

NTE5374 & NTE5375 Silicon Controlled Rectifier (SCR) for High Speed Switching

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

Repetitive Peak Voltages, $V_{\text{DRM}}, V_{\text{RRM}}$	
NTE5374	600V
NTE5375	1200V
Non-Repetitive Peak Off-State Voltage, V_{DSM}	
NTE5374	600V
NTE5375	1200V
Non-Repetitive Peak Reverse Blocking Voltage, V_{RSM}	
NTE5374	700V
NTE5375	1300V
Average On-State Current ($T_C = +85^\circ\text{C}$, Single phase, 50Hz, 180° sinewave), $I_{\text{T(AV)}}$	183A
RMS On-State Current, $I_{\text{T(RMS)}}$	355A
Continuous On-State Current, I_{T}	355A
Peak One-Cycle Surge (Non-Repetitive) On-State Current, I_{TSM}	
($t = 10\text{ms}$, half sinewave, $T_J(\text{initial}) = +125^\circ\text{C}$, $V_{\text{RM}} = 0.6V_{\text{RRMmax}}$)	3500A
($t = 10\text{ms}$, half sinewave, $T_J(\text{initial}) = +125^\circ\text{C}$, $V_{\text{RM}} \leq 10\text{V}$)	3850A
Maximum Permissible Surge Energy ($T_J(\text{initial}) = +125^\circ\text{C}$), I^2t	
($t = 10\text{ms}$, $V_{\text{RM}} = 0.6V_{\text{RRMmax}}$)	$61.3 \times 10^3 \text{A}^2\text{sec}$
($t = 10\text{ms}$, $V_{\text{RM}} \leq 10\text{V}$)	$74.1 \times 10^3 \text{A}^2\text{sec}$
($t = 3\text{ms}$, $V_{\text{RM}} \leq 10\text{V}$)	$54.5 \times 10^3 \text{A}^2\text{sec}$
Peak Forward Gate Current (Anode Positive with Respect to Cathode), I_{FGM}	18A
Peak Forward Gate Voltage (Anode Positive with Respect to Cathode), V_{FGM}	12V
Peak Reverse Gate Voltage, V_{RGM}	5V
Average Gate Power, $P_{\text{G(AV)}}$	1.5W
Peak Gate Power, P_{GM}	60W
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 (Repetitive, Gate Drive 20V, 20Ω with $t_r \leq 1\mu\text{s}$), di/dt ..	500A/ μs
Peak On-State Voltage ($I_{\text{TM}} = 600\text{A}$), V_{TM}	1.96V
Forward Conduction Threshold Voltage, V_{O}	1.4V
Forward Conduction Slope Resistance, r	0.937m Ω
Repetitive Peak Off-State Current (At Rated V_{DRM}), I_{DRM}	30mA
Repetitive Peak Reverse Current (At Rated V_{RRM}), I_{RRM}	30mA
Maximum Gate Current Required to Fire All Devices ($T_J = +25^\circ\text{C}$, $V_{\text{A}} = 6\text{V}$, $I_{\text{A}} = 1\text{A}$), I_{GT} ..	200mA
Maximum Gate Voltage Required to Fire All Devices ($T_J = +25^\circ\text{C}$, $V_{\text{A}} = 6\text{V}$, $I_{\text{A}} = 1\text{A}$), V_{GT}	3V

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

Maximum Holding Current ($T_J = +25^\circ\text{C}$, $V_A = 6\text{V}$, $I_A = 1\text{A}$), I_H 600mA

Maximum Gate Voltage Which Will Not Trigger Any Device, V_{GD} 0.25V

Typical Stored Charge ($I_{TM} = 300\text{A}$, $\text{dir}/\text{dt} = 20\text{A}/\mu\text{s}$, $V_{RM} = 50\text{V}$, 50% Chord Value), Q_{rr} 50 μC

Maximum Circuit Commutated Turn-Off Time, t_q
 ($I_{TM} = 300\text{A}$, $\text{dir}/\text{dt} = 20\text{A}/\mu\text{s}$, $\text{dv}/\text{dt} = 200\text{V}/\mu\text{s}$ to 80% V_{DRM}) 30 – 40 μs

Typical Circuit Commutated Turn-Off Time, t_q
 ($I_{TM} = 300\text{A}$, $\text{dir}/\text{dt} = 20\text{A}/\mu\text{s}$, $\text{dv}/\text{dt} = 20\text{V}/\mu\text{s}$ to 80% V_{DRM}) 25 – 35 μs

Operating Temperature Range, T_{HS} -40° to $+125^\circ\text{C}$

Storage Temperature Range, T_{stg} -40° to $+150^\circ\text{C}$

Thermal Resistance, Junction-to-Case, R_{thJC} 0.04/W

