# MMSZ5221B-MMSZ5259B
Plastic-Encapsulate Zener Diodes

## Features

- Planar Die Construction
- 500mW Power Dissipation on Ceramic PCB
- General Purpose, Medium Current
- Ideally Suited for Automated Assembly Processes
- Available in Lead Free Version


SOD-123

## Package Marking and Ordering Information

| Product ID | Pack | Marking | Qty(PCS) |
|---|---|---|---|
| MMSZ4678-MMSZ4717 | SOD-123 | XX | 3000 |

XX=Device code, see table on page2 the marking code.

The marking bar indicates the cathode.

## Absolute Maximum Ratings(Ta=25℃)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Forward voltage @$I_F$ =10mA | $V_F$ | 0.85 | V |
| Power Dissipation | $P_D$ | 500 | mW |
| Thermal Resistance, Junction to Ambient Air | $R_{\theta JA}$ | 556 | ℃/W |
| Junction Temperature | $T_j$ | 150 | ℃ |
| Storage Temperature Range | $T_{stg}$ | -55 ~ +150 | ℃ |

Notes: Device mounted on ceramic PCB;5.0mm×7.0mm with pad areas 35 $mm^2$

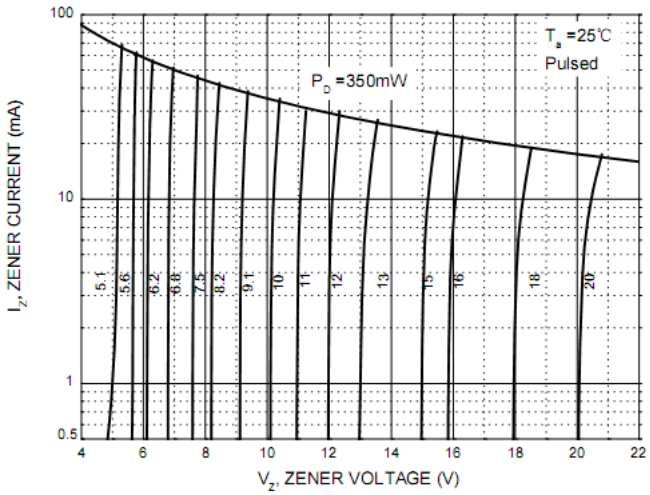
## Electrical Characteristics (Ta=25℃ unless otherwise specified)

