

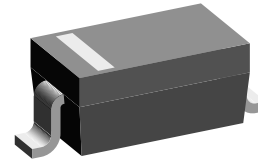
Small Signal Zener Diodes

Features

- Silicon planar power zener diodes
- These diodes are also available in other case styles and other configurations including: the SOT-23 case with type designation BZX84 series, the dual zener diode common anode configuration in the SOT-23 case with type designation AZ23 series and the dual zener diode common cathode configuration in the SOT-23 case with type designation DZ23 series.
- The zener voltages are graded according to the international E 24 standard.
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT
GREEN
(5-2008)**



17431

Mechanical Data

Case: SOD-123

Weight: approx. 9.4 mg

Packaging codes/options:

18/10 k per 13 " reel (8 mm tape), 10 k/box

08/3 k per 7 " reel (8 mm tape), 15 k/box

Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

| Parameter | Test condition | Symbol | Value | Unit |
|---|----------------|-----------|-------------------|------|
| Zener current see table " Characteristics " | | | | |
| Power dissipation | | P_{tot} | 500 ²⁾ | mW |
| Power dissipation | | P_{tot} | 410 ¹⁾ | mW |

¹⁾ Diode on ceramic substrate 0.7 mm; 2.5 mm² pad areas

²⁾ Diode on ceramic substrate 0.7 mm; 5 mm² pad areas

Thermal Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

| Parameter | Test condition | Symbol | Value | Unit |
|--|----------------|------------|-------------------|-----------------------------|
| Thermal resistance junction to ambient air | | R_{thJA} | 300 ¹⁾ | $^{\circ}\text{C}/\text{W}$ |
| Junction temperature | | T_J | 150 | $^{\circ}\text{C}$ |
| Storage temperature range | | T_S | - 65 to + 150 | $^{\circ}\text{C}$ |

