

T-31-15



SILICON PLANAR TRANSISTOR

P-N-P transistor in a plastic T-package, primarily intended for application as gain controlled preamplifier in u.h.f. television tuners.

QUICK REFERENCE DATA

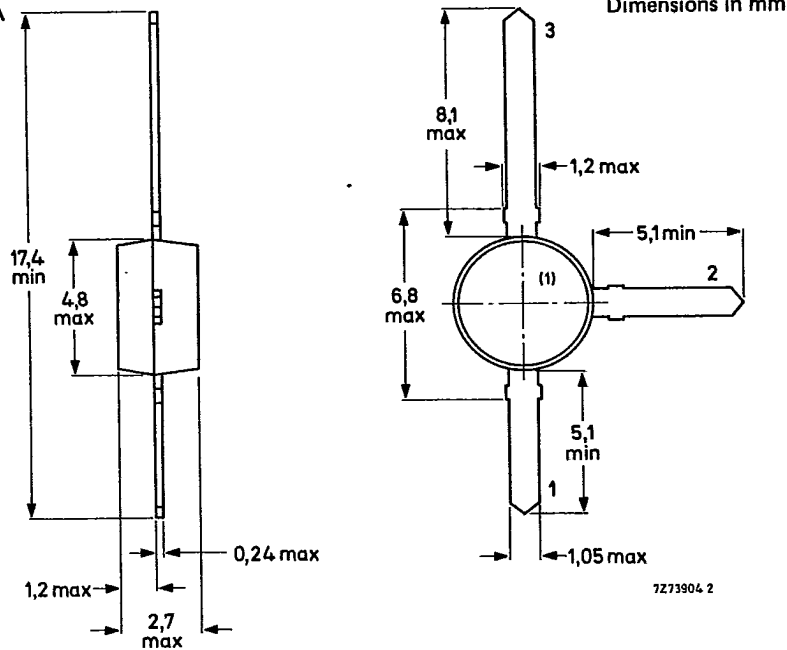
Collector-base voltage (open emitter)	$-V_{CBO}$	max.	30 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	30 V
Collector current (d.c.)	$-I_C$	max.	20 mA
Total power dissipation up to $T_{amb} = 55\text{ }^\circ\text{C}$	P_{tot}	max.	160 mW
Junction temperature	T_j	max.	150 $^\circ\text{C}$
Transition frequency at $f = 100\text{ MHz}$ $I_E = 3\text{ mA}; -V_{CB} = 10\text{ V}$	f_T	typ.	900 MHz
Noise figure (common base) $I_E = 3\text{ mA}; -V_{CB} = 10\text{ V}; f = 800\text{ MHz}$ $R_S = 60\ \Omega; R_L = 500\ \Omega$	F	typ.	4 dB
Transducer gain (common base) $I_E = 3\text{ mA}; -V_{CB} = 10\text{ V}; f = 800\text{ MHz}$ $R_S = 60\ \Omega; R_L = 500\ \Omega$	G_{tr}	typ.	13 dB

MECHANICAL DATA

Fig. 1 SOT-37.

Connections

- 1. Emitter
- 2. Base
- 3. Collector



(1) = type number marking.

Products approved to CECC 50 002-127

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RATINGS

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

Collector-base voltage (open emitter)	$-V_{CBO}$	max.	30 V
Collector-emitter voltage (open base)	$-V_{CEO}$	max.	30 V
Emitter-base voltage (open collector)	$-V_{EBO}$	max.	3 V
Collector current (d.c.)	$-I_C$	max.	20 mA
Base current (d.c.)	$-I_B$	max.	5 mA
Total power dissipation up to $T_{amb} = 55^\circ\text{C}$	P_{tot}	max.	160 mW
Storage temperature	T_{stg}		-55 to $+150^\circ\text{C}$
Junction temperature	T_j	max.	150°C

