

# BLF2425M7L100; BLF2425M7LS100

Power LDMOS transistor

Rev. 2 — 1 September 2015

AMPLEON

Product data sheet

## 1. Product profile

### 1.1 General description

100 W LDMOS power transistor for industrial applications at frequencies from 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 (MHz)	$I_{Dq}$ (mA)	$V_{DS}$ (V)	$P_{L(AV)}$ (W)	$G_p$ (dB)	$\eta_D$ (%)	ACPR <sub>885k</sub> (dBc)	ACPR <sub>5M</sub> (dBc)
IS-95	2300 to 2400	900	28	20	18	27	-46 <sup>[1]</sup>	-
1 carrier W-CDMA	2300 to 2400	900	28	30	18.7	33	-	-40 <sup>[2]</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.

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

### 1.2 Features and benefits

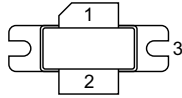
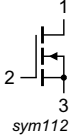
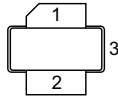
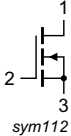
- Excellent ruggedness
- High efficiency
- Low  $R_{th}$  providing excellent thermal stability
- Designed for low memory effects providing excellent digital pre-distortion capability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

### 1.3 Applications

- RF power amplifiers for industrial and multi carrier applications in the 2300 MHz to 2400 MHz frequency range

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
<b>BLF2425M7L100 (SOT502A)</b>			
1	drain		 sym112
2	gate		
3	source		
<b>BLF2425M7LS100 (SOT502B)</b>			
1	drain		 sym112
2	gate		
3	source		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
BLF2425M7L100	-	flanged ceramic package; 2 mounting holes; 2 leads	SOT502A
BLF2425M7LS100	-	earless flanged ceramic package; 2 leads	SOT502B

## 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
$T_j$	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	$T_{case} = 80\text{ °C}; P_L = 100\text{ W}$	0.3	K/W

## 6. Characteristics

**Table 6. DC characteristics**

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 1\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 150\text{ mA}$	1.5	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	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	25.1	29	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	500	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 5.35\text{ A}$	-	10.5	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 5.25\text{ A}$	-	0.1	-	$\Omega$

**Table 7. RF characteristics**

Test signal: 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  $V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 900\text{ mA}$ ;  $T_{case} = 25\text{ }^\circ\text{C}$ ; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_{L(AV)} = 20\text{ W}$	17.3	18	-	dB
$RL_{in}$	input return loss	$P_{L(AV)} = 20\text{ W}$	-	-14	-	dB
$\eta_D$	drain efficiency	$P_{L(AV)} = 20\text{ W}$	22	27	-	%
$ACPR_{885k}$	adjacent channel power ratio (885 kHz)	$P_{L(AV)} = 20\text{ W}$	-	-46	-40	dBc

## 7. Test information

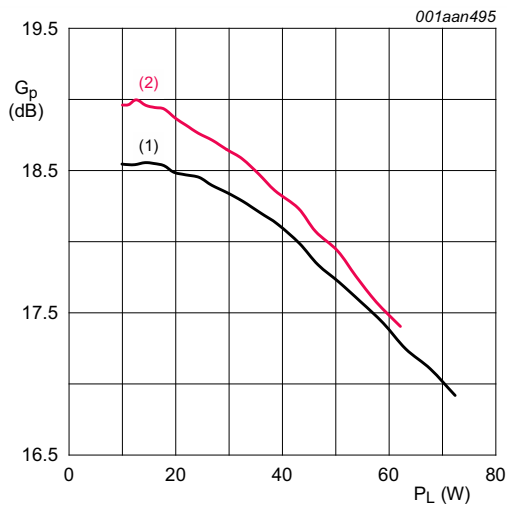
### 7.1 Ruggedness in class-AB operation

The BLF2425M7L100 and BLF2425M7LS100 are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions:  $V_{DS} = 28\text{ V}$ ;  $I_{Dq} = 900\text{ mA}$ ;  $P_L = 100\text{ W}$  (CW);  $f = 2300\text{ MHz}$ .

