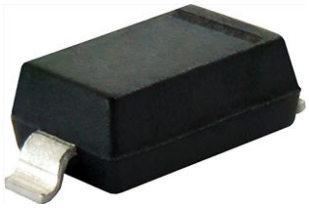
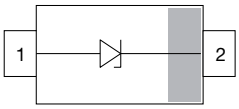
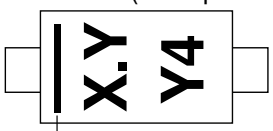
## Small Signal Zener Diodes






### MARKING (example only)




X.Y = type code
Y4 = date code

23210

### LINKS TO ADDITIONAL RESOURCES

3D Models

SPICE Models

### FEATURES

AUTOMOTIVE GRADE Available

Pb-free

e3

RoHS COMPLIANT

- 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 available
- 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_A - RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

### PRIMARY CHARACTERISTICS

| PARAMETER | VALUE | UNIT |
|---|---|---|
| $V_Z$ range nom. | 3.0 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 | ZENER VOLTAGE TOLERANCE | AEC-Q101 QUALIFIED | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
|---|---|---|---|---|---|
| MMSZ5225 to MMSZ5267 | MMSZ5225B-E3-08 to MMSZ5267B-E3-08 | 5 % | no | 3000 (8 mm tape on 7" reel) | 15 000/box |
| | MMSZ5225C-E3-08 to MMSZ5267C-E3-08 | 2 % | no | | |
| | MMSZ5225B-HE3_A-08 to MMSZ5267B-HE3_A-08 | 5 % | yes | | |
| | MMSZ5225C-HE3_A-08 to MMSZ5267C-HE3_A-08 | 2 % | yes | | |
| | MMSZ5225B-E3-18 to MMSZ5267B-E3-18 | 5 % | no | 10 000 (8 mm tape on 13" reel) | 10 000/box |
| | MMSZ5225C-E3-18 to MMSZ5267C-E3-18 | 2 % | no | | |
| | MMSZ5225B-HE3_A-18 to MMSZ5267B-HE3_A-18 | 5 % | yes | | |
| | MMSZ5225C-HE3_A-18 to MMSZ5267C-HE3_A-18 | 2 % | yes | | |

### PACKAGE

| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
|---|---|---|---|---|
| SOD-123 | 10.6 mg | UL 94 V-0 | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

