

## Zener Diodes



### FEATURES

- Silicon planar power Zener diodes
- For use in stabilizing and clipping circuits with high power rating
- Standard Zener voltage tolerance is  $\pm 5\%$
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

### APPLICATIONS

- Voltage stabilization

### 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 |
| 1N4728A to 1N4761A   | 1N4728A to 1N4761A -series-TR | 5000 per 14" reel             | 25 000/box             |
| 1N4728A to 1N4761A   | 1N4728A to 1N4761A-series-TAP | 5000 per ammpack (52 mm tape) | 25 000/box             |

| PACKAGE          |                |                                      |                                   |                              |
|------------------|----------------|--------------------------------------|-----------------------------------|------------------------------|
| PACKAGE NAME     | WEIGHT         | MOLDING COMPOUND FLAMMABILITY RATING | MOISTURE SENSITIVITY LEVEL        | SOLDERING CONDITIONS         |
| DO-41 (DO-204AL) | approx. 310 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 leads at a distance of 4 mm from case are kept at ambient temperature<br>$t_p = 10\text{ ms}$ | $P_{tot}$  | 1300        | mW   |  |
| Zener current                                                                     |                                                                                                                   | $I_Z$      | $P_V/V_Z$   | mA   |  |
| Thermal resistance junction to ambient air                                        | Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature<br>$t_p = 10\text{ ms}$ | $R_{thJA}$ | 110         | K/W  |  |
| Junction temperature                                                              |                                                                                                                   | $T_j$      | 175         | °C   |  |
| Storage temperature range                                                         |                                                                                                                   | $T_{stg}$  | -65 to +175 | °C   |  |
| Forward voltage (max.)                                                            | $I_F = 200\text{ mA}$                                                                                             | $V_F$      | 1.2         | V    |  |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified) |                                    |              |           |                         |      |                                       |                       |                              |                                  |
|----------------------------------------------------------------------------------------------------------|------------------------------------|--------------|-----------|-------------------------|------|---------------------------------------|-----------------------|------------------------------|----------------------------------|
| PART NUMBER                                                                                              | ZENER VOLTAGE RANGE <sup>(1)</sup> | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |      | DYNAMIC RESISTANCE $f = 1\text{ kHz}$ |                       | SURGE CURRENT <sup>(3)</sup> | REGULATOR CURRENT <sup>(2)</sup> |
|                                                                                                          | $V_Z$ at $I_{ZT1}$                 | $I_{ZT1}$    | $I_{ZT2}$ | $I_R$ at $V_R$          |      | $Z_{ZT}$ at $I_{ZT1}$                 | $Z_{ZK}$ at $I_{ZT2}$ | $I_R$                        | $I_{ZM}$                         |
|                                                                                                          | V                                  | mA           | mA        | $\mu\text{A}$           | V    | $\Omega$                              |                       | mA                           | mA                               |
|                                                                                                          | NOM.                               |              |           | MAX.                    |      | TYP.                                  | MAX.                  |                              | MAX.                             |
| 1N4728A                                                                                                  | 3.3                                | 76           | 1         | 100                     | 1    | 10                                    | 400                   | 1380                         | 276                              |
| 1N4729A                                                                                                  | 3.6                                | 69           | 1         | 100                     | 1    | 10                                    | 400                   | 1260                         | 252                              |
| 1N4730A                                                                                                  | 3.9                                | 64           | 1         | 50                      | 1    | 9                                     | 400                   | 1190                         | 234                              |
| 1N4731A                                                                                                  | 4.3                                | 58           | 1         | 10                      | 1    | 9                                     | 400                   | 1070                         | 217                              |
| 1N4732A                                                                                                  | 4.7                                | 53           | 1         | 10                      | 1    | 8                                     | 500                   | 970                          | 193                              |
| 1N4733A                                                                                                  | 5.1                                | 49           | 1         | 10                      | 1    | 7                                     | 550                   | 890                          | 178                              |
| 1N4734A                                                                                                  | 5.6                                | 45           | 1         | 10                      | 2    | 5                                     | 600                   | 810                          | 162                              |
| 1N4735A                                                                                                  | 6.2                                | 41           | 1         | 10                      | 3    | 2                                     | 700                   | 730                          | 146                              |
| 1N4736A                                                                                                  | 6.8                                | 37           | 1         | 10                      | 4    | 3.5                                   | 700                   | 660                          | 133                              |
| 1N4737A                                                                                                  | 7.5                                | 34           | 0.5       | 10                      | 5    | 4                                     | 700                   | 605                          | 121                              |
| 1N4738A                                                                                                  | 8.2                                | 31           | 0.5       | 10                      | 6    | 4.5                                   | 700                   | 550                          | 110                              |
