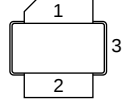
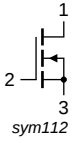


2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	drain		
2	gate		
3	source		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLS6G2731S-130	-	ceramic earless flanged cavity package; 2 leads	SOT922-1

4. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Min	Max	Unit
V_{DS}	drain-source voltage	-	60	V
V_{GS}	gate-source voltage	-0.5	+13	V
I_D	drain current	-	33	A
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
$Z_{th(j-mb)}$	transient thermal impedance from junction to mounting base	$T_{case} = 85\text{ °C}; P_L = 130\text{ W}$		
		$t_p = 100\text{ }\mu\text{s}; \delta = 10\text{ }\%$	0.23	K/W
		$t_p = 200\text{ }\mu\text{s}; \delta = 10\text{ }\%$	0.28	K/W
		$t_p = 300\text{ }\mu\text{s}; \delta = 10\text{ }\%$	0.32	K/W
		$t_p = 100\text{ }\mu\text{s}; \delta = 20\text{ }\%$	0.33	K/W

6. Characteristics

Table 6. 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	$V_{GS} = 0\text{ V}; I_D = 0.6\text{ mA}$	60	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 180\text{ mA}$	1.4	1.8	2.4	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	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $V_{DS} = 10\text{ V}$	27	33	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	450	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 9\text{ A}$	8.1	13	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $I_D = 6.3\text{ A}$	-	0.085	0.135	Ω

7. Application information

Table 7. Application information

Mode of operation: pulsed RF; $t_p = 300\text{ }\mu\text{s}$; $\delta = 10\text{ }\%$; RF performance at $V_{DS} = 32\text{ V}$; $I_{Dq} = 100\text{ mA}$; $T_{case} = 25\text{ }^{\circ}\text{C}$; unless otherwise specified, in a class-AB production circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
P_L	output power		-	130	-	W
V_{DD}	supply voltage	$P_L = 130\text{ W}$	-	-	32	V
G_p	power gain	$P_L = 130\text{ W}$	10	12	-	dB
RL_{in}	input return loss	$P_L = 130\text{ W}$	5.5	8	-	dB
$P_{L(1dB)}$	output power at 1 dB gain compression		-	140	-	W
η_D	drain efficiency	$P_L = 130\text{ W}$	45	50	-	%
$P_{droop(pulse)}$	pulse droop power	$P_L = 130\text{ W}$	-	0	0.25	dB
t_r	rise time	$P_L = 130\text{ W}$	-	20	50	ns
t_f	fall time	$P_L = 130\text{ W}$	-	6	50	ns

Table 8. Typical impedance

f (GHz)	Z_S (Ω)	Z_L (Ω)
2.7	$3.2 - j6.5$	$4.5 - j3.6$
2.8	$4.4 - j6.2$	$3.5 - j3.8$
2.9	$5.6 - j7.3$	$3.7 - j3.1$
3.0	$4.9 - j9.2$	$3.0 - j3.3$
3.1	$3 - j9.5$	$2.8 - j3.6$

