

Features

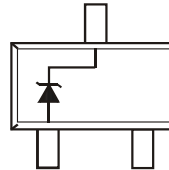
- Ultra-Small Surface Mount Package
- Planar Die Construction
- General Purpose
- Ideally Suited for Automated Assembly Processes
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 3 and 4)**

Mechanical Data

- Case: SOT-523
- 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: 0.002 grams (approximate)



Top View



Device Schematic

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---------------------------------------|--------|-------|------|
| Zener Current (See Table on page 2) | — | — | — |
| Forward Voltage @ $I_F = 10\text{mA}$ | V_F | 0.9 | V |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|--------------------|
| Power Dissipation (Note 1) | P_D | 150 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 833 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +150 | $^\circ\text{C}$ |

- Notes:
1. Device mounted on FR-4 PC board with recommended pad layout 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.
 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_A} = 25°C unless otherwise specified

| Type Number | Marking Code | Zener Voltage Range (Note 5) | | | Test Current | Maximum Zener Impedance (Note 6) | | Maximum Reverse Leakage Current (Note 5) | |
|-------------|--------------|----------------------------------|---------|---------|--------------|----------------------------------|-----------------------------------|---|----------------|
| | | V _Z @ I _{ZT} | | | | I _{ZT} | Z _{ZT} @ I _{ZT} | Z _{ZK} @ I _{ZK} = 0.25mA | I _R |
| | | Nom (V) | Min (V) | Max (V) | mA | | | | |
| 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.

