

# 1. DATA SHEET

## 1N4728A~1N4764A

### GLASS PASSIVATED JUNCTION SILICON ZENER DIODE

**VOLTAGE** 3.3 to 100 Volts

**POWER**

1.0 Watts

DO-41/DO-41G

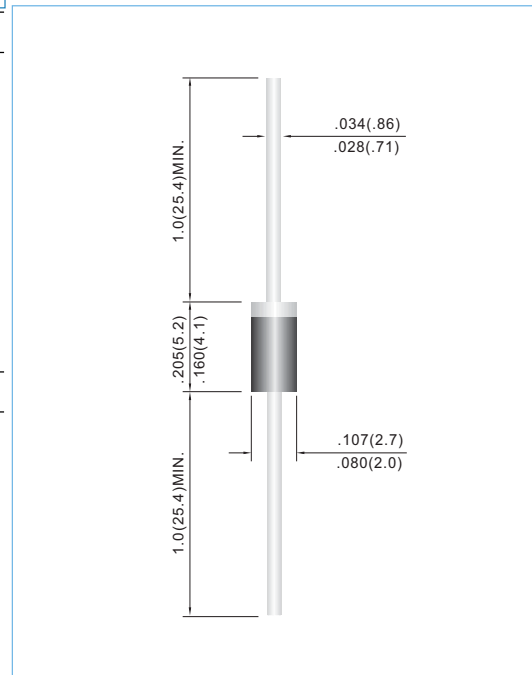
Unit: inch(mm)

#### FEATURES

- Low profile package
- Built-in strain relief
- Low inductance
- High temperature soldering : 260°C /10 seconds at terminals
- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- Both normal and Pb free product are available :  
Normal : 80~95% Sn, 5~20% Pb  
Pb free: 98.5% Sn above

#### MECHANICAL DATA

- Case: Molded Glass DO-41G / Molded plastic DO-41
- Epoxy:UL 94V-O rate flame retardant
- Terminals: Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- Polarity: Color band denotes positive end
- Mounting position:Any
- Weight: 0.012 ounce, 0.3 gram
- Ordering information :  
Suffix : " -G " to order Molded Glass Package  
Suffix : " -P " to order Molded plastic Package
- Packing information  
B - 1K per Bulk box  
T/R - 5K per 13" paper Reel  
T/B - 2.5K per horiz. tape & Ammo box



Note :

This outline drawing is model plastics.  
Its appearance size same as glass.

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                         | Symbol           | Value        | Units |
|-----------------------------------|------------------|--------------|-------|
| Power Dissipation at Tamb = 25 °C | P <sub>TOT</sub> | 1*           | W     |
| Junction Temperature              | T <sub>J</sub>   | 150          | °C    |
| Storage Temperature Range         | T <sub>STG</sub> | -55 to + 150 | °C    |

\*Valid provided that leads at a distance of 10mm from case are kept at ambient temperature.

| Parameter                                  | Symbol           | Min. | Typ. | Max. | Units |
|--------------------------------------------|------------------|------|------|------|-------|
| Thermal Resistance Junction to Ambient Air | R <sub>thA</sub> | --   | --   | 170* | K/W   |
| Forward Voltage at I <sub>F</sub> = 200mA  | V <sub>F</sub>   | --   | --   | 1.2  | V     |

