

BLS7G2325L-105

Power LDMOS transistor

Rev. 2 — 19 July 2011

Product data sheet

1. Product profile

1.1 General description

105 W LDMOS power transistor for S-band radar applications at frequencies from 2300 MHz to 2500 MHz.

Table 1. Typical performance

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

Mode of operation	f (MHz)	I _{DQ} (mA)	V _{DS} (V)	P _{L(AV)} (W)	G _p (dB)	η _D (%)
Pulse CW	2300 to 2500	900	30	110	16.5	55

1.2 Features and benefits

- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

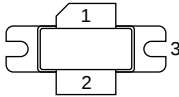
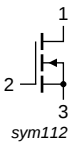
1.3 Applications

- RF power amplifiers for S-band radar applications in the 2300 MHz to 2500 MHz frequency range



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
BLS7G2325L-105	-	flanged LDMOST ceramic package; 2 mounting holes; 2 leads	SOT502A

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
I_D	drain current		-	28	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
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}$; $P_L = 100\text{ W}$	0.3	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	$V_{GS} = 0\text{ V}$; $I_D = 1\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$; $I_D = 150\text{ mA}$	1.5	1.8	2.3	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}$; $V_{DS} = 28\text{ V}$	-	-	5	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $V_{DS} = 10\text{ V}$	25.1	29	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}$; $V_{DS} = 0\text{ V}$	-	-	500	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}$; $I_D = 5.35\text{ A}$	-	10.5	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $I_D = 5.25\text{ A}$	-	0.1	-	Ω

7. Test information

Remark: All testing performed in a class-AB production test circuit.

Table 7. Functional test information

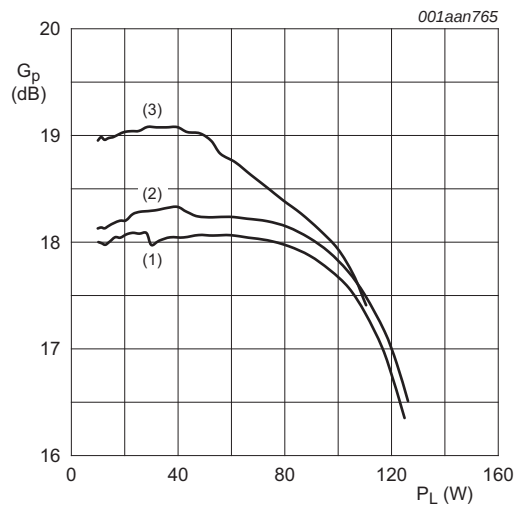
Mode of operation: 1-carrier N-CDMA, single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF; channel bandwidth is 1.2288 MHz; $f_1 = 2300\text{ MHz}$; $f_2 = 2500\text{ MHz}$; RF performance at $V_{DS} = 28\text{ V}$; $I_{Dq} = 900\text{ mA}$; $T_{case} = 25\text{ }^{\circ}\text{C}$; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		-	20	-	W
G_p	power gain		17.3	18	-	dB
RL_{in}	input return loss		-	-10	-	dB
η_D	drain efficiency		22	27	-	%
$ACPR_{885k}$	adjacent channel power ratio (885 kHz)		-	-46	-40	dBc

7.1 Ruggedness in class-AB operation

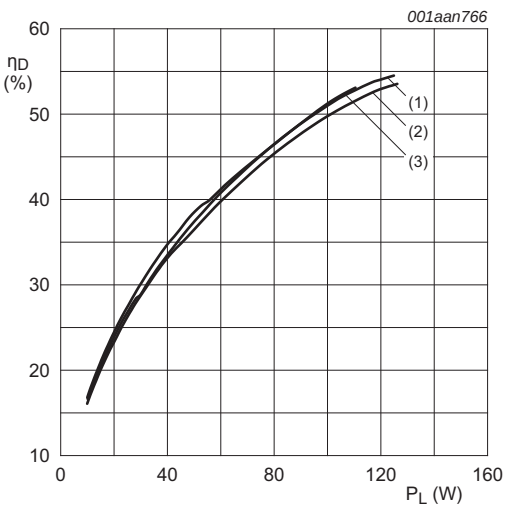
The BLS7G2325L-105 is capable of withstanding a load mismatch corresponding to $VSWR = 10 : 1$ through all phases under the following conditions: $V_{DS} = 28\text{ V}$; $I_{Dq} = 900\text{ mA}$; $P_L = 100\text{ W}$ (CW); $f = 2300\text{ MHz}$.

