

# BLF7G27L-75P; BLF7G27LS-75P

Power LDMOS transistor

Rev. 3 — 1 September 2015

AMPLEON

Product data sheet

## 1. Product profile

### 1.1 General description

75 W LDMOS power transistor for base station applications at frequencies from 2300 MHz to 2700 MHz.

**Table 1. Typical performance**

Typical RF performance at  $T_{case} = 25\text{ °C}$  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)	$\eta_D$ (%)	$ACPR_{885k}$ (dBc)
IS-95	2300 to 2400	650	28	12	17	26	-46 <sup>[1]</sup>

[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  $R_{th}$  providing excellent thermal stability
- Designed for broadband operation (2300 MHz to 2700 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 2300 MHz to 2700 MHz frequency range

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
<b>BLF7G27L-75P (SOT1121A)</b>			
1	drain1		<p style="text-align: right;">sym117</p>
2	drain2		
3	gate1		
4	gate2		
5	source		
<b>BLF7G27LS-75P (SOT1121B)</b>			
1	drain1		<p style="text-align: right;">sym117</p>
2	drain2		
3	gate1		
4	gate2		
5	source		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF7G27L-75P	-	flanged LDMOST ceramic package; 2 mounting holes; 4 leads	SOT1121A
BLF7G27LS-75P	-	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		-	18	A
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-	225	°C

## 5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 10\text{ W}$	0.5	K/W

## 6. Characteristics

Table 6. Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 0.5\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 50\text{ mA}$	1.3	1.8	2.3	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	5	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	9.5	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	500	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 2.5\text{ A}$	-	3.8	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 3.5\text{ A}$	-	0.29	-	$\Omega$

## 7. Test information

Table 7. Functional test information

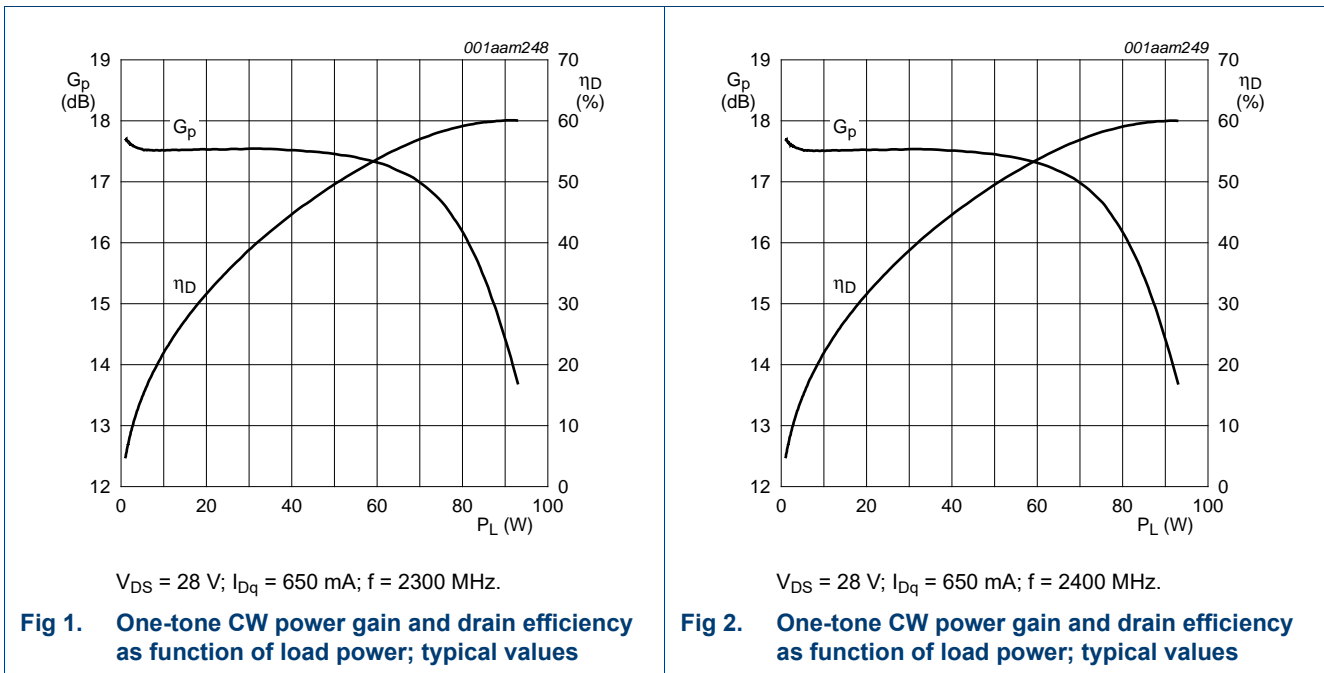
Mode of operation: 1-carrier N-CDMA, single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF, channel bandwidth is 1.2288 MHz;  $f_1 = 2300\text{ MHz}$ ;  $f_2 = 2400\text{ MHz}$ ; RF performance at  $V_{DS} = 28\text{ V}; I_{Dq} = 650\text{ mA}$ ;  $T_{case} = 25\text{ °C}$ ; 2 sections combined unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		-	12	-	W
$G_p$	power gain	$P_{L(AV)} = 12\text{ W}$	15.8	17	-	dB
$RL_{in}$	input return loss	$P_{L(AV)} = 12\text{ W}$	-	-12	-8	dB
$\eta_D$	drain efficiency	$P_{L(AV)} = 12\text{ W}$	23	26	-	%
$ACPR_{885k}$	adjacent channel power ratio (885 kHz)	$P_{L(AV)} = 12\text{ W}$	-	-46	-42	dBc

