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VHF power transistor

BLW60C

DESCRIPTION

N-P-N silicon planar epitaxial transistor intended for use in class-A, B and C operated mobile, industrial and military transmitters with a nominal supply voltage of 12,5 V. The transistor is resistance stabilized and is guaranteed to withstand severe load mismatch conditions with a supply over-voltage to 16,5 V.

Matched h_{FE} groups are available on request.

It has a 3/8" capstan envelope with a ceramic cap. All leads are isolated from the stud.

QUICK REFERENCE DATA

R.F. performance up to T_h = 25 °C

MODE OF OPERATION	V_{CC} V	f MHz	P_L W	G_L dB	η %	$\bar{z}_i$ Ω	$\bar{Z}_L$ Ω	d_3 dB
c.w. (class-B)	**12,5**	**175**	**45**	**> 5,0**	**> 75**	**1,2 + j1,4**	**2,6 – j1,2**	–
s.s.b. (class-AB)	12,5	1,6-28	3-30 (P.E.P.)	typ. 19,5	typ. 35	–	–	typ. –33

PIN CONFIGURATION

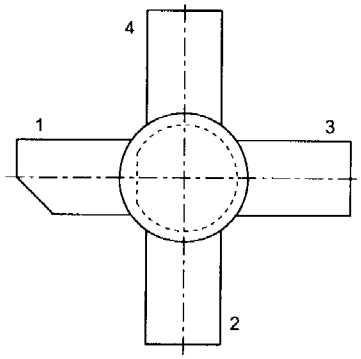


Fig.1 Simplified outline. SOT120A.

PINNING - SOT120A.

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.	36	V
Collector-emitter voltage (open base)	V_{CEO}	max.	16	V
Emitter-base voltage (open collector)	V_{EBO}	max.	4	V
Collector current (average)	$I_{C(AV)}$	max.	9	A
Collector current (peak value); f > 1 MHz	I_{CM}	max.	22	A
R.F. power dissipation (f > 1 MHz); T_{mb} = 25 °C	P_{rf}	max.	100	W
Storage temperature	T_{stg}	−65 to +	150	°C
Operating junction temperature	T_j	max.	200	°C

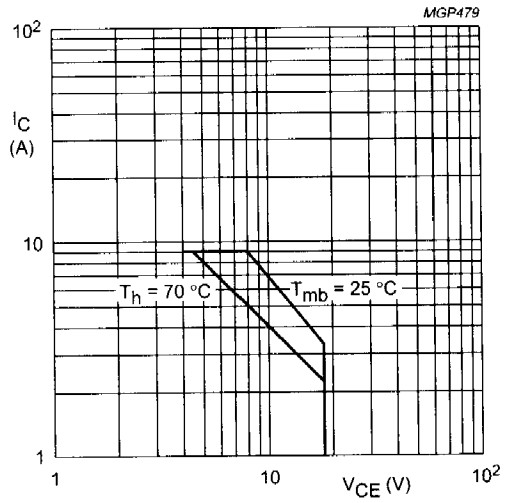
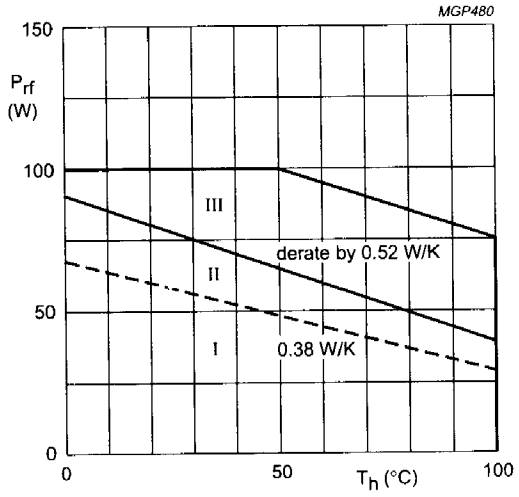


Fig.2 D.C. SOAR.



I Continuous d.c. operation
II Continuous r.f. operation
III Short-time operation during mismatch

Fig.3 R.F. power dissipation; $V_{CE} \leq 16{,}5$ V; f > MHz.

THERMAL RESISTANCE

(dissipation = 40 W; T_{mb} = 88 °C, i.e. T_h = 70 °C)

From junction to mounting base (d.c. dissipation)	$R_{th\ j\text{-}mb(dc)}$	=	2,8 K/W
From junction to mounting base (r.f. dissipation)	$R_{th\ j\text{-}mb(rf)}$	=	2,05 K/W
From mounting base to heatsink	$R_{th\ mb\text{-}h}$	=	0,45 K/W

CHARACTERISTICS

T_j = 25 °C

Breakdown voltage				
Collector-emitter voltage				
V_{BE} = 0; I_C = 50 mA	$V_{(BR)CES}$	>	36	V
Collector-emitter voltage				
open base; I_C = 100 mA	$V_{(BR)CEO}$	>	16	V
Emitter-base voltage				
open collector; I_E = 25 mA	$V_{(BR)EBO}$	>	4	V
Collector cut-off current				
V_{BE} = 0; V_{CE} = 15 V	I_{CES}	<	25	mA
Transient energy				
L = 25 mH; f = 50 Hz				
open base	E	>	8	ms
$-V_{BE}$ = 1,5 V; R_{BE} = 33 Ω	E	>	8	ms
D.C. current gain (1)				
I_C = 4 A; V_{CE} = 5 V	h_{FE}	typ	50	
		10 to	80	
D.C. current gain ratio of matched devices (1)				
I_C = 4 A; V_{CE} = 5 V	h_{FE1}/h_{FE2}	<	1,2	
Collector-emitter saturation voltage (1)				
I_C = 12,5 A; I_B = 2,5 A	V_{CEsat}	typ	1,5	V
Transition frequency at f = 100 MHz (1)				
I_C = 4 A; V_{CE} = 12,5 V	f_T	typ	650	MHz
I_C = 12,5 A; V_{CE} = 12,5 V	f_T	typ	600	MHz
Collector capacitance at f = 1 MHz				
$I_E = I_e$ = 0; V_{CB} = 15 V	C_c	typ	120	pF
		<	160	pF
Feedback capacitance at f = 1 MHz				
I_C = 200 mA; V_{CE} = 15 V	C_{re}	typ	80	pF
Collector-stud capacitance	C_{cs}	typ	2	pF

Note

1. Measured under pulse conditions: $t_p \leq 200$ μs; $\delta \leq 0{,}02$.