# 0.4W SURFACE MOUNT PRECISION ZENER DIODE

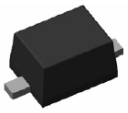
## Features

- 400mW Power Dissipation on FR-4 PCB
- Very Tight Tolerance on $V_Z$
- Ideally Suited for Automated Assembly Processes
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOD323F
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish - Matte Tin Annealed over Copper Alloy leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.01 grams (Approximate)

SOD323F



Top View

## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| (Type Number)-7* | SOD323F | 3,000/Tape & Reel |

* Example: The part number for the 3.6 Volt device would be D3Z3V6BF-7.

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/quality/lead_free.html 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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

## Marking Information

XX = Product Type Marking Code
(See Electrical Characteristics Table)
YM = Date Code Marking
Y = Year (ex: X = 2010)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Code | X | Y | Z | A | B | C | D | E | F | G | H |

| 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 |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## Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Forward Voltage | @ $I_F$ = 10mA | $V_F$ | 0.9 | V |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Power Dissipation (Note 5) | $P_D$ | 400 | mW |
| Thermal Resistance, Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 312.5 | °C/W |
| Operating and Storage Temperature Range | $T_J, T_{STG}$ | -65 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Type Number | Marking Code | Zener Voltage Range (Note 6) | | | Maximum Zener Impedance f = 1kHz | | | Maximum Reverse Current (Note 7) | | Typical Temperature Coefficient | Typical Total Capacitance |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ @ $I_{ZT}$ | | $I_{ZT}$ | $Z_{ZT}$ @ $I_{ZT}$ | $Z_{ZK}$ @ $I_{ZK}$ | $I_{ZK}$ | $I_R$ | @ $V_R$ | @ $I_{ZT}$ = 5mA | @ $V_R$ = 0V, f = 1MHz |
| | | Min (V) | Max (V) | mA | Ω | | mA | µA | V | mV/°C | pF |
| D3Z2V4BF | L0 | 2.43 | 2.63 | 5 | 100 | 1000 | 0.5 | 50 | 1 | -1.6 | 215 |
| D3Z2V7BF | L1 | 2.69 | 2.91 | 5 | 100 | 1000 | 0.5 | 20 | 1 | -1.7 | 205 |
| D3Z3V0BF | L2 | 2.85 | 3.07 | 5 | 95 | 1000 | 0.5 | 10 | 1 | -1.7 | 195 |
| D3Z3V3BF | L3 | 3.32 | 3.53 | 5 | 95 | 1000 | 0.5 | 5 | 1 | -1.9 | 145 |
| D3Z3V6BF | L4 | 3.60 | 3.85 | 5 | 90 | 500 | 1.0 | 5 | 1 | -2.4 | 185 |
| D3Z3V9BF | L5 | 3.89 | 4.16 | 5 | 90 | 500 | 1.0 | 3 | 1 | -2.5 | 175 |
| D3Z4V3BF | L6 | 4.17 | 4.48 | 5 | 90 | 600 | 1.0 | 3 | 1 | -2.5 | 165 |
| D3Z4V7BF | L7 | 4.55 | 4.75 | 5 | 90 | 600 | 1.0 | 2 | 1 | -1.1 | 150 |
| D3Z5V1BF | GM, L8 | 4.96 | 5.20 | 5 | 60 | 250 | 0.5 | 2 | 1.5 | 0.3 | 145 |
| D3Z5V6BF | L9 | 5.48 | 5.73 | 5 | 50 | 100 | 0.5 | 1 | 2.5 | 1.7 | 20 |
| D3Z6V2BF | LA | 6.06 | 6.33 | 5 | 50 | 80 | 0.5 | 0.5 | 3 | 2.5 | 95 |
| D3Z6V8BF | LB | 6.65 | 6.93 | 5 | 40 | 60 | 0.5 | 0.5 | 3.5 | 3.4 | 82 |
| D3Z7V5BF | LC | 7.28 | 7.60 | 5 | 10 | 60 | 0.5 | 0.5 | 4 | 4.0 | 70 |
| D3Z8V2BF | LD | 8.02 | 8.36 | 5 | 10 | 60 | 0.5 | 0.5 | 5 | 4.6 | 57 |
| D3Z9V1BF | LE | 8.85 | 9.23 | 5 | 10 | 60 | 0.5 | 0.5 | 6 | 5.0 | 50 |
| D3Z10BF | LF | 9.77 | 10.21 | 5 | 10 | 60 | 0.5 | 0.1 | 7 | 6.1 | 45 |
| D3Z11BF | LG | 10.78 | 11.22 | 5 | 10 | 60 | 0.5 | 0.1 | 8 | 7.4 | 41 |
| D3Z12BF | LH | 11.74 | 12.24 | 5 | 10 | 80 | 0.5 | 0.1 | 9 | 8.2 | 36 |
| D3Z13BF | LJ | 12.91 | 13.49 | 5 | 10 | 80 | 0.5 | 0.1 | 10 | 9.4 | 33 |
| D3Z15BF | LK | 14.34 | 14.98 | 5 | 15 | 80 | 0.5 | 0.05 | 11 | 12.1 | 28 |
| D3Z16BF | LL | 15.85 | 16.51 | 5 | 20 | 80 | 0.5 | 0.05 | 12 | 13.7 | 25 |
| D3Z18BF | LM | 17.56 | 18.35 | 5 | 20 | 80 | 0.5 | 0.05 | 13 | 15.8 | 24 |
| D3Z20BF | LN | 19.52 | 20.39 | 5 | 20 | 100 | 0.5 | 0.05 | 15 | 16.4 | 22 |
| D3Z22BF | LP | 21.54 | 22.47 | 5 | 25 | 100 | 0.5 | 0.05 | 17 | 18.4 | 20 |
| D3Z24BF | LQ | 23.72 | 24.78 | 5 | 30 | 120 | 0.5 | 0.05 | 19 | 20.4 | 18 |
| D3Z27BF | LR | 26.19 | 27.53 | 5 | 40 | 150 | 0.5 | 0.05 | 21 | 18.0 | 17 |
| D3Z30BF | LS | 29.19 | 30.69 | 5 | 40 | 200 | 0.5 | 0.05 | 23 | 28.6 | 17 |
| D3Z33BF | LT | 32.15 | 33.79 | 5 | 40 | 250 | 0.5 | 0.05 | 25 | 32.2 | 15 |
| D3Z36BF | LU | 35.07 | 36.87 | 5 | 60 | 300 | 0.5 | 0.05 | 27 | 34.9 | 14 |