### 7.1 Ruggedness in class-AB operation

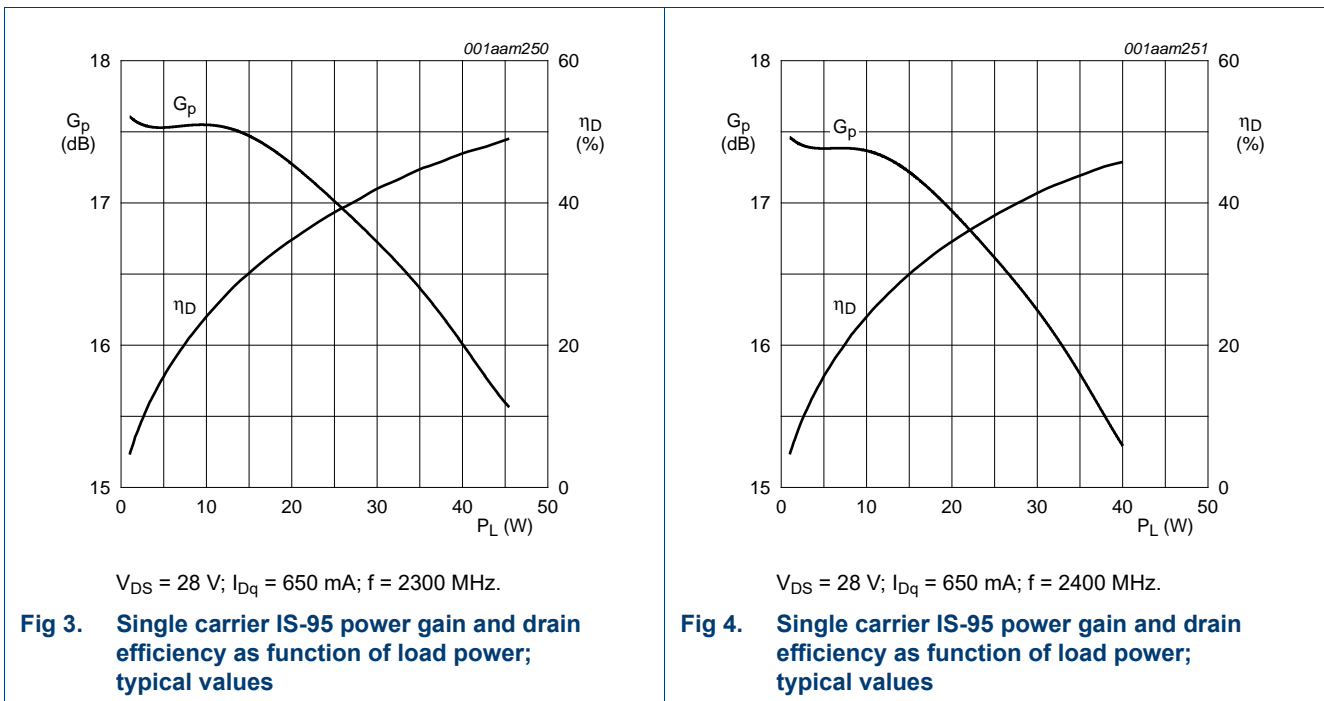
The BLF7G27L-75P and BLF7G27LS-75P are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions:  $V_{DS} = 28\text{ V}; I_{Dq} = 650\text{ mA}; P_L = 75\text{ W (CW)}; f = 2300\text{ MHz}$ .