| Type Number | Type Code | Zener Voltage Range (Note 2) | | | | Maximum Zener Impedance (Note 3) | | | Maximum Reverse Current | | Typical Temperature Coefficent @$I_{ZTC}$ | | Test Current $I_{ZTC}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $V_Z$@$I_{ZT}$ | | | $I_{ZT}$ | $Z_{ZT}$@$I_{ZT}$ | $Z_{ZK}$@$I_{ZK}$ | $I_{ZK}$ | $I_R$ | $V_R$ | mV/°C | | |
| | | Nom(V) | Min(V) | Max(V) | mA | Ω | | mA | μA | V | Min | Max | mA |
| MMSZ5221B | C1 | 2.4 | 2.35 | 2.45 | 5 | 100 | 600 | 1.0 | 50 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5223B | C3 | 2.7 | 2.65 | 2.75 | 5 | 100 | 600 | 1.0 | 20 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5225B | C5 | 3.0 | 2.94 | 3.06 | 5 | 95 | 600 | 1.0 | 10 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5226B | G1 | 3.3 | 3.23 | 3.37 | 5 | 95 | 600 | 1.0 | 5 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5227B | G2 | 3.6 | 3.53 | 3.67 | 5 | 90 | 600 | 1.0 | 5 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5228B | G3 | 3.9 | 3.82 | 3.98 | 5 | 90 | 600 | 1.0 | 0.5 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5229B | G4 | 4.3 | 4.21 | 4.39 | 5 | 90 | 600 | 1.0 | 0.5 | 1.0 | -3.5 | 0 | 5 |
| MMSZ5230B | G5 | 4.7 | 4.61 | 4.79 | 5 | 80 | 500 | 1.0 | 3 | 2.0 | -3.5 | 0.2 | 5 |
| MMSZ5231B | E1 | 5.1 | 5.00 | 5.20 | 5 | 60 | 480 | 1.0 | 2 | 2.0 | -2.7 | 1.2 | 5 |
| MMSZ5232B | E2 | 5.6 | 5.49 | 5.71 | 5 | 40 | 400 | 1.0 | 1 | 2.0 | 2.0 | 2.5 | 5 |
| MMSZ5234B | E4 | 6.2 | 6.08 | 6.32 | 5 | 9.5 | 150 | 1.0 | 3 | 4.0 | 0.4 | 3.7 | 5 |
| MMSZ5235B | E5 | 6.8 | 6.66 | 6.94 | 5 | 14.2 | 76 | 1.0 | 2 | 4.0 | 1.2 | 4.5 | 5 |
| MMSZ5236B | F1 | 7.5 | 7.35 | 7.65 | 5 | 14.2 | 76 | 1.0 | 1 | 5.0 | 2.5 | 5.3 | 5 |
| MMSZ5237B | F2 | 8.2 | 8.04 | 8.36 | 5 | 14.2 | 76 | 1.0 | 0.7 | 5.0 | 3.2 | 6.2 | 5 |
| MMSZ5239B | F4 | 9.1 | 8.92 | 9.28 | 5 | 14.2 | 95 | 1.0 | 0.5 | 7.0 | 3.8 | 7.0 | 5 |
| MMSZ5240B | F5 | 10 | 9.80 | 10.20 | 5 | 19 | 142.5 | 1.0 | 0.2 | 8.0 | 4.5 | 8.0 | 5 |
| MMSZ5241B | H1 | 11 | 10.78 | 11.22 | 5 | 19 | 142.5 | 1.0 | 0.1 | 8.0 | 5.4 | 9.0 | 5 |
| MMSZ5242B | H2 | 12 | 11.76 | 12.24 | 5 | 23.7 | 150 | 1.0 | 0.1 | 8.0 | 6.0 | 10.0 | 5 |
| MMSZ5243B | H3 | 13 | 12.74 | 13.30 | 5 | 28.5 | 190 | 1.0 | 0.1 | 8.0 | 7.0 | 11.0 | 5 |
| MMSZ5245B | H5 | 15 | 14.70 | 15.30 | 5 | 28.5 | 190 | 1.0 | 0.1 | 11.0 | 9.2 | 13.0 | 5 |
| MMSZ5246B | J1 | 16 | 15.68 | 16.30 | 5 | 38 | 190 | 1.0 | 0.1 | 11.0 | 10.4 | 14.0 | 5 |
| MMSZ5248B | J3 | 18 | 17.60 | 18.40 | 5 | 42.7 | 213 | 1.0 | 0.1 | 13.0 | 12.4 | 16.0 | 5 |
| MMSZ5250B | J5 | 20 | 19.60 | 20.40 | 5 | 52.2 | 213 | 1.0 | 0.1 | 14.0 | 14.4 | 18.0 | 5 |
| MMSZ5251B | K1 | 22 | 21.56 | 22.44 | 5 | 52.2 | 237 | 1.0 | 0.1 | 15.0 | 16.4 | 20.0 | 5 |
| MMSZ5252B | K2 | 24 | 23.52 | 24.50 | 5 | 66.5 | 250 | 1.0 | 0.1 | 17.0 | 18.4 | 22.0 | 5 |
| MMSZ5254B | K4 | 27 | 26.46 | 27.54 | 2 | 75 | 295 | 0.5 | 0.1 | 19.0 | 21.4 | 25.3 | 2 |
| MMSZ5256B | M1 | 30 | 29.40 | 30.60 | 2 | 75 | 295 | 0.5 | 0.1 | 21.0 | 24.4 | 29.4 | 2 |
| MMSZ5257B | M2 | 33 | 32.34 | 33.66 | 2 | 75 | 320 | 0.5 | 0.1 | 23.0 | 27.4 | 33.4 | 2 |
| MMSZ5258B | M3 | 36 | 35.28 | 36.72 | 2 | 85 | 345 | 0.5 | 0.1 | 25.0 | 30.4 | 37.4 | 2 |
| MMSZ5259B | M4 | 39 | 38.22 | 39.78 | 2 | 125 | 345 | 0.5 | 0.1 | 27.0 | 33.4 | 41.2 | 2 |
| MMSZ5260B | M5 | 43 | 42.14 | 43.86 | 2 | 145 | 370 | 0.5 | 0.1 | 30 0 | 37.6 | 46.6 | 2 |

