BLS7G2729L-350P; BLS7G2729LS-350P

LDMOS S-band radar power transistor

Rev. 1 — 24 May 2011 Objective data sheet

1. Product profile

1.1 General description

350 W LDMOS power transistor intended for radar applications in the 2.7 GHz to 2.9 GHz range.

Table 1. Typical performance

Typical RF performance at T_{case} = 25 °C; t_p = 300 µs; δ = 10 %; I_{Dq} = 200 mA; in a class-AB production test circuit.

Mode of operation	f	V_{DS}	P_L	G_p	η_D	t_r	t_f
	(GHz)	(V)	(W)	(dB)	(%)	(ns)	(ns)
pulsed RF	2.7 to 2.9	32	350	13.5	50	20	6

1.2 Features and benefits

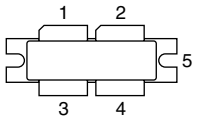
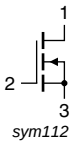
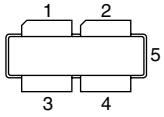
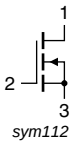
- Typical pulsed RF performance at a frequency of 2.7 GHz to 2.9 GHz, a supply voltage of 32 V, an I_{Dq} of 200 mA, a t_p of 300 µs with δ of 10 %:
  - Output power = 350 W
  - Power gain = 13.5 dB
  - Efficiency = 50 %
- Easy power control
- Integrated ESD protection
- High flexibility with respect to pulse formats
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for S-band operation (2.7 GHz to 2.9 GHz)
- Internally matched for ease of use
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- S-band power amplifiers for radar applications in the 2.7 GHz to 2.9 GHz frequency range

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLS7G2729L-350P (SOT539A)			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source [1]		
BLS7G2729LS-350P (SOT539B)			
1	drain1		
2	drain2		
3	gate1		
4	gate2		
5	source [1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLS7G2729L-350P	-	flanged balanced LSMOST ceramic package; 2 mounting holes; 4 leads	SOT539A
BLS7G2729LS-350P	-	earless flanged balanced LSMOST ceramic package; 4 leads	SOT539B

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 °C; P_L = 150 W		
		t_p = 100 μs; δ = 10 %	<tbd>	K/W
		t_p = 200 μs; δ = 10 %	<tbd>	K/W
		t_p = 300 μs; δ = 10 %	<tbd>	K/W
		t_p = 100 μs; δ = 20 %	<tbd>	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 = 2.2 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 220 mA	1.5	1.9	2.3	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	2.8	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	34	39	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	280	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 11.0 A	-	16.2	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 7.7 A	-	0.065	-	Ω

7. Application information

Table 7. Application information

Mode of operation: pulsed RF; t_p = 300 μs; δ = 10 %; RF performance at V_{DS} = 32 V; I_{Dq} = 200 mA; T_{case} = 25 °C; unless otherwise specified, in a class-AB production circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
P_L	output power		-	350	-	W
V_{CC}	supply voltage	P_L = 350 W	-	-	32	V
G_p	power gain	P_L = 350 W	12	13.5	-	dB
RL_{in}	input return loss	P_L = 350 W	-	−10	-	dB
$P_{L(1dB)}$	output power at 1 dB gain compression		-	<tbd>	-	W
η_D	drain efficiency	P_L = 350 W	45	50	-	%
$P_{droop(pulse)}$	pulse droop power	P_L = 350 W	-	0	0.3	dB
t_r	rise time	P_L = 350 W	-	20	50	ns
t_f	fall time	P_L = 350 W	-	6	50	ns