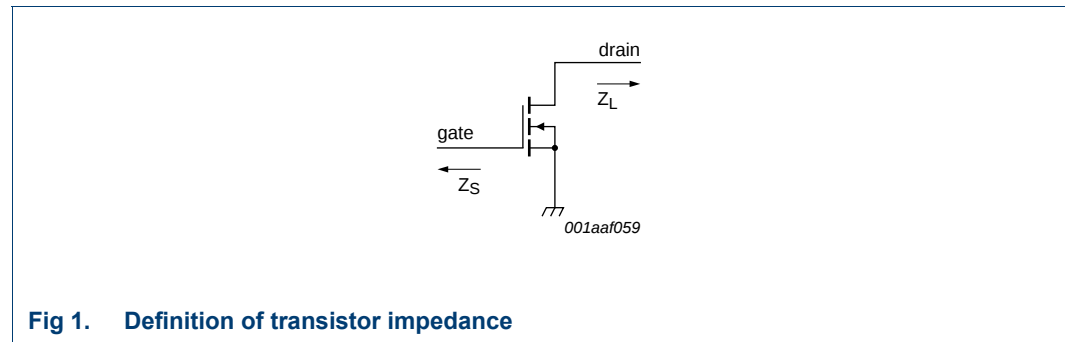
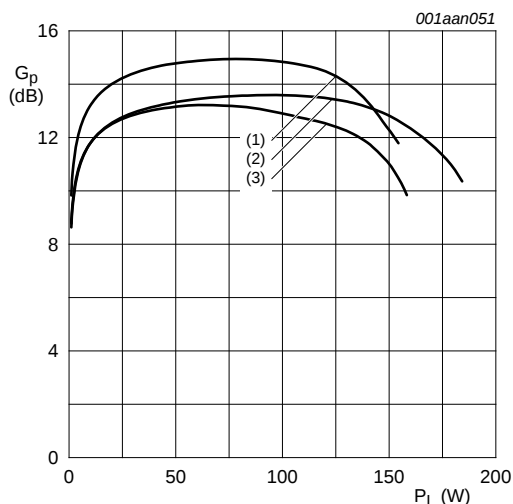


Fig 1. Definition of transistor impedance

7.1 Ruggedness in class-AB operation

The BLS6G2731S-130 is capable of withstanding a load mismatch corresponding to $V_{SWR} = 5 : 1$ through all phases under the following conditions: $V_{DS} = 32 \text{ V}$; $I_{DQ} = 100 \text{ mA}$; $P_L = 130 \text{ W}$; $t_p = 300 \text{ }\mu\text{s}$; $\delta = 10 \text{ \%}$.

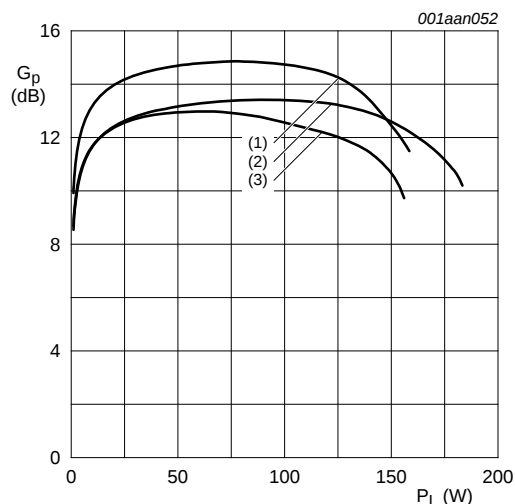
7.2 Graphs



$V_{DS} = 32 \text{ V}$; $I_{Dq} = 100 \text{ mA}$; $t_p = 300 \text{ } \mu\text{s}$; $\delta = 10 \text{ } \%$.

- (1) $f = 2.7 \text{ GHz}$
- (2) $f = 2.9 \text{ GHz}$
- (3) $f = 3.1 \text{ GHz}$

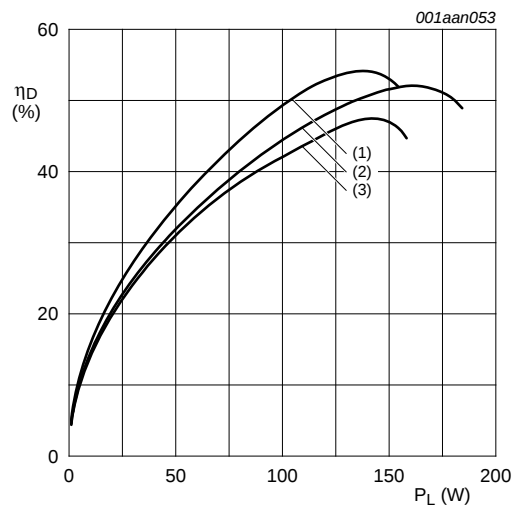
Fig 2. Power gain as a function of load power; typical values



$V_{DS} = 32 \text{ V}$; $I_{Dq} = 100 \text{ mA}$; $t_p = 100 \text{ } \mu\text{s}$; $\delta = 20 \text{ } \%$.

