

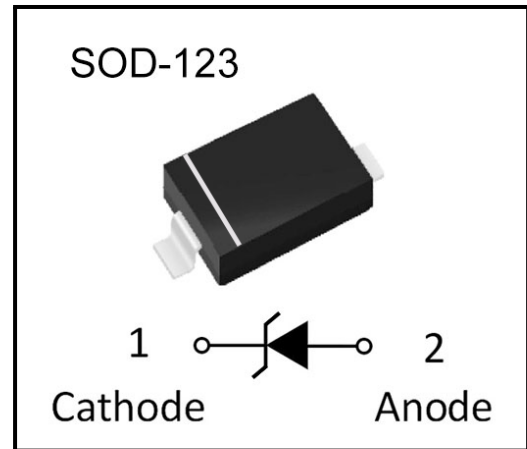
# BZT52Bxx

Zener Diode

## Features

- Low Zener Impedance
- Power Dissipation of 500mW
- High Stability and High Reliability

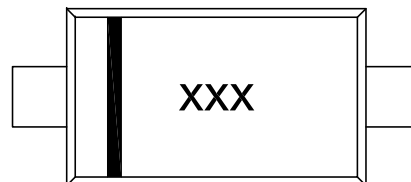
## Package



## Description

- Case: molded plastic
- Package: SOD-123 Plastic Package
- Polarity: Color band denotes cathode
- Epoxy UL: 94V-0

## Marking



## Ordering information

| Order code | Package | Marking | Base qty | Deliverymode  |
|------------|---------|---------|----------|---------------|
| BZT52Bxx   | SOD-123 | xxx     | 3K       | Tape and reel |

## Maximum Ratings @T<sub>A</sub>=25°C unless otherwise noted

| Symbol         | Parameter                             | Value              | Unit |
|----------------|---------------------------------------|--------------------|------|
| P <sub>d</sub> | Power Dissipation                     | 500 <sup>(1)</sup> | mW   |
| V <sub>F</sub> | Forward Voltage @I <sub>F</sub> =10mA | 0.9 <sup>(2)</sup> | V    |
| T <sub>J</sub> | Junction temperature                  | 150                | °C   |
| T <sub>S</sub> | Storage temperature range             | -55 to +150        | °C   |

Notes: (1)Device mounted on ceramic PCB: 7.6mm x 9.4mm x 0.87mm with pad areas 25mm<sup>2</sup>

(2)Short duration test pulse used to minimize self-heating effect



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Typical Performance Characteristics( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

