

NTE253 (NPN) & NTE254 (PNP) Silicon Complementary Transistors Darlington Power Amplifier

Description:

The NTE253 (NPN) and NTE254 (PNP) are silicon complementary Darlington transistors in a TO126 type case designed for general-purpose amplifier and low-speed switching applications.

Features:

- High DC Current Gain: $h_{FE} = 2000$ (Typ) @ $I_C = 2A$
- Monolithic Construction with Built-In Base-Emitter Resistors to Limit Leakage Multiplication

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

Collector-Emitter Voltage, V_{CEO}	80V
Collector-Base Voltage, V_{CB}	80V
Emitter-Base Voltage, V_{EB}	5V
Collector Current, I_C	4A
Base Current, I_B	100mA
Total Power Dissipation ($T_C = +25^\circ C$), P_D	40W
Derate Above $25^\circ C$	0.32W/ $^\circ C$
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}	3.23 $^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 50mA$, $I_B = 0$, Note 1	80	—	—	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 80V$, $I_B = 0$	—	—	100	μA
		$V_{CE} = 80V$, $I_E = 0$	—	—	100	μA
		$V_{CE} = 80V$, $I_E = 0$, $T_C = +100^\circ C$	—	—	500	μA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5V$, $I_C = 0$	—	—	2.0	mA

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 NTE253	h _{FE}	V _{CE} = 3V, I _C = 1.5A	750	2000	–	
NTE254		V _{CE} = 3V, I _C = 2A	750	2000	–	
NTE253 & NTE253		V _{CE} = 3V, I _C = 4A	100	–	–	
Collector–Emitter Saturation Voltage NTE253	V _{CE(sat)}	I _C = 1.5A, I _B = 30mA	–	–	2.5	V
NTE254		I _C = 2.0A, I _B = 40mA	–	–	2.8	V
NTE253 & NTE254		I _C = 4.0A, I _B = 40mA	–	–	3.0	V
Base–Emitter ON Voltage NTE253	V _{BE(on)}	V _{CE} = 3V, I _C = 1.5A	–	–	2.5	V
NTE254		V _{CE} = 3V, I _C = 2.0A	–	–	2.5	V
NTE253 & NTE254		V _{CE} = 3V, I _C = 4.0A	–	–	3.0	V
Dynamic Characteristics						
Small–Signal Current Gain	h _{fe}	V _{CE} = 3V, I _C = 1.5A, f = 1MHz	1.0	–	–	

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

Note 2. NTE253MCP is a matched complementary pair containing 1 each of NTE253 (NPN) and NTE254 (PNP).

