

BLF6G27L-50BN

Power LDMOS transistor

Rev. 4 — 1 September 2015

AMPLEON

Product data sheet

1. Product profile

1.1 General description

50 W LDMOS power transistor for base station applications at frequencies from 2500 MHz to 2700 MHz.

Table 1. Typical performance

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

Test signal	f (MHz)	I_{Dq} (mA)	V_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	ACPR (dBc)
2-carrier W-CDMA	2500 to 2700	430	28	3	16.5	14.5	-47 [1]

[1] Test signal: 3GPP; test model 1; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on CCDF per carrier; carrier spacing 5 MHz

1.2 Features and benefits

- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (2500 MHz to 2700 MHz)
- Internally matched for ease of use
- Integrated current sense
- 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 2500 MHz to 2700 MHz frequency range

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	drain		
2	gate		
3	source ^[1]		
4, 5	sense drain		
6, 7	sense gate		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF6G27L-50BN	-	flanged ceramic package; 2 mounting holes; 6 leads	SOT1112A

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
$V_{GS(sense)}$	sense gate-source voltage		-0.5	+9	V
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
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}$; $P_L = 12.5\text{ W (CW)}$	1.3	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	$V_{DS} = 10\text{ V}; I_D = 72\text{ mA}$	1.4	1.9	2.4	V
I_{Dq}	quiescent drain current	sense transistor: $I_{DS} = 9.1\text{ mA};$ $V_{DS} = 26.5\text{ V}$ main transistor: $V_{DS} = 28\text{ V}$	380	430	480	mA
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	1.5	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $V_{DS} = 10\text{ V}$	10	12	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	150	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 3.6\text{ A}$	-	5.0	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $I_D = 2.52\text{ A}$	-	0.25	-	Ω

7. Application information

Table 7. 2-carrier W-CDMA application information

All testing performed in Class-AB production test circuit; test signal 3GPP; test model 1; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on CCDF per carrier; carrier spacing 5 MHz; $f_1 = 2500\text{ MHz};$ $f_2 = 2600\text{ MHz};$ $f_3 = 2700\text{ MHz};$ RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}; T_{case} = 25\text{ °C};$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)} = 3\text{ W}$	15.3	16.5	-	dB
η_D	drain efficiency	$P_{L(AV)} = 3\text{ W}$	12.5	14.5	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)} = 3\text{ W}$	-	-47	-43	dBc
I_{Dq}	quiescent drain current	$V_{DD} = 28\text{ V}$	-	430	-	mA

Table 8. 1-carrier W-CDMA application information

All testing performed in Class-AB production test circuit; test signal 3GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF per carrier; $f = 2700\text{ MHz};$ RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}; T_{case} = 25\text{ °C};$ unless otherwise specified.

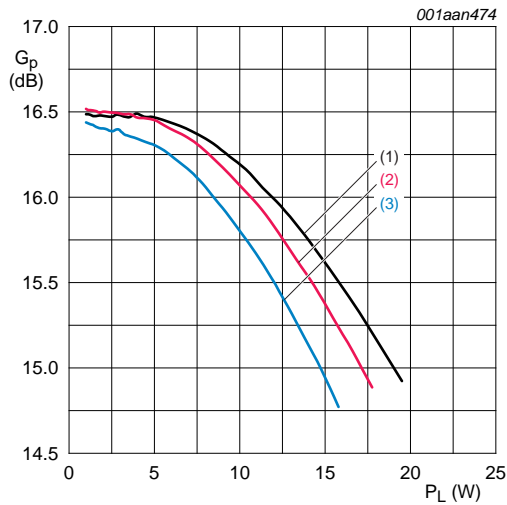
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
PAR_O	output peak-to-average ratio	$P_{L(AV)} = 16\text{ W}$	4.1	4.7	5.3	dB

7.1 Ruggedness in Class-AB operation

The BLF6G27L-50BN is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: $V_{DS} = 28\text{ V};$ $I_{Dq} = 430\text{ mA}; P_L = 40\text{ W (CW)}; f = 2500\text{ MHz}.$

