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BLF25M612; BLF25M612G

Power LDMOS transistor

Rev. 4 — 1 September 2015

AMMPLION

Product data sheet

1. Product profile

1.1 General description

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

The BLF25M612 and BLF25M612G are drivers designed for high power CW applications and is assembled in a high performance ceramic package.

Table 1. Typical performance

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

Test signal	f	V _{DS}	P _{L(AV)}	G _p	η _D
	(MHz)	(V)	(W)	(dB)	(%)
CW	2450	28	12	19	60

1.2 Features and benefits

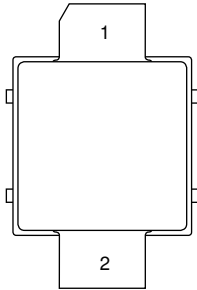
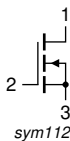
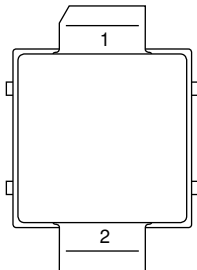
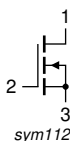
- High efficiency
- High power gain
- Excellent ruggedness
- Excellent thermal stability
- Integrated ESD protection
- Designed for broadband operation (2400 MHz to 2500 MHz)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- Industrial, scientific and medical applications in the frequency range 2400 MHz to 2500 MHz (this product is qualified according to the solid state cooking profile)

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF25M612 (SOT975B)			
1	drain		 sym112
2	gate		
3	source [1]		
BLF25M612G (SOT975C)			
1	drain		 sym112
2	gate		
3	source [1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF25M612	-	earless flanged ceramic package; 2 leads	SOT975B
BLF25M612G	-	earless flanged ceramic package; 2 leads	SOT975C

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	[1]	-	225	°C

[1] Continuous use at maximum temperature will affect reliability.

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 12\text{ W}$	4.0	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	$V_{GS} = 0\text{ V}; I_D = 0.18\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 18\text{ mA}$	1.4	1.9	2.4	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	1.4	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	3.2	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	140	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 0.9\text{ A}$	-	1.3	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 0.6\text{ A}$	-	0.8	1.3	Ω

Table 7. RF characteristics

Test signal: CW at $f = 2450\text{ MHz}$; RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 10\text{ mA}; T_{case} = 25\text{ °C}$; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_L = 12\text{ W}$	17	19	-	dB
RL_{in}	input return loss	$P_L = 12\text{ W}$	-	-14	-10	dB
η_D	drain efficiency	$P_L = 12\text{ W}$	54	60	-	%

7. Test information

7.1 Ruggedness in class-AB operation

The BLF25M612 and BLF25M612G are capable of withstanding a load mismatch corresponding to $VSWR = 10 : 1$ through all phases under the following conditions: $V_{DS} = 28\text{ V}; I_{Dq} = 10\text{ mA}; P_L = 12\text{ W}$ (CW); $f = 2450\text{ MHz}$.

7.2 Impedance information

Table 8. Typical impedance

Measured load-pull data. Typical values unless otherwise specified.

f (MHz)	Z _S (Ω)	Z _L (Ω)
2400	3.0 – 11.4j	4.17 – 3.3j
2450	3.7 – 11.4j	4.3 – 2.7j
2500	3.8 – 11.4j	4.7 – 4.6j