| Device    | Marking | Zener Voltage Range             |         |         | Maximum Zener Impedance |                 |                                  |                 | Maximum        |                | Typical Temperature coefficient |                  | Test Current |
|-----------|---------|---------------------------------|---------|---------|-------------------------|-----------------|----------------------------------|-----------------|----------------|----------------|---------------------------------|------------------|--------------|
|           |         |                                 |         |         |                         |                 |                                  |                 | Reverse        | Current        |                                 |                  |              |
|           |         | V <sub>Z</sub> @I <sub>ZT</sub> |         |         | I <sub>ZT</sub>         | Z <sub>ZT</sub> | Z <sub>ZK</sub> @I <sub>ZK</sub> | I <sub>ZK</sub> | I <sub>R</sub> | V <sub>R</sub> | @ I <sub>ZTC</sub> =mV/°C       | I <sub>ZTC</sub> |              |
|           |         | Nom.(V)                         | Min.(V) | Max.(V) | (mA)                    | (Ω)             | (Ω)                              | (mA)            | (uA)           | (V)            | (Min)                           | (Max)            | (mA)         |
| BZT52B2V4 | 2WX     | 2.4                             | 2.35    | 2.45    | 5                       | 100             | 600                              | 1.0             | 50             | 1.0            | -3.5                            | 0                | 5            |
| BZT52B2V7 | 2W1     | 2.7                             | 2.65    | 2.75    | 5                       | 100             | 600                              | 1.0             | 20             | 1.0            | -3.5                            | 0                | 5            |
| BZT52B3V0 | 2W2     | 3.0                             | 2.94    | 3.06    | 5                       | 95              | 600                              | 1.0             | 10             | 1.0            | -3.5                            | 0                | 5            |
| BZT52B3V3 | 2W3     | 3.3                             | 3.23    | 3.37    | 5                       | 95              | 600                              | 1.0             | 5              | 1.0            | -3.5                            | 0                | 5            |
| BZT52B3V6 | 2W4     | 3.6                             | 3.53    | 3.67    | 5                       | 90              | 600                              | 1.0             | 5              | 1.0            | -3.5                            | 0                | 5            |
| BZT52B3V9 | 2W5     | 3.9                             | 3.82    | 3.98    | 5                       | 90              | 600                              | 1.0             | 3              | 1.0            | -3.5                            | 0                | 5            |
| BZT52B4V3 | 2W6     | 4.3                             | 4.21    | 4.39    | 5                       | 90              | 600                              | 1.0             | 3              | 1.0            | -3.5                            | 0                | 5            |
| BZT52B4V7 | 2W7     | 4.7                             | 4.61    | 4.79    | 5                       | 80              | 500                              | 1.0             | 3              | 2.0            | -3.5                            | 0.2              | 5            |
| BZT52B5V1 | 2W8     | 5.1                             | 5.00    | 5.20    | 5                       | 60              | 480                              | 1.0             | 2              | 2.0            | -2.7                            | 1.2              | 5            |
| BZT52B5V6 | 2W9     | 5.6                             | 5.49    | 5.71    | 5                       | 40              | 400                              | 1.0             | 1              | 2.0            | -2.0                            | 2.5              | 5            |
| BZT52B6V2 | 2WA     | 6.2                             | 6.08    | 6.32    | 5                       | 10              | 150                              | 1.0             | 3              | 4.0            | 0.4                             | 3.7              | 5            |
| BZT52B6V8 | 2WB     | 6.8                             | 6.66    | 6.94    | 5                       | 15              | 80                               | 1.0             | 2              | 4.0            | 1.2                             | 4.5              | 5            |
| BZT52B7V5 | 2WC     | 7.5                             | 7.35    | 7.65    | 5                       | 15              | 80                               | 1.0             | 1              | 5.0            | 2.5                             | 5.3              | 5            |
| BZT52B8V2 | 2WD     | 8.2                             | 8.04    | 8.36    | 5                       | 15              | 80                               | 1.0             | 0.7            | 5.0            | 3.2                             | 6.2              | 5            |
| BZT52B9V1 | 2WE     | 9.1                             | 8.92    | 9.28    | 5                       | 15              | 100                              | 1.0             | 0.5            | 6.0            | 3.8                             | 7.0              | 5            |
| BZT52B10  | 2WF     | 10                              | 9.80    | 10.20   | 5                       | 20              | 150                              | 1.0             | 0.2            | 7.0            | 4.5                             | 8.0              | 5            |
| BZT52B11  | 2WG     | 11                              | 10.78   | 11.22   | 5                       | 20              | 150                              | 1.0             | 0.1            | 8.0            | 5.4                             | 9.0              | 5            |
| BZT52B12  | 2WH     | 12                              | 11.76   | 12.24   | 5                       | 25              | 150                              | 1.0             | 0.1            | 8.0            | 6.0                             | 10.0             | 5            |
| BZT52B13  | 2WI     | 13                              | 12.74   | 13.26   | 5                       | 30              | 170                              | 1.0             | 0.1            | 8.0            | 7.0                             | 11.0             | 5            |
| BZT52B15  | 2WJ     | 15                              | 14.70   | 15.30   | 5                       | 30              | 200                              | 1.0             | 0.2            | 10.5           | 9.2                             | 13.0             | 5            |
| BZT52B16  | 2WK     | 16                              | 15.68   | 16.32   | 5                       | 40              | 200                              | 1.0             | 0.1            | 11.2           | 10.4                            | 14.0             | 5            |
| BZT52B18  | 2WL     | 18                              | 17.64   | 18.36   | 5                       | 45              | 225                              | 1.0             | 0.2            | 12.6           | 12.4                            | 16.0             | 5            |
| BZT52B20  | 2WM     | 20                              | 19.60   | 20.40   | 5                       | 55              | 225                              | 1.0             | 0.1            | 14.0           | 14.4                            | 18.0             | 5            |
| BZT52B22  | 2WN     | 22                              | 21.56   | 22.44   | 5                       | 55              | 250                              | 1.0             | 0.1            | 15.4           | 16.4                            | 20.0             | 5            |
| BZT52B24  | 2WO     | 24                              | 23.52   | 24.48   | 5                       | 70              | 250                              | 1.0             | 0.1            | 16.8           | 18.4                            | 22.0             | 5            |
| BZT52B27  | 2WP     | 27                              | 26.46   | 27.54   | 2                       | 80              | 300                              | 0.5             | 0.1            | 18.9           | 21.4                            | 25.3             | 2            |
| BZT52B30  | 2WQ     | 30                              | 29.40   | 30.60   | 2                       | 80              | 300                              | 0.5             | 0.1            | 21.0           | 24.4                            | 29.4             | 2            |
| BZT52B33  | 2WR     | 33                              | 32.34   | 33.66   | 2                       | 80              | 325                              | 0.5             | 0.1            | 23.1           | 27.4                            | 33.4             | 2            |
| BZT52B36  | 2WS     | 36                              | 35.28   | 36.72   | 2                       | 90              | 350                              | 0.5             | 0.1            | 25.2           | 30.4                            | 37.4             | 2            |
| BZT52B39  | 2WT     | 39                              | 38.22   | 39.78   | 2                       | 130             | 350                              | 0.5             | 0.1            | 27.3           | 33.4                            | 41.2             | 2            |
| BZT52B43  | 2WU     | 43                              | 41.16   | 43.84   | 2                       | 100             | 700                              | 1.0             | 0.1            | 32.0           | 10.0                            | 12.0             | 5            |
| BZT52B47  | 2WV     | 47                              | 46.06   | 47.94   | 2                       | 100             | 750                              | 1.0             | 0.1            | 35.0           | 10.0                            | 12.0             | 5            |
| BZT52B51  | 2WW     | 51                              | 49.98   | 52.02   | 2                       | 100             | 750                              | 1.0             | 0.1            | 38.0           | 10.0                            | 12.0             | 5            |



