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## 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 $25^\circ\text{C}$ .....	20mW/ $^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ 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
<b>OFF Characteristics</b>						
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	$\mu\text{A}$
	$I_{CEX}$	$V_{CE} = 15\text{V}, V_{BE} = -1.5\text{V}, T_C = +150^\circ\text{C}$	-	-	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	$\mu\text{A}$

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
<b>ON Characteristics</b>						
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	-	210	
<b>Dynamic Characteristics</b>						
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
<b>Functional Test</b>						
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

