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## NTE190 Silicon NPN Transistor High Voltage Amplifier

**Description:**

The NTE190 is an NPN silicon transistor in a TO202N type case designed for horizontal drive applications, high voltage linear amplifiers, and high voltage transistor regulators.

**Features:**

- High Collector–Emitter Breakdown Voltage:  $V_{(BR)CEO} = 180V$  (Min) @  $I_C = 1mA$
- Low Collector–Emitter Saturation Voltage:  $V_{CE(sat)} = 0.5V$  (Max) @  $I_C = 200mA$
- High Power Dissipation:  $P_D = 10W$  @  $T_C = +25^\circ C$

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	180V
Collector–Base Voltage, $V_{CB}$ .....	180V
Emitter–Base Voltage, $V_{EB}$ .....	5V
Collector Current, $I_C$ .....	1A
Total Device Dissipation ( $T_A = +25^\circ C$ ), $P_D$ .....	1W
Derate Above $25^\circ C$ .....	8mW/ $^\circ C$
Total Device Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	10W
Derate Above $25^\circ C$ .....	80mW/ $^\circ C$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ C$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ C$
Lead Temperature (During Soldering, 1/16" from case for 10sec), $T_L$ .....	$+260^\circ C$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	125 $^\circ C/W$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	12.5 $^\circ C/W$

**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	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0$	180	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu A, I_E = 0$	180	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu A, I_C = 0$	5	–	–	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 150V, I_E = 0$	–	–	0.1	mA

**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	$h_{FE}$	$I_C = 10\text{mA}$ , $V_{CE} = 10\text{V}$	40	–	–	
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 200\text{mA}$ , $V_{CE} = 1\text{V}$	–	–	1.0	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 200\text{mA}$ , $I_B = 20\text{mA}$	–	–	0.5	V
<b>Dynamic Characteristics</b>						
Current Gain–Bandwidth Product	$f_T$	$I_C = 50\text{mA}$ , $V_{CE} = 20\text{V}$ , $f = 20\text{MHz}$	35	–	–	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}$ , $I_E = 0$ , $f = 100\text{kHz}$	–	–	12	pF
Input Capacitance	$C_{ib}$	$V_{BE} = 0.5\text{V}$ , $I_C = 0$ , $f = 100\text{kHz}$	–	–	110	pF

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

