



Micro Commercial Components  
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# MMSZ5221B THRU MMSZ5259B

## 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
- Approx. Weight: 0.008 grams
- Mounting Position: Any
- Storage & Operating Temperature: -55°C to +150°C

Maximum Ratings @ 25°C Unless Otherwise Specified

|                                             |                         |            |              |
|---------------------------------------------|-------------------------|------------|--------------|
| <b>Zener Current</b>                        | <b>I<sub>F</sub></b>    | <b>100</b> | <b>mA</b>    |
| <b>Maximum Forward Voltage</b>              | <b>V<sub>F</sub></b>    | <b>1.2</b> | <b>V</b>     |
| <b>Power Dissipation (Notes A)</b>          | <b>P<sub>(AV)</sub></b> | <b>500</b> | <b>mWatt</b> |
| <b>Peak Forward Surge Current (Notes B)</b> | <b>I<sub>FSM</sub></b>  | <b>4.0</b> | <b>Amps</b>  |

### NOTES:

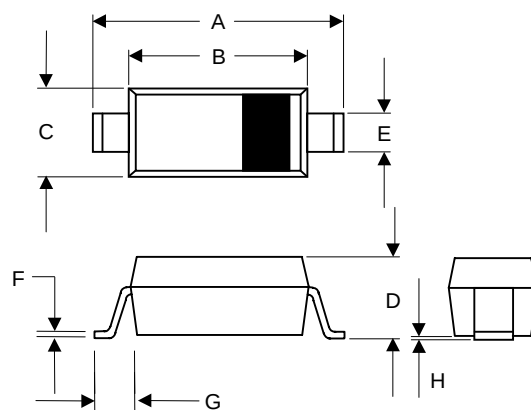
- A. Mounted on 5.0mm<sup>2</sup> (.013mm thick) land areas.  
B. Measured on 8.3ms, single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

**500 mW**

**Zener Diodes**

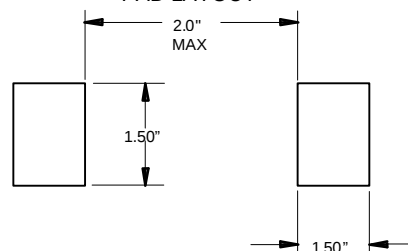
**2.4 to 39 Volts**

## SOD123



| DIMENSIONS |        |      |      |      |      |
|------------|--------|------|------|------|------|
| DIM        | INCHES |      | MM   |      | NOTE |
|            | MIN    | MAX  | MIN  | MAX  |      |
| A          | .141   | .154 | 3.60 | 3.90 |      |
| B          | .098   | .110 | 2.50 | 2.80 |      |
| C          | .055   | .071 | 1.40 | 1.80 |      |
| D          | .037   | .053 | 0.95 | 1.35 |      |
| E          | .019   | .028 | 0.50 | 0.70 |      |
| F          | ---    | .008 | ---  | 0.20 |      |
| G          | .016   | ---  | 0.40 | ---  |      |
| H          | ---    | .005 | ---  | 0.12 |      |

