

SILICON PLANAR EPITAXIAL TRANSISTORS

N-P-N transistor in a microminiature plastic envelope. It has a very low feedback capacitance and is intended for i.f. and v.h.f. applications in thick and thin-film circuits.

QUICK REFERENCE DATA

Collector-base voltage (open emitter)	V_{CBO}	max.	30 V	
Collector-emitter voltage (open base)	V_{CEO}	max.	20 V	
Collector current (d.c.)	I_C	max.	25 mA	
Total power dissipation up to $T_{amb} = 65^\circ\text{C}$	P_{tot}	max.	250 mW	←
Junction temperature	T_j	max.	175 $^\circ\text{C}$	←
D.C. current gain $I_C = 7\text{ mA}; V_{CE} = 10\text{ V}$	h_{FE}	>	40	
Transition frequency at $f = 100\text{ MHz}$ $I_C = 5\text{ mA}; V_{CE} = 5\text{ V}$	f_T	typ.	450 MHz	
Feedback capacitance at $f = 1\text{ MHz}$ $I_C = 1\text{ mA}; V_{CE} = 10\text{ V}$	C_{re}	typ.	350 fF	

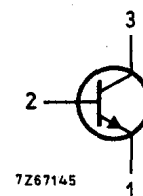
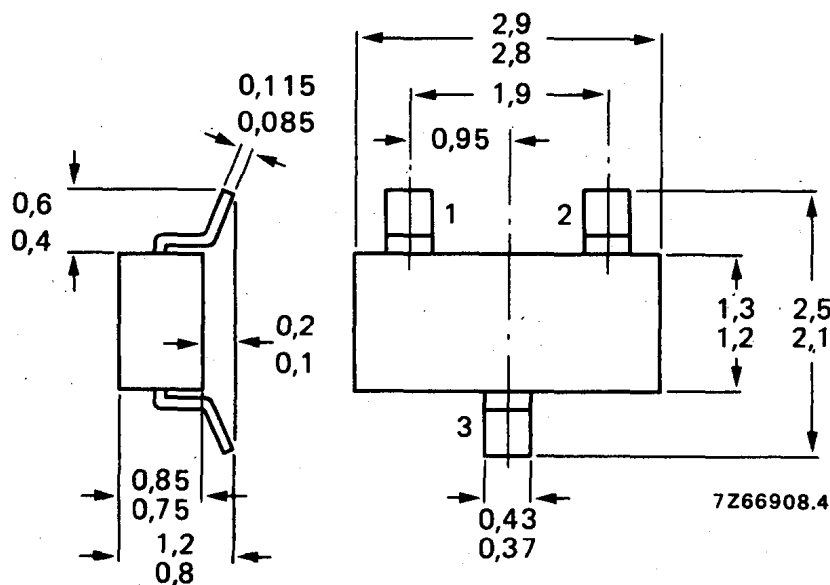
MECHANICAL DATA

Fig. 1 SOT-23.

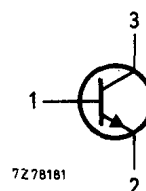
Dimensions in mm

Marking code

BFS20 = G1



BFS20R = G4



See also *Soldering recommendations*.

RATINGS

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

Collector-base voltage (open emitter) see Fig. 2

V_{CBO} max. 30 V

Collector-emitter voltage (open base) see Fig. 2

V_{CEO} max. 20 V

$I_C = 2 \text{ mA}$

Emitter-base voltage (open collector) see Fig. 2

V_{EBO} max. 4 V

Collector current (d.c.)

I_C max. 25 mA

Collector current (peak value)

