# THE DATASHEET OF

# TZMB4V3-GS08

www.win-source.net 0086-755-83957316

# Small Signal Zener Diodes

## FEATURES

- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- TZMC - $V_Z$-tolerance ± 5 %
- TZMB - $V_Z$-tolerance ± 2 %
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

## DESIGN SUPPORT TOOLS AVAILABLE

3D Models

## APPLICATIONS

- Voltage stabilization

| PRIMARY CHARACTERISTICS | | |
|---|---|---|
| PARAMETER | VALUE | UNIT |
| $V_Z$ range nom. | 2.4 to 75 | V |
| Test current $I_{ZT}$ | 2.5; 5 | mA |
| $V_Z$ specification | Pulse current | |
| Circuit configuration | Single | |

| ORDERING INFORMATION | | | |
|---|---|---|---|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| TZM-series | TZM-series-GS18 | 10 000 (8 mm tape on 13" reel) | 10 000/box |
| TZM-series | TZM-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) | 31 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 | $R_{thJA} \leq 300$ 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 | | $T_j$ | 175 | °C |
| Storage temperature range | | $T_{stg}$ | -65 to +175 | °C |
| Forward voltage (max.) | $I_F$ = 200 mA | $V_F$ | 1.5 | V |



For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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

| PART NUMBER | ZENER VOLTAGE RANGE | | | TEST CURRENT | | REVERSE LEAKAGE CURRENT | | | | DYNAMIC RESISTANCE | | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $I_{ZT2}$ | $I_R$ at $V_R$ | | $I_R$ (1) at $V_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $TK_{VZ}$ | |
| | V | | | mA | | µA | V | µA | V | Ω | | %/K | |
| | MIN. | NOM. | MAX. | | | | | | | TYP. | TYP. | MIN. | MAX. |
| TZMC2V4 | 2.28 | 2.4 | 2.56 | 5 | 1 | < 50 | 1 | < 100 | 1 | < 85 | < 600 | -0.09 | -0.06 |
| TZMC2V7 | 2.5 | 2.7 | 2.9 | 5 | 1 | < 10 | 1 | < 50 | 1 | < 85 | < 600 | -0.09 | -0.06 |
| TZMC3V0 | 2.8 | 3.0 | 3.2 | 5 | 1 | < 4 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMC3V3 | 3.1 | 3.3 | 3.5 | 5 | 1 | < 2 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMC3V6 | 3.4 | 3.6 | 3.8 | 5 | 1 | < 2 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMC3V9 | 3.7 | 3.9 | 4.1 | 5 | 1 | < 2 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMC4V3 | 4 | 4.3 | 4.6 | 5 | 1 | < 1 | 1 | < 20 | 1 | < 90 | < 600 | -0.06 | -0.03 |
| TZMC4V7 | 4.4 | 4.7 | 5 | 5 | 1 | < 0.5 | 1 | < 10 | 1 | < 80 | < 600 | -0.05 | 0.02 |
| TZMC5V1 | 4.8 | 5.1 | 5.4 | 5 | 1 | < 0.1 | 1 | < 2 | 1 | < 60 | < 550 | -0.02 | 0.02 |
| TZMC5V6 | 5.2 | 5.6 | 6 | 5 | 1 | < 0.1 | 1 | < 2 | 1 | < 40 | < 450 | -0.05 | 0.05 |
