

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, $V_{\text{DRM}}, V_{\text{RRM}}$	
NTE5386	600V
NTE5387	1200V
Non-Repetitive Peak Off-State Voltage, V_{DSM}	
NTE5386	600V
NTE5387	1200V
Non-Repetitive Peak Reverse Blocking Voltage, V_{RSM}	
NTE5386	700V
NTE5387	1300V
Average On-State Current, $I_{\text{T(AV)}}$	
($+55^\circ\text{C}$ heatsink temperature, double side cooled)	745A
($+85^\circ\text{C}$ heatsink temperature, single side cooled)	261A
RMS On-State Current ($+25^\circ\text{C}$ heatsink temperature, double side cooled), $I_{\text{T(RMS)}}$	1535A
Continuous On-State Current ($+25^\circ\text{C}$ heatsink temperature, double side cooled), I_{T}	1180A
Peak One-Cycle Surge (Non-Repetitive) On-State Current, I_{TSM}	
($t = 10\text{ms}$, 60% V_{RRM} re-applied)	9500A
($t = 10\text{ms}$, $V_{\text{R}} \leq 10\text{V}$)	10450A
Maximum Permissible Surge Energy ($V_{\text{R}} \leq 10\text{V}$), I^2t	
($t = 10\text{ms}$)	546000A ² sec
($t = 3\text{ms}$)	400000A ² 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, $P_{\text{G(AV)}}$	4W
Peak Gate Power (100 μs 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, 20 Ω with $t_r \leq 1\mu\text{s}$, Anode voltage $\leq 80\%$ V_{DRM})	
Repetitive	500A/ μs
Non-Repetitive	1000A/ μs
Operating Temperature Range, T_{C}	-40° to $+125^\circ\text{C}$
Storage Temperature Range, T_{stg}	-40° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Heatsink, R_{thJHS}	
Double Side Cooled	0.047 $^\circ\text{C/W}$
Single Side Cooled	0.094 $^\circ\text{C/W}$

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 Ω
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 ($I_{TM} = 800\text{A}$, $\text{dir}/\text{dt} = 50\text{A}/\mu\text{s}$, $V_{RM} = 50\text{V}$, 50% Chord Value), Q_{rr}	150 μC
Circuit Commutated Turn-Off Time Available Down To, t_q	
($I_{TM} = 800\text{A}$, $\text{dir}/\text{dt} = 50\text{A}/\mu\text{s}$, $V_{RM} = 50\text{V}$)	
Maximum ($\text{dv}/\text{dt} = 200\text{V}/\mu\text{s}$ to 80% V_{DRM})	20–35 μs
Typical ($\text{dv}/\text{dt} = 20\text{V}/\mu\text{s}$ to 80% V_{DRM})	15–30 μs