¹⁾ Valid provided that electrodes are kept at ambient temperature

** Please see document "Vishay Material Category Policy": www.vishay.com/doc?99902

Electrical Characteristics

| Part number | Marking code | Zener voltage range ¹⁾ | | Dynamic resistance | | Test current | Temp. coefficient | Reverse voltage | Admissible Zener current ⁴⁾ | |
|---------------|--------------|-----------------------------------|------|-----------------------|-----------------------|--------------|---------------------------------------|-------------------------|--|----------------------------|
| | | V_Z at I_{ZT1} | | r_{zj} at I_{ZT1} | r_{zj} at I_{ZT2} | I_{ZT1} | at I_{ZT1} | V_R at $I_R = 100$ nA | I_Z at $T_{amb} = 45$ °C | I_Z at $T_{amb} = 25$ °C |
| | | V | | Ω | | mA | α_{VZ} ($10^{-4}/^{\circ}C$) | V | mA | |
| | | min. | max. | | | | | | | |
| BZT52C2V4-V-G | Y1 | 2.2 | 2.6 | 85 | 600 | 5 | - 9 to - 4 | - | - | - |
| BZT52C2V7-V-G | Y2 | 2.5 | 2.9 | 75 (< 83) | < 500 | 5 | - 9 to - 4 | - | 113 | 134 |
| BZT52C3V0-V-G | Y3 | 2.8 | 3.2 | 80 (< 95) | < 500 | 5 | - 9 to - 3 | - | 98 | 118 |
| BZT52C3V3-V-G | Y4 | 3.1 | 3.5 | 80 (< 95) | < 500 | 5 | - 8 to - 3 | - | 92 | 109 |
| BZT52C3V6-V-G | Y5 | 3.4 | 3.8 | 80 (< 95) | < 500 | 5 | - 8 to - 3 | - | 85 | 100 |
| BZT52C3V9-V-G | Y6 | 3.7 | 4.1 | 80 (< 95) | < 500 | 5 | - 7 to - 3 | - | 77 | 92 |
| BZT52C4V3-V-G | Y7 | 4 | 4.6 | 80 (< 95) | < 500 | 5 | - 6 to - 1 | - | 71 | 84 |
| BZT52C4V7-V-G | Y8 | 4.4 | 5 | 70 (< 78) | < 500 | 5 | - 5 to + 2 | - | 64 | 76 |
| BZT52C5V1-V-G | Y9 | 4.8 | 5.4 | 30 (< 60) | < 480 | 5 | - 3 to + 4 | > 0.8 | 56 | 67 |
| BZT52C5V6-V-G | YA | 5.2 | 6 | 10 (< 40) | < 400 | 5 | - 2 to + 6 | > 1 | 50 | 59 |
| BZT52C6V2-V-G | YB | 5.8 | 6.6 | 4.8 (< 10) | < 200 | 5 | - 1 to + 7 | > 2 | 45 | 54 |
| BZT52C6V8-V-G | YC | 6.4 | 7.2 | 4.5 (< 8) | < 150 | 5 | + 2 to + 7 | > 3 | 41 | 49 |
| BZT52C7V5-V-G | YD | 7 | 7.9 | 4 (< 7) | < 50 | 5 | + 3 to + 7 | > 5 | 37 | 44 |
| BZT52C8V2-V-G | YE | 7.7 | 8.7 | 4.5 (< 7) | < 50 | 5 | + 4 to + 7 | > 6 | 34 | 40 |
| BZT52C9V1-V-G | YF | 8.5 | 9.6 | 4.8 (< 10) | < 50 | 5 | + 5 to + 8 | > 7 | 30 | 36 |
| BZT52C10-V-G | YG | 9.4 | 10.6 | 5.2 (< 15) | < 70 | 5 | + 5 to + 8 | > 7.5 | 28 | 33 |
| BZT52C11-V-G | YH | 10.4 | 11.6 | 6 (< 20) | < 70 | 5 | + 5 to + 9 | > 8.5 | 25 | 30 |
| BZT52C12-V-G | YI | 11.4 | 12.7 | 7 (< 20) | < 90 | 5 | + 6 to + 9 | > 9 | 23 | 28 |
| BZT52C13-V-G | YK | 12.4 | 14.1 | 9 (< 25) | < 110 | 5 | + 7 to + 9 | > 10 | 21 | 25 |
| BZT52C15-V-G | YL | 13.8 | 15.6 | 11 (< 30) | < 110 | 5 | + 7 to + 9 | > 11 | 19 | 23 |
| BZT52C16-V-G | YM | 15.3 | 17.1 | 13 (< 40) | < 170 | 5 | + 8 to + 9.5 | > 12 | 17 | 20 |
| BZT52C18-V-G | YN | 16.8 | 19.1 | 18 (< 50) | < 170 | 5 | + 8 to + 9.5 | > 14 | 15 | 18 |
| BZT52C20-V-G | YO | 18.8 | 21.2 | 20 (< 50) | < 220 | 5 | + 8 to + 10 | > 15 | 14 | 17 |
| BZT52C22-V-G | YP | 20.8 | 23.3 | 25 (< 55) | < 220 | 5 | + 8 to + 10 | > 17 | 13 | 16 |
| BZT52C24-V-G | YR | 22.8 | 25.6 | 28 (< 80) | < 220 | 5 | + 8 to + 10 | > 18 | 11 | 13 |
| BZT52C27-V-G | YS | 25.1 | 28.9 | 30 (< 80) | < 250 | 5 | + 8 to + 10 | > 20 | 10 | 12 |
| BZT52C30-V-G | YT | 28 | 32 | 35 (< 80) | < 250 | 5 | + 8 to + 10 | > 22.5 | 9 | 10 |
| BZT52C33-V-G | YU | 31 | 35 | 40 (< 80) | < 250 | 5 | + 8 to + 10 | > 25 | 8 | 9 |
| BZT52C36-V-G | YW | 34 | 38 | 40 (< 90) | < 250 | 5 | + 8 to + 10 | > 27 | 8 | 9 |
| BZT52C39-V-G | YX | 37 | 41 | 50 (< 90) | < 300 | 5 | + 10 to + 12 | > 29 | 7 | 8 |
| BZT52C43-V-G | YY | 40 | 46 | 60 (< 100) | < 700 | 5 | + 10 to + 12 | > 32 | 6 | 7 |
| BZT52C47-V-G | YZ | 44 | 50 | 70 (< 100) | < 750 | 5 | + 10 to + 12 | > 35 | 5 | 6 |
| BZT52C51-V-G | Z1 | 48 | 54 | 70 (< 100) | < 750 | 5 | + 10 to + 12 | > 38 | 5 | 6 |
| BZT52C56-V-G | Z2 | 52 | 60 | < 135 ²⁾ | < 1000 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |
| BZT52C62-V-G | Z3 | 58 | 66 | < 150 ²⁾ | < 1000 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |
| BZT52C68-V-G | Z4 | 64 | 72 | < 200 ²⁾ | < 1000 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |
| BZT52C75-V-G | Z5 | 70 | 79 | < 250 ²⁾ | < 1500 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |

$I_{ZT1} = 5$ mA, $I_{ZT2} = 1$ mA

¹⁾ Measured with pulses $T_p = 5$ ms

²⁾ = $I_{ZT1} = 2.5$ mA

³⁾ = $I_{ZT2} = 0.5$ mA

⁴⁾ Valid provided that electrodes are kept at ambient temperature

Electrical Characteristics

| Part number | Marking code | Zener voltage range ¹⁾ | | Dynamic resistance | | Test current | Temp. coefficient | Reverse voltage | Admissible Zener current ⁴⁾ | |
|---------------|--------------|-----------------------------------|------|-----------------------|-----------------------|--------------|--|-------------------------|--|----------------------------|
| | | V_Z at I_{ZT1} | | r_{zj} at I_{ZT1} | r_{zj} at I_{ZT2} | I_{ZT1} | at I_{ZT1} | V_R at $I_R = 100$ nA | I_Z at $T_{amb} = 45$ °C | I_Z at $T_{amb} = 25$ °C |
| | | V | | Ω | | mA | α_{VZ} ($10^{-4}/^{\circ}C$) | V | mA | |
| | | min. | max. | | | | | | | |
| BZT52B2V4-V-G | V1 | 2.35 | 2.45 | 85 | 600 | 5 | - 9 to - 4 | - | - | - |
| BZT52B2V7-V-G | V2 | 2.65 | 2.75 | 75 (< 83) | < 500 | 5 | - 9 to - 4 | - | 113 | 134 |
| BZT52B3V0-V-G | V3 | 2.94 | 3.06 | 80 (< 95) | < 500 | 5 | - 9 to - 3 | - | 98 | 118 |
| BZT52B3V3-V-G | V4 | 3.23 | 3.37 | 80 (< 95) | < 500 | 5 | - 8 to - 3 | - | 92 | 109 |
| BZT52B3V6-V-G | V5 | 3.53 | 3.67 | 80 (< 95) | < 500 | 5 | - 8 to - 3 | - | 85 | 100 |
| BZT52B3V9-V-G | V6 | 3.82 | 3.98 | 80 (< 95) | < 500 | 5 | - 7 to - 3 | - | 77 | 92 |
| BZT52B4V3-V-G | V7 | 4.21 | 4.39 | 80 (< 95) | < 500 | 5 | - 6 to - 1 | - | 71 | 84 |
| BZT52B4V7-V-G | V8 | 4.61 | 4.79 | 70 (< 78) | < 500 | 5 | - 5 to + 2 | - | 64 | 76 |
| BZT52B5V1-V-G | V9 | 5 | 5.2 | 30 (< 60) | < 480 | 5 | - 3 to + 4 | > 0.8 | 56 | 67 |
| BZT52B5V6-V-G | VA | 5.49 | 5.71 | 10 (< 40) | < 400 | 5 | - 2 to + 6 | > 1 | 50 | 59 |
| BZT52B6V2-V-G | VB | 6.08 | 6.32 | 4.8 (< 10) | < 200 | 5 | - 1 to + 7 | > 2 | 45 | 54 |
| BZT52B6V8-V-G | VC | 6.66 | 6.94 | 4.5 (< 8) | < 150 | 5 | + 2 to + 7 | > 3 | 41 | 49 |
| BZT52B7V5-V-G | VD | 7.35 | 7.65 | 4 (< 7) | < 50 | 5 | + 3 to + 7 | > 5 | 37 | 44 |
| BZT52B8V2-V-G | VE | 8.04 | 8.36 | 4.5 (< 7) | < 50 | 5 | + 4 to + 7 | > 6 | 34 | 40 |
