

## NTE157 Silicon NPN Transistor Audio Power Amp, High Voltage Converter (Compl to NTE39)

**Description:**

The NTE157 is a silicon NPN transistor in a TO126 type package designed for use in line-operated equipment such as audio output amplifiers, low-current, high-voltage converters, and AC line relays.

**Features:**

- Excellent DC Current Gain:  $h_{FE} = 30$  to  $250$  @  $I_C = 100\text{mA}$
- Current-Gain – Bandwidth Product:  $f_T = 10\text{MHz}$  (Min) @  $I_C = 50\text{mA}$

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	300V
Collector–Base Voltage, $V_{CB}$ .....	325V
Emitter–Base Voltage, $V_{EB}$ .....	6V
Collector Current, $I_C$	
Continuous .....	500mA
Peak .....	1A
Base Current, $I_B$ .....	250mA
Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	20W
Derate Above $25^\circ\text{C}$ .....	0.16W/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction to case, $R_{\theta JC}$ .....	6.25 $^\circ\text{C}/\text{W}$

**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	$V_{CEO(sus)}$	$I_C = 100\text{mA}$ (Inductive), $L = 50\text{mH}$	300	–	–	V
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$ , $I_B = 0$	300	–	–	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 200\text{V}$ , $I_B = 0$	–	–	0.1	mA
		$V_{CE} = 300\text{V}$ , $V_{EB(off)} = 1.5\text{V}$	–	–	0.1	mA
	$I_{CEX}$	$V_{CE} = 300\text{V}$ , $V_{EB(off)} = 1.5\text{V}$ , $T_C = +100^\circ\text{C}$	–	–	1.0	mA
		$V_{CB} = 325\text{V}$ , $I_E = 0$	–	–	10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 6\text{V}$ , $I_C = 0$	–	–	10	$\mu\text{A}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics (Note 1)</b>						
DC Current Gain	$h_{FE}$	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$	25	–	–	
		$I_C = 100\text{mA}, V_{CE} = 10\text{V}$	30	–	250	
		$I_C = 250\text{mA}, V_{CE} = 10\text{V}$	15	–	–	
		$I_C = 500\text{mA}, V_{CE} = 10\text{V}$	5	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_B = 10\text{mA}$	–	–	1	V
		$I_C = 250\text{mA}, I_B = 25\text{mA}$	–	–	2.5	
		$I_C = 500\text{mA}, I_B = 100\text{mA}$	–	–	10	
Base–Emitter Voltage	$V_{BE}$	$I_C = 100\text{mA}, V_{CE} = 10\text{V}$	–	–	1	V
<b>Dynamic Characteristics</b>						
Current–Gain–Bandwidth Product	$f_T$	$I_C = 50\text{mA}, V_{CE} = 10\text{V}, f = 10\text{MHz}$ , Note 2	10	–	–	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 100\text{kHz}$	–	–	25	pF
Small–Signal Current Gain	$h_{fe}$	$I_C = 100\text{mA}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	20	–	–	

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

Note 2.  $f_T$  is defined as the frequency at which  $|h_{fe}|$  extrapolates to unity.

