

# BZT52B2V4 THRU BZT52B51

SURFACE MOUNT ZENER DIODES

## SOD-123 SURFACE MOUNT SILICON ZENER DIODES

### Features

- Low Zener Impedance
- Power Dissipation of 500mW
- High Stability and High Reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C

### Applications

Zener diode is generally used as reference voltage sources in regulated power supplies or as protective diode in overvoltage protection circuits.

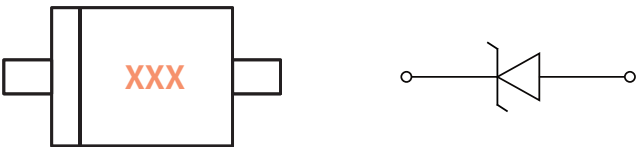
### Mechanical Data

- Case: SOD-123  
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant, halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Cathode line denotes the cathode end

### Function Diagram

**Zener Diode**  
2.4 to 43 Volts  
**Power Dissipation**  
500 Milliwatts

SOD-123



### Maximum Ratings (Ta=25°C Unless otherwise specified)

| PARAMETER                           | SYMBOL          | UNIT  | VALUE      |
|-------------------------------------|-----------------|-------|------------|
| Power Dissipation                   | $P_D$           | mW    | 500        |
| Forward Voltage @ $I_F=10\text{mA}$ | $V_F$           | V     | 0.9        |
| Storage Temperature                 | $T_{stg}$       | °C    | -55 ~ +150 |
| Junction Temperature                | $T_J$           | °C    | -55 ~ +150 |
| Typical Thermal Resistance          | $R_{\theta JA}$ | °C /W | 357        |

### Electrical Parameter

| SYMBOL   | PARAMETER                          |
|----------|------------------------------------|
| $V_Z$    | Reverse zener voltage @ $I_{ZT}$   |
| $I_{ZT}$ | Reverse current                    |
| $Z_{ZT}$ | Maximum Zener Impedance @ $I_{ZT}$ |
| $I_{ZK}$ | Reverse Current                    |
| $Z_{ZK}$ | Maximum Zener Impedance @ $I_{ZK}$ |
| $I_R$    | Reverse leakage current @ $V_R$    |
| $V_R$    | Reverse voltage                    |
| $I_F$    | Forward current                    |
| $V_F$    | Forward voltage @ $I_F$            |

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● Electrical Characteristics (Ta=25°C Unless otherwise noted)

