# Small Signal Zener Diodes



## FEATURES

- Very sharp reverse characteristic
- Low reverse current level
- Available with tighter tolerances
- Very high stability
- Low noise
- $V_Z$ - tolerance ± 5 %
- Material categorization: for definitions of compliance please see 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 |
| TZQ5221B to TZQ5267B | TZQ5221B to TZQ5267-series-GS18 | 10 000 (per 13" reel) | 10 000/box |
| TZQ5221B to TZQ5267B | TZQ5221B to TZQ5267B-series-GS08 | 2500 (per 7" reel) | 12 500/box |

| PACKAGE | | | | |
|---|---|---|---|---|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| QuadroMELF (SOD-80) | approx. 34 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 | $R_{thJA} \leq 300$ 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, maximum | | $T_j$ | 175 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +175 | °C |
| Forward voltage (max.) | $I_F$ = 200 mA | $V_F$ | 1.5 | V |



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

| PART NUMBER | ZENER VOLTAGE RANGE | TEST CURRENT | | REVERSE LAEKAGE 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 $I_{ZT2}$ | $TK_{VZ}$ |
| | V | mA | | µA | V | Ω | | %/K |
| | NOM. | | | | | | | |
| TZQ5221B | 2.4 | 20 | 0.25 | < 100 | 1 | < 30 | < 1200 | < -0.085 |
| TZQ5222B | 2.5 | 20 | 0.25 | < 100 | 1 | < 30 | < 1250 | < -0.085 |
| TZQ5223B | 2.7 | 20 | 0.25 | < 75 | 1 | < 30 | < 1300 | < -0.080 |
| TZQ5224B | 2.8 | 20 | 0.25 | < 75 | 1 | < 30 | < 1400 | < -0.080 |
| TZQ5225B | 3 | 20 | 0.25 | < 50 | 1 | < 29 | < 1600 | < -0.075 |
| TZQ5226B | 3.3 | 20 | 0.25 | < 25 | 1 | < 28 | < 1600 | < -0.070 |
| TZQ5227B | 3.6 | 20 | 0.25 | < 15 | 1 | < 24 | < 1700 | < -0.065 |
| TZQ5228B | 3.9 | 20 | 0.25 | < 10 | 1 | < 23 | < 1900 | < -0.060 |
| TZQ5229B | 4.3 | 20 | 0.25 | < 5 | 1 | < 22 | < 2000 | < ± 0.055 |
| TZQ5230B | 4.7 | 20 | 0.25 | < 5 | 2 | < 19 | < 1900 | < ± 0.030 |
| TZQ5231B | 5.1 | 20 | 0.25 | < 5 | 2 | < 17 | < 1600 | < ± 0.030 |
| TZQ5232B | 5.6 | 20 | 0.25 | < 5 | 3 | < 11 | < 1600 | < +0.038 |
| TZQ5233B | 6 | 20 | 0.25 | < 5 | 3.5 | < 7 | < 1600 | < +0.038 |
| TZQ5234B | 6.2 | 20 | 0.25 | < 5 | 4 | < 7 | < 1000 | < +0.045 |
| TZQ5235B | 6.8 | 20 | 0.25 | < 3 | 5 | < 5 | < 750 | < +0.050 |
| TZQ5236B | 7.5 | 20 | 0.25 | < 3 | 6 | < 6 | < 500 | < +0.058 |