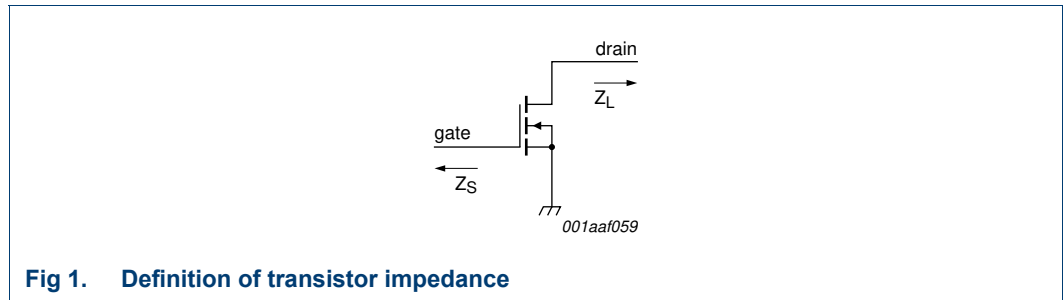
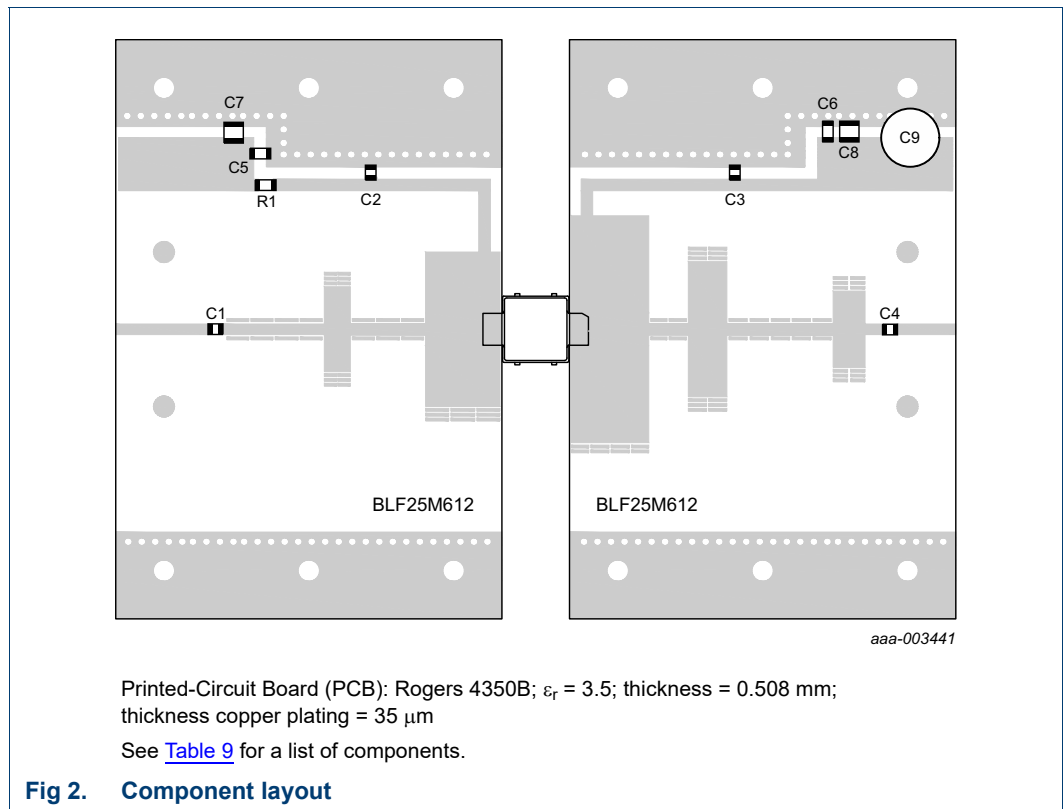


Fig 1. Definition of transistor impedance

7.3 Test circuit



Printed-Circuit Board (PCB): Rogers 4350B; $\epsilon_r = 3.5$; thickness = 0.508 mm; thickness copper plating = 35 μm