| Type Number | Marking | Nominal Zener Voltage |      |       |                 | Zener Impedance                  |                                  |                 | Leakage Current                |                    | Typical Temperature coefficient @ I <sub>ZTC</sub> (mV/°C) |      | Admissible Zener Current |
|-------------|---------|-----------------------|------|-------|-----------------|----------------------------------|----------------------------------|-----------------|--------------------------------|--------------------|------------------------------------------------------------|------|--------------------------|
|             |         | V <sub>Z</sub> (V)    |      |       | 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.                  | Nom. | Max.  | (mA)            | (Ω)                              |                                  | (mA)            | I <sub>R</sub> (μA)            | V <sub>R</sub> (V) | Min.                                                       | Max. | I <sub>ZM</sub> (mA)     |
| BZT52B2V4   | 2WX     | 2.35                  | 2.4  | 2.45  | 5               | 100                              | 600                              | 1.0             | 50                             | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B2V7   | 2W1     | 2.65                  | 2.7  | 2.75  | 5               | 100                              | 600                              | 1.0             | 20                             | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B3V0   | 2W2     | 2.94                  | 3.0  | 3.06  | 5               | 95                               | 600                              | 1.0             | 10                             | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B3V3   | 2W3     | 3.23                  | 3.3  | 3.37  | 5               | 95                               | 600                              | 1.0             | 5                              | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B3V6   | 2W4     | 3.53                  | 3.6  | 3.67  | 5               | 90                               | 600                              | 1.0             | 5                              | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B3V9   | 2W5     | 3.82                  | 3.9  | 3.98  | 5               | 90                               | 600                              | 1.0             | 3                              | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B4V3   | 2W6     | 4.21                  | 4.3  | 4.39  | 5               | 90                               | 600                              | 1.0             | 3                              | 1.0                | -3.5                                                       | 0    | 5                        |
| BZT52B4V7   | 2W7     | 4.61                  | 4.7  | 4.79  | 5               | 80                               | 500                              | 1.0             | 3                              | 2.0                | -3.5                                                       | 0.2  | 5                        |
| BZT52B5V1   | 2W8     | 5.00                  | 5.1  | 5.20  | 5               | 60                               | 480                              | 1.0             | 2                              | 2.0                | -2.7                                                       | 1.2  | 5                        |
| BZT52B5V6   | 2W9     | 5.49                  | 5.6  | 5.71  | 5               | 40                               | 400                              | 1.0             | 1                              | 2.0                | -2.0                                                       | 2.5  | 5                        |
| BZT52B6V2   | 2WA     | 6.08                  | 6.2  | 6.32  | 5               | 10                               | 150                              | 1.0             | 3                              | 4.0                | 0.4                                                        | 3.7  | 5                        |
| BZT52B6V8   | 2WB     | 6.66                  | 6.8  | 6.94  | 5               | 15                               | 80                               | 1.0             | 2                              | 4.0                | 1.2                                                        | 4.5  | 5                        |
| BZT52B7V5   | 2WC     | 7.35                  | 7.5  | 7.65  | 5               | 15                               | 80                               | 1.0             | 1                              | 5.0                | 2.5                                                        | 5.3  | 5                        |
| BZT52B8V2   | 2WD     | 8.04                  | 8.2  | 8.36  | 5               | 15                               | 80                               | 1.0             | 0.7                            | 5.0                | 3.2                                                        | 6.2  | 5                        |
| BZT52B9V1   | 2WE     | 8.92                  | 9.1  | 9.28  | 5               | 15                               | 100                              | 1.0             | 0.5                            | 6.0                | 3.8                                                        | 7.0  | 5                        |
| BZT52B10    | 2WF     | 9.80                  | 10   | 10.20 | 5               | 20                               | 150                              | 1.0             | 0.2                            | 7.0                | 4.5                                                        | 8.0  | 5                        |
| BZT52B11    | 2WG     | 10.78                 | 11   | 11.22 | 5               | 20                               | 150                              | 1.0             | 0.1                            | 8.0                | 5.4                                                        | 9.0  | 5                        |
| BZT52B12    | 2WH     | 11.76                 | 12   | 12.24 | 5               | 25                               | 150                              | 1.0             | 0.1                            | 8.0                | 6.0                                                        | 10.0 | 5                        |
| BZT52B13    | 2WI     | 12.74                 | 13   | 13.26 | 5               | 30                               | 170                              | 1.0             | 0.1                            | 8.0                | 7.0                                                        | 11.0 | 5                        |
| BZT52B15    | 2WJ     | 14.70                 | 15   | 15.30 | 5               | 30                               | 200                              | 1.0             | 0.1                            | 10.5               | 9.2                                                        | 13.0 | 5                        |
| BZT52B16    | 2WK     | 15.68                 | 16   | 16.32 | 5               | 40                               | 200                              | 1.0             | 0.1                            | 11.2               | 10.4                                                       | 14.0 | 5                        |
| BZT52B18    | 2WL     | 17.64                 | 18   | 18.36 | 5               | 45                               | 225                              | 1.0             | 0.1                            | 12.6               | 12.4                                                       | 16.0 | 5                        |
| BZT52B20    | 2WM     | 19.60                 | 20   | 20.40 | 5               | 55                               | 225                              | 1.0             | 0.1                            | 14.0               | 14.4                                                       | 18.0 | 5                        |
| BZT52B22    | 2WN     | 21.56                 | 22   | 22.44 | 5               | 55                               | 250                              | 1.0             | 0.1                            | 15.4               | 16.4                                                       | 20.0 | 5                        |
| BZT52B24    | 2WO     | 23.52                 | 24   | 24.48 | 5               | 70                               | 250                              | 1.0             | 0.1                            | 16.8               | 18.4                                                       | 22.0 | 5                        |
| BZT52B27    | 2WP     | 26.46                 | 27   | 27.54 | 2               | 80                               | 300                              | 0.5             | 0.1                            | 18.9               | 21.4                                                       | 25.3 | 2                        |
| BZT52B30    | 2WQ     | 29.40                 | 30   | 30.60 | 2               | 80                               | 300                              | 0.5             | 0.1                            | 21.0               | 24.4                                                       | 29.4 | 2                        |
| BZT52B33    | 2WR     | 32.34                 | 33   | 33.66 | 2               | 80                               | 325                              | 0.5             | 0.1                            | 23.1               | 27.4                                                       | 33.4 | 2                        |
| BZT52B36    | 2WS     | 35.28                 | 36   | 36.72 | 2               | 90                               | 350                              | 0.5             | 0.1                            | 25.2               | 30.4                                                       | 37.4 | 2                        |
| BZT52B39    | 2WT     | 38.22                 | 39   | 39.78 | 2               | 130                              | 350                              | 0.5             | 0.1                            | 27.3               | 33.4                                                       | 41.2 | 2                        |
| BZT52B43    | 2WU     | 41.16                 | 43   | 43.84 | 2               | 130                              | 350                              | 0.5             | 0.1                            | 29.4               | 36.4                                                       | 45.2 | 2                        |
| BZT52B47    | 2WV     | 46.06                 | 47   | 47.94 | 5               | 100                              | 750                              | 1.0             | 0.1                            | 35                 | 10.0                                                       | 12   | 5                        |
| BZT52B51    | 2WW     | 49.98                 | 51   | 52.02 | 5               | 100                              | 750                              | 1.0             | 0.1                            | 38                 | 10.0                                                       | 12   | 5                        |

