

200mW, 2% Tolerance SMD Zener Diode

FEATURES

- Wide Zener voltage range selection: 2.4V to 75V
- V_Z tolerance selection of $\pm 2\%$
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant

APPLICATIONS

- Low voltage stabilizers or voltage references
- Adapters
- On-board DC/DC converter

MECHANICAL DATA

- Case: SOD-323F
- Molding compound meets UL 94 V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Polarity: Indicated by cathode band
- Weight: 4.60mg (approximately)

| KEY PARAMETERS | | |
|------------------------------|------------|--------------------|
| PARAMETER | VALUE | UNIT |
| V_Z | 2.4 - 75 | V |
| P_D | 200 | mW |
| V_F at $I_F = 10\text{mA}$ | 1 | V |
| $T_{J \text{ MAX}}$ | 150 | $^{\circ}\text{C}$ |
| Package | SOD-323F | |
| Configuration | Single die | |



SOD-323F



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

| PARAMETER | SYMBOL | VALUE | UNIT |
|---------------------------------------|------------------|-------------|--------------------|
| Forward voltage @ $I_F = 10\text{mA}$ | V_F | 1 | V |
| Power dissipation | P_D | 200 | mW |
| Junction temperature range | T_J | -65 to +150 | $^{\circ}\text{C}$ |
| Storage temperature range | T_{STG} | -65 to +150 | $^{\circ}\text{C}$ |

THERMAL PERFORMANCE

| PARAMETER | SYMBOL | TYP | UNIT |
|--|-----------------|-----|----------------------|
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 625 | $^{\circ}\text{C/W}$ |

| ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | | | | | |
|---|--------------|----------------------|-------|-------|--------------|-------------------|-------------------|--------------|-----------------|------|
| PART NUMBER | MARKING CODE | ZENER VOLTAGE | | | TEST CURRENT | REGULAR IMPEDANCE | | TEST CURRENT | LEAKAGE CURRENT | |
| | | $V_Z @ I_{ZT}^{(1)}$ | | | I_{ZT} | $Z_{ZT} @ I_{ZT}$ | $Z_{ZK} @ I_{ZK}$ | I_{ZK} | $I_R @ V_R$ | |
| | | V | | | mA | Ω | Ω | mA | μA | V |
| | | Min | Nom | Max | | Max | Max | | Max | |
| BZT52B2V4S | 0Z | 2.35 | 2.40 | 2.45 | 5 | 100 | 564 | 1 | 45 | 1 |
| BZT52B2V7S | 1Z | 2.65 | 2.70 | 2.75 | 5 | 100 | 564 | 1 | 18 | 1 |
| BZT52B3V0S | 2Z | 2.94 | 3.00 | 3.06 | 5 | 100 | 564 | 1 | 9 | 1 |
| BZT52B3V3S | 3Z | 3.23 | 3.30 | 3.37 | 5 | 95 | 564 | 1 | 4.5 | 1 |
| BZT52B3V6S | 4Z | 3.53 | 3.60 | 3.67 | 5 | 90 | 564 | 1 | 4.5 | 1 |
| BZT52B3V9S | 5Z | 3.82 | 3.90 | 3.98 | 5 | 90 | 564 | 1 | 2.7 | 1 |
| BZT52B4V3S | 6Z | 4.21 | 4.30 | 4.39 | 5 | 90 | 564 | 1 | 2.7 | 1 |
| BZT52B4V7S | 7Z | 4.61 | 4.70 | 4.79 | 5 | 80 | 470 | 1 | 2.7 | 2.0 |
| BZT52B5V1S | 8Z | 5.00 | 5.10 | 5.20 | 5 | 60 | 451 | 1 | 1.8 | 2.0 |
| BZT52B5V6S | 9Z | 5.49 | 5.60 | 5.71 | 5 | 40 | 376 | 1 | 0.9 | 2.0 |
| BZT52B6V2S | AZ | 6.08 | 6.20 | 6.32 | 5 | 10 | 141 | 1 | 2.7 | 4.0 |
| BZT52B6V8S | BZ | 6.66 | 6.80 | 6.94 | 5 | 15 | 75 | 1 | 1.8 | 4.0 |
| BZT52B7V5S | CZ | 7.35 | 7.50 | 7.65 | 5 | 15 | 75 | 1 | 0.9 | 5.0 |
| BZT52B8V2S | DZ | 8.04 | 8.20 | 8.36 | 5 | 15 | 75 | 1 | 0.63 | 5.0 |
| BZT52B9V1S | EZ | 8.92 | 9.10 | 9.28 | 5 | 15 | 94 | 1 | 0.45 | 6.0 |
| BZT52B10S | FZ | 9.80 | 10.00 | 10.20 | 5 | 20 | 141 | 1 | 0.18 | 7.0 |
| BZT52B11S | GZ | 10.78 | 11.00 | 11.22 | 5 | 20 | 141 | 1 | 0.09 | 8.0 |
| BZT52B12S | HZ | 11.76 | 12.00 | 12.24 | 5 | 25 | 141 | 1 | 0.09 | 8.0 |
| BZT52B13S | JZ | 12.74 | 13.00 | 13.26 | 5 | 30 | 160 | 1 | 0.09 | 8.0 |
| BZT52B15S | KZ | 14.70 | 15.00 | 15.30 | 5 | 30 | 188 | 1 | 0.045 | 10.5 |