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Fig 1: Breakdown characteristics (at  $T_J = \text{constant}$  (pulsed))

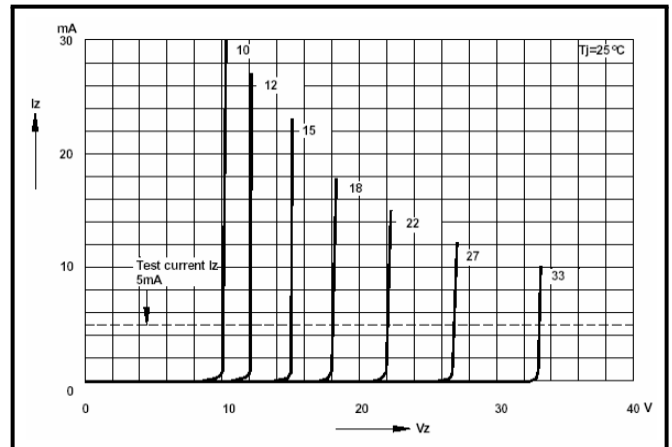
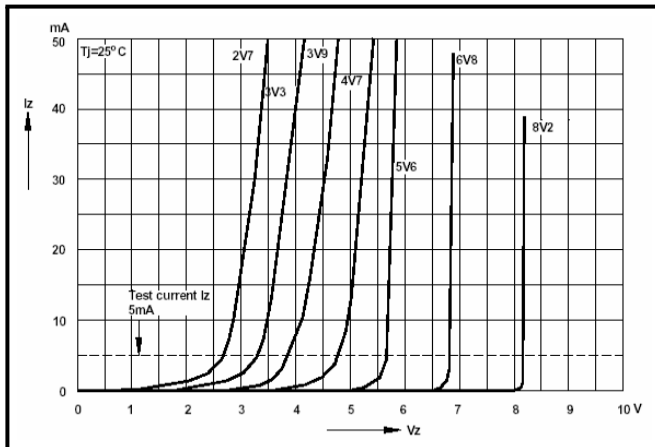
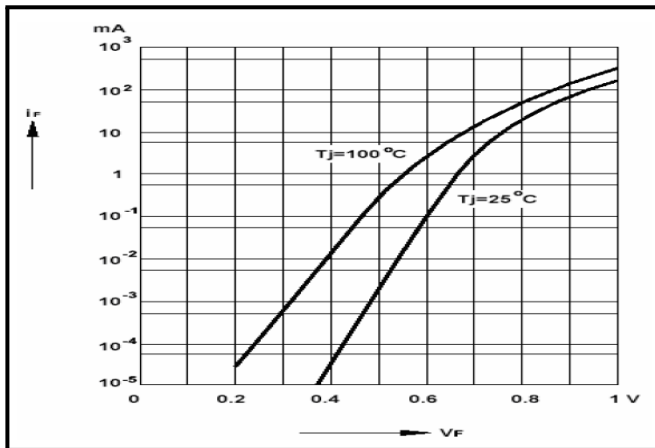