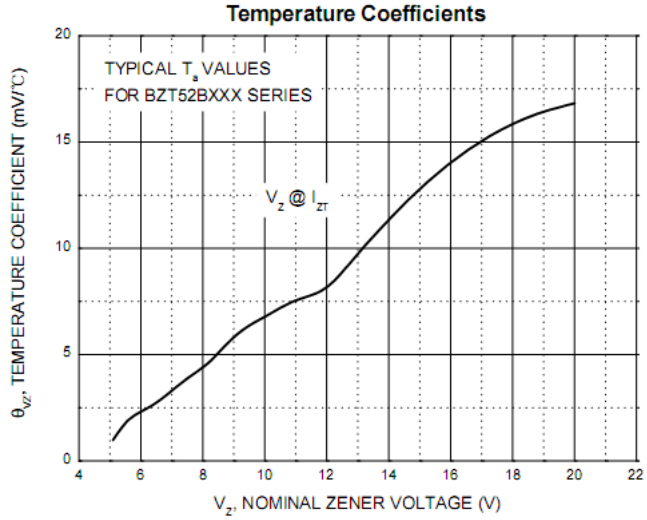
Notes: 1. Device mounted on ceramic PCB:7.6mm x 9.4mm x 0.87mm with pad areas 25mm$^2$
2. Short duration test pulse used to minimize self-heating effect
3. f = 1kHz

## Typical Characteristics

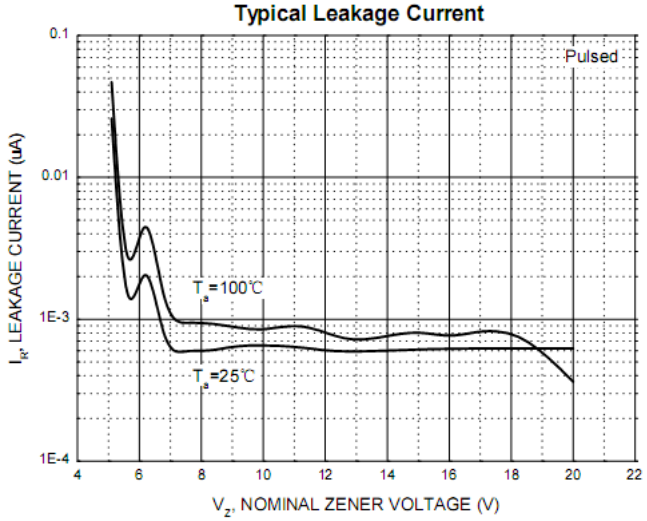
Zener Characteristics ($V_Z$ 5.1V to 20 V)