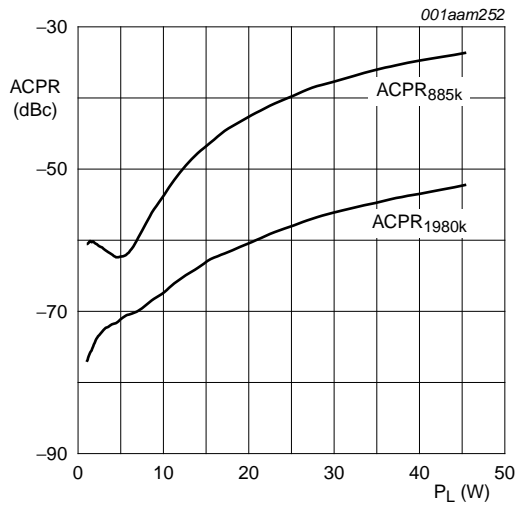
7.2 One-tone CW



7.3 Single carrier IS-95

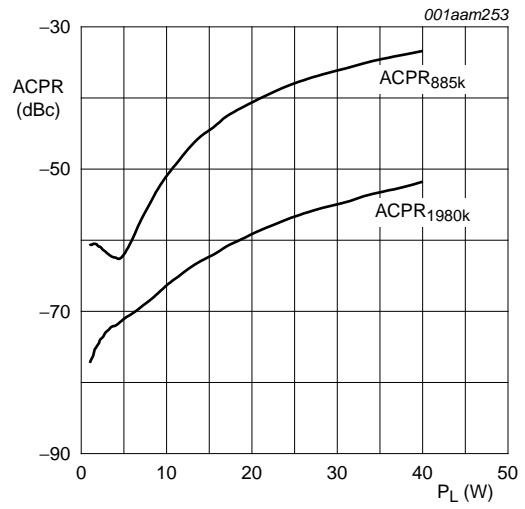
Single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF. Channel bandwidth is 1.2288 MHz.





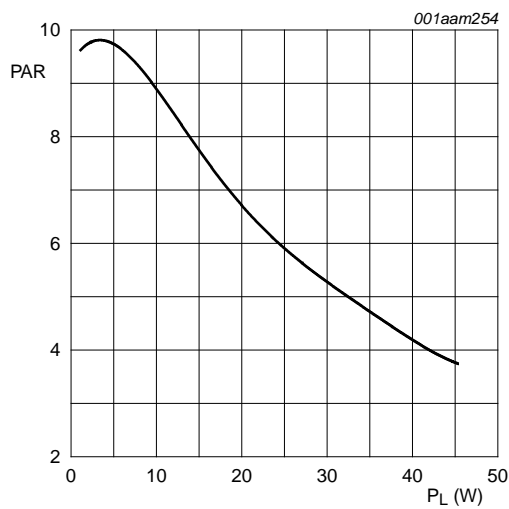
$V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 650\text{ mA}$ ;  $f = 2300\text{ MHz}$ .

**Fig 5. Single carrier IS-95 ACPR at 885 kHz and at 1980 kHz as function of load power; typical values**



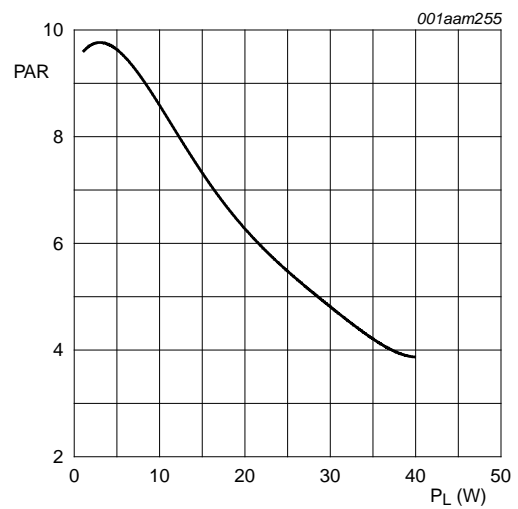
$V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 650\text{ mA}$ ;  $f = 2400\text{ MHz}$ .