| TZQ5237B | 8.2 | 20 | 0.25 | < 3 | 6.5 | < 8 | < 500 | < +0.062 |
| TZQ5238B | 8.7 | 20 | 0.25 | < 3 | 6.5 | < 8 | < 600 | < +0.065 |
| TZQ5239B | 9.1 | 20 | 0.25 | < 3 | 7 | < 10 | < 600 | < +0.068 |
| TZQ5240B | 10 | 20 | 0.25 | < 3 | 8 | < 17 | < 600 | < +0.075 |
| TZQ5241B | 11 | 20 | 0.25 | < 2 | 8.4 | < 22 | < 600 | < +0.076 |
| TZQ5242B | 12 | 20 | 0.25 | < 1 | 9.1 | < 30 | < 600 | < +0.077 |
| TZQ5243B | 13 | 9.5 | 0.25 | < 0.5 | 9.9 | < 13 | < 600 | < +0.079 |
| TZQ5244B | 14 | 9 | 0.25 | < 0.1 | 10 | < 15 | < 600 | < +0.082 |
| TZQ5245B | 15 | 8.5 | 0.25 | < 0.1 | 11 | < 16 | < 600 | < +0.082 |
| TZQ5246B | 16 | 7.8 | 0.25 | < 0.1 | 12 | < 17 | < 600 | < +0.083 |
| TZQ5247B | 17 | 7.4 | 0.25 | < 0.1 | 13 | < 19 | < 600 | < +0.084 |
| TZQ5248B | 18 | 7 | 0.25 | < 0.1 | 14 | < 21 | < 600 | < +0.085 |
| TZQ5249B | 19 | 6.6 | 0.25 | < 0.1 | 14 | < 23 | < 600 | < +0.086 |
| TZQ5250B | 20 | 6.2 | 0.25 | < 0.1 | 15 | < 25 | < 600 | < +0.086 |
| TZQ5251B | 22 | 5.6 | 0.25 | < 0.1 | 17 | < 29 | < 600 | < +0.087 |
| TZQ5252B | 24 | 5.2 | 0.25 | < 0.1 | 18 | < 33 | < 600 | < +0.088 |
| TZQ5253B | 25 | 5 | 0.25 | < 0.1 | 19 | < 35 | < 600 | < +0.089 |
| TZQ5254B | 27 | 4.6 | 0.25 | < 0.1 | 21 | < 41 | < 600 | < +0.090 |
| TZQ5255B | 28 | 4.5 | 0.25 | < 0.1 | 21 | < 44 | < 600 | < +0.091 |
| TZQ5256B | 30 | 4.2 | 0.25 | < 0.1 | 23 | < 49 | < 600 | < +0.091 |
| TZQ5257B | 33 | 3.8 | 0.25 | < 0.1 | 25 | < 58 | < 700 | < +0.092 |
| TZQ5258B | 36 | 3.4 | 0.25 | < 0.1 | 27 | < 70 | < 700 | < +0.093 |
| TZQ5259B | 39 | 3.2 | 0.25 | < 0.1 | 30 | < 80 | < 800 | < +0.094 |
| TZQ5260B | 43 | 3 | 0.25 | < 0.1 | 33 | < 93 | < 900 | < +0.095 |
| TZQ5261B | 47 | 2.7 | 0.25 | < 0.1 | 36 | < 105 | < 1000 | < +0.095 |
| TZQ5262B | 51 | 2.5 | 0.25 | < 0.1 | 39 | < 125 | < 1100 | < +0.096 |
| TZQ5263B | 56 | 2.2 | 0.25 | < 0.1 | 43 | < 150 | < 1300 | < +0.096 |
| TZQ5264B | 60 | 2.1 | 0.25 | < 0.1 | 46 | < 170 | < 1400 | < +0.097 |
| TZQ5265B | 62 | 2 | 0.25 | < 0.1 | 47 | < 185 | < 1400 | < +0.097 |
| TZQ5266B | 68 | 1.8 | 0.25 | < 0.1 | 52 | < 230 | < 1600 | < +0.097 |
| TZQ5267B | 75 | 1.7 | 0.25 | < 0.1 | 56 | < 270 | < 1700 | < +0.098 |

**Note**

- Based on DC measurement at thermal equilibrium; case temperature maintained at 30 °C ± 2 °C