Fig 2: Forward characteristics

Fig 3: Admissible power dissipation versus ambient



temperature

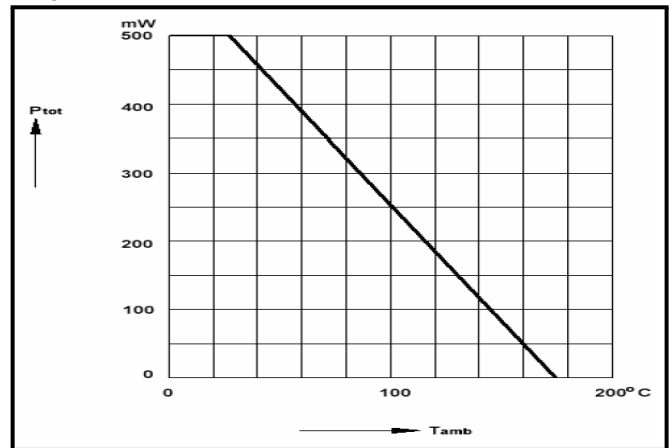
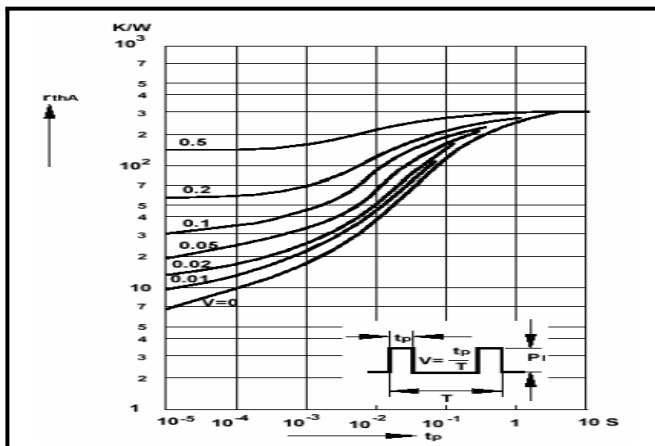


Fig 4: Pulse thermal resistance versus pulse duration

Fig 5: Dynamic resistance versus Zener current



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Fig 6: Capacitance versus Zener voltage

