

## SOD-123



## Features

Low Zener Impedance  
Power Dissipation of 500mW  
High Stability and High Reliability  
Halogen free and RoHS compliant

## Mechanical Data

SOD-123 Small Outline Plastic Package  
Polarity: Color band denotes cathode end  
Epoxy UL: 94V-0  
Mounting Position: Any

## Summary of Packing Options

| Package | Packing Description | Packing Quantity | Industry Standard |
|---------|---------------------|------------------|-------------------|
| SOD-123 | Tape/Reel, 7" reel  | 3000             | EIA-481-1         |

## Maximum Ratings & Thermal Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

| Parameters                | Symbol | Value             | Unit |
|---------------------------|--------|-------------------|------|
| Power Dissipation         | Pd     | 350 <sup>1)</sup> | mW   |
| Forward Voltage @IF=10mA  | Vf     | 0.9 <sup>2)</sup> | V    |
| Storage temperature range | Ts     | -65-+150          | °C   |

1) Device mounted on ceramic PCB: 7.6mm x 9.4mm x 0.87mm with pad areas 25mm²

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

3) f=1KHz

## Electrical Characteristics

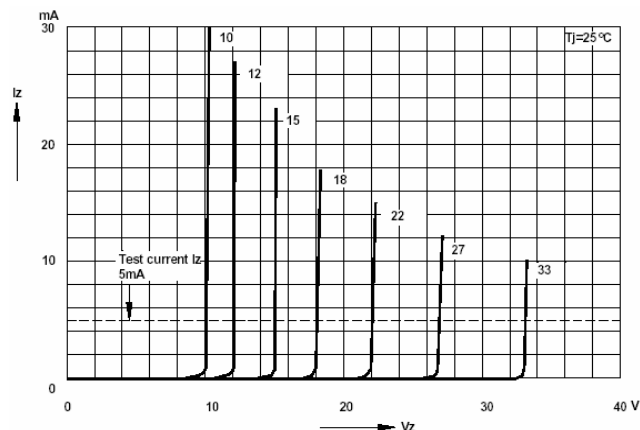
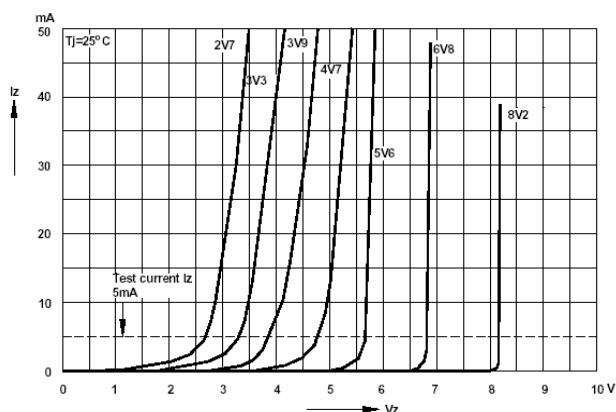
(Ratings at 25°C ambient temperature unless otherwise specified).

| Device    | Marking | Zener Voltage Range |        |        |     | Maximum Zener Impedance |          |     | Maximum Reverse Current |     | Typical Temperature coefficient @ IZTC=mV/°C |      | Test Current IZTC |
|-----------|---------|---------------------|--------|--------|-----|-------------------------|----------|-----|-------------------------|-----|----------------------------------------------|------|-------------------|
|           |         | Vz@Izt              |        |        | Izt | Zzt @Izt                | Zzk @Izk | Izk | IR                      | VR  | Min                                          | Max  |                   |
|           |         | Nom(V)              | Min(V) | Max(V) | mA  | Ω                       |          |     | mA                      | uA  |                                              |      | V                 |
| 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                 |

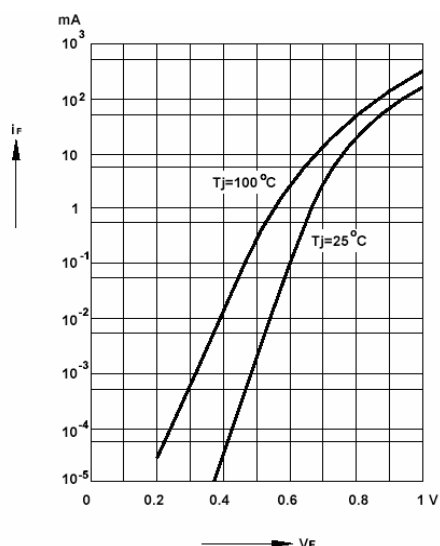
| Device   | Marking | Zener Voltage Range |        |        |     | Maximum Zener Impedance |          |     | Maximum Reverse Current |      | Typical Temperature coefficient @ IZTC=mV/°C |      | Test Current IZTC |
|----------|---------|---------------------|--------|--------|-----|-------------------------|----------|-----|-------------------------|------|----------------------------------------------|------|-------------------|
|          |         | Vz@Izt              |        |        | Izt | Zzt @Izt                | Zzk @Izk | Izk | IR                      | VR   | Min                                          | Max  |                   |
|          |         | Nom(V)              | Min(V) | Max(V) | mA  | Ω                       |          | mA  | uA                      | V    |                                              |      |                   |
| 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                 |

