

NTE5411 thru NTE5416

Silicon Controlled Rectifier (SCR)

4 Amp, Sensitive Gate

Description:

The NTE5411 through NTE5416 are PNP silicon controlled rectifier (SCR) devices designed for high volume consumer applications such as temperature, light, and speed control: process and remote control, and warning systems where reliability of operation is important.

Features:

- Passivated Surface for Reliability and Uniformity
- Power Rated at Economical Prices
- Practical Level Triggering and Holding Characteristics

Absolute Maximum Ratings: ($T_C = +110^\circ\text{C}$ unless otherwise specified)

Repetitive Peak Forward and Reverse Blocking Voltage, V_{DRM} , V_{RRM}

(1/2 Sine Wave, $R_{GK} = 1000\Omega$, $T_C = -40^\circ$ to $+110^\circ\text{C}$, Note 1)

NTE5411	30V
NTE5412	60V
NTE5413	100V
NTE5414	200V
NTE5415	400V
NTE5416	600V

Non-Repetitive Peak Reverse Blocking Voltage, V_{RSM}

(1/2 Sine Wave, $R_{GK} = 1000\Omega$, $T_C = -40^\circ$ to $+110^\circ\text{C}$)

NTE5411	100V
NTE5412	100V
NTE5413	150V
NTE5414	250V
NTE5415	450V
NTE5416	650V

Average On-State Current, $I_{T(AV)}$

$T_C = -40^\circ$ to $+110^\circ\text{C}$	2.6A
$T_C = +100^\circ\text{C}$	1.6A

Surge On-State Current ($T_C = +90^\circ\text{C}$), I_{TSM}

1/2 Sine wave, 60Hz	25A
1/2 Sine wave, 1.5ms	35A

Circuit Fusing ($t = 8.3\text{ms}$), I^2t

Peak Gate Power (Pulse Width = $10\mu\text{s}$, $T_C = +90^\circ\text{C}$), P_{GM}

Note 1. Ratings apply for zero or negative gate voltage. Devices shall not have a positive bias applied to the gate concurrently with a negative potential on the anode. Devices should not be tested with a constant current source for forward or reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.

Absolute Maximum Ratings (Cont'd): ($T_C = +110^\circ\text{C}$ unless otherwise specified)

Average Gate Power ($t = 8.2\text{ms}$, $T_C = +90^\circ\text{C}$), $P_{G(AV)}$	0.1W
Peak Forward Gate Current, I_{GM}	0.2A
Peak Reverse Gate Voltage, V_{RGM}	6V
Operating Junction Temperature Range, T_J	-40° to $+110^\circ\text{C}$
Storage Temperature Range, T_{stg}	-40° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	3°C/W
Thermal Resistance, Junction-to-Ambient, R_{thJA}	75°C/W
Mounting Torque (Note 2)	6 in. lb.

Note 2. Torque rating applies with the use of a compression washer. Mounting torque in excess of 6 in. lb. does not appreciably lower case-to-sink thermal resistance. Anode lead and heat-sink contact pad are common.

Electrical Characteristics: ($T_C = +25^\circ\text{C}$, $R_{GK} = 1000\Omega$ 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} , $T_C = +25^\circ\text{C}$	—	—	10	μA
		Rated V_{DRM} or V_{RRM} , $T_C = +110^\circ\text{C}$	—	—	200	μA
Peak Forward "ON" Voltage	V_{TM}	$I_{TM} = 8.2\text{A}$ Peak, Note 3	—	—	2.2	V
Gate Trigger Current (Continuous DC, Note 4)	I_{GT}	$V_{AK} = 12\text{V}$, $R_L = 24\Omega$	—	—	200	μA
		$V_{AK} = 12\text{V}$, $R_L = 24\Omega$, $T_C = -40^\circ\text{C}$	—	—	500	μA
Gate Trigger Voltage (Continuous DC)	V_{GT}	Source Voltage = 12V, $R_S = 50\Omega$, $V_{AK} = 12\text{V}$, $R_L = 24\Omega$, $T_C = -40^\circ\text{C}$	—	—	1	V
Gate Non-Trigger Voltage	V_{GD}	$V_{AK} = \text{Rated } V_{DRM}$, $R_L = 100\Omega$, $T_C = +110^\circ\text{C}$	0.2	—	—	V
Holding Current	I_H	$V_{AK} = 12\text{V}$, $I_{GT} = 2\text{mA}$, $T_C = +25^\circ\text{C}$	—	—	5	mA
		Initiating On-State Current = 200mA, $T_C = -40^\circ\text{C}$	—	—	10	mA
Total Turn-On Time	t_{gt}	Source Voltage = 12V, $R_S = 6k\Omega$, $I_{TM} = 8.2\text{A}$, $I_{GT} = 2\text{mA}$, Rated V_{DRM} , Rise Time = 20ns, Pulse Width = 10 μs	—	2	—	μs
Forward Voltage Application Rate	dv/dt	$V_D = \text{Rated } V_{DRM}$, $T_C = +110^\circ\text{C}$	—	10	—	V/ μs

Note 3. Pulse Width = 1ms to 2ms, Duty Cycle = 2%.

Note 4. Measurement does not include R_{GK} current.

