

# DATA SHEET

## **BLT71/8** UHF power transistor

Preliminary specification  
File under Discrete Semiconductors, SC08b

1996 Feb 06

UHF power transistor

BLT71/8

FEATURES

- High efficiency
- Very high gain
- Internal pre-matched input
- Low supply voltage.

APPLICATIONS

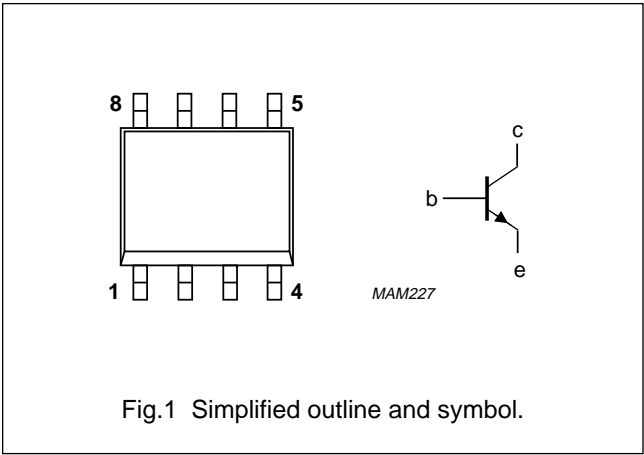
- Hand-held radio equipment in common emitter class-AB operation for 900 MHz communication band.

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

MODE OF OPERATION	f (MHz)	V <sub>CE</sub> (V)	P <sub>L</sub> (W)	G <sub>p</sub> (dB)	η <sub>c</sub> (%)
CW, class-AB	900	4.8	1.2	≥11 typ. 13	≥55 typ. 63

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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)		–	500	mA
$P_{tot}$	total power dissipation	$T_s = 60\text{ °C}$ ; note 1	–	2.9	W
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	operating junction temperature		–	175	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point	$P_{tot} = 2.9\text{ W}$ ; $T_s = 60\text{ °C}$ ; note 1	40	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** $T_j = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{(BR)CBO}$	collector-base breakdown voltage	open emitter; $I_C = 0.5\text{ mA}$	16	–	V
$V_{(BR)CEO}$	collector-emitter breakdown voltage	open base; $I_C = 10\text{ mA}$	8	–	V
$V_{(BR)EBO}$	emitter-base breakdown voltage	open collector; $I_E = 0.1\text{ mA}$	2.5	–	V
$I_{CES}$	collector leakage current	$V_{CE} = 8\text{ V}$ ; $V_{BE} = 0$	–	0.1	mA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}$ ; $I_C = 100\text{ mA}$	25	–	
$C_c$	collector capacitance	$V_{CB} = 4.8\text{ V}$ ; $I_E = i_e = 0$ ; $f = 1\text{ MHz}$	–	7	pF
$C_{re}$	feedback capacitance	$V_{CE} = 4.8\text{ V}$ ; $I_C = 0$ ; $f = 1\text{ MHz}$	–	5	pF

