



## 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, $T_J$ .....	$-65^\circ$ to $+150^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ C$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	$1^\circ C/W$

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
<b>OFF Characteristics</b>						
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	$\mu A$
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	$\mu A$

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
<b>ON Characteristics</b> (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
<b>Dynamic Characteristics</b>						
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.  $f_T = |h_{FE}| \cdot f_{test}$ .

