

# BLF2425M7L250P; BLF2425M7LS250P

Power LDMOS transistor

Rev. 5 — 1 September 2015

AMPLEON

Product data sheet

## 1. Product profile

### 1.1 General description

250 W LDMOS power transistor for Industrial, Scientific and Medical (ISM) applications at frequencies from 2400 MHz to 2500 MHz.

The BLF2425M7L250P and BLF2425M7LS250P are designed for high-power CW applications and are assembled in high performance ceramic packages, available in eared and earless versions

**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)	$V_{DS}$ (V)	$P_{L(AV)}$ (W)	$G_p$ (dB)	$\eta_D$ (%)
CW	2450	28	250	15	51

### 1.2 Features and benefits

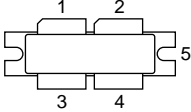
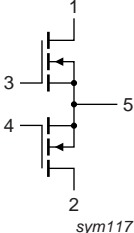
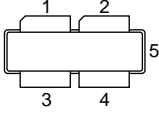
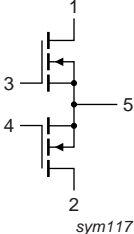
- High efficiency
- Easy power control
- Excellent ruggedness
- Excellent thermal stability
- Integrated ESD protection
- Designed for broadband operation (2400 MHz to 2500 MHz)
- Internally matched
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

### 1.3 Applications

- RF power amplifiers for CW applications in the 2400 MHz to 2500 MHz frequency range such as ISM and industrial heating.

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
<b>BLF2425M7L250P (SOT539A)</b>			
1	drain1		 sym117
2	drain2		
3	gate1		
4	gate2		
5	source		
<b>BLF2425M7LS250P (SOT539B)</b>			
1	drain1		 sym117
2	drain2		
3	gate1		
4	gate2		
5	source		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
BLF2425M7L250P	-	flanged balanced ceramic package; 2 mounting holes; 4 leads	SOT539A
BLF2425M7LS250P	-	earless flanged balanced ceramic package; 4 leads	SOT539B

## 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		-	225	°C

## 5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 250\text{ W}$	0.19	K/W

## 6. Characteristics

Table 6. DC 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	$V_{GS} = 0\text{ V}; I_D = 2.2\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 220\text{ mA}$	1.5	1.9	2.3	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	3	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	39	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	300	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 11\text{ A}$	-	16	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 7.7\text{ A}$	-	0.08	-	$\Omega$

Table 7. RF characteristics

Test signal: CW at 2450 MHz; RF performance at  $V_{DS} = 28\text{ V}; I_{Dq} = 20\text{ mA}; T_{case} = 25\text{ °C}$ ; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_L = 250\text{ W}$	14	15	-	dB
$RL_{in}$	input return loss	$P_L = 250\text{ W}$	-	-18	-10	dB
$\eta_D$	drain efficiency	$P_L = 250\text{ W}$	46	51	-	%

## 7. Test information

### 7.1 Ruggedness in class-AB operation

The BLF2425M7L250P and BLF2425M7LS250P are capable of withstanding a load mismatch corresponding to  $VSWR = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 28\text{ V}; I_{Dq} = 20\text{ mA}; P_L = 250\text{ W}$  (CW);  $f = 2450\text{ MHz}$ .

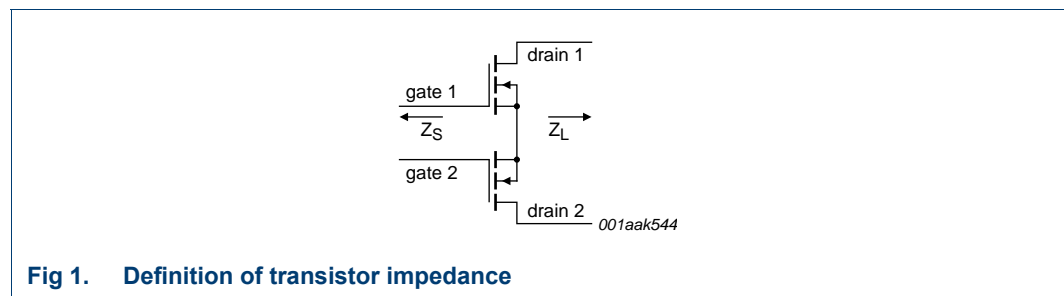
### 7.2 Impedance information

**Table 8. Typical impedance**

Measured load-pull data half device. Typical values unless otherwise specified.  $I_{Dq} = 20 \text{ mA}$ ;  $V_{DS} = 28 \text{ V}$ .

