BLF7G22L-250PB; BLF7G22LS-250PB

Power LDMOS transistor

Rev. 01 — 16 December 2009 Objective data sheet

1. Product profile

1.1 General description

250 W LDMOS power transistor for base station applications at frequencies from 2110 MHz to 2170 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 (dBc)
2-carrier W-CDMA	2110 to 2170	2160	28	70	> 17	30	–28[1]

[1] Test signal: 3GPP; test model 1; 64 PDPCH; PAR = 7.5 dB at 0.01 % probability on CCDF.

1.2 Features

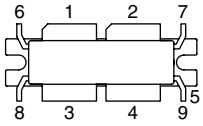
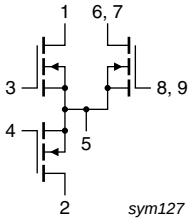
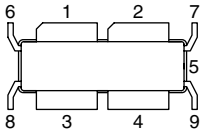
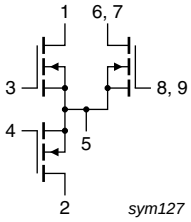
- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Designed for broadband operation (2110 MHz to 2170 MHz)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent pre-distortability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- RF power amplifiers for W-CDMA base stations and multi carrier applications in the 2110 MHz to 2170 MHz frequency range

2. Pinning information

Table 2. Pinning

Pin	Description		Simplified outline	Graphic symbol
BLF7G22L-250PB (SOT1110A)				
1	drain1			
2	drain2			
3	gate1			
4	gate2			
5	source	[1]		
6, 7	sense drain			
8, 9	sense gate			
BLF7G22LS-250PB (SOT1110B)				
1	drain1			
2	drain2			
3	gate1			
4	gate2			
5	source	[1]		
6, 7	sense drain			
8, 9	sense gate			

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF7G22L-250PB	-	flanged LDMOST ceramic package; 2 mounting holes; 8 leads	SOT1110A
BLF7G22LS-250PB	-	earless flanged LDMOST ceramic package; 8 leads	SOT1110B

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 = 50 W; $T_j \leq 150$ °C	0.45	K/W

6. Characteristics

Table 6. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0 V; I_D = 1.5 mA	<tbd>	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 150 mA	<tbd>	<tbd>	<tbd>	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	<tbd>	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	-	<tbd>	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	<tbd>	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 7.5 A	-	<tbd>	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)}$ + 3.75 V; I_D = 5.25 A	-	<tbd>	-	Ω

7. Test information

Table 7. Functional test information

Mode of operation: 2-carrier W-CDMA; PAR = 7.5 dB at 0.01 % probability on the CCDF; 3GPP test model 1; 1-64 PDPCH; f_1 = 2110 MHz; f_2 = 2140 MHz; f_3 = 2170 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 2160 mA; T_{case} = 25 °C; unless otherwise specified; in a class-AB production test circuit.

