

## Vishay Semiconductors

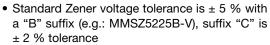
# **Small Signal Zener Diodes**



| PRIMARY CHARACTERISTICS      |                     |      |  |  |  |
|------------------------------|---------------------|------|--|--|--|
| PARAMETER                    | VALUE               | UNIT |  |  |  |
| V <sub>Z</sub> range nom.    | 3.3 to 75           | V    |  |  |  |
| Test current I <sub>ZT</sub> | 1.7 to 20           | mA   |  |  |  |
| V <sub>Z</sub> specification | Thermal equilibrium |      |  |  |  |
| Int. construction            | Single              |      |  |  |  |

#### **FEATURES**

· Silicon planar power Zener diodes





- These diodes are also available in MiniMELF case with the designation TZM5225 to COMPLIANT TZM5267, DO-35 case with type designation 1N5225 to 1N5267 and SOT-23 case with the type designation MMBZ5225-V to MMBZ5267-V
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

| ORDERING INFORMATION      |   |                                |                        |  |  |  |
|---------------------------|---|--------------------------------|------------------------|--|--|--|
| DEVICE NAME ORDERING CODE |   | TAPED UNITS PER REEL           | MINIMUM ORDER QUANTITY |  |  |  |
| MMSZ5225-V to MMSZ5267-V  | MMSZ5225-V to<br>MMSZ5267-V-series-GS18 | 10 000 (8 mm tape on 13" reel) | 10 000/box             |  |  |  |
| MMSZ5225-V to MMSZ5267-V  | MMSZ5225-V to<br>MMSZ5267-V-series-GS08 | 3000 (8 mm tape on 7" reel)    | 15 000/box             |  |  |  |

| PACKAGE               |         |                                      |                                   |                          |  |  |
|-----------------------|---------|--------------------------------------|-----------------------------------|--------------------------|--|--|
| PACKAGE NAME   WEIGHT |         | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY<br>LEVEL     | SOLDERING<br>CONDITIONS  |  |  |
| SOD-123               | 10.3 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | 260 °C/10 s at terminals |  |  |

| ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |   |                      |               |      |  |  |
|---|---|----------------------|---------------|------|--|--|
| PARAMETER   | TEST CONDITION  | SYMBOL               | VALUE         | UNIT |  |  |
| Power dissipation   | $T_L$ = 75 °C, on FR - 4 or FR - 5 board with minimum recommended solder pad layout | P <sub>tot</sub> 500 |               | mW   |  |  |
| Zener current   | See table "Characteristics"   |                      |               |      |  |  |
| Thermal resistance junction to ambient air                                      | On FR - 4 or FR - 5 board with minimum recommended solder pad layout                | R <sub>thJA</sub>    | 340           | K/W  |  |  |
| Junction temperature, maximum   |   | Tj                   | 150           |      |  |  |
| Operating temperature range   |   | Tj                   | - 55 to + 150 | °C   |  |  |
| Storage temperature range   |   | T <sub>stg</sub>     | - 65 to + 150 |      |  |  |



