

## Features

- Planar Die Construction
- Small Surface Mount Package
- 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: SOD323
- 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: 0.0049 grams (approximate)

SOD323



Top View

## Ordering Information (Note 5)

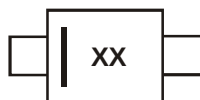
| Part Number         | Qualification | Case   | Packaging        |
|---------------------|---------------|--------|------------------|
| (Type Number)-7-F*  | Commercial    | SOD323 | 3000/Tape & Reel |
| (Type Number)Q-7-F* | Automotive    | SOD323 | 3000/Tape & Reel |

\*Add "-7-F" to the appropriate type number in Electrical Characteristics Table, example: 6.2V Zener – BZT52C6V2S-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 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>.

## Marking Information



xx = Product Type Marking Code  
(See Electrical Characteristics Table)

## 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 (Note 6) @ I <sub>F</sub> = 10mA | V <sub>F</sub> | 0.9   | V    |

## Thermal Characteristics

| Characteristic                                       | Symbol                            | Value       | Unit |
|------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 7)                           | P <sub>D</sub>                    | 200         | mW   |
| Thermal Resistance, Junction to Ambient Air (Note 7) | R <sub>θJA</sub>                  | 625         | °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 Code | Zener Voltage Range (Note 4)     |         |         |                 | Maximum Zener Impedance f = 1kHz  |                                   |                 | Maximum Reverse Current (Note 6) |                  | Temperature Coefficient of Zener Voltage @ I <sub>ZT</sub> = 5mA mV/°C |      |
|-------------|--------------|----------------------------------|---------|---------|-----------------|-----------------------------------|-----------------------------------|-----------------|----------------------------------|------------------|------------------------------------------------------------------------|------|
|             |              | 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                                |                  |                                                                        |      |
| BZT52C2V0S  | WY           | 2.0                              | 1.91    | 2.09    | 5               | 100                               | 600                               | 1.0             | 150                              | 1.0              | -3.5                                                                   | 0    |
| BZT52C2V4S  | WX           | 2.4                              | 2.20    | 2.60    | 5               | 100                               | 600                               | 1.0             | 50                               | 1.0              | -3.5                                                                   | 0    |
| BZT52C2V7S  | W1           | 2.7                              | 2.5     | 2.9     | 5               | 100                               | 600                               | 1.0             | 20                               | 1.0              | -3.5                                                                   | 0    |
| BZT52C3V0S  | W2           | 3.0                              | 2.8     | 3.2     | 5               | 95                                | 600                               | 1.0             | 10                               | 1.0              | -3.5                                                                   | 0    |
| BZT52C3V3S  | W3           | 3.3                              | 3.1     | 3.5     | 5               | 95                                | 600                               | 1.0             | 5                                | 1.0              | -3.5                                                                   | 0    |
| BZT52C3V6S  | W4           | 3.6                              | 3.4     | 3.8     | 5               | 90                                | 600                               | 1.0             | 5                                | 1.0              | -3.5                                                                   | 0    |
| BZT52C3V9S  | W5           | 3.9                              | 3.7     | 4.1     | 5               | 90                                | 600                               | 1.0             | 3                                | 1.0              | -3.5                                                                   | 0    |
| BZT52C4V3S  | W6           | 4.3                              | 4.0     | 4.6     | 5               | 90                                | 600                               | 1.0             | 3                                | 1.0              | -3.5                                                                   | 0    |
| BZT52C4V7S  | W7           | 4.7                              | 4.4     | 5.0     | 5               | 80                                | 500                               | 1.0             | 2                                | 2.0              | -3.5                                                                   | 0.2  |
| BZT52C5V1S  | W8           | 5.1                              | 4.8     | 5.4     | 5               | 60                                | 480                               | 1.0             | 1                                | 2.0              | -2.7                                                                   | 1.2  |
| BZT52C5V6S  | W9           | 5.6                              | 5.2     | 6.0     | 5               | 40                                | 400                               | 1.0             | 3                                | 2.0              | -2.0                                                                   | 2.5  |
| BZT52C6V2S  | WA           | 6.2                              | 5.8     | 6.6     | 5               | 10                                | 150                               | 1.0             | 2                                | 4.0              | 0.4                                                                    | 3.7  |
