

# BLF6G13L-250; BLF6G13LS-250

Power LDMOS transistor

Rev. 01 — 28 April 2010

Objective data sheet

## 1. Product profile

### 1.1 General description

250 W LDMOS power transistor intended for CW applications at a frequency of 1.3 GHz.

**Table 1. Test information**

Typical RF performance at  $T_{case} = 25\text{ °C}$ ;  $I_{Dq} = 100\text{ mA}$ ; in a class-AB production test circuit.

Mode of operation	f (GHz)	V <sub>DS</sub> (V)	P <sub>L(1dB)</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)
CW	1.3	50	250	16	55

#### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features and benefits

- Typical CW performance at a frequency of 1.3 GHz, a supply voltage of 50 V, an  $I_{Dq}$  of 100 mA:
  - ◆ Output power = 250 W
  - ◆ Power gain = 16 dB
  - ◆ Efficiency = 55 %
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Internally matched for ease of use
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

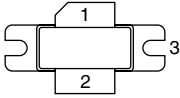
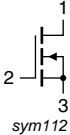
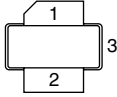
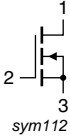
### 1.3 Applications

- Industrial, scientific and medical applications



## 2. Pinning information

**Table 2. Pinning**

Pin	Description	Simplified outline	Graphic symbol
<b>BLF6G13L-250 (SOT502A)</b>			
1	drain		 sym112
2	gate		
3	source		
<b>BLF6G13LS-250 (SOT502B)</b>			
1	drain		 sym112
2	gate		
3	source		

[1] Connected to flange.

## 3. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
BLF6G13L-250	-	flanged LDMOST ceramic package; 2 mounting holes; 2 leads	SOT502A
BLF6G13LS-250	-	earless flanged LDMOST ceramic package; 2 leads	SOT502B

## 4. Limiting values

**Table 4. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	drain-source voltage		-	100	V
$V_{GS}$	gate-source voltage		-0.5	+13	V
$I_D$	drain current		-	42	A
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-	200	°C

## 5. Thermal characteristics

**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 85\text{ °C}; P_L = 250\text{ W}$	0.44	K/W

**6. Characteristics**

**Table 6. DC characteristics**

$T_j = 25\text{ }^\circ\text{C}$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 2.7\text{ mA}$	100	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 270\text{ mA}$	1.3	1.8	2.25	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}$	-	-	1.4	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	32	42	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	140	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 270\text{ mA}$	1.6	2.3	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 9.5\text{ A}$	-	100	169	$\text{m}\Omega$

**Table 7. RF characteristics**

Mode of operation: CW;  $f = 1.3\text{ GHz}$ ; RF performance at  $V_{DS} = 50\text{ V}; I_{Dq} = 100\text{ mA}; T_{case} = 25\text{ }^\circ\text{C}$ ; unless otherwise specified, in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_L$	output power		250	-	-	W
$V_{DS}$	drain-source voltage	$P_L = 250\text{ W}$	-	-	50	V
$G_p$	power gain	$P_L = 250\text{ W}$	14	16	-	dB
$RL_{in}$	input return loss	$P_L = 250\text{ W}$	-	10	-	dB
$\eta_D$	drain efficiency	$P_L = 250\text{ W}$	50	55	-	%

**6.1 Ruggedness in class-AB operation**

The BLF6G13L-250 and BLF6G13LS-250 are capable of withstanding a load mismatch corresponding to  $VSWR = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 50\text{ V}; I_{Dq} = 100\text{ mA}; P_L = 250\text{ W}; f = 1.3\text{ GHz}$ .

7. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT502A

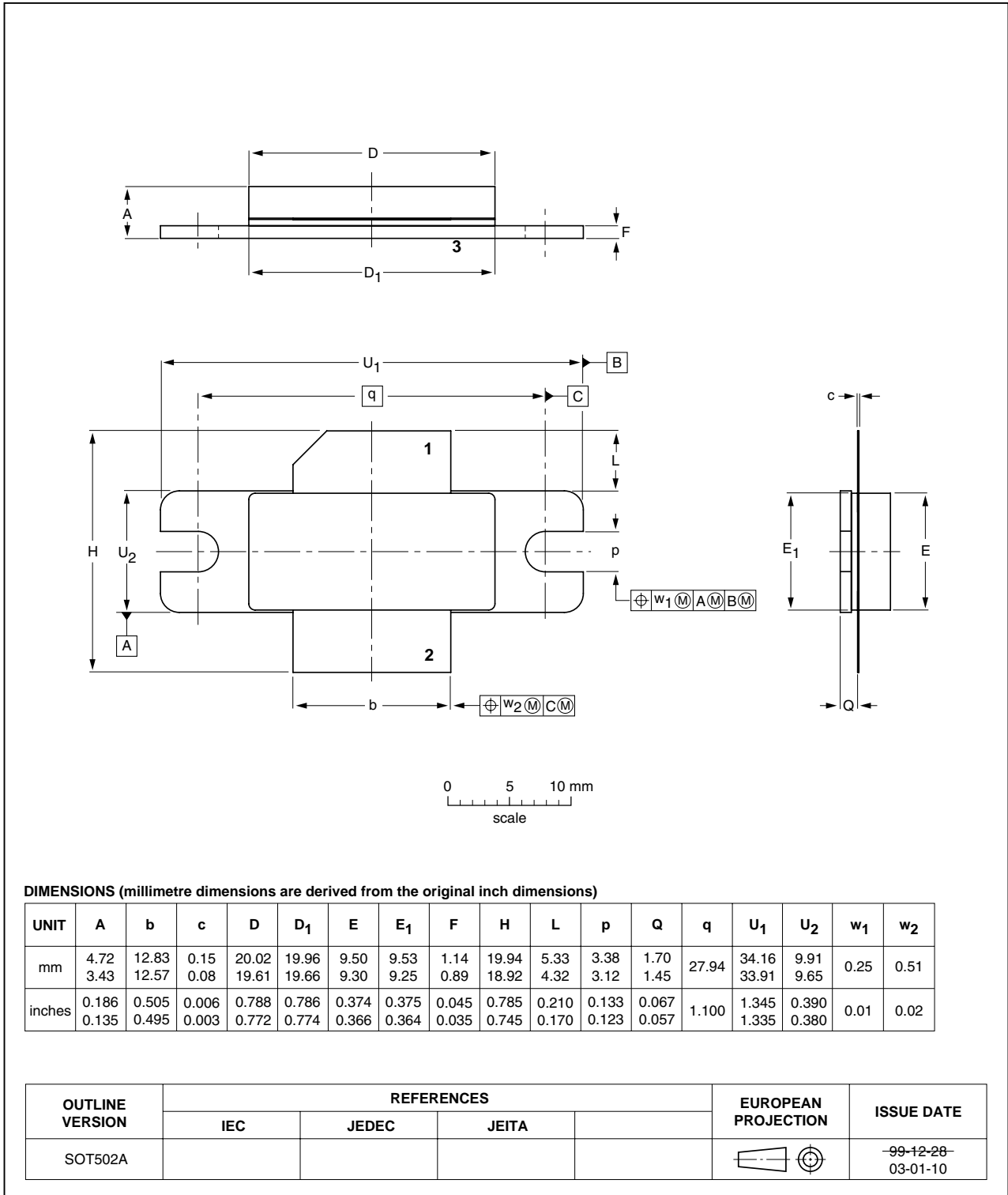


Fig 1. Package outline SOT502A

Earless flanged LDMOST ceramic package; 2 leads

SOT502B

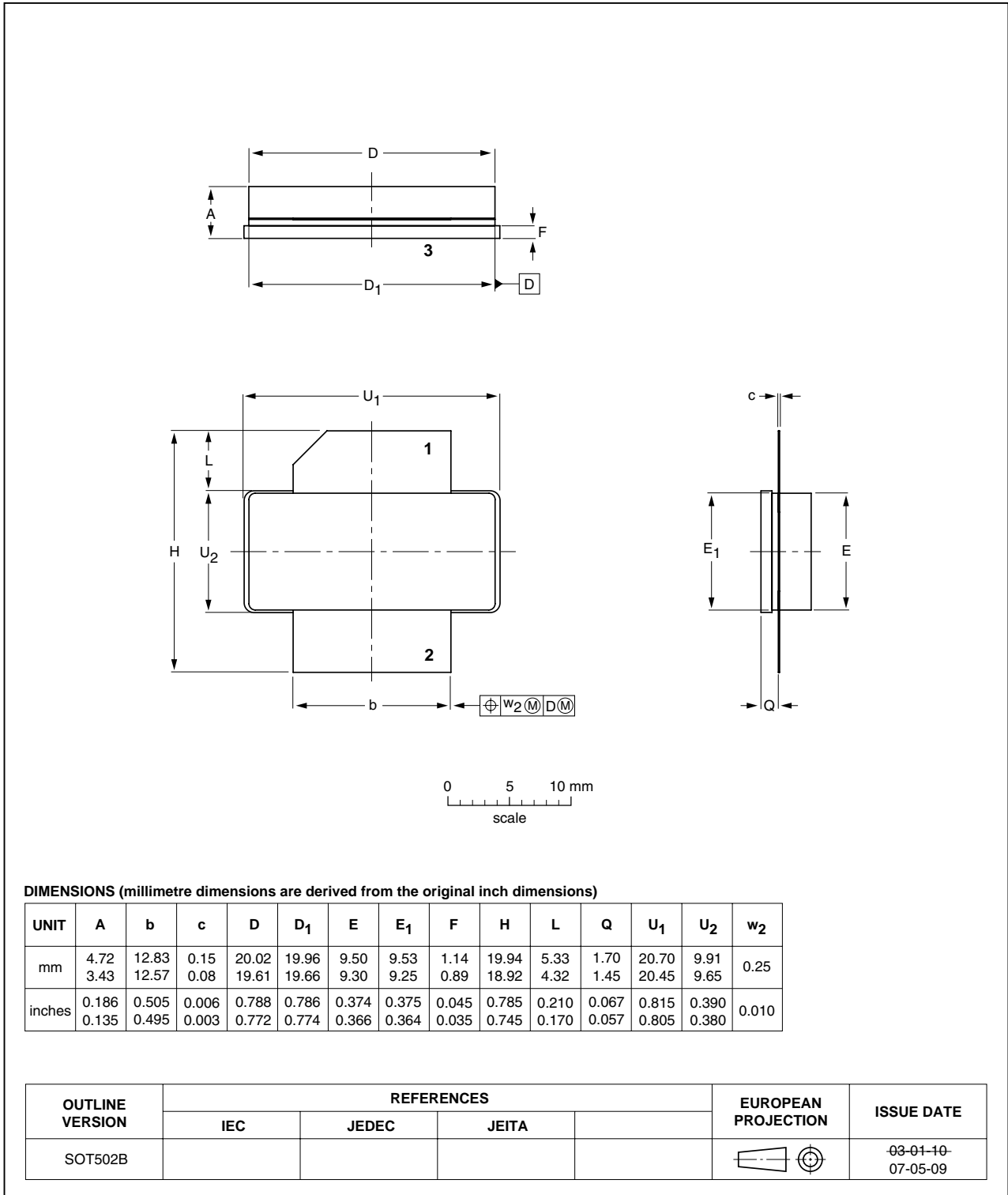


Fig 2. Package outline SOT502B

## 8. Abbreviations

**Table 8. Abbreviations**

Acronym	Description
CW	Continuous Wave
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LDMOST	Laterally Diffused Metal-Oxide Semiconductor Transistor
RF	Radio Frequency
VSWR	Voltage Standing-Wave Ratio

## 9. Revision history

**Table 9. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF6G13L-250_13LS-250_1	20100428	Objective data sheet	-	-

## 10. Legal information

### 10.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
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[2] The term 'short data sheet' is explained in section "Definitions".

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