SILICON PLANAR PNP

BF 680

PRELIMINARY DATA

UHF MIXER-OSCILLATOR

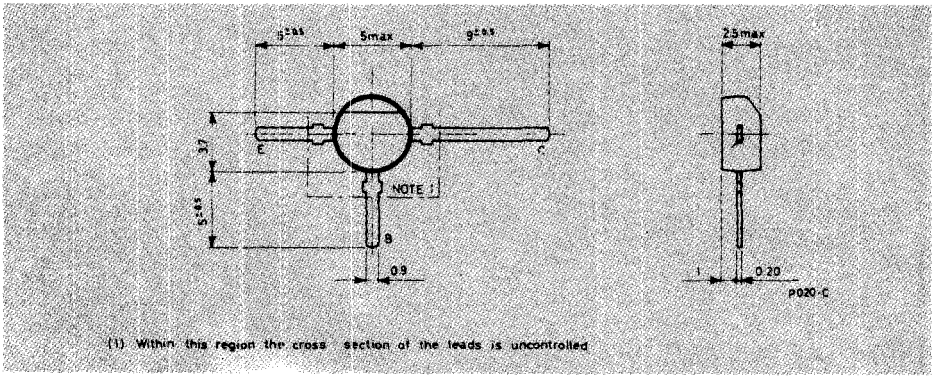
The BF 680 is a PNP silicon planar epitaxial transistor in T-plastic package. It is intended for use in TV varicap tuners as mixer-oscillator stage up to 900 MHz.

ABSOLUTE MAXIMUM RATINGS

V_{CBO}	Collector-base voltage ($I_E = 0$)	-40	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	-35	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	-3	V
I_C	Collector current	-30	mA
I_B	Base current	-5	mA
P_{tot}	Total power dissipation at $T_{amb} \leq 45$ °C	170	mW
T_{stg}	Storage temperature	-55 to 150	°C
T_j	Junction temperature	150	°C

MECHANICAL DATA

Dimensions in mm



(1) Within this region the cross section of the leads is uncontrolled

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THERMAL DATA

$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	600	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current (I_E = 0)	V_{CB} = -20 V			-100	nA
$V_{(BR)\ CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = -100 μA	-40			V
$V_{(BR)\ CEO}$	Collector-emitter breakdown voltage (I_B = 0)	I_C = -5 mA	-35			V
$V_{(BR)\ EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = -10 μA	-3			V
h_{FE}	DC current gain	I_C = -3 mA V_{CE} = -10 V	35	50		—
f_T	Transition frequency	I_C = -3 mA V_{CE} = -10 V f = 100 MHz		650		MHz
C_{CBO}	Collector-base capacitance	I_E = 0 V_{CB} = -10 V f = 100 MHz		0.6		pF
C_{rb}	Reverse capacitance	I_C = 0 V_{CB} = -10 V f = 100 MHz		0.07		pF
NF*	Noise figure	I_C = -3 mA V_{CB} = -10 V R_g = 50 Ω f = 800 MHz		5.5		dB
G_{pb}*	Power gain	I_C = -3 mA V_{CB} = -10 V R_L = 2 kΩ f = 800 MHz	11	14		dB

* See TEST CIRCUIT

ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
g_{ib}	Input conductance	I_C = -2 mA V_{CE} = -10 V				
		f = 860 MHz		7		mS
		f = 500 MHz		14		mS
$-b_{ib}$	Input susceptance	I_C = -2 mA V_{CE} = -10 V				
		f = 860 MHz		19		mS
		f = 500 MHz		24		mS
$\|y_{fb}\|$	Forward transadmittance	I_C = -2 mA V_{CE} = -10 V				
		f = 860 MHz		25		mS
		f = 500 MHz		42		mS
φ_{fb}	Phase angle of the forward transadmittance	I_C = -2 mA V_{CE} = -10 V				
		f = 860 MHz		50°		—
		f = 500 MHz		110°		—
g_{ob}	Output conductance	I_C = -2 mA V_{CE} = -10 V				
		f = 860 MHz		0.8		mS
		f = 500 MHz		0.4		mS
b_{ob}	Cutput susceptance	I_C = -2 mA V_{CE} = -10 V				
		f = 860 MHz		2.5		mS
		f = 500 MHz		1.6		mS

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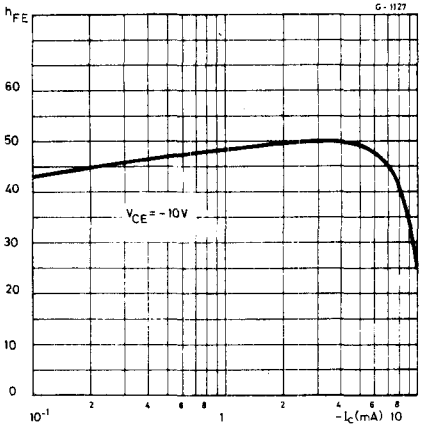
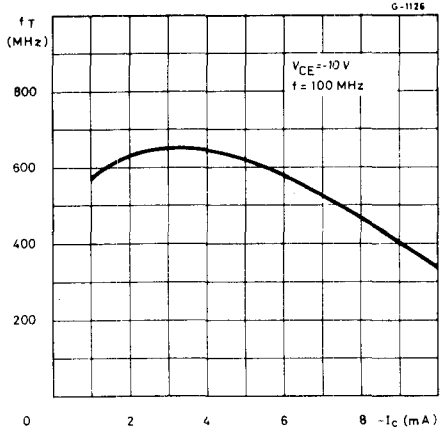
Typical DC current gain



Typical transition frequency



TEST CIRCUIT

Power gain and noise figure