

N-P-N SILICON PLANAR TRANSISTOR

BF197

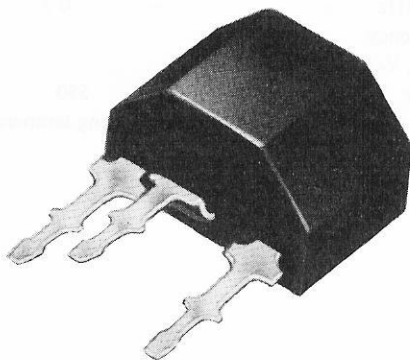
N-P-N silicon planar transistor in plastic encapsulation with three rigid self-locking strips suitable for insertion in printed circuit boards using standard grids. The transistor has a very low feedback capacitance and is primarily intended for use in the output stage of television video i.f. amplifiers.

QUICK REFERENCE DATA

V_{CE0} max.	40	V
V_{CE0} max.	25	V
I_C max.	25	mA
P_{tot} max. ($T_{amb} = 25^\circ\text{C}$)	250	mW
T_j max.	125	$^\circ\text{C}$
f_T typ. ($I_C = 5\text{mA}$, $V_{CE} = 10\text{V}$, $f = 100\text{MHz}$)	550	MHz
$-C_{re}$ typ. ($I_C = 1\text{mA}$, $V_{CE} = 10\text{V}$, $f = 10.7\text{MHz}$)	0.3	pF
G_{UM} typ. ($I_C = 7\text{mA}$, $V_{CE} = 10\text{V}$) $f = 35\text{MHz}$	43	dB
$f = 45\text{MHz}$	41	dB
Video detector output voltage, typ.	7.7	V

OUTLINE AND DIMENSIONS

For details see page 4



RATINGS

Limiting values of operation according to the absolute maximum system.

Electrical

V_{CBO} max.	40	V
V_{CEO} max. (see also page 5)	25	V
V_{EBO} max.	4.0	V
I_C max.	25	mA
I_{CM} max.	25	mA
P_{tot} max. ($T_{amb} = 25^\circ\text{C}$)	250	mW

Temperature

T_{stg}	-65 to +125	$^\circ\text{C}$
T_j max.	125	$^\circ\text{C}$

THERMAL CHARACTERISTIC

$R_{th(j-amb)}$ in free air	0.4	deg C/mW
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ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^\circ\text{C}$)

	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	
I_B Base current				
$I_C = 7.0\text{mA}$, $V_{CE} = 10\text{V}$	—	80	185	μA
V_{BE} *Base-emitter voltage				
$I_C = 7.0\text{mA}$, $V_{CE} = 10\text{V}$	—	750	900	mV
$-C_{re}$ Feedback capacitance				
$I_C = 1.0\text{mA}$, $V_{CE} = 10\text{V}$, $f = 10.7\text{MHz}$	—	0.3	—	pF
f_T Transition frequency				
$I_C = 5.0\text{mA}$, $V_{CE} = 10\text{V}$, $f = 100\text{MHz}$	—	550	—	MHz
* V_{BE} decreases by about 1.7mV/degC with increasing temperature.				



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ELECTRICAL CHARACTERISTICS (continued)

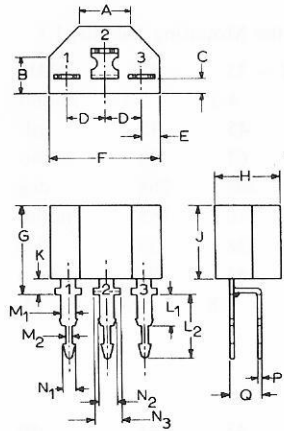
Typical y-parameters (common emitter)

$I_C = 7.0\text{mA}$, $V_{CE} = 10\text{V}$ (mounted as in the Mounting Details, 1.)

		f = 35	= 45	MHz
g_{ie}	Input conductance	4.5	5.5	mmho
C_{ie}	Input capacitance	45	45	pF
$ y_{re} $	Feedback admittance	67	86	μmho
ϕ_{re}	Phase angle of feedback admittance	268	268	deg
$ y_{fe} $	Transfer admittance	170	155	mmho
ϕ_{fe}	Phase angle of transfer admittance	338	335	deg
g_{oe}	Output conductance	85	95	μmho
C_{oe}	Output capacitance	1.8	1.8	pF
G_{UM}	Maximum unilateralised power gain			
	$G_{UM} \text{ (in dB)} = 10 \log \frac{ y_{fe} ^2}{4g_{ie}g_{oe}}$			
	$I_C = 7.0\text{mA}$, $V_{CE} = 10\text{V}$	43	41	dB



OUTLINE AND DIMENSIONS



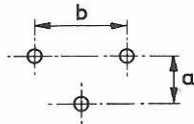
- Connections
 1. Base
 2. Emitter
 3. Collector

