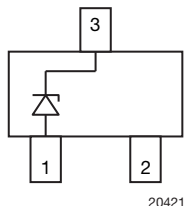


## Small Signal Zener Diodes



### FEATURES

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard. Standard Zener voltage tolerance is  $\pm 5\%$ , indicated by the "C" in the ordering code. Replace "C" with "B" for  $\pm 2\%$  tolerance.
- AEC-Q101 qualified
- ESD capability acc. to AEC-Q101:  
human body model:  $> 8\text{ kV}$ ,  
machine model:  $> 800\text{ V}$
- Base P/N-G3 - green, commercial grade
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### PRIMARY CHARACTERISTICS

| PARAMETER             | VALUE         | UNIT |
|-----------------------|---------------|------|
| $V_Z$ range nom.      | 2.4 to 75     | V    |
| Test current $I_{ZT}$ | 2; 5          | mA   |
| $V_Z$ specification   | Pulse current |      |
| Int. construction     | Single        |      |

### ORDERING INFORMATION

| DEVICE NAME    | ORDERING CODE                     | TAPED UNITS PER REEL           | MINIMUM ORDER QUANTITY |
|----------------|-----------------------------------|--------------------------------|------------------------|
| BZX84-G-series | BZX84C2V4-G3-08 to BZX84C75-G3-08 | 3000 (8 mm tape on 7" reel)    | 15 000                 |
|                | BZX84B2V4-G3-08 to BZX84B75-G3-08 |                                |                        |
|                | BZX84C2V4-G3-18 to BZX84C75-G3-18 | 10 000 (8 mm tape on 13" reel) | 10 000                 |
|                | BZX84B2V4-G3-18 to BZX84B75-G3-18 |                                |                        |

### PACKAGE

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

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                                  | TEST CONDITION                                                                      | SYMBOL     | VALUE         | UNIT |
|--------------------------------------------|-------------------------------------------------------------------------------------|------------|---------------|------|
| Power dissipation                          | $T_{amb} = 25\text{ °C}$ , device on fiberglass substrate,<br>acc. layout on page 7 | $P_{tot}$  | 300           | mW   |
| Thermal resistance junction to ambient air | $T_{amb} = 25\text{ °C}$ , device on fiberglass substrate,<br>acc. layout on page 7 | $R_{thJA}$ | 420           | K/W  |
| Junction temperature                       |                                                                                     | $T_j$      | 150           | °C   |
| Storage temperature range                  |                                                                                     | $T_{stg}$  | - 65 to + 150 | °C   |
| Operating temperature range                |                                                                                     | $T_{op}$   | - 55 to + 150 | °C   |

