



# Frontier Electronics Corp.

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## 5 WATT SILICON ZENER DIODE

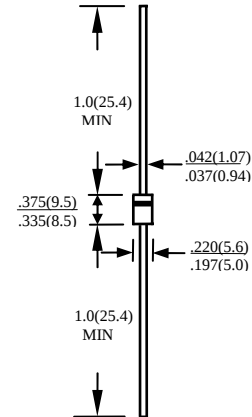
### 1N5333B THRU 1N5388B

#### FEATURES

- PLASTIC PACKAGE HAS UNDERWRITERS LABORATORY FLAMMABILITY CLASSIFICATION 94V-0
- LOW ZENER IMPEDANCE
- EXCELLENT CLAMPING CAPABILITY

#### MECHANICAL DATA

- CASE: MOLDED PLASTIC, DO-201AE, DIMENSIONS IN INCHES AND (MILLIMETERS)
- TERMINALS: AXIAL LEADS SOLDERABLE PER MIL-STD-202, METHOD 208
- POLARITY: COLOR BAND DENOTES CATHODE
- MOUNTING POSITION: ANY
- WEIGHT: 1.2 GRAM



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS RATINGS AT 25°C AMBIENT TEMPERATURE UNLESS OTHERWISE SPECIFIED  
STORAGE AND OPERATING TEMPERATURE RANGE -55 TO + 150°C

