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## NTE5650 thru NTE5653 TRIAC – 100V<sub>RM</sub>, 2.5A

**Description:**

The NTE5650 through NTE5653 sensitive gate TRIACs are designed to be driven directly with IC and MOS devices. These devices features a void-free glass passivated chip and are hermetically sealed in TO-5 outline cans.

The NTE5650 through NTE5653 are bi-directional triode thyristors and may be switched from off-state to conduction for either polarity of applied voltage with positive or negative gate-trigger current and are designed for control applications in lighting, heating, cooling and static switching relays.

**Absolute Maximum Ratings:**

Repetitive Peak Off-State Voltage ( $T_J = +90^\circ\text{C}$ , Gate Open, Note 1),  $V_{DROM}$

|               |      |
|---------------|------|
| NTE5650 ..... | 100V |
| NTE5651 ..... | 200V |
| NTE5652 ..... | 400V |
| NTE5653 ..... | 600V |

|                                                                                                            |                                     |
|------------------------------------------------------------------------------------------------------------|-------------------------------------|
| RMS On-State Current ( $T_C = +75^\circ\text{C}$ and Conduction Angle of $360^\circ$ ), $I_{T(RMS)}$ ..... | 3A                                  |
| Peak Surge (Non-Repetitive) On-State Current (One-Cycle at 50Hz or 60Hz), $I_{TSM}$ .....                  | 30A                                 |
| Peak Gate-Trigger Current (3 $\mu$ sec, Max.), $I_{GTM}$ .....                                             | 1A                                  |
| Peak Gate-Power Dissipation ( $I_{GT} \leq I_{GTM}$ for 3 $\mu$ sec. Max.), $P_{GM}$ .....                 | 20W                                 |
| Average Gate-Power Dissipation, $P_{G(AV)}$ .....                                                          | 0.2W                                |
| Operating Temperature Range ( $T_C$ ), $T_{opr}$ .....                                                     | $-40^\circ$ to $+90^\circ\text{C}$  |
| Storage Temperature Range, $T_{stg}$ .....                                                                 | $-40^\circ$ to $+150^\circ\text{C}$ |
| Typical Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....                                             | 4 $^\circ\text{C/W}$                |

Note 1. All values apply in either direction.

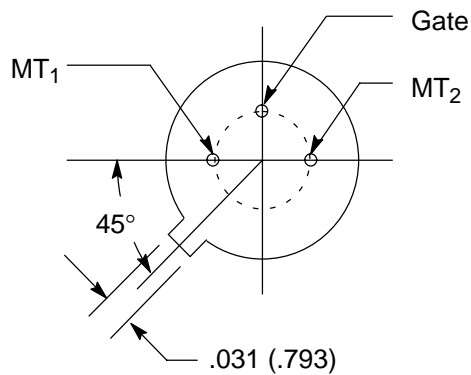
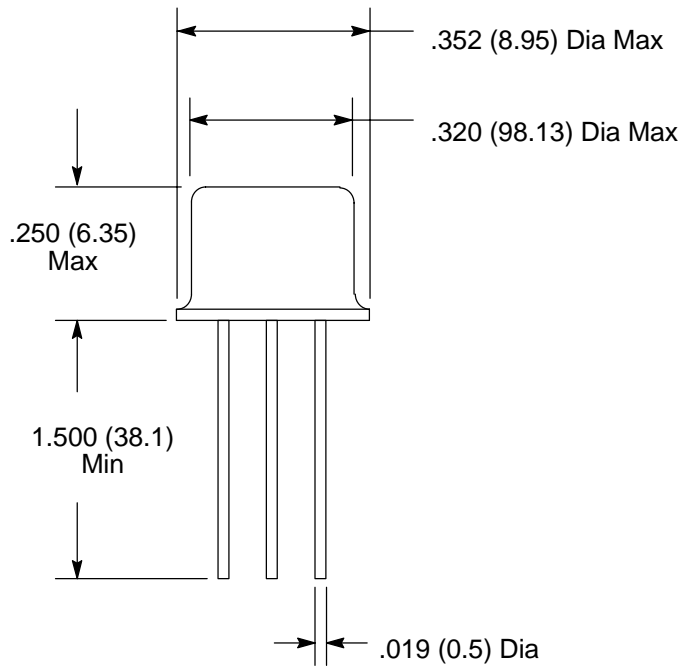
**Electrical Characteristics:** (At Maximum Ratings & Specified Case Temperature)

| Parameter                                                                                                       | Symbol           | Test Conditions                                                                | Min | Typ | Max  | Unit       |
|-----------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------|-----|-----|------|------------|
| Peak Off-State Current                                                                                          | $I_{DROM}$       | $T_J = +90^\circ\text{C}$ , $V_{DROM} = \text{Max Rating}$ , Gate Open, Note 1 | -   | -   | 0.75 | mA         |
| Maximum On-State Voltage                                                                                        | $V_{TM}$         | $T_C = +25^\circ\text{C}$ , $i_T = 5A$ (Peak), Note 1                          | -   | -   | 1.85 | V          |
| DC Holding Current                                                                                              | $I_{HO}$         | $T_C = +25^\circ\text{C}$ , Gate Open                                          | -   | -   | 5    | mA         |
| Critical Rate-of-Rise of Off-State Voltage                                                                      | Critical $dv/dt$ | $T_C = +90^\circ\text{C}$ , $v_D = V_{DROM}$ , Gate Open, Note 1               | -   | 3   | -    | V/ $\mu$ s |
| DC Gate-Trigger Current<br>$MT_2$ (+) Gate (+), $MT_2$ (-) Gate (-)<br>$MT_2$ (+) Gate (-), $MT_2$ (-) Gate (+) | $I_{GT}$         | $T_C = +25^\circ\text{C}$ , $v_D = 6V$ , $R_L = 39\Omega$                      | -   | -   | 3    | mA         |

Note 1. All values apply in either direction.

**Electrical Characteristics (Cont'd):** (At Maximum Ratings & Specified Case Temperature)

| Parameter                             | Symbol   | Test Conditions                                                                                                               | Min | Typ | Max | Unit                 |
|---------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|----------------------|
| DC Gate Trigger Voltage               | $V_{GT}$ | $T_C = +25^\circ\text{C}$ , $v_D = 6\text{V}$ , $R_L = 39\Omega$                                                              | -   | -   | 2.2 | V                    |
| Gate-Controlled Turn-On Time          | $t_{gt}$ | $T_C = +25^\circ\text{C}$ , $v_D = V_{DROM}$ , $I_{GT} = 80\text{mA}$ ,<br>$t_r = 0.1\mu\text{s}$ , $i_T = 10\text{A}$ (Peak) | -   | 2.2 | -   | $\mu\text{s}$        |
| Fusing Current (For TRIAC Protection) | $I^2t$   | $T = 1.25$ to $10\text{ms}$                                                                                                   | -   | -   | 3   | $\text{A}^2\text{s}$ |



TO5