

Silicon NPN Transistor

BLT13

UHF Power Transistor

20V / 1A

DATASHEET

OEM – Philips

Source: Philips Data Handbook SC09

RF Power Modules and Transistors for Mobile Phones 1996

UHF power transistor**BLT13****FEATURES**

- High efficiency
- High gain
- Internal pre-matched input.

APPLICATIONS

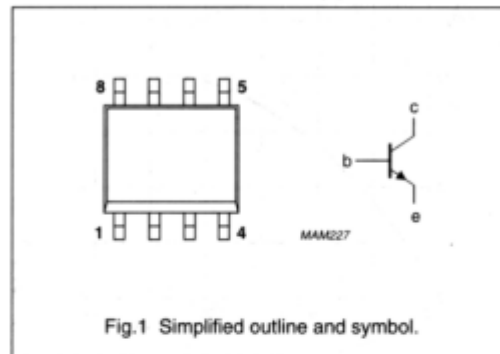
- Hand-held radio equipment in common emitter class-AB operation for 1.8 GHz Time Division Multiple Access (TDMA) communication systems.

PINNING - SOT96-1

PIN	SYMBOL	DESCRIPTION
1, 8	b	base
2, 4, 5, 7	e	emitter
3, 6	c	collector

DESCRIPTION

NPN silicon planar epitaxial transistor encapsulated in a plastic SOT96-1 (SO8) SMD package.

**QUICK REFERENCE DATA**

RF performance at $T_s \leq 60^\circ\text{C}$ in a common emitter test circuit.

MODE OF OPERATION	f (MHz)	V_{CE} (V)	P_L (W)	G_p (dB)	η_c (%)
Pulsed, class-AB	1800	6	2	≥ 6	≥ 50

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LIMITING VALUES

In accordance with the Absolute Maximum Rating 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	–	2.5	V
I_C	collector current (DC)		–	1	A
P_{tot}	total power dissipation	$T_s = 130\text{ }^\circ\text{C}$; note 1	–	1	W
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	operating junction temperature		–	175	$^\circ\text{C}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	$P_{tot} = 1\text{ W}$; $T_s = 130\text{ }^\circ\text{C}$; note 1	45	K/W

Note to the "Limiting values" and "Thermal characteristics"

- T_s is the temperature at the soldering point of the collector pin.

CHARACTERISTICS $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; $I_C = 5\text{ mA}$	20	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; $I_C = 10\text{ mA}$	10	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = 1\text{ mA}$	2.5	–	V
I_{CES}	collector leakage current	$V_{CE} = 6\text{ V}$; $V_{BE} = 0$	–	0.1	mA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}$; $I_C = 100\text{ mA}$	30	150	
C_c	collector capacitance	$V_{CB} = 6\text{ V}$; $I_E = I_B = 0$; $f = 1\text{ MHz}$	–	8	pF
C_{re}	feedback capacitance	$V_{CE} = 6\text{ V}$; $I_C = 0$; $f = 1\text{ MHz}$	–	6	pF

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APPLICATION INFORMATION

RF performance at $T_s \leq 60^\circ\text{C}$ in a common emitter test circuit (note 1).

MODE OF OPERATION	f (MHz)	V _{CE} (V)	I _{CO} (mA)	P _L (W)	G _p (dB)	η_c (%)
Pulsed, class-AB; $\delta = 1 : 8$; $t_p \leq 5$ ms	1800	6	2	2	≥ 6 typ. 8.5	≥ 50 typ. 65

Note

- T_s is the temperature at the soldering point of the collector pin.

Ruggedness in class-AB operation

The BLT13 is capable of withstanding a load mismatch corresponding to VSWR = 6 : 1 through all phases under the following conditions: $\delta = 1 : 8$; $t_p \leq 5$ ms; $f = 1800$ MHz; $V_{CE} = 8.5$ V; $P_L = 2$ W; $T_s \leq 60^\circ\text{C}$.

