



**THE DATASHEET OF  
ZMY51-GS18**





## Zener Diodes



### DESIGN SUPPORT TOOLS AVAILABLE



### FEATURES

- Silicon planar power Zener diodes
- For use in stabilizing 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

| PRIMARY CHARACTERISTICS      |               |      |
|------------------------------|---------------|------|
| PARAMETER                    | VALUE         | UNIT |
| V <sub>Z</sub> range nom.    | 3.9 to 100    | V    |
| Test current I <sub>ZT</sub> | 5 to 100      | mA   |
| V <sub>Z</sub> specification | Pulse current |      |
| Circuit configuration        | 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) | Peak temperature max. 260 °C |

| ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified) |  |                   |             |      |
|---|--|-------------------|-------------|------|
| PARAMETER   | TEST CONDITION   | SYMBOL            | VALUE       | UNIT |
| Power dissipation   | Valid provided that electrodes are kept at ambient temperature | P <sub>tot</sub>  | 1000        | mW   |
| Zener current   | See table "Characteristics"                                    |                   |             |      |
| Junction to ambient air   | Valid provided that electrodes are kept at ambient temperature | R <sub>thJA</sub> | 170         | K/W  |
| Junction to ambient case  |  | R <sub>thJC</sub> | 60          | K/W  |
| Junction temperature, maximum   |  | T <sub>j</sub>    | 175         | °C   |
| Storage temperature range   |  | T <sub>stg</sub>  | -55 to +175 | °C   |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                    |      |      |              |                 |               |  |      |   |  |      |
|--|------------------------------------|------|------|--------------|-----------------|---------------|--|------|---|--|------|
| PART NUMBER  | ZENER VOLTAGE RANGE <sup>(2)</sup> |      |      | TEST CURRENT | REVERSE VOLTAGE |               | DYNAMIC RESISTANCE<br>$f = 1\text{ kHz}$ |      | ADMISSIBLE ZENER CURRENT <sup>(1)</sup> | 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               | $\mu\text{A}$ | $\Omega$                                 |      | mA                                      | $10^{-4}/^{\circ}\text{C}$               |      |
|  | 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**

<sup>(1)</sup> Valid provided that electrodes are kept at ambient temperature

<sup>(2)</sup> Tested with pulses  $t_p = 5\text{ ms}$

## BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)



Fig. 1 - Dynamic Resistance vs. Zener Current



Fig. 4 - Admissible Power Dissipation vs. Ambient Temperature

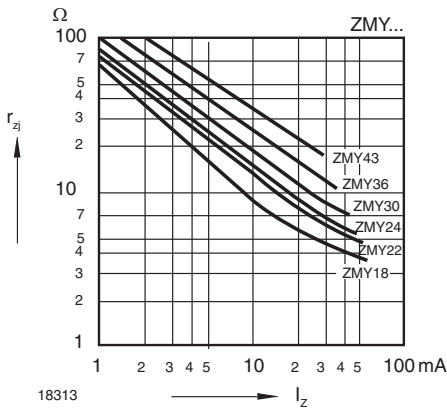


Fig. 2 - Dynamic Resistance vs. Zener Current



Fig. 5 - Pulse Thermal Resistance vs. Pulse Duration

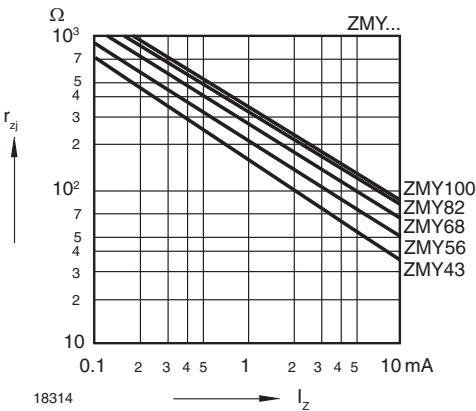


Fig. 3 - Dynamic Resistance vs. Zener Current

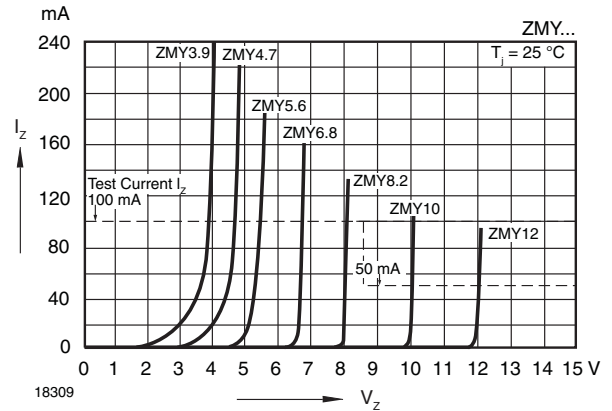


Fig. 6 - Breakdown Characteristics

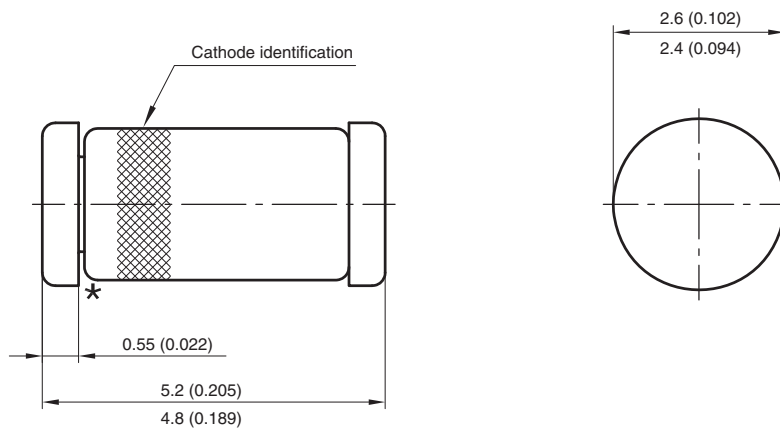


Fig. 7 - Breakdown Characteristics



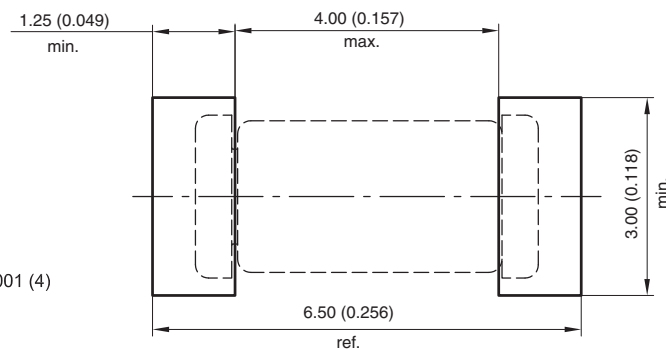
Fig. 8 - Breakdown Characteristics

**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:



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. 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.

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

Click below to explore more details on WIN SOURCE:

 [View ZMY51-GS18 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