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APPLICATION INFORMATION

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

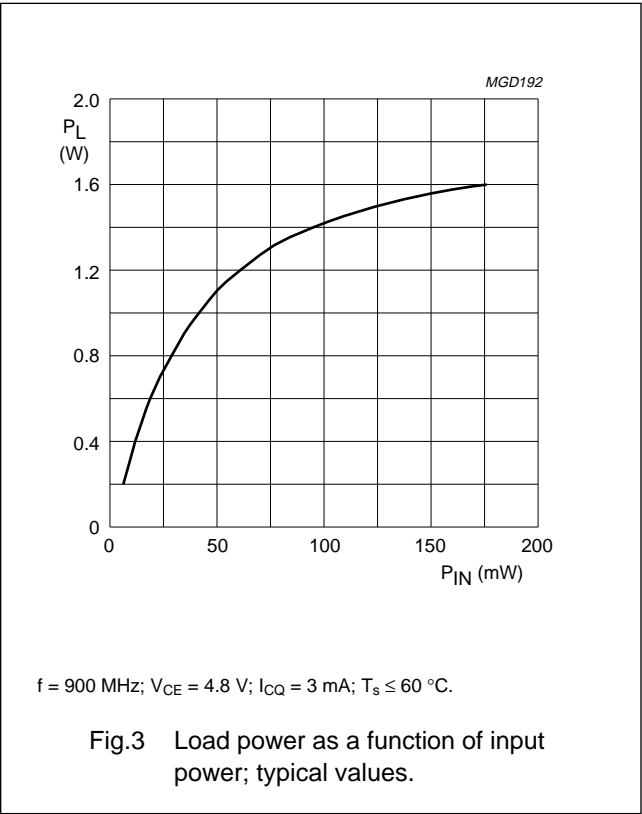
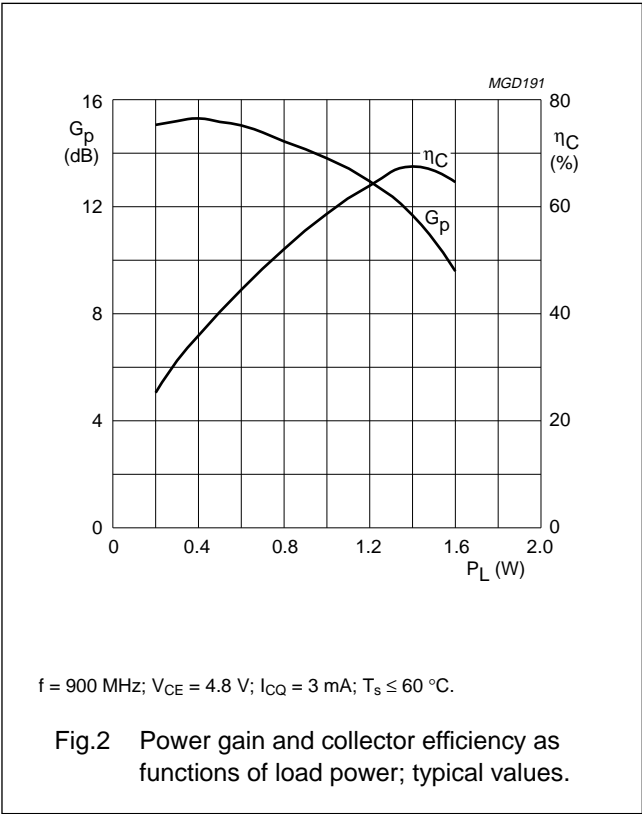
MODE OF OPERATION	f (MHz)	V <sub>CE</sub> (V)	I <sub>CQ</sub> (mA)	P <sub>L</sub> (W)	G <sub>p</sub> (dB)	η <sub>c</sub> (%)
CW, class-AB	900	4.8	3	1.2	≥11 typ. 13	≥55 typ. 63

Note

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

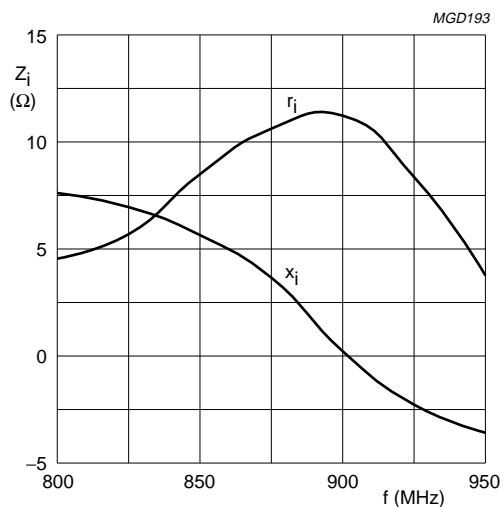
Ruggedness in class-AB operation

The BLT71/8 is capable of withstanding a load mismatch corresponding to VSWR = 6 : 1 through all phases under the following conditions:  $f = 900\text{ MHz}$ ;  $V_{CE} = 6.5\text{ V}$ ;  $I_{CQ} = 3\text{ mA}$ ;  $P_L = 1.2\text{ W}$ ;  $T_s \leq 60\text{ }^{\circ}\text{C}$ .



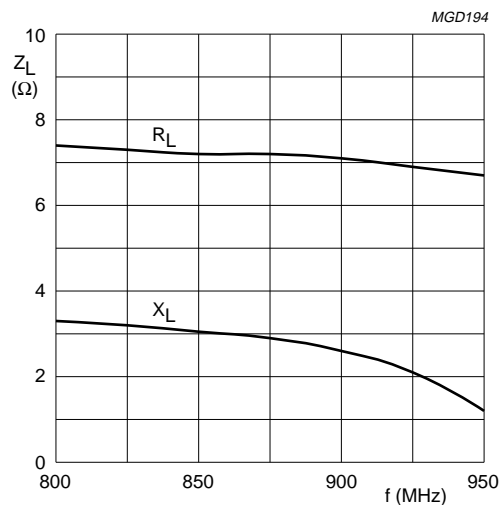
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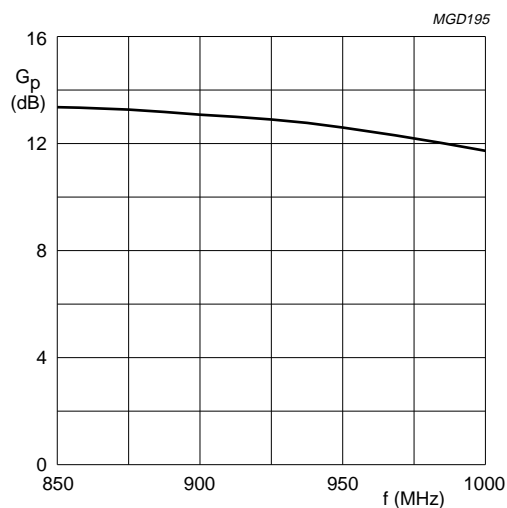
$V_{CE} = 4.8$  V;  $I_{CQ} = 3$  mA;  $P_L = 1.2$  W;  $T_{amb} = 25$  °C.

