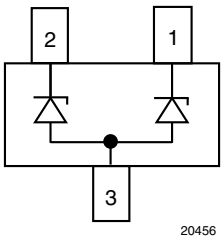
# Small Signal Zener Diodes, Dual






## FEATURES

- Dual silicon planar Zener diodes, common anode
- The Zener voltages are graded according to the international E24 standard. Standard Zener voltage tolerance is ± 5 %, indicated by the “C” in the ordering code. Replace “C” with “B” for 2 % tolerance.
- The parameters are valid for both diodes in one case. $\Delta V_Z$ and $\Delta R_{zj}$ of the two diodes in one case is ≤ 5 %
- AEC-Q101 qualified
- ESD capability according to AEC-Q101:
  Human body model > 8 kV
  Machine model > 800 V
- Base P/N-G3 - green, commercial grade
- Base P/N-HG3 - green, AEC-Q101 qualified (part number available on request)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

## PRIMARY CHARACTERISTICS

| PARAMETER | VALUE | UNIT |
|---|---|---|
| $V_Z$ range nom. | 2.7 to 51 | V |
| Test current $I_{ZT}$ | 5 | mA |
| $V_Z$ specification | Pulse current | |
| Int. construction | Dual common anode | |

## ORDERING INFORMATION

| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
|---|---|---|---|
| AZ23-G-series | AZ23C2V7-G3-08 to AZ23C51-G3-08 | 3000 (8 mm tape on 7" reel) | 15 000 |
| | AZ23B2V7-G3-08 to AZ23B51-G3-08 | | |
| | AZ23C2V7-G3-18 to AZ23C51-G3-18 | 10 000 (8 mm tape on 13" reel) | 10 000 |
| | AZ23B2V7-G3-18 to AZ23B51-G3-18 | | |

## PACKAGE

| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
|---|---|---|---|---|
| SOT-23 | 8.1 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |

## ABSOLUTE MAXIMUM RATINGS ($T_{amb}$ = 25 °C, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Power dissipation | Device on fiberglass substrate, see layout on page 6 | $P_{tot}$ | 300 | mW |
| Thermal resistance, junction to ambient air | Device on fiberglass substrate, see layout on page 6 | $R_{thJA}$ | 420 | K/W |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +150 | °C |
| Zener current | | $I_Z$ | $P_{tot}/V_Z$ | mA |
| Operating temperature range | | $T_{op}$ | -55 to +150 | °C |



