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## NTE180 (PNP) & NTE181 (NPN) Silicon Power Transistor High Power Audio Amplifier

### Description:

The NTE180 (PNP) and NTE181 (NPN) are silicon complementary transistors in a TO3 type case designed for use as output devices in complementary audio amplifiers to 100 watts music power per channel.

### Features:

- High DC Current Gain:  $h_{FE} = 25 - 100 @ I_C = 7.5A$
- Excellent Safe Operating Area

### Absolute Maximum Ratings:

Collector–Emitter Voltage, $V_{CER}$ .....	100V
Collector–Base Voltage, $V_{CB}$ .....	100V
Collector–Emitter Voltage, $V_{CEO}$ .....	90V
Emitter–Base Voltage, $V_{EB}$ .....	4V
Collector Current, $I_C$ .....	30A
Base Current, $I_B$ .....	7.5A
Total Device Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	200W
Derate Above $25^\circ C$ .....	1.14W/ $^\circ C$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+200^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+200^\circ C$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	0.875 $^\circ C/W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CER}$	$I_C = 200mA, R_{BE} = 100\Omega$ , Note 1	100	–	–	V
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 200mA$ , Note 1	90	–	–	V
Collector–Base Cutoff Current	$I_{CBO}$	$V_{CB} = 100V, I_E = 0$	–	–	1.0	mA
		$V_{CB} = 100V, I_E = 0, T_C = +150^\circ C$	–	–	5.0	mA
Emitter–Base Cutoff Current	$I_{EBO}$	$V_{BE} = 4V, I_C = 0$	–	–	1.0	mA

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

**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 1)						
DC Current Gain	$h_{FE}$	$I_C = 7.5\text{A}, V_{CE} = 2\text{V}$	25	–	100	
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 7.5\text{A}, V_{CE} = 2\text{V}$	–	–	1.3	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 7.5\text{A}, I_B = 750\text{mA}$	–	–	0.8	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 7.5\text{A}, I_B = 750\text{mA}$	–	–	1.3	V
<b>Dynamic Characteristics</b>						
Current Gain–Bandwidth Product	$f_T$	$I_C = 1\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	2.0	–	–	MHz

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

Note 2. NTE181MP is a matched pair of NTE181 with their DC Current Gain ( $h_{FE}$ ) matched to within 10% of each other.

Note 3. NTE180MCP is a matched complementary pair containing 1 each of NTE180 (PNP) and NTE181 (NPN).