7.2 Single carrier IS-95

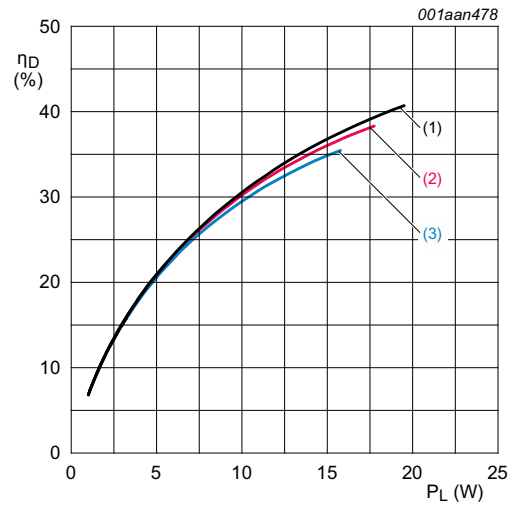
Single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13).
 PAR = 9.7 dB at 0.01 % probability on the CCDF. Channel bandwidth is 1.2288 MHz.



$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}$.

- (1) $f = 2500\text{ MHz}$
- (2) $f = 2600\text{ MHz}$
- (3) $f = 2700\text{ MHz}$

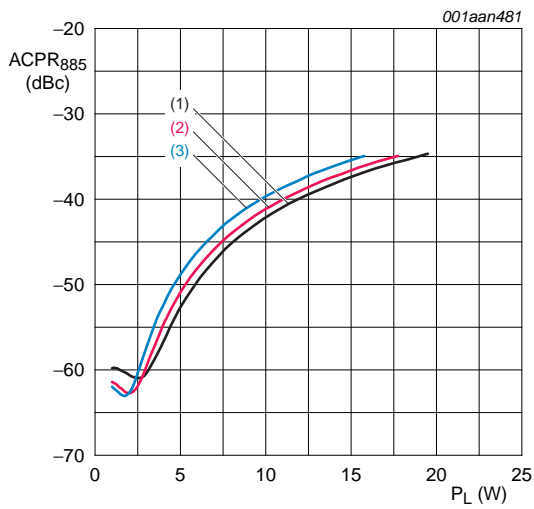
Fig 1. Single carrier IS-95 power gain as a function of output power; typical values



$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}$.

- (1) $f = 2500\text{ MHz}$
- (2) $f = 2600\text{ MHz}$
- (3) $f = 2700\text{ MHz}$

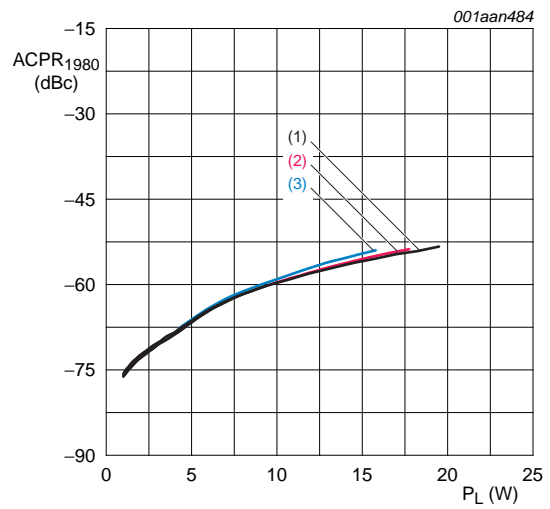
Fig 2. Single carrier IS-95 drain efficiency as a function of output power; typical values



$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}$.

- (1) $f = 2500\text{ MHz}$
- (2) $f = 2600\text{ MHz}$
- (3) $f = 2700\text{ MHz}$

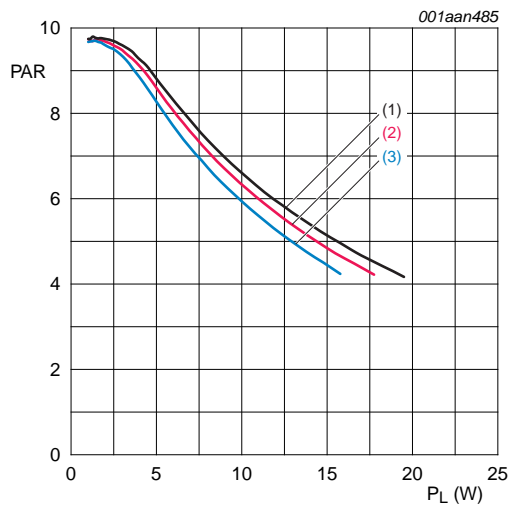
Fig 3. Single carrier IS-95 ACPR at 885 kHz as a function of output power; typical values



$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}$.