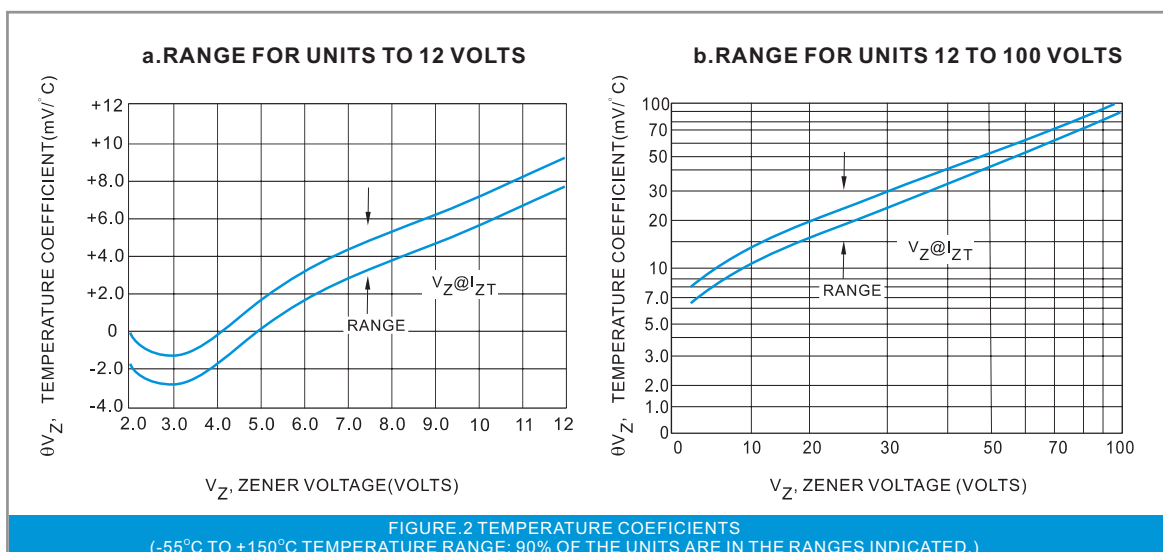
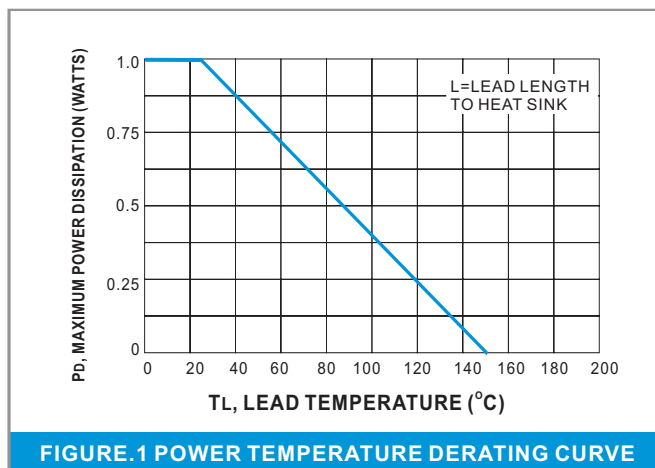
\*Valid provided that leads at a distance of 10mm from case are kept at ambient temperature.

