



Micro Commercial Components



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## MMBZ5221B THRU MMBZ5259B

### Features

- Halogen free available upon request by adding suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Wide Voltage Range Available
- Small Outline Package For Space Savings
- High Temp Soldering: 260°C for 10 Seconds At Terminals
- Surface Mount Package

### Maximum Ratings

- Operating Junction Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Maximum Thermal Resistance; 357°C/W Junction To Ambient

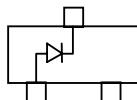
#### Maximum Ratings @ 25°C Unless Otherwise Specified

|                                         |           |     |       |
|-----------------------------------------|-----------|-----|-------|
| Zener Current                           | $I_F$     | 100 | mA    |
| Maximum Forward Voltage                 | $V_F$     | 1.2 | V     |
| Power Dissipation<br>(Notes A)          | $P_d$     | 350 | mWatt |
| Peak Forward Surge<br>Current (Notes B) | $I_{FSM}$ | 4.0 | Amps  |

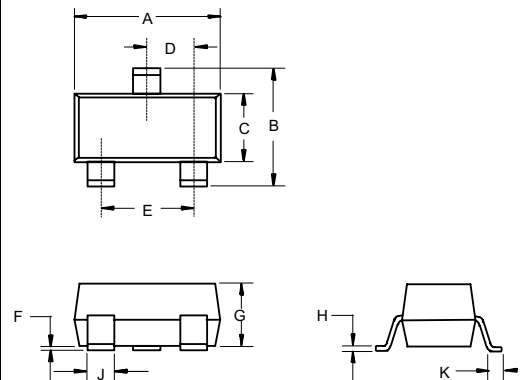
#### NOTES:

- A. Mounted on FR4 PC board with our suggested solder pad layout.  
B. Measured on 8.3ms, single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.

\*Pin Configuration - Top View

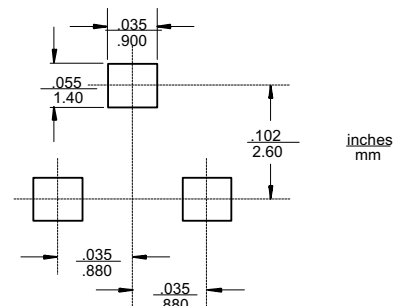


### SOT-23



| DIM | INCHES |      | MM   |      | NOTE |
|-----|--------|------|------|------|------|
|     | MIN    | MAX  | MIN  | MAX  |      |
| A   | .110   | .119 | 2.80 | 3.00 |      |
| B   | .086   | .103 | 2.20 | 2.60 |      |
| C   | .047   | .056 | 1.20 | 1.40 |      |
| D   | .033   | .041 | .85  | 1.05 |      |
| E   | .066   | .083 | 1.70 | 2.10 |      |
| F   | ---    | .006 | ---  | .15  |      |
| G   | .035   | .044 | .90  | 1.10 |      |
| H   | .002   | .006 | .05  | .15  |      |
| J   | .013   | .020 | .35  | .50  |      |
| K   | .007   | ---  | .20  | ---  |      |

