

**DESCRIPTION**

The popular 1N4728AG thru 1N4764AG glass body series of 1.0 watt Zeners provides voltage regulation in a selection from 3.3 to 100 volts in 5% tolerances with other tighter tolerances also available as identified by different suffix letters on the part number. These glass encapsulated Zeners with a G suffix provide hermetic-sealed qualities and higher rated temperature when required beyond that optionally provided in the same size DO-41 plastic-body (P suffix) for these JEDEC part numbers. Both of these package options are available by Microsemi including RoHS Compliant devices with an "e3" suffix. A variety of other Zener product offerings and packages are available by Microsemi to meet higher and lower power or test current applications.

**APPEARANCE**

**DO-41 or  
DO-204AL  
(Glass)**



**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**FEATURES**

- JEDEC registered 1N4728A to 1N4764A
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, JANTXV, and JANS are available by adding MQ, MX, MV, or MSP prefixes respectively to part numbers.
- Surface mount equivalents available as SMAJ4728A to SMAJ4764A and MLL4728A to MLL4764A (consult factory for others)
- Plastic body axial-leaded Zener equivalents are also available as 1N4728AP to 1N4764AP
- RoHS Compliant devices available by adding "e3" suffix

**APPLICATIONS / BENEFITS**

- Regulates voltage over a broad operating current and temperature range
- Extensive voltage selection from 3.3 to 100 V
- Flexible axial-lead mounting terminals
- Standard voltage tolerances are plus/minus 5% with A suffix and 10 % with no suffix identification
- Tight tolerances available in plus or minus 2% or 1% with C or D suffix respectively
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Hermetically sealed glass body construction

**MAXIMUM RATINGS**

- Power dissipation at 25°C: 1.0 watts (also see derating in Figure 1).
- Operating and Storage temperature: -65°C to +175°C
- Thermal Resistance: 80 °C/W junction to lead at 3/8 (10 mm) lead length from body, or 140°C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with 4 mm<sup>2</sup> copper pads and track width 1 mm, length 25 mm
- Steady-State Power: 1.0 watts at T<sub>L</sub> ≤ 95°C 3/8 inch (10 mm) from body or 1.00 watt at T<sub>A</sub> ≤ 35°C when mounted on FR4 PC board as described for thermal resistance above (also see Figure 1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260 °C for 10 s (max)

**MECHANICAL AND PACKAGING**

- CASE: Hermetically sealed axial-lead glass package
- TERMINALS: Tin-Lead (Sn/Pb) or RoHS Compliant annealed matte-Tin plated solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. Diode to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: Part number
- TAPE & REEL option: Standard per EIA-296 (add "TR" suffix to part number)
- WEIGHT: 0.4 grams
- See package dimensions on last page

