

BF 680

SILICON PLANAR PNP

PRELIMINARY DATA

UHF MIXER-OSCILLATOR

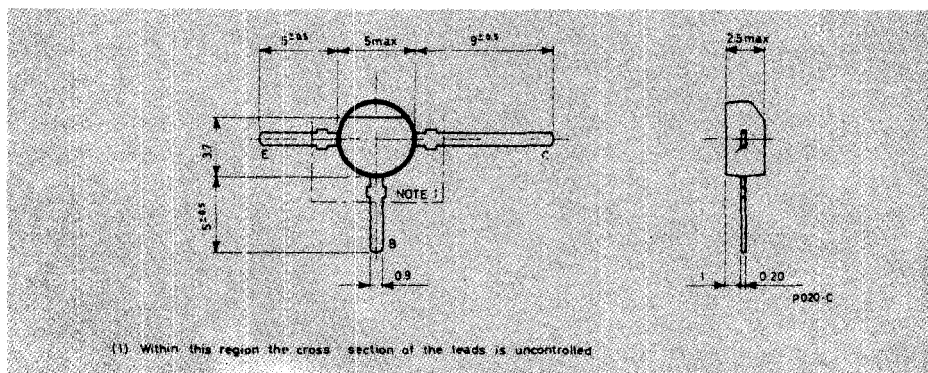
The BF 680 is a PNP silicon planar epitaxial transistor in T-plastic package. It is intended for use in TV varicap tuners as mixer-oscillator stage up to 900 MHz.

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 $T_{amb} \leq 45^\circ\text{C}$	170 mW
T_{stg}	Storage temperature	-55 to 150 $^\circ\text{C}$
T_j	Junction temperature	150 $^\circ\text{C}$

MECHANICAL DATA

Dimensions in mm



BF 680

THERMAL DATA

$R_{th j-amb}$	Thermal resistance junction-ambient	max	600 °C/W
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ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ °C}$ unless otherwise specified)

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

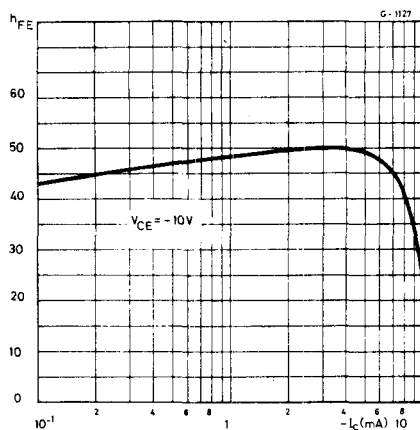
* See TEST CIRCUIT

ELECTRICAL CHARACTERISTICS (continued)

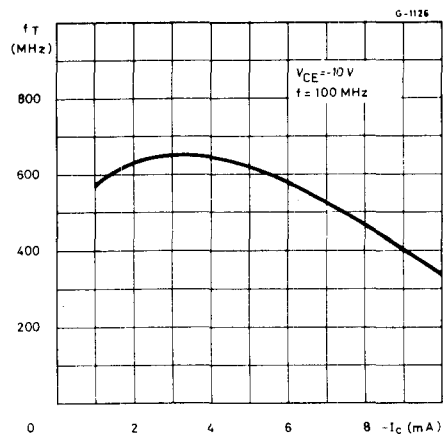
Parameter	Test conditions	Min.	Typ.	Max.	Unit
g_{ib} Input conductance	$I_C = -2 \text{ mA}$ $V_{CE} = -10 \text{ V}$ $f = 860 \text{ MHz}$ $f = 500 \text{ MHz}$		7 14		mS mS
$-b_{ib}$ Input susceptance	$I_C = -2 \text{ mA}$ $V_{CE} = -10 \text{ V}$ $f = 860 \text{ MHz}$ $f = 500 \text{ MHz}$		19 24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

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Typical DC current gain

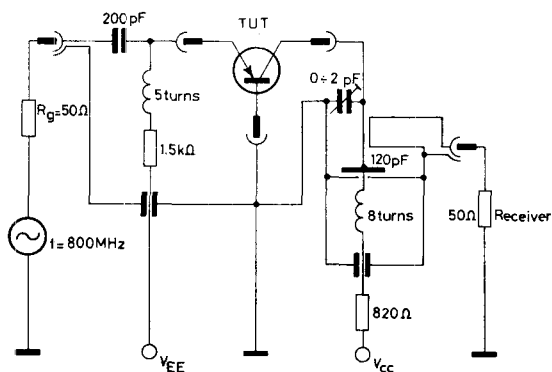


Typical transition frequency



TEST CIRCUIT

Power gain and noise figure



S-0486/1