| BZT52C6V8S  | WB           | 6.8                              | 6.4     | 7.2     | 5               | 15                                | 80                                | 1.0             | 1                                | 4.0              | 1.2                                                                    | 4.5  |
| BZT52C7V5S  | WC           | 7.5                              | 7.0     | 7.9     | 5               | 15                                | 80                                | 1.0             | 0.7                              | 5.0              | 2.5                                                                    | 5.3  |
| BZT52C8V2S  | WD           | 8.2                              | 7.7     | 8.7     | 5               | 15                                | 80                                | 1.0             | 0.5                              | 5.0              | 3.2                                                                    | 6.2  |
| BZT52C9V1S  | WE           | 9.1                              | 8.5     | 9.6     | 5               | 15                                | 100                               | 1.0             | 0.2                              | 6.0              | 3.8                                                                    | 7.0  |
| BZT52C10S   | WF           | 10                               | 9.4     | 10.6    | 5               | 20                                | 150                               | 1.0             | 0.1                              | 7.0              | 4.5                                                                    | 8.0  |
| BZT52C11S   | WG           | 11                               | 10.4    | 11.6    | 5               | 20                                | 150                               | 1.0             | 0.1                              | 8.0              | 5.4                                                                    | 9.0  |
| BZT52C12S   | WH           | 12                               | 11.4    | 12.7    | 5               | 25                                | 150                               | 1.0             | 0.1                              | 8.0              | 6.0                                                                    | 10.0 |
| BZT52C13S   | WI           | 13                               | 12.4    | 14.1    | 5               | 30                                | 170                               | 1.0             | 0.1                              | 8.0              | 7.0                                                                    | 11.0 |
| BZT52C15S   | WJ           | 15                               | 13.8    | 15.6    | 5               | 30                                | 200                               | 1.0             | 0.1                              | 10.5             | 9.2                                                                    | 13.0 |
| BZT52C16S   | WK           | 16                               | 15.3    | 17.1    | 5               | 40                                | 200                               | 1.0             | 0.1                              | 11.2             | 10.4                                                                   | 14.0 |
| BZT52C18S   | WL           | 18                               | 16.8    | 19.1    | 5               | 45                                | 225                               | 1.0             | 0.1                              | 12.6             | 12.4                                                                   | 16.0 |
| BZT52C20S   | WM           | 20                               | 18.8    | 21.2    | 5               | 55                                | 225                               | 1.0             | 0.1                              | 14.0             | 14.4                                                                   | 18.0 |
| BZT52C22S   | WN           | 22                               | 20.8    | 23.3    | 5               | 55                                | 250                               | 1.0             | 0.1                              | 15.4             | 16.4                                                                   | 20.0 |
| BZT52C24S   | WO           | 24                               | 22.8    | 25.6    | 5               | 70                                | 250                               | 1.0             | 0.1                              | 16.8             | 18.4                                                                   | -    |
| BZT52C27S   | WP           | 27                               | 25.1    | 28.9    | 2               | 80                                | 300                               | 0.5             | 0.1                              | 18.9             | 21.4                                                                   | -    |
| BZT52C30S   | WQ           | 30                               | 28.0    | 32.0    | 2               | 80                                | 300                               | 0.5             | 0.1                              | 21.0             | 24.4                                                                   | -    |
| BZT52C33S   | WR           | 33                               | 31.0    | 35.0    | 2               | 80                                | 325                               | 0.5             | 0.1                              | 23.1             | 27.4                                                                   | -    |
| BZT52C36S   | WS           | 36                               | 34.0    | 38.0    | 2               | 90                                | 350                               | 0.5             | 0.1                              | 25.2             | 30.4                                                                   | -    |
| BZT52C39S   | WT           | 39                               | 37.0    | 41.0    | 2               | 130                               | 350                               | 0.5             | 0.1                              | 27.3             | 33.4                                                                   | -    |