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

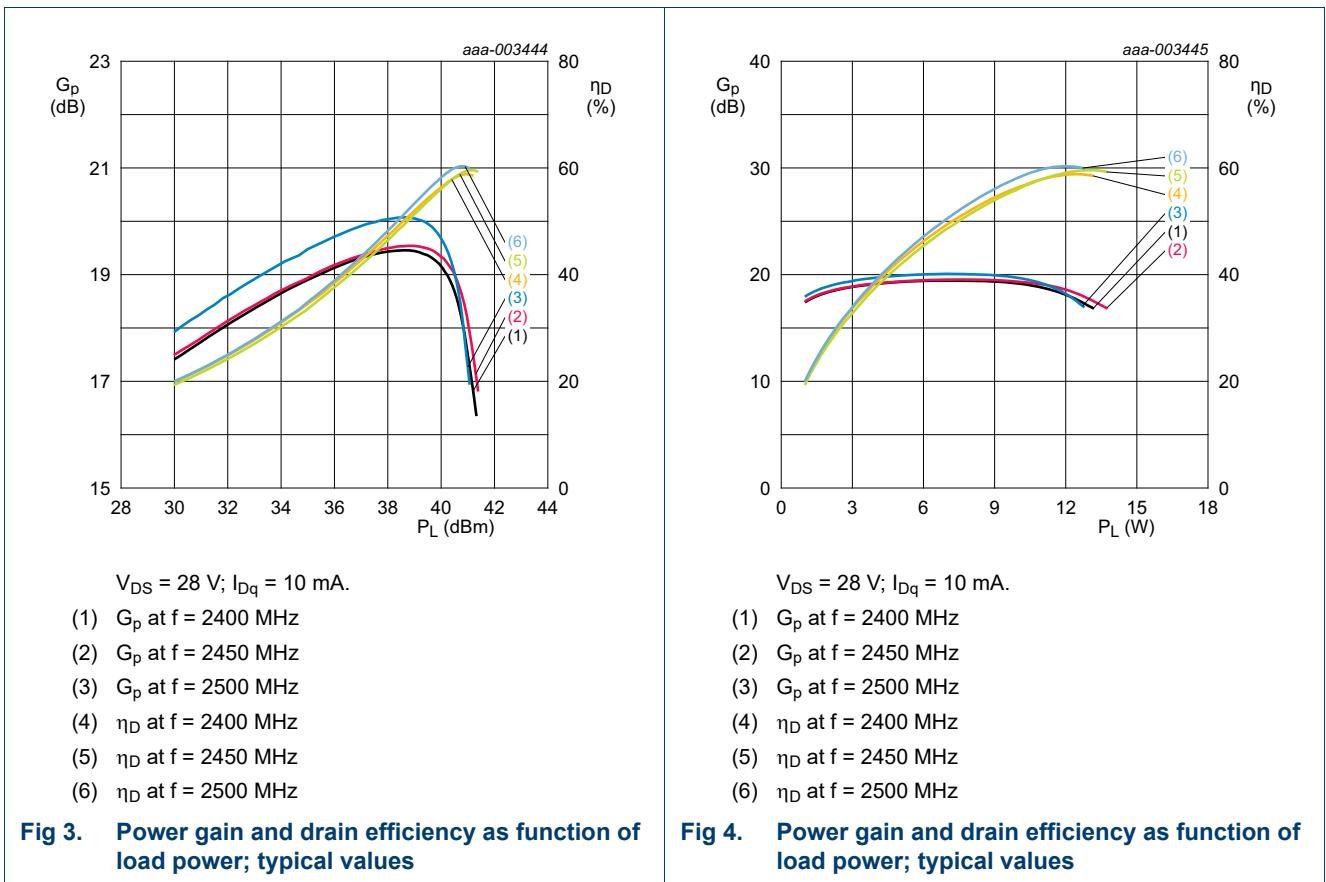
Fig 2. Component layout

Table 9. List of components

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

Component	Description	Value	Remarks
C1, C2, C3, C4	multilayer ceramic chip capacitor	15 pF	ATC100A
C5, C6	multilayer ceramic chip capacitor	220 nF	SMD 1206
C7, C8	multilayer ceramic chip capacitor	4.7 μ F, 50 V	
C9	electrolytic capacitor	100 μ F, 63 V	
R1	SMD resistor	7.5 Ω	SMD 0805