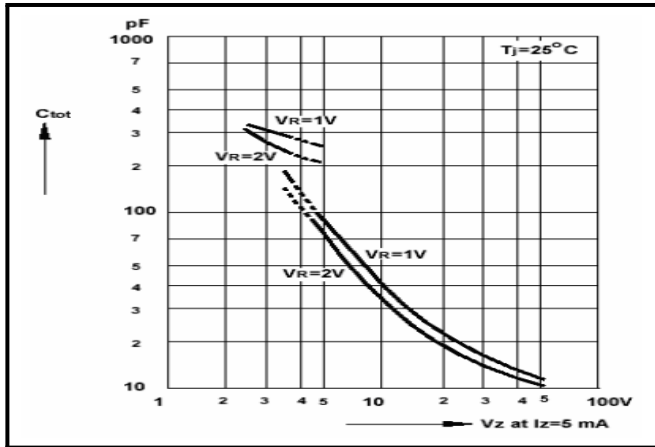


Fig 7: Dynamic resistance versus Zener current

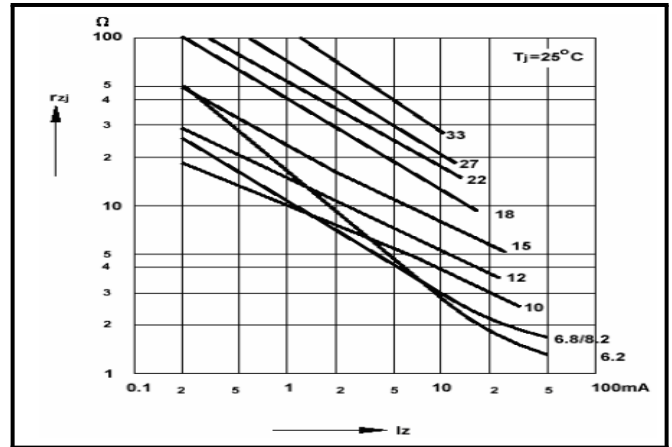


Fig 8: Dynamic resistance versus Zener current

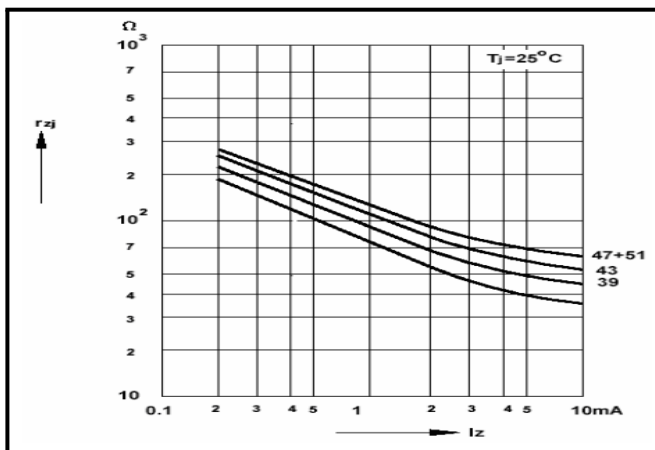


Fig 9: Thermal differential resistance versus Zener voltage

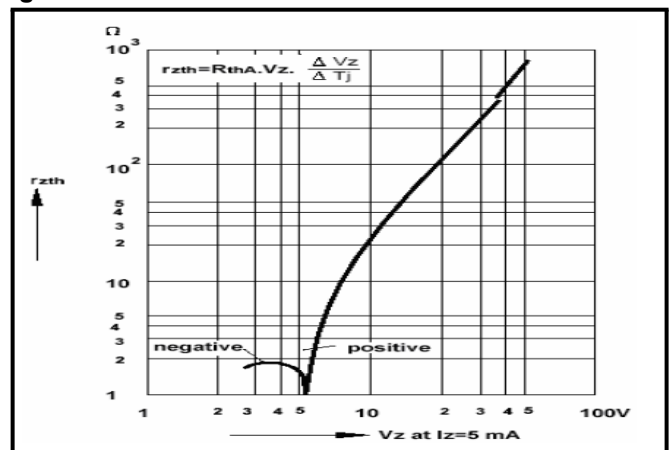


Fig 10: Dynamic resistance versus Zener voltage

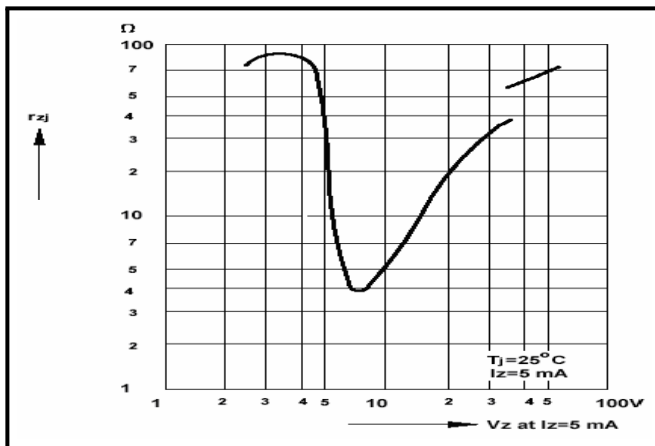
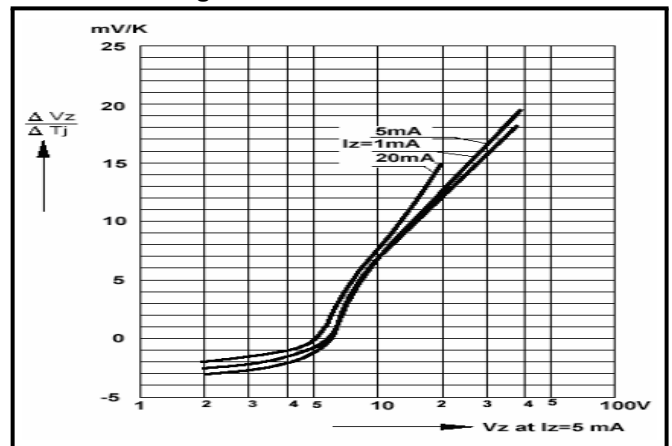


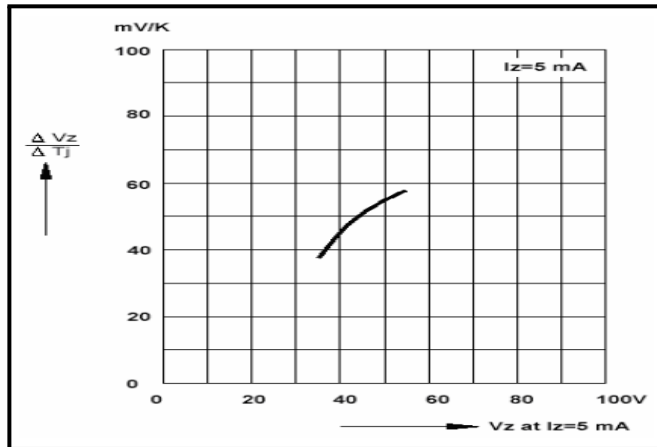
Fig 11: Temperature dependence of Zener voltage versus Zener voltage



