

## NTE195A Silicon NPN Transistor RF Power Amp/Driver, CB

**Description:**

The NTE195A is designed primarily for use in large-signal output amplifier stages. Intended for use in Citizen-Band communications equipment operating to 30MHz. High breakdown voltages allow a high percentage of up-modulation in AM circuits.

**Features:**

- Specified 12.5V, 28MHz Characteristic:  
     Power Output = 3.5W  
     Power Gain = 10dB  
     Efficiency = 70% Typical

**Absolute Maximum Ratings:**

Collector-Emitter Voltage, $V_{CER}$	70V
Collector-Base Voltage, $V_{CBO}$	70V
Emitter-Base Voltage, $V_{EBO}$	3.0V
Collector Current-Continuous, $I_C$	1.5A
Total Device Dissipation ( $T_C = +25^\circ C$ ), $P_D$	8W
Derate above $25^\circ C$	28.6mW/ $^\circ C$
Storage Temperature Range, $T_{stg}$	$-65^\circ$ to $+200^\circ C$

**Electrical Characteristics:** ( $T_A = +25^\circ C$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 200mA, V_{BE} = 0$	70	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EB0}$	$I_E = 1mA, I_C = 0$	4	-	-	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 15V, I_E = 0$	-	-	0.01	mA
<b>ON Characteristics</b>						
DC Current Gain	$h_{FE}$	$V_{CE} = 2V, I_C = 400mA$	30	-	-	-
<b>Dynamic Characteristics</b>						
Capacitance	$C_{ob}$	$V_{CB} = 12.5V, I_E = 0, f = 1MHz$	-	35	70	pF

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Functional Test</b>						
Common Emitter Amplifier Power Gain	$G_{PE}$	$P_{OUT} = 3.5\text{W}$ , $V_{CC} = 12.5\text{V}$ , $f = 27\text{MHz}$	10	–	–	dB
Collector Efficiency	$\eta$	$P_{OUT} = 3.5\text{W}$ , $V_{CC} = 12.5\text{V}$ , $f = 27\text{MHz}$ , Note 1	62.5	70.0	–	%
Percent Up-Modulation	–	$f = 27\text{MHz}$ , Note 2	–	85	–	%
Parallel Equivalent Input Resistance	$R_{in}$	$P_{OUT} = 3.5\text{W}$ , $V_{CC} = 12.5\text{V}$ , $f = 27\text{MHz}$	–	21	–	$\Omega$
Parallel Equivalent Input Capacitance	$C_{in}$	$P_{OUT} = 3.5\text{W}$ , $V_{CC} = 12.5\text{V}$ , $f = 27\text{MHz}$	–	900	–	pF
Parallel Equivalent Output Capacitance	$C_{out}$	$P_{OUT} = 3.5\text{W}$ , $V_{CC} = 12.5\text{V}$ , $f = 27\text{MHz}$	–	200	–	pF

Note 1.  $\eta = R_F \frac{P_{OUT}}{(V_{CC}) (I_C)} \cdot 100$

Note 2. Percentage Up-Modulation is measured by setting the Carrier Power ( $P_C$ ) to 3.5 Watts with  $V_{CC} = 12.5\text{Vdc}$  and noting the power input. The peak envelope power (PEP) is noted after doubling the original power input to simulate driver modulation (at a 25% duty cycle for thermal considerations) and raising the  $V_{CC}$  to 25Vdc (to simulate the modulating voltage). Percentage Up-Modulation is then determined by the relation:

$$\text{Percentage Up-Modulation} = \frac{(PEP) 1/2_{-1} \cdot 100}{P_C}$$