| TZMC6V2 | 5.8 | 6.2 | 6.6 | 5 | 1 | < 0.1 | 2 | < 2 | 2 | < 10 | < 200 | 0.03 | 0.06 |
| TZMC6V8 | 6.4 | 6.8 | 7.2 | 5 | 1 | < 0.1 | 3 | < 2 | 3 | < 8 | < 150 | 0.03 | 0.07 |
| TZMC7V5 | 7 | 7.5 | 7.9 | 5 | 1 | < 0.1 | 5 | < 2 | 5 | < 7 | < 50 | 0.03 | 0.07 |
| TZMC8V2 | 7.7 | 8.2 | 8.7 | 5 | 1 | < 0.1 | 6.2 | < 2 | 6.2 | < 7 | < 50 | 0.03 | 0.08 |
| TZMC9V1 | 8.5 | 9.1 | 9.6 | 5 | 1 | < 0.1 | 6.8 | < 2 | 6.8 | < 10 | < 50 | 0.03 | 0.09 |
| TZMC10 | 9.4 | 10 | 10.6 | 5 | 1 | < 0.1 | 7.5 | < 2 | 7.5 | < 15 | < 70 | 0.03 | 0.1 |
| TZMC11 | 10.4 | 11 | 11.6 | 5 | 1 | < 0.1 | 8.2 | < 2 | 8.2 | < 20 | < 70 | 0.03 | 0.11 |
| TZMC12 | 11.4 | 12 | 12.7 | 5 | 1 | < 0.1 | 9.1 | < 2 | 9.1 | < 20 | < 90 | 0.03 | 0.11 |
| TZMC13 | 12.4 | 13 | 14.1 | 5 | 1 | < 0.1 | 10 | < 2 | 10 | < 26 | < 110 | 0.03 | 0.11 |
| TZMC15 | 13.8 | 15 | 15.6 | 5 | 1 | < 0.1 | 11 | < 2 | 11 | < 30 | < 110 | 0.03 | 0.11 |
| TZMC16 | 15.3 | 16 | 17.1 | 5 | 1 | < 0.1 | 12 | < 2 | 12 | < 40 | < 170 | 0.03 | 0.11 |
| TZMC18 | 16.8 | 18 | 19.1 | 5 | 1 | < 0.1 | 13 | < 2 | 13 | < 50 | < 170 | 0.03 | 0.11 |
| TZMC20 | 18.8 | 20 | 21.2 | 5 | 1 | < 0.1 | 15 | < 2 | 15 | < 55 | < 220 | 0.03 | 0.11 |
| TZMC22 | 20.8 | 22 | 23.3 | 5 | 1 | < 0.1 | 16 | < 2 | 16 | < 55 | < 220 | 0.04 | 0.12 |
| TZMC24 | 22.8 | 24 | 25.6 | 5 | 1 | < 0.1 | 18 | < 2 | 18 | < 80 | < 220 | 0.04 | 0,12 |
| TZMC27 | 25.1 | 27 | 28.9 | 5 | 1 | < 0.1 | 20 | < 2 | 20 | < 80 | < 220 | 0.04 | 0.12 |
| TZMC30 | 28 | 30 | 32 | 5 | 1 | < 0.1 | 22 | < 2 | 22 | < 80 | < 220 | 0.04 | 0.12 |
| TZMC33 | 31 | 33 | 35 | 5 | 1 | < 0.1 | 24 | < 2 | 24 | < 80 | < 220 | 0.04 | 0.12 |
| TZMC36 | 34 | 36 | 38 | 5 | 1 | < 0.1 | 27 | < 2 | 27 | < 80 | < 220 | 0.04 | 0.12 |
| TZMC39 | 37 | 39 | 41 | 2.5 | 0.5 | < 0.1 | 30 | < 5 | 30 | < 90 | < 500 | 0.04 | 0.12 |
| TZMC43 | 40 | 43 | 46 | 2.5 | 0.5 | < 0.1 | 33 | < 5 | 33 | < 90 | < 600 | 0.04 | 0.12 |
| TZMC47 | 44 | 47 | 50 | 2.5 | 0.5 | < 0.1 | 36 | < 5 | 36 | < 110 | < 700 | 0.04 | 0.12 |
| TZMC51 | 48 | 51 | 54 | 2.5 | 0.5 | < 0.1 | 39 | < 10 | 39 | < 125 | < 700 | 0.04 | 0.12 |
| TZMC56 | 52 | 56 | 60 | 2.5 | 0.5 | < 0.1 | 43 | < 10 | 43 | < 135 | < 1000 | 0.04 | 0.12 |
| TZMC62 | 58 | 62 | 66 | 2.5 | 0.5 | < 0.1 | 47 | < 10 | 47 | < 150 | < 1000 | 0.04 | 0.12 |
| TZMC68 | 64 | 68 | 72 | 2.5 | 0.5 | < 0.1 | 51 | < 10 | 51 | < 200 | < 1000 | 0.04 | 0.12 |
| TZMC75 | 70 | 75 | 79 | 2.5 | 0.5 | < 0.1 | 56 | < 10 | 56 | < 250 | < 1500 | 0.04 | 0.12 |

**Notes**

- Additional measurement of voltage group TZMC9V1 to TZMC75, $I_R$ at 95 % $V_{Zmin.}$ ≤ 35 nA at $T_j$ = 25 °C