| 1N4739A                                                                                                  | 9.1                                | 28           | 0.5       | 10                      | 7    | 5                                     | 700                   | 500                          | 100                              |
| 1N4740A                                                                                                  | 10                                 | 25           | 0.25      | 10                      | 7.6  | 7                                     | 700                   | 454                          | 91                               |
| 1N4741A                                                                                                  | 11                                 | 23           | 0.25      | 5                       | 8.4  | 8                                     | 700                   | 414                          | 83                               |
| 1N4742A                                                                                                  | 12                                 | 21           | 0.25      | 5                       | 9.1  | 9                                     | 700                   | 380                          | 76                               |
| 1N4743A                                                                                                  | 13                                 | 19           | 0.25      | 5                       | 9.9  | 10                                    | 700                   | 344                          | 69                               |
| 1N4744A                                                                                                  | 15                                 | 17           | 0.25      | 5                       | 11.4 | 14                                    | 700                   | 304                          | 61                               |
| 1N4745A                                                                                                  | 16                                 | 15.5         | 0.25      | 5                       | 12.2 | 16                                    | 700                   | 285                          | 57                               |
| 1N4746A                                                                                                  | 18                                 | 14           | 0.25      | 5                       | 13.7 | 20                                    | 750                   | 250                          | 50                               |
| 1N4747A                                                                                                  | 20                                 | 12.5         | 0.25      | 5                       | 15.2 | 22                                    | 750                   | 225                          | 45                               |
| 1N4748A                                                                                                  | 22                                 | 11.5         | 0.25      | 5                       | 16.7 | 23                                    | 750                   | 205                          | 41                               |
| 1N4749A                                                                                                  | 24                                 | 10.5         | 0.25      | 5                       | 18.2 | 25                                    | 750                   | 190                          | 38                               |
| 1N4750A                                                                                                  | 27                                 | 9.5          | 0.25      | 5                       | 20.6 | 35                                    | 750                   | 170                          | 34                               |
| 1N4751A                                                                                                  | 30                                 | 8.5          | 0.25      | 5                       | 22.8 | 40                                    | 1000                  | 150                          | 30                               |
| 1N4752A                                                                                                  | 33                                 | 7.5          | 0.25      | 5                       | 25.1 | 45                                    | 1000                  | 135                          | 27                               |
| 1N4753A                                                                                                  | 36                                 | 7            | 0.25      | 5                       | 27.4 | 50                                    | 1000                  | 125                          | 25                               |
| 1N4754A                                                                                                  | 39                                 | 6.5          | 0.25      | 5                       | 29.7 | 60                                    | 1000                  | 115                          | 23                               |
| 1N4755A                                                                                                  | 43                                 | 6            | 0.25      | 5                       | 32.7 | 70                                    | 1500                  | 110                          | 22                               |
| 1N4756A                                                                                                  | 47                                 | 5.5          | 0.25      | 5                       | 35.8 | 80                                    | 1500                  | 95                           | 19                               |
| 1N4757A                                                                                                  | 51                                 | 5            | 0.25      | 5                       | 38.8 | 95                                    | 1500                  | 90                           | 18                               |
| 1N4758A                                                                                                  | 56                                 | 4.5          | 0.25      | 5                       | 42.6 | 110                                   | 2000                  | 80                           | 16                               |
| 1N4759A                                                                                                  | 62                                 | 4            | 0.25      | 5                       | 47.1 | 125                                   | 2000                  | 70                           | 14                               |
| 1N4760A                                                                                                  | 68                                 | 3.7          | 0.25      | 5                       | 51.7 | 150                                   | 2000                  | 65                           | 13                               |
| 1N4761A                                                                                                  | 75                                 | 3.3          | 0.25      | 5                       | 56   | 175                                   | 2000                  | 60                           | 12                               |

**Notes**

- (1) Based on DC measurement at thermal equilibrium while maintaining the lead temperature ( $T_L$ ) at  $30\text{ }^{\circ}\text{C} + 1\text{ }^{\circ}\text{C}$ , 9.5 mm (3/8") from the diode body
- (2) Valid provided that electrodes at a distance of 4 mm from case are kept at ambient temperature,  $t_p = 10\text{ ms}$
- (3)  $t_p = 10\text{ ms}$ .

