

NTE130 (NPN) & NTE219 (PNP) Silicon Power Transistor Audio Power Amp, Medium Speed Switch

Description:

The NTE130 (NPN) and NTE219 (PNP) are silicon complementary transistors in a TO3 type case designed for general purpose switching and amplifier applications.

Features:

- DC Current Gain: $h_{FE} = 20 - 70 @ I_C = 4A$
- Collector–Emitter Saturation Voltage: $V_{CE(sat)} = 1.1V (Max) @ I_C = 4A$
- Excellent Safe Operating Area

Absolute Maximum Ratings:

| | |
|--|----------------------------------|
| Collector–Emitter Voltage, V_{CEO} | 60V |
| Collector–Emitter Voltage, V_{CER} | 70V |
| Collector–Base Voltage, V_{CB} | 100V |
| Emitter–Base Voltage, V_{EB} | 7V |
| Continuous Collector Current, I_C | 15A |
| Base Current, I_B | 7A |
| Total Device Dissipation ($T_C = +25^{\circ}C$), P_D | 115W |
| Derate Above $25^{\circ}C$ | 0.657W/ $^{\circ}C$ |
| Operating Junction Temperature Range, T_J | -65° to $+200^{\circ}C$ |
| Storage Temperature Range, T_{stg} | -65° to $+200^{\circ}C$ |
| Thermal Resistance, Junction–to–Case, R_{thJC} | 1.52 $^{\circ}C/W$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|----------------|--|-----|-----|-----|------|
| OFF Characteristics | | | | | | |
| Collector–Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 200mA, I_B = 0, \text{Note 1}$ | 60 | – | – | V |
| Collector–Emitter Sustaining Voltage | $V_{CER(sus)}$ | $I_C = 200mA, R_{BE} = 100\Omega, \text{Note 1}$ | 70 | – | – | V |
| Collector Cutoff Current | I_{CEO} | $V_{CE} = 30V, I_B = 0$ | – | – | 0.7 | mA |
| | | $V_{CE} = 100V, V_{BE(off)} = 1.5V$ | – | – | 1.0 | mA |
| | | $V_{CE} = 100V, V_{BE(off)} = 1.5V, T_C = +150^{\circ}C$ | – | – | 5.0 | mA |
| Emitter Cutoff Current | I_{EBO} | $V_{BE} = 7V, I_C = 0$ | – | – | 5.0 | 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 |
|---|---------------|--|------|-----|-----|------|
| ON Characteristics (Note 1) | | | | | | |
| DC Current Gain | h_{FE} | $I_C = 4\text{A}, V_{CE} = 4\text{V}$ | 20 | – | 70 | |
| | | $I_C = 10\text{A}, V_{CE} = 4\text{V}$ | 5 | – | – | |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 4\text{A}, I_B = 400\text{mA}$ | – | – | 1.1 | V |
| | | $I_C = 10\text{A}, I_B = 3.3\text{A}$ | – | – | 3.0 | V |
| Base–Emitter ON Voltage | $V_{BE(on)}$ | $I_C = 4\text{A}, V_{CE} = 4\text{V}$ | – | – | 1.5 | V |
| Second Breakdown | | | | | | |
| Second Breakdown Collector Current with Base Forward Biased | $I_{s/b}$ | $V_{CE} = 40\text{V}, t = 1.0\text{s};$ Nonrepetitive | 2.87 | – | – | A |
| Dynamic Characteristics | | | | | | |
| Current Gain–Bandwidth Product | f_T | $I_C = 500\text{mA}, V_{CE} = 10\text{V}, f = 1\text{MHz}$ | 2.5 | – | – | MHz |
| Small–Signal Current Gain | h_{fe} | $I_C = 1\text{A}, V_{CE} = 4\text{V}, f = 1\text{kHz}$ | 15 | – | 120 | |
| Small–Signal Current Gain Cutoff Frequency | f_{hfe} | $V_{CE} = 4\text{V}, I_C = 1\text{A}, f = 1\text{kHz}$ | 10 | – | – | kHz |

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

Note 2. NTE130MP is a matched pair of NTE130 with their DC Current Gain (h_{FE}) matched to within 10% of each other.

Note 3. NTE219MCP is a matched complementary pair containing 1 each of NTE219 (PNP) and NTE130 (NPN).

