



## NTE4902 thru NTE4998 Zener Transient Overvoltage Suppressor Unidirectional

### **Description:**

The NTE4900 series of silicon Transient Suppressors designed to protect voltage sensitive components from high energy voltage transients. Transient over voltage suppressor devices have become very important as a consequence of their high surge capability, extremely fast response time, and low incremental surge resistance (Rs).

### **Application:**

The NTE4900 series has a peak pulse power rating of 1500 watts for one millisecond can protect integrated circuits, hybrids, CMOS, MOS, and other voltage sensitive components in a broad range of applications such as telecommunications, power supplies, computers, automotive, industrial, and medical equipment.

### **Absolute Maximum Ratings:**

Peak Pulse Power Dissipation ( $T_A = +25^\circ\text{C}$ ) ..... 1500W  
 $t_{\text{clamping}}$  (0 volts to BV Min) .....  $< 1 \times 10^{-12}$  sec  
 Operating and Storage Temperature .....  $-65^\circ\text{C}$  to  $+175^\circ\text{C}$   
 Forward Surge Rating 200 Amps, ..... 1/20 Second at  $+25^\circ\text{C}$   
 Steady State Power Dissipation ..... 5.0 W @  $T_1 = +25^\circ\text{C}$

### **Electrical Characteristics:**

Clamping Factor: 1.33 @ full rated power  
 1.20 @ 50% rated power

The clamping factor is defined as: The ratio of the actual  $V_C$  (Clamping voltage) to the actual BV (Breakdown Voltage) as measured on a specific device.

| NTE Type Number | Diagram Number | Maximum Reverse Stand Off Voltage (Volts) | Breakdown Voltage @ $I_T$ (Volts) |       |       |          | Maximum Ratings                             |                                                   |                           | Temperature Coefficient of BV%/°C |
|-----------------|----------------|-------------------------------------------|-----------------------------------|-------|-------|----------|---------------------------------------------|---------------------------------------------------|---------------------------|-----------------------------------|
|                 |                |                                           |                                   |       |       |          | Clamping Voltage @ $I_{pp}$ (1msec) (Volts) | Reverse Leakage Current @ $V_R$ ( $\mu\text{A}$ ) | Peak Pulse Current (Amps) |                                   |
|                 |                |                                           | $V_{BR}$                          |       |       |          | $V_C$                                       | $I_R$                                             | $I_{pp}$                  |                                   |
|                 |                |                                           | Min                               | Typ   | Max   | $I_T$ mA |                                             |                                                   |                           |                                   |
| 4902            | 183            | 5.80                                      | 6.45                              | 6.80  | 7.14  | 10.0     | 10.5                                        | 1000.0                                            | 143.00                    | 0.057                             |
| 4904            | 183            | 6.40                                      | 7.13                              | 7.50  | 7.88  | 10.0     | 11.3                                        | 500.0                                             | 132.00                    | 0.061                             |
| 4906            | 183            | 7.02                                      | 7.79                              | 8.20  | 8.61  | 10.0     | 12.1                                        | 200.0                                             | 124.00                    | 0.065                             |
| 4910            | 183            | 8.55                                      | 9.50                              | 10.00 | 10.50 | 1.0      | 14.5                                        | 10.0                                              | 103.00                    | 0.073                             |
| 4914            | 183            | 10.20                                     | 11.40                             | 12.00 | 12.60 | 1.0      | 16.7                                        | 5.0                                               | 90.00                     | 0.078                             |
| 4918            | 183            | 11.10                                     | 12.40                             | 13.00 | 13.70 | 1.0      | 18.2                                        | 5.0                                               | 82.00                     | 0.081                             |

### Electrical Characteristics (Cont'd):

Clamping Factor: 1.33 @ full rated power  
1.20 @ 50% rated power

The clamping factor is defined as: The ratio of the actual  $V_C$  (Clamping voltage) to the actual BV (Breakdown Voltage) as measured on a specific device.

