



**ELECTRONICS, INC.**  
 44 FARRAND STREET  
 BLOOMFIELD, NJ 07003  
 (973) 748-5089  
<http://www.nteinc.com>

**NTE5000A thru NTE5060A**  
**Zener Diode, 1/2 Watt**  
**±5% Tolerance**  
**DO35 Type Package**

**Features:**

- Zener Voltage 2.4 to 200V

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

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  $75^\circ\text{C}$  .....  $4.0\text{mW}/^\circ\text{C}$   
 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>$I_R @ V_R$ |       |
|-----------------|---|------------------------------------|---------------------------|-----------------------------------|--|--|-------|
|                 |   |                                    | $Z_{zt} @ I_{zt}$         | $Z_{zk} @ 0.25\text{mA} (I_{zk})$ |  | $\mu\text{A}$                          | Volts |
|                 | Volts   | mA                                 | Ohms                      | Ohms                              | $\%/^\circ\text{C}$  |  |       |
| 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 $V_Z @ I_{ZT}$ (Note 1) | Zener Test Current ( $I_{ZT}$ ) | Maximum Dynamic Impedance |                                   | Typical Temperature Coefficient (Note 2) $\alpha_{VZ}$ | Maximum Leakage Current $I_R @ V_R$ |       |
|-----------------|---|---------------------------------|---------------------------|-----------------------------------|--|-------------------------------------|-------|
|                 |   |                                 | $Z_{ZT} @ I_{ZT}$         | $Z_{ZK} @ 0.25\text{mA} (I_{ZK})$ |  | $\mu\text{A}$                       | Volts |
|                 | Volts   | mA                              | Ohms                      | Ohms                              | %/ $^\circ\text{C}$                                    |                                     |       |
| 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 $V_Z @ I_{ZT}$ (Note 1) | Zener Test Current ( $I_{ZT}$ ) | Maximum Dynamic Impedance |                                   | Typical Temperature Coefficient (Note 2) $\alpha_{VZ}$ | Maximum Leakage Current $I_R @ V_R$ |       |
|-----------------|---|---------------------------------|---------------------------|-----------------------------------|--|-------------------------------------|-------|
|                 |   |                                 | $Z_{ZT} @ I_{ZT}$         | $Z_{ZK} @ 0.25\text{mA} (I_{ZK})$ |  | $\mu\text{A}$                       | 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   |

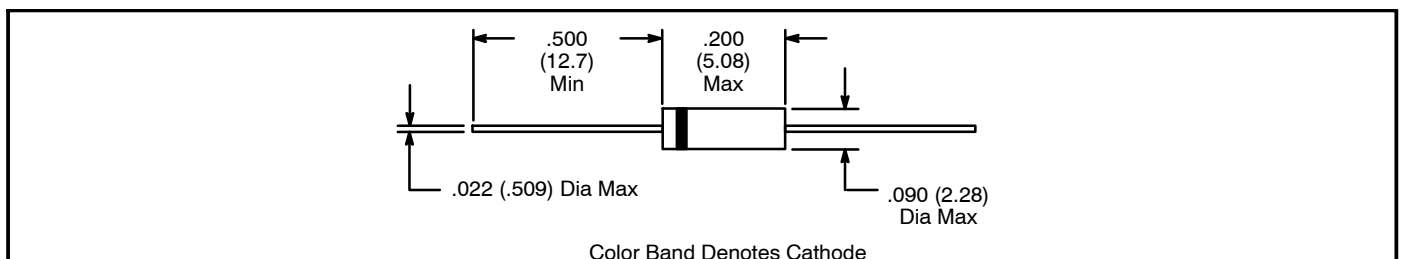
Note 1. The electrical characteristics are measured after allowing the device to stabilize for 90 seconds with  $+30^\circ\text{C}$  lead temperature.

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.



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