#### Suggested Solder Pad Layout



# MMBZ5221B thru MMBZ5259B



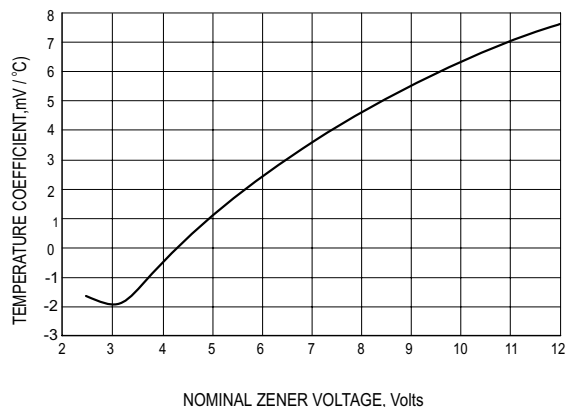
## ELECTRICAL CHARACTERISTICS @25°C

| MCC<br>PART<br>NUMBER | MARKING | NOMINAL ZENER<br>VOLTAGE $V_Z$ @ $I_{ZT}$ | TEST CURRENT<br>$I_{ZT}$ | MAXIMUM ZENER IMPEDANCE<br>'B' SUFFIX ONLY<br>$Z_{ZT}$ @ $I_{ZT}$ $Z_{ZK}$ @ $I_{ZK} = 0.25mA$ |      | MAXIMUM REVERSE LEAKAGE<br>CURRENT<br>$I_R$ @ $V_R$ |       |
|-----------------------|---------|-------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------|------|-----------------------------------------------------|-------|
|                       |         | VOLTS                                     | mA                       | OHMS                                                                                           | OHMS | $\mu A$                                             | VOLTS |
| MMBZ5221B             | KC1/C1  | 2.4                                       | 20                       | 30                                                                                             | 1200 | 100                                                 | 1.0   |
| MMBZ5222B             | KC2/C2  | 2.5                                       | 20                       | 30                                                                                             | 1250 | 100                                                 | 1.0   |
| MMBZ5223B             | KC3/C3  | 2.7                                       | 20                       | 30                                                                                             | 1300 | 75                                                  | 1.0   |
| MMBZ5225B             | KC5/C5  | 3.0                                       | 20                       | 29                                                                                             | 1600 | 50                                                  | 1.0   |
| MMBZ5226B             | KG1/D1  | 3.3                                       | 20                       | 28                                                                                             | 1600 | 25                                                  | 1.0   |
| MMBZ5227B             | KG2/D2  | 3.6                                       | 20                       | 24                                                                                             | 1700 | 15                                                  | 1.0   |
| MMBZ5228B             | KG3/D3  | 3.9                                       | 20                       | 23                                                                                             | 1900 | 10                                                  | 1.0   |
| MMBZ5229B             | KG4/D4  | 4.3                                       | 20                       | 22                                                                                             | 2000 | 5.0                                                 | 1.0   |
| MMBZ5230B             | KG5/D5  | 4.7                                       | 20                       | 19                                                                                             | 1900 | 5.0                                                 | 2.0   |
| MMBZ5231B             | KE1/E1  | 5.1                                       | 20                       | 17                                                                                             | 1600 | 5.0                                                 | 2.0   |
| MMBZ5232B             | KE2/E2  | 5.6                                       | 20                       | 11                                                                                             | 1600 | 5.0                                                 | 3.0   |
| MMBZ5233B             | KE3/E3  | 6.0                                       | 20                       | 7.0                                                                                            | 1600 | 5.0                                                 | 3.5   |
| MMBZ5234B             | KE4/E4  | 6.2                                       | 20                       | 7.0                                                                                            | 1000 | 5.0                                                 | 4.0   |
| MMBZ5235B             | KE5/E5  | 6.8                                       | 20                       | 5.0                                                                                            | 750  | 3.0                                                 | 5.0   |
| MMBZ5236B             | KF1/F1  | 7.5                                       | 20                       | 6.0                                                                                            | 500  | 3.0                                                 | 6.0   |
| MMBZ5237B             | KF2/F2  | 8.2                                       | 20                       | 8.0                                                                                            | 500  | 3.0                                                 | 6.5   |
| MMBZ5238B             | KF3/F3  | 8.7                                       | 20                       | 8.0                                                                                            | 600  | 3.0                                                 | 6.5   |
| MMBZ5239B             | KF4/F4  | 9.1                                       | 20                       | 10                                                                                             | 600  | 3.0                                                 | 7.0   |
| MMBZ5240B             | KF5/F5  | 10                                        | 20                       | 17                                                                                             | 600  | 3.0                                                 | 8.0   |
| MMBZ5241B             | KH1/H1  | 11                                        | 20                       | 22                                                                                             | 600  | 2.0                                                 | 8.4   |
| MMBZ5242B             | KH2/H2  | 12                                        | 20                       | 30                                                                                             | 600  | 1.0                                                 | 9.1   |
| MMBZ5243B             | KH3/H3  | 13                                        | 9.5                      | 13                                                                                             | 600  | 0.5                                                 | 9.9   |
| MMBZ5244B             | KH4/H4  | 14                                        | 9.0                      | 15                                                                                             | 600  | 0.1                                                 | 10    |
| MMBZ5245B             | KH5/H5  | 15                                        | 8.5                      | 16                                                                                             | 600  | 0.1                                                 | 11    |
| MMBZ5246B             | KJ1/J1  | 16                                        | 7.8                      | 17                                                                                             | 600  | 0.1                                                 | 12    |
| MMBZ5248B             | KJ3/J3  | 18                                        | 7.0                      | 21                                                                                             | 600  | 0.1                                                 | 14    |
| MMBZ5250B             | KJ5/J5  | 20                                        | 6.2                      | 25                                                                                             | 600  | 0.1                                                 | 15    |
| MMBZ5251B             | KK1/K1  | 22                                        | 5.6                      | 29                                                                                             | 600  | 0.1                                                 | 17    |
| MMBZ5252B             | KK2/K2  | 24                                        | 5.2                      | 33                                                                                             | 600  | 0.1                                                 | 18    |
| MMBZ5254B             | KK4/K4  | 27                                        | 5.0                      | 41                                                                                             | 600  | 0.1                                                 | 21    |
| MMBZ5255B             | KK5/K5  | 28                                        | 4.5                      | 44                                                                                             | 600  | 0.1                                                 | 21    |
| MMBZ5256B             | KM1/M1  | 30                                        | 4.2                      | 49                                                                                             | 600  | 0.1                                                 | 23    |
| MMBZ5257B             | KM2/M2  | 33                                        | 3.8                      | 58                                                                                             | 700  | 0.1                                                 | 25    |
| MMBZ5258B             | KM3/M3  | 36                                        | 3.4                      | 70                                                                                             | 700  | 0.1                                                 | 27    |
| MMBZ5259B             | KM4/M4  | 39                                        | 3.2                      | 80                                                                                             | 800  | 0.1                                                 | 30    |

