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## NTE5240A thru NTE5296A 50 Watt Zener Diodes ±5% Tolerance

### **Features:**

- Zener Voltage 3.9 to 200V
- Low Zener Impedance
- Highly Reliable and Rugged
- Also Available in Reverse Polarity (NTE5240AK thru NTE5296AK)

### **Maximum Ratings:**

Operating Junction Temperature Range,  $T_{opr}$  ..... -65° to +175°C  
Storage Temperature Range,  $T_{stg}$  ..... -65° to +175°C  
DC Power Dissipation,  $P_D$  ..... 50W  
Derate Above 75°C ..... 0.5W/°C  
Forward Voltage ( $I_F = 10A$ ),  $V_F$  ..... 1.5V

Note 1. Suffix "A" denotes anode to case polarity, "AK" denotes cathode to case.

### **Electrical Characteristics:** ( $T_C = +30^\circ C$ , unless otherwise specified)

| NTE Type Number | Nominal Zener Voltage<br>$V_Z @ I_{zt}$<br>(Note 2) | Zener Test Current<br>( $I_{zt}$ ) | Maximum Dynamic Impedance<br>(Note 3) |                         | Maximum DC Zener Current<br>( $I_{zm}$ ) | Typical Temperature Coefficient<br>$\alpha_{VZ}$ | Maximum Leakage Current<br>$I_R @ V_R$ |       |
|-----------------|-----------------------------------------------------|------------------------------------|---------------------------------------|-------------------------|------------------------------------------|--------------------------------------------------|----------------------------------------|-------|
|                 |                                                     |                                    | $Z_{zt} @ I_{zt}$                     | $Z_{zk} @ 1mA (I_{zk})$ |                                          |                                                  | $I_R @ V_R$                            |       |
|                 | Volts                                               | mA                                 | Ohms                                  | Ohms                    | mA                                       | %/°C                                             | μA                                     | Volts |
| NTE5240A        | 3.9                                                 | 3200                               | 0.16                                  | 400                     | 11900                                    | -0.046                                           | 150                                    | 0.5   |
| NTE5241A        | 4.3                                                 | 2900                               | 0.16                                  | 500                     | 10650                                    | -0.033                                           | 150                                    | 0.5   |
| NTE5242A        | 4.7                                                 | 2650                               | 0.12                                  | 600                     | 9700                                     | -0.015                                           | 100                                    | 1.0   |
| NTE5243A        | 5.1                                                 | 2450                               | 0.12                                  | 650                     | 8900                                     | ±0.010                                           | 20                                     | 1.0   |
| NTE5244A        | 5.6                                                 | 2250                               | 0.12                                  | 900                     | 8100                                     | +0.030                                           | 29                                     | 1.0   |
| NTE5245A        | 6.0                                                 | 2125                               | 0.13                                  | 950                     | 7700                                     | +0.040                                           | 20                                     | 1.5   |
| NTE5246A        | 6.2                                                 | 2000                               | 0.14                                  | 1000                    | 7300                                     | +0.049                                           | 20                                     | 2.0   |
| NTE5247A        | 6.8                                                 | 1850                               | 0.20                                  | 70                      | 6600                                     | 0.040                                            | 300                                    | 4.5   |
| NTE5248A        | 7.5                                                 | 1700                               | 0.30                                  | 70                      | 5900                                     | 0.045                                            | 125                                    | 5.0   |
| NTE5249A        | 8.2                                                 | 1500                               | 0.40                                  | 70                      | 5200                                     | 0.048                                            | 50                                     | 5.4   |

