

Microsemi Corp.
The diode experts

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1N3154 & A thru 1N3157 & A

FEATURES

- ZENER VOLTAGE $8.4V \pm 5\%$ (See Note 1)
- 1N3154 THRU 1N3157 HAVE JAN, JANTX, JANTXV, AND -1 QUALIFICATIONS TO MIL-S-19500/158
- HIGH LEVEL STABILITY WITH VIBRATION, THERMAL SHOCK & MECHANICAL SHOCK
- RADIATION HARDENED DEVICES AVAILABLE (SEE NOTE 5)
- JANS EQUIVALENT AVAILABLE VIA SCD

MAXIMUM RATINGS

Operating Temperature: -65°C to $+175^{\circ}\text{C}$

Storage Temperature: -65°C to $+175^{\circ}\text{C}$

DC Power Dissipation: 500 mW @ 25°C

Power Derating: 3.33 mW/ $^{\circ}\text{C}$ above 25°C

* ELECTRICAL CHARACTERISTICS

@ 25°C , unless otherwise specified

JEDEC TYPE NUMBERS	ZENER VOLTAGE V_Z @ I_Z (Note 1 & 4)	ZENER TEST CURRENT I_{ZT}	MAXIMUM ZENER IMPEDANCE (NOTE 2) Z_{ZT}	VOLTAGE TEMPERATURE STABILITY (Note 3 & 4) ΔV_Z MAXIMUM	TEMPERATURE RANGE	EFFECTIVE TEMPERATURE COEFFICIENT α_{VZ}
	VOLTS	mA	OHMS	mV	$^{\circ}\text{C}$	%/ $^{\circ}\text{C}$
1N3154 1N3154A	8.00-8.80 8.00-8.80	10 10	15 15	130 172	-55 to $+100$ -55 to $+150$	.01 .01
1N3155 1N3155A	8.00-8.80 8.00-8.80	10 10	15 15	65 86	-55 to $+100$ -55 to $+150$	.005 .005
1N3156 1N3156A	8.00-8.80 8.00-8.80	10 10	15 15	26 34	-55 to $+100$ -55 to $+150$	.002 .002
1N3157 1N3157A	8.00-8.80 8.00-8.80	10 10	15 15	13 17	-55 to $+100$ -55 to $+150$	.001 .001

* JEDEC Registered Data

NOTE 1 When ordering devices with tighter tolerance than specified, use a nominal center voltage of 8.7 volts.

NOTE 2 Measured by superimposing 1.0 mA ac rms on 10 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 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. RH3157A instead of 1N3157A.

8.4 VOLT TEMPERATURE COMPENSATED ZENER REFERENCE DIODES

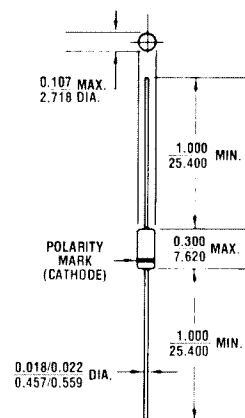


FIGURE 1

All dimensions in
INCH
m.m.

MECHANICAL CHARACTERISTICS

CASE: Hermetically sealed glass case. DO-7.

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

THERMAL RESISTANCE: $300^{\circ}\text{C}/\text{W}$ (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.

1N3154 thru 1N3157A

NOTE 5

The curve 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 10 mA.

EXAMPLE: A diode in this series is operated at a current of 10 mA 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 7.5 mA, the new TC limits ($\%/^{\circ}\text{C}$) can be estimated using the graph in FIGURE 3.

At a test current of 7.5 mA the change in Temperature Coefficient (TC) is approximately $-0.0012\%/^{\circ}\text{C}$. The algebraic sum of $\pm 0.005\%/^{\circ}\text{C}$ and $-0.0012\%/^{\circ}\text{C}$ gives the new limits of $+0.0038\%/^{\circ}\text{C}$ and $-0.0062\%/^{\circ}\text{C}$.

NOTE 6

The 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 Fig. 3 this curve can be used to estimate total voltage regulation under conditions of both varying temperature and current.

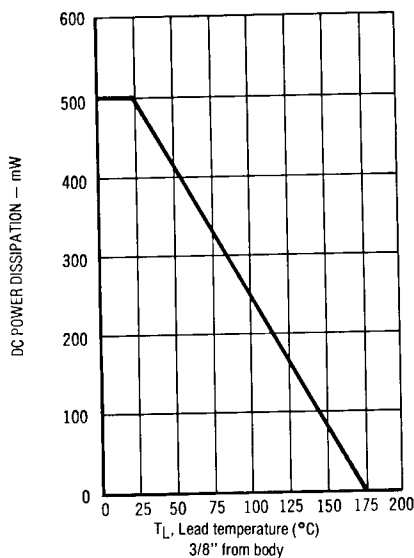


FIGURE 2 Power Derating Curve

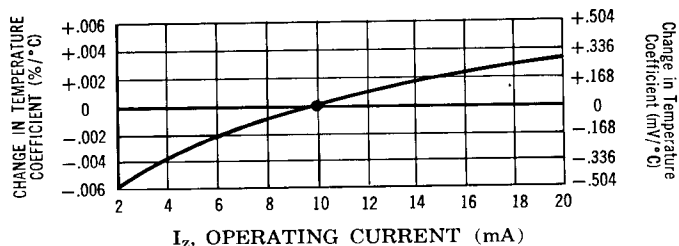


FIGURE 3 Typical change of Temperature Coefficient with Change in Operating Current.

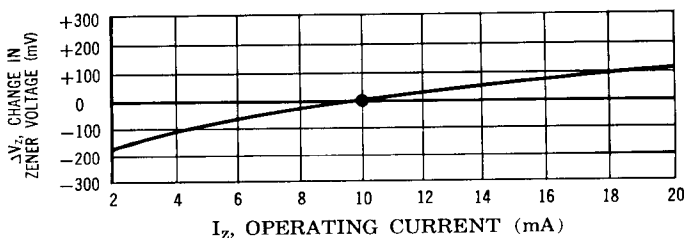


FIGURE 4 Typical change of Zener Voltage with Change in Operating Current.