

## 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),  $I^2t$  ..... 170A<sup>2</sup>s  
 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,  $T_J$  .....  $-40^\circ$  to  $+100^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-40^\circ$  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:** ( $V_D = 400V$ ,  $T_C = +25^\circ\text{C}$  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	–	$\mu s$
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	–	$\mu s$
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  $\leq 1\%$ .

