

VHF power transistor

BLV20

DESCRIPTION

N-P-N silicon planar epitaxial transistor intended for use in class-A, B and C operated h.f. and v.h.f. transmitters with a nominal supply voltage of 28 V. The transistor is resistance stabilized and is guaranteed to withstand severe load mismatch conditions.

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

PINNING - SOT123

PIN	DESCRIPTION
1	collector
2	emitter
3	base
4	emitter

QUICK REFERENCE DATA

R.F. performance up to  $T_h = 25^\circ\text{C}$  in an unneutralized common-emitter class-B circuit

MODE OF OPERATION	$V_{CE}$ V	f MHz	$P_L$ W	$G_p$ dB	$\eta$ %	$\bar{Z}_i$ $\Omega$	$\bar{Y}_L$ mS
c.w.	28	175	8	> 12	> 65	$1,8 + j0,7$	$18 - j20$

PIN CONFIGURATION

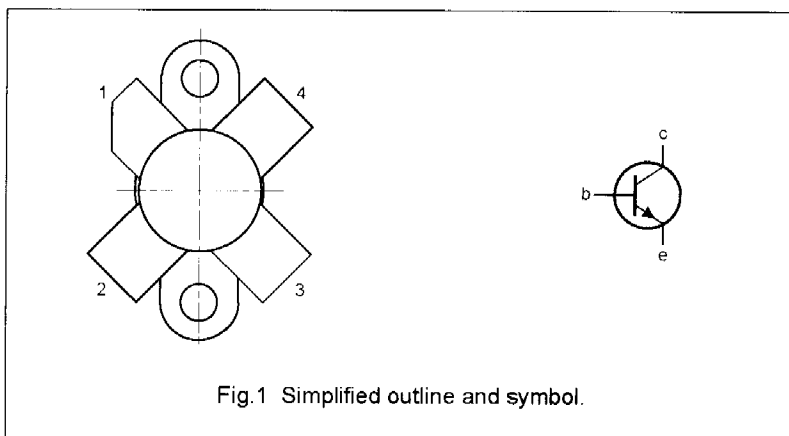


Fig.1 Simplified outline and symbol.

RATINGS

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

Collector-emitter voltage ( $V_{BE} = 0$ )

peak value

$V_{CESM}$  max. 65 V

Collector-emitter voltage (open base)

$V_{CEO}$  max. 36 V

Emitter-base voltage (open collector)

$V_{EBO}$  max. 4 V

Collector current (average)