THERMAL RESISTANCE

From junction to ambient in free air $R_{thj-a} = 600 \text{ K/W}$

CHARACTERISTICS

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

Collector cut-off current

 $I_E = 0; -V_{CB} = 15 \text{ V}$ $-I_{CBO} < 100 \text{ nA}$

Emitter cut-off current

 $I_C = 0; -V_{EB} = 1 \text{ V}$ $-I_{EBO} < 100 \text{ nA}$

Collector-base breakdown voltage

open emitter; $-I_C = 10 \mu\text{A}$ $-V_{(BR)CBO} > 30 \text{ V}$

Collector-emitter breakdown voltage

open base; $-I_C = 1 \text{ mA}$ $-V_{(BR)CEO} > 30 \text{ V}$

Emitter-base breakdown voltage

open collector; $-I_E = 10 \mu\text{A}$ $-V_{(BR)EBO} > 3 \text{ V}$

D.C. current gain

 $I_E = 3 \text{ mA}; -V_{CE} = 10 \text{ V}$ $h_{FE} > 15$
typ. 60 $I_E = 7 \text{ mA}; -V_{CE} = 4 \text{ V}$ $h_{FE} > 10$ Transition frequency at $f = 100 \text{ MHz}$ $I_E = 3 \text{ mA}; -V_{CB} = 10 \text{ V}$ f_T typ. 900 MHz
700 to 1100 MHz $I_E = 7 \text{ mA}; -V_{CB} = 5 \text{ V}$ $f_T < 200 \text{ MHz}$ Feedback capacitance at $f = 500 \text{ kHz}$ $I_E = 1 \text{ mA}; -V_{CB} = 10 \text{ V}$ C_{re} typ. 0,45 pF $I_E = 0; -V_{CB} = 10 \text{ V}$ C_{rb} typ. 115 fF
< 140 fF

Noise figure (common base)

 $I_E = 3 \text{ mA}; -V_{CB} = 10 \text{ V}; f = 800 \text{ MHz}$ $R_S = 60 \Omega; R_L = 500 \Omega$ F typ. 4 dB
< 5 dB

Transducer gain (common base)

 $I_E = 3 \text{ mA}; -V_{CB} = 10 \text{ V}; f = 800 \text{ MHz}$ $R_S = 60 \Omega; R_L = 500 \Omega$ $G_{tr} > 11 \text{ dB}$
typ. 13 dB

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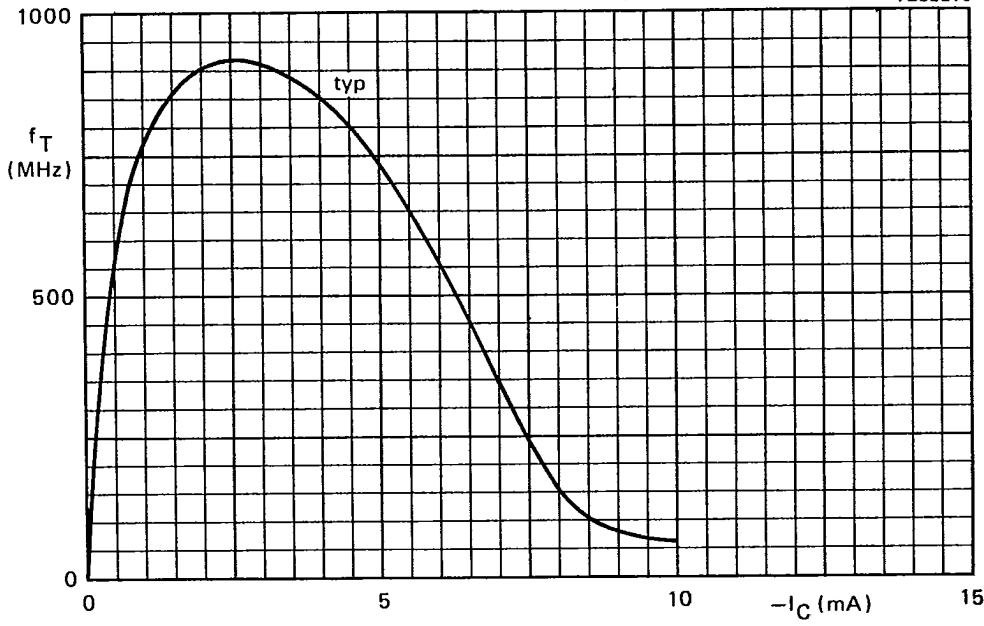


Fig. 2 $-V_{CB} = 10\text{ V}$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$.