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE |      |      | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |      | DYNAMIC RESISTANCE |                       | TEMPERATURE COEFFICIENT    |      |
|-------------|--------------|---------------------|------|------|--------------|-----------|-------------------------|------|--------------------|-----------------------|----------------------------|------|
|             |              | $V_Z$ at $I_{ZT1}$  |      |      | $I_{ZT1}$    | $I_{ZT2}$ | $I_R$ at $V_R$          |      | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ at $I_{ZT1}$ |      |
|             |              | V                   |      |      | mA           |           | $\mu\text{A}$           | V    | $\Omega$           |                       | $10^{-4}/^{\circ}\text{C}$ |      |
|             |              | MIN.                | NOM. | MAX. |              |           |                         |      | MAX.               | MAX.                  | MIN.                       | MAX. |
| BZX84C2V4-G | G50          | 2.2                 | 2.4  | 2.6  | 5            | 1         | 50                      | 1    | 100                | 275                   | - 9                        | - 4  |
| BZX84C2V7-G | G51          | 2.5                 | 2.7  | 2.9  | 5            | 1         | 20                      | 1    | 100                | 600                   | - 9                        | - 4  |
| BZX84C3V0-G | G52          | 2.8                 | 3.0  | 3.2  | 5            | 1         | 10                      | 1    | 95                 | 600                   | - 9                        | - 3  |
| BZX84C3V3-G | G53          | 3.1                 | 3.3  | 3.5  | 5            | 1         | 5                       | 1    | 95                 | 600                   | - 8                        | - 3  |
| BZX84C3V6-G | G54          | 3.4                 | 3.6  | 3.8  | 5            | 1         | 5                       | 1    | 90                 | 600                   | - 8                        | - 3  |
| BZX84C3V9-G | G55          | 3.7                 | 3.9  | 4.1  | 5            | 1         | 3                       | 1    | 90                 | 600                   | - 7                        | - 3  |
| BZX84C4V3-G | G56          | 4.0                 | 4.3  | 4.6  | 5            | 1         | 3                       | 1    | 90                 | 600                   | - 6                        | - 1  |
| BZX84C4V7-G | G57          | 4.4                 | 4.7  | 5.0  | 5            | 1         | 3                       | 2    | 80                 | 500                   | - 5                        | 2    |
| BZX84C5V1-G | G58          | 4.8                 | 5.1  | 5.4  | 5            | 1         | 2                       | 2    | 60                 | 480                   | - 3                        | 4    |
| BZX84C5V6-G | G59          | 5.2                 | 5.6  | 6.0  | 5            | 1         | 1                       | 2    | 40                 | 400                   | - 2                        | 6    |
| BZX84C6V2-G | G60          | 5.8                 | 6.2  | 6.6  | 5            | 1         | 3                       | 4    | 10                 | 150                   | - 1                        | 7    |
| BZX84C6V8-G | G61          | 6.4                 | 6.8  | 7.2  | 5            | 1         | 2                       | 4    | 15                 | 80                    | 2                          | 7    |
| BZX84C7V5-G | G62          | 7.0                 | 7.5  | 7.9  | 5            | 1         | 1                       | 5    | 15                 | 80                    | 3                          | 7    |
| BZX84C8V2-G | G63          | 7.7                 | 8.2  | 8.7  | 5            | 1         | 0.7                     | 5    | 15                 | 80                    | 4                          | 7    |
| BZX84C9V1-G | G64          | 8.5                 | 9.1  | 9.6  | 5            | 1         | 0.5                     | 6    | 15                 | 100                   | 5                          | 8    |
| BZX84C10-G  | G65          | 9.4                 | 10   | 10.6 | 5            | 1         | 0.2                     | 7    | 20                 | 150                   | 5                          | 8    |