| BZT52B9V1-V-G | VF | 8.92 | 9.28 | 4.8 (< 10) | < 50 | 5 | + 5 to + 8 | > 7 | 30 | 36 |
| BZT52B10-V-G | VG | 9.8 | 10.2 | 5.2 (< 15) | < 70 | 5 | + 5 to + 8 | > 7.5 | 28 | 33 |
| BZT52B11-V-G | VH | 10.8 | 11.2 | 6 (< 20) | < 70 | 5 | + 5 to + 9 | > 8.5 | 25 | 30 |
| BZT52B12-V-G | VI | 11.8 | 12.2 | 7 (< 20) | < 90 | 5 | + 6 to + 9 | > 9 | 23 | 28 |
| BZT52B13-V-G | VK | 12.7 | 13.3 | 9 (< 25) | < 110 | 5 | + 7 to + 9 | > 10 | 21 | 25 |
| BZT52B15-V-G | VL | 14.7 | 15.3 | 11 (< 30) | < 110 | 5 | + 7 to + 9 | > 11 | 19 | 23 |
| BZT52B16-V-G | VM | 15.7 | 16.3 | 13 (< 40) | < 170 | 5 | + 8 to + 9.5 | > 12 | 17 | 20 |
| BZT52B18-V-G | VN | 17.6 | 18.4 | 18 (< 50) | < 170 | 5 | + 8 to + 9.5 | > 14 | 15 | 18 |
| BZT52B20-V-G | VO | 19.6 | 20.4 | 20 (< 50) | < 220 | 5 | + 8 to + 10 | > 15 | 14 | 17 |
| BZT52B22-V-G | VP | 21.6 | 22.4 | 25 (< 55) | < 220 | 5 | + 8 to + 10 | > 17 | 13 | 16 |
| BZT52B24-V-G | VR | 23.5 | 24.5 | 28 (< 80) | < 220 | 5 | + 8 to + 10 | > 18 | 11 | 13 |
| BZT52B27-V-G | VS | 26.5 | 27.5 | 30 (< 80) | < 250 | 5 | + 8 to + 10 | > 20 | 10 | 12 |
| BZT52B30-V-G | VT | 29.4 | 30.6 | 35 (< 80) | < 250 | 5 | + 8 to + 10 | > 22.5 | 9 | 10 |
| BZT52B33-V-G | VU | 32.3 | 33.7 | 40 (< 80) | < 250 | 5 | + 8 to + 10 | > 25 | 8 | 9 |
| BZT52B36-V-G | VW | 35.3 | 36.7 | 40 (< 90) | < 250 | 5 | + 8 to + 10 | > 27 | 8 | 9 |
| BZT52B39-V-G | VX | 38.2 | 39.8 | 50 (< 90) | < 300 | 5 | + 10 to + 12 | > 29 | 7 | 8 |
| BZT52B43-V-G | VY | 42.1 | 43.9 | 60 (< 100) | < 700 | 5 | + 10 to + 12 | > 32 | 6 | 7 |
| BZT52B47-V-G | VZ | 46.1 | 47.9 | 70 (< 100) | < 750 | 5 | + 10 to + 12 | > 35 | 5 | 6 |
| BZT52B51-V-G | U1 | 50 | 52 | 70 (< 100) | < 750 | 5 | + 10 to + 12 | > 38 | 5 | 6 |
| BZT52B56-V-G | U2 | 54.9 | 57.1 | < 135 ²⁾ | < 1000 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |
| BZT52B62-V-G | U3 | 60.8 | 63.2 | < 150 ²⁾ | < 1000 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |
| BZT52B68-V-G | U4 | 66.6 | 69.4 | < 200 ²⁾ | < 1000 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |
| BZT52B75-V-G | U5 | 73.5 | 76.5 | < 250 ²⁾ | < 1500 ³⁾ | 2.5 | typ. + 10 ²⁾ | - | - | - |