| ELECTRICAL CHARACTERISTICS (TA=25°C UNLESS OTHERWISE NOTED VF=1.2V MAX,@IF = 1A FOR ALL TYPES) |                                                                       |                                          |                                           |                                                |                                 |                           |                                                |                                                     |                                                       |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------------------|---------------------------------|---------------------------|------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------|
| JEDEC<br>TYPE NO                                                                               | NOMINAL<br>ZENER<br>VOLTS<br>V <sub>Z</sub> @I <sub>ZT</sub><br>VOLTS | TEST<br>CURRENT<br>I <sub>ZT</sub><br>mA | MAXIMUM ZENER IMPEDANCE                   |                                                | MAX. REVERSE<br>LEAKAGE CURRENT |                           | MAX<br>SURGE<br>CURRENT<br>I <sub>R</sub> AMPS | MAX<br>VOLTAGE<br>REGULATION<br>V <sub>Z</sub> VOLT | MAXIMUM REGULATOR<br>CURRENT<br>I <sub>ZM</sub><br>mA |
|                                                                                                |                                                                       |                                          | Z <sub>ZT</sub> @ I <sub>ZT</sub><br>Ohms | Z <sub>ZK</sub> @ I <sub>ZK</sub> =1mA<br>Ohms | I <sub>R</sub><br>μA            | @ V <sub>R</sub><br>VOLTS |                                                |                                                     |                                                       |
| 1N5333B                                                                                        | 3.3                                                                   | 380                                      | 3                                         | 400                                            | 300                             | 1                         | 20                                             | 0.85                                                | 1440                                                  |
| 1N5334B                                                                                        | 3.6                                                                   | 350                                      | 2.5                                       | 500                                            | 150                             | 1                         | 18.7                                           | 0.8                                                 | 1320                                                  |
| 1N5335B                                                                                        | 3.9                                                                   | 320                                      | 2                                         | 500                                            | 50                              | 1                         | 17.6                                           | 0.54                                                | 1220                                                  |
| 1N5336B                                                                                        | 4.3                                                                   | 290                                      | 2                                         | 500                                            | 10                              | 1                         | 16.4                                           | 0.49                                                | 1100                                                  |
| 1N5337B                                                                                        | 4.7                                                                   | 260                                      | 2                                         | 450                                            | 5                               | 1                         | 15.3                                           | 0.44                                                | 1010                                                  |
| 1N5338B                                                                                        | 5.1                                                                   | 240                                      | 1.5                                       | 400                                            | 1                               | 1                         | 14.4                                           | 0.39                                                | 930                                                   |
| 1N5339B                                                                                        | 5.6                                                                   | 220                                      | 1                                         | 400                                            | 1                               | 2                         | 13.4                                           | 0.25                                                | 865                                                   |
| 1N5340B                                                                                        | 6.0                                                                   | 200                                      | 1                                         | 300                                            | 1                               | 3                         | 12.7                                           | 0.19                                                | 790                                                   |
| 1N5341B                                                                                        | 6.2                                                                   | 200                                      | 1                                         | 200                                            | 1                               | 3                         | 12.4                                           | 0.1                                                 | 765                                                   |
| 1N5342B                                                                                        | 6.8                                                                   | 175                                      | 1                                         | 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                                             | 0.2                                                 | 580                                                   |
| 1N5345B                                                                                        | 8.7                                                                   | 150                                      | 2                                         | 200                                            | 10                              | 6.6                       | 9.5                                            | 0.2                                                 | 545                                                   |
| 1N5346B                                                                                        | 9.1                                                                   | 150                                      | 2                                         | 150                                            | 7.5                             | 6.9                       | 9.2                                            | 0.22                                                | 520                                                   |
| 1N5347B                                                                                        | 10                                                                    | 125                                      | 2                                         | 125                                            | 5                               | 7.6                       | 8.6                                            | 0.22                                                | 475                                                   |
| 1N5348B                                                                                        | 11                                                                    | 125                                      | 2.5                                       | 125                                            | 5                               | 8.4                       | 8                                              | 0.25                                                | 430                                                   |
| 1N5349B                                                                                        | 12                                                                    | 100                                      | 2.5                                       | 125                                            | 2                               | 9.1                       | 7.5                                            | 0.25                                                | 395                                                   |
| 1N5350B                                                                                        | 13                                                                    | 100                                      | 2.5                                       | 100                                            | 1                               | 9.9                       | 7                                              | 0.25                                                | 365                                                   |
