



# BZT52C2V0 - BZT52C39

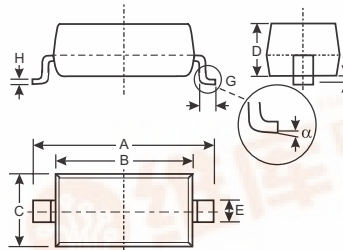
## SURFACE MOUNT ZENER DIODE

### Features

- Planar Die Construction
- 500mW Power Dissipation on Ceramic PCB
- General Purpose, Medium Current
- Ideally Suited for Automated Assembly Processes
- Lead Free/RoHS Compliant (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

### Mechanical Data

- Case: SOD-123
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe)
- Polarity: Cathode Band
- Marking: See Below
- Weight: 0.01 grams (approximate)



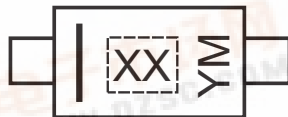
| SOD-123              |              |      |
|----------------------|--------------|------|
| Dim                  | Min          | Max  |
| A                    | 3.55         | 3.85 |
| B                    | 2.55         | 2.85 |
| C                    | 1.40         | 1.70 |
| D                    | —            | 1.35 |
| E                    | 0.45         | 0.65 |
|                      | 0.55 Typical |      |
| G                    | 0.25         | —    |
| H                    | 0.11 Typical |      |
| J                    | —            | 0.10 |
| α                    | 0°           | 8°   |
| All Dimensions in mm |              |      |

### 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    |
| Power Dissipation (Note 1)                           | P <sub>d</sub>                    | 500         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 1) | R <sub>θJA</sub>                  | 250         | °C/W |
| Operating and Storage Temperature Range              | T <sub>j</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

- Notes:
1. Device mounted on ceramic PCB; 7.6mm x 9.4mm x 0.87mm with pad areas 25mm<sup>2</sup>.
  2. No purposefully added lead.

### Marking Information



XX = Product Type Marking Code (See Page 2)  
 YM = Date Code Marking  
 Y = Year (ex: N = 2002)  
 M = Month (ex: 9 = September)

#### Date Code Key

| Year  | 1998 | 1999 | 2000  | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|-------|------|------|-------|------|------|------|------|------|------|------|------|------|
| Code  | J    | K    | L     | M    | N    | P    | R    | S    | T    | U    | V    | W    |
| Month | Jan  | Feb  | March | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  |
| Code  | 1    | 2    | 3     | 4    | 5    | 6    | 7    | 8    | 9    | O    | N    | D    |





