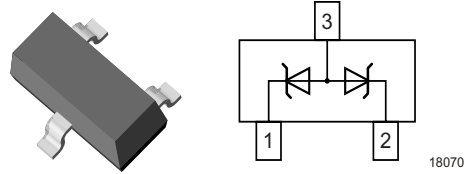


## Small Signal Zener Diodes, Dual

### Features

- These diodes are also available in other case styles and configurations including: the dual diode common cathode configuration with type designation DZ23, the single diode SOT-23 case with the type designation BZX84C, and the single diode SOD-123 case with the type designation BZT52C.
- Dual Silicon Planar Zener Diodes, Common Anode
- The Zener voltages are graded according to the international E 24 standard.
- 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  $\leq 5\%$



### Mechanical Data

**Case:** SOT-23 Plastic case

**Weight:** approx. 8.8 mg

**Packaging Codes/Options:**

GS18 / 10 k per 13 " reel, (8 mm tape), 10 k/box

GS08 / 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 |
|-------------------|----------------|-----------|-------------------|------|
| Power dissipation |                | $P_{tot}$ | 300 <sup>1)</sup> | mW   |

<sup>1)</sup> Device on fiberglass substrate, see layout

### Thermal Characteristics

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

| Parameter                                  | Test condition | Symbol     | Value             | Unit               |
|--|----------------|------------|-------------------|--------------------|
| Thermal resistance junction to ambient air |                | $R_{thJA}$ | 420 <sup>1)</sup> | $^\circ\text{C/W}$ |
| Junction temperature                       |                | $T_j$      | 150               | $^\circ\text{C}$   |
| Storage temperature range                  |                | $T_S$      | - 65 to + 150     | $^\circ\text{C}$   |

