

- 50  $\mu$ A, LOW OPERATING CURRENT, ZENER DIODES
- DOUBLE PLUG CONSTRUCTION
- METALLURGICALLY BONDED

1N4678  
thru  
1N4717

### MAXIMUM RATINGS

Operating Temperature: -65°C to +175°C

Storage Temperature: -65°C to +175°C

Power Dissipation: 500mW @ +50°C

DC Power Derating: 4 mW / °C above +50°C

Forward Voltage: 1.1 Volts maximum @ 200 mA

ELECTRICAL CHARACTERISTICS @ 25°C, unless otherwise specified.

| CDI<br>TYPE<br>NUMBER<br><br>(Note 1) | NOMINAL<br>ZENER<br>VOLTAGE<br>$V_Z$ | ZENER<br>TEST<br>CURRENT<br>$I_{ZT}$ | MAXIMUM<br>VOLTAGE<br>REGULATION<br>$\Delta V_Z$<br>(Note 2) | MAXIMUM REVERSE<br>LEAKAGE<br>CURRENT<br>$I_R @ V_R$ |       | MAXIMUM<br>DC ZENER<br>CURRENT<br>$I_{ZM}$ |
|---------------------------------------|--------------------------------------|--------------------------------------|--|--|-------|--|
|                                       | VOLTS                                | $\mu$ A                              | VOLTS  | $\mu$ A  | VOLTS | mA   |
| 1N4678                                | 1.8                                  | 50                                   | 0.70   | 7.5  | 1.0   | 120.0                                      |
| 1N4679                                | 2.0                                  | 50                                   | 0.70   | 5.0  | 1.0   | 110.0                                      |
| 1N4680                                | 2.2                                  | 50                                   | 0.75   | 4.0  | 1.0   | 100.0                                      |
| 1N4681                                | 2.4                                  | 50                                   | 0.80   | 2.0  | 1.0   | 95.0                                       |
| 1N4682                                | 2.7                                  | 50                                   | 0.85   | 1.0  | 1.0   | 90.0                                       |
| 1N4683                                | 3.0                                  | 50                                   | 0.90   | 0.8  | 1.0   | 85.0                                       |
| 1N4684                                | 3.3                                  | 50                                   | 0.95   | 7.5  | 1.5   | 80.0                                       |
| 1N4685                                | 3.6                                  | 50                                   | 0.95   | 7.5  | 2.0   | 75.0                                       |
| 1N4686                                | 3.9                                  | 50                                   | 0.97   | 5.0  | 2.0   | 70.0                                       |
| 1N4687                                | 4.3                                  | 50                                   | 0.99   | 4.0  | 2.0   | 65.0                                       |
| 1N4688                                | 4.7                                  | 50                                   | 0.99   | 10.0   | 3.0   | 60.0                                       |
| 1N4689                                | 5.1                                  | 50                                   | 0.97   | 10.0   | 3.0   | 55.0                                       |
| 1N4690                                | 5.6                                  | 50                                   | 0.96   | 10.0   | 4.0   | 50.0                                       |
| 1N4691                                | 6.2                                  | 50                                   | 0.95   | 10.0   | 5.0   | 45.0                                       |
| 1N4692                                | 6.8                                  | 50                                   | 0.90   | 10.0   | 5.1   | 35.0                                       |
| 1N4693                                | 7.5                                  | 50                                   | 0.75   | 10.0   | 5.7   | 31.8                                       |
| 1N4694                                | 8.2                                  | 50                                   | 0.50   | 1.0  | 6.2   | 29.0                                       |