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

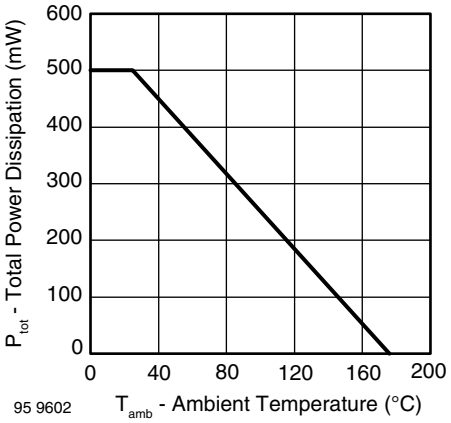



Fig. 1 - Total Power Dissipation vs. Ambient Temperature

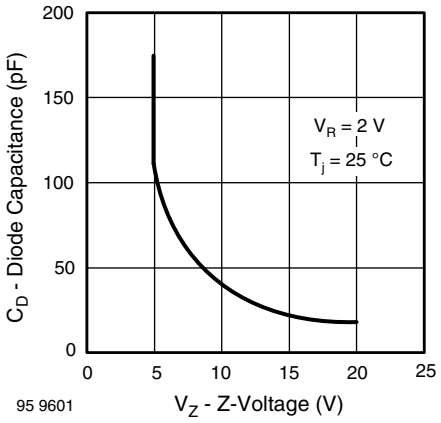



Fig. 4 - Diode Capacitance vs. Z-Voltage

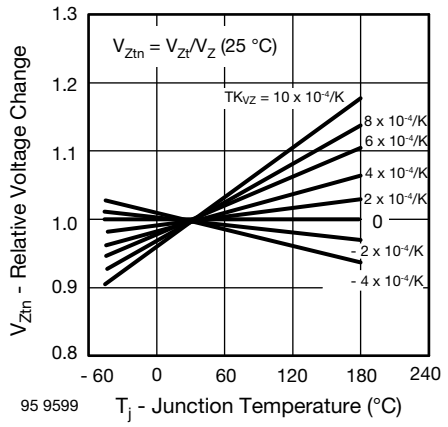



Fig. 2 - Typical Change of Working Voltage vs. Junction Temperature

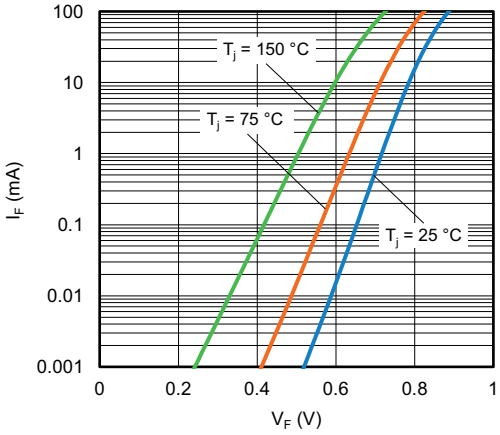



Fig. 5 - Typical Forward Current $I_F$ vs. Forward Voltage $V_F$

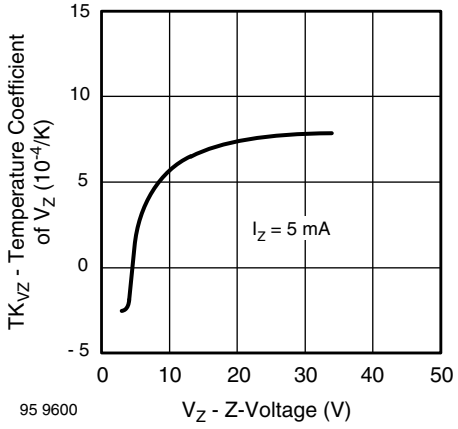



Fig. 3 - Typical Temperature Coefficient of $V_Z$ vs. Z-Voltage