<sup>1)</sup> Device on fiberglass substrate, see layout

### Electrical Characteristics

| Partnumber | Marking Code | Zener Voltage Range <sup>1)</sup> |      | Dynamic Resistance  |   | Test Current | Temperature Coefficient of Zener Voltage |                        | Reverse Voltage |
|------------|--------------|-----------------------------------|------|---|---|--------------|--|------------------------|-----------------|
|            |              | $V_Z @ I_{ZT}$                    |      | $r_{zj} @$<br>$I_{ZT} = 5 \text{ mA},$<br>$f = 1 \text{ kHz}$ | $r_{zj} @$<br>$I_{ZT} = 1 \text{ mA},$<br>$f = 1 \text{ kHz}$ |              | $I_{ZT}$                                 | $\alpha_{VZ} @ I_{ZT}$ |                 |
|            |              | V                                 |      | $\Omega$  |   | mA           | $10^{-4}/^\circ\text{C}$                 |                        | V               |
|            |              | min                               | max  |   |   |              | min                                      | max                    |                 |
| AZ23C2V7   | D1           | 2.5                               | 2.9  | 75 (<83)  | <500  | 5            | -9                                       | -4                     | -               |
| AZ23C3V0   | D2           | 2.8                               | 3.2  | 80 (<95)  | <500  | 5            | -9                                       | -3                     | -               |
| AZ23C3V3   | D3           | 3.1                               | 3.5  | 80 (<95)  | <500  | 5            | -8                                       | -3                     | -               |
| AZ23C3V6   | D4           | 3.4                               | 3.8  | 80 (<95)  | <500  | 5            | -8                                       | -3                     | -               |
| AZ23C3V9   | D5           | 3.7                               | 4.1  | 80 (<95)  | <500  | 5            | -7                                       | -3                     | -               |
| AZ23C4V3   | D6           | 4                                 | 4.6  | 80 (<95)  | <500  | 5            | -6                                       | -1                     | -               |
| AZ23C4V7   | D7           | 4.4                               | 5    | 70 (<78)  | <500  | 5            | -5                                       | 2                      | -               |
| AZ23C5V1   | D8           | 4.8                               | 5.4  | 30 (<60)  | <480  | 5            | -3                                       | 4                      | >0.8            |
| AZ23C5V6   | D9           | 5.2                               | 6    | 10 (<40)  | <400  | 5            | -2                                       | 6                      | >1              |
| AZ23C6V2   | D10          | 5.8                               | 6.6  | 4.8 (<10)   | <200  | 5            | -1                                       | 7                      | >2              |
| AZ23C6V8   | D11          | 6.4                               | 7.2  | 4.5 (<8)  | <150  | 5            | 2  | 7                      | >3              |
| AZ23C7V5   | D12          | 7                                 | 7.9  | 4 (<7)  | <50   | 5            | -3                                       | 7                      | >5              |
| AZ23C8V2   | D13          | 7.7                               | 8.7  | 4.5 (<7)  | <50   | 5            | 4  | 7                      | >6              |
| AZ23C9V1   | D14          | 8.5                               | 9.6  | 4.8 (<10)   | <50   | 5            | 5  | 8                      | >7              |
| AZ23C10    | D15          | 9.4                               | 10.6 | 5.2 (<15)   | <70   | 5            | 5  | 8                      | >7.5            |
| AZ23C11    | D16          | 10.4                              | 11.6 | 6 (<20)   | <70   | 5            | 5  | 9                      | >8.5            |
| AZ23C12    | D17          | 11.4                              | 12.7 | 7 (<20)   | <90   | 5            | 6  | 9                      | >9              |
| AZ23C13    | D18          | 12.4                              | 14.1 | 9 (<25)   | <110  | 5            | 7  | 9                      | >10             |
| AZ23C15    | D19          | 13.8                              | 15.6 | 11 (<30)  | <110  | 5            | 7  | 9                      | >11             |
| AZ23C16    | D20          | 15.3                              | 17.1 | 13 (<40)  | <170  | 5            | 8  | 9.5                    | >12             |
| AZ23C18    | D21          | 16.8                              | 19.1 | 18 (<50)  | <170  | 5            | 8  | 9.5                    | >14             |
| AZ23C20    | D22          | 18.8                              | 21.2 | 20 (<50)  | <220  | 5            | 8  | 10                     | >15             |
| AZ23C22    | D23          | 20.8                              | 23.3 | 25 (<55)  | <220  | 5            | 8  | 10                     | >17             |
| AZ23C24    | D24          | 22.8                              | 25.6 | 28 (<80)  | <220  | 5            | 8  | 10                     | >18             |
| AZ23C27    | D25          | 25.1                              | 28.9 | 30 (<80)  | <250  | 5            | 8  | 10                     | >20             |
| AZ23C30    | D26          | 28                                | 32   | 35 (<80)  | <250  | 5            | 8  | 10                     | >22.5           |
| AZ23C33    | D27          | 31                                | 35   | 40 (<80)  | <250  | 5            | 8  | 10                     | >25             |
| AZ23C36    | D28          | 34                                | 38   | 40 (<90)  | <250  | 5            | 8  | 10                     | >27             |
| AZ23C39    | D29          | 37                                | 41   | 50 (<90)  | <300  | 5            | 10                                       | 12                     | >29             |
| AZ23C43    | D30          | 40                                | 46   | 60 (<100)   | <700  | 5            | 10                                       | 12                     | >32             |
| AZ23C47    | D31          | 44                                | 50   | 70 (<100)   | <750  | 5            | 10                                       | 12                     | >35             |
| AZ23C51    | D32          | 48                                | 54   | 70 (<100)   | <750  | 5            | 10                                       | 12                     | >38             |