### SUGGESTED SOLDER PAD LAYOUT



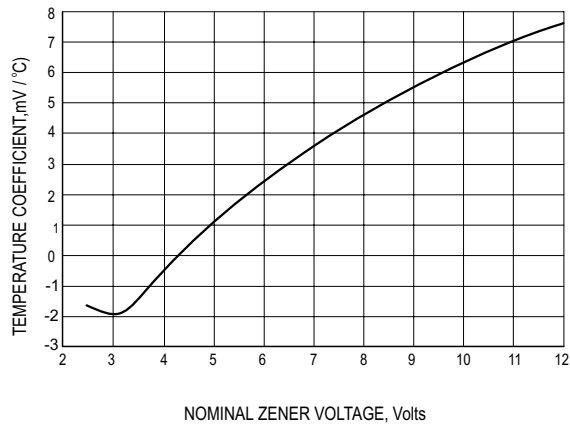
# MMSZ5221B thru MMSZ5259B

Electrical Characteristics @ 25°C Unless Otherwise Specified

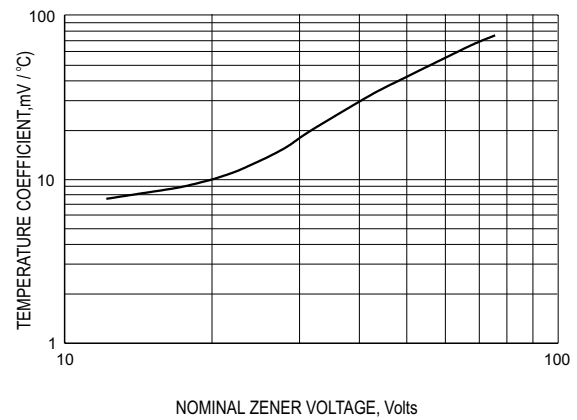
| MCC PART NUMBER | Marking | NORMAL ZENER VOLTAGE<br>Vz @ Iz | TEST CURRENT Iz | MAXIMUM ZENER IMPEDANCE<br>'B' SUFFIX ONLY<br>Zzt @ Iz Zzk @ Izk=0.25mA |      | MAXIMUM REVERSE LEAKAGE CURRENT<br>Ir @ Vr |       | MAXIMUM ZENER VOLTAGE TEMP COEFFICIENT 'B' SUFFIX ONLY |
|-----------------|---------|---------------------------------|-----------------|-------------------------------------------------------------------------|------|--------------------------------------------|-------|--------------------------------------------------------|
|                 |         | VOLTS                           | mA              | OHMS                                                                    | OHMS | uA                                         | VOLTS | %/°C                                                   |
| MMSZ5221B       | C1      | 2.4                             | 20              | 30                                                                      | 1200 | 100                                        | 1.0   | -0.085                                                 |
| MMSZ5222B       | C2      | 2.5                             | 20              | 30                                                                      | 1250 | 100                                        | 1.0   | -0.085                                                 |
| MMSZ5223B       | C3      | 2.7                             | 20              | 30                                                                      | 1300 | 75                                         | 1.0   | -0.080                                                 |
| MMSZ5225B       | C5      | 3.0                             | 20              | 29                                                                      | 1600 | 50                                         | 1.0   | -0.075                                                 |
| MMSZ5226B       | D1      | 3.3                             | 20              | 28                                                                      | 1600 | 25                                         | 1.0   | -0.070                                                 |
| MMSZ5227B       | D2      | 3.6                             | 20              | 24                                                                      | 1700 | 15                                         | 1.0   | -0.065                                                 |
| MMSZ5228B       | D3      | 3.9                             | 20              | 23                                                                      | 1900 | 10                                         | 1.0   | -0.060                                                 |
| MMSZ5229B       | D4      | 4.3                             | 20              | 22                                                                      | 2000 | 5.0                                        | 1.0   | ±0.055                                                 |
| MMSZ5230B       | D5      | 4.7                             | 20              | 19                                                                      | 1900 | 5.0                                        | 2.0   | ±0.030                                                 |
| MMSZ5231B       | E1      | 5.1                             | 20              | 17                                                                      | 1600 | 5.0                                        | 2.0   | ±0.030                                                 |
| MMSZ5232B       | E2      | 5.6                             | 20              | 11                                                                      | 1600 | 5.0                                        | 3.0   | +0.038                                                 |
| MMSZ5234B       | E4      | 6.2                             | 20              | 7.0                                                                     | 1000 | 5.0                                        | 4.0   | +0.045                                                 |
| MMSZ5235B       | E5      | 6.8                             | 20              | 5.0                                                                     | 750  | 3.0                                        | 5.0   | +0.050                                                 |
| MMSZ5236B       | F1      | 7.5                             | 20              | 6.0                                                                     | 500  | 3.0                                        | 6.0   | +0.058                                                 |
| MMSZ5237B       | F2      | 8.2                             | 20              | 8.0                                                                     | 500  | 3.0                                        | 6.5   | +0.062                                                 |
| MMSZ5239B       | F4      | 9.1                             | 20              | 10                                                                      | 600  | 3.0                                        | 7.0   | +0.068                                                 |
| MMSZ5240B       | F5      | 10                              | 20              | 17                                                                      | 600  | 3.0                                        | 8.0   | +0.075                                                 |
| MMSZ5241B       | H1      | 11                              | 20              | 22                                                                      | 600  | 2.0                                        | 8.4   | +0.076                                                 |
| MMSZ5242B       | H2      | 12                              | 20              | 30                                                                      | 600  | 1.0                                        | 9.1   | +0.077                                                 |
| MMSZ5243B       | H3      | 13                              | 9.5             | 13                                                                      | 600  | 0.5                                        | 9.9   | +0.079                                                 |
| MMSZ5245B       | H5      | 15                              | 8.5             | 16                                                                      | 600  | 0.1                                        | 11    | +0.082                                                 |
| MMSZ5246B       | J1      | 16                              | 7.8             | 17                                                                      | 600  | 0.1                                        | 12    | +0.083                                                 |
| MMSZ5248B       | J3      | 18                              | 7.0             | 21                                                                      | 600  | 0.1                                        | 14    | +0.085                                                 |
| MMSZ5250B       | J5      | 20                              | 6.2             | 25                                                                      | 600  | 0.1                                        | 15    | +0.086                                                 |
| MMSZ5251B       | K1      | 22                              | 5.6             | 29                                                                      | 600  | 0.1                                        | 17    | +0.087                                                 |
| MMSZ5252B       | K2      | 24                              | 5.2             | 33                                                                      | 600  | 0.1                                        | 18    | +0.088                                                 |
| MMSZ5254B       | K4      | 27                              | 4.6             | 41                                                                      | 600  | 0.1                                        | 21    | +0.090                                                 |
| MMSZ5255B       | K5      | 28                              | 4.5             | 44                                                                      | 600  | 0.1                                        | 21    | +0.091                                                 |
| MMSZ5256B       | M1      | 30                              | 4.2             | 49                                                                      | 600  | 0.1                                        | 23    | +0.091                                                 |
| MMSZ5257B       | M2      | 33                              | 3.8             | 58                                                                      | 700  | 0.1                                        | 25    | +0.092                                                 |
| MMSZ5258B       | M3      | 36                              | 3.4             | 70                                                                      | 700  | 0.1                                        | 27    | +0.093                                                 |
| MMSZ5259B       | M4      | 39                              | 3.2             | 80                                                                      | 800  | 0.1                                        | 30    | +0.094                                                 |

