

BLA8G1011L(S)-300; BLA8G1011L(S)-300G

Power LDMOS transistor

Rev. 1 — 29 September 2014

Objective data sheet

1. Product profile

1.1 General description

300 W LDMOS power transistor for avionics applications at frequencies from 1030 MHz to 1090 MHz.

Table 1. Test information

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

Test signal	f (MHz)	V _{DS} (V)	P _L (W)	G _p (dB)	η _D (%)	t _r (ns)	t _f (ns)
pulsed RF	1030 to 1090	32	300	16	61	<tdb>	<tdb>

1.2 Features and benefits

- Easy power control
- Integrated ESD protection
- Enhanced ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (1030 MHz to 1090 MHz)
- Internally matched for ease of use
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

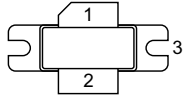
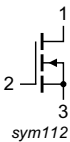
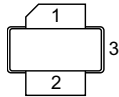
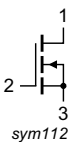
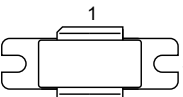
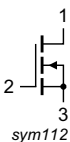
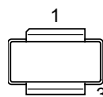
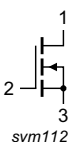
1.3 Applications

- Avionics transmitter applications in the 1030 MHz to 1090 MHz frequency range.



2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLA8G1011L-300 (SOT502A)			
1	drain		
2	gate		
3	source [1]		
BLA8G1011LS-300 (SOT502B)			
1	drain		
2	gate		
3	source [1]		
BLA8G1011L-300G (SOT502F)			
1	drain		
2	gate		
3	source [1]		
BLA8G1011LS-300G (SOT502E)			
1	drain		
2	gate		
3	source [1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLA8G1011L-300	-	flanged ceramic package; 2 mounting holes; 2 leads	SOT502A
BLA8G1011LS-300	-	earless flanged ceramic package; 2 leads	SOT502B
BLA8G1011L-300G	-	eared flanged ceramic package; 2 leads; 2 mounting holes	SOT502F
BLA8G1011LS-300G	-	earless flanged ceramic package; 2 leads	SOT502E

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 the reliability, for details refer to the on-line MTF calculator.

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$Z_{th(j-c)}$	transient thermal impedance from junction to case	$T_{case} = 25\text{ °C}$; $t_p = 50\text{ }\mu\text{s}$; $\delta = 2\%$	<td>	K/W

6. Characteristics

Table 6. DC characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}$; $I_D = 4.5\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$; $I_D = 450\text{ mA}$	1.5	1.8	2.3	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}$; $V_{DS} = 28\text{ V}$	-	-	4.2	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $V_{DS} = 10\text{ V}$	<td>	82	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}$; $V_{DS} = 0\text{ V}$	-	-	420	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}$; $I_D = 450\text{ mA}$	<td>	3.92	<td>	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $I_D = 15.75\text{ A}$	<td>	0.04	<td>	Ω

Table 7. RF characteristics

Test signal: Pulsed RF; $t_p = 50\text{ }\mu\text{s}$; $\delta = 2\%$; $V_{DS} = 32\text{ V}$; $I_{Dq} = 150\text{ mA}$; $T_{case} = 25\text{ °C}$; unless otherwise specified; in a class-AB production test circuit for straight leads.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_L = 300\text{ W}$	<td>	16	-	dB
RL_{in}	input return loss	$P_L = 300\text{ W}$	-	-20	<td>	dB
η_D	drain efficiency	$P_L = 300\text{ W}$	<td>	61	-	%
t_r	rise time	$P_L = 300\text{ W}$	-	<td>	<td>	ns
t_f	fall time	$P_L = 300\text{ W}$	-	<td>	<td>	ns

7. Test information

7.1 Ruggedness in class-AB operation

The BLA8G1011L-300, BLA8G1011LS-300, BLA8G1011L-300G and BLA8G1011LS-300G are enhanced rugged devices and are capable of withstanding a load mismatch corresponding to $V_{SWR} = <td>$ through all phases under the following conditions: $t_p = 50 \mu s$; $\delta = 2 \%$; $V_{DS} = 32 V$; $I_{Dq} = 100 mA$; $P_L = 300 W$; $f = 1030 MHz$ to $1090 MHz$.

