

# BLP05M7200

Power LDMOS transistor

Rev. 4 — 26 February 2016

AMPLEON

Product data sheet

## 1. Product profile

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### 1.1 General description

200 W LDMOS power transistor for various applications such as ISM and RF plasma lighting at frequencies from 425 MHz to 450 MHz.

**Table 1. Typical performance**

*RF performance at  $T_{case} = 25\text{ °C}$ ,  $I_{Dq} = 2\text{ mA}$  in an application circuit.*

Test signal	f (MHz)	V <sub>DS</sub> (V)	P <sub>L(AV)</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)
CW	440	28	210	21	81

### 1.2 Features and benefits

- High efficiency
- Excellent ruggedness
- Excellent thermal stability
- Integrated ESD protection
- Easy power control
- Designed for ISM operation (425 MHz to 450 MHz)
- Input integration for simple board design
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

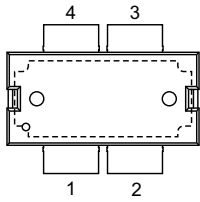
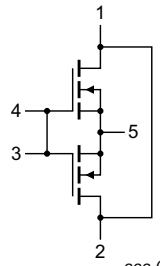
### 1.3 Applications

- RF power amplifiers for CW applications in the 425 MHz to 450 MHz frequency range such as ISM and RF plasma lighting.

## 2. Pinning information

**Table 2. Pinning**

All pins must be connected for correct operation and to prevent damage to the device.

Pin	Description	Simplified outline	Graphic symbol
1, 2	drain		 aaa-008976
3, 4	gate		
5	source <a href="#">[1]</a>		

[1] Connected to flange.

## 3. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
BLP05M7200	HSOP4F	plastic, heatsink small outline package; 4 leads (flat)	SOT1138-2

## 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
$T_{case}$	case temperature		-	150	°C
$T_j$	junction temperature <a href="#">[1]</a>		-	225	°C

[1] Continuous use at maximum temperature will affect the reliability.

## 5. Thermal characteristics

**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 200\text{ W}$	0.5	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	$V_{GS} = 0\text{ V}; I_D = 3.2\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 320\text{ mA}$	1.5	1.9	2.3	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	2.8	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	52	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	280	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 11.2\text{ A}$	-	20	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 11.2\text{ A}$	-	0.08	-	$\Omega$

**Table 7. RF characteristics**

Test signal: CW at 440 MHz; RF performance at  $V_{DS} = 28\text{ V}; I_{Dq} = 2\text{ mA}; T_{case} = 25\text{ °C}$ ; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_L = 210\text{ W}$	19.5	21	-	dB
$RL_{in}$	input return loss	$P_L = 210\text{ W}$	-	-15	-11	dB
$\eta_D$	drain efficiency	$P_L = 210\text{ W}$	73	77	-	%

## 7. Test information

### 7.1 Ruggedness in class-AB operation

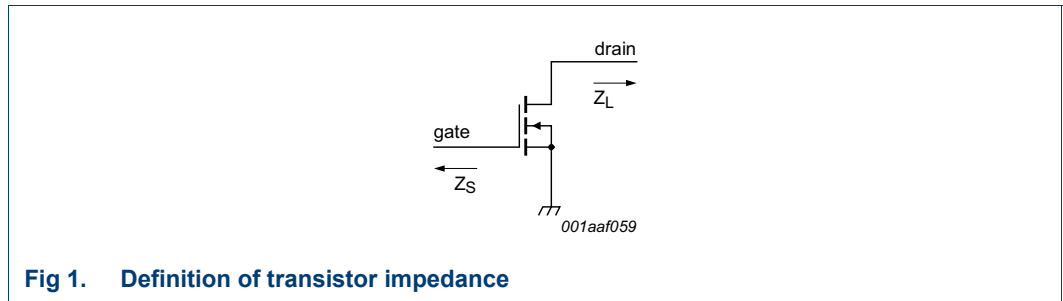
The BLP05M7200 is capable of withstanding a load mismatch corresponding to  $VSWR = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 28\text{ V}; I_{Dq} = 20\text{ mA}; P_L = 200\text{ W}$  (CW);  $f = 440\text{ MHz}$ .

