

**SURFACE MOUNT SILICON ZENER DIODES**
**VOLTAGE** 2.4 - 39 Volts

**POWER** 200 mWatts

**PACKAGE** SOD-323

**FEATURES**

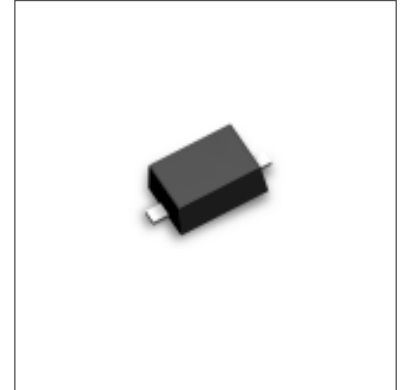
- Planar Die construction
- 200mW Power Dissipation
- Zener Voltages from 2.4V - 39V
- Ideally Suited for Automated Assembly Processes

**MECHANICAL DATA**

Case: SOD-323, Plastic

Terminals: Solderable per MIL-STD-202, Method 208

Approx. Weight: 0.008 gram


**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

| Parameter                                                                                                   | Symbol           | Value       | Units |
|-------------------------------------------------------------------------------------------------------------|------------------|-------------|-------|
| Power Dissipation (Notes A) at 25°C                                                                         | P <sub>D</sub>   | 200         | mW    |
| Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC method) (Notes B) | I <sub>FSM</sub> | 2.0         | Amps  |
| Operating Junction and Storage Temperature Range                                                            | T <sub>J</sub>   | -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.



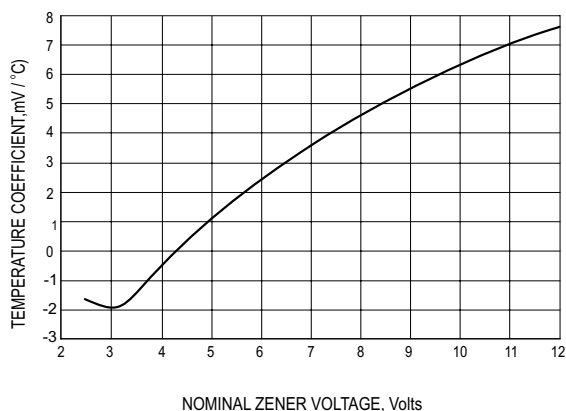
# MMSZ5221BS thru MMSZ5259BS

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.

