BLF6G27L-40P; **BLF6G27LS-40P**(**G**)

Power LDMOS transistor

Rev. 4 — 1 September 2015

AMPLEON Product data sheet

1. Product profile

1.1 General description

40 W LDMOS power transistor for base station applications at frequencies from 2500 MHz to 2700 MHz, also suitable for operation at 2300 MHz to 2400 MHz.

Table 1. Typical performance

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

Test signal	f	I_{Dq}	V _{DS}	P _{L(AV)}	Gp	η_D	ACPR _{885k}	ACPR _{5M}
	(MHz)	(mA)	(V)	(W)	(dB)	(%)	(dBc)	(dBc)
IS-95	2500 to 2700	450	28	12	17.5	30	-46 [1]	-
Single carrier W-CDMA	2500 to 2700	450	28	20	17.5	37	-	-35 <u>[2]</u>

^[1] Single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF. Channel bandwidth is 1.2288 MHz.

1.2 Features and benefits

- Excellent ruggedness
- High efficiency
- Low thermal resistance providing excellent thermal stability
- Designed for broadband operation (2500 MHz to 2700 MHz)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent pre-distortability
- Design optimized for gull-wing and straight lead versions
- 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 2500 MHz to 2700 MHz frequency range

^{[2] 3}GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF. Channel bandwidth is 3.84 MHz.

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF6G27L	-40P (SOT1121A)		
1	drain1		
2	drain2	1 2 [*] [*]	1
3	gate1		
4	gate2		5
5	source	3 4	2 sym117
BLF6G27L	S-40P (SOT1121B)		
1	drain1	S2 S2	
2	drain2	1 2	
3	gate1		
4	gate2	3 4 5	5
5	source	[1]	2 sym117
BLF6G27L	S-40PG (SOT1121E)		
1	drain1	4 2	
2	drain2	1 2	<u>ا</u>
3	gate1		_
4	gate2	3 4 5	5
5	source	[1]	2 sym117

^[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package					
	Name	Description	Version			
BLF6G27L-40P	-	flanged LDMOST ceramic package; 2 mounting holes; 4 leads	SOT1121A			
BLF6G27LS-40P	-	earless flanged ceramic package; 4 leads	SOT1121B			
BLF6G27LS-40PG	-	earless flanged LDMOST ceramic package; 4 leads	SOT1121E			

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
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature	[1]	-	225	°C

^[1] Continuous use at maximum temperature will affect the reliability, for details refer to the on-line MTF calculator.

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Тур	Unit
R _{th(j-c)}	thermal resistance from junction to case	$T_{case} = 80 ^{\circ}C; P_{L} = 40 W$	0.7	K/W

6. Characteristics

Table 6. Characteristics

 $T_i = 25$ °C; per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0 \text{ V}; I_D = 0.4 \text{ mA}$	65	-	-	V
V _{GS(th)}	gate-source threshold voltage	V _{DS} = 10 V; I _D = 40 mA	1.4	1.8	2.4	V
I _{DSS}	drain leakage current	V _{GS} = 0 V; V _{DS} = 28 V	-	-	1.4	μΑ
I _{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75 \text{ V};$ $V_{DS} = 10 \text{ V}$	5.96	7.2	-	А
I _{GSS}	gate leakage current	V _{GS} = 11 V; V _{DS} = 0 V	-	-	150	nA
9fs	forward transconductance	V _{DS} = 10 V; I _D = 2000 mA	1.8	2.9	-	S
R _{DS(on)}	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75 \text{ V};$ $I_D = 1400 \text{ mA}$	0.14	0.36	-	Ω

7. Test information

Table 7. Functional test information

Test signal: 1-carrier N-CDMA, single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF, channel bandwidth is 1.2288 MHz; f_1 = 2500 MHz; f_2 = 2700 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 450 mA; T_{case} = 25 °C; 2 sections combined unless otherwise specified; in a class-AB production test circuit.

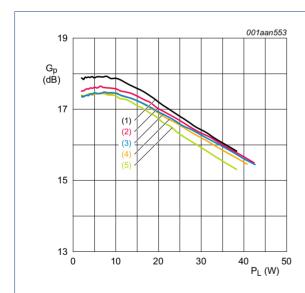
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
G _p	power gain	P _{L(AV)} = 12 W	15.5	17.5	-	dB
RLin	input return loss	P _{L(AV)} = 12 W	-	-10	-	dB
η_{D}	drain efficiency	P _{L(AV)} = 12 W	26	30	-	%
ACPR _{885k}	adjacent channel power ratio (885 kHz)	P _{L(AV)} = 12 W	-	-4 6	-41	dBc

7.1 Ruggedness in class-AB operation

The BLF6G27LS-40P, BLF6G27LS-40P and BLF6G27LS-40PG are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: $V_{DS} = 28 \text{ V}$; $I_{Dg} = 450 \text{ mA}$; $P_{L} = 40 \text{ W}$ (CW); f = 2500 MHz.