| Part Number   | V <sub>Z</sub> @ I <sub>T</sub> |        |        | I <sub>T</sub> | Maximum Zener Impedance          |                                   |                 | Maximum Leakage Current         |      | Marking Code |         | Package       |
|---------------|---------------------------------|--------|--------|----------------|----------------------------------|-----------------------------------|-----------------|---------------------------------|------|--------------|---------|---------------|
|               |                                 |        |        |                | Z <sub>ZT</sub> @ I <sub>T</sub> | Z <sub>ZK</sub> @ I <sub>ZK</sub> | I <sub>ZK</sub> | I <sub>R</sub> @ V <sub>R</sub> |      |              |         |               |
|               | Nom. V                          | Min. V | Max. V | mA             | Ω                                | Ω                                 | mA              | μA                              | V    | D0 -41       | D0 -41G |               |
| 10 Watt ZENER |                                 |        |        |                |                                  |                                   |                 |                                 |      |              |         |               |
| 1N4728A       | 3.3                             | 3.1    | 3.5    | 76             | 10                               | 400                               | 1.0             | 100                             | 1.0  | -            | 4728A   | D0 -41G       |
| 1N4729A       | 3.6                             | 3.4    | 3.8    | 69             | 10                               | 400                               | 1.0             | 100                             | 1.0  | -            | 4729A   | D0 -41G       |
| 1N4730A       | 3.9                             | 3.7    | 4.1    | 64             | 9.0                              | 400                               | 1.0             | 50                              | 1.0  | -            | 4730A   | D0 -41G       |
| 1N4731A       | 4.3                             | 4.1    | 4.5    | 58             | 9.0                              | 400                               | 1.0             | 10                              | 1.0  | -            | 4731A   | D0 -41G       |
| 1N4732A       | 4.7                             | 4.5    | 4.9    | 53             | 8.0                              | 500                               | 1.0             | 10                              | 1.0  | -            | 4732A   | D0 -41G       |
| 1N4733A       | 5.1                             | 4.8    | 5.4    | 49             | 7.0                              | 550                               | 1.0             | 10                              | 1.0  | -            | 4733A   | D0 -41G       |
| 1N4734A       | 5.6                             | 5.3    | 5.9    | 45             | 5.0                              | 600                               | 1.0             | 10                              | 2.0  | -            | 4734A   | D0 -41G       |
| 1N4735A       | 6.2                             | 5.9    | 6.5    | 41             | 2.0                              | 700                               | 1.0             | 10                              | 3.0  | -            | 4735A   | D0 -41G       |
| 1N4736A       | 6.8                             | 6.5    | 7.1    | 37             | 3.5                              | 700                               | 1.0             | 10                              | 4.0  | -            | 4736A   | D0 -41G       |
| 1N4737A       | 7.5                             | 7.1    | 7.9    | 34             | 4.0                              | 700                               | 0.5             | 10                              | 5.0  | -            | 4737A   | D0 -41G       |
| 1N4738A       | 8.2                             | 7.8    | 8.6    | 31             | 4.5                              | 700                               | 0.5             | 10                              | 6.0  | -            | 4738A   | D0 -41G       |
| 1N4739A       | 9.1                             | 8.6    | 9.6    | 28             | 5.0                              | 700                               | 0.5             | 10                              | 7.0  | -            | 4739A   | D0 -41G       |
| 1N4740A       | 10.0                            | 9.5    | 10.5   | 25             | 7.0                              | 700                               | 0.25            | 10                              | 7.6  | -            | 4740A   | D0 -41G       |
| 1N4741A       | 11.0                            | 10.5   | 11.6   | 23             | 8.0                              | 700                               | 0.25            | 5.0                             | 8.4  | 1N4741A      | 4741A   | D0 -41D0 -41G |
| 1N4742A       | 12.0                            | 11.4   | 12.6   | 21             | 9.0                              | 700                               | 0.25            | 5.0                             | 9.1  | 1N4742A      | 4742A   | D0 -41D0 -41G |
| 1N4743A       | 13.0                            | 12.4   | 13.7   | 19             | 10                               | 700                               | 0.25            | 5.0                             | 9.9  | 1N4743A      | 4743A   | D0 -41D0 -41G |
