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## NTE5381 Silicon Controlled Rectifier (SCR) for High Speed Switching, 1200V, 400 Amp, TO200AB

**Features:**

- High di/dt with Soft Gate Control
- High Frequency Operation
- Low Dynamic Forward Voltage Drop
- Low Switching Losses at High Frequency

**Applications:**

- Inverters for UPS, Induction Heating, and Motor Control
- Choppers
- Crowbars

**Voltage: Blocking State Maximums** ( $T_J = +125^\circ\text{C}$ , Note 1 unless otherwise specified)

Repetitive Peak Forward Blocking Voltage, $V_{DRM}$ .....	1200V
Repetitive Peak Reverse Voltage, $V_{RRM}$ .....	1200V
Non-Repetitive Transient Peak Reverse Voltage ( $t \leq 5.0$ msec), $V_{RSM}$ .....	1300V
Peak Forward Leakage Current, $I_{DRM}$ .....	25mA
Peak Reverse Leakage Current, $I_{RRM}$ .....	25mA

**Current: Conducting State Maximums** ( $T_J = +125^\circ\text{C}$  unless otherwise specified)

RMS Forward Current, $I_{T(RMS)}$ .....	400A
Average Forward Current, $I_{T(AV)}$ .....	250A
One-Half Cycle Surge Current, $I_{TSM}$ .....	4500A
$I^2t$ for Fusing (for times $\geq 8.3$ ms), $I^2t$ .....	84,000A <sup>2</sup> sec
Forward Voltage Drop ( $I_{TM} = 625$ A, $T_J = +25^\circ\text{C}$ ), $V_{TM}$ .....	1.85V
Minimum Repetitive Rate of Rise of Turned-On Current (Note 2), di/dt .....	300A/ $\mu$ s

**Switching:** ( $T_J = +25^\circ\text{C}$  unless otherwise specified)

Maximum Turn-Off Time, $t_q$ ( $I_T = 150$ A, $di_R/dt = 12.5$ A/ $\mu$ s, Reapplied $dv/dt = 20$ V/ $\mu$ s. Linear to $0.8V_{DRM}$ ) ...	10 to 50 $\mu$ s
Typical Turn-On Time ( $I_T = 100$ A, $V_D = 100$ V, Note 2), $t_{on}$ .....	3.5 $\mu$ s
Minimum Critical Rate of Rise of Off-State Voltage, $dv/dt$ (Exponential to $V_{DRM}$ , $T_J = +125^\circ\text{C}$ ) .....	300V/ $\mu$ s
Minimum Rate of Rise of Turned-On Current (Note 2), di/dt .....	800A/ $\mu$ s

Note 1. Applies for zero or negative gate bias.

Note 2. With recommended gate drive.

**Gate: Maximum Parameters** ( $T_J = +25^\circ\text{C}$  unless otherwise specified)

Gate Current to Trigger ( $V_D = 12\text{V}$ ), $I_{GT}$ .....	150mA
Gate Voltage to Trigger ( $V_D = 12\text{V}$ ), $V_{GT}$ .....	3V
Non-Triggering Gate Voltage ( $V_{DRM} = \text{Rated Voltage}$ , $T_J = +125^\circ\text{C}$ ), $V_{GDM}$ .....	0.15V
Peak Forward Gate Current, $I_{GTM}$ .....	4A
Peak Reverse Gate Voltage, $V_{GRM}$ .....	5V
Peak Gate Power, $P_{GM}$ .....	16W
Average Gate Power, $P_{G(AV)}$ .....	3W

**Thermal and Mechanical:**

Maximum Operating Temperature Range, $T_J$ .....	$-40^\circ$ to $+125^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-40^\circ$ to $+150^\circ\text{C}$
Max Thermal Resistance, Junction-to-Heatsink (Double Side Cooled), $R_{thJC}$ .....	$0.08^\circ\text{C/W}$
Max Thermal Resistance, Case-to-Heatsink (Double Side Cooled, Lubricated), $R_{thCS}$ ..	$0.02^\circ\text{C/W}$
Mounting Torque Range, F .....	1000 to 1400lb.