| 1N5351B                                                                                        | 14                                                                    | 100                                      | 2.5                                       | 75                                             | 1                               | 10.6                      | 6.7                                            | 0.25                                                | 340                                                   |
| 1N5352B                                                                                        | 15                                                                    | 75                                       | 2.5                                       | 75                                             | 1                               | 11.5                      | 6.3                                            | 0.25                                                | 315                                                   |
| 1N5353B                                                                                        | 16                                                                    | 75                                       | 2.5                                       | 75                                             | 1                               | 12.2                      | 6                                              | 0.3                                                 | 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                                            | 0.4                                                 | 265                                                   |
| 1N5356B                                                                                        | 19                                                                    | 65                                       | 3                                         | 75                                             | 0.5                             | 14.4                      | 5.3                                            | 0.4                                                 | 250                                                   |
| 1N5357B                                                                                        | 20                                                                    | 65                                       | 3                                         | 75                                             | 0.5                             | 15.2                      | 5.1                                            | 0.4                                                 | 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                                         | 110                                            | 0.5                             | 19                        | 4.3                                            | 0.55                                                | 190                                                   |
| 1N5361B                                                                                        | 27                                                                    | 50                                       | 5                                         | 120                                            | 0.5                             | 20.6                      | 4.1                                            | 0.6                                                 | 176                                                   |
| 1N5362B                                                                                        | 28                                                                    | 50                                       | 6                                         | 130                                            | 0.5                             | 21.2                      | 3.9                                            | 0.6                                                 | 170                                                   |
| 1N5363B                                                                                        | 30                                                                    | 40                                       | 8                                         | 140                                            | 0.5                             | 22.8                      | 3.7                                            | 0.6                                                 | 158                                                   |
| 1N5364B                                                                                        | 33                                                                    | 40                                       | 10                                        | 150                                            | 0.5                             | 25.1                      | 3.5                                            | 0.6                                                 | 144                                                   |
| 1N5365B                                                                                        | 36                                                                    | 30                                       | 11                                        | 160                                            | 0.5                             | 27.4                      | 3.3                                            | 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                                            | 0.7                                                 | 110                                                   |
| 1N5368B                                                                                        | 47                                                                    | 25                                       | 25                                        | 210                                            | 0.5                             | 35.8                      | 2.7                                            | 0.8                                                 | 100                                                   |
| 1N5369B                                                                                        | 51                                                                    | 25                                       | 27                                        | 230                                            | 0.5                             | 38.8                      | 2.5                                            | 0.9                                                 | 93                                                    |
| 1N5370B                                                                                        | 56                                                                    | 20                                       | 35                                        | 280                                            | 0.5                             | 42.6                      | 2.3                                            | 1                                                   | 86                                                    |
| 1N5371B                                                                                        | 60                                                                    | 20                                       | 40                                        | 350                                            | 0.5                             | 42.5                      | 2.2                                            | 1.2                                                 | 79                                                    |
| 1N5372B                                                                                        | 62                                                                    | 20                                       | 42                                        | 400                                            | 0.5                             | 47.1                      | 2.1                                            | 1.35                                                | 76                                                    |
| 1N5373B                                                                                        | 68                                                                    | 20                                       | 44                                        | 500                                            | 0.5                             | 51.7                      | 2                                              | 1.5                                                 | 70                                                    |
| 1N5374B                                                                                        | 75                                                                    | 20                                       | 45                                        | 620                                            | 0.5                             | 56                        | 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                        | 1.7                                            | 2                                                   | 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                        | 1.5                                            | 2.5                                                 | 47.5                                                  |