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

| Type Number (Note 3) | Marking Codes      | Zener Voltage Range (Note 4)     |         |         |                 | Maximum Zener Impedance (Note 3)  |                                   |                 | Maximum Reverse Current (Note 4) |                  | Typical Temperature Coefficient @ I <sub>ZTC</sub> mV/°C |      | Test Current I <sub>ZTC</sub> mA |
|----------------------|--------------------|----------------------------------|---------|---------|-----------------|-----------------------------------|-----------------------------------|-----------------|----------------------------------|------------------|--|------|----------------------------------|
|                      |                    | 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> | I <sub>ZK</sub> | I <sub>R</sub>                   | @ V <sub>R</sub> | Min  | Max  |                                  |
|                      |                    | Nom (V)                          | Min (V) | Max (V) | mA              | Ω                                 |                                   | mA              | uA                               | V                |  |      |                                  |
| BZT52C2V0            | WY, <u>W</u> Y     | 2.0                              | 1.91    | 2.09    | 5               | 100                               | 600                               | 1.0             | 150                              | 1.0              | -3.5   | 0    | 5                                |
| BZT52C2V4            | WX, <u>W</u> X     | 2.4                              | 2.2     | 2.6     | 5               | 100                               | 600                               | 1.0             | 50                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C2V7            | W1, <u>W</u> 1     | 2.7                              | 2.5     | 2.9     | 5               | 100                               | 600                               | 1.0             | 20                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V0            | W2, <u>W</u> 2     | 3.0                              | 2.8     | 3.2     | 5               | 95                                | 600                               | 1.0             | 10                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V3            | W3, <u>W</u> 3     | 3.3                              | 3.1     | 3.5     | 5               | 95                                | 600                               | 1.0             | 5.0                              | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V6            | W4, <u>W</u> 4     | 3.6                              | 3.4     | 3.8     | 5               | 90                                | 600                               | 1.0             | 5.0                              | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V9            | W5, <u>W</u> 5     | 3.9                              | 3.7     | 4.1     | 5               | 90                                | 600                               | 1.0             | 3.0                              | 1.0              | -3.5   | 0    | 5                                |
| BZT52C4V3            | W6, <u>W</u> 6, UB | 4.3                              | 4.0     | 4.6     | 5               | 90                                | 600                               | 1.0             | 3.0                              | 1.0              | -3.5   | 0    | 5                                |
| BZT52C4V7            | W7, <u>W</u> 7     | 4.7                              | 4.4     | 5.0     | 5               | 80                                | 500                               | 1.0             | 3.0                              | 2.0              | -3.5   | 0.2  | 5                                |
| BZT52C5V1            | W8, <u>W</u> 8     | 5.1                              | 4.8     | 5.4     | 5               | 60                                | 480                               | 1.0             | 2.0                              | 2.0              | -2.7   | 1.2  | 5                                |
| BZT52C5V6            | W9, <u>W</u> 9     | 5.6                              | 5.2     | 6.0     | 5               | 40                                | 400                               | 1.0             | 1.0                              | 2.0              | -2   | 2.5  | 5                                |
| BZT52C6V2            | WA, <u>W</u> A     | 6.2                              | 5.8     | 6.6     | 5               | 10                                | 150                               | 1.0             | 3.0                              | 4.0              | 0.4  | 3.7  | 5                                |
| BZT52C6V8            | WB, <u>W</u> B     | 6.8                              | 6.4     | 7.2     | 5               | 15                                | 80                                | 1.0             | 2.0                              | 4.0              | 1.2  | 4.5  | 5                                |
| BZT52C7V5            | WC, <u>W</u> C     | 7.5                              | 7.0     | 7.9     | 5               | 15                                | 80                                | 1.0             | 1.0                              | 5.0              | 2.5  | 5.3  | 5                                |