Millimetres

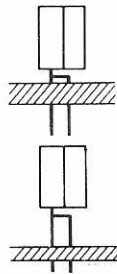
	Min.	Max.
A	3.4	3.6
B	2.4	2.6
C	0.8	1.1
D	2.44	2.64
E	1.1	1.3
F	7.4	7.6
G	6.0	6.4
H	4.4	4.6
J	4.9	5.1
K	1.1	1.3
L1	2.1	2.2
L2	4.0	4.3
M1	0.65	0.80
M2	0.45	0.60
N1	0.70	0.80
N2	1.15	1.25
N3	1.75	2.00
P	0.17	0.25
Q	1.75	2.00

MOUNTING DETAILS

See also General Explanatory Notes, Section IV



a = 2.49 to 2.59mm
 b = 5.03 to 5.13mm

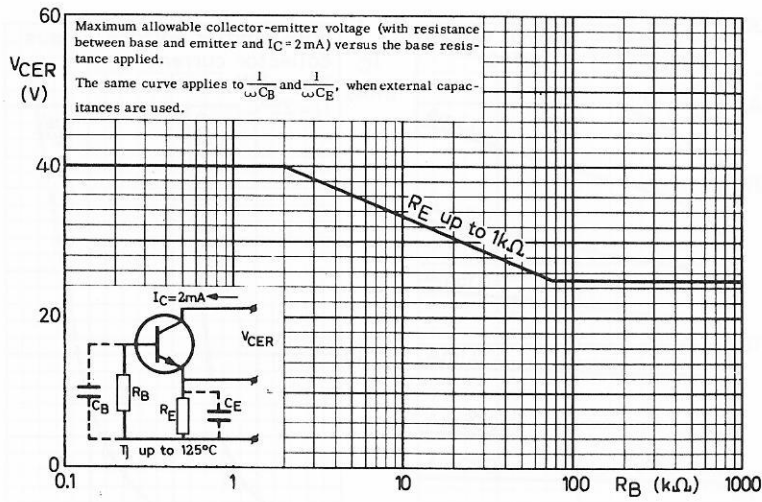
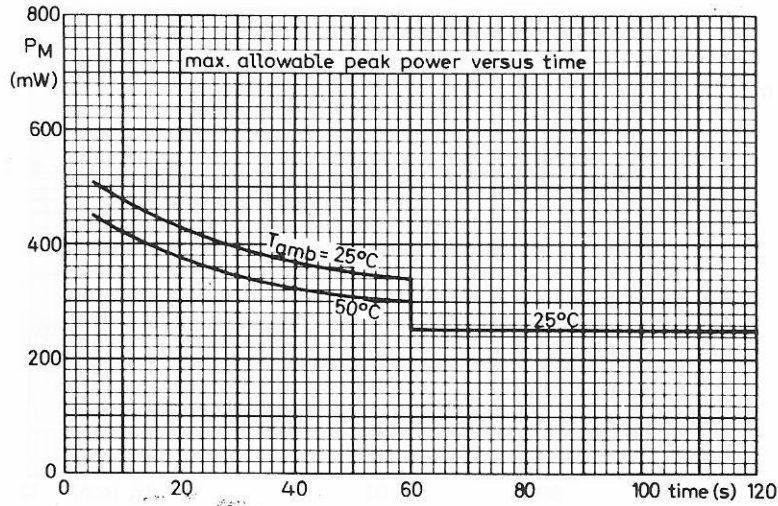