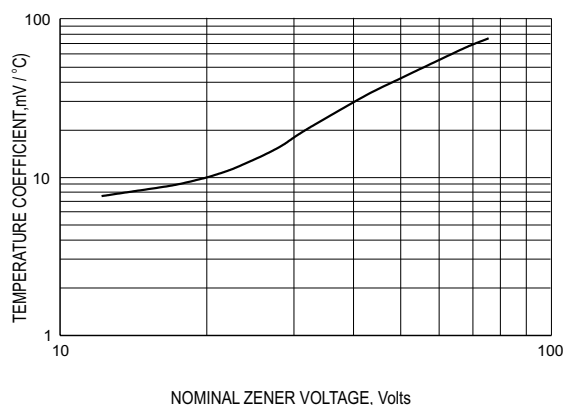
| Part Number             | Nominal Zener Voltage            |        |        | Max. Zener Impedance              |     |                                   |      | Max Reverse Leakage Current     |     | Package |
|-------------------------|----------------------------------|--------|--------|-----------------------------------|-----|-----------------------------------|------|---------------------------------|-----|---------|
|                         | 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> |     |         |
|                         | Nom. V                           | Min. V | Max. V | Ω                                 | mA  | Ω                                 | mA   | μA                              | V   |         |
| 200 mWatts Zener Diodes |                                  |        |        |                                   |     |                                   |      |                                 |     |         |
| MMSZ5221BS              | 2.4                              | 2.28   | 2.52   | 30                                | 20  | 1200                              | 0.25 | 100                             | 1   | SOD-323 |
| MMSZ5222BS              | 2.5                              | 2.38   | 2.63   | 30                                | 20  | 1250                              | 0.25 | 100                             | 1   | SOD-323 |
| MMSZ5223BS              | 2.7                              | 2.57   | 2.84   | 30                                | 20  | 1300                              | 0.25 | 75                              | 1   | SOD-323 |
| MMSZ5225BS              | 3                                | 2.85   | 3.15   | 30                                | 20  | 1600                              | 0.25 | 50                              | 1   | SOD-323 |
| MMSZ5226BS              | 3.3                              | 3.14   | 3.47   | 28                                | 20  | 1600                              | 0.25 | 25                              | 1   | SOD-323 |
| MMSZ5227BS              | 3.6                              | 3.42   | 3.78   | 24                                | 20  | 1700                              | 0.25 | 15                              | 1   | SOD-323 |
| MMSZ5228BS              | 3.9                              | 3.71   | 4.1    | 23                                | 20  | 1900                              | 0.25 | 10                              | 1   | SOD-323 |
| MMSZ5229BS              | 4.3                              | 4.09   | 4.52   | 22                                | 20  | 2000                              | 0.25 | 5                               | 1   | SOD-323 |
| MMSZ5230BS              | 4.7                              | 4.47   | 4.94   | 19                                | 20  | 1900                              | 0.25 | 5                               | 2   | SOD-323 |
| MMSZ5231BS              | 5.1                              | 4.85   | 5.36   | 17                                | 20  | 1600                              | 0.25 | 5                               | 2   | SOD-323 |
| MMSZ5232BS              | 5.6                              | 5.32   | 5.88   | 11                                | 20  | 1600                              | 0.25 | 5                               | 3   | SOD-323 |
| MMSZ5234BS              | 6.2                              | 5.89   | 6.51   | 7                                 | 20  | 1000                              | 0.25 | 5                               | 4   | SOD-323 |
| MMSZ5235BS              | 6.8                              | 6.46   | 7.14   | 5                                 | 20  | 750                               | 0.25 | 3                               | 5   | SOD-323 |
| MMSZ5236BS              | 7.5                              | 7.13   | 7.88   | 6                                 | 20  | 500                               | 0.25 | 3                               | 6   | SOD-323 |
| MMSZ5237BS              | 8.2                              | 7.79   | 8.61   | 8                                 | 20  | 500                               | 0.25 | 3                               | 6   | SOD-323 |
| MMSZ5239BS              | 9.1                              | 8.65   | 9.56   | 10                                | 20  | 600                               | 0.25 | 3                               | 6.5 | SOD-323 |
| MMSZ5240BS              | 10                               | 9.5    | 10.5   | 17                                | 20  | 600                               | 0.25 | 3                               | 8   | SOD-323 |
| MMSZ5241BS              | 11                               | 10.45  | 11.55  | 22                                | 20  | 600                               | 0.25 | 3                               | 8.4 | SOD-323 |
| MMSZ5242BS              | 12                               | 11.4   | 12.6   | 30                                | 20  | 600                               | 0.25 | 2                               | 9.1 | SOD-323 |
| MMSZ5243BS              | 13                               | 12.35  | 13.65  | 13                                | 9.5 | 600                               | 0.25 | 1                               | 9.9 | SOD-323 |
| MMSZ5245BS              | 15                               | 14.25  | 15.75  | 16                                | 8.5 | 600                               | 0.25 | 0.5                             | 11  | SOD-323 |
| MMSZ5246BS              | 16                               | 15.2   | 16.8   | 17                                | 7.8 | 600                               | 0.25 | 0.1                             | 12  | SOD-323 |
| MMSZ5248BS              | 18                               | 17.1   | 18.9   | 21                                | 7   | 600                               | 0.25 | 0.1                             | 14  | SOD-323 |
| MMSZ5250BS              | 20                               | 19     | 21     | 25                                | 6.2 | 600                               | 0.25 | 0.1                             | 15  | SOD-323 |
| MMSZ5251BS              | 22                               | 20.9   | 23.1   | 29                                | 5.6 | 600                               | 0.25 | 0.1                             | 17  | SOD-323 |
| MMSZ5252BS              | 24                               | 22.8   | 25.2   | 33                                | 5.2 | 600                               | 0.25 | 0.1                             | 18  | SOD-323 |
| MMSZ5254BS              | 27                               | 25.65  | 28.35  | 41                                | 5   | 600                               | 0.25 | 0.1                             | 21  | SOD-323 |
| MMSZ5255BS              | 28                               | 26.6   | 29.4   | 44                                | 4.5 | 600                               | 0.25 | 0.1                             | 21  | SOD-323 |
| MMSZ5256BS              | 30                               | 28.5   | 31.5   | 49                                | 4.2 | 600                               | 0.25 | 0.1                             | 23  | SOD-323 |
| MMSZ5257BS              | 33                               | 31.35  | 34.65  | 58                                | 3.8 | 700                               | 0.25 | 0.1                             | 25  | SOD-323 |
| MMSZ5258BS              | 36                               | 34.2   | 37.8   | 70                                | 3.4 | 700                               | 0.25 | 0.1                             | 27  | SOD-323 |
| MMSZ5259BS              | 39                               | 37.05  | 40.95  | 80                                | 3.2 | 800                               | 0.25 | 0.1                             | 30  | SOD-323 |

