

# BLF882; BLF882S

UHF power LDMOS transistor

Rev. 3 — 1 September 2015

AMMPLÉON

Product data sheet

## 1. Product profile

### 1.1 General description

A 200 W LDMOS RF power transistor for broadcast transmitter applications and industrial applications. The transistor can deliver 200 W in broadband applications from HF to 860 MHz. The excellent ruggedness and broadband performance of this device makes it ideal for digital transmitter applications.

**Table 1. Test information**

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

Test signal	f (MHz)	V <sub>DS</sub> (V)	P <sub>L(AV)</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)	PAR (dB)
<b>RF performance in a class-AB 705 MHz narrowband test circuit</b>						
CW, class-AB	705	50	180	21	62	-
CW pulsed, class-AB	705	50	200	21	63	-
<b>RF performance in a class-AB 470 MHz to 705 MHz broadband test circuit</b>						
DVB-T (8k OFDM)	470 to 705	50	33	20	28 to 31	8.0 to 8.4 <a href="#">[1]</a>

[1] PAR of output signal at 0.01% probability on CCDF; PAR of input signal = 9.5 dB at 0.01% probability on CCDF.

### 1.2 Features and benefits

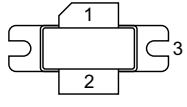
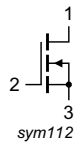
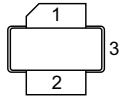
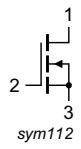
- Integrated ESD protection
- Excellent ruggedness
- High power gain
- High efficiency
- Excellent reliability
- Easy power control
- Compliant to Directive 2002/95/EC, regarding restriction of hazardous substances (RoHS)

### 1.3 Applications

- Transmitter applications in the HF to 860 MHz frequency range
- Industrial applications in the HF to 860 MHz frequency range
- Broadcast transmitters

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
<b>BLF882 (SOT502A)</b>			
1	drain		
2	gate		
3	source <sup>[1]</sup>		
<b>BLF882S (SOT502B)</b>			
1	drain		
2	gate		
3	source <sup>[1]</sup>		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF882	-	flanged ceramic package; 2 mounting holes; 2 leads	SOT502A
BLF882S	-	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		-	104	V
$V_{GS}$	gate-source voltage		-0.5	+13	V
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature	<sup>[1]</sup>	-	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	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 85\text{ °C}; P_L = 180\text{ W}$ <sup>[1]</sup>	0.56	K/W

[1]  $R_{th(j-c)}$  is measured under RF conditions.

## 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	$V_{GS} = 0\text{ V}$ ; $I_D = 1.2\text{ mA}$ [1]	104	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$ ; $I_D = 120\text{ mA}$ [1]	1.4	1.9	2.4	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$	-	-	1.4	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$ ; $V_{DS} = 10\text{ V}$ [1]	-	19	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 10\text{ V}$ ; $V_{DS} = 0\text{ V}$	-	-	140	nA
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$ ; $I_D = 4.25\text{ A}$ [1]	-	240	-	m $\Omega$

[1]  $I_D$  is the drain current

**Table 7. AC characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_{iss}$	input capacitance	$V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$ ; $f = 1\text{ MHz}$	-	105	-	pF
$C_{oss}$	output capacitance	$V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$ ; $f = 1\text{ MHz}$	-	34	-	pF
$C_{rs}$	feedback capacitance	$V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$ ; $f = 1\text{ MHz}$	-	0.7	-	pF

**Table 8. RF characteristics**

Test signal: CW pulsed; RF characteristics in Ampleon production narrowband test circuit;  $T_j = 25\text{ }^\circ\text{C}$ ; unless otherwise specified.