## Ratings and Characteristic Curves

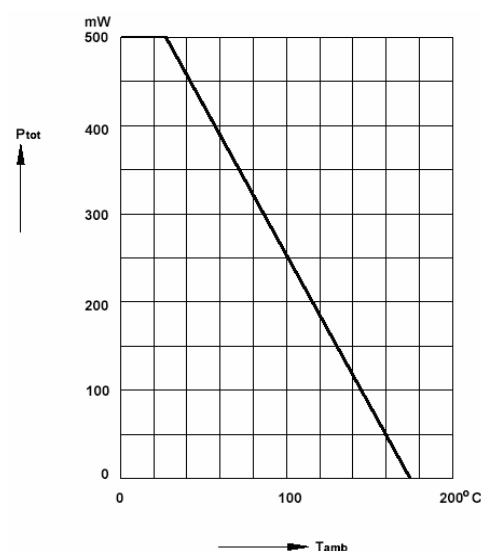
Breakdown characteristics  
at Tj=constant (pulsed)



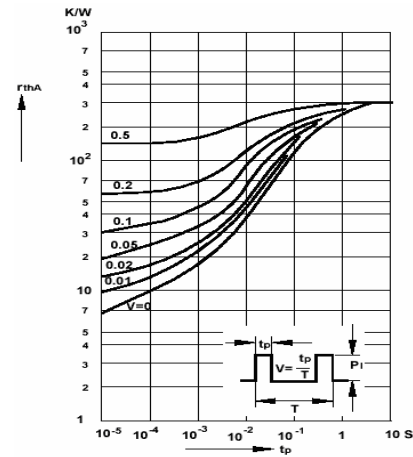
Forward characteristics



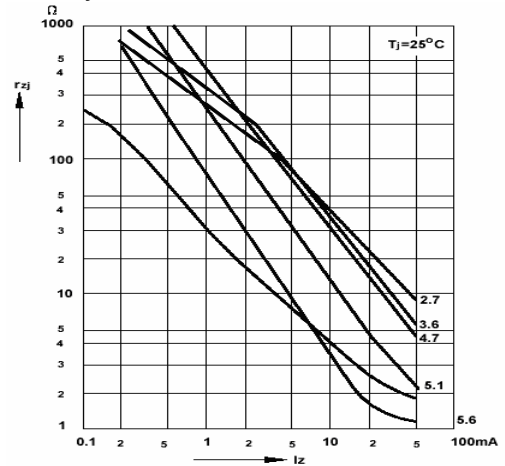
Admissible power dissipation versus ambient temperature



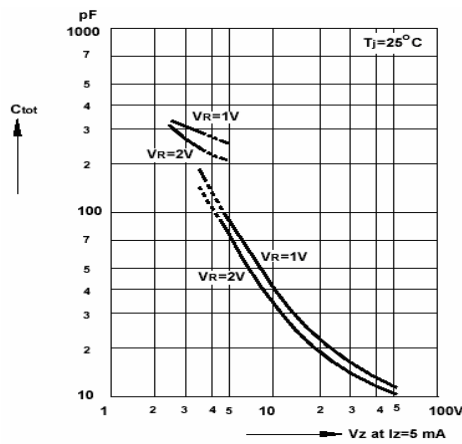
Pulse thermal resistance versus pulse duration



