



ELECTRONICS, INC.  
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## NTE5371 & NTE5372 Silicon Controlled Rectifier (SCR) 125 Amp

**Features:**

- All Diffused Design
- Center Amplifying Gate
- High Surge Current Capability
- Low Thermal Impedance
- High Speed Performance

**Applications:**

- Inverters
- Choppers
- Induction Heating
- All Types of Force-Commutated Converters

**Maximum Ratings and Electrical Characteristics:**

Max. Repetitive Peak Voltages, $V_{RRM}$ , $V_{DRM}$	
NTE5371 .....	600V
NTE5372 .....	1200V
Max. Non-Repetitive Peak Voltage, $V_{RSM}$	
NTE5371 .....	700V
NTE5372 .....	1300V
Average On-State Current (180° Conduction, Half Sine Wave, $T_C = +85^\circ\text{C}$ ), $I_{T(AV)}$ .....	
85A	
Max. RMS On-State Current (DC at $T_C = +77^\circ\text{C}$ ), $I_{T(RMS)}$ .....	
135A	
Max. Peak One Half-Cycle Non-Repetitive Surge Current ( $T_J = +125^\circ\text{C}$ , Sinusoidal Half Wave), $I_{TSM}$	
(No Voltage Reapplied)	
(t = 10ms) .....	2450A
(t = 8.3ms) .....	2560A
(100% $V_{RRM}$ Reapplied)	
(t = 10ms) .....	2060A
(t = 8.3ms) .....	2160A
Max. Permissible Surge Energy ( $T_J = +125^\circ\text{C}$ , Sinusoidal Half Wave), $I^2t$	
(No Voltage Reapplied)	
(t = 10ms) .....	30KA <sup>2</sup> s
(t = 8.3ms) .....	27KA <sup>2</sup> s
(100% $V_{RRM}$ Reapplied)	
(t = 10ms) .....	21KA <sup>2</sup> s
(t = 8.3ms) .....	19KA <sup>2</sup> s