**ELECTRICAL CHARACTERISTICS\***

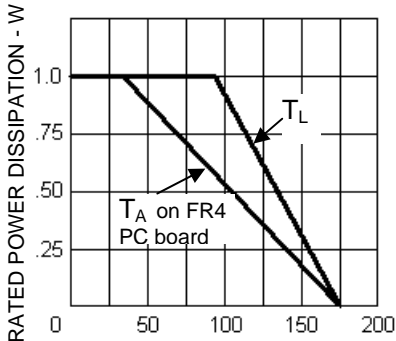
| JEDEC TYPE NUMBER (Note 1) | ZENER VOLTAGE (Note 4) | TEST CURRENT       | MAXIMUM DYNAMIC IMPEDANCE (Note 2)   | MAXIMUM REVERSE CURRENT            | TEST VOLTAGE      | MAXIMUM REGULATOR CURRENT<br>T <sub>A</sub> = 50°C | MAXIMUM KNEE IMPEDANCE (Note 2)      | TEST CURRENT       | MAXIMUM (SURGE) CURRENT (Note 3) |
|----------------------------|------------------------|--------------------|--------------------------------------|------------------------------------|-------------------|--|--------------------------------------|--------------------|----------------------------------|
|                            | (V <sub>Z</sub> )      | (I <sub>ZT</sub> ) | (Z <sub>ZT</sub> @ I <sub>ZT</sub> ) | (I <sub>R</sub> @ V <sub>R</sub> ) | (V <sub>R</sub> ) | (I <sub>ZM</sub> )                                 | (Z <sub>ZK</sub> @ I <sub>ZK</sub> ) | (I <sub>ZK</sub> ) | (I <sub>S</sub> )                |
|                            | VOLTS                  | mA                 | OHMS                                 | μA                                 | VOLTS             | mA   | OHMS                                 | mA                 | mA                               |
| 1N4728A                    | 3.3                    | 76                 | 10                                   | 100                                | 1                 | 276  | 400                                  | 1.0                | 1380                             |
| 1N4729A                    | 3.6                    | 69                 | 10                                   | 100                                | 1                 | 252  | 400                                  | 1.0                | 1260                             |
| 1N4730A                    | 3.9                    | 64                 | 9                                    | 50                                 | 1                 | 234  | 400                                  | 1.0                | 1190                             |
| 1N4731A                    | 4.3                    | 58                 | 9                                    | 10                                 | 1                 | 217  | 400                                  | 1.0                | 1070                             |
| 1N4732A                    | 4.7                    | 53                 | 8                                    | 10                                 | 1                 | 193  | 500                                  | 1.0                | 970                              |
| 1N4733A                    | 5.1                    | 49                 | 7                                    | 10                                 | 1                 | 178  | 550                                  | 1.0                | 890                              |
| 1N4734A                    | 5.6                    | 45                 | 5                                    | 10                                 | 2                 | 162  | 600                                  | 1.0                | 810                              |
| 1N4735A                    | 6.2                    | 41                 | 2                                    | 10                                 | 3                 | 146  | 700                                  | 1.0                | 730                              |
| 1N4736A                    | 6.8                    | 37                 | 3.5                                  | 10                                 | 4                 | 133  | 700                                  | 1.0                | 660                              |
| 1N4737A                    | 7.5                    | 34                 | 4.0                                  | 10                                 | 5                 | 121  | 700                                  | 0.5                | 605                              |
| 1N4738A                    | 8.2                    | 31                 | 4.5                                  | 10                                 | 6                 | 110  | 700                                  | 0.5                | 550                              |
| 1N4739A                    | 9.1                    | 28                 | 5.0                                  | 10                                 | 7                 | 100  | 700                                  | 0.5                | 500                              |
| 1N4740A                    | 10                     | 25                 | 7                                    | 10                                 | 7.6               | 91   | 700                                  | 0.25               | 454                              |
| 1N4741A                    | 11                     | 23                 | 8                                    | 5                                  | 8.4               | 83   | 700                                  | 0.25               | 414                              |
| 1N4742A                    | 12                     | 21                 | 9                                    | 5                                  | 9.1               | 76   | 700                                  | 0.25               | 380                              |
| 1N4743A                    | 13                     | 19                 | 10                                   | 5                                  | 9.9               | 69   | 700                                  | 0.25               | 344                              |
| 1N4744A                    | 15                     | 17                 | 14                                   | 5                                  | 11.4              | 61   | 700                                  | 0.25               | 304                              |
| 1N4745A                    | 16                     | 15.5               | 16                                   | 5                                  | 12.2              | 57   | 700                                  | 0.25               | 285                              |
| 1N4746A                    | 18                     | 14                 | 20                                   | 5                                  | 13.7              | 50   | 750                                  | 0.25               | 250                              |
| 1N4747A                    | 20                     | 12.5               | 22                                   | 5                                  | 15.2              | 45   | 750                                  | 0.25               | 225                              |
| 1N4748A                    | 22                     | 11.5               | 23                                   | 5                                  | 16.7              | 41   | 750                                  | 0.25               | 205                              |
| 1N4749A                    | 24                     | 10.5               | 25                                   | 5                                  | 18.2              | 38   | 750                                  | 0.25               | 190                              |
| 1N4750A                    | 27                     | 9.5                | 35                                   | 5                                  | 20.6              | 34   | 750                                  | 0.25               | 170                              |
| 1N4751A                    | 30                     | 8.5                | 40                                   | 5                                  | 22.8              | 30   | 1000                                 | 0.25               | 150                              |
| 1N4752A                    | 33                     | 7.5                | 45                                   | 5                                  | 25.1              | 27   | 1000                                 | 0.25               | 135                              |
| 1N4753A                    | 36                     | 7.0                | 50                                   | 5                                  | 27.4              | 25   | 1000                                 | 0.25               | 125                              |
| 1N4754A                    | 39                     | 6.5                | 60                                   | 5                                  | 29.7              | 23   | 1000                                 | 0.25               | 115                              |
| 1N4755A                    | 43                     | 6.0                | 70                                   | 5                                  | 32.7              | 22   | 1500                                 | 0.25               | 110                              |
| 1N4756A                    | 47                     | 5.5                | 80                                   | 5                                  | 35.8              | 19   | 1500                                 | 0.25               | 95                               |
| 1N4757A                    | 51                     | 5.0                | 95                                   | 5                                  | 38.8              | 18   | 1500                                 | 0.25               | 90                               |
| 1N4758A                    | 56                     | 4.5                | 110                                  | 5                                  | 42.6              | 16   | 2000                                 | 0.25               | 80                               |
| 1N4759A                    | 62                     | 4.0                | 125                                  | 5                                  | 47.1              | 14   | 2000                                 | 0.25               | 70                               |
| 1N4760A                    | 68                     | 3.7                | 150                                  | 5                                  | 51.7              | 13   | 2000                                 | 0.25               | 65                               |
| 1N4761A                    | 75                     | 3.3                | 175                                  | 5                                  | 56.0              | 12   | 2000                                 | 0.25               | 60                               |
| 1N4762A                    | 82                     | 3.0                | 200                                  | 5                                  | 62.2              | 11   | 3000                                 | 0.25               | 55                               |
| 1N4763A                    | 91                     | 2.8                | 250                                  | 5                                  | 69.2              | 10   | 3000                                 | 0.25               | 50                               |
| 1N4764A                    | 100                    | 2.5                | 350                                  | 5                                  | 76.0              | 9  | 3000                                 | 0.25               | 45                               |

