

BLC10M6XS200

Power LDMOS transistor

Rev. 1 — 5 December 2016

AMMPELON

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

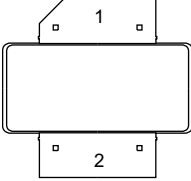
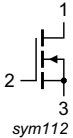
- High efficiency
- Easy power control
- Excellent ruggedness
- Excellent thermal resistance due to copper flange
- Integrated ESD protection
- Designed for broadband operation (425 MHz to 450 MHz)
- Internally input matched
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances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

1.3 Applications

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

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

6. Characteristics

Table 6. DC characteristics

$T_j = 25\text{ °C}$, per section; unless otherwise specified.

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

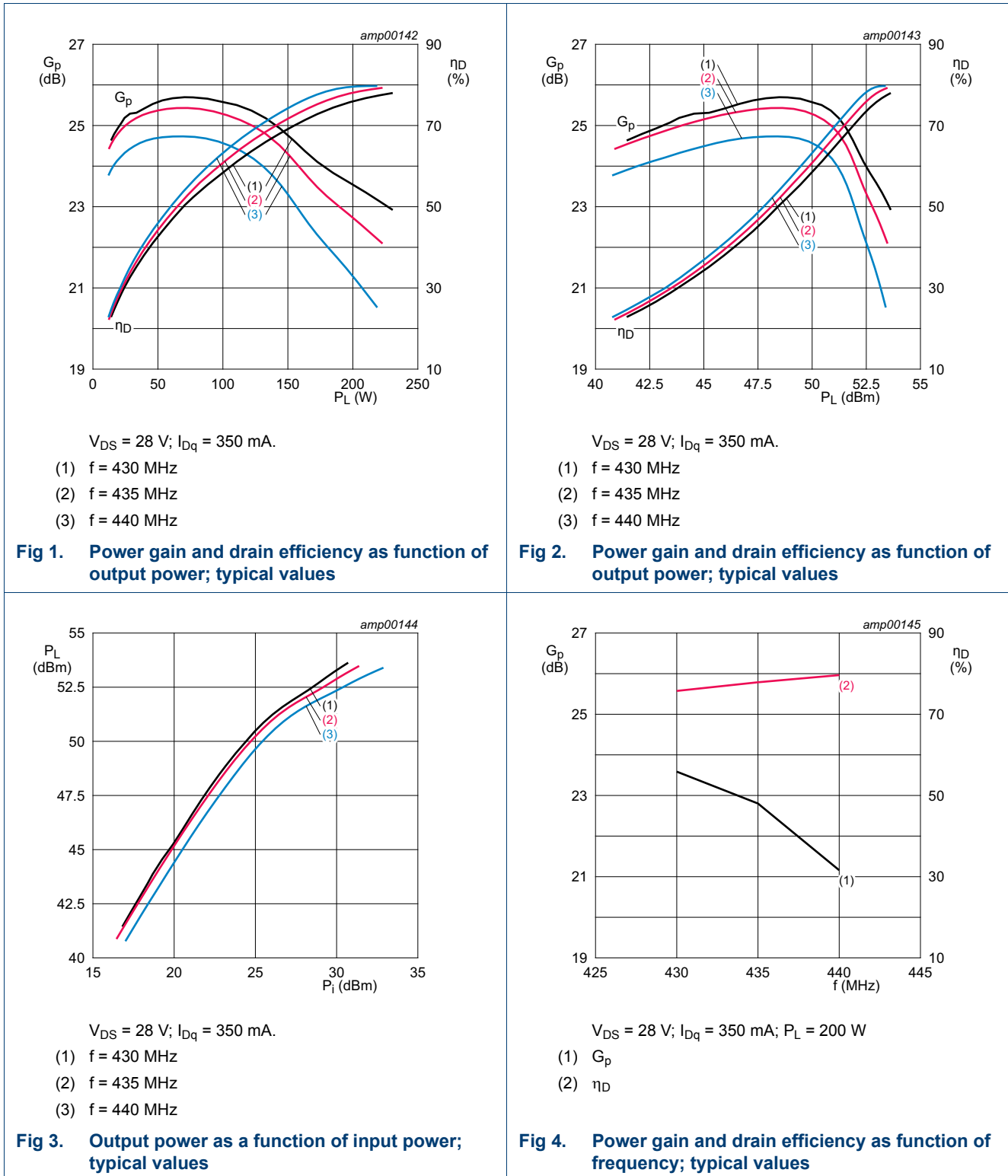
Table 7. RF characteristics

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

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

7. Application information

7.1 Graphical data



8. Test information

8.1 Ruggedness in class-AB operation

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

9. Package outline

Air cavity plastic earless flanged package; 2 leads

SOT1270-1

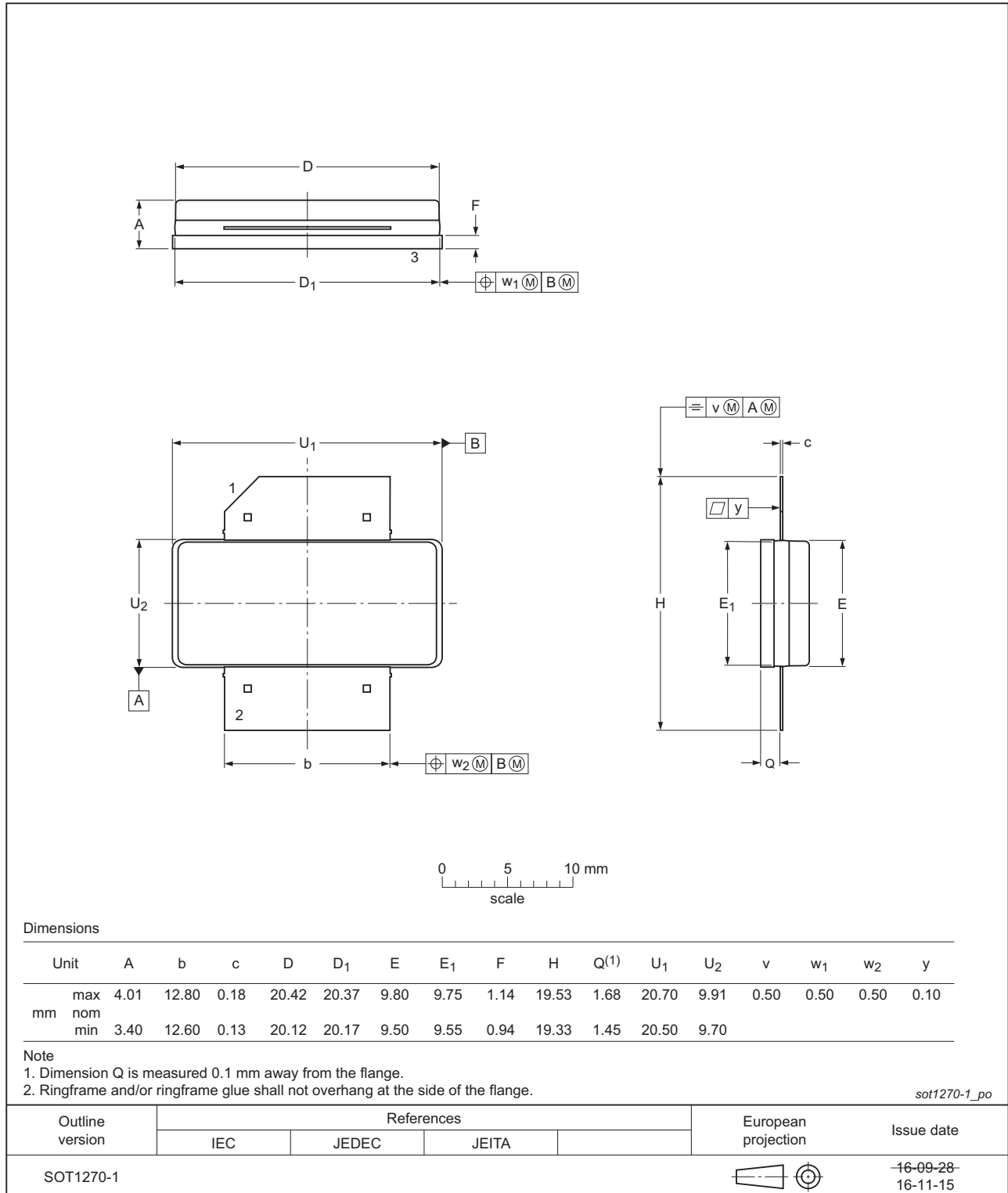


Fig 5. Package outline SOT1270-1

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	-	-

13. Legal information

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.
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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