

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

| Type<br>Number | Marking<br>Code | Zener Voltage Range<br>(Note 5)  |         |         | Test<br>Current | Maximum Zener Impedance<br>(Note 6) |                                               | Maximum Reverse<br>Leakage Current<br>(Note 5) |                  |
|----------------|-----------------|----------------------------------|---------|---------|-----------------|-------------------------------------|-----------------------------------------------|------------------------------------------------|------------------|
|                |                 | V <sub>Z</sub> @ I <sub>ZT</sub> |         |         | I <sub>ZT</sub> | Z <sub>ZT</sub> @ I <sub>ZT</sub>   | Z <sub>ZK</sub> @ I <sub>ZK</sub><br>= 0.25mA | I <sub>R</sub>                                 | @ V <sub>R</sub> |
|                |                 | Nom (V)                          | Min (V) | Max (V) | mA              | Ω                                   |                                               | μA                                             | V                |
| MMBZ5221BT     | KC1             | 2.4                              | 2.28    | 2.52    | 20              | 30                                  | 1200                                          | 100                                            | 1.0              |
| MMBZ5223BT     | KC3             | 2.7                              | 2.57    | 2.84    | 20              | 30                                  | 1300                                          | 75                                             | 1.0              |
| MMBZ5225BT     | KC5             | 3.0                              | 2.85    | 3.15    | 20              | 30                                  | 1600                                          | 50                                             | 1.0              |
| MMBZ5226BT     | KG1             | 3.3                              | 3.14    | 3.47    | 20              | 28                                  | 1600                                          | 25                                             | 1.0              |
| MMBZ5227BT     | KG2             | 3.6                              | 3.42    | 3.78    | 20              | 24                                  | 1700                                          | 15                                             | 1.0              |
| MMBZ5228BT     | KG3             | 3.9                              | 3.71    | 4.10    | 20              | 23                                  | 1900                                          | 10                                             | 1.0              |
| MMBZ5229BT     | KG4             | 4.3                              | 4.09    | 4.52    | 20              | 22                                  | 2000                                          | 5.0                                            | 1.0              |
| MMBZ5230BT     | KG5             | 4.7                              | 4.47    | 4.94    | 20              | 19                                  | 1900                                          | 5.0                                            | 2.0              |
| MMBZ5231BT     | KE1             | 5.1                              | 4.85    | 5.36    | 20              | 17                                  | 1600                                          | 5.0                                            | 2.0              |
| MMBZ5232BT     | KE2             | 5.6                              | 5.32    | 5.88    | 20              | 11                                  | 1600                                          | 5.0                                            | 3.0              |
| MMBZ5234BT     | KE4             | 6.2                              | 5.89    | 6.51    | 20              | 7.0                                 | 1000                                          | 5.0                                            | 4.0              |
| MMBZ5235BT     | KE5             | 6.8                              | 6.46    | 7.14    | 20              | 5.0                                 | 750                                           | 3.0                                            | 5.0              |
| MMBZ5236BT     | KF1             | 7.5                              | 7.13    | 7.88    | 20              | 6.0                                 | 500                                           | 3.0                                            | 6.0              |