(1) at $T_j$ = 150 °C


For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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

| PART NUMBER | ZENER VOLTAGE RANGE | | | TEST CURRENT | | REVERSE LEAKAGE CURRENT | | | | DYNAMIC RESISTANCE | | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $I_{ZT2}$ | $I_R$ at $V_R$ | | $I_R$ (1) at $V_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $TK_{VZ}$ | |
| | V | | | mA | | µA | V | µA | V | Ω | | %/K | |
| | MIN. | NOM. | MAX. | | | | | | | TYP. | TYP. | MIN. | MAX. |
| TZMB2V4 | 2.35 | 2.4 | 2.45 | 5 | 1 | < 50 | 1 | < 100 | 1 | < 85 | < 600 | -0.09 | -0.06 |
| TZMB2V7 | 2.64 | 2.7 | 2.76 | 5 | 1 | < 10 | 1 | < 50 | 1 | < 85 | < 600 | -0.09 | -0.06 |
| TZMB3V0 | 2.94 | 3.0 | 3.06 | 5 | 1 | < 4 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMB3V3 | 3.24 | 3.3 | 3.36 | 5 | 1 | < 2 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMB3V6 | 3.52 | 3.6 | 3.68 | 5 | 1 | < 2 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMB3V9 | 3.82 | 3.9 | 3.98 | 5 | 1 | < 2 | 1 | < 40 | 1 | < 90 | < 600 | -0.08 | -0.05 |
| TZMB4V3 | 4.22 | 4.3 | 4.38 | 5 | 1 | < 1 | 1 | < 20 | 1 | < 90 | < 600 | -0.06 | -0.03 |
| TZMB4V7 | 4.6 | 4.7 | 4.8 | 5 | 1 | < 0.5 | 1 | < 10 | 1 | < 80 | < 600 | -0.05 | 0.02 |
| TZMB5V1 | 5 | 5.1 | 5.2 | 5 | 1 | < 0.1 | 1 | < 2 | 1 | < 60 | < 550 | -0.02 | 0.02 |
| TZMB5V6 | 5.48 | 5.6 | 5.72 | 5 | 1 | < 0.1 | 1 | < 2 | 1 | < 40 | < 450 | -0.05 | 0.05 |
| TZMB6V2 | 6.08 | 6.2 | 6.32 | 5 | 1 | < 0.1 | 2 | < 2 | 2 | < 10 | < 200 | 0.03 | 0.06 |
| TZMB6V8 | 6.66 | 6.8 | 6.94 | 5 | 1 | < 0.1 | 3 | < 2 | 3 | < 8 | < 150 | 0.03 | 0.07 |
| TZMB7V5 | 7.35 | 7.5 | 7.65 | 5 | 1 | < 0.1 | 5 | < 2 | 5 | < 7 | < 50 | 0.03 | 0.07 |
| TZMB8V2 | 8.04 | 8.2 | 8.36 | 5 | 1 | < 0.1 | 6.2 | < 2 | 6.2 | < 7 | < 50 | 0.03 | 0.08 |
| TZMB9V1 | 8.92 | 9.1 | 9.28 | 5 | 1 | < 0.1 | 6.8 | < 2 | 6.8 | < 10 | < 50 | 0.03 | 0.09 |
| TZMB10 | 9.8 | 10 | 10.2 | 5 | 1 | < 0.1 | 7.5 | < 2 | 7.5 | < 15 | < 70 | 0.03 | 0.1 |
| TZMB11 | 10.78 | 11 | 11.22 | 5 | 1 | < 0.1 | 8.2 | < 2 | 8.2 | < 20 | < 70 | 0.03 | 0.11 |
| TZMB12 | 11.76 | 12 | 12.24 | 5 | 1 | < 0.1 | 9.1 | < 2 | 9.1 | < 20 | < 90 | 0.03 | 0.11 |
| TZMB13 | 12.74 | 13 | 13.26 | 5 | 1 | < 0.1 | 10 | < 2 | 10 | < 26 | < 110 | 0.03 | 0.11 |
| TZMB15 | 14.7 | 15 | 15.3 | 5 | 1 | < 0.1 | 11 | < 2 | 11 | < 30 | < 110 | 0.03 | 0.11 |
| TZMB16 | 15.7 | 16 | 16.3 | 5 | 1 | < 0.1 | 12 | < 2 | 12 | < 40 | < 170 | 0.03 | 0.11 |
| TZMB18 | 17.64 | 18 | 18.36 | 5 | 1 | < 0.1 | 13 | < 2 | 13 | < 50 | < 170 | 0.03 | 0.11 |
| TZMB20 | 19.6 | 20 | 20.4 | 5 | 1 | < 0.1 | 15 | < 2 | 15 | < 55 | < 220 | 0.03 | 0.11 |
| TZMB22 | 21.55 | 22 | 22.45 | 5 | 1 | < 0.1 | 16 | < 2 | 16 | < 55 | < 220 | 0.04 | 0.12 |
| TZMB24 | 23.5 | 24 | 24.5 | 5 | 1 | < 0.1 | 18 | < 2 | 18 | < 80 | < 220 | 0.04 | 0,12 |
| TZMB27 | 26.4 | 27 | 27.6 | 5 | 1 | < 0.1 | 20 | < 2 | 20 | < 80 | < 220 | 0.04 | 0.12 |
| TZMB30 | 29.4 | 30 | 30.6 | 5 | 1 | < 0.1 | 22 | < 2 | 22 | < 80 | < 220 | 0.04 | 0.12 |
| TZMB33 | 32.4 | 33 | 33.6 | 5 | 1 | < 0.1 | 24 | < 2 | 24 | < 80 | < 220 | 0.04 | 0.12 |
| TZMB36 | 35.3 | 36 | 36.7 | 5 | 1 | < 0.1 | 27 | < 2 | 27 | < 80 | < 220 | 0.04 | 0.12 |
| TZMB39 | 38.2 | 39 | 39.8 | 2.5 | 0.5 | < 0.1 | 30 | < 5 | 30 | < 90 | < 500 | 0.04 | 0.12 |
| TZMB43 | 42.1 | 43 | 43.9 | 2.5 | 0.5 | < 0.1 | 33 | < 5 | 33 | < 90 | < 600 | 0.04 | 0.12 |
| TZMB47 | 46.1 | 47 | 47.9 | 2.5 | 0.5 | < 0.1 | 36 | < 5 | 36 | < 110 | < 700 | 0.04 | 0.12 |
| TZMB51 | 50 | 51 | 52 | 2.5 | 0.5 | < 0.1 | 39 | < 10 | 39 | < 125 | < 700 | 0.04 | 0.12 |
| TZMB56 | 54.9 | 56 | 57.1 | 2.5 | 0.5 | < 0.1 | 43 | < 10 | 43 | < 135 | < 1000 | 0.04 | 0.12 |
| TZMB62 | 60.8 | 62 | 63.2 | 2.5 | 0.5 | < 0.1 | 47 | < 10 | 47 | < 150 | < 1000 | 0.04 | 0.12 |
| TZMB68 | 66.6 | 68 | 69.4 | 2.5 | 0.5 | < 0.1 | 51 | < 10 | 51 | < 200 | < 1000 | 0.04 | 0.12 |
| TZMB75 | 73.5 | 75 | 76.5 | 2.5 | 0.5 | < 0.1 | 56 | < 10 | 56 | < 250 | < 1500 | 0.04 | 0.12 |

