



**Microsemi Corp.**

*The diode experts*



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**1N821, A, -1  
thru  
1N829, A, -1  
DO-7**

**FEATURES**

- ZENER VOLTAGE 6.2V AND 6.55V
- 1N821, 823, 825, 827 AND 829 HAVE JAN, JANTX, JANTXV, JANS, AND -1 QUALIFICATIONS TO MIL-S-19500/159
- RADIATION HARDENED DEVICES AVAILABLE (SEE NOTE 5)
- ALSO AVAILABLE IN DO-35 PACKAGE
- JANS EQUIVALENT AVAILABLE VIA SCD

**MAXIMUM RATINGS**

Operating Temperatures: -65°C to +175°C  
Storage Temperatures: -65°C to +175°C  
DC Power Dissipation: 475 mW @ 25°C  
Derating: 3.16 mW/°C above 25°C

**\*ELECTRICAL CHARACTERISTICS**

@ 25°C, unless otherwise specified

JEDEC TYPE NUMBER	ZENER VOLTAGE (Note 1 and 4) $V_z @ I_{zT}$	ZENER TEST CURRENT $I_{zT}$	MAXIMUM ZENER IMPEDANCE (Note 3 and 4) $Z_{zT}$	VOLTAGE TEMPERATURE STABILITY ( $\Delta V_{zT}$ MAX) -55° to +100° (Note 3 and 4)	EFFECTIVE TEMPERATURE COEFFICIENT $\alpha_{Vz}$
	VOLTS	mA	OHMS	mV	%/°C
1N821	5.9 - 6.5	7.5	15	96	0.01
1N821A	5.9 - 6.5	7.5	10	96	0.01
1N822†	5.9 - 6.5	7.5	15	96	0.01
1N823	5.9 - 6.5	7.5	15	48	0.005
1N823A	5.9 - 6.5	7.5	10	48	0.005
1N824†	5.9 - 6.5	7.5	15	48	0.005
1N825	5.9 - 6.5	7.5	15	19	0.002
1N825A	5.9 - 6.5	7.5	10	19	0.002
1N826	6.2 - 6.9	7.5	15	20	0.002
1N827	5.9 - 6.5	7.5	15	9	0.001
1N827A	5.9 - 6.5	7.5	10	9	0.001
1N828	6.2 - 6.9	7.5	15	10	0.001
1N829	5.9 - 6.5	7.5	15	5	0.0005
1N829A	5.9 - 6.5	7.5	10	5	0.0005

† Double Anode; Electrical Specifications Apply Under Both Bias Polarities.

\*JEDEC Registered Data

**NOTE 1** When ordering devices with tighter tolerances than specified, use a nominal  $V_z$  voltage of 6.35V.

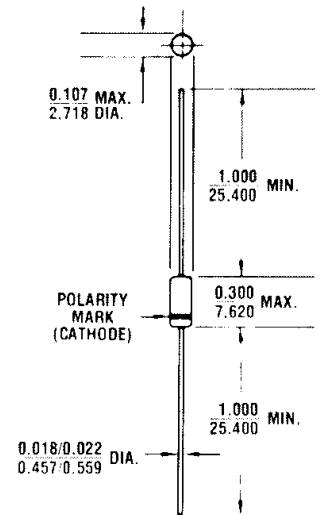
**NOTE 2** Measured by superimposing 0.75 mA ac rms on 7.5 mA DC @ 25°C.

**NOTE 3** The maximum allowable change observed over the entire temperature range i.e., the diode voltage will not exceed the specified mV change at any discrete temperature between the established limits.