| MMBZ5237BT     | KF2             | 8.2                              | 7.79    | 8.61    | 20              | 8.0                                 | 500                                           | 3.0                                            | 6.5              |
| MMBZ5239BT     | KF4             | 9.1                              | 8.65    | 9.56    | 20              | 10                                  | 600                                           | 3.0                                            | 7.0              |
| MMBZ5240BT     | KF5             | 10                               | 9.50    | 10.50   | 20              | 17                                  | 600                                           | 3.0                                            | 8.0              |
| MMBZ5241BT     | KH1             | 11                               | 10.45   | 11.55   | 20              | 22                                  | 600                                           | 2.0                                            | 8.4              |
| MMBZ5242BT     | KH2             | 12                               | 11.40   | 12.60   | 20              | 30                                  | 600                                           | 1.0                                            | 9.1              |
| MMBZ5243BT     | KH3             | 13                               | 12.35   | 13.65   | 9.5             | 13                                  | 600                                           | 0.5                                            | 9.9              |
| MMBZ5245BT     | KH5             | 15                               | 14.25   | 15.75   | 8.5             | 16                                  | 600                                           | 0.1                                            | 11               |
| MMBZ5246BT     | KJ1             | 16                               | 15.20   | 16.80   | 7.8             | 17                                  | 600                                           | 0.1                                            | 12               |
| MMBZ5248BT     | KJ3             | 18                               | 17.10   | 18.90   | 7.0             | 21                                  | 600                                           | 0.1                                            | 14               |
| MMBZ5250BT     | KJ5             | 20                               | 19.00   | 21.00   | 6.2             | 25                                  | 600                                           | 0.1                                            | 15               |
| MMBZ5251BT     | KK1             | 22                               | 20.90   | 23.10   | 5.6             | 29                                  | 600                                           | 0.1                                            | 17               |
| MMBZ5252BT     | KK2             | 24                               | 22.80   | 25.20   | 5.2             | 33                                  | 600                                           | 0.1                                            | 18               |
| MMBZ5254BT     | KK4             | 27                               | 25.65   | 28.35   | 5.0             | 41                                  | 600                                           | 0.1                                            | 21               |
| MMBZ5255BT     | KK5             | 28                               | 26.60   | 29.40   | 4.5             | 44                                  | 600                                           | 0.1                                            | 21               |
| MMBZ5256BT     | KM1             | 30                               | 28.50   | 31.50   | 4.2             | 49                                  | 600                                           | 0.1                                            | 23               |
| MMBZ5257BT     | KM2             | 33                               | 31.35   | 34.65   | 3.8             | 58                                  | 700                                           | 0.1                                            | 25               |
| MMBZ5258BT     | KM3             | 36                               | 34.20   | 37.80   | 3.4             | 70                                  | 700                                           | 0.1                                            | 27               |
| MMBZ5259BT     | KM4             | 39                               | 37.05   | 40.95   | 3.2             | 80                                  | 800                                           | 0.1                                            | 30               |

