

BLF7G20L-160P; BLF7G20LS-160P

Power LDMOS transistor

Rev. 01 — 22 June 2010

Objective data sheet

1. Product profile

1.1 General description

160 W LDMOS power transistor for base station applications at frequencies from 1800 MHz to 2000 MHz.

Table 1. Typical performance

Typical RF performance at $T_{case} = 25\text{ }^{\circ}\text{C}$ in a common source class-AB production test circuit.

Mode of operation	f (MHz)	I _{DQ} (mA)	V _{DS} (V)	P _{L(AV)} (W)	G _p (dB)	η_D (%)	ACPR _{400k} (dBc)	ACPR _{600k} (dBc)	EVM _{rms} (%)
CW	1805 to 1880	850	28	135	17.5	57	-	-	-
GSM EDGE	1805 to 1880	850	28	65	18.5	43	-61	-74	2.5

1.2 Features and benefits

- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Designed for broadband operation (1800 MHz to 2000 MHz)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low-memory effects providing excellent digital pre-distortion capability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

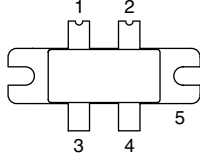
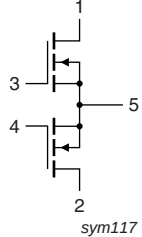
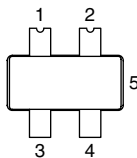
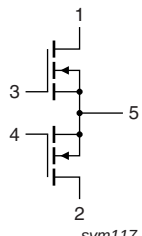
1.3 Applications

- RF power amplifiers for base stations and multi carrier applications in the 1800 MHz to 2000 MHz frequency range



2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF7G20L-160P (SOT1121A)			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source		
[1]			
BLF7G20LS-160P (SOT1121B)			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source		
[1]			

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF7G20L-160P	-	flanged LDMOST ceramic package; 2 mounting holes; 4 leads	SOT1121A
BLF7G20LS-160P	-	earless flanged LDMOST ceramic package; 4 leads	SOT1121B

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		-	65	V
V_{GS}	gate-source voltage		-0.5	+13	V
I_D	drain current		-	<tb>	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	$T_{case} = 80\text{ }^{\circ}\text{C}$; $P_L = 100\text{ W}$	0.41	K/W

6. Characteristics

Table 6. Characteristics

$T_j = 25\text{ }^{\circ}\text{C}$; per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}$; $I_D = 0.9\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$; $I_D = 90\text{ mA}$	1.5	1.9	2.3	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}$; $V_{DS} = 28\text{ V}$	-	-	2	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $V_{DS} = 10\text{ V}$	14	-	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}$; $V_{DS} = 0\text{ V}$	-	-	200	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}$; $I_D = 2.5\text{ A}$	-	<tb>	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $I_D = 3.15\text{ A}$	-	0.15	-	Ω

7. Test information

Table 7. Application information

$f = 1805\text{ MHz}$ and 1880 MHz ; RF performance at $V_{DS} = 28\text{ V}$; $I_{DQ} = 850\text{ mA}$; $T_{case} = 25\text{ }^{\circ}\text{C}$; 2 sections combined unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Mode of operation: GSM EDGE; $P_{L(AV)} = 65\text{ W}$						
G_p	power gain		17.3	18.5	-	dB
RL_{in}	input return loss		-	-15	-8	dB
η_D	drain efficiency		40	43	-	%
$ACPR_{400k}$	adjacent channel power ratio (400 kHz)		-	-61	-58	dBc
$ACPR_{600k}$	adjacent channel power ratio (600 kHz)		-	-74	-70.5	dBc
EVM_{rms}	RMS EDGE signal distortion error		-	2.5	3.8	%
EVM_M	peak EDGE signal distortion error		-	8	12.5	%
Mode of operation: CW; $P_{L(AV)} = 135\text{ W}$						
G_p	power gain		16.8	17.5	-	dB
η_D	drain efficiency		52	57	-	%

7.1 Ruggedness in class-AB operation

The BLF7G20L-160P and BLF7G20LS-160P are capable of withstanding a load mismatch corresponding to $VSWR = 10 : 1$ through all phases under the following conditions: $V_{DS} = 28\text{ V}$; $I_{DQ} = 850\text{ mA}$; $P_L = 160\text{ W}$ (CW); $f = 1805\text{ MHz}$.

