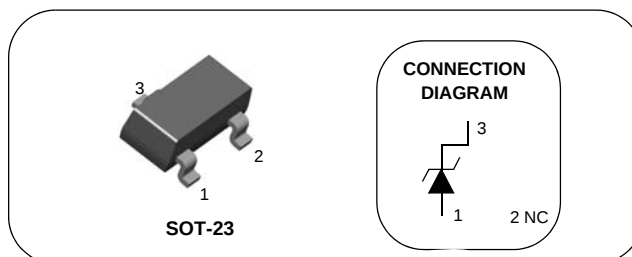


# MMBZ5221B-MMBZ5257B

## Zener Diodes

Tolerance = 5%



### Absolute Maximum Ratings \* $T_A = 25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter                      | Value       | Units            |
|-----------|--------------------------------|-------------|------------------|
| $P_D$     | Power Dissipation              | 350         | mW               |
| $T_{STG}$ | Storage Temperature Range      | -55 to +150 | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature | +150        | $^\circ\text{C}$ |

\* These ratings are limiting values above which the serviceability of the diode may be impaired.

### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

| Device    | Mark | $V_Z$ (V) |      |       | $Z_Z(\Omega)$ @ $I_Z$ (mA) |    | $Z_{ZK}(\Omega)$ @ $I_{ZK}$ (mA) |      | $I_R$ ( $\mu\text{A}$ ) @ $V_R$ (V) |     |
|-----------|------|-----------|------|-------|----------------------------|----|----------------------------------|------|-------------------------------------|-----|
|           |      | Min.      | Nor. | Max.  |                            |    |                                  |      |                                     |     |
| MMBZ5221B | 18A  | 2.28      | 2.4  | 2.52  | 30                         | 20 | 1,200                            | 0.25 | 100                                 | 1.0 |
| MMBZ5223B | 18C  | 2.565     | 2.7  | 2.835 | 30                         | 20 | 1,300                            | 0.25 | 75                                  | 1.0 |
| MMBZ5226B | 8A   | 3.135     | 3.3  | 3.465 | 28                         | 20 | 1,600                            | 0.25 | 25                                  | 1.0 |
| MMBZ5227B | 8B   | 3.42      | 3.6  | 3.78  | 24                         | 20 | 1,700                            | 0.25 | 15                                  | 1.0 |
| MMBZ5228B | 8C   | 3.705     | 3.9  | 4.095 | 23                         | 20 | 1,900                            | 0.25 | 10                                  | 1.0 |
| MMBZ5229B | 8D   | 4.085     | 4.3  | 4.515 | 22                         | 20 | 1,000                            | 0.25 | 5.0                                 | 1.0 |
| MMBZ5230B | 8E   | 4.465     | 4.7  | 4.935 | 19                         | 20 | 1,900                            | 0.25 | 5.0                                 | 2.0 |
| MMBZ5231B | 8F   | 4.845     | 5.1  | 5.355 | 17                         | 20 | 1,600                            | 0.25 | 5.0                                 | 2.0 |
| MMBZ5232B | 8G   | 5.32      | 5.6  | 5.88  | 11                         | 20 | 1,600                            | 0.25 | 5.0                                 | 3.0 |
| MMBZ5233B | 8H   | 5.7       | 6.0  | 6.3   | 7.0                        | 20 | 1,600                            | 0.25 | 5.0                                 | 3.5 |
| MMBZ5234B | 8J   | 5.89      | 6.2  | 6.51  | 7.0                        | 20 | 1,000                            | 0.25 | 5.0                                 | 4.0 |
| MMBZ5235B | 8K   | 6.46      | 6.8  | 7.14  | 5.0                        | 20 | 750                              | 0.25 | 3.0                                 | 5.0 |
| MMBZ5236B | 8L   | 7.125     | 7.5  | 7.875 | 6.0                        | 20 | 500                              | 0.25 | 3.0                                 | 6.0 |
| MMBZ5237B | 8M   | 7.79      | 8.2  | 8.61  | 8.0                        | 20 | 500                              | 0.25 | 3.0                                 | 6.5 |
| MMBZ5238B | 8N   | 8.265     | 8.7  | 9.135 | 8.0                        | 20 | 600                              | 0.25 | 3.0                                 | 6.5 |
| MMBZ5239B | 8P   | 8.645     | 9.1  | 9.555 | 10                         | 20 | 600                              | 0.25 | 3.0                                 | 7.0 |
| MMBZ5240B | 8Q   | 9.5       | 10   | 10.5  | 17                         | 20 | 600                              | 0.25 | 3.0                                 | 8.0 |
| MMBZ5241B | 8R   | 10.45     | 11   | 11.55 | 22                         | 20 | 600                              | 0.25 | 2.0                                 | 8.4 |
| MMBZ5242B | 8S   | 11.4      | 12   | 12.6  | 30                         | 20 | 600                              | 0.25 | 1.0                                 | 9.1 |

