

# **BZT52Cxxx Series**

Surface Mount Zener Diodes

Vz Range: 2.0 to 51V Power Dissipation: 500mW

## Features

- Low zener impedance
- Power dissipation: 500 mW
- High stability and reliability



Package: SOD-123

## Mechanical Data

- SOD-123 small outline plastic package
- Color band denotes cathode end
- Mounting position: any
- Epoxy UL: 94V-0



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

| Parameter                                  | Symbol           | Value             | Unit |
|--|------------------|-------------------|------|
| Power Dissipation                          | P <sub>D</sub>   | 500 <sup>1)</sup> | mW   |
| Forward Voltage @I <sub>F</sub> =10mA      | V <sub>F</sub>   | 0.9 <sup>2)</sup> | V    |
| Storage Temperature Range                  | T <sub>STG</sub> | -65 to +150       | °C   |
| Thermal Resistance Junction to Ambient Air | R <sub>thA</sub> | 400               | K/W  |

- 1) Device mounted on ceramic PCB: 7.6mm x 9.4mm x 0.87mm with pad area 25mm<sup>2</sup>
- 2) Short duration test pulse used to minimize self-heating effect
- 3) f=1KHz

## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)

| Part Number | Marking | Zener Voltage Range |        |        |     | Maximum Zener Impedance |         |     | Maximum Reverse Current |      | Typical Temperature Coefficient @Iztc |      | Test Current |
|-------------|---------|---------------------|--------|--------|-----|-------------------------|---------|-----|-------------------------|------|---------------------------------------|------|--------------|
|             |         | Vz@Izt              |        |        | Izt | Zzt@Izt                 | Zzk@Izk | Izk | IR                      | VR   | mV/°C                                 |      |              |
|             |         | Nom(V)              | Min(V) | Max(V) | mA  | Ω                       | Ω       | mA  | uA                      | V    | Min                                   | Max  |              |
| BZT52C2V0   | WY      | 2.0                 | 1.8    | 2.15   | 5   | 150                     | 600     | 1.0 | 100                     | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C2V4   | WX      | 2.4                 | 2.2    | 2.6    | 5   | 100                     | 600     | 1.0 | 50                      | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C2V7   | W1      | 2.7                 | 2.5    | 2.9    | 5   | 100                     | 600     | 1.0 | 20                      | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C3V0   | W2      | 3.0                 | 2.8    | 3.2    | 5   | 95                      | 600     | 1.0 | 10                      | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C3V3   | W3      | 3.3                 | 3.1    | 3.5    | 5   | 95                      | 600     | 1.0 | 5                       | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C3V6   | W4      | 3.6                 | 3.4    | 3.8    | 5   | 90                      | 600     | 1.0 | 5                       | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C3V9   | W5      | 3.9                 | 3.7    | 4.1    | 5   | 90                      | 600     | 1.0 | 3                       | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C4V3   | W6      | 4.3                 | 4.0    | 4.6    | 5   | 90                      | 600     | 1.0 | 3                       | 1.0  | -3.5                                  | 0    | 5            |
| BZT52C4V7   | W7      | 4.7                 | 4.4    | 5.0    | 5   | 80                      | 500     | 1.0 | 3                       | 2.0  | -3.5                                  | 0.2  | 5            |
| BZT52C5V1   | W8      | 5.1                 | 4.8    | 5.4    | 5   | 60                      | 480     | 1.0 | 2                       | 2.0  | -2.7                                  | 1.2  | 5            |
| BZT52C5V6   | W9      | 5.6                 | 5.2    | 6.0    | 5   | 40                      | 400     | 1.0 | 1                       | 2.0  | -2.0                                  | 2.5  | 5            |
| BZT52C6V2   | WA      | 6.2                 | 5.8    | 6.6    | 5   | 10                      | 150     | 1.0 | 3                       | 4.0  | 0.4                                   | 3.7  | 5            |
| BZT52C6V8   | WB      | 6.8                 | 6.4    | 7.2    | 5   | 15                      | 80      | 1.0 | 2                       | 4.0  | 1.2                                   | 4.5  | 5            |