Notes: 6. Short duration pulse test used to minimize self-heating effect.  
7. Part mounted on FR-4 PC board with recommended pad layout, as per <http://www.diodes.com>.

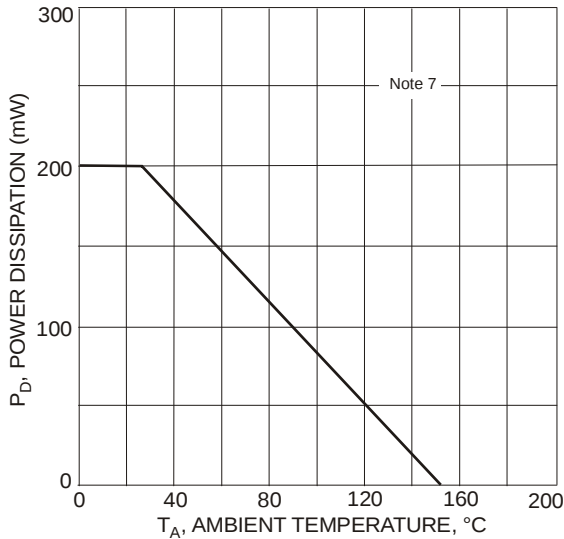


Fig. 1 Power Derating Curve

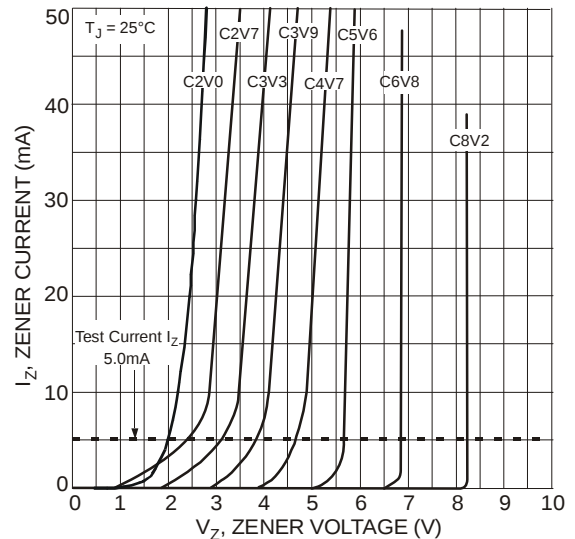


Fig. 2 Typical Zener Breakdown Characteristics

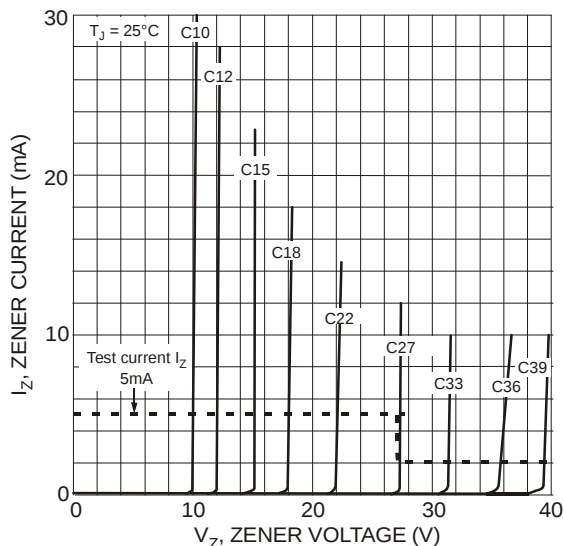


Fig. 3 Typical Zener Breakdown Characteristics

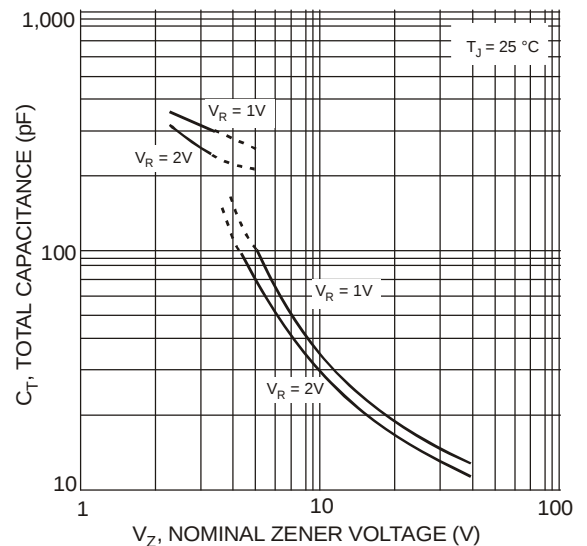
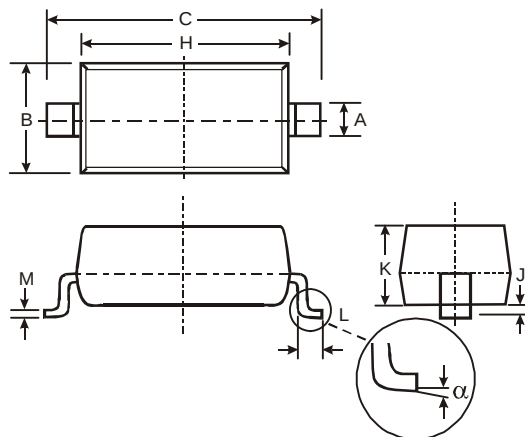


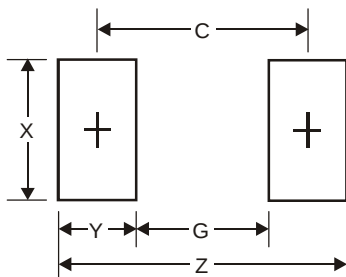
Fig. 4 Typical Total Capacitance vs. Nominal Zener Voltage

## Package Outline Dimensions



| SOD323               |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 0.25 | 0.35 |
| B                    | 1.20 | 1.40 |
| C                    | 2.30 | 2.70 |
| H                    | 1.60 | 1.80 |
| J                    | 0.00 | 0.10 |
| K                    | 1.0  | 1.1  |
| L                    | 0.20 | 0.40 |
| M                    | 0.10 | 0.15 |
| $\alpha$             | 0°   | 8°   |
| All Dimensions in mm |      |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 3.75          |
| G          | 1.05          |
| X          | 0.65          |
| Y          | 1.35          |
| C          | 2.40          |

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