8. Package outline

Flanged ceramic package; 2 mounting holes; 2 leads

SOT502A

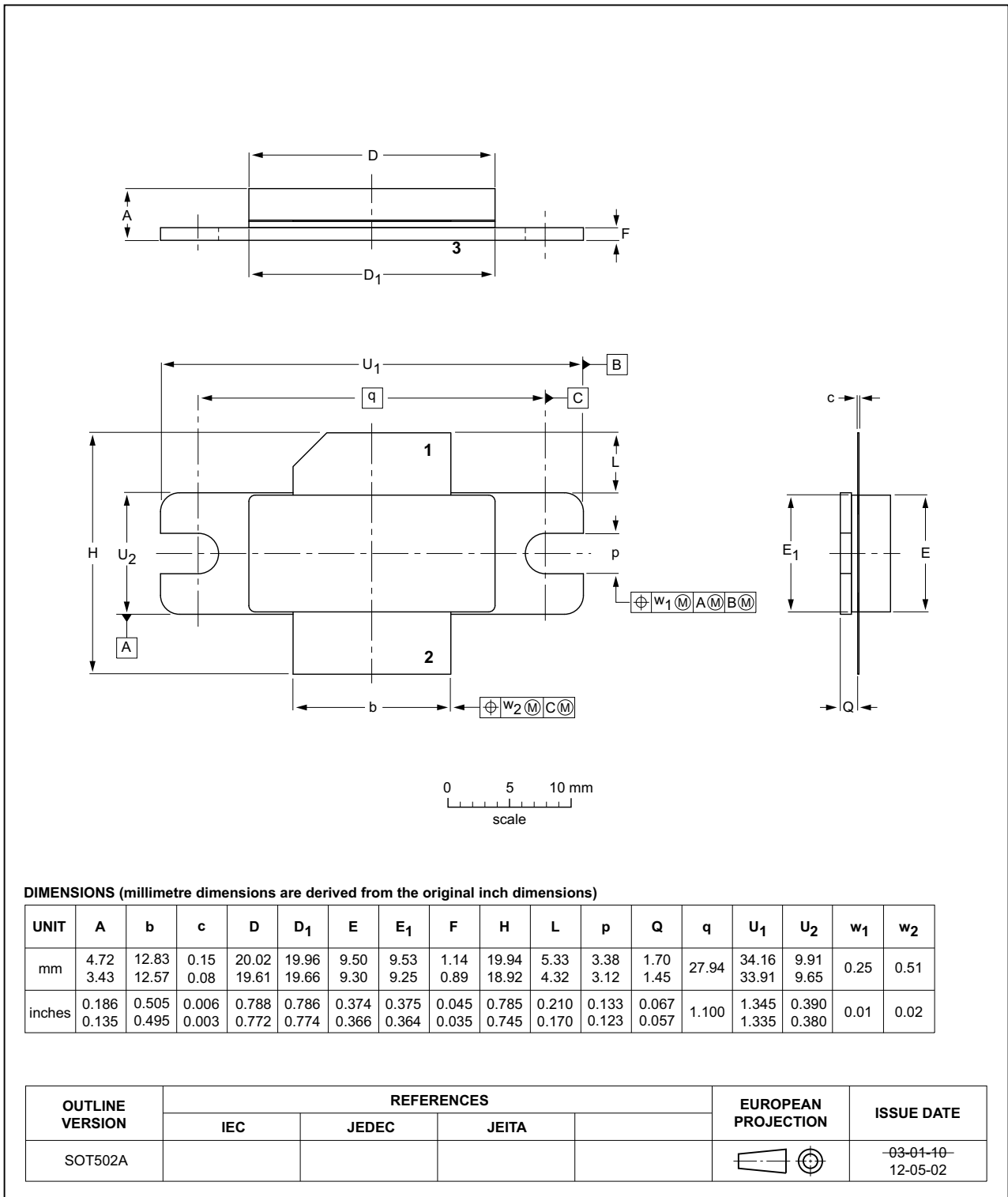


Fig 1. Package outline SOT502A

Earless flanged ceramic package; 2 leads

SOT502B

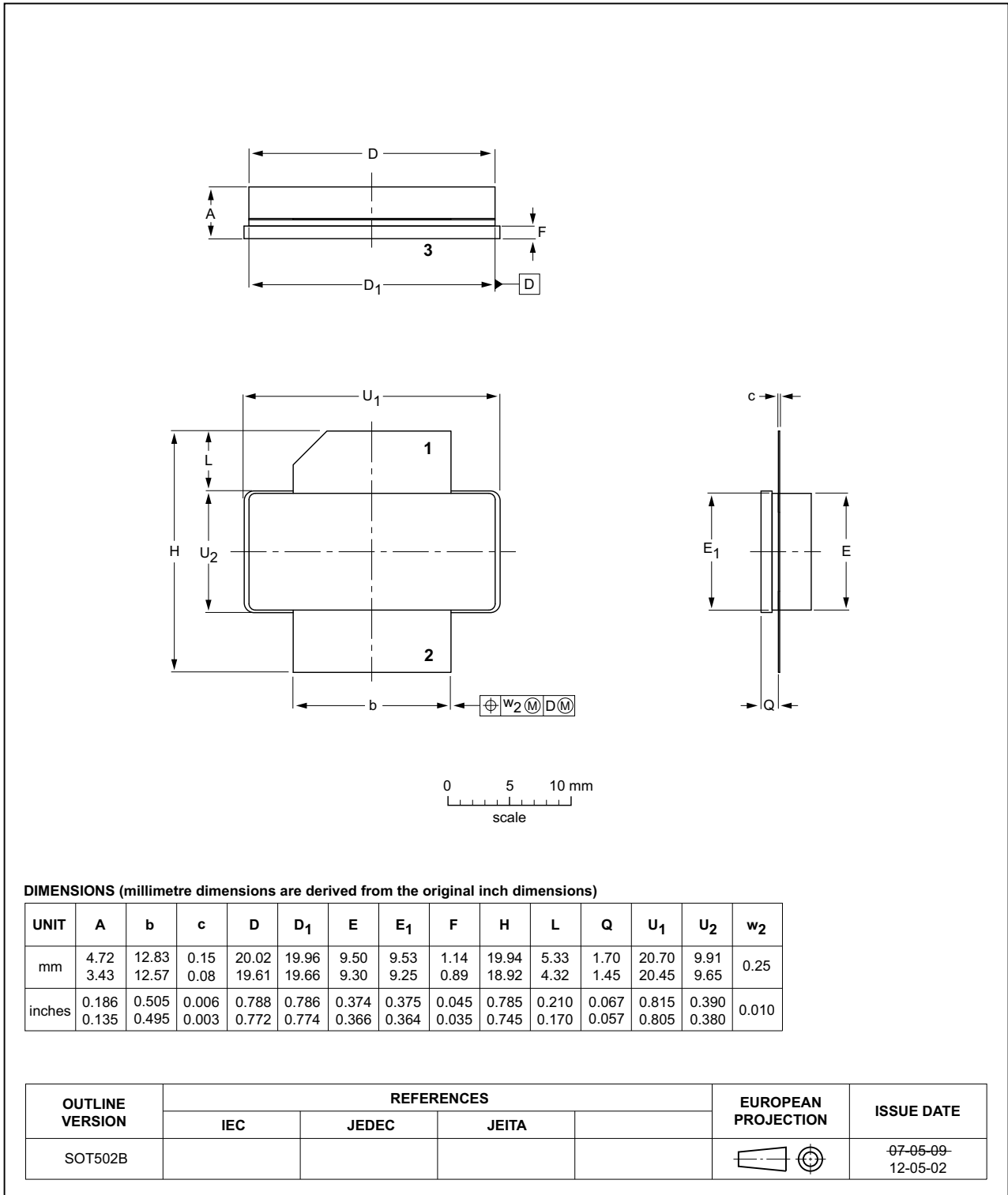


Fig 2. Package outline SOT502B

