

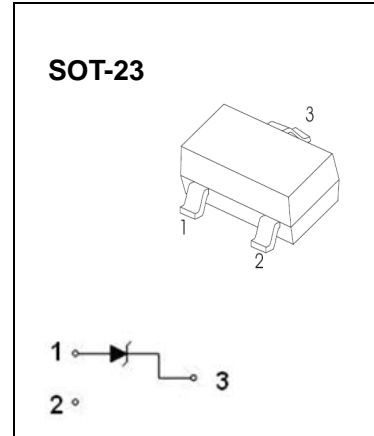


## SOT-23 Plastic-Encapsulate Diode

**MMBZ5221B-MMBZ5259B** ZENER DIODE

### FEATURES

- Planar Die Construction
- General Purpose, Medium Current
- Ideally Suited for Automated Assembly



**Marking:** see table on page2 the marking code

### Maximum Ratings( $T_a = 25^\circ\text{C}$ unless otherwise specified)

| Characteristic                           | Symbol   | Value      | Unit                      |
|--|----------|------------|---------------------------|
| Forward Voltage @ $I_F = 10\text{mA}$    | $V_F$    | 0.9        | V                         |
| Power Dissipation                        | $P_D$    | 300        | mW                        |
| Thermal Resistance [ Junction to Ambient | $R_{JA}$ | 417        | $^\circ\text{C}/\text{W}$ |
| Operating Temperature                    | $T_j$    | 150        | $^\circ\text{C}$          |
| Storage Temperature Range                | $T_c$    | -55 ~ +150 | $^\circ\text{C}$          |