NOTE:

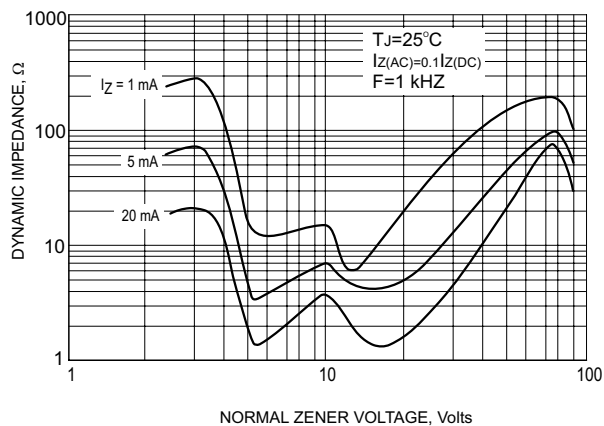
1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of ±5%.
2. Specials Available Include:
  - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
  - B. Matched sets.
3. Zener Voltage (Vz) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature (TL) at 30°C, from the diode body.
4. Zener Impedance (Zz) 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 (Izt or Izk) is superimposed on Izr or Izk.
5. Surge Current (Ir) 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, Izr, per JEDEC registration; however, actual device capability is as described in Figure 5.



