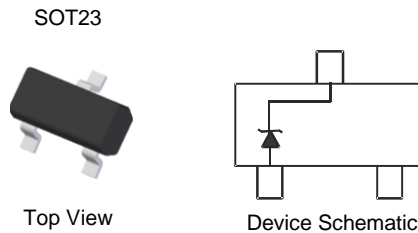


## Features

- Planar Die Construction
- 350mW Power Dissipation on FR-4 PCB
- General Purpose, Medium Current
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208<sup>(3)</sup>
- Weight: 0.008 grams (Approximate)



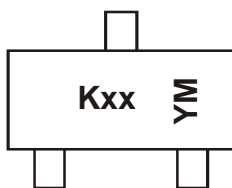
## Ordering Information (Notes 5 & 6)

| Device                        | Qualification | Packaging | Shipping           |
|-------------------------------|---------------|-----------|--------------------|
| (Type Number)-7-F*            | Commercial    | SOT23     | 3,000/Tape & Reel  |
| (Type Number)Q-7-F* (Note 7)  | Automotive    | SOT23     | 3,000/Tape & Reel  |
| (Type Number)-13-F*           | Commercial    | SOT23     | 10,000/Tape & Reel |
| (Type Number)Q-13-F* (Note 7) | Automotive    | SOT23     | 10,000/Tape & Reel |

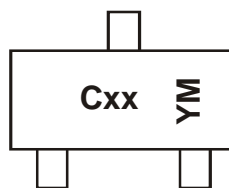
\* Add "-7-F" to the appropriate type number in Electrical Characteristics Table from Page 2. Example: 6.2V Zener = MMBZ5234B-7-F.

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. Product manufactured with Date Code OW (week 42, 2009) and newer are built with Green Molding Compound. Product manufactured prior to Date Code OW are built with Non-Green Molding Compound and may contain Halogens or Sb<sub>2</sub>O<sub>3</sub> Fire Retardants.
  5. For Packaging Details, go to our website at <http://www.diodes.com>.
  6. Selected voltages are available on 13" reels (10,000 devices per reel). Add "-13-F" to the appropriate type number in Electrical Characteristics Table from Page 2. Example: 6.2V Zener = MMBZ5234B-13-F. Please contact your Diodes Inc. sales representative for availability.
  7. Automotive products are AEC-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x and standard products are and thermally the same, except where specified. For more information, please refer to <https://www.diodes.com/quality/product-compliance-definitions/>.

## Marking Information



K = SAT (Shanghai Assembly / Test site)  
 xx = Product Type Marking Code  
 See Electrical Characteristics Table  
 YM = Date Code Marking  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)



C = CAT (Chengdu Assembly / Test site)  
 xx = Product Type Marking Code  
 See Electrical Characteristics Table  
 YM = Date Code Marking  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | ... | 2021 | 2022 | 2023 |
|------|------|------|------|------|------|------|------|-----|------|------|------|
| Code | Z    | A    | B    | C    | D    | E    | F    | ... | I    | J    | K    |

