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## NTE5906, NTE5907, NTE5980 thru NTE6005 Silicon Power Rectifier Diode, 40 Amp, DO5

### 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,  $I_{FSM}$  ..... 480A  
     50Hz ..... 500A  
     60Hz ..... 500A  
 Fusing Current,  $I^2t$  ..... 1150A<sup>2</sup>s  
     50Hz ..... 1050A<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-Repertitive 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                     | $I_F$ (AV)          | 180° sinusoidal condition, $T_C = +140^{\circ}\text{C}$ Max       |                                                                                          | 40     | A                    |
| Maximum Peak One–Cycle Non–Repetitive Surge Current | $I_{\text{FSM}}$    | Half cycle 50Hz sine wave or 8ms rectangular pulse                | Following any rated load condition and with rated $V_{\text{RRM}}$ 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 $V_{\text{RRM}}$ applied following surge = 0 | 570    | A                    |
|                                                     |                     | Half cycle 60Hz sine wave at 3ms rectangular pulse                |                                                                                          | 586    | A                    |
| Maximum $I^2t$ for Fusing                           | $I^2t$              | $t = 10\text{ms}$                                                 | With rated $V_{\text{RRM}}$ applied following surge                                      | 1150   | $\text{A}^2\text{s}$ |
|                                                     |                     | $t = 8.3\text{ms}$                                                |                                                                                          | 1050   | $\text{A}^2\text{s}$ |
| Maximum $I^2t$ for Individual Device Fusing         |                     | $t = 10\text{ms}$                                                 | With $V_{\text{RRM}} = 0$ following surge                                                | 1600   | $\text{A}^2\text{s}$ |
|                                                     |                     | $t = 8.3\text{ms}$                                                |                                                                                          | 1450   | $\text{A}^2\text{s}$ |
| Maximum $I^2\sqrt{t}$                               | $I^2\sqrt{t}$       | $t = 0.1$ to $10\text{ms}$ , $V_{\text{RRM}} = 0$ following surge |                                                                                          | 16000  | $\text{A}^2\sqrt{t}$ |
| Maximum Peak Forward Voltage                        | $V_{\text{FM}}$     | $I_F$ (AV) = 40A (125 peak), $T_J = +25^{\circ}\text{C}$          |                                                                                          | 1.30   | V                    |
| Maximum Value of Threshold Voltage                  | $V_{\text{M}}$ (TO) | $T_J = +100^{\circ}\text{C}$                                      |                                                                                          | 0.69   | V                    |
| Maximum Value of Forward Slope Resistance           | $r_t$               | $T_J = +100^{\circ}\text{C}$                                      |                                                                                          | 3.79   | mΩ                   |

## Thermal-Mechanical Specifications:

| Parameter                                            | Symbol     | Test Conditions                           | Rating                 | Unit                               |
|------------------------------------------------------|------------|-------------------------------------------|------------------------|------------------------------------|
| Maximum Operation Junction Temperature               | $T_J$      |                                           | -65 to + 190           | $^{\circ}C$                        |
| Maximum Storage Temperature                          | $T_{stg}$  |                                           | -65 to + 190           | $^{\circ}C$                        |
| 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) | $m\bullet N$<br>( $in\bullet lb$ ) |
| Approximate Weight                                   | wt         |                                           | 17 (0.8)               | g (oz)                             |