7.4 Graphical data



8. Package outline

Earless flanged ceramic package; 2 leads

SOT975B

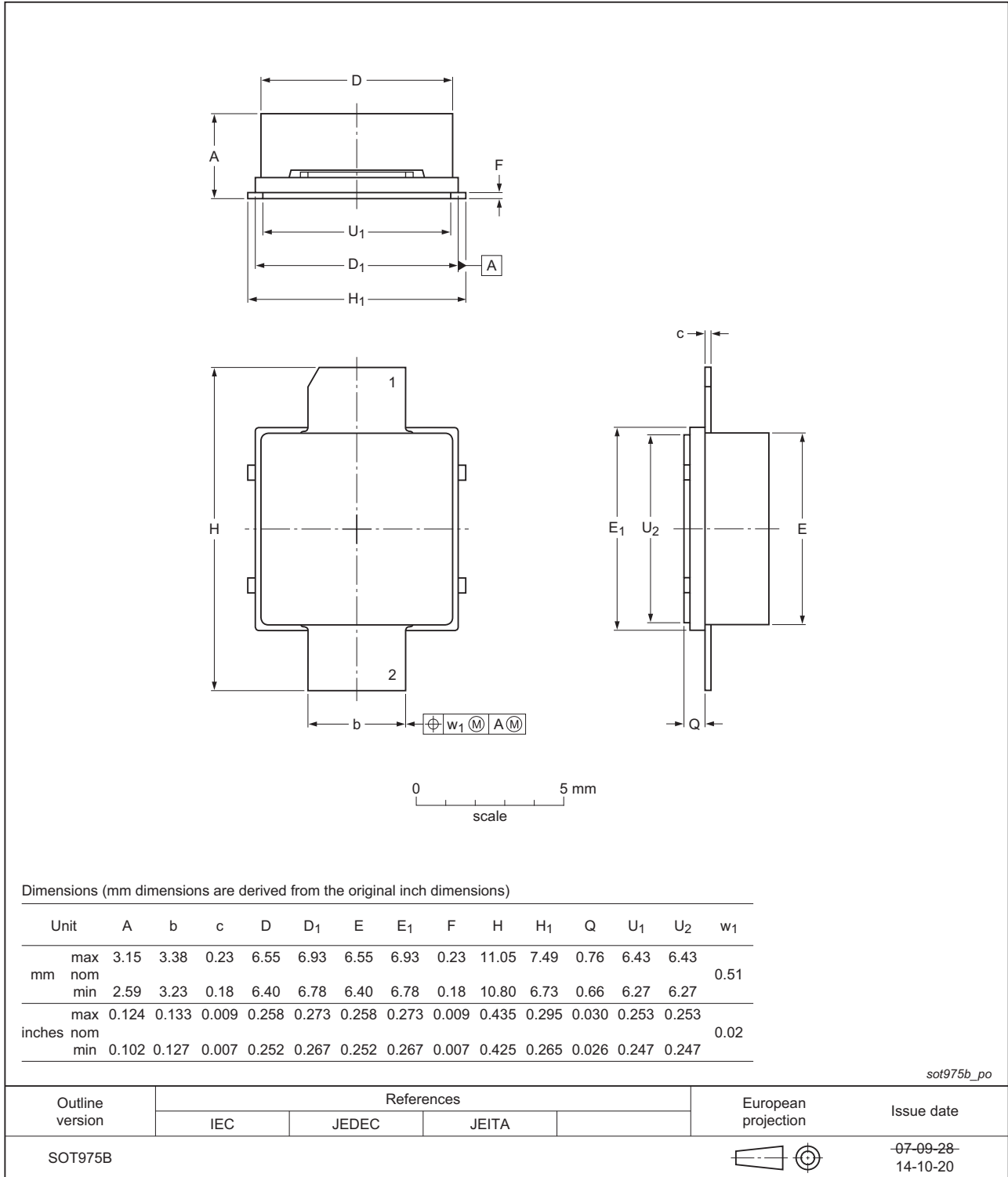


Fig 5. Package outline SOT975B

Earless flanged ceramic package; 2 leads

SOT975C

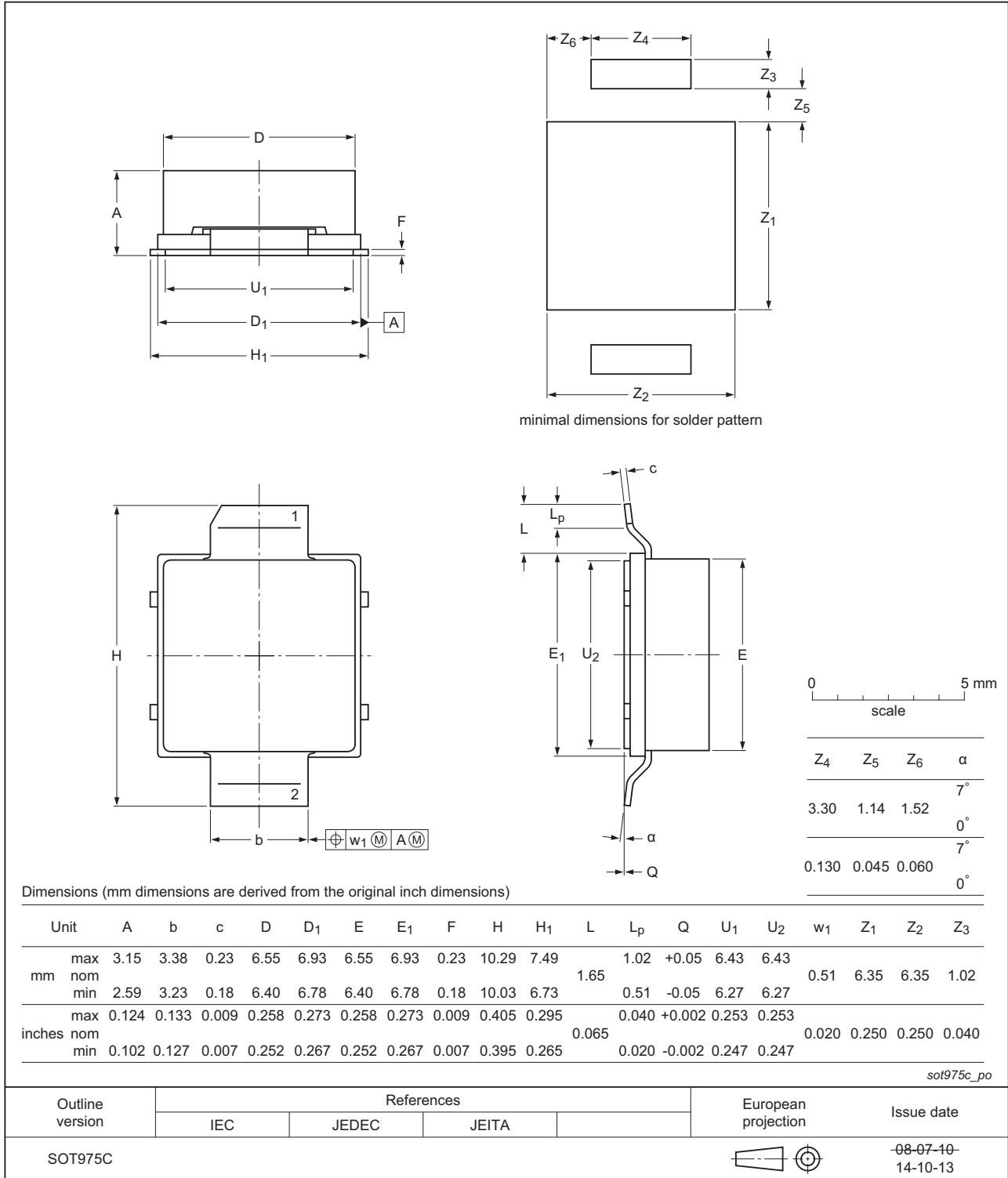


Fig 6. Package outline SOT975C

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
BLF25M612_BLF25M612G#4	20150901	Product data sheet	-	BLF25M612_BLF25M612G 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. 			
BLF25M612_BLF25M612G v.3	20141216	Product data sheet	-	BLF25M612_BLF25M612G v.2
BLF25M612_BLF25M612G v.2	20130620	Product data sheet	-	BLF25M612G v.1
BLF25M612G v.1	20120605	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: BLF25M612_BLF25M612G#4