



## NTE5906, NTE5907, NTE5980 thru NTE6005 Silicon Power Rectifier Diode, 40 Amp

### Features:

- High Surge Current Capability
- High Voltage Available
- Designed for a Wide Range of Applications
- Available in Anode-to-Case or Cathode-to-Case Style

### Ratings and Characteristics:

|                                                                               |                                |
|-------------------------------------------------------------------------------|--------------------------------|
| Average Forward Current ( $T_C = +140^\circ\text{C Max}$ ), $I_{F(AV)}$ ..... | 40A                            |
| Maximum Forward Surge Current, $I_{FSM}$                                      |                                |
| 50Hz .....                                                                    | 480A                           |
| 60Hz .....                                                                    | 500A                           |
| Fusing Current, $I^2t$                                                        |                                |
| 50Hz .....                                                                    | 1150A <sup>2</sup> s           |
| 60Hz .....                                                                    | 1050A <sup>2</sup> s           |
| Fusing Current, $I^2\sqrt{t}$ .....                                           | 16000A <sup>2</sup> $\sqrt{s}$ |
| Maximum Reverse Recovery Voltage Range, $V_{RRM}$ .....                       | 50 to 1600V                    |

### Voltage Ratings:

| NTE Type Number    |                  | $V_{RRM}$ -Max<br>Repetitive Peak<br>Reverse Volt.<br>(V) | $V_{RSM}$ -Max<br>Non-Replicative Peak<br>Reverse Voltage<br>(V) $t_p < 5\text{ms}$ | $V_R$ -Max.<br>Direct Reverse<br>Voltage<br>(V)  | $V_{R(SR)}$<br>Minimum Avalanche<br>Voltage<br>(V) | $I_{RM}$ -Max<br>Reverse Current<br>Rated $V_{RRM}$<br>(mA) |
|--------------------|------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------|
| Cathode<br>to Case | Anode<br>to Case | $T_J = -65^\circ \text{ to } +150^\circ\text{C}$          | $T_J = +25^\circ \text{ to } +150^\circ\text{C}$                                    | $T_J = -65^\circ \text{ to } +150^\circ\text{C}$ | $T_J = +25^\circ\text{C}$                          | $T_J = +150^\circ\text{C}$                                  |
| 5980               | 5981             | 50                                                        | 100                                                                                 | 50                                               | —                                                  | 15                                                          |
| 5982               | 5983             | 100                                                       | 200                                                                                 | 100                                              | —                                                  | 15                                                          |
| 5986               | 5987             | 200                                                       | 300                                                                                 | 200                                              | —                                                  | 15                                                          |
| 5988               | 5989             | 300                                                       | 450                                                                                 | 300                                              | —                                                  | 15                                                          |
| 5990               | 5991             | 400                                                       | 500                                                                                 | 400                                              | 500                                                | 15                                                          |
| 5992               | 5993             | 500                                                       | 600                                                                                 | 500                                              | 600                                                | 9                                                           |
| 5994               | 5995             | 600                                                       | 720                                                                                 | 600                                              | 725                                                | 9                                                           |
| 5998               | 5999             | 800                                                       | 960                                                                                 | 800                                              | 960                                                | 9                                                           |
| 6002               | 6003             | 1000                                                      | 1200                                                                                | 1000                                             | 1150                                               | 9                                                           |
| 5906               | 5907             | 1200                                                      | 1400                                                                                | 1200                                             | 1350                                               | 9                                                           |
| 6004               | 6005             | 1600                                                      | 1700                                                                                | 1600                                             | 1700                                               | 9                                                           |

**Electrical Specifications:**

| Parameter                                             | Symbol              | Test Conditions                                              |                                                                                          | Rating | Unit              |
|-------------------------------------------------------|---------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------|--------|-------------------|
| Maximum Average Forward Current                       | I <sub>F (AV)</sub> | 180° sinusoidal condition, T <sub>C</sub> = +140°C Max       |                                                                                          | 40     | A                 |
| Maximum Peak One–Cycle Non–Repetitive Surge Current   | I <sub>FSM</sub>    | Half cycle 50Hz sine wave or 8ms rectangular pulse           | Following any rated load condition and with rated V <sub>RRM</sub> applied               | 480    | A                 |
|                                                       |                     | Half cycle 60Hz sine wave at 5ms rectangular pulse           |                                                                                          | 500    | A                 |
|                                                       |                     | Half cycle 50Hz sine wave or 6ms rectangular pulse           | Following any rated load condition and with V <sub>RRM</sub> applied following surge = 0 | 570    | A                 |
|                                                       |                     | Half cycle 60Hz sine wave at 3ms rectangular pulse           |                                                                                          | 586    | A                 |
| Maximum I <sup>2</sup> t for Fusing                   | I <sup>2</sup> t    | t = 10ms                                                     | With rated V <sub>RRM</sub> applied following surge                                      | 1150   | A <sup>2</sup> s  |
|                                                       |                     | t = 8.3ms                                                    |                                                                                          | 1050   | A <sup>2</sup> s  |
| Maximum I <sup>2</sup> t for Individual Device Fusing |                     | t = 10ms                                                     | With V <sub>RRM</sub> = 0 following surge                                                | 1600   | A <sup>2</sup> s  |
|                                                       |                     | t = 8.3ms                                                    |                                                                                          | 1450   | A <sup>2</sup> s  |
| Maximum I <sup>2</sup> √t                             | I <sup>2</sup> √t   | t = 0.1 to 10ms, V <sub>RRM</sub> = 0 following surge        |                                                                                          | 16000  | A <sup>2</sup> √t |
| Maximum Peak Forward Voltage                          | V <sub>FM</sub>     | I <sub>F (AV)</sub> = 40A (125 peak), T <sub>J</sub> = +25°C |                                                                                          | 1.30   | V                 |
| Maximum Value of Threshold Voltage                    | V <sub>M (TO)</sub> | T <sub>J</sub> = +100°C                                      |                                                                                          | 0.69   | V                 |
| Maximum Value of Forward Slope Resistance             | r <sub>t</sub>      | T <sub>J</sub> = +100°C                                      |                                                                                          | 3.79   | mΩ                |

**Thermal–Mechanical Specifications:**

| Parameter                                            | Symbol     | Test Conditions                           | Rating                 | Unit                                                         |
|------------------------------------------------------|------------|-------------------------------------------|------------------------|--------------------------------------------------------------|
| Maximum Operation Junction Temperature               | $T_J$      |                                           | –65 to + 190           | $^\circ\text{C}$                                             |
| Maximum Storage Temperature                          | $T_{stg}$  |                                           | –65 to + 190           | $^\circ\text{C}$                                             |
| Maximum Internal Thermal Resistance Junction–to–Case | $R_{thJC}$ | DC operation                              | 1.00                   | K/W                                                          |
| Thermal Resistance, Case–to–Sink                     | $R_{thCS}$ | Mounting surface flat, smooth and greased | 0.25                   | K/W                                                          |
| Mounting Torque                                      | T          | Non–lubricated threads                    | 2.3 – 3.4<br>(20 – 30) | $\text{m}\bullet\text{N}$<br>( $\text{in}\bullet\text{lb}$ ) |
| Approximate Weight                                   | wt         |                                           | 17 (0.8)               | g (oz)                                                       |