<sup>1)</sup> Tested with pulses  $t_p = 5 \text{ ms}$



## Electrical Characteristics

| Partnumber | Marking Code | Zener Voltage Range <sup>1)</sup> |      | Dynamic Resistance                                  |   | Test Current<br>$I_{ZT}$ | Temperature Coefficient of Zener Voltage |                          | Reverse Voltage<br>$V_R @ I_R = 100 \text{ nA}$ |
|------------|--------------|-----------------------------------|------|---|---|--------------------------|--|--------------------------|---|
|            |              | $V_Z @ I_{ZT}$                    |      | $r_{zj} @ I_{ZT} = 5 \text{ mA}, f = 1 \text{ kHz}$ | $r_{zj} @ I_{ZT} = 1 \text{ mA}, f = 1 \text{ kHz}$ |                          | $\alpha_{VZ} @ I_{ZT}$                   |                          |   |
|            |              | V                                 |      | $\Omega$  |   |                          | mA                                       | $10^{-4}/^\circ\text{C}$ |   |
|            |              | min                               | max  |   |   |                          | min                                      | max                      |   |
| AZ23B2V7   | D1           | 2.65                              | 2.75 | 75 (<83)  | <500  | 5                        | -9                                       | -4                       | -   |
| AZ23B3V0   | D2           | 2.94                              | 3.06 | 80 (<95)  | <500  | 5                        | -9                                       | -3                       | -   |
| AZ23B3V3   | D3           | 3.23                              | 3.37 | 80 (<95)  | <500  | 5                        | -8                                       | -3                       | -   |
| AZ23B3V6   | D4           | 3.53                              | 3.67 | 80 (<95)  | <500  | 5                        | -8                                       | -3                       | -   |
| AZ23B3V9   | D5           | 3.82                              | 3.98 | 80 (<95)  | <500  | 5                        | -7                                       | -3                       | -   |
| AZ23B4V3   | D6           | 4.21                              | 4.39 | 80 (<95)  | <500  | 5                        | -6                                       | -1                       | -   |
| AZ23B4V7   | D7           | 4.61                              | 4.79 | 70 (<78)  | <500  | 5                        | -5                                       | 2                        | -   |
| AZ23B5V1   | D8           | 5                                 | 5.2  | 30 (<60)  | <480  | 5                        | -3                                       | 4                        | >0.8  |
| AZ23B5V6   | D9           | 5.49                              | 5.71 | 10 (<40)  | <400  | 5                        | -2                                       | 6                        | >1  |
| AZ23B6V2   | D10          | 6.08                              | 6.32 | 4.8 (<10)   | <200  | 5                        | -1                                       | 7                        | >2  |
| AZ23B6V8   | D11          | 6.66                              | 6.94 | 4.5 (<8)  | <150  | 5                        | 2  | 7                        | >3  |
| AZ23B7V5   | D12          | 7.35                              | 7.65 | 4 (<7)  | <50   | 5                        | -3                                       | 7                        | >5  |
| AZ23B8V2   | D13          | 8.04                              | 8.36 | 4.5 (<7)  | <50   | 5                        | 4  | 7                        | >6  |
| AZ23B9V1   | D14          | 8.92                              | 9.28 | 4.8 (<10)   | <50   | 5                        | 5  | 8                        | >7  |
| AZ23B10    | D15          | 9.8                               | 10.2 | 5.2 (<15)   | <70   | 5                        | 5  | 8                        | >7.5  |
| AZ23B11    | D16          | 10.8                              | 11.2 | 6 (<20)   | <70   | 5                        | 5  | 9                        | >8.5  |
| AZ23B12    | D17          | 11.8                              | 12.2 | 7 (<20)   | <90   | 5                        | 6  | 9                        | >9  |
| AZ23B13    | D18          | 12.7                              | 13.3 | 9 (<25)   | <110  | 5                        | 7  | 9                        | >10   |
| AZ23B15    | D19          | 14.7                              | 15.3 | 11 (<30)  | <110  | 5                        | 7  | 9                        | >11   |
| AZ23B16    | D20          | 15.7                              | 16.3 | 13 (<40)  | <170  | 5                        | 8  | 0.5                      | >12   |
| AZ23B18    | D21          | 17.6                              | 18.4 | 18 (<50)  | <170  | 5                        | 8  | 0.5                      | >14   |
| AZ23B20    | D22          | 19.6                              | 20.4 | 20 (<50)  | <220  | 5                        | 8  | 10                       | >15   |
| AZ23B22    | D23          | 21.6                              | 22.4 | 25 (<55)  | <220  | 5                        | 8  | 10                       | >17   |
| AZ23B24    | D24          | 23.5                              | 24.5 | 28 (<80)  | <220  | 5                        | 8  | 10                       | >18   |
| AZ23B27    | D25          | 26.5                              | 27.5 | 30 (<80)  | <250  | 5                        | 8  | 10                       | >20   |
| AZ23B30    | D26          | 29.4                              | 30.6 | 35 (<80)  | <250  | 5                        | 8  | 10                       | >22.5   |
| AZ23B33    | D27          | 32.3                              | 33.7 | 40 (<80)  | <250  | 5                        | 8  | 10                       | >25   |
| AZ23B36    | D28          | 35.3                              | 36.7 | 40 (<90)  | <250  | 5                        | 8  | 10                       | >27   |
| AZ23B39    | D29          | 38.2                              | 39.8 | 50 (<90)  | <300  | 5                        | 10                                       | 12                       | >29   |
| AZ23B43    | D30          | 42.1                              | 43.9 | 60 (<100)   | <700  | 5                        | 10                                       | 12                       | >32   |
| AZ23B47    | D31          | 46.1                              | 47.9 | 70 (<100)   | <750  | 5                        | 10                                       | 12                       | >35   |
| AZ23B51    | D32          | 50                                | 52   | 70 (<100)   | <750  | 5                        | 10                                       | 12                       | >38   |

