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NTE77
Silicon NPN Transistor
Broadband CATV Driver

Description:

The NTE77 is an NPN transistor in a TO39 type case designed to be utilized in broadband and linear amplifier circuitry requiring low noise and low intermodulation distortion. This device is suitable for use in CATV driver stages in trunk line, bridger, and line extender amplifiers.

Features:

- High Gain–Bandwidth Product: f_T = 1.5GHz Typ
- Low Intermodulation, Low Cross–Modulation Distortion: X–MOD = –57dB
- Low Noise Figure: NF = 2.7dB Typ
- Low Output Capacitance: C_{ob} = 3.5pF Max @ V_{CB} = 30V

Absolute Maximum Ratings: (T_C = +25°C unless otherwise specified)

Collector–Base Voltage, V_{CBO} 50V
Collector–Emitter Voltage, V_{CEO} 30V
Emitter–Base Voltage, V_{EBO} 5V
Maximum Collector Current, I_C 400mA
Total Device Dissipation (T_A = +25°C), P_{tot} 3.5W
Junction Temperature, T_J . . . . . +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . +50°C/W

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 5mA, I_B = 0, Note 1	30	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 0.1mA, I_E = 0, Note 1	50	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 0.1mA, I_C = 0	5	–	–	V
Collector Cutoff Current	I_{CEO}	V_{CE} =, 28V, I_B = 0	–	–	0.1	mA

Note 1. Pulsed through 25mH Inductor.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics						
DC Current Gain	h_{FE}	V_{CE} = 15V, I_C = 50mA	30	–	300	
Dynamic Characteristics						
Current Gain–Bandwidth Product	f_T	V_{CE} = 15V, I_C = 50mA, f = 200MHz	1500	1800	–	MHz
Collector Output Capacitance	C_{ob}	V_{CB} = 30V, I_E = 0, f = 1MHz	–	2.5	3.5	pF
Collector Input Capacitance	C_{ib}	V_{EB} = 0.5V, I_C = 0, f = 1MHz	–	8.0	10	pF
Functional Test						
Noise Figure Narrow Band	NF_{NB}	V_{CE} = 10V, I_C = 10mA, f = 200MHz	–	2.7	–	dB
Broad Band	NF_{BB}	V_{CE} = 15V, I_C = 50mA, f = 216MHz	–	7.0	8.0	dB
Power Gain at Optimum Noise Figure	G_{VE}	V_{CE} = 15V, I_C = 50mA, f = 260MHz	6.8	7.2	–	dB
Cross–Modulation	X–MOD	V_{CE} = 15V, I_C = 50mA, P_O = +45dBmV, Note 2	–	–60	–57	dB
Second Order Distortion	2^{nd} O	V_{CE} = 15V, I_C = 50mA, P_O = +45dBmV, Note 3	–	–60	–57	dB

Note 2. 12 Channel Flat — NCTA Channel 2 through 12 100% Mod (Square wave) Channel 13CW

Note 3. Channel 2 and Channel G Intermod Product on Channel 13