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NTE5377 & NTE5378 Silicon Controlled Rectifier (SCR) for High Speed Switching, 475 Amp, TO-118

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

Repetitive Peak Voltages, V_{DRM} , V_{RRM}	
NTE5377	600V
NTE5378	1200V
Non-Repetitive Peak Reverse Blocking Voltage, V_{RSM}	
NTE5377	700V
NTE5378	1300V
Average On-State Current (180° Conduction, Half Sine Wave, $T_C = +75^\circ\text{C}$), $I_{T(AV)}$	330A
RMS On-State Current (DC at $T_C = +75^\circ\text{C}$), $I_{T(RMS)}$	520A
Peak One-Cycle Non-Repetitive Surge Current (Sinusoidal Half Wave, Initial $T_J = +125^\circ\text{C}$), I_{TSM}	
No Voltage Reapplied	
$t = 10\text{ms}$	9000A
$t = 8.3\text{ms}$	9420A
100% V_{RRM} Reapplied	
$t = 10\text{ms}$	7570A
$t = 8.3\text{ms}$	7920A
Maximum I^2t for Fusing (Sinusoidal Half Wave, Initial $T_J = +125^\circ\text{C}$), I^2t	
No Voltage Reapplied	
$t = 10\text{ms}$	405kA ² s
$t = 8.3\text{ms}$	370kA ² s
100% V_{RRM} Reapplied	
$t = 10\text{ms}$	287kA ² s
$t = 8.3\text{ms}$	262kA ² s
Maximum $I^2\sqrt{t}$ for Fusing ($t = 0.1$ to 10ms , No Voltage Reapplied), $I^2\sqrt{t}$	4050kA ² $\sqrt{\text{s}}$
Low Level Value of Threshold Voltage ($16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)}$), $V_{T(TO)1}$	0.834V
High Level Value of Threshold Voltage ($I > \pi \times I_{T(AV)}$), $V_{T(TO)2}$	0.898V
Low Level Value of On-State Slope Resistance, r_{t1}	
($16.7\% \times \pi \times I_{T(AV)} < I < \pi \times I_{T(AV)}$)	0.687m Ω
High Level Value of On-State Slope Resistance ($I > \pi \times I_{T(AV)}$), r_{t2}	0.636m Ω
Maximum On-State Voltage ($I_{pk} = 1000\text{A}$, $t_p = 10\text{ms}$ Sine Pulse), V_{TM}	1.52V
Maximum Holding Current ($T_J = +25^\circ\text{C}$, Anode Supply 12V Resistive Load), I_H	600mA
Typical Latching Current ($T_J = +25^\circ\text{C}$, Anode Supply 12V Resistive Load), I_L	1000mA
Maximum on-Repetitive Rate of Rise of Turned-On Current, di/dt	
(Gate Drive 20V, 20 Ω with $t_r \leq 1\mu\text{s}$, Anode voltage $\leq 80\% V_{DRM}$)	1000A/ μs
Typical Delay Time (Gate Current A, $di_g/dt = 1\text{A}/\mu\text{s}$, $V_d = 0.67\% V_{DRM}$), t_d	1.0 μs
Typical Turn-Off Time, t_q	
($I_{TM} = 550\text{A}$, $di/dt = 40\text{A}/\mu\text{s}$, $V_R = 50\text{V}$, $dV/dt = 20\text{V}/\mu\text{s}$, gate 0V 100 Ω , $t_p = 500\mu\text{s}$) ..	100 μs
Maximum Critical Rate of Rise of Off-State Voltage (To 80% V_{DRM}), dv/dt	500V/ μs
Repetitive Peak Off-State Current (At Rated V_{DRM}), I_{DRM}	50mA
Repetitive Peak Reverse Current (At Rated V_{RRM}), I_{RRM}	50mA
Maximum Peak Gate Power ($t_p \leq 5\text{ms}$), P_{GM}	10W



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

Maximum Average Gate Power ($f = 50\text{Hz}$, $d\% = 50$), $P_{G(AV)}$	2W
Maximum Peak Positive Gate Current ($t_p \leq 5\text{ms}$), I_{GM}	3A
Maximum Peak Positive Gate Voltage ($t_p \leq 5\text{ms}$), $+V_{GM}$	20V
Maximum Peak Negative Gate Voltage ($t_p \leq 5\text{ms}$), $-V_{GM}$	5V
Typical DC Gate Current Required to Trigger (12V Anode-to-Cathode Applied), I_{GT}	
$T_J = -40^\circ\text{C}$	200mA
$T_J = +25^\circ\text{C}$	
Typical	100mA
Maximum	200mA
$T_J = +125^\circ\text{C}$	50mA
Typical DC Gate Voltage Required to Trigger (12V Anode-to-Cathode Applied), V_{GT}	
$T_J = -40^\circ\text{C}$	2.5V
$T_J = +25^\circ\text{C}$	
Typical	1.8V
Maximum	3.0V
$T_J = +125^\circ\text{C}$	1.1V
Maximum Gate Current Not To Trigger, I_{GD}	10mA
Maximum Gate Voltage Not To Trigger, V_{GD}	0.25V
Maximum Operating Junction Temperature Range, T_J	-40° to $+125^\circ\text{C}$
Maximum Storage Temperature Range, T_{stg}	-40° to $+150^\circ\text{C}$
Maximum Thermal Resistance, Junction-to-Case (DC Operation), R_{thJC}	0.10K/W
Maximum Thermal Resistance, Case-to-Heatsink, R_{thC-HS}	
(Mounting Surface, Smooth, Flat and Greased)	0.3K/W
Mounting Torque, $\pm 10\%$ (Non-Lubricated Threads)	48.5N • m (425lbf • in)