- (1) $f = 2.7 \text{ GHz}$
- (2) $f = 2.9 \text{ GHz}$
- (3) $f = 3.1 \text{ GHz}$

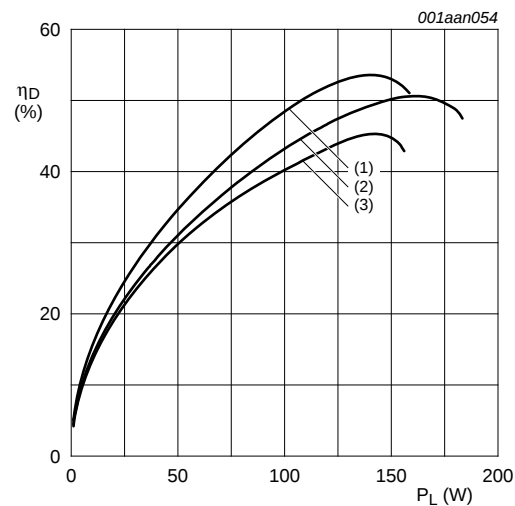
Fig 3. Power gain as a function of load power; typical values



$V_{DS} = 32 \text{ V}$; $I_{Dq} = 100 \text{ mA}$; $t_p = 300 \text{ } \mu\text{s}$; $\delta = 10 \text{ } \%$.

- (1) $f = 2.7 \text{ GHz}$
- (2) $f = 2.9 \text{ GHz}$
- (3) $f = 3.1 \text{ GHz}$

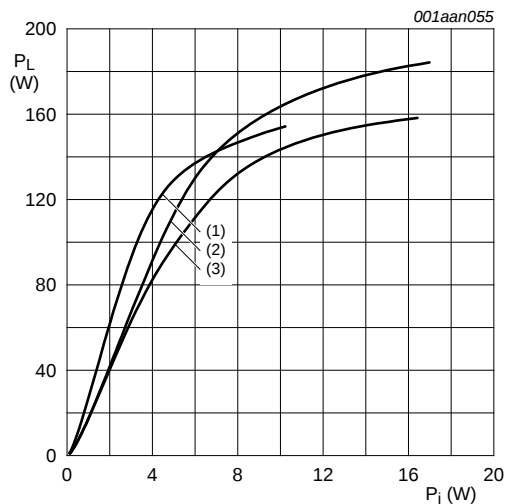
Fig 4. Drain efficiency as a function of load power; typical values



$V_{DS} = 32 \text{ V}$; $I_{Dq} = 100 \text{ mA}$; $t_p = 100 \text{ } \mu\text{s}$; $\delta = 20 \text{ } \%$.

- (1) $f = 2.7 \text{ GHz}$
- (2) $f = 2.9 \text{ GHz}$
- (3) $f = 3.1 \text{ GHz}$

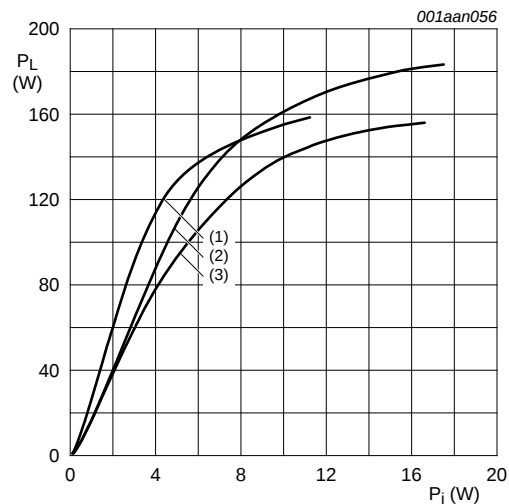
Fig 5. Drain efficiency as a function of load power; typical values



$V_{DS} = 32$ V; $I_{DQ} = 100$ mA; $t_p = 300$ μ s; $\delta = 10$ %.

