

## Features

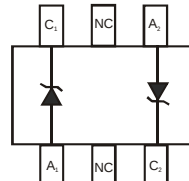
- Planar Die Construction
- Dual Isolated Zeners in Ultra-Small Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**



Top View

## Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Polarity: See Diagram
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.006 grams (approximate)



Device Schematic

## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                          | Symbol         | Value | Unit |
|-----------------------------------------|----------------|-------|------|
| Forward Voltage @ I <sub>F</sub> = 10mA | V <sub>F</sub> | 0.9   | V    |

## Thermal Characteristics

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 1)                           | P <sub>D</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R <sub>θJA</sub>                  | 625         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

- Notes:
1. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  2. No purposefully added lead.
  3. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  4. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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

| Type Number | Marking Code | Zener Voltage Range (Note 5)     |         |         |                 | Maximum Zener Impedance (Note 6)  |                                            | Maximum Reverse Leakage Current (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> = 0.25mA | I <sub>R</sub>                           | @ V <sub>R</sub> |
|             |              | Nom (V)                          | Min (V) | Max (V) | mA              | Ω                                 |                                            | μA                                       | V                |
| MMBZ5221BS  | KC1          | 2.4                              | 2.28    | 2.52    | 20              | 30                                | 1200                                       | 100                                      | 1.0              |
| MMBZ5223BS  | KC3          | 2.7                              | 2.57    | 2.84    | 20              | 30                                | 1300                                       | 75                                       | 1.0              |
| MMBZ5225BS  | KC5          | 3.0                              | 2.85    | 3.15    | 20              | 30                                | 1600                                       | 50                                       | 1.0              |
| MMBZ5226BS  | KG1          | 3.3                              | 3.14    | 3.47    | 20              | 28                                | 1600                                       | 25                                       | 1.0              |
| MMBZ5227BS  | KG2          | 3.6                              | 3.42    | 3.78    | 20              | 24                                | 1700                                       | 15                                       | 1.0              |
| MMBZ5228BS  | KG3          | 3.9                              | 3.71    | 4.10    | 20              | 23                                | 1900                                       | 10                                       | 1.0              |
| MMBZ5229BS  | KG4          | 4.3                              | 4.09    | 4.52    | 20              | 22                                | 2000                                       | 5.0                                      | 1.0              |
| MMBZ5230BS  | KG5          | 4.7                              | 4.47    | 4.94    | 20              | 19                                | 1900                                       | 5.0                                      | 2.0              |
| MMBZ5231BS  | KE1          | 5.1                              | 4.85    | 5.36    | 20              | 17                                | 1600                                       | 5.0                                      | 2.0              |
| MMBZ5232BS  | KE2          | 5.6                              | 5.32    | 5.88    | 20              | 11                                | 1600                                       | 5.0                                      | 3.0              |
| MMBZ5233BS  | KE3          | 6.0                              | 5.70    | 6.30    | 20              | 7                                 | 1600                                       | 5.0                                      | 3.5              |
| MMBZ5234BS  | KE4          | 6.2                              | 5.89    | 6.51    | 20              | 7                                 | 1000                                       | 5.0                                      | 4.0              |
| MMBZ5235BS  | KE5          | 6.8                              | 6.46    | 7.14    | 20              | 5                                 | 750                                        | 3.0                                      | 5.0              |