**Fig 6. Single carrier IS-95 ACPR at 885 kHz and at 1980 kHz as function of load power; typical values**



$V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 650\text{ mA}$ ;  $f = 2300\text{ MHz}$ .

**Fig 7. Single carrier IS-95 peak-to-average power ratio as a function of load power; typical values**

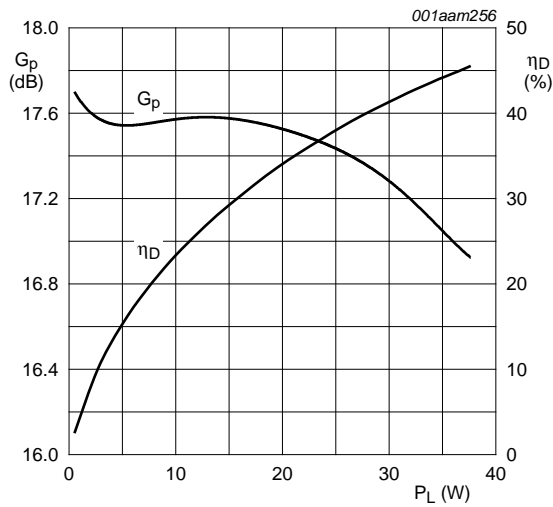


$V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 650\text{ mA}$ ;  $f = 2400\text{ MHz}$ .

**Fig 8. Single carrier IS-95 peak-to-average power ratio as a function of load power; typical values**

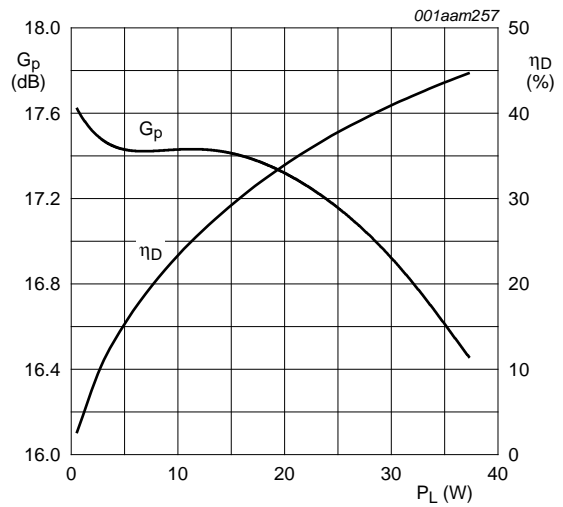
7.4 Single carrier W-CDMA

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



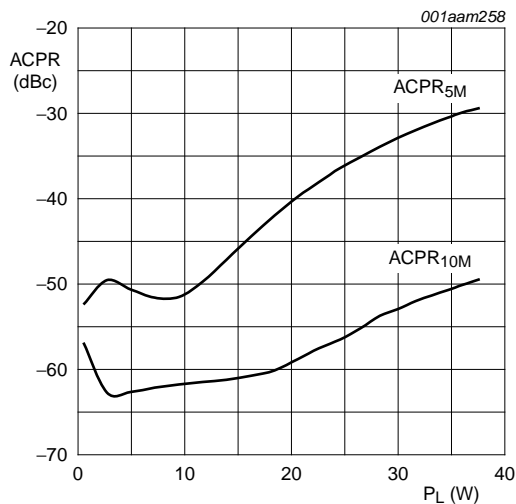
V<sub>DS</sub> = 28 V; I<sub>Dq</sub> = 650 mA; f = 2300 MHz.

