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NTE5442 thru NTE5448 Silicon Controlled Rectifier (SCR) 8 Amp

Description:

The NTE5442 thru NTE5448 are silicon controlled rectifiers (SCR's) in a TO127 type package designed for high-volume consumer phase-control applications such as motor speed, temperature, and light controls, and for fast switching applications in ignition and starting systems, voltage regulators, vending machines, and lamp drivers.

Features:

- Small, Rugged Construction
- Practical Level Triggering and Holding Characteristics @ +25°C:
 $I_{GT} = 7\text{mA Typ}$
 $I_{Hold} = 6\text{mA Typ}$
- Low "ON" Voltage: $V_{TM} = 1\text{V Typ @ } 5\text{A @ } +25^\circ\text{C}$
- High Surge Current Rating: $I_{TSM} = 80\text{A}$

Absolute Maximum Ratings: (Note 1, $T_J = +100^\circ\text{C}$ unless otherwise specified)

Peak Repetitive Forward and Reverse Blocking Voltage (Note 2), V_{DRM} or V_{RRM}	
NTE5442	50V
NTE5444	200V
NTE5446	400V
NTE5448	600V
Non-Replicative Peak Reverse Blocking Voltage ($t = 5\text{ms (max) duration}$), V_{RSM}	
NTE5442	75V
NTE5444	300V
NTE5446	500V
NTE5448	700V
RMS On-State Current (All Conduction Angles), $I_{T(RMS)}$	8A
Average On-State Current ($T_C = +73^\circ\text{C}$), $I_{T(AV)}$	5.1A
Peak Non-Replicative Surge Current, I_{TSM}	
(1/2 cycle, 60Hz preceeded and followed by rated current and voltage)	80A
Circuit Fusing ($T_J = -40^\circ$ to $+100^\circ\text{C}$, $t = 1\text{ms to } 8.3\text{ms}$), I^2t	25A ² sec
Peak Gate Power, P_{GM}	5W
Average Gate Power, $P_{G(AV)}$	500mW
Peak Forward Gate Current, I_{GM}	2A
Peak Reverse Gate Voltage, V_{RGM}	10V
Operating Junction Temperature Range, T_J	-40° to +100°C
Storage Temperature Range, T_{stg}	-40° to +150°C
Maximum Thermal Resistance, Junction-to-Case, R_{thJC}	2.5°C/W
Typical Thermal Resistance, Junction-to-Ambient, R_{thJA}	40°C/W

- Note 1. **NTE5444** and **NTE5446** are **discontinued** devices and are replaced by **NTE5448**.
- Note 2. Ratings apply for zero or negative gate voltage but positive gate voltage shall not be applied concurrently with a negative potential on the anode. When checking forward or reverse blocking capability, thyristor devices should not be tested with a constant current source in a manner that the voltage applied exceeds the rated blocking voltage.

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} , Gate Open	$T_J = +25^\circ\text{C}$	-	-	10	μA
			$T_J = +100^\circ\text{C}$	-	-	2	mA
Gate Trigger Current (Continuous DC)	I_{GT}	$V_D = 7\text{V}, R_L = 100\Omega$	$T_C = +25^\circ\text{C}$	-	7	30	mA
			$T_C = -40^\circ\text{C}$	-	-	60	mA
Gate Trigger Voltage (Continuous DC)	V_{GT}	$V_D = 7\text{V}, R_L = 100\Omega$	$T_C = +25^\circ\text{C}$	-	0.75	1.5	V
			$T_C = -40^\circ\text{C}$	-	-	2.5	V
		$V_D = \text{Rated } V_{DRM}, R_L = 100\Omega, T_J = +100^\circ\text{C}$	0.2	-	-	V	
Peak On-State Voltage	V_{TM}	Pulse Width = 1ms to 2 ms, Duty Cycle $\leq 2\%$	$I_{TM} = 5A_{peak}$	-	1.0	1.5	V
			$I_{TM} = 15.7A_{peak}$	-	-	2.0	V
Holding Current	I_{Hold}	$V_D = 7\text{V}, \text{Gate Open}$	$T_C = +25^\circ\text{C}$	-	6	40	mA
			$T_C = -40^\circ\text{C}$	-	-	70	mA
Gate Controlled Turn-On Time	t_{gt}	$I_{TM} = 5\text{A}, I_{GT} = 20\text{mA}, V_D = \text{Rated } V_{DRM}$	-	1	-	μs	
Circuit Commutated Turn-Off Time	t_q	$I_{TM} = 5\text{A}, I_R = 5\text{A}$	-	15	-	μs	
			$T_J = +100^\circ\text{C}$	-	20	-	μs
Critical Rate-of-Rise of Off-State Voltage	dv/dt	$V_D = \text{Rated } V_{DRM}, \text{Exponential Waveform}, T_J = +100^\circ\text{C}, \text{Gate Open}$	-	50	-	$\text{V}/\mu\text{s}$	

