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HF/VHF power transistor

BLW96

DESCRIPTION

N-P-N silicon planar epitaxial transistor intended for use in class-A, AB and B operated high power industrial and military transmitting equipment in the h.f. and v.h.f. band. The transistor presents excellent performance as a linear amplifier in s.s.b. applications. It is resistance stabilized and is guaranteed to withstand severe load mismatch conditions. Transistors are supplied in matched h_{FE} groups.

The transistor has a ½" flange envelope with a ceramic cap. All leads are isolated from the flange.

QUICK REFERENCE DATA

R.F. performance up to T_h = 25 °C

MODE OF OPERATION	V_{CE} V	f MHz	P_L W	G_p dB	η %	d_3 dB	d_5 dB	$I_{C(ZS)}$ (I_C) A
s.s.b. (class-AB)	**50**	**1,6 – 28**	**25 – 200 (P.E.P.)**	**> 13,5**	**> 40**(1)	**< –30**	**< –30**	**0,1**
c.w. (class-B)	50	108	200	typ. 6,5	typ. 67	–	–	(6)
s.s.b. (class-A)	40	28	50 (P.E.P.)	typ. 19	–	typ. –40	< –40	(4)

Note

1. η_{dt} at 200 W P.E.P.

PIN CONFIGURATION

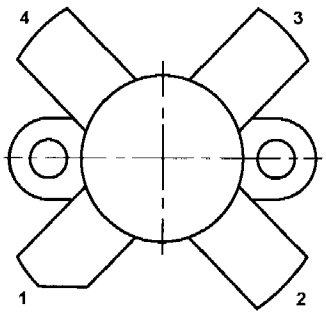


Fig.1 Simplified outline. SOT121B.

PINNING - SOT121B.

PIN	DESCRIPTION
1	collector
2	emitter
3	base
4	emitter

RATINGS

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

Collector-emitter voltage (V_{BE} = 0) peak value	V_{CESM}	max.	110 V
Collector-emitter voltage (open base)	V_{CEO}	max.	55 V
Emitter-base voltage (open collector)	V_{EBO}	max.	4 V
Collector current (average)	$I_{C(AV)}$	max.	12 A
Collector current (peak value); f > 1 MHz	I_{CM}	max.	40 A
R.F. power dissipation (f > 1 MHz); T_{mb} = 45 °C	P_{rf}	max.	340 W
Storage temperature	T_{stg}		−65 to + 150 °C
Operating junction temperature	T_j	max.	200 °C

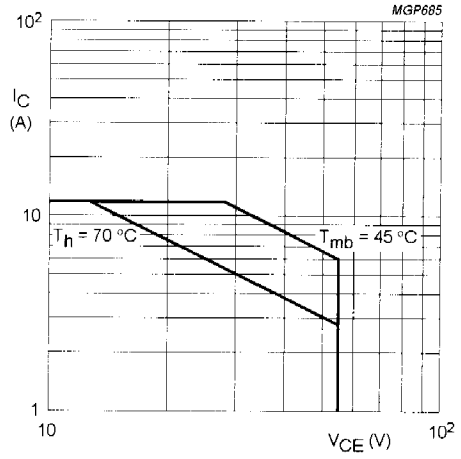
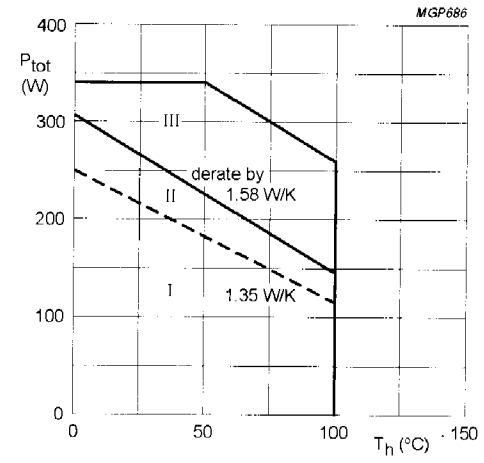


Fig.2 D.C. SOAR.



I Continuous d.c. operation
II Continuous r.f. operation; f > 1 MHz
III Short-time operation during mismatch, f > 1 MHz

Fig.3 Power/temperature derating curves.

THERMAL RESISTANCE

(dissipation = 150 W; T_{mb} = 100 °C, i.e. T_h = 70 °C)

From junction to mounting base (d.c. dissipation)	$R_{th\ j\text{-}mb(dc)}$	=	0,63 K/W
From junction to mounting base (r.f. dissipation)	$R_{th\ j\text{-}mb(rf)}$	=	0,45 K/W
From mounting base to heatsink	$R_{th\ mb\text{-}h}$	=	0,2 K/W

