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## NTE60 (NPN) & NTE61 (PNP) Silicon Complementary Transistors High Power Audio, Disk Head Positioner for Linear Applications

**Description:**

The NTE60 (NPN) and NTE61 (PNP) are complementary silicon power transistors in a TO-3 type package designed for high power audio, disk head positioners, and other linear applications.

**Features:**

- High Safe Operating Area: 250W @ 50V
- For Low Distortion Complementary Designs
- High DC Current Gain:  $h_{FE} = 25 \text{ Min @ } I_C = 5A$

**Absolute Maximum Ratings:**

Collector-Emitter Voltage, $V_{CEO(sus)}$ .....	140V
Collector-Base Voltage, $V_{CBO}$ .....	140V
Emitter-Base Voltage, $V_{EBO}$ .....	5V
Continuous Collector Current, $I_C$ .....	20A
Continuous Base Current, $I_B$ .....	5A
Continuous Emitter Current, $I_E$ .....	25A
Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	250W
Derate Above $25^\circ\text{C}$ .....	1.43W/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+200^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+200^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	$0.70^\circ\text{C/W}$
Lead Temperature (During Soldering, 1/16" from Case, 10sec Max), $T_L$ .....	$+265^\circ\text{C}$

Note 1. Matched complementary pairs are available upon request (NTE61MCP). Matched complementary pairs have their gain specification ( $h_{FE}$ ) matched to within 10% of each other.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 200\text{mA}$ , $I_B = 0$ , Note 2	140	-	-	V
Collector Cutoff Current	$I_{CEX}$	$V_{CE} = 140\text{V}$ , $V_{BE(off)} = 1.5\text{V}$	-	-	100	$\mu\text{A}$
		$V_{CE} = 140\text{V}$ , $V_{BE(off)} = 1.5\text{V}$ , $T_C = +150^\circ\text{C}$	-	-	2	mA
	$I_{CEO}$	$V_{CE} = 140\text{V}$ , $I_B = 0$	-	-	250	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}$ , $I_C = 0$	-	-	100	$\mu\text{A}$

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Second Breakdown</b>						
Second Breakdown Collector Current with Base Forward Bias	$I_{S/b}$	$V_{CE} = 50\text{V}, t = 1\text{s}$ (non-repetitive)	5	-	-	$\mu\text{A}$
		$V_{CE} = 100\text{V}, t = 1\text{s}$ (non-repetitive)	1	-	-	$\mu\text{A}$
<b>ON Characteristics</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 2\text{V}, I_C = 5\text{A}$	25	-	150	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{A}, I_B = 500\text{mA}$	-	-	1	V
Base-Emitter On Voltage	$V_{BE(on)}$	$V_{CE} = 2\text{V}, I_C = 5\text{A}$	-	-	2	V
<b>Dynamic Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 500\text{mA}, f_{\text{test}} = 0.5\text{MHz}$	2	-	-	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f_{\text{test}} = 1\text{MHz}$	-	-	1000	pF

