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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 Min @ I_C = 7A
- Collector–Emitter Sustaining Voltage: $V_{CEO(sus)}$ = 70V Min
- High Current–Gain Bandwidth Product:
  f_T = 4MHz Min @ I_C = 500mA (NTE196)
  = 10MHz Min @ I_C = 500mA (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°C), P_D 40W
  Derate Above 25°C . . . . . 0.32W/°C
Operating Junction Temperature Range, T_J . . . . . –65° to +150°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 3.125°C/W

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

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

Note 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Electrical Characteristics (Cont'd): (T_C = +25°C unless otherwise specified)

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

Note 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

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