# Zener Diodes

## FEATURES

- Silicon planar power Zener diodes
- For use in stablilizing and clipping circuits with high power rating
- The Zener voltages are graded according to the international E 24 standard. Smaller voltage tolerances are available upon request
- These diodes are also available in the DO-41 case with the type designation ZPY3V9 to ZPY100
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

RoHS COMPLIANT

HALOGEN FREE

| PRIMARY CHARACTERISTICS | | |
|---|---|---|
| PARAMETER | VALUE | UNIT |
| $V_Z$ range nom. | 3.9 to 100 | V |
| Test current $I_{ZT}$ | 5 to 100 | mA |
| $V_Z$ specification | Pulse current | |
| Int. construction | Single | |

| ORDERING INFORMATION | | | |
|---|---|---|---|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| ZMY3V9 to ZMY100 | ZMY3V9 to ZMY100-series-GS18 | 5 000 (12 mm tape on 13" reel) | 10 000/box |
| ZMY3V9 to ZMY100 | ZMY3V9 to ZMY100-series-GS08 | 1 500 (12 mm tape on 7" reel) | 12 000/box |

| PACKAGE | | | | |
|---|---|---|---|---|
| PACKAGE NAME | WEIGHT | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL | SOLDERING CONDITIONS |
| MELF DO-213AB (glass) | 135 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 | Valid provided that electrodes are kept at ambient temperature | $P_{tot}$ | 1000 | mW |
| Zener current | See table “Characteristics” | | | |
| Junction to ambient air | Valid provided that electrodes are kept at ambient temperature | $R_{thJA}$ | 170 | K/W |
| Junction to ambient case | | $R_{thJC}$ | 60 | K/W |
| Junction temperature, maximum | | $T_j$ | 175 | °C |
| Storage temperature range | | $T_{stg}$ | - 55 to + 175 | °C |