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**ELECTRICAL CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE (1) | | | TEST CURRENT | | REVERSE VOLTAGE | | DYNAMIC RESISTANCE | | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $I_{ZT2}$ | $V_R$ at $I_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ at $I_{ZT}$ | |
| | | V | | | mA | | V | nA | Ω | | $10^{-4}$/°C | |
| | | MIN. | NOM. | MAX. | | | | | | | MIN. | MAX. |
| AZ23C2V7-G | D41 | 2.5 | 2.7 | 2.9 | 5 | 1 | - | - | 75 (< 83) | < 500 | -9 | -4 |
| AZ23C3V0-G | D42 | 2.8 | 3.0 | 3.2 | 5 | 1 | - | - | 80 (< 95) | < 500 | -9 | -3 |
| AZ23C3V3-G | D43 | 3.1 | 3.3 | 3.5 | 5 | 1 | - | - | 80 (< 95) | < 500 | -8 | -3 |
| AZ23C3V6-G | D44 | 3.4 | 3.6 | 3.8 | 5 | 1 | - | - | 80 (< 95) | < 500 | -8 | -3 |
| AZ23C3V9-G | D45 | 3.7 | 3.9 | 4.1 | 5 | 1 | - | - | 80 (< 95) | < 500 | -7 | -3 |
| AZ23C4V3-G | D46 | 4 | 4.3 | 4.6 | 5 | 1 | - | - | 80 (< 95) | < 500 | -6 | -1 |
| AZ23C4V7-G | D47 | 4.4 | 4.7 | 5 | 5 | 1 | - | - | 70 (< 78) | < 500 | -5 | 2 |
| AZ23C5V1-G | D48 | 4.8 | 5.1 | 5.4 | 5 | 1 | > 0.8 | 100 | 30 (< 60) | < 480 | -3 | 4 |
| AZ23C5V6-G | D49 | 5.2 | 5.6 | 6 | 5 | 1 | > 1 | 100 | 10 (< 40) | < 400 | -2 | 6 |
| AZ23C6V2-G | D50 | 5.8 | 6.2 | 6.6 | 5 | 1 | > 2 | 100 | 4.8 (< 10) | < 200 | -1 | 7 |
| AZ23C6V8-G | D51 | 6.4 | 6.8 | 7.2 | 5 | 1 | > 3 | 100 | 4.5 (< 8) | < 150 | 2 | 7 |
| AZ23C7V5-G | D52 | 7 | 7.5 | 7.9 | 5 | 1 | > 5 | 100 | 4 (< 7) | < 50 | 3 | 7 |
| AZ23C8V2-G | D53 | 7.7 | 8.2 | 8.7 | 5 | 1 | > 6 | 100 | 4.5 (< 7) | < 50 | 4 | 7 |
| AZ23C9V1-G | D54 | 8.5 | 9.1 | 9.6 | 5 | 1 | > 7 | 100 | 4.8 (< 10) | < 50 | 5 | 8 |
| AZ23C10-G | D55 | 9.4 | 10 | 10.6 | 5 | 1 | > 7.5 | 100 | 5.2 (< 15) | < 70 | 5 | 8 |
| AZ23C11-G | D56 | 10.4 | 11 | 11.6 | 5 | 1 | > 8.5 | 100 | 6 (< 20) | < 70 | 5 | 9 |
| AZ23C12-G | D57 | 11.4 | 12 | 12.7 | 5 | 1 | > 9 | 100 | 7 (< 20) | < 90 | 6 | 9 |
| AZ23C13-G | D58 | 12.4 | 13 | 14.1 | 5 | 1 | > 10 | 100 | 9 (< 25) | < 110 | 7 | 9 |
| AZ23C15-G | D59 | 13.8 | 15 | 15.6 | 5 | 1 | > 11 | 100 | 11 (< 30) | < 110 | 7 | 9 |
| AZ23C16-G | D60 | 15.3 | 16 | 17.1 | 5 | 1 | > 12 | 100 | 13 (< 40) | < 170 | 8 | 9.5 |
| AZ23C18-G | D61 | 16.8 | 18 | 19.1 | 5 | 1 | > 14 | 100 | 18 (< 50) | < 170 | 8 | 9.5 |
| AZ23C20-G | D62 | 18.8 | 20 | 21.2 | 5 | 1 | > 15 | 100 | 20 (< 50) | < 220 | 8 | 10 |
| AZ23C22-G | D63 | 20.8 | 22 | 23.3 | 5 | 1 | > 17 | 100 | 25 (< 55) | < 220 | 8 | 10 |
| AZ23C24-G | D64 | 22.8 | 24 | 25.6 | 5 | 1 | > 18 | 100 | 28 (< 80) | < 220 | 8 | 10 |
| AZ23C27-G | D65 | 25.1 | 27 | 28.9 | 5 | 1 | > 20 | 100 | 30 (< 80) | < 250 | 8 | 10 |
| AZ23C30-G | D66 | 28 | 30 | 32 | 5 | 1 | > 22.5 | 100 | 35 (< 80) | < 250 | 8 | 10 |
| AZ23C33-G | D67 | 31 | 33 | 35 | 5 | 1 | > 25 | 100 | 40 (< 80) | < 250 | 8 | 10 |
| AZ23C36-G | D68 | 34 | 36 | 38 | 5 | 1 | > 27 | 100 | 40 (< 90) | < 250 | 8 | 10 |
| AZ23C39-G | D69 | 37 | 39 | 41 | 5 | 1 | > 29 | 100 | 50 (< 90) | < 300 | 10 | 12 |
| AZ23C43-G | D70 | 40 | 43 | 46 | 5 | 1 | > 32 | 100 | 60 (< 100) | < 700 | 10 | 12 |
| AZ23C47-G | D71 | 44 | 47 | 50 | 5 | 1 | > 35 | 100 | 70 (< 100) | < 750 | 10 | 12 |
| AZ23C51-G | D72 | 48 | 51 | 50 | 5 | 1 | > 38 | 100 | 70 (< 100) | < 750 | 10 | 12 |

