

## Small Signal Zener Diodes



### FEATURES

- Very sharp reverse characteristic
- Very high stability
- Electrical data identical with the devices 1N5221B to 1N5267B
- Low reverse current level
- Standard Zener voltage tolerance  $\pm 5\%$
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### LINKS TO ADDITIONAL RESOURCES



3D Models



Marking



Parametric Search



Order Samples

### APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS |                     |      |
|-------------------------|---------------------|------|
| PARAMETER               | VALUE               | UNIT |
| $V_Z$ range nom.        | 2.4 to 75           | V    |
| Test current $I_{ZT}$   | 1.7 to 20           | mA   |
| $V_Z$ specification     | Thermal equilibrium |      |
| Circuit configuration   | Single              |      |

| ORDERING INFORMATION |                                  |                                |                        |
|----------------------|----------------------------------|--------------------------------|------------------------|
| DEVICE NAME          | ORDERING CODE                    | TAPED UNITS PER REEL           | MINIMUM ORDER QUANTITY |
| TZM5221B to TZM5267B | TZM5221B to TZM5267B-series-GS18 | 10 000 (8 mm tape on 13" reel) | 10 000/box             |
| TZM5221B to TZM5267B | TZM5221B to TZM5267B-series-GS08 | 2500 (8 mm tape on 7" reel)    | 12 500/box             |

| PACKAGE           |               |                                      |                                   |                              |
|-------------------|---------------|--------------------------------------|-----------------------------------|------------------------------|
| PACKAGE NAME      | WEIGHT        | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL        | SOLDERING CONDITIONS         |
| MiniMELF (SOD-80) | approx. 31 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

| ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified) |                                    |            |               |      |
|---|------------------------------------|------------|---------------|------|
| PARAMETER   | TEST CONDITION                     | SYMBOL     | VALUE         | UNIT |
| Power dissipation   | $R_{thJA} = < 300\text{ K/W}$      | $P_{tot}$  | 500           | mW   |
| Zener current   |                                    | $I_Z$      | $P_{tot}/V_Z$ | mA   |
| Junction to ambient air   | On PC board 50 mm x 50 mm x 1.6 mm | $R_{thJA}$ | 500           | K/W  |
| Junction temperature  |                                    | $T_j$      | 175           | °C   |
| Storage temperature range   |                                    | $T_{stg}$  | -65 to +175   | °C   |
| Forward voltage (max.)  | $I_F = 200\text{ mA}$              | $V_F$      | 1.1           | V    |



| ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |                                    |                  |                  |                                  |     |                                    |                                     |                         |
|---|------------------------------------|------------------|------------------|----------------------------------|-----|------------------------------------|-------------------------------------|-------------------------|
| PART NUMBER   | ZENER VOLTAGE RANGE <sup>(1)</sup> | TEST CURRENT     |                  | REVERSE LEAKAGE CURRENT          |     | DYNAMIC RESISTANCE                 |                                     | TEMPERATURE COEFFICIENT |
|   | V <sub>Z</sub> at I <sub>ZT1</sub> | I <sub>ZT1</sub> | I <sub>ZT2</sub> | I <sub>R</sub> at V <sub>R</sub> |     | Z <sub>Z</sub> at I <sub>ZT1</sub> | Z <sub>ZK</sub> at I <sub>ZT2</sub> | TK <sub>VZ</sub>        |
|   | V                                  | mA               |                  | µA                               | V   | Ω                                  |                                     |                         |
|   | NOM.                               |                  |                  |                                  |     | TYP.                               | TYP.                                |                         |
| TZM5221   | 2.4                                | 20               | 0.25             | < 100                            | 1   | < 30                               | < 1200                              | < -0.085                |
| TZM5222   | 2.5                                | 20               | 0.25             | < 100                            | 1   | < 30                               | < 1250                              | < -0.085                |
| TZM5223   | 2.7                                | 20               | 0.25             | < 75                             | 1   | < 30                               | < 1300                              | < -0.080                |
| TZM5224   | 2.8                                | 20               | 0.25             | < 75                             | 1   | < 30                               | < 1400                              | < -0.080                |
| TZM5225   | 3                                  | 20               | 0.25             | < 50                             | 1   | < 29                               | < 1600                              | < -0.075                |
| TZM5226   | 3.3                                | 20               | 0.25             | < 25                             | 1   | < 28                               | < 1600                              | < -0.070                |
| TZM5227   | 3.6                                | 20               | 0.25             | < 15                             | 1   | < 24                               | < 1700                              | < -0.065                |
| TZM5228   | 3.9                                | 20               | 0.25             | < 10                             | 1   | < 23                               | < 1900                              | < -0.060                |
| TZM5229   | 4.3                                | 20               | 0.25             | < 5                              | 1   | < 22                               | < 2000                              | < ± 0.055               |
| TZM5230   | 4.7                                | 20               | 0.25             | < 5                              | 2   | < 19                               | < 1900                              | < ± 0.030               |
| TZM5231   | 5.1                                | 20               | 0.25             | < 5                              | 2   | < 17                               | < 1600                              | < ± 0.030               |
| TZM5232   | 5.6                                | 20               | 0.25             | < 5                              | 3   | < 11                               | < 1600                              | < +0.038                |
| TZM5233   | 6                                  | 20               | 0.25             | < 5                              | 3.5 | < 7                                | < 1600                              | < +0.038                |
| TZM5234   | 6.2                                | 20               | 0.25             | < 5                              | 4   | < 7                                | < 1000                              | < +0.045                |
| TZM5235   | 6.8                                | 20               | 0.25             | < 3                              | 5   | < 5                                | < 750                               | < +0.050                |
| TZM5236   | 7.5                                | 20               | 0.25             | < 3                              | 6   | < 6                                | < 500                               | < +0.058                |
| TZM5237   | 8.2                                | 20               | 0.25             | < 3                              | 6.5 | < 8                                | < 500                               | < +0.062                |
| TZM5238   | 8.7                                | 20               | 0.25             | < 3                              | 6.5 | < 8                                | < 600                               | < +0.065                |
| TZM5239   | 9.1                                | 20               | 0.25             | < 3                              | 7   | < 10                               | < 600                               | < +0.068                |
| TZM5240   | 10                                 | 20               | 0.25             | < 3                              | 8   | < 17                               | < 600                               | < +0.075                |
| TZM5241   | 11                                 | 20               | 0.25             | < 2                              | 8.4 | < 22                               | < 600                               | < +0.076                |
| TZM5242   | 12                                 | 20               | 0.25             | < 1                              | 9.1 | < 30                               | < 600                               | < +0.077                |
| TZM5243   | 13                                 | 9.5              | 0.25             | < 0.5                            | 9.9 | < 13                               | < 600                               | < +0.079                |
| TZM5244   | 14                                 | 9                | 0.25             | < 0.1                            | 10  | < 15                               | < 600                               | < +0.082                |
| TZM5245   | 15                                 | 8.5              | 0.25             | < 0.1                            | 11  | < 16                               | < 600                               | < +0.082                |
| TZM5246   | 16                                 | 7.8              | 0.25             | < 0.1                            | 12  | < 17                               | < 600                               | < +0.083                |
| TZM5247   | 17                                 | 7.4              | 0.25             | < 0.1                            | 13  | < 19                               | < 600                               | < +0.084                |
| TZM5248   | 18                                 | 7                | 0.25             | < 0.1                            | 14  | < 21                               | < 600                               | < +0.085                |
| TZM5249   | 19                                 | 6.6              | 0.25             | < 0.1                            | 14  | < 23                               | < 600                               | < +0.086                |
| TZM5250   | 20                                 | 6.2              | 0.25             | < 0.1                            | 15  | < 25                               | < 600                               | < +0.086                |
| TZM5251   | 22                                 | 5.6              | 0.25             | < 0.1                            | 17  | < 29                               | < 600                               | < +0.087                |
| TZM5252   | 24                                 | 5.2              | 0.25             | < 0.1                            | 18  | < 33                               | < 600                               | < +0.088                |
| TZM5253   | 25                                 | 5                | 0.25             | < 0.1                            | 19  | < 35                               | < 600                               | < +0.089                |
| TZM5254   | 27                                 | 4.6              | 0.25             | < 0.1                            | 21  | < 41                               | < 600                               | < +0.090                |
| TZM5255   | 28                                 | 4.5              | 0.25             | < 0.1                            | 21  | < 44                               | < 600                               | < +0.091                |
| TZM5256   | 30                                 | 4.2              | 0.25             | < 0.1                            | 23  | < 49                               | < 600                               | < +0.091                |
| TZM5257   | 33                                 | 3.8              | 0.25             | < 0.1                            | 25  | < 58                               | < 700                               | < +0.092                |
| TZM5258   | 36                                 | 3.4              | 0.25             | < 0.1                            | 27  | < 70                               | < 700                               | < +0.093                |
| TZM5259   | 39                                 | 3.2              | 0.25             | < 0.1                            | 30  | < 80                               | < 800                               | < +0.094                |
| TZM5260   | 43                                 | 3                | 0.25             | < 0.1                            | 33  | < 93                               | < 900                               | < +0.095                |
| TZM5261   | 47                                 | 2.7              | 0.25             | < 0.1                            | 36  | 105                                | < 1000                              | < +0.095                |
| TZM5262   | 51                                 | 2.5              | 0.25             | < 0.1                            | 39  | 125                                | < 1100                              | < +0.096                |
| TZM5263   | 56                                 | 2.2              | 0.25             | < 0.1                            | 43  | 150                                | < 1300                              | < +0.096                |
| TZM5264   | 60                                 | 2.1              | 0.25             | < 0.1                            | 46  | 170                                | < 1400                              | < +0.097                |
| TZM5265   | 62                                 | 2                | 0.25             | < 0.1                            | 47  | 185                                | < 1400                              | < +0.097                |
| TZM5266   | 68                                 | 1.8              | 0.25             | < 0.1                            | 52  | 230                                | < 1600                              | < +0.097                |
| TZM5267   | 75                                 | 1.7              | 0.25             | < 0.1                            | 56  | 270                                | < 1700                              | < +0.098                |