- (1) $f = 2500\text{ MHz}$
- (2) $f = 2600\text{ MHz}$
- (3) $f = 2700\text{ MHz}$

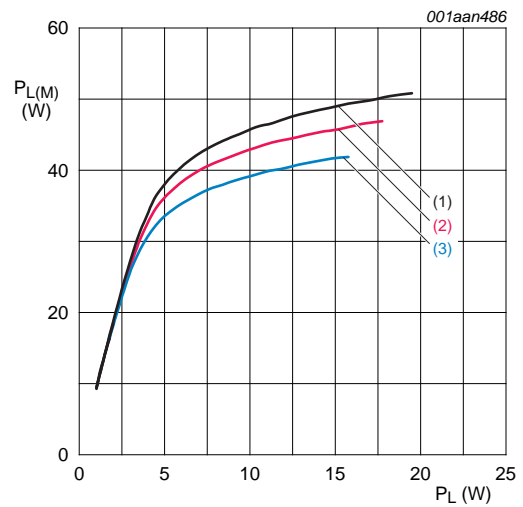
Fig 4. Single carrier IS-95 ACPR at 1980 kHz as a function of output power; typical values



$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}$.

- (1) $f = 2500\text{ MHz}$
- (2) $f = 2600\text{ MHz}$
- (3) $f = 2700\text{ MHz}$

Fig 5. Single carrier IS-95 peak-to-average power ratio as a function of output power; typical values

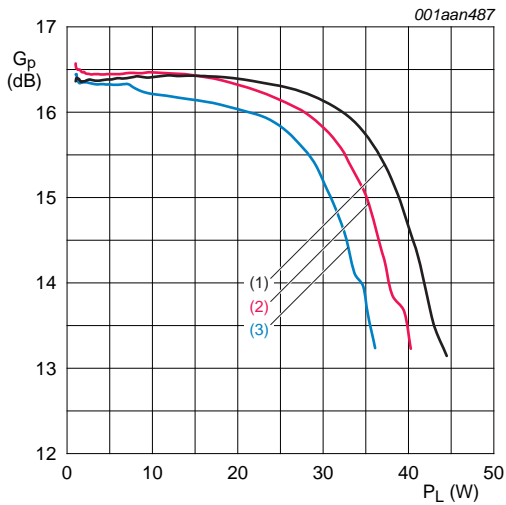


$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}$.

- (1) $f = 2500\text{ MHz}$
- (2) $f = 2600\text{ MHz}$
- (3) $f = 2700\text{ MHz}$

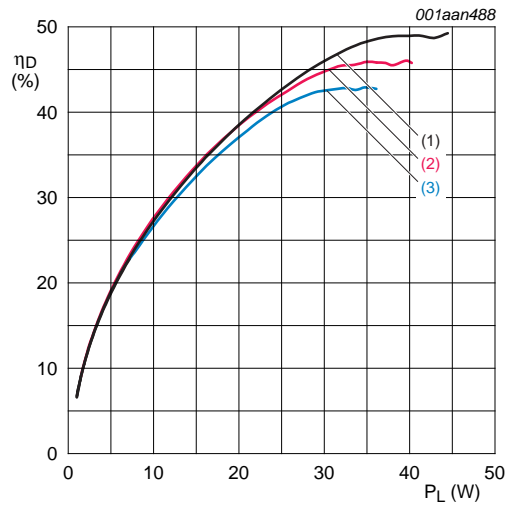
Fig 6. Single carrier IS-95 peak power as a function of output power; typical values

7.3 Pulsed CW



$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

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

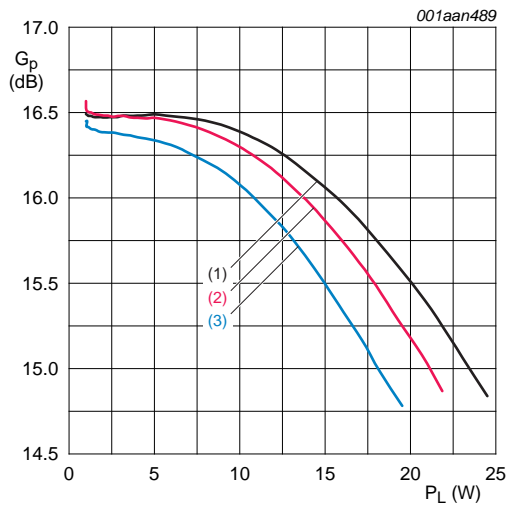


$V_{DS} = 28\text{ V}; I_{Dq} = 430\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