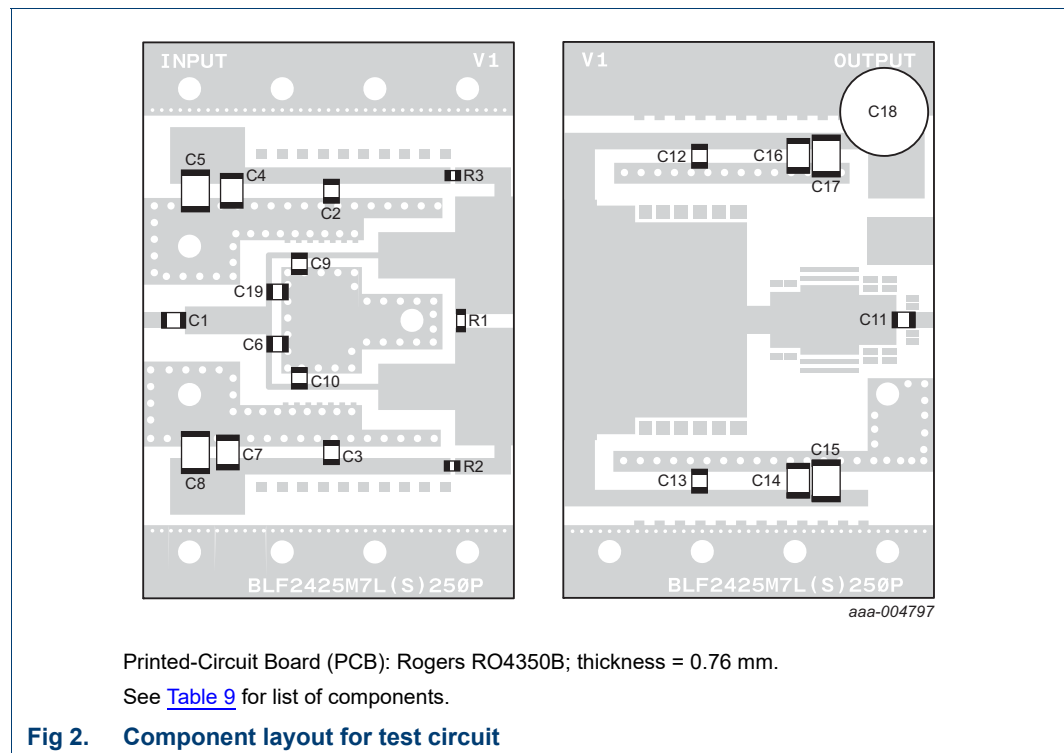
$Z_S$  and  $Z_L$  defined in [Figure 1](#).

f (MHz)	$Z_S$ ( $\Omega$ )	$Z_L$ ( $\Omega$ )
2400	2.3 – 6.3j	3.8 – 2.7j
2450	3.3 – 6.0j	2.5 – 2.9j
2500	4.1 – 6.0j	3.3 – 2.3j



**Fig 1. Definition of transistor impedance**

### 7.3 Test circuit



Printed-Circuit Board (PCB): Rogers RO4350B; thickness = 0.76 mm.

See [Table 9](#) for list of components.