| BZT52B16S | LZ | 15.68 | 16.00 | 16.32 | 5 | 40 | 188 | 1 | 0.045 | 11.2 |
| BZT52B18S | MZ | 17.64 | 18.00 | 18.36 | 5 | 45 | 212 | 1 | 0.045 | 12.6 |
| BZT52B20S | NZ | 19.60 | 20.00 | 20.40 | 5 | 55 | 212 | 1 | 0.045 | 14.0 |
| BZT52B22S | PZ | 21.56 | 22.00 | 22.44 | 5 | 55 | 235 | 1 | 0.045 | 15.4 |
| BZT52B24S | RZ | 23.52 | 24.00 | 24.48 | 5 | 70 | 235 | 1 | 0.045 | 16.8 |
| BZT52B27S | SZ | 26.46 | 27.00 | 27.54 | 2 | 80 | 282 | 0.5 | 0.045 | 18.9 |
| BZT52B30S | TZ | 29.40 | 30.00 | 30.60 | 2 | 80 | 282 | 0.5 | 0.045 | 21.0 |
| BZT52B33S | UZ | 32.34 | 33.00 | 33.66 | 2 | 80 | 306 | 0.5 | 0.045 | 23.0 |
| BZT52B36S | VZ | 35.28 | 36.00 | 36.72 | 2 | 90 | 329 | 0.5 | 0.045 | 25.2 |
| BZT52B39S | WZ | 38.22 | 39.00 | 39.78 | 2 | 130 | 329 | 0.5 | 0.045 | 27.3 |
| BZT52B43S | XZ | 42.14 | 43.00 | 43.86 | 2 | 150 | 353 | 0.5 | 0.045 | 30.1 |
| BZT52B47S | YZ | 46.06 | 47.00 | 47.94 | 2 | 170 | 353 | 0.5 | 0.045 | 33.0 |
| BZT52B51S | -Z | 49.98 | 51.00 | 52.02 | 2 | 180 | 376 | 0.5 | 0.045 | 35.7 |
| BZT52B56S | =Z | 54.88 | 56.00 | 57.12 | 2 | 200 | 400 | 0.5 | 0.045 | 39.2 |
| BZT52B62S | ≡Z | 60.76 | 62.00 | 63.24 | 2 | 215 | 423 | 0.5 | 0.045 | 43.4 |
| BZT52B68S | >Z | 66.64 | 68.00 | 69.36 | 2 | 240 | 447 | 0.5 | 0.045 | 47.6 |
| BZT52B75S | <Z | 73.50 | 75.00 | 76.50 | 2 | 255 | 470 | 0.5 | 0.045 | 52.5 |

Notes:

1. The Zener voltage (V_Z) is tested under pulse condition of 30ms.
2. The device numbers listed have a standard tolerance on the normal Zener voltage of $\pm 2\%$.
3. For detailed information on price, availability and delivery of normal Zener voltages between the voltages shown and tighter voltage tolerances, contact your nearest Taiwan Semiconductor representative.
4. The Zener impedance is derived from the 60-cycle AC voltage, which results when an AC current having an RMS value equal to 10% of the DC Zener current (I_{ZT} or I_{ZK}) is superimposed to I_{ZT} or I_{ZK} .