| BZX84C11-G  | G66          | 10.4                | 11   | 11.6 | 5            | 1         | 0.1                     | 8    | 20                 | 150                   | 5                          | 9    |
| BZX84C12-G  | G67          | 11.4                | 12   | 12.7 | 5            | 1         | 0.1                     | 8    | 25                 | 150                   | 6                          | 9    |
| BZX84C13-G  | G68          | 12.4                | 13   | 14.1 | 5            | 1         | 0.1                     | 8    | 30                 | 170                   | 7                          | 9    |
| BZX84C15-G  | G69          | 13.8                | 15   | 15.6 | 5            | 1         | 0.05                    | 10.5 | 30                 | 200                   | 7                          | 9    |
| BZX84C16-G  | G70          | 15.3                | 16   | 17.1 | 5            | 1         | 0.05                    | 11.2 | 40                 | 200                   | 8                          | 9.5  |
| BZX84C18-G  | G71          | 16.8                | 18   | 19.1 | 5            | 1         | 0.05                    | 12.6 | 45                 | 225                   | 8                          | 9.5  |
| BZX84C20-G  | G72          | 18.8                | 20   | 21.2 | 5            | 1         | 0.05                    | 14.0 | 55                 | 225                   | 8                          | 10   |
| BZX84C22-G  | G73          | 20.8                | 22   | 23.3 | 5            | 1         | 0.05                    | 15.4 | 55                 | 250                   | 8                          | 10   |
| BZX84C24-G  | G74          | 22.8                | 24   | 25.6 | 5            | 1         | 0.05                    | 16.8 | 70                 | 250                   | 8                          | 10   |
| BZX84C27-G  | G75          | 25.1                | 27   | 28.9 | 2            | 0.5       | 0.05                    | 18.9 | 80                 | 300                   | 8                          | 10   |
| BZX84C30-G  | G76          | 28                  | 30   | 32   | 2            | 0.5       | 0.05                    | 21.0 | 80                 | 300                   | 8                          | 10   |
| BZX84C33-G  | G77          | 31                  | 33   | 35   | 2            | 0.5       | 0.05                    | 23.1 | 80                 | 325                   | 8                          | 10   |
| BZX84C36-G  | G78          | 34                  | 36   | 38   | 2            | 0.5       | 0.05                    | 25.2 | 90                 | 350                   | 8                          | 10   |
| BZX84C39-G  | G79          | 37                  | 39   | 41   | 2            | 0.5       | 0.05                    | 27.3 | 130                | 350                   | 10                         | 12   |
| BZX84C43-G  | G80          | 40                  | 43   | 46   | 2            | 0.5       | 0.05                    | 30.1 | 150                | 375                   | 10                         | 12   |
| BZX84C47-G  | G81          | 44                  | 47   | 50   | 2            | 0.5       | 0.05                    | 32.9 | 170                | 375                   | 10                         | 12   |
| BZX84C51-G  | G82          | 48                  | 51   | 54   | 2            | 0.5       | 0.05                    | 35.7 | 180                | 400                   | 10                         | 12   |
| BZX84C56-G  | G83          | 52                  | 56   | 60   | 2            | 0.5       | 0.05                    | 39.2 | 200                | 425                   | 9                          | 11   |
| BZX84C62-G  | G84          | 58                  | 62   | 66   | 2            | 0.5       | 0.05                    | 43.4 | 215                | 450                   | 9                          | 12   |
| BZX84C68-G  | G85          | 64                  | 68   | 72   | 2            | 0.5       | 0.05                    | 47.6 | 240                | 475                   | 10                         | 12   |
| BZX84C75-G  | G86          | 70                  | 75   | 79   | 2            | 0.5       | 0.05                    | 52.5 | 255                | 500                   | 10                         | 12   |

