

NTE278 Silicon NPN Transistor Broadband RF Amp

Description:

The NTE278 is a silicon NPN transistor in a TO39 type package designed specifically for broadband applications requiring good linearity. Usable as a high frequency current mode switch to 200mA.

Features:

- Low Noise Figure: NF = 3.0dB Typ @ f = 200MHz
- High Current-Gain Bandwidth Product: $f_T = 1200\text{MHz}$ Min @ $I_C = 50\text{mA}$

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	20V
Collector-Base Voltage, V_{CBO}	40V
Emitter-Base Voltage, V_{EBO}	3V
Continuous Collector Current, I_C	400mA
Continuous Base Current, I_B	400mA
Total Device Dissipation ($T_C = +75^\circ\text{C}$, Note 1), P_D	2.5W
Derate Above 25°C	20mW/ $^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ\text{C}$

Note 1. Total Device Dissipation at $T_A = +25^\circ\text{C}$ is 1 Watt.

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
	$V_{CER(sus)}$	$I_C = 5\text{mA}$, $R_{BE} = 10\Omega$, Note 2	40	—	—	V
Collector Cutoff Current	I_{CEO}	$V_{CE} = 15\text{V}$, $I_B = 0$	—	—	20	μA
	I_{CEX}	$V_{CE} = 15\text{V}$, $V_{BE} = -1.5\text{V}$, $T_C = +150^\circ\text{C}$	—	—	5	mA
		$V_{CE} = 35\text{V}$, $V_{BE} = -1.5\text{V}$	—	—	5	mA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 3\text{V}$, $I_C = 0$	—	—	100	μA

Note 2. Pulsed through a 25mH inductor; 50% Duty Cycle.

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}	$I_C = 360\text{mA}, V_{CE} = 5\text{V}$	5	–	–	
		$I_C = 50\text{mA}, V_{CE} = 15\text{V}$	40	–	120	
Dynamic Characteristics						
Current–Gain Bandwidth Product	f_T	$I_C = 50\text{mA}, V_{CE} = 15\text{V}, f = 200\text{MHz}$	1200	–	–	MHz
Collector–Base Capacitance	C_{cb}	$V_{CB} = 15\text{V}, I_E = 0, f = 1\text{MHz}$	–	1.8	3.5	pF
Noise Figure	NF	$I_C = 10\text{mA}, V_{CE} = 15\text{V}, f = 200\text{MHz}$	–	3	–	dB
Functional Test						
Common–Emitter Amplifier Voltage Gain	G_{ve}	$I_C = 50\text{mA}, V_{CC} = 15\text{V}, f = 50 \text{ to } 216\text{MHz}$	11	–	–	dB
Power Input	P_{in}	$I_C = 50\text{mA}, V_{CC} = 15\text{V}, R_S = 50\Omega, P_{out} = 1.26\text{mW}, f = 200\text{MHz}$	–	–	0.1	mW