Earless flanged ceramic package; 2 leads

SOT502E

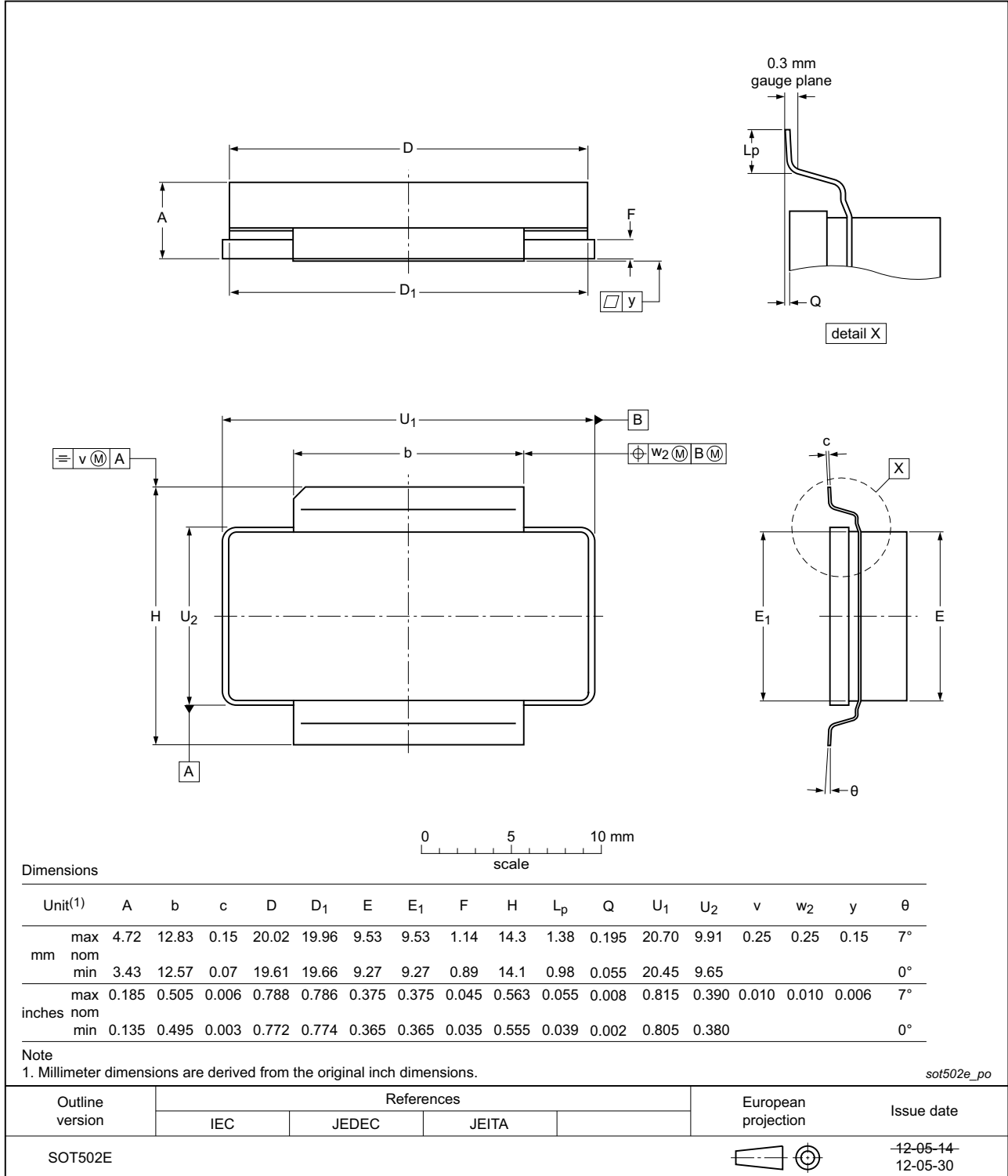


Fig 3. Package outline SOT502E

Eared flanged ceramic package; 2 leads; 2 mounting holes

SOT502F

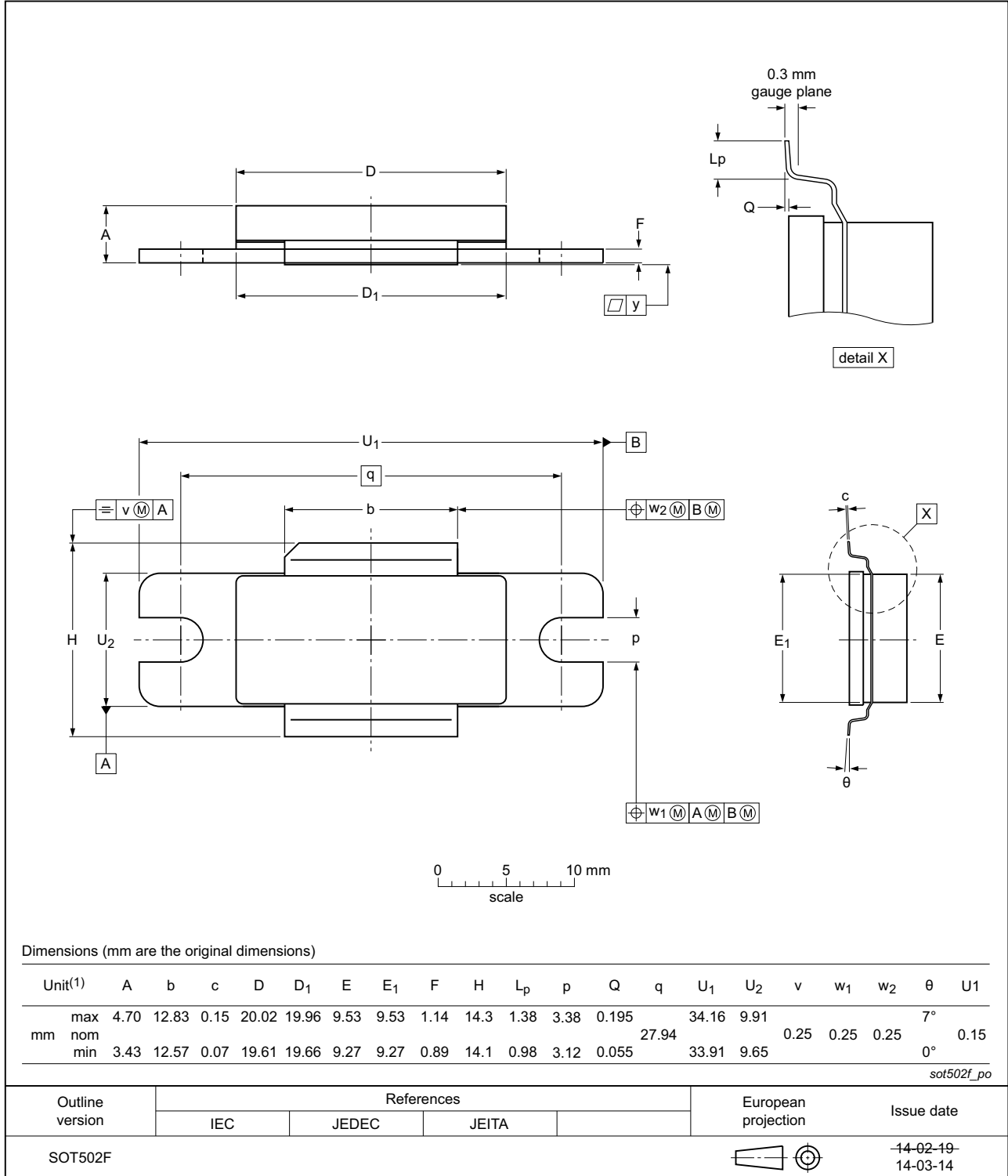


Fig 4. Package outline SOT502F

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 8. Abbreviations

Acronym	Description
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
MTF	Median Time to Failure
VSWR	Voltage Standing-Wave Ratio

11. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLA8G1011L-300_LS-300_L-300G_LS-300G v.1	20140929	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.
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Product [short] data sheet	Production	This document contains the product specification.

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