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UHF push-pull power transistor

BLV948

FEATURES

- Double input and output matching for easy matching and high gain
- Poly-silicon emitter-ballasting resistors for an optimum temperature profile
- Gold metallization ensures excellent reliability.

DESCRIPTION

Two NPN silicon planar epitaxial transistors in push-pull configuration, intended for linear common emitter class-AB operation in base station transmitters in the 800 to 960 MHz range.

The transistor is encapsulated in a 4-lead SOT262A2 flange envelope, with two ceramic caps. The flange provides the common emitter connection for both transistors.

PINNING – SOT262A2

PIN	DESCRIPTION
1	collector 1
2	collector 2
3	base 1
4	base 2
5	emitter (connected to flange)

QUICK REFERENCE DATA

RF performance at T_h = 25 °C in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	P_L (W)	G_p (dB)	η_C (%)	d_3 (dBc)
CW, class-AB	900	26	150	≥ 7	≥ 48	–
	960	26	150	≥ 6.5	≥ 45	–
2-tone, class-AB	900	26	150 (PEP)	≥ 7.5	≥ 34	≤ –24
	960	26	150 (PEP)	≥ 7.5	≥ 34	≤ –22

WARNING

Product and environmental safety - toxic materials

This product contains beryllium oxide. The product is entirely safe provided that the BeO discs are 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.

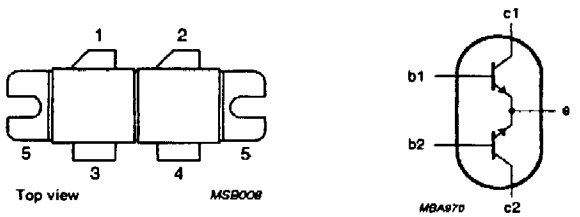


Fig.1 Simplified outline and symbol.

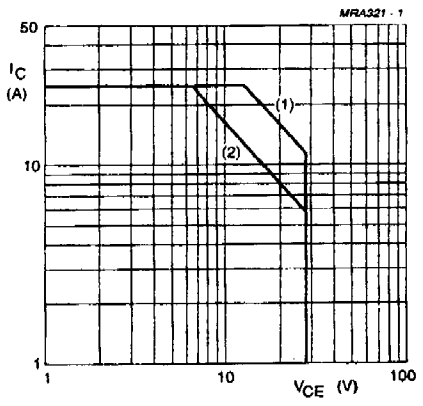
LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).
Per transistor section unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	60	V
V_{CEO}	collector-emitter voltage	open base	–	28	V
V_{EBO}	emitter-base voltage	open collector	–	3	V
I_C	DC collector current		–	12.5	A
$I_{C(AV)}$	average collector current		–	12.5	A
P_{tot}	total power dissipation	T_{mb} = 25 °C; total device; both sections equally loaded	–	320	W
T_{stg}	storage temperature		−65	150	°C
T_j	junction temperature		–	200	°C

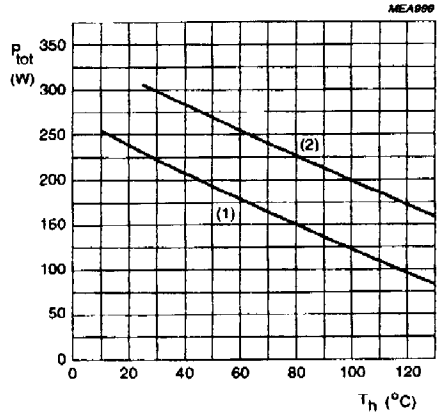
THERMAL RESISTANCE

SYMBOL	PARAMETER	CONDITIONS	THERMAL RESISTANCE
$R_{th\ j\text{-}mb}$	thermal resistance from junction to mounting base	P_{tot} = 320 W; T_{mb} = 25 °C; total device; both sections equally loaded	max. 0.55 K/W
$R_{th\ mb\text{-}h}$	thermal resistance from mounting base to heatsink	total device; both sections equally loaded	max. 0.15 K/W



(1) T_{mb} = 25 °C.
(2) T_h = 70 °C.
Total device; both sections equally loaded.