**Note**

(1) Tested with pulses $t_p$ = 5 ms


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**ELECTRICAL CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE (1) | | | TEST CURRENT | | REVERSE VOLTAGE | | DYNAMIC RESISTANCE | | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $I_{ZT2}$ | $V_R$ at $I_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ at $I_{ZT}$ | |
| | | V | | | mA | | V | nA | Ω | | $10^{-4}$/°C | |
| | | MIN. | NOM. | MAX. | | | | | | | MIN. | MAX. |
| AZ23B2V7-G | D41 | 2.65 | 2.7 | 2.75 | 5 | 1 | - | - | 75 (< 83) | < 500 | -9 | -4 |
| AZ23B3V0-G | D42 | 2.94 | 3.0 | 3.06 | 5 | 1 | - | - | 80 (< 95) | < 500 | -9 | -3 |
| AZ23B3V3-G | D43 | 3.23 | 3.3 | 3.37 | 5 | 1 | - | - | 80 (< 95) | < 500 | -8 | -3 |
| AZ23B3V6-G | D44 | 3.53 | 3.6 | 3.67 | 5 | 1 | - | - | 80 (< 95) | < 500 | -8 | -3 |
| AZ23B3V9-G | D45 | 3.82 | 3.9 | 3.98 | 5 | 1 | - | - | 80 (< 95) | < 500 | -7 | -3 |
| AZ23B4V3-G | D46 | 4.21 | 4.3 | 4.39 | 5 | 1 | - | - | 80 (< 95) | < 500 | -6 | -1 |
| AZ23B4V7-G | D47 | 4.61 | 4.7 | 4.79 | 5 | 1 | - | - | 70 (< 78) | < 500 | -5 | 2 |
| AZ23B5V1-G | D48 | 5 | 5.1 | 5.2 | 5 | 1 | > 0.8 | 100 | 30 (< 60) | < 480 | -3 | 4 |
| AZ23B5V6-G | D49 | 5.49 | 5.6 | 5.71 | 5 | 1 | > 1 | 100 | 10 (< 40) | < 400 | -2 | 6 |
| AZ23B6V2-G | D50 | 6.08 | 6.2 | 6.32 | 5 | 1 | > 2 | 100 | 4.8 (< 10) | < 200 | -1 | 7 |
| AZ23B6V8-G | D51 | 6.66 | 6.8 | 6.94 | 5 | 1 | > 3 | 100 | 4.5 (< 8) | < 150 | 2 | 7 |
| AZ23B7V5-G | D52 | 7.35 | 7.5 | 7.65 | 5 | 1 | > 5 | 100 | 4 (< 7) | < 50 | 3 | 7 |
| AZ23B8V2-G | D53 | 8.04 | 8.2 | 8.36 | 5 | 1 | > 6 | 100 | 4.5 (< 7) | < 50 | 4 | 7 |