<sup>1)</sup> Tested with pulses  $t_p = 5 \text{ ms}$

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

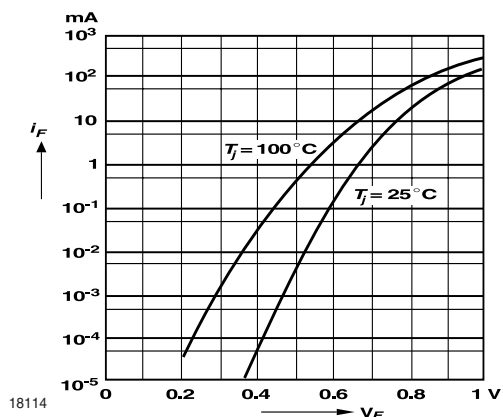


Figure 1. Forward characteristics

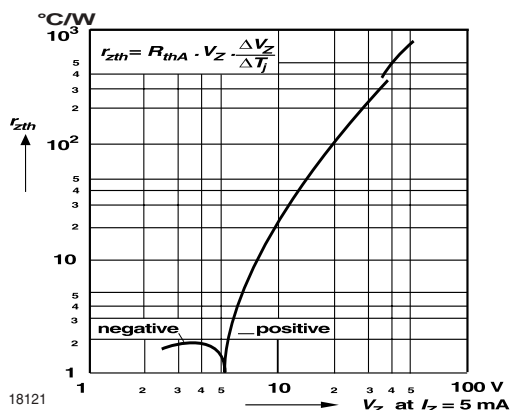


Figure 4. Thermal Differential Resistance vs. Zener Voltage

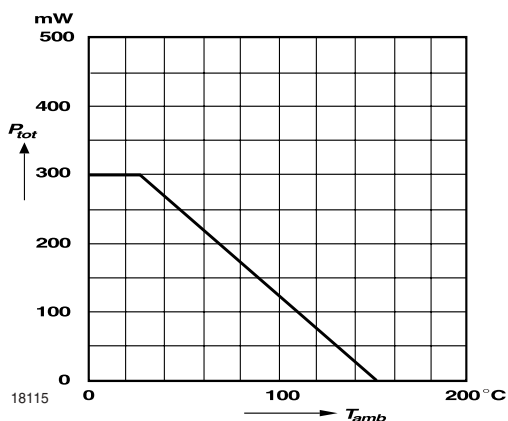


Figure 2. Admissible Power Dissipation vs. Ambient Temperature

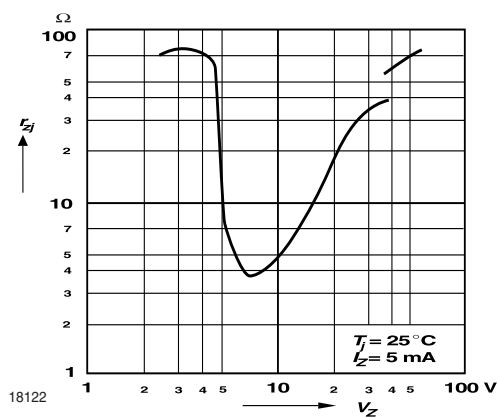


Figure 5. Dynamic Resistance vs. Zener Voltage

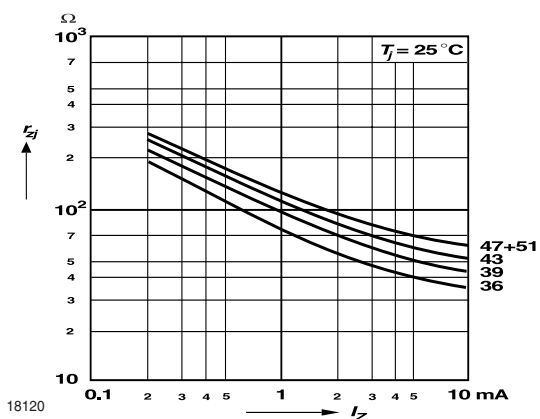


Figure 3. Dynamic Resistance vs. Zener Current