\*JEDEC Registered Data

**NOTES:**

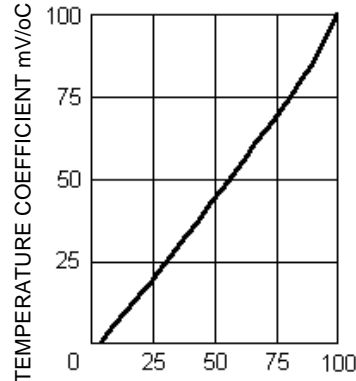
- The JEDEC type numbers shown with an A suffix have a 5% tolerance on nominal zener voltage. No suffix signifies a 10% tolerance, C signifies 2%, and D signifies 1% tolerance. Also add a G suffix for designating glass construction (P suffix designates plastic body options described by separate data sheet).
- The Zener impedance is derived from the 60 Hz ac voltage that results when an ac current having an rms value equal to 10% of the dc Zener current (I<sub>ZT</sub> or I<sub>ZK</sub>) is superimposed on I<sub>ZT</sub> or I<sub>ZK</sub>. Zener impedance is measured at two points to ensure a sharp knee on the breakdown curve and eliminate unstable units. See MicroNote 202 for zener impedance variation with different operating currents.
- The reverse surge current is measured at 25°C ambient using a ½ square wave or equivalent sine wave pulse 1/120 second duration superimposed on I<sub>ZT</sub>.
- Zener voltage (V<sub>Z</sub>) is measured at T<sub>L</sub> = 25°C (+8, -2°C) and 90 seconds after application of dc current.

GRAPHS



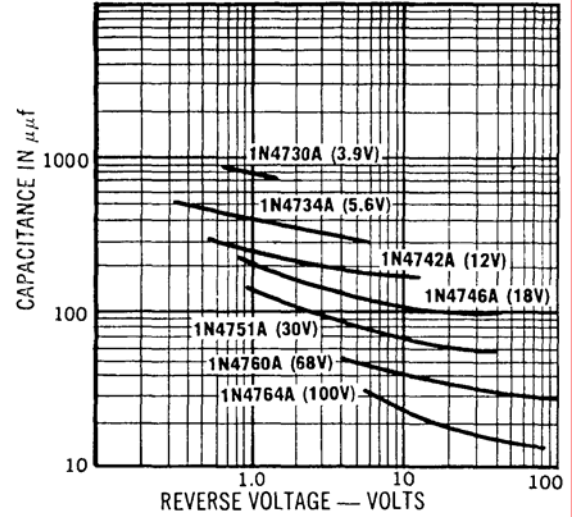
$T_L$ , LEAD TEMP. ( $^{\circ}$ C) 3/8" from body  
or  $T_A$  on FR4 PC Board

**FIGURE 1**  
Power Derating Curve



NOMINAL ZENER VOLTAGE (VOLTS)

**FIGURE 2**  
Temp. Coeff. vs. Zener Voltage



**FIGURE 3**  
Capacitance vs. Voltage  
for Representative Types

PACKAGE DIMENSIONS (DO-41 or DO-204AL)

