

## Zener Diodes



### FEATURES

- Silicon planar power Zener diodes
- For use in stabilizing and clipping circuits with high power rating
- Standard Zener voltage tolerance is  $\pm 5\%$
- These diodes are also available in the DO-41 case with type designation 1N4728A to 1N4761A
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**

### LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |                     |      |
|-------------------------|---------------------|------|
| PARAMETER               | VALUE               | UNIT |
| $V_Z$ range nom.        | 3.3 to 75           | V    |
| Test current $I_{ZT}$   | 3.3 to 76           | mA   |
| $V_Z$ specification     | Thermal equilibrium |      |
| Circuit configuration   | Single              |      |

| ORDERING INFORMATION |                                |                                |                        |
|----------------------|--------------------------------|--------------------------------|------------------------|
| DEVICE NAME          | ORDERING CODE                  | TAPED UNITS PER REEL           | MINIMUM ORDER QUANTITY |
| ZM4728A to ZM4761A   | ZM4728A to ZM4761A-series-GS18 | 5 000 (12 mm tape on 13" reel) | 10 000/box             |
| ZM4728A to ZM4761A   | ZM4728A to ZM4761A-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 | approx. 135 mg | UL 94 V-0                            | MSL level 1 (according J-STD-020) | Peak temperature max. 260 °C |

| ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , 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   |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                    |              |           |                         |      |                                                         |                       |                              |                                  |
|----------------------------------------------------------------------------------------------------------|------------------------------------|--------------|-----------|-------------------------|------|---------------------------------------------------------|-----------------------|------------------------------|----------------------------------|
| PART NUMBER                                                                                              | ZENER VOLTAGE RANGE <sup>(3)</sup> | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |      | DYNAMIC RESISTANCE <sup>(1)</sup><br>$f = 1\text{ kHz}$ |                       | SURGE CURRENT <sup>(4)</sup> | REGULATOR CURRENT <sup>(2)</sup> |
|                                                                                                          | $V_Z$ at $I_{ZT1}$                 | $I_{ZT1}$    | $I_{ZT2}$ | $I_R$ at $V_R$          |      | $Z_Z$ at $I_{ZT1}$                                      | $Z_{ZK}$ at $I_{ZT2}$ | $I_{ZSM}$                    | $I_{ZM}$                         |
|                                                                                                          | V                                  | mA           |           | $\mu\text{A}$           | V    | $\Omega$                                                |                       | 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                               |

**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
- (4) Width of the test pulse is 8.3 ms



**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

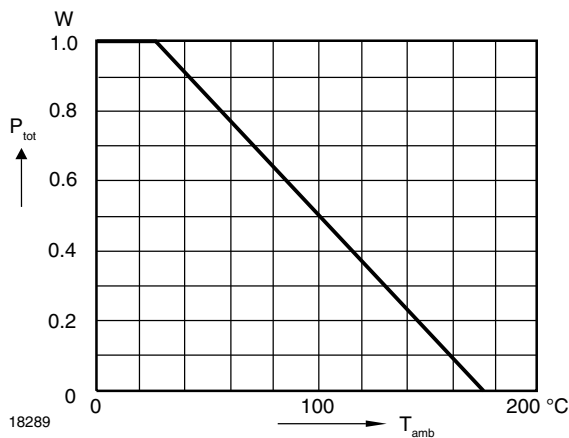


Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

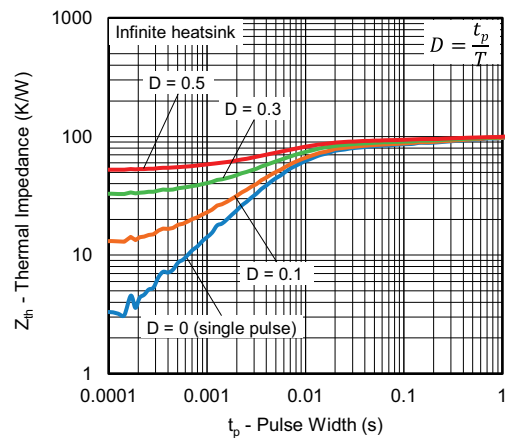


Fig. 2 - Thermal Impedance vs. Time

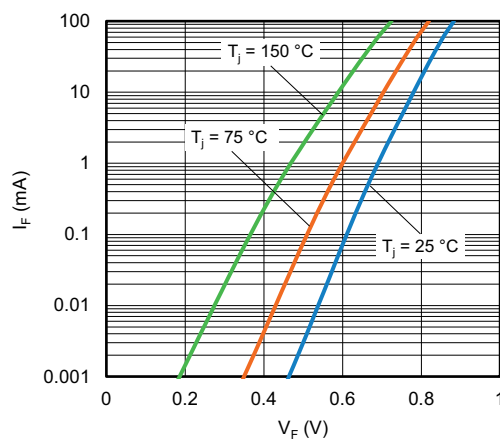
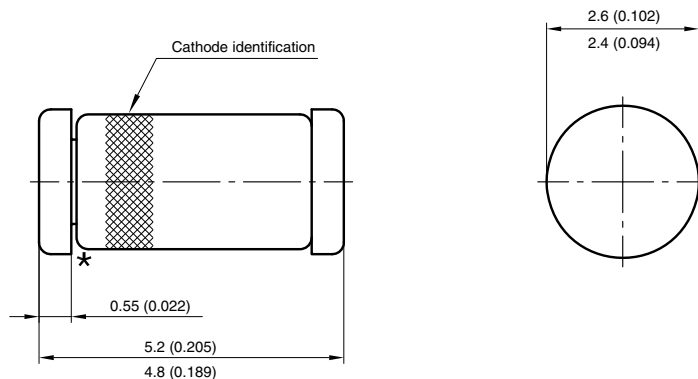


Fig. 3 - Typical Forward Current  $I_F$  vs. Forward Voltage  $V_F$

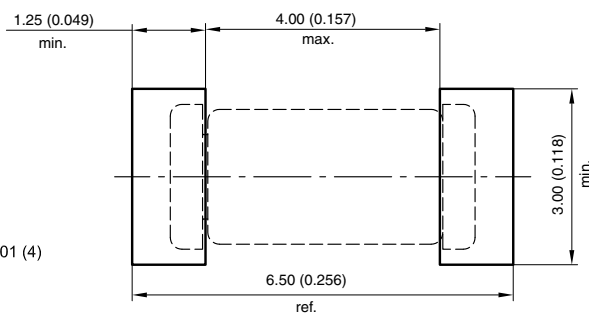


**PACKAGE DIMENSIONS** in millimeters (inches): **MELF DO-213AB (glass)**



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

Foot print recommendation:



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



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