**Notes**

- Additional measurement of voltage group TZMB9V1 to TZMB75, $I_R$ at 95 % $V_{Zmin.}$ ≤ 35 nA at $T_j$ = 25 °C

(1) at $T_j$ = 150 °C


For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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

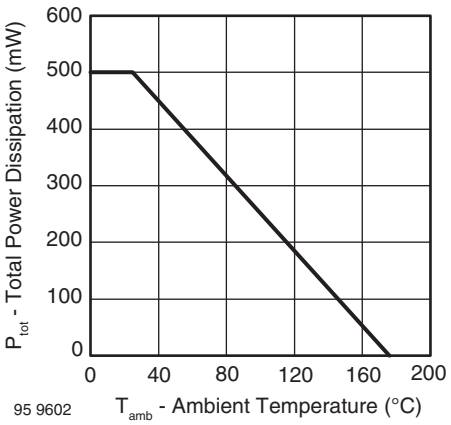



Fig. 1 - Total Power Dissipation vs. Ambient Temperature

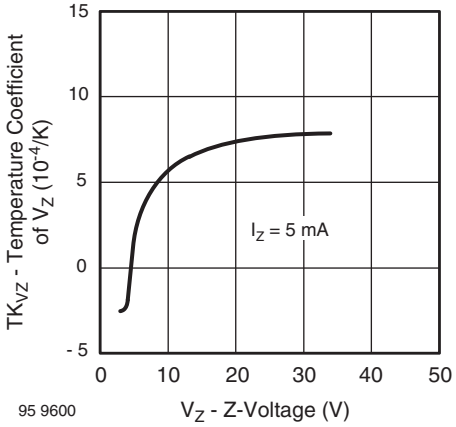



Fig. 4 - Temperature Coefficient of $V_Z$ vs. Z-Voltage

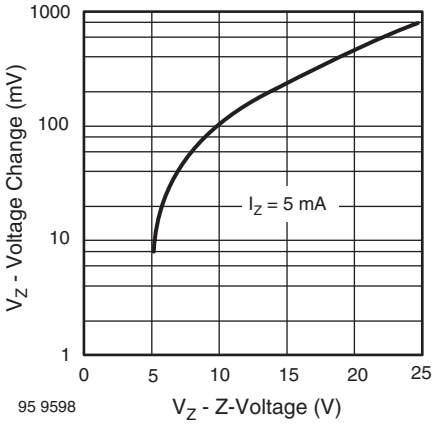



Fig. 2 - Typical Change of Working Voltage under Operating Conditions at $T_{amb}$ = 25 °C

