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NTE2305 (NPN) & NTE2306 (PNP) Silicon Complementary Transistors High Voltage Power Amplifier

Description:

The NTE2305 (NPN) and NTE2306 (PNP) are silicon complementary transistors in a TO218 type package designed for use in high power audio amplifier applications and high voltage switching regulator circuits.

Features:

- High Collector–Emitter Sustaining Voltage: $V_{CEO(sus)} = 160V$
- High DC Current Gain: $h_{FE} = 35$ Typ @ $I_C = 8A$
- Low Collector–Emitter Saturation Voltage: $V_{CE(sat)} = 2V$ Max @ $I_C = 8A$

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	160V
Collector–Base Voltage, V_{CB}	160V
Emitter–Base Voltage, V_{EB}	70V
Collector Current, I_C	
Continuous	16A
Peak (Note 1)	20A
Continuous Base Current, I_B	5A
Power Dissipation ($T_C = +25^\circ C$), P_D	125W
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}	1°C/W

Note 1. Pulse Test: Pulse Width $\leq 5ms$, Duty Cycle $\geq 10\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 200mA, I_B = 0$, Note 2	160	–	–	V
Collector–Emitter Cutoff Current	I_{CEX}	$V_{CE} = 160V, V_{EB(off)} = 1.5V$	–	–	0.1	mA
		$V_{CE} = 160V, V_{EB9(off)} = 1.5V, T_C = +150^\circ C$	–	–	5.0	mA
	I_{CEO}	$V_{CE} = 80V, I_B = 0$	–	–	750	μA
Emitter–Base Cutoff Current	I_{EBO}	$V_{BE} = 7V, I_C = 0$	–	–	1.0	mA
Collector–Base Cutoff Current	I_{CBO}	$V_{CB} = 160V, I_E = 0$	–	–	750	μA

Note 2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\geq 2\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 2)						
DC Current Gain	h_{FE}	$V_{CE} = 2\text{V}, I_C = 8\text{A}$	15	35	—	
		$V_{CE} = 4\text{V}, I_C = 16\text{A}$	8	15	—	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 8\text{A}, I_B = 0.8\text{A}$	—	—	2.0	V
		$I_C = 16\text{A}, I_B = 2\text{A}$	—	—	3.5	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 16\text{A}, I_B = 2\text{A}$	—	—	3.9	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$V_{CE} = 4\text{V}, I_C = 16\text{A}$	—	—	3.9	V
Dynamic Characteristics						
Current–Gain Bandwidth Product	f_T	$V_{CE} = 20\text{V}, I_C = 1\text{A}, f = 0.5\text{MHz}$, Note 3	1.0	—	—	MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, I_E = 0, f = 0.1\text{MHz}$	—	—	800	pF

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

Note 3. $f_T = |h_{FE}| \cdot f_{test}$.