$V_F$  Forward Voltage = 0.9V Maximum @  $I_F = 10\text{mA}$  for all MMBZ5200 series

**Electrical Characteristics** (Continued)  $T_A = 25^\circ\text{C}$  unless otherwise noted

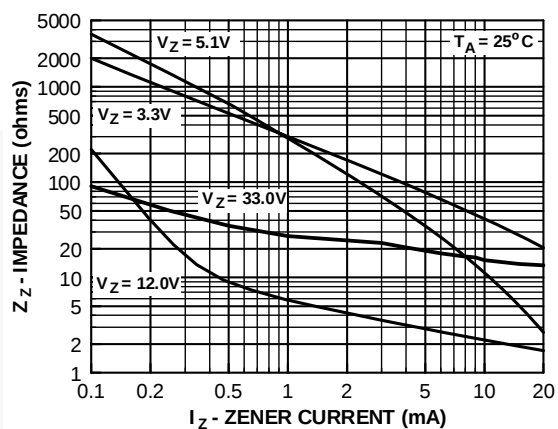
| Device    | Mark | $V_Z$ (V) |      |       | $Z_Z(\Omega) @ I_Z$ (mA) |     | $Z_{ZK}(\Omega) @ I_{ZK}$ (mA) |      | $I_R$ ( $\mu\text{A}$ ) @ $V_R$ (V) |     |
|-----------|------|-----------|------|-------|--------------------------|-----|--------------------------------|------|-------------------------------------|-----|
|           |      | Min.      | Nor. | Max.  |                          |     |                                |      |                                     |     |
| MMBZ5243B | 8T   | 12.35     | 13   | 13.65 | 13                       | 9.5 | 600                            | 0.25 | 0.5                                 | 9.9 |
| MMBZ5244B | 8U   | 13.3      | 14   | 14.7  | 15                       | 9.0 | 600                            | 0.25 | 0.1                                 | 10  |
| MMBZ5245B | 8V   | 14.25     | 15   | 15.75 | 16                       | 8.5 | 600                            | 0.25 | 0.1                                 | 11  |
| MMBZ5246B | 8W   | 15.2      | 16   | 16.8  | 17                       | 7.8 | 600                            | 0.25 | 0.1                                 | 12  |
| MMBZ5247B | 8X   | 16.15     | 17   | 17.85 | 19                       | 7.4 | 600                            | 0.25 | 0.1                                 | 13  |
| MMBZ5248B | 8Y   | 17.1      | 18   | 18.9  | 21                       | 7.0 | 600                            | 0.25 | 0.1                                 | 14  |
| MMBZ5249B | 8Z   | 18.05     | 19   | 19.95 | 23                       | 6.6 | 600                            | 0.25 | 0.1                                 | 14  |
| MMBZ5250B | 81A  | 19        | 20   | 21    | 25                       | 6.2 | 600                            | 0.25 | 0.1                                 | 15  |
| MMBZ5251B | 81B  | 20.9      | 22   | 23.1  | 29                       | 5.6 | 600                            | 0.25 | 0.1                                 | 17  |
| MMBZ5252B | 81C  | 22.8      | 24   | 25.2  | 33                       | 5.2 | 600                            | 0.25 | 0.1                                 | 18  |
| MMBZ5253B | 81D  | 23.75     | 25   | 26.25 | 35                       | 5.0 | 600                            | 0.25 | 0.1                                 | 19  |
| MMBZ5254B | 81E  | 25.65     | 27   | 28.35 | 41                       | 4.6 | 600                            | 0.25 | 0.1                                 | 21  |
| MMBZ5255B | 81F  | 26.6      | 28   | 29.4  | 44                       | 4.5 | 600                            | 0.25 | 0.1                                 | 21  |
| MMBZ5256B | 81G  | 28.5      | 30   | 31.5  | 49                       | 4.2 | 600                            | 0.25 | 0.1                                 | 23  |
| MMBZ5257B | 81H  | 31.35     | 33   | 34.65 | 58                       | 3.8 | 600                            | 0.25 | 0.1                                 | 25  |