| AZ23B9V1-G | D54 | 8.92 | 9.1 | 9.28 | 5 | 1 | > 7 | 100 | 4.8 (< 10) | < 50 | 5 | 8 |
| AZ23B10-G | D55 | 9.8 | 10 | 10.2 | 5 | 1 | > 7.5 | 100 | 5.2 (< 15) | < 70 | 5 | 8 |
| AZ23B11-G | D56 | 10.8 | 11 | 11.2 | 5 | 1 | > 8.5 | 100 | 6 (< 20) | < 70 | 5 | 9 |
| AZ23B12-G | D57 | 11.8 | 12 | 12.2 | 5 | 1 | > 9 | 100 | 7 (< 20) | < 90 | 6 | 9 |
| AZ23B13-G | D58 | 12.7 | 13 | 13.3 | 5 | 1 | > 10 | 100 | 9 (< 25) | < 110 | 7 | 9 |
| AZ23B15-G | D59 | 14.7 | 15 | 15.3 | 5 | 1 | > 11 | 100 | 11 (< 30) | < 110 | 7 | 9 |
| AZ23B16-G | D60 | 15.7 | 16 | 16.3 | 5 | 1 | > 12 | 100 | 13 (< 40) | < 170 | 8 | 0.5 |
| AZ23B18-G | D61 | 17.6 | 18 | 18.4 | 5 | 1 | > 14 | 100 | 18 (< 50) | < 170 | 8 | 0.5 |
| AZ23B20-G | D62 | 19.6 | 20 | 20.4 | 5 | 1 | > 15 | 100 | 20 (< 50) | < 220 | 8 | 10 |
| AZ23B22-G | D63 | 21.6 | 22 | 22.4 | 5 | 1 | > 17 | 100 | 25 (< 55) | < 220 | 8 | 10 |
| AZ23B24-G | D64 | 23.5 | 24 | 24.5 | 5 | 1 | > 18 | 100 | 28 (< 80) | < 220 | 8 | 10 |
| AZ23B27-G | D65 | 26.5 | 27 | 27.5 | 5 | 1 | > 20 | 100 | 30 (< 80) | < 250 | 8 | 10 |
| AZ23B30-G | D66 | 29.4 | 30 | 30.6 | 5 | 1 | > 22.5 | 100 | 35 (< 80) | < 250 | 8 | 10 |
| AZ23B33-G | D67 | 32.3 | 33 | 33.7 | 5 | 1 | > 25 | 100 | 40 (< 80) | < 250 | 8 | 10 |
| AZ23B36-G | D68 | 35.3 | 36 | 36.7 | 5 | 1 | > 27 | 100 | 40 (< 90) | < 250 | 8 | 10 |
| AZ23B39-G | D69 | 38.2 | 39 | 39.8 | 5 | 1 | > 29 | 100 | 50 (< 90) | < 300 | 10 | 12 |
| AZ23B43-G | D70 | 42.1 | 43 | 43.9 | 5 | 1 | > 32 | 100 | 60 (< 100) | < 700 | 10 | 12 |
| AZ23B47-G | D71 | 46.1 | 47 | 47.9 | 5 | 1 | > 35 | 100 | 70 (< 100) | < 750 | 10 | 12 |
| AZ23B51-G | D72 | 50 | 51 | 52 | 5 | 1 | > 38 | 100 | 70 (< 100) | < 750 | 10 | 12 |

