



## NTE4903 thru NTE4999 Zener Transient Overvoltage Suppressor Bidirectional

### **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  $B_V$  Min) .....  $< 5 \times 10^{-9}$  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  $B_V$  (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 $B_V$ $^\circ\text{C}$ |
|-----------------|----------------|-------------------------------------------|-----------------------------------|-------|-------|----------|---------------------------------------------|---------------------------------------------------|---------------------------|---------------------------------------------------|
|                 |                |                                           |                                   |       |       |          | Clamping Voltage @ $I_{PP}$ (1msec) (Volts) | Reverse Leakage Current @ $V_R$ ( $\mu\text{A}$ ) | Peak Pulse Current (Amps) |                                                   |
|                 |                |                                           | $V_{BR}$                          |       |       |          | $V_C$                                       | $I_R$                                             | $I_{PP}$                  |                                                   |
|                 |                | $V_R$                                     | Min                               | Typ   | Max   | $I_T$ mA |                                             |                                                   |                           |                                                   |
| 4903            | 183            | 5.50                                      | 6.12                              | 6.80  | 7.48  | 10.0     | 10.8                                        | 1000.0                                            | 139.00                    | 0.057                                             |
| 4905            | 183            | 6.40                                      | 7.13                              | 7.50  | 7.88  | 10.0     | 11.3                                        | 500.0                                             | 132.00                    | 0.061                                             |
| 4907            | 183            | 7.02                                      | 7.79                              | 8.20  | 8.61  | 10.0     | 12.1                                        | 200.0                                             | 124.00                    | 0.065                                             |
| 4911            | 183            | 8.55                                      | 9.50                              | 10.00 | 10.50 | 10.0     | 14.5                                        | 10.0                                              | 103.00                    | 0.073                                             |
| 4915            | 183            | 10.20                                     | 11.40                             | 12.00 | 12.60 | 1.0      | 16.7                                        | 5.0                                               | 90.00                     | 0.078                                             |

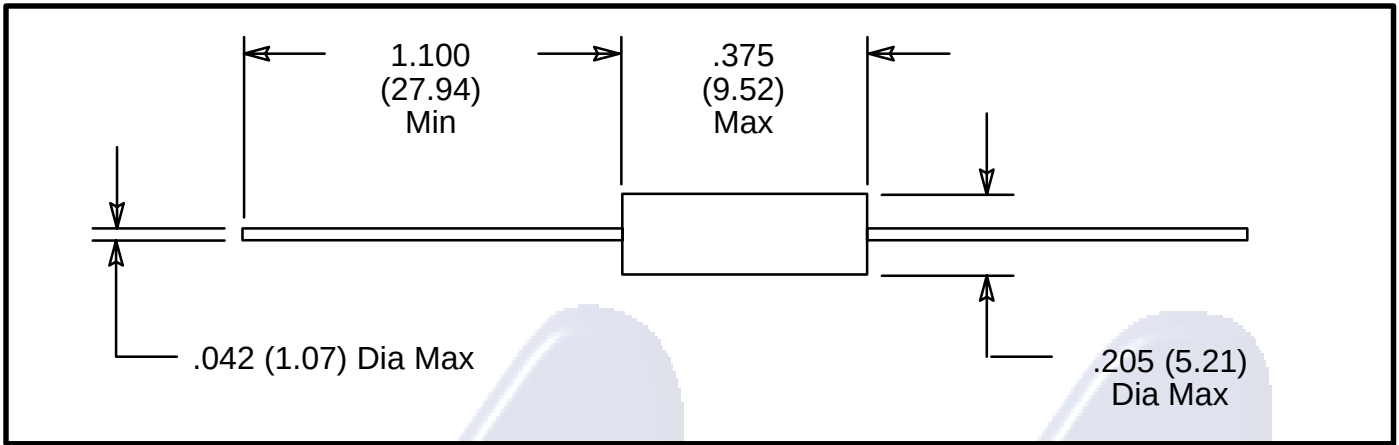
### Electrical Characteristics (Cont'd):

