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# BLC10M6XS200

Power LDMOS transistor

Rev. 1 — 5 December 2016

AMMPLION

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	$V_{DS}$	$P_L$	$G_p$	$\eta_D$
	(MHz)	(V)	(W)	(dB)	(%)
CW	440	28	200	21	80

### 1.2 Features and benefits

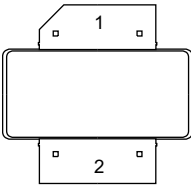
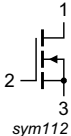
- High efficiency
- Easy power control
- Excellent ruggedness
- Excellent thermal resistance due to copper flange
- Integrated ESD protection
- Designed for broadband operation (425 MHz to 450 MHz)
- Internally input matched
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (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 <a href="#">[1]</a>		

[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	<a href="#">[1]</a>	-	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	$\mu\text{A}$
$I_{DSX}$	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	-	$\Omega$

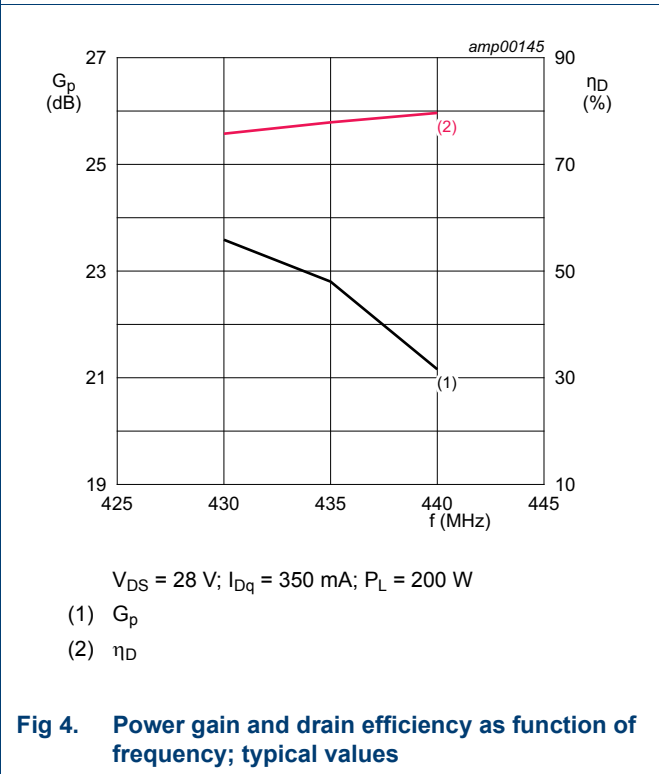
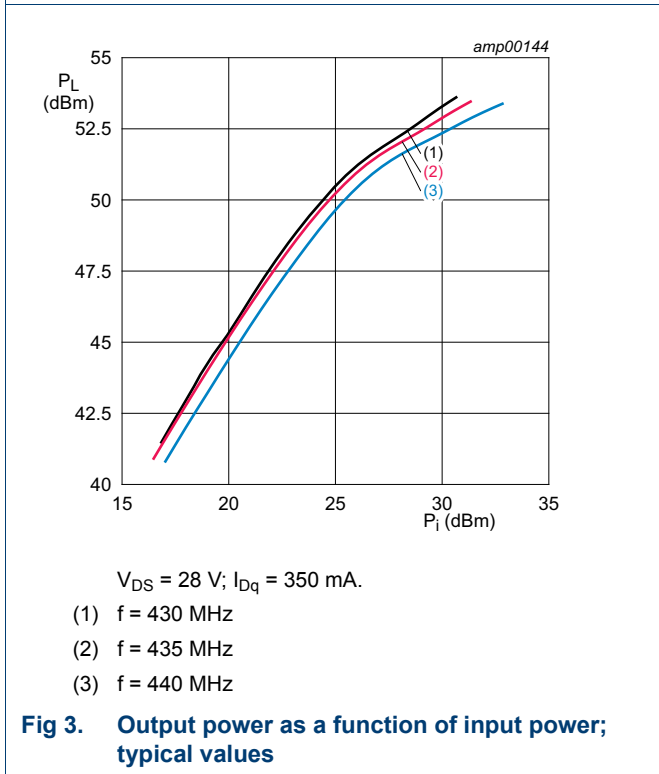
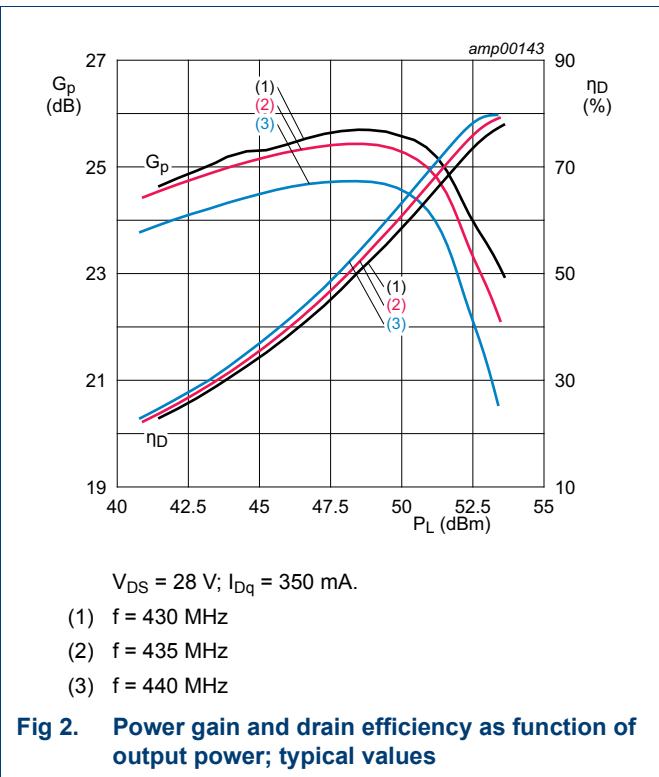
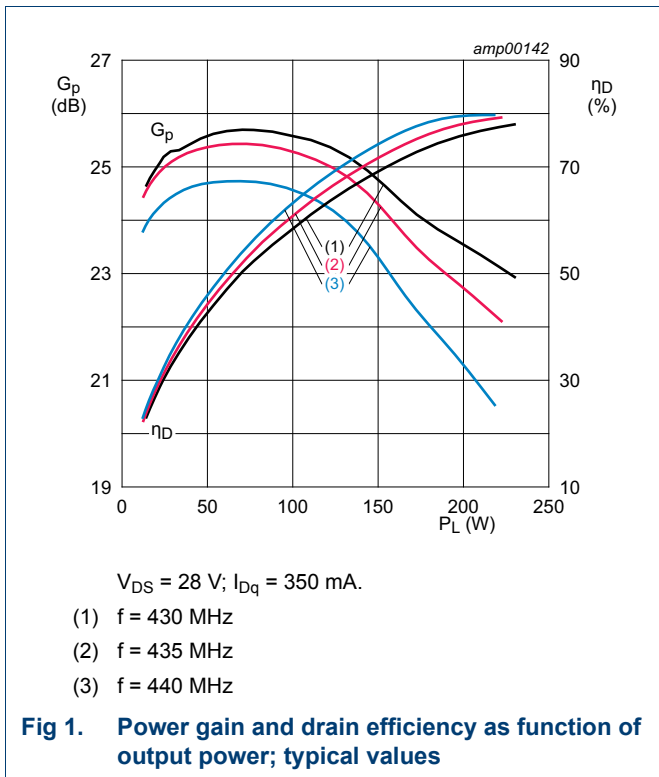
**Table 7. RF characteristics**

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
$\eta_D$	drain efficiency	$P_{L(AV)} = 40\text{ W}$	25	29.5	-	%

7. Application information

7.1 Graphical data



## 8. Test information

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### 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