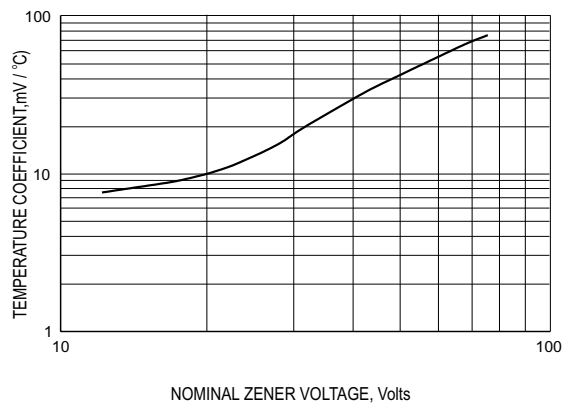
### Note:

1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of  $\pm 5\%$ .
2. Specials Available Include:
  - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
  - B. Matched sets.
3. Zener Voltage ( $V_Z$ ) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature ( $T_L$ ) at  $30^\circ C$ , from the diode body.
4. Zener Impedance ( $Z_Z$ ) 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 ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ .
5. Surge Current ( $I_R$ ) 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,  $I_{ZT}$ , per JEDEC registration; however, actual device capability is as described in Figure 5.

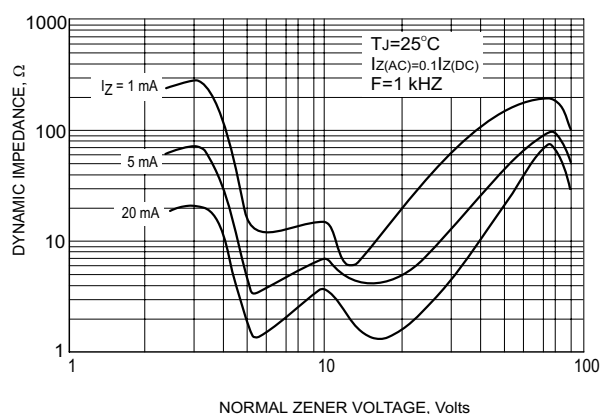