Table 8. Typical impedance

f	Z_S	Z_L
GHz	Ω	Ω
2.7	<tbd>	<tbd>
2.8	<tbd>	<tbd>
2.9	<tbd>	<tbd>

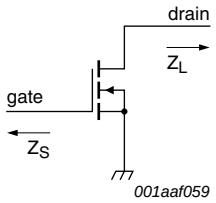


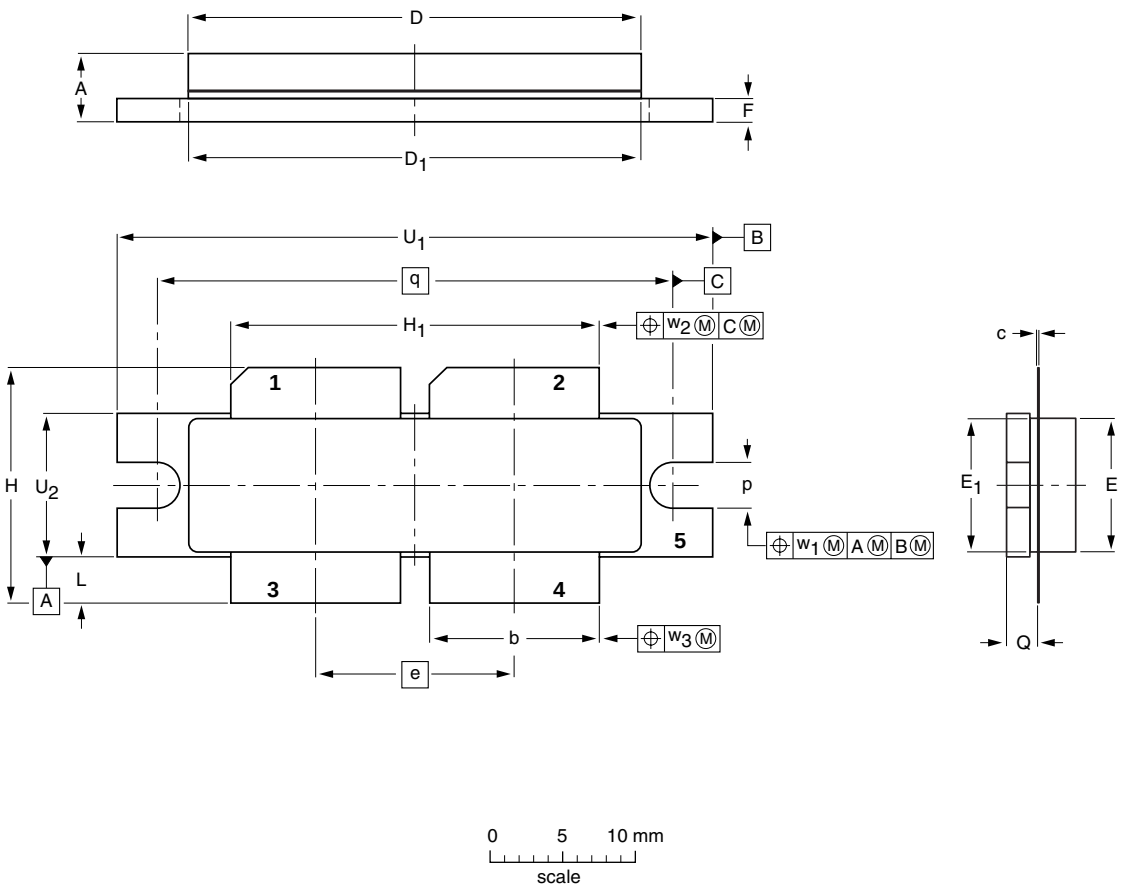
Fig 1. Definition of transistor impedance

7.1 Ruggedness in class-AB operation

The BLS7G2729L-350P and BLS7G2729LS-350P are capable of withstanding a load mismatch corresponding to VSWR = 5 : 1 through all phases under the following conditions: V_{DS} = 32 V; I_{Dq} = 200 mA; P_L = 350 W; t_p = 300 μs; δ = 10 %.