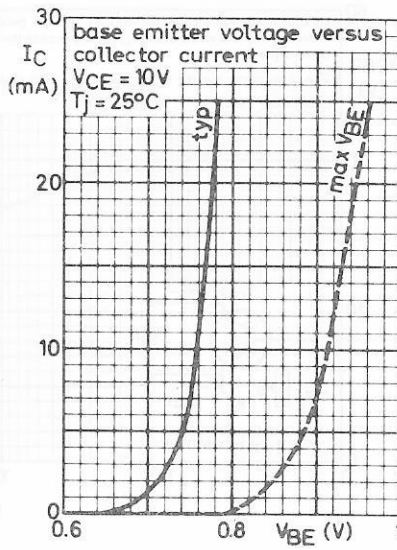
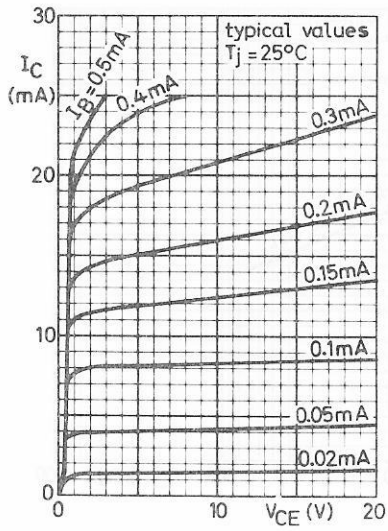
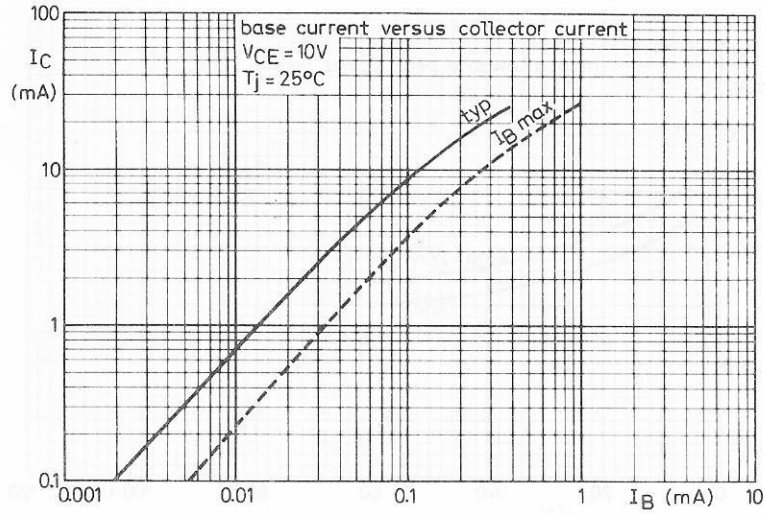
1. Maximum thickness of printed board = 1.7mm
 Hole diameter = 1.25 to 1.35mm
2. Maximum thickness of printed board = 1.1mm
 Hole diameter = 0.77 to 0.83mm



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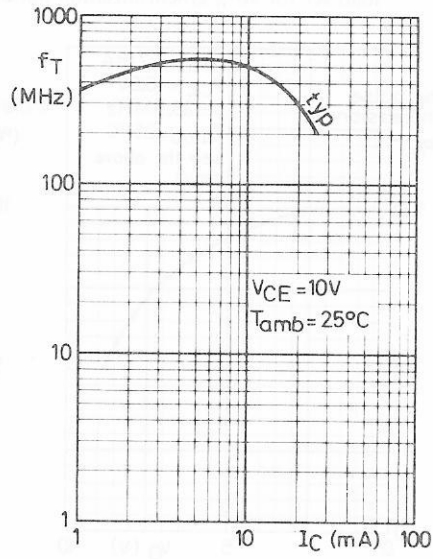
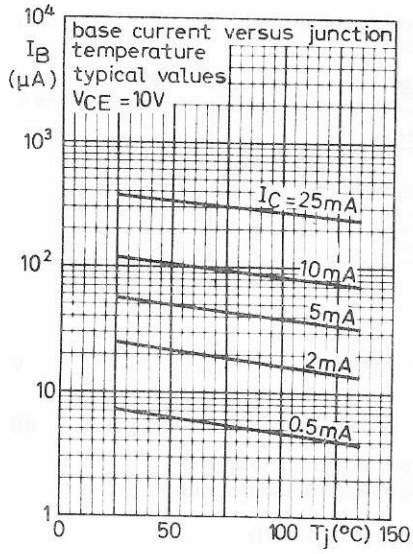
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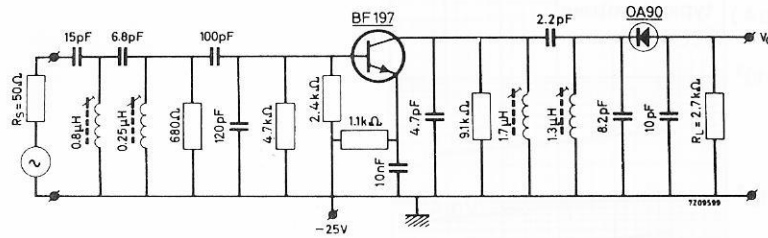
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APPLICATION INFORMATION

Output stage of a television video i.f. amplifier with the BF197 transistor followed by a video detector circuit.



† V_O Video detector output voltage

	$I_C = 7.2\text{mA}$, $V_{CE} = 16.6\text{V}$, $f = 38.9\text{MHz}$	Min.	Typ.	
		6.0	7.7	V

G_{tr} Transducer gain

	$I_C = 7.2\text{mA}$, $V_{CE} = 16.6\text{V}$, $f = 36.4\text{MHz}$	—	25.5	dB
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$$G_{tr} \text{ (in dB)} = 10 \log \frac{\text{output power in load } R_L}{\text{available power from source with } R_S}$$

Tuning frequency for all tuned circuits is 37MHz

†The output voltage V_O is defined as the voltage across the 2.7kΩ detector load R_L for 30% synchronisation pulse compression.

