

## NTE180 (PNP) & NTE181 (NPN) Silicon Power Transistor High Power Audio Amplifier

### **Description:**

The NTE180 (PNP) and NTE181 (NPN) are silicon complementary transistors in a TO3 type case designed for use as output devices in complementary audio amplifiers to 100 watts music power per channel.

### **Features:**

- High DC Current Gain:  $h_{FE} = 25 - 100$  @  $I_C = 7.5A$
- Excellent Safe Operating Area

### **Absolute Maximum Ratings:**

|                                                         |                               |
|---------------------------------------------------------|-------------------------------|
| Collector–Emitter Voltage, $V_{CER}$                    | 100V                          |
| Collector–Base Voltage, $V_{CB}$                        | 100V                          |
| Collector–Emitter Voltage, $V_{CEO}$                    | 90V                           |
| Emitter–Base Voltage, $V_{EB}$                          | 4V                            |
| Collector Current, $I_C$                                | 30A                           |
| Base Current, $I_B$                                     | 7.5A                          |
| Total Device Dissipation ( $T_C = +25^\circ C$ ), $P_D$ | 200W                          |
| Derate Above $25^\circ C$                               | 1.14W/ $^\circ C$             |
| Operating Junction Temperature Range, $T_J$             | $-65^\circ$ to $+200^\circ C$ |
| Storage Temperature Range, $T_{stg}$                    | $-65^\circ$ to $+200^\circ C$ |
| Thermal Resistance, Junction–to–Case, $R_{thJC}$        | 0.875 $^\circ C/W$            |

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

| Parameter                            | Symbol         | Test Conditions                                    | Min | Typ | Max | Unit |
|--------------------------------------|----------------|----------------------------------------------------|-----|-----|-----|------|
| <b>OFF Characteristics</b>           |                |                                                    |     |     |     |      |
| Collector–Emitter Breakdown Voltage  | $V_{(BR)CER}$  | $I_C = 200mA$ , $R_{BE} = 100\Omega$ , Note 1      | 100 | –   | –   | V    |
| Collector–Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 200mA$ , Note 1                             | 90  | –   | –   | V    |
| Collector–Base Cutoff Current        | $I_{CBO}$      | $V_{CB} = 100V$ , $I_E = 0$                        | –   | –   | 1.0 | mA   |
|                                      |                | $V_{CB} = 100V$ , $I_E = 0$ , $T_C = +150^\circ C$ | –   | –   | 5.0 | mA   |
| Emitter–Base Cutoff Current          | $I_{EBO}$      | $V_{BE} = 4V$ , $I_C = 0$                          | –   | –   | 1.0 | mA   |

Note 1. Pulse Test: Pulse Width  $\leq 300\mu s$ . Duty Cycle  $\leq 2\%$ .

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

| Parameter                            | Symbol        | Test Conditions                                               | Min | Typ | Max | Unit |
|--------------------------------------|---------------|---------------------------------------------------------------|-----|-----|-----|------|
| <b>ON Characteristics</b> (Note 1)   |               |                                                               |     |     |     |      |
| DC Current Gain                      | $h_{FE}$      | $I_C = 7.5\text{A}$ , $V_{CE} = 2\text{V}$                    | 25  | —   | 100 |      |
| Base–Emitter ON Voltage              | $V_{BE(on)}$  | $I_C = 7.5\text{A}$ , $V_{CE} = 2\text{V}$                    | —   | —   | 1.3 | V    |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 7.5\text{A}$ , $I_B = 750\text{mA}$                    | —   | —   | 0.8 | V    |
| Base–Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 7.5\text{A}$ , $I_B = 750\text{mA}$                    | —   | —   | 1.3 | V    |
| <b>Dynamic Characteristics</b>       |               |                                                               |     |     |     |      |
| Current Gain–Bandwidth Product       | $f_T$         | $I_C = 1\text{A}$ , $V_{CE} = 10\text{V}$ , $f = 1\text{MHz}$ | 2.0 | —   | —   | MHz  |

Note 1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ . Duty Cycle  $\leq 2\%$ .

Note 2. NTE181MP is a matched pair of NTE181 with their DC Current Gain ( $h_{FE}$ ) matched to within 10% of each other.

Note 3. NTE180MCP is a matched complementary pair containing 1 each of NTE180 (PNP) and NTE181 (NPN).