| 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   |

**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**

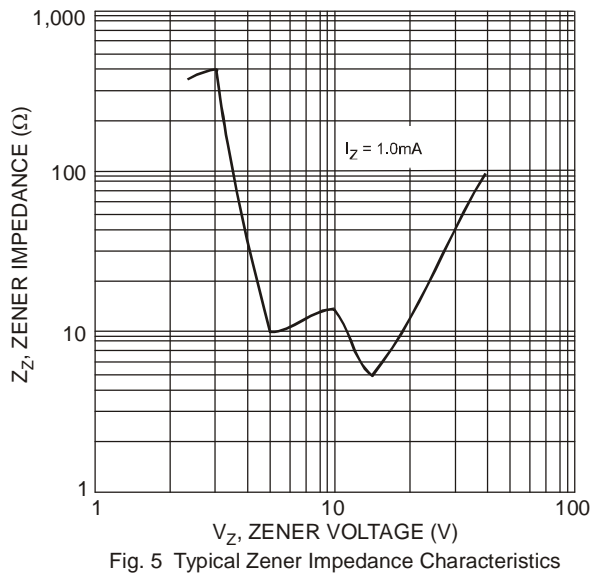
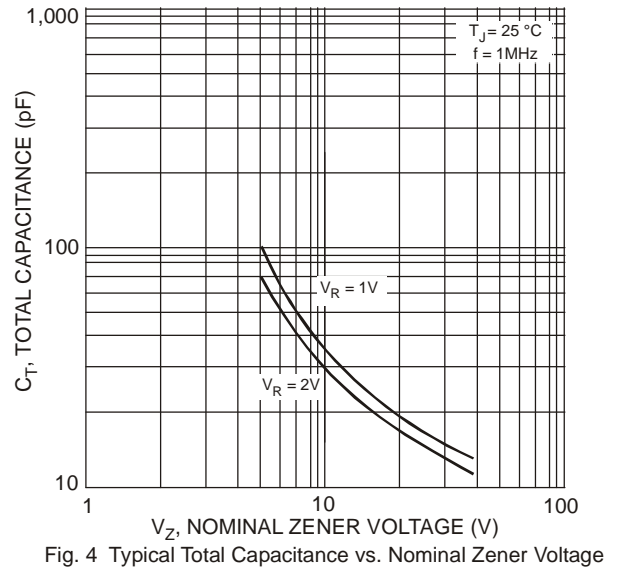
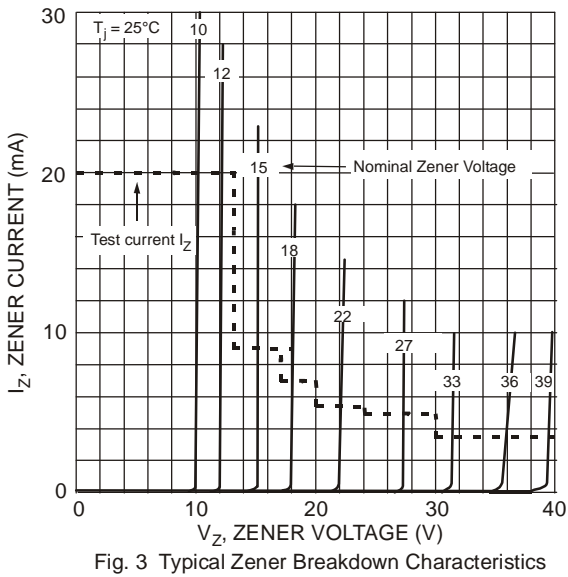
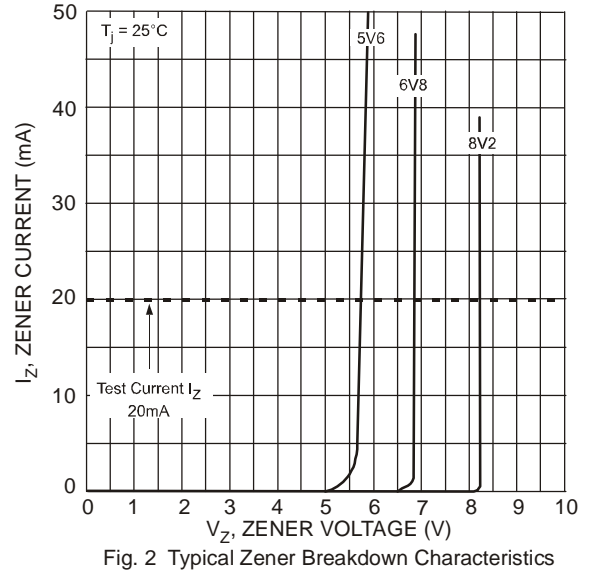
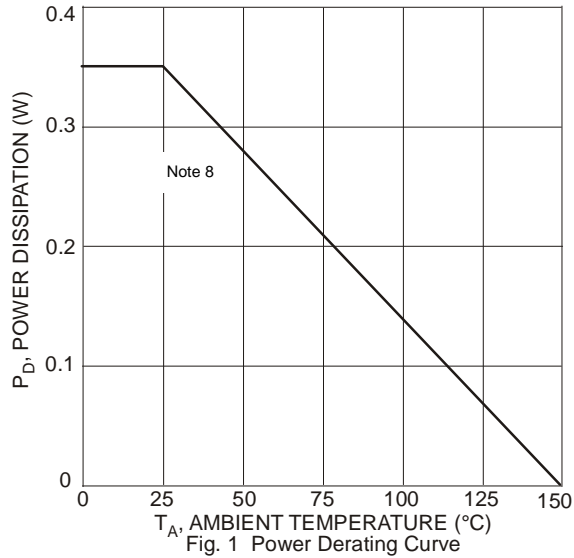
| Characteristic                                       | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 8)                           | P <sub>D</sub>                    | 350         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 8) | R <sub>θJA</sub>                  | 357         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

Note: 8. Mounted on FR4 PC Board with recommended pad layout which can be found on our website at <http://www.diodes.com>.