# MMBZ5221B thru MMBZ5259B



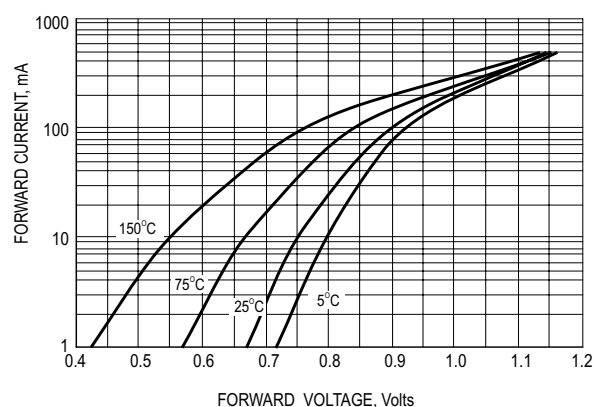
**TYPICAL REVERSE CURRENT**



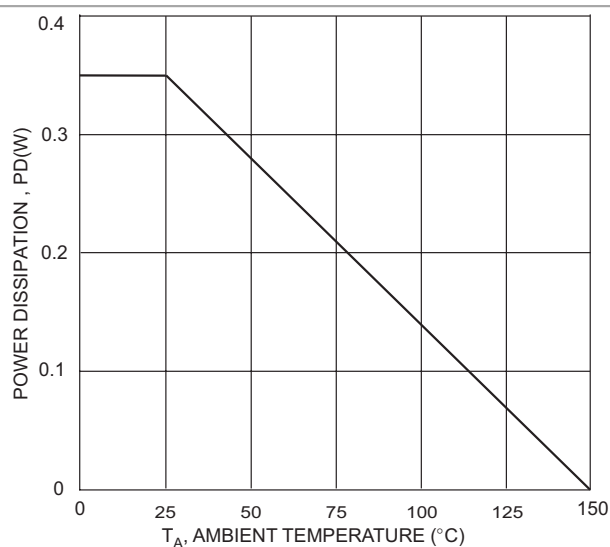
**STEADY STATE POWER DERATING**



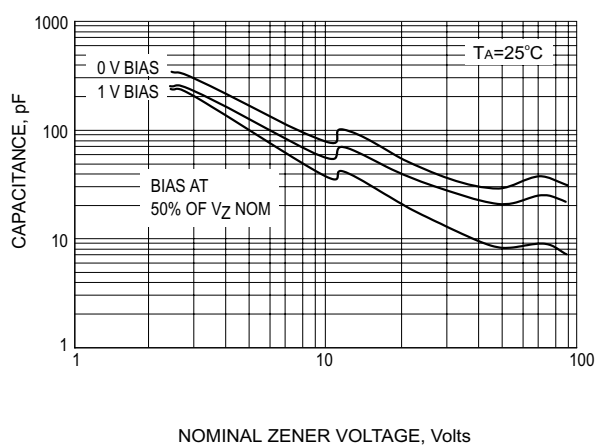
**EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE**



**TYPICAL FORWARD VOLTAGE**

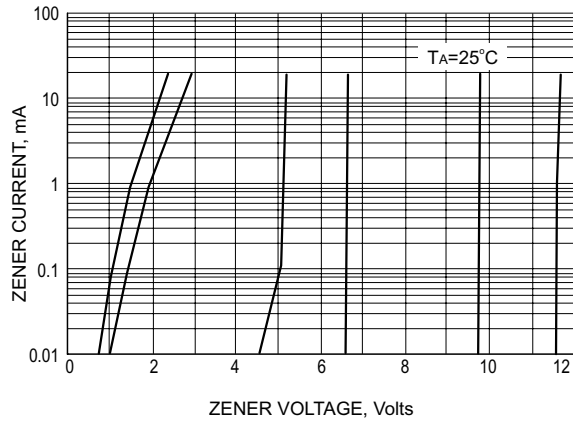


**STEADY STATE POWER DERATING**

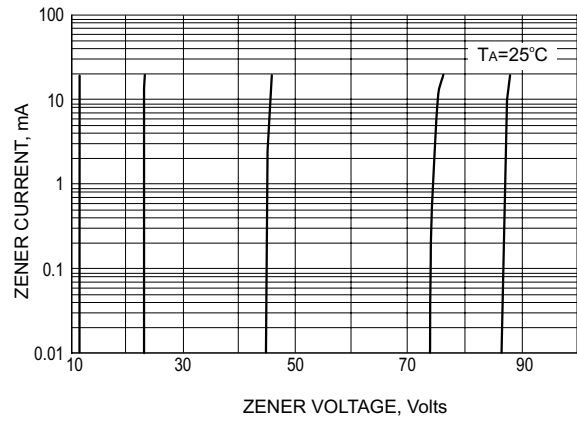


**TYPICAL CAPACITANCE**

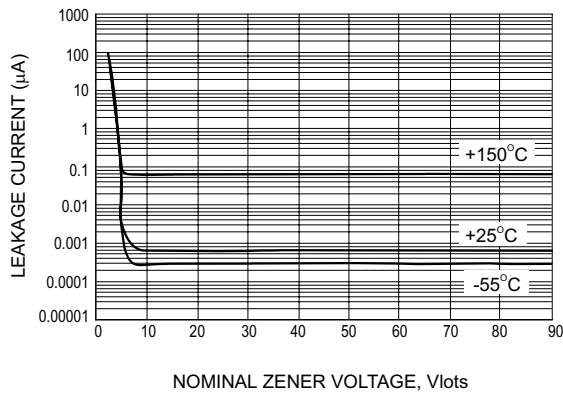
# MMBZ5221B thru MMBZ5259B



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



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



**TYPICAL LEAKGE CURRENT**

## Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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