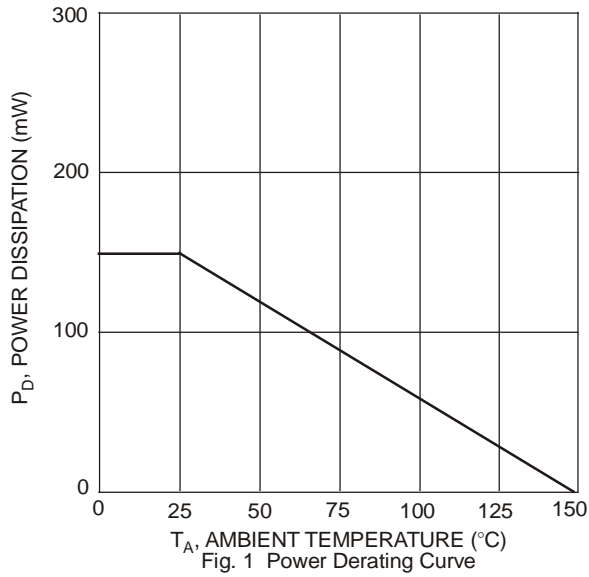


Fig. 1 Power Derating Curve

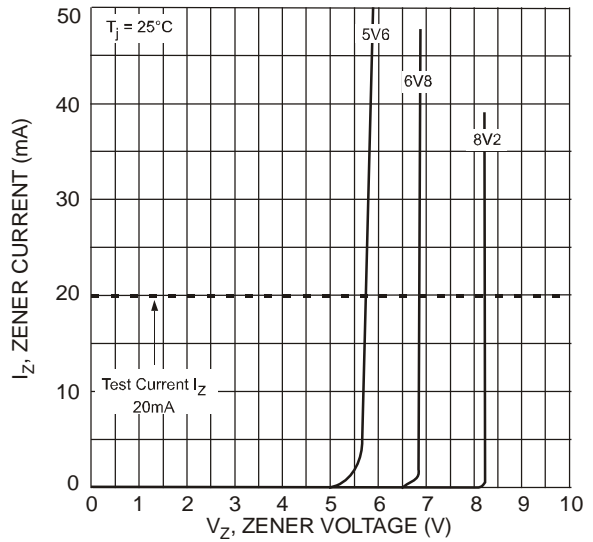


Fig. 2 Typical Zener Breakdown Characteristics

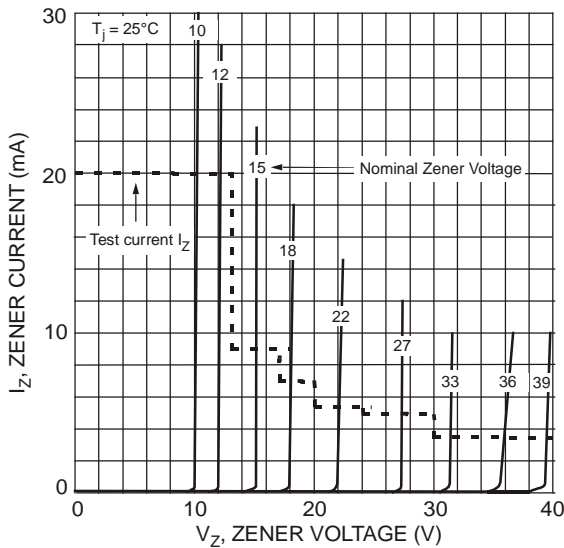


Fig. 3 Typical Zener Breakdown Characteristics

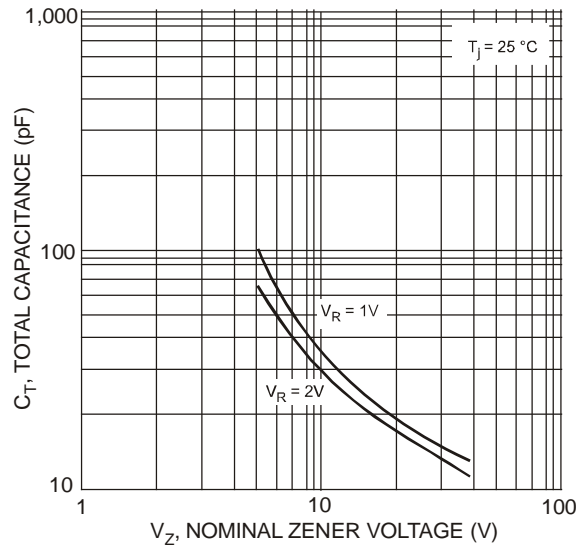


Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

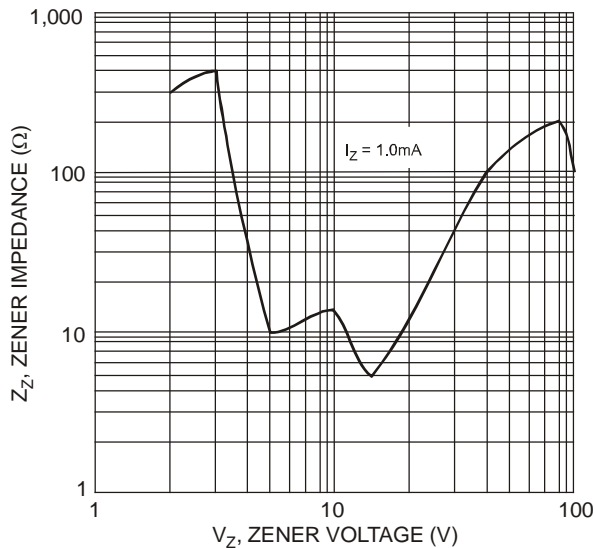


Fig. 5 Typical Zener Impedance Characteristics

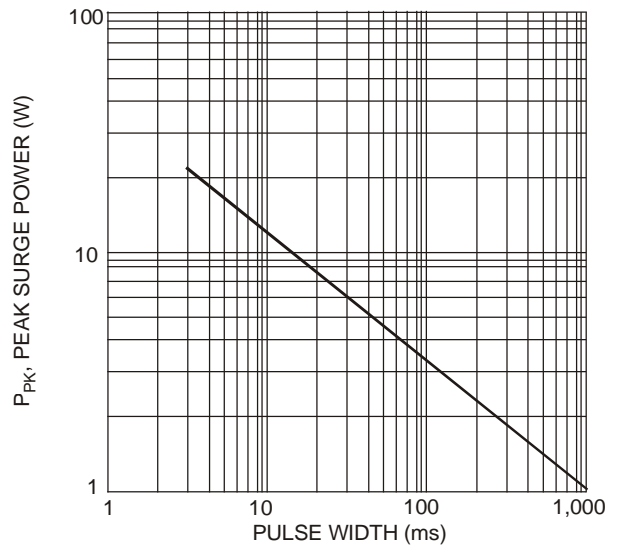


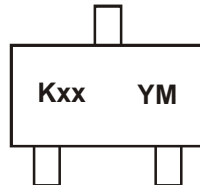
Fig. 6 Maximum Non-repetitive Surge Power

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

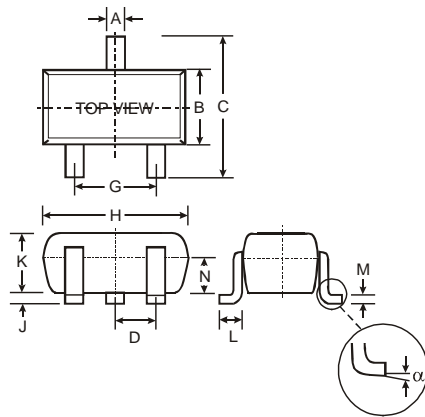
Y = Year (ex: N = 2002)

M = Month (ex: 9 = September)

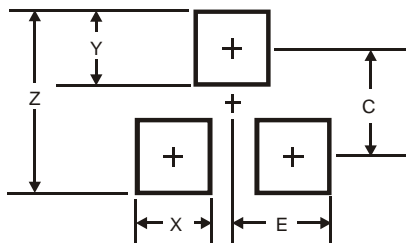
Date Code Key

| 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 |
| α | 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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