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 °C in a common source class-AB production test circuit.

Mode of operation	f	I_{Dq}	V_{DS}	$P_{L(AV)}$	G_p	η_D
	(MHz)	(mA)	(V)	(W)	(dB)	(%)
Pulse CW	2300 to 2500	900	30	110	16.5	55

1.2 Features and benefits

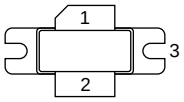
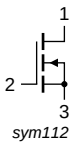
- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

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]		

sym112

[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 °C; P_L = 100 W	0.3	K/W

6. Characteristics

Table 6. Characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0 V; I_D = 1 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 150 mA	1.5	1.8	2.3	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	5	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	25.1	29	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	500	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 5.35 A	-	10.5	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 5.25 A	-	0.1	-	Ω

7. Test information

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

Table 7. Functional test information

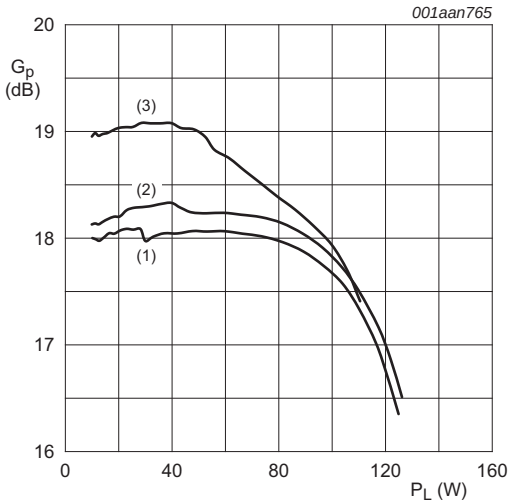
Mode of operation: 1-carrier N-CDMA, single carrier IS-95 with pilot, paging, sync and 6 traffic channels (Walsh codes 8 - 13). PAR = 9.7 dB at 0.01 % probability on the CCDF, channel bandwidth is 1.2288 MHz; f_1 = 2300 MHz; f_2 = 2500 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 900 mA; T_{case} = 25 °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 V; I_{Dq} = 900 mA; P_L = 100 W (CW); f = 2300 MHz.

7.2 Pulsed CW



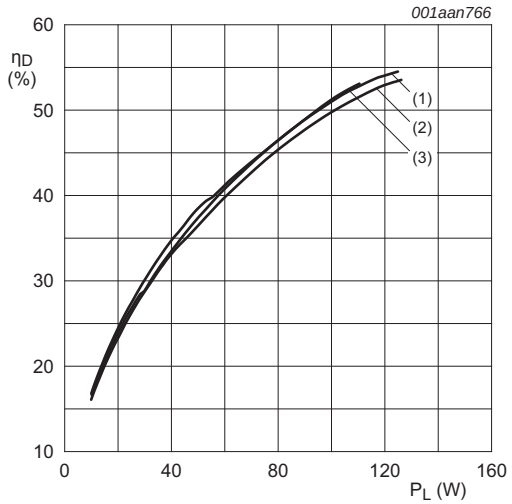
V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

(3) f = 2500 MHz

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



V_{DS} = 28 V; I_{Dq} = 900 mA.