| MMBZ5236BS  | KF1          | 7.5                              | 7.13    | 7.88    | 20              | 6                                 | 500                                        | 3.0                                      | 6.0              |
| MMBZ5237BS  | KF2          | 8.2                              | 7.79    | 8.61    | 20              | 8                                 | 500                                        | 3.0                                      | 6.5              |
| MMBZ5238BS  | KF3          | 8.7                              | 8.27    | 9.14    | 20              | 8                                 | 600                                        | 3.0                                      | 6.5              |
| MMBZ5239BS  | KF4          | 9.1                              | 8.65    | 9.56    | 20              | 10                                | 600                                        | 3.0                                      | 7.0              |
| MMBZ5240BS  | KF5          | 10                               | 9.50    | 10.50   | 20              | 17                                | 600                                        | 3.0                                      | 8.0              |
| MMBZ5241BS  | KH1          | 11                               | 10.45   | 11.55   | 20              | 22                                | 600                                        | 2.0                                      | 8.4              |
| MMBZ5242BS  | KH2          | 12                               | 11.40   | 12.60   | 20              | 30                                | 600                                        | 1.0                                      | 9.1              |
| MMBZ5243BS  | KH3          | 13                               | 12.35   | 13.65   | 9.5             | 13                                | 600                                        | 0.5                                      | 9.9              |
| MMBZ5245BS  | KH5          | 15                               | 14.25   | 15.75   | 8.5             | 16                                | 600                                        | 0.1                                      | 11               |
| MMBZ5246BS  | KJ1          | 16                               | 15.20   | 16.80   | 7.8             | 17                                | 600                                        | 0.1                                      | 12               |
| MMBZ5248BS  | KJ3          | 18                               | 17.10   | 18.90   | 7.0             | 21                                | 600                                        | 0.1                                      | 14               |
| MMBZ5250BS  | KJ5          | 20                               | 19.00   | 21.00   | 6.2             | 25                                | 600                                        | 0.1                                      | 15               |
| MMBZ5251BS  | KK1          | 22                               | 20.90   | 23.10   | 5.6             | 29                                | 600                                        | 0.1                                      | 17               |
| MMBZ5252BS  | KK2          | 24                               | 22.80   | 25.20   | 5.2             | 33                                | 600                                        | 0.1                                      | 18               |
| MMBZ5254BS  | KK4          | 27                               | 25.65   | 28.35   | 5.0             | 41                                | 600                                        | 0.1                                      | 21               |
| MMBZ5255BS  | KK5          | 28                               | 26.60   | 29.40   | 4.5             | 44                                | 600                                        | 0.1                                      | 21               |
| MMBZ5256BS  | KM1          | 30                               | 28.50   | 31.50   | 4.2             | 49                                | 600                                        | 0.1                                      | 23               |
| MMBZ5257BS  | KM2          | 33                               | 31.35   | 34.65   | 3.8             | 58                                | 700                                        | 0.1                                      | 25               |
| MMBZ5258BS  | KM3          | 36                               | 34.20   | 37.80   | 3.4             | 70                                | 700                                        | 0.1                                      | 27               |
| MMBZ5259BS  | 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.