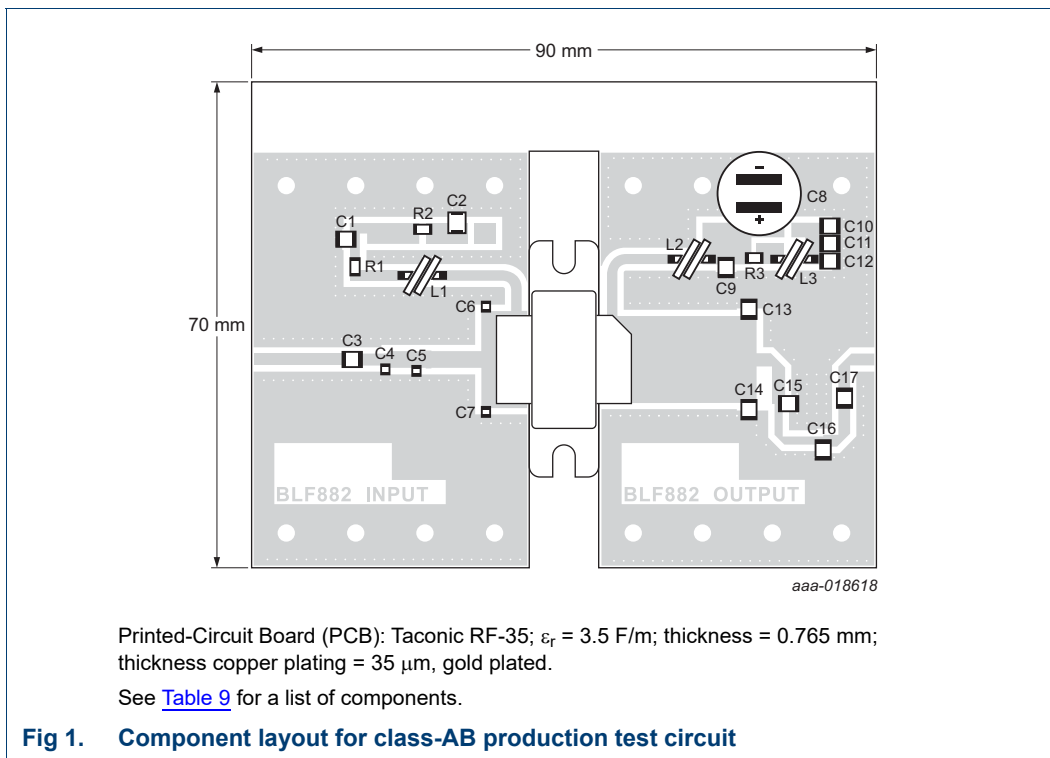
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{DS}$	drain-source voltage		-	50	-	V
$I_{Dq}$	quiescent drain current		-	100	-	mA
$P_{L(AV)}$	average output power	$f = 705\text{ MHz}$ ; $t_p = 100\text{ }\mu\text{s}$ ; $\delta = 10\text{ }\%$	196	200	-	W
$G_p$	power gain		19.6	20.6	-	dB
$\eta_D$	drain efficiency		60	63	-	%

## 7. Test information

### 7.1 Ruggedness in class-AB operation

The BLF882 and BLF882S are capable of withstanding a load mismatch corresponding to  $V_{SWR} \geq 20 : 1$  through all phases under the following conditions:  $V_{DS} = 50\text{ V}$ ;  $f = 705\text{ MHz}$  at rated  $P_{L(1dB)}$ .

7.2 Test circuit



**Table 9. List of components**

For test circuit see [Figure 1](#).

Component	Description	Value	Remarks
C1	multilayer ceramic chip capacitor	62 pF <a href="#">[1]</a>	
C2	multilayer ceramic chip capacitor	100 nF	
C3, C9	multilayer ceramic chip capacitor	56 pF <a href="#">[1]</a>	
C4	multilayer ceramic chip capacitor	12 pF <a href="#">[2]</a>	
C5	multilayer ceramic chip capacitor	11 pF <a href="#">[2]</a>	
C6, C7	multilayer ceramic chip capacitor	24 pF <a href="#">[2]</a>	
C8	electrolytic capacitor	220 $\mu\text{F}$	
C10, C11, C12	electrolytic capacitor	750 pF <a href="#">[1]</a>	
C13	multilayer ceramic chip capacitor	16 pF <a href="#">[3]</a>	
C14	multilayer ceramic chip capacitor	18 pF <a href="#">[3]</a>	
C15	multilayer ceramic chip capacitor	5.6 pF <a href="#">[3]</a>	
C16	multilayer ceramic chip capacitor	6.8 pF <a href="#">[3]</a>	
C17	multilayer ceramic chip capacitor	56 pF <a href="#">[3]</a>	
L1, L2, L3	3 turn 1 mm spiral coil	D = 3.0 mm; 120 nH	
R1, R2	resistor	10 $\Omega$	SMD 1206
R3	resistor	15 $\Omega$	SMD 1206