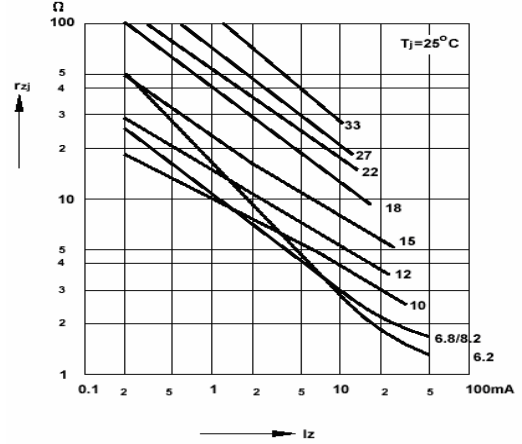
Dynamic resistance versus Zener current



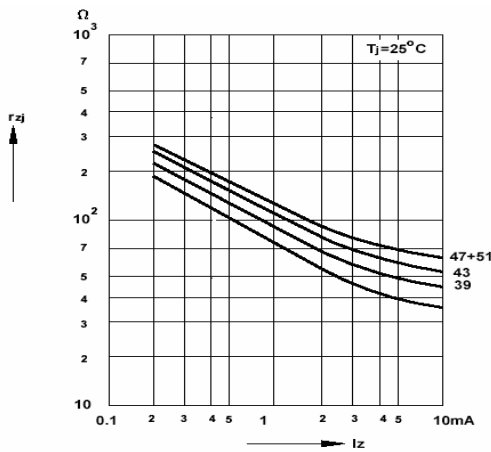
Capacitance versus Zener voltage



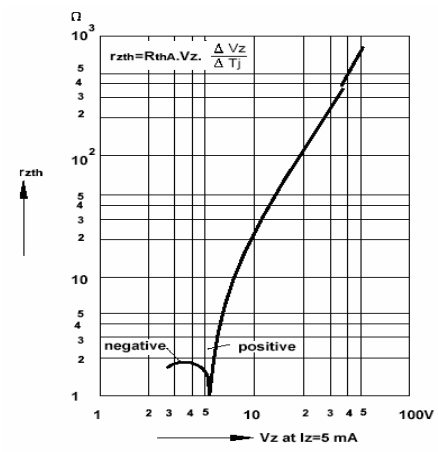
Dynamic resistance versus Zener current



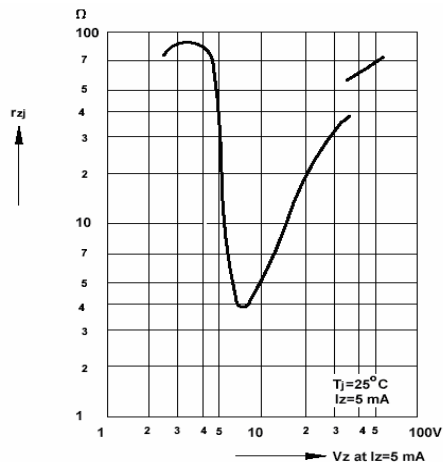
Dynamic resistance versus Zener current



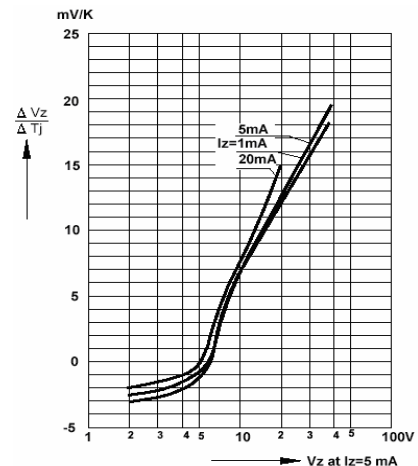
Thermal differential resistance versus Zener voltage



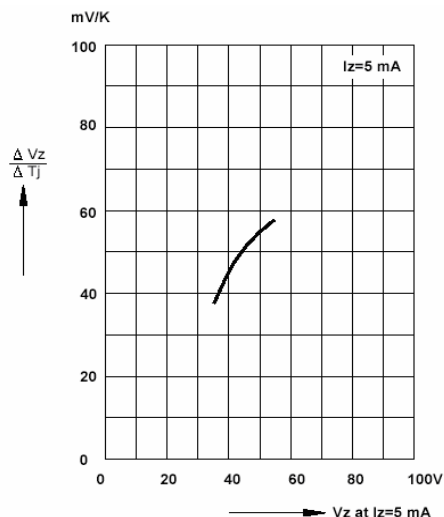
Dynamic resistance versus Zener voltage



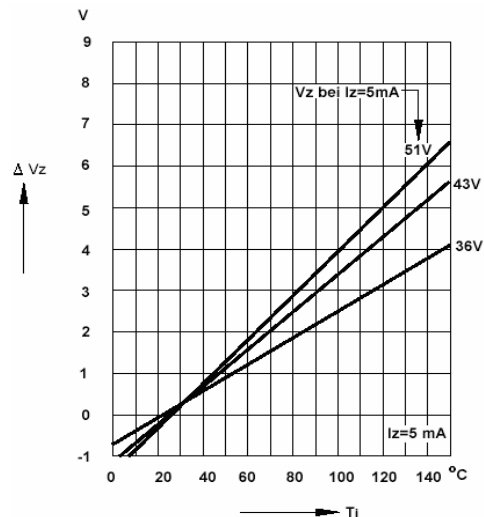
Temperature dependence of Zener voltage versus Zener voltage