| NTE Type Number | Diagram Number | Maximum Reverse Stand Off Voltage (Volts) | Breakdown Voltage @ I <sub>T</sub> (Volts) |              |              |                          | Maximum Ratings                                    |                                               |                           | Temperature Coefficient of BV%/°C |
|-----------------|----------------|-------------------------------------------|--------------------------------------------|--------------|--------------|--------------------------|----------------------------------------------------|-----------------------------------------------|---------------------------|-----------------------------------|
|                 |                |                                           |                                            |              |              |                          | Clamping Voltage @ I <sub>pp</sub> (1msec) (Volts) | Reverse Leakage Current @ V <sub>R</sub> (μA) | Peak Pulse Current (Amps) |                                   |
|                 |                | V <sub>R</sub>                            | V <sub>BR</sub>                            |              |              |                          | V <sub>C</sub>                                     | I <sub>R</sub>                                | I <sub>pp</sub>           |                                   |
| 4920            | 183            | 12.80                                     | Min<br>14.30                               | Typ<br>15.00 | Max<br>15.80 | I <sub>T</sub> mA<br>1.0 | 21.2                                               | 5.0                                           | 71.00                     | 0.084                             |
| 4922            | 183            | 13.60                                     | 15.20                                      | 16.00        | 16.80        | 1.0                      | 22.5                                               | 5.0                                           | 67.00                     | 0.086                             |
| 4926            | 183            | 15.30                                     | 17.10                                      | 18.00        | 18.90        | 1.0                      | 25.2                                               | 5.0                                           | 59.50                     | 0.088                             |
| 4928            | 183            | 17.10                                     | 19.00                                      | 20.00        | 21.00        | 1.0                      | 27.7                                               | 5.0                                           | 54.00                     | 0.090                             |
| 4932            | 183            | 20.50                                     | 22.80                                      | 24.00        | 25.20        | 1.0                      | 33.2                                               | 5.0                                           | 45.00                     | 0.094                             |
| 4934            | 183            | 23.10                                     | 25.70                                      | 27.05        | 28.40        | 1.0                      | 37.5                                               | 5.0                                           | 40.00                     | 0.096                             |
| 4936            | 183            | 25.60                                     | 28.50                                      | 30.00        | 31.50        | 1.0                      | 41.4                                               | 5.0                                           | 36.00                     | 0.097                             |
| 4938            | 183            | 28.20                                     | 31.40                                      | 33.00        | 34.70        | 1.0                      | 45.7                                               | 5.0                                           | 33.00                     | 0.098                             |
| 4940            | 183            | 30.80                                     | 34.20                                      | 36.00        | 37.80        | 1.0                      | 49.9                                               | 5.0                                           | 30.00                     | 0.099                             |
| 4942            | 183            | 33.30                                     | 37.10                                      | 39.00        | 41.00        | 1.0                      | 53.9                                               | 5.0                                           | 28.00                     | 0.100                             |
| 4944            | 183            | 36.80                                     | 40.90                                      | 43.00        | 45.20        | 1.0                      | 59.3                                               | 5.0                                           | 25.30                     | 0.101                             |
| 4946            | 183            | 40.20                                     | 44.70                                      | 47.00        | 49.40        | 1.0                      | 64.8                                               | 5.0                                           | 23.20                     | 0.101                             |
| 4950            | 183            | 43.60                                     | 48.50                                      | 51.05        | 53.60        | 1.0                      | 70.1                                               | 5.0                                           | 21.40                     | 0.102                             |
| 4952            | 183            | 47.80                                     | 53.20                                      | 56.00        | 58.80        | 1.0                      | 77.0                                               | 5.0                                           | 19.50                     | 0.103                             |
| 4954            | 183            | 53.00                                     | 58.90                                      | 62.00        | 65.10        | 1.0                      | 85.0                                               | 5.0                                           | 17.70                     | 0.104                             |
| 4958            | 183            | 58.10                                     | 64.60                                      | 68.00        | 71.40        | 1.0                      | 92.0                                               | 5.0                                           | 16.30                     | 0.104                             |
