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## NTE241 (NPN) & NTE242 (PNP) Silicon Complementary Transistors Audio Power Amplifier, Switch

**Description:**

The NTE241 (NPN) and NTE242 (PNP) are silicon complementary transistors in a TO220 type package designed for use in power amplifier and switching circuits.

**Absolute Maximum Ratings:**

|  |                                     |
|--|-------------------------------------|
| Collector–Emitter Voltage, $V_{CEO}$ .....                         | 80V                                 |
| Collector–Base Voltage, $V_{CB}$ .....                             | 80V                                 |
| Emitter–Base Voltage, $V_{EB}$ .....                               | 5V                                  |
| Collector Current, $I_C$ .....                                     | 4A                                  |
| Base Current, $I_B$ .....  | 1A                                  |
| Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ ..... | 60W                                 |
| Derate Above $25^\circ\text{C}$ .....                              | 320mW/ $^\circ\text{C}$             |
| Operating Junction Temperature Range, $T_J$ .....                  | $-65^\circ$ to $+150^\circ\text{C}$ |
| Storage Temperature Range, $T_{stg}$ .....                         | $-65^\circ$ to $+150^\circ\text{C}$ |
| Thermal Resistance, Junction–to–Case, $R_{\theta JC}$ .....        | 3.12 $^\circ\text{C}/\text{W}$      |

**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 | $V_{CEO(sus)}$   | $I_C = 100\text{mA}$ , $I_B = 0$ , Note 1           | 80  | –   | –   | V    |
| Collector Cutoff Current             | $I_{CEO}$  | $V_{CE} = 80\text{V}$ , $I_B = 0$                   | –   | –   | 1.0 | mA   |
|                                      |  | $V_{CE} = 80\text{V}$ , $V_{EB(off)} = 1.5\text{V}$ | –   | –   | 0.1 | mA   |
|                                      | $V_{CE} = 80\text{V}$ , $V_{EB(off)} = 1.5\text{V}$ , $T_C = +125^\circ\text{C}$ | –   | –   | 2.0 | mA  |      |
|                                      | $I_{CBO}$  | $V_{CB} = 80\text{V}$ , $I_E = 0$                   | –   | –   | 0.1 | mA   |
| Emitter Cutoff Current               | $I_{EBO}$  | $V_{BE} = 5\text{V}$ , $I_C = 0$                    | –   | –   | 1.0 | mA   |

Note 1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , 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 (Note 1)</b>   |               |   |     |     |     |      |
| DC Current Gain                      | $h_{FE}$      | $I_C = 1.5\text{A}, V_{CE} = 2\text{V}$                   | 20  | -   | 80  |      |
|                                      |               | $I_C = 4.0\text{A}, V_{CE} = 2\text{V}$                   | 7   | -   | -   |      |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 1.5\text{A}, I_B = 150\text{mA}$                   | -   | -   | 0.6 | V    |
|                                      |               | $I_C = 4.0\text{A}, I_B = 1\text{A}$                      | -   | -   | 1.4 | V    |
| Base-Emitter ON Voltage              | $V_{BE(on)}$  | $I_C = 1.5\text{A}, V_{CE} = 2\text{V}$                   | -   | -   | 1.2 | V    |
| <b>Dynamic Characteristics</b>       |               |   |     |     |     |      |
| Small-Signal Current Gain            | $h_{fe}$      | $I_C = 100\text{mA}, V_{CE} = 2\text{V}, f = 1\text{kHz}$ | 25  | -   | -   |      |
| Current-Gain Bandwidth Product       | $f_T$         | $I_C = 1\text{A}, V_{CE} = 4\text{V}, f = 1\text{MHz}$    | 2.5 | -   | -   | MHz  |

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

