



ELECTRONICS, INC.

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## NTE5567, NTE5568, NTE5569, & NTE5571 Silicon Controlled Rectifier (SCR) for Phase Control Applications

### Features:

- High Current Rating
- Excellent Dynamic Characteristics
- Superior Surge Capabilities
- Standard Package

### Voltage Ratings and Electrical Characteristics: ( $T_J = +125^\circ\text{C}$ unless otherwise specified)

|  |                        |
|--|------------------------|
| Maximum Repetitive Peak Forward and Reverse Voltage (Note 1), $V_{DRM}$ , $V_{RRM}$                        |                        |
| NTE5567 .....  | 200V                   |
| NTE5568 .....  | 600V                   |
| NTE5569 .....  | 1200V                  |
| NTE5571 .....  | 1600V                  |
| Maximum Non-Repetitive Peak Voltage (Note 2), $V_{RSM}$  |                        |
| NTE5567 .....  | 300V                   |
| NTE5568 .....  | 700V                   |
| NTE5569 .....  | 1300V                  |
| NTE5571 .....  | 1700V                  |
| Maximum Peak Reverse and Off-State Current, $I_{DRM}$ , $I_{RRM}$ .....                                    |                        |
| 15mA   |                        |
| Maximum Average On-State Current (180° Sinusoidal Conduction), $I_{T(RMS)}$                                |                        |
| NTE5567, NTE5568, NTE5569 ( $T_C = +94^\circ\text{C}$ ) .....  | 50A                    |
| NTE5571 ( $T_C = +90^\circ\text{C}$ ) .....  | 50A                    |
| Maximum RMS On-State Current, $I_{T(RMS)}$ .....   |                        |
| 80A  |                        |
| Maximum Peak One-Cycle Non-Repetitive Surge Current ( $t = 10\text{ms}$ , Sinusoidal Half Wave), $I_{TSM}$ |                        |
| (No Voltage Reapplied)   |                        |
| NTE5567, NTE5568, NTE5569 .....  | 1430A                  |
| NTE5571 .....  | 1200A                  |
| (100% $V_{RRM}$ Reapplied)   |                        |
| NTE5567, NTE5568, NTE5569 .....  | 1200A                  |
| NTE5571 .....  | 1010A                  |
| Maximum $I^2t$ for Fusing ( $t = 10\text{ms}$ , Sinusoidal Half Wave), $I^2t$                              |                        |
| (No Voltage Reapplied)   |                        |
| NTE5567, NTE5568, NTE5569 .....  | 10.18KA <sup>2</sup> s |
| NTE5571 .....  | 7.21KA <sup>2</sup> s  |
| (100% $V_{RRM}$ Reapplied)   |                        |
| NTE5567, NTE5568, NTE5569 .....  | 7.20KA <sup>2</sup> s  |
| NTE5571 .....  | 5.10KA <sup>2</sup> s  |

**Voltage Ratings and Electrical Characteristics (Cont'd):** ( $T_J = +125^\circ\text{C}$  unless otherwise specified)

|  |                                     |
|--|-------------------------------------|
| Maximum $I^2\sqrt{t}$ for Fusing ( $t = 0.1$ to $10\text{ms}$ , No Voltage Reapplied), $I^2\sqrt{t}$   |                                     |
| NTE5567, NTE5568, NTE5569  | 101.8KA <sup>2</sup> √s             |
| NTE5571  | 72.1KA <sup>2</sup> √s              |
| Low Level Value of Threshold Voltage ( $16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)}$ ), $V_{T(TO)1}$   |                                     |
| NTE5567, NTE5568, NTE5569  | 0.94V                               |
| NTE5571  | 1.02V                               |
| High Level Value of Threshold Voltage ( $\pi \times I_{T(AV)} < I < 20 \times \pi \times I_{T(AV)}$ ), $V_{T(TO)2}$  |                                     |
| NTE5567, NTE5568, NTE5569  | 1.08V                               |
| NTE5571  | 1.17V                               |
| Low Level Value of On–State Slope Resistance ( $16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)}$ ), $r_{t1}$   |                                     |
| NTE5567, NTE5568, NTE5569  | 4.08mΩ                              |
| NTE5571  | 4.78mΩ                              |
| High Level Value of On–State Slope Resistance ( $\pi \times I_{T(AV)} < I < 20 \times \pi \times I_{T(AV)}$ ), $V_{T(TO)2}$  |                                     |
| NTE5567, NTE5568, NTE5569  | 3.34mΩ                              |
| NTE5571  | 3.97mΩ                              |
| Maximum On–State Voltage ( $I_{pk} = 157\text{A}$ , $T_J = +25^\circ\text{C}$ ), $V_{TM}$  |                                     |
| NTE5567, NTE5568, NTE5569  | 1.60V                               |
| NTE5571  | 1.78V                               |
| Maximum Holding Current ( $T_J = +25^\circ\text{C}$ , Anode Supply 22V, Resistive Load, Initial $I_T = 2\text{A}$ ), $I_H$   | 200mA                               |
| Latching Current (Anode Supply 6V, Resistive Load), $I_L$  | 400mA                               |
| Maximum Rate of Rise of Turned–On Current, $di/dt$   |                                     |
| ( $V_{DM} = \text{Rated } V_{DRM}$ , Gate Pulse = 20V, 15Ω, $t_p = 6\mu\text{s}$ , $t_r = 0.1\mu\text{s}$ ax., $I_{TM} = (2 \times \text{Rated } di/dt) \text{ A}$ ) |                                     |
| NTE5567, NTE5568   | 200A/μs                             |
| NTE5569, NTE5571   | 100A/μs                             |
| Typical Delay Time, $t_d$  | 0.9μs                               |
| ( $T_C = +25^\circ\text{C}$ , $V_{DM} = \text{Rated } V_{DRM}$ , DC Resistive Circuit, Gate Pulse = 10V, 15Ω Source, $t_p = 20\mu\text{s}$ )                         |                                     |
| Typical Turn–Off Time, $t_q$   | 110μs                               |
| ( $T_C = +125^\circ\text{C}$ , $I_{TM} = 50\text{A}$ , Reapplied $dv/dt = 20\text{V}/\mu\text{s}$ , $dir/dt = -10\text{A}/\mu\text{s}$ , $V_R = 50\text{V}$ )        |                                     |
| Maximum Critical Rate of Rise of Off–State Voltage, $dv/dt$  |                                     |
| (Linear to 100% rated $V_{DRM}$ )  | 200V/μs                             |
| (Linear to 67% rated $V_{DRM}$ )   | 500V/μs                             |
| Maximum Peak Gate Power ( $t_p \leq 5\text{ms}$ ), $P_{G(AV)}$   | 10W                                 |
| Maximum Average Gate Power, $P_{GM}$   | 2.5W                                |
| Maximum Peak Positive Gate Current, $I_{GM}$   | 2.5A                                |
| Maximum Peak Positive Gate Voltage, $+V_{GM}$  | 20V                                 |
| Maximum Peak Negative Gate Voltage, $-V_{GM}$  | 10V                                 |
| DC Gate Current Required to Trigger (6V Anode–to–Cathode Applied), $I_{GT}$  | 50mA                                |
| DC Gate Voltage Required to Trigger (6V Anode–to–Cathode Applied, $T_J = +25^\circ\text{C}$ ), $V_{GT}$  | 2.5V                                |
| DC Gate Current Not to Trigger (Rated $V_{DRM}$ Anode–to–Cathode Applied), $I_{GD}$  | 5.0mA                               |
| DC Gate Voltage Not to Trigger (Rated $V_{DRM}$ Anode–to–Cathode Applied), $V_{GD}$  | 0.2V                                |
| Operating Junction Temperature Range, $T_J$  | $-40^\circ$ to $+125^\circ\text{C}$ |
| Storage Temperature Range, $T_{stg}$   | $-40^\circ$ to $+125^\circ\text{C}$ |
| Thermal Resistance   |                                     |
| Junction–to–Case (DC Operation), $R_{thJC}$  | 0.35K/W                             |
| Case–to–Heatsink (Mounting Surface Smooth, Flat, and Greased), $R_{thCS}$  | 0.25K/W                             |
| Mounting Torque (Non–Lubricated Threads), $T$  | 25 – 30 (2.8 – 3.4) lbf–in (Nm)     |

Note 1. Units may be broken over non–repetitively in the off–state direction without damage, if  $di/dt$  does not exceed 20A/μs.

Note 2. For voltage pulses with  $t_p \leq 5\text{ms}$ .