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

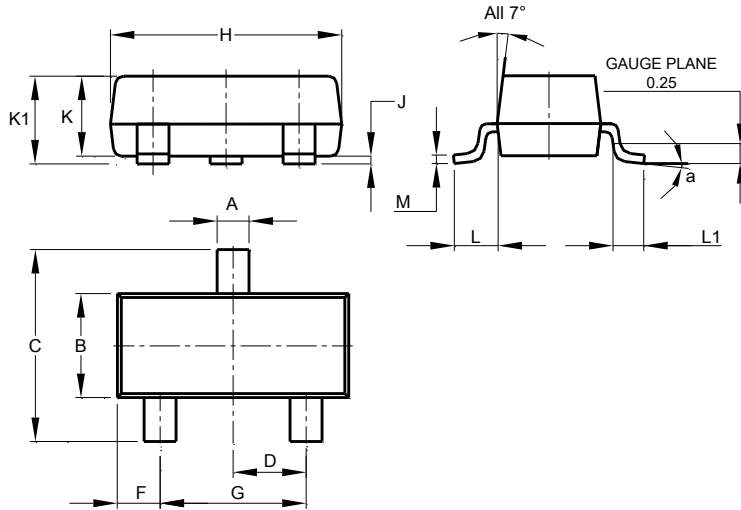
| Type Number | Type Code | Zener Voltage Range (Note 9)     |         |         |                 | Maximum Zener Impedance<br>f = 1kHz |   | Maximum Reverse Leakage Current (Note 9) |                  |
|-------------|-----------|----------------------------------|---------|---------|-----------------|-------------------------------------|---|--|------------------|
|             |           | V <sub>Z</sub> @ I <sub>ZT</sub> |         |         | I <sub>ZT</sub> | Z <sub>KT</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                |
| MMBZ5221B   | C1        | 2.4                              | 2.28    | 2.52    | 20              | 30                                  | 1,200   | 100                                      | 1.0              |
| MMBZ5222B   | C2        | 2.5                              | 2.38    | 2.63    | 20              | 30                                  | 1,200   | 100                                      | 1.0              |
| MMBZ5223B   | C3        | 2.7                              | 2.57    | 2.84    | 20              | 30                                  | 1,300   | 75                                       | 1.0              |
| MMBZ5225B   | C5        | 3.0                              | 2.85    | 3.15    | 20              | 30                                  | 1,600   | 50                                       | 1.0              |
| MMBZ5226B   | G1        | 3.3                              | 3.14    | 3.47    | 20              | 28                                  | 1,600   | 25                                       | 1.0              |
| MMBZ5227B   | G2        | 3.6                              | 3.42    | 3.78    | 20              | 24                                  | 1,700   | 15                                       | 1.0              |
| MMBZ5228B   | G3        | 3.9                              | 3.71    | 4.10    | 20              | 23                                  | 1,900   | 10                                       | 1.0              |
| MMBZ5229B   | G4        | 4.3                              | 4.09    | 4.52    | 20              | 22                                  | 2,000   | 5.0                                      | 1.0              |
| MMBZ5230B   | G5        | 4.7                              | 4.47    | 4.94    | 20              | 19                                  | 1,900   | 5.0                                      | 2.0              |
| MMBZ5231B   | E1        | 5.1                              | 4.85    | 5.36    | 20              | 17                                  | 1,600   | 5.0                                      | 2.0              |
| MMBZ5232B   | E2        | 5.6                              | 5.32    | 5.88    | 20              | 11                                  | 1,600   | 5.0                                      | 3.0              |
| MMBZ5233B   | E3        | 6.0                              | 5.70    | 6.30    | 20              | 7                                   | 1,600   | 5.0                                      | 3.5              |
| MMBZ5234B   | E4        | 6.2                              | 5.89    | 6.51    | 20              | 7                                   | 1,000   | 5.0                                      | 4.0              |
| MMBZ5235B   | E5        | 6.8                              | 6.46    | 7.14    | 20              | 5                                   | 750   | 3.0                                      | 5.0              |
| MMBZ5236B   | F1        | 7.5                              | 7.13    | 7.88    | 20              | 6                                   | 500   | 3.0                                      | 6.0              |
| MMBZ5237B   | F2        | 8.2                              | 7.79    | 8.61    | 20              | 8                                   | 500   | 3.0                                      | 6.5              |
| MMBZ5238B   | F3        | 8.7                              | 8.27    | 9.14    | 20              | 8                                   | 600   | 3.0                                      | 6.5              |