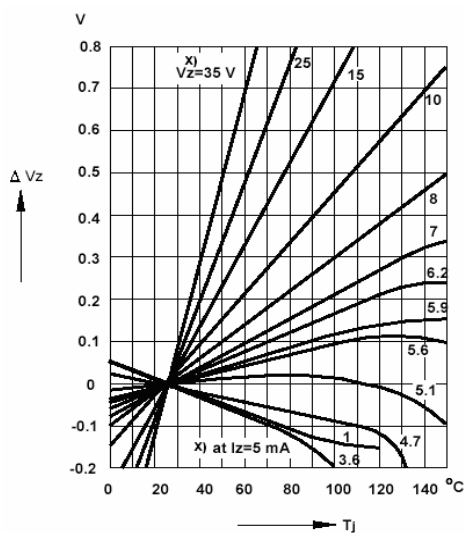
Temperature dependence of Zener voltage versus Zener voltage



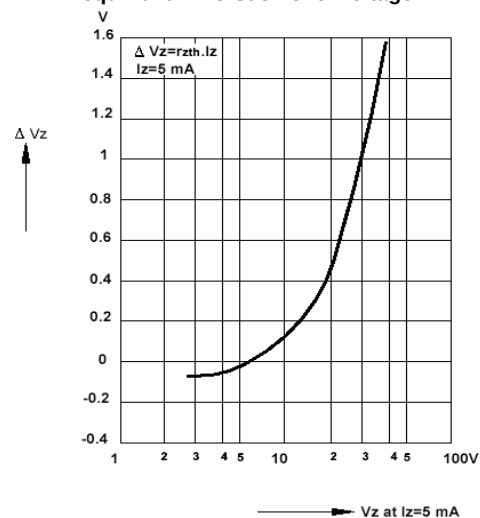
Change of Zener voltage versus junction temperature



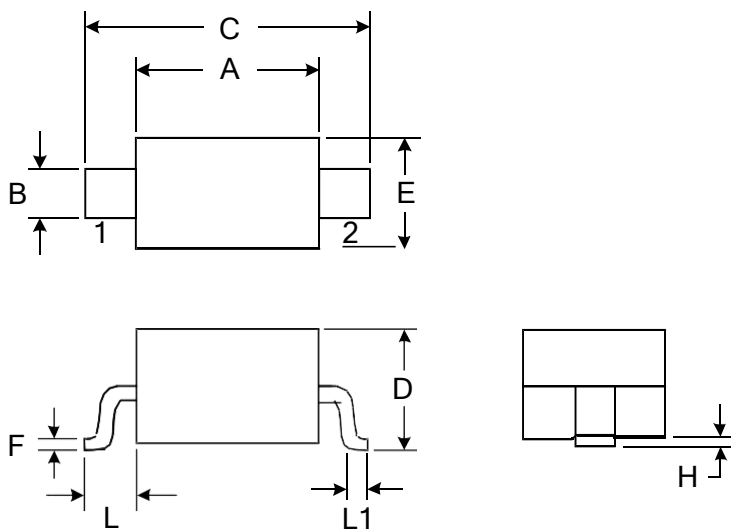
Change of Zener voltage versus junction temperature



Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage



## Package Outline Dimensions: SOD-123



| DIMENSIONS |            |       |           |       |
|------------|------------|-------|-----------|-------|
| SYMBOL     | MILLIMETER |       | INCHES    |       |
|            | MIN        | MAX   | MIN       | MAX   |
| A          | 2.600      | 2.800 | 0.102     | 0.110 |
| B          | 0.450      | 0.650 | 0.018     | 0.026 |
| C          | 3.550      | 3.850 | 0.139     | 0.152 |
| D          | 1.050      | 1.250 | 0.041     | 0.049 |
| E          | 1.500      | 1.700 | 0.059     | 0.067 |
| F          | 0.080      | 0.150 | 0.003     | 0.006 |
| L          | 0.500 REF  |       | 0.020 REF |       |
| L1         | 0.250      | 0.450 | 0.010     | 0.018 |
| H          | 0.000      | 0.100 | 0.000     | 0.004 |