

## NTE331 (NPN) & NTE332 (PNP) Silicon Complementary Transistors Audio Power Amp, Switch

### **Description:**

The NTE331 (NPN) and NTE332 (PNP) are silicon epitaxial-base complementary power transistors in a TO-220 plastic package intended for use in power linear and switching applications.

### **Absolute Maximum Ratings:**

|   |                |
|---|----------------|
| Collector-Base Voltage ( $I_E = 0$ ), $V_{CBO}$ .....                 | 100V           |
| Collector-Emitter Voltage ( $I_B = 0$ ), $V_{CEO}$ .....              | 100V           |
| Emitter-Base Voltage ( $I_C = 0$ ), $V_{EBO}$ .....                   | 5V             |
| Emitter Current, $I_E$ .....  | 15A            |
| Collector Current, $I_C$ .....  | 15A            |
| Base Current, $I_B$ .....   | 5A             |
| Total Power Dissipation ( $T_C \leq +25^\circ\text{C}$ ), $P_D$ ..... | 90W            |
| Operating Junction Temperature, $T_J$ .....                           | +150°C         |
| Storage Temperature Range, $T_{stg}$ .....                            | -65° to +150°C |
| Thermal Resistance Junction-to-Case, $R_{thJC}$ .....                 | 1.4°C/W Max    |

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

| Parameter                            | Symbol         | Test Conditions                                    | Min | Typ | Max | Unit          |
|--------------------------------------|----------------|--|-----|-----|-----|---------------|
| Collector Cutoff Current             | $I_{CBO}$      | $I_E = 0, V_{CB} = 100V$                           | -   | -   | 500 | $\mu\text{A}$ |
|                                      |                | $I_E = 0, V_{CB} = 100V, T_C = +150^\circ\text{C}$ | -   | -   | 5   | mA            |
| Collector Cutoff Current             | $I_{CEO}$      | $I_B = 0, V_{CE} = 50V$                            | -   | -   | 1   | mA            |
| Emitter Cutoff Current               | $I_{EBO}$      | $I_C = 0, V_{EB} = 5V$                             | -   | -   | 1   | mA            |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_B = 0, I_C = 100\text{mA}$ , Note 1             | 100 | -   | -   | V             |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$  | $I_C = 5A, I_B = 0.5A$ , Note 1                    | -   | -   | 1   | V             |
|                                      |                | $I_C = 10A, I_B = 2.5A$ , Note 1                   | -   | -   | 3   | V             |

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

| Parameter                       | Symbol        | Test Conditions                                  | Min | Typ | Max | Unit |
|---------------------------------|---------------|--|-----|-----|-----|------|
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 10\text{A}, I_B = 2.5\text{A}$ , Note 1   | –   | –   | 2.5 | V    |
| Base-Emitter Voltage            | $V_{BE}$      | $I_C = 5\text{A}, V_{CE} = 4\text{V}$ , Note 1   | –   | –   | 1.5 | V    |
| DC Current Gain                 | $h_{FE}$      | $I_C = 0.5\text{A}, V_{CE} = 4\text{V}$ , Note 1 | 40  | –   | 250 |      |
|                                 |               | $I_C = 5\text{A}, V_{CE} = 4\text{V}$ , Note 1   | 15  | –   | 150 |      |
|                                 |               | $I_C = 10\text{A}, V_{CE} = 4\text{V}$ , Note 1  | 5   | –   | –   |      |
| Transistion Frequency           | $f_T$         | $I_C = 0.5\text{A}, V_{CE} = 4\text{V}$          | 3   | –   | –   | MHz  |

Note 1. Pulsed; Pulse Duration =  $300\mu\text{s}$ , Duty Cycle = 1.5%.

