



## NTE5480 thru NTE5487 Silicon Controlled Rectifier (SCR) 8 Amp

### **Description:**

The NTE5480 through NTE5487 are multi-purpose PNP silicon controlled rectifiers in a TO64 type package suited for industrial and consumer applications. These 8 amp devices are available in voltages ranging from 25V to 600V.

### **Features:**

- Uniform Low-Level Noise-Immune Gate Triggering:  $I_{GT} = 10\text{mA Typ @ } T_C = +25^\circ\text{C}$
- Low Forward "ON" Voltage:  $v_T = 1\text{V Typ @ } 5\text{A @ } +25^\circ\text{C}$
- High Surge-Current Capability:  $I_{TSM} = 100\text{A Peak}$
- Shorted Emitter Construction

### **Absolute Maximum Ratings:** ( $T_J = -40^\circ$ to $+100^\circ\text{C}$ unless otherwise specified)

Peak Repetitive Forward and Reverse Blocking Voltage (Note 1), $V_{DRM}$ or $V_{RRM}$	
NTE5480 .....	25V
NTE5481 .....	50V
NTE5482 .....	100V
NTE5483 .....	200V
NTE5484 .....	300V
NTE5485 .....	400V
NTE5486 .....	500V
NTE5487 ( <b>This device is discontinued</b> ) .....	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 ( $t \leq 8.3\text{ms}$ , $T_J = -40^\circ$ to $+100^\circ\text{C}$ ), $I^2t$ .....	40A <sup>2</sup> s
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 $+150^\circ\text{C}$
Typical Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	1.5°C/W
Typical Thermal Resistance, Case-to-Ambient, $R_{thJA}$ .....	50°C/W

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

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

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

