

## 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  $T_L \leq 95^\circ\text{C}$  3/8 inch (10 mm) from body or 1.00 watt at  $T_A \leq 35^\circ\text{C}$  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\***

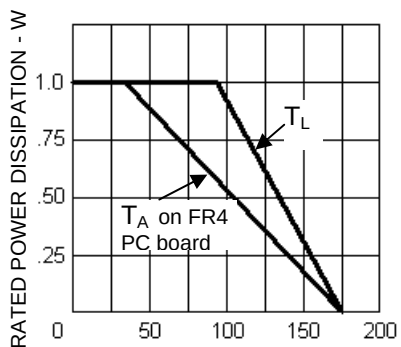
| JEDEC<br>TYPE<br>NUMBER<br>(Note 1) | ZENER<br>VOLTAGE<br>(Note 4)<br>(V <sub>Z</sub> ) | TEST<br>CURRENT<br>(I <sub>ZT</sub> ) | MAXIMUM<br>DYNAMIC<br>IMPEDANCE<br>(Note 2)<br>(Z <sub>DT</sub> @ I <sub>ZT</sub> ) | MAXIMUM<br>REVERSE<br>CURRENT<br>(I <sub>R</sub> @ V <sub>R</sub> ) | TEST<br>VOLTAGE<br>(V <sub>R</sub> ) | MAXIMUM<br>REGULATOR<br>CURRENT<br>T <sub>A</sub> = 50°C<br>(I <sub>ZM</sub> ) | MAXIMUM<br>KNEE<br>IMPEDANCE<br>(Note 2)<br>(Z <sub>ZK</sub> @ I <sub>ZK</sub> ) | TEST<br>CURRENT<br>(I <sub>ZK</sub> ) | MAXIMUM<br>(SURGE)<br>CURRENT<br>(Note 3)<br>(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

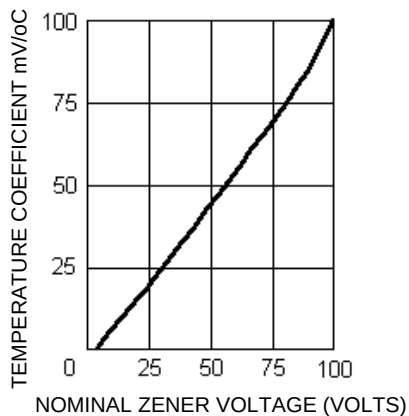
**NOTES:**

- 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.

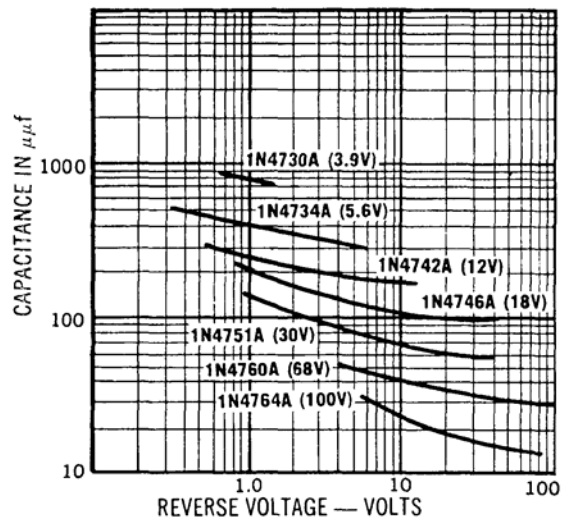
GRAPHS



**FIGURE 1**  
Power Derating Curve

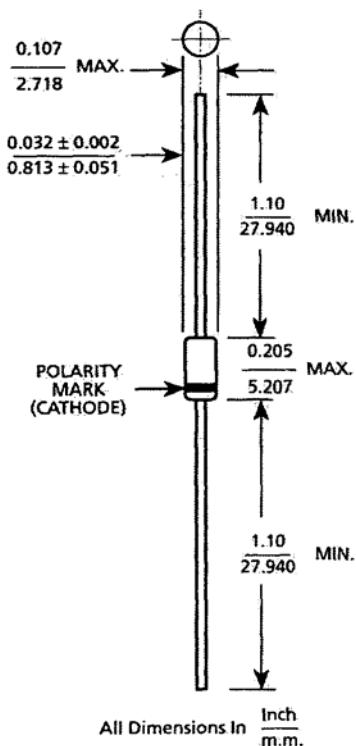


**FIGURE 2**  
Temp. Coeff. vs. Zener Voltage



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

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



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- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
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- Изготовление тестовой платы монтаж и пусконаладочные работы.



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