| ELECTRICAL CHARACTERISTICS (TA=25°C UNLESS OTHERWISE NOTED VF=1.2V MAX, @IF = 1A FOR ALL TYPES) |                                                                       |                                          |                                           |                                                  |                                 |                           |                                                |                                                     |                                                          |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------|-------------------------------------------|--------------------------------------------------|---------------------------------|---------------------------|------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------|
| JEDEC<br>TYPE NO                                                                                | NOMINAL<br>ZENER<br>VOLTS<br>V <sub>Z</sub> @I <sub>ZT</sub><br>VOLTS | TEST<br>CURRENT<br>I <sub>ZT</sub><br>mA | MAXIMUM ZENER<br>IMPEDANCE                |                                                  | MAX. REVERSE<br>LEAKAGE CURRENT |                           | MAX<br>SURGE<br>CURRENT<br>I <sub>R</sub> AMPS | MAX<br>VOLTAGE<br>REGULATION<br>V <sub>Z</sub> VOLT | MAXIMUM<br>REGULATOR<br>CURRENT<br>I <sub>ZM</sub><br>mA |
|                                                                                                 |                                                                       |                                          | Z <sub>ZT</sub> @ I <sub>ZT</sub><br>Ohms | Z <sub>ZK</sub><br>@I <sub>ZK</sub> =1mA<br>Ohms | I <sub>R</sub><br>μA            | @ V <sub>R</sub><br>VOLTS |                                                |                                                     |                                                          |
| 1N5379B                                                                                         | 110                                                                   | 12                                       | 125                                       | 1000                                             | 0.5                             | 83.6                      | 1.4                                            | 2.5                                                 | 1440                                                     |
| 1N5380B                                                                                         | 120                                                                   | 10                                       | 170                                       | 1150                                             | 0.5                             | 91.2                      | 1.3                                            | 2.5                                                 | 1320                                                     |
| 1N5381B                                                                                         | 130                                                                   | 10                                       | 190                                       | 1250                                             | 0.5                             | 98.8                      | 1.2                                            | 2.5                                                 | 1220                                                     |
| 1N5382B                                                                                         | 140                                                                   | 8                                        | 230                                       | 1500                                             | 0.5                             | 106                       | 1.2                                            | 2.5                                                 | 1100                                                     |
| 1N5383B                                                                                         | 150                                                                   | 8                                        | 330                                       | 1500                                             | 0.5                             | 114                       | 1.1                                            | 3                                                   | 1010                                                     |
| 1N5384B                                                                                         | 160                                                                   | 8                                        | 350                                       | 1650                                             | 0.5                             | 122                       | 1.1                                            | 3                                                   | 930                                                      |
| 1N5385B                                                                                         | 170                                                                   | 8                                        | 380                                       | 1750                                             | 0.5                             | 129                       | 1.0                                            | 3                                                   | 865                                                      |
| 1N5386B                                                                                         | 180                                                                   | 5                                        | 430                                       | 1750                                             | 0.5                             | 137                       | 1.0                                            | 4                                                   | 790                                                      |
| 1N5387B                                                                                         | 190                                                                   | 5                                        | 450                                       | 1850                                             | 0.5                             | 144                       | 0.9                                            | 5                                                   | 765                                                      |
| 1N5388B                                                                                         | 200                                                                   | 5                                        | 480                                       | 1850                                             | 0.5                             | 152                       | 0.9                                            | 5                                                   | 700                                                      |
|                                                                                                 |                                                                       |                                          |                                           |                                                  |                                 |                           |                                                |                                                     | 630                                                      |