| BZT52C7V5   | WC      | 7.5                 | 7.0    | 7.9    | 5   | 15                      | 80      | 1.0 | 1                       | 5.0  | 2.5                                   | 5.3  | 5            |
| BZT52C8V2   | WD      | 8.2                 | 7.7    | 8.7    | 5   | 15                      | 80      | 1.0 | 0.7                     | 5.0  | 3.2                                   | 6.2  | 5            |
| BZT52C9V1   | WE      | 9.1                 | 8.5    | 9.6    | 5   | 15                      | 100     | 1.0 | 0.5                     | 6.0  | 3.8                                   | 7.0  | 5            |
| BZT52C10    | WF      | 10                  | 9.4    | 10.6   | 5   | 20                      | 150     | 1.0 | 0.2                     | 7.0  | 4.5                                   | 8.0  | 5            |
| BZT52C11    | WG      | 11                  | 10.4   | 11.6   | 5   | 20                      | 150     | 1.0 | 0.1                     | 8.0  | 5.4                                   | 9.0  | 5            |
| BZT52C12    | WH      | 12                  | 11.4   | 12.7   | 5   | 25                      | 150     | 1.0 | 0.1                     | 8.0  | 6.0                                   | 10.0 | 5            |
| BZT52C13    | WI      | 13                  | 12.4   | 14.1   | 5   | 30                      | 170     | 1.0 | 0.1                     | 8.0  | 7.0                                   | 11.0 | 5            |
| BZT52C15    | WJ      | 15                  | 13.8   | 15.6   | 5   | 30                      | 200     | 1.0 | 0.1                     | 10.5 | 9.2                                   | 13.0 | 5            |
| BZT52C16    | WK      | 16                  | 15.3   | 17.1   | 5   | 40                      | 200     | 1.0 | 0.1                     | 11.2 | 10.4                                  | 14.0 | 5            |
| BZT52C18    | WL      | 18                  | 16.8   | 19.1   | 5   | 45                      | 225     | 1.0 | 0.1                     | 12.6 | 12.4                                  | 16.0 | 5            |
| BZT52C20    | WM      | 20                  | 18.8   | 21.2   | 5   | 55                      | 225     | 1.0 | 0.1                     | 14.0 | 14.4                                  | 18.0 | 5            |
| BZT52C22    | WN      | 22                  | 20.8   | 23.3   | 5   | 55                      | 250     | 1.0 | 0.1                     | 15.4 | 16.4                                  | 20.0 | 5            |
| BZT52C24    | WO      | 24                  | 22.8   | 25.6   | 5   | 70                      | 250     | 1.0 | 0.1                     | 16.8 | 18.4                                  | 22.0 | 5            |
| BZT52C27    | WP      | 27                  | 25.1   | 28.9   | 2   | 80                      | 300     | 0.5 | 0.1                     | 18.9 | 21.4                                  | 25.3 | 2            |
| BZT52C30    | WQ      | 30                  | 28.0   | 32.0   | 2   | 80                      | 300     | 0.5 | 0.1                     | 21.0 | 24.4                                  | 29.4 | 2            |
| BZT52C33    | WR      | 33                  | 31.0   | 35.0   | 2   | 80                      | 325     | 0.5 | 0.1                     | 23.1 | 27.4                                  | 33.4 | 2            |
| BZT52C36    | WS      | 36                  | 34.0   | 38.0   | 2   | 90                      | 350     | 0.5 | 0.1                     | 25.2 | 30.4                                  | 37.4 | 2            |
| BZT52C39    | WT      | 39                  | 37.0   | 41.0   | 2   | 130                     | 350     | 0.5 | 0.1                     | 27.3 | 33.4                                  | 41.2 | 2            |
| BZT52C43    | WU      | 43                  | 40.0   | 46.0   | 2   | 100                     | 700     | 1.0 | 0.1                     | 32.0 | 10.0                                  | 12.0 | 5            |
| BZT52C47    | WV      | 47                  | 44.0   | 50.0   | 2   | 100                     | 750     | 1.0 | 0.1                     | 35.0 | 10.0                                  | 12.0 | 5            |
| BZT52C51    | WW      | 51                  | 48.0   | 54.0   | 2   | 100                     | 750     | 1.0 | 0.1                     | 38.0 | 10.0                                  | 12.0 | 5            |

