

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) @ $I_C = 50\text{mA}$
- 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°C	5.71mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	3.5W
Derate above 25°C	20mW/ $^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
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
ON Characteristics						
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
Dynamic Characteristics						
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
Functional Test						
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	η		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

