



ELECTRONICS, INC.
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NTE46
Silicon NPN Transistor
Darlington, General Purpose Amplifier,
Preamp, Driver

Absolute Maximum Ratings:

| | |
|---|-------------------------------------|
| Collector–Emitter Voltage, V_{CES} | 100V |
| Collector–Base Voltage, V_{CBO} | 100V |
| Emitter–Base Voltage, V_{EBO} | 12V |
| Continuous Collector Current, I_C | 500mA |
| Total Device Dissipation ($T_A = +25^\circ\text{C}$), P_D | 625mW |
| Derate Above 25°C | 5mW/ $^\circ\text{C}$ |
| Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D | 1.5W |
| Derate Above 25°C | 12mW/ $^\circ\text{C}$ |
| Operating Junction Temperature Range, T_J | -55° to $+150^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -55° to $+150^\circ\text{C}$ |
| Thermal Resistance, Junction to Case, $R_{\theta JC}$ | 83.3 $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Ambient, $R_{\theta JA}$ | 200 $^\circ\text{C/W}$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|-------------------------------------|---------------|---------------------------------------|-----|-----|-----|------|
| OFF Characteristics | | | | | | |
| Collector–Emitter Breakdown Voltage | $V_{(BR)CES}$ | $I_C = 100\mu\text{A}$, $V_{BE} = 0$ | 100 | – | – | V |
| Collector–Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = 100\mu\text{A}$, $I_E = 0$ | 100 | – | – | V |
| Emitter–Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E = 10\mu\text{A}$, $I_C = 0$ | 12 | – | – | V |
| Collector Cutoff Voltage | I_{CBO} | $V_{CB} = 80\text{V}$, $I_E = 0$ | – | – | 100 | nA |
| | I_{CES} | $V_{CE} = 80\text{V}$, $V_{BE} = 0$ | – | – | 500 | nA |
| Emitter Cutoff Current | I_{EBO} | $V_{BE} = 10\text{V}$, $I_C = 0$ | – | – | 100 | nA |

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} | $I_C = 10\text{mA}, V_{CE} = 5\text{V}$ | 10,000 | – | – | |
| | | $I_C = 100\text{mA}, V_{CE} = 5\text{V}$ | 10,000 | – | – | |
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 10\text{mA}, I_B = 0.01\text{mA}$ | – | 0.7 | 1.2 | V |
| | | $I_C = 100\text{mA}, I_B = 0.1\text{mA}$ | – | 0.8 | 1.5 | V |
| Base–Emitter ON Voltage | $V_{BE(on)}$ | $I_C = 100\text{mA}, V_{CE} = 5\text{V}$ | – | 1.4 | 2.0 | V |
| Small–Signal Characteristics | | | | | | |
| Current Gain–Bandwidth Product | f_T | $I_C = 10\text{mA}, V_{CE} = 5\text{V},$ $f = 100\text{MHz}, \text{Note 2}$ | 125 | 200 | – | MHz |
| Output Capacitance | C_{obo} | $V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$ | – | 5.0 | 8.0 | pF |

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

Note 2. $f_T = h_{fe} \cdot f_{test}$