**NOTE 4** Voltage measurements to be performed 15 seconds after application of DC current.

**NOTE 5** Designate Radiation Hardened devices with "RH" prefix instead of "1N", i.e., RH829A instead of 1N829A.

**6.2 & 6.55 VOLT  
TEMPERATURE  
COMPENSATED  
ZENER REFERENCE  
DIODES**



**FIGURE 1**

All dimensions in  $\frac{\text{INCH}}{\text{m.m}}$

**MECHANICAL CHARACTERISTICS**

**CASE:** Hermetically sealed glass case. DO-7 (DO-204AA).

**FINISH:** All external surfaces are corrosion resistant and leads solderable.

**THERMAL RESISTANCE:** 300°C/W (Typical) junction to lead at 0.375-inches from body.

**POLARITY:** Diode to be operated with the banded end positive with respect to the opposite end.

**WEIGHT:** 0.2 grams.

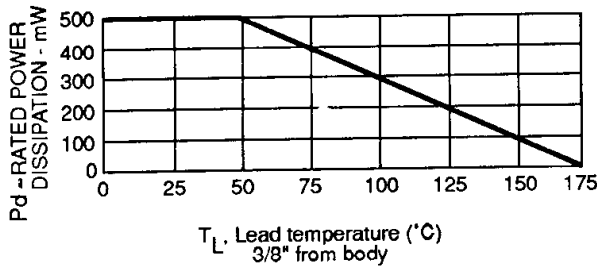
**MOUNTING POSITION:** Any

# 1N821, A, -1 thru 1N829, A, -1 DO-7

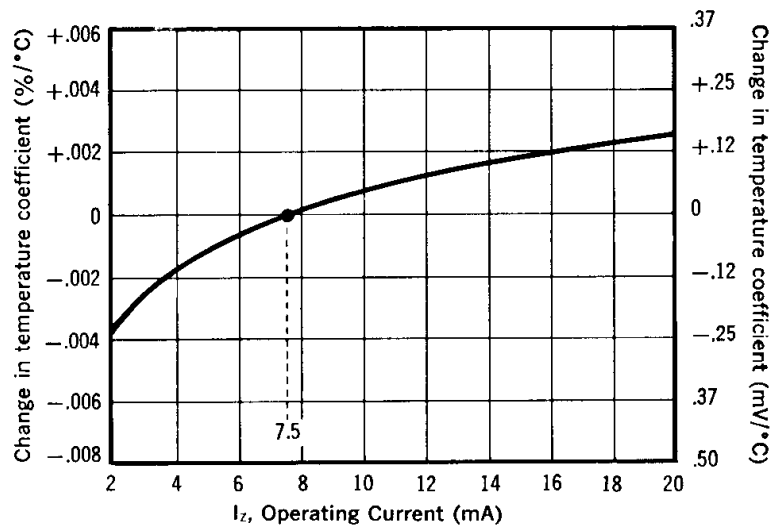
The curve shown in Figure 3 is typical of the diode series and greatly simplifies the estimation of the Temperature Coefficient (TC) when the diode is operated at currents other than 7.5 mA.

**EXAMPLE:** A diode in this series is operated at a current of 7.5mA and has specified Temperature Coefficient (TC) limits of  $\pm 0.005\%/^{\circ}\text{C}$ . To obtain the typical Temperature Coefficient limits for this same diode operated at a current of 6.0mA, the new TC limits ( $\%/^{\circ}\text{C}$ ) can be estimated using the graph in FIGURE 3.

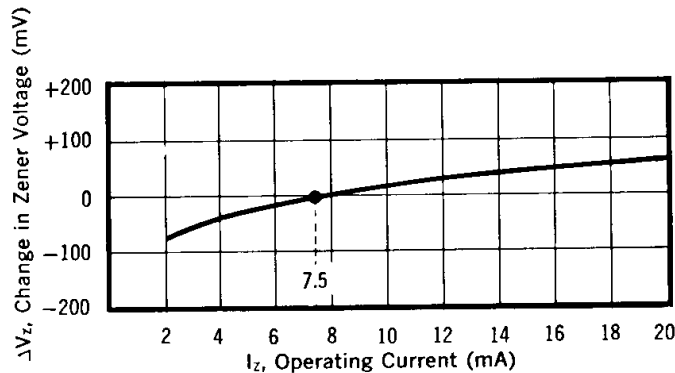
At a test current of 6.0mA the change in Temperature Coefficient (TC) is approximately  $-0.0006\%/^{\circ}\text{C}$ . The algebraic sum of  $\pm 0.005\%/^{\circ}\text{C}$  and  $-0.0006\%/^{\circ}\text{C}$  gives the new estimated limits of  $+0.0044\%/^{\circ}\text{C}$  and  $-0.0056\%/^{\circ}\text{C}$ .



**FIGURE 2** POWER DERATING CURVE



**FIGURE 3**  
TYPICAL CHANGE OF TEMPERATURE COEFFICIENT WITH CHANGE IN OPERATING CURRENT



**FIGURE 4**  
TYPICAL CHANGE OF ZENER VOLTAGE WITH CHANGE IN OPERATING CURRENT

This curve in Figure 4 illustrates the change of diode voltage arising from the effect of impedance. It is in effect an exploded view of the zener operating region of the I-V characteristic.

In conjunction with Figure 3, this curve can be used to estimate total voltage regulation under conditions of both varying temperature and current.