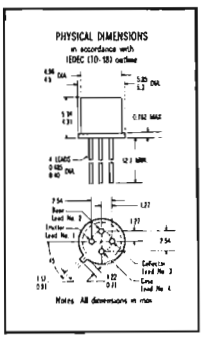
BFX 21

800 Mc/s LOW NOISE, SMALL SIGNAL AMPLIFIER

NPN DIFFUSED SILICON PLANAR TRANSISTOR

GENERAL DESCRIPTION - The BFX 21 is a high frequency NPN silicon PLANAR transistor specifically designed for low noise, small signal amplifiers and is particularly suitable for the UHF stages of radar and telecommunications systems up to 800 Mc/s. It features 10 dB of Power Gain and 6.5 dB of NF at 800 Mc/s and excellent AGC characteristics.



ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures

Storage Temperature	- 55°C to + 200°C
Operating Junction Temperature	200°C Maximum
Lead Temperature (Soldering, No Time Limit)	200°C Maximum

Maximum Power Dissipations

Total Dissipation at 25°C Case Temperature (Note 2)	0.26 Watt
at 25°C Ambient Temperature (Note 2)	0.175 Watt

Maximum Voltages

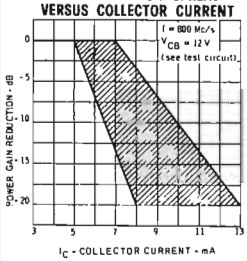
BV_{CBO}	Collecror to Base Voltage	30 Volts
LV_{CEO}	Collector to Emitter Volrage (Note 3)	30 Volts
BV_{EBO}	Emitter to Base Voltage	3.0 Volts

ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

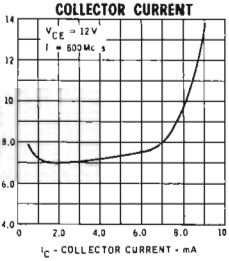
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
h_{FE}	DC Pulse Current Gain (Note 4)	20	70			I_C = 1.5 mA V_{CE} = 24 V
h_{FE}	DC Pulse Current Gain (Note 4)	20	70			I_C = 2.5 mA V_{CE} = 12 V
V_{BE} (on)	Base to Collector Voltage			0.9	V	I_C = 2.5 mA V_{CE} = 24 V
I_{CBO}	Collector Cutoff Current		0.1	50	nA	I_E = 0 V_{CB} = 10 V
BV_{CBO}	Collector to Base Breakdown Voltage	30			V	I_C = 50 µA I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	3.0			V	I_C = 0 I_E = 50 µA
LV_{CEO}	Collector to Emitter Sustaining Voltage (Notes 3 and 4)	30			V	I_C = 5.0 mA I_B = 0
h_{fe}	High Frequency Current Gain (f = 100 Mc/s)	4.0	5.5			I_C = 2.5 mA V_{CE} = 12 V
C_{re}	Common Emitter Feedback Capacirance		0.4	0.6	pF	I_C = 2.5 mA V_{CE} = 12 V
C_{re}	Common Emitter Feedback Capacitance		0.27	0.5	pF	I_C = 1.5 mA V_{CE} = 24 V
PG_1	Power Gain (f = 800 Mc/s) (Note 5)	8.0	10		dB	I_C = 2.5 mA V_{CB} = 12 V
PG_2	Power Gain (f = 800 Mc/s) (Note 5)	9.0	12		dB	I_C = 1.5 mA V_{CB} = 24 V
AGC	Automatic Gain Control (f=800 Mc/s) (Note 5)	8.0		13	mA	I_C for which $P_G = P_{G1} - 20$ dB
NF	Noise Figure (Note 6)		7.0	9.0	dB	I_C = 2.5 mA V_{CB} = 12 V
NF	Noise Figure (Note 6)		6.5	8.5	dB	I_C = 1.5 mA V_{CB} = 24 V

TYPICAL ELECTRICAL CHARACTERISTICS

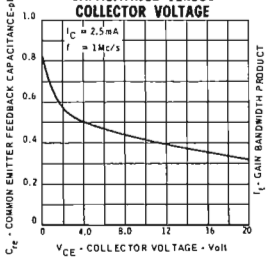
GAIN REDUCTION SPREAD VERSUS COLLECTOR CURRENT



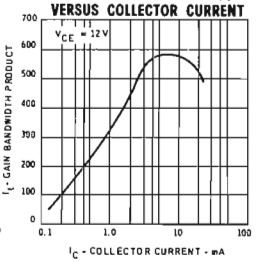
NOISE FIGURE VERSUS COLLECTOR CURRENT



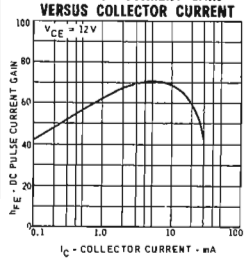
COMMON EMITTER FEED-BACK CAPACITANCE VERSUS COLLECTOR VOLTAGE



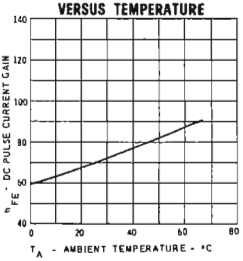
GAIN BANDWIDTH PRODUCT VERSUS COLLECTOR CURRENT



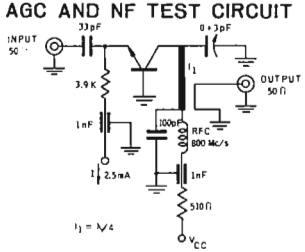
DC PULSE CURRENT GAIN VERSUS COLLECTOR CURRENT



DC PULSE CURRENT GAIN VERSUS TEMPERATURE



800 Mc/s POWER GAIN, AGC AND NF TEST CIRCUIT



NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.

(2) These ratings give a maximum junction temperature of 200°C and junction-to-case thermal resistance of 67°C/watt (derating factor of 1.48 mW/°C); junction-to-ambient thermal resistance of 1000°C/watt (derating factor of 1.0 mW/°C).

(3) Rating refers to a high-current point where collector-to-emitter voltage is lowest. For more information send for SGS-AR5.

(4) Pulse Conditions: length = 300 µsec; duty cycle = 1%.

(5) See the 800 Mc/s Power Gain, AGC and NF test circuits.

(6) f = 800 Mc/s; YG = 40 + j 4.0 mmho.