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## NTE5470 thru 5476 Silicon Controlled Rectifier (SCR) 5 Amp, TO64

### **Description:**

The NTE5470 through NTE5476 are multi-purpose PNP silicon controlled rectifiers in a TO64 type stud mount package suitable for industrial and consumer applications.

### **Features:**

- Uniform Low-Level Noise-Immune Gate Triggering
- Low Forward "ON" Voltage
- High Surge-Current Capability

### **Absolute Maximum Ratings:** (Apply over operating temperature range unless otherwise specified)

Peak Repetitive Forward and Reverse Blocking Voltage (Note 1),  $V_{DRM}$ ,  $V_{RRM}$

|         |      |
|---------|------|
| NTE5470 | 50V  |
| NTE5471 | 100V |
| NTE5472 | 200V |
| NTE5473 | 300V |
| NTE5474 | 400V |
| NTE5475 | 500V |
| NTE5476 | 600V |

Forward Current RMS,  $I_{T(RMS)}$  8A

Peak Forward Surge Current (One Cycle, 60Hz,  $T_J = -40^\circ$  to  $+100^\circ\text{C}$ ),  $I_{TSM}$  100A

Circuit Fusing ( $T_J = -40^\circ$  to  $+100^\circ\text{C}$ ,  $t \leq 8.3\text{ms}$ ),  $I^2t$  40A<sup>2</sup>sec

Peak Gate Power,  $P_{GM}$  5W

Average Gate Power,  $P_{G(AV)}$  0.5W

Peak Gate Current,  $I_{GM}$  2A

Peak Gate Voltage (Note 2),  $V_{GM}$  10V

Operating Temperature Range,  $T_J$   $-40^\circ$  to  $+100^\circ\text{C}$

Storage Temperature Range,  $T_{stg}$   $-40^\circ$  to  $+150^\circ\text{C}$

Thermal Resistance, Junction-to-Case,  $R_{thJC}$  2.5°C/W

Stud Torque 15 in. lb.

Note 1. Ratings apply for zero or negative gate voltage. Devices should not be tested for blocking capability in a manner such that the voltage applied exceeds the rated blocking voltage.

Note 2. Devices should not be operated with a positive bias applied to the gate concurrently with a negative potential applied to the anode.

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

| Parameter                                      | Symbol                           | Test Conditions                                                                                                 | Min                        | Typ | Max  | Unit                   |
|------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------|-----|------|------------------------|
| Peak Forward or Reverse Blocking Current       | $I_{\text{DRM}}, I_{\text{RRM}}$ | Rated $V_{\text{DRM}}$ or $V_{\text{RRM}}$ , Gate Open                                                          | $T_J = +25^\circ\text{C}$  | –   | –    | 10 $\mu\text{A}$       |
|                                                |                                  |                                                                                                                 | $T_J = +100^\circ\text{C}$ | –   | –    | 2 mA                   |
| Gate Trigger Current, Continuous DC            | $I_{\text{GT}}$                  | $V_D = 7\text{V}$ , $R_L = 100\Omega$ , Note 3                                                                  |                            | –   | 10   | 30 mA                  |
|                                                |                                  |                                                                                                                 | $T_C = -40^\circ\text{C}$  | –   | –    | 60 mA                  |
| Gate Trigger Voltage, Continuous DC            | $V_{\text{GT}}$                  | $V_D = 7\text{V}$ , $R_L = 100\Omega$                                                                           |                            | –   | 0.75 | 1.5 V                  |
|                                                |                                  |                                                                                                                 | $T_C = -40^\circ\text{C}$  | –   | –    | 2.5 V                  |
|                                                |                                  |                                                                                                                 | $T_J = +100^\circ\text{C}$ | 0.2 | –    | – V                    |
| Forward “ON” Voltage                           | $V_{\text{TM}}$                  | $I_{\text{TM}} = 15.7\text{A}$ , Note 4                                                                         | –                          | 1.4 | 2.0  | V                      |
| Holding Current                                | $I_{\text{H}}$                   | $V_D = 7\text{V}$ , Gate Open                                                                                   |                            | –   | 10   | 30 mA                  |
|                                                |                                  |                                                                                                                 | $T_C = -40^\circ\text{C}$  | –   | –    | 60 mA                  |
| Turn-On Time ( $t_d + t_r$ )                   | $t_{\text{on}}$                  | $I_G = 20\text{mA}$ , $I_F = 5\text{A}$ , $V_D = \text{Rated } V_{\text{DRM}}$                                  | –                          | 1   | –    | $\mu\text{s}$          |
| Turn-Off Time                                  | $t_{\text{off}}$                 | $I_F = 5\text{A}$ , $I_R = 5\text{A}$ , $V_D = \text{Rated } V_{\text{DRM}}$ , $dv/dt = 30\text{V}/\mu\text{s}$ |                            | –   | 15   | $\mu\text{s}$          |
|                                                |                                  |                                                                                                                 | $T_J = +100^\circ\text{C}$ | –   | 25   | $\mu\text{s}$          |
| Forward Voltage Application Rate (Exponential) | $dv/dt$                          | Gate Open, $T_J = +100^\circ\text{C}$ , $V_D = \text{Rated } V_{\text{DRM}}$                                    | –                          | 50  | –    | $\text{V}/\mu\text{s}$ |

Note 3. For optimum operation, i.e. faster turn-on, lower switching losses, best  $di/dt$  capability, recommended  $I_{\text{GT}} = 200\text{mA}$  minimum.

Note 4. Pulsed, 1ms Max, Duty Cycle  $\leq 1\%$ .