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 @ $I_T$ (Volts) |        |        |          | Maximum Ratings                             |                                            |                           | Temperature Coefficient of BV%/°C |
|-----------------|----------------|-------------------------------------------|-----------------------------------|--------|--------|----------|---------------------------------------------|--------------------------------------------|---------------------------|-----------------------------------|
|                 |                |                                           |                                   |        |        |          | Clamping Voltage @ $I_{pp}$ (1msec) (Volts) | Reverse Leakage Current @ $V_R$ ( $\mu$ A) | Peak Pulse Current (Amps) |                                   |
|                 |                |                                           | $V_{BR}$                          |        |        |          | $V_C$                                       | $I_R$                                      | $I_{pp}$                  |                                   |
|                 |                |                                           | Min                               | Typ    | Max    | $I_T$ mA |                                             |                                            |                           |                                   |
| 4919            | 183            | 11.10                                     | 12.40                             | 13.00  | 13.70  | 1.0      | 18.2                                        | 5.0                                        | 82.00                     | 0.081                             |
| 4921            | 183            | 12.80                                     | 14.30                             | 15.00  | 15.80  | 1.0      | 21.1                                        | 5.0                                        | 71.00                     | 0.084                             |
| 4923            | 183            | 13.60                                     | 15.20                             | 16.00  | 16.80  | 1.0      | 22.5                                        | 5.0                                        | 67.00                     | 0.086                             |
| 4927            | 183            | 15.30                                     | 17.10                             | 18.00  | 18.90  | 1.0      | 25.2                                        | 5.0                                        | 59.50                     | 0.088                             |
| 4929            | 183            | 17.10                                     | 19.00                             | 20.00  | 21.00  | 1.0      | 27.7                                        | 5.0                                        | 54.00                     | 0.090                             |
| 4933            | 183            | 20.50                                     | 22.80                             | 24.00  | 25.20  | 1.0      | 33.2                                        | 5.0                                        | 45.00                     | 0.094                             |
| 4935            | 183            | 23.10                                     | 25.70                             | 27.05  | 28.40  | 1.0      | 37.5                                        | 5.0                                        | 40.00                     | 0.096                             |
| 4937            | 183            | 25.60                                     | 28.50                             | 30.00  | 31.50  | 1.0      | 36.0                                        | 5.0                                        | 41.40                     | 0.097                             |
| 4939            | 183            | 28.20                                     | 31.40                             | 33.00  | 34.70  | 1.0      | 45.7                                        | 5.0                                        | 33.00                     | 0.098                             |
| 4941            | 183            | 30.80                                     | 34.20                             | 36.00  | 37.80  | 1.0      | 49.9                                        | 5.0                                        | 30.00                     | 0.099                             |
| 4943            | 183            | 33.30                                     | 37.10                             | 39.00  | 41.00  | 1.0      | 53.9                                        | 5.0                                        | 28.00                     | 0.100                             |
| 4945            | 183            | 36.80                                     | 40.90                             | 43.00  | 45.20  | 1.0      | 59.3                                        | 5.0                                        | 25.30                     | 0.101                             |
| 4947            | 183            | 40.20                                     | 44.70                             | 47.00  | 49.40  | 1.0      | 64.8                                        | 5.0                                        | 23.30                     | 0.101                             |
| 4951            | 183            | 43.60                                     | 48.50                             | 51.05  | 53.60  | 1.0      | 70.1                                        | 5.0                                        | 21.40                     | 0.102                             |
| 4953            | 183            | 47.80                                     | 53.20                             | 56.00  | 58.80  | 1.0      | 77.0                                        | 5.0                                        | 19.50                     | 0.103                             |
| 4955            | 183            | 53.00                                     | 58.90                             | 62.00  | 65.10  | 1.0      | 85.0                                        | 5.0                                        | 17.70                     | 0.104                             |
| 4959            | 183            | 58.10                                     | 64.60                             | 68.00  | 71.40  | 1.0      | 92.0                                        | 5.0                                        | 16.30                     | 0.104                             |
| 4961            | 183            | 64.10                                     | 71.30                             | 75.00  | 78.80  | 1.0      | 103.0                                       | 5.0                                        | 14.60                     | 0.105                             |
| 4963            | 183            | 70.10                                     | 77.90                             | 82.00  | 86.10  | 1.0      | 113.0                                       | 5.0                                        | 13.30                     | 0.105                             |
| 4965            | 183            | 77.80                                     | 86.50                             | 91.00  | 95.50  | 1.0      | 125.0                                       | 5.0                                        | 12.00                     | 0.106                             |
| 4967            | 183            | 85.50                                     | 95.00                             | 100.00 | 105.00 | 1.0      | 137.0                                       | 5.0                                        | 11.00                     | 0.106                             |
| 4969            | 183            | 94.00                                     | 105.00                            | 110.00 | 116.00 | 1.0      | 152.0                                       | 5.0                                        | 9.90                      | 0.107                             |
| 4971            | 183            | 102.00                                    | 114.00                            | 120.00 | 126.00 | 1.0      | 165.0                                       | 5.0                                        | 9.10                      | 0.107                             |
| 4973            | 183            | 111.00                                    | 124.00                            | 130.00 | 137.00 | 1.0      | 179.0                                       | 5.0                                        | 8.40                      | 0.107                             |
| 4975            | 183            | 128.00                                    | 143.00                            | 150.00 | 158.00 | 1.0      | 207.0                                       | 5.0                                        | 7.20                      | 0.108                             |
| 4977            | 183            | 136.00                                    | 152.00                            | 160.00 | 168.00 | 1.0      | 219.0                                       | 5.0                                        | 6.80                      | 0.108                             |
| 4979            | 183            | 145.00                                    | 162.00                            | 170.00 | 179.00 | 1.0      | 234.0                                       | 5.0                                        | 6.40                      | 0.108                             |
| 4981            | 183            | 154.00                                    | 171.00                            | 180.00 | 189.00 | 1.0      | 246.0                                       | 5.0                                        | 6.10                      | 0.108                             |
| 4983            | 183            | 185.00                                    | 209.00                            | 220.00 | 231.00 | 1.0      | 328.0                                       | 5.0                                        | 4.60                      | 0.109                             |
| 4985            | 183            | 214.00                                    | 237.00                            | 250.00 | 263.00 | 1.0      | 344.0                                       | 5.0                                        | 5.00                      | 0.109                             |
| 4989            | 183            | 171.00                                    | 190.00                            | 200.00 | 210.00 | 1.0      | 274.0                                       | 5.0                                        | 5.50                      | 0.108                             |
| 4991            | 183            | 256.00                                    | 285.00                            | 300.00 | 315.00 | 1.0      | 414.0                                       | 5.0                                        | 3.58                      | 0.110                             |
| 4993            | 183            | 273.00                                    | 304.00                            | 320.00 | 336.00 | 1.0      | 438.0                                       | 5.0                                        | 4.50                      | 0.110                             |
| 4995            | 183            | 300.00                                    | 333.00                            | 350.00 | 368.00 | 1.0      | 482.0                                       | 4.0                                        | 3.08                      | 0.110                             |
| 4997            | 183            | 342.00                                    | 380.00                            | 400.00 | 420.00 | 1.0      | 548.0                                       | 4.0                                        | 2.78                      | 0.110                             |
| 4999            | 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.



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