Fig.4 Input impedance as a function of frequency (series components); typical values.



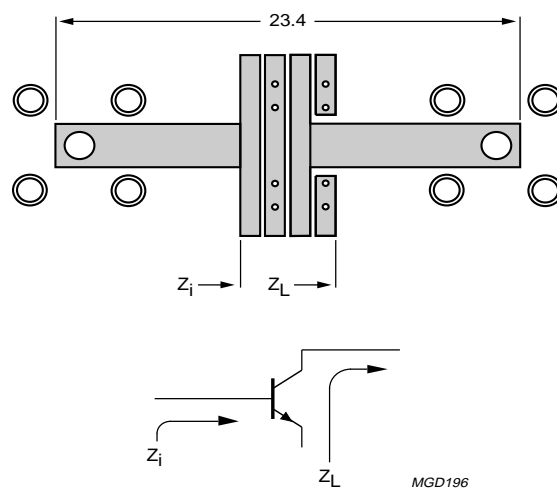
$V_{CE} = 4.8$  V;  $I_{CQ} = 3$  mA;  $P_L = 1.2$  W;  $T_{amb} = 25$  °C.

Fig.5 Load impedance as a function of frequency (series components); typical values.



$V_{CE} = 4.8$  V;  $I_{CQ} = 3$  mA;  $P_L = 1.2$  W;  $T_{amb} = 25$  °C.

Fig.6 Power gain as a function of frequency (series components); typical values.



Dimensions in mm.

Fig.7 RF test print and definition of transistor impedance.

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PACKAGE OUTLINE

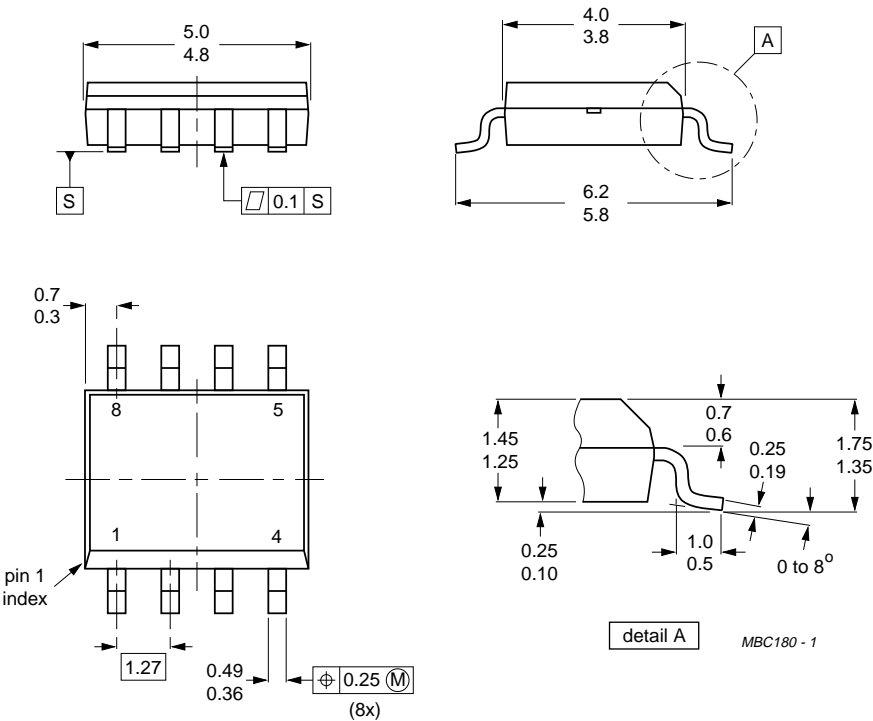


Fig.8 SOT96-1.

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## DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

## LIFE SUPPORT APPLICATIONS

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