| ORDERING INFORMATION | | |
|---------------------------------------|----------------|--------------------------|
| ORDERING CODE⁽¹⁾⁽²⁾ | PACKAGE | PACKING |
| BZT52BxS RRG | SOD-323F | 3,000 / 7" Tape & Reel |
| BZT52BxS RR | SOD-323F | 3,000 / 7" Tape & Reel |
| BZT52BxS R9G | SOD-323F | 10,000 / 13" Tape & Reel |
| BZT52BxS R9 | SOD-323F | 10,000 / 13" Tape & Reel |

Notes:

1. "x" defines voltage from 2.4V (BZT52B2V4S) to 75V (BZT52B75S)
2. "G" means green compound (halogen-free according to IEC 61249-2-21)

CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.1 Typical Forward Characteristics

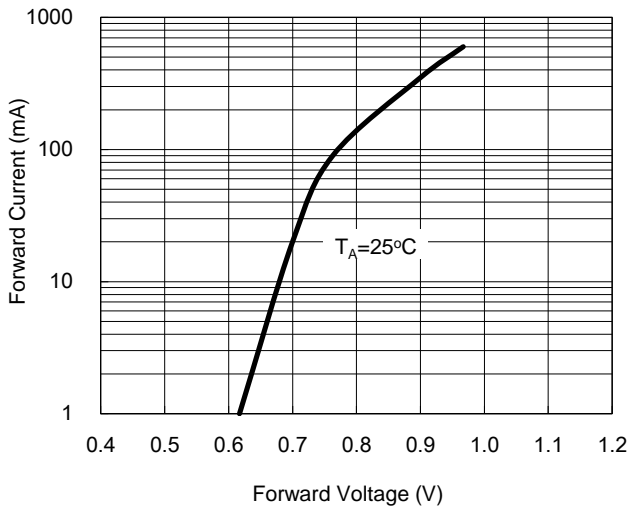


Fig.2 Zener Breakdown Characteristics

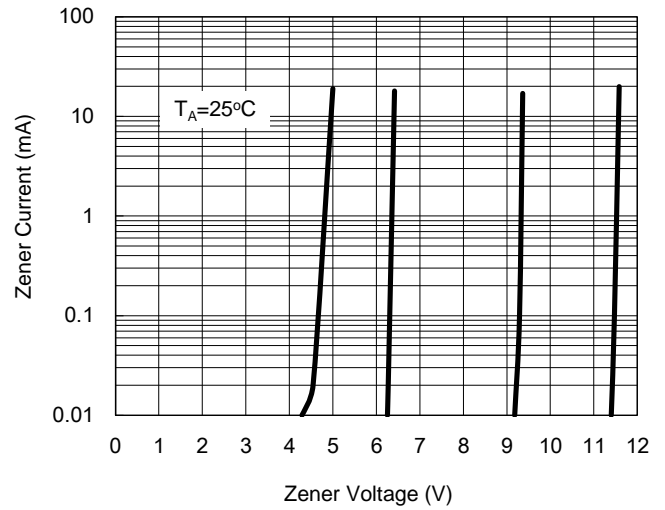


Fig.3 Zener Breakdown Characteristics

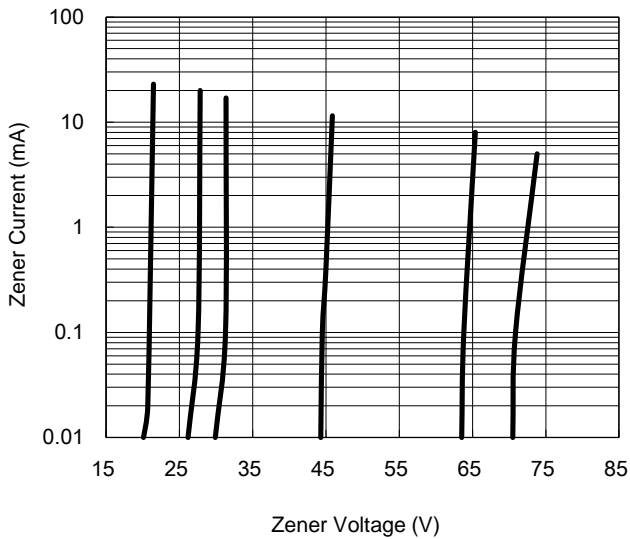
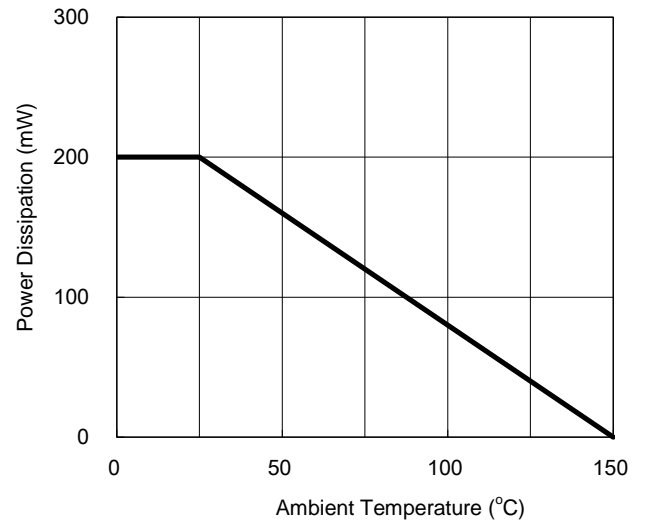


Fig.4 Power Dissipation Curve



CHARACTERISTICS CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig.5 Typical Capacitance