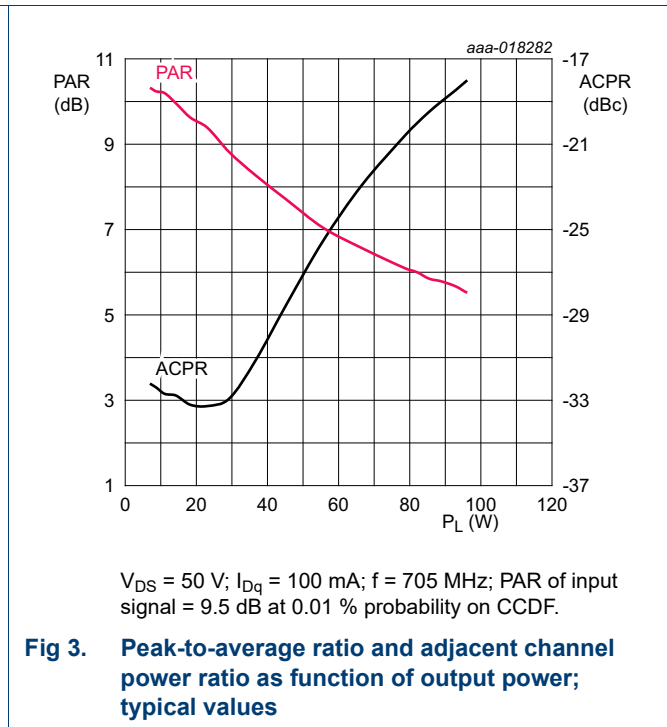
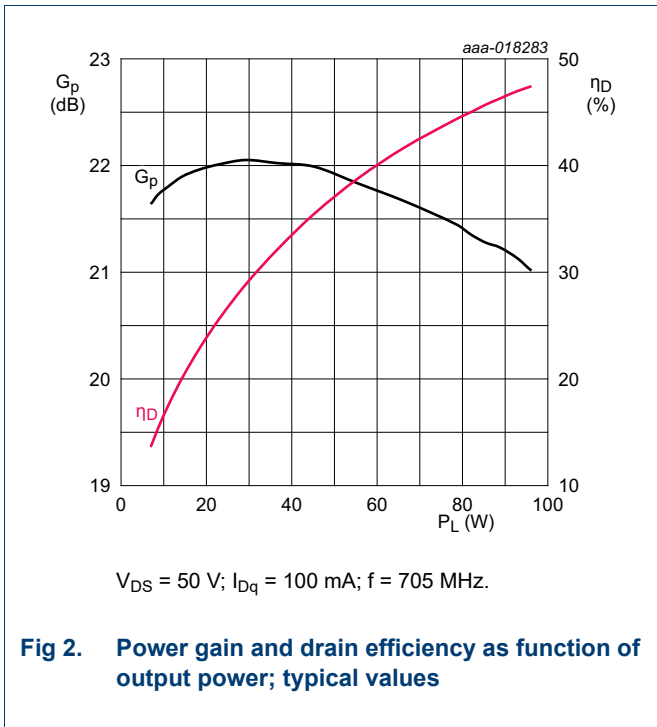
[1] American Technical Ceramics type 100B.

[2] American Technical Ceramics type 800A.