NOTE: SUFFIX "B" FOR ± 5%

# RATING AND CHARACTERISTIC CURVES 1N5333B THRU 1N5388B

## TEMPERATURE COEFFICIENTS

Figure 1. Temperature Coefficient-Range for Units 3 to 10 Volts

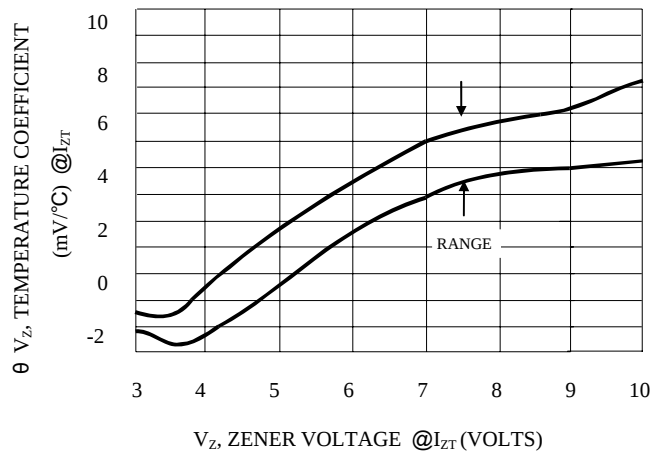


Figure 2. Power Temperature Derating Curve

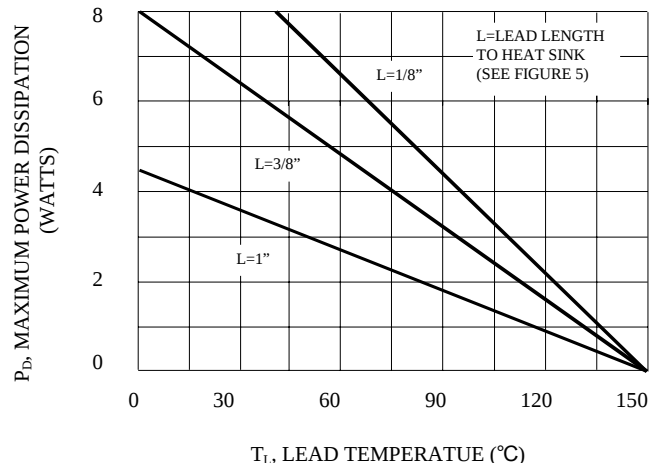


Figure 3. Typical Thermal Response L, Lead Length=3/8 Inch

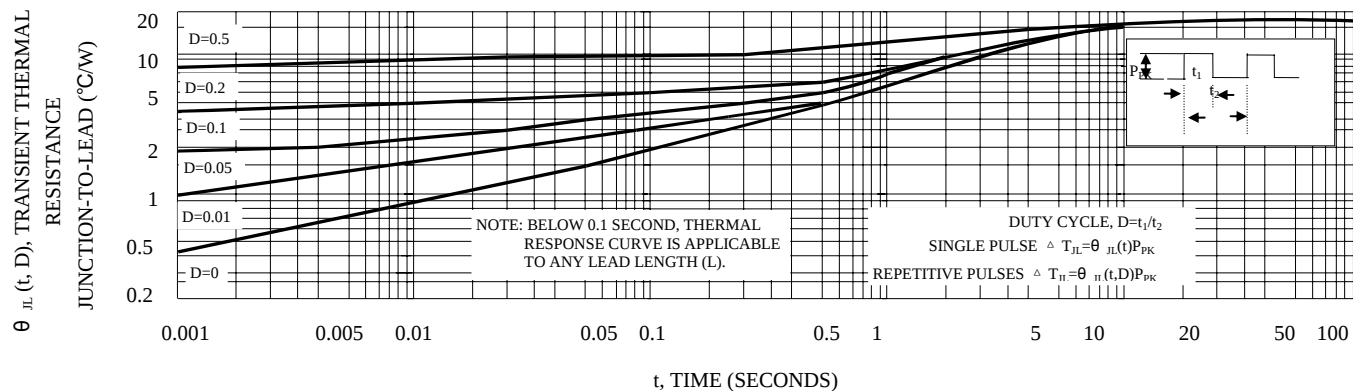


Figure 4. Temperature Coefficient-Range for Units 10 to 220 Volts

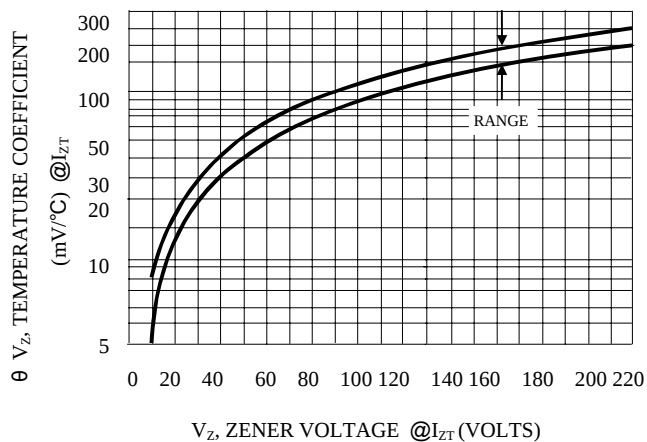
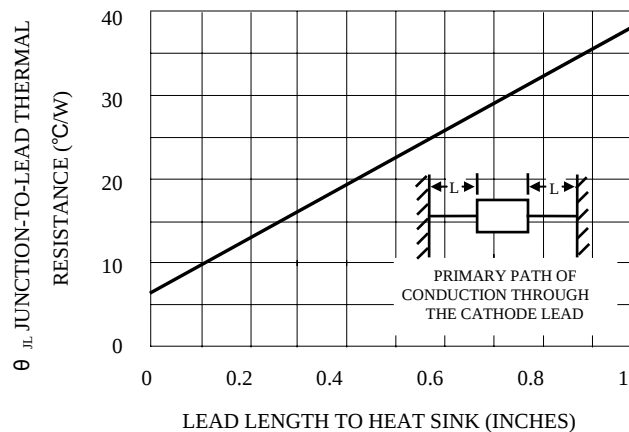