Fig.2 DC SOAR.



(1) Continuous operation.
(2) Short-time operation during mismatch.
Total device; both sections equally loaded.

Fig.3 Power/temperature derating curve.

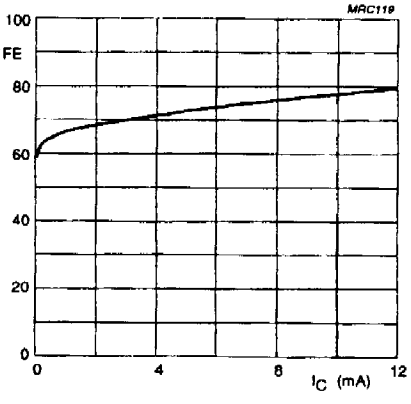
CHARACTERISTICS

T_j = 25 °C unless otherwise specified.
Per transistor section unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = 60 mA	60	–	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; I_C = 150 mA	28	–	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = 3 mA	3	–	–	V
I_{CES}	collector-emitter cut-off current	V_{BE} = 0; V_{CE} = 25 V	–	–	10	mA
h_{FE}	DC current gain	I_C = 1.5 A; V_{CE} = 10 V	30	–	120	
Δh_{FE}	DC current gain ratio of both sections	I_C = 1.5 A; V_{CE} = 10 V	0.67	–	1.5	
C_c	collector capacitance (note1)	$I_E = i_e$ = 0; V_{CB} = 25 V; f = 1 MHz	–	80	90	pF

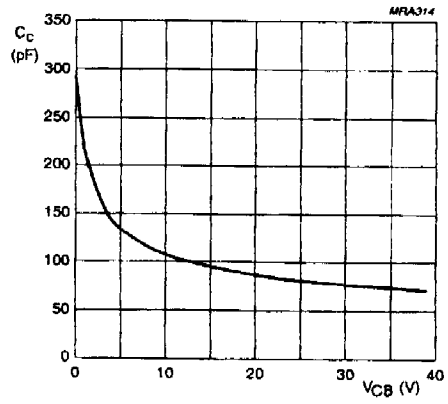
Note

1. Value C_c is that of the die only, it is not measurable because of the internal matching network.



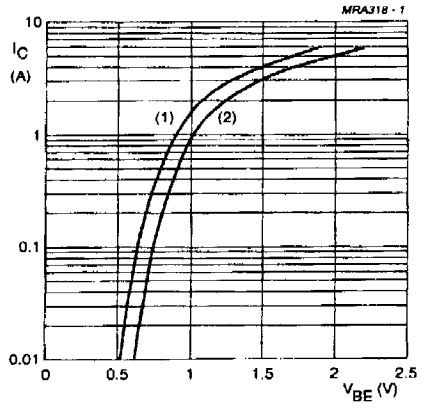
V_{CE} = 10 V.

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.



V_{CE} = 25 V.
(1) T_h = 70 °C.
(2) T_h = 25 °C.

Fig.6 Collector current as a function of base-emitter voltage, typical values.

APPLICATION INFORMATION

RF performance at T_h = 25 °C in a common emitter test circuit.
$R_{th\ mb\text{-}h}$ = 0.15 K/W.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	I_{CQ} (mA)	P_L (W)	G_p (dB)	η_C (%)
CW, class-AB	900	26	2 x 100	150	≥ 7 typ. 8.3	≥ 48 typ. 53
	960	26	2 x 100	150	≥ 6.5 typ. 7.9	≥ 45 typ. 50

Ruggedness in class-AB operation

The BLV948 is capable of withstanding a load mismatch corresponding to VSWR = 2:1 through all phases under the following conditions: V_{CE} = 26 V; T_h = 25 °C; $R_{th\ mb\text{-}h}$ = 0.15 K/W; P_L = 150 W; f = 960 MHz.