Fig. 9. Single carrier W-CDMA power gain and drain efficiency as function of load power; typical values



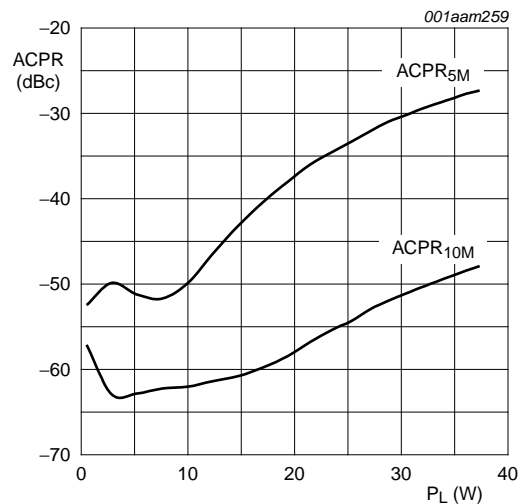
V<sub>DS</sub> = 28 V; I<sub>Dq</sub> = 650 mA; f = 2400 MHz.

Fig. 10. Single carrier W-CDMA power gain and drain efficiency as function of load power; typical values



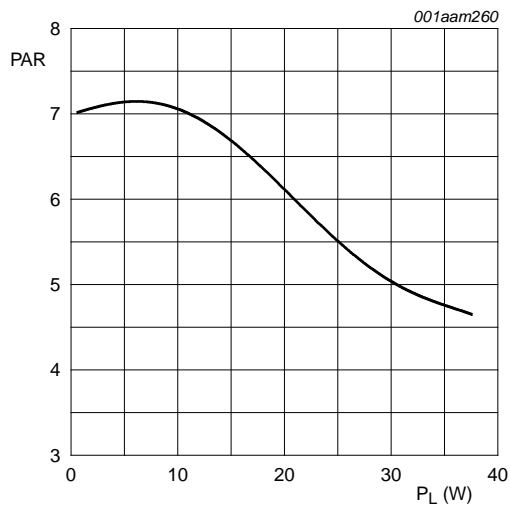
V<sub>DS</sub> = 28 V; I<sub>Dq</sub> = 650 mA; f = 2300 MHz.

Fig. 11. Single carrier W-CDMA ACPR at 5 MHz and at 10 MHz as function of load power; typical values



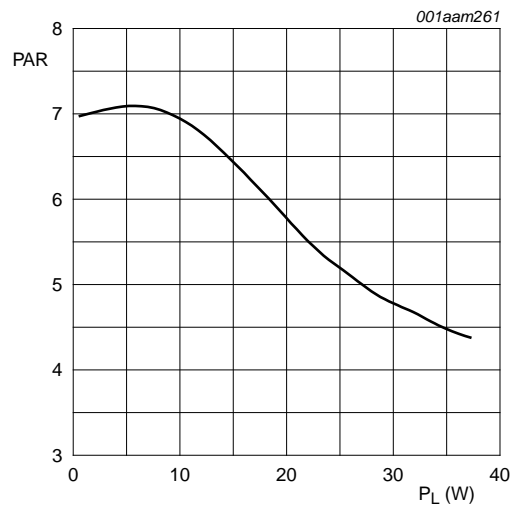
V<sub>DS</sub> = 28 V; I<sub>Dq</sub> = 650 mA; f = 2400 MHz.

Fig. 12. Single carrier W-CDMA ACPR at 5 MHz and at 10 MHz as function of load power; typical values



$V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 650\text{ mA}$ ;  $f = 2300\text{ MHz}$ .

