

RF LOW NOISE AMPLIFIER
NPN SILICON EPITAXIAL TRANSISTOR

2

DESCRIPTION

Suitable for low noise amplifier in the VHF to UHF band.

FEATURES

- NF 3.0dB TYP. @f = 500MHz
- G_{pe} 15dB TYP. @f = 500MHz
- f_T 2.0GHz TYP.

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Maximum Voltages and Current

Collector to Base Voltage	V _{CB0}	30	V
Collector to Emitter Voltage	V _{CE0}	14	V
Emitter to Base Voltage	V _{EBO}	3.0	V
Collector Current	I _C	50	mA

Maximum Power Dissipation

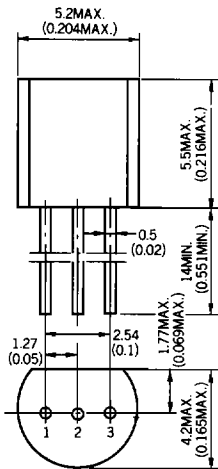
Total Power Dissipation	P _T	250	mW
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Maximum Temperatures

Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

PACKAGE DIMENSIONS

in millimeter (inches)



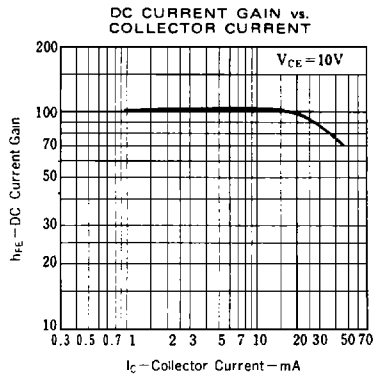
- 1. Base EIAJ : SC-43
- 2. Emitter JEDEC : TO-92
- 3. Collector IEC : PA33

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

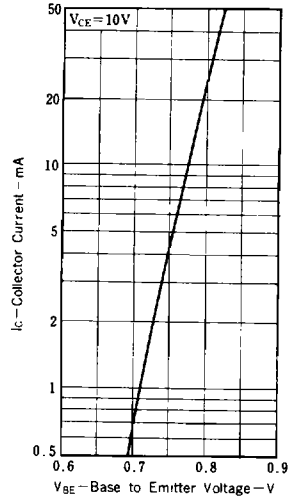
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I _{CB0}			0.1	μA	V _{CB} = 15V, I _E = 0
Emitter Cutoff Current	I _{EBO}			0.1	μA	V _{EB} = 2.0V, I _C = 0
DC Current Gain	h _{FE}	25	80	200		V _{CE} = 10V, I _C = 10mA
Gain Bandwidth Product	f _T	1.5	2.0		GHz	V _{CE} = 10V, I _C = 10mA
Output Capacitance *	C _{ob}		0.75	1.1	pF	V _{CB} = 10V, I _E = 0, f = 1.0MHz
Power Gain	G _{pe}	13	15		dB	V _{CE} = 10V, I _C = 10mA, f = 500MHz
Noise Figure	NF		3.0	4.0	dB	V _{CE} = 10V, I _C = 3.0mA, f = 500MHz, R _G = 50Ω

* The emitter terminal should be connected to the guard terminal of the three-terminal capacitance bridge.

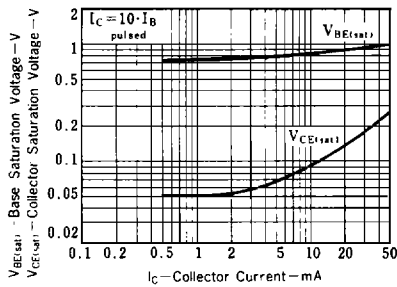
TYPICAL CHARACTERISTICS (Ta = 25°C)



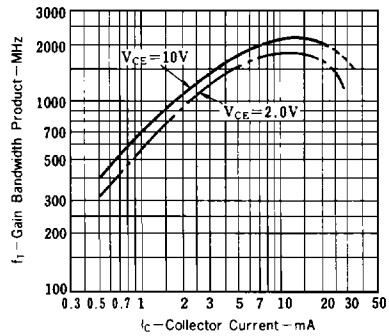
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