## NOTE:

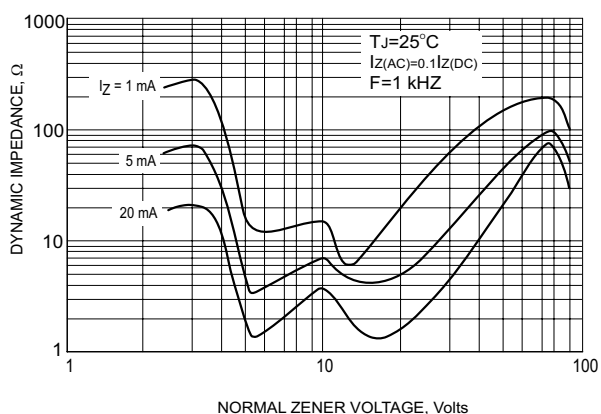
1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of ±5%.
2. Specials Available Include:
  - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
  - B. Matched sets.
3. Zener Voltage (V<sub>Z</sub>) 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.



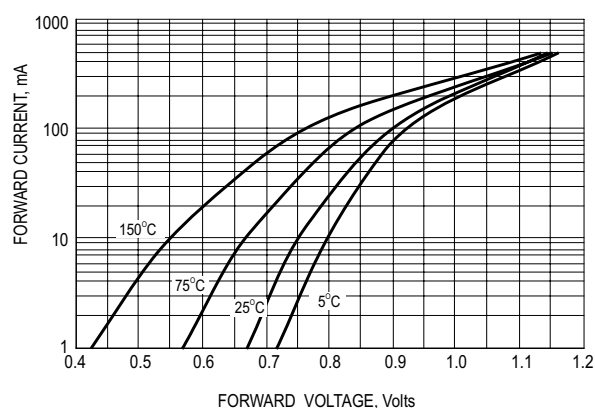
TYPICAL REVERSE CURRENT



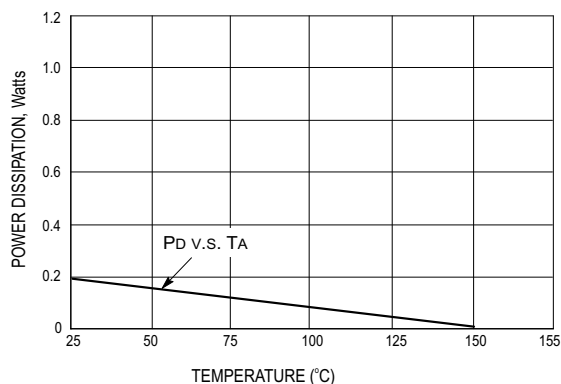
STEADY STATE POWER DERATING



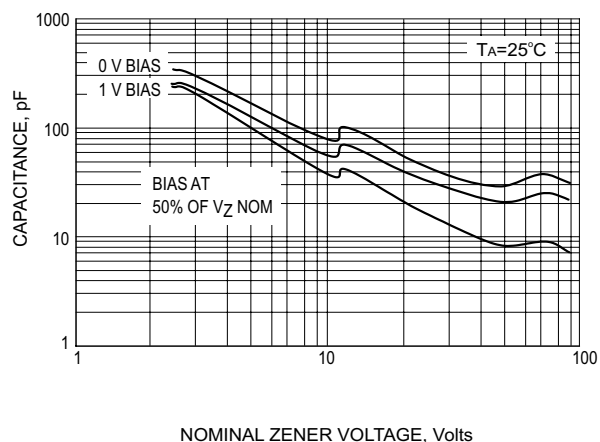
EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE



