

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-Repetitive 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-Repetitive 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 $+100^\circ\text{C}$	
Storage Temperature Range, T_{stg}	
-40° to $+150^\circ\text{C}$	
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. **NTE5446** is a **discontinued** device and is 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	$I_{\text{DRM}}, I_{\text{RRM}}$	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
		$V_D = \text{Rated } V_{\text{DRM}}, R_L = 100\Omega, T_J = +100^\circ\text{C}$	0.2	-	-	V
Peak On-State Voltage	V_{TM}	Pulse Width = 1ms to 2 ms, Duty Cycle $\leq 2\%$	$I_{\text{TM}} = 5A_{\text{peak}}$	-	1.0	1.5 V
			$I_{\text{TM}} = 15.7A_{\text{peak}}$	-	-	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}	$I_{\text{TM}} = 5\text{A}, I_{\text{GT}} = 20\text{mA}, V_D = \text{Rated } V_{\text{DRM}}$	-	1	-	μs
Circuit Commutated Turn-Off Time	t_q	$I_{\text{TM}} = 5\text{A}, I_R = 5\text{A}$		-	15	μs
			$T_J = +100^\circ\text{C}$	-	20	μs
Critical Rate-of-Rise of Off-State Voltage	dv/dt	$V_D = \text{Rated } V_{\text{DRM}}, \text{Exponential Waveform}, T_J = +100^\circ\text{C}, \text{Gate Open}$	-	50	-	$\text{V}/\mu\text{s}$