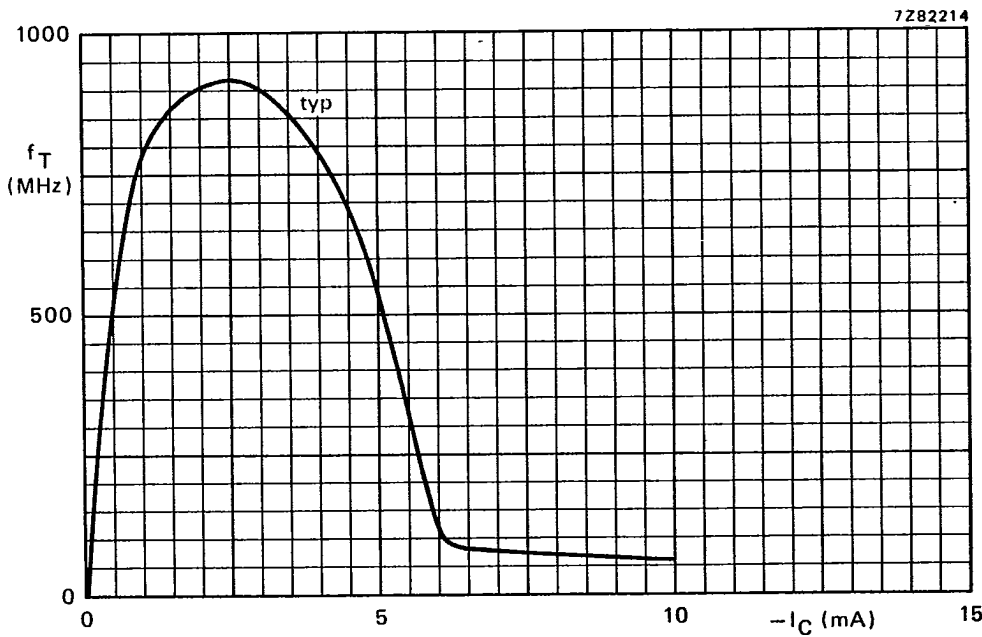


Fig. 3 $-V_{CC} = 12\text{ V}$; $R_C = 1\text{ k}\Omega$; $f = 100\text{ MHz}$; $T_{amb} = 25\text{ }^\circ\text{C}$.

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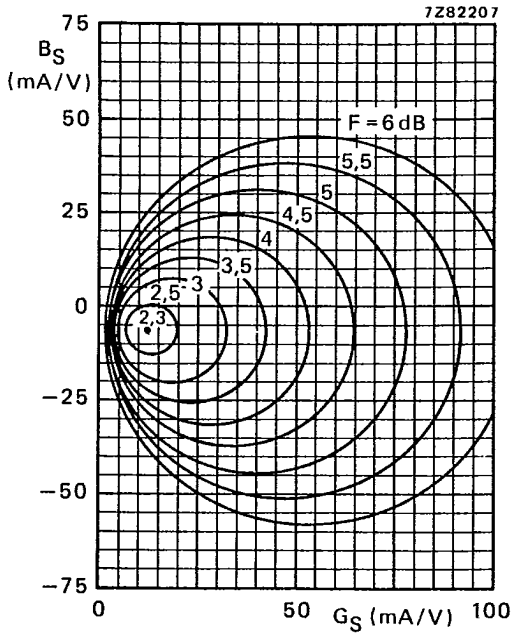


Fig. 4 Circles of constant noise figure.

