

**DESCRIPTION**

This surface mountable 1 watt Zener diode series is electrically equivalent to the 1N4728A thru 1N4764A registration in the DO-41 equivalent package except that it meets the JEDEC surface mount outline DO-213AB. It is an ideal selection for applications of high density and low parasitic requirements for voltage regulation. Standard voltage tolerance is +/- 5% with tighter tolerances available down to 1%. With its glass hermetic qualities, it may also be used for high reliability applications when required by a source control drawing (SCD).

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

**APPEARANCE**



**DO-213AB**

**FEATURES**

- Electrically similar to the JEDEC registered 1N4728 thru 1N4764 zener series
- Zener voltages available 3.3V to 100V
- Standard voltage tolerances are +/- 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
- 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 also available as SMAJ4728A to SMAJ4764A and SMAJ4728A to SMAJ4764A
- RoHS Compliant devices also available by adding e3 suffix
- Plastic body axial-leaded Zener equivalents are also available as 1N4728A to 1N4764A

**APPLICATIONS / BENEFITS**

- Regulates voltage over a broad operating current and temperature range
- Wide selection from 3.3 to 100 V
- Leadless package for surface mounting
- Ideal for high density mounting
- Nonsensitive to ESD
- Hermetically sealed glass package
- Specified capacitance (see Figure 2)
- Inherently radiation hard per MicroNote 050

**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: 50°C/W junction to end cap, or 130°C/W junction to ambient when mounted on FR4 PC board (1 oz Cu) with recommended footprint (see last page)
- Steady-State Power: 1.00 watts at  $T_{EC} \leq 125^{\circ}C$ , or 1.00 watts at  $T_A \leq 45^{\circ}C$  when mounted on FR4 PC board and recommended footprint as described for thermal resistance (also see Figure 1)
- Forward voltage @200 mA: 1.2 volts (maximum)
- Solder Temperatures: 260°C for 10 s (max)

**MECHANICAL AND PACKAGING**

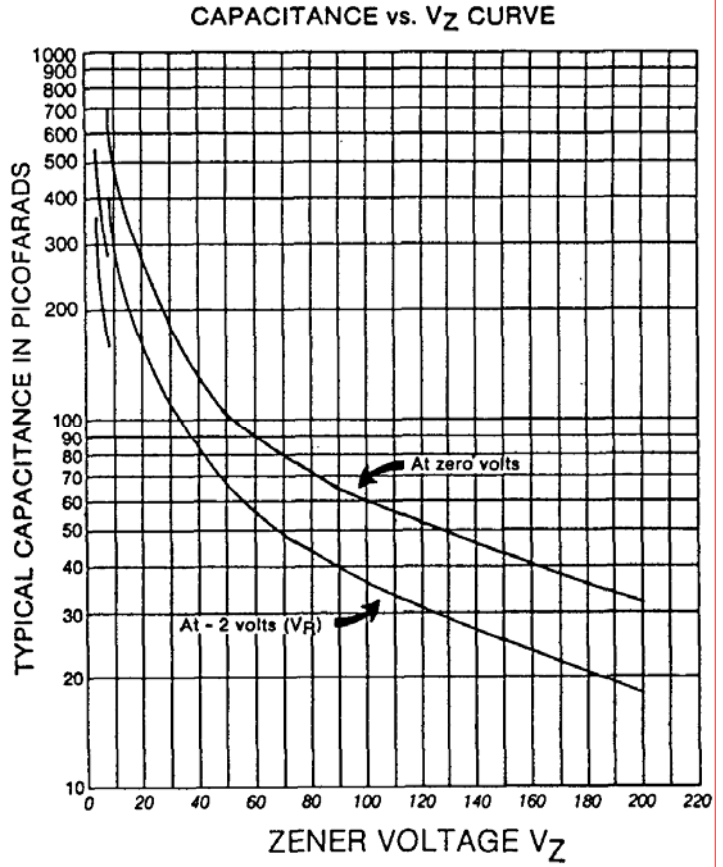
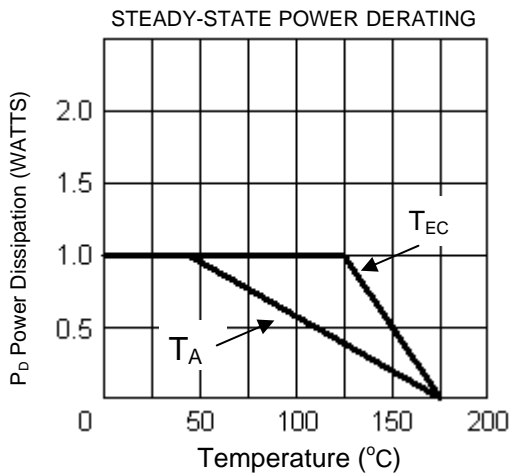
- CASE: Hermetically sealed DO-213AB glass MELF
- TERMINALS: Tin-Lead or RoHS Compliant annealed matte-Tin plating solderable per MIL-STD-750, method 2026
- POLARITY: Cathode indicated by band. Diode to be operated with the banded end positive with respect to the opposite end for Zener regulation
- MARKING: Cathode band only
- TAPE & REEL optional: Standard per EIA-481-B with 12 mm tape, 1500 per 7 inch reel or 5000 per 13 inch reel (add "TR" suffix to part number)
- WEIGHT: 0.05 grams
- See package dimensions & recommended mounting pad on last page