## ELECTRICAL CHARACTERISTICS

$T_a=25^\circ\text{C}$  unless otherwise specified

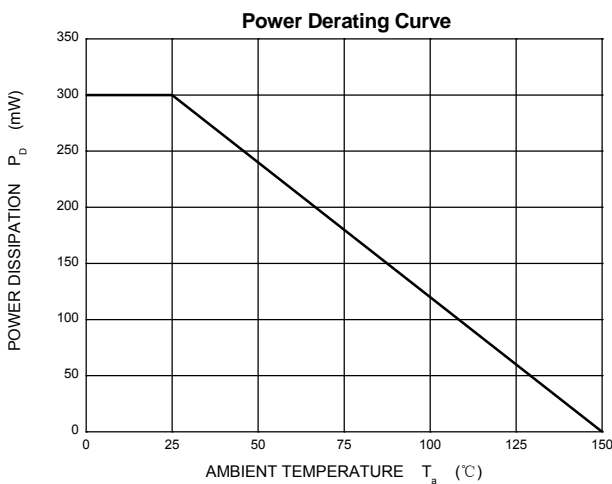
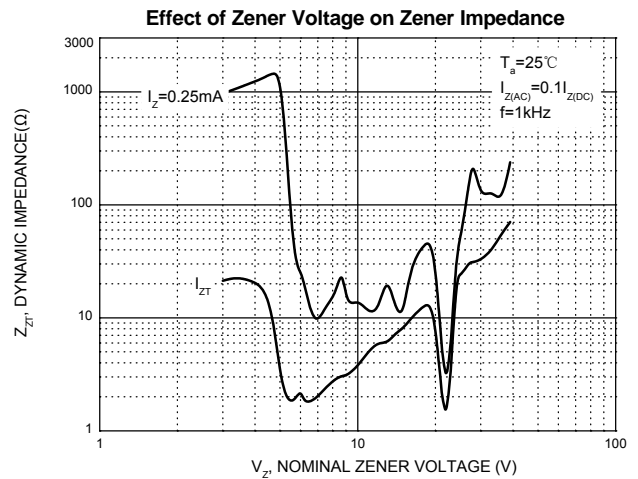
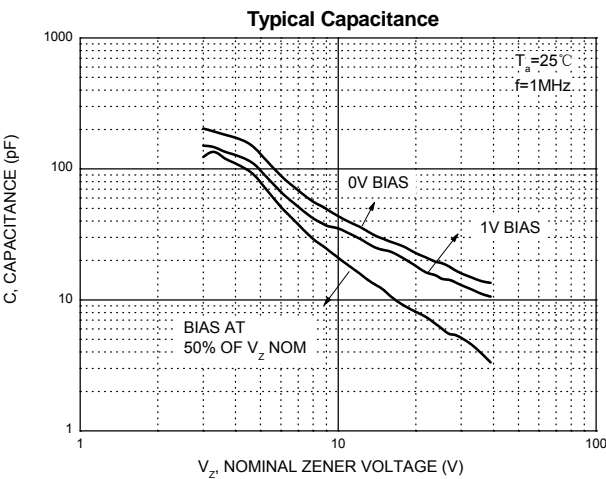
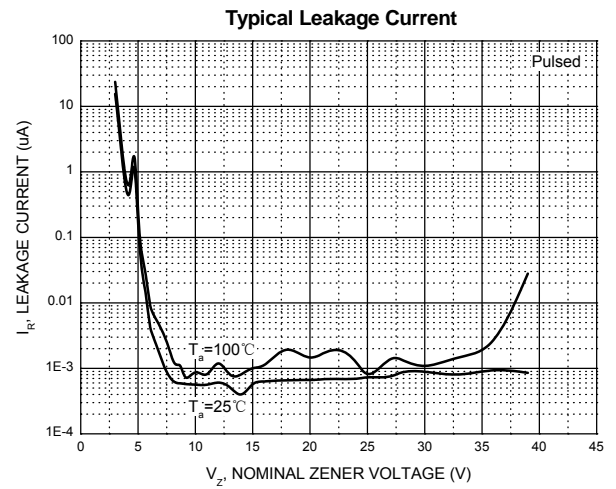
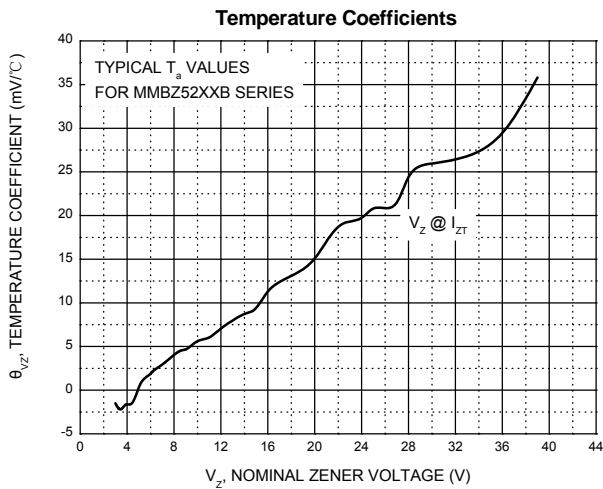
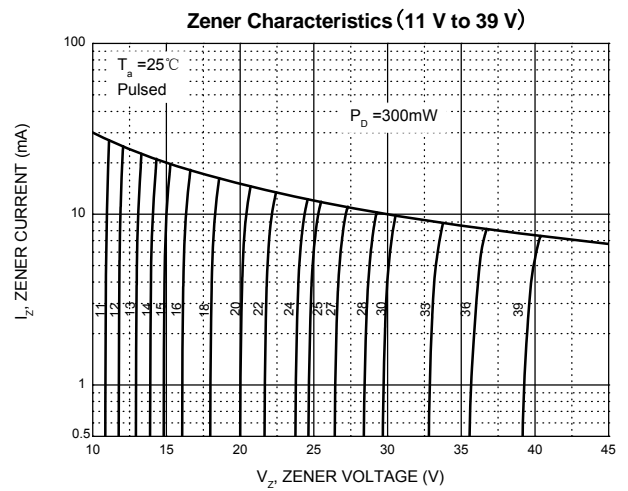
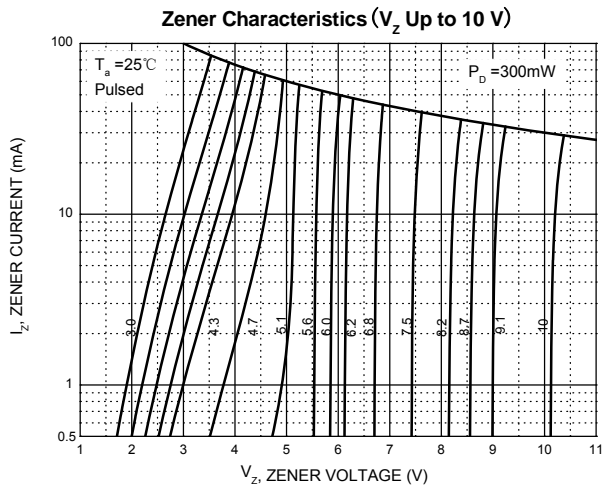
| Type Number | Marking Code | Zener Voltage Range (Note 1) |         |         | Test Current | Maximum Zener Impedance (Note 2) |                   | Maximum Reverse Leakage Current (Note 1) |       |
|-------------|--------------|------------------------------|---------|---------|--------------|----------------------------------|-------------------|--|-------|
|             |              | $V_z @ I_{zT}$               |         |         |              | $I_{zT}$                         | $Z_{zT} @ I_{zT}$ | $Z_{zK} @ I_{zK} = 0.25\text{mA}$        | $I_R$ |
|             |              | Nom (V)                      | Min (V) | Max (V) | mA           | $\Omega$                         |                   | $\mu\text{A}$                            | V     |
| MMBZ5221B   | KC1          | 2.4                          | 2.28    | 2.52    | 20           | 30                               | 1200              | 100                                      | 1.0   |
| MMBZ5222B   | KC2          | 2.5                          | 2.38    | 2.63    | 20           | 30                               | 1250              | 100                                      | 1.0   |
| MMBZ5223B   | KC3          | 2.7                          | 2.57    | 2.84    | 20           | 30                               | 1300              | 75                                       | 1.0   |
| MMBZ5225B   | KC5          | 3.0                          | 2.85    | 3.15    | 20           | 30                               | 1600              | 50                                       | 1.0   |
| MMBZ5226B   | KG1          | 3.3                          | 3.14    | 3.47    | 20           | 28                               | 1600              | 25                                       | 1.0   |
| MMBZ5227B   | KG2          | 3.6                          | 3.42    | 3.78    | 20           | 24                               | 1700              | 15                                       | 1.0   |
| MMBZ5228B   | KG3          | 3.9                          | 3.71    | 4.10    | 20           | 23                               | 1900              | 10                                       | 1.0   |
| MMBZ5229B   | KG4          | 4.3                          | 4.09    | 4.52    | 20           | 22                               | 2000              | 5.0                                      | 1.0   |
| MMBZ5230B   | KG5          | 4.7                          | 4.47    | 4.94    | 20           | 19                               | 1900              | 5.0                                      | 2.0   |
| MMBZ5231B   | KE1          | 5.1                          | 4.85    | 5.36    | 20           | 17                               | 1600              | 5.0                                      | 2.0   |
| MMBZ5232B   | KE2          | 5.6                          | 5.32    | 5.88    | 20           | 11                               | 1600              | 5.0                                      | 3.0   |
| MMBZ5233B   | KE3          | 6.0                          | 5.70    | 6.30    | 20           | 7                                | 1600              | 5.0                                      | 3.5   |
| MMBZ5234B   | KE4          | 6.2                          | 5.89    | 6.51    | 20           | 7                                | 1000              | 5.0                                      | 4.0   |
| MMBZ5235B   | KE5          | 6.8                          | 6.46    | 7.14    | 20           | 5                                | 750               | 3.0                                      | 5.0   |
| MMBZ5236B   | KF1          | 7.5                          | 7.13    | 7.88    | 20           | 6                                | 500               | 3.0                                      | 6.0   |
| MMBZ5237B   | KF2          | 8.2                          | 7.79    | 8.61    | 20           | 8                                | 500               | 3.0                                      | 6.5   |