7.2 Single carrier IS-95

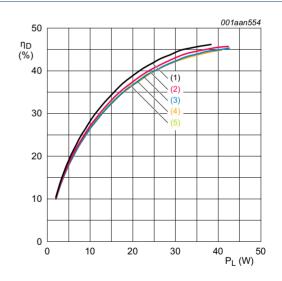
Single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF. Channel bandwidth is 1.2288 MHz.



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

Fig 1. Single carrier IS-95 power gain as a function of output power; typical values



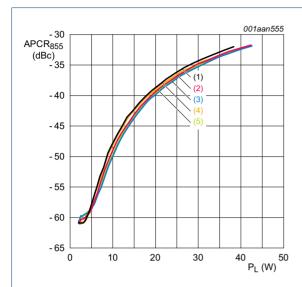
 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

Fig 2. Single carrier IS-95 drain efficiency as a function of output power; typical values

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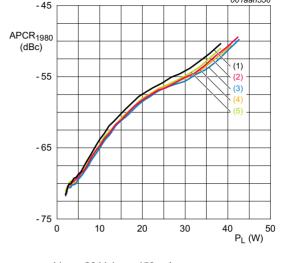
001aan556



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

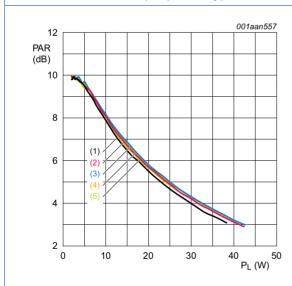
Fig 3. Single carrier IS-95 ACPR at 885 kHz as a function of output power; typical values



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

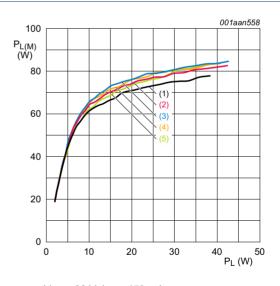
Fig 4. Single carrier IS-95 ACPR at 1980 kHz as a function of output power; typical values



 V_{DS} = 28 V; I_{Dq} = 450 mA.

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz



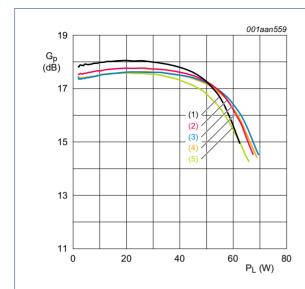


 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

Fig 6. Single carrier IS-95 peak output power as a function of output power; typical values

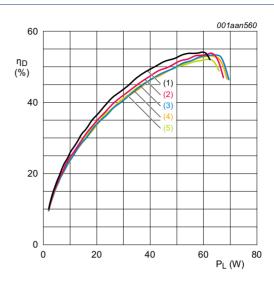
7.3 Pulsed CW



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

Fig 7. Pulsed CW power gain as a function of output power; typical values



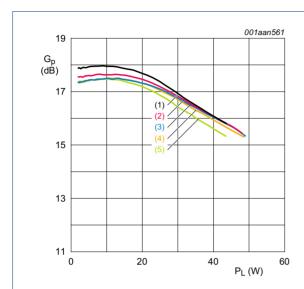
 V_{DS} = 28 V; I_{Dq} = 450 mA.

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

Fig 8. Pulsed CW drain efficiency as a function of output power; typical values

7.4 Single carrier W-CDMA

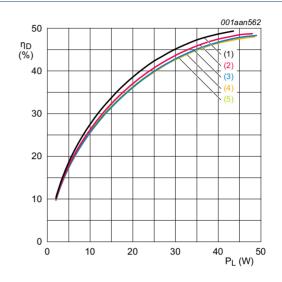
3GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF. Channel bandwidth is 3.84 MHz.