- (1) $f = 2.7$ GHz
- (2) $f = 2.9$ GHz
- (3) $f = 3.1$ GHz

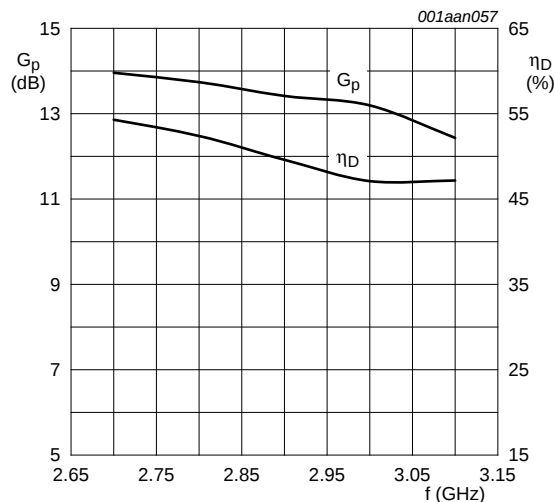
Fig 6. Load power as a function of input power; typical values



$V_{DS} = 32$ V; $I_{DQ} = 100$ mA; $t_p = 100$ μ s; $\delta = 20$ %.

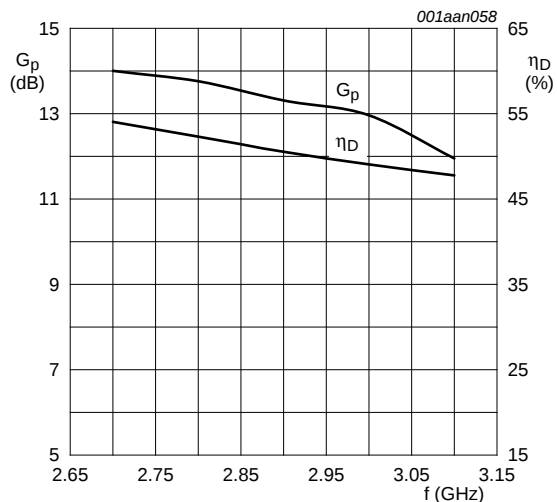
- (1) $f = 2.7$ GHz
- (2) $f = 2.9$ GHz
- (3) $f = 3.1$ GHz

Fig 7. Load power as a function of input power; typical values



$P_L = 130$ W; $V_{DS} = 32$ V; $I_{DQ} = 100$ mA; $t_p = 300$ μ s; $\delta = 10$ %.

Fig 8. Power gain and drain efficiency as function of frequency; typical values



$P_L = 130$ W; $V_{DS} = 32$ V; $I_{DQ} = 100$ mA; $t_p = 100$ μ s; $\delta = 20$ %.

