

NTE65 Silicon NPN Transistor High Voltage, Low Noise for CATV, MATV

Description:

The NTE65 is silicon NPN transistor designed primarily for use in high-gain, low-noise, small-signal amplifier and also used in applications requiring fast switching times.

Features:

- High Current-Gain Bandwidth Product
- Low Noise Figure
- High Power Gain

Absolute Maximum Ratings:

Collector-Emitter Voltage, V_{CEO}	15V
Collector-Base Voltage, V_{CBO}	20V
Emitter-Base Voltage, V_{EBO}	3V
Continuous Collector Current, I_C	30mA
Total Device Dissipation ($T_A = +60^\circ\text{C}$), P_D	180mW
Derate Above 60°C	2.0mW/ $^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient, R_{thJA}	500 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	15	–	–	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 0.1\text{mA}, I_E = 0$	20	–	–	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 0.1\text{mA}, I_C = 0$	3	–	–	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 10\text{V}, I_E = 0$	–	–	50	nA
ON Characteristics						
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}, I_C = 14\text{mA}$	25	–	250	

Electrical Characteristics (Cont'd): ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Dynamic Characteristics						
Current-Gain Bandwidth Product	f_T	$V_{CE} = 10\text{V}, I_C = 14\text{mA}, f = 0.5\text{GHz}$	-	5.0	-	GHz
Collector-Base Capacitance	C_{cb}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	-	0.5	1.0	pF
Functional Tests						
Noise Figure	NF	$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 0.5\text{GHz}$	-	2.4	-	dB
		$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 1.0\text{GHz}$	-	3.0	-	dB
Power Gain at Optimum Noise Figure	G_{NF}	$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 0.5\text{GHz}$	-	15	-	dB
		$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 1.0\text{GHz}$	-	10	-	dB
Maximum Available Power Gain (Note 1)	G_{max}	$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 0.5\text{GHz}$	-	18	-	dB
		$V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 1.0\text{GHz}$	-	12	-	dB

Note 1. $G_{max} = \frac{|S_{21}|^2}{(1 - |S_{11}|^2)(1 - |S_{22}|^2)}$