7.2 Graphical data

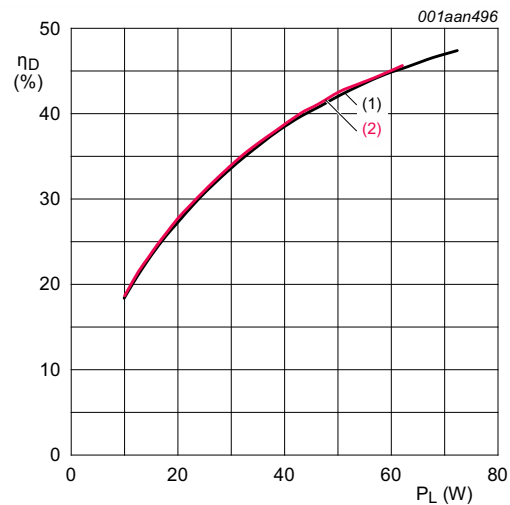
7.2.1 Single carrier IS-95

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.



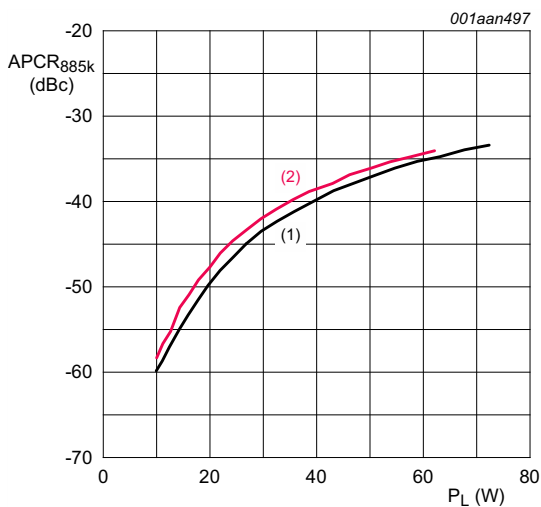
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 1. Power gain as a function of output power; typical values**



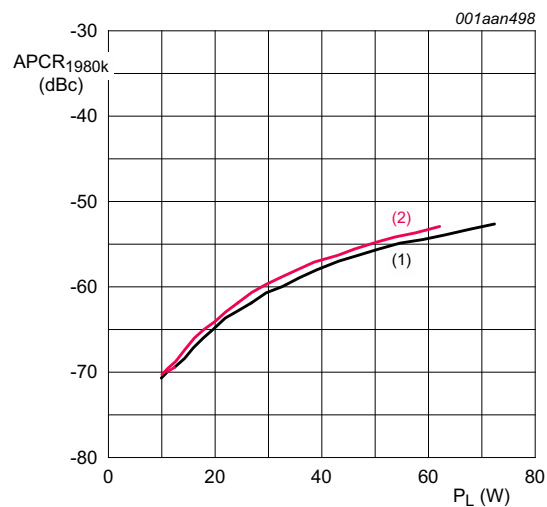
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 2. Drain efficiency as a function of output power; typical values**



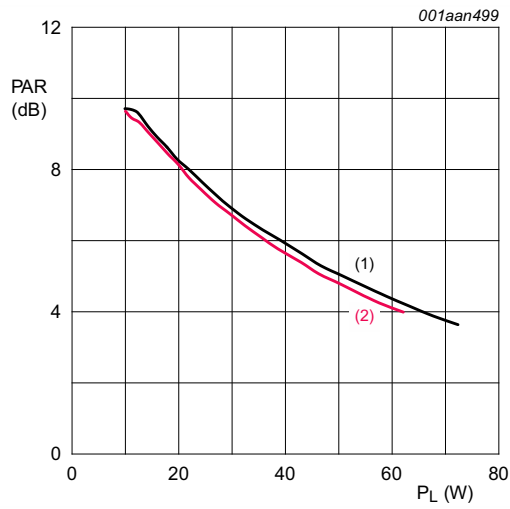
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 3. Adjacent channel power ratio (885 kHz) as a function of output power; typical values**



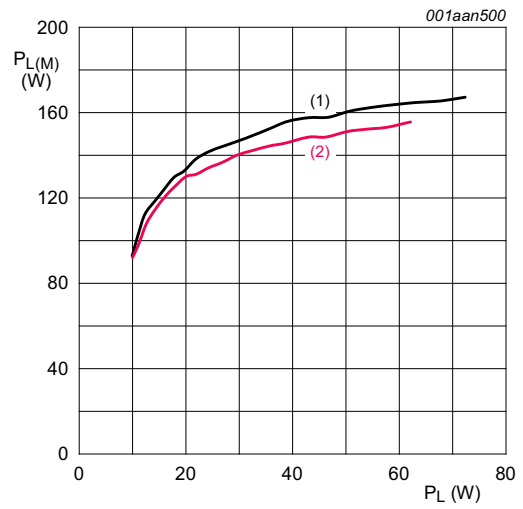
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 4. Adjacent channel power ratio (1980 kHz) as a function of output power; typical values**



