



**THE DATASHEET OF  
BZT52C5V1-7**



## Features

- Planar Die Construction
- 500mW Power Dissipation
- 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: SOD123
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Weight: 0.010 grams (Approximate)

SOD123



Top View

## Ordering Information (Notes 5 & 6)

| Part Number         | Qualification | Case   | Packaging          |
|---------------------|---------------|--------|--------------------|
| (Type Number)-7-F   | Commercial    | SOD123 | 3,000/Tape & Reel  |
| (Type Number)Q-7-F  | Automotive    | SOD123 | 3,000/Tape & Reel  |
| (Type Number)-13-F  | Commercial    | SOD123 | 10,000/Tape & Reel |
| (Type Number)Q-13-F | Automotive    | SOD123 | 10,000/Tape & Reel |

- 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 V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 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. For (Type Number), please see the Electrical Characteristics Table. Example: 6.2V Zener = BZT52C6V2Q-13-F.

## Marking Information



xx = Product Type Marking Code  
(See Electrical Characteristics Table)  
YM = Date Code Marking  
Y = Year (ex: E = 2017)  
M = Month (ex: 9 = September)

### Date Code Key

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | ... | 2020 | 2021 | 2022 | 2023 | 2024 |
|------|------|------|------|------|------|-----|------|------|------|------|------|
| Code | A    | B    | C    | D    | E    | ... | H    | I    | J    | K    | L    |

| 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.)

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitance load, derate current by 20%.

| 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 7) @T <sub>L</sub> = +75°C   | P <sub>D</sub>                    | 500         | mW   |
| Power Dissipation (Note 8) @T <sub>A</sub> = +25°C   | P <sub>D</sub>                    | 370         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 8) | R <sub>θJA</sub>                  | 338         | °C/W |
| Thermal Resistance, Junction to Lead (Note 9)        | R <sub>θJL</sub>                  | 150         | °C/W |
| Operating and Storage Temperature Range              | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

