



## **NTE907 Integrated Circuit Diode Array**

### **Description:**

The NTE907 consists of six ultra-fast, low capacitance diodes on a common monolithic substrate. Five of the diodes are independently accessible, with the sixth sharing a common terminal with the substrate. The NTE907 comes in a 12-Lead TO5 type package.

### **Features:**

- Excellent Reverse Recovery Time: 1ns typ.
- Matched Monolithic Construction:  $V_F$  matched within 5mV
- Low Diode Capacitance:  $C_D = 0.65\text{pF}$  typical at  $V_R = -2\text{V}$

### **Applications:**

- Balanced Modulators or Demodulators
- Ring Modulators
- High Speed Diode Gates
- Analog Switches

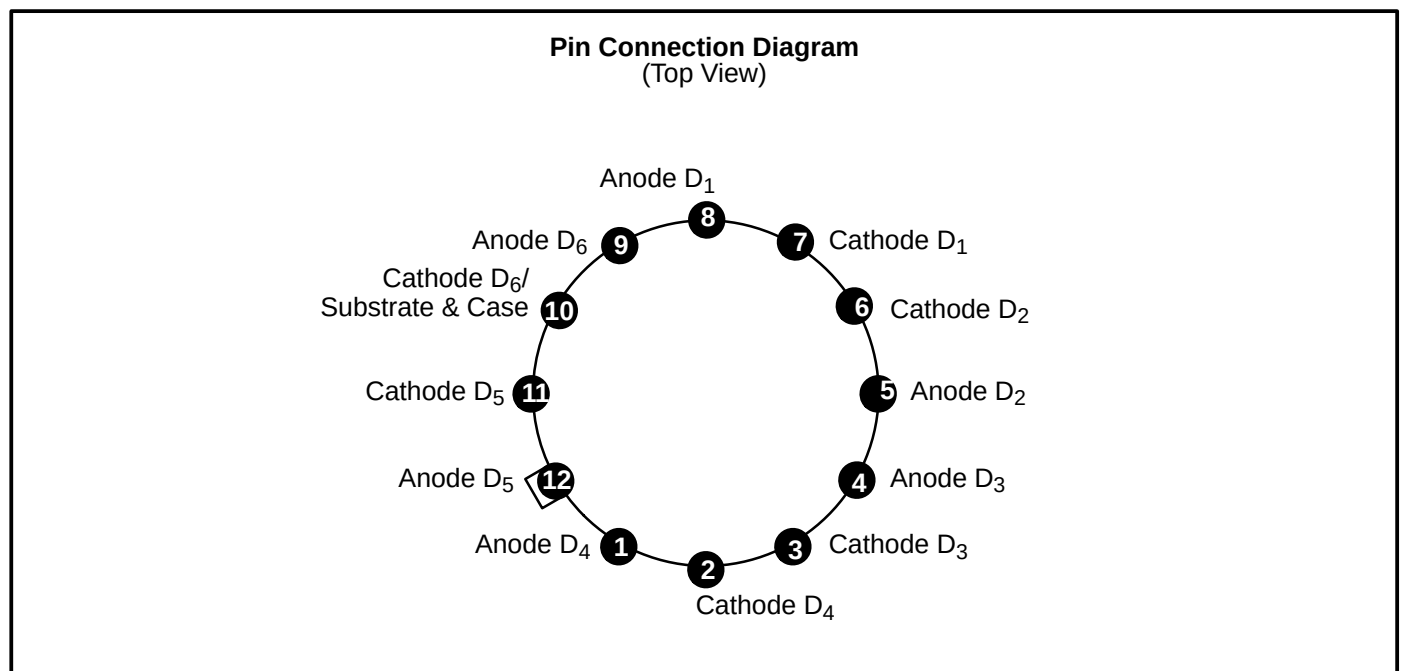
### **Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

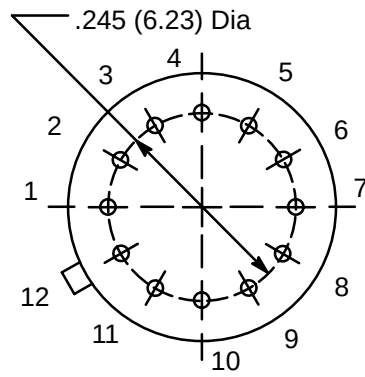
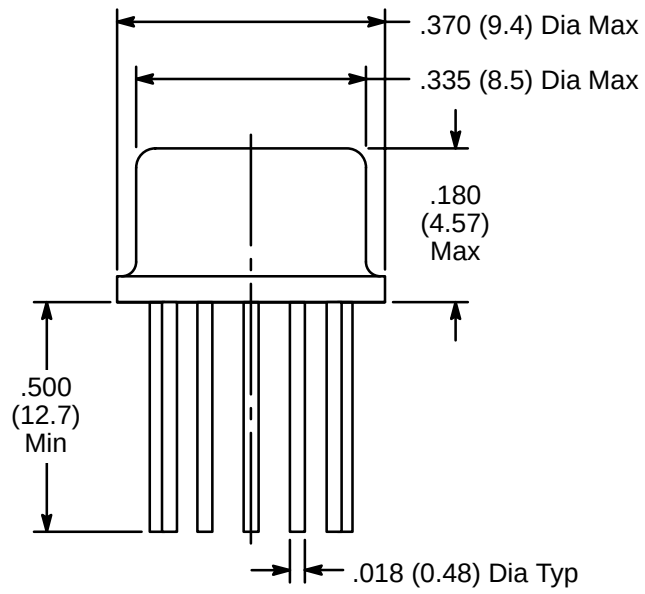
|                                                                                 |                                         |
|---------------------------------------------------------------------------------|-----------------------------------------|
| Power Dissipation, $P_D$                                                        |                                         |
| Any one diode unit                                                              | 100mW                                   |
| Total for device                                                                | 600mW                                   |
| For $T_A > 55^\circ\text{C}$                                                    | derate linearly 5.7mW/ $^\circ\text{C}$ |
| Operating Temperature Range, $T_{opr}$                                          | $-55^\circ$ to $+125^\circ\text{C}$     |
| Storage Temperature Range, $T_{stg}$                                            | $-65^\circ$ to $+150^\circ\text{C}$     |
| Peak Inverse Voltage, $P_{IV}$                                                  |                                         |
| $D_1 - D_5$                                                                     | 5V                                      |
| $D_6$                                                                           | 0.5V                                    |
| Peak Diode-to-Substrate Voltage, $V_{DI}$                                       |                                         |
| for $D_1 - D_5$ (Pin1, 4, 5, 8, or 12 to Pin10)                                 | +20V, -1V                               |
| DC Forward Current, $I_F$                                                       | 25mA                                    |
| Peak Recurrent Forward Current, $I_F$                                           | 100mA                                   |
| Peak Forward Surge Current, $I_F$ (Surge)                                       | 100mA                                   |
| Lead Temperature, $T_L$                                                         |                                         |
| (During soldering 1/16 $\pm$ 1/32" (1.59 $\pm$ 0.79mm) from case for 10sec Max) | +265 $^\circ\text{C}$                   |

**Electrical Characteristics:** ( $T_A = +25^{\circ}\text{C}$ , Note 1 unless otherwise specified)

| Parameter                                                                                         | Symbol                                   | Test Conditions                           | Min | Typ   | Max  | Unit                           |
|---------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|-----|-------|------|--------------------------------|
| DC Forward Voltage Drop                                                                           | $V_F$                                    | $I_F = 50\mu\text{A}$                     | –   | 0.65  | 0.69 | V                              |
|                                                                                                   |                                          | $I_F = 1\text{ mA}$                       | –   | 0.73  | 0.78 |                                |
|                                                                                                   |                                          | $I_F = 3\text{mA}$                        | –   | 0.76  | 0.80 |                                |
|                                                                                                   |                                          | $I_F = 10\text{mA}$                       | –   | 0.81  | 0.90 |                                |
| DC Reverse Breakdown Voltage                                                                      | $V_{(BR)R}$                              | $I_R = -10\mu\text{A}$                    | 5   | 7     | –    | V                              |
| DC Reverse Breakdown Voltage Between any Diode Unit and Substrate                                 | $V_{(BR)R}$                              | $I_R = -10\mu\text{A}$                    | 20  | –     | –    | V                              |
| DC Reverse (Leakage) Current                                                                      | $I_R$                                    | $V_R = -4\text{V}$                        | –   | 0.016 | 100  | nA                             |
| DC Reverse (Leakage) Current Between any Diode Unit and Substrate                                 | $I_R$                                    | $V_R = -10\text{V}$                       | –   | 0.022 | 100  | nA                             |
| Magnitude of Diode Offset Voltage (Difference in DC Forward Voltage Drops of any Two Diode Units) | $ V_{F1}-V_{F2} $                        | $I_F = 1\text{mA}$                        | –   | 0.5   | 5    | mV                             |
| Temperature Coefficient of $ V_{F1}-V_{F2} $                                                      | $\frac{\Delta V_{F1}-V_{F2} }{\Delta T}$ | $I_F = 1\text{mA}$                        | –   | 1     | –    | $\mu\text{V}/^{\circ}\text{C}$ |
| Temperature Coefficient of Forward Drop                                                           | $\frac{\Delta V_F}{\Delta T}$            | $I_F = 1\text{mA}$                        | –   | -1.9  | –    | $\text{mV}/^{\circ}\text{C}$   |
| DC Forward Voltage Drop for Anode-to-Substrate Diode ( $D_S$ )                                    | $V_F$                                    | $I_F = 1\text{mA}$                        | –   | 0.65  | –    | V                              |
| Reverse Recovery Time                                                                             | $t_{rr}$                                 | $I_F = 10\text{mA}$ , $I_R = 10\text{mA}$ | –   | 1     | –    | ns                             |
| Diode Resistance                                                                                  | $R_D$                                    | $f = 1\text{kHz}$ , $I_F = 1\text{mA}$    | 25  | 30    | 45   | $\Omega$                       |
| Diode Capacitance                                                                                 | $C_D$                                    | $V_R = -2\text{V}$ , $I_F = 0$            | –   | 0.65  | –    | pF                             |
| Diode-to-Substrate Capacitance                                                                    | $C_{D1}$                                 | $V_{D1} = +4\text{V}$ , $I_F = 0$         | –   | 3.2   | –    | pF                             |

Note 1. Characteristics apply for each diode unit, unless otherwise specified.





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