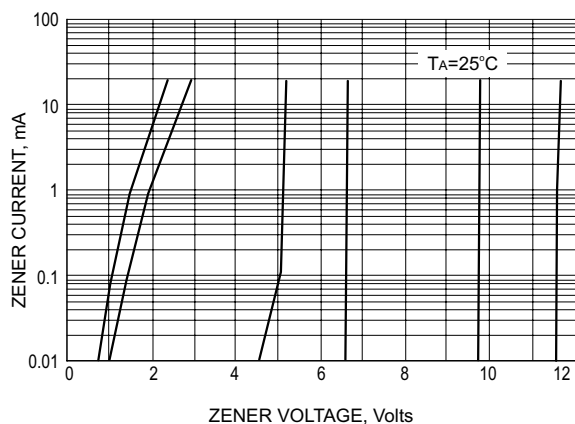
TYPICAL FORWARD VOLTAGE



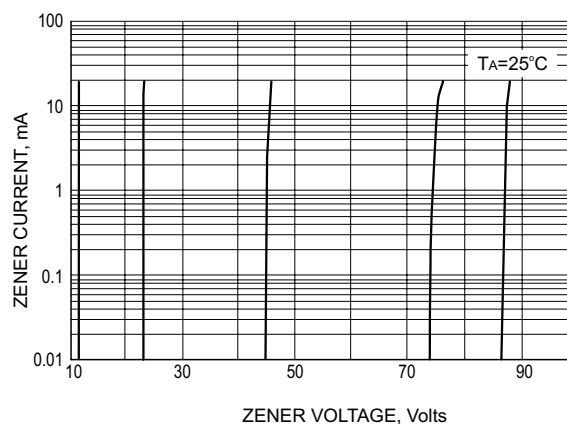
STEADY STATE POWER DERATING



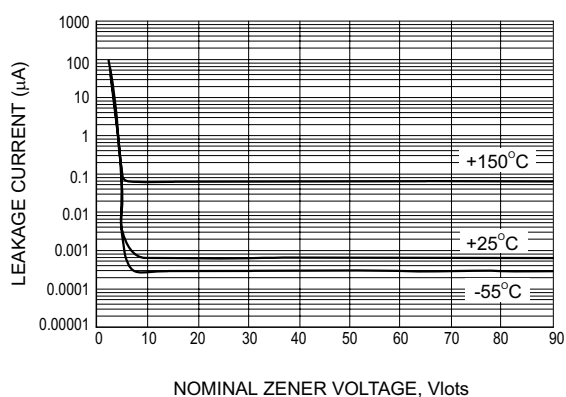
TYPICAL CAPACITANCE



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

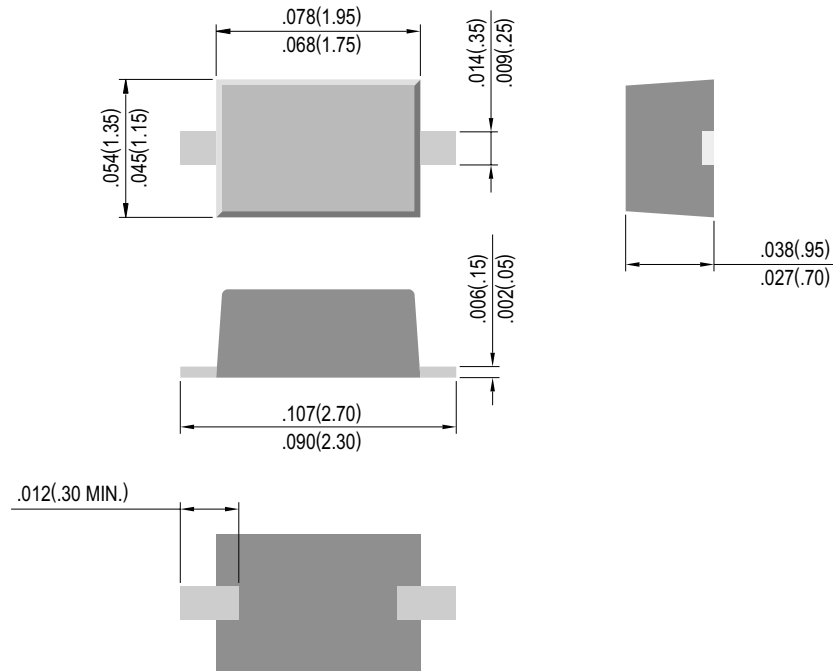


**ZENER VOLTAGE V.S. ZENER CURRENT**



**TYPICAL LEAKGE CURRENT**

## SOD-323



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