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BF496

SILICON PLANAR TRANSISTOR

NPN transistor in a plastic TO-92 envelope intended for VHF applications, e.g. as gain controlled pre-amplifier in VHF television and FM tuners.

QUICK REFERENCE DATA

Collector-base voltage (open emitter)	V_{CB0}	max.	30 V
Collector-emitter voltage (open base)	V_{CEO}	max.	20 V
Collector current (DC)	I_C	max.	20 mA
Total power dissipation up to $T_{amb} = 75^\circ C$	P_{tot}	max.	300 mW
Junction temperature	T_j	max.	150 $^\circ C$
Transition frequency $-I_E = 2 \text{ mA}; V_{CB} = 10 \text{ V}$	f_T	min.	300 MHz

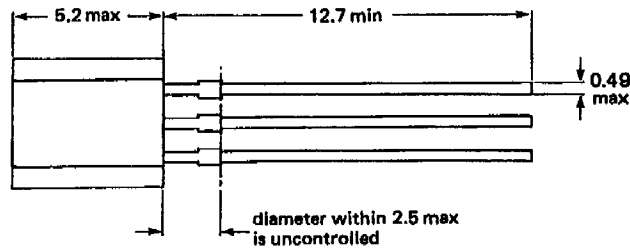
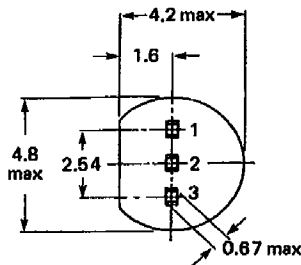
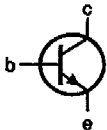
MECHANICAL DATA

Dimensions in mm

Fig.1 TO-92.

Pinning

- 1 = emitter
- 2 = base
- 3 = collector



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Collector-base voltage (open emitter)	V_{CB0}	max.	30 V
Collector-emitter voltage (open base)	V_{CEO}	max.	20 V
Collector-emitter voltage ($R_{BE} \leq 1 \text{ k}\Omega$)	V_{CER}	max.	30 V
Emitter-base voltage (open collector)	V_{EBO}	max.	3 V
Collector current (DC)	I_C	max.	20 mA
Collector current (peak value)	I_{CM}	max.	20 mA
Total power dissipation up to $T_{amb} = 75 \text{ }^\circ\text{C}$	P_{tot}	max.	300 mW
Storage temperature range	T_{stg}		$-65 \text{ to } +150 \text{ }^\circ\text{C}$
Junction temperature	T_J	max.	150 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th J-a}$	=	420 K/W
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CHARACTERISTICS

$T_{amb} = 25 \text{ }^\circ\text{C}$ unless otherwise specified

DC current gain

$-I_E = 2 \text{ mA}; V_{CB} = 10 \text{ V}$

h_{FE} min. 13

$-I_E = 12 \text{ mA}; V_{CB} = 7 \text{ V}^*$

h_{FE} min. 6

Emitter-base voltage

$-I_E = 2 \text{ mA}; V_{CB} = 10 \text{ V}$

$-V_{EB}$ max. 0.9 V

$-I_E = 12 \text{ mA}; V_{CB} = 7 \text{ V}^*$

$-V_{EB}$ max. 1.0 V

Transition frequency

$-I_E = 2 \text{ mA}; V_{CB} = 10 \text{ V}$

f_T 300 to 800 MHz

$-I_E = 4 \text{ mA}; V_{CB} = 5 \text{ V}$

f_T max. 530 MHz

Feedback capacitance at $f = 10.7 \text{ MHz}$

$I_C = 1 \text{ mA}; V_{CE} = 10 \text{ V}$

C_{re} typ. 0.8 pF
max. 1.0 pF

Collector cut-off current

$I_E = 0; V_{CB} = 20 \text{ V}$

I_{CBO} max. 500 nA

$I_E = 0; V_{CB} = 20 \text{ V}; T_{amb} = 150 \text{ }^\circ\text{C}$

I_{CBO} max. 10 μA

Emitter-base cut-off current

$I_C = 0; V_{EB} = 2 \text{ V}$

I_{EBO} max. 500 nA

y-parameters at $f = 100 \text{ MHz}$ (common base)

$I_C = 2 \text{ mA}; V_{CE} = 10 \text{ V}$

Input conductance	g_{ib}	typ.	66 mS
Input susceptance	$-b_{ib}$	typ.	15 mS
Feedback admittance	$ Y_{rb} $	typ.	190 mS
Phase angle of feedback admittance	φ_{rb}	typ.	280°
Transfer admittance	$ Y_{fb} $	typ.	66 mS
Phase angle of transfer admittance	φ_{fb}	typ.	155°
Output conductance	g_{ob}	typ.	15 μS
Output susceptance	b_{ob}	typ.	660 μS

y-parameters at $f = 50 \text{ MHz}$ (common base)

$-I_E = 3 \text{ mA}; V_{CB} = 10 \text{ V}$

Input conductance	g_{ib}	typ.	9.5 mS
Input susceptance	$-b_{ib}$	typ.	12 mS
Feedback admittance	$ Y_{rb} $	typ.	100 μS
Phase angle of feedback admittance	φ_{rb}	typ.	270°
Transfer admittance	$ Y_{fb} $	typ.	95 mS
Phase angle of transfer admittance	φ_{fb}	typ.	160°
Output conductance	g_{ob}	typ.	10 μS
Output susceptance	b_{ob}	typ.	350 μS

y-parameters at $f = 200 \text{ MHz}$ (common base)

$-I_E = 3 \text{ mA}; V_{CB} = 10 \text{ V}$

Input conductance	g_{ib}	typ.	70 mS
Input susceptance	$-b_{ib}$	typ.	46 mS
Feedback admittance	$ Y_{rb} $	typ.	340 μS
Phase angle of feedback admittance	φ_{rb}	typ.	275°
Transfer admittance	$ Y_{fb} $	typ.	85 mS
Phase angle of transfer admittance	φ_{fb}	typ.	130°
Output conductance	g_{ob}	typ.	75 μS
Output susceptance	b_{ob}	typ.	1.3 mS