8. Package outline

Flanged balanced LDMOST ceramic package; 2 mounting holes; 4 leads **SOT539A**



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

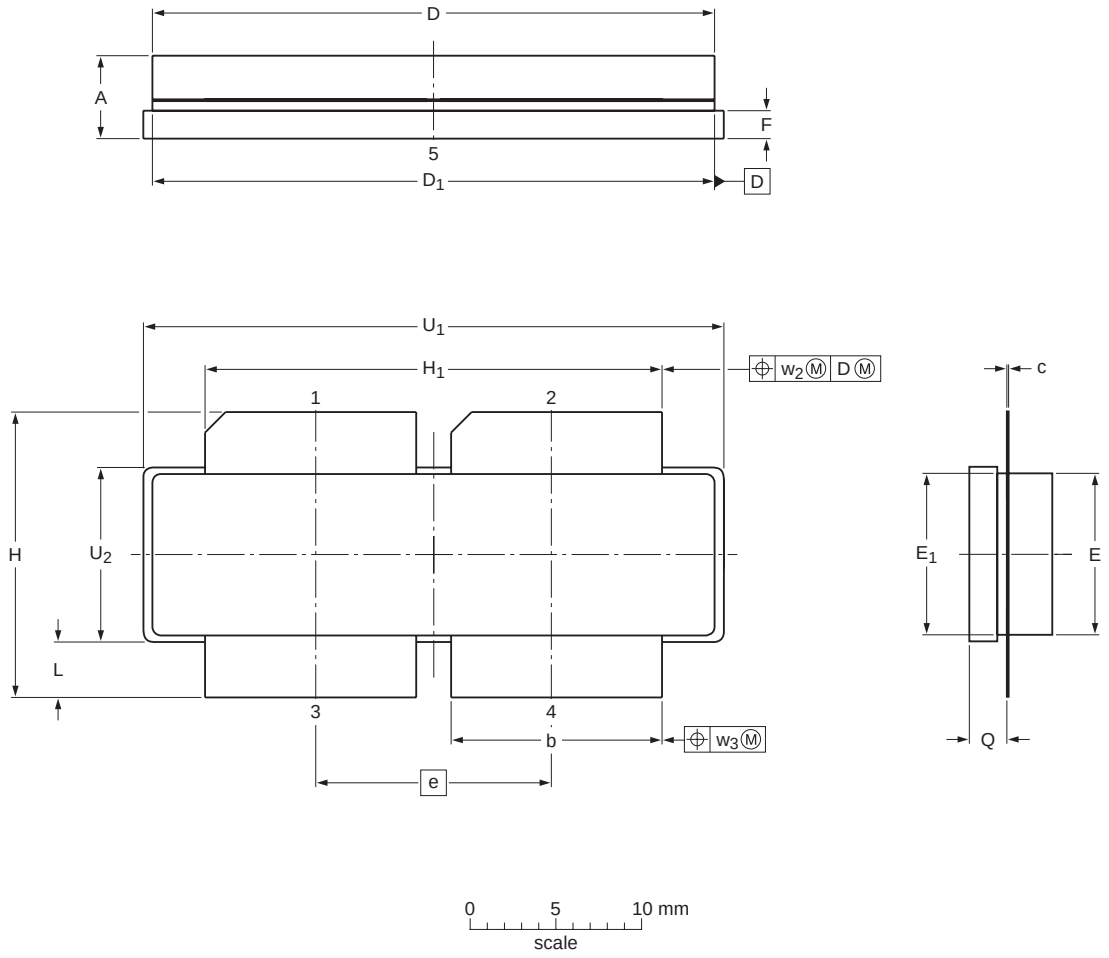
UNIT	A	b	c	D	D_1	e	E	E_1	F	H	H_1	L	p	Q	q	U_1	U_2	w_1	w_2	w_3
mm	4.7 4.2	11.81 11.56	0.18 0.10	31.55 30.94	31.52 30.96	13.72	9.50 9.30	9.53 9.27	1.75 1.50	17.12 16.10	25.53 25.27	3.48 2.97	3.30 3.05	2.26 2.01	35.56	41.28 41.02	10.29 10.03	0.25	0.51	0.25
inches	0.185 0.165	0.465 0.455	0.007 0.004	1.242 1.218	1.241 1.219	0.540	0.374 0.366	0.375 0.365	0.069 0.059	0.674 0.634	1.005 0.995	0.137 0.117	0.130 0.120	0.089 0.079	1.400	1.625 1.615	0.405 0.395	0.010	0.020	0.010

Note
1. millimeter dimensions are derived from the original inch dimensions.
2. recommended screw pitch dimension of 1.52 inch (38.6 mm) based on M3 screw.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT539A						~~00-03-03~~ 10-02-02

Fig 2. Package outline SOT539A

Earless flanged balanced LDMOST ceramic package; 4 leads **SOT539B**



Dimensions

Unit[1]		A	b	c	D	D_1	E	E_1	e	F	H	H_1	L	Q	U_1	U_2	w_2	w_3
mm	max	4.7	11.81	0.18	31.55	31.52	9.5	9.53		1.75	17.12	25.53	3.48	2.26	32.77	10.29		
	nom								13.72								0.25	0.25
	min	4.2	11.56	0.10	30.94	30.96	9.3	9.27		1.50	16.10	25.27	2.97	2.01	32.13	10.03		
mm	max	0.185	0.465	0.007	1.242	1.241	0.374	0.375		0.069	0.674	1.005	0.137	0.089	1.275	0.405		
	nom								0.54								0.01	0.01
	min	0.165	0.455	0.004	1.218	1.219	0.366	0.365		0.059	0.634	0.995	0.117	0.079	1.265	0.395		

Note
1. millimeter dimensions are derived from the original inch dimensions.

sot539b_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT539B						~~10-02-02~~ 11-02-17

Fig 3. Package outline SOT539B

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 9. Abbreviations

Acronym	Description
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LDMOST	Laterally Diffused Metal-Oxide Semiconductor Transistor
RF	Radio Frequency
S-band	Short wave Band
VSWR	Voltage Standing-Wave Ratio

11. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLS7G2729L-350P_LS-350P v.1	20110524	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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14. Contents

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