**ELECTRICAL CHARACTERISTICS @ T<sub>c</sub> = 30°C**

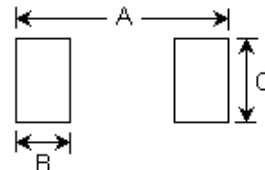
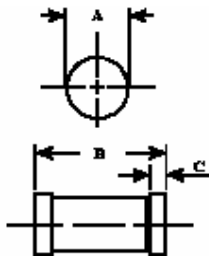
| TYPE NUMBER<br>(NOTE 1 & 5) | ZENER VOLTAGE<br>(NOTE 4) | TEST CURRENT          | MAXIMUM DYNAMIC IMPEDANCE<br>(Note 2)     | MAXIMUM REVERSE CURRENT               | TEST VOLTAGE            | MAXIMUM REGULATOR CURRENT<br>T <sub>A</sub> = 50°C | MAXIMUM KNEE IMPEDANCE<br>(NOTE2)         | TEST CURRENT          | MAXIMUM (SURGE) CURRENT<br>(NOTE 3) |
|-----------------------------|---------------------------|-----------------------|---|---------------------------------------|-------------------------|--|---|-----------------------|-------------------------------------|
|                             | V <sub>Z</sub><br>Volts   | I <sub>ZT</sub><br>mA | Z <sub>ZT</sub> @ I <sub>ZT</sub><br>Ohms | I <sub>R</sub> @ V <sub>R</sub><br>µA | V <sub>R</sub><br>Volts | I <sub>ZM</sub><br>mA                              | Z <sub>ZK</sub> @ I <sub>ZK</sub><br>Ohms | I <sub>ZK</sub><br>mA | I <sub>S</sub><br>mA                |
| 1N4728AUR                   | 3.3                       | 76                    | 10  | 100                                   | 1                       | 276  | 400                                       | 1.0                   | 1380                                |
| 1N4729AUR                   | 3.6                       | 69                    | 10  | 100                                   | 1                       | 252  | 400                                       | 1.0                   | 1260                                |
| 1N4730AUR                   | 3.9                       | 64                    | 9   | 50                                    | 1                       | 234  | 400                                       | 1.0                   | 1190                                |
| 1N4731AUR                   | 4.3                       | 58                    | 9   | 10                                    | 1                       | 217  | 400                                       | 1.0                   | 1070                                |
| 1N4732AUR                   | 4.7                       | 53                    | 8   | 10                                    | 1                       | 193  | 500                                       | 1.0                   | 970                                 |
| 1N4733AUR                   | 5.1                       | 49                    | 7   | 10                                    | 1                       | 178  | 550                                       | 1.0                   | 890                                 |
| 1N4734AUR                   | 5.6                       | 45                    | 5   | 10                                    | 2                       | 162  | 600                                       | 1.0                   | 810                                 |
| 1N4735AUR                   | 6.2                       | 41                    | 2   | 10                                    | 3                       | 146  | 700                                       | 1.0                   | 730                                 |
| 1N4736AUR                   | 6.8                       | 37                    | 3.5                                       | 10                                    | 4                       | 133  | 700                                       | 1.0                   | 660                                 |
| 1N4737AUR                   | 7.5                       | 34                    | 4.0                                       | 10                                    | 5                       | 121  | 700                                       | 0.5                   | 605                                 |
| 1N4738AUR                   | 8.2                       | 31                    | 4.5                                       | 10                                    | 6                       | 110  | 700                                       | 0.5                   | 550                                 |
| 1N4739AUR                   | 9.1                       | 28                    | 5.0                                       | 10                                    | 7                       | 100  | 700                                       | 0.5                   | 500                                 |
| 1N4740AUR                   | 10                        | 25                    | 7   | 10                                    | 7.6                     | 91   | 700                                       | 0.25                  | 454                                 |
| 1N4741AUR                   | 11                        | 23                    | 8   | 5                                     | 8.4                     | 83   | 700                                       | 0.25                  | 414                                 |
| 1N4742AUR                   | 12                        | 21                    | 9   | 5                                     | 9.1                     | 76   | 700                                       | 0.25                  | 380                                 |
| 1N4743AUR                   | 13                        | 19                    | 10  | 5                                     | 9.9                     | 69   | 700                                       | 0.25                  | 344                                 |
| 1N4744AUR                   | 15                        | 17                    | 14  | 5                                     | 11.4                    | 61   | 700                                       | 0.25                  | 304                                 |
| 1N4745AUR                   | 16                        | 15.5                  | 16  | 5                                     | 12.2                    | 57   | 700                                       | 0.25                  | 285                                 |
| 1N4746AUR                   | 18                        | 14                    | 20  | 5                                     | 13.7                    | 50   | 750                                       | 0.25                  | 250                                 |