I_{CM} max. 25 mA

→ Total power dissipation up to $T_{amb} = 65^\circ\text{C}^{**}$

P_{tot} max. 250 mW

→ Storage temperature

T_{stg} -65 to $+175^\circ\text{C}$

→ Junction temperature

T_j max. 175°C

→ THERMAL CHARACTERISTICS *

$$T_j = P \times (R_{th j-t} + R_{th t-s} + R_{th s-a}) + T_{amb}$$

Thermal resistance

From junction to tab

$R_{th j-t}$ = 60 K/W

From tab to soldering points

$R_{th t-s}$ = 260 K/W

From soldering points to ambient **

$R_{th s-a}$ = 120 K/W

CHARACTERISTICS

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

Collector cut-off current

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

I_{CBO} < 100 nA

$I_E = 0; V_{CB} = 20 \text{ V}; T_j = 100^\circ\text{C}$

I_{CBO} < 10 μA

Base-emitter voltage

$I_C = 7 \text{ mA}; V_{CE} = 10 \text{ V}$

V_{BE} typ. 740 mV
< 900 mV

D.C. current gain

$I_C = 7 \text{ mA}; V_{CE} = 10 \text{ V}$

h_{FE} > 40
typ. 85

Transition frequency at $f = 100 \text{ MHz}$

$I_C = 5 \text{ mA}; V_{CE} = 10 \text{ V}$

f_T > 275 MHz
typ. 450 MHz

Collector capacitance at $f = 1 \text{ MHz}$

$I_E = I_C = 0; V_{CB} = 10 \text{ V}$

C_c typ. 0,8 pF

Feedback capacitance at $f = 1 \text{ MHz}$

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

$-C_{re}$ typ. 350 fF

* See *Thermal characteristics* in chapter GENERAL.

** Mounted on a ceramic substrate of 7 mm x 5 mm x 0,6 mm.

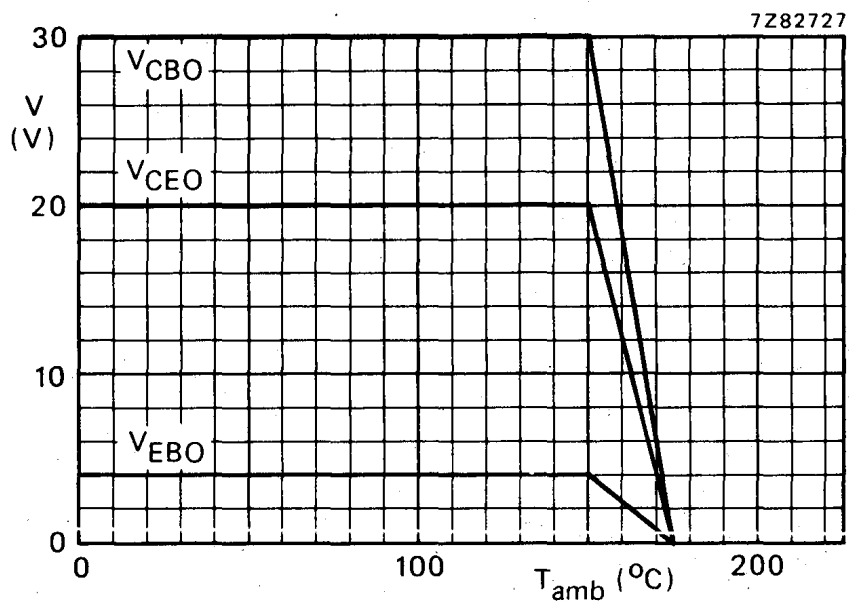


Fig. 2 Voltage derating curves.

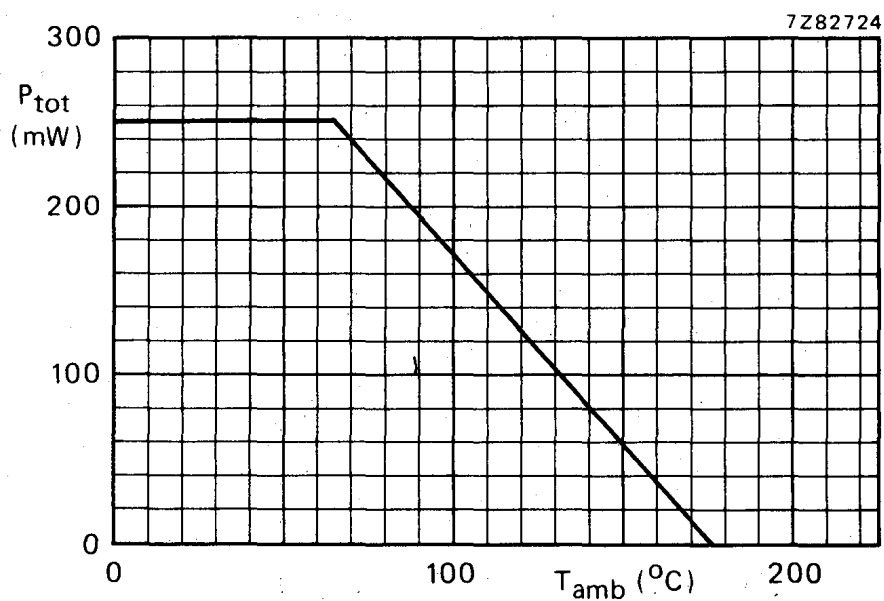


Fig. 3 Power derating curve.

