

NTE63

Silicon NPN Transistor

High Gain, Low Noise Amp

Description:

The NTE63 is a silicon NPN high frequency transistor designed primarily for use in high-gain, low noise tuned and wideband small-signal amplifiers and applications requiring fast switching times.

Features:

- High Current Gain-Bandwidth Product: $f_T = 5\text{GHz Typ @ } f = 1\text{GHz}$
- High Power Gain: $G_{pe} = 12.5\text{dB Min @ } f = 1\text{GHz}$

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	12V
Collector-Base Voltage, V_{CBO}	20V
Emitter-Base Voltage, V_{EBO}	2V
Continuous Collector Current, I_C	40mA
Total Device Dissipation ($T_L = +50^\circ\text{C}$), P_D	400mW
Derate Above 50°C	4.0mW/ $^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Lead, R_{thJL}	250 $^\circ\text{C/W}$

Electrical Characteristics: ($T_C = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	12	—	—	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1\text{mA}, I_E = 0$	20	—	—	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 0.1\text{mA}, I_C = 0$	2	—	—	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 15\text{V}, I_E = 0$	—	—	50	nA

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}	$I_C = 30\text{mA}$, $V_{CE} = 10\text{V}$	30	–	200	
Dynamic Characteristics						
Current Gain–Bandwidth Product	f_T	$I_C = 30\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1\text{GHz}$	–	5.0	–	GHz
Collector–Base Capacitance	C_{cb}	$V_{CB} = 10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	–	0.6	1.0	pF
Functional Tests						
Noise Figure	NF_{MIN}	$I_C = 5\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1\text{GHz}$	–	2.5	–	dB
		$I_C = 5\text{mA}$, $V_{CE} = 10\text{V}$, $f = 2\text{GHz}$	–	4.0	–	dB
Power Gain at Optimum Noise Figure	G_{NF}	$I_C = 5\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1\text{GHz}$	–	10	–	dB
		$I_C = 5\text{mA}$, $V_{CE} = 10\text{V}$, $f = 2\text{GHz}$	–	6	–	dB
Maximum Available Power Gain (Note 1)	G_{max}	$I_C = 30\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1\text{GHz}$	–	12.5	–	dB
		$I_C = 30\text{mA}$, $V_{CE} = 10\text{V}$, $f = 2\text{GHz}$	–	7.5	–	dB

Note1. $G_{max} = |S_{21}|^2 / (1 - |S_{11}|^2) (1 - |S_{22}|^2)$