**Electrical Characteristics (Cont'd):** ( $T_C = +30^{\circ}\text{C}$ , unless otherwise specified)

| NTE Type Number | Nominal Zener Voltage<br>$V_Z @ I_{ZT}$<br>(Note 2) | Zener Test Current<br>( $I_{ZT}$ ) | Maximum Dynamic Impedance<br>(Note 3) |                                 | Maximum DC Zener Current<br>( $I_{ZM}$ ) | Typical Temperature Coefficient<br>$\alpha_{VZ}$ | Maximum Leakage Current<br>$I_R @ V_R$ |       |
|-----------------|-----------------------------------------------------|------------------------------------|---------------------------------------|---------------------------------|------------------------------------------|--------------------------------------------------|----------------------------------------|-------|
|                 |                                                     |                                    | $Z_{ZT} @ I_{ZT}$                     | $Z_{ZK} @ 1\text{mA } (I_{ZK})$ |                                          |                                                  | $\mu\text{A}$                          | Volts |
|                 |                                                     |                                    | Ohms                                  | Ohms                            |                                          |                                                  |                                        |       |
| NTE5250A        | 8.7                                                 | 1435                               | 0.45                                  | 70                              | 5000                                     | 0.049                                            | 37                                     | 5.7   |
| NTE5251A        | 9.1                                                 | 1370                               | 0.50                                  | 70                              | 4800                                     | 0.050                                            | 25                                     | 6.1   |
| NTE5252A        | 10.0                                                | 1200                               | 0.60                                  | 80                              | 4300                                     | 0.055                                            | 25                                     | 6.7   |
| NTE5253A        | 11.0                                                | 1100                               | 0.80                                  | 80                              | 3900                                     | 0.060                                            | 10                                     | 8.4   |
| NTE5254A        | 12.0                                                | 1000                               | 1.00                                  | 80                              | 3800                                     | 0.065                                            | 10                                     | 9.1   |
| NTE5255A        | 13.0                                                | 960                                | 1.10                                  | 80                              | 3300                                     | 0.065                                            | 10                                     | 9.9   |
| NTE5256A        | 14.0                                                | 890                                | 1.20                                  | 80                              | 3000                                     | 0.070                                            | 10                                     | 11.4  |
| NTE5257A        | 15.0                                                | 835                                | 1.40                                  | 80                              | 2825                                     | 0.070                                            | 10                                     | 11.8  |
| NTE5258A        | 16.0                                                | 780                                | 1.60                                  | 80                              | 2650                                     | 0.070                                            | 10                                     | 12.2  |
| NTE5259A        | 17.0                                                | 740                                | 1.80                                  | 80                              | 2500                                     | 0.075                                            | 10                                     | 13.0  |
| NTE5260A        | 18.0                                                | 700                                | 2.00                                  | 80                              | 2300                                     | 0.075                                            | 10                                     | 13.7  |
| NTE5261A        | 19.0                                                | 660                                | 2.20                                  | 80                              | 2200                                     | 0.075                                            | 10                                     | 13.7  |
| NTE5262A        | 20.0                                                | 630                                | 2.40                                  | 80                              | 2100                                     | 0.075                                            | 10                                     | 15.2  |
| NTE5263A        | 22.0                                                | 570                                | 2.50                                  | 80                              | 1900                                     | 0.080                                            | 10                                     | 16.7  |
| NTE5264A        | 24.0                                                | 520                                | 2.60                                  | 80                              | 1750                                     | 0.080                                            | 10                                     | 18.2  |
| NTE5265A        | 25.0                                                | 500                                | 2.70                                  | 90                              | 1550                                     | 0.080                                            | 10                                     | 18.2  |
| NTE5266A        | 27.0                                                | 460                                | 2.80                                  | 90                              | 1500                                     | 0.085                                            | 10                                     | 20.6  |
| NTE5267A        | 28.0                                                | 440                                | 2.90                                  | 90                              | 1450                                     | 0.085                                            | 10                                     | 21.7  |
| NTE5268A        | 30.0                                                | 420                                | 3.00                                  | 90                              | 1400                                     | 0.085                                            | 10                                     | 22.8  |
| NTE5269A        | 33.0                                                | 380                                | 3.20                                  | 90                              | 1300                                     | 0.085                                            | 10                                     | 25.1  |
| NTE5270A        | 36.0                                                | 350                                | 3.50                                  | 90                              | 1150                                     | 0.085                                            | 10                                     | 27.4  |
| NTE5271A        | 39.0                                                | 320                                | 4.00                                  | 90                              | 1050                                     | 0.090                                            | 10                                     | 29.7  |
| NTE5272A        | 43.0                                                | 290                                | 4.50                                  | 90                              | 975                                      | 0.090                                            | 10                                     | 32.7  |
| NTE5273A        | 45.0                                                | 280                                | 4.50                                  | 100                             | 930                                      | 0.090                                            | 10                                     | 32.7  |
| NTE5274A        | 47.0                                                | 270                                | 5.00                                  | 100                             | 880                                      | 0.090                                            | 10                                     | 35.8  |
| NTE5275A        | 50.0                                                | 250                                | 5.00                                  | 100                             | 830                                      | 0.090                                            | 10                                     | 38.8  |
| NTE5276A        | 51.0                                                | 245                                | 5.20                                  | 100                             | 810                                      | 0.090                                            | 10                                     | 38.8  |
| NTE5277A        | 52.0                                                | 240                                | 5.50                                  | 100                             | 790                                      | 0.090                                            | 10                                     | 42.6  |
| NTE5278A        | 56.0                                                | 220                                | 6.00                                  | 110                             | 740                                      | 0.090                                            | 10                                     | 42.6  |
| NTE5279A        | 60.0                                                | 210                                | 6.50                                  | 115                             | 700                                      | 0.090                                            | 10                                     | 44.8  |
| NTE5280A        | 62.0                                                | 200                                | 7.00                                  | 120                             | 660                                      | 0.090                                            | 10                                     | 47.1  |
| NTE5281A        | 68.0                                                | 180                                | 8.00                                  | 140                             | 600                                      | 0.090                                            | 10                                     | 51.7  |

