

## 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, $T_J$ .....	$-65^\circ$ to $+200^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ 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
<b>OFF Characteristics</b>						
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 $\mu s$ , Duty Cycle = 2%

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics (Note 1)</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 3\text{V}, I_C = 6\text{A}$	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
<b>Dynamic Characteristics</b>						
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 =  $300\mu\text{s}$ , Duty Cycle = 2%