### ABSOLUTE MAXIMUM RATINGS ($T_{amb}$ = 25 °C, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---|---|---|---|---|
| Power dissipation | $R_{thJL}$ = 250 K/W | $P_{tot}$ | 500 | mW |
| | On FR-4 board with recommended soldering footprint | $P_{tot}$ | 300 | mW |
| Thermal resistance junction to lead | | $R_{thJL}$ | 250 | K/W |
| Thermal resistance junction to ambient | According to JEDEC® 51-3 on FR-4 board with recommended soldering footprint | $R_{thJA}$ | 420 | 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 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 $I_{ZT2}$ | $\alpha_{VZ}$ |
| | | | V | mA | | µA | V | Ω | | %/°C |
| | ± 2 % | ± 5 % | NOM. | | | MAX. | | MAX. | MAX. | TYP. |
| MMSZ5225 | C.0 | C0 | 3 | 20 | 0.25 | 50 | 1 | 30 | 1600 | -0.06 |
| MMSZ5226 | D.6 | D6 | 3.3 | 20 | 0.25 | 25 | 1 | 28 | 1600 | -0.057 |
| MMSZ5227 | D.7 | D7 | 3.6 | 20 | 0.25 | 15 | 1 | 24 | 1700 | -0.056 |
| MMSZ5228 | D.8 | D8 | 3.9 | 20 | 0.25 | 10 | 1 | 23 | 1900 | -0.045 |
| MMSZ5229 | D.9 | D9 | 4.3 | 20 | 0.25 | 5 | 1 | 22 | 2000 | -0.029 |
| MMSZ5230 | D.0 | D0 | 4.7 | 20 | 0.25 | 5 | 2 | 19 | 1900 | 0.00 |
| MMSZ5231 | E.6 | E6 | 5.1 | 20 | 0.25 | 5 | 2 | 17 | 1600 | 0.00 |
| MMSZ5232 | E.7 | E7 | 5.6 | 20 | 0.25 | 5 | 3 | 11 | 1600 | 0.032 |
| MMSZ5233 | E.8 | E8 | 6 | 20 | 0.25 | 5 | 3.5 | 7 | 1600 | 0.035 |
| MMSZ5234 | E.9 | E9 | 6.2 | 20 | 0.25 | 5 | 4 | 7 | 1000 | 0.039 |
| MMSZ5235 | E.0 | E0 | 6.8 | 20 | 0.25 | 3 | 5 | 5 | 750 | 0.045 |
| MMSZ5236 | F.6 | F6 | 7.5 | 20 | 0.25 | 3 | 6 | 6 | 500 | 0.052 |
| MMSZ5237 | F.7 | F7 | 8.2 | 20 | 0.25 | 3 | 6.5 | 8 | 500 | 0.056 |
| MMSZ5238 | F.8 | F8 | 8.7 | 20 | 0.25 | 3 | 6.5 | 8 | 600 | 0.058 |
| MMSZ5239 | F.9 | F9 | 9.1 | 20 | 0.25 | 3 | 7 | 10 | 600 | 0.060 |
| MMSZ5240 | F.0 | F0 | 10 | 20 | 0.25 | 3 | 8 | 17 | 600 | 0.064 |
| MMSZ5241 | H.6 | H6 | 11 | 20 | 0.25 | 2 | 8.4 | 22 | 600 | 0.067 |
| MMSZ5242 | H.7 | H7 | 12 | 20 | 0.25 | 1 | 9.1 | 30 | 600 | 0.070 |
| MMSZ5243 | H.8 | H8 | 13 | 9.5 | 0.25 | 0.5 | 9.9 | 13 | 600 | 0.073 |
| MMSZ5244 | H.9 | H9 | 14 | 9 | 0.25 | 0.1 | 10 | 15 | 600 | 0.076 |
| MMSZ5245 | H.0 | H0 | 15 | 8.5 | 0.25 | 0.1 | 11 | 16 | 600 | 0.078 |
| MMSZ5246 | J.6 | J6 | 16 | 7.8 | 0.25 | 0.1 | 12 | 17 | 600 | 0.080 |
| MMSZ5247 | J.7 | J7 | 17 | 7.4 | 0.25 | 0.1 | 13 | 19 | 600 | 0.081 |
| MMSZ5248 | J.8 | J8 | 18 | 7 | 0.25 | 0.1 | 14 | 21 | 600 | 0.082 |
| MMSZ5249 | J.9 | J9 | 19 | 6.6 | 0.25 | 0.1 | 14 | 23 | 600 | 0.083 |
| MMSZ5250 | J.0 | J0 | 20 | 6.2 | 0.25 | 0.1 | 15 | 25 | 600 | 0.084 |
| MMSZ5251 | K.6 | K6 | 22 | 5.6 | 0.25 | 0.1 | 17 | 29 | 600 | 0.085 |
| MMSZ5252 | K.7 | K7 | 24 | 5.2 | 0.25 | 0.1 | 18 | 33 | 600 | 0.087 |
| MMSZ5253 | K.8 | K8 | 25 | 5 | 0.25 | 0.1 | 19 | 35 | 600 | 0.088 |
| MMSZ5254 | K.9 | K9 | 27 | 4.6 | 0.25 | 0.1 | 21 | 41 | 600 | 0.09 |
| MMSZ5255 | K.0 | K0 | 28 | 4.5 | 0.25 | 0.1 | 21 | 44 | 600 | 0.091 |
| MMSZ5256 | M.6 | M6 | 30 | 4.2 | 0.25 | 0.1 | 23 | 49 | 600 | 0.092 |
| MMSZ5257 | M.7 | M7 | 33 | 3.8 | 0.25 | 0.1 | 25 | 58 | 700 | 0.092 |
| MMSZ5258 | M.8 | M8 | 36 | 3.4 | 0.25 | 0.1 | 27 | 70 | 700 | 0.093 |
| MMSZ5259 | M.9 | M9 | 39 | 3.2 | 0.25 | 0.1 | 30 | 80 | 800 | 0.094 |
| MMSZ5260 | M.0 | M0 | 43 | 3 | 0.25 | 0.1 | 33 | 93 | 900 | 0.095 |
| MMSZ5261 | N.6 | N6 | 47 | 2.7 | 0.25 | 0.1 | 36 | 105 | 1000 | 0.095 |
| MMSZ5262 | N.7 | N7 | 51 | 2.5 | 0.25 | 0.1 | 39 | 125 | 1100 | 0.096 |
| MMSZ5263 | N.8 | N8 | 56 | 2.2 | 0.25 | 0.1 | 43 | 150 | 1300 | 0.096 |
| MMSZ5264 | N.9 | N9 | 60 | 2.1 | 0.25 | 0.1 | 46 | 170 | 1400 | 0.097 |
| MMSZ5265 | N.0 | N0 | 62 | 2 | 0.25 | 0.1 | 47 | 185 | 1400 | 0.097 |
| MMSZ5266 | P.6 | P6 | 68 | 1.8 | 0.25 | 0.1 | 52 | 230 | 1600 | 0.097 |
| MMSZ5267 | P.7 | P7 | 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 with typ. $R_{thJA}$ of 370 K/W


