BLC10M6XS200

Power LDMOS transistor

Rev. 1 — 5 December 2016

AMPLEON

Product data sheet

1. Product profile

1.1 General description

200 W LDMOS power transistor for RF lighting applications at frequencies from 425 MHz to 450 MHz.

The BLC10M6XS200 is designed for high-power CW applications and is assembled in a high performance plastic package.

Table 1. Typical performance

RF performance at V_{DS} = 28 V; I_{Dq} = 350 mA; T_{case} = 25 °C in a class-AB application circuit.

Test signal	f	V_{DS}	P_L	G_p	η_D
	(MHz)	(V)	(W)	(dB)	(%)
CW	440	28	200	21	80

1.2 Features and benefits

- High efficiency
- Easy power control
- Excellent ruggedness
- Excellent thermal resistance due to copper flange
- Integrated ESD protection
- Designed for broadband operation (425 MHz to 450 MHz)
- Internally input matched
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- RF lighting applications in the 425 MHz to 450 MHz ISM band

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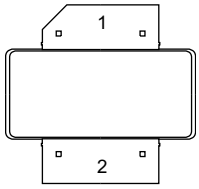
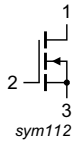
2. Pinning information

Table 2. Pinning

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

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLC10M6XS200	-	air cavity plastic earless flanged package; 2 leads	SOT1270-1

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 online MTF calculator.

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j\text{-}case)}$	thermal resistance from junction to case	T_{case} = 90 °C; P_L = 200 W	0.23	K/W

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6. Characteristics

Table 6. DC characteristics

T_j = 25 °C, per section; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0 V; I_D = 2.7 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 270 mA	1.4	2.0	2.4	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	4.2	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	-	45	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	420	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 13.5 A	-	17	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 9.45 A	-	0.09	-	Ω

Table 7. RF characteristics

Test signal: 2-carrier W-CDMA; PAR = 7.5 dB at 0.01% probability on CCDF; 3GPP test model 1; 1 to 64 PDPCH; f_1 = 886.5 MHz; f_2 = 891.5 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 1400 mA; T_{case} = 25 °C; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 40 W	17.8	19.5	-	dB
RL_{in}	input return loss	$P_{L(AV)}$ = 40 W	-	−6.4	−4.5	dB
η_D	drain efficiency	$P_{L(AV)}$ = 40 W	25	29.5	-	%

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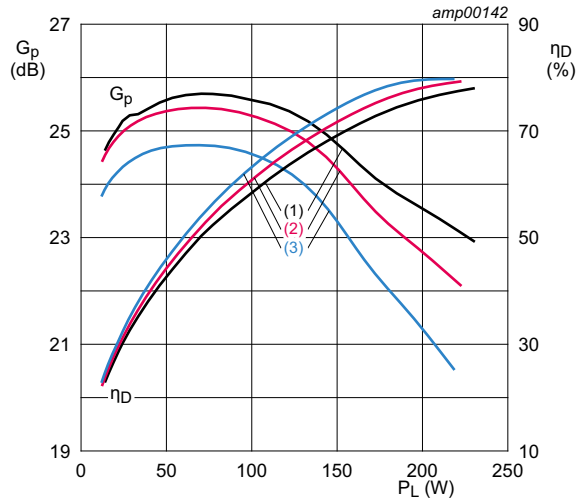
7. Application information

7.1 Graphical data



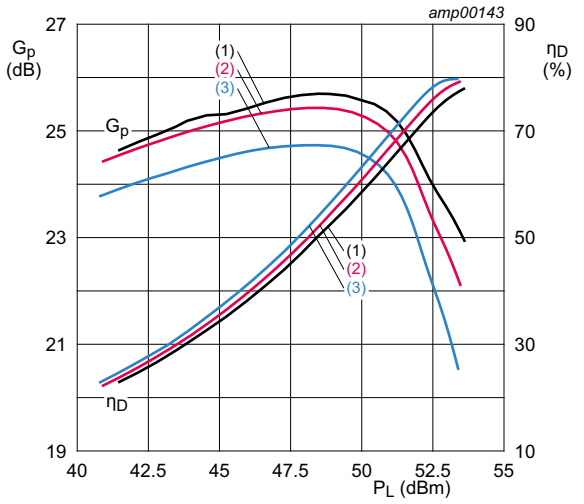
V_{DS} = 28 V; I_{Dq} = 350 mA.

(1) f = 430 MHz

(2) f = 435 MHz

(3) f = 440 MHz

Fig 1. Power gain and drain efficiency as function of output power; typical values



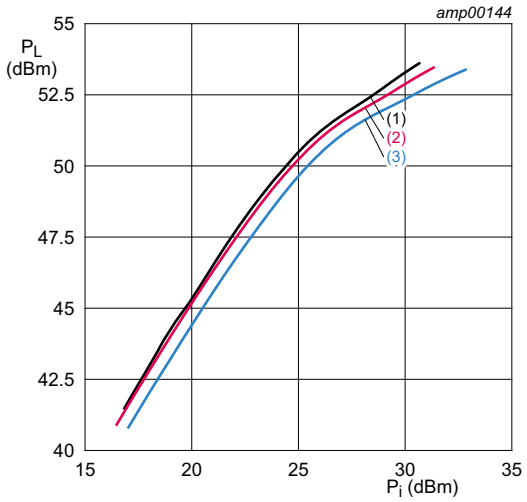
V_{DS} = 28 V; I_{Dq} = 350 mA.

