Microsemi
SCOTTSDALE DIVISION

# 1N4765 thru 1N4774A

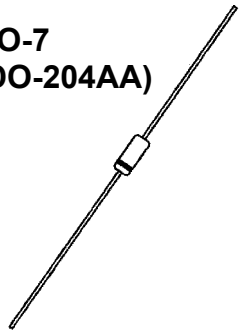
## 9.1 Volt Temperature Compensated Zener Reference Diodes

## DESCRIPTION

The 1N4765 thru 1N4774A series of Zero-TC Reference Diodes provides a selection of 9.1 V nominal voltages and temperature coefficients to as low as 0.0005%/°C for minimal voltage change with temperature when operated at 7.5 mA. Options for screening similar to JAN, JANTX, JANTXV, and JANS also exist by using MQ, MX, MV or MSP respectively for part number prefixes and high reliability screening. Microsemi also offers numerous other Zener Reference Diode products for a variety of other voltages from 6.2 V to 200 V

## APPEARANCE

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



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

## FEATURES

- JEDEC registered 1N935 thru 1N940 series
- Standard reference voltage of 9.1V +/- 5%
- Internal metallurgical bonds
- JANS Equivalent available via SCD
- 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. For example, designate "MX1N4769A" for a JANTX screen
- Radiation Hardened devices available by changing "1N" prefix to "RH", e.g. RH4769A, RH 4774A, etc. Also consult factory for "RH" data sheet brochure for other radiation hardened reference diode products.

## APPLICATIONS / BENEFITS

- Provides minimal voltage changes over a broad temperature range for instrumentation and other circuit designs requiring a voltage reference
- Temperature coefficient selections available from 0.01%/°C to 0.0005%/°C
- Tight voltage tolerances available by adding tolerance 1%, 2%, 3%, etc. after part number for further identification, e.g. 1N4773A-2%, 1N4774A-1%, 1N4769-3%, 1N4769A-1%, etc.
- Flexible axial-leaded mounting terminals
- Nonsensitive to ESD per MIL-STD-750 Method 1020

## MAXIMUM RATINGS

- Operating & StorageTemperature: -65°C to +175°C
- DC Power Dissipation: 250 mW @ $T_L$ = 25°C NOTE: For optimum voltage-temperature stability, the test current $I_{ZT}$ = 0.5 or 1.0 mA as shown in Electrical Characteristics (less than 10 mW in dissipated power)
- Solder temperatures: 260 °C for 10 s (maximum)

## MECHANICAL AND PACKAGING

- CASE: Hermetically sealed glass case with DO-7 (DO-204AA) package
- TERMINALS: Tin-lead plated and solderable per MIL-STD-750, Method 2026
- MARKING: Part number and cathode band
- POLARITY: Reference diode to be operated with the banded end positive with respect to the opposite end
- 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

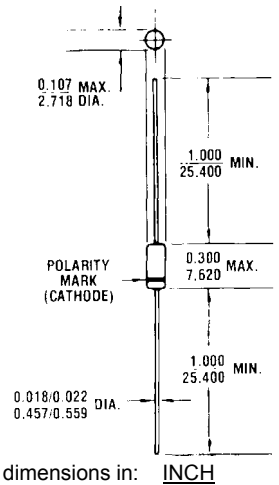
| JEDEC TYPE NUMBER | ZENER VOLTAGE (Note 3) | ZENER TEST CURRENT | MAXIMUM DYNAMIC IMPEDANCE | MAXIMUM REVERSE CURRENT $I_R$ @ 6 V | MAXIMUM VOLTAGE TEMPERATURE STABILITY (Note 2 & 3) | TEMPERATURE RANGE | EFFECTIVE TEMPERATURE COMPENSIATIONS $\alpha_{VZ}$ |
|---|---|---|---|---|---|---|---|
| | $V_Z$ @ $I_{ZT}$ | $I_{ZT}$ | $Z_{ZT}$ | $I_R$ | $\Delta V_{ZT}$ | | |
| | VOLTS | mA | OHMS | µA | mV | °C | %/°C |
| **1N4765** | 9.1 | 0.5 | 350 | 10 | 68 | 0 to + 75 | 0.01 |
| **1N4765A** | 9.1 | 0.5 | 350 | 10 | 141 | -55 to +100 | 0.01 |
| **1N4766** | 9.1 | 0.5 | 350 | 10 | 34 | 0 to + 75 | 0.005 |
| **1N4766A** | 9.1 | 0.5 | 350 | 10 | 70 | -55 to +100 | 0.005 |
| **1N4767** | 9.1 | 0.5 | 350 | 10 | 14 | 0 to + 75 | 0.002 |
| **1N4767A** | 9.1 | 0.5 | 350 | 10 | 28 | -55 to +100 | 0.002 |
| **1N4768** | 9.1 | 0.5 | 350 | 10 | 7 | 0 to + 75 | 0.001 |
| **1N4768A** | 9.1 | 0.5 | 350 | 10 | 14 | -55 to +100 | 0.001 |
| **1N4769** | 9.1 | 0.5 | 350 | 10 | 3 | 0 to + 75 | 0.0005 |
| **1N4769A** | 9.1 | 0.5 | 350 | 10 | 7 | -55 to +100 | 0.0005 |
| **1N4770** | 9.1 | 1.0 | 200 | 10 | 68 | 0 to + 75 | 0.01 |
| **1N4770A** | 9.1 | 1.0 | 200 | 10 | 141 | -55 to +100 | 0.01 |
| **1N4771** | 9.1 | 1.0 | 200 | 10 | 34 | 0 to + 75 | 0.005 |
| **1N4771A** | 9.1 | 1.0 | 200 | 10 | 70 | -55 to +100 | 0.005 |
| **1N4772** | 9.1 | 1.0 | 200 | 10 | 14 | 0 to + 75 | 0.002 |
| **1N4772A** | 9.1 | 1.0 | 200 | 10 | 28 | -55 to +100 | 0.002 |
| **1N4773** | 9.1 | 1.0 | 200 | 10 | 7 | 0 to + 75 | 0.001 |
| **1N4773A** | 9.1 | 1.0 | 200 | 10 | 14 | -55 to +100 | 0.001 |
| **1N4774** | 9.1 | 1.0 | 200 | 10 | 3 | 0 to + 75 | 0.005 |
| **1N4774A** | 9.1 | 1.0 | 200 | 10 | 7 | -55 to +100 | 0.005 |

*JEDEC Registered Data.

**NOTES:**

1. Measured by superimposing $I_Z$ ac rms on $I_Z$ dc @ +25°C where $I_Z$ ac rms = 10% $I_Z$ dc.
2. Maximum allowable change between any two discrete temperatures over the specified temperature range.
3. Voltage measurements to be performed 15 seconds after application of dc current.
4. Designate Radiation Hardened devices with “RH” prefix instead of “1N”, i.e., RH4774A.
5. Consult factory for TX, TXV or JANS equivalent SCDs.

## PACKAGE DIMENSIONS




All dimensions in: INCH
mm