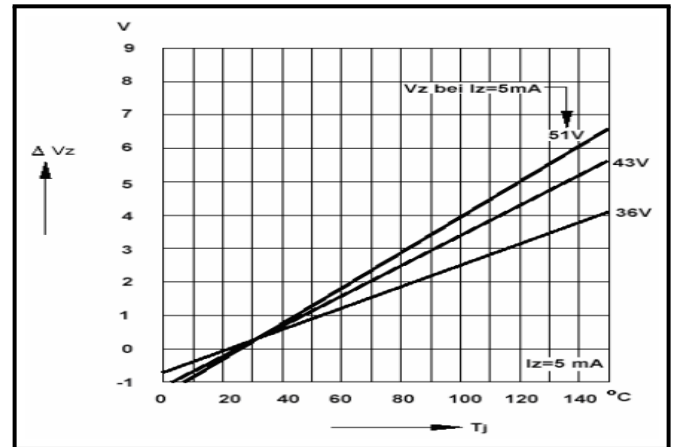
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Zener Diode

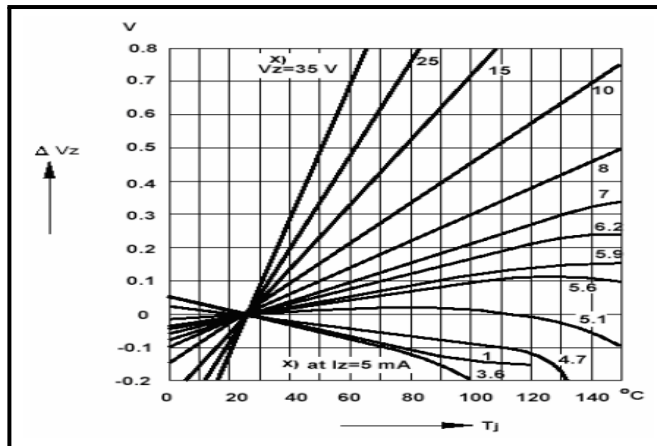
**Fig 12: Temperature dependence of Zener voltage versus Zener voltage**



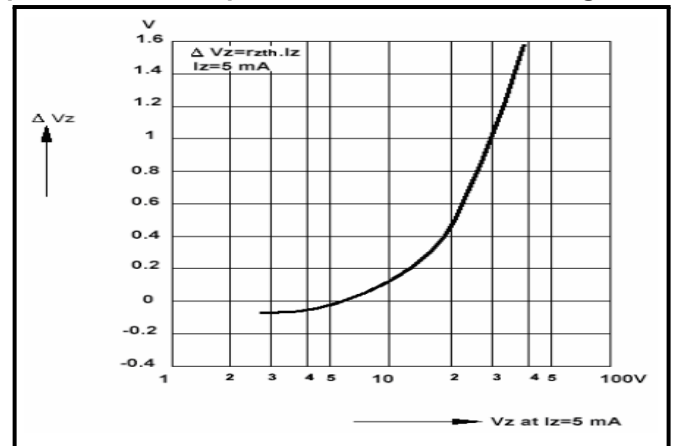
**Fig 13: Change of Zener voltage versus junction temperature**



