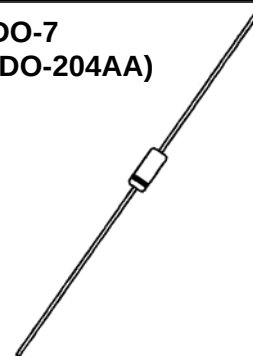


## DESCRIPTION

The popular 1N746 thru 1N759A series of 0.5 watt Zener Voltage Regulators provides a selection from 2.4 to 12 volts in standard 5% or 10% tolerances as well as tighter tolerances identified by different suffix letters on the part number. The DO-7 packaging option offers a "straight-through" soldered internal connection with a larger active die element than otherwise provided in the smaller DO-35 package when needed. It is also available as a RoHS Compliant option by adding an "e3" suffix. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

## APPEARANCE

**DO-7  
(DO-204AA)**



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

## FEATURES

- JEDEC registered 1N746 thru 1N759A series
- Internally solder bonded
- 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.
- RoHS Compliant devices available by adding "e3" suffix
- Surface mount equivalents in DO-213AA also available as MLL1N746 thru MLL759A (consult factory for other surface mount options)
- Smaller DO-35 glass body axial-leaded Zener equivalents are also available

## APPLICATIONS / BENEFITS

- Regulates voltage over a broad operating current and temperature range
- Selection from 2.4 to 12 V
- Standard voltage tolerances are plus/minus 5% with A suffix, 10 % with no suffix identification
- Tight tolerances available in plus or minus 2% or 1% with C or D suffix respectively
- Flexible axial-lead mounting terminals
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Capacitance also specified (see Figure 3)
- Inherently radiation hard as described in Microsemi MicroNote 050

## MAXIMUM RATINGS

- Operating and Storage temperature: -65°C to +175°C
- Thermal Resistance: 300°C/W junction to lead at 3/8 (10 mm) lead length from body, or 360°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: 0.5 watts at  $T_L \leq 25^\circ\text{C}$  3/8 inch (10 mm) from body or 0.417 W at  $T_A \leq 25^\circ\text{C}$  when mounted on FR4 PC board as described for thermal resistance above (also see Figure1)
- Forward voltage @200 mA: 1.1 volts
- Solder Temperatures: 260°C for 10 s (max)

## MECHANICAL AND PACKAGING

- CASE: Hermetically sealed axial-lead glass DO-7 (DO-204AA) package
- 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: Part number
- TAPE & REEL option: Standard per EIA-296 (add "TR" suffix to part number)
- WEIGHT: 0.2 grams
- See package dimensions on last page

**ELECTRICAL CHARACTERISTICS\* @ 25°C**

| JEDEC<br>TYPE NO.<br>(NOTE 1) | NOMINAL<br>ZENER<br>VOLTAGE<br>$V_Z @ I_{ZT}$<br>(NOTE 2) | ZENER<br>TEST<br>CURRENT<br>$I_{ZT}$ | MAXIMUM<br>ZENER<br>IMPEDANCE<br>$Z_{ZT} @ I_{ZT}$<br>(NOTE 3) | MAXIMUM REVERSE<br>CURRENT<br>@ $V_R = 1$ VOLT |         | MAXIMUM<br>ZENER<br>CURRENT<br>$I_{ZM}$<br>(NOTE 4) | TYPICAL<br>TEMP COEFF.<br>OF ZENER<br>VOLTAGE<br>$\alpha_{VZ}$ |
|-------------------------------|-----------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|------------------------------------------------|---------|-----------------------------------------------------|----------------------------------------------------------------|
|                               |                                                           |                                      |                                                                | @25°C                                          | @+150°C |                                                     |                                                                |
|                               | VOLTS                                                     | mA                                   | OHMS                                                           | $\mu A$                                        | $\mu A$ | mA                                                  | %/°C                                                           |
| 1N4370                        | 2.4                                                       | 20                                   | 30                                                             | 100                                            | 200     | 150                                                 | -.085                                                          |
| 1N4371                        | 2.7                                                       | 20                                   | 30                                                             | 75                                             | 150     | 135                                                 | -.080                                                          |
| 1N4372                        | 3.0                                                       | 20                                   | 29                                                             | 50                                             | 100     | 120                                                 | -.075                                                          |
| 1N746                         | 3.3                                                       | 20                                   | 28                                                             | 10                                             | 30      | 110                                                 | -.066                                                          |
| 1N747                         | 3.6                                                       | 20                                   | 24                                                             | 10                                             | 30      | 100                                                 | -.058                                                          |
| 1N748                         | 3.9                                                       | 20                                   | 23                                                             | 10                                             | 30      | 95                                                  | -.046                                                          |
| 1N749                         | 4.3                                                       | 20                                   | 22                                                             | 2                                              | 30      | 85                                                  | -.033                                                          |
| 1N750                         | 4.7                                                       | 20                                   | 19                                                             | 2                                              | 30      | 75                                                  | -.015                                                          |
| 1N751                         | 5.1                                                       | 20                                   | 17                                                             | 1                                              | 20      | 70                                                  | +/- .010                                                       |
| 1N752                         | 5.6                                                       | 20                                   | 11                                                             | 1                                              | 20      | 65                                                  | +0.030                                                         |
| 1N753                         | 6.2                                                       | 20                                   | 7                                                              | .1                                             | 20      | 60                                                  | +0.049                                                         |
| 1N754                         | 6.8                                                       | 20                                   | 5                                                              | .1                                             | 20      | 55                                                  | +0.053                                                         |
| 1N755                         | 7.5                                                       | 20                                   | 6                                                              | .1                                             | 20      | 50                                                  | +0.057                                                         |
| 1N756                         | 8.2                                                       | 20                                   | 8                                                              | .1                                             | 20      | 45                                                  | +0.060                                                         |
| 1N757                         | 9.1                                                       | 20                                   | 10                                                             | .1                                             | 20      | 40                                                  | +0.061                                                         |
| 1N758                         | 10.0                                                      | 20                                   | 17                                                             | .1                                             | 20      | 35                                                  | +0.062                                                         |
| 1N759                         | 12.0                                                      | 20                                   | 30                                                             | .1                                             | 20      | 30                                                  | +0.062                                                         |

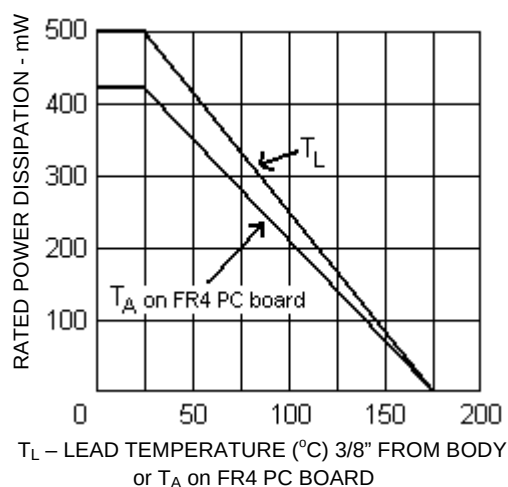
**\* JEDEC Registered Data**

**NOTE 1:** Standard tolerance on JEDEC types shown is +/- 10%. Suffix letter A denotes +/- 5% tolerance; suffix letter C denotes +/- 2%; and suffix letter D denotes +/- 1% tolerance.

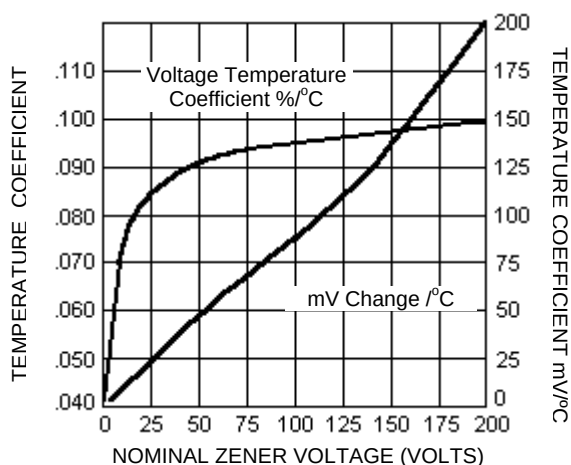
**NOTE 2:** Voltage measurements to be performed 20 seconds after application of dc test current.

**NOTE 3:** Zener impedance derived by superimposing on  $I_{ZT}$ , a 60 cps, rms ac current equal to 10%  $I_{ZT}$  (2 mA ac). See MicroNote 202 for typical zener impedance variation with different operating currents.

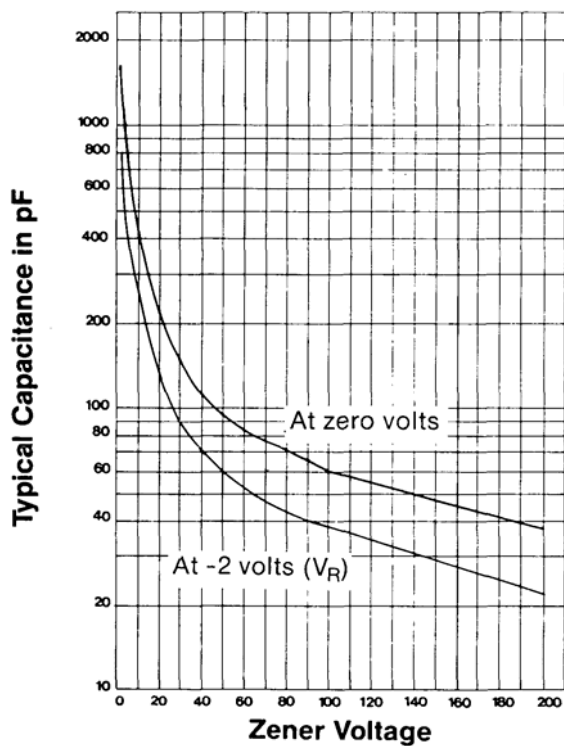
**NOTE 4:** Allowance has been made for the increase in  $V_Z$  due to  $Z_Z$  and for the increase in junction temperature as the unit approaches thermal equilibrium at the power dissipation of 400 mW.

**GRAPHS**


**FIGURE 1**  
 POWER DERATING CURVE

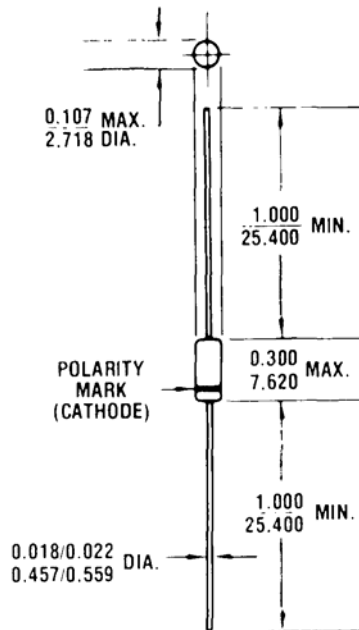


**FIGURE 2**  
 ZENER VOLTAGE TEMPERATURE  
 COEFFICIENT vs. ZENER VOLTAGE



**FIGURE 3**  
CAPACITANCE vs. ZENER VOLTAGE  
(TYPICAL)

PACKAGE DIMENSIONS



All dimensions in: INCH  
mm