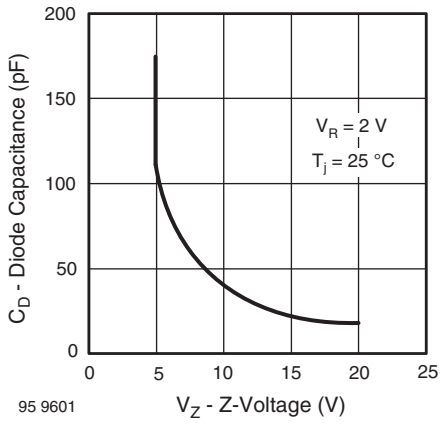



Fig. 5 - Diode Capacitance vs. Z-Voltage

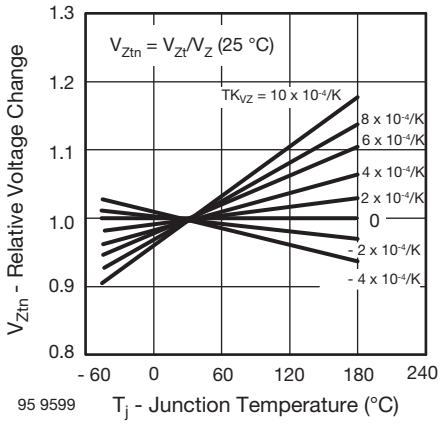



Fig. 3 - Typical Change of Working Voltage vs. Junction Temperature

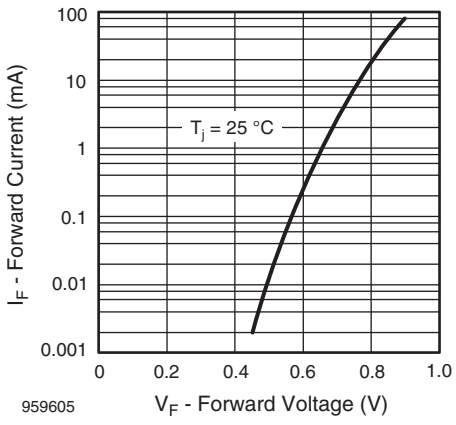



Fig. 6 - Forward Current vs. Forward Voltage


For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

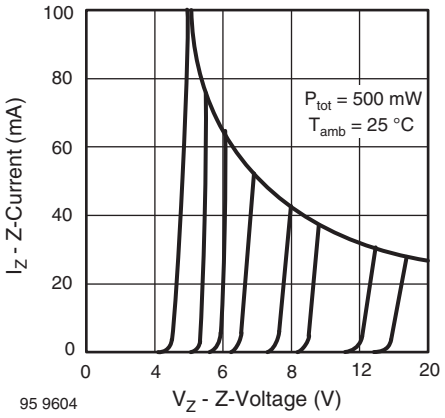



Fig. 7 - Z-Current vs. Z-Voltage

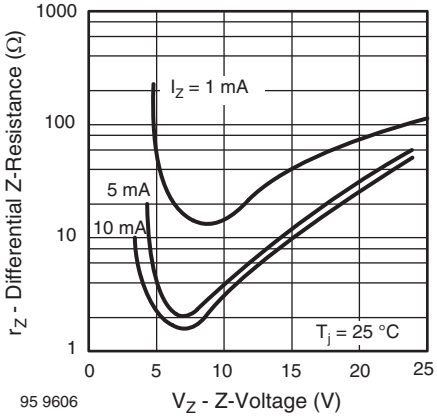



Fig. 9 - Differential Z-Resistance vs. Z-Voltage

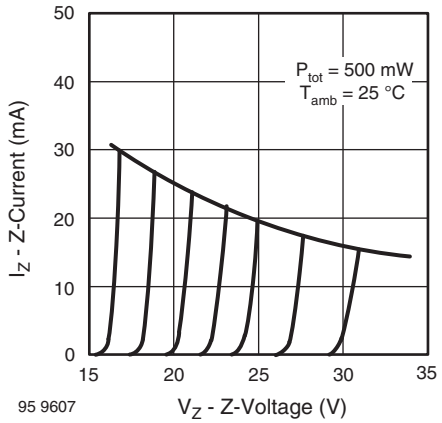



Fig. 8 - Z-Current vs. Z-Voltage

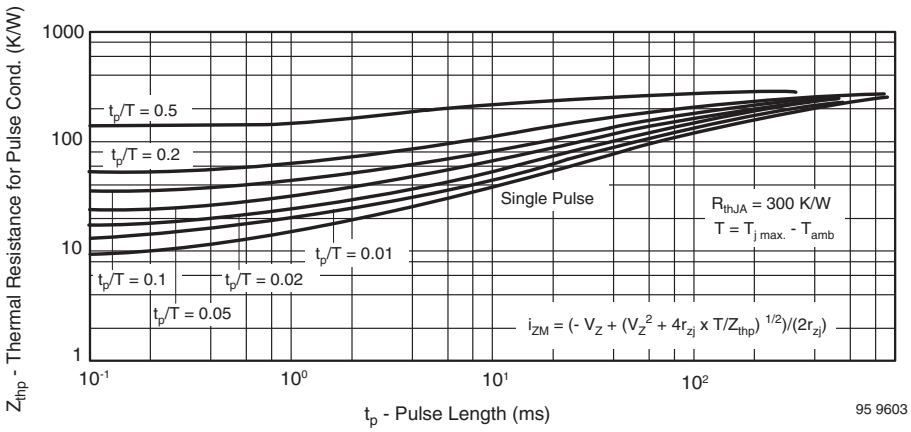
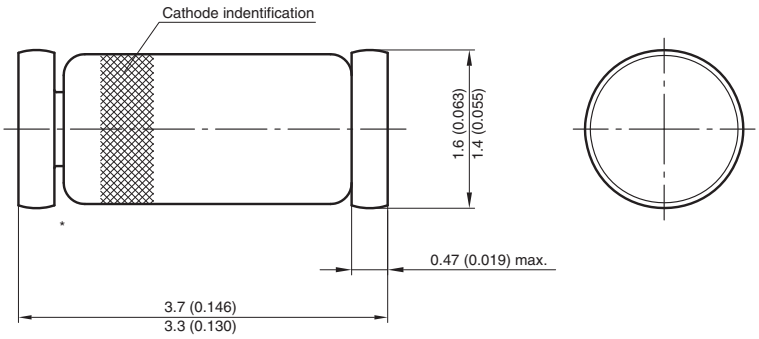



Fig. 10 - Thermal Response

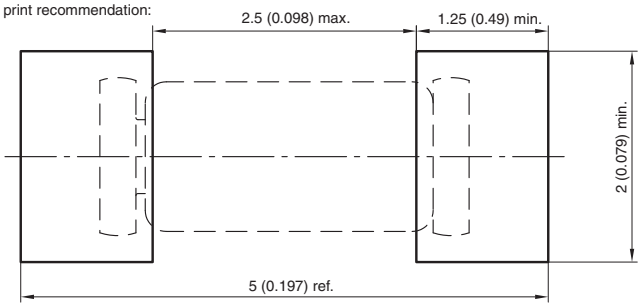

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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




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

Foot print recommendation:




Document no.:6.560-5005.01-4
Rev. 8 - Date: 07.June.2006
96 12070


For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

# Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

*© 2019 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED*

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

- View TZMB4V3-GS08 on WIN SOURCE
- Vishay Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

- Global Sourcing Solution
- Obsolete Management
- Cost Control Management
- Shortage Management
- Alternative Solution
- Excess Inventory Management