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NTE251 (NPN) & NTE252 (PNP) Silicon Complementary Transistors Darlington Power Amplifier

Description:

The NTE251 (NPN) and NTE252 (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 @ $I_C = 10A$:
 $h_{FE} = 2400$ Typ (NTE251)
 $h_{FE} = 4000$ Typ (NTE252)
- Collector-Emitter Sustaining Voltage: $V_{CEO(sus)} = 100V$ Min
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors

Absolute Maximum Ratings: ($T_A = +25^\circ C$ unless otherwise specified)

Collector-Emitter Voltage, V_{CEO}	100V
Collector-Base Voltage, V_{CB}	100V
Emitter-Base Voltage, V_{EB}	5V
Collector Current, I_C	
Continuous	20A
Peak	40A
Base Current, I_B	500mA
Total Power Dissipation ($T_C = +25^\circ C$), P_D	160W
Derate Above $25^\circ C$	0.915W/ $^\circ C$
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}	1.09 $^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 100\text{mA}, I_B = 0$	100	–	–	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 50\text{V}, I_E = 0$	–	–	1.0	mA
		$V_{CE} = 100\text{V}, V_{BE(off)} = 1.5\text{V}$	–	–	0.5	mA
	$V_{CE} = 100\text{V}, V_{BE(off)} = 1.5\text{V}, T_A = +150^\circ\text{C}$	–	–	5.0	mA	
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5\text{V}, I_C = 0$	–	–	2.0	mA
ON Characteristics (Note 1)						
DC Current Gain	h_{FE}	$V_{CE} = 3\text{V}, I_C = 10\text{A}$	750	–	18000	
		$V_{CE} = 3\text{V}, I_C = 20\text{A}$	100	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{A}, I_B = 40\text{mA}$	–	–	2.0	V
		$I_C = 20\text{A}, I_B = 200\text{mA}$	–	–	3.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 20\text{A}, I_B = 200\text{mA}$	–	–	4.0	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$V_{CE} = 3\text{V}, I_C = 10\text{A}$	–	–	2.8	V
Dynamic Characteristics						
Small–Signal Current Gain	h_{fe}	$V_{CE} = 3\text{V}, I_C = 10\text{A}, f = 1\text{kHz}$	300	–	–	
Magnitude of Common Emitter Small–Signal Short–Circuit Forward Current Transfer Ratio	$ h_{fe} $	$V_{CE} = 3\text{V}, I_C = 10\text{A}, f = 1\text{MHz}$	4.0	–	–	MHz
Output Capacitance NTE251 NTE252	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$	–	–	400	pF
			–	–	600	

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



