

NTE270 (NPN) & NTE271 (PNP) Silicon Complementary Transistors Darlington Power Amp, Switch

Description:

The NTE270 (NPN) and NTE271 (PNP) are silicon Darlington complementary power transistors in a TO218 type package designed for general purpose amplifier and low frequency switching applications.

Features:

- High DC Current Gain: $h_{FE} = 1000 \text{ Min @ } I_C = 5A, V_{CE} = 4V$
- Collector–Emitter Sustaining Voltage: $V_{CEO(sus)} = 100V \text{ Min @ } 30mA$
- Monolithic Construction with Built–In Base–Emitter Shunt Resistor

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	10A
Peak (Note 1)	15A
Continuous Base Current, I_B	500mA
Total Device Dissipation ($T_C = +25^\circ C$), P_D	125W
Operating Junction Temperature Range, T_J	-65° to $+150^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ C$
Thermal Resistance, Junction–to–Case, R_{thJC}	$1.0^\circ C/W$
Thermal Resistance, Junction–to–Ambient, R_{thJA}	$35.7^\circ C/W$

Note 1. Pulse Width = 5ms, Duty Cycle $\leq 10\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30mA, I_B = 0, \text{ Note 2}$	100	–	–	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 50V, I_B = 0$	–	–	2.0	mA
	I_{CBO}	$V_{CB} = 100V, I_E = 0$	–	–	1.0	mA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5V$	–	–	2.0	mA

Note 2. Pulse Test: Pulse Width = 300 μs , 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 2)						
DC Current Gain	h_{FE}	$I_C = 5A, V_{CE} = 4V$	1000	–	–	
		$I_C = 10A, V_{CE} = 4V$	500	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5A, I_B = 10mA$	–	–	2.0	V
		$I_C = 10A, I_B = 40mA$	–	–	3.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10A, I_B = 40mA$	–	–	3.5	V
Switching Characteristics (Resistive Load)						
Delay Time	t_d	$V_{CC} = 30V, I_C = 5A,$ $I_B = 20mA, \text{Duty Cycle} \leq 2\%,$ $I_{B1} = I_{B2}, R_C \text{ \& } R_B \text{ Varied},$ $T_J = +25^\circ\text{C}$	–	0.15	–	μs
Rise Time	t_r		–	0.55	–	μs
Storage Time	t_s		–	2.5	–	μs
Fall Time	t_f		–	2.5	–	μs

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