 **$V_F$  Forward Voltage = 0.9V Maximum @  $I_F = 10\text{mA}$  for all MMBZ5200 series**

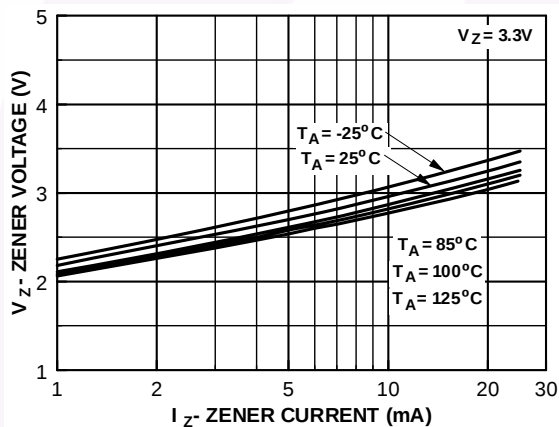
## Typical Performance Characteristics



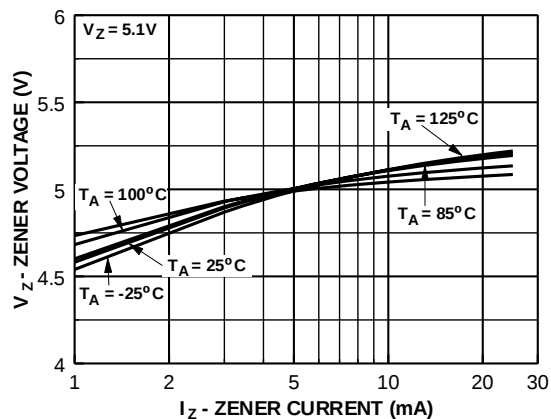
Zener Current vs. Zener Voltage



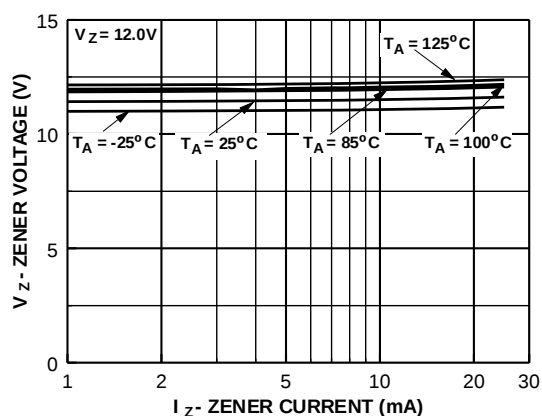
Zener Current vs. Zener Impedance



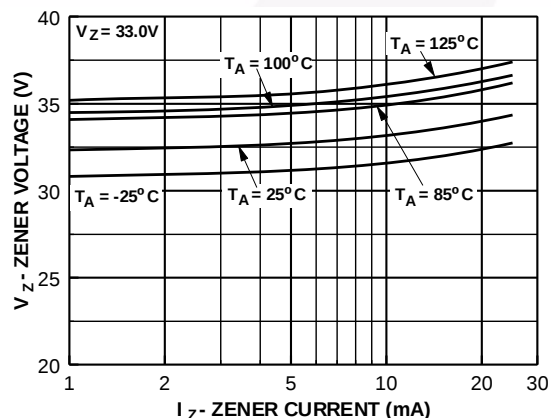
3.3 Zener Voltage vs. Temperature



5.1 Zener Voltage vs. Temperature



12 Zener Voltage vs. Zener Temperature



33 Zener Voltage vs. Zener Temperature



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Rev. I60

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