**Note**

(1) Tested with pulses $t_p$ = 5 ms


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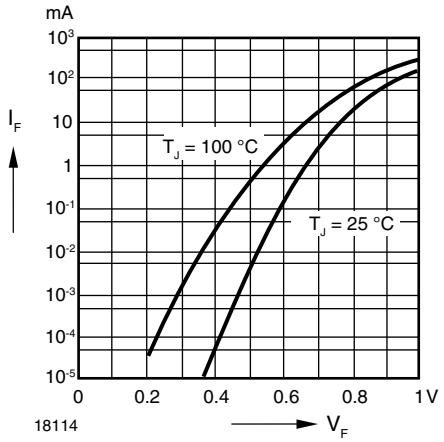



Fig. 1 - Forward Characteristics

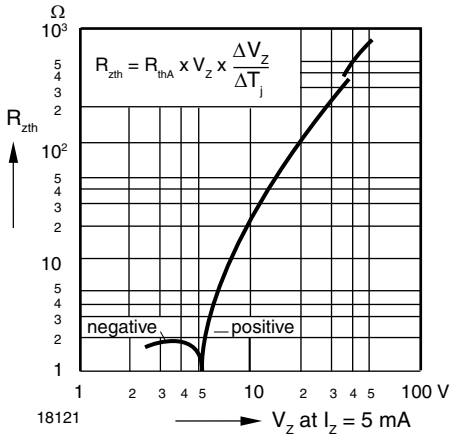



Fig. 4 - Thermal Differential Resistance vs. Zener Voltage

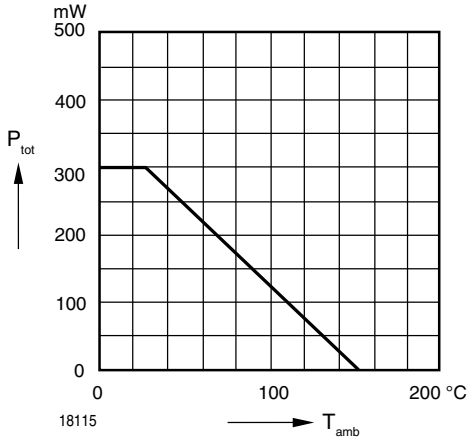



Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

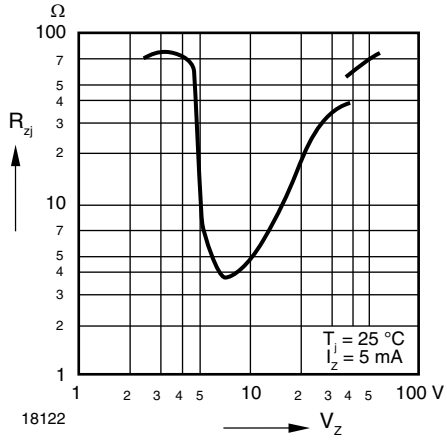



Fig. 5 - Dynamic Resistance vs. Zener Voltage

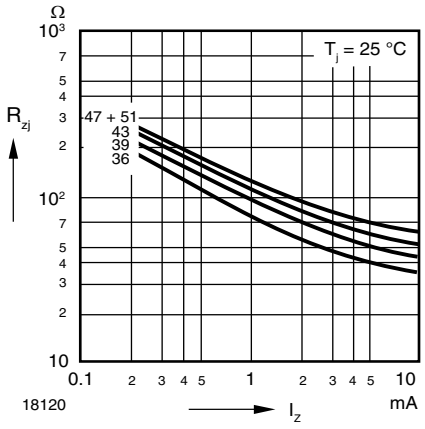



Fig. 3 - Dynamic Resistance vs. Zener Current

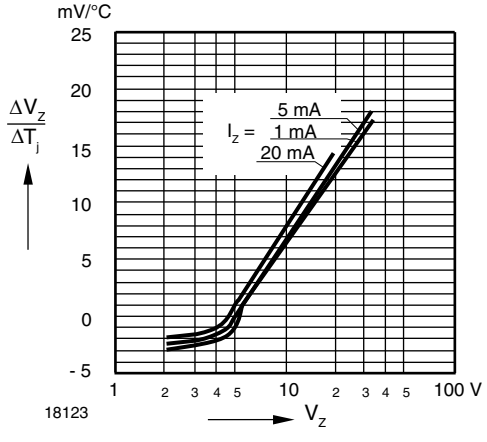



Fig. 6 - Temperature Dependence of Zener Voltage vs. Zener Voltage


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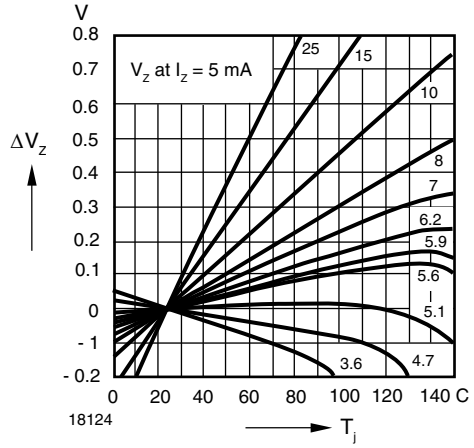



