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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°C), P_D 180mW
Derate Above 60°C . . . . . 2.0mW/°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Thremal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 500°C/W

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

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

Electrical Characteristics (Cont'd): (T_A = +25°C unless otherwise specified)

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

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