| 1N4744A       | 15.0                            | 14.3   | 15.8   | 17             | 14                               | 700                               | 0.25            | 5.0                             | 11.4 | 1N4744A      | 4744A   | D0 -41D0 -41G |
| 1N4745A       | 16.0                            | 15.2   | 16.8   | 15.5           | 16                               | 700                               | 0.25            | 5.0                             | 12.2 | 1N4745A      | 4745A   | D0 -41D0 -41G |
| 1N4746A       | 18.0                            | 17.1   | 18.9   | 14             | 20                               | 750                               | 0.25            | 5.0                             | 13.7 | 1N4746A      | 4746A   | D0 -41D0 -41G |
| 1N4747A       | 20.0                            | 19.0   | 21.0   | 12.5           | 22                               | 750                               | 0.25            | 5.0                             | 15.2 | 1N4747A      | 4747A   | D0 -41D0 -41G |
| 1N4748A       | 22.0                            | 20.9   | 23.1   | 11.5           | 23                               | 750                               | 0.25            | 5.0                             | 16.7 | 1N4748A      | 4748A   | D0 -41D0 -41G |
| 1N4749A       | 24.0                            | 22.8   | 25.2   | 10.5           | 25                               | 750                               | 0.25            | 5.0                             | 18.2 | 1N4749A      | 4749A   | D0 -41D0 -41G |
| 1N4750A       | 27.0                            | 25.7   | 28.4   | 9.5            | 35                               | 750                               | 0.25            | 5.0                             | 20.6 | 1N4750A      | 4750A   | D0 -41D0 -41G |
| 1N4751A       | 30.0                            | 28.5   | 31.5   | 8.5            | 40                               | 1000                              | 0.25            | 5.0                             | 22.8 | 1N4751A      | 4751A   | D0 -41D0 -41G |
| 1N4752A       | 33.0                            | 31.4   | 34.7   | 7.5            | 45                               | 1000                              | 0.25            | 5.0                             | 25.1 | 1N4752A      | 4752A   | D0 -41D0 -41G |
| 1N4753A       | 36.0                            | 34.2   | 37.8   | 7.0            | 50                               | 1000                              | 0.25            | 5.0                             | 27.4 | 1N4753A      | 4753A   | D0 -41D0 -41G |
| 1N4754A       | 39.0                            | 37.1   | 41.0   | 6.5            | 60                               | 1000                              | 0.25            | 5.0                             | 29.7 | 1N4754A      | 4754A   | D0 -41D0 -41G |
| 1N4755A       | 43.0                            | 40.9   | 45.2   | 6.0            | 70                               | 1500                              | 0.25            | 5.0                             | 32.7 | 1N4755A      | 4755A   | D0 -41D0 -41G |
| 1N4756A       | 47.0                            | 44.7   | 49.4   | 5.5            | 80                               | 1500                              | 0.25            | 5.0                             | 35.8 | 1N4756A      | 4756A   | D0 -41D0 -41G |
| 1N4757A       | 51.0                            | 48.5   | 53.6   | 5.0            | 95                               | 1500                              | 0.25            | 5.0                             | 38.8 | 1N4757A      | 4757A   | D0 -41D0 -41G |
| 1N4758A       | 56.0                            | 53.2   | 58.8   | 4.5            | 110                              | 2000                              | 0.25            | 5.0                             | 42.6 | 1N4758A      | 4758A   | D0 -41D0 -41G |
| 1N4759A       | 62.0                            | 58.9   | 65.1   | 4.0            | 125                              | 2000                              | 0.25            | 5.0                             | 47.1 | 1N4759A      | 4759A   | D0 -41D0 -41G |
| 1N4760A       | 68.0                            | 64.6   | 71.4   | 3.7            | 150                              | 2000                              | 0.25            | 5.0                             | 51.7 | 1N4760A      | 4760A   | D0 -41D0 -41G |
| 1N4761A       | 75.0                            | 71.3   | 78.8   | 3.3            | 175                              | 2000                              | 0.25            | 5.0                             | 56.0 | 1N4761A      | 4761A   | D0 -41D0 -41G |
| 1N4762A       | 82.0                            | 77.9   | 86.1   | 3.0            | 200                              | 3000                              | 0.25            | 5.0                             | 62.2 | 1N4762A      | 4762A   | D0 -41D0 -41G |
| 1N4763A       | 91.0                            | 86.5   | 95.6   | 2.8            | 250                              | 3000                              | 0.25            | 5.0                             | 69.2 | 1N4763A      | 4763A   | D0 -41D0 -41G |
| 1N4764A       | 100.0                           | 95.0   | 105.0  | 2.5            | 350                              | 3000                              | 0.25            | 5.0                             | 76.0 | 1N4764A      | 4764A   | D0 -41D0 -41G |

**NOTE:**

1. Tolerance and Type Number Designation. The type numbers listed have a standard tolerance on the nominal zener voltage of  $\pm 5\%$
2. Specials Available Include:
  - A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
  - B. Matched sets.
3. Zener Voltage ( $V_Z$ ) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature ( $T_L$ ) at  $30^\circ\text{C} \pm 1^\circ\text{C}$ , from the diode body.
4. Zener Impedance ( $Z_Z$ ) Derivation. The zener impedance is derived from the 60 cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current ( $I_{ZT}$  or  $I_{ZK}$ ) is superimposed on  $I_{ZT}$  or  $I_{ZK}$ .
5. Surge Current ( $I_R$ ) Non-Repetitive. The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2

## RATING AND CHARACTERISTICS CURVES



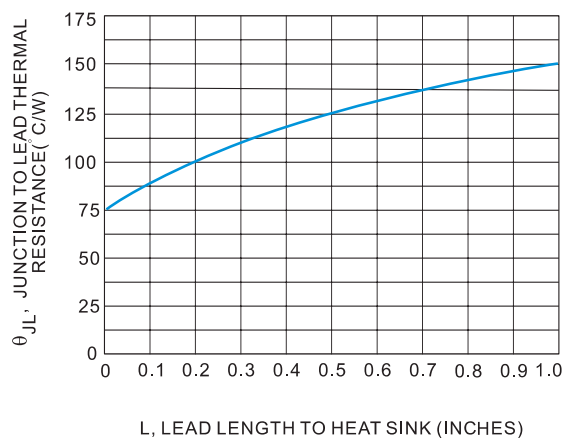


FIGURE.3 TYPICAL THERMAL RESISTANCE versus LEAD LENGTH

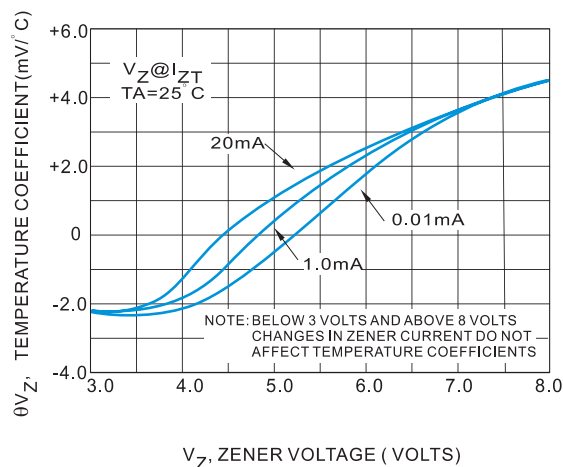
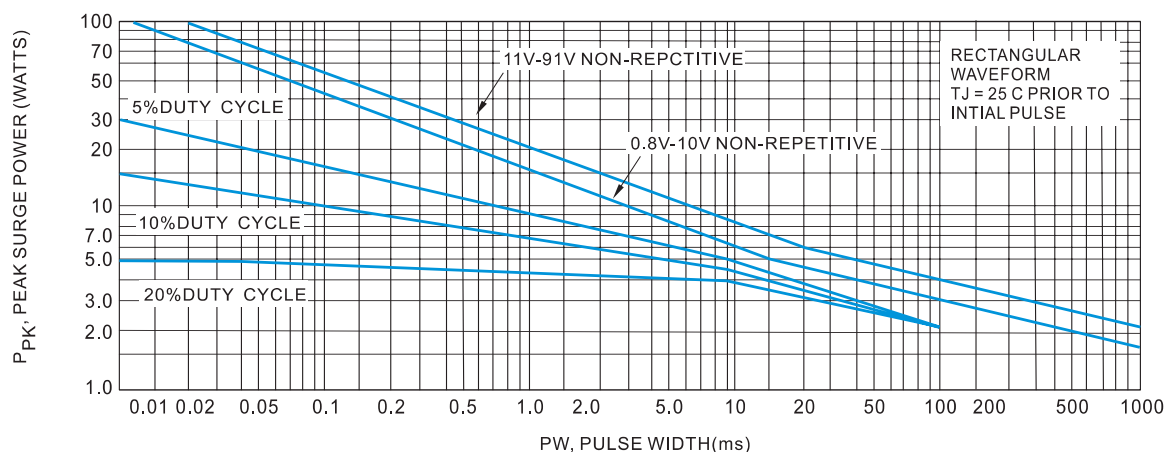


FIGURE.4 EFFECT OF ZENER CURRENT



This graph represents 90 percentile data points.  
FOR worst-case design characteristics, multiply surge power by 2/3

FIGURE.5 MAXIMUM SURGE POWER

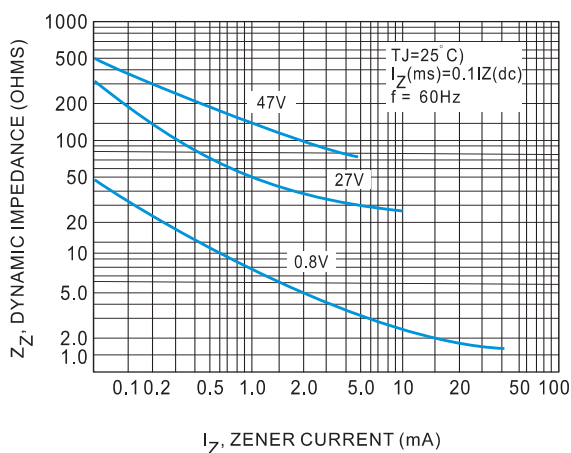


FIGURE.6 EFFECT OF ZENER CURRENT ON ZENER IMPEDANCE

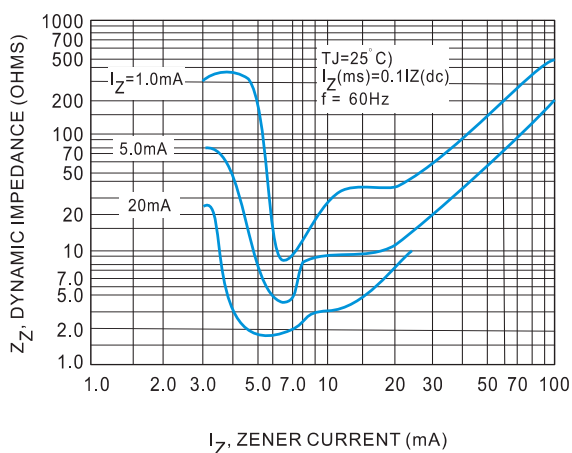
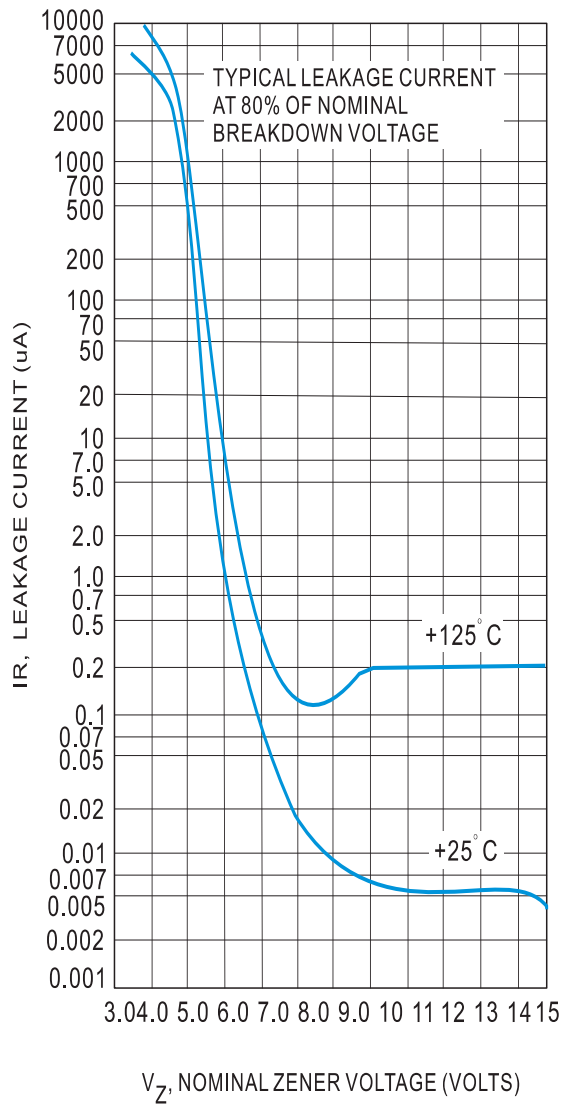
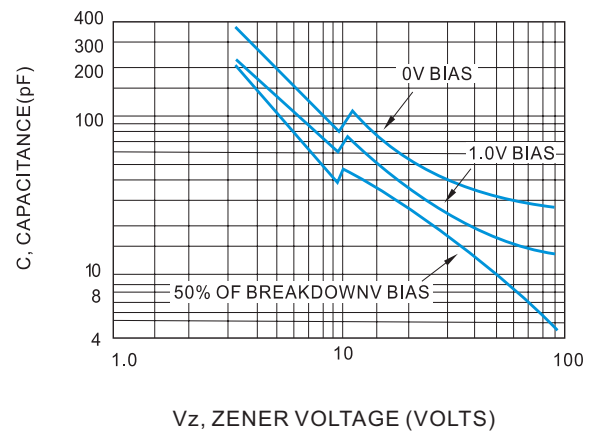


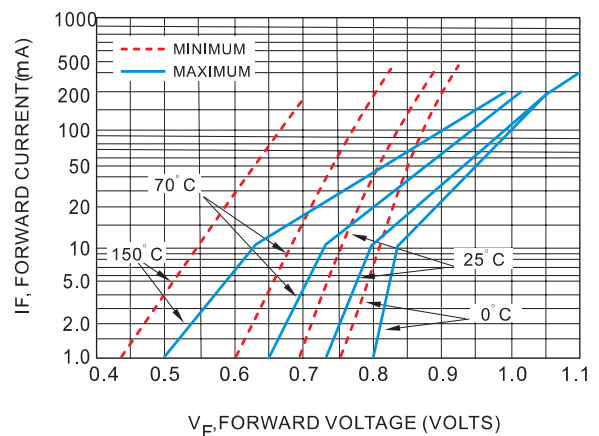
FIGURE.7 EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE



**FIGURE.8 TYPICAL LEAKAGE CURRENT**



**FIGURE.9 TYPICAL CAPACITANCE versus Vz**



**FIGURE.10 TYPICAL FORWARD CHARACTERISTICS**