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

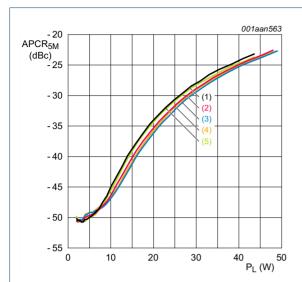
Fig 9. Single carrier W-CDMA power gain as a function of output power; typical values



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

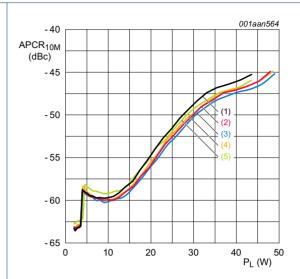
Fig 10. Single carrier W-CDMA drain efficiency as a function of output power; typical values



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

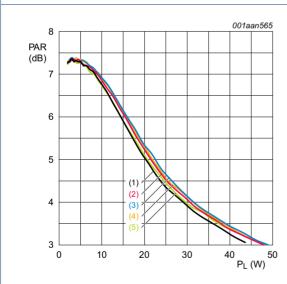
Fig 11. Single carrier W-CDMA ACPR at 5 MHz as a function of output power; typical values



 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

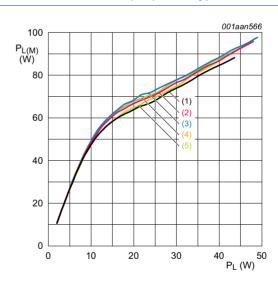
Fig 12. Single carrier W-CDMA ACPR at 10 MHz as a function of output power; typical values



 V_{DS} = 28 V; I_{Dq} = 450 mA.

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz





 $V_{DS} = 28 \text{ V}; I_{Dq} = 450 \text{ mA}.$

- (1) f = 2500 MHz
- (2) f = 2550 MHz
- (3) f = 2600 MHz
- (4) f = 2650 MHz
- (5) f = 2700 MHz

Fig 14. Single carrier W-CDMA peak output power as a function of output power; typical values