| MMBZ5238B   | KF3          | 8.7                          | 8.27    | 9.14    | 20           | 8                                | 600               | 3.0                                      | 6.5   |
| MMBZ5239B   | KF4          | 9.1                          | 8.65    | 9.56    | 20           | 10                               | 600               | 3.0                                      | 7.0   |
| MMBZ5240B   | KF5          | 10                           | 9.50    | 10.50   | 20           | 17                               | 600               | 3.0                                      | 8.0   |
| MMBZ5241B   | KH1          | 11                           | 10.45   | 11.55   | 20           | 22                               | 600               | 2.0                                      | 8.4   |
| MMBZ5242B   | KH2          | 12                           | 11.40   | 12.60   | 20           | 30                               | 600               | 1.0                                      | 9.1   |
| MMBZ5243B   | KH3          | 13                           | 12.35   | 13.65   | 9.5          | 13                               | 600               | 0.5                                      | 9.9   |
| MMBZ5244B   | KH4          | 14                           | 13.30   | 14.70   | 9.0          | 15                               | 600               | 0.1                                      | 10    |
| MMBZ5245B   | KH5          | 15                           | 14.25   | 15.75   | 8.5          | 16                               | 600               | 0.1                                      | 11    |
| MMBZ5246B   | KJ1          | 16                           | 15.20   | 16.80   | 7.8          | 17                               | 600               | 0.1                                      | 12    |
| MMBZ5247B   | KJ2          | 17                           | 16.15   | 17.85   | 7.4          | 19                               | 600               | 0.1                                      | 13    |
| MMBZ5248B   | KJ3          | 18                           | 17.10   | 18.90   | 7.0          | 21                               | 600               | 0.1                                      | 14    |
| MMBZ5249B   | KJ4          | 19                           | 18.05   | 19.95   | 6.6          | 23                               | 600               | 0.1                                      | 14    |
| MMBZ5250B   | KJ5          | 20                           | 19.00   | 21.00   | 6.2          | 25                               | 600               | 0.1                                      | 15    |
| MMBZ5251B   | KK1          | 22                           | 20.90   | 23.10   | 5.6          | 29                               | 600               | 0.1                                      | 17    |
| MMBZ5252B   | KK2          | 24                           | 22.80   | 25.20   | 5.2          | 33                               | 600               | 0.1                                      | 18    |
| MMBZ5253B   | KK3          | 25                           | 23.75   | 26.25   | 5.0          | 35                               | 600               | 0.1                                      | 19    |
| MMBZ5254B   | KK4          | 27                           | 25.65   | 28.35   | 5.0          | 41                               | 600               | 0.1                                      | 21    |
| MMBZ5255B   | KK5          | 28                           | 26.60   | 29.40   | 4.5          | 44                               | 600               | 0.1                                      | 21    |
| MMBZ5256B   | KM1          | 30                           | 28.50   | 31.50   | 4.2          | 49                               | 600               | 0.1                                      | 23    |
| MMBZ5257B   | KM2          | 33                           | 31.35   | 34.65   | 3.8          | 58                               | 700               | 0.1                                      | 25    |
| MMBZ5258B   | KM3          | 36                           | 34.20   | 37.80   | 3.4          | 70                               | 700               | 0.1                                      | 27    |
| MMBZ5259B   | KM4          | 39                           | 37.05   | 40.95   | 3.2          | 80                               | 800               | 0.1                                      | 30    |