7.2 Pulsed CW



$V_{DS} = 28\text{ V}; I_{DQ} = 900\text{ mA}.$
(1) $f = 2300\text{ MHz}$
(2) $f = 2400\text{ MHz}$
(3) $f = 2500\text{ MHz}$

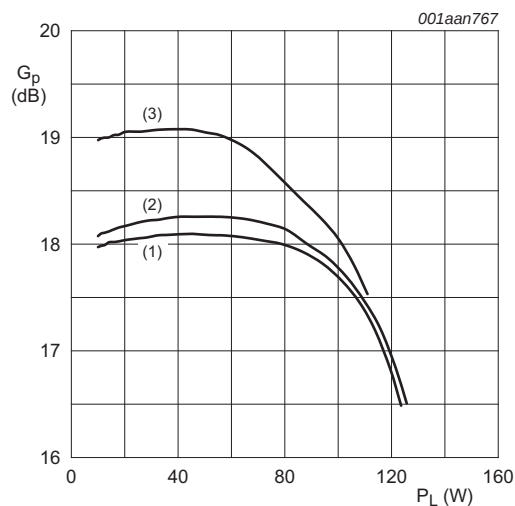
Fig 1. Pulsed CW power gain as a function of load power; typical values



$V_{DS} = 28\text{ V}; I_{DQ} = 900\text{ mA}.$
(1) $f = 2300\text{ MHz}$
(2) $f = 2400\text{ MHz}$
(3) $f = 2500\text{ MHz}$

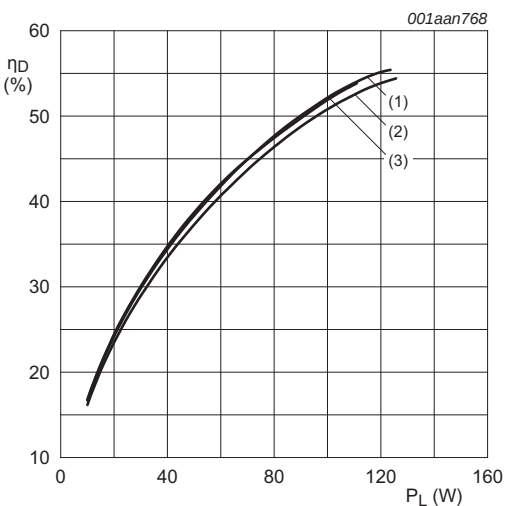
Fig 2. Pulsed CW drain efficiency as a function of load power; typical values

7.3 CW



$V_{DS} = 28\text{ V}; I_{DQ} = 900\text{ mA}.$
(1) $f = 2300\text{ MHz}$
(2) $f = 2400\text{ MHz}$
(3) $f = 2500\text{ MHz}$

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



$V_{DS} = 28\text{ V}; I_{DQ} = 900\text{ mA}.$
(1) $f = 2300\text{ MHz}$
(2) $f = 2400\text{ MHz}$
(3) $f = 2500\text{ MHz}$