Notes: 5. Device mounted on FR-4 PCB with suggested pad layout, board size 35mm * 25mm.
6. The Zener voltage is measured <40ms after power is supplied.
7. Short duration pulse test used to minimize self-heating effect.


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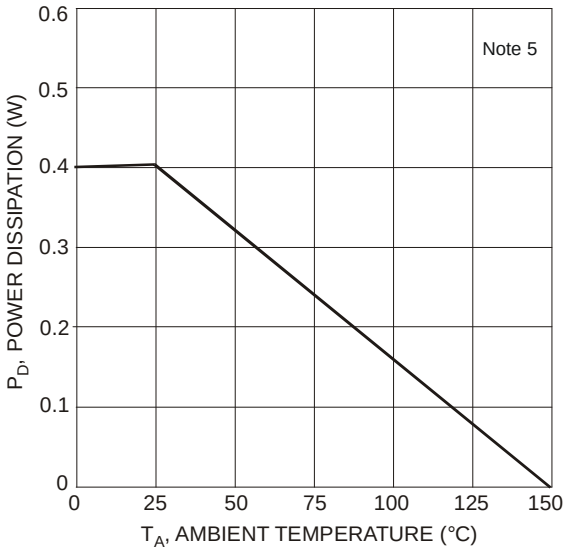


