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UHF power transistor

BLT53

FEATURES

- Emitter-ballasting resistors for an optimum temperature profile
- Gold metallization ensures excellent reliability
- Withstands full load mismatch.

DESCRIPTION

NPN silicon planar epitaxial transistor encapsulated in a 4-lead SOT122D studless envelope with a ceramic cap. It is designed for common emitter, class-B operation in portable radio transmitters in the 470 MHz communications band. All leads are isolated from the mounting flange.

PINNING - SOT122D

PIN	DESCRIPTION
1	collector
2	emitter
3	base
4	emitter

QUICK REFERENCE DATA

RF performance at T_{mb} = 25 °C in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	P_L (W)	G_p (dB)	η_c (%)
c.w. class-B	470	7.5	8	> 6	> 60

WARNING

Product and environmental safety - toxic materials

This product contains beryllium oxide. The product is entirely safe provided that the BeO disc is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with the general or domestic waste.

PIN CONFIGURATION

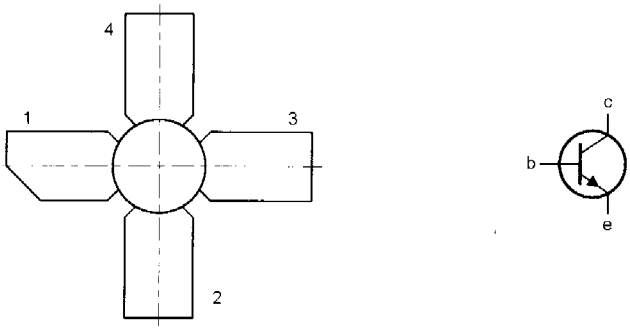


Fig.1 Simplified outline and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	20	V
V_{CEO}	collector-emitter voltage	open base	–	10	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C, $I_{C(AV)}$	collector current	DC or average value	–	2.5	A
I_{CM}	collector current	peak value f > 1 MHz	–	7.5	A
P_{tot}	total power dissipation	RF operation; T_{mb} = 25 °C	–	35.5	W
T_{stg}	storage temperature range		–65	150	°C
T_j	junction operating temperature		–	200	°C

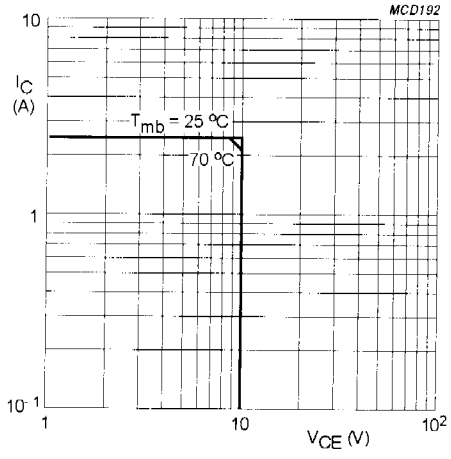
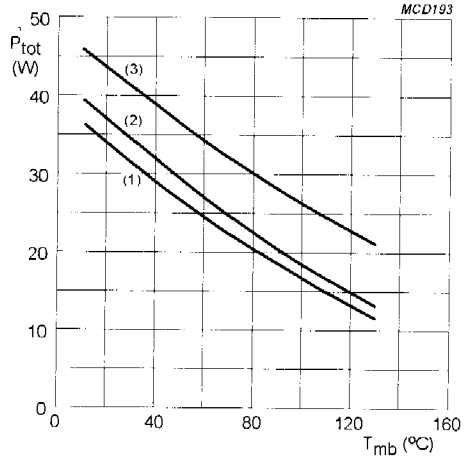


Fig.2 DC SOAR.



(1) Continuous DC operation.
(2) Continuous RF operation (f > 1 MHz).
(3) Short time operation during mismatch (f > 1 MHz).

Fig.3 Power derating curve.