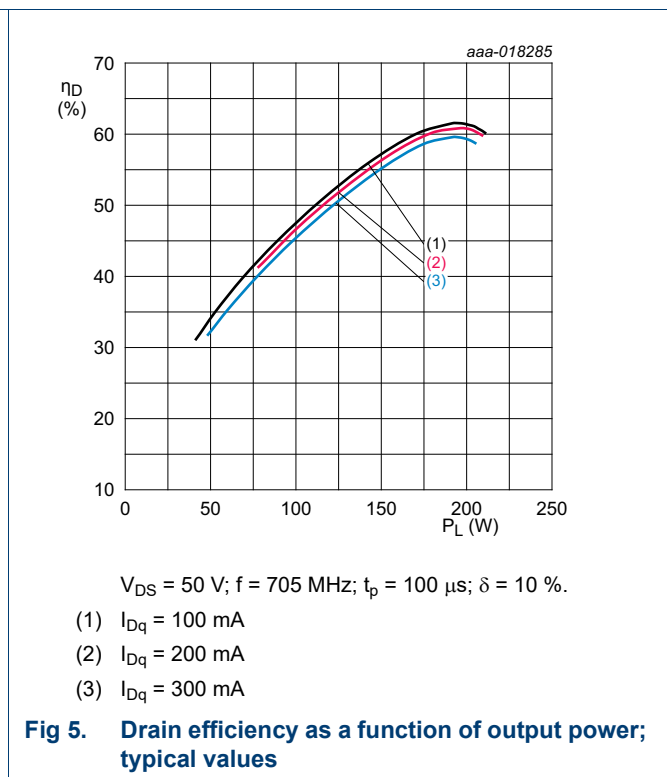
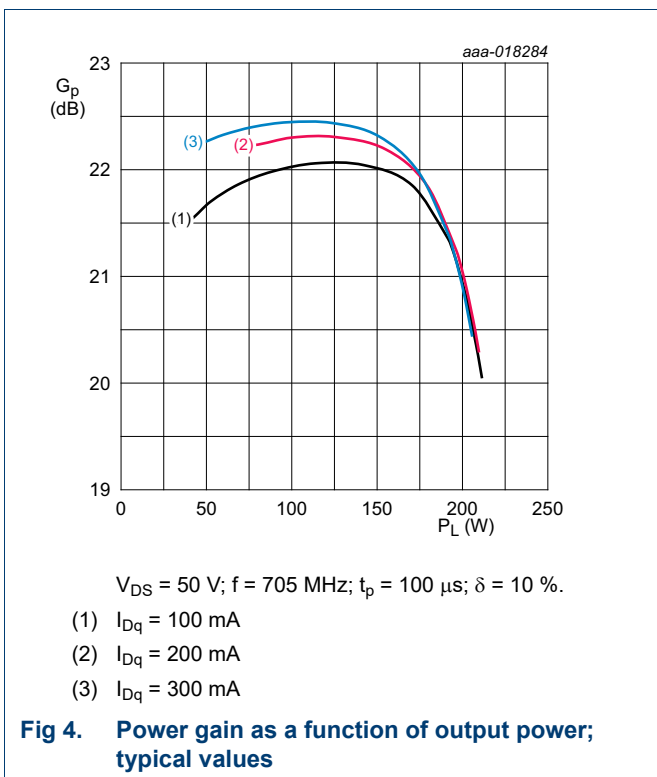
[3] American Technical Ceramics type 800B.

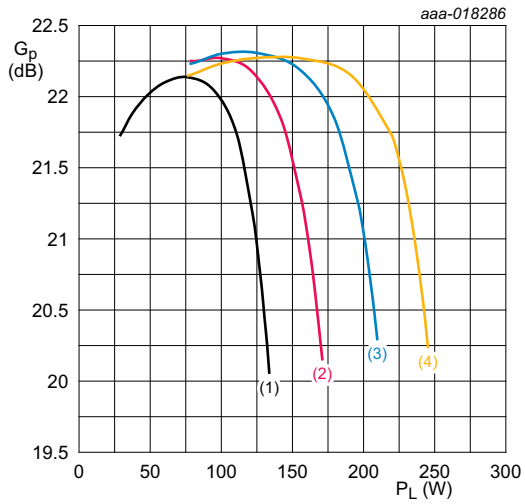
7.3 Graphical data

7.3.1 DVB-T



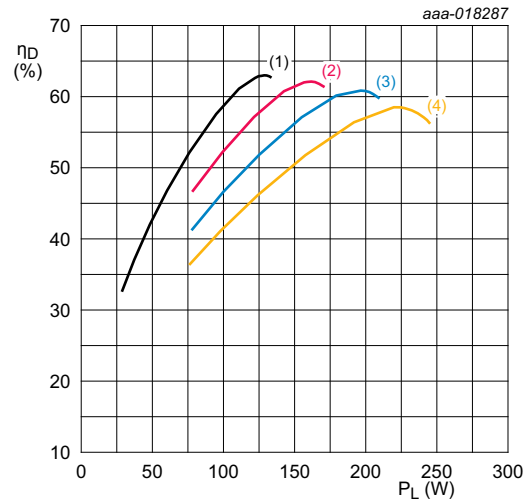
7.3.2 CW pulsed





$I_{Dq} = 100 \text{ mA}; f = 705 \text{ MHz}; t_p = 100 \text{ }\mu\text{s}; \delta = 10 \text{ \%}.$   
 (1)  $V_{DS} = 40 \text{ V}$   
 (2)  $V_{DS} = 45 \text{ V}$   
 (3)  $V_{DS} = 50 \text{ V}$   
 (4)  $V_{DS} = 55 \text{ V}$

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



$I_{Dq} = 100 \text{ mA}; f = 705 \text{ MHz}; t_p = 100 \text{ }\mu\text{s}; \delta = 10 \text{ \%}.$   
 (1)  $V_{DS} = 40 \text{ V}$   
 (2)  $V_{DS} = 45 \text{ V}$   
 (3)  $V_{DS} = 50 \text{ V}$   
 (4)  $V_{DS} = 55 \text{ V}$