$I_{C(AV)}$  max. 0,9 A

Collector current (peak value);  $f > 1$  MHz

$I_{CM}$  max. 2,5 A

R.F. power dissipation ( $f > 1$  MHz);  $T_{mb} = 25^\circ\text{C}$

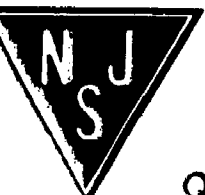
$P_{rf}$  max. 20 W

Storage temperature

$T_{stg}$  -65 to + 150  $^\circ\text{C}$

Operating junction temperature

$T_j$  max. 200  $^\circ\text{C}$



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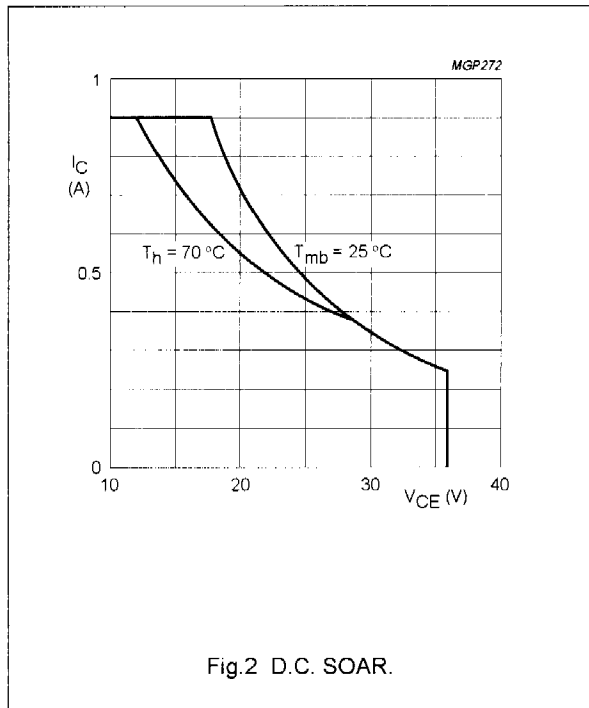
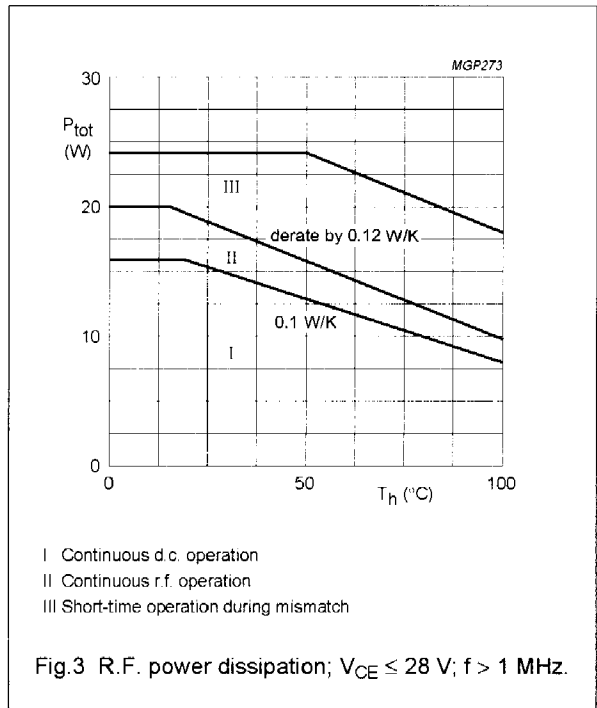


Fig.2 D.C. SOAR.



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

Fig.3 R.F. power dissipation;  $V_{CE} \leq 28$  V;  $f > 1$  MHz.

**THERMAL RESISTANCE**

(dissipation = 8 W;  $T_{mb} = 72,4$  °C, i.e.  $T_h = 70$  °C)

- From junction to mounting base (d.c. dissipation)
- From junction to mounting base (r.f. dissipation)
- From mounting base to heatsink

$R_{th\ j-mb(dc)}$	=	10,7 K/W
$R_{th\ j-mb(rf)}$	=	8,6 K/W
$R_{th\ mb-h}$	=	0,3 K/W

**CHARACTERISTICS**

$T_j = 25$  °C

- Collector-emitter breakdown voltage  
 $V_{BE} = 0$ ;  $I_C = 2$  mA
- Collector-emitter breakdown voltage  
open base;  $I_C = 10$  mA
- Emitter-base breakdown voltage  
open collector;  $I_E = 1$  mA
- Collector cut-off current  
 $V_{BE} = 0$ ;  $V_{CE} = 36$  V
- Second breakdown energy;  $L = 25$  mH;  $f = 50$  Hz  
open base  
 $R_{BE} = 10$   $\Omega$
- D.C. current gain <sup>(1)</sup>  
 $I_C = 0,4$  A;  $V_{CE} = 5$  V
- Collector-emitter saturation voltage <sup>(1)</sup>  
 $I_C = 1,25$  A;  $I_B = 0,25$  A
- Transition frequency at  $f = 100$  MHz <sup>(1)</sup>  
 $-I_E = 0,4$  A;  $V_{CB} = 28$  V  
 $-I_E = 1,25$  A;  $V_{CB} = 28$  V
- Collector capacitance at  $f = 1$  MHz  
 $I_E = I_e = 0$ ;  $V_{CB} = 28$  V
- Feedback capacitance at  $f = 1$  MHz  
 $I_C = 50$  mA;  $V_{CE} = 28$  V
- Collector-flange capacitance

