

## NTE5000A thru NTE5060A Zener Diode, $\frac{1}{2}$ Watt $\pm 5\%$ Tolerance

### Features:

- Zener Voltage 2.4 to 200V
- DO35 Package

### Maximum Ratings:

Operating Junction Temperature Range,  $T_{opr}$  .....  $-65^{\circ}$  to  $+200^{\circ}\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-65^{\circ}$  to  $+200^{\circ}\text{C}$   
 DC Power Dissipation,  $P_D$  ..... 500mW  
     Derate Above  $75^{\circ}\text{C}$  ..... 4.0mW/ $^{\circ}\text{C}$   
 Forward Voltage ( $I_F = 200\text{mA}$ ),  $V_F$  ..... 1.1V

### Electrical Characteristics: ( $T_C = +25^{\circ}\text{C}$ , unless otherwise specified)

| NTE Type Number | Nominal Zener Voltage<br>$V_Z @ I_{zt}$<br>(Note 1) | Zener Test Current<br>( $I_{zt}$ ) | Maximum Dynamic Impedance |                                   | Typical Temperature Coefficient<br>(Note 2)<br>$\alpha_{VZ}$ | Maximum Leakage Current<br>$I_R @ V_R$ |       |
|-----------------|-----------------------------------------------------|------------------------------------|---------------------------|-----------------------------------|--------------------------------------------------------------|----------------------------------------|-------|
|                 |                                                     |                                    | $Z_{zt} @ I_{zt}$         | $Z_{zk} @ 0.25\text{mA} (I_{zk})$ |                                                              |                                        |       |
|                 | Volts                                               | mA                                 | Ohms                      | Ohms                              | %/ $^{\circ}\text{C}$                                        | $\mu\text{A}$                          | Volts |
| NTE5000A        | 2.4                                                 | 20                                 | 30                        | 1200                              | -0.085                                                       | 100                                    | 1.0   |
| NTE5001A        | 2.5                                                 | 20                                 | 30                        | 1250                              | -0.085                                                       | 100                                    | 1.0   |
| NTE5002A        | 2.7                                                 | 20                                 | 30                        | 1300                              | -0.080                                                       | 75                                     | 1.0   |
| NTE5003A        | 2.8                                                 | 20                                 | 30                        | 1400                              | -0.080                                                       | 75                                     | 1.0   |
| NTE5004A        | 3.0                                                 | 20                                 | 29                        | 1600                              | -0.075                                                       | 50                                     | 1.0   |
| NTE5005A        | 3.3                                                 | 20                                 | 28                        | 1600                              | -0.070                                                       | 25                                     | 1.0   |
| NTE5006A        | 3.6                                                 | 20                                 | 24                        | 1700                              | -0.065                                                       | 15                                     | 1.0   |
| NTE5007A        | 3.9                                                 | 20                                 | 23                        | 1900                              | -0.060                                                       | 10                                     | 1.0   |
| NTE5008A        | 4.3                                                 | 20                                 | 22                        | 2000                              | $\pm 0.055$                                                  | 5                                      | 1.0   |
| NTE5009A        | 4.7                                                 | 20                                 | 19                        | 1900                              | $\pm 0.030$                                                  | 5                                      | 2.0   |
| NTE5010A        | 5.1                                                 | 20                                 | 17                        | 1600                              | $\pm 0.030$                                                  | 5                                      | 2.0   |
| NTE5011A        | 5.6                                                 | 20                                 | 11                        | 1600                              | +0.038                                                       | 5                                      | 3.0   |

