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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°C, Note 1), P_D 5W
Derate above 25°C . . . . . 28.6mW/°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°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°C, unless otherwise specified)

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

Electrical Characteristics (Cont'd): (T_A = +25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Functional Test						
Common–Emitter Amplifier Power Gain	G_{PE}	P_{OUT} = 3.5W, V_{CC} = 12.5V, f = 27MHz	10	–	–	dB
Collector Efficiency	η	P_{OUT} = 3.5W, V_{CC} = 12.5V, f = 27MHz, Note 3	62.5	70.0	–	%
Percent Up–Modulation	–	f = 27MHz, Note 2	–	85	–	%
Parallel Equivalent Input Resistance	R_{in}	P_{OUT} = 3.5W, V_{CC} = 12.5V, f = 27MHz	–	21	–	Ω
Parallel Equivalent Input Capacitance	C_{in}	P_{OUT} = 3.5W, V_{CC} = 12.5V, f = 27MHz	–	900	–	pF
Parallel Equivalent Output Capaciatnce	C_{out}	P_{OUT} = 3.5W, V_{CC} = 12.5V, f = 27MHz	–	200	–	pF

Note 2. $\eta = R_F \frac{P_{OUT} \cdot 100}{(V_{CC})(I_C)}$

Note 3. Percentage Up–Modulation is measured by setting the Carrier Power (P_C) to 3.5 Watts with V_{CC} = 12.5Vdc 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:

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