## Typical Characteristics Curves

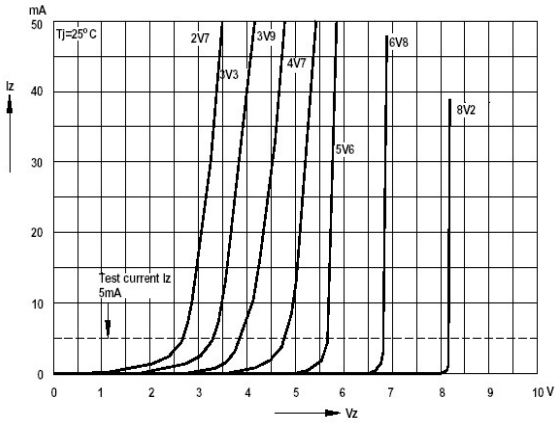


Fig 1. Breakdown Characteristics @  $T_J = \text{Constant}$  (pulsed)

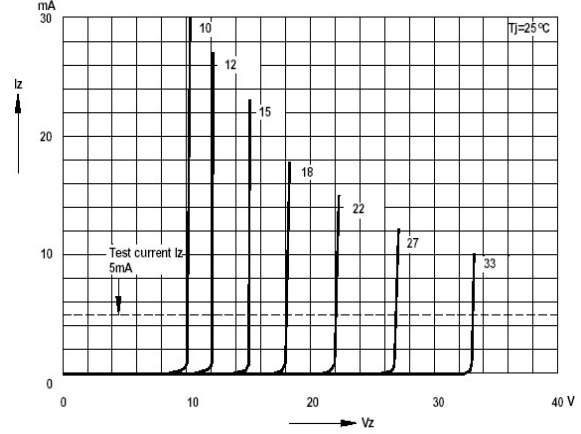


Fig 2. Breakdown Characteristics @  $T_J = \text{Constant}$  (pulsed)