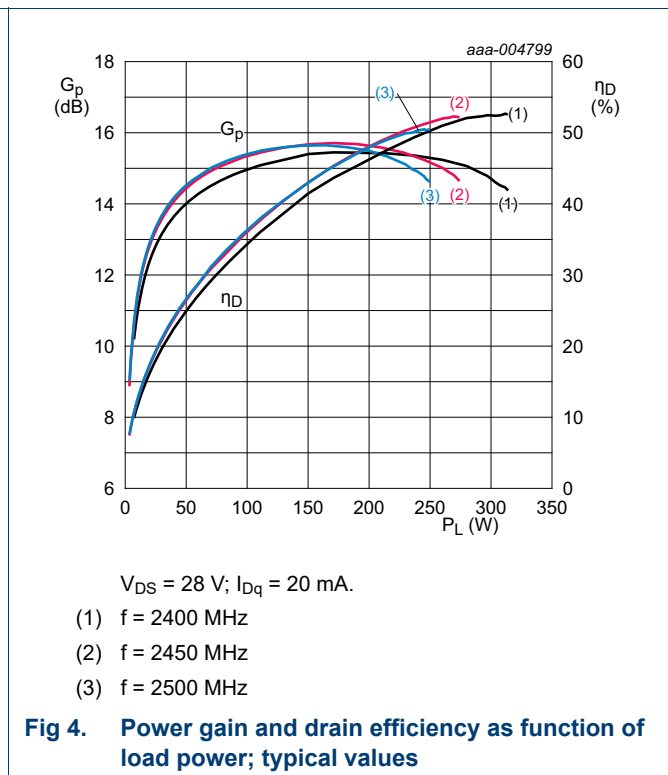
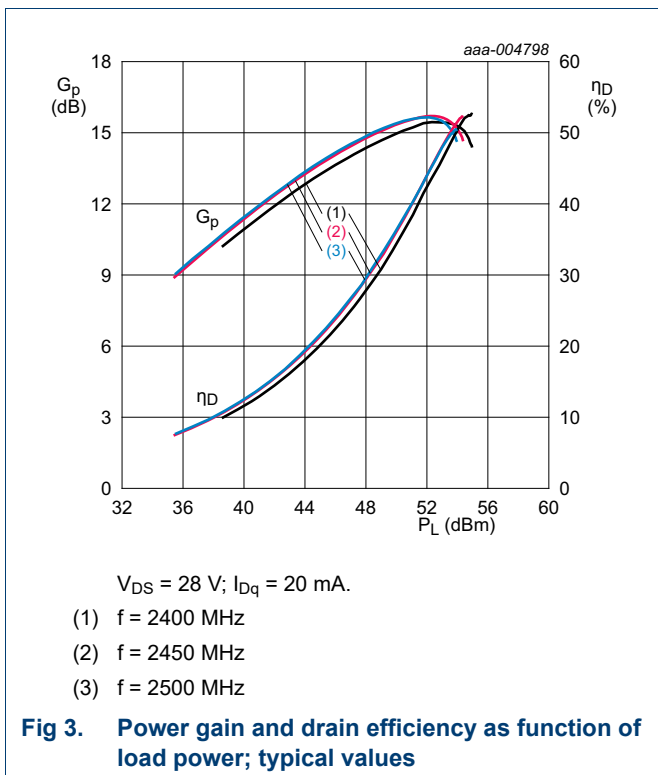
**Fig 2. Component layout for test circuit**

**Table 9. List of components**

For test circuit, see [Figure 2](#).

Component	Description	Value	Remarks
C1, C2, C3, C11, C12, C13	multilayer ceramic chip capacitor	36 pF	ATC800B
C4, C7, C14, C16	SMD capacitor	470 nF, 50 V	
C5, C8, C15, C17	SMD capacitor	10 μF, 50 V	
C6, C19	multilayer ceramic chip capacitor	1.4 pF	ATC100B
C9, C10	multilayer ceramic chip capacitor	1.8 pF	ATC100B
C18	electrolytic capacitor	470 μF, 63 V	
R1	resistor	9.1 Ω	SMD 0805
R2, R3	resistor	5.1 Ω	SMD 0805