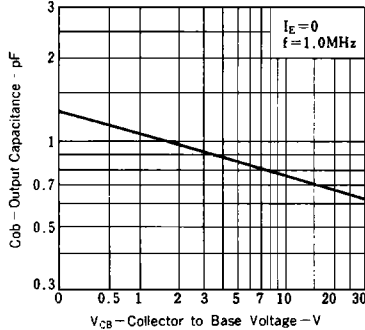
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



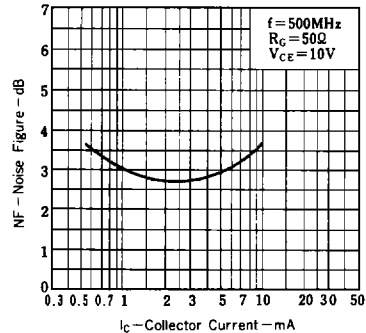
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



NOISE FIGURE vs. COLLECTOR CURRENT



TYPICAL S-PARAMETER

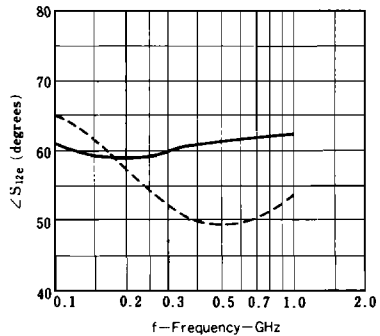
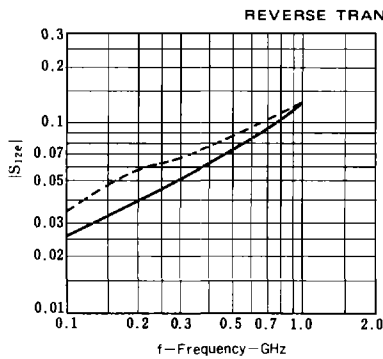
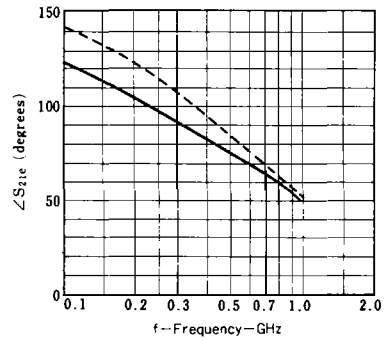
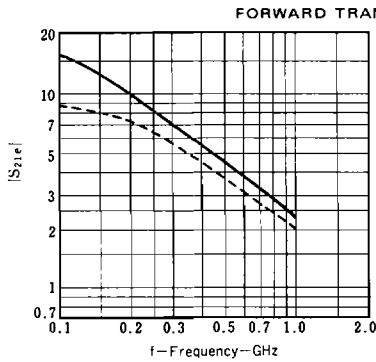
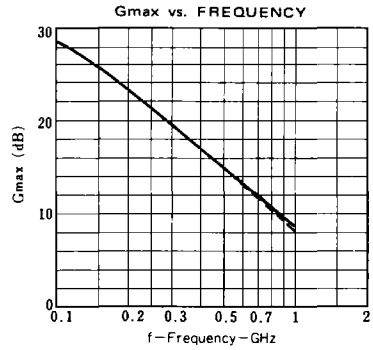
$Z_0 = 50\Omega$

$V_{CE} = 10V$

———— $I_C = 10mA$

----- $I_C = 3.0mA$

$$G_{max} = |S_{21}|^2 \cdot \frac{1}{1 - |S_{11}|^2} \cdot \frac{1}{1 - |S_{22}|^2}$$



S_{11e}, S_{22e}

$V_{CE} = 10V$

$Z_0 = 50\Omega$

○ — — — ○ $I_c = 3.0mA$

x — — — x $I_c = 10mA$