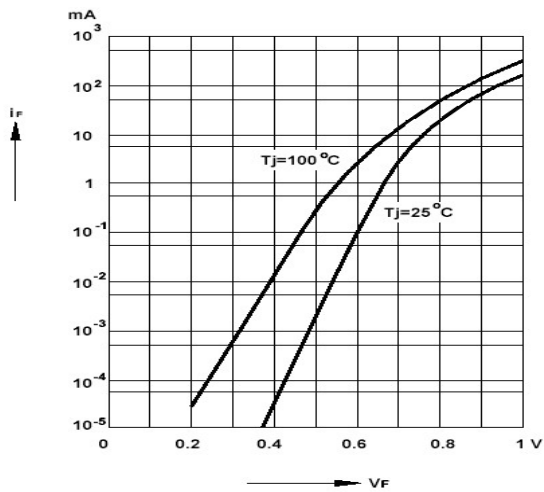


Fig 3. Forward Characteristics

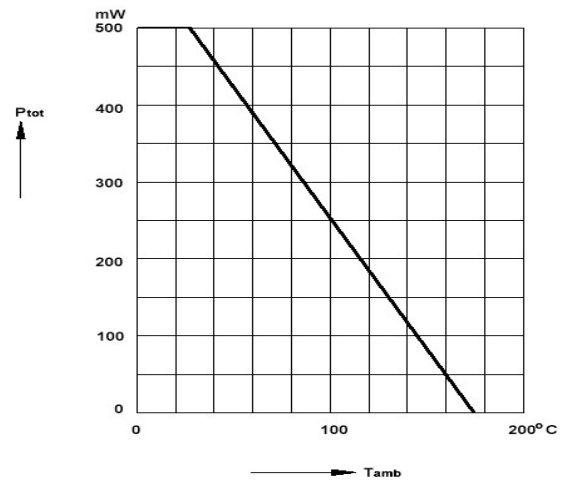


Fig 4. Admissible Power Dissipation vs  $T_A$

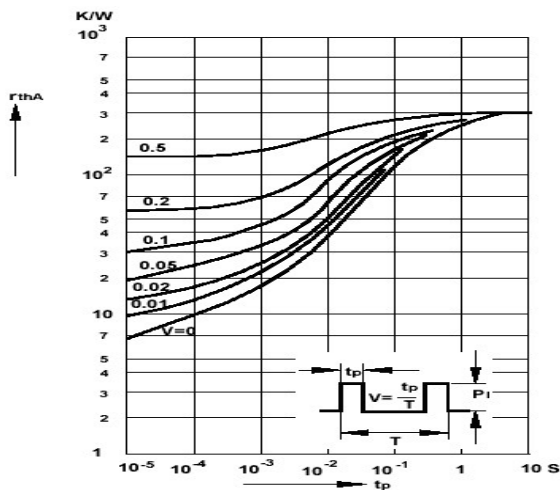


Fig 5. Pulse Thermal Resistance vs Pulse Duration

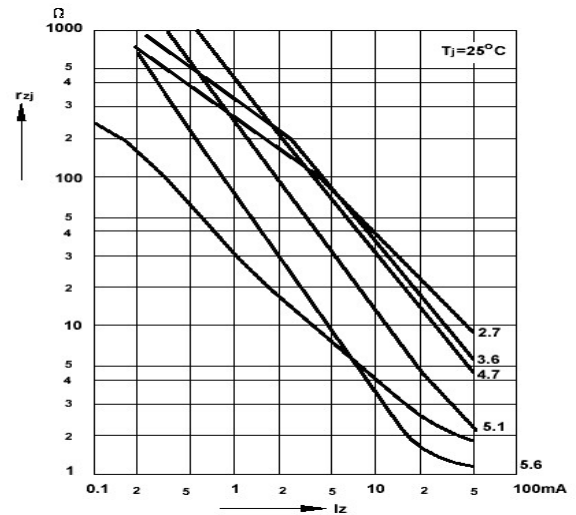


Fig 6. Dynamic Resistance vs Zener Current

## Typical Characteristics Curves

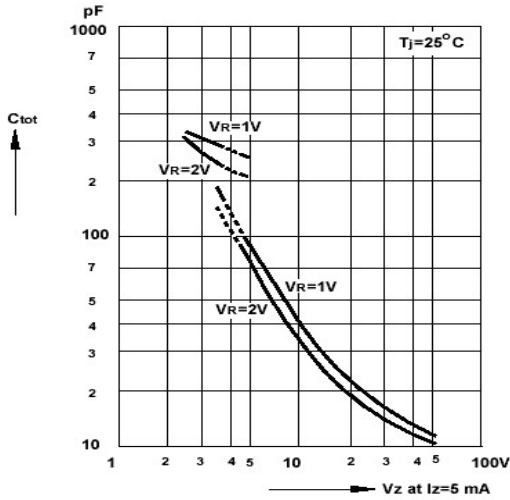


Fig 7. Capacitance vs Zener Voltage

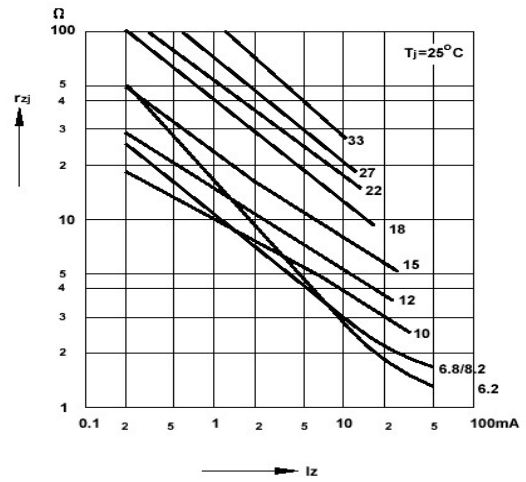


Fig 8. Dynamic Resistance vs Zener Current

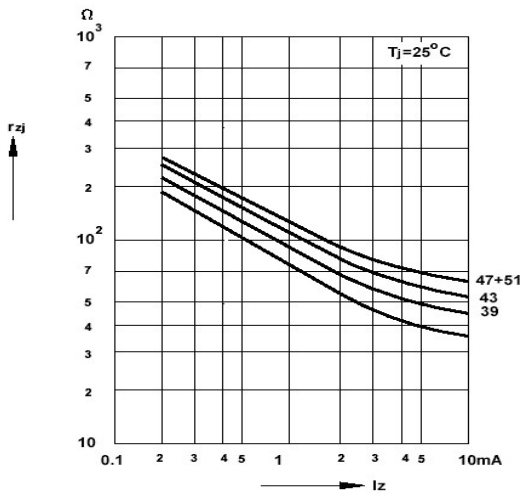


Fig 9. Dynamic Resistance vs Zener Current

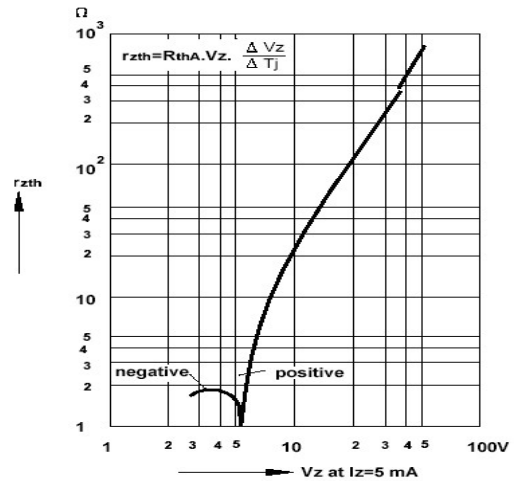