**Note**

<sup>(1)</sup> Based on DC measurement at thermal equilibrium; case temperature maintained at 30 °C ± 2 °C



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

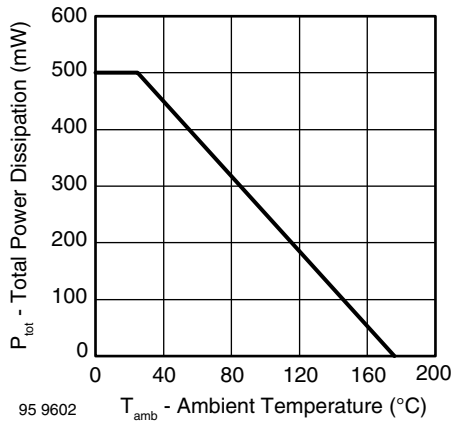


Fig. 1 - Total Power Dissipation vs. Ambient Temperature

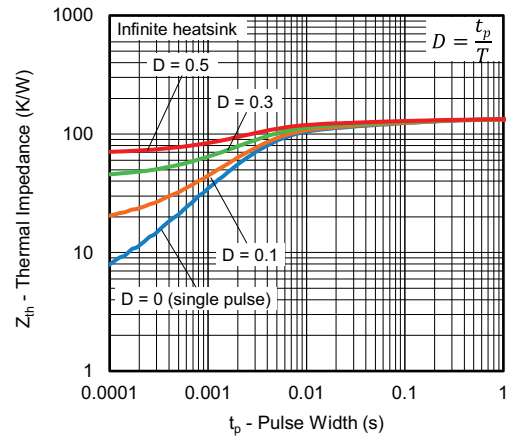


Fig. 2 - Typical Thermal Response

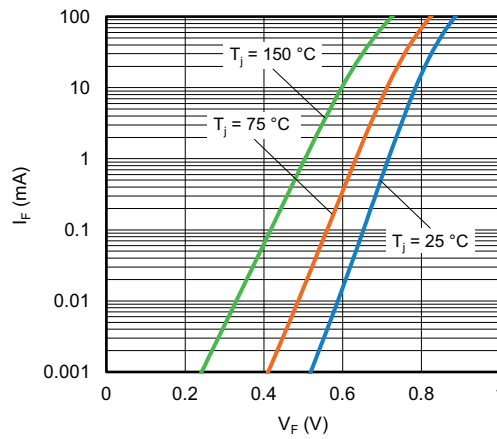
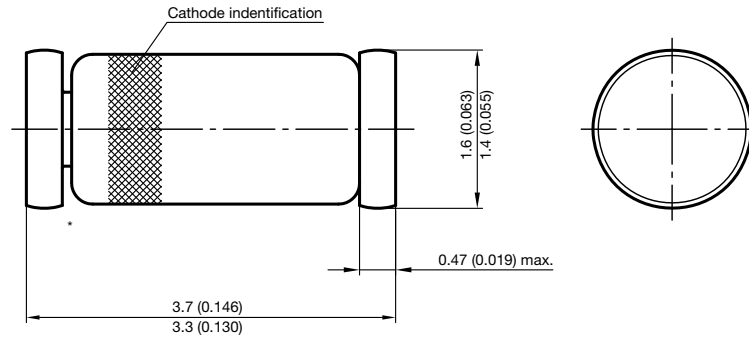


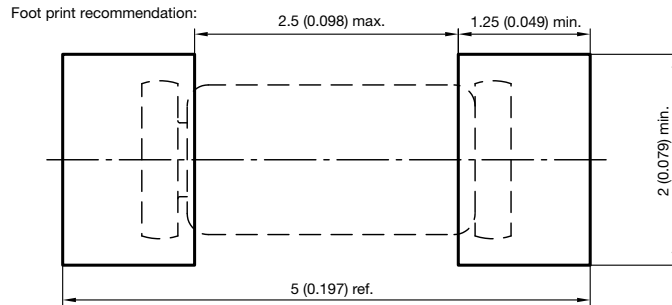
Fig. 3 - Typical Forward Current  $I_F$  vs. Forward Voltage  $V_F$



## PACKAGE DIMENSIONS in millimeters (inches): MiniMELF (SOD-80)



\* The gap between plug and glass can be either on cathode or anode side



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