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 °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

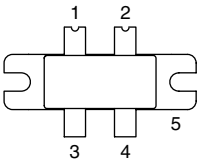
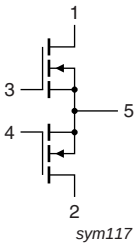
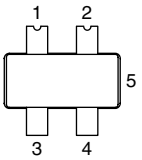
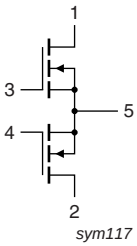
- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Designed for broadband operation (1800 MHz to 2000 MHz)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low-memory effects providing excellent digital pre-distortion 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		-	<tbd>	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 °C; P_L = 100 W	0.41	K/W

6. Characteristics

Table 6. Characteristics

T_j = 25 °C; per section unless otherwise specified.

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

7. Test information

Table 7. Application information

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

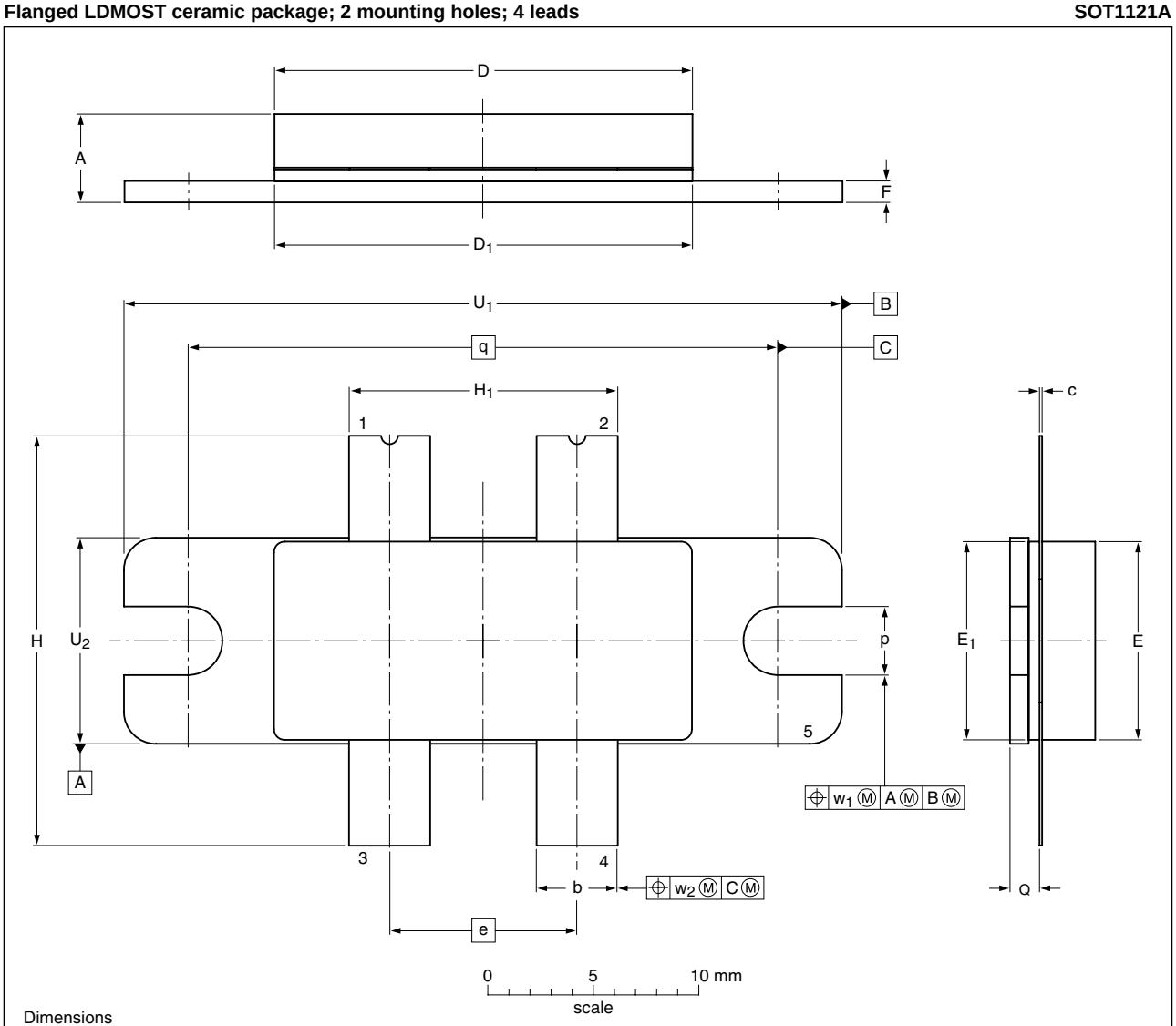
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Mode of operation: GSM EDGE; $P_{L(AV)}$ = 65 W						
G_p	power gain		17.3	18.5	-	dB
RL_{in}	input return loss		-	–15	–8	dB
η_D	drain efficiency		40	43	-	%
$ACPR_{400k}$	adjacent channel power ratio (400 kHz)		-	–61	–58	dBc
$ACPR_{600k}$	adjacent channel power 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 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 V; I_{Dq} = 850 mA; P_L = 160 W (CW); f = 1805 MHz.

8. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 4 leads **SOT1121A**



Dimensions

Unit[1]		A	b	c	D	D_1	e	E	E_1	F	H	H_1	p	Q[2]	q	U_1	U_2	w_1	w_2
mm	max	4.75	3.94	0.18	20.02	19.96		9.53	9.53	1.14	19.94	12.83	3.38	1.70		34.16	9.91		
	nom						8.89								27.94			0.25	0.51
	min	3.45	3.68	0.10	19.61	19.66		9.27	9.27	0.89	18.92	12.57	3.12	1.45		33.91	9.65		
inches	max	0.187	0.155	0.007	0.788	0.786		0.375	0.375	0.045	0.785	0.505	0.133	0.067		1.345	0.39		
	nom						0.35								1.1			0.01	0.02
	min	0.136	0.145	0.004	0.772	0.774		0.365	0.365	0.035	0.745	0.495	0.123	0.057		1.335	0.38		

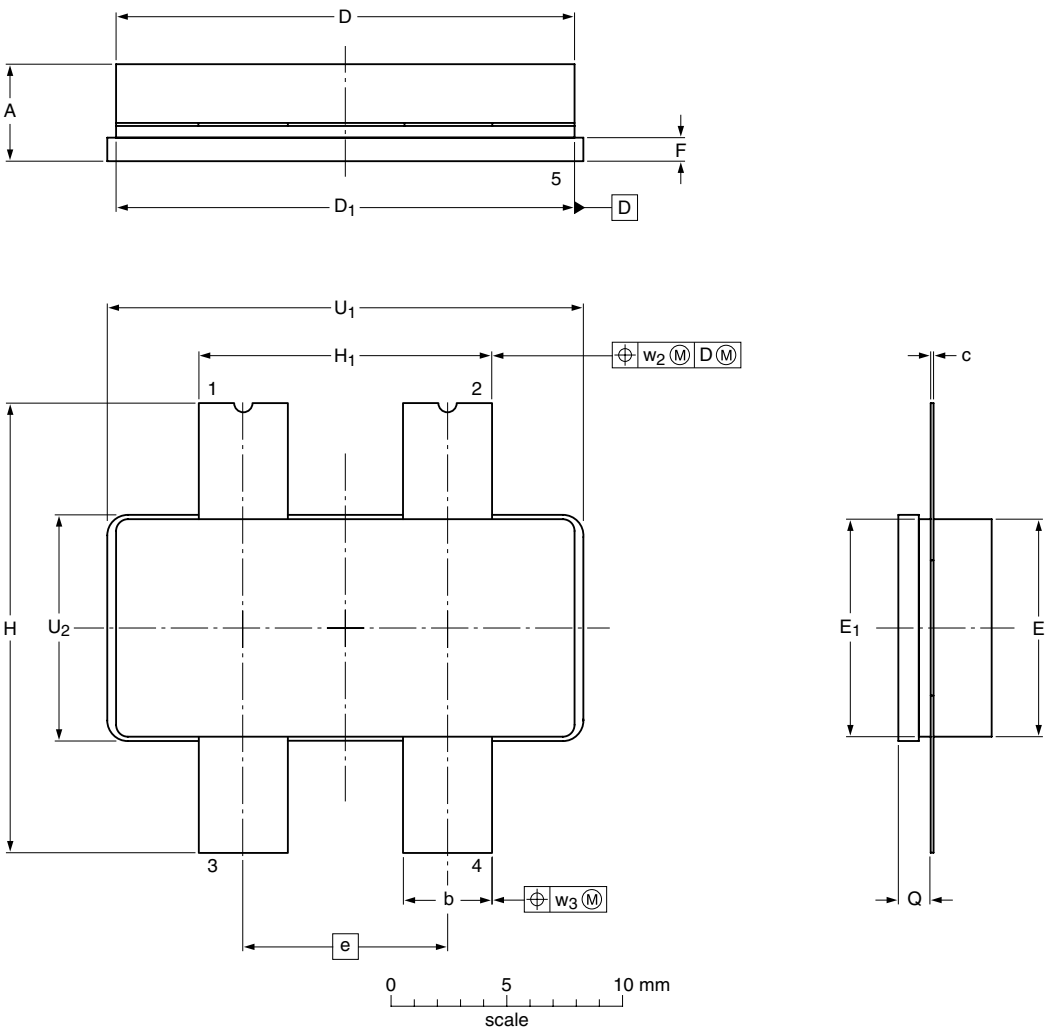
Note
1. millimeter dimensions are derived from the original inch dimensions.
2. dimension is measured 0.030 inch (0.76 mm) from the body.

sot1121a_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1121A						~~09-10-12~~ 10-02-02

Fig 1. Package outline SOT1121A

Earless flanged LDMOST ceramic package; 4 leads **SOT1121B**



Dimensions

Unit[1]		A	b	c	D	D_1	e	E	E_1	F	H	H_1	Q	U_1	U_2	w_2	w_3
mm	max	4.75	3.94	0.18	20.02	19.96		9.53	9.53	1.14	19.94	12.83	1.70	20.70	9.91		
	nom						8.89									0.51	0.25
	min	3.45	3.68	0.08	19.61	19.66		9.27	9.27	0.89	18.92	12.57	1.45	20.45	9.65		
inches	max	0.187	0.155	0.007	0.788	0.786		0.375	0.375	0.045	0.785	0.505	0.067	0.815	0.39		
	nom						0.35									0.02	0.01
	min	0.136	0.145	0.003	0.772	0.774		0.365	0.365	0.035	0.745	0.495	0.057	0.805	0.38		

Note
1. millimeter dimensions are derived from the original inch dimensions.
2. dimension is measured 0.030 inch (0.76 mm) from the body.

sot1121b_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1121B						~~09-10-12~~ 09-12-14

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.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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13. Contents

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