Silicon NPN Transistor

BLT14

UHF Power Transistor

16V / 1A

DATASHEET

OEM – Philips

Source: Philips Data Handbook SC09

RF Power Modules and Transistors for Mobile Phones 1996

Datasheet Rev. 2.0 – 09/19– data without warranty / liability

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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) communications 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.

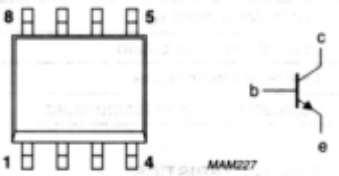

Fig.1 Simplified outline and symbol.

QUICK REFERENCE DATA

RF performance at $T_s \leq 60$ °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	4.8	1.6	≥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	–	16	V
V_{CEO}	collector-emitter voltage	open base	–	8	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 °C; note 1	–	1	W
T_{stg}	storage temperature		–65	+150	°C
T_j	operating junction temperature		–	175	°C

THERMAL CHARACTERISTICS

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

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

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

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; I_C = 5 mA	16	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; I_C = 10 mA	8	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; I_E = 1 mA	2.5	–	V
I_{CES}	collector leakage current	V_{CE} = 4.8 V; V_{BE} = 0	–	0.1	mA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 100 mA	30	150	
C_c	collector capacitance	V_{CB} = 4.8 V; I_E = i_e = 0; f = 1 MHz	–	8	pF
C_{re}	feedback capacitance	V_{CE} = 4.8 V; I_C = 0; f = 1 MHz	–	6	pF

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APPLICATION INFORMATION

RF performance at $T_s \leq 60$ °C in a common emitter test circuit (note 1).

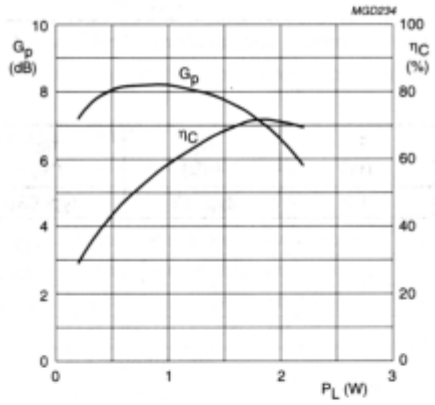
MODE OF OPERATION	f (MHz)	V_{CE} (V)	I_{CQ} (mA)	P_L (W)	G_p (dB)	η_C (%)
Pulsed, class-AB; $\delta = 1 : 8$; $t_p \leq 5$ ms	1800	4.8	2	1.6	≥6 typ. 7.5	≥50 typ. 65

Note

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

Ruggedness in class-AB operation

The BLT14 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; $V_{CE} = 6.5$ V; $P_L = 1.6$ W; $T_s \leq 60$ °C.



Pulsed, class-AB; $\delta = 1 : 8$; $t_p \leq 5$ ms; f = 1800 MHz; $V_{CE} = 4.8$ V; $I_{CQ} = 1.6$ mA; tuned at $P_L = 1.6$ W; $T_s \leq 60$ °C.

Fig.2 Power gain and collector efficiency as functions of load power; typical values.