Figure 5. Typical Thermal Resistance



# RATINGD AND CHARACTEISTIC CURVES 1N5333B THRU 1N5388B

Figure 6. Maximum Non-Repetitive Surge Current versus Nominal Zener Voltage

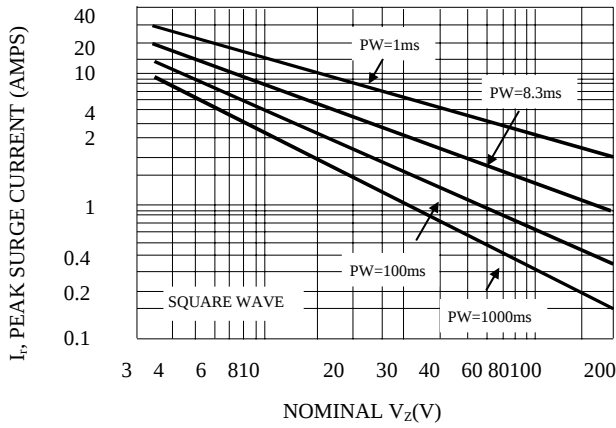


Figure 7. Peak Surge Current versus Pulse Width

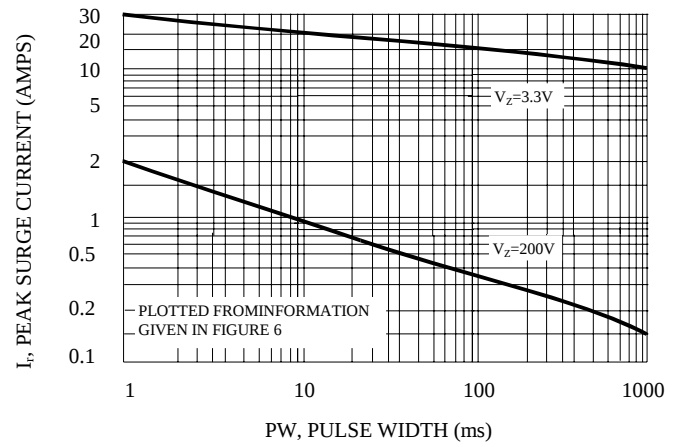


Figure 8. Zener Voltage versus Zener Current  
 $V_z = 3.3$  thru 10 Volts

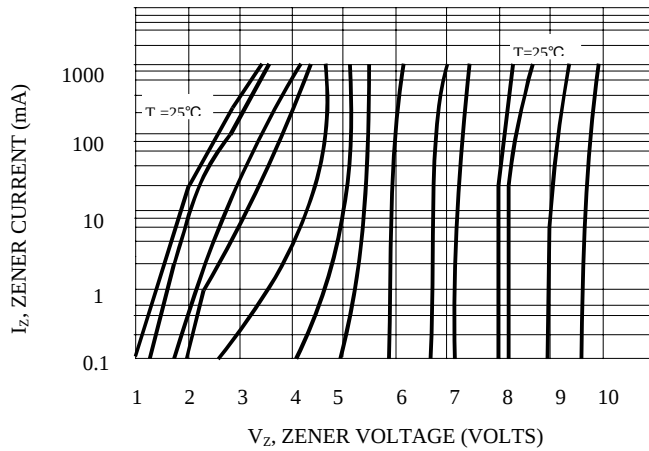


Figure 9. Zener Voltage versus Zener Current  
 $V_z = 11$  thru 75 Volts

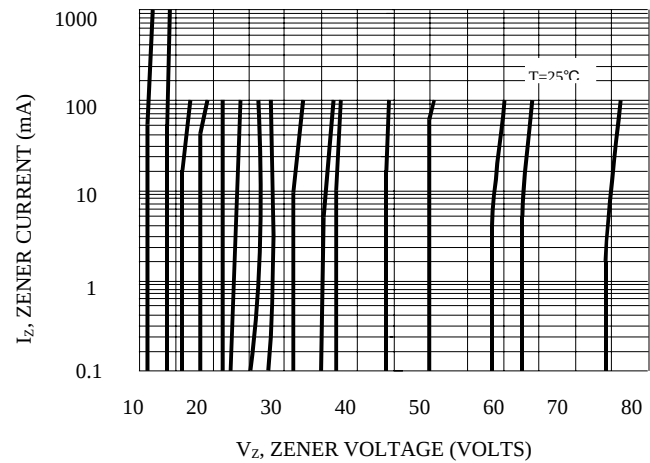


Figure 10. Zener Voltage versus Zener Current  
 $V_z = 82$  thru 200 Volts

