# Zener Diodes

## FEATURES

- Silicon planar power Zener diodes
- For use in stablilizing and clipping circuits with high power rating
- Standard Zener voltage tolerance is ± 5 %
- These diodes are also available in the DO-41 case with type designation 1N4728A to 1N4764A
- 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. | 3.3 to 100 | V |
| Test current $I_{ZT}$ | 2.5 to 76 | mA |
| $V_Z$ specification | Pulse current | |
| Int. construction | Single | |

| ORDERING INFORMATION | | | |
|---|---|---|---|
| DEVICE NAME | ORDERING CODE | TAPED UNITS PER REEL | MINIMUM ORDER QUANTITY |
| ZM4728A to ZM4764A | ZM4728A to ZM4764A-series-GS18 | 5 000 (12 mm tape on 13" reel) | 10 000/box |
| ZM4728A to ZM4764A | ZM4728A to ZM4764A-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 temperature | | $T_j$ | 175 | °C |
| Storage temperature range | | $T_{stg}$ | - 65 to + 175 | °C |

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

| PART NUMBER | ZENER VOLTAGE RANGE (1) | TEST CURRENT | | REVERSE LAEKAGE CURRENT | | DYNAMIC RESISTANCE f = 1 kHz | | SURGE CURRENT(3) | REGULATOR CURRENT (2) |
|---|---|---|---|---|---|---|---|---|---|
| | $V_Z$ at $I_{ZT1}$ | $I_{ZT1}$ | $I_{ZT2}$ | $I_R$ at $V_R$ | | $Z_Z$ at $I_{ZT1}$ | $Z_{ZK}$ at $I_{ZT2}$ | $I_R$ | $I_{ZM}$ |
| | V | mA | | µA | V | Ω | | mA | mA |
| | NOM. | | | MAX. | | MAX. | MAX. | | MAX. |
| ZM4728A | 3.3 | 76 | 1 | 100 | 1 | 10 | 400 | 1380 | 276 |
| ZM4729A | 3.6 | 69 | 1 | 100 | 1 | 10 | 400 | 1260 | 252 |
| ZM4730A | 3.9 | 64 | 1 | 50 | 1 | 9 | 400 | 1190 | 234 |
| ZM4731A | 4.3 | 58 | 1 | 10 | 1 | 9 | 400 | 1070 | 217 |
| ZM4732A | 4.7 | 53 | 1 | 10 | 1 | 8 | 500 | 970 | 193 |
| ZM4733A | 5.1 | 49 | 1 | 10 | 1 | 7 | 550 | 890 | 178 |
| ZM4734A | 5.6 | 45 | 1 | 10 | 2 | 5 | 600 | 810 | 162 |
| ZM4735A | 6.2 | 41 | 1 | 10 | 3 | 2 | 700 | 730 | 146 |
| ZM4736A | 6.8 | 37 | 1 | 10 | 4 | 3.5 | 700 | 660 | 133 |
| ZM4737A | 7.5 | 34 | 0.5 | 10 | 5 | 4 | 700 | 605 | 121 |
| ZM4738A | 8.2 | 31 | 0.5 | 10 | 6 | 4.5 | 700 | 550 | 110 |
| ZM4739A | 9.1 | 28 | 0.5 | 10 | 7 | 5 | 700 | 500 | 100 |
| ZM4740A | 10 | 25 | 0.25 | 10 | 7.6 | 7 | 700 | 454 | 91 |
| ZM4741A | 11 | 23 | 0.25 | 5 | 8.4 | 8 | 700 | 414 | 83 |
| ZM4742A | 12 | 21 | 0.25 | 5 | 9.1 | 9 | 700 | 380 | 76 |
| ZM4743A | 13 | 19 | 0.25 | 5 | 9.9 | 10 | 700 | 344 | 69 |
| ZM4744A | 15 | 17 | 0.25 | 5 | 11.4 | 14 | 700 | 304 | 61 |
| ZM4745A | 16 | 15.5 | 0.25 | 5 | 12.2 | 16 | 700 | 285 | 57 |
| ZM4746A | 18 | 14 | 0.25 | 5 | 13.7 | 20 | 750 | 250 | 50 |
| ZM4747A | 20 | 12.5 | 0.25 | 5 | 15.2 | 22 | 750 | 225 | 45 |
| ZM4748A | 22 | 11.5 | 0.25 | 5 | 16.7 | 23 | 750 | 205 | 41 |
| ZM4749A | 24 | 10.5 | 0.25 | 5 | 18.2 | 25 | 750 | 190 | 38 |
| ZM4750A | 27 | 9.5 | 0.25 | 5 | 20.6 | 35 | 750 | 170 | 34 |
| ZM4751A | 30 | 8.5 | 0.25 | 5 | 22.8 | 40 | 1000 | 150 | 30 |
| ZM4752A | 33 | 7.5 | 0.25 | 5 | 25.1 | 45 | 1000 | 135 | 27 |
| ZM4753A | 36 | 7 | 0.25 | 5 | 27.4 | 50 | 1000 | 125 | 25 |
| ZM4754A | 39 | 6.5 | 0.25 | 5 | 29.7 | 60 | 1000 | 115 | 23 |
| ZM4755A | 43 | 6 | 0.25 | 5 | 32.7 | 70 | 1500 | 110 | 22 |
| ZM4756A | 47 | 5.5 | 0.25 | 5 | 35.8 | 80 | 1500 | 95 | 19 |
| ZM4757A | 51 | 5 | 0.25 | 5 | 38.8 | 95 | 1500 | 90 | 18 |
| ZM4758A | 56 | 4.5 | 0.25 | 5 | 42.6 | 110 | 2000 | 80 | 16 |
| ZM4759A | 62 | 4 | 0.25 | 5 | 47.1 | 125 | 2000 | 70 | 14 |
| ZM4760A | 68 | 3.7 | 0.25 | 5 | 51.7 | 150 | 2000 | 65 | 13 |
| ZM4761A | 75 | 3.3 | 0.25 | 5 | 56 | 175 | 2000 | 60 | 12 |
| ZM4762A | 82 | 3 | 0.25 | 5 | 62.2 | 200 | 3000 | 55 | 11 |
| ZM4763A | 91 | 2.8 | 0.25 | 5 | 69.2 | 250 | 3000 | 50 | 10 |
| ZM4764A | 100 | 2.5 | 0.25 | 5 | 76 | 350 | 3000 | 45 | 9 |