| BZT52C8V2            | WD, <u>W</u> D     | 8.2                              | 7.7     | 8.7     | 5               | 15                                | 80                                | 1.0             | 0.7                              | 5.0              | 3.2  | 6.2  | 5                                |
| BZT52C9V1            | WE, <u>W</u> E     | 9.1                              | 8.5     | 9.6     | 5               | 15                                | 100                               | 1.0             | 0.5                              | 6.0              | 3.8  | 7.0  | 5                                |
| BZT52C10             | WF, <u>W</u> F     | 10                               | 9.4     | 10.6    | 5               | 20                                | 150                               | 1.0             | 0.2                              | 7.0              | 4.5  | 8.0  | 5                                |
| BZT52C11             | WG, <u>W</u> G     | 11                               | 10.4    | 11.6    | 5               | 20                                | 150                               | 1.0             | 0.1                              | 8.0              | 5.4  | 9.0  | 5                                |
| BZT52C12             | WH, <u>W</u> H     | 12                               | 11.4    | 12.7    | 5               | 25                                | 150                               | 1.0             | 0.1                              | 8.0              | 6.0  | 10.0 | 5                                |
| BZT52C13             | WI, <u>W</u> I     | 13                               | 12.4    | 14.1    | 5               | 30                                | 170                               | 1.0             | 0.1                              | 8.0              | 7.0  | 11.0 | 5                                |
| BZT52C15             | WJ, <u>W</u> J     | 15                               | 13.8    | 15.6    | 5               | 30                                | 200                               | 1.0             | 0.1                              | 10.5             | 9.2  | 13.0 | 5                                |
| BZT52C16             | WK, <u>W</u> K     | 16                               | 15.3    | 17.1    | 5               | 40                                | 200                               | 1.0             | 0.1                              | 11.2             | 10.4   | 14.0 | 5                                |
| BZT52C18             | WL, <u>W</u> L     | 18                               | 16.8    | 19.1    | 5               | 45                                | 225                               | 1.0             | 0.1                              | 12.6             | 12.4   | 16.0 | 5                                |
| BZT52C20             | WM, <u>W</u> M     | 20                               | 18.8    | 21.2    | 5               | 55                                | 225                               | 1.0             | 0.1                              | 14.0             | 14.4   | 18.0 | 5                                |
| BZT52C22             | WN, <u>W</u> N     | 22                               | 20.8    | 23.3    | 5               | 55                                | 250                               | 1.0             | 0.1                              | 15.4             | 16.4   | 20.0 | 5                                |
| BZT52C24             | WO, <u>W</u> O     | 24                               | 22.8    | 25.6    | 5               | 70                                | 250                               | 1.0             | 0.1                              | 16.8             | 18.4   | 22.0 | 5                                |
| BZT52C27             | WP, <u>W</u> P     | 27                               | 25.1    | 28.9    | 2               | 80                                | 300                               | 0.5             | 0.1                              | 18.9             | 21.4   | 25.3 | 2                                |
| BZT52C30             | WQ, <u>W</u> Q     | 30                               | 28.0    | 32.0    | 2               | 80                                | 300                               | 0.5             | 0.1                              | 21.0             | 24.4   | 29.4 | 2                                |
| BZT52C33             | WR, <u>W</u> R     | 33                               | 31.0    | 35.0    | 2               | 80                                | 325                               | 0.5             | 0.1                              | 23.1             | 27.4   | 33.4 | 2                                |
| BZT52C36             | WS, <u>W</u> S     | 36                               | 34.0    | 38.0    | 2               | 90                                | 350                               | 0.5             | 0.1                              | 25.2             | 30.4   | 37.4 | 2                                |
| BZT52C39             | WT, <u>W</u> T     | 39                               | 37.0    | 41.0    | 2               | 130                               | 350                               | 0.5             | 0.1                              | 27.3             | 33.4   | 41.2 | 2                                |