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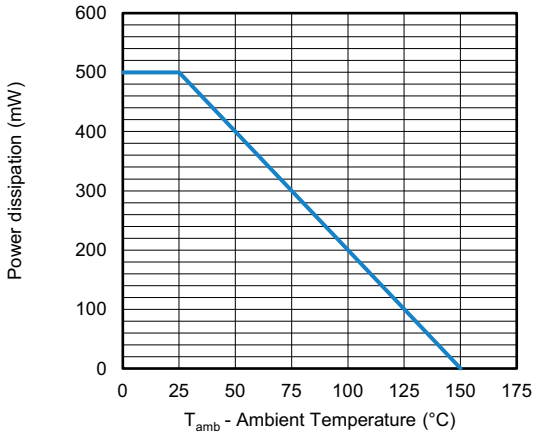



Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

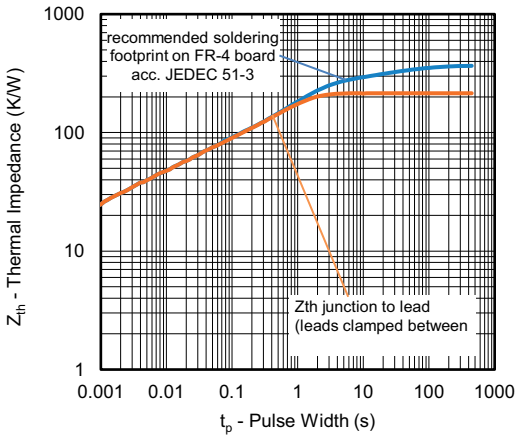
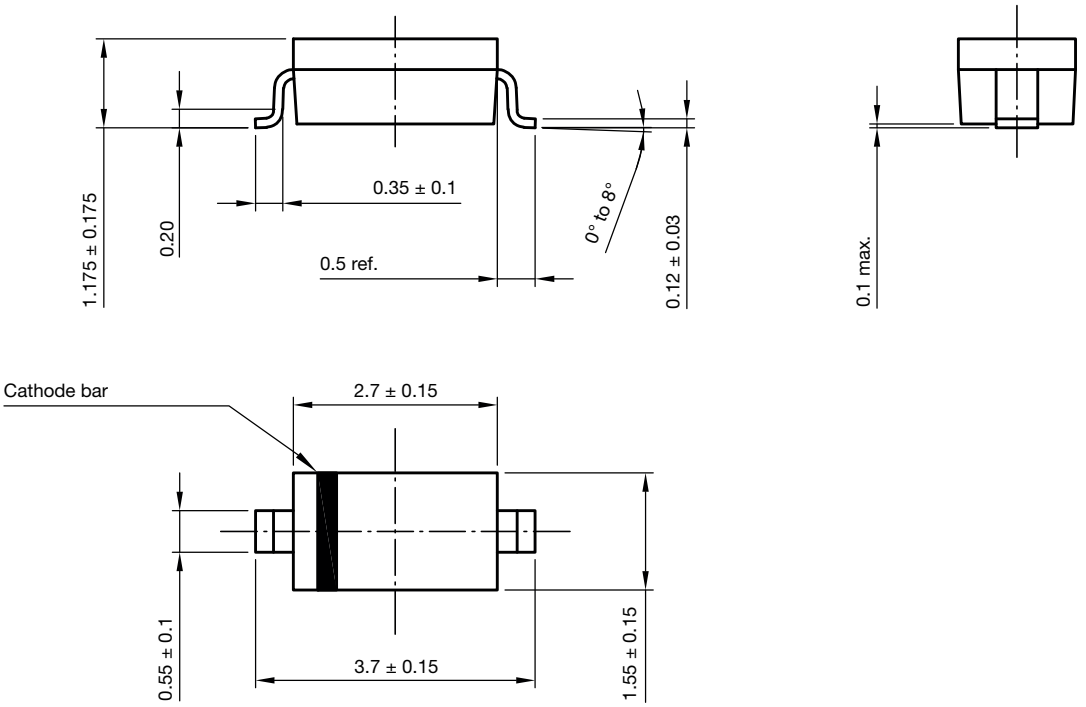


