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## NTE5461 thru NTE5468 Silicon Controlled Rectifier (SCR) 10 Amp, TO220

**Description:**

The NTE5461 through NTE5468 series silicon controlled rectifiers are designed primarily for half-wave AC control applications such as motor controls, heating controls, and power supplies; or wherever half-wave silicon gate-controlled, solid-state devices are needed. These devices are supplied in a TO220 type package.

**Features:**

- Glass Passivated Junctions and Center Gate Fire for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation, and Durability
- Blocking Voltage to 800 Volts

**Absolute Maximum Ratings:**

Peak Repetitive Reverse Voltage; Peak Repetitive Off-State Voltage (Note 1), $V_{RRM}$ , $V_{DRM}$	
NTE5461 .....	50V
NTE5462 .....	100V
NTE5463 .....	200V
NTE5465 .....	400V
NTE5466 .....	600V
NTE5468 .....	800V
Non-Repetitive Peak Reverse Voltage; Non-Repetitive Off-State Voltage, $V_{RSM}$ , $V_{DSM}$	
NTE5461 .....	75V
NTE5462 .....	125V
NTE5463 .....	250V
NTE5465 .....	500V
NTE5466 .....	700V
NTE5468 .....	900V
RMS Forward Current (All Conducting Angles, $T_C = +75^\circ\text{C}$ ), $I_{T(RMS)}$ .....	
10A	
Peak Forward Surge Current (1 Cycle, Sine Wave, 60Hz, $T_C = +80^\circ\text{C}$ ), $I_{TSM}$ .....	
100A	
Circuit Fusing Considerations ( $T_J = -65^\circ$ to $+100^\circ\text{C}$ , $t = 1$ to $8.3\text{ms}$ ), $I^2t$ .....	
40A <sup>2</sup> s	
Forward Peak gate Power ( $t \leq 10\mu\text{s}$ ), $P_{GM}$ .....	
16W	
Forward Average Gate Power, $P_{G(AV)}$ .....	
500mW	
Operating Junction Temperature Range, $T_J$ .....	
$-40^\circ$ to $+100^\circ\text{C}$	
Storage Temperature Range, $T_{stg}$ .....	
$-40^\circ$ to $+150^\circ\text{C}$	
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	
$2^\circ\text{C/W}$	

Note 1.  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous DC basis without incurring damage. Ratings apply for zero or negative gate voltage. Devices shall not have a positive bias applied to the gate concurrently with a negative potential on the anode.

**Electrical Characteristics:** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Peak Forward or Reverse Blocking Current	$I_{DRM}$ , $I_{RRM}$	Rated $V_{DRM}$ or $V_{RRM}$	$T_C = +25^\circ\text{C}$	-	-	10	$\mu\text{A}$
			$T_C = +100^\circ\text{C}$	-	-	2	$\text{mA}$
Instantaneous On-State Voltage	$V_T$	$I_{TM} = 30A_{(Peak)}$ , Pulse Width $\leq 1\text{ms}$ , Duty Cycle $\leq 2\%$	-	1.7	2.0	V	
Gate Trigger Current (Continuous DC)	$I_{GT}$	$V_D = 12\text{V}$ , $R_L = 30\Omega$	-	8	15	$\text{mA}$	
Gate Trigger Voltage (Continuous DC)	$V_{GT}$	$V_D = 12\text{V}$ , $R_L = 30\Omega$	-	0.9	1.5	V	
Holding Current	$I_H$	Gate Open, $V_D = 12\text{V}$ , $I_T = 150\text{mA}$	-	10	20	$\text{mA}$	
Gate Controlled Turn-On Time	$t_{gt}$	$V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 2\text{A}$ , $I_{GR} = 80\text{mA}$	-	1.6	-	$\mu\text{s}$	
Circuit Commutated Turn-Off Time	$t_q$	$V_D = V_{DRM}$ , $I_{TM} = 2\text{A}$ , Pulse Width = $50\mu\text{s}$ , $dv/dt = 200\text{V}/\mu\text{s}$ , $di/dt = 10\text{A}/\mu\text{s}$ , $T_C = +75^\circ\text{C}$	-	25	-	$\mu\text{s}$	
Critical Rate-of-Rise of Off-State Voltage	$dv/dt$	$V_D = \text{Rated } V_{DRM}$ , Exponential Rise, $T_C = +100^\circ\text{C}$	-	100	-	$\text{V}/\mu\text{s}$	