Fig 9. Power gain and drain efficiency as function of frequency; typical values

8. Test information

Table 9. List of components

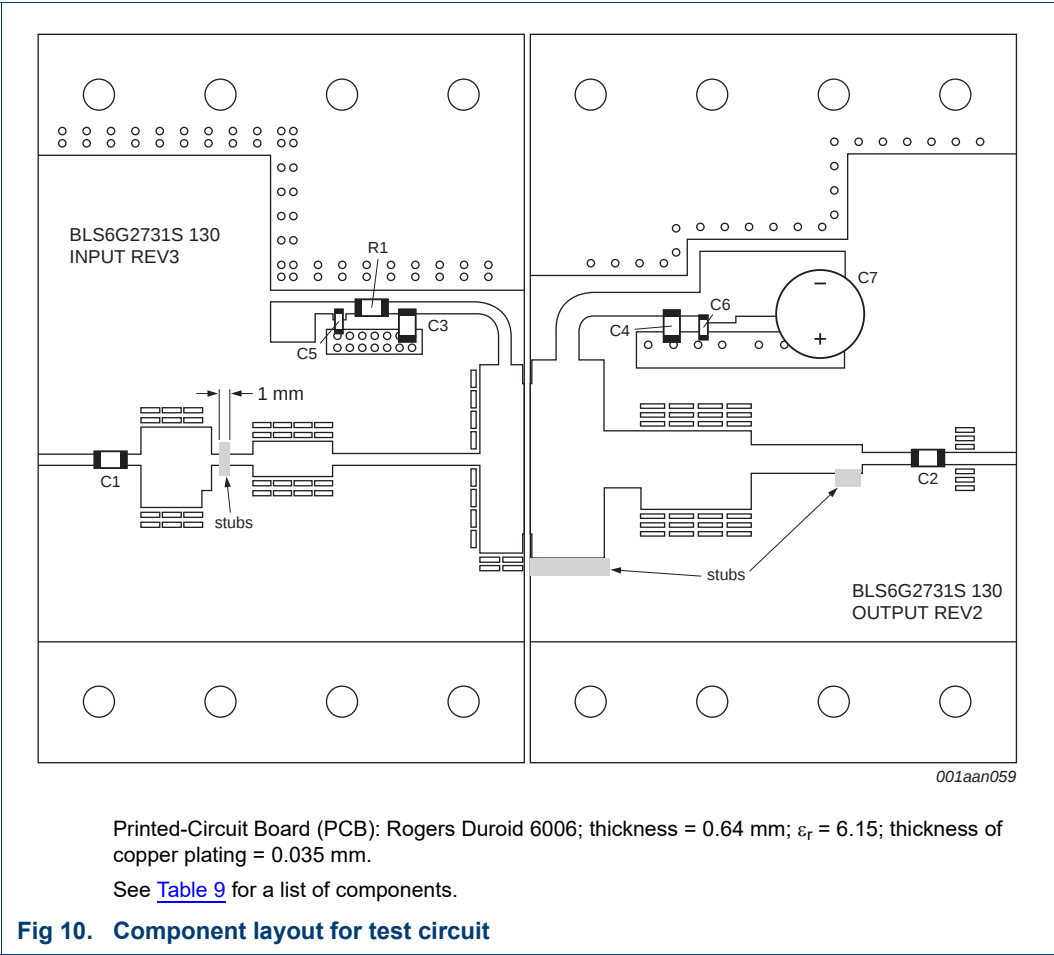
Printed-Circuit Board (PCB): Rogers Duroid 6006; thickness = 0.64 mm; $\epsilon_r = 6.15$; thickness of copper plating = 0.035 mm.

For test circuit see [Figure 10](#).

Component	Description	Value	Remarks
C1, C2, C3, C4	multilayer ceramic chip capacitor	20 pF	[1]
C5, C6	multilayer ceramic chip capacitor	1 nF	[2]
C7	electrolytic capacitor	470 μ F; 63 V	
R1	SMD resistor	10 Ω	

[1] American Technical Ceramics type 100A or capacitor of same quality.

[2] American Technical Ceramics type 700A or capacitor of same quality.