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE |      |      | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |      | DYNAMIC RESISTANCE |                       | TEMPERATURE COEFFICIENT    |      |
|-------------|--------------|---------------------|------|------|--------------|-----------|-------------------------|------|--------------------|-----------------------|----------------------------|------|
|             |              | $V_Z$ at $I_{ZT1}$  |      |      | $I_{ZT1}$    | $I_{ZT2}$ | $I_R$ at $V_R$          |      | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ at $I_{ZT1}$ |      |
|             |              | V                   |      |      | mA           |           | $\mu\text{A}$           | V    | $\Omega$           |                       | $10^{-4}/^{\circ}\text{C}$ |      |
|             |              | MIN.                | NOM. | MAX. |              |           |                         |      | MAX.               | MAX.                  | MIN.                       | MAX. |
| BZX84B2V4-G | H50          | 2.35                | 2.4  | 2.45 | 5            | 1         | 50                      | 1    | 100                | 275                   | - 9                        | - 4  |
| BZX84B2V7-G | H51          | 2.65                | 2.7  | 2.75 | 5            | 1         | 20                      | 1    | 100                | 600                   | - 9                        | - 4  |
| BZX84B3V0-G | H52          | 2.94                | 3.0  | 3.06 | 5            | 1         | 10                      | 1    | 95                 | 600                   | - 9                        | - 3  |
| BZX84B3V3-G | H53          | 3.23                | 3.3  | 3.37 | 5            | 1         | 5                       | 1    | 95                 | 600                   | - 8                        | - 3  |
| BZX84B3V6-G | H54          | 3.53                | 3.6  | 3.67 | 5            | 1         | 5                       | 1    | 90                 | 600                   | - 8                        | - 3  |
| BZX84B3V9-G | H55          | 3.82                | 3.9  | 3.98 | 5            | 1         | 3                       | 1    | 90                 | 600                   | - 7                        | - 3  |
| BZX84B4V3-G | H56          | 4.21                | 4.3  | 4.39 | 5            | 1         | 3                       | 1    | 90                 | 600                   | - 6                        | - 1  |
| BZX84B4V7-G | H57          | 4.61                | 4.7  | 4.79 | 5            | 1         | 3                       | 2    | 80                 | 500                   | - 5                        | 2    |
| BZX84B5V1-G | H58          | 5.0                 | 5.1  | 5.2  | 5            | 1         | 2                       | 2    | 60                 | 480                   | - 3                        | 4    |
| BZX84B5V6-G | H59          | 5.49                | 5.6  | 5.71 | 5            | 1         | 1                       | 2    | 40                 | 400                   | - 2                        | 6    |
| BZX84B6V2-G | H60          | 6.08                | 6.2  | 6.32 | 5            | 1         | 3                       | 4    | 10                 | 150                   | - 1                        | 7    |
| BZX84B6V8-G | H61          | 6.66                | 6.8  | 6.94 | 5            | 1         | 2                       | 4    | 15                 | 80                    | 2                          | 7    |
| BZX84B7V5-G | H62          | 7.35                | 7.5  | 7.65 | 5            | 1         | 1                       | 5    | 15                 | 80                    | 3                          | 7    |
| BZX84B8V2-G | H63          | 8.04                | 8.2  | 8.36 | 5            | 1         | 0.7                     | 5    | 15                 | 80                    | 4                          | 7    |
| BZX84B9V1-G | H64          | 8.92                | 9.1  | 9.28 | 5            | 1         | 0.5                     | 6    | 15                 | 100                   | 5                          | 8    |
| BZX84B10-G  | H65          | 9.8                 | 10   | 10.2 | 5            | 1         | 0.2                     | 7    | 20                 | 150                   | 5                          | 8    |