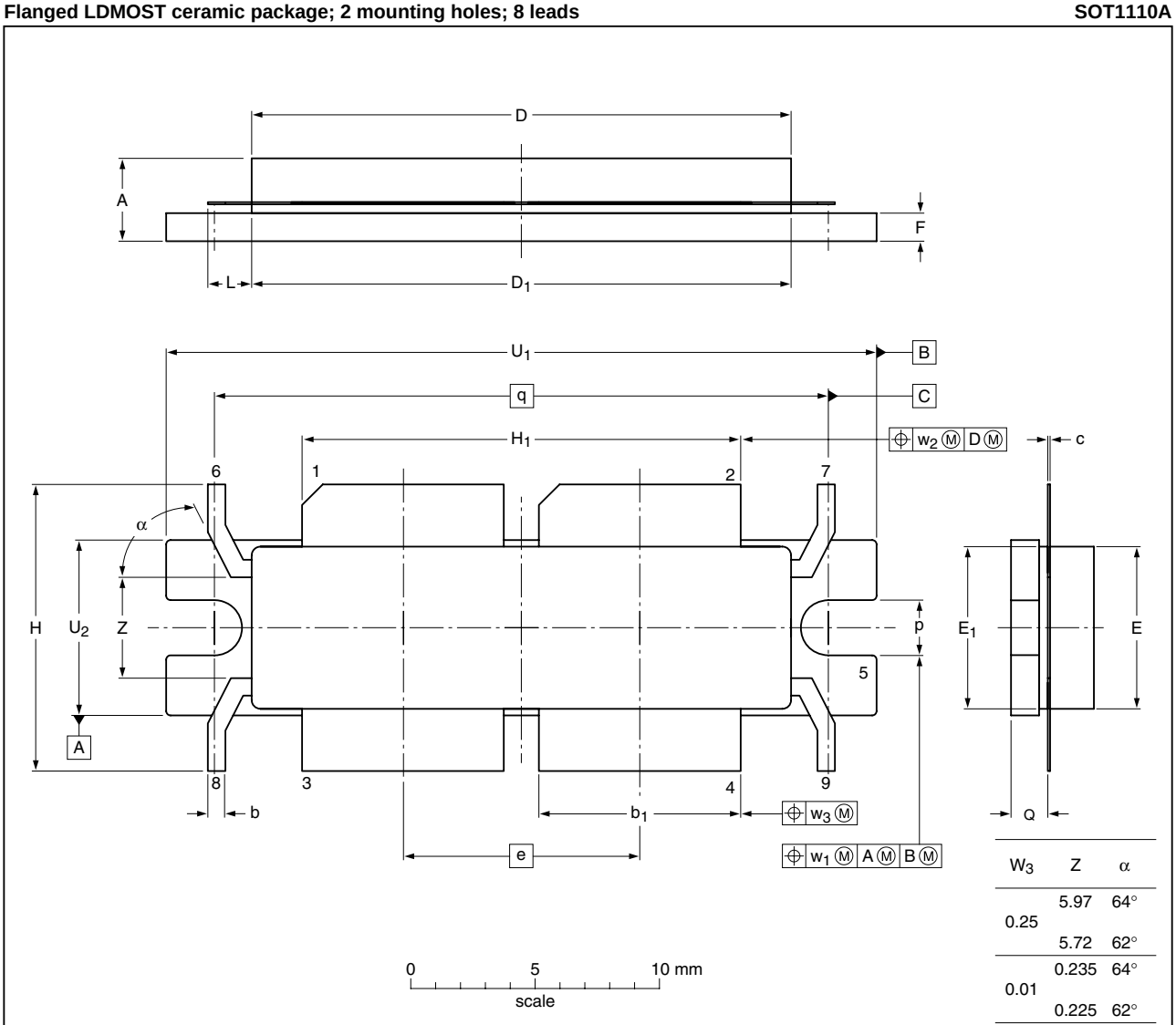
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		-	70	-	W
G_p	power gain	$P_{L(AV)}$ = 70 W	-	-	17	dB
RL_{in}	input return loss	$P_{L(AV)}$ = 70 W	-	<tbd>	-	dB
η_D	drain efficiency	$P_{L(AV)}$ = 70 W	-	30	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)}$ = 70 W	-	–28	-	dBc

7.1 Ruggedness in class-AB operation

The BLF7G22L-250PB and BLF7G22LS-250PB are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 32 V; I_{Dq} = 2160 mA; P_L = 70 W (CW); f = 2140 MHz.

8. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 8 leads **SOT1110A**



W3	Z	α
0.25	5.97	64°
	5.72	62°
0.01	0.235	64°
	0.225	62°

Dimensions

Unit[1]		A	b	b1	c	D	D1	e	E	E1	F	H	H1	L	p	Q	q	U1	U2	w1	w2
mm	max	5.36	1.14	11.81	0.18	31.55	31.52		9.50	9.53	1.75	17.12	25.53	2.67	3.30	2.26		41.28	10.29		
	nom							13.72									35.56			0.25	0.51
	min	3.99	0.89	11.56	0.10	30.94	30.96		9.30	9.27	1.50	16.10	25.27	2.41	3.05	2.01		41.02	10.03		
inches	max	0.211	0.045	0.465	0.007	1.242	1.241		0.374	0.375	0.069	0.674	1.005	0.105	0.13	0.089		1.625	0.405		
	nom							0.540									1.4			0.01	0.02
	min	0.157	0.035	0.455	0.004	1.218	1.219		0.366	0.365	0.059	0.634	0.995	0.095	0.12	0.079		1.615	0.395		

