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, \( T_C = +75\,^\circ C \)), \( I_{T(RMS)} \) .............................. 10A

Peak Forward Surge Current (1 Cycle, Sine Wave, 60Hz, \( T_C = +80\,^\circ C \)), \( I_{TSM} \) ......................... 100A

Circuit Fusing Considerations (\( T_J = -65\,^\circ C \) to +100\,^\circ C, \( t = 1 \) to 8.3ms), \( I^2t \) ...................... 40A^2s

Forward Peak gate Power (\( t \leq 10\mu s \)), \( P_{GM} \) ................................. 16W

Forward Average Gate Power, \( P_{G(AV)} \) .......................... 500mW

Operating Junction Temperature Range, \( T_J \) ........................................... -40\,^\circ C \) to +100\,^\circ C

Storage Temperature Range, \( T_{stg} \) ........................................... -40\,^\circ C \) to +150\,^\circ C

Thermal Resistance, Junction–to–Case, \( R_{thJC} \) ........................................... 2\,^\circ 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:**  \((T_C = +25^\circ C\) unless otherwise specified)

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

**Diagram:**

- Anode
- Cathode
- Gate
- Diode

Dimensions:
- .147 (3.75) Dia Max
- .420 (10.67) Max
- .100 (2.54)
- .250 (6.35) Max
- .110 (2.79)
- .500 (12.7) Max
- .070 (1.78) Max
- .050 (12.7) Min
- .500 (12.7) Min