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

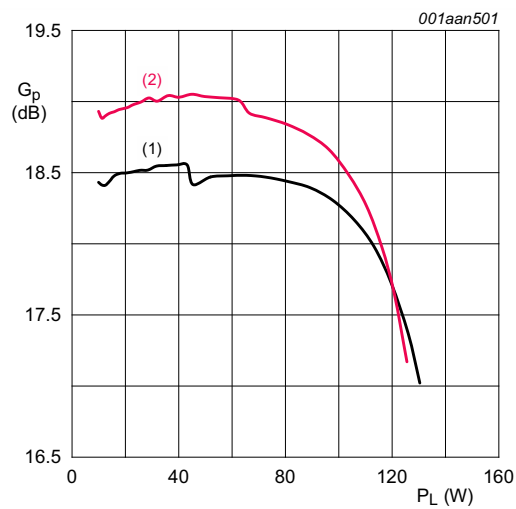
**Fig 5. Peak-to-average power ratio as a function of output power; typical values**



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

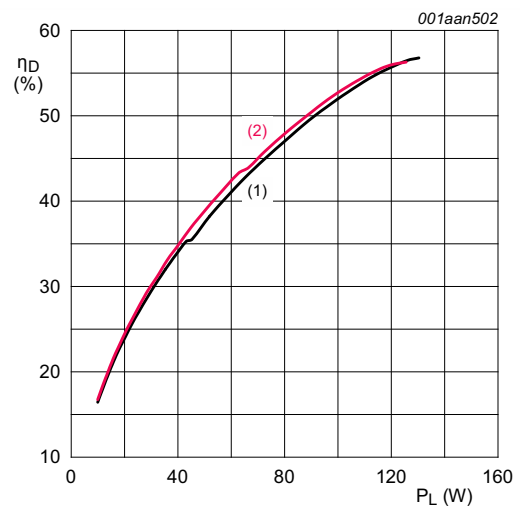
**Fig 6. Peak power as a function of output power; typical values**

7.2.2 Pulsed CW



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 7. Power gain as a function of output power; typical values**

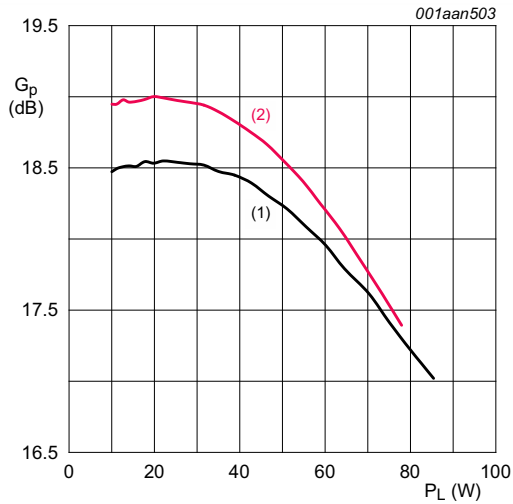


$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$   
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 8. Drain efficiency as a function of output power; typical values**