$I_{ZT1} = 5$ mA, $I_{ZT2} = 1$ mA

¹⁾ Measured with pulses $T_p = 5$ ms

²⁾ = $I_{ZT1} = 2.5$ mA

³⁾ = $I_{ZT2} = 0.5$ mA

⁴⁾ Valid provided that electrodes are kept at ambient temperature

Typical Characteristics ($T_{amb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

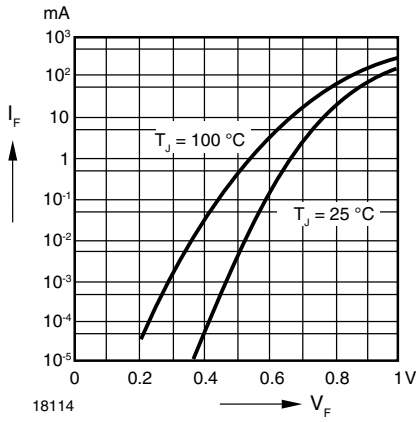


Figure 1. Forward Characteristics

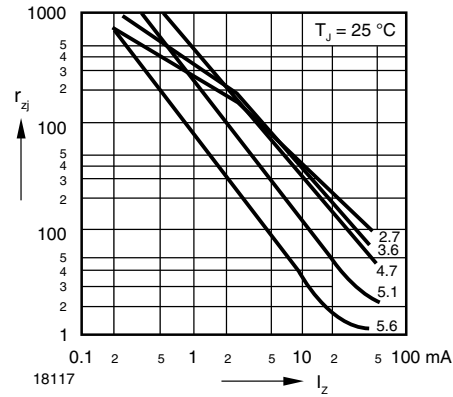


Figure 4. Dynamic Resistance vs. Zener Current

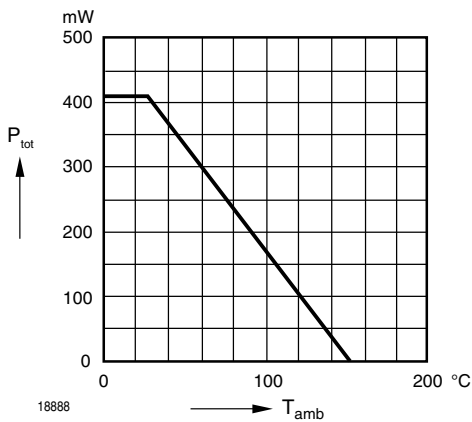


Figure 2. Admissible Power Dissipation vs. Ambient Temperature

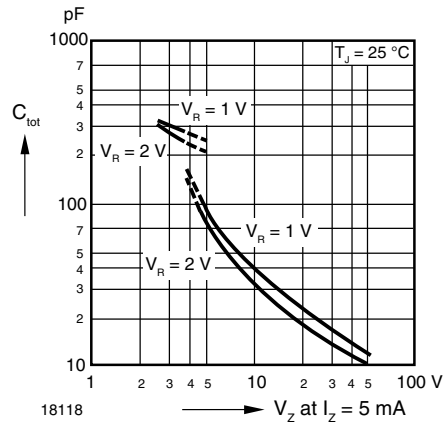