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

| PART NUMBER | ZENER VOLTAGE RANGE (2) | | | TEST CURRENT | REVERSE VOLTAGE | | DYNAMIC RESISTANCE f = 1 kHz | | ADMISSIBLE ZENER CURRENT (1) | TEMPERATURE COEFFICIENT OF ZENER VOLTAGE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $V_Z$ at $I_{ZT1}$ | | | $I_{ZT1}$ | $V_R$ at $I_R$ | | $Z_Z$ at $I_{ZT1}$ | | $I_Z$ | $\alpha_{VZ}$ at $I_{ZT1}$ | |
| | V | | | mA | V | µA | Ω | | mA | $10^{-4}$/°C | |
| | MIN. | NOM. | MAX. | | | | MAX. | TYP. | | MIN. | MAX. |
| ZMY3V9 | 3.7 | 3.9 | 4.1 | 100 | - | 0.5 | 7 | 4 | 203 | - 7 | 2 |
| ZMY4V3 | 4 | 4.3 | 4.6 | 100 | - | 0.5 | 7 | 4 | 182 | - 7 | 3 |
| ZMY4V7 | 4.4 | 4.7 | 5 | 100 | - | 0.5 | 7 | 4 | 165 | - 7 | 4 |
| ZMY5V1 | 4.8 | 5.1 | 5.4 | 100 | 0.7 | 0.5 | 5 | 2 | 150 | - 6 | 5 |
| ZMY5V6 | 5.2 | 5.6 | 6 | 100 | 1.5 | 0.5 | 2 | 1 | 135 | - 3 | 5 |
| ZMY6V2 | 5.8 | 6.2 | 6.6 | 100 | 2 | 0.5 | 2 | 1 | 128 | - 1 | 6 |
| ZMY6V8 | 6.4 | 6.8 | 7.2 | 100 | 3 | 0.5 | 2 | 1 | 110 | 0 | 7 |
| ZMY7V5 | 7 | 7.5 | 7.9 | 100 | 5 | 0.5 | 2 | 1 | 100 | 0 | 7 |
| ZMY8V2 | 7.7 | 8.2 | 8.7 | 100 | 6 | 0.5 | 2 | 1 | 89 | 3 | 8 |
| ZMY9V1 | 8.5 | 9.1 | 9.6 | 50 | 7 | 0.5 | 4 | 2 | 82 | 3 | 8 |
| ZMY10 | 9.4 | 10 | 10.6 | 50 | 7.5 | 0.5 | 4 | 2 | 74 | 5 | 9 |
| ZMY11 | 10.4 | 11 | 11.6 | 50 | 8.5 | 0.5 | 7 | 3 | 66 | 5 | 10 |
| ZMY12 | 11.4 | 12 | 12.7 | 50 | 9 | 0.5 | 7 | 3 | 60 | 5 | 10 |
| ZMY13 | 12.4 | 13 | 14.1 | 50 | 10 | 0.5 | 9 | 4 | 55 | 5 | 10 |
| ZMY15 | 13.8 | 15 | 15.8 | 50 | 11 | 0.5 | 9 | 4 | 49 | 5 | 10 |
| ZMY16 | 15.3 | 16 | 17.1 | 25 | 12 | 0.5 | 10 | 5 | 44 | 7 | 11 |
| ZMY18 | 16.8 | 18 | 19.1 | 25 | 14 | 0.5 | 11 | 5 | 40 | 7 | 11 |
| ZMY20 | 18.8 | 20 | 21.2 | 25 | 15 | 0.5 | 12 | 6 | 36 | 7 | 11 |
| ZMY22 | 20.8 | 22 | 23.3 | 25 | 17 | 0.5 | 13 | 7 | 34 | 7 | 11 |
| ZMY24 | 22.8 | 24 | 25.6 | 25 | 18 | 0.5 | 14 | 8 | 29 | 7 | 12 |
| ZMY27 | 25.1 | 27 | 28.9 | 25 | 20 | 0.5 | 15 | 9 | 27 | 7 | 12 |
| ZMY30 | 28 | 30 | 32 | 25 | 22.5 | 0.5 | 20 | 10 | 25 | 7 | 12 |
| ZMY33 | 31 | 33 | 35 | 25 | 25 | 0.5 | 20 | 11 | 22 | 7 | 12 |
| ZMY36 | 34 | 36 | 38 | 10 | 27 | 0.5 | 60 | 25 | 20 | 7 | 12 |
| ZMY39 | 37 | 39 | 41 | 10 | 29 | 0.5 | 60 | 30 | 18 | 8 | 12 |
| ZMY43 | 40 | 43 | 46 | 10 | 32 | 0.5 | 80 | 35 | 17 | 8 | 13 |
| ZMY47 | 44 | 47 | 50 | 10 | 35 | 0.5 | 80 | 40 | 15 | 8 | 13 |
| ZMY51 | 48 | 51 | 54 | 10 | 38 | 0.5 | 100 | 45 | 14 | 8 | 13 |
| ZMY56 | 52 | 56 | 60 | 10 | 42 | 0.5 | 100 | 50 | 13 | 8 | 13 |
| ZMY62 | 58 | 62 | 66 | 10 | 47 | 0.5 | 130 | 60 | 11 | 8 | 13 |
| ZMY68 | 64 | 68 | 72 | 10 | 51 | 0.5 | 130 | 65 | 10 | 8 | 13 |
| ZMY75 | 70 | 75 | 79 | 10 | 56 | 0.5 | 160 | 70 | 9 | 8 | 13 |
| ZMY82 | 77 | 82 | 88 | 10 | 61 | 0.5 | 160 | 80 | 8 | 8 | 13 |
| ZMY91 | 85 | 91 | 96 | 5 | 68 | 0.5 | 250 | 120 | 7.5 | 9 | 13 |
| ZMY100 | 94 | 100 | 106 | 5 | 75 | 0.5 | 250 | 130 | 7 | 9 | 13 |

