

NTE314 Silicon Controlled Rectifier (SCR) Power Regulator Switch

Description:

The NTE314 is a silicon controlled rectifier (SCR) in a TO3 type package designed for 12.5 Ampere RMS, 400 Volt power supply and computer control applications to +100°C maximum junction.

Features:

- Low Forward "ON" Voltage
- All Diffused Junctions for Greater Parameter Uniformity
- Glass Passivated for Greater Stability

Absolute Maximum Ratings:

Peak Repetitive Forward and Reverse Blocking Voltage (Note 1), V_{DRM} , V_{RRM} 400V
 RMS Forward Current ($T_C = +80^\circ\text{C}$, All Conduction Angles), $I_{T(RMS)}$ 12.5A
 Peak Forward Surge Current (1/2 Cycle Sine Wave, 60Hz, $T_J = -40^\circ$ to $+100^\circ\text{C}$), I_{TSM} 200A
 Fusing Current ($T_J = -40^\circ$ to $+100^\circ\text{C}$, $t = 1$ to 8.3ms), I^2t 170A²s
 Forward Peak Gate Power, P_{GM} 5W
 Forward Average Gate Power, $P_{G(AV)}$ 0.5W
 Forward Peak Gate Current, I_{GM} 2A
 Peak Forward Gate Voltage, V_{GF} 19V
 Peak Reverse Gate Voltage, V_{GR} 5V
 Operating Junction Temperature Range, T_J -40° to $+100^\circ\text{C}$
 Storage Temperature Range, T_{stg} -40° to $+125^\circ\text{C}$
 Thermal Resistance, Junction-to-Case, R_{thJC} 1.7°C/W

Note 1. V_{DRM} and V_{RRM} can be applied on a continuous DC basis without incurrent damage. Ratings apply for zero or negative gate voltage. Devices should not be tested for blocking capability in a manner such that the voltage supplied exceeds the rated blocking voltage.

Electrical Characteristics: ($V_D = 400\text{V}$, $T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Peak Forward Blocking Current	I_{DRM}	$T_J = +100^\circ\text{C}$	-	-	3	mA
		$T_J = +25^\circ\text{C}$	-	-	10	μA
Peak Reverse Blocking Current	I_{RRM}	$T_J = +100^\circ\text{C}$	-	-	1.5	mA
		$T_J = +25^\circ\text{C}$	-	-	10	μA

Electrical Characteristics (Cont'd): ($V_D = 400V$, $T_C = +25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward "ON" Voltage	V_{TM}	$I_{TM} = 25A$ Peak, Note 2	–	1.1	1.8	V
Gate Trigger Current (Continuous DC)	I_{GT}	$V_D = 12V$, $R_L = 24\Omega$, $T_J = +25^\circ C$	–	7	40	mA
		$V_D = 12V$, $R_L = 24\Omega$, $T_J = -40^\circ C$	–	–	80	mA
Gate Trigger Voltage (Continuous DC)	V_{GT}	$V_D = 12V$, $R_L = 24\Omega$, $T_J = -40^\circ C$	–	1	3	V
		$V_D = 12V$, $R_L = 24\Omega$, $T_J = +25^\circ C$	–	0.68	2	V
		$V_D = 12V$, $R_L = 24\Omega$, $T_J = +100^\circ C$	0.3	–	–	V
Holding Current	I_H	$V_D = 12V$, $I_T = 0.5A$	–	20	50	mA
Turn-On Time	t_{gt}	$I_{TM} = 8A$, $I_G = 0.2A$, $t_r = 100ns$	–	0.5	–	μs
Turn-Off Time	t_q	$I_{TM} = 8A$, $I_G = 0.2A$, $dv/dt = 20V/\mu s$, $di/dt = 30A/\mu s$, $T_C = +80^\circ C$, Pulse Width $\leq 50\mu s$	–	20	–	μs
Forward Voltage Application Rate Exponential	dv/dt	$T_C = +100^\circ C$	10	100	–	$V/\mu s$

Note 2. Pulse test: Pulse Width $\leq 1ms$, Duty Cycle $\leq 1\%$.

