

# 1N4954 ~ 1N4989

# SILICON ZENER DIODE

**V<sub>Z</sub> : 6.8 - 200 Volts**

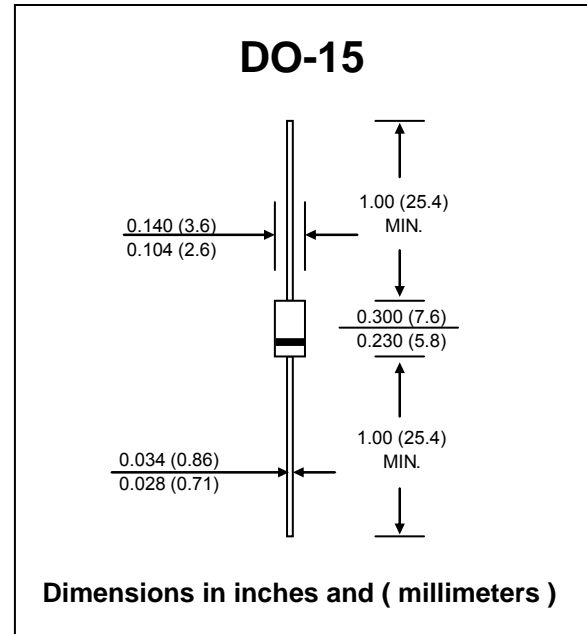
**P<sub>D</sub> : 5 Watts**

### FEATURES :

- \* Glass passivated junction chip
- \* High peak reverse power dissipation
- \* High reliability
- \* Low leakage current
- \* **Pb Free/RoHS Compliant**

### MECHANICAL DATA :

- \* Case : DO-15 Molded plastic
- \* Epoxy : UL94V-0 rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
- \* Polarity : Color band denotes cathode end
- \* Mounting position : Any
- \* Weight : 0.4 gram



### MAXIMUM RATINGS

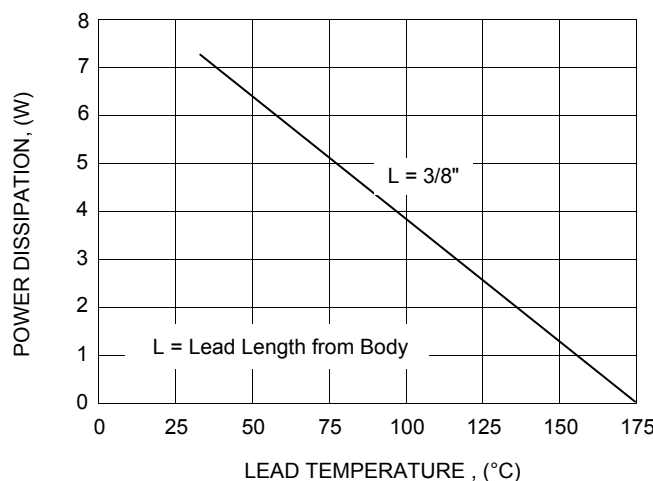
Rating at 25 °C ambient temperature unless otherwise specified.

| Rating  | Symbol           | Value         | Unit |
|---|------------------|---------------|------|
| DC Power Dissipation                            | P <sub>D</sub>   | 5.0           | W    |
| Maximum Forward Voltage at I <sub>F</sub> = 1 A | V <sub>F</sub>   | 1.5           | V    |
| Thermal Resistance Junction to Lead (Note 1)    | R <sub>θJL</sub> | 22            | °C/W |
| Operating Junction Temperature Range            | T <sub>J</sub>   | - 65 to + 175 | °C   |
| Storage Temperature Range                       | T <sub>STG</sub> | - 65 to + 175 | °C   |