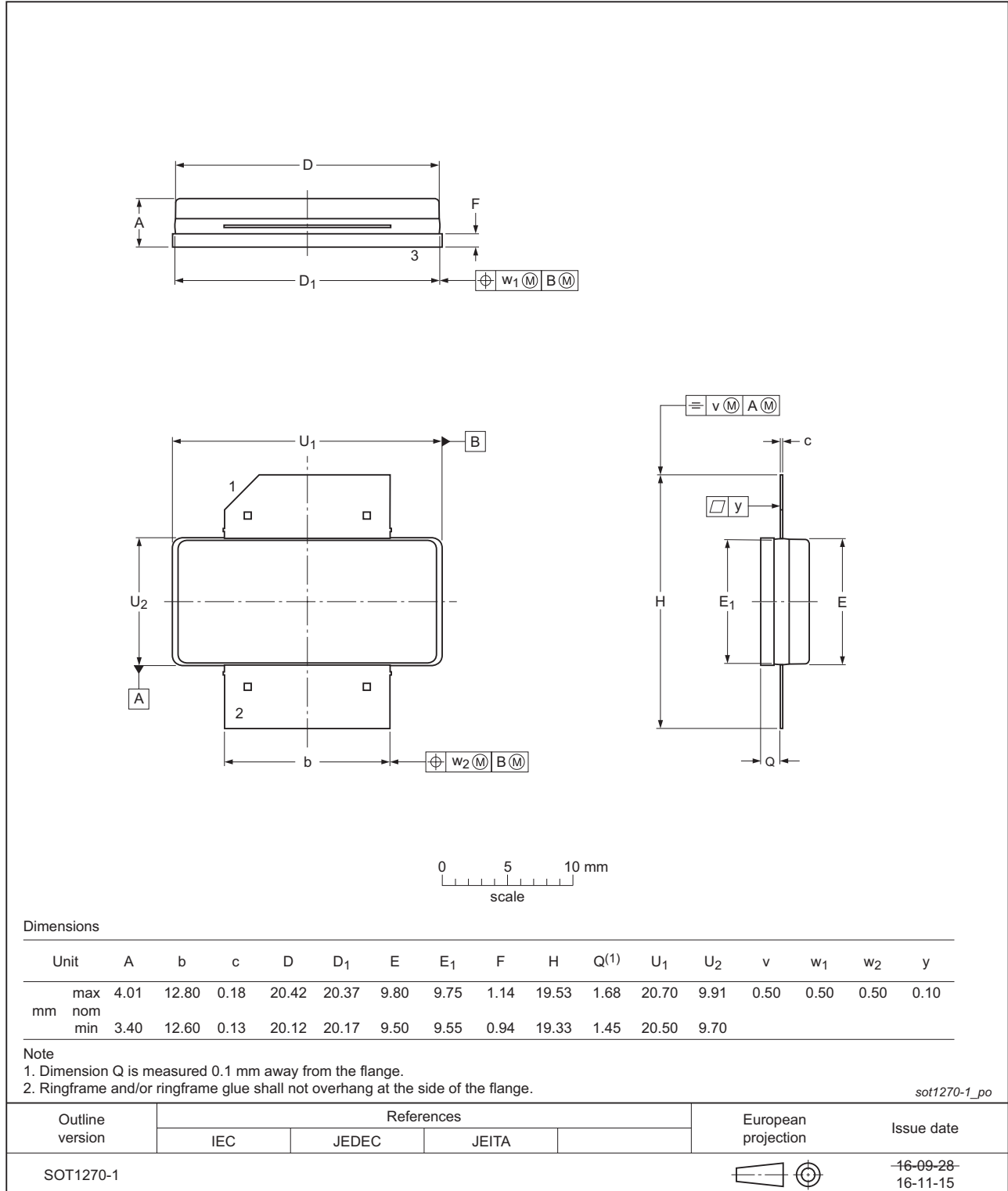


Fig 5. Package outline SOT1270-1

## 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 <a href="#">[1]</a>
Human Body Model (HBM); According to ANSI/ESDA/JEDEC standard JS-001	2 <a href="#">[2]</a>

- [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 <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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.

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[2] The term 'short data sheet' is explained in section "Definitions".

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Date of release: 5 December 2016

Document identifier: BLC10M6XS200