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## NTE5386 & NTE5387 Silicon Controlled Rectifier (SCR) for High Speed Switching, 700 Amp, TO200AC

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

Repetitive Peak Voltages, $V_{DRM}$ , $V_{RRM}$	
NTE5386 .....	600V
NTE5387 .....	1200V
Non-Repertitive Peak Off-State Voltage, $V_{DSM}$	
NTE5386 .....	600V
NTE5387 .....	1200V
Non-Repertitive Peak Reverse Blocking Voltage, $V_{RSM}$	
NTE5386 .....	700V
NTE5387 .....	1300V
Average On-State Current, $I_{T(AV)}$	
(+55°C heatsink temperature, double side cooled) .....	745A
(+85°C heatsink temperature, single side cooled) .....	261A
RMS On-State Current (+25°C heatsink temperature, double side cooled), $I_{T(RMS)}$ .....	1535A
Continuous On-State Current (+25°C heatsink temperature, double side cooled), $I_T$ .....	1180A
Peak One-Cycle Surge (Non-Repertitive) On-State Current, $I_{TSM}$	
(t = 10ms, 60% $V_{RRM}$ re-applied) .....	9500A
(t = 10ms, $V_R \leq 10V$ ) .....	10450A
Maximum Permissible Surge Energy ( $V_R \leq 10V$ ), $I^2t$	
(t = 10ms) .....	546000A <sup>2</sup> sec
(t = 3ms) .....	400000A <sup>2</sup> sec
Peak Forward Gate Current (Anode Positive with Respect to Cathode), $I_{FGM}$ .....	20A
Peak Forward Gate Voltage (Anode Positive with Respect to Cathode), $V_{FGM}$ .....	23V
Peak Reverse Gate Voltage, $V_{RGM}$ .....	5V
Average Gate Power, $P_{G(AV)}$ .....	4W
Peak Gate Power (100µs Pulse Width), $P_{GM}$ .....	120W
Rate of Rise of Off-State Voltage (To 80% $V_{DRM}$ , Gate Open-Circuit), $dv/dt$ .....	200V/µs
Rate of Rise of On-State Current, $di/dt$	
(Gate Drive 20V, 20Ω with $t_r \leq 1\mu\text{s}$ , Anode voltage $\leq 80\% V_{DRM}$ )	
Repetitive .....	500A/µs
Non-Repertitive .....	1000A/µs
Operating Temperature Range, $T_C$ .....	-40° to +125°C
Storage Temperature Range, $T_{stg}$ .....	-40° to +150°C
Thermal Resistance, Junction-to-Heatsink, $R_{thJHS}$	
Double Side Cooled .....	0.047°C/W
Single Side Cooled .....	0.094°C/W

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

Peak On-State Voltage ( $I_{TM} = 1500\text{A}$ ), $V_{TM}$ .....	1.9V
Forward Conduction Threshold Voltage, $V_O$ .....	1.43V
Forward Conduction Slope Resistance, $r$ .....	0.31m $\Omega$
Repetitive Peak Off-State Current (At Rated $V_{DRM}$ ), $I_{DRM}$ .....	75mA
Repetitive Peak Reverse Current (At Rated $V_{RRM}$ ), $I_{RRM}$ .....	75mA
Maximum Gate Current Required to Fire All Devices ( $T_J = +25^\circ\text{C}$ , $V_A = 6\text{V}$ , $I_A = 2\text{A}$ ), $I_{GT}$ ..	300mA
Maximum Gate Voltage Required to Fire All Devices ( $T_J = +25^\circ\text{C}$ , $V_A = 6\text{V}$ , $I_A = 2\text{A}$ ), $V_{GT}$ .....	3V
Maximum Holding Current ( $T_J = +25^\circ\text{C}$ , $V_A = 6\text{V}$ , $I_A = 1\text{A}$ ), $I_H$ .....	1A
Maximum Gate Voltage Which Will Not Trigger Any Device, $V_{GD}$ .....	0.25V
Typical Stored Charge ( $I_{TM} = 800\text{A}$ , $di/dt = 50\text{A}/\mu\text{s}$ , $V_{RM} = 50\text{V}$ , 50% Chord Value), $Q_{rr}$ .....	150 $\mu\text{C}$
Circuit Commutated Turn-Off Time Available Down To, $t_q$ ( $I_{TM} = 800\text{A}$ , $di/dt = 50\text{A}/\mu\text{s}$ , $V_{RM} = 50\text{V}$ )	
Maximum ( $dv/dt = 200\text{V}/\mu\text{s}$ to 80% $V_{DRM}$ ) .....	20–35 $\mu\text{s}$
Typical ( $dv/dt = 20\text{V}/\mu\text{s}$ to 80% $V_{DRM}$ ) .....	15–30 $\mu\text{s}$

