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## NTE346 Silicon NPN Transistor RF Power Transistor

**Description:**

The NTE346 is a silicon NPN transistor in a TO39 type package designed for amplifier, frequency multiplier, or oscillator applications in military and industrial equipment. Suitable for use as output driver or pre-driver stages, in VHF and UHF equipment.

**Features:**

- Current-Gain-Bandwidth Product- $f_T = 500\text{MHz}$  (Min) @  $I_C = 50\text{mA}$ dc
- Power Gain- $G_{pe} = 10\text{dB}$  (Min) @  $V_{CE} = 12\text{Vdc}$
- 1 Watt Minimum Power Output @  $f = 175\text{MHz}$
- Multiple-Emitter Construction for Excellent High-Frequency Performance

**Absolute Maximum Ratings:**

Collector-Emitter Voltage, $V_{CEO}$ .....	20V
Collector-Base Voltage, $V_{CB}$ .....	40V
Emitter-Base Voltage, $V_{EB}$ .....	2.0V
Collector Current-Continuous, $I_C$ .....	400mA
Base Current-Continuous, $I_B$ .....	400mA
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	1.0W
Derate above $25^\circ\text{C}$ .....	5.71mW/ $^\circ\text{C}$
Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	3.5W
Derate above $25^\circ\text{C}$ .....	20mW/ $^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+200^\circ\text{C}$

**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	$V_{CEO(sus)}$	$I_C = 5\text{mA}, I_B = 0$	20	-	-	V
	$V_{CER(sus)}$	$I_C = 5\text{mA}, R_{BE} = 10\Omega$	40	-	-	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 12\text{V}, I_B = 0$	-	-	0.02	mA
	$I_{CEV}$	$V_{CE} = 40\text{V}, V_{BE} = -1.5\text{V}$	-	-	0.1	mA
		$V_{CE} = 12\text{V}, V_{BE} = -1.5\text{V}, T_C = +150^\circ\text{C}$	-	-	5.0	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 2\text{V}, I_C = 0$	-	-	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</b>						
DC Current Gain	$h_{FE}$	$I_C = 100\text{mA}, V_{CE} = 5\text{V}$	10	-	200	
		$I_C = 360\text{mA}, V_{CE} = 5\text{V}$	5	-	-	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100\text{mA}, I_B = 20\text{mA}$	-	-	0.5	V
<b>Dynamic Characteristics</b>						
Current-Gain Bandwidth Product	$f_T$	$I_C = 50\text{mA}, V_{CE} = 15\text{V}, f = 1\text{MHz}$	500	-	-	MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 12\text{V}, I_E = 0, f = 1\text{MHz}$	-	-	4	pF
<b>Functional Test</b>						
Power Input	$P_{in}$	$P_{out} = 1\text{W}, Z_S = 50\Omega, V_{CC} = 12\text{V}, f = 175\text{MHz}$	-	-	100	W
Collector Efficiency	$\eta$		50	-	-	%
Common-Emitter Amplifier Power Gain	$G_{pe}$	$P_{in} = 100\text{mW}, Z_S = 50\Omega, V_{CC} = 12\text{V}, f = 175\text{MHz}$	10	-	-	dB