CHARACTERISTICS

T_j = 25 °C

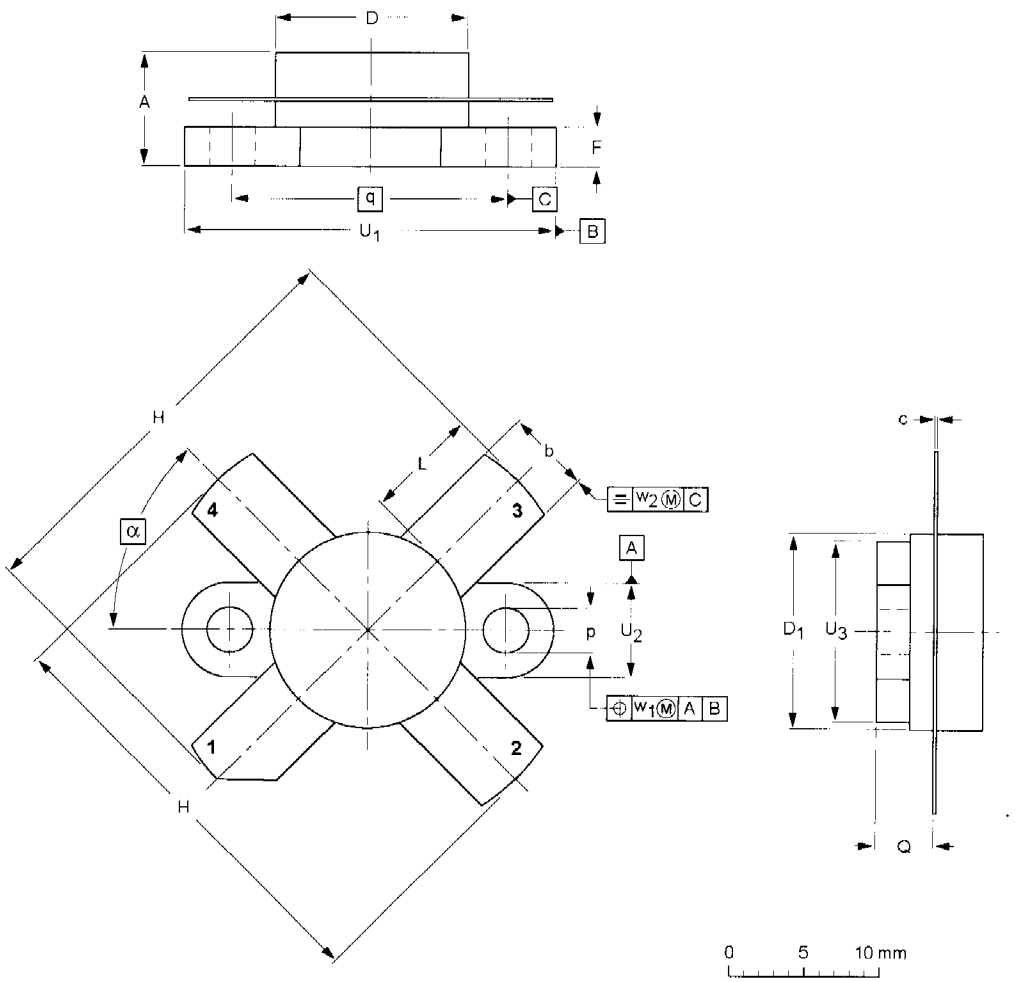
Collector-emitter breakdown voltage				
V_{BE} = 0; I_C = 50 mA	$V_{(BR)CES}$	>	110	V
Collector-emitter breakdown voltage				
open base; I_C = 200 mA	$V_{(BR)CEO}$	>	55	V
Emitter-base breakdown voltage				
open collector; I_E = 20 mA	$V_{(BR)EBO}$	>	4	V
Collector cut-off current				
V_{BE} = 0; V_{CE} = 55 V	I_{CES}	<	10	mA
Second breakdown energy; L = 25 mH; f = 50 Hz				
open base	E_{SBO}	>	20	mJ
R_{BE} = 10 Ω	E_{SBR}	>	20	mJ
D.C. current gain[1]				
I_C = 7 A; V_{CE} = 5 V	h_{FE}	typ. 15 to	30 50	
D.C. current gain ratio of matched devices[1]				
I_C = 7 A; V_{CE} = 5 V	h_{FE1}/h_{FE2}	≤	1,2	
Collector-emitter saturation voltage[1]				
I_C = 20 A; I_B = 4 A	V_{CEsat}	typ.	1,9	V
Transition frequency at f = 100 MHz[2]				
$-I_E$ = 7 A; V_{CB} = 45 V	f_T	typ.	235	MHz
$-I_E$ = 20 A; V_{CB} = 45 V	f_T	typ.	245	MHz
Collector capacitance at f = 1 MHz				
$I_E = I_e$ = 0; V_{CB} = 50 V				
Feedback capacitance at f = 1 MHz	C_c	typ.	280	pF
I_C = 150 mA; V_{CE} = 50 V	C_{re}	typ.	170	pF
Collecting-flange capacitance	C_{cf}	typ.	4,4	pF

Notes

1. Measured under pulse conditions: $t_p \leq 300$ μs; $\delta \leq 0{,}02$.
2. Measured under pulse conditions: $t_p \leq 50$ μs; $\delta \leq 0{,}01$.

PACKAGE OUTLINE

Flanged ceramic package; 2 mounting holes; 4 leads **SOT121B**



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D_1	F	H	L	p	Q	q	U_1	U_2	U_3	w_1	w_2	α
mm	7.27 6.17	5.82 5.56	0.16 0.10	12.86 12.59	12.83 12.57	2.67 2.41	28.45 25.52	7.93 6.32	3.30 3.05	4.45 3.91	18.42	24.90 24.63	6.48 6.22	12.32 12.06	0.51	1.02	45°
inches	0.286 0.243	0.229 0.219	0.006 0.004	0.506 0.496	0.505 0.495	0.105 0.095	1.120 1.005	0.312 0.249	0.130 0.120	0.175 0.154	0.725	0.98 0.97	0.255 0.245	0.485 0.475	0.02	0.04	

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT121B						97-06-28