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

| Type Number | Marking Codes | Zener Voltage Range (Note 10)    |         |         |                 | Maximum Zener Impedance f = 1kHz  |                                   |                 | Maximum Reverse Current (Note 10) |                  | 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                                 | Ω                                 | mA              | μA                                | V                |  |      |                                  |
| BZT52C2V0   | WY            | 2.0                              | 1.91    | 2.09    | 5               | 100                               | 600                               | 1.0             | 150                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C2V4   | WX            | 2.4                              | 2.2     | 2.6     | 5               | 100                               | 600                               | 1.0             | 50                                | 1.0              | -3.5   | 0    | 5                                |
| BZT52C2V7   | W1            | 2.7                              | 2.5     | 2.9     | 5               | 100                               | 600                               | 1.0             | 20                                | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V0   | W2            | 3.0                              | 2.8     | 3.2     | 5               | 95                                | 600                               | 1.0             | 10                                | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V3   | W3            | 3.3                              | 3.1     | 3.5     | 5               | 95                                | 600                               | 1.0             | 5.0                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V6   | W4            | 3.6                              | 3.4     | 3.8     | 5               | 90                                | 600                               | 1.0             | 5.0                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C3V9   | W5            | 3.9                              | 3.7     | 4.1     | 5               | 90                                | 600                               | 1.0             | 3.0                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C4V3   | W6            | 4.3                              | 4.0     | 4.6     | 5               | 90                                | 600                               | 1.0             | 3.0                               | 1.0              | -3.5   | 0    | 5                                |
| BZT52C4V7   | W7            | 4.7                              | 4.4     | 5.0     | 5               | 80                                | 500                               | 1.0             | 3.0                               | 2.0              | -3.5   | 0.2  | 5                                |
| BZT52C5V1   | W8            | 5.1                              | 4.8     | 5.4     | 5               | 60                                | 480                               | 1.0             | 2.0                               | 2.0              | -2.7   | 1.2  | 5                                |
| BZT52C5V6   | W9            | 5.6                              | 5.2     | 6.0     | 5               | 40                                | 400                               | 1.0             | 1.0                               | 2.0              | -2   | 2.5  | 5                                |
| BZT52C6V2   | WA            | 6.2                              | 5.8     | 6.6     | 5               | 10                                | 150                               | 1.0             | 3.0                               | 4.0              | 0.4  | 3.7  | 5                                |
| BZT52C6V8   | WB            | 6.8                              | 6.4     | 7.2     | 5               | 15                                | 80                                | 1.0             | 2.0                               | 4.0              | 1.2  | 4.5  | 5                                |
| BZT52C7V5   | WC            | 7.5                              | 7.0     | 7.9     | 5               | 15                                | 80                                | 1.0             | 1.0                               | 5.0              | 2.5  | 5.3  | 5                                |
| BZT52C8V2   | WD            | 8.2                              | 7.7     | 8.7     | 5               | 15                                | 80                                | 1.0             | 0.7                               | 5.0              | 3.2  | 6.2  | 5                                |
| BZT52C9V1   | WE            | 9.1                              | 8.5     | 9.6     | 5               | 15                                | 100                               | 1.0             | 0.5                               | 6.0              | 3.8  | 7.0  | 5                                |
| BZT52C10    | WF            | 10                               | 9.4     | 10.6    | 5               | 20                                | 150                               | 1.0             | 0.2                               | 7.0              | 4.5  | 8.0  | 5                                |
| BZT52C11    | WG            | 11                               | 10.4    | 11.6    | 5               | 20                                | 150                               | 1.0             | 0.1                               | 8.0              | 5.4  | 9.0  | 5                                |
| BZT52C12    | WH            | 12                               | 11.4    | 12.7    | 5               | 25                                | 150                               | 1.0             | 0.1                               | 8.0              | 6.0  | 10.0 | 5                                |
| BZT52C13    | WI            | 13                               | 12.4    | 14.1    | 5               | 30                                | 170                               | 1.0             | 0.1                               | 8.0              | 7.0  | 11.0 | 5                                |
| BZT52C15    | WJ            | 15                               | 13.8    | 15.6    | 5               | 30                                | 200                               | 1.0             | 0.1                               | 10.5             | 9.2  | 13.0 | 5                                |
| BZT52C16    | WK            | 16                               | 15.3    | 17.1    | 5               | 40                                | 200                               | 1.0             | 0.1                               | 11.2             | 10.4   | 14.0 | 5                                |
| BZT52C18    | WL            | 18                               | 16.8    | 19.1    | 5               | 45                                | 225                               | 1.0             | 0.1                               | 12.6             | 12.4   | 16.0 | 5                                |
| BZT52C20    | WM            | 20                               | 18.8    | 21.2    | 5               | 55                                | 225                               | 1.0             | 0.1                               | 14.0             | 14.4   | 18.0 | 5                                |
| BZT52C22    | WN            | 22                               | 20.8    | 23.3    | 5               | 55                                | 250                               | 1.0             | 0.1                               | 15.4             | 16.4   | -    | 5                                |
| BZT52C24    | WO            | 24                               | 22.8    | 25.6    | 5               | 70                                | 250                               | 1.0             | 0.1                               | 16.8             | 18.4   | -    | 5                                |
| BZT52C27    | WP            | 27                               | 25.1    | 28.9    | 2               | 80                                | 300                               | 0.5             | 0.1                               | 18.9             | 21.4   | -    | 2                                |
| BZT52C30    | WQ            | 30                               | 28.0    | 32.0    | 2               | 80                                | 300                               | 0.5             | 0.1                               | 21.0             | 24.4   | -    | 2                                |
| BZT52C33    | WR            | 33                               | 31.0    | 35.0    | 2               | 80                                | 325                               | 0.5             | 0.1                               | 23.1             | 27.4   | -    | 2                                |
| BZT52C36    | WS            | 36                               | 34.0    | 38.0    | 2               | 90                                | 350                               | 0.5             | 0.1                               | 25.2             | 30.4   | -    | 2                                |
| BZT52C39    | WT            | 39                               | 37.0    | 41.0    | 2               | 130                               | 350                               | 0.5             | 0.1                               | 27.3             | 33.4   | -    | 2                                |
| BZT52C43    | WU            | 43                               | 40.0    | 46.0    | 5               | 100                               | 700                               | 1.0             | 0.1                               | 32.0             | 37.6   | -    | 5                                |
| BZT52C47    | WV            | 47                               | 44.0    | 50.0    | 5               | 100                               | 750                               | 1.0             | 0.1                               | 35.0             | 42.0   | -    | 5                                |
| BZT52C51    | WW            | 51                               | 48.0    | 54.0    | 5               | 100                               | 750                               | 1.0             | 0.1                               | 38.0             | 46.6   | -    | 5                                |

- Notes:
7. R<sub>θJL</sub> = 132°C/W
  8. Device mounted on FR-4 PCB with 1 inch copper pad layout.
  9. Thermal Resistance measurement obtained via infrared scan method.
  10. Short duration pulse test used to minimize self-heating effect.