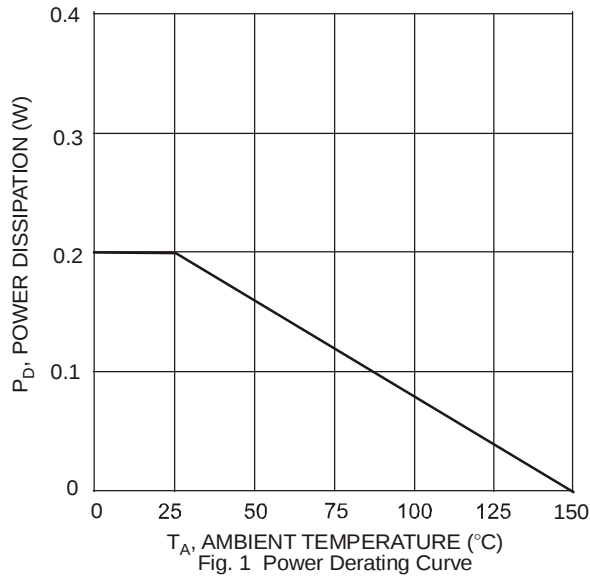


Fig. 1 Power Derating Curve

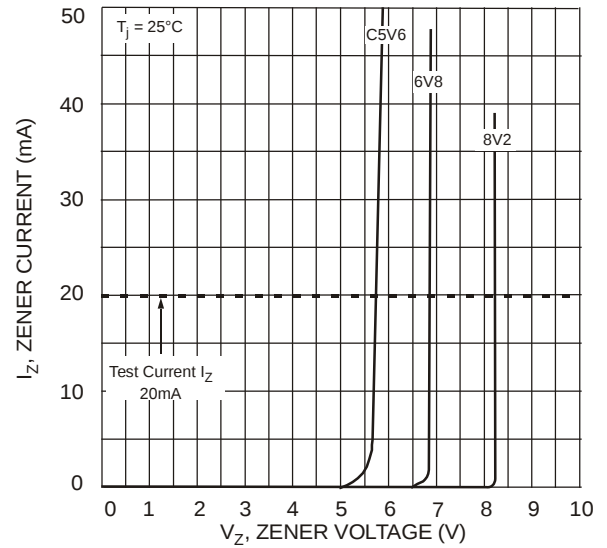


Fig. 2 Typical Zener Breakdown Characteristics

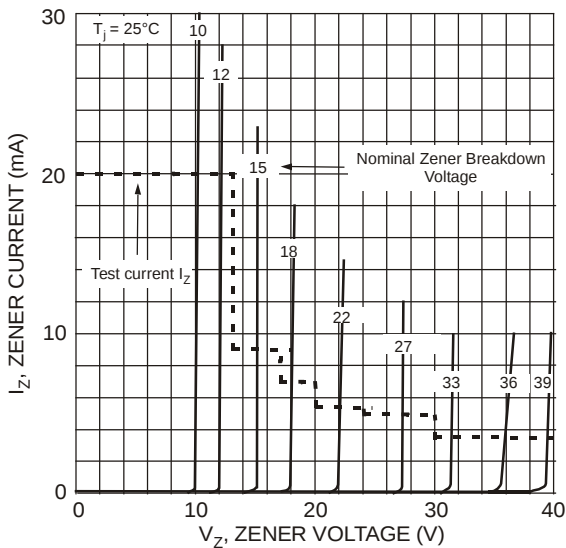


Fig. 3 Typical Zener Breakdown Characteristics

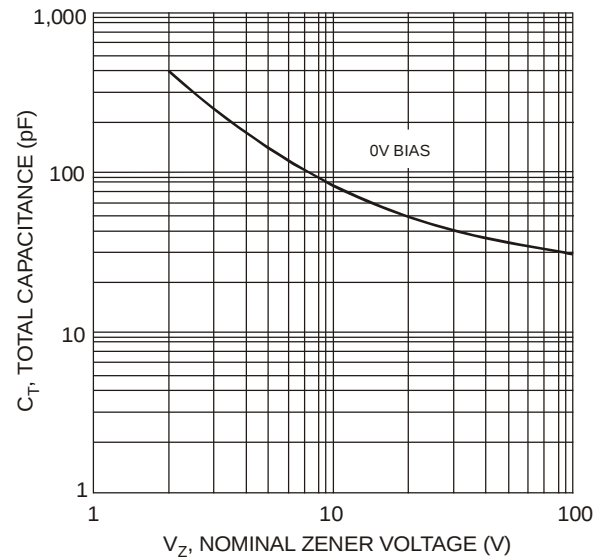


Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

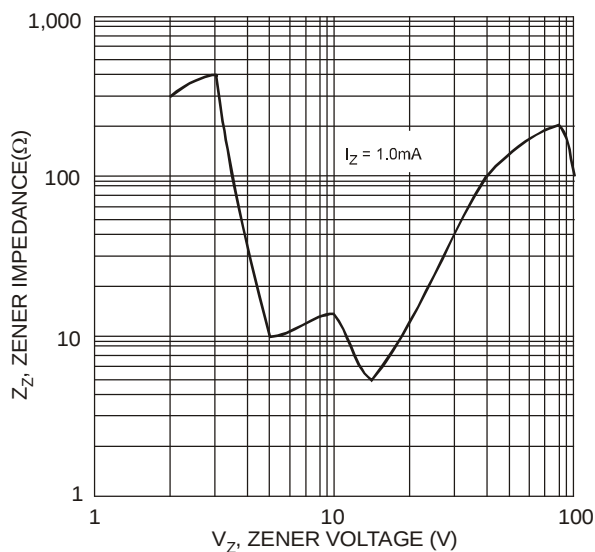


Fig. 5 Typical Zener Impedance Characteristics

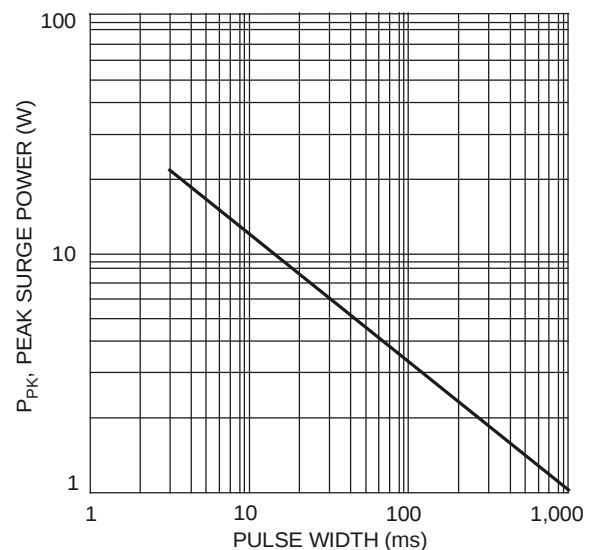


Fig. 6 Maximum Non-repetitive Surge Power

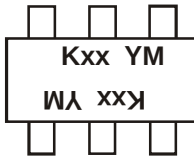
## Ordering Information (Note 7)

| Device            | Packaging | Shipping         |
|-------------------|-----------|------------------|
| (Type Number)-7-F | SOT-363   | 3000/Tape & Reel |

\*Add "-7" to the appropriate type number in Electrical Characteristics Table on Page 2. Example: 6.2V Zener = MMBZ5234BS-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)

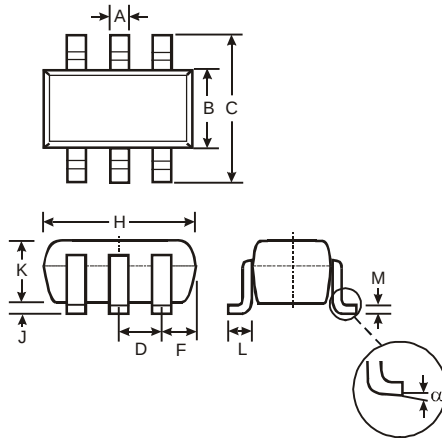
### Date Code Key

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | P    | Q    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    | A    | B    | C    |

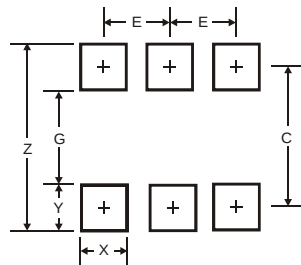
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

## Package Outline Dimensions



| SOT-363              |              |      |
|----------------------|--------------|------|
| Dim                  | Min          | Max  |
| A                    | 0.10         | 0.30 |
| B                    | 1.15         | 1.35 |
| C                    | 2.00         | 2.20 |
| D                    | 0.65 Nominal |      |
| F                    | 0.40         | 0.45 |
| H                    | 1.80         | 2.20 |
| J                    | 0            | 0.10 |
| K                    | 0.90         | 1.00 |
| L                    | 0.25         | 0.40 |
| M                    | 0.10         | 0.22 |
| α                    | 0°           | 8°   |
| All Dimensions in mm |              |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C          | 1.9           |
| E          | 0.65          |

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