**Fig 14: Change of Zener voltage versus junction temperature**



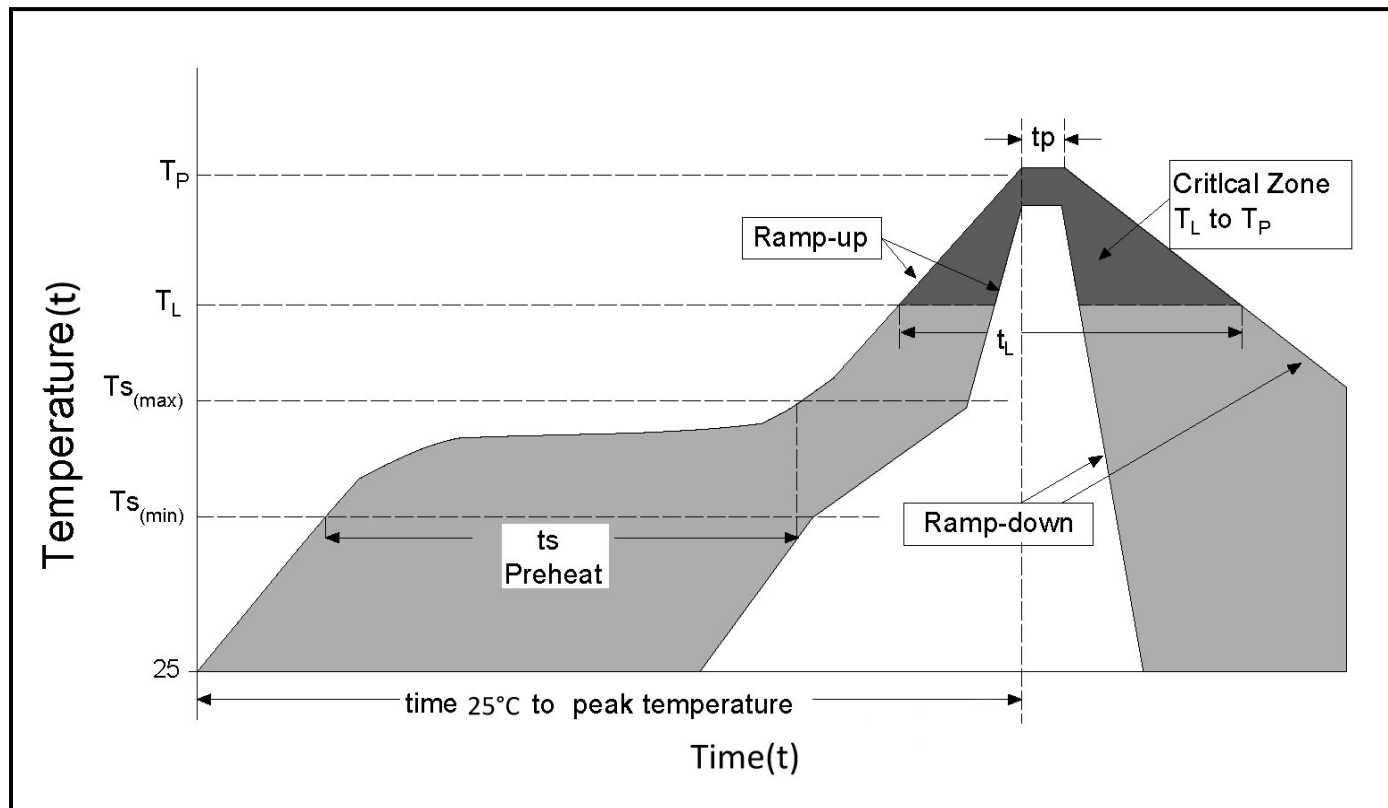
**Fig 15: Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage**



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Zener Diode

## Soldering Parameters



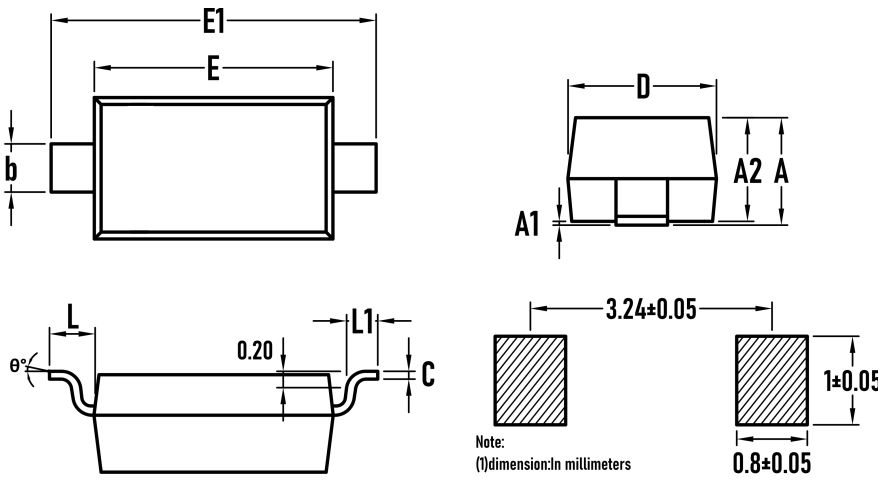
| Reflow Condition                                       |                                    | Lead-free assembly      |
|--------------------------------------------------------|------------------------------------|-------------------------|
| Pre Heat                                               | - Temperature Min ( $T_{S(min)}$ ) | 150°C                   |
|                                                        | - Temperature Max ( $T_{S(max)}$ ) | 200°C                   |
|                                                        | - Time (min to max) ( $t_s$ )      | 60 - 180 secs           |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak) |                                    | 3°C/second max          |
| $T_{S(max)}$ to $T_L$ - Ramp-up Rate                   |                                    | 3°C/second max          |
| Reflow                                                 | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                        | - Time ( $t_L$ )                   | 60 -150 secs            |
| Peak Temperature ( $T_P$ )                             |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 20-40 secs              |
| Ramp-down Rate                                         |                                    | 6°C/second max          |
| Time 25°C to peak Temperature (t)                      |                                    | 8 minutes Max.          |
| Do not exceed                                          |                                    | 260°C                   |