**Fig 13. Single carrier W-CDMA peak-to-average power ratio as a function of load power; typical values**



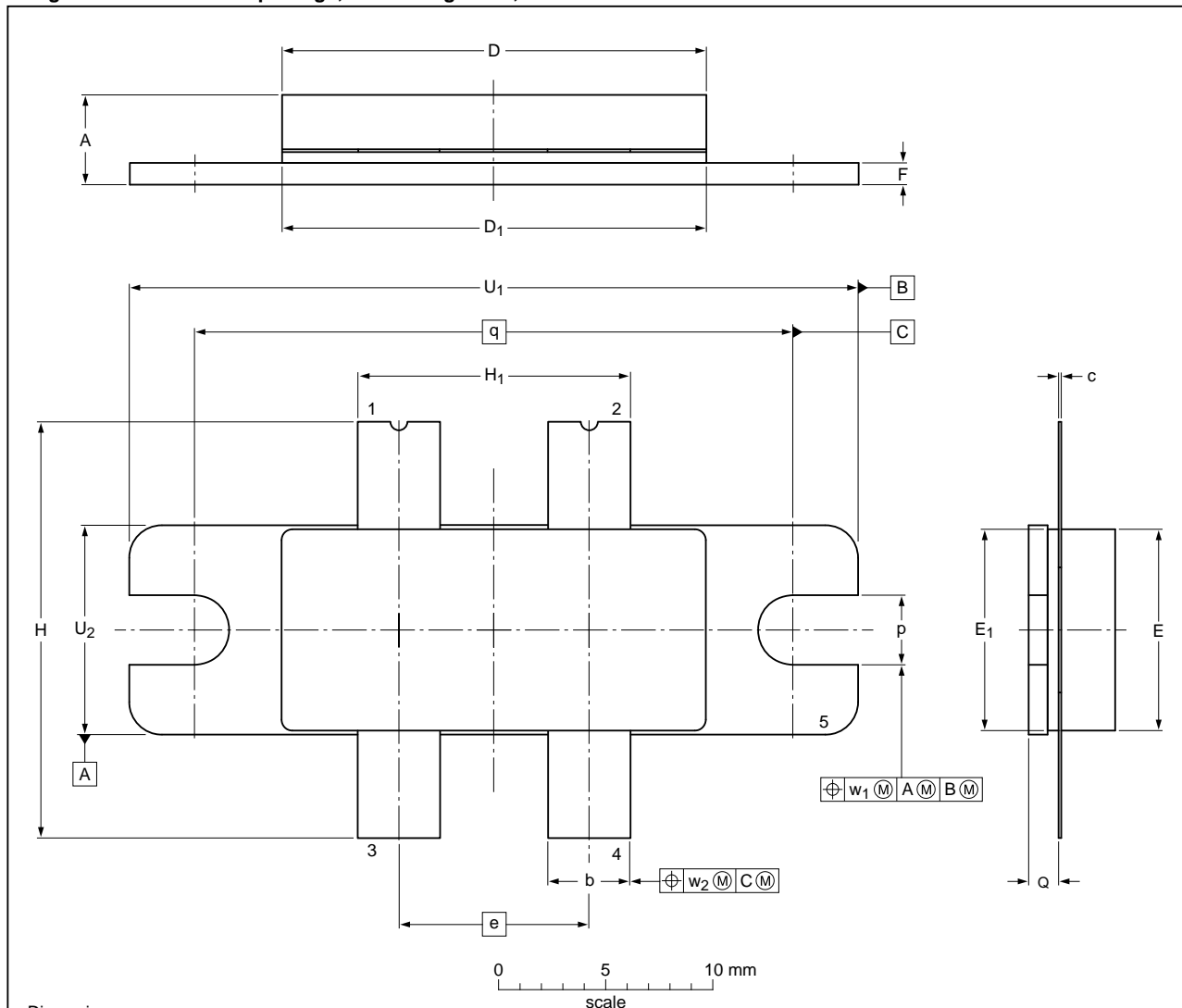
$V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 650\text{ mA}$ ;  $f = 2400\text{ MHz}$ .

**Fig 14. Single carrier W-CDMA peak-to-average power ratio as a function of load power; typical values**

### 8. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 4 leads

SOT1121A



Dimensions

Unit <sup>(1)</sup>	A	b	c	D	D <sub>1</sub>	e	E	E <sub>1</sub>	F	H	H <sub>1</sub>	p	Q <sup>(2)</sup>	q	U <sub>1</sub>	U <sub>2</sub>	w <sub>1</sub>	w <sub>2</sub>
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		0.25	0.51
	nom					8.89							27.94					
	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		0.01	0.02
	nom					0.35							1.1					
	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 15. Package outline SOT1121A