- Notes:
1. Device mounted on ceramic PCB; 7.6mm x 9.4mm x 0.87mm with pad areas 25mm<sup>2</sup>.
  2. No purposefully added lead.
  3. f = 1kHz.
  4. Short duration pulse test used to minimize self-heating effect.

## Ordering Information (Note 5)

| Device             | Packaging | Shipping         |
|--------------------|-----------|------------------|
| (Type Number)-7-F* | SOD-123   | 3000/Tape & Reel |

\* Add "-7-F" to the appropriate type number in Table 1 above example: 6.2V Zener = BZT52C6V2-7-F.

- Notes:
5. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

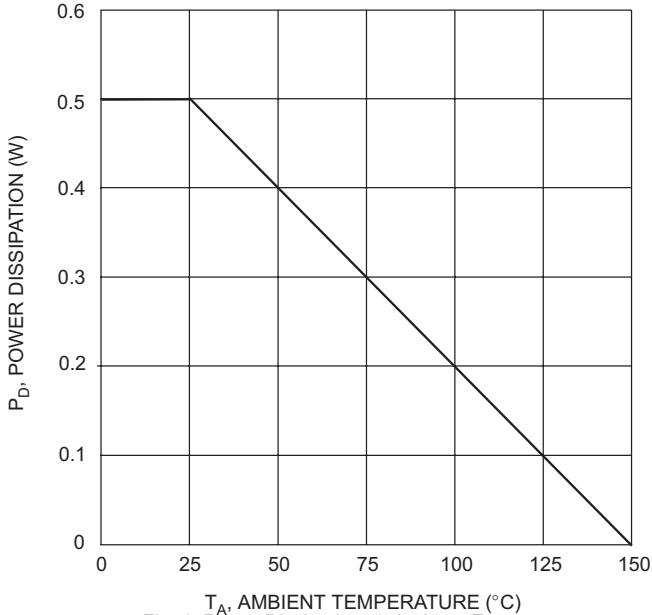


Fig. 1 Power Dissipation vs Ambient Temperature

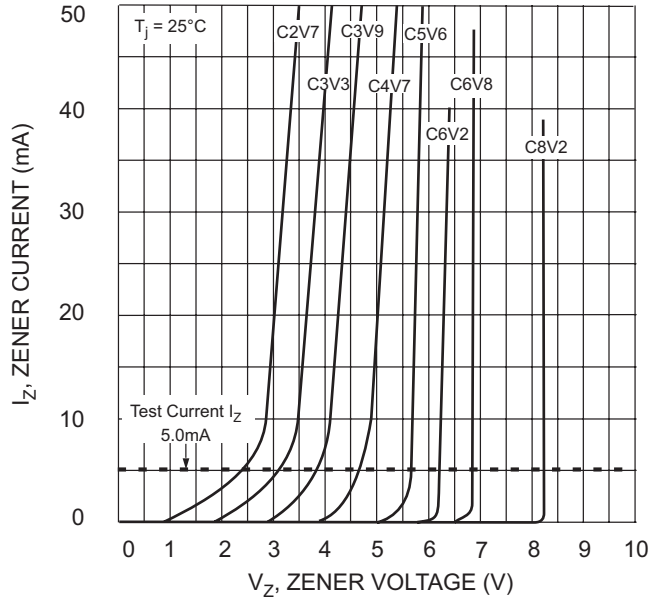


Fig. 2 Zener Breakdown Characteristics

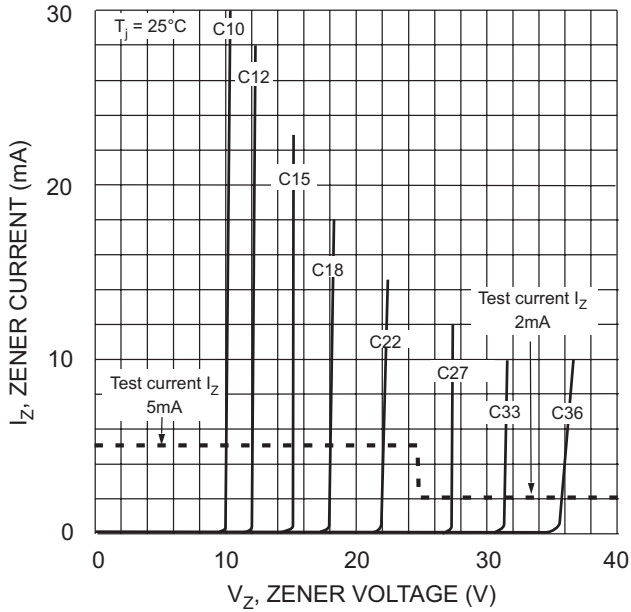


Fig. 3 Zener Breakdown Characteristics

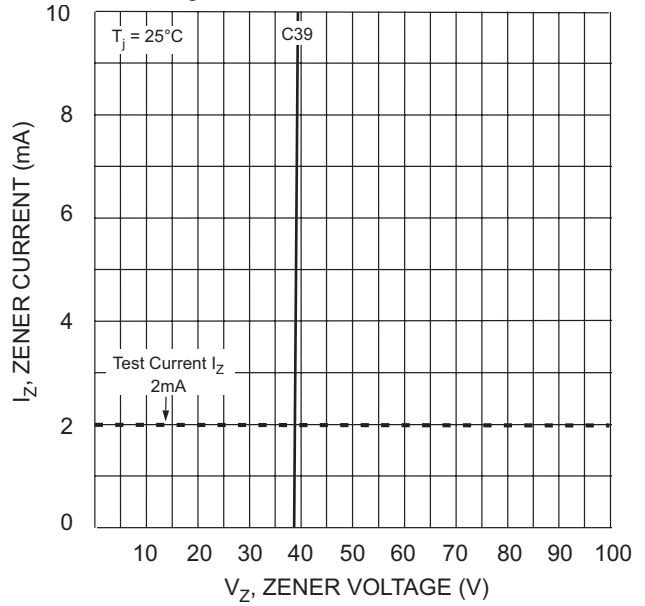


Fig. 4 Zener Breakdown Characteristics

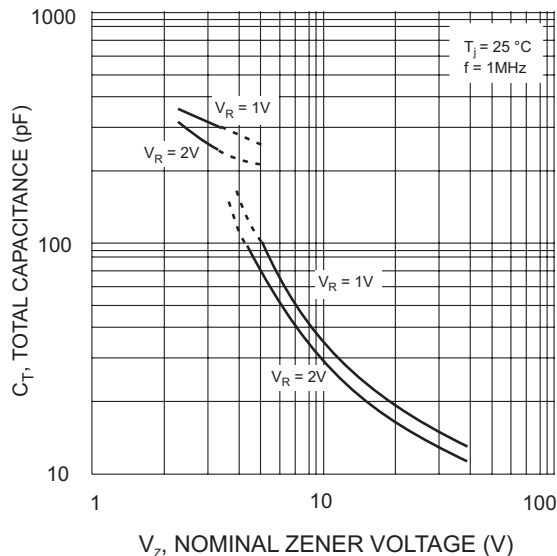


Fig. 5 Total Capacitance vs Nominal Zener Voltage



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