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

7.4 2-carrier W-CDMA

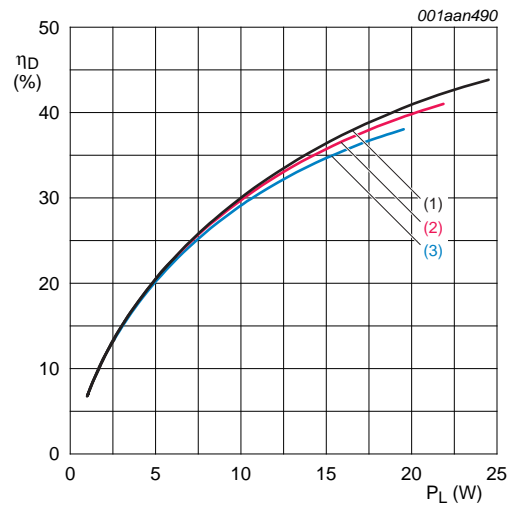
All testing performed in Class-AB production test circuit; test signal 3GPP; test model 1; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on CCDF per carrier; carrier spacing 5 MHz; $f_1 = 2500$ MHz; $f_2 = 2600$ MHz; $f_3 = 2700$ MHz; $T_{case} = 25$ °C; unless otherwise specified.



$V_{DS} = 28$ V; $I_{Dq} = 430$ mA.

- (1) $f = 2500$ MHz
- (2) $f = 2600$ MHz
- (3) $f = 2700$ MHz

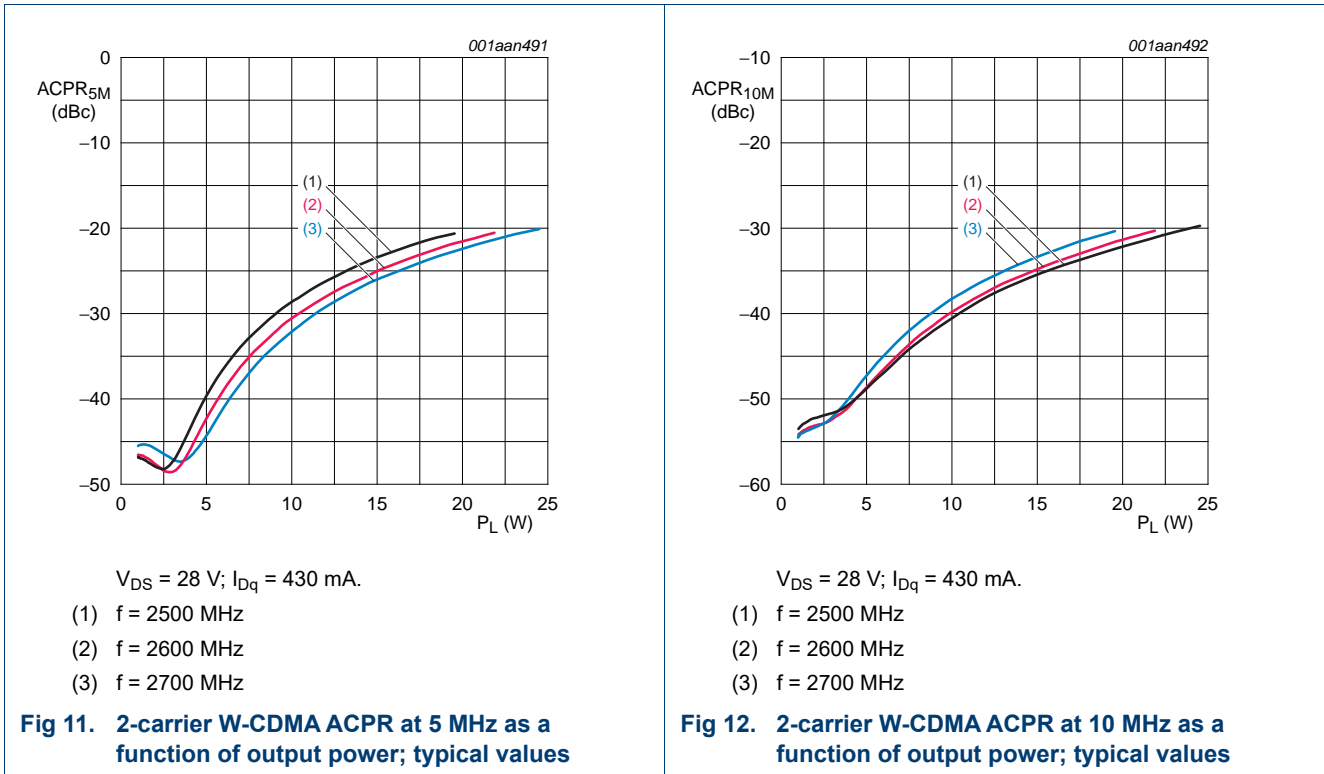
Fig 9. 2-carrier W-CDMA power gain as a function of output power; typical values