Notes: 1. Short duration test pulse used to minimize self-heating effect.

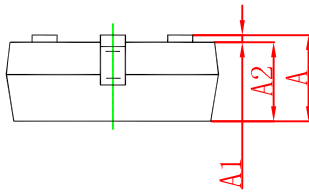
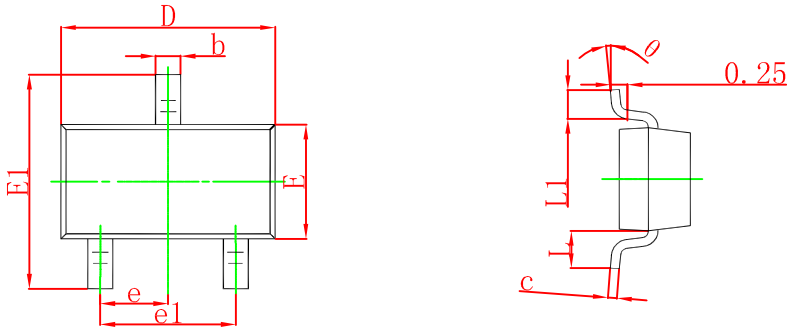
2.  $f = 1\text{kHz}$ .

# Typical Characteristics

Notes: Our company currently provide 3.0V-39V products only

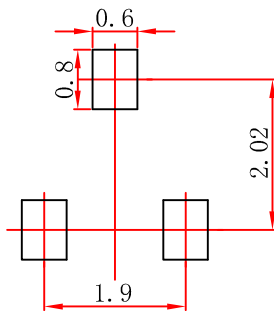


## SOT-23 Package Outline Dimensions



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| A        | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 0.900                     | 1.050 | 0.035                | 0.041 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.080                     | 0.150 | 0.003                | 0.006 |
| D        | 2.800                     | 3.000 | 0.110                | 0.118 |
| E        | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1       | 2.250                     | 2.550 | 0.089                | 0.100 |
| e        | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.550 REF                 |       | 0.022 REF            |       |
| L1       | 0.300                     | 0.500 | 0.012                | 0.020 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