**Electrical Characteristics (Cont'd):** ( $T_C = +25^{\circ}\text{C}$ , unless otherwise specified)

| NTE Type Number | Nominal Zener Voltage<br>$V_Z @ I_{ZT}$<br>(Note 1) | Zener Test Current<br>( $I_{ZT}$ ) | Maximum Dynamic Impedance |                                    | Typical Temperature Coefficient<br>(Note 2)<br>$\alpha_{VZ}$ | Maximum Leakage Current<br>$I_R @ V_R$ |       |
|-----------------|-----------------------------------------------------|------------------------------------|---------------------------|------------------------------------|--------------------------------------------------------------|----------------------------------------|-------|
|                 |                                                     |                                    | $Z_{ZT} @ I_{ZT}$         | $Z_{ZK} @ 0.25\text{mA } (I_{ZK})$ |                                                              | $I_R$                                  | $V_R$ |
|                 | Volts                                               | mA                                 | Ohms                      | Ohms                               | %/ $^{\circ}\text{C}$                                        | $\mu\text{A}$                          | Volts |
| NTE5012A        | 6.0                                                 | 20                                 | 7                         | 1600                               | +0.038                                                       | 5                                      | 3.5   |
| NTE5013A        | 6.2                                                 | 20                                 | 7                         | 1000                               | 0.045                                                        | 5                                      | 4.0   |
| NTE5014A        | 6.8                                                 | 20                                 | 5                         | 750                                | 0.050                                                        | 3                                      | 5.0   |
| NTE5015A        | 7.5                                                 | 20                                 | 6                         | 500                                | 0.058                                                        | 3                                      | 6.0   |
| NTE5016A        | 8.2                                                 | 20                                 | 8                         | 500                                | 0.062                                                        | 3                                      | 6.5   |
| NTE5017A        | 8.7                                                 | 20                                 | 8                         | 600                                | 0.065                                                        | 3                                      | 6.5   |
| NTE5018A        | 9.1                                                 | 20                                 | 10                        | 600                                | 0.068                                                        | 3                                      | 7.0   |
| NTE5019A        | 10                                                  | 20                                 | 17                        | 600                                | 0.075                                                        | 3                                      | 8.0   |
| NTE5020A        | 11                                                  | 20                                 | 22                        | 600                                | 0.076                                                        | 2                                      | 8.4   |
| NTE5021A        | 12                                                  | 20                                 | 30                        | 600                                | 0.077                                                        | 1                                      | 9.1   |
| NTE5022A        | 13                                                  | 9.5                                | 13                        | 600                                | 0.079                                                        | 0.5                                    | 9.9   |
| NTE5023A        | 14                                                  | 9.0                                | 15                        | 600                                | 0.082                                                        | 0.1                                    | 10    |
| NTE5024A        | 15                                                  | 8.5                                | 16                        | 600                                | 0.082                                                        | 0.1                                    | 11    |
| NTE5025A        | 16                                                  | 7.8                                | 17                        | 600                                | 0.083                                                        | 0.1                                    | 12    |
| NTE5026A        | 17                                                  | 7.4                                | 19                        | 600                                | 0.084                                                        | 0.1                                    | 13    |
| NTE5027A        | 18                                                  | 7.0                                | 21                        | 600                                | 0.085                                                        | 0.1                                    | 14    |
| NTE5028A        | 19                                                  | 6.6                                | 23                        | 600                                | 0.086                                                        | 0.1                                    | 14    |
| NTE5029A        | 20                                                  | 6.2                                | 25                        | 600                                | 0.086                                                        | 0.1                                    | 15    |
| NTE5030A        | 22                                                  | 5.6                                | 29                        | 600                                | 0.087                                                        | 0.1                                    | 17    |
| NTE5031A        | 24                                                  | 5.2                                | 33                        | 600                                | 0.088                                                        | 0.1                                    | 18    |
| NTE5032A        | 25                                                  | 5.0                                | 35                        | 600                                | 0.089                                                        | 0.1                                    | 19    |
| NTE5033A        | 27                                                  | 4.6                                | 41                        | 600                                | 0.090                                                        | 0.1                                    | 21    |
| NTE5034A        | 28                                                  | 4.5                                | 44                        | 600                                | 0.091                                                        | 0.1                                    | 21    |
| NTE5035A        | 30                                                  | 4.2                                | 49                        | 600                                | 0.091                                                        | 0.1                                    | 23    |
| NTE5036A        | 33                                                  | 3.8                                | 58                        | 700                                | 0.092                                                        | 0.1                                    | 25    |
| NTE5037A        | 36                                                  | 3.4                                | 70                        | 700                                | 0.093                                                        | 0.1                                    | 27    |
| NTE5038A        | 39                                                  | 3.2                                | 80                        | 800                                | 0.094                                                        | 0.1                                    | 30    |
| NTE5039A        | 43                                                  | 3.0                                | 93                        | 900                                | 0.095                                                        | 0.1                                    | 33    |
| NTE5040A        | 47                                                  | 2.7                                | 105                       | 1000                               | 0.095                                                        | 0.1                                    | 36    |