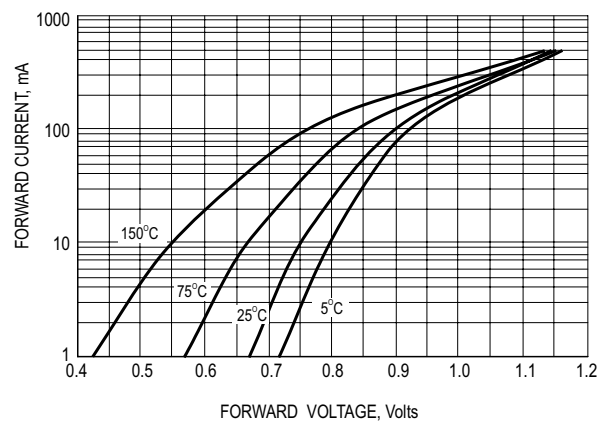
TYPICAL REVERSE CURRENT



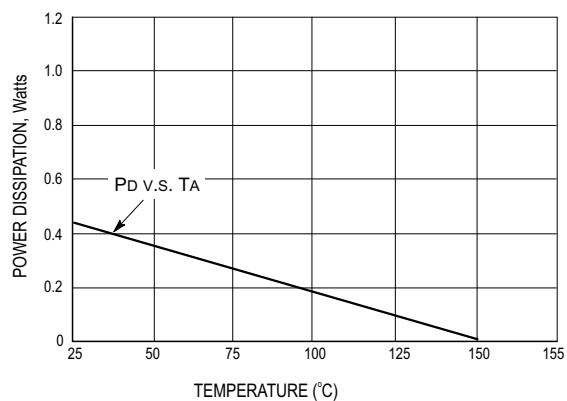
STEADY STATE POWER DERATING



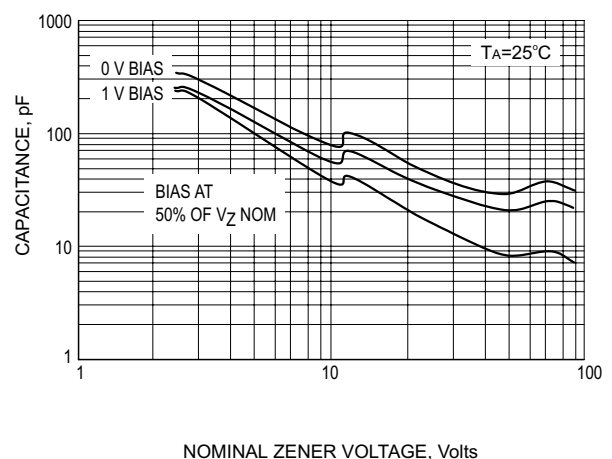
EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE



TYPICAL FORWARD VOLTAGE

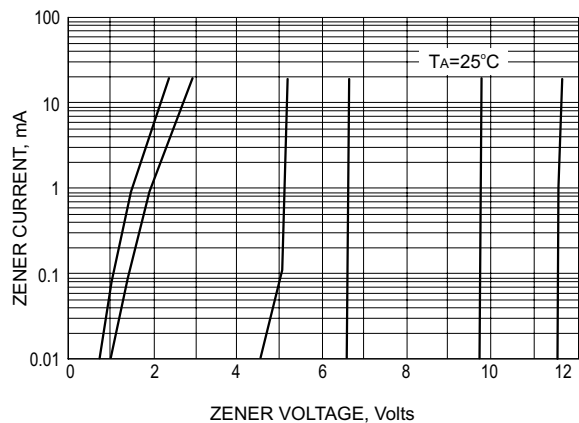


STEADY STATE POWER DERATING

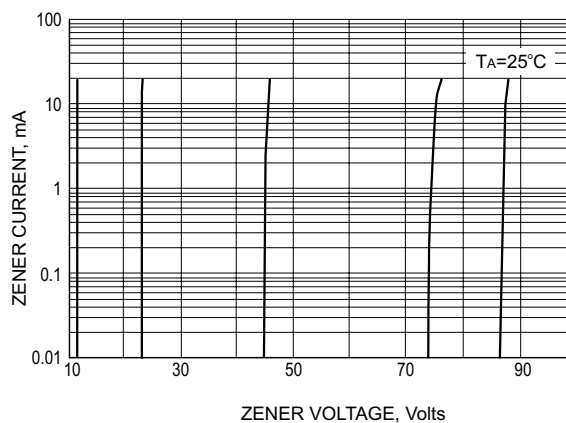


TYPICAL CAPACITANCE

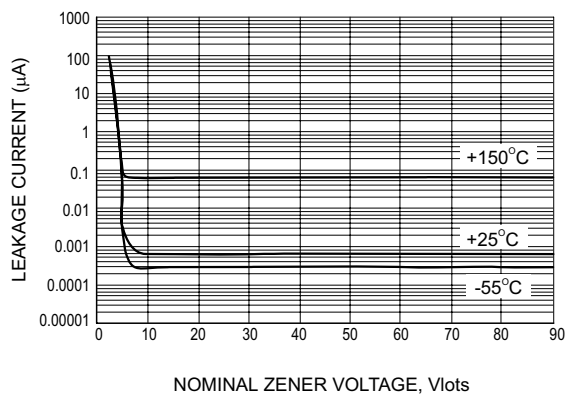
# MMSZ5221B thru MMSZ5259B



ZENER VOLTAGE V.S. ZENER CURRENT



ZENER VOLTAGE V.S. ZENER CURRENT



TYPICAL LEAKGE CURRENT