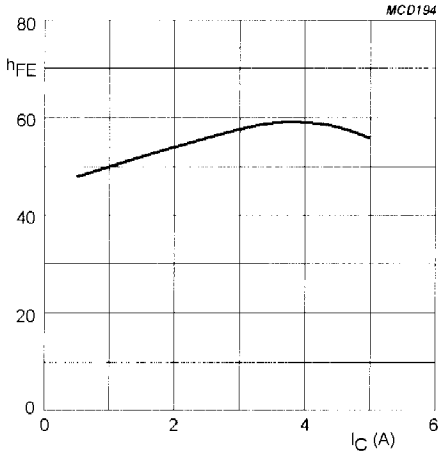
THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$R_{th\ j\text{-}mb(RF)}$	from junction to mounting base	P_{tot} = 35.5 W; T_{mb} = 25 °C	4.9	K/W

CHARACTERISTICS

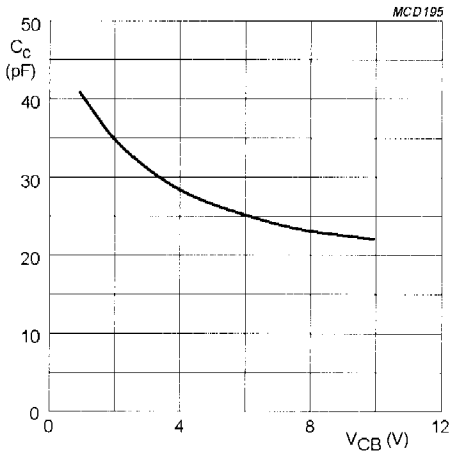
T_j = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = 20 mA	20	–	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; I_C = 40 mA	10	–	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = 4 mA	3	–	–	V
I_{CES}	collector-emitter leakage current	V_{BE} = 0; V_{CE} = 10 V	–	–	1	mA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 1.2 A	25	–	–	
f_T	transition frequency	V_{CE} = 7.5 V; I_E = 1.6 A	–	3.9	–	GHz
C_c	collector capacitance	V_{CB} = 7.5 V; $I_E = i_e$ = 0; f = 1 MHz	–	24	–	pF
C_{re}	feedback capacitance	V_{CE} = 7.5 V; I_C = 0; f = 1 MHz	–	17	–	pF
$C_{c\text{-}mb}$	collector-mounting base capacitance	f = 1 MHz	–	1.2	–	pF



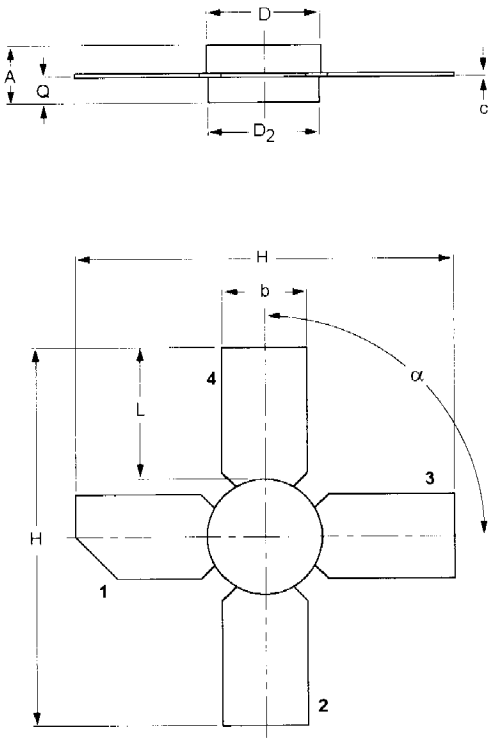
V_{CE} = 5 V.

Fig.4 DC current gain as a function of collector current, typical values.



$I_E = i_e$ = 0; f = 1 MHz.

Fig.5 Collector capacitance as a function of collector-base voltage, typical values.



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

UNIT	A	b	c	D	D_2	H	L	Q	α
mm	4.17 3.27	5.85 5.58	0.18 0.14	7.50 7.23	7.24 6.98	27.56 25.78	9.91 9.14	1.58 1.27	90°