Figure 5. Capacitance vs. Zener Voltage

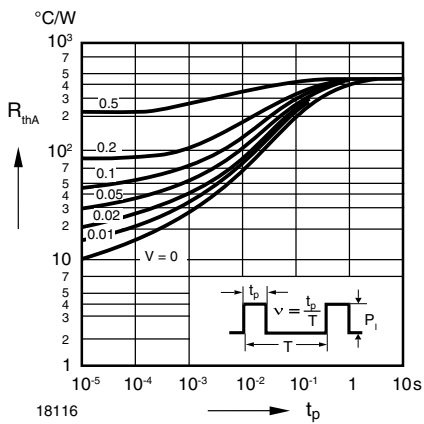


Figure 3. Pulse Thermal Resistance vs. Pulse Duration

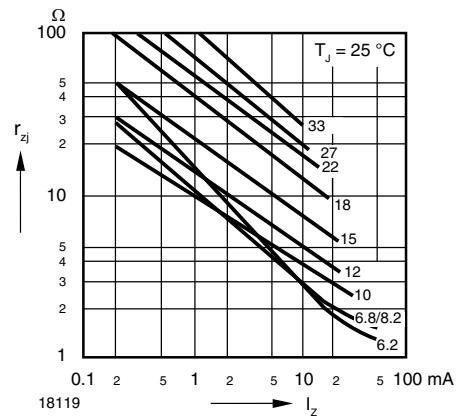


Figure 6. Dynamic Resistance vs. Zener Current

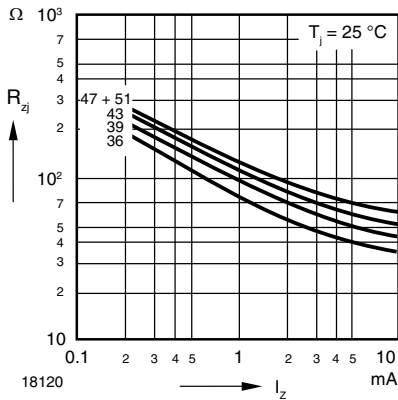


Figure 7. Dynamic Resistance vs. Zener Current

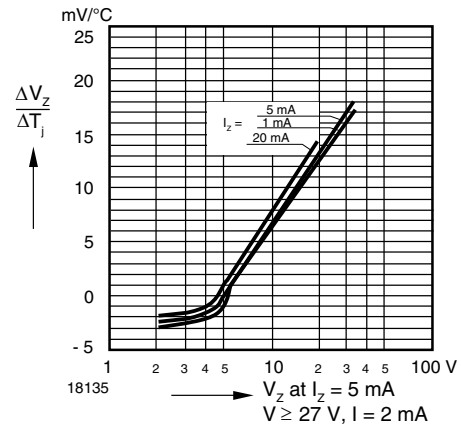


Figure 10. Temperature Dependence of Zener Voltage vs. Zener Voltage

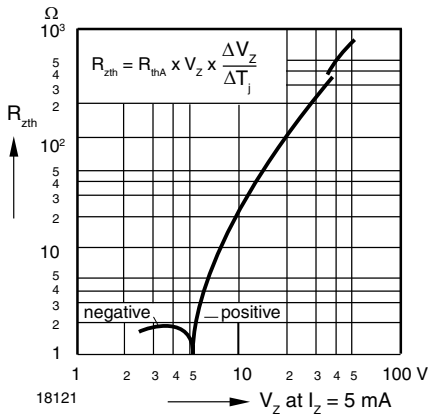


Figure 8. Thermal Differential Resistance vs. Zener Voltage

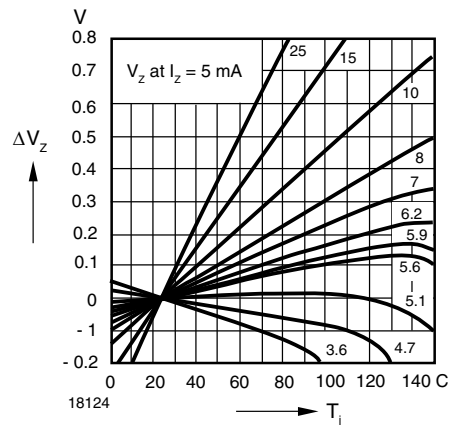