### **Maximum Ratings and Electrical Characteristics (Cont'd):**

Max. $I^2t$ for Fusing ( $t = 0.1$ to $10\text{ms}$ , No Voltage Reapplied), $I^2t$ .....	$300\text{KA}^2/\text{s}$
Max. Peak On-State Voltage ( $I_{\text{TM}} = 300\text{A}$ , $T_{\text{J}} = +125^\circ\text{C}$ , $t_{\text{p}} = 10\text{ms}$ Sine Wave Pulse), $V_{\text{TM}}$ ...	$2.15\text{V}$
Threshold Voltage ( $T_{\text{J}} = +125^\circ\text{C}$ ), $V_{\text{T(TO)}}$	
Low Level ( $16.7\% \times \pi \times I_{\text{T(AV)}} < I < \pi \times I_{\text{T(AV)}}$ ) .....	$1.46\text{V}$
High Level ( $I > \pi \times I_{\text{T(AV)}}$ ) .....	$1.52\text{V}$
Forward Slope Resistance ( $T_{\text{J}} = +125^\circ\text{C}$ ), $r_{\text{f}}$	
Low Level ( $16.7\% \times \pi \times I_{\text{T(AV)}} < I < \pi \times I_{\text{T(AV)}}$ ) .....	$2.32\Omega$
High Level ( $I > \pi \times I_{\text{T(AV)}}$ ) .....	$2.34\Omega$
Max. Holding Current ( $T_{\text{J}} = +25^\circ\text{C}$ , $I_{\text{T}} > 30\text{A}$ ), $I_{\text{H}}$ .....	$600\text{mA}$
Typical Latching Current ( $T_{\text{J}} = +25^\circ\text{C}$ , $V_{\text{A}} = 12\text{V}$ , $R_{\text{a}} = 6\Omega$ , $I_{\text{G}} = 1\text{A}$ ), $I_{\text{L}}$ .....	$1000\text{mA}$
Max. Non-Repetitive Rate of Rise of On-State Current ( $T_{\text{J}} = +25^\circ\text{C}$ , $V_{\text{DRM}} = \text{Rated } V_{\text{DRM}}$ ), $di/dt$ ( $I_{\text{TM}} = I_{\text{TM}} = 2 \times di/dt$ ) .....	$1000\text{A}/\mu\text{s}$
Typical Delay Time ( $T_{\text{J}} = +125^\circ\text{C}$ , $V_{\text{DRM}} = \text{Rated } V_{\text{DRM}}$ ), $t_{\text{d}}$ ( $I_{\text{TM}} = 50\text{A DC}$ , $t_{\text{p}} = 1\mu\text{s}$ , Resistive Load, Gate Pulse: $10\text{V}$ , $5\Omega$ Source) .....	$0.80\mu\text{s}$
Max. Turn-Off Time, $t_{\text{q}}$ ( $T_{\text{J}} = +125^\circ\text{C}$ , $I_{\text{TM}} = 100\text{A}$ , Commutating $di/dt = 10\text{A}/\mu\text{s}$ , $V_{\text{R}} = 50\text{V}$ , $t_{\text{p}} = 200\mu\text{s}$ )	
NTE5371 .....	$10$ to $20\mu\text{s}$
NTE5372 .....	$15$ to $30\mu\text{s}$
Max. Critical Rate of Rise of Off-State Voltage, $dv/dt$ ( $T_{\text{J}} = +125^\circ\text{C}$ , Linear To $80\% V_{\text{DRM}}$ ) .....	$500\text{V}/\mu\text{s}$
Max. Peak Reverse and Off-State Leakage Current, $I_{\text{RRM}}$ , $I_{\text{DRM}}$ ( $T_{\text{J}} = +125^\circ\text{C}$ , Rated $V_{\text{DRM}}/V_{\text{RRM}}$ Applied) .....	$30\text{mA}$
Max. Peak Gate Power ( $T_{\text{J}} = +125^\circ\text{C}$ , $f = 50\text{Hz}$ , $d\% = 50$ ), $P_{\text{GM}}$ .....	$40\text{W}$
Max. Average Gate Power ( $T_{\text{J}} = +125^\circ\text{C}$ , $f = 50\text{Hz}$ , $d\% = 50$ ), $P_{\text{G(AV)}}$ .....	$5\text{W}$
Max. Peak Positive Gate Current ( $T_{\text{J}} = +125^\circ\text{C}$ , $t_{\text{p}} \leq 5\text{ms}$ ), $I_{\text{GM}}$ .....	$5\text{A}$
Max. Peak Gate Voltage ( $T_{\text{J}} = +125^\circ\text{C}$ , $t_{\text{p}} \leq 5\text{ms}$ ), $V_{\text{GM}}$	
Positive .....	$20\text{V}$
Negative .....	$5\text{V}$
Max. DC Gate Current Required to Trigger ( $T_{\text{J}} = +25^\circ\text{C}$ , $V_{\text{A}} = 12\text{V}$ , $R_{\text{a}} = 6\Omega$ ), $I_{\text{GT}}$ .....	$200\text{mA}$
Max. DC Gate Voltage Required to Trigger ( $T_{\text{J}} = +25^\circ\text{C}$ , $V_{\text{A}} = 12\text{V}$ , $R_{\text{a}} = 6\Omega$ ), $V_{\text{GT}}$ .....	$3\text{V}$
Max. DC Gate Current not to Trigger ( $T_{\text{J}} = +125^\circ\text{C}$ , Rated $V_{\text{DRM}}$ Applied), $I_{\text{GD}}$ .....	$20\text{mA}$
Max. DC Gate Voltage not to Trigger ( $T_{\text{J}} = +125^\circ\text{C}$ , Rated $V_{\text{DRM}}$ Applied), $V_{\text{GD}}$ .....	$250\text{mV}$
Maximum Operating Temperature Range, $T_{\text{J}}$ .....	$-40^\circ$ to $+125^\circ\text{C}$
Maximum Storage Temperature Range, $T_{\text{stg}}$ .....	$-40^\circ$ to $+150^\circ\text{C}$
Maximum Thermal Resistance, Junction-to-Case (DC Operation), $R_{\text{thJC}}$ .....	$0.195\text{K/W}$
Maximum Thermal Resistance, Case-to-Heatsink, $R_{\text{thCS}}$ (Mounting Surface Smooth, Flat and Greased) .....	$0.08\text{K/W}$