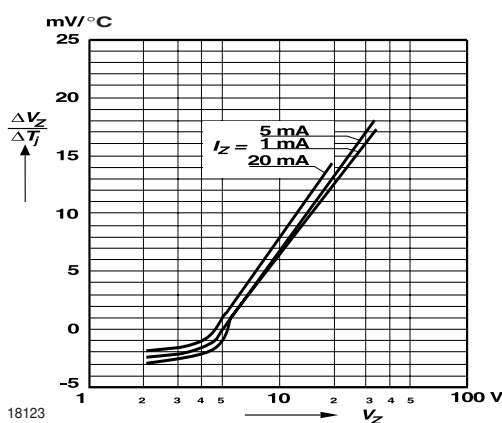


Figure 6. Temperature Dependence of Zener Voltage vs. Zener Voltage

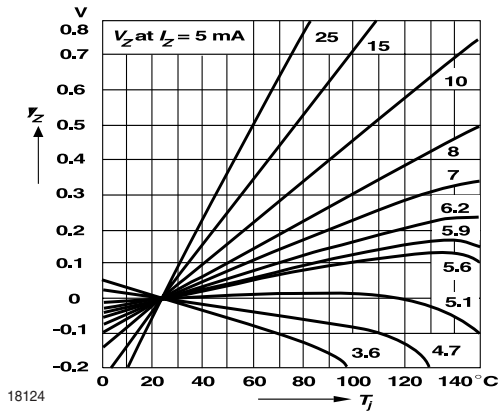


Figure 7. Change of Zener Voltage vs. Junction Temperature

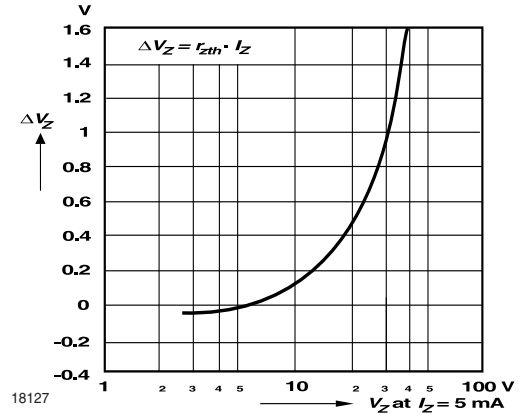


Figure 10. Change of Zener voltage from turn-on up to the point of thermal equilibrium vs. Zener voltage

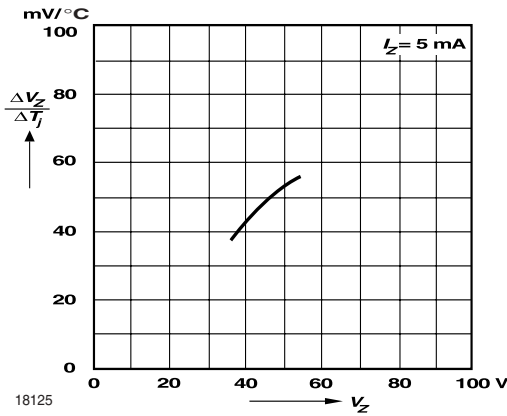


Figure 8. Temperature Dependence of Zener Voltage vs. Zener Voltage

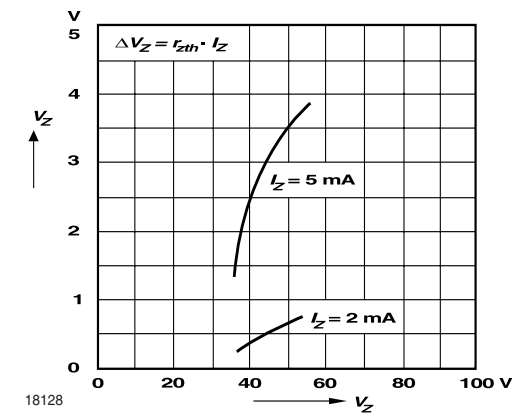


Figure 11. Change of Zener voltage from turn-on up to the point of thermal equilibrium vs. Zener voltage