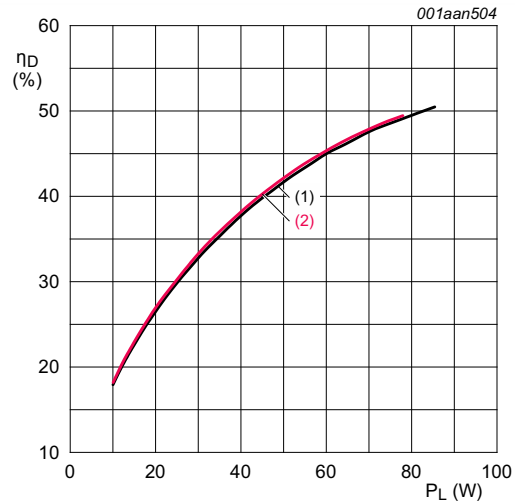
7.2.3 Single carrier W-CDMA

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



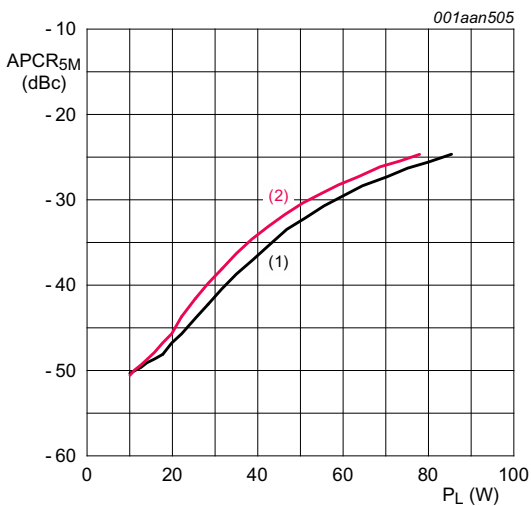
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}$ .  
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 9. Power gain as a function of output power; typical values**



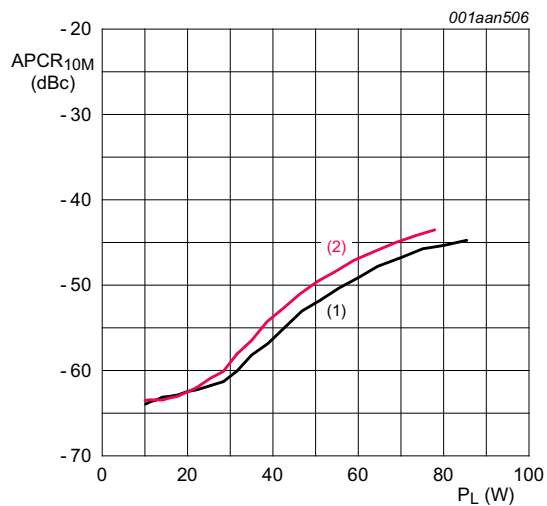
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}$ .  
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 10. Drain efficiency as a function of output power; typical values**



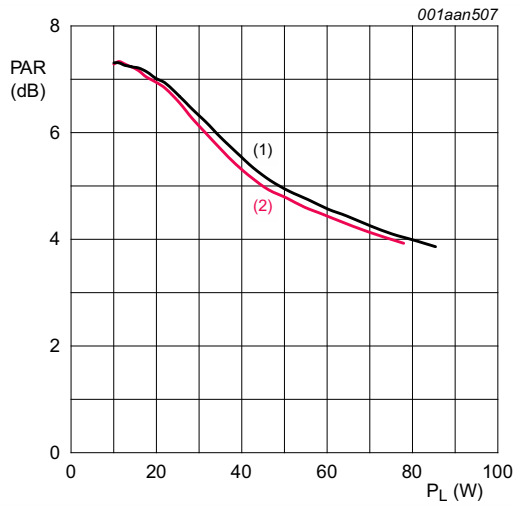
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}$ .  
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

**Fig 11. Adjacent channel power ratio (5 MHz) as a function of output power; typical values**



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}$ .  
 (1)  $f = 2300\text{ MHz}$   
 (2)  $f = 2400\text{ MHz}$

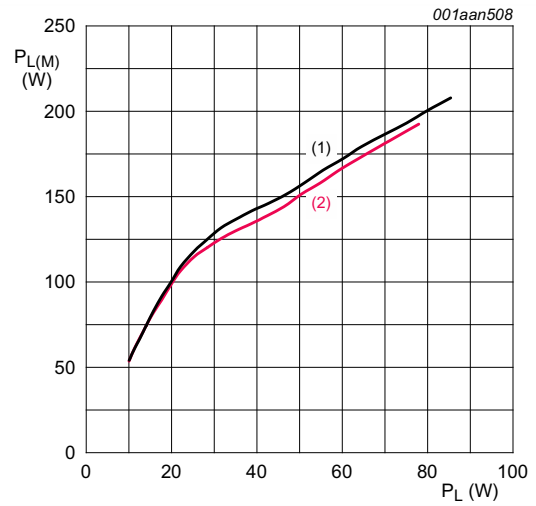
**Fig 12. Adjacent channel power ratio (10 MHz) as a function of output power; typical values**



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}$ .

