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## NTE76 Silicon NPN Transistor Broadband CATV Amplifier

**Description:**

The NTE76 is an NPN transistor in a TO117 type case designed to be utilized in broadband linear amplifier circuitry such as CATV trunk, bridger, and line extender amplifiers.

**Features:**

- High Gain-Bandwidth Product:  $f_T = 1.5\text{GHz}$
- Low Intermodulation, Low Cross-Modulation Distortion:  $X\text{-MOD} = -50\text{dB}$
- Low Noise Figure:  $NF = 2.7\text{dB}$
- High Power Gain:  $G_{VE} = 10\text{dB}$

**Absolute Maximum Ratings:** ( $T_C = +25^\circ\text{C}$ )

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 ( $T_A = +25^\circ\text{C}$ ), $P_{tot}$ .....	5W
Junction Temperature, $T_J$ .....	+200°C
Storage Temperature Range, $T_{stg}$ .....	-65° to +150°C
Thermal Resistance, Junction to Case, $R_{\theta JC}$ .....	+35°C/W

**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 Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 5\text{mA}, I_B = 0$ , Note 1	30	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1\text{mA}, I_E = 0$	50	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 0.1\text{mA}, I_C = 0$	5	-	-	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} =, 20\text{V}, I_B = 0$	-	-	0.1	mA

Note 1. Pulsed through 25mH Inductor.

**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	$h_{FE}$	$V_{CE} = 20\text{V}, I_C = 70\text{mA}$	30	-	300	
<b>Dynamic Characteristics</b>						
Collector Output Capacitance	$C_{ob}$	$V_{CB} = 30\text{V}, I_E = 0, f = 1\text{MHz}$	-	2.6	4.0	pF
Collector Input Capacitance	$C_{ib}$	$V_{EB} = 0.5\text{V}, I_C = 0, f = 1\text{MHz}$	-	8.0	10	pF
<b>Functional Test</b>						
Noise Figure Narrow Band	$NF_{NB}$	$V_{CE} = 10\text{V}, I_C = 10\text{mA}, f = 200\text{MHz}$	-	2.7	-	dB
Broad Band	$NF_{BB}$	$V_{CE} = 22\text{V}, I_C = 70\text{mA}, f = 216\text{MHz}$	-	7.5	9.0	dB
Power Gain at Optimum Noise Figure	$G_{VE}$	$V_{CE} = 22\text{V}, I_C = 70\text{mA}, f = 260\text{MHz}$	10	11	-	dB
Cross-Modulation	X-MOD	$V_{CE} = 22\text{V}, I_C = 70\text{mA}, P_O = +50\text{dBmV}, \text{Note 2}$	-	-53	-50	dB
Second Order Distortion	2 <sup>nd</sup> O	$V_{CE} = 22\text{V}, I_C = 70\text{mA}, P_O = +50\text{dBmV}, \text{Note 3}$	-	-55	-50	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