| BZX84B11-G  | H66          | 10.8                | 11   | 11.2 | 5            | 1         | 0.1                     | 8    | 20                 | 150                   | 5                          | 9    |
| BZX84B12-G  | H67          | 11.8                | 12   | 12.2 | 5            | 1         | 0.1                     | 8    | 25                 | 150                   | 6                          | 9    |
| BZX84B13-G  | H68          | 12.7                | 13   | 13.3 | 5            | 1         | 0.1                     | 8    | 30                 | 170                   | 7                          | 9    |
| BZX84B15-G  | H69          | 14.7                | 15   | 15.3 | 5            | 1         | 0.05                    | 10.5 | 30                 | 200                   | 7                          | 9    |
| BZX84B16-G  | H70          | 15.7                | 16   | 16.3 | 5            | 1         | 0.05                    | 11.2 | 40                 | 200                   | 8                          | 9.5  |
| BZX84B18-G  | H71          | 17.6                | 18   | 18.4 | 5            | 1         | 0.05                    | 12.6 | 45                 | 225                   | 8                          | 9.5  |
| BZX84B20-G  | H72          | 19.6                | 20   | 20.4 | 5            | 1         | 0.05                    | 14   | 55                 | 225                   | 8                          | 10   |
| BZX84B22-G  | H73          | 21.6                | 22   | 22.4 | 5            | 1         | 0.05                    | 15.4 | 55                 | 250                   | 8                          | 10   |
| BZX84B24-G  | H74          | 23.5                | 24   | 24.5 | 5            | 1         | 0.05                    | 16.8 | 70                 | 250                   | 8                          | 10   |
| BZX84B27-G  | H75          | 26.5                | 27   | 27.5 | 2            | 0.5       | 0.05                    | 18.9 | 80                 | 300                   | 8                          | 10   |
| BZX84B30-G  | H76          | 29.4                | 30   | 30.6 | 2            | 0.5       | 0.05                    | 21   | 80                 | 300                   | 8                          | 10   |
| BZX84B33-G  | H77          | 32.3                | 33   | 33.7 | 2            | 0.5       | 0.05                    | 23.1 | 80                 | 325                   | 8                          | 10   |
| BZX84B36-G  | H78          | 35.3                | 36   | 36.7 | 2            | 0.5       | 0.05                    | 25.2 | 90                 | 350                   | 8                          | 10   |
| BZX84B39-G  | H79          | 38.2                | 39   | 39.8 | 2            | 0.5       | 0.05                    | 27.3 | 130                | 350                   | 10                         | 12   |
| BZX84B43-G  | H80          | 42.1                | 43   | 43.9 | 2            | 0.5       | 0.05                    | 30.1 | 150                | 375                   | 10                         | 12   |
| BZX84B47-G  | H81          | 46.1                | 47   | 47.9 | 2            | 0.5       | 0.05                    | 32.9 | 170                | 375                   | 10                         | 12   |
| BZX84B51-G  | H82          | 50                  | 51   | 52   | 2            | 0.5       | 0.05                    | 35.7 | 180                | 400                   | 10                         | 12   |
| BZX84B56-G  | H83          | 54.9                | 56   | 57.1 | 2            | 0.5       | 0.05                    | 39.2 | 200                | 425                   | 9                          | 11   |
| BZX84B62-G  | H84          | 60.8                | 62   | 63.2 | 2            | 0.5       | 0.05                    | 43.4 | 215                | 450                   | 9                          | 12   |
| BZX84B68-G  | H85          | 66.6                | 68   | 69.4 | 2            | 0.5       | 0.05                    | 47.6 | 240                | 475                   | 10                         | 12   |
| BZX84B75-G  | H86          | 73.5                | 75   | 76.5 | 2            | 0.5       | 0.05                    | 52.5 | 255                | 500                   | 10                         | 12   |

### TYPICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

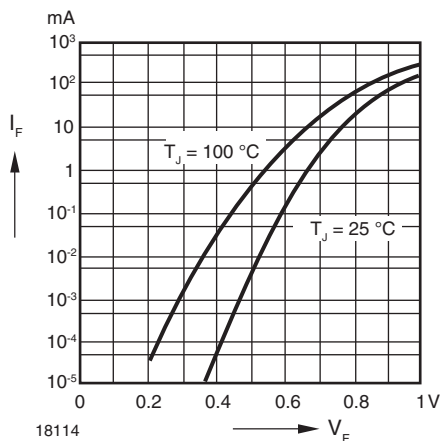


Fig. 1 - Forward Characteristics

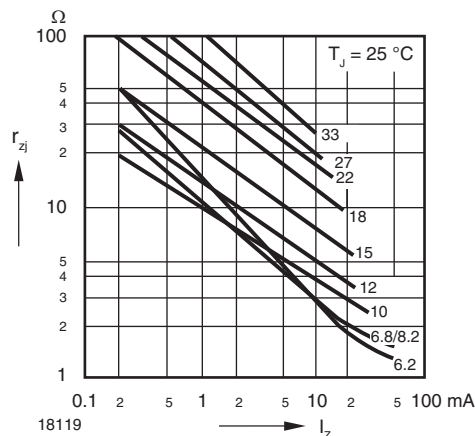


Fig. 4 - Dynamic Resistance vs. Zener Current

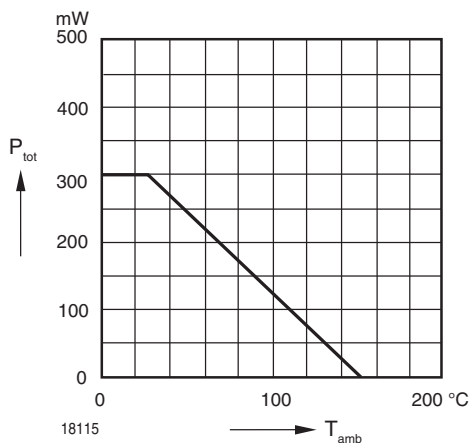


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

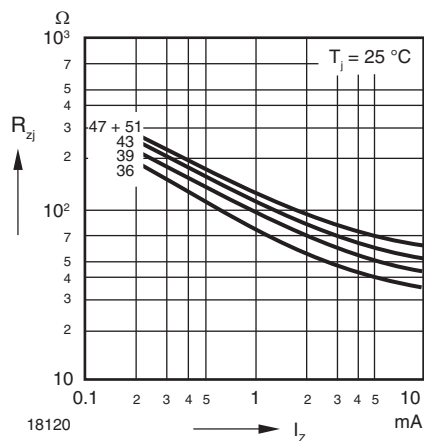


Fig. 5 - Dynamic Resistance vs. Zener Current

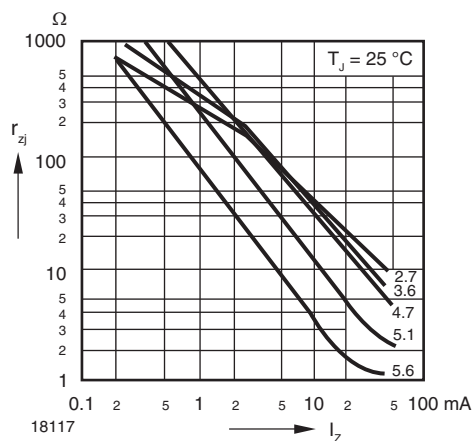


Fig. 3 - Dynamic Resistance vs. Zener Current

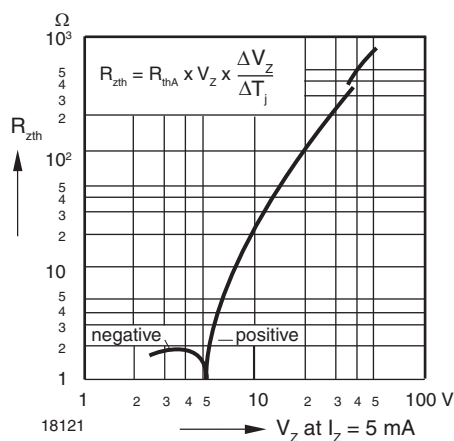


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

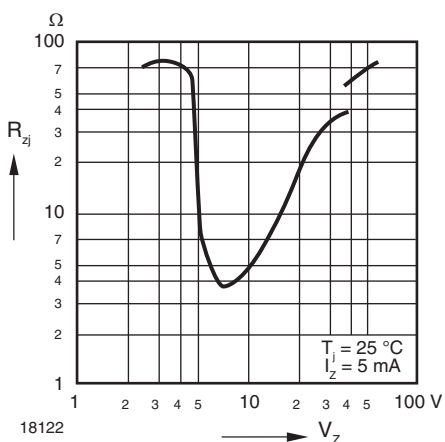


Fig. 7 - Dynamic Resistance vs. Zener Voltage