Fig 10. Thermal Differential Resistance vs Zener Voltage

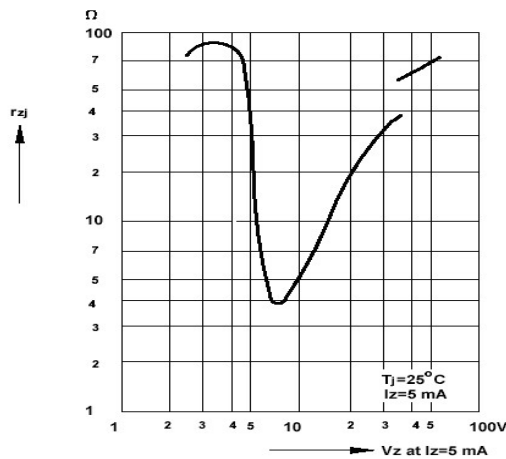


Fig 11. Dynamic Resistance vs Zener Voltage

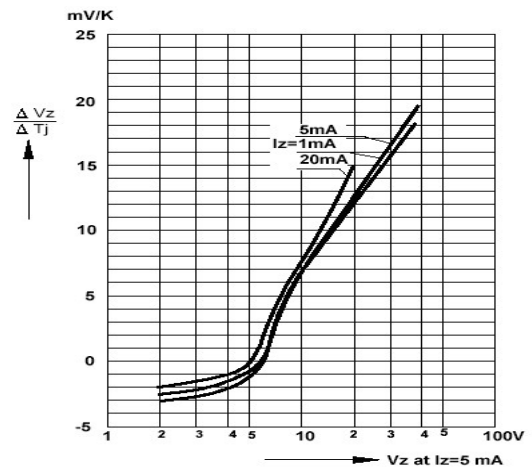


Fig 12. Temperature Dependence of Zener Voltage vs Zener Voltage

## Typical Characteristics Curves

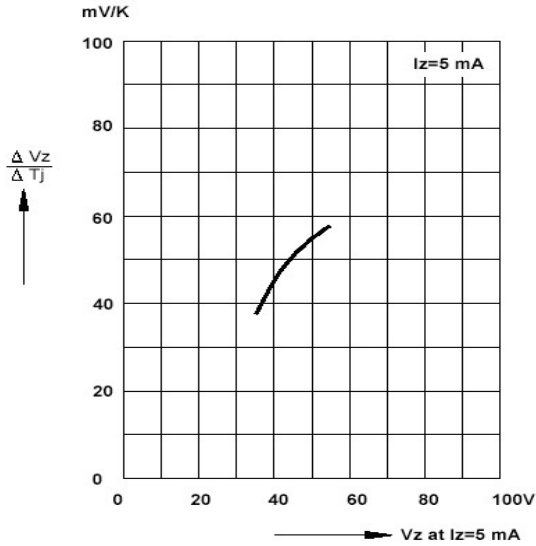


Fig 13. Temperature Dependence of Zener Voltage vs Zener Voltage

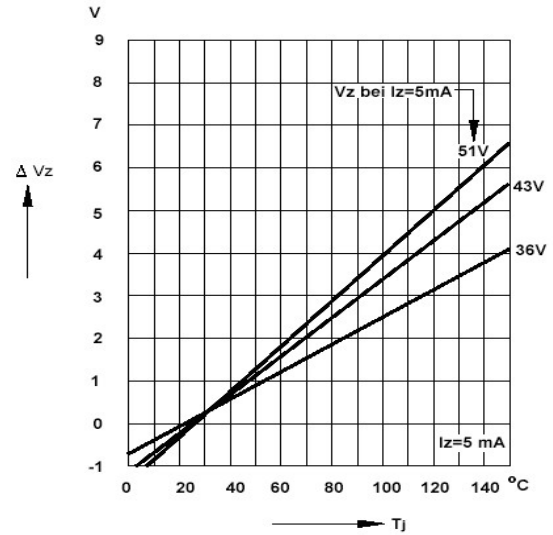


Fig 14. Change of Zener Voltage vs T<sub>J</sub>

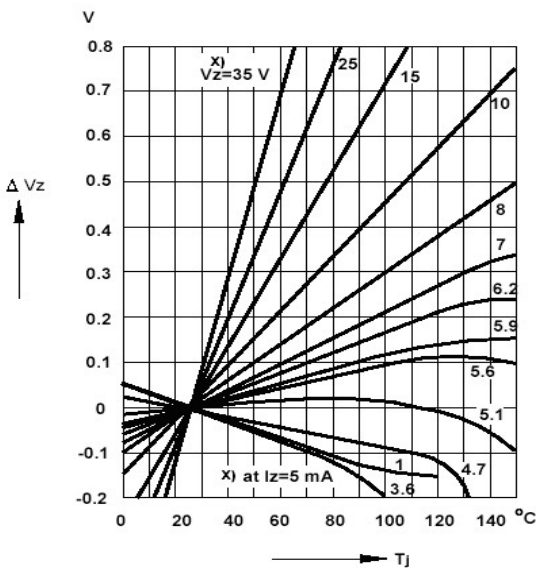


Fig 15. Change of Zener Voltage vs T<sub>J</sub>

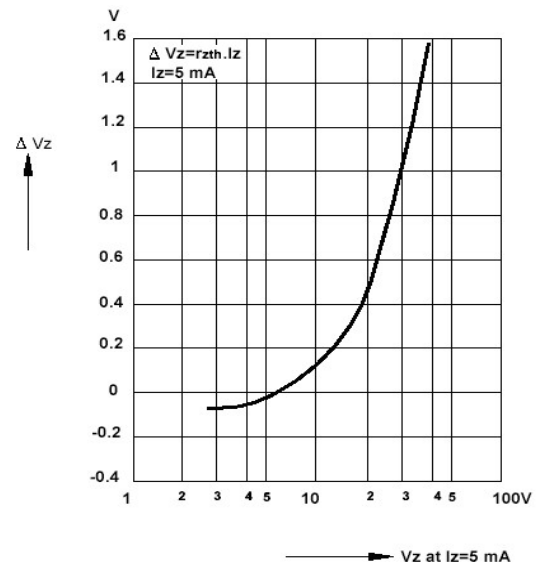


Fig 16. Change of Zener Voltage From Turn-on Up To The Point of Thermal Equilibrium vs Zener Voltage