Fig. 7 - Change of Zener Voltage vs. Junction Temperature

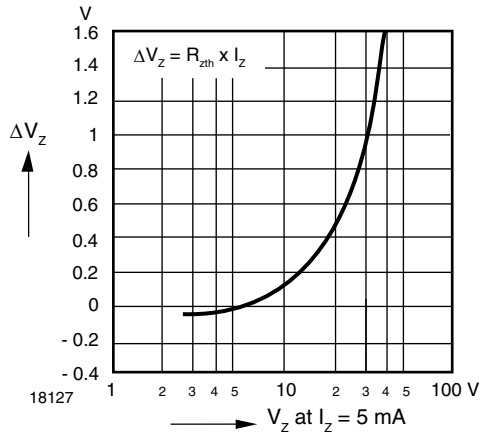



Fig. 10 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

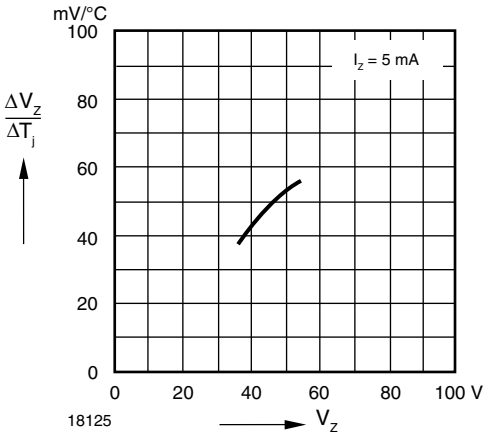



Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

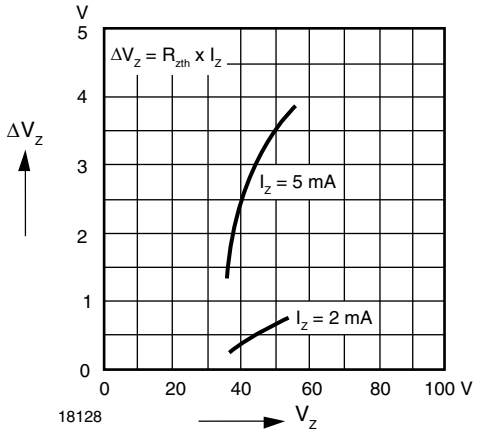



Fig. 11 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

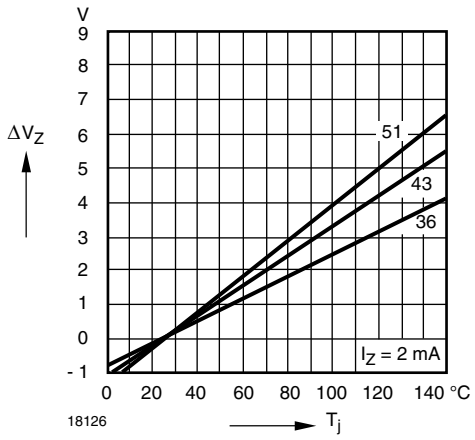



Fig. 9 - Change of Zener Voltage vs. Junction Temperature

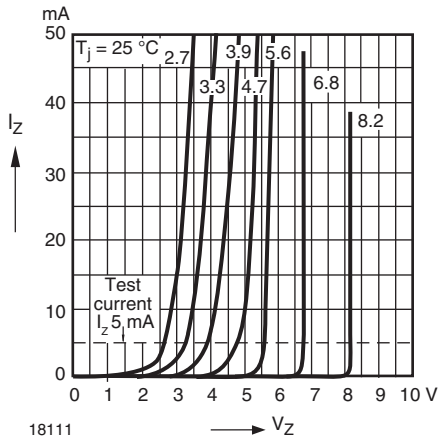



Fig. 12 - Breakdown Characteristics


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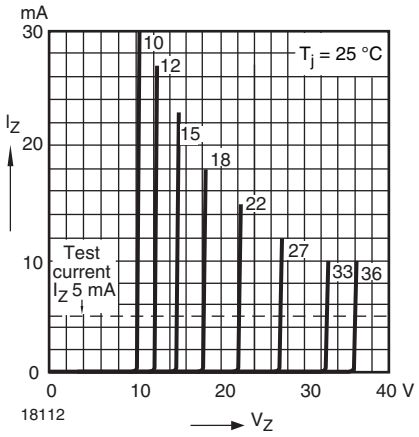