**Notes**

(1) Valid provided that electrodes are kept at ambient temperature

(2) Tested with pulses $t_p$ = 5 ms

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

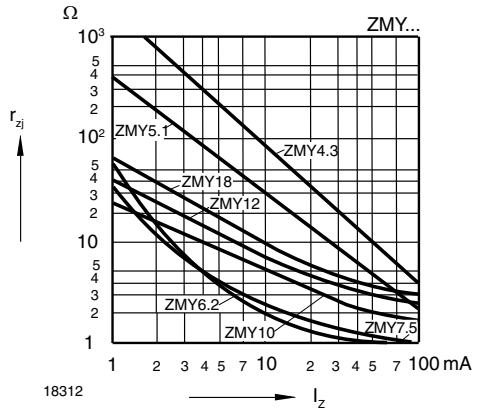



Fig. 1 - Dynamic Resistance vs. Zener Current

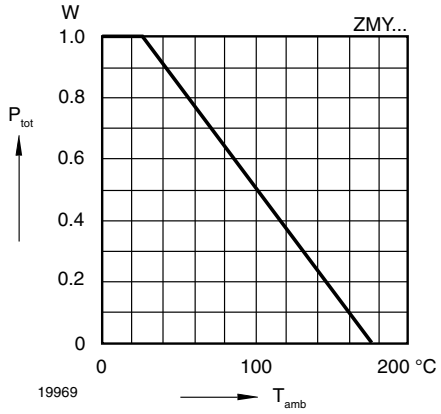



Fig. 4 - Admissible Power Dissipation vs. Ambient Temperature

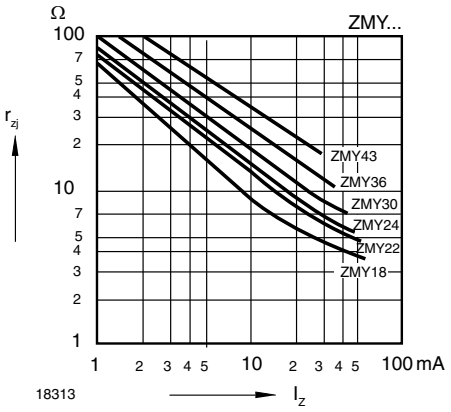



Fig. 2 - Dynamic Resistance vs. Zener Current

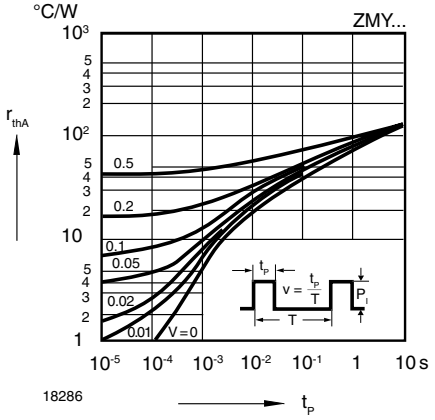



Fig. 5 - Pulse Thermal Resistance vs. Pulse Duration

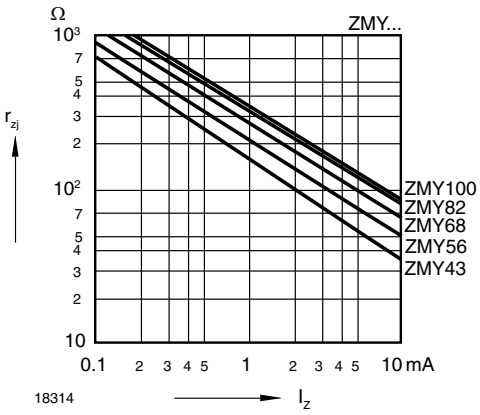