**Notes**

(1) 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

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

(3) Measured under thermal equilibrium and DC test conditions

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

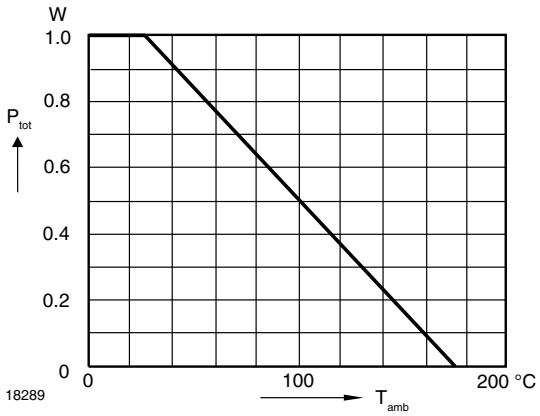
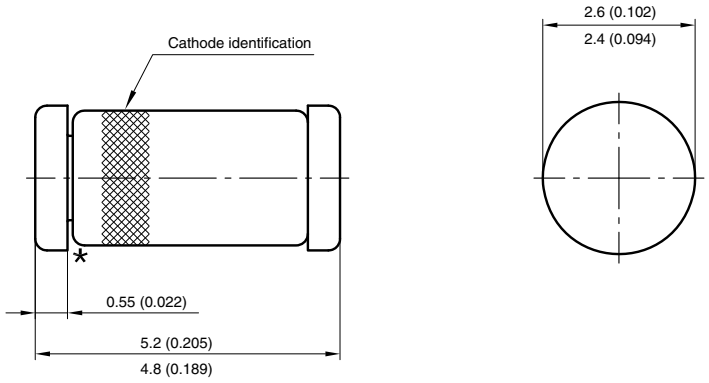
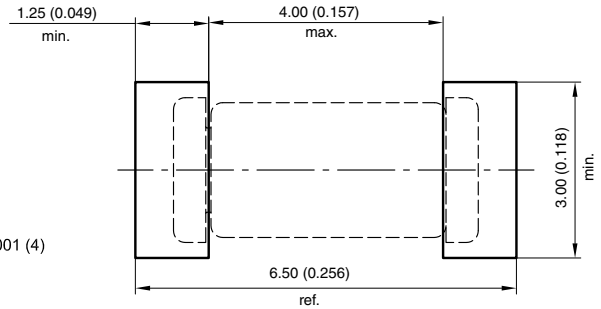



Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

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




Foot print recommendation:




Document no.:S8-V-3453.02-001 (4)
Rev. 3 - Date: 07 June 2006
18317

# 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 and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.

# Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**