8. Package outline

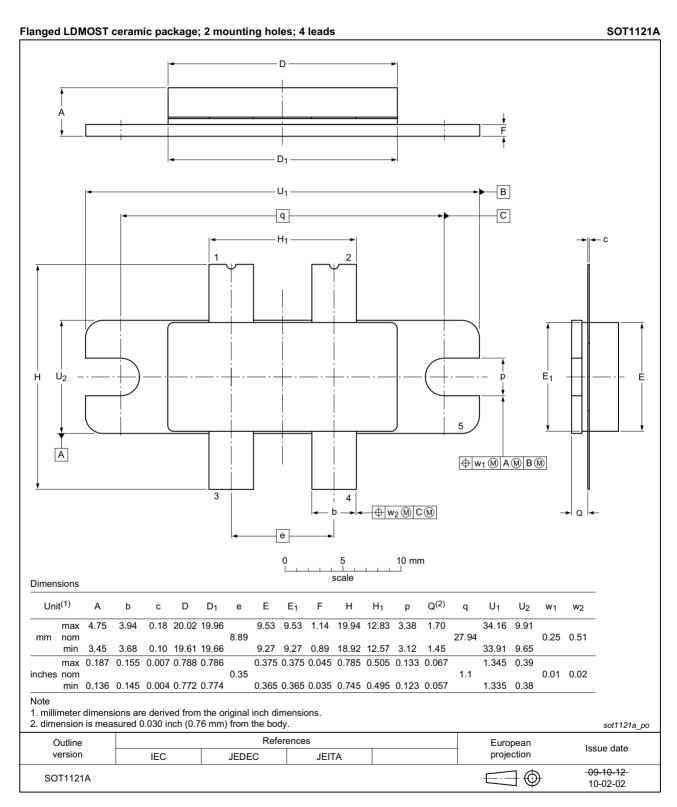


Fig 15. Package outline SOT1121A

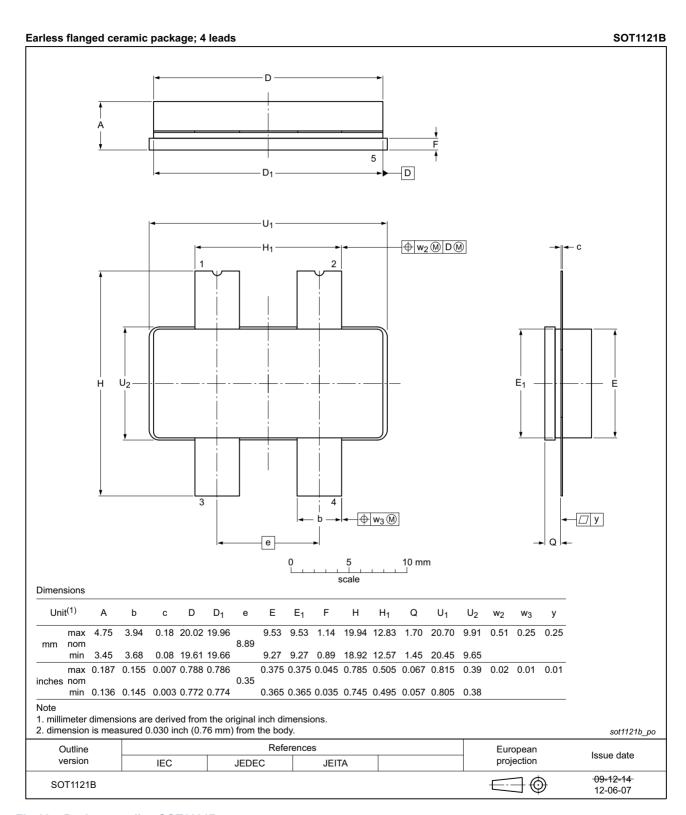


Fig 16. Package outline SOT1121B

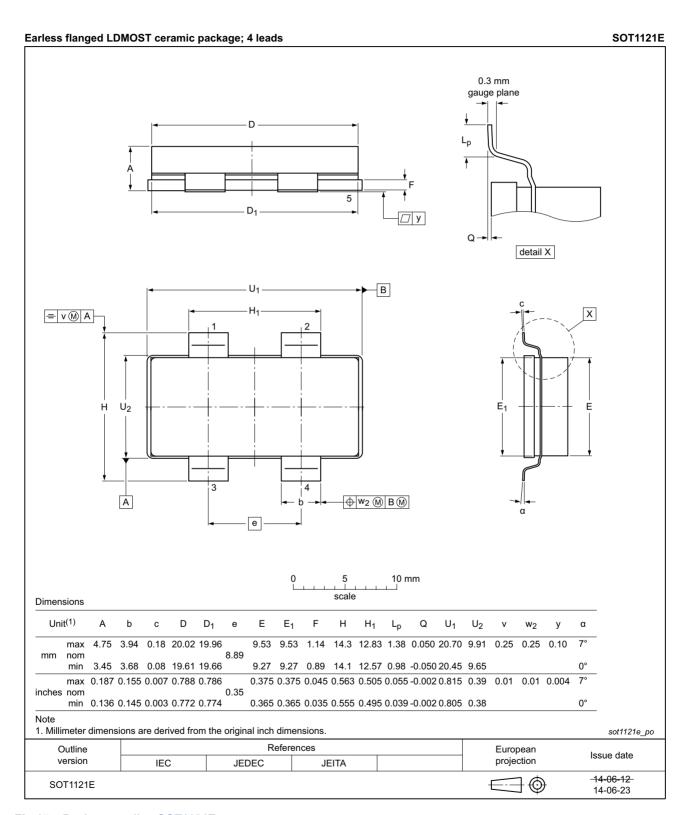


Fig 17. Package outline SOT1121E

9. Handling information

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the ANSI/ESD S20.20, IEC/ST 61340-5, JESD625-A or equivalent standards.

10. Abbreviations

Table 8. Abbreviations

Acronym	Description
3GPP	3rd Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
ESD	ElectroStatic Discharge
IS-95	Interim Standard 95
LDMOS	Laterally Diffused Metal Oxide Semiconductor
LDMOST	Laterally Diffused Metal Oxide Semiconductor Transistor
MTF	Median Time to Failure
N-CDMA	Narrowband Code Division Multiple Access
PAR	Peak-to-Average Ratio
VSWR	Voltage Standing Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

11. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes	
BLF6G27L-40P_27LS-40P_27LS-40PG#4	20150901	Product data sheet	-	BLF6G27L-40P_27LS -40P_27LS-40PG v.3	
Modifications:	 The format of this document has been redesigned to comply with identity guidelines of Ampleon. 				
	 Legal texts appropriate 	have been adapted to	o the new compa	ny name where	
BLF6G27L-40P_27LS-40P_27LS-40PG v.3	20150114	Product data sheet	-	BLF6G27L-40P_27LS -40P_27LS-40PG v.2	
BLF6G27L-40P_27LS-40P_27LS-40PG v.2	20141114	Product data sheet	-	BLF6G27L-40P_6G27 LS-40P v.1	
BLF6G27L-40P_6G27LS-40P v.1	20110704	Product data sheet	-	-	

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12.1 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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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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BLF6G27L-40P;BLF6G27LS-40P(G)

Power LDMOS transistor

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AMPLEON

BLF6G27L-40P;BLF6G27LS-40P(G)

Power LDMOS transistor

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