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## ● Ratings And Characteristics Curves ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

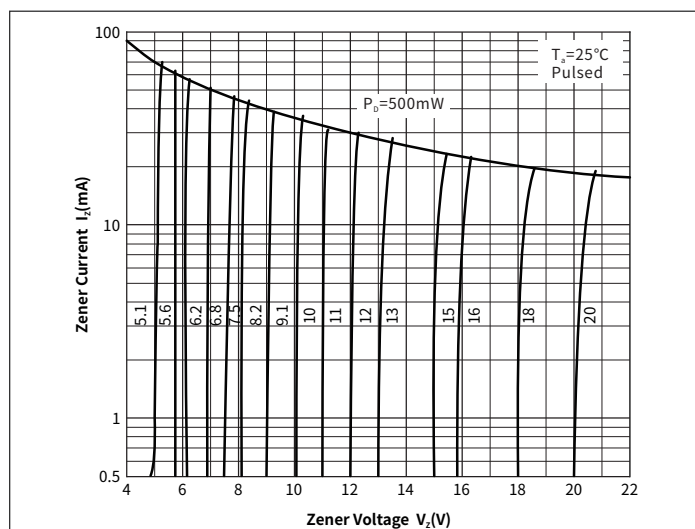


Fig. 1 Zener Characteristics ( $V_z$  5.1V to 20V)