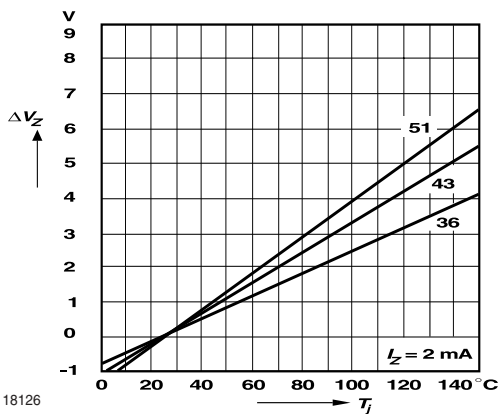
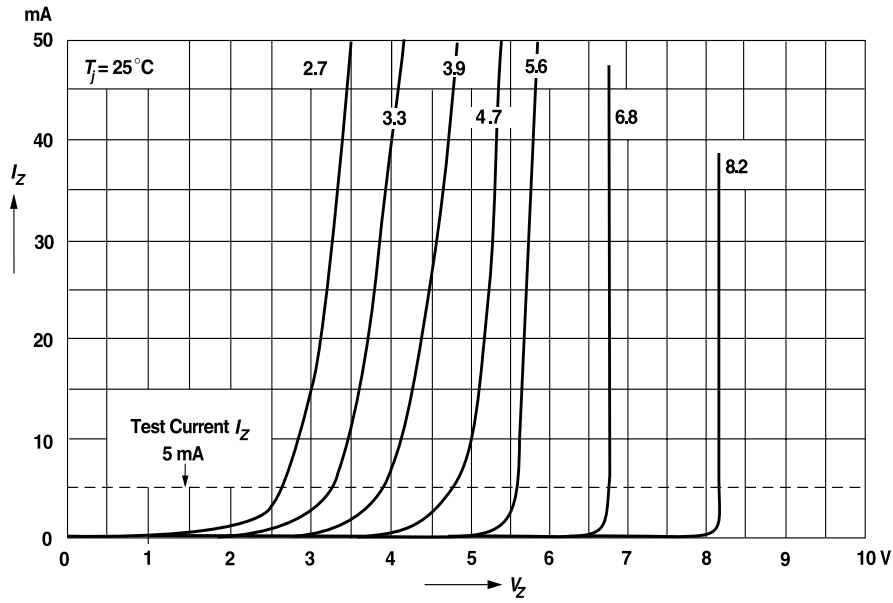
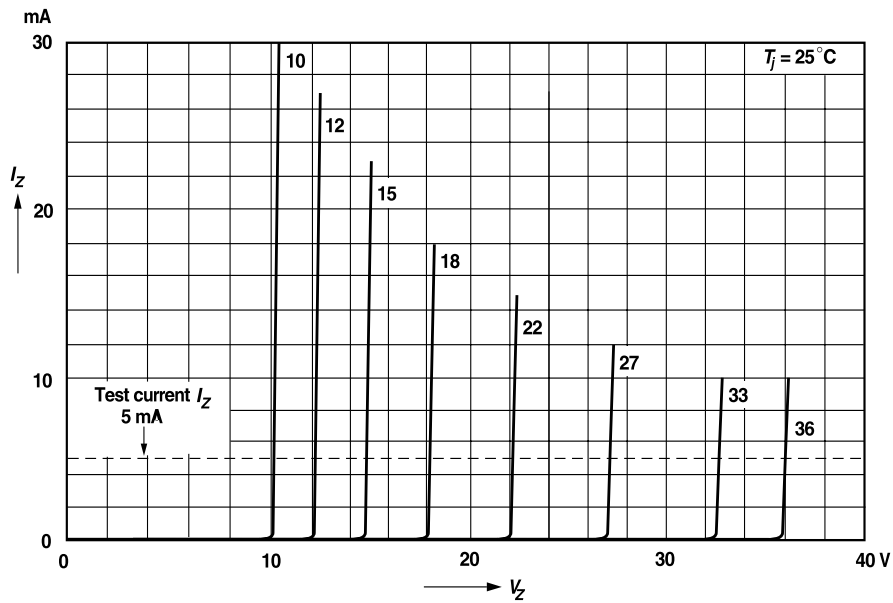