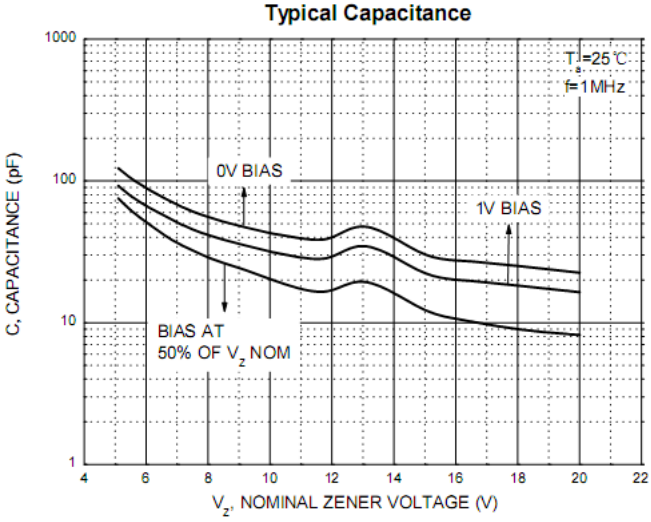

Temperature Coefficients



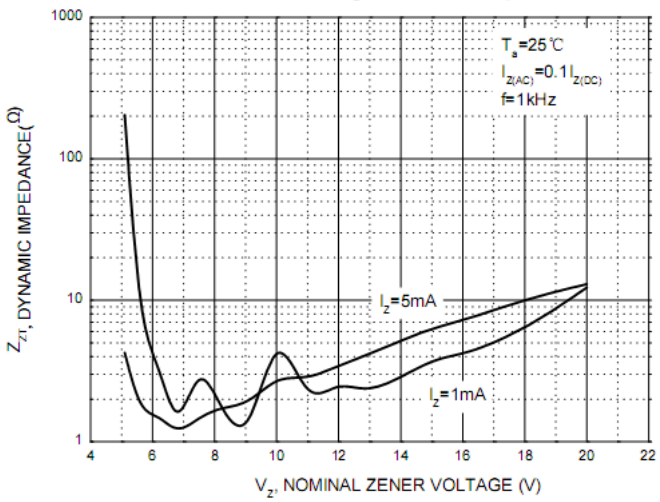

Typical Leakage Current



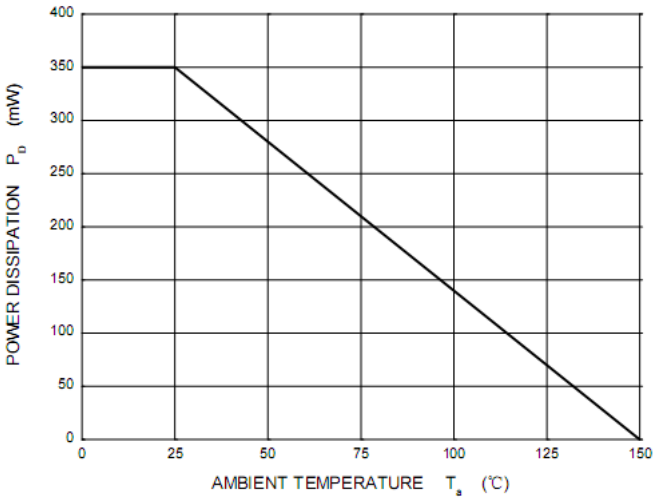

Typical Capacitance



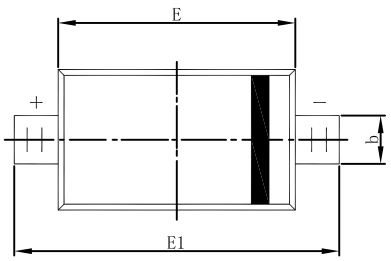

Effect of Zener Voltage on Zener Impedance

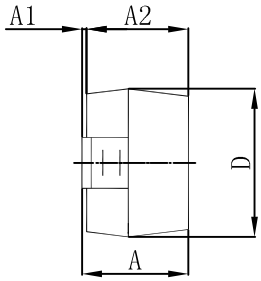


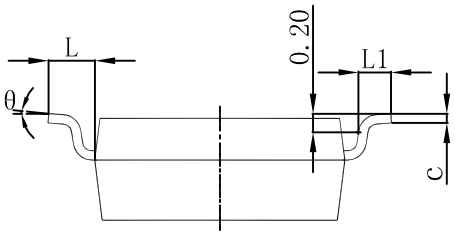

Power Derating Curve



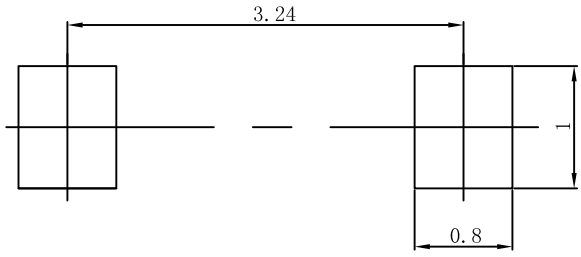
## SOD-123 Package Outline Dimensions




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.450 | 0.650 | 0.018 | 0.026 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.600 | 2.800 | 0.102 | 0.110 |
| E1 | 3.550 | 3.850 | 0.140 | 0.152 |
| L | 0.500 REF | | 0.020 REF | |
| L1 | 0.250 | 0.450 | 0.010 | 0.018 |
| θ | 0° | 8° | 0° | 8° |




**Note:**
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

## Attention

■ Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.

■ HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.

■ Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

■ HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could
give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.



■ Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.