## SOT-23 Suggested Pad Layout



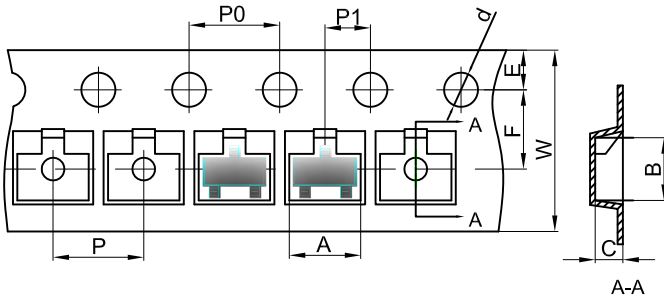
- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.

### NOTICE

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# SOT-23 Tape and Reel

## SOT-23 Embossed Carrier Tape



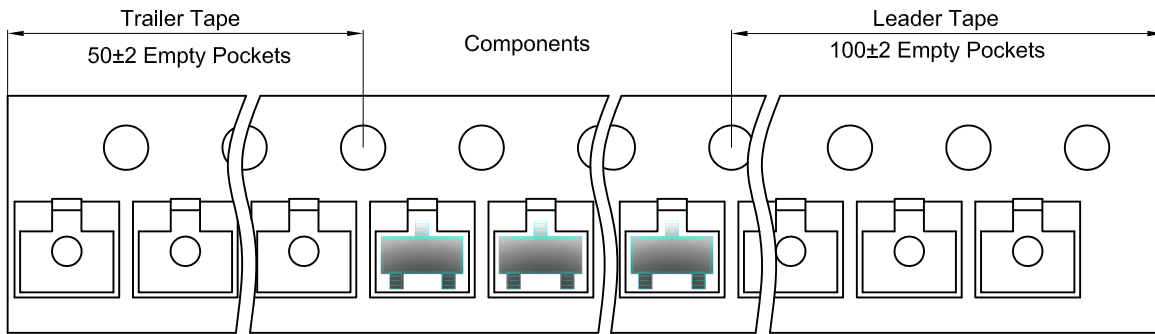
### Packaging Description:

SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

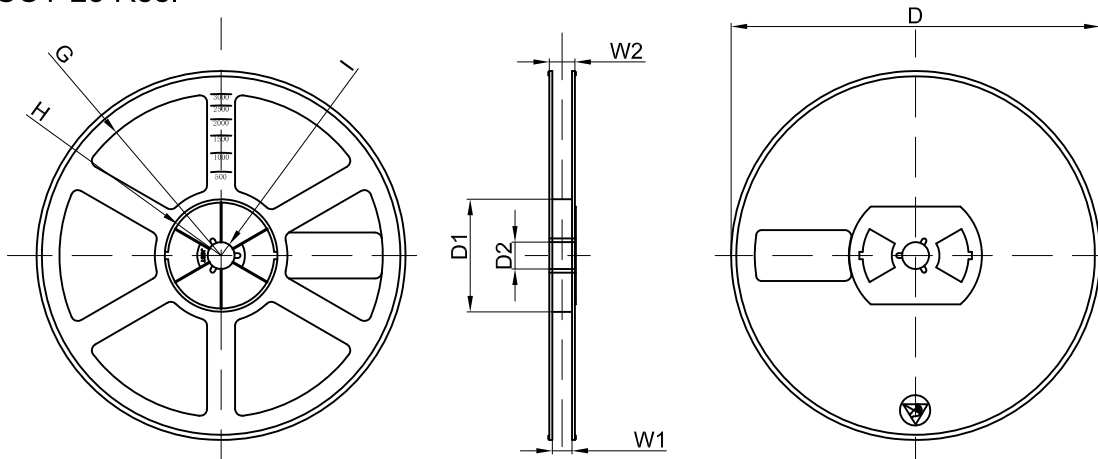
Dimensions are in millimeter

| Pkg type | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
|----------|------|------|------|-------|------|------|------|------|------|------|
| SOT-23   | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

## SOT-23 Tape Leader and Trailer



## SOT-23 Reel



Dimensions are in millimeter

| Reel Option | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
|-------------|---------|-------|-------|--------|--------|-------|------|-------|
| 7"Dia       | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 inch    | 45,000 pcs | 203×203×195  | 180,000 pcs | 438×438×220     |          |

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