| 1N4747AUR                   | 20                        | 12.5                  | 22  | 5                                     | 15.2                    | 45   | 750                                       | 0.25                  | 225                                 |
| 1N4748AUR                   | 22                        | 11.5                  | 23  | 5                                     | 16.7                    | 41   | 750                                       | 0.25                  | 205                                 |
| 1N4749AUR                   | 24                        | 10.5                  | 25  | 5                                     | 18.2                    | 38   | 750                                       | 0.25                  | 190                                 |
| 1N4750AUR                   | 27                        | 9.5                   | 35  | 5                                     | 20.6                    | 34   | 750                                       | 0.25                  | 170                                 |
| 1N4751AUR                   | 30                        | 8.5                   | 40  | 5                                     | 22.8                    | 30   | 1000                                      | 0.25                  | 150                                 |
| 1N4752AUR                   | 33                        | 7.5                   | 45  | 5                                     | 25.1                    | 27   | 1000                                      | 0.25                  | 135                                 |
| 1N4753AUR                   | 36                        | 7.0                   | 50  | 5                                     | 27.4                    | 25   | 1000                                      | 0.25                  | 125                                 |
| 1N4754AUR                   | 39                        | 6.5                   | 60  | 5                                     | 29.7                    | 23   | 1000                                      | 0.25                  | 115                                 |
| 1N4755AUR                   | 43                        | 6.0                   | 70  | 5                                     | 32.7                    | 22   | 1500                                      | 0.25                  | 110                                 |
| 1N4756AUR                   | 47                        | 5.5                   | 80  | 5                                     | 35.8                    | 19   | 1500                                      | 0.25                  | 95                                  |
| 1N4757AUR                   | 51                        | 5.0                   | 95  | 5                                     | 38.8                    | 18   | 1500                                      | 0.25                  | 90                                  |
| 1N4758AUR                   | 56                        | 4.5                   | 110                                       | 5                                     | 42.6                    | 16   | 2000                                      | 0.25                  | 80                                  |
| 1N4759AUR                   | 62                        | 4.0                   | 125                                       | 5                                     | 47.1                    | 14   | 2000                                      | 0.25                  | 70                                  |
| 1N4760AUR                   | 68                        | 3.7                   | 150                                       | 5                                     | 51.7                    | 13   | 2000                                      | 0.25                  | 65                                  |
| 1N4761AUR                   | 75                        | 3.3                   | 175                                       | 5                                     | 56.0                    | 12   | 2000                                      | 0.25                  | 60                                  |
| 1N4762AUR                   | 82                        | 3.0                   | 200                                       | 5                                     | 62.2                    | 11   | 3000                                      | 0.25                  | 55                                  |
| 1N4763AUR                   | 91                        | 2.8                   | 250                                       | 5                                     | 69.2                    | 10   | 3000                                      | 0.25                  | 50                                  |
| 1N4764AUR                   | 100                       | 2.5                   | 350                                       | 5                                     | 76.0                    | 9  | 3000                                      | 0.25                  | 45                                  |

- NOTE 1:** The type numbers shown with an "A" suffix have a +/-5% tolerance on the nominal Zener voltage. Also available with suffix "C" for +/-2%, and "D" for +/-1%, while the absence of a suffix letter denotes +/- 10% tolerance.
- NOTE 2:** The Zener impedance is derived from the 60Hz ac voltage, which 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.
- NOTE 3:** 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>.
- NOTE 4:** Voltage measurements to be performed 90 seconds after application of dc current.
- NOTE 5:** This product series has also been previously identified as the MLL4728A thru MLL4764A series. This alternate name may still be used.

GRAPHS



PACKAGE DIMENSIONS



| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.094  | 0.105 | 2.39        | 2.66 |
| B   | 0.189  | 0.205 | 4.80        | 5.20 |
| C   | 0.016  | 0.022 | 0.41        | 0.55 |

PAD LAYOUT

|   | INCHES | mm   |
|---|--------|------|
|   | A      | .276 |
| B | 0.070  | 1.8  |
| C | 0.110  | 2.8  |

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