Figure 11. Change of Zener Voltage vs. Junction Temperature

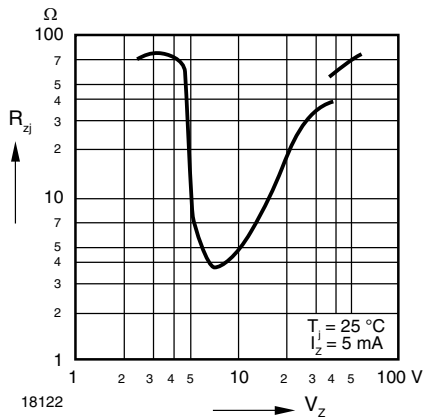


Figure 9. Dynamic Resistance vs. Zener Voltage

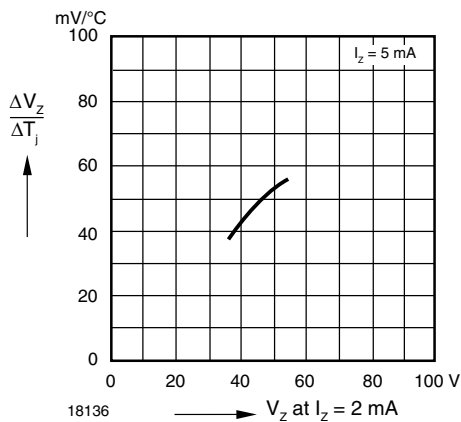


Figure 12. Temperature Dependence of Zener Voltage vs. Zener Voltage

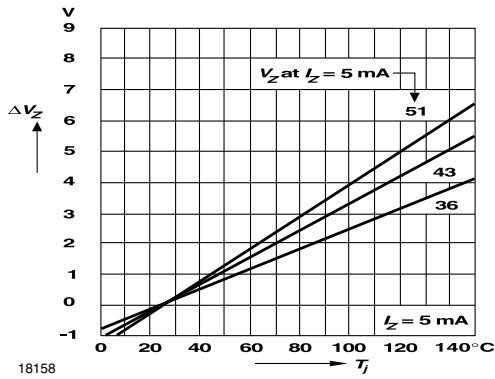


Figure 13. Change of Zener Voltage vs. Junction Temperature

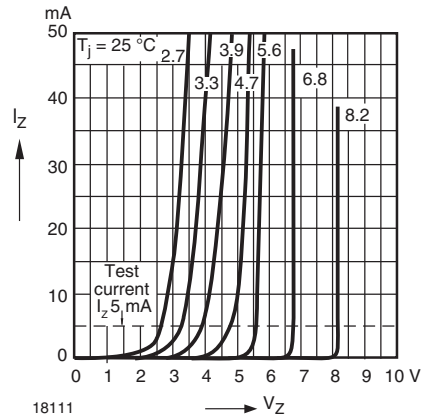


Figure 16. Breakdown Characteristics

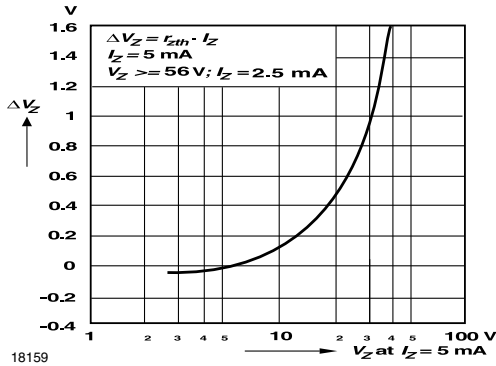


Figure 14. Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

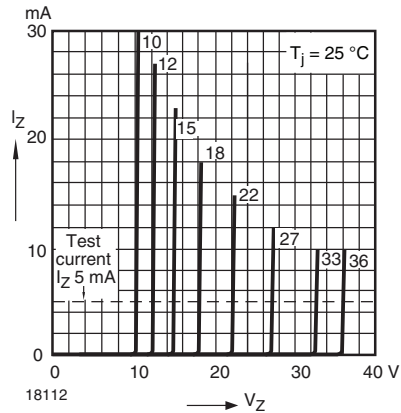