$V_{(BR)CES}$	>	65 V
$V_{(BR)CEO}$	>	36 V
$V_{(BR)EBO}$	>	4 V
$I_{CES}$	<	1 mA
$E_{SBO}$	>	0,5 mJ
$E_{SBR}$	>	0,5 mJ
$h_{FE}$	typ.	50
		10 to 100
$V_{CEsat}$	typ.	0,8 V
$f_T$	typ.	600 MHz
$f_T$	typ.	520 MHz
$C_c$	typ.	10 pF
$C_{re}$	typ.	7,1 pF
$C_{cf}$	typ.	2 pF

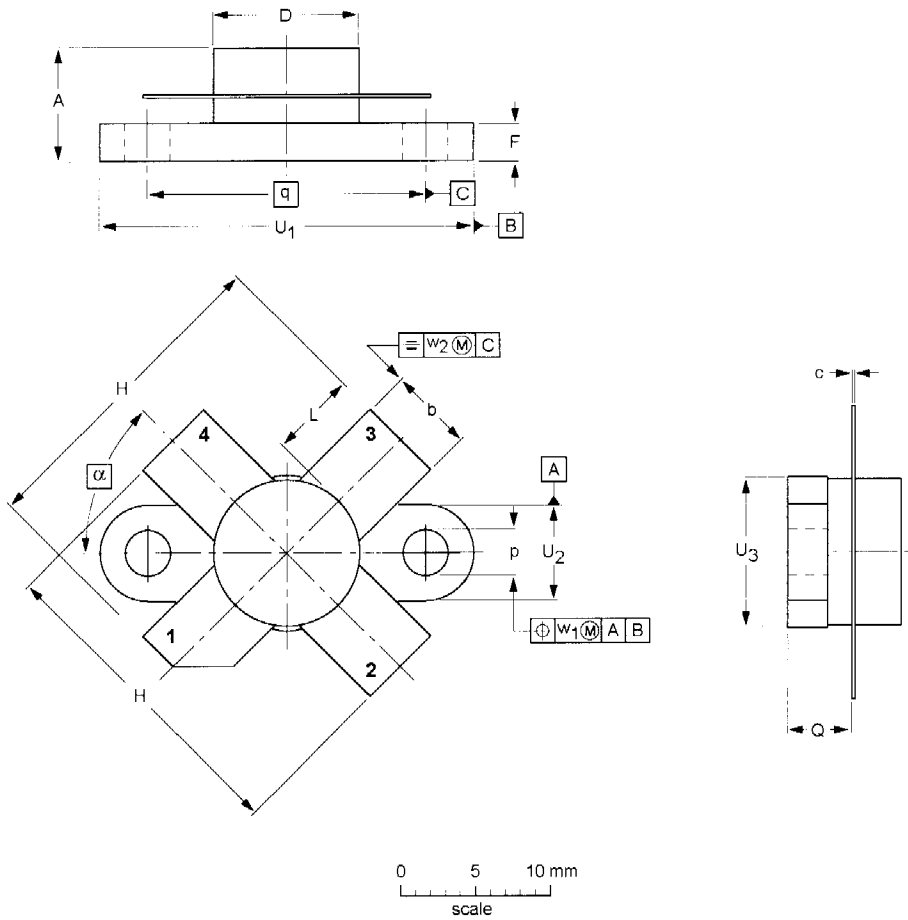
**Note**

1. Measured under pulse conditions:  $t_p \leq 200$   $\mu$ s;  $\delta \leq 0,02$ .

PACKAGE OUTLINE

Flanged ceramic package; 2 mounting holes; 4 leads

SOT123A



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

UNIT	A	b	c	D	D <sub>1</sub>	F	H	L	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	U <sub>3</sub>	w <sub>1</sub>	w <sub>2</sub>	α
mm	7.47 6.37	5.82 5.56	0.18 0.10	9.73 9.47	9.63 9.42	2.72 2.31	20.71 19.93	5.61 5.16	3.33 3.04	4.63 4.11	18.42	25.15 24.36	6.61 6.09	9.78 9.39	0.51	1.02	45°
inches	0.294 0.251	0.229 0.219	0.007 0.004	0.383 0.373	0.397 0.371	0.107 0.091	0.815 0.785	0.221 0.203	0.131 0.120	0.182 0.162	0.725	0.99 0.96	0.26 0.24	0.385 0.370	0.02	0.04	

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION
	IEC	JEDEC	EIAJ	
SOT123A				