**Fig 7. Drain efficiency as a function of output power; typical values**

8. Package outline

Flanged ceramic package; 2 mounting holes; 2 leads

SOT502A

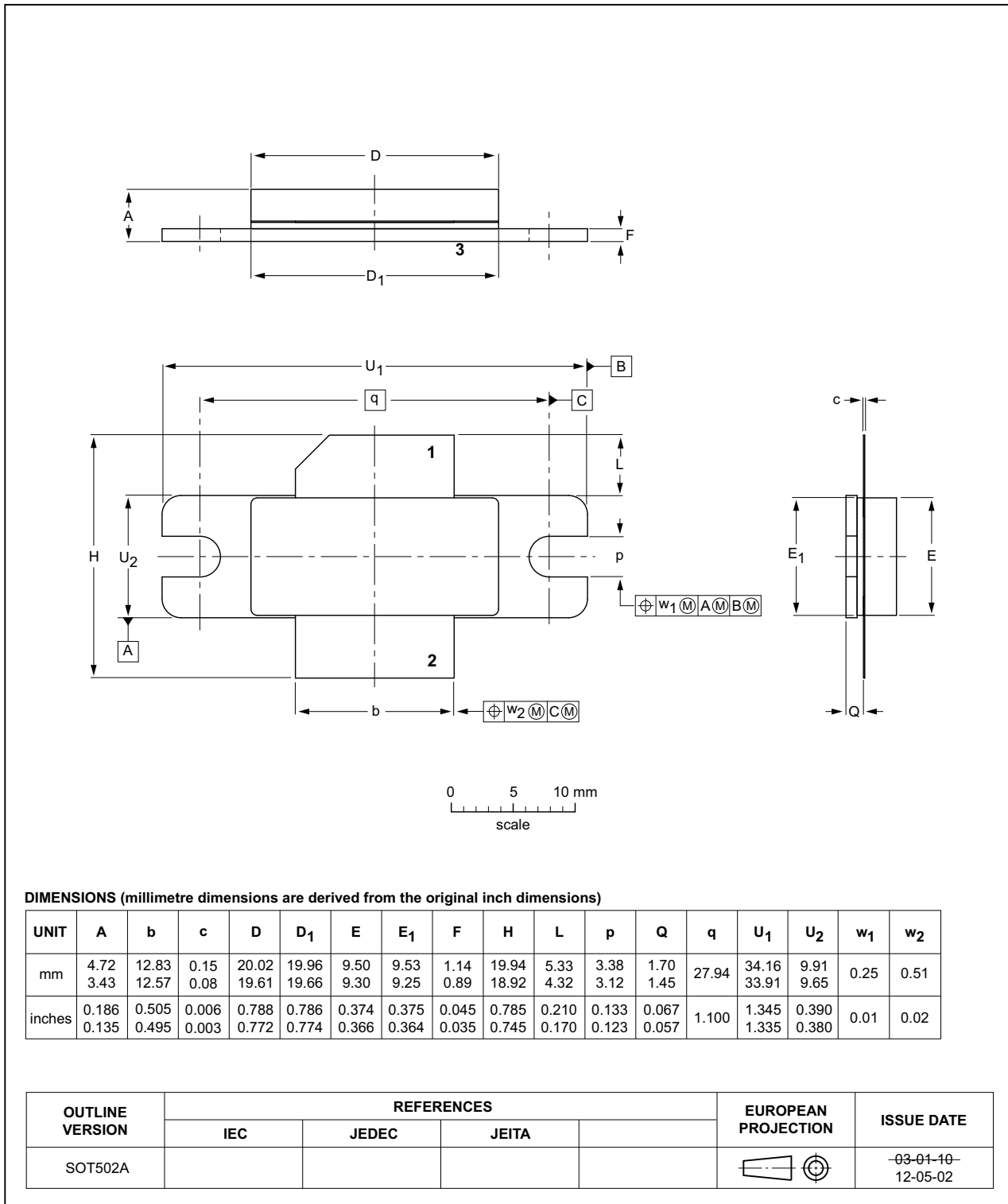


Fig 8. Package outline SOT502A

Earless flanged ceramic package; 2 leads

SOT502B

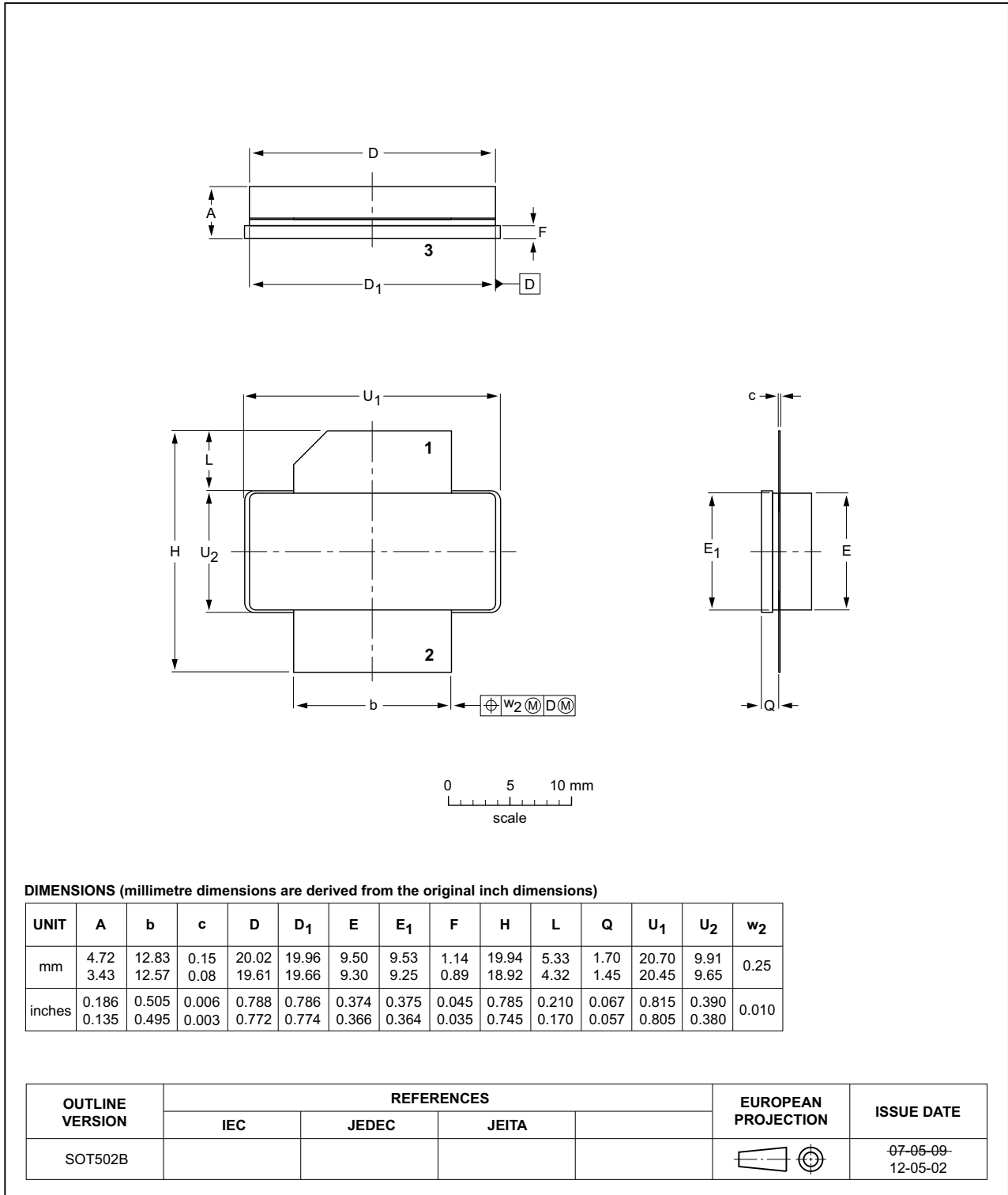


Fig 9. Package outline SOT502B



## 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 10. Abbreviations

Acronym	Description
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
ESD	ElectroStatic Discharge
DVB-T	Digital Video Broadcast - Terrestrial
HF	High Frequency
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
MTF	Median Time to Failure
OFDM	Orthogonal Frequency Division Multiplexing
PAR	Peak-to-Average Ratio
SMD	Surface Mounted Device
UHF	Ultra High Frequency
VSWR	Voltage Standing-Wave Ratio

## 11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF882_BLF882S#3	20150901	Product data sheet	-	BLF882_BLF882S 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>			
BLF882_BLF882S v.2	20150703	Product data sheet	-	BLF882_BLF882S v.1
BLF882_BLF882S v.1	20141219	Objective data sheet	-	-

## 12. Legal information

### 12.1 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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Date of release: 1 September 2015  
 Document identifier: BLF882\_BLF882S#3