| 4960            | 183            | 64.10                                     | 71.30                                      | 75.00        | 78.80        | 1.0                      | 103.0                                              | 5.0                                           | 14.60                     | 0.105                             |
| 4962            | 183            | 70.10                                     | 77.90                                      | 82.00        | 86.10        | 1.0                      | 113.0                                              | 5.0                                           | 13.30                     | 0.105                             |
| 4964            | 183            | 77.80                                     | 86.50                                      | 91.00        | 95.50        | 1.0                      | 125.0                                              | 5.0                                           | 12.00                     | 0.106                             |
| 4966            | 183            | 85.50                                     | 95.00                                      | 100.00       | 105.00       | 1.0                      | 137.0                                              | 5.0                                           | 11.00                     | 0.106                             |
| 4968            | 183            | 94.00                                     | 105.00                                     | 110.00       | 116.00       | 1.0                      | 152.0                                              | 5.0                                           | 9.90                      | 0.107                             |
| 4970            | 183            | 102.00                                    | 114.00                                     | 120.00       | 126.00       | 1.0                      | 165.0                                              | 5.0                                           | 9.10                      | 0.107                             |
| 4972            | 183            | 111.00                                    | 124.00                                     | 130.00       | 137.00       | 1.0                      | 179.0                                              | 5.0                                           | 8.40                      | 0.107                             |
| 4974            | 183            | 121.00                                    | 135.00                                     | 150.00       | 165.00       | 1.0                      | 215.0                                              | 5.0                                           | 7.00                      | 0.108                             |
| 4976            | 183            | 136.00                                    | 152.00                                     | 160.00       | 168.00       | 1.0                      | 219.0                                              | 5.0                                           | 6.80                      | 0.108                             |
| 4978            | 183            | 145.00                                    | 162.00                                     | 170.00       | 179.00       | 1.0                      | 234.0                                              | 5.0                                           | 6.40                      | 0.108                             |
| 4980            | 183            | 154.00                                    | 171.00                                     | 180.00       | 189.00       | 1.0                      | 246.0                                              | 5.0                                           | 6.10                      | 0.108                             |
| 4982            | 183            | 185.00                                    | 209.00                                     | 220.00       | 231.00       | 1.0                      | 328.0                                              | 5.0                                           | 4.60                      | 0.109                             |
| 4984            | 183            | 214.00                                    | 237.00                                     | 250.00       | 263.00       | 1.0                      | 344.0                                              | 5.0                                           | 5.00                      | 0.109                             |
| 4988            | 183            | 171.00                                    | 190.00                                     | 200.00       | 210.00       | 1.0                      | 274.0                                              | 5.0                                           | 5.50                      | 0.108                             |
| 4990            | 183            | 256.00                                    | 285.00                                     | 300.00       | 315.00       | 1.0                      | 414.0                                              | 5.0                                           | 3.58                      | 0.110                             |
| 4992            | 183            | 273.00                                    | 304.00                                     | 320.00       | 336.00       | 1.0                      | 438.0                                              | 5.0                                           | 4.50                      | 0.110                             |
| 4994            | 183            | 300.00                                    | 333.00                                     | 350.00       | 368.00       | 1.0                      | 482.0                                              | 5.0                                           | 3.08                      | 0.110                             |
| 4996            | 183            | 342.00                                    | 380.00                                     | 400.00       | 420.00       | 1.0                      | 548.0                                              | 5.0                                           | 2.78                      | 0.110                             |
| 4998            | 183            | 376.00                                    | 418.00                                     | 440.00       | 462.00       | 1.0                      | 603.0                                              | 5.0                                           | 3.50                      | 0.110                             |

Note 1. Normal selection of a zener transient over voltage suppressor is by rated stand-off voltage ( $V_{WM}$ ) and should be equal or greater than DC or continuous peak operating voltage.