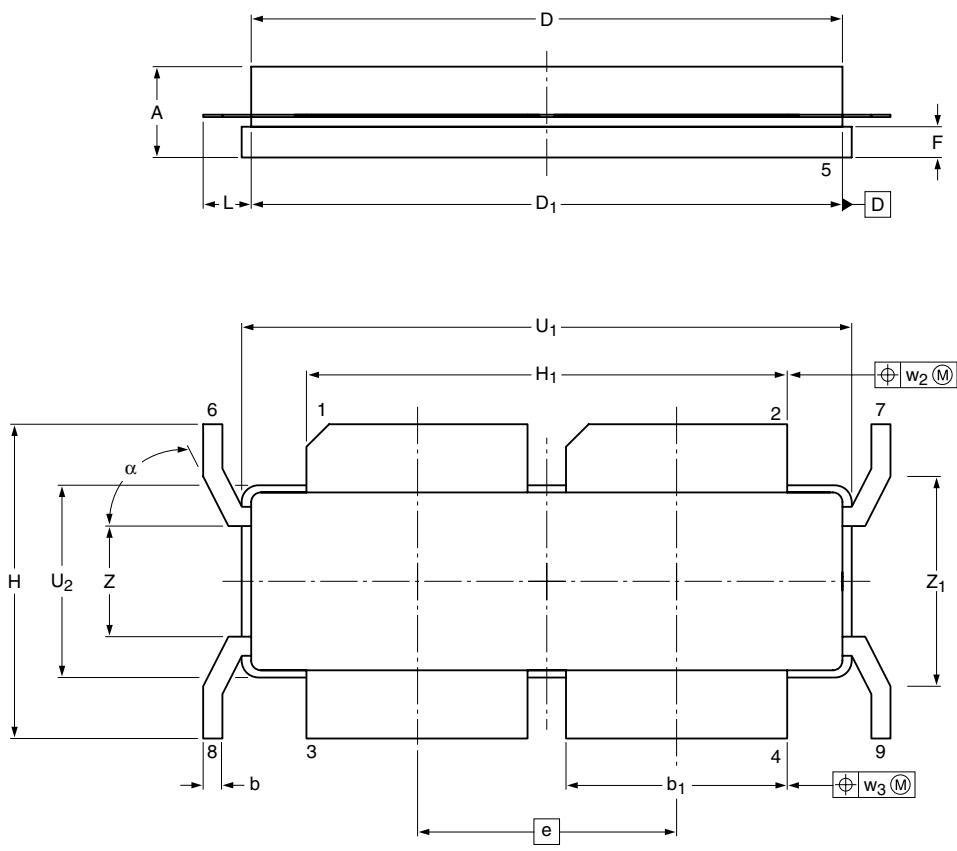
Note
1. Millimeter dimensions are derived from the original inch dimensions.

sot1110a_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1110A						~~09-11-03~~ 09-11-20

Fig 1. Package outline SOT1110A

Earless flanged LDMOST ceramic package; 8 leads **SOT1110B**



Z_1	α
11.20	64°
10.95	62°
0.441	64°
0.431	62°

Dimensions

Unit[1]		A	b	b_1	c	D	D_1	e	E	E_1	F	H	H_1	L	Q	U_1	U_2	W_2	W_3	Z
mm	max	5.36	1.14	11.81	0.18	31.55	31.52		9.5	9.53	1.75	17.12	25.53	2.67	2.26	32.39	10.29			5.97
	nom							13.72										0.51	0.25	
	min	3.99	0.89	11.56	0.10	30.94	30.96		9.3	9.27	1.50	16.10	25.27	2.41	2.01	32.13	10.03			5.72
inches	max	0.211	0.045	0.465	0.007	1.242	1.241		0.374	0.375	0.069	0.674	1.005	0.105	0.089	1.275	0.405			0.235
	nom							0.54										0.02	0.01	
	min	0.157	0.035	0.455	0.004	1.218	1.219		0.366	0.365	0.059	0.634	0.995	0.095	0.079	1.265	0.395			0.225

Note

1. Millimeter dimensions are derived from the original inch dimensions.

sot1110b_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1110B						~~09-11-03~~ 09-11-20

Fig 2. Package outline SOT1110B

9. Abbreviations

Table 8. Abbreviations

Acronym	Description
3GPP	Third Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal Oxide Semiconductor
LDMOST	Laterally Diffused Metal Oxide Semiconductor Transistor
PAR	Peak-to-Average power Ratio
PDPCH	transmission Power of the Dedicated Physical CHannel
RF	Radio Frequency
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
BLF7G22L-250PB_22LS-250PB_1	20091216	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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