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| <b>ELECTRICAL CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified) |                 |                                    |                  |                  |                               |                  |                                    |                                     |                            |
|--|-----------------|------------------------------------|------------------|------------------|-------------------------------|------------------|------------------------------------|-------------------------------------|----------------------------|
| MARKING  |                 | ZENER VOLTAGE<br>RANGE (1)         | TEST<br>CURRENT  |                  | REVERSE<br>LAEKAGE<br>CURRENT |                  | DYNAMIC<br>RESISTANCE (2)          |                                     | TEMPERATURE<br>COEFFICIENT |
| PART NUMBER  | MARKING<br>CODE | V <sub>Z</sub> at I <sub>ZT1</sub> | I <sub>ZT1</sub> | I <sub>ZT2</sub> | I <sub>R</sub> a              | t V <sub>R</sub> | Z <sub>Z</sub> at I <sub>ZT1</sub> | Z <sub>ZK</sub> at I <sub>ZT2</sub> | ανΖ                        |
|  |                 | V                                  | m                | Α                | μA                            | V                | !                                  | Ω                                   | %/°C                       |
|  |                 | NOM.                               |                  |                  | MAX.                          |                  | MAX.                               | MAX.                                | TYP.                       |
| MMSZ5225   | C5              | 3                                  | 20               | 0.25             | 50                            | 1                | 30                                 | 1600                                | - 0.075                    |
| MMSZ5226   | D1              | 3.3                                | 20               | 0.25             | 25                            | 1                | 28                                 | 1600                                | - 0.07                     |
| MMSZ5227   | D2              | 3.6                                | 20               | 0.25             | 15                            | 1                | 24                                 | 1700                                | - 0.065                    |
| MMSZ5228   | D3              | 3.9                                | 20               | 0.25             | 10                            | 1                | 23                                 | 1900                                | - 0.06                     |
| MMSZ5229   | D4              | 4.3                                | 20               | 0.25             | 5                             | 1                | 22                                 | 2000                                | - 0.055                    |
| MMSZ5230   | D5              | 4.7                                | 20               | 0.25             | 5                             | 2                | 19                                 | 1900                                | ± 0.030                    |
| MMSZ5231   | E1              | 5.1                                | 20               | 0.25             | 5                             | 2                | 17                                 | 1600                                | ± 0.030                    |
| MMSZ5232   | E2              | 5.6                                | 20               | 0.25             | 5                             | 3                | 11                                 | 1600                                | 0.038                      |
| MMSZ5233   | E3              | 6                                  | 20               | 0.25             | 5                             | 3.5              | 7                                  | 1600                                | 0.038                      |
| MMSZ5234   | E4              | 6.2                                | 20               | 0.25             | 5                             | 4                | 7                                  | 1000                                | 0.045                      |
| MMSZ5235   | E5              | 6.8                                | 20               | 0.25             | 3                             | 5                | 5                                  | 750                                 | 0.05                       |
| MMSZ5236   | F1              | 7.5                                | 20               | 0.25             | 3                             | 6                | 6                                  | 500                                 | 0.058                      |
| MMSZ5237   | F2              | 8.2                                | 20               | 0.25             | 3                             | 6.5              | 8                                  | 500                                 | 0.062                      |
| MMSZ5238   | F3              | 8.7                                | 20               | 0.25             | 3                             | 6.5              | 8                                  | 600                                 | 0.065                      |
| MMSZ5239   | F4              | 9.1                                | 20               | 0.25             | 3                             | 7                | 10                                 | 600                                 | 0.068                      |
| MMSZ5240   | F5              | 10                                 | 20               | 0.25             | 3                             | 8                | 17                                 | 600                                 | 0.075                      |
| MMSZ5241   | H1              | 11                                 | 20               | 0.25             | 2                             | 8.4              | 22                                 | 600                                 | 0.076                      |
| MMSZ5242   | H2              | 12                                 | 20               | 0.25             | 1                             | 9.1              | 30                                 | 600                                 | 0.077                      |
| MMSZ5243   | НЗ              | 13                                 | 9.5              | 0.25             | 0.5                           | 9.9              | 13                                 | 600                                 | 0.079                      |
| MMSZ5244   | H4              | 14                                 | 9                | 0.25             | 0.1                           | 10               | 15                                 | 600                                 | 0.082                      |