### 7.4 Graphical data



8. Package outline

Flanged balanced ceramic package; 2 mounting holes; 4 leads

SOT539A

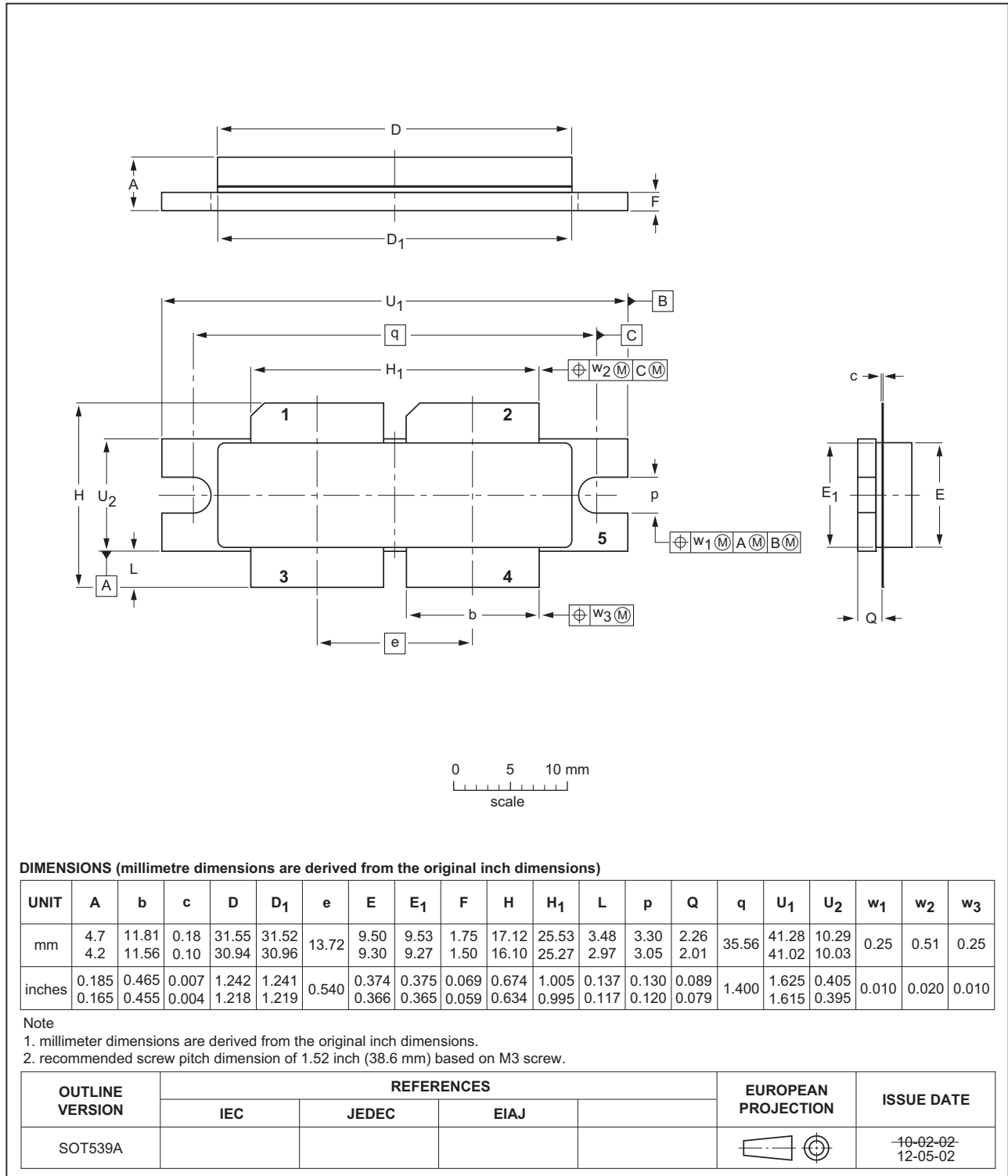


Fig 5. Package outline SOT539A

Earless flanged balanced ceramic package; 4 leads

SOT539B

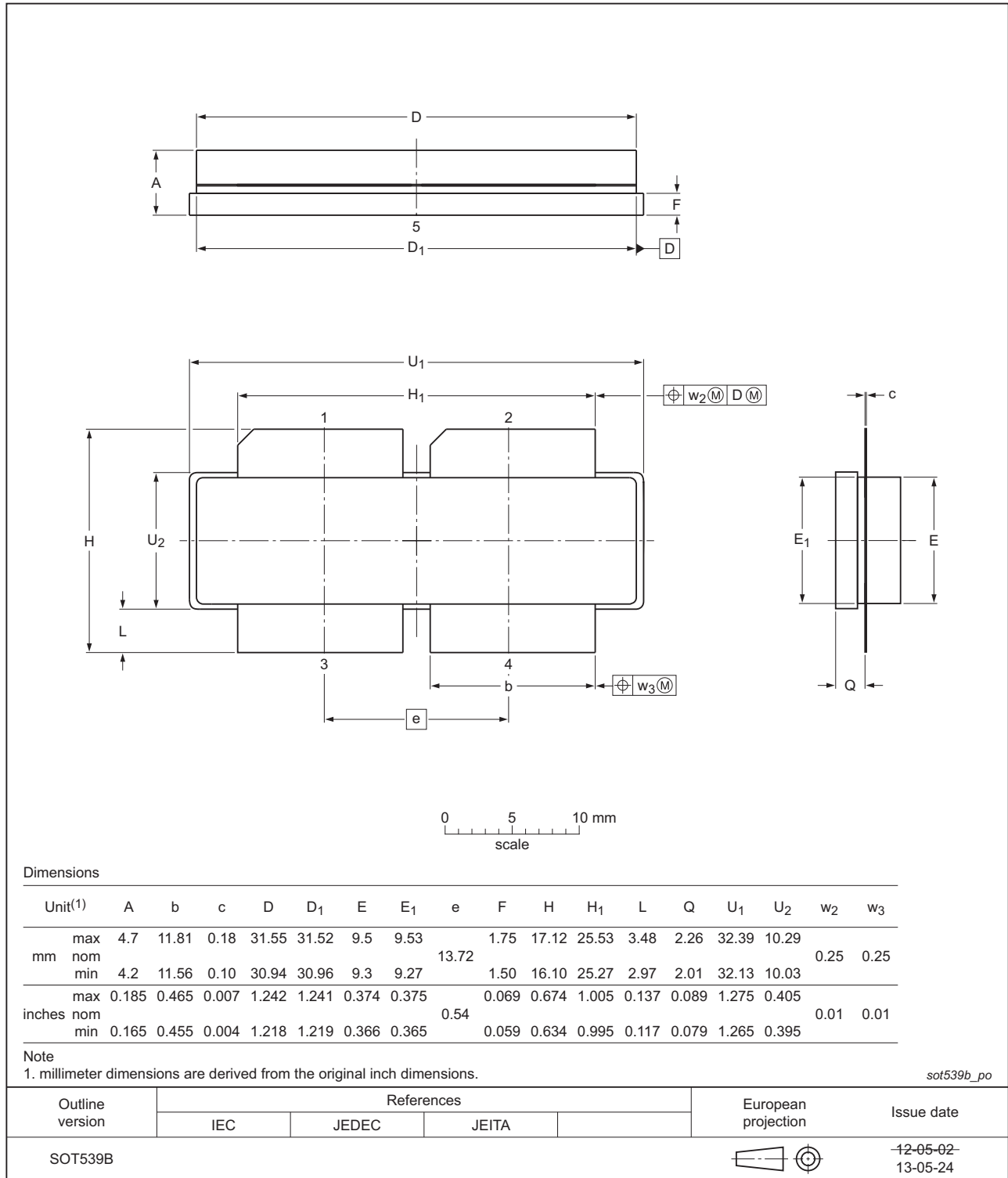


Fig 6. Package outline SOT539B

## 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
CW	Continuous Wave
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
SMD	Surface Mounted Device
VSWR	Voltage Standing-Wave Ratio

## 11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF2425M7L250P_2425M7LS250P#5	20150901	Product data sheet	-	BLF2425M7L250P_2425M7LS250P v.4
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>		
BLF2425M7L250P_2425M7LS250P v.4	20130712	Product data sheet	-	BLF2425M7L250P_2425M7LS250P v.3
BLF2425M7L250P_2425M7LS250P v.3	20130226	Product data sheet	-	BLF2425M7L250P_2425M7LS250P v.2
BLF2425M7L250P_2425M7LS250P v.2	20120906	Objective data sheet	-	BLF2425M7L250P_2425M7LS250P v.1
BLF2425M7L250P_2425M7LS250P v.1	20110718	Objective data sheet	-	-



## 12. Legal information

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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.
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Date of release: 1 September 2015

Document identifier: BLF2425M7L250P\_2425M7LS250P#5