9. Package outline

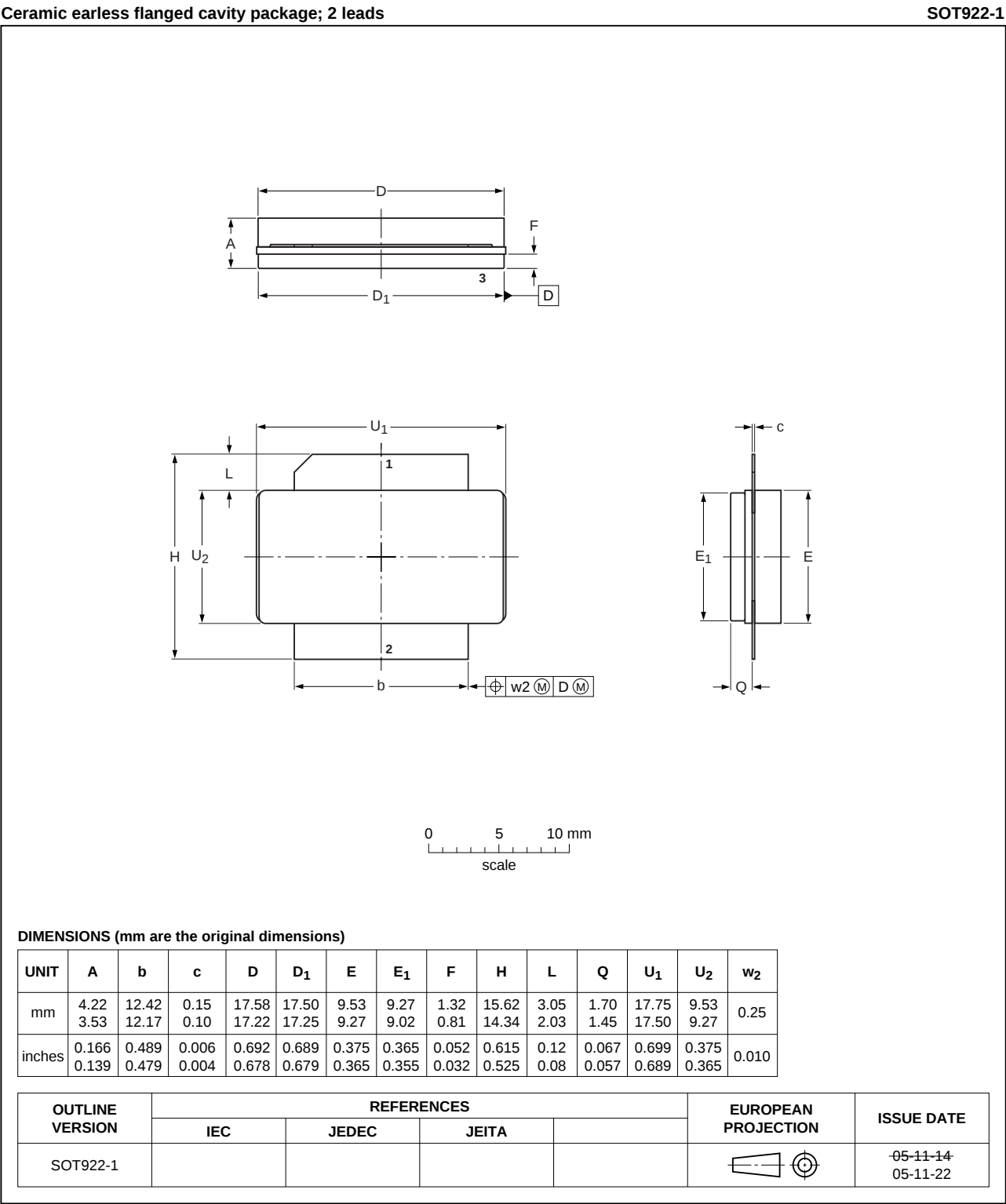


Fig 11. Package outline SOT922-1

10. Abbreviations

Table 10. Abbreviations

Acronym	Description
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
RF	Radio Frequency
VSWR	Voltage Standing-Wave Ratio

11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLS6G2731S-130#3	20150901	Product data sheet		BLS6G2731S-130 v.2
Modifications:	- 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.			
BLS6G2731S-130 v.2	20101118	Product data sheet	-	BLS6G2731S-130 v.1
BLS6G2731S-130 v.1	20100726	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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.ampleon.com>.

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