| MMSZ5245   | H5              | 15                                 | 8.5              | 0.25             | 0.1                           | 11               | 16                                 | 600                                 | 0.082                      |
| MMSZ5246   | J1              | 16                                 | 7.8              | 0.25             | 0.1                           | 12               | 17                                 | 600                                 | 0.083                      |
| MMSZ5247   | J2              | 17                                 | 7.4              | 0.25             | 0.1                           | 13               | 19                                 | 600                                 | 0.084                      |
| MMSZ5248   | J3              | 18                                 | 7                | 0.25             | 0.1                           | 14               | 21                                 | 600                                 | 0.085                      |
| MMSZ5249   | J4              | 19                                 | 6.6              | 0.25             | 0.1                           | 14               | 23                                 | 600                                 | 0.086                      |
| MMSZ5250   | J5              | 20                                 | 6.2              | 0.25             | 0.1                           | 15               | 25                                 | 600                                 | 0.086                      |
| MMSZ5251   | K1              | 22                                 | 5.6              | 0.25             | 0.1                           | 17               | 29                                 | 600                                 | 0.087                      |
| MMSZ5252   | K2              | 24                                 | 5.2              | 0.25             | 0.1                           | 18               | 33                                 | 600                                 | 0.087                      |
| MMSZ5253   | K3              | 25                                 | 5                | 0.25             | 0.1                           | 19               | 35                                 | 600                                 | 0.089                      |
| MMSZ5254   | K4              | 27                                 | 4.6              | 0.25             | 0.1                           | 21               | 41                                 | 600                                 | 0.09                       |
| MMSZ5255   | K5              | 28                                 | 4.5              | 0.25             | 0.1                           | 21               | 44                                 | 600                                 | 0.091                      |
| MMSZ5256   | M1              | 30                                 | 4.2              | 0.25             | 0.1                           | 23               | 49                                 | 600                                 | 0.091                      |
| MMSZ5257   | M2              | 33                                 | 3.8              | 0.25             | 0.1                           | 25               | 58                                 | 700                                 | 0.092                      |
| MMSZ5258   | M3              | 36                                 | 3.4              | 0.25             | 0.1                           | 27               | 70                                 | 700                                 | 0.093                      |
| MMSZ5259   | M4              | 39                                 | 3.2              | 0.25             | 0.1                           | 30               | 80                                 | 800                                 | 0.094                      |
| MMSZ5260   | M5              | 43                                 | 3                | 0.25             | 0.1                           | 33               | 93                                 | 900                                 | 0.095                      |
| MMSZ5261   | N1              | 47                                 | 2.7              | 0.25             | 0.1                           | 36               | 105                                | 1000                                | 0.095                      |
| MMSZ5262   | N2              | 51                                 | 2.5              | 0.25             | 0.1                           | 39               | 125                                | 1100                                | 0.096                      |
| MMSZ5263   | N3              | 56                                 | 2.2              | 0.25             | 0.1                           | 43               | 150                                | 1300                                | 0.096                      |
| MMSZ5264   | N4              | 60                                 | 2.1              | 0.25             | 0.1                           | 46               | 170                                | 1400                                | 0.097                      |
| MMSZ5265   | N5              | 62                                 | 2                | 0.25             | 0.1                           | 47               | 185                                | 1400                                | 0.097                      |
| MMSZ5266   | P1              | 68                                 | 1.8              | 0.25             | 0.1                           | 52               | 230                                | 1600                                | 0.097                      |
| MMSZ5267   | P2              | 75                                 | 1.7              | 0.25             | 0.1                           | 56               | 270                                | 1700                                | 0.098                      |

#### Notes

Maximum V<sub>F</sub> = 0.9 V, at I<sub>F</sub> = 10 mA

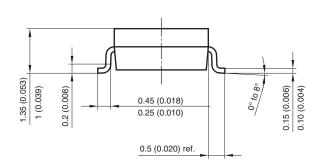
<sup>(1)</sup> Measured with device junction in thermal equilibrium

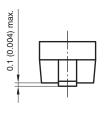
The Zener Impedance is derived from the 1 kHz AC voltage which results when an AC current having an RMS value equal to 10 % of the Zener current (I<sub>ZT1</sub> or I<sub>ZT2</sub>) is superimposed on I<sub>ZT1</sub> or I<sub>ZT2</sub>. Zener Impedance is measured at two points to insure a sharp knee on the breakdown curve and to eliminate unstable units



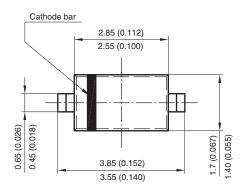
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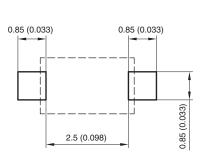
#### PACKAGE DIMENSIONS in millimeters (inches): SOD-123





Mounting Pad Layout





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