**Electrical Characteristics (Cont'd):** ( $T_C = +25^\circ\text{C}$ , unless otherwise specified)

| NTE Type Number | Nominal Zener Voltage<br>$V_Z @ I_{ZT}$<br>(Note 1) | Zener Test Current<br>( $I_{ZT}$ ) | Maximum Dynamic Impedance |                                    | Typical Temperature Coefficient<br>(Note 2)<br>$\alpha_{VZ}$ | Maximum Leakage Current<br>$I_R @ V_R$ |       |
|-----------------|-----------------------------------------------------|------------------------------------|---------------------------|------------------------------------|--------------------------------------------------------------|----------------------------------------|-------|
|                 |                                                     |                                    | $Z_{ZT} @ I_{ZT}$         | $Z_{ZK} @ 0.25\text{mA } (I_{ZK})$ |                                                              | $\mu\text{A}$                          | Volts |
|                 | Volts                                               | mA                                 | Ohms                      | Ohms                               | $\%/^\circ\text{C}$                                          |                                        |       |
| NTE5041A        | 51                                                  | 2.5                                | 125                       | 1100                               | 0.096                                                        | 0.1                                    | 39    |
| NTE5042A        | 56                                                  | 2.2                                | 150                       | 1300                               | 0.096                                                        | 0.1                                    | 43    |
| NTE5043A        | 60                                                  | 2.1                                | 170                       | 1400                               | 0.097                                                        | 0.1                                    | 46    |
| NTE5044A        | 62                                                  | 2.0                                | 185                       | 1400                               | 0.097                                                        | 0.1                                    | 47    |
| NTE5045A        | 68                                                  | 1.8                                | 230                       | 1600                               | 0.097                                                        | 0.1                                    | 52    |
| NTE5046A        | 75                                                  | 1.7                                | 270                       | 1700                               | 0.098                                                        | 0.1                                    | 56    |
| NTE5047A        | 82                                                  | 1.5                                | 330                       | 2000                               | 0.098                                                        | 0.1                                    | 62    |
| NTE5048A        | 87                                                  | 1.4                                | 370                       | 2200                               | 0.099                                                        | 0.1                                    | 68    |
| NTE5049A        | 91                                                  | 1.4                                | 400                       | 2300                               | 0.099                                                        | 0.1                                    | 69    |
| NTE5050A        | 100                                                 | 1.3                                | 500                       | 2600                               | 0.110                                                        | 0.1                                    | 76    |
| NTE5051A        | 110                                                 | 1.1                                | 750                       | 3000                               | 0.110                                                        | 0.1                                    | 84    |
| NTE5052A        | 120                                                 | 1.0                                | 900                       | 4000                               | 0.110                                                        | 0.1                                    | 91    |
| NTE5053A        | 130                                                 | 0.95                               | 1100                      | 4500                               | 0.110                                                        | 0.1                                    | 00    |
| NTE5054A        | 140                                                 | 0.90                               | 1300                      | 4500                               | 0.110                                                        | 0.1                                    | 106   |
| NTE5055A        | 150                                                 | 0.85                               | 1500                      | 5000                               | 0.110                                                        | 0.1                                    | 114   |
| NTE5056A        | 160                                                 | 0.80                               | 1700                      | 5500                               | 0.110                                                        | 0.1                                    | 122   |
| NTE5057A        | 170                                                 | 0.74                               | 1900                      | 5500                               | 0.110                                                        | 0.1                                    | 129   |
| NTE5058A        | 180                                                 | 0.68                               | 2200                      | 6000                               | 0.110                                                        | 0.1                                    | 137   |
| NTE5059A        | 190                                                 | 0.66                               | 2400                      | 6500                               | 0.110                                                        | 0.1                                    | 144   |
| NTE5060A        | 200                                                 | 0.65                               | 2500                      | 7000                               | 0.110                                                        | 0.1                                    | 152   |

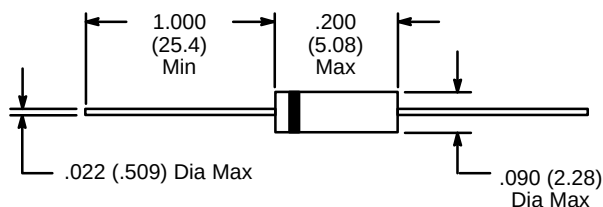
Note 1. The electrical characteristics are measured after allowing the device to stabilize for 90 seconds with  $+30^\circ\text{C}$  lead temperature.

Note 2. Test conditions for temperature coefficient are as follows:

a.  $I_{ZT} = 7.5\text{mA}$ ,  $T_1 = +25^\circ\text{C}$ ,  $T_2 = +125^\circ\text{C}$  (NTE5000A thru NTE5021A)

b.  $I_{ZT} = \text{Rated } I_{ZT}$ ,  $T_1 = +25^\circ\text{C}$ ,  $T_2 = +125^\circ\text{C}$  (NTE5022A thru NTE5060A)

Device to be temperature stabilized with current applied prior to reading breakdown voltage at the specified ambient temperature.



Color Band Denotes Cathode