Fig. 1 Power Derating Curve

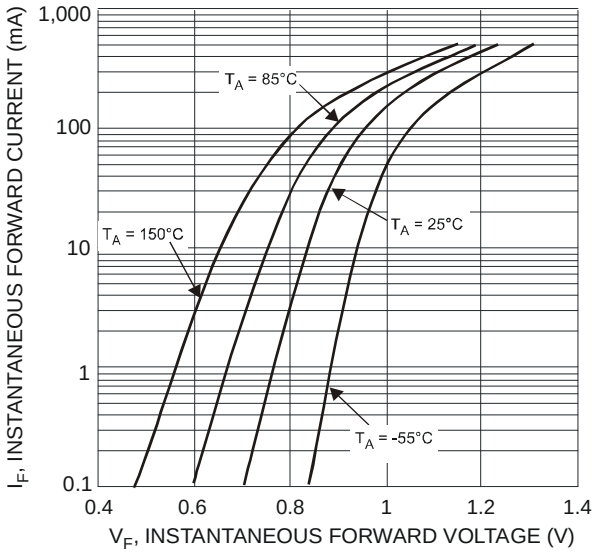


Fig. 2 Typical Forward Characteristics

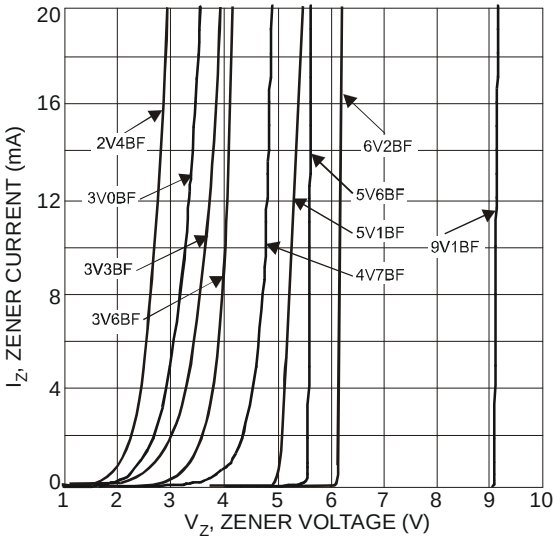


Fig. 3 Typical Zener Breakdown Characteristics

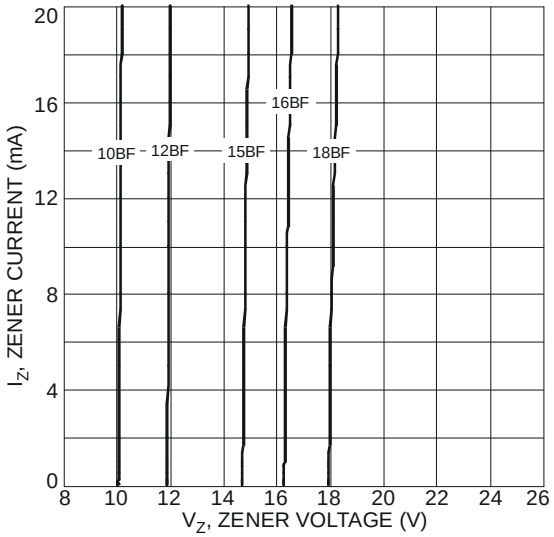


Fig. 4 Typical Zener Breakdown Characteristics

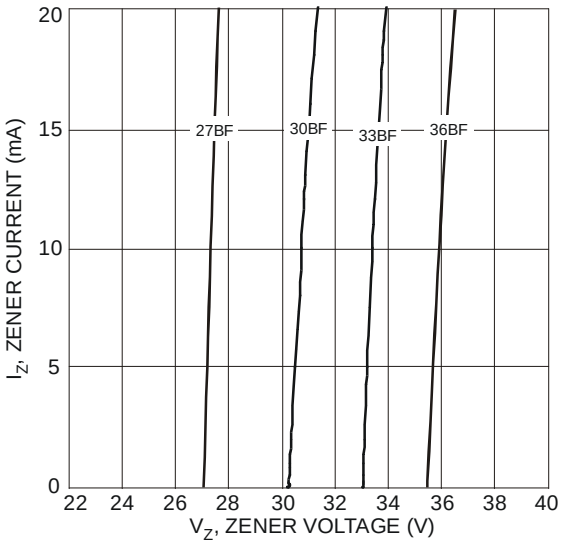


Fig. 5 Typical Zener Breakdown Characteristics


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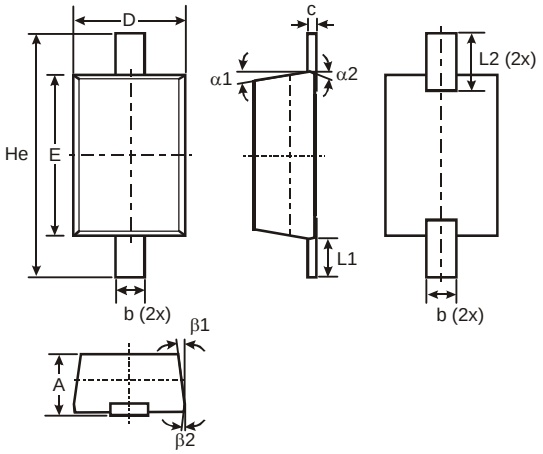
## Package Outline Dimensions

Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

**SOD323F**

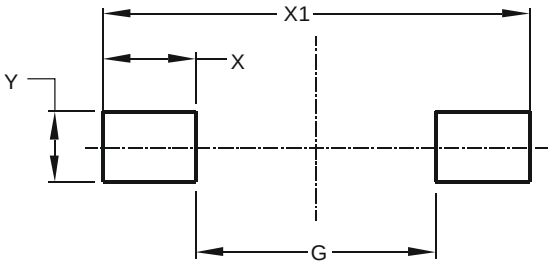



| SOD323F | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.60 | 0.75 | – |
| **b** | 0.25 | 0.35 | – |
| **c** | 0.05 | 0.26 | – |
| **D** | 1.15 | 1.35 | 1.25 |
| **E** | 1.60 | 1.80 | 1.70 |
| **He** | 2.30 | 2.70 | 2.50 |
| **L1** | 0.30 | 0.50 | 0.40 |
| **L2** | 0.41 | 0.61 | 0.51 |
| **α1** | – | – | 7° |
| **α2** | – | – | 3° |
| **β1** | – | – | 7° |
| **β2** | – | – | 3° |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

**SOD323F**




| Dimensions | Value (in mm) |
|---|---|
| **G** | 1.280 |
| **X** | 0.710 |
| **X1** | 2.700 |
| **Y** | 0.403 |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