Figure 9. Change of Zener Voltage vs. Junction Temperature



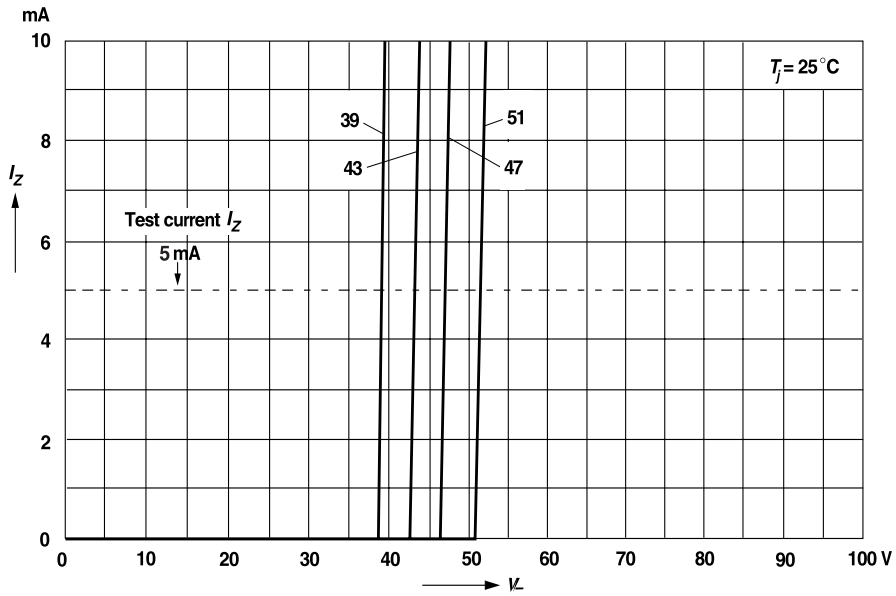
18111

Figure 12. Breakdown Characteristics



18112

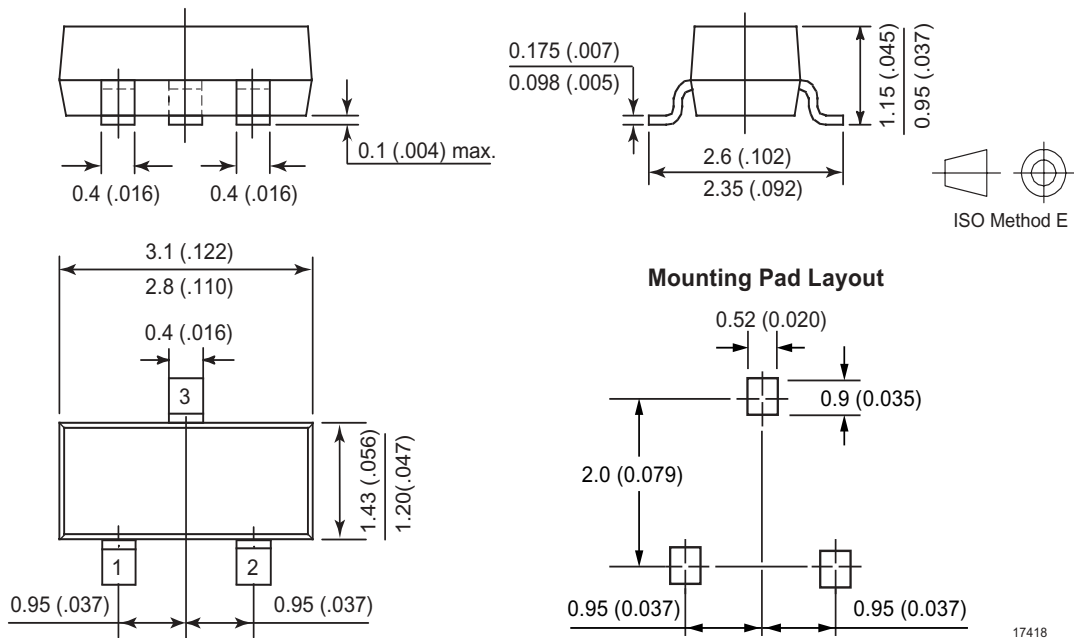
Figure 13. Breakdown Characteristics



18113

Figure 14. Breakdown Characteristics

## Package Dimensions in mm (Inches)



17418

### Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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