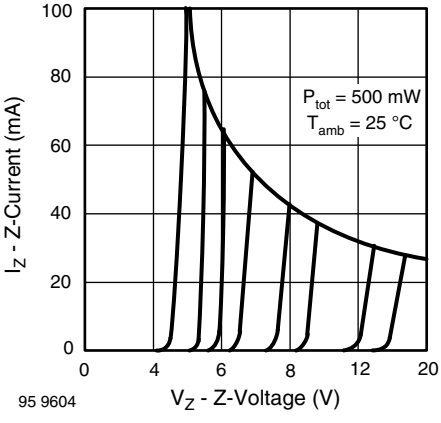



Fig. 6 - Typical Z-Current vs. Z-Voltage


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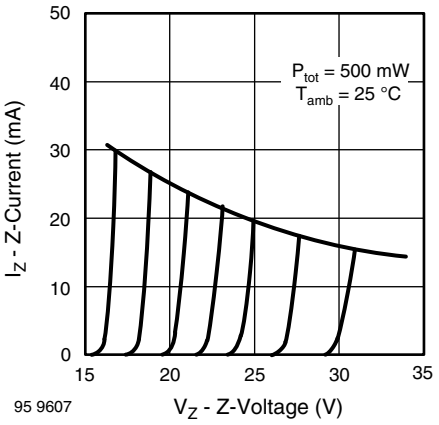



Fig. 7 - Typical Z-Current vs. Z-Voltage

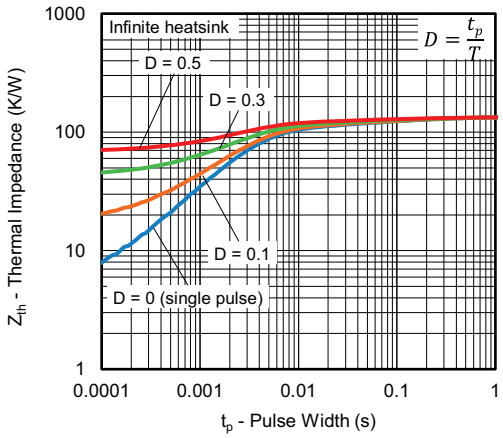
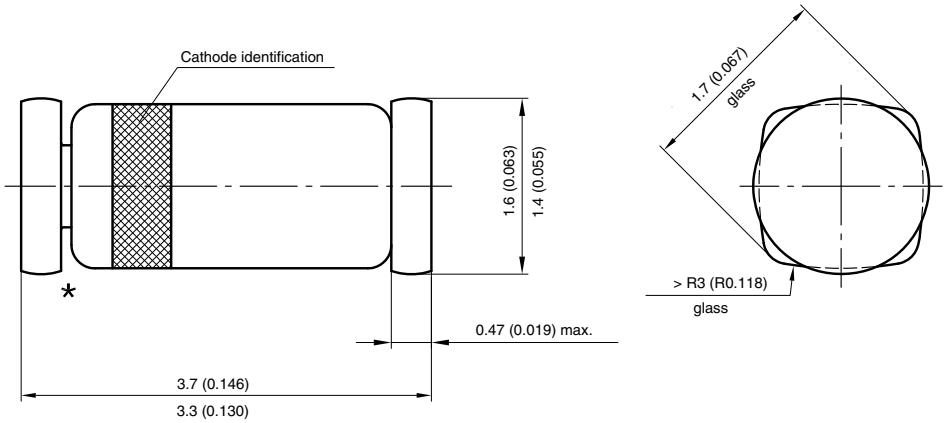
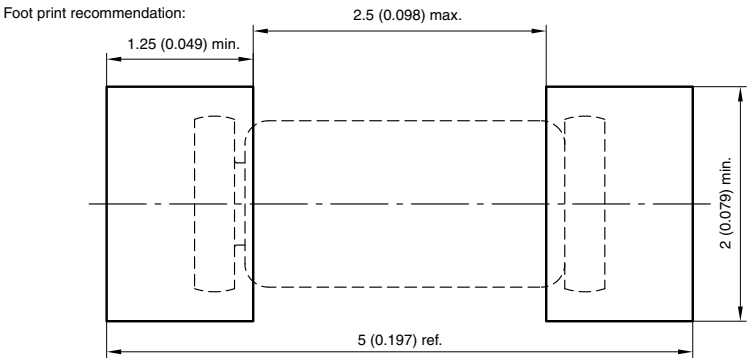



Fig. 8 - Typical Thermal Response

**PACKAGE DIMENSIONS** in millimeters (inches): **QuadroMELF SOD-80**




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




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