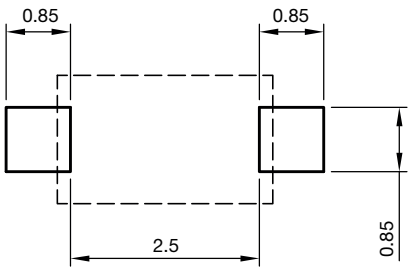

Fig. 2 - Thermal Impedance vs. Time


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



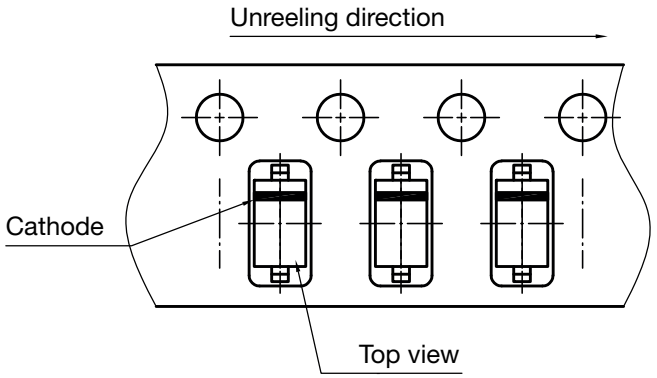

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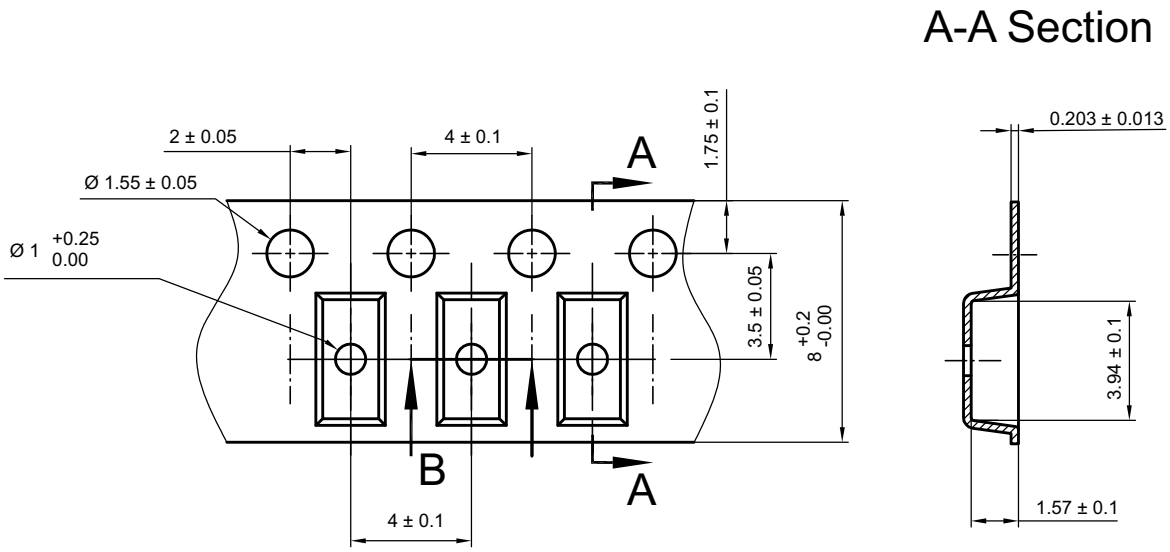
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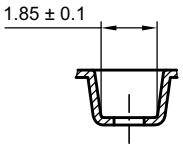



**SOD-123**

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