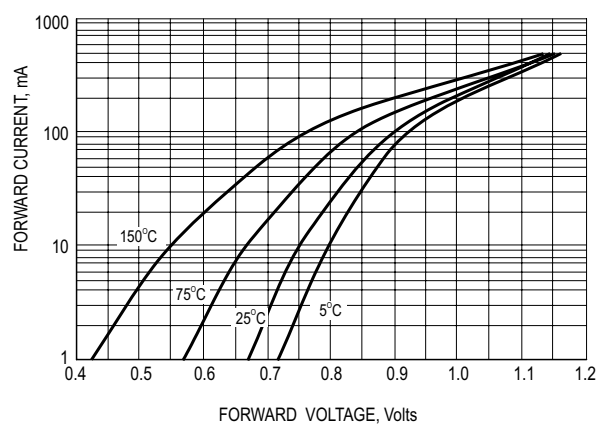
**TYPICAL REVERSE CURRENT**



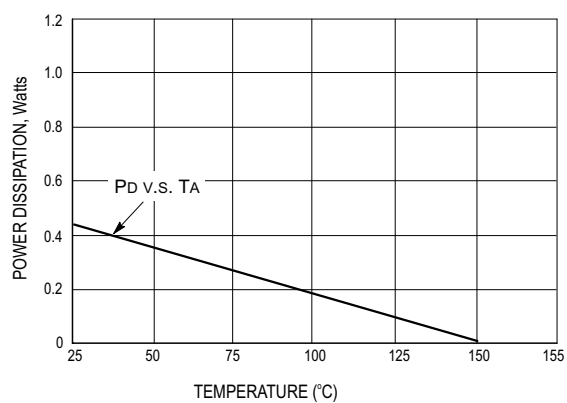
**STEADY STATE POWER DERATING**



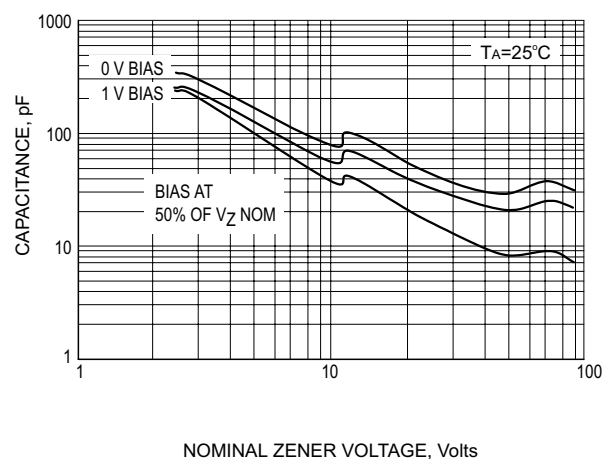
**EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE**



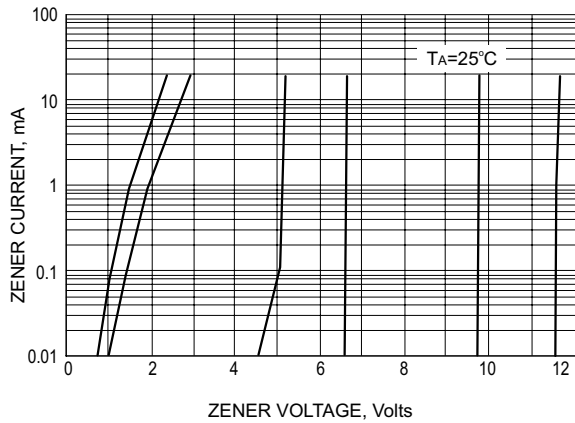
**TYPICAL FORWARD VOLTAGE**



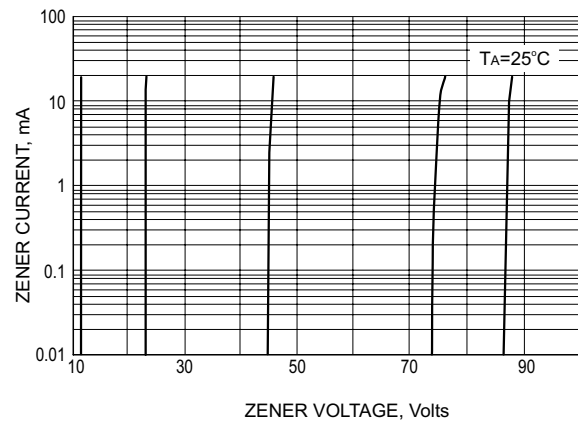
**STEADY STATE POWER DERATING**



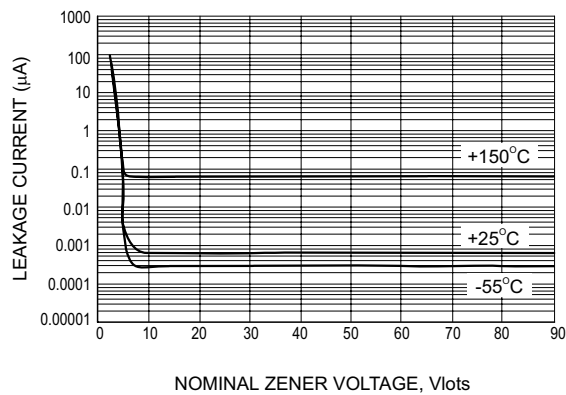
**TYPICAL CAPACITANCE**



**ZENER VOLTAGE V.S. ZENER CURRENT**

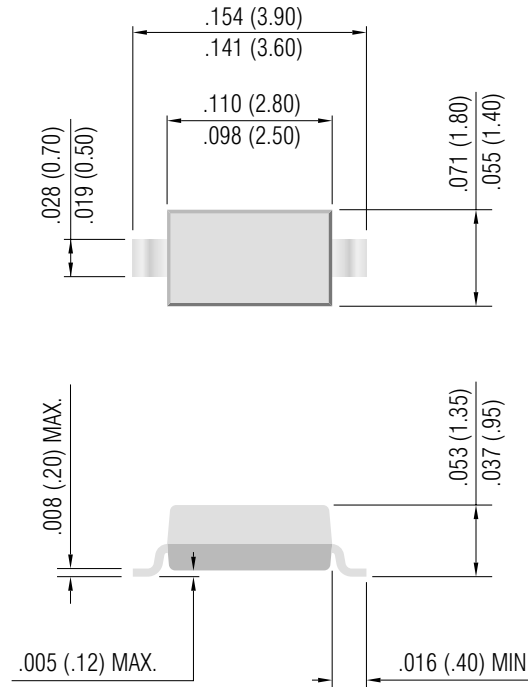


**ZENER VOLTAGE V.S. ZENER CURRENT**



**TYPICAL LEAKGE CURRENT**

## SOD-123



Dimensions in inches and (millimeters)

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