| MMBZ5239B   | F4        | 9.1                              | 8.65    | 9.56    | 20              | 10                                  | 600   | 3.0                                      | 7.0              |
| MMBZ5240B   | F5        | 10                               | 9.50    | 10.50   | 20              | 17                                  | 600   | 3.0                                      | 8.0              |
| MMBZ5241B   | H1        | 11                               | 10.45   | 11.55   | 20              | 22                                  | 600   | 2.0                                      | 8.4              |
| MMBZ5242B   | H2        | 12                               | 11.40   | 12.60   | 20              | 30                                  | 600   | 1.0                                      | 9.1              |
| MMBZ5243B   | H3        | 13                               | 12.35   | 13.65   | 9.5             | 13                                  | 600   | 0.5                                      | 9.9              |
| MMBZ5244B   | H4        | 14                               | 13.30   | 14.70   | 9.0             | 15                                  | 600   | 0.1                                      | 10               |
| MMBZ5245B   | H5        | 15                               | 14.25   | 15.75   | 8.5             | 16                                  | 600   | 0.1                                      | 11               |
| MMBZ5246B   | J1        | 16                               | 15.20   | 16.80   | 7.8             | 17                                  | 600   | 0.1                                      | 12               |
| MMBZ5248B   | J3        | 18                               | 17.10   | 18.90   | 7.0             | 21                                  | 600   | 0.1                                      | 14               |
| MMBZ5250B   | J5        | 20                               | 19.00   | 21.00   | 6.2             | 25                                  | 600   | 0.1                                      | 15               |
| MMBZ5251B   | K1        | 22                               | 20.90   | 23.10   | 5.6             | 29                                  | 600   | 0.1                                      | 17               |
| MMBZ5252B   | K2        | 24                               | 22.80   | 25.20   | 5.2             | 33                                  | 600   | 0.1                                      | 18               |
| MMBZ5254B   | K4        | 27                               | 25.65   | 28.35   | 5.0             | 41                                  | 600   | 0.1                                      | 21               |
| MMBZ5255B   | K5        | 28                               | 26.60   | 29.40   | 4.5             | 44                                  | 600   | 0.1                                      | 21               |
| MMBZ5256B   | M1        | 30                               | 28.50   | 31.50   | 4.2             | 49                                  | 600   | 0.1                                      | 23               |
| MMBZ5257B   | M2        | 33                               | 31.35   | 34.65   | 3.8             | 58                                  | 700   | 0.1                                      | 25               |
| MMBZ5258B   | M3        | 36                               | 34.20   | 37.80   | 3.4             | 70                                  | 700   | 0.1                                      | 27               |
| MMBZ5259B   | M4        | 39                               | 37.05   | 40.95   | 3.2             | 80                                  | 800   | 0.1                                      | 30               |

Note: 9. Short duration pulse test used to minimize self-heating effect.



**Package Outline Dimensions**

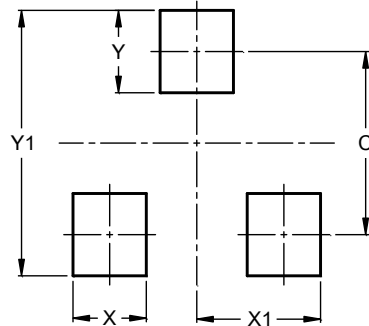
Please see <http://www.diodes.com/package-outlines.html> for the latest version.  
**SOT23**



| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| a                    | 0°    | 8°    | --    |
| All Dimensions in mm |       |       |       |

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.  
**SOT23**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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