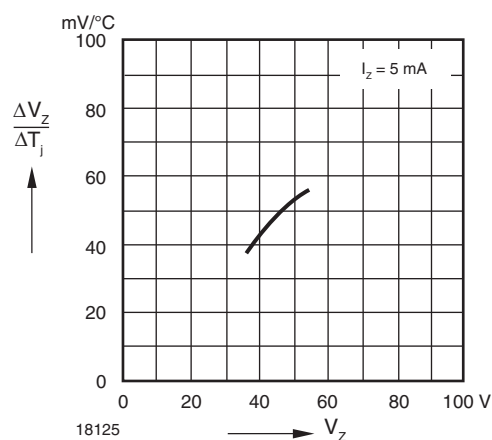


Fig. 10 - Temperature Dependence of Zener Voltage vs. Zener Voltage

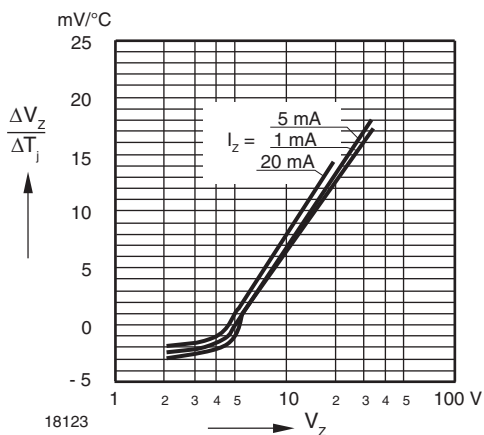


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

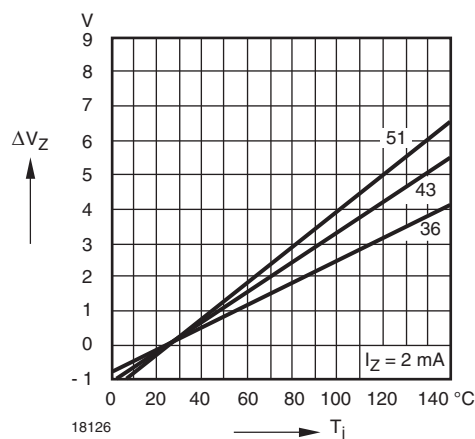


Fig. 11 - Change of Zener Voltage vs. Junction Temperature

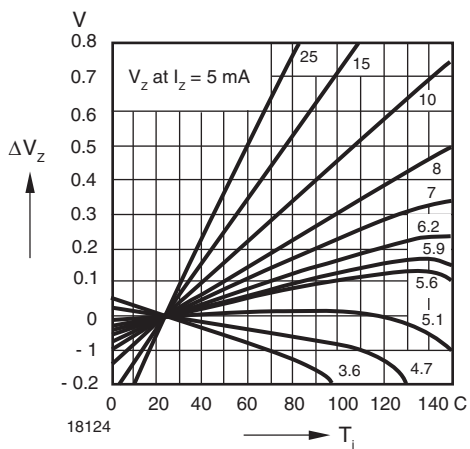


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

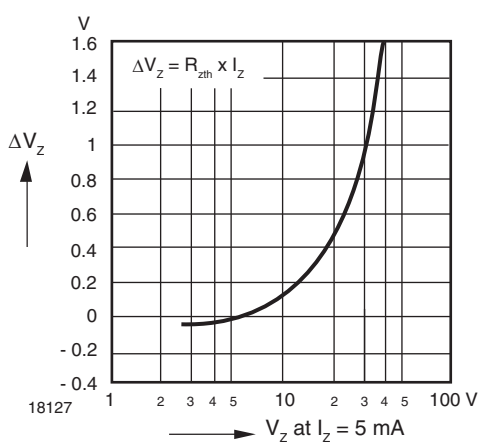


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

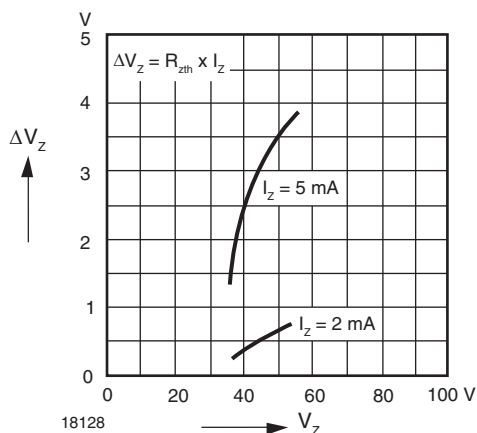


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

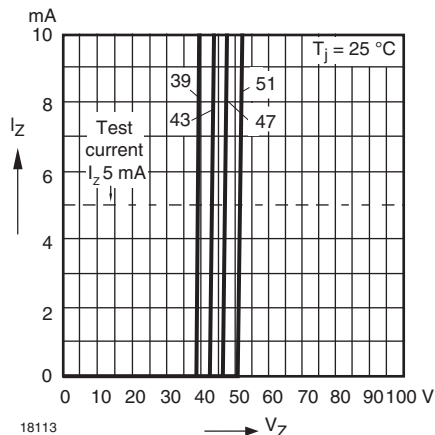


Fig. 16 - Breakdown Characteristics

