# Small Signal Zener Diodes



## FEATURES

- Silicon planar Zener diodes
- Standard Zener voltage tolerance is ± 5 % with a “B” suffix (e.g.: MMSZ5225B), suffix “C” is ± 2 % tolerance
- AEC-Q101 qualified
- ESD capability according to AEC-Q101:
  Human body model > 8 kV
  Machine model > 800 V
- Base P/N-E3 - RoHS-compliant, commercial grade
- Base P/N-HE3 - RoHS-compliant, AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

| PRIMARY CHARACTERISTICS | | |
|---|---|---|
| PARAMETER | VALUE | UNIT |
| $V_Z$ range nom. | 3.3 to 75 | V |
| Test current $I_{ZT}$ | 1.7 to 20 | mA |
| $V_Z$ specification | Thermal equilibrium | |
| Int. construction | Single | |

| ORDERING INFORMATION | | | |
|---|---|---|---|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| MMSZ5225 to MMSZ5267 | MMSZ5225B-E3-08 to MMSZ5267B-E3-08 | 3000 (8 mm tape on 7" reel) | 15 000/box |
| | MMSZ5225C-E3-08 to MMSZ5267C-E3-08 | | |
| | MMSZ5225B-HE3-08 to MMSZ5267B-HE3-08 | | |
| | MMSZ5225C-HE3-08 to MMSZ5267C-HE3-08 | | |
| | MMSZ5225B-E3-18 to MMSZ5267B-E3-18 | 10 000 (8 mm tape on 13" reel) | 10 000/box |
| | MMSZ5225C-E3-18 to MMSZ5267C-E3-18 | | |
| | MMSZ5225B-HE3-18 to MMSZ5267B-HE3-18 | | |
| | MMSZ5225C-HE3-18 to MMSZ5267C-HE3-18 | | |

| PACKAGE | | | | |
|---|---|---|---|---|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING 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 ($T_{amb}$ = 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 | $P_{tot}$ | 500 | mW |
| Zener current | See table “Electrical Characteristics” | | | |
| Thermal resistance junction to ambient air | On FR - 4 or FR - 5 board with minimum recommended solder pad layout | $R_{thJA}$ | 340 | K/W |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature range | | $T_{stg}$ | - 65 to + 150 | |
| Operating temperature range | | $T_{op}$ | - 55 to + 150 | |



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

| PART NUMBER | MARKING CODE | ZENER VOLTAGE RANGE (1) | TEST CURRENT | | REVERSE LAEKAGE CURRENT | | DYNAMIC RESISTANCE (2) | | TEMPERATURE COEFFICIENT |
|---|---|---|---|---|---|---|---|---|---|
| | | $V_Z$ at $I_{ZT1}$ | $I_{ZT1}$ | $I_{ZT2}$ | $I_R$ at $V_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $\alpha_{VZ}$ |
| | | V | mA | | 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 | H3 | 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 $V_F$ = 0.9 V, at $I_F$ = 10 mA

(1) Measured with device junction in thermal equilibrium

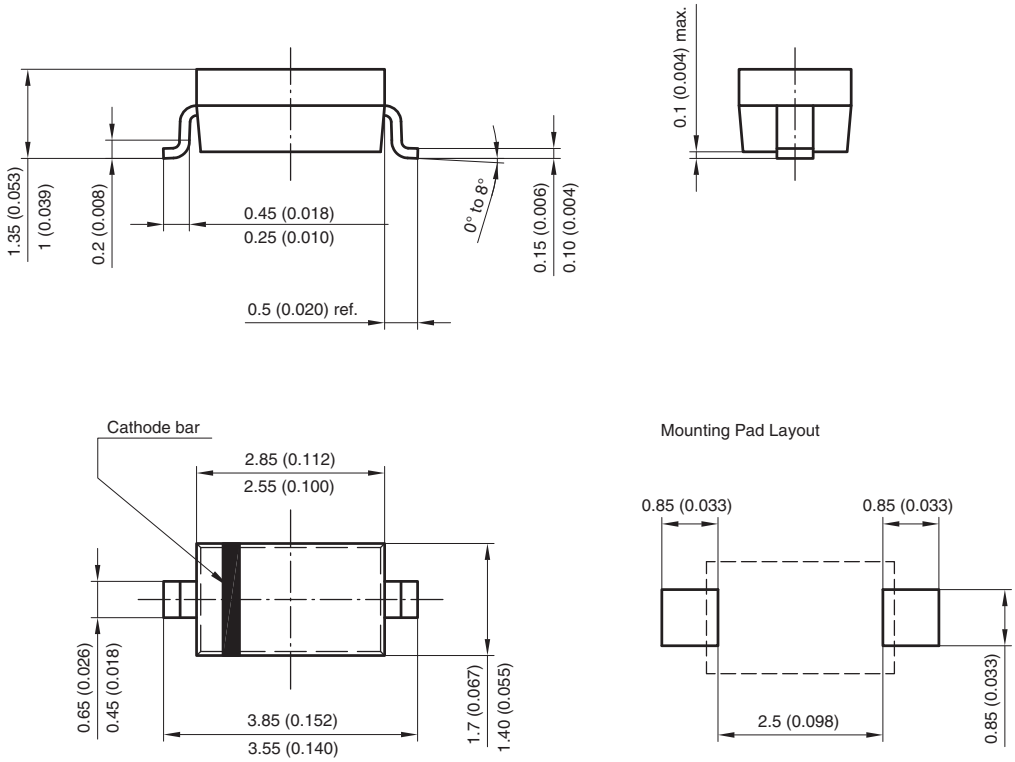
(2) The Zener Impedance is derived from the 1 kHz AC voltage which results when an AC current having an RMS value equal to 10 % of the Zener current ($I_{ZT1}$ or $I_{ZT2}$) is superimposed on $I_{ZT1}$ or $I_{ZT2}$. Zener Impedance is measured at two points to insure a sharp knee on the breakdown curve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



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




Rev. 4 - Date: 24. Sep. 2009
Document no.: S8-V-3910.01-001 (4)
17432



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