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## NTE392 (NPN) & NTE393 (PNP) Silicon Complementary Transistors General Purpose

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**Description:**

The NTE392 (NPN) and NTE393 (PNP) are silicon complementary transistors in a TO218 type package designed for general purpose power amplifier and switching applications.

**Features:**

- 25A Collector Current
- Low Leakage Current:  $I_{CEO} = 1\text{mA} @ V_{CE} = 60\text{V}$
- Excellent DC Gain:  $h_{FE} = 40 \text{ Typ} @ 15\text{A}$
- High Current Gain Bandwidth Product:  $h_{fe} = 3 \text{ Min} @ I_C = 1\text{A}, f = 1\text{MHz}$

**Absolute Maximum Ratings:**

|  |                                     |
|--|-------------------------------------|
| Collector–Emitter Voltage, $V_{CEO}$ .....                         | 100V                                |
| Collector–Base Voltage, $V_{CB}$ .....                             | 100V                                |
| Emitter–Base Voltage, $V_{EB}$ .....                               | 5V                                  |
| Collector Current, $I_C$   |                                     |
| Continuous .....   | 25A                                 |
| Peak (Note 1) .....  | 40A                                 |
| Continuous Base Current, $I_B$ .....                               | 5A                                  |
| Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ ..... | 125W                                |
| Derate Above $25^\circ\text{C}$ .....                              | 1W/ $^\circ\text{C}$                |
| Operating Junction Temperature Range, $T_J$ .....                  | $-65^\circ$ to $+150^\circ\text{C}$ |
| Storage Temperature Range, $T_{stg}$ .....                         | $-65^\circ$ to $+150^\circ\text{C}$ |
| Unclamped Inductive Load, $E_{SB}$ .....                           | 90mJ                                |
| Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....             | 1.0 $^\circ\text{C}/\text{W}$       |
| Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....          | 35.7 $^\circ\text{C}/\text{W}$      |

Note 1. Pulse Test: Pulse Width = 10ms, Duty Cycle  $\leq$  10%.

**Electrical Characteristics:** ( $T_C = +25^\circ\text{C}$  unless otherwise specified)

| Parameter                            | Symbol         | Test Conditions  | Min | Typ | Max | Unit |
|--------------------------------------|----------------|--|-----|-----|-----|------|
| <b>OFF Characteristics</b>           |                |  |     |     |     |      |
| Collector–Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 30\text{mA}, I_B = 0, \text{Note 2}$                            | 100 | –   | –   | V    |
| Collector–Emitter Cutoff Current     | $I_{CEO}$      | $V_{CE} = 60\text{V}, I_B = 0$   | –   | –   | 1   | mA   |
|                                      | $I_{CES}$      | $V_{CE} = 100\text{V}, V_{EB} = 0$                                     | –   | –   | 0.7 | mA   |
| Emitter–Base Cutoff Current          | $I_{EBO}$      | $V_{EB} = 5\text{V}, I_C = 0$  | –   | –   | 1   | mA   |
| <b>ON Characteristics (Note 2)</b>   |                |  |     |     |     |      |
| DC Current Gain                      | $h_{FE}$       | $I_C = 1.5\text{A}, V_{CE} = 4\text{V}$                                | 25  | –   | –   |      |
|                                      |                | $I_C = 15\text{A}, V_{CE} = 4\text{V}$                                 | 15  | –   | 75  |      |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C = 15\text{A}, I_B = 1.5\text{A}$                                  | –   | –   | 1.8 | V    |
|                                      |                | $I_C = 25\text{A}, I_B = 5\text{A}$                                    | –   | –   | 4   | V    |
| Base–Emitter ON Voltage              | $V_{BE(on)}$   | $I_C = 15\text{A}, V_{CE} = 4\text{V}$                                 | –   | –   | 2.0 | V    |
|                                      |                | $I_C = 25\text{A}, V_{CE} = 4\text{V}$                                 | –   | –   | 4.0 | V    |
| <b>Dynamic Characteristics</b>       |                |  |     |     |     |      |
| Small–Signal Current Gain            | $h_{fe}$       | $I_C = 1\text{A}, V_{CE} = 10\text{V}, f = 1\text{kHz}$                | 25  | –   | –   |      |
| Current–Gain Bandwidth Product       | $f_T$          | $I_C = 1\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}, \text{Note 3}$ | 3   | –   | –   | MHz  |

Note 2. Pulse Test: Pulse Width =  $300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

Note 3.  $f_T = |h_{fe}| \cdot f_{test}$