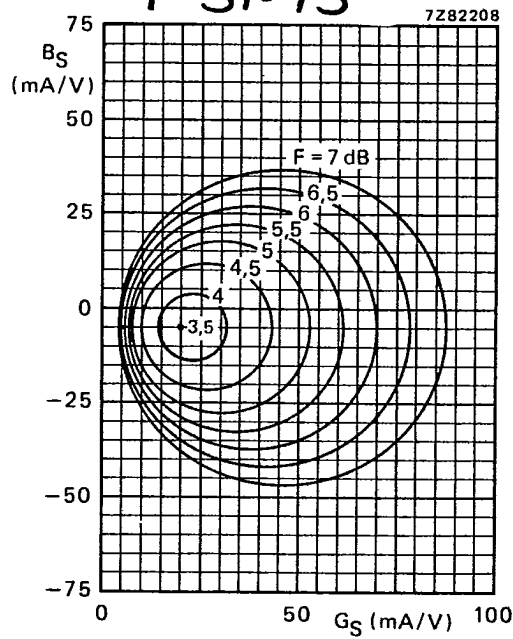
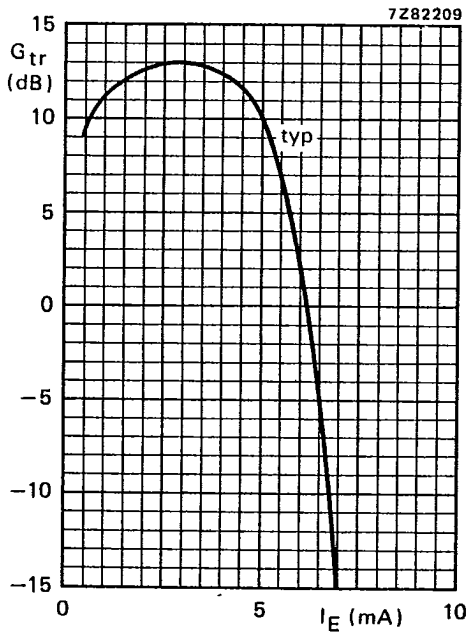


Fig. 5 Circles of constant noise figure.



Measuring conditions:

Fig. 4 $-V_{CB} = 10 \text{ V}$; $I_E = 3 \text{ mA}$; $f = 200 \text{ MHz}$; $T_{amb} = 25 \text{ }^\circ\text{C}$; typical values.

Fig. 5 $-V_{CB} = 10 \text{ V}$; $I_E = 3 \text{ mA}$; $f = 800 \text{ MHz}$; $T_{amb} = 25 \text{ }^\circ\text{C}$; typical values.

Fig. 6 $-V_{CC} = 12 \text{ V}$; $R_C = 1 \text{ k}\Omega$; $R_L = 500 \text{ }\Omega$; $f = 800 \text{ MHz}$; $T_{amb} = 25 \text{ }^\circ\text{C}$.

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Conditions for Figs 7 to 10: $I_E = 3 \text{ mA}$; $-V_{CB} = 10 \text{ V}$; $T_{amb} = 25 \text{ }^\circ\text{C}$; typical values.

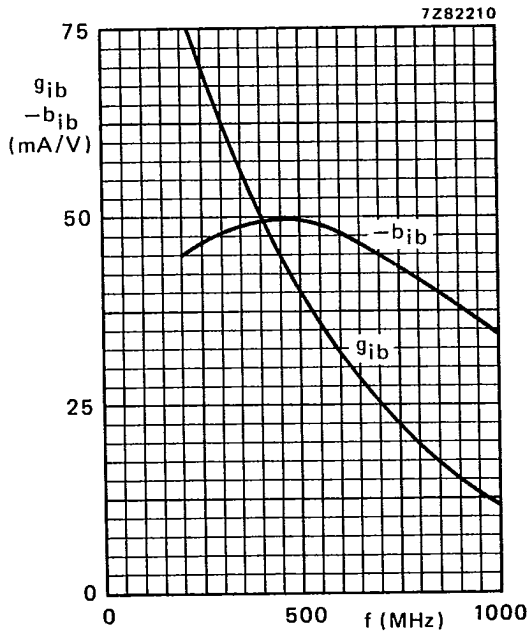


Fig. 7.