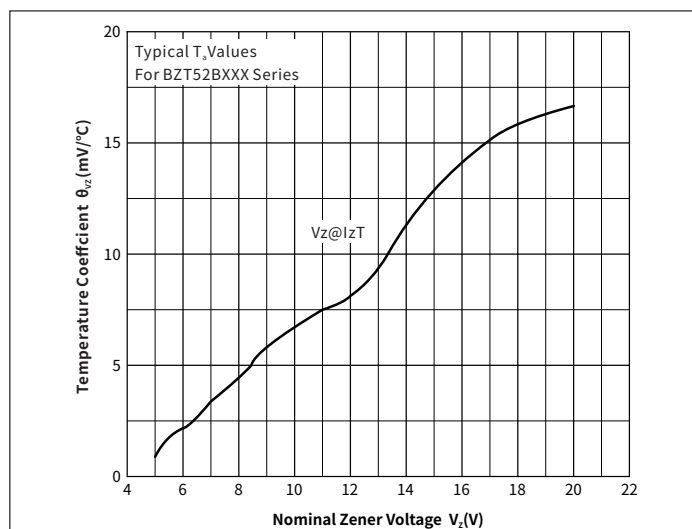


Fig. 2 Temperature Coefficients

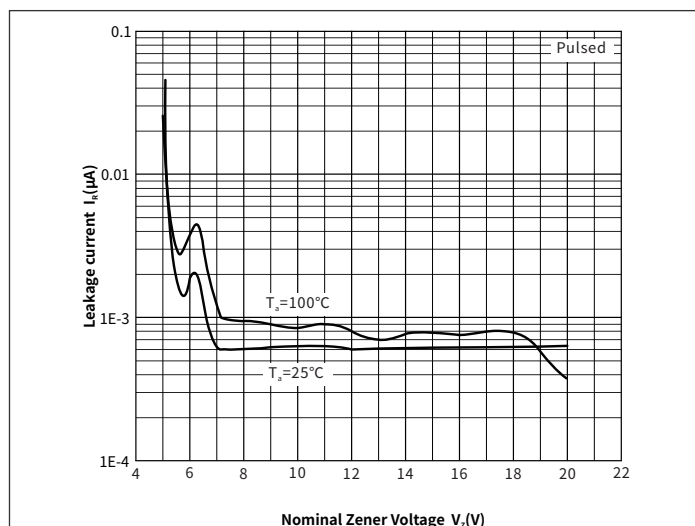


Fig. 3 Typical Leakage Current

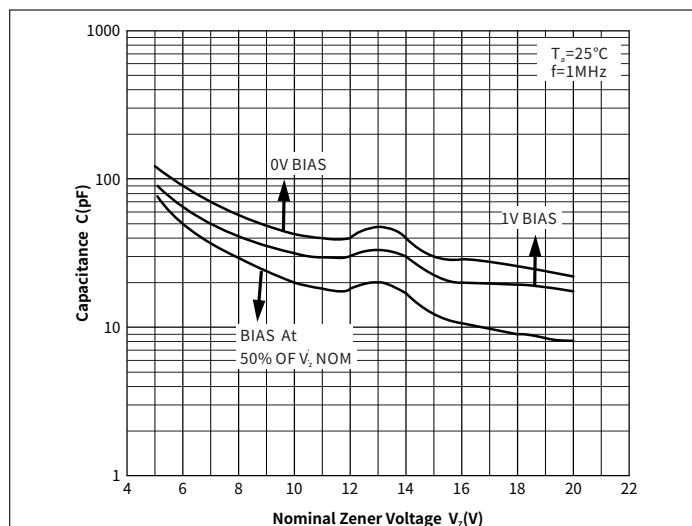


Fig. 4 Typical Capacitance

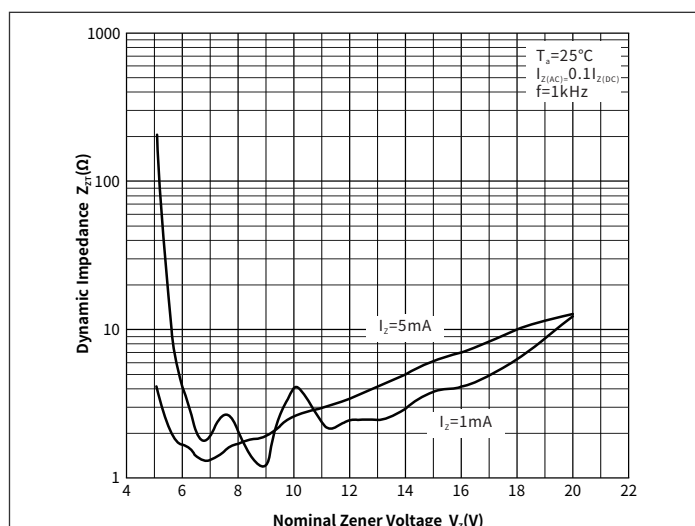


Fig. 3 Effect of Zener Voltage on Zener Impedance

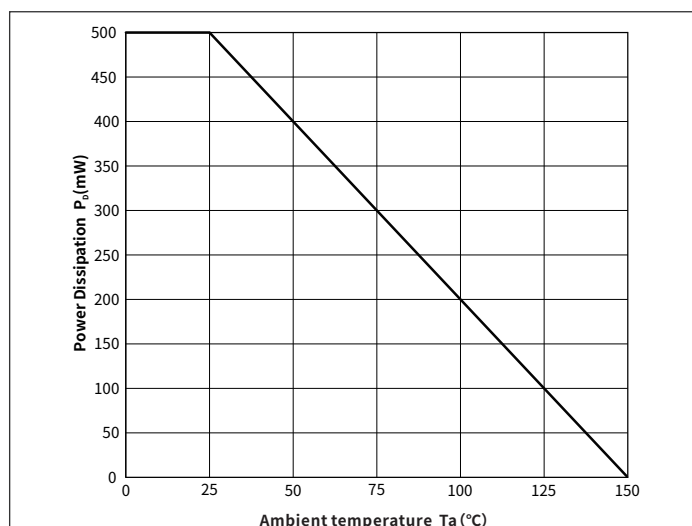


Fig. 4 Power Derating Curve

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## ● Ordering Information

| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---------|--------------|----------------|-----------|----------|-------------|---------------|
| SOD-123 | R1           | 0.012          | 3000      | 45000    | 180000      | 7"            |

## ● Package Outline Dimensions (SOD-123)

| Symbol | Dimensions  |      |        |       |
|--------|-------------|------|--------|-------|
|        | Millimeters |      | Inches |       |
|        | Min.        | Max. | Min.   | Max.  |
| A      | 3.55        | 3.85 | 0.140  | 0.152 |
| B      | 2.55        | 2.85 | 0.100  | 0.112 |
| C      | 1.40        | 1.80 | 0.055  | 0.071 |
| D      | 0.95        | 1.35 | 0.140  | 0.152 |
| E      | 0.51        | 0.71 | 0.037  | 0.053 |
| F      | -           | 0.15 | -      | 0.006 |
| G      | 0.15        | 0.45 | 0.006  | 0.008 |
| H      | 0.08        | 0.25 | 0.003  | 0.010 |
| θ      | -           | 8°   | -      | 8°    |

## ● Suggested Pad Layout

| Symbol | Dimensions  |      |        |       |
|--------|-------------|------|--------|-------|
|        | Millimeters |      | Inches |       |
|        | Min.        | Max. | Min.   | Max.  |
| J      | 0.91        | -    | 0.036  | -     |
| K      | -           | 2.36 | -      | 0.092 |
| M      | 1.22        | -    | 0.048  | -     |