Notes: 5. Short duration pulse test used to minimize self-heating effect.  
6. f = 1KHz.

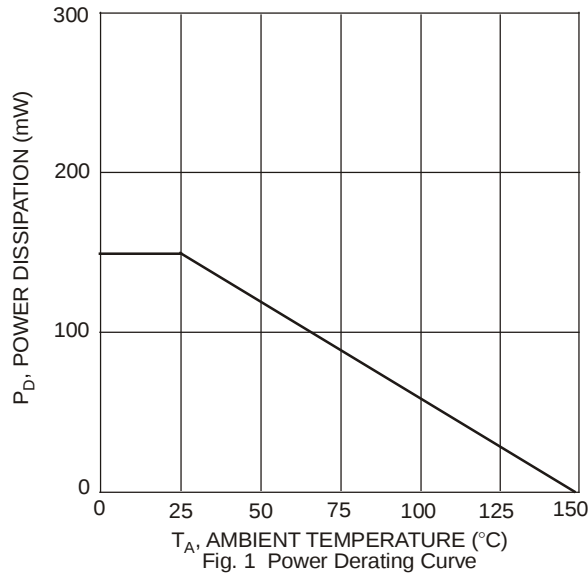


Fig. 1 Power Derating Curve

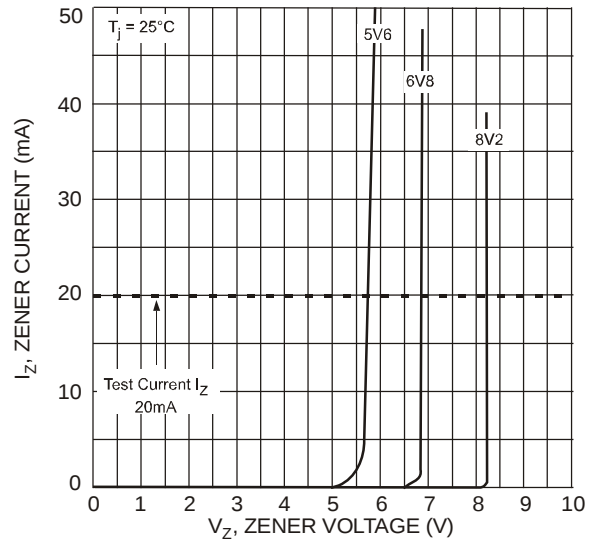


Fig. 2 Typical Zener Breakdown Characteristics

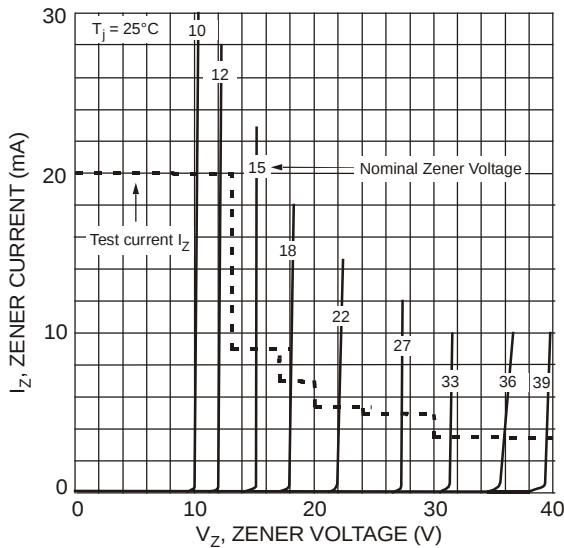


Fig. 3 Typical Zener Breakdown Characteristics

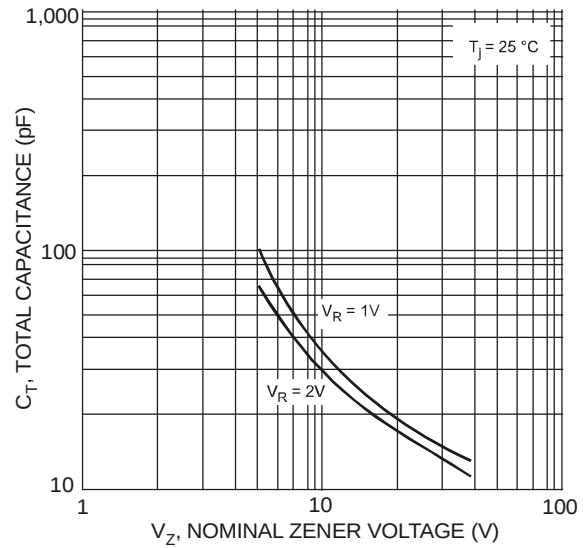


Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

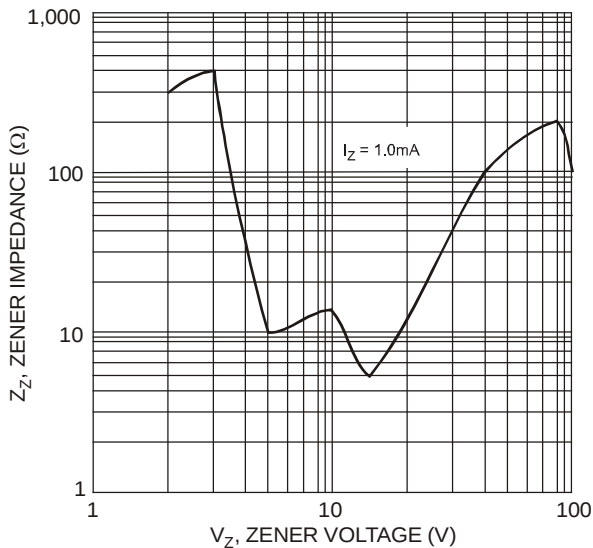


Fig. 5 Typical Zener Impedance Characteristics

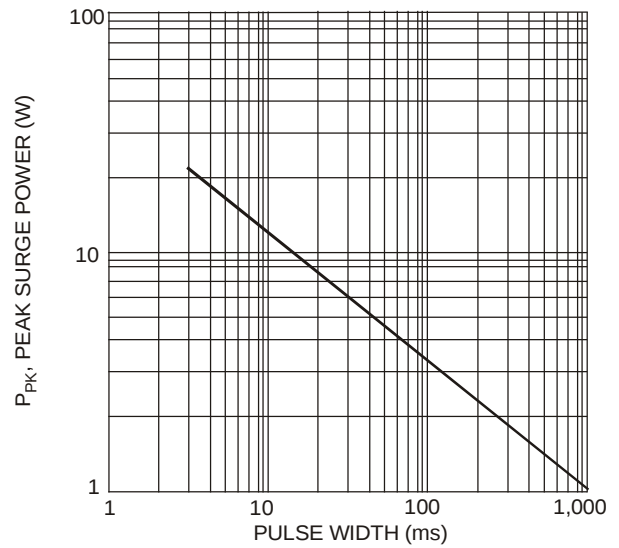


Fig. 6 Maximum Non-repetitive Surge Power

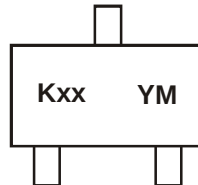
## Ordering Information (Note 7)

| Device            | Packaging | Shipping         |
|-------------------|-----------|------------------|
| (Type Number)-7-F | SOT-523   | 3000/Tape & Reel |

\* Add "-7-F" to the appropriate type number in from Electrical Characteristics Table, example: 6.2V Zener = MMBZ5234BTS-7-F.

Notes: 7. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



Kxx = Product Type Marking Code  
(See Electrical Characteristics Table)

YM = Date Code Marking

Y = Year (ex: N = 2002)

M = Month (ex: 9 = September)

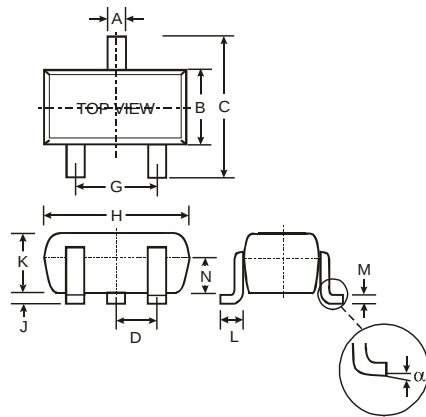
### Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2111 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | N    | P    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    | A    | B    | C    |

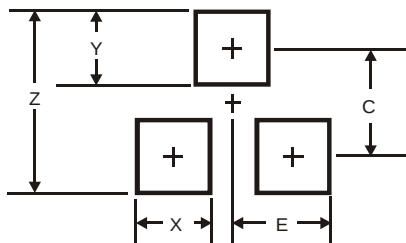
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

## Package Outline Dimensions



| SOT-523              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.15 | 0.30 | 0.22 |
| B                    | 0.75 | 0.85 | 0.80 |
| C                    | 1.45 | 1.75 | 1.60 |
| D                    | —    | —    | 0.50 |
| G                    | 0.90 | 1.10 | 1.00 |
| H                    | 1.50 | 1.70 | 1.60 |
| J                    | 0.00 | 0.10 | 0.05 |
| K                    | 0.60 | 0.80 | 0.75 |
| L                    | 0.10 | 0.30 | 0.22 |
| M                    | 0.10 | 0.20 | 0.12 |
| N                    | 0.45 | 0.65 | 0.50 |
| $\alpha$             | 0°   | 8°   | —    |
| All Dimensions in mm |      |      |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 1.8           |
| X          | 0.4           |
| Y          | 0.51          |
| C          | 1.3           |
| E          | 0.7           |

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