$V_{DS} = 28$ V; $I_{Dq} = 430$ mA.

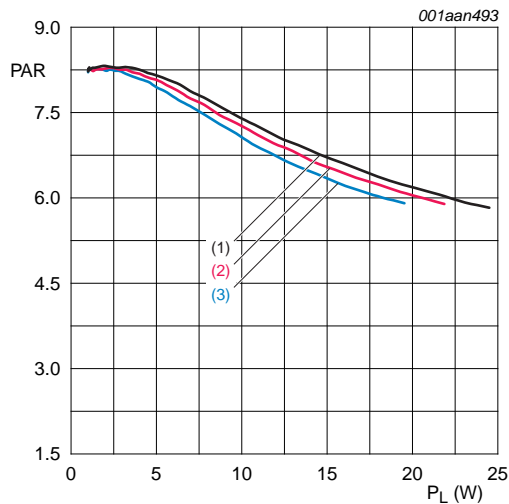
- (1) $f = 2500$ MHz
- (2) $f = 2600$ MHz
- (3) $f = 2700$ MHz

Fig 10. 2-carrier W-CDMA drain efficiency as a function of output power; typical values



7.5 Single carrier W-CDMA

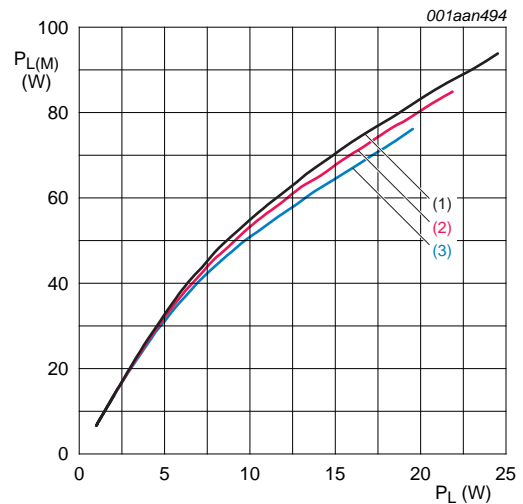
All testing performed in Class-AB production test circuit; test signal 3GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF per carrier; f = 2700 MHz; T_{case} = 25 °C; unless otherwise specified.



V_{DS} = 28 V; I_{Dq} = 430 mA.

- (1) f = 2500 MHz
- (2) f = 2600 MHz
- (3) f = 2700 MHz

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



V_{DS} = 28 V; I_{Dq} = 430 mA.