- (1)  $f = 2300\text{ MHz}$
- (2)  $f = 2400\text{ MHz}$

**Fig 13. Peak-to-average power ratio as a function of output power; typical values**



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}$ .

- (1)  $f = 2300\text{ MHz}$
- (2)  $f = 2400\text{ MHz}$

**Fig 14. Peak output power as a function of output power; typical values**

8. Package outline

Flanged ceramic package; 2 mounting holes; 2 leads

SOT502A

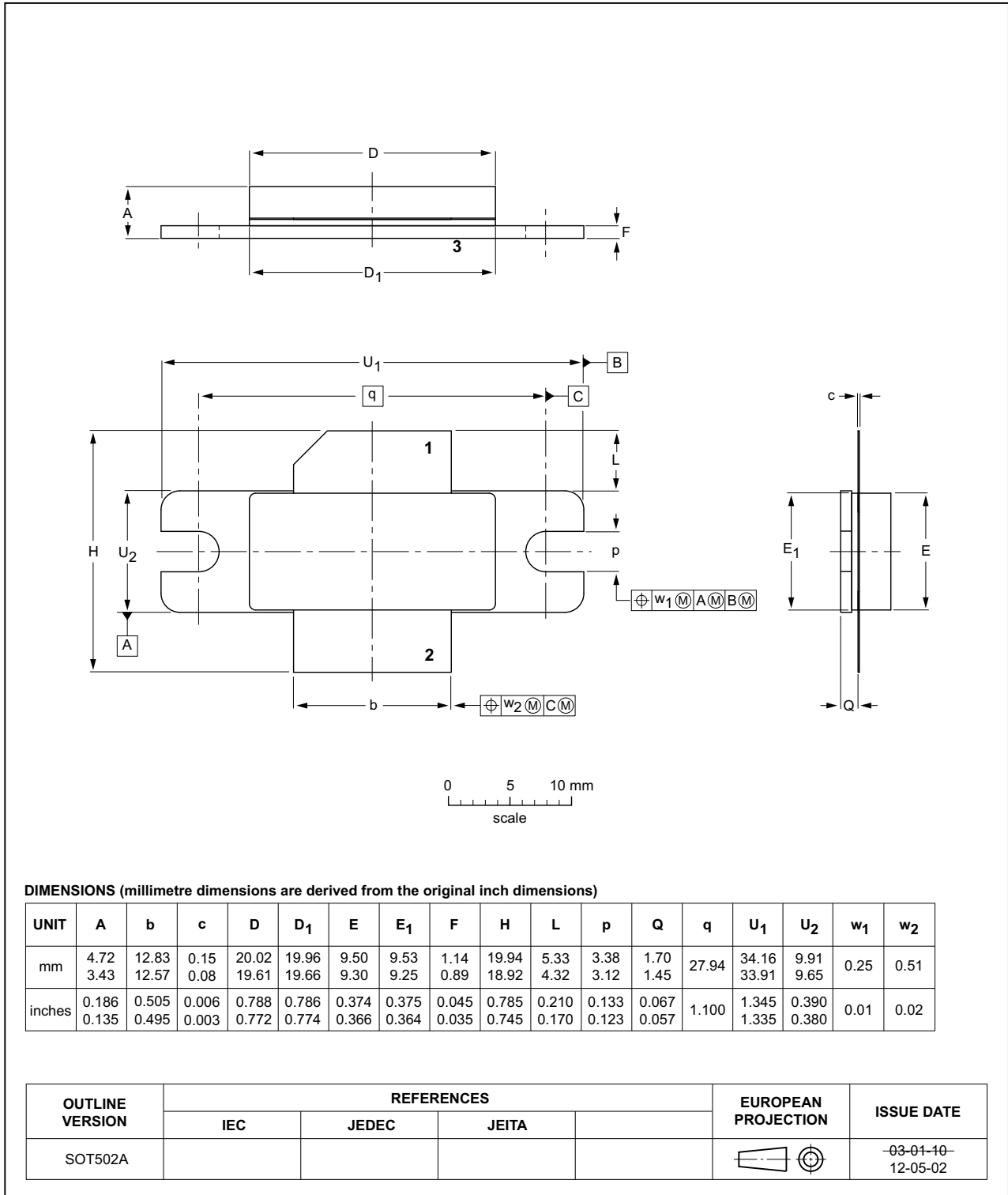


Fig 15. Package outline SOT502A



Earless flanged ceramic package; 2 leads

SOT502B

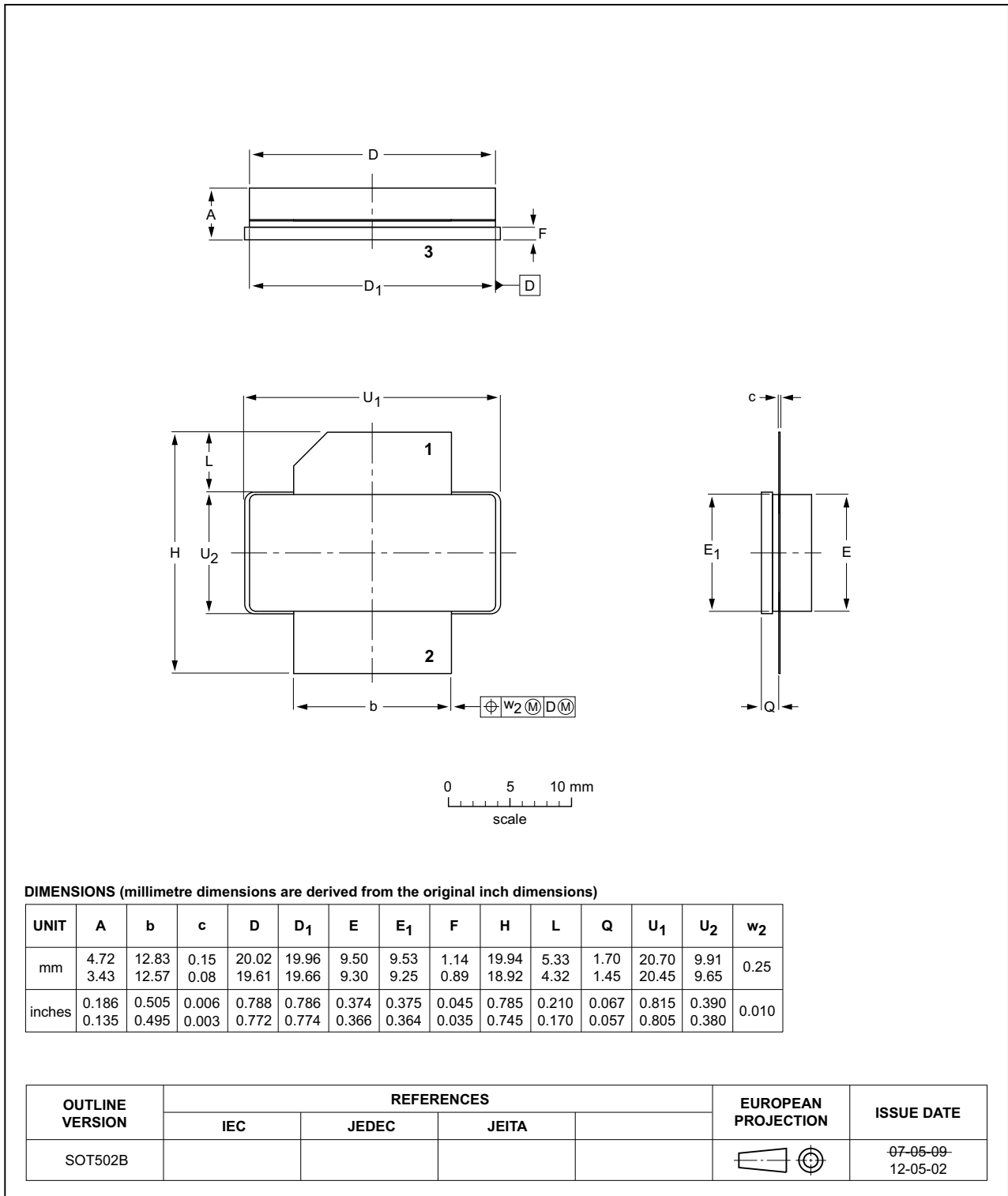


Fig 16. Package outline SOT502B

## 9. 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
PAR	Peak-to-Average Ratio
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
BLF2425M7L100_2425M7LS100#2	20150901	Product data sheet	-	BLF2425M7L100_2425M7LS100#1
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>			
BLF2425M7L100_2425M7LS100#1	20131206	Product data sheet	-	-

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### 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.
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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