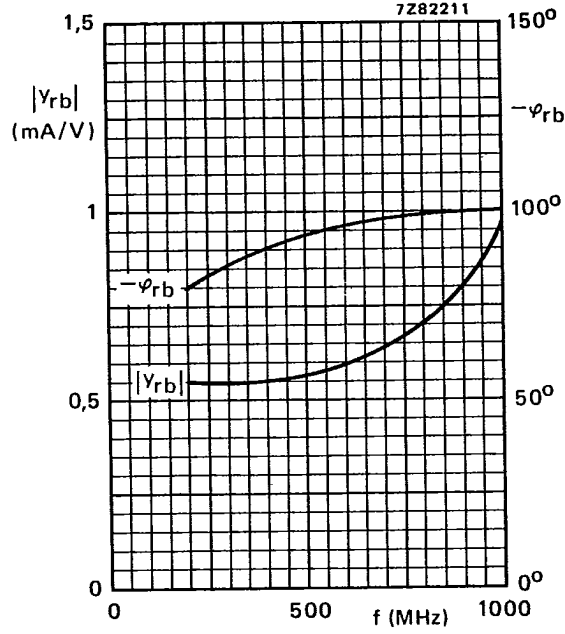


Fig. 8.

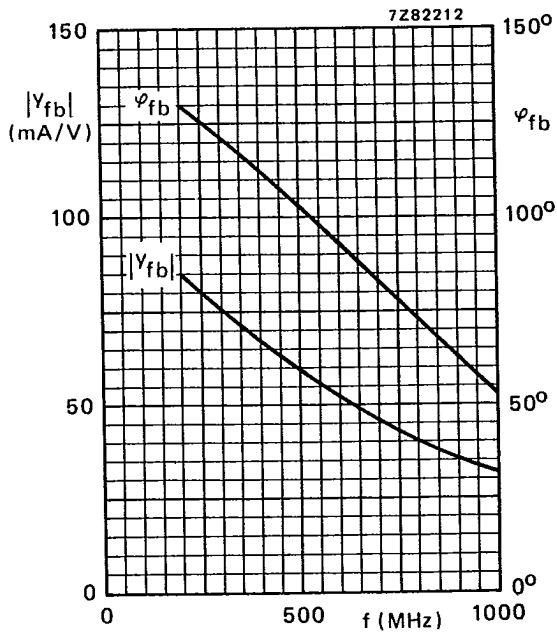


Fig. 9.

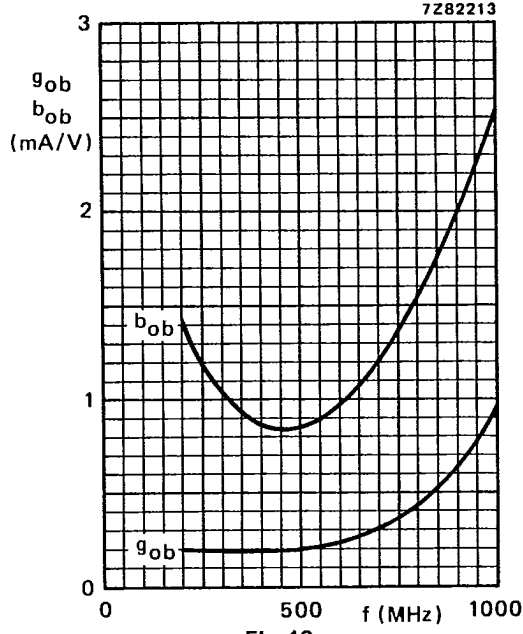


Fig. 10.