- (1) f = 2500 MHz
- (2) f = 2600 MHz
- (3) f = 2700 MHz

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

8. Package outline

Flanged ceramic package; 2 mounting holes; 6 leads

SOT1112A

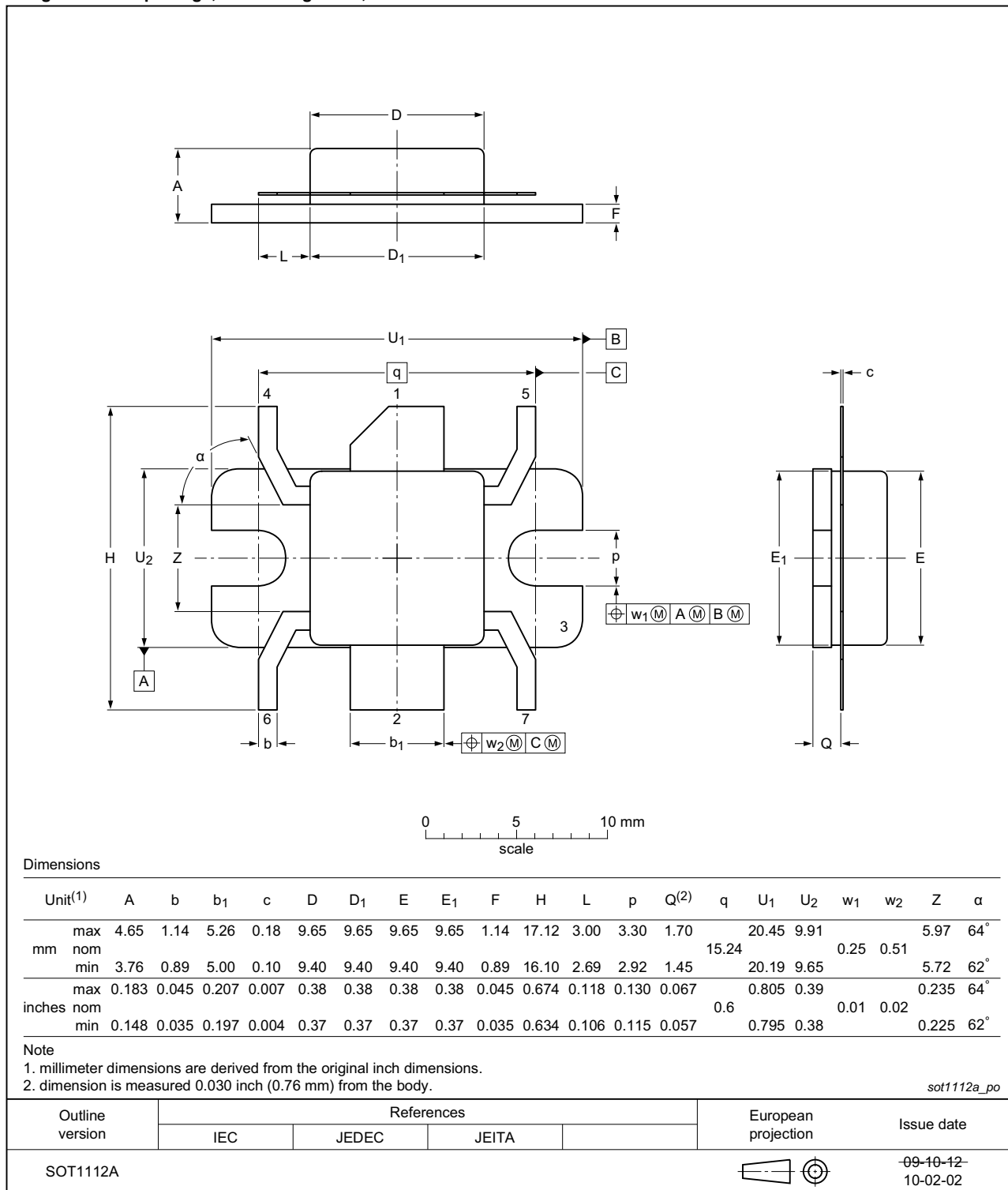



Fig 15. Package outline SOT1112A

9. Handling information

CAUTION	
	<p>This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.</p> <p>Such precautions are described in the <i>ANSI/ESD S20.20</i>, <i>IEC/ST 61340-5</i>, <i>JESD625-A</i> or equivalent standards.</p>

10. Abbreviations

Table 9. 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
PAR	Peak-to-Average Ratio
VSWR	Voltage Standing-Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF6G27L-50BN#4	20150901	Product data sheet	-	BLF6G27L-50BN v.3
Modifications:	<ul style="list-style-type: none"> The format of this document has been redesigned to comply with the new identity guidelines of Ampleon. Legal texts have been adapted to the new company name where appropriate. 			
BLF6G27L-50BN v.3	20141008	Product data sheet	-	BLF6G27L-50BN_6G27LS-50BN v.2
BLF6G27L-50BN_6G27LS-50BN v.2	20110407	Product data sheet	-	BLF6G27L-50BN_6G27LS-50BN v.1
BLF6G27L-50BN_6G27LS-50BN v.1	20100916	Objective data sheet	-	-

12. Legal information

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.
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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Date of release: 1 September 2015
 Document identifier: BLF6G27L-50BN#4