# BZT52Bxx

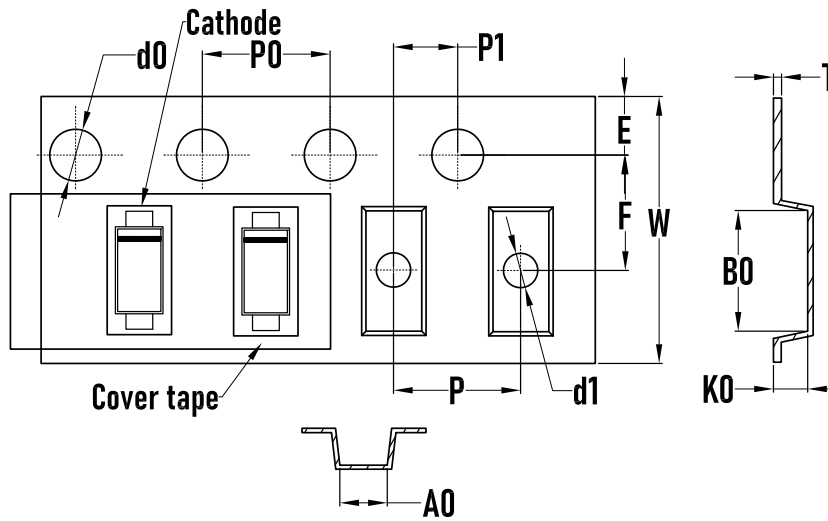
Zener Diode

## Package Information – SOD-123



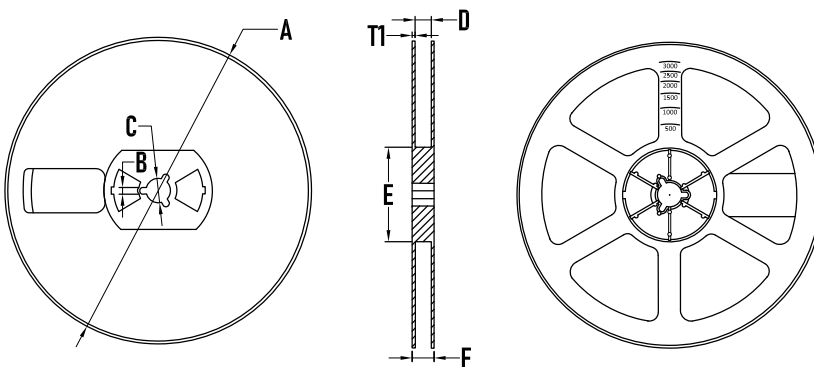
| Symbol | Millimeters |       | Inches   |       |
|--------|-------------|-------|----------|-------|
|        | MIN         | MAX   | MIN      | MAX   |
| A      | 0.950       | 1.350 | 0.037    | 0.053 |
| A1     | 0.000       | 0.100 | 0.000    | 0.004 |
| A2     | 1.050       | 1.150 | 0.041    | 0.045 |
| b      | 0.450       | 0.650 | 0.018    | 0.026 |
| c      | 0.080       | 0.150 | 0.003    | 0.006 |
| D      | 1.500       | 1.700 | 0.059    | 0.067 |
| E      | 2.600       | 2.800 | 0.102    | 0.110 |
| E1     | 3.550       | 3.850 | 0.140    | 0.152 |
| L      | 0.500REF    |       | 0.020REF |       |
| L1     | 0.250       | 0.450 | 0.010    | 0.018 |
| θ      | 0°          | 8°    | 0°       | 8°    |

## Packaging Tape – SOD-123



| SYMBOL | MILLIMETER |
|--------|------------|
| A0     | 2.10±0.1   |
| B0     | 4.0 ±0.1   |
| d0     | 1.5±0.1    |
| d1     | 1.0±0.1    |
| E      | 1.75±0.1   |
| F      | 3.50±0.1   |
| K0     | 1.25±0.1   |
| P      | 4.00±0.1   |
| P0     | 4.00±0.1   |
| P1     | 2.00±0.1   |
| W      | 8.00±0.1   |
| T      | 0.2±0.02   |

## Packaging Reel



| SYMBOL   | MILLIMETER |
|----------|------------|
| A        | 177.8±0.2  |
| B        | 2.7±0.2    |
| C        | 13.5±0.2   |
| D        | 9.6±0.3    |
| E        | 54.5±0.2   |
| F        | 12.3±0.3   |
| T1       | 1.0±0.2    |
| Quantity | 3000PCS    |

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Specifications are subject to change without notice.

Please refer to <http://www.born-tw.com> for current information.

Revision: 2022-Jan-1-A