| 1N4695                                | 8.7                                  | 50                                   | 0.10   | 1.0  | 6.6   | 27.4                                       |
| 1N4696                                | 9.1                                  | 50                                   | 0.08   | 1.0  | 6.9   | 26.2                                       |
| 1N4697                                | 10.0                                 | 50                                   | 0.10   | 1.0  | 7.6   | 24.8                                       |
| 1N4698                                | 11.0                                 | 50                                   | 0.11   | 0.05   | 8.4   | 21.6                                       |
| 1N4699                                | 12.0                                 | 50                                   | 0.12   | 0.05   | 9.1   | 20.4                                       |
| 1N4700                                | 13.0                                 | 50                                   | 0.13   | 0.05   | 9.8   | 19.0                                       |
| 1N4701                                | 14.0                                 | 50                                   | 0.14   | 0.05   | 10.6  | 17.5                                       |
| 1N4702                                | 15.0                                 | 50                                   | 0.15   | 0.05   | 11.4  | 16.3                                       |
| 1N4703                                | 16.0                                 | 50                                   | 0.16   | 0.05   | 12.1  | 15.4                                       |
| 1N4704                                | 17.0                                 | 50                                   | 0.17   | 0.05   | 12.9  | 14.5                                       |
| 1N4705                                | 18.0                                 | 50                                   | 0.18   | 0.05   | 13.6  | 13.2                                       |
| 1N4706                                | 19.0                                 | 50                                   | 0.19   | 0.05   | 14.4  | 12.5                                       |
| 1N4707                                | 20.0                                 | 50                                   | 0.20   | 0.01   | 15.2  | 11.9                                       |
| 1N4708                                | 22.0                                 | 50                                   | 0.22   | 0.01   | 16.7  | 10.8                                       |
| 1N4709                                | 24.0                                 | 50                                   | 0.24   | 0.01   | 18.2  | 9.9  |
| 1N4710                                | 25.0                                 | 50                                   | 0.25   | 0.01   | 19.0  | 9.5  |
| 1N4711                                | 27.0                                 | 50                                   | 0.27   | 0.01   | 20.4  | 8.8  |
| 1N4712                                | 28.0                                 | 50                                   | 0.28   | 0.01   | 21.2  | 8.5  |
| 1N4713                                | 30.0                                 | 50                                   | 0.30   | 0.01   | 22.8  | 7.9  |
| 1N4714                                | 33.0                                 | 50                                   | 0.33   | 0.01   | 25.0  | 7.2  |
| 1N4715                                | 36.0                                 | 50                                   | 0.36   | 0.01   | 27.3  | 6.6  |
| 1N4716                                | 39.0                                 | 50                                   | 0.39   | 0.01   | 29.6  | 6.1  |
| 1N4717                                | 43.0                                 | 50                                   | 0.43   | 0.01   | 32.6  | 5.5  |