Earless flanged ceramic package; 4 leads

SOT1121B

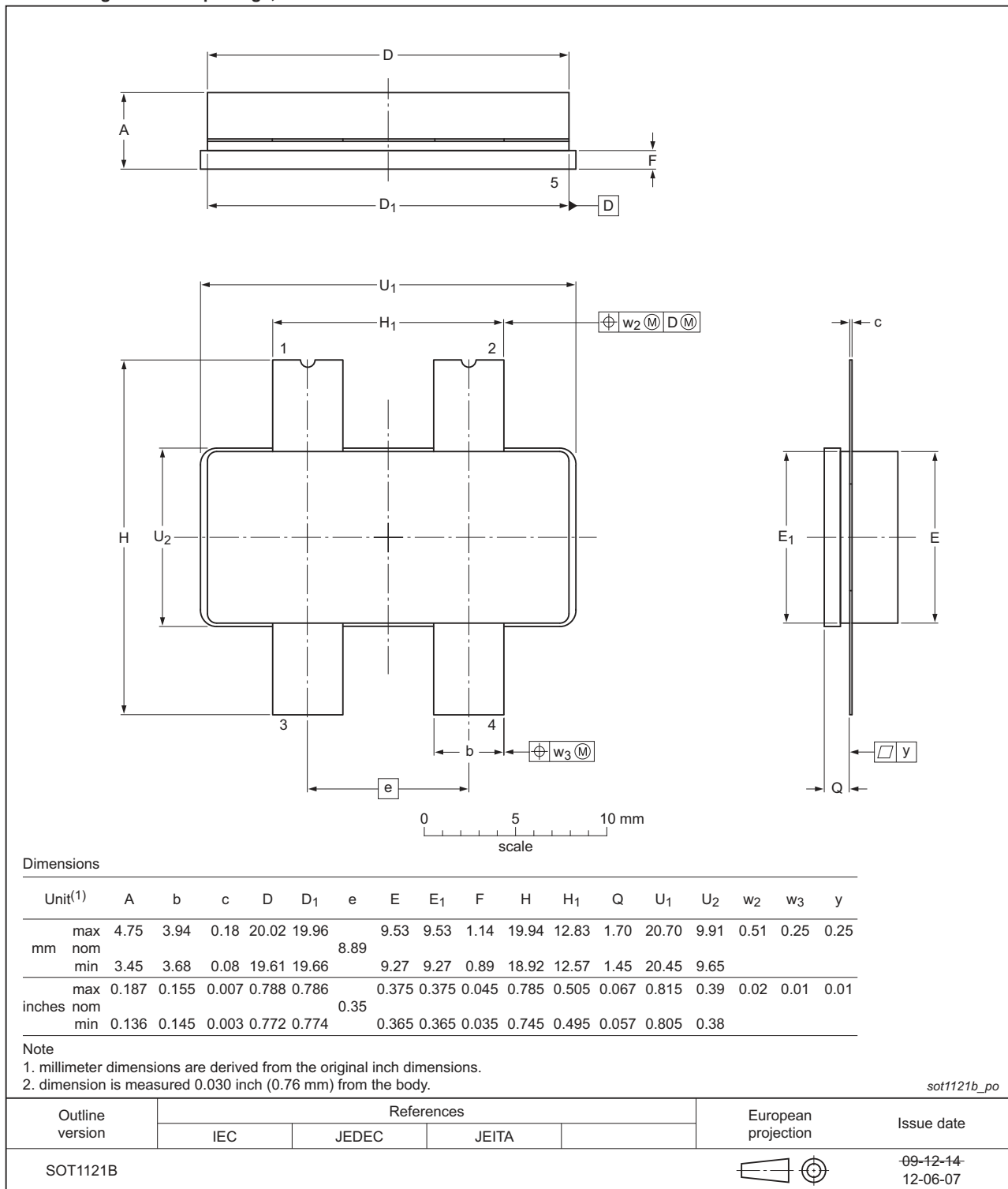


Fig 16. Package outline SOT1121B

## 9. Abbreviations

**Table 8. Abbreviations**

Acronym	Description
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
3GPP	3rd Generation Partnership Project
IS-95	Interim Standard 95
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal Oxide Semiconductor
LDMOST	Laterally Diffused Metal Oxide Semiconductor Transistor
N-CDMA	Narrowband Code Division Multiple Access
PAR	Peak-to-Average power Ratio
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
BLF7G27L-75P_BLF7G27LS-75P#3	20150901	Product data sheet	-	BLF7G27L-75P_BLF7G27LS-75P v.2
Modifications:	<ul style="list-style-type: none"> <li>The format of this document has been redesigned to comply with the new identity guidelines of Ampleon.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>			
BLF7G27L-75P_BLF7G27LS-75P v.2	20100714	Product data sheet	-	BLF7G27L-75P_BLF7G27LS-75P v.1
BLF7G27L-75P_BLF7G27LS-75P v.1	20100329	Objective data sheet	-	-

## 11. Legal information

### 11.1 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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