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NTE196 (NPN) & NTE197 (PNP) Silicon Complementary Transistors Audio Power Output and Medium Power Switching

Description:

The NTE196 (NPN) and NTE197 (PNP) are silicon complementary transistors in a TO220 type package designed for use in general purpose amplifier and switching applications.

Features:

- DC Current Gain Specified to 7 Amps: $h_{FE} = 2.3 \text{ Min @ } I_C = 7 \text{ A}$
- Collector–Emitter Sustaining Voltage: $V_{CEO(sus)} = 70 \text{ V Min}$
- High Current–Gain Bandwidth Product:
 $f_T = 4 \text{ MHz Min @ } I_C = 500 \text{ mA (NTE196)}$
 $= 10 \text{ MHz Min @ } I_C = 500 \text{ mA (NTE197)}$

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	70V
Collector–Base Voltage, V_{CB}	80V
Emitter–Base Voltage, V_{EB}	5V
Collector Current, I_C	
Continuous	7A
Peak	10A
Base Current, I_B	3A
Total Power Dissipation ($T_C = +25^\circ\text{C}$), P_D	40W
Derate Above 25°C	0.32W/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, R_{thJC}	3.125 $^\circ\text{C/W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 100 \text{ mA}, I_B = 0$, Note 1	70	–	–	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 60 \text{ V}, I_B = 0$	–	–	1.0	mA
		$V_{CE} = 80 \text{ V}, V_{EB(off)} = 1.5 \text{ V}$	–	–	100	μA
	$V_{CE} = 80 \text{ V}, V_{EB(off)} = 1.5 \text{ V}, T_C = +150^\circ\text{C}$	–	–	2.0	mA	
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5 \text{ V}, I_C = 0$	–	–	1.0	mA

Note 1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, 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 1)						
DC Current Gain	h_{FE}	$I_C = 2\text{A}, V_{CE} = 4\text{V}$	30	–	150	
		$I_C = 7\text{A}, V_{CE} = 4\text{V}$	2.3	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 7\text{A}, I_B = 3\text{A}$	–	–	3.5	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 7\text{A}, V_{CE} = 4\text{V}$	–	–	3.0	V
Dynamic Characteristics						
Current–Gain Bandwidth Product NTE196 NTE197	f_T	$I_C = 500\text{mA}, V_{CE} = 4\text{V}, f_{test} = 1\text{MHz},$ Note 2	4	–	–	MHz
			10	–	–	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	–	–	250	pF
Small–Signal Current Gain	h_{fe}	$I_C = 500\text{mA}, V_{CE} = 4\text{V}, f = 50\text{kHz}$	20	–	–	

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

Note 2. $f_T = |h_{fe}| \cdot f_{test}$