### 7.2 Impedance information

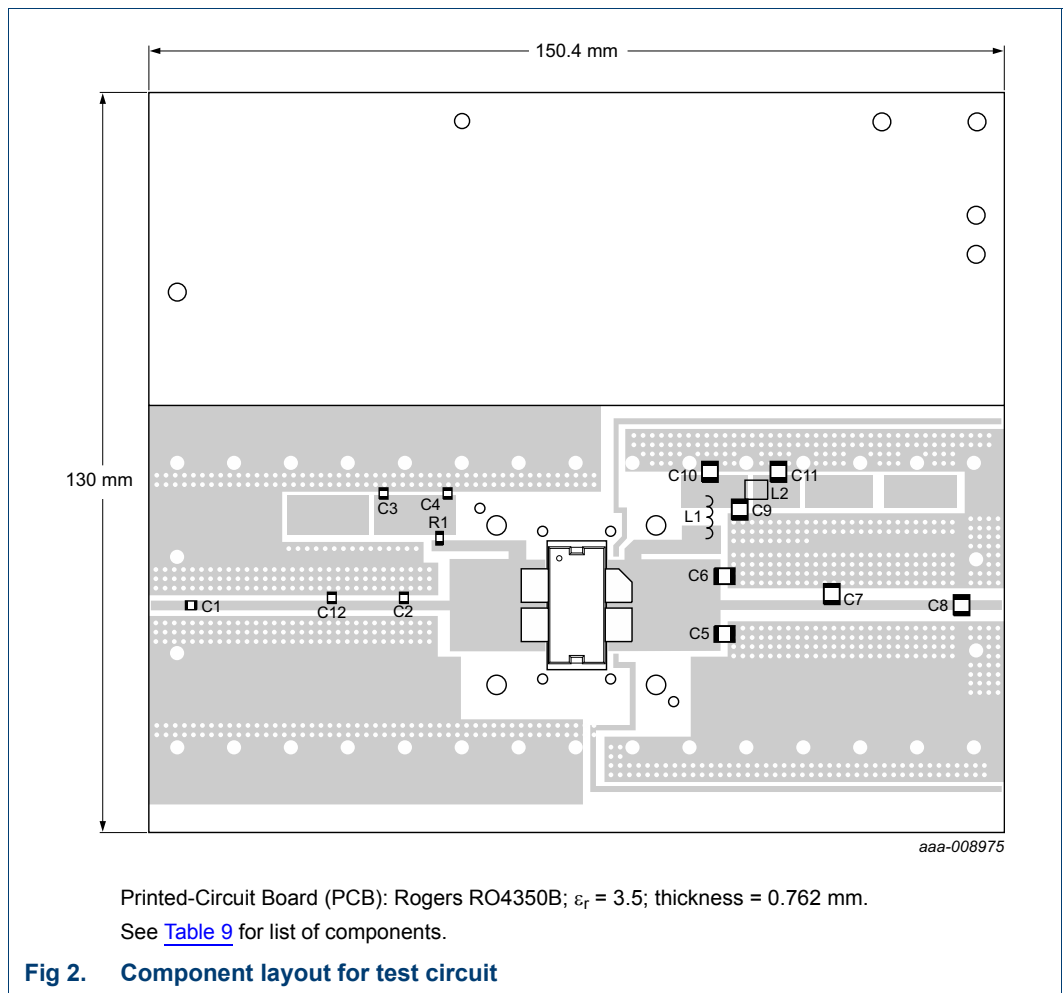
**Table 8. Typical impedance**

Measured load-pull data. Typical values unless otherwise specified.  $I_{Dq} = 20\text{ mA}; V_{DS} = 28\text{ V}$ .  $Z_S$  and  $Z_L$  defined in [Figure 1](#).

f (MHz)	$Z_S$ ( $\Omega$ )	$Z_L$ ( $\Omega$ )
440	$1.5 + j0.7$	$1.1 + j0.14$



7.3 Test circuit



**Table 9. List of components**

For test circuit, see [Figure 2](#).

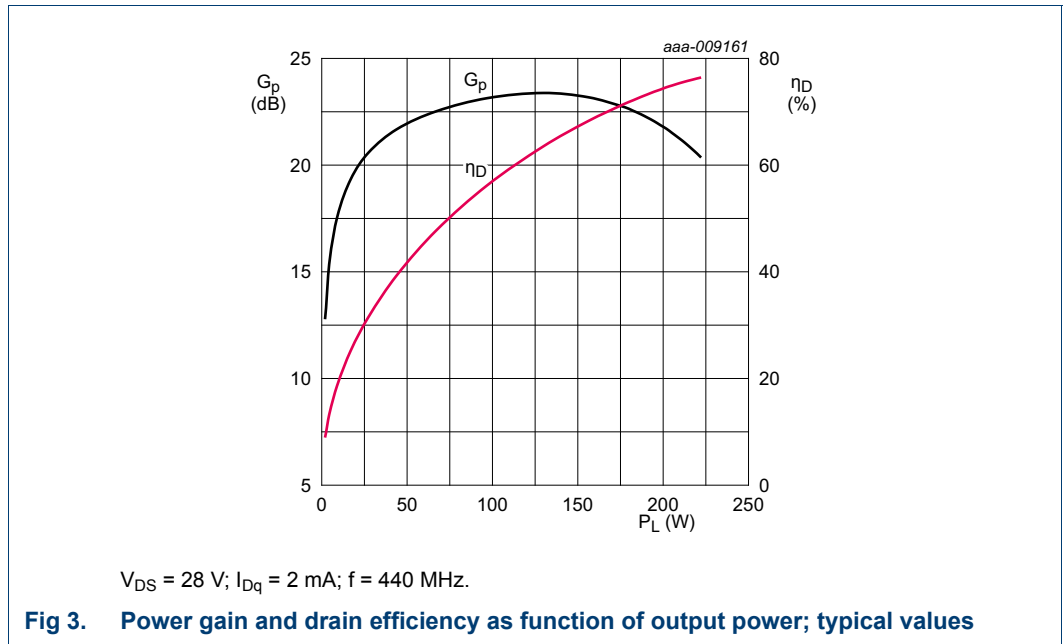
Component	Description	Value	Remarks
C1, C3	multilayer ceramic chip capacitor	160 pF	ATC800A
C2	multilayer ceramic chip capacitor	39 pF	ATC800A
C4, C9	multilayer ceramic chip capacitor	910 pF	ATC800B
C5, C6	multilayer ceramic chip capacitor	33 pF	ATC800B

**Table 9. List of components ...continued**  
 For test circuit, see [Figure 2](#).

Component	Description	Value	Remarks
C7	multilayer ceramic chip capacitor	15 pF	ATC800B
C8, C10	multilayer ceramic chip capacitor	130 pF	ATC800B
C11	electrolytic capacitor	220 $\mu$ F, 63 V	
C12	multilayer ceramic chip capacitor	4.3 pF	ATC800A
R1	chip resistor	10 $\Omega$	Philips SMD 1206
L1	copper wire	6 turns	
L2	copper foil	-	

## 7.4 Graphical data

### 7.4.1 CW



### 8. Package outline

HSOP4F: plastic, heatsink small outline package; 4 leads(flat)

SOT1138-2