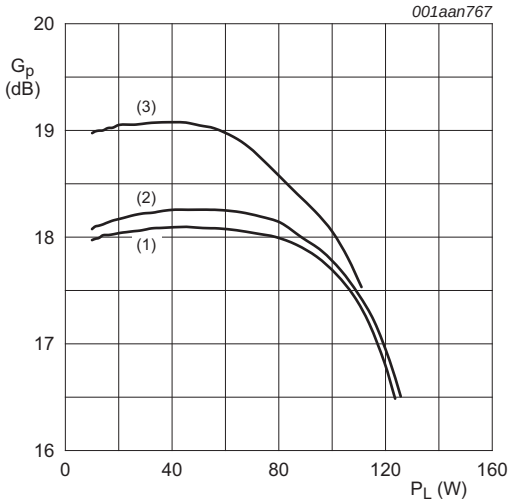
(1) f = 2300 MHz

(2) f = 2400 MHz

(3) f = 2500 MHz

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

7.3 CW



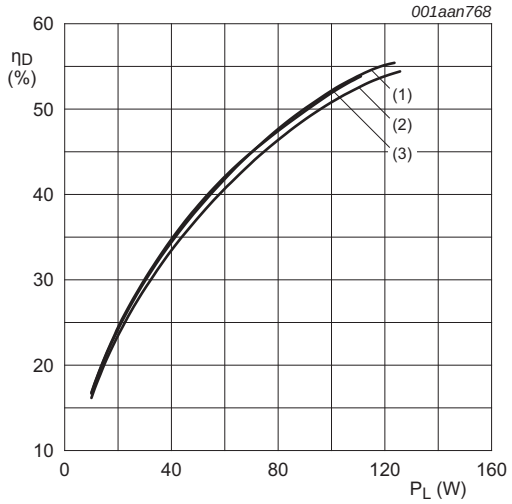
V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

(2) f = 2400 MHz

(3) f = 2500 MHz

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



V_{DS} = 28 V; I_{Dq} = 900 mA.

(1) f = 2300 MHz

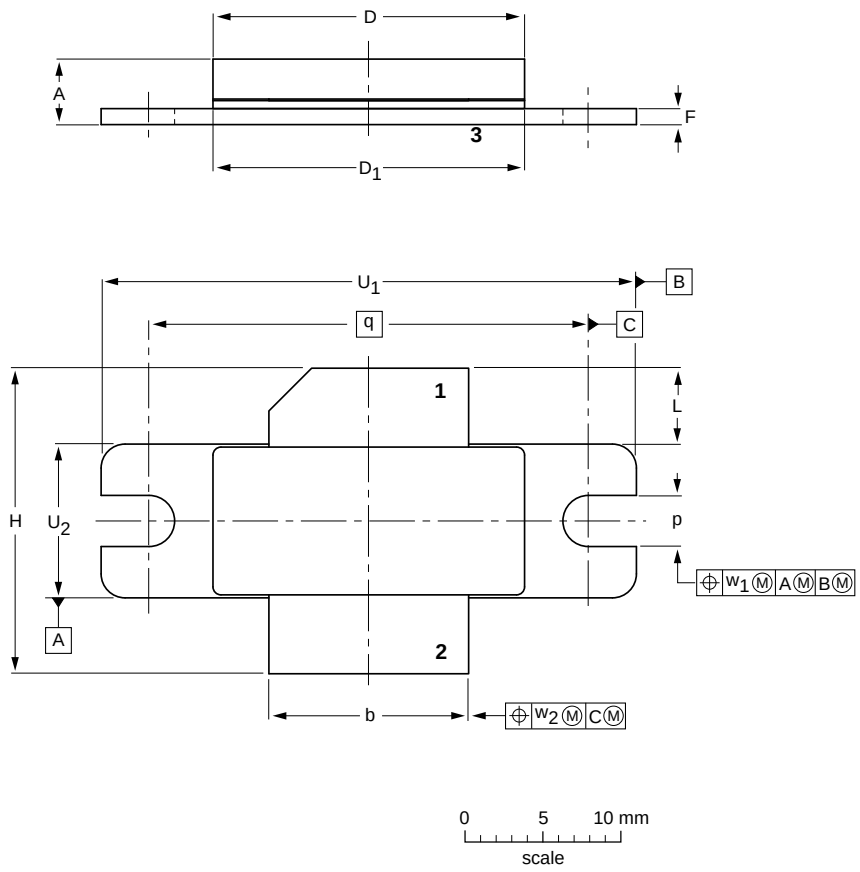
(2) f = 2400 MHz

(3) f = 2500 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**



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D_1	E	E_1	F	H	L	p	Q	q	U_1	U_2	w_1	w_2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	3.38 3.12	1.70 1.45	27.94	34.16 33.91	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.133 0.123	0.067 0.057	1.100	1.345 1.335	0.390 0.380	0.01	0.02

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502A						~~99-12-28~~ 03-01-10

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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