**Note :**

- (1) At 3/8 inch (10 mm) from body

**FIG. - 1 POWER DERATING CURVE**



## ELECTRICAL CHARACTERISTICS (Rating at 25 °C ambient temperature unless otherwise specified)

| TYPE   | Nominal Zener Voltage            |                 | Maximum Zener Impedance           |  | Maximum Reverse Leakage Current |                                   | Temp. coefficient of Zener Voltage | Maximum DC Zener Current | Voltage Regulation <sup>(1)</sup> | Surge Current |
|--------|----------------------------------|-----------------|-----------------------------------|--|---------------------------------|-----------------------------------|------------------------------------|--------------------------|-----------------------------------|---------------|
|        | V <sub>Z</sub> @ I <sub>ZT</sub> | I <sub>ZT</sub> | Z <sub>ZT</sub> @ I <sub>ZT</sub> | Z <sub>ZK</sub> @ I <sub>ZK</sub> =1mA | I <sub>R</sub> @ V <sub>R</sub> | α <sub>VZ</sub> @ I <sub>ZT</sub> | I <sub>ZM</sub>                    | ΔV <sub>Z</sub>          | I <sub>ZSM</sub>                  |               |
|        | (V)                              | (mA)            | (Ω)                               | (Ω)                                    | (μA)                            | (V)                               | (% / °C)                           | (mA)                     | (V)                               | (A)           |
| 1N4954 | 6.8                              | 175             | 1.0                               | 1000                                   | 150                             | 5.2                               | 0.05                               | 700                      | 0.7                               | 29.3          |
| 1N4955 | 7.5                              | 175             | 1.5                               | 800                                    | 100                             | 5.7                               | 0.06                               | 630                      | 0.7                               | 26.4          |
| 1N4956 | 8.2                              | 150             | 1.5                               | 600                                    | 50                              | 6.2                               | 0.06                               | 580                      | 0.7                               | 24.0          |
| 1N4957 | 9.1                              | 150             | 2.0                               | 400                                    | 25                              | 6.9                               | 0.06                               | 520                      | 0.7                               | 22.0          |
| 1N4958 | 10                               | 125             | 2.0                               | 125                                    | 25.0                            | 7.6                               | 0.07                               | 475                      | 0.8                               | 20.0          |
| 1N4959 | 11                               | 125             | 2.5                               | 130                                    | 10.0                            | 8.4                               | 0.07                               | 430                      | 0.8                               | 19.0          |
| 1N4960 | 12                               | 100             | 2.5                               | 140                                    | 10.0                            | 9.1                               | 0.07                               | 395                      | 0.8                               | 18.0          |
| 1N4961 | 13                               | 100             | 3.0                               | 145                                    | 10.0                            | 9.9                               | 0.08                               | 365                      | 0.9                               | 16.0          |
| 1N4962 | 15                               | 75              | 3.5                               | 150                                    | 5.0                             | 11.4                              | 0.08                               | 315                      | 1.0                               | 12.0          |
| 1N4963 | 16                               | 75              | 3.5                               | 155                                    | 5.0                             | 12.2                              | 0.08                               | 294                      | 1.1                               | 10.0          |
| 1N4964 | 18                               | 65              | 4.0                               | 160                                    | 5.0                             | 13.7                              | 0.085                              | 264                      | 1.2                               | 9.0           |
| 1N4965 | 20                               | 65              | 4.5                               | 165                                    | 2.0                             | 15.2                              | 0.085                              | 237                      | 1.5                               | 8.0           |
| 1N4966 | 22                               | 50              | 5.0                               | 170                                    | 2.0                             | 16.7                              | 0.085                              | 216                      | 1.8                               | 7.0           |
| 1N4967 | 24                               | 50              | 5.0                               | 175                                    | 2.0                             | 18.2                              | 0.090                              | 198                      | 2.0                               | 6.5           |
| 1N4968 | 27                               | 50              | 6.0                               | 180                                    | 2.0                             | 20.6                              | 0.090                              | 176                      | 2.0                               | 6.0           |
| 1N4969 | 30                               | 40              | 8.0                               | 190                                    | 2.0                             | 22.8                              | 0.090                              | 158                      | 2.5                               | 5.5           |
| 1N4970 | 33                               | 40              | 10                                | 200                                    | 2.0                             | 25.1                              | 0.095                              | 144                      | 2.8                               | 5.0           |
| 1N4971 | 36                               | 30              | 11                                | 220                                    | 2.0                             | 27.4                              | 0.095                              | 132                      | 3.0                               | 4.5           |
| 1N4972 | 39                               | 30              | 14                                | 230                                    | 2.0                             | 29.7                              | 0.095                              | 122                      | 3.0                               | 4.0           |
| 1N4973 | 43                               | 30              | 20                                | 240                                    | 2.0                             | 32.7                              | 0.095                              | 110                      | 3.3                               | 3.5           |
| 1N4974 | 47                               | 25              | 25                                | 250                                    | 2.0                             | 35.8                              | 0.095                              | 100                      | 3.2                               | 3.2           |
| 1N4975 | 51                               | 25              | 27                                | 270                                    | 2.0                             | 38.8                              | 0.095                              | 92                       | 4.0                               | 3.0           |
| 1N4976 | 56                               | 20              | 35                                | 320                                    | 2.0                             | 42.6                              | 0.095                              | 84                       | 4.4                               | 2.8           |
| 1N4977 | 62                               | 20              | 42                                | 400                                    | 2.0                             | 47.1                              | 0.100                              | 76                       | 5.0                               | 2.5           |
| 1N4978 | 68                               | 20              | 50                                | 500                                    | 2.0                             | 51.7                              | 0.100                              | 70                       | 5.5                               | 2.2           |
| 1N4979 | 75                               | 20              | 55                                | 620                                    | 2.0                             | 56.0                              | 0.100                              | 63                       | 6.0                               | 2.0           |
| 1N4980 | 82                               | 15              | 80                                | 720                                    | 2.0                             | 62.2                              | 0.100                              | 58                       | 6.6                               | 1.8           |
| 1N4981 | 91                               | 15              | 90                                | 760                                    | 2.0                             | 69.2                              | 0.100                              | 52.5                     | 7.5                               | 1.6           |
| 1N4982 | 100                              | 12              | 110                               | 800                                    | 2.0                             | 76.0                              | 0.100                              | 47.5                     | 8.0                               | 1.4           |
| 1N4983 | 110                              | 12              | 125                               | 1000                                   | 2.0                             | 83.6                              | 0.100                              | 43                       | 9.0                               | 1.2           |
| 1N4984 | 120                              | 10              | 170                               | 1150                                   | 2.0                             | 91.2                              | 0.100                              | 39.5                     | 10                                | 1.00          |
| 1N4985 | 130                              | 10              | 190                               | 1250                                   | 2.0                             | 98.8                              | 0.105                              | 36.6                     | 11                                | 0.80          |
| 1N4986 | 150                              | 8               | 330                               | 1500                                   | 2.0                             | 114                               | 0.105                              | 31.6                     | 13                                | 0.75          |
| 1N4987 | 160                              | 8               | 350                               | 1650                                   | 2.0                             | 121.6                             | 0.105                              | 29.4                     | 14                                | 0.70          |
| 1N4988 | 180                              | 5               | 450                               | 1750                                   | 2.0                             | 136.8                             | 0.110                              | 26.4                     | 16                                | 0.60          |
| 1N4989 | 200                              | 5               | 500                               | 1850                                   | 2.0                             | 152                               | 0.110                              | 23.6                     | 18                                | 0.50          |

**Note :**

(1) Maximum voltage change ΔV<sub>Z</sub> between 10% of I<sub>ZM</sub> and 50% of I<sub>ZM</sub>

(2) Standard voltage tolerance is ± 5%