Fig. 13 - Breakdown Characteristics

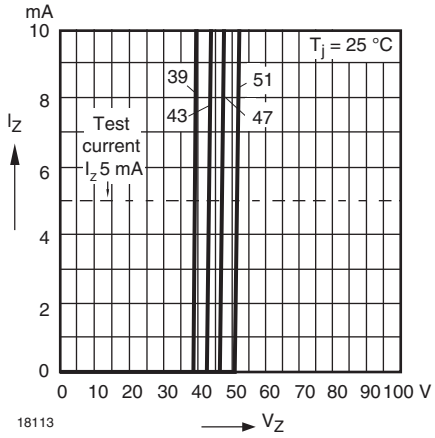
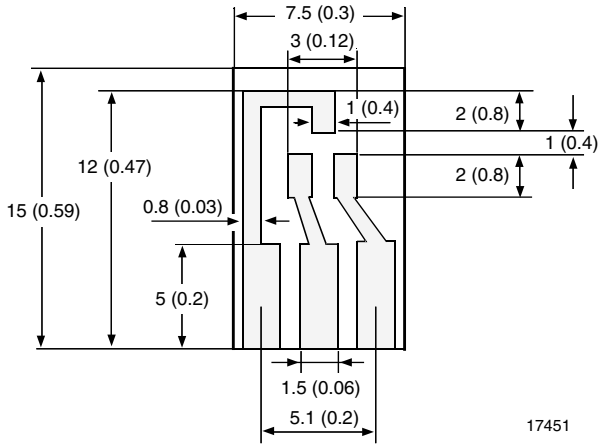



Fig. 14 - Breakdown Characteristics

## LAYOUT FOR $R_{thJA}$ TEST

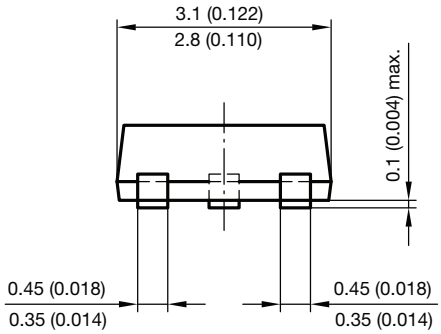
Thickness: fiberglass 0.059" (1.5 mm)
Copper leads 0.012" (0.3 mm)

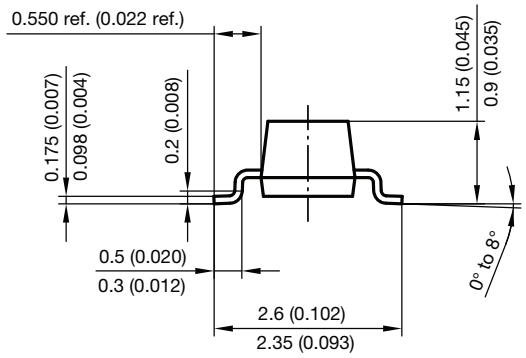


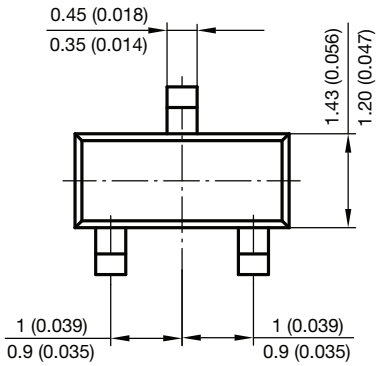


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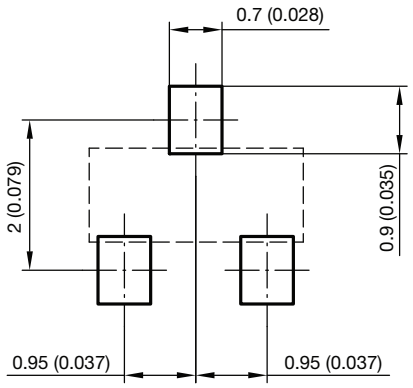
**PACKAGE DIMENSIONS** in millimeters (inches): **SOT-23**




Foot print recommendation:




Document no.: 6.541-5014.01-4
Rev. 8 - Date: 23.Sept.2009
17418



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# Material Category Policy

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