Figure 17. Breakdown Characteristics

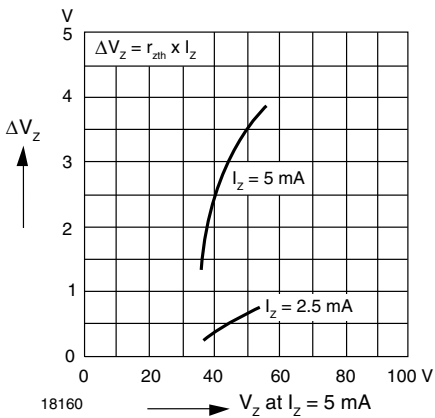
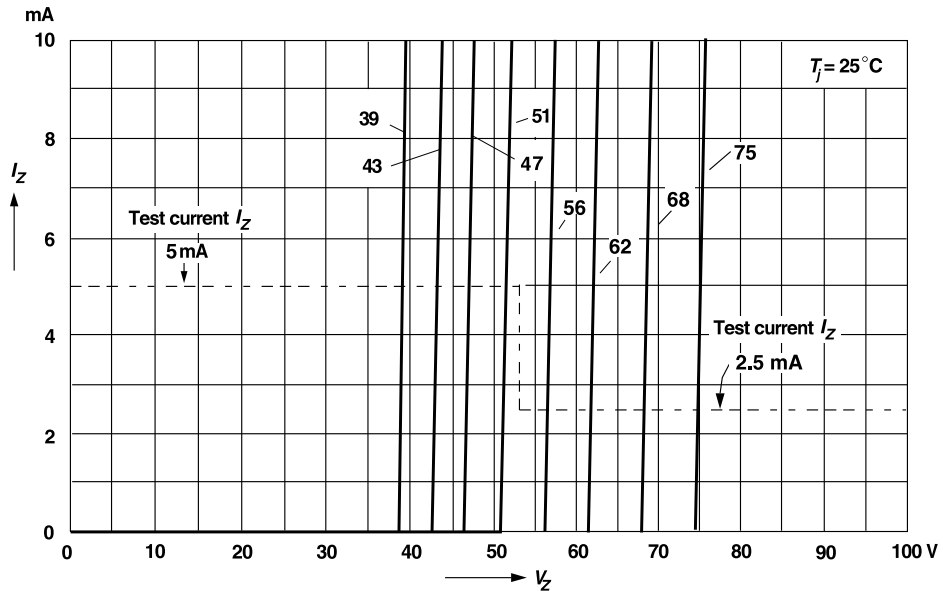


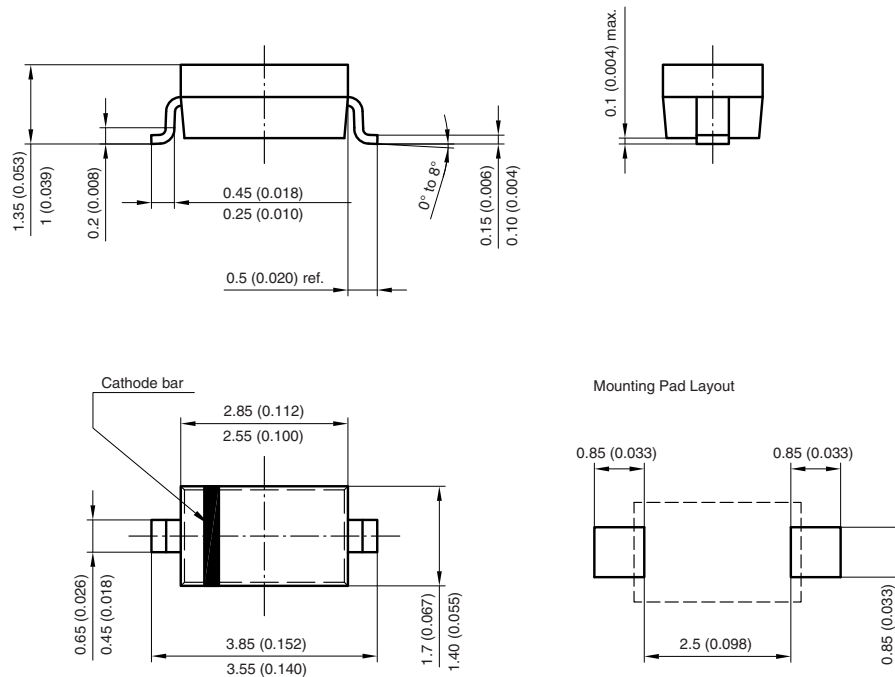
Figure 15. Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage



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Figure 18. Breakdown Characteristics

Package Dimensions in millimeters (inches): SOD-123



Rev. 4 - Date: 24. Sep. 2009
 Document no.: S8-V-3910.01-001 (4)
 17432



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Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

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