

NTE329 Silicon NPN Transistor RF Power Amp, CB

Description:

The NTE329 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_{CEO}	30V
Collector-Base Voltage, V_{CBO}	60V
Emitter-Base Voltage, V_{EBO}	3V
Continuous Collector Current, I_C	1A
Total Device Dissipation ($T_C = +25^\circ\text{C}$, Note 1), P_D	5W
Derate above 25°C	28.6mW/ $^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ\text{C}$

Note 1. This device is designed for RF operation. The total device dissipation rating applies only when the device is operated as an RF amplifier.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 50\text{mA}, I_B = 0$	30	-	-	V
	$V_{(BR)CES}$	$I_C = 200\text{mA}, V_{BE} = 0$	60	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1\text{mA}, I_C = 0$	3	-	-	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 15\text{V}, I_E = 0$	-	-	0.01	mA
ON Characteristics						
DC Current Gain	h_{FE}	$V_{CE} = 2\text{V}, I_C = 400\text{mA}$	10	-	-	-
Dynamic Characteristics						
Output Capacitance	C_{ob}	$V_{CB} = 12.5\text{V}, I_E = 0, f = 1\text{MHz}$	-	35	70	pF

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Functional Test						
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	η	$P_{OUT} = 3.5\text{W}$, $V_{CC} = 12.5\text{V}$, $f = 27\text{MHz}$, Note 3	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	–	Ω
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 2. $\eta = R_F \frac{P_{OUT}}{(V_{CC}) (I_C)} \cdot 100$

Note 3. 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:

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