**Electrical Characteristics (Cont'd):** ( $T_C = +30^\circ\text{C}$ , unless otherwise specified)

| NTE Type Number | Nominal Zener Voltage<br>$V_Z @ I_{ZT}$<br>(Note 2) | Zener Test Current<br>( $I_{ZT}$ ) | Maximum Dynamic Impedance<br>(Note 3) |                                 | Maximum DC Zener Current<br>( $I_{ZM}$ ) | Typical Temperature Coefficient<br>$\alpha_{VZ}$ | Maximum Leakage Current<br>$I_R @ V_R$ |       |
|-----------------|-----------------------------------------------------|------------------------------------|---------------------------------------|---------------------------------|------------------------------------------|--------------------------------------------------|----------------------------------------|-------|
|                 |                                                     |                                    | $Z_{ZT} @ I_{ZT}$                     | $Z_{ZK} @ 1\text{mA } (I_{ZK})$ |                                          |                                                  |                                        |       |
|                 |                                                     |                                    | Ohms                                  | Ohms                            |                                          |                                                  | $\mu\text{A}$                          | Volts |
| NTE5282A        | 75.0                                                | 170                                | 9.00                                  | 150                             | 540                                      | 0.090                                            | 10                                     | 56.0  |
| NTE5283A        | 82.0                                                | 150                                | 11.00                                 | 160                             | 490                                      | 0.090                                            | 10                                     | 62.2  |
| NTE5284A        | 91.0                                                | 140                                | 15.00                                 | 180                             | 420                                      | 0.090                                            | 10                                     | 69.2  |
| NTE5285A        | 100.0                                               | 120                                | 20.00                                 | 200                             | 400                                      | 0.090                                            | 10                                     | 76.0  |
| NTE5286A        | 105.0                                               | 120                                | 25.00                                 | 210                             | 380                                      | 0.095                                            | 10                                     | 83.0  |
| NTE5287A        | 110.0                                               | 110                                | 30.00                                 | 220                             | 365                                      | 0.095                                            | 10                                     | 83.0  |
| NTE5288A        | 120.0                                               | 100                                | 40.00                                 | 240                             | 335                                      | 0.095                                            | 10                                     | 91.2  |
| NTE5289A        | 130.0                                               | 95                                 | 50.00                                 | 275                             | 310                                      | 0.095                                            | 10                                     | 99.8  |
| NTE5290A        | 140.0                                               | 90                                 | 60.00                                 | 325                             | 290                                      | 0.095                                            | 10                                     | 114.0 |
| NTE5291A        | 150.0                                               | 85                                 | 75.00                                 | 400                             | 270                                      | 0.095                                            | 10                                     | 114.0 |
| NTE5292A        | 160.0                                               | 80                                 | 80.00                                 | 450                             | 250                                      | 0.095                                            | 10                                     | 121.6 |
| NTE5293A        | 175.0                                               | 70                                 | 85.00                                 | 500                             | 230                                      | 0.095                                            | 10                                     | 121.6 |
| NTE5294A        | 180.0                                               | 68                                 | 90.00                                 | 525                             | 220                                      | 0.095                                            | 10                                     | 136.8 |
| NTE5295A        | 190.0                                               | 66                                 | 95.00                                 | 561                             | 210                                      | 0.098                                            | 10                                     | 144.4 |
| NTE5296A        | 200.0                                               | 65                                 | 100.00                                | 600                             | 200                                      | 0.100                                            | 10                                     | 152.0 |

Note 2. Zener Voltage ( $V_Z$ ) is measured with junction in thermal equilibrium with  $30^\circ\text{C}$  stud temperature.

Note 3. The zener impedance is derived from the 60 cycle A.C. 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  $I_{ZK}$ . Zener impedance is measured at 2 points to insure a sharp knee on the breakdown curve and to eliminate unstable units.