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

8. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT502A

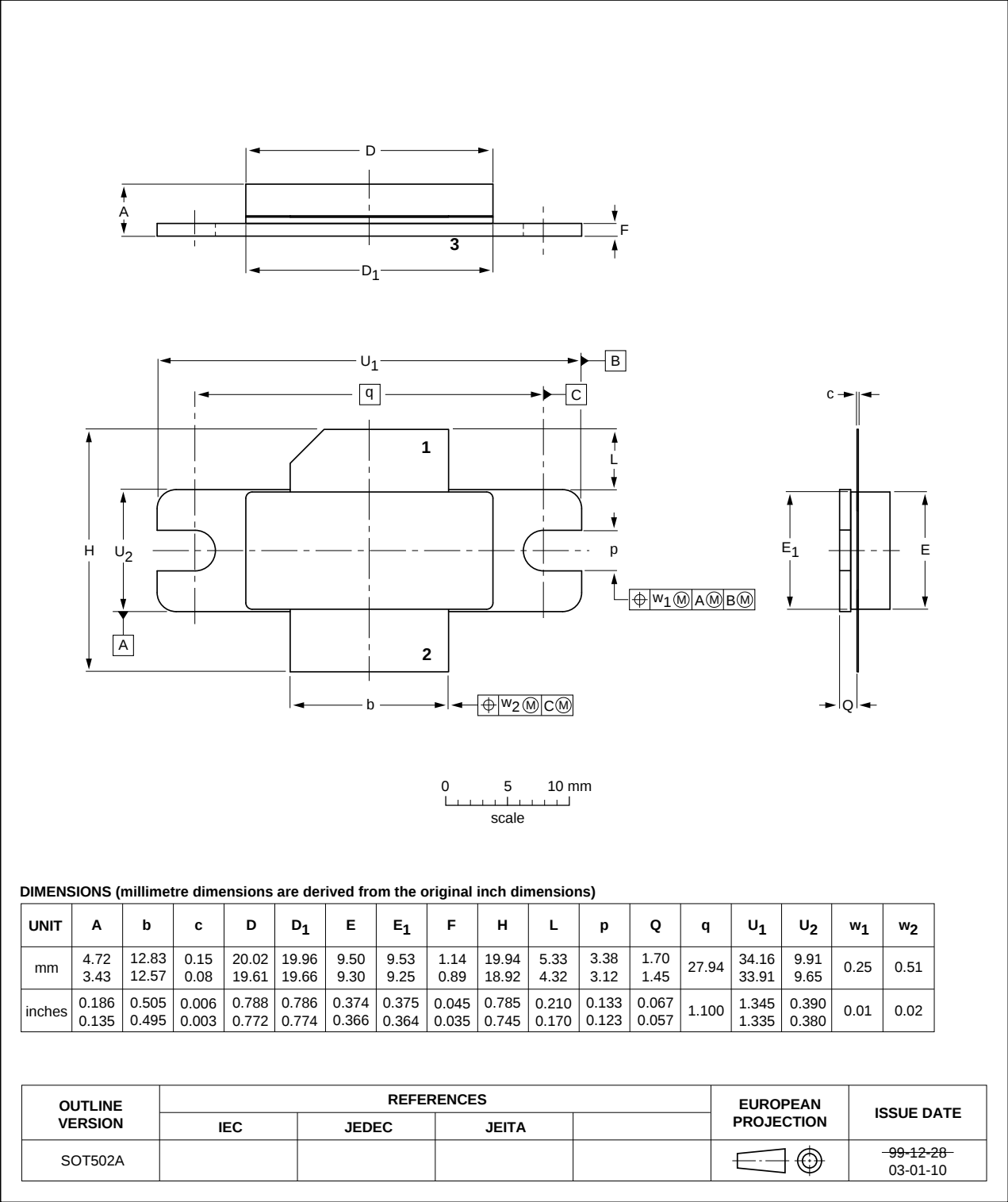


Fig 5. Package outline SOT502A

9. Abbreviations

Table 8. Abbreviations

Acronym	Description
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
IS-95	Interim Standard 95
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal Oxide Semiconductor
LDMOST	Laterally Diffused Metal Oxide Semiconductor Transistor
N-CDMA	Narrowband Code Division Multiple Access
PAR	Peak-to-Average power Ratio
RF	Radio Frequency
S-band	Short wave Band
VSWR	Voltage Standing Wave Ratio

10. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLS7G2325L-105 v.2	20110719	Product data sheet	-	BLS7G2325L-105 v.1
Modifications:	• The status of this document has been changed to Product data sheet.			
BLS7G2325L-105 v.1	20110301	Objective data sheet	-	-

11. Legal information

11.1 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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