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

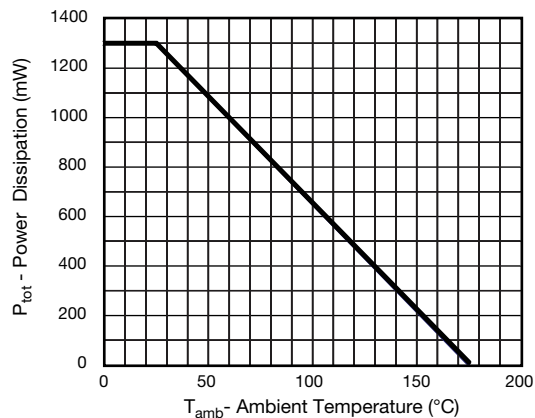


Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature  
 $P_{tot} = f(T_{amb})$

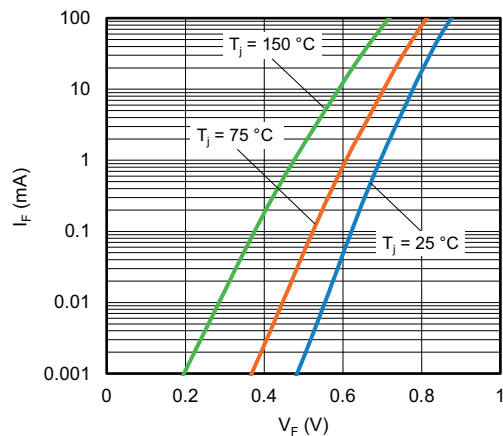
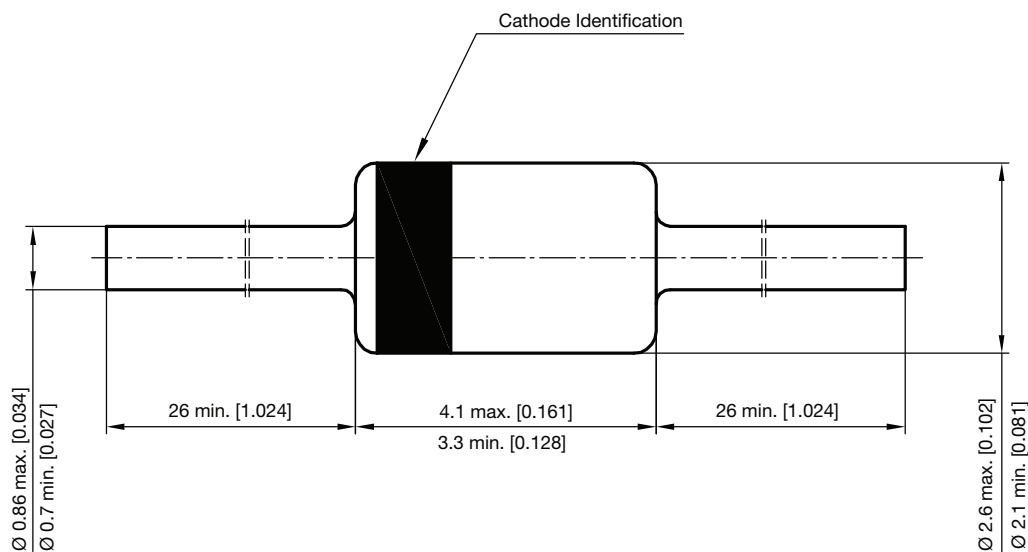


Fig. 2 - Typical Forward Current  $I_F$  vs. Forward Voltage  $V_F$

### PACKAGE DIMENSIONS in millimeters (inches): DO-41 (DO-204AL) 1N47xx



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