

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}	$V_{CE} = 3\text{V}, I_C = 1.5\text{A}$	750	2000	–	
NTE254		$V_{CE} = 3\text{V}, I_C = 2\text{A}$	750	2000	–	
NTE253 & NTE254		$V_{CE} = 3\text{V}, I_C = 4\text{A}$	100	–	–	
Collector–Emitter Saturation Voltage NTE253	$V_{CE(sat)}$	$I_C = 1.5\text{A}, I_B = 30\text{mA}$	–	–	2.5	V
NTE254		$I_C = 2.0\text{A}, I_B = 40\text{mA}$	–	–	2.8	V
NTE253 & NTE254		$I_C = 4.0\text{A}, I_B = 40\text{mA}$	–	–	3.0	V
Base–Emitter ON Voltage NTE253	$V_{BE(on)}$	$V_{CE} = 3\text{V}, I_C = 1.5\text{A}$	–	–	2.5	V
NTE254		$V_{CE} = 3\text{V}, I_C = 2.0\text{A}$	–	–	2.5	V
NTE253 & NTE254		$V_{CE} = 3\text{V}, I_C = 4.0\text{A}$	–	–	3.0	V
Dynamic Characteristics						
Small–Signal Current Gain	$ h_{fe} $	$V_{CE} = 3\text{V}, I_C = 1.5\text{A}, f = 1\text{MHz}$	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).