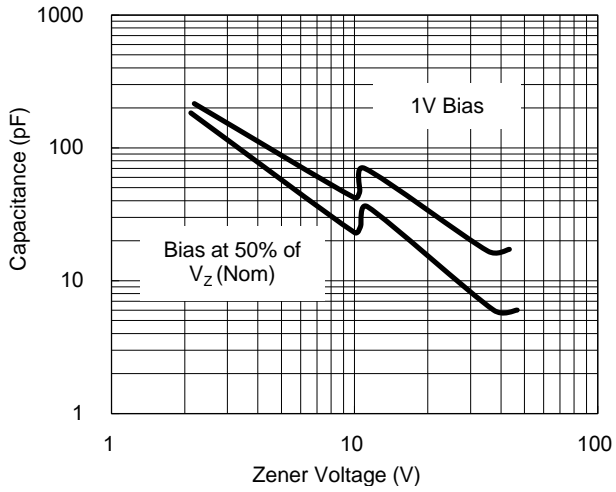
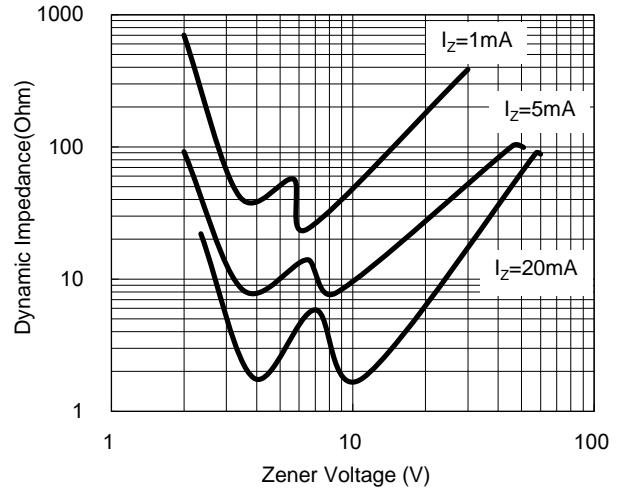
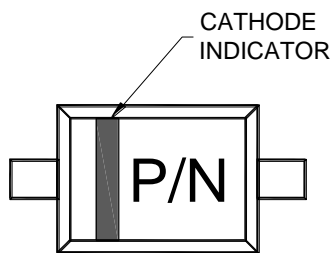
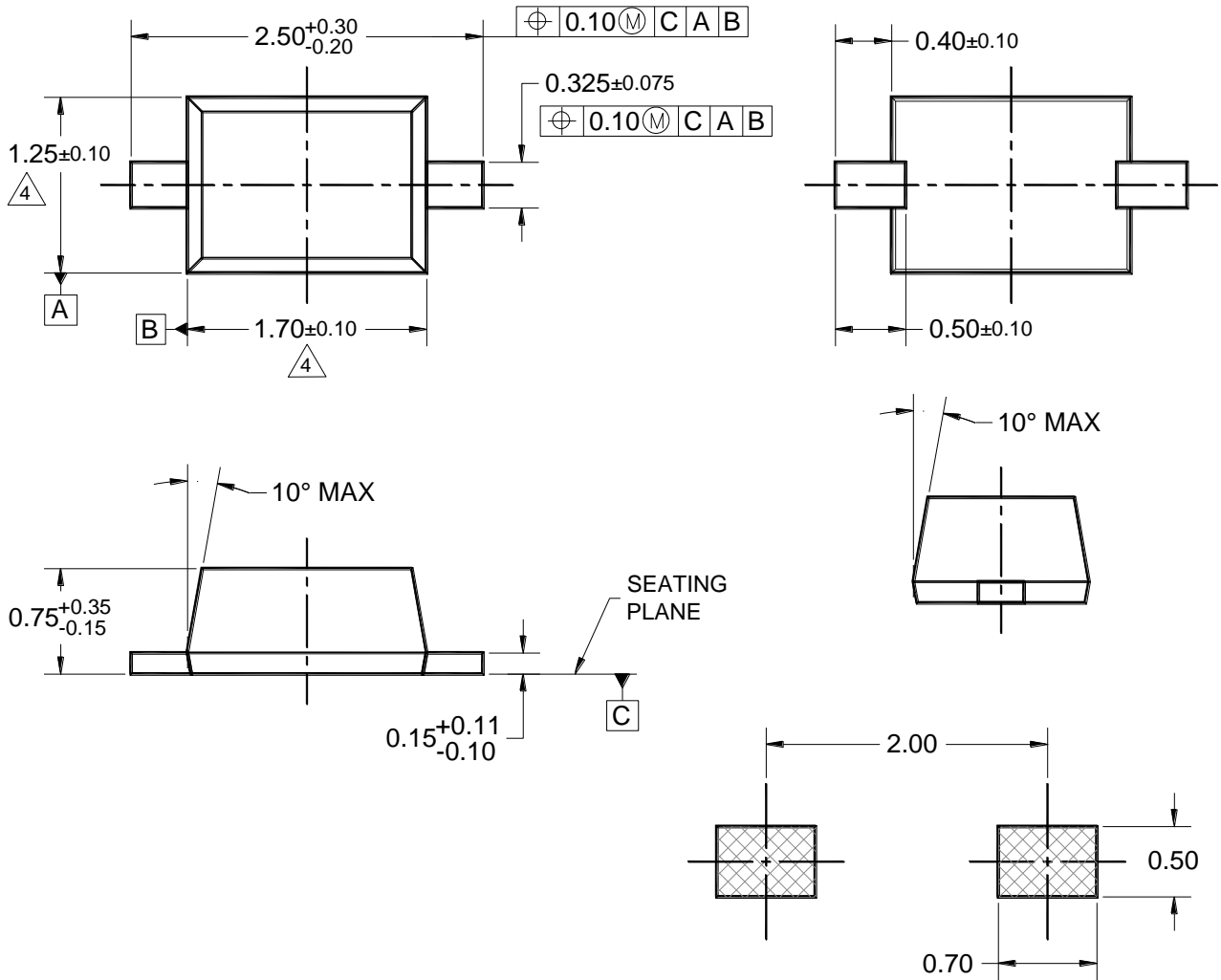


Fig.6 Effect of Zener Voltage on Impedance



PACKAGE OUTLINE DIMENSIONS

SOD-323F



MARKING DIAGRAM

P/N = MARKING CODE

SUGGESTED PAD LAYOUT

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: EIAJ ED-7500A-1, SC-90.

4. MOLDED PLASTIC BODY LATERAL DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

5. DWG NO. REF: HQ2SD07-SOD323F-018 REV A.

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