

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

2.6A²s

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

0.5W

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, $R_S = 6\text{k}\Omega$, $I_{TM} = 8.2\text{A}$, $I_{GT} = 2\text{mA}$, 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.