**NOTE 1** The JEDEC type numbers shown above have a standard tolerance of  $\pm 5\%$  of the nominal Zener voltage.  $V_Z$  is measured with the diode in thermal equilibrium at  $25^\circ\text{C} \pm 3^\circ\text{C}$ .

**NOTE 2**  $V_Z @ 100 \mu\text{A}$  minus  $V_Z @ 10 \mu\text{A}$ .

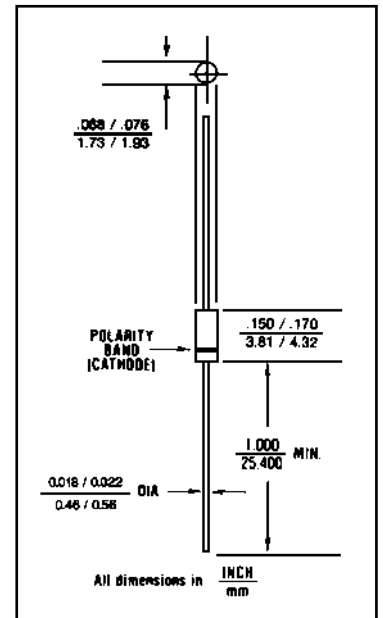


FIGURE 1

### DESIGN DATA

**CASE:** Hermetically sealed glass case. DO – 35 outline.

**LEAD MATERIAL:** Copper clad steel.

**LEAD FINISH:** Tin / Lead

**THERMAL RESISTANCE:** ( $R_{\theta JEC}$ ): 250 °C/W maximum at L = .375 inch

**THERMAL IMPEDANCE:** ( $Z_{\theta JX}$ ): 35 °C/W maximum

**POLARITY:** Diode to be operated with the banded (cathode) end positive.

**MOUNTING POSITION:** ANY.



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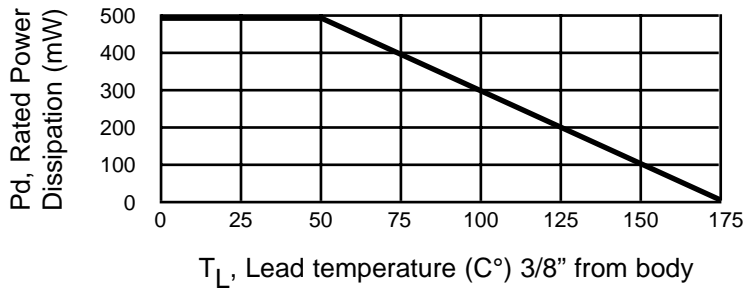
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# 1N4678 thru 1N4717

FIGURE 2



POWER DERATING CURVE

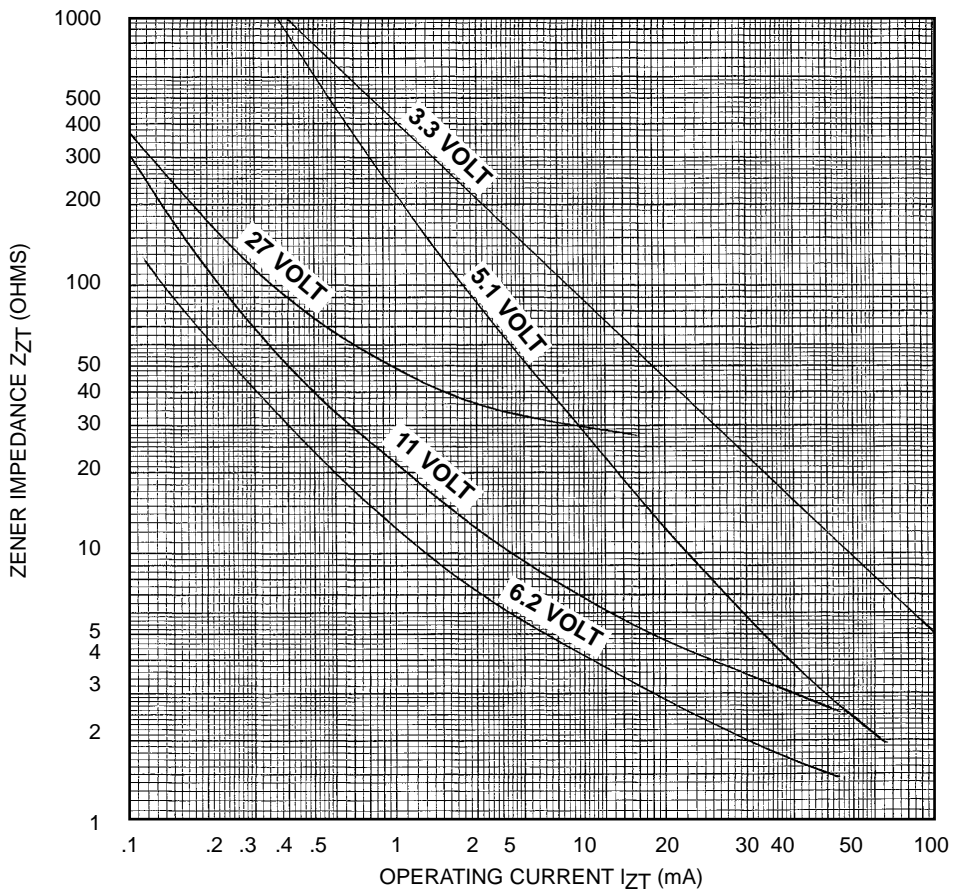


FIGURE 3

ZENER IMPEDANCE VS. OPERATING CURRENT