(1) f = 430 MHz

(2) f = 435 MHz

(3) f = 440 MHz

Fig 2. Power gain and drain efficiency as function of output power; typical values



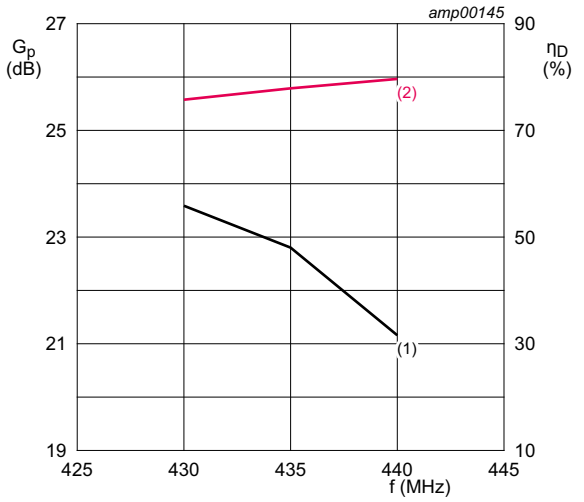
V_{DS} = 28 V; I_{Dq} = 350 mA.

(1) f = 430 MHz

(2) f = 435 MHz

(3) f = 440 MHz

Fig 3. Output power as a function of input power; typical values



V_{DS} = 28 V; I_{Dq} = 350 mA; P_L = 200 W

(1) G_p

(2) η_D

Fig 4. Power gain and drain efficiency as function of frequency; typical values

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8. Test information

8.1 Ruggedness in class-AB operation

The BLC10M6XS200 is capable of withstanding a load mismatch corresponding to VSWR = 20 : 1 through all phases under the following conditions: V_{DS} = 28 V; I_{Dq} = 300 mA; P_L = 200 W (CW); f = 894 MHz.

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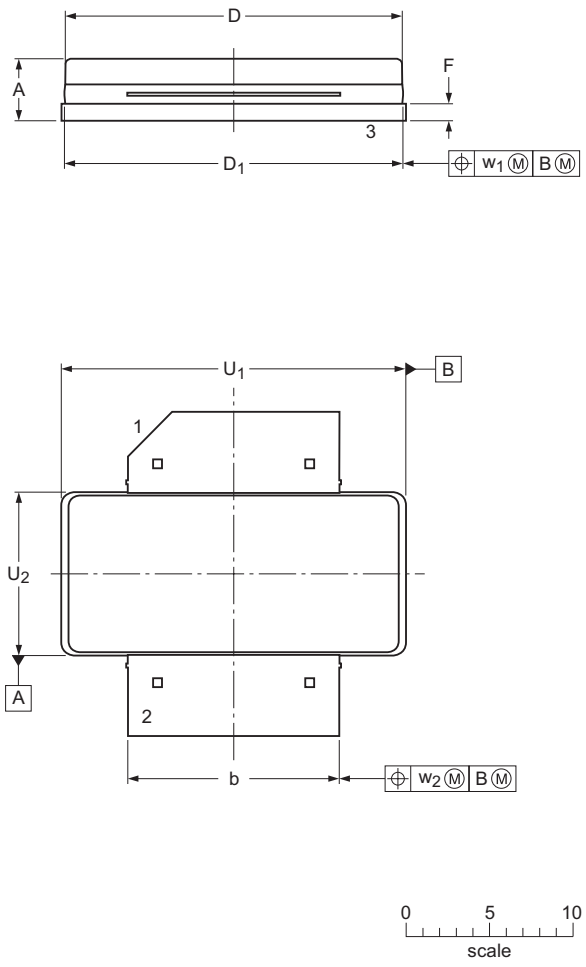
9. Package outline

Air cavity plastic earless flanged package; 2 leads **SOT1270-1**



Dimensions

Unit		A	b	c	D	D_1	E	E_1	F	H	Q(1)	U_1	U_2	v	w_1	w_2	y
mm	max	4.01	12.80	0.18	20.42	20.37	9.80	9.75	1.14	19.53	1.68	20.70	9.91	0.50	0.50	0.50	0.10
	nom																
	min	3.40	12.60	0.13	20.12	20.17	9.50	9.55	0.94	19.33	1.45	20.50	9.70				

Note
1. Dimension Q is measured 0.1 mm away from the flange.
2. Ringframe and/or ringframe glue shall not overhang at the side of the flange.

sot1270-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1270-1						~~16-09-28~~ 16-11-15

Fig 5. Package outline SOT1270-1

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10. 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.

Table 8. ESD sensitivity

ESD model	Class
Charged Device Model (CDM); According to ANSI/ESDA/JEDEC standard JS-002	C1 [1]
Human Body Model (HBM); According to ANSI/ESDA/JEDEC standard JS-001	2 [2]

[1] CDM classification C1 is granted to any part that passes after exposure to an ESD pulse of 250 V, but fails after exposure to an ESD pulse of 500 V.

[2] HBM classification 2 is granted to any part that passes after exposure to an ESD pulse of 2000 V, but fails after exposure to an ESD pulse of 4000 V.

11. Abbreviations

Table 9. Abbreviations

Acronym	Description
3GPP	3rd Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
ESD	ElectroStatic Discharge
ISM	Industrial, Scientific and Medical
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
MTF	Median Time to Failure
PAR	Peak-to-Average Ratio
PDPCH	transmission Power of the Dedicated Physical CHannel
VSWR	Voltage Standing-Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLC10M6XS200 v.1	20161205	Product data sheet	-	-

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13.1 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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