Fig. 3 - Dynamic Resistance vs. Zener Current

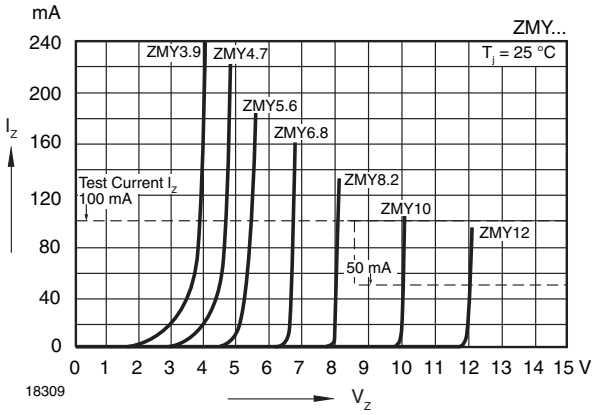



Fig. 6 - Breakdown Characteristics

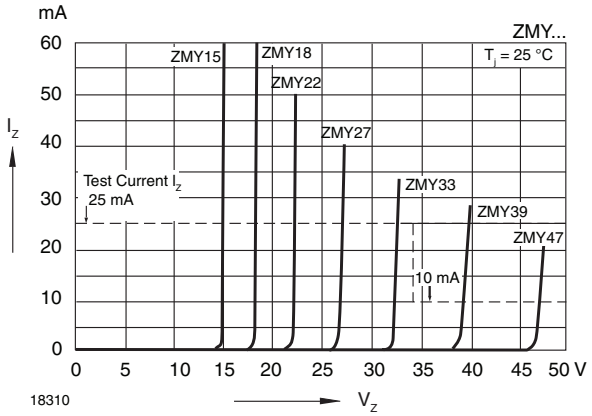



Fig. 7 - Breakdown Characteristics

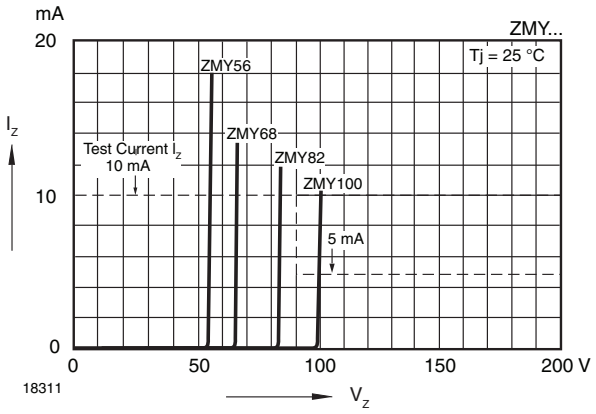
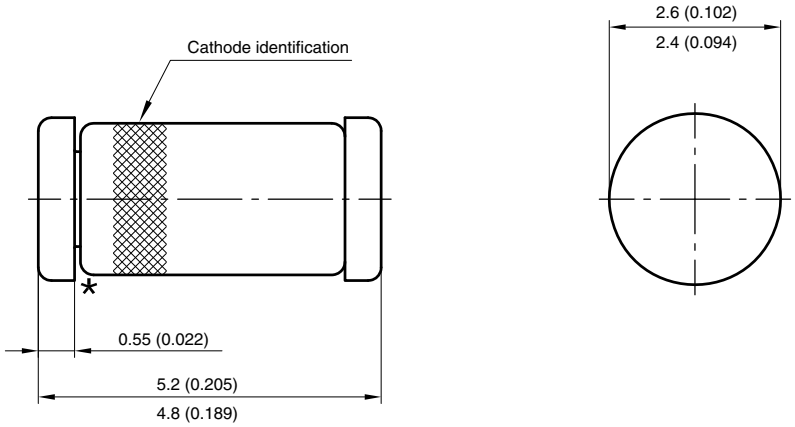


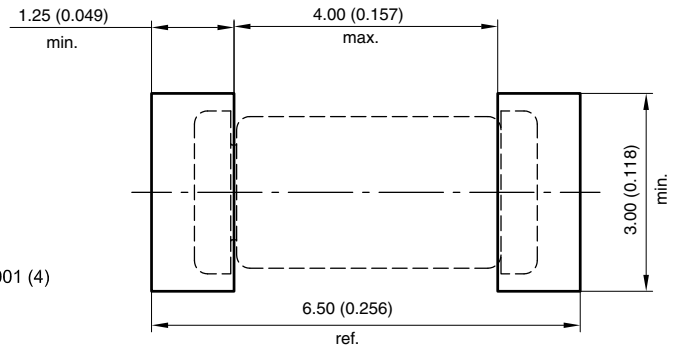

Fig. 8 - Breakdown Characteristics

**PACKAGE DIMENSIONS** in millimeters (inches): **MELF DO-213AB (glass)**




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

Foot print recommendation:

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