Fig. 1 Power Derating Curve

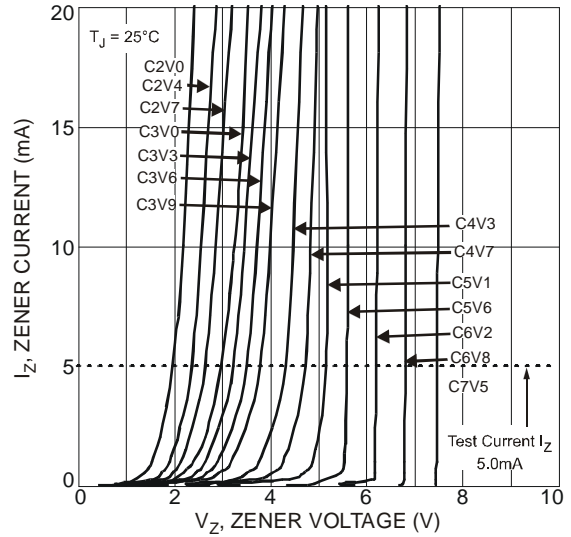


Fig. 2 Typical Zener Breakdown Characteristics

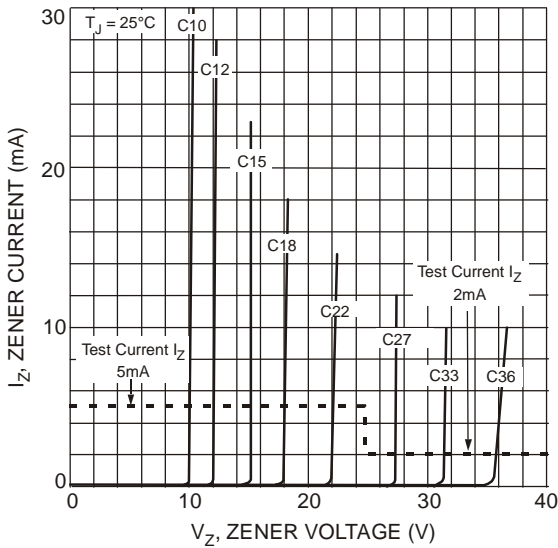


Fig. 3 Typical Zener Breakdown Characteristics

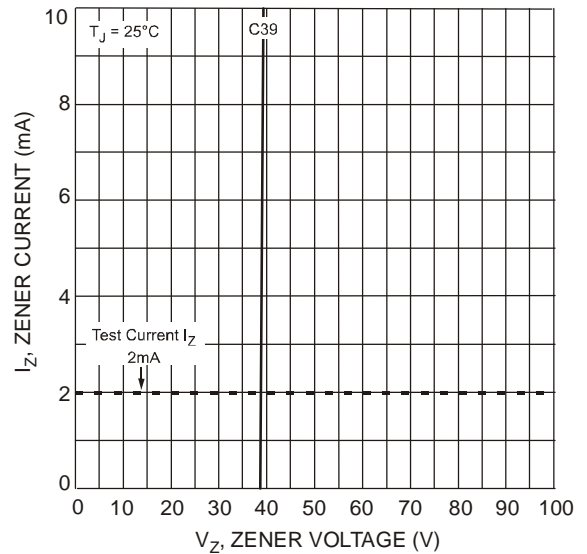


Fig. 4 Typical Zener Breakdown Characteristics

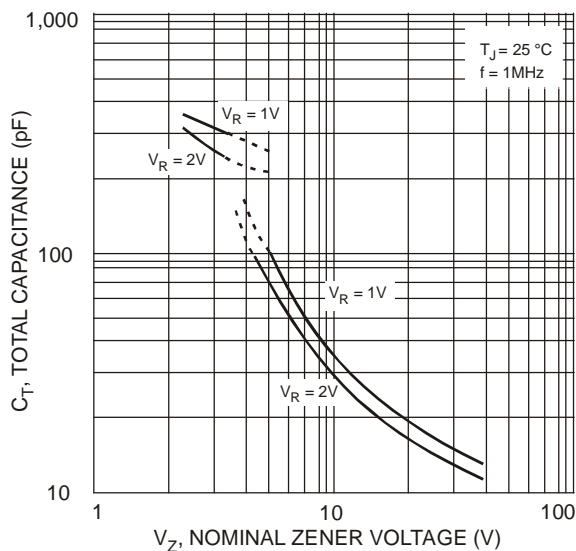


Fig. 5 Typical Total Capacitance vs. Nominal Zener Voltage

**Package Outline Dimensions**

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

SOD123



| SOD123               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 1.00 | 1.35 | 1.05 |
| A1                   | 0.00 | 0.10 | 0.05 |
| b                    | 0.52 | 0.62 | 0.57 |
| c                    | 0.10 | 0.15 | 0.11 |
| D                    | 1.40 | 1.70 | 1.55 |
| E                    | 2.55 | 2.85 | 2.65 |
| He                   | 3.55 | 3.85 | 3.65 |
| L                    | 0.25 | 0.40 | 0.30 |
| a                    | 0°   | 8°   | --   |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**

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

SOD123



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.900         |
| X1         | 4.050         |
| Y          | 0.950         |

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