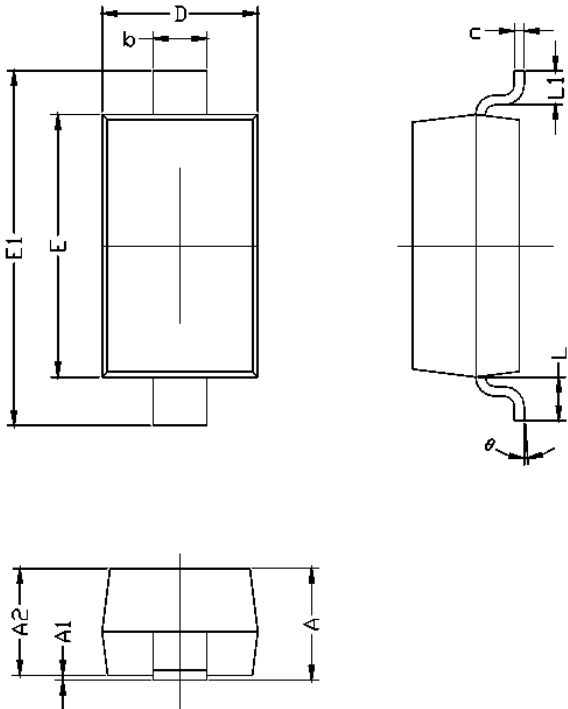
# **BZT52Cxxx Series**

Surface Mount Zener Diodes

Vz Range: 2.0 to 51V Power Dissipation: 500mW

## Package Outline Dimensions

## SOD-123



| SYMBOL   | DIMENSIONS |       |
|----------|------------|-------|
|          | MIN.       | MAX.  |
| A        | 1.050      | 1.250 |
| A1       | 0.000      | 0.100 |
| A2       | 1.050      | 1.150 |
| b        | 0.450      | 0.650 |
| c        | 0.080      | 0.150 |
| D        | 1.500      | 1.700 |
| E        | 2.600      | 2.800 |
| E1       | 3.550      | 3.850 |
| L        | 0.500REF   |       |
| L1       | 0.250      | 0.450 |
| $\theta$ | 0°         | 8°    |