

NTE247 (NPN) & NTE248 (PNP) Silicon Complementary Transistors Darlington Power Amplifier

Description:

The NTE247 (NPN) and NTE248 (PNP) are silicon complementary Darlington transistors in a TO3 type case designed for general-purpose amplifier and low-frequency switching applications.

Features:

- High DC Current Gain: $h_{FE} = 3500$ Typ @ $I_C = 5A$
- Collector-Emitter Sustaining Voltage: $V_{CEO(sus)} = 100V$ Min @ 100mA
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors

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 | 12A |
| Peak | 120A |
| Base Current, I_B | 200mA |
| Total Power Dissipation ($T_C = +25^\circ C$), P_D | 150W |
| Derate Above $25^\circ C$ | 0.857W/ $^\circ C$ |
| 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} | 1.17 $^\circ C/W$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|----------------|---|-----|-----|-----|------|
| OFF Characteristics | | | | | | |
| Collector-Emitter Sustaining Voltage | $V_{CEO(sus)}$ | $I_C = 100mA, I_B = 0$, Note 1 | 100 | — | — | V |
| Collector Cutoff Current | I_{CEO} | $V_{CE} = 50V, I_E = 0$ | — | — | 1.0 | mA |
| | | $V_{CE} = 100V, V_{BE(off)} = 1.5V$ | — | — | 0.5 | mA |
| | | $V_{CE} = 100V, V_{BE(off)} = 1.5V, T_A = +150^\circ C$ | — | — | 5.0 | mA |
| Emitter Cutoff Current | I_{EBO} | $V_{BE} = 5V, I_C = 0$ | — | — | 2.0 | mA |

Note 1. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2%

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---------------|--|-----|-----|-------|------|
| ON Characteristics (Note 1) | | | | | | |
| DC Current Gain | h_{FE} | $V_{CE} = 3\text{V}, I_C = 6\text{A}$ | 750 | – | 18000 | |
| | | $V_{CE} = 3\text{V}, I_C = 12\text{A}$ | 100 | – | – | |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 6\text{A}, I_B = 24\text{mA}$ | – | – | 2.0 | V |
| | | $I_C = 12\text{A}, I_B = 120\text{mA}$ | – | – | 3.0 | V |
| Base–Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 12\text{A}, I_B = 120\text{mA}$ | – | – | 4.0 | V |
| Base–Emitter ON Voltage | $V_{BE(on)}$ | $V_{CE} = 3\text{V}, I_C = 6\text{A}$ | – | – | 2.8 | V |
| Dynamic Characteristics | | | | | | |
| Small–Signal Current Gain | h_{fe} | $V_{CE} = 3\text{V}, I_C = 5\text{A}, f = 1\text{kHz}$ | 300 | – | – | |
| Magnitude of Common Emitter Small–Signal Short–Circuit Forward Current Transfer Ratio | $ h_{fe} $ | $V_{CE} = 3\text{V}, I_C = 5\text{A}, f = 1\text{MHz}$ | 4.0 | – | – | MHz |
| Output Capacitance NTE247 | C_{ob} | $V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$ | – | – | 300 | pF |
| | | | – | – | 500 | pF |
| NTE248 | | | | | | |

Note 1. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2%