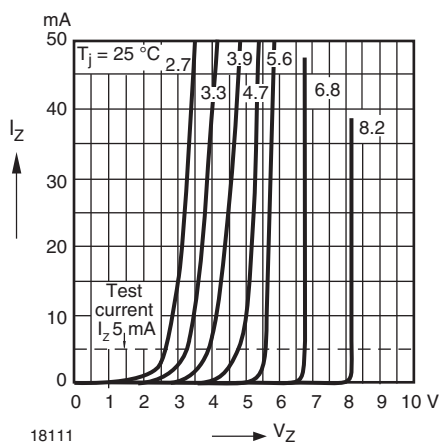


Fig. 14 - Breakdown Characteristics

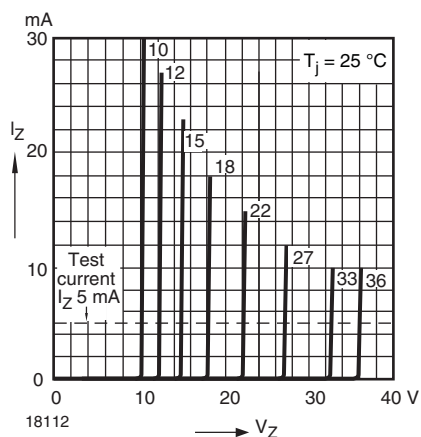


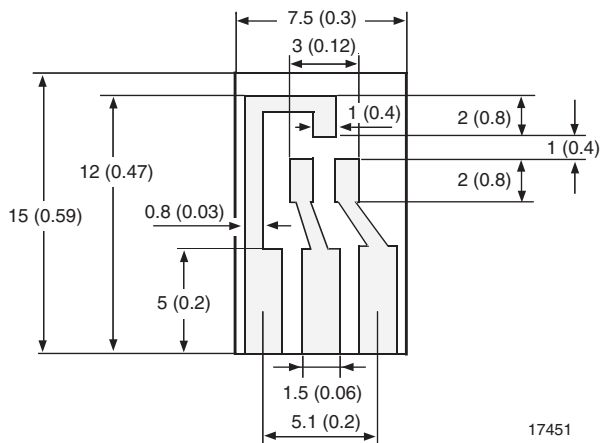
Fig. 15 - Breakdown Characteristics



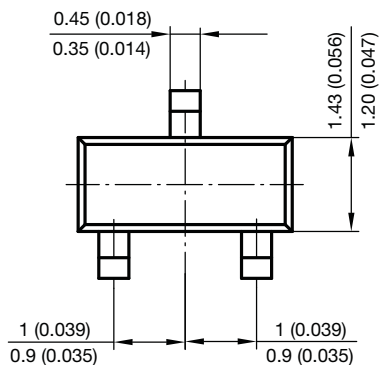
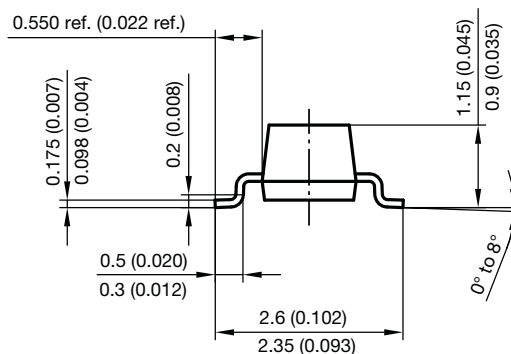
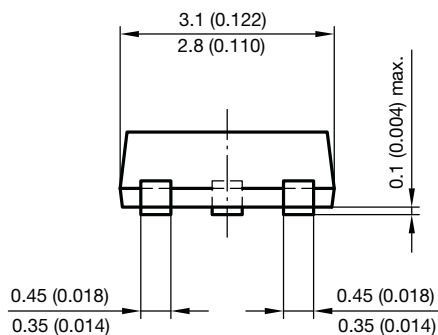
**LAYOUT FOR  $R_{thJA}$  TEST**

Thickness: fiberglass 0.059" (1.5 mm)

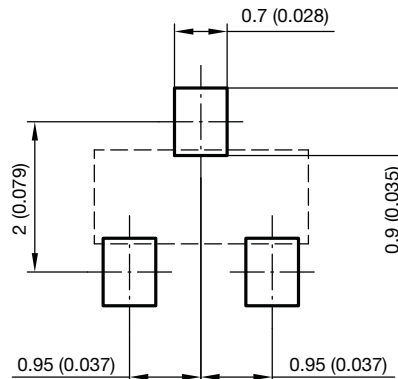
Copper leads 0.012" (0.3 mm)



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



Foot print recommendation:





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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