8. Package outline

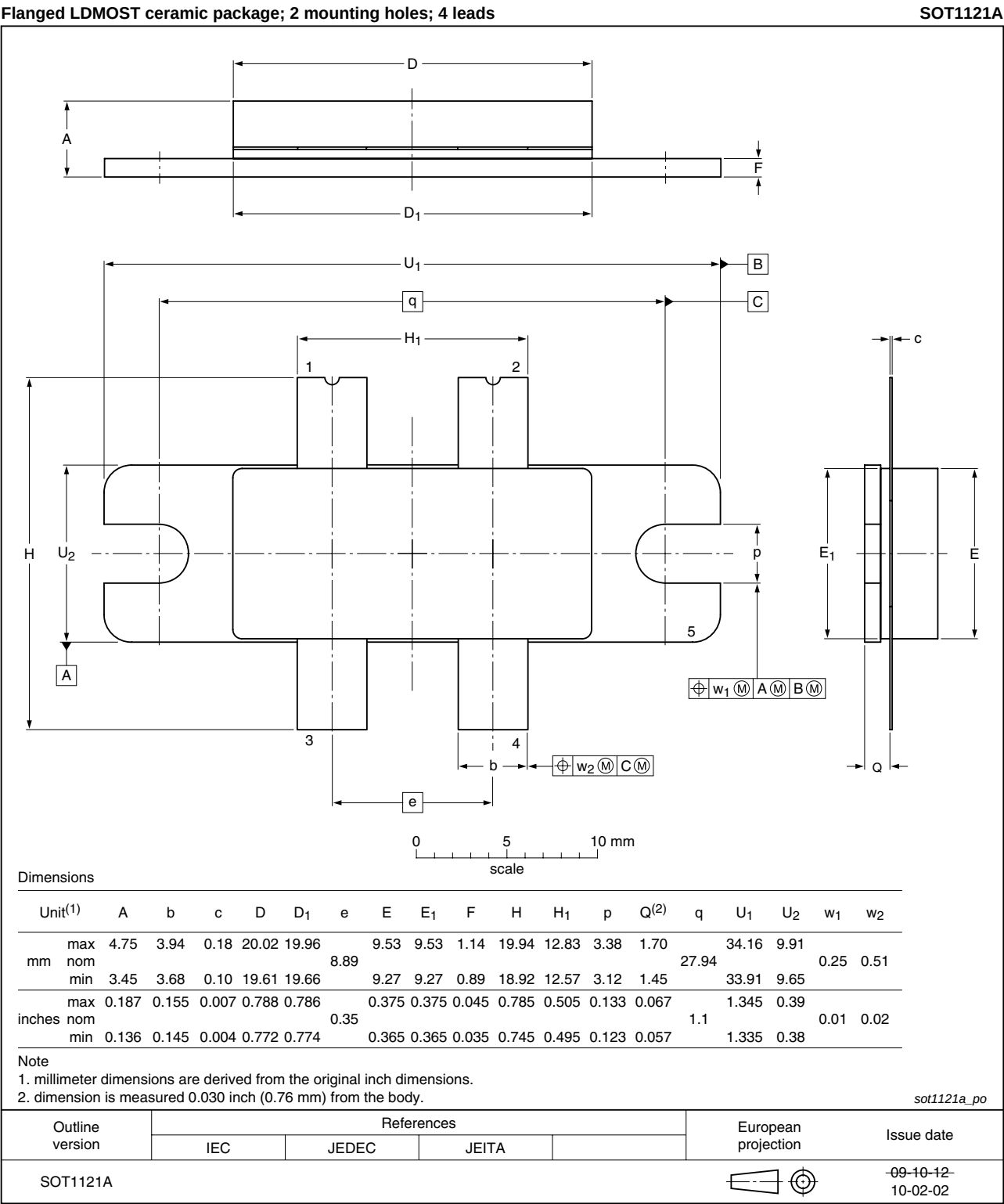


Fig 1. Package outline SOT1121A

Earless flanged LDMOST ceramic package; 4 leads

SOT1121B

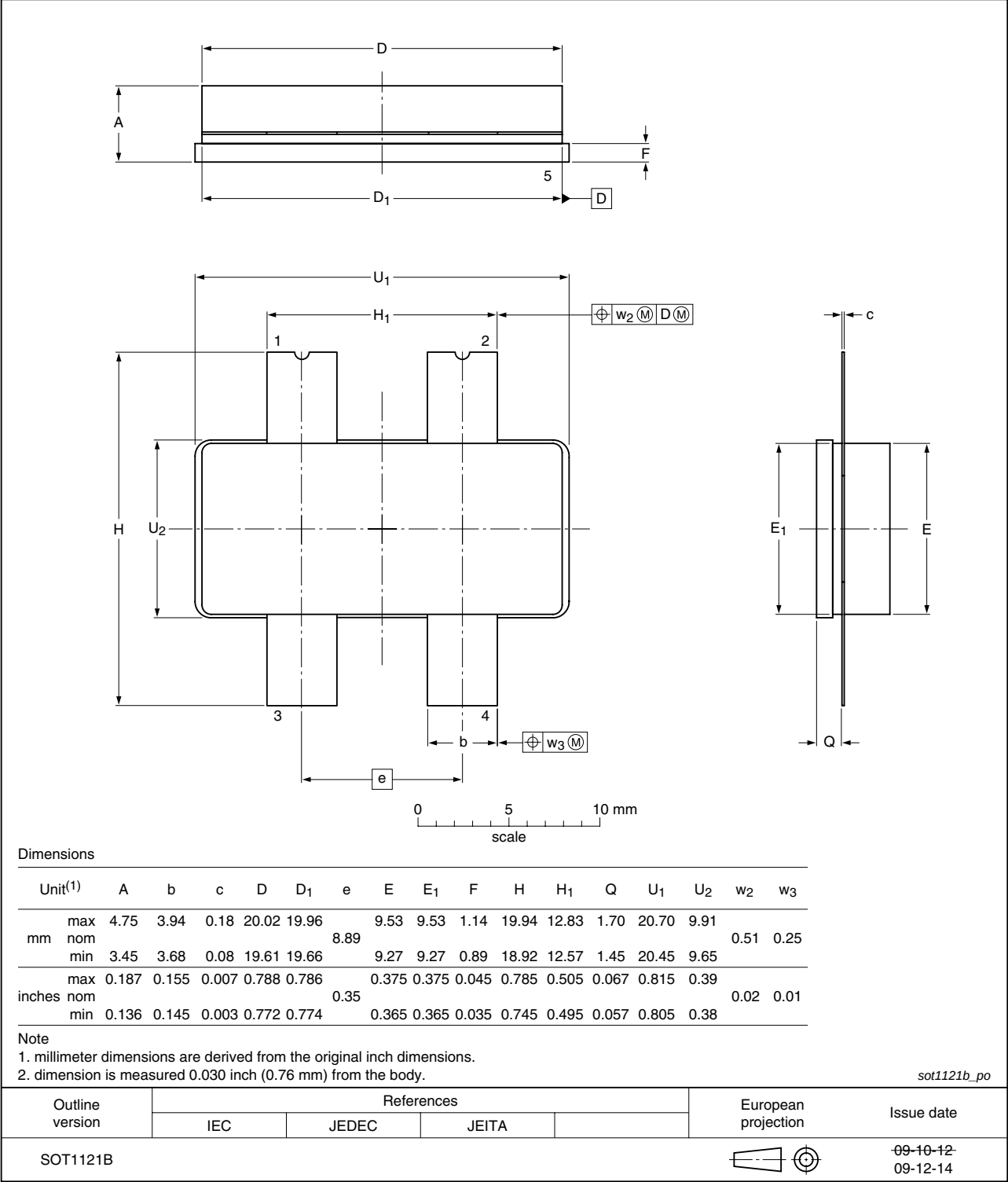


Fig 2. Package outline SOT1121B

9. Abbreviations

Table 8. Abbreviations

Acronym	Description
CW	Continuous Wave
EDGE	Enhanced Data rates for GSM Evolution
ESD	ElectroStatic Discharge
IS-95	Interim Standard 95
LDMOS	Laterally Diffused Metal Oxide Semiconductor
LDMOST	Laterally Diffused Metal Oxide Semiconductor Transistor
RF	Radio Frequency
SMD	Surface Mounted Device
VSWR	Voltage Standing Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

10. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF7G20L-160P_7G20LS-160P v.1	20100622	Objective data sheet	-	-

11. Legal information

11.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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[2] The term 'short data sheet' is explained in section "Definitions".

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