



**POWER DISSIPATION: 5.0 W**

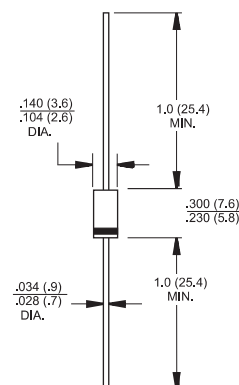
## Features

- ◇ Silicon planar power zener diodes
- ◇ For use in stabilizing and clipping circuits with high power rating.
- ◇ Standard zener voltage tolerance is  $\pm 10\%$ . Add suffix "B" for  $\pm 5\%$  tolerance. other zener voltage and tolerances are available upon request.

## Mechanical Data

- ◇ Case:DO-15
- ◇ Polarity: cathode Band
- ◇ Marking: type number
- ◇ Approx. weight: 0.40grams

### DO-15



Dimensions in inches and (millimeters)

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate by 20%.

|                                                                                                            | SYMBOL    | VALUE       | UNIT    |
|------------------------------------------------------------------------------------------------------------|-----------|-------------|---------|
| Zener current (see Table "Characteristics")                                                                |           |             |         |
| DC power dissipation @ $T_L = 75$ , measure at zero lead length (Fig.1)<br>derate above 75 (NOTE 1)        | $P_D$     | 5.0<br>40.0 | W<br>mW |
| Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)(NOTE 1,2) | $I_{FSM}$ | see fig.5   | A       |
| Junction temperature                                                                                       | $T_J$     | -55---+150  | °C      |
| Storage temperature range                                                                                  | $T_s$     | -55---+150  | °C      |

NOTES: (1) Mounted on 8.0mm<sup>2</sup> copper pads to each terminal.

(2) 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minute maximum.

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$ )

| Type<br>(Note 1) | Zener voltage<br>(Note 2)            |                       | Maximum Zener<br>Impedance<br>(Note 2) |                                            | Max Reverse Leakage<br>Current |                | I <sub>R</sub><br>(Note 3)<br>A | V <sub>Z</sub><br>(Note 4)<br>V | I <sub>ZM</sub><br>(Note 5)<br>mA |
|------------------|--------------------------------------|-----------------------|----------------------------------------|--------------------------------------------|--------------------------------|----------------|---------------------------------|---------------------------------|-----------------------------------|
|                  | V <sub>Z</sub> @I <sub>ZT</sub><br>V | I <sub>ZT</sub><br>mA | Z <sub>ZT</sub> @I <sub>ZT</sub><br>Ω  | Z <sub>ZT</sub> @I <sub>ZK</sub> =1μA<br>Ω | I <sub>R</sub>                 | V <sub>R</sub> |                                 |                                 |                                   |
|                  |                                      |                       |                                        |                                            | μA                             | V              |                                 |                                 |                                   |
| 1N5333B          | 3.3                                  | 380                   | 3.0                                    | 400                                        | 300                            | 1.0            | 20                              | 0.85                            | 1440                              |
| 1N5334B          | 3.6                                  | 350                   | 2.5                                    | 500                                        | 150                            | 1.0            | 18.7                            | 0.80                            | 1320                              |
| 1N5335B          | 3.9                                  | 320                   | 2.0                                    | 500                                        | 50                             | 1.0            | 17.6                            | 0.54                            | 1220                              |
| 1N5336B          | 4.3                                  | 290                   | 2.0                                    | 500                                        | 10                             | 1.0            | 16.4                            | 0.49                            | 1100                              |
| 1N5337B          | 4.7                                  | 260                   | 2.0                                    | 450                                        | 5.0                            | 1.0            | 15.3                            | 0.44                            | 1010                              |
| 1N5338B          | 5.1                                  | 240                   | 1.5                                    | 400                                        | 1.0                            | 1.0            | 14.4                            | 0.39                            | 930                               |
| 1N5339B          | 5.6                                  | 220                   | 1.0                                    | 400                                        | 1.0                            | 2.0            | 13.4                            | 0.25                            | 865                               |
| 1N5340B          | 6.0                                  | 200                   | 1.0                                    | 300                                        | 1.0                            | 3.0            | 12.7                            | 0.19                            | 790                               |
| 1N5341B          | 6.2                                  | 200                   | 1.0                                    | 200                                        | 1.0                            | 3.0            | 12.4                            | 0.10                            | 765                               |
| 1N5342B          | 6.8                                  | 175                   | 1.0                                    | 200                                        | 10                             | 5.2            | 11.5                            | 0.15                            | 700                               |
| 1N5343B          | 7.5                                  | 175                   | 1.5                                    | 200                                        | 10                             | 5.7            | 10.7                            | 0.15                            | 630                               |
| 1N5344B          | 8.2                                  | 150                   | 1.5                                    | 200                                        | 10                             | 6.2            | 10.0                            | 0.20                            | 580                               |
| 1N5345B          | 8.7                                  | 150                   | 2.0                                    | 200                                        | 10                             | 6.6            | 9.5                             | 0.20                            | 545                               |
| 1N5346B          | 9.1                                  | 150                   | 2.0                                    | 150                                        | 7.5                            | 6.9            | 9.2                             | 0.22                            | 520                               |
| 1N5347B          | 10                                   | 125                   | 2.0                                    | 125                                        | 5.0                            | 7.6            | 8.6                             | 0.22                            | 475                               |
| 1N5348B          | 11                                   | 125                   | 2.5                                    | 125                                        | 5.0                            | 8.4            | 8.0                             | 0.25                            | 430                               |
| 1N5349B          | 12                                   | 100                   | 2.5                                    | 125                                        | 2.0                            | 9.1            | 7.5                             | 0.25                            | 395                               |
| 1N5350B          | 13                                   | 100                   | 2.5                                    | 100                                        | 1.0                            | 9.9            | 7.0                             | 0.25                            | 365                               |
| 1N5351B          | 14                                   | 100                   | 2.5                                    | 75                                         | 1.0                            | 10.6           | 6.7                             | 0.25                            | 340                               |
| 1N5352B          | 15                                   | 75                    | 2.5                                    | 75                                         | 1.0                            | 11.5           | 6.3                             | 0.25                            | 315                               |
| 1N5353B          | 16                                   | 75                    | 2.5                                    | 75                                         | 1.0                            | 12.2           | 6.0                             | 0.30                            | 295                               |
| 1N5354B          | 17                                   | 70                    | 2.5                                    | 75                                         | 0.5                            | 12.9           | 5.8                             | 0.35                            | 280                               |
| 1N5355B          | 18                                   | 65                    | 2.5                                    | 75                                         | 0.5                            | 13.7           | 5.5                             | 0.40                            | 264                               |
| 1N5356B          | 19                                   | 65                    | 3.0                                    | 75                                         | 0.5                            | 14.4           | 5.3                             | 0.40                            | 250                               |
| 1N5357B          | 20                                   | 65                    | 3.0                                    | 75                                         | 0.5                            | 15.2           | 5.1                             | 0.40                            | 237                               |
| 1N5358B          | 22                                   | 50                    | 3.5                                    | 75                                         | 0.5                            | 16.7           | 4.7                             | 0.45                            | 216                               |
| 1N5359B          | 24                                   | 50                    | 3.5                                    | 100                                        | 0.5                            | 18.2           | 4.4                             | 0.55                            | 198                               |
| 1N5360B          | 25                                   | 50                    | 4.0                                    | 110                                        | 0.5                            | 19.0           | 4.3                             | 0.55                            | 190                               |
| 1N5361B          | 27                                   | 50                    | 5.0                                    | 120                                        | 0.5                            | 20.6           | 4.1                             | 0.60                            | 176                               |
| 1N5362B          | 28                                   | 50                    | 6.0                                    | 130                                        | 0.5                            | 21.2           | 3.9                             | 0.60                            | 170                               |
| 1N5363B          | 30                                   | 40                    | 8.0                                    | 140                                        | 0.5                            | 22.8           | 3.7                             | 0.60                            | 158                               |
| 1N5364B          | 33                                   | 40                    | 10                                     | 150                                        | 0.5                            | 25.1           | 3.5                             | 0.60                            | 144                               |
| 1N5365B          | 36                                   | 30                    | 11                                     | 160                                        | 0.5                            | 27.4           | 3.5                             | 0.65                            | 132                               |
| 1N5366B          | 39                                   | 30                    | 14                                     | 170                                        | 0.5                            | 29.7           | 3.1                             | 0.65                            | 122                               |
| 1N5367B          | 43                                   | 30                    | 20                                     | 190                                        | 0.5                            | 32.7           | 2.8                             | 0.70                            | 110                               |
| 1N5368B          | 47                                   | 25                    | 25                                     | 210                                        | 0.5                            | 35.8           | 2.7                             | 0.80                            | 100                               |
| 1N5369B          | 51                                   | 25                    | 27                                     | 230                                        | 0.5                            | 38.8           | 2.5                             | 0.90                            | 93                                |
| 1N5370B          | 56                                   | 20                    | 35                                     | 280                                        | 0.5                            | 42.6           | 2.3                             | 1.00                            | 86                                |
| 1N5371B          | 60                                   | 20                    | 40                                     | 350                                        | 0.5                            | 45.5           | 2.2                             | 1.20                            | 79                                |
| 1N5372B          | 62                                   | 20                    | 42                                     | 400                                        | 0.5                            | 47.1           | 2.1                             | 1.35                            | 76                                |

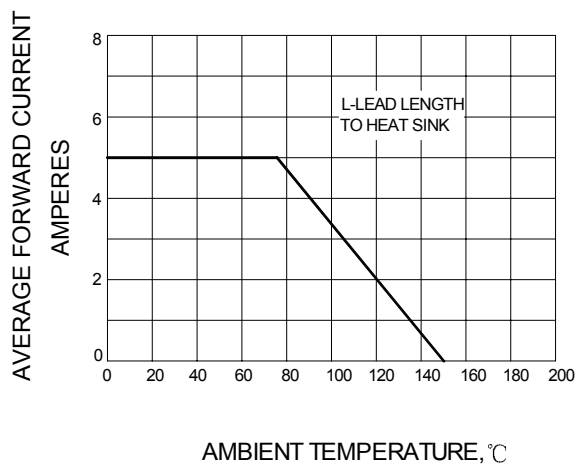
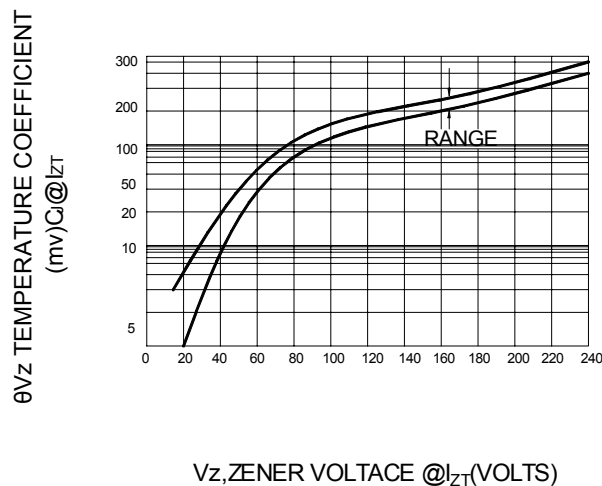
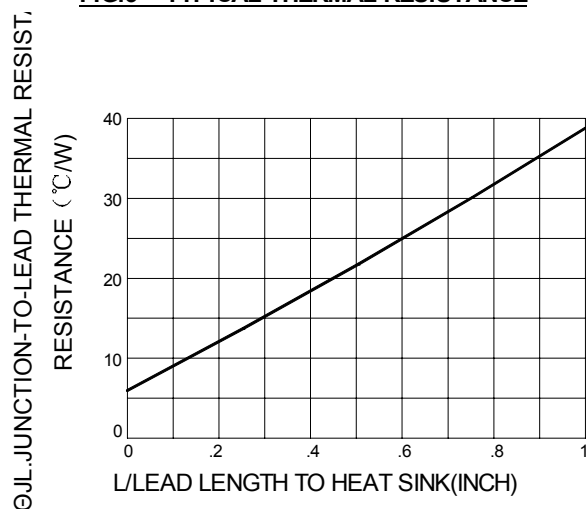
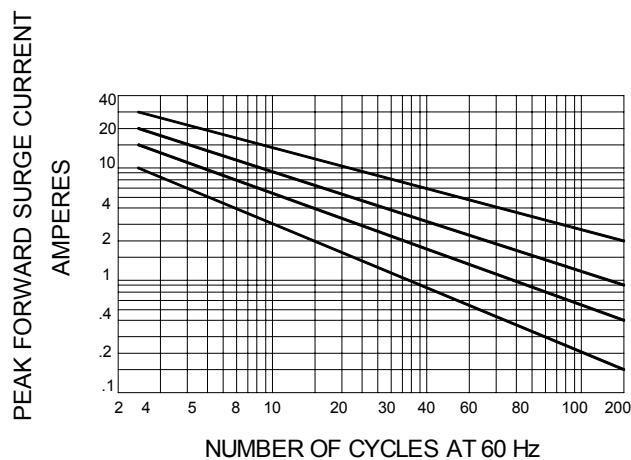
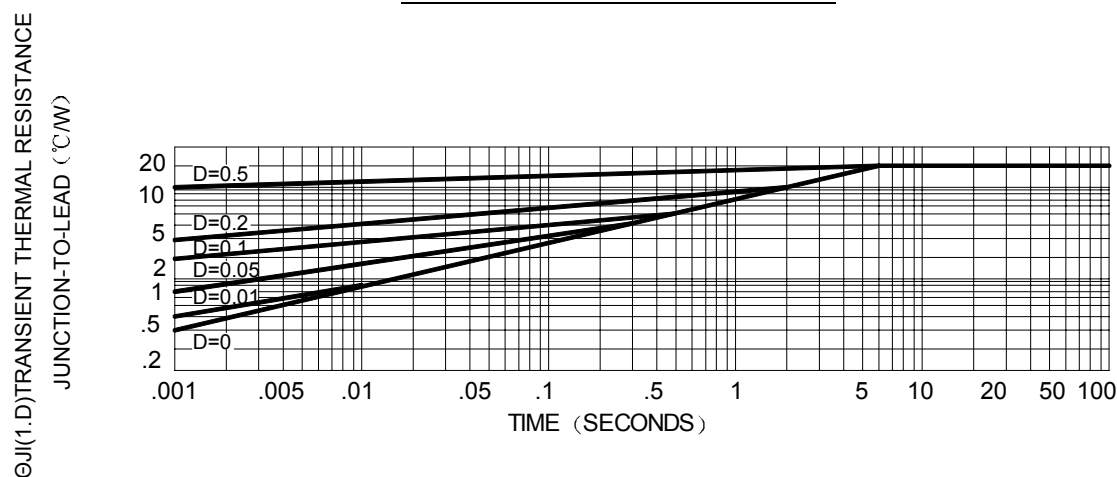
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25 °C)

| Type<br>(Note 1) | Zener voltage<br>(Note 2)            |                       | Maximum Zener<br>Impedance<br>(Note 2) |                                             | Max Reverse Leakage<br>Current |                | I <sub>R</sub><br>(Note 3)<br>A | V <sub>Z</sub><br>(Note 4)<br>V | I <sub>ZM</sub><br>(Note 5)<br>mA |
|------------------|--------------------------------------|-----------------------|----------------------------------------|---------------------------------------------|--------------------------------|----------------|---------------------------------|---------------------------------|-----------------------------------|
|                  | V <sub>Z</sub> @I <sub>ZT</sub><br>V | I <sub>ZT</sub><br>mA | Z <sub>ZT</sub> @I <sub>ZT</sub><br>Ω  | Z <sub>ZT</sub> @I <sub>ZK</sub> = 1μA<br>Ω | I <sub>R</sub>                 | V <sub>R</sub> |                                 |                                 |                                   |
|                  |                                      |                       |                                        |                                             | μA                             | V              |                                 |                                 |                                   |
| 1N5373B          | 68                                   | 20                    | 44                                     | 500                                         | 0.5                            | 51.7           | 2.0                             | 1.5                             | 70                                |
| 1N5374B          | 75                                   | 20                    | 45                                     | 620                                         | 0.5                            | 56.0           | 1.9                             | 1.6                             | 63                                |
| 1N5375B          | 82                                   | 15                    | 65                                     | 720                                         | 0.5                            | 62.2           | 1.8                             | 1.8                             | 58                                |
| 1N5376B          | 87                                   | 15                    | 75                                     | 760                                         | 0.5                            | 66.0           | 1.7                             | 2.0                             | 54.5                              |
| 1N5377B          | 91                                   | 15                    | 75                                     | 760                                         | 0.5                            | 69.2           | 1.6                             | 2.2                             | 52.5                              |
| 1N5378B          | 100                                  | 12                    | 90                                     | 800                                         | 0.5                            | 76.0           | 1.5                             | 2.5                             | 47.5                              |
| 1N5379B          | 110                                  | 12                    | 125                                    | 1000                                        | 0.5                            | 83.6           | 1.4                             | 2.5                             | 43.0                              |
| 1N5380B          | 120                                  | 10                    | 170                                    | 1150                                        | 0.5                            | 91.2           | 1.3                             | 2.5                             | 39.5                              |
| 1N5381B          | 130                                  | 10                    | 190                                    | 1250                                        | 0.5                            | 98.8           | 1.2                             | 2.5                             | 36.6                              |
| 1N5382B          | 140                                  | 8.0                   | 230                                    | 1500                                        | 0.5                            | 106            | 1.2                             | 2.5                             | 34.0                              |
| 1N5383B          | 150                                  | 8.0                   | 330                                    | 1500                                        | 0.5                            | 114            | 1.1                             | 3.0                             | 31.6                              |
| 1N5384B          | 160                                  | 8.0                   | 350                                    | 1650                                        | 0.5                            | 122            | 1.1                             | 3.0                             | 29.4                              |
| 1N5385B          | 170                                  | 8.0                   | 380                                    | 1750                                        | 0.5                            | 129            | 1.0                             | 3.0                             | 28.0                              |
| 1N5386B          | 180                                  | 5.0                   | 430                                    | 1750                                        | 0.5                            | 137            | 1.0                             | 4.0                             | 26.4                              |
| 1N5387B          | 190                                  | 5.0                   | 450                                    | 1850                                        | 0.5                            | 144            | 0.9                             | 5.0                             | 25.0                              |
| 1N5388B          | 200                                  | 5.0                   | 480                                    | 1850                                        | 0.5                            | 152            | 0.9                             | 5.0                             | 23.6                              |

### NOTE:

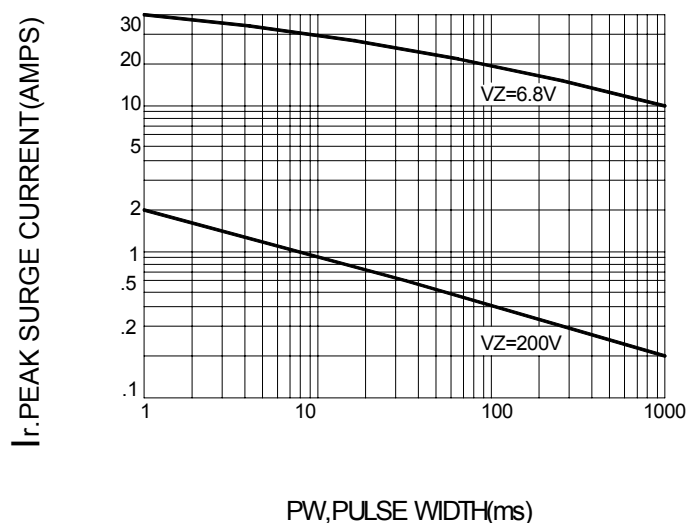
- TOLERANCE AND VOLTAGE DESIGNATION**-The JEDEC type numbers shown indicate a tolerance of ±10% with guaranteed limits on only V<sub>Z</sub>, I<sub>R</sub>, I<sub>r</sub>, and V<sub>F</sub> as shown in the electrical characteristics table. Units with guaranteed limits on all seven parameters are indicated by suffix "B" for ±5% tolerance.
- ZENER VOLTAGE (V<sub>Z</sub>) AND IMPEDANCE (Z<sub>ZT</sub> & Z<sub>ZK</sub>)** - Test conditions for zener voltage and impedance are as follows;I<sub>Z</sub> is applied 40±10ms prior to reading. Mounting contacts are located from the inside edge of mounting clips to the body of the diode.
- SURGE CURRENT (I<sub>r</sub>)** - Surge current is specified as the maximum allowable peak, non-recurrent square-wave current with a pulse width, PW, of 8.3ms. The data given in Fig 5. May be used to find the maximum surge current for a square wave of any pulse width between 1 ms by plotting the applicable points on logarithmic paper. Examples of this, using the 6.8v and 200v zeners, are shown in Fig 6. Mounting contact located as specified in NOTE 3.
- VOLTAGE REGULATION (V<sub>Z</sub>)** - Test conditions for voltage regulation are as follows: V<sub>Z</sub> measurements are made at 10% and then at 50% of the I<sub>Z</sub> max value listed in the electrical characteristics table. The test currents are the same for the 5% and 10% tolerance devices. The test current time duration for each V<sub>Z</sub> measurement is 40±10ms. Mounting contact located as specified in NOTE 2.
- MAXIMUM REGULATOR CURRENT (I<sub>ZM</sub>)** - The maximum current shown is based on the maximum voltage of a 5% type unit. Therefore, it applies only to the B-suffix device. The actual I<sub>ZM</sub> for any device may not exceed the value of 5 watts divided by the actual V<sub>Z</sub> of the device. T<sub>J</sub>=75 °C at 3/8" maximum from the device body.

## Ratings And Characteristic Curves

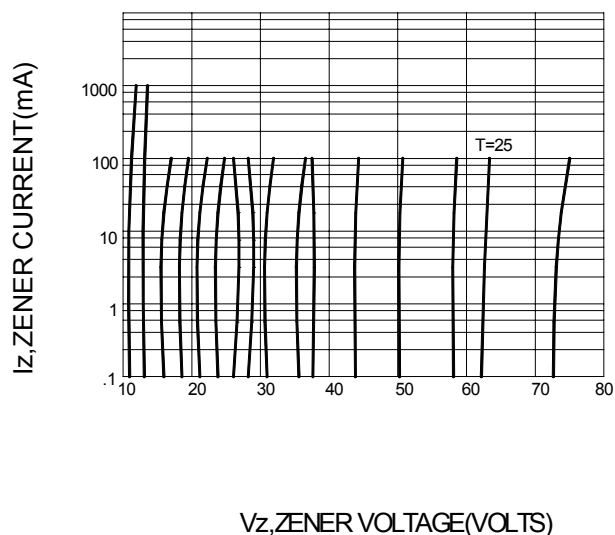
**FIG.1 --FORWARD DERATING CURVE**

**FIG.2 -- TEMPERATURE COEFFICIENT RANGE**

**FIG.3 -- TYPICAL THERMAL RESISTANCE**

**FIG.4 -- MAXIMUM NON-REPETITIVE SURGE CURRENT**

**FIG.5 -- TYPICAL THERMAL RESPONSE**


## Ratings And Characteristic Curves

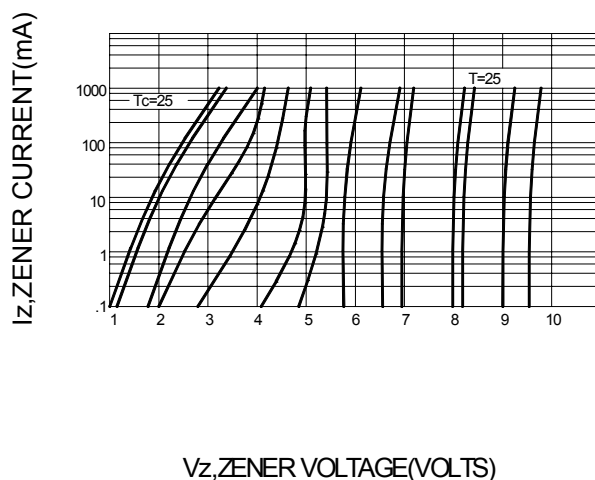
**FIG.6 – PEAK SURGE CURRENT VERSUS PULSE WIDTH**



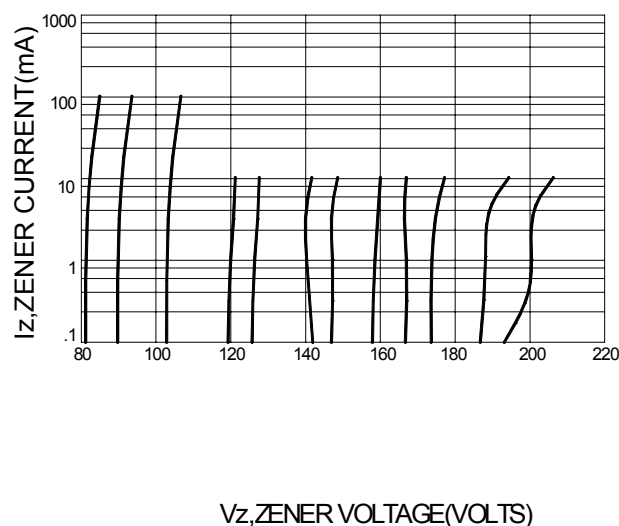
**FIG.8 – ZENER VOLTAGE VERSUS ZENER CURRENT**  
 **$V_Z = 11$  THRU 75 VOLTS**



**FIG.7 – ZENER VOLTAGE VERSUS ZENER CURRENT**  
 **$V_Z = 6.8$  THRU 10 VOLTS**



**FIG.9 – ZENER VOLTAGE VERSUS ZENER CURRENT**  
 **$V_Z = 82$  THRU 200 VOLTS**



| PACKAGE | SPQ/PCS   | CARTON<br>SPQ/PCS | CARTON<br>SIZE/CM | CARTON<br>GW/KG | CARTON<br>NW/KG |
|---------|-----------|-------------------|-------------------|-----------------|-----------------|
| DO-15   | 3000/AMMO | 30000             | 42X28X31          | 12.00           | 10.00           |

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