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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, $V_{\text{DRM}}, V_{\text{RRM}}$

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°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), $I_{\text{T(RMS)}}$

1535A

Continuous On-State Current (+25°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
($t = 10\text{ms}$, $V_R \leq 10\text{V}$)	10450A

Maximum Permissible Surge Energy ($V_R \leq 10\text{V}$), I^2t

($t = 10\text{ms}$)	$546000\text{A}^2\text{sec}$
($t = 3\text{ms}$)	$400000\text{A}^2\text{sec}$

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

