

## DESCRIPTION

The popular 1N746 thru 1N759A and 1N4370 thru 1N4372A 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. These glass axial-leaded DO-35 Zeners are also available with an internal-metallurgical-bond option by adding a "-1" suffix. These are also available in JAN, JANTX, and JANTXV military qualifications. Microsemi also offers numerous other Zener products to meet higher and lower power applications.

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

## APPEARANCE

**DO-35  
(DO-204AH)**



## FEATURES

- JEDEC registered 1N746 thru 1N759A and 1N4370 thru 1N4372A series
- Internal metallurgical bond option available by adding a "-1" suffix
- Also available in JAN, JANTX, and JANTXV qualifications per MIL-PRF-19500/127 by adding the JAN, JANTX, or JANTXV prefixes to part numbers for desired level of screening as well as "-1" suffix; (e.g. JANTX1N751A-1, JANTXV1N758C-1, etc.)
- Military Surface Mount equivalents also available in DO-213AA by adding a UR-1 suffix in addition to the JAN, JANTX, and JANTXV prefix; e.g. JANTX1N962BUR-1 (see separate data sheet)
- Commercial Surface Mount equivalents available as MLL746 to MLL759A and MLL4370 to MLL4372A including the "-1" suffix in the DO-213AA MELF style package (consult factory for others)
- DO-7 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 identification and 10 % with no suffix
- 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
- Minimal capacitance (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: 250 °C/W junction to lead at 3/8 (10 mm) lead length from body, or 310 °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  $T_L \leq 50^\circ\text{C}$  3/8 inch (10 mm) from body or 0.48 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-35 (DO-204AH) package
- TERMINALS: Leads, tin-lead 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: 0.2 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>$I_{ZT}$<br>mA | MAXIMUM<br>ZENER<br>IMPEDANCE<br>$Z_{ZT} @ I_{ZT}$<br>(NOTE 3) | MAXIMUM REVERSE<br>CURRENT $I_R$<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>$\alpha_{VZ}$<br>%/°C |
|-------------------------------|-----------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|---------|-----------------------------------------------------|------------------------------------------------------------------------|
|                               |                                                           |                                            |                                                                | @25°C                                                | @+150°C |                                                     |                                                                        |
|                               |                                                           |                                            |                                                                | $\mu A$                                              | $\mu A$ |                                                     |                                                                        |
| 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                                                  | + .030                                                                 |
| 1N753                         | 6.2                                                       | 20                                         | 7                                                              | .1                                                   | 20      | 60                                                  | + .049                                                                 |
| 1N754                         | 6.8                                                       | 20                                         | 5                                                              | .1                                                   | 20      | 55                                                  | + .053                                                                 |
| 1N755                         | 7.5                                                       | 20                                         | 6                                                              | .1                                                   | 20      | 50                                                  | + .057                                                                 |
| 1N756                         | 8.2                                                       | 20                                         | 8                                                              | .1                                                   | 20      | 45                                                  | + .060                                                                 |
| 1N757                         | 9.1                                                       | 20                                         | 10                                                             | .1                                                   | 20      | 40                                                  | + .061                                                                 |
| 1N758                         | 10.0                                                      | 20                                         | 17                                                             | .1                                                   | 20      | 35                                                  | + .062                                                                 |
| 1N759                         | 12.0                                                      | 20                                         | 30                                                             | .1                                                   | 20      | 30                                                  | + .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%  $I_{ZT}$  (2mA 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

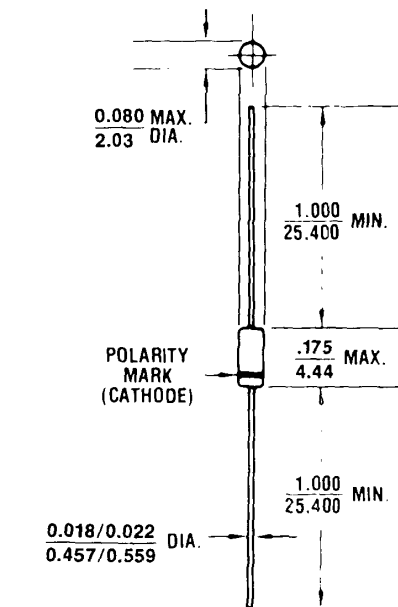


**FIGURE 2**  
ZENER VOLTAGE TEMPERATURE  
COEFFICIENT vs. ZENER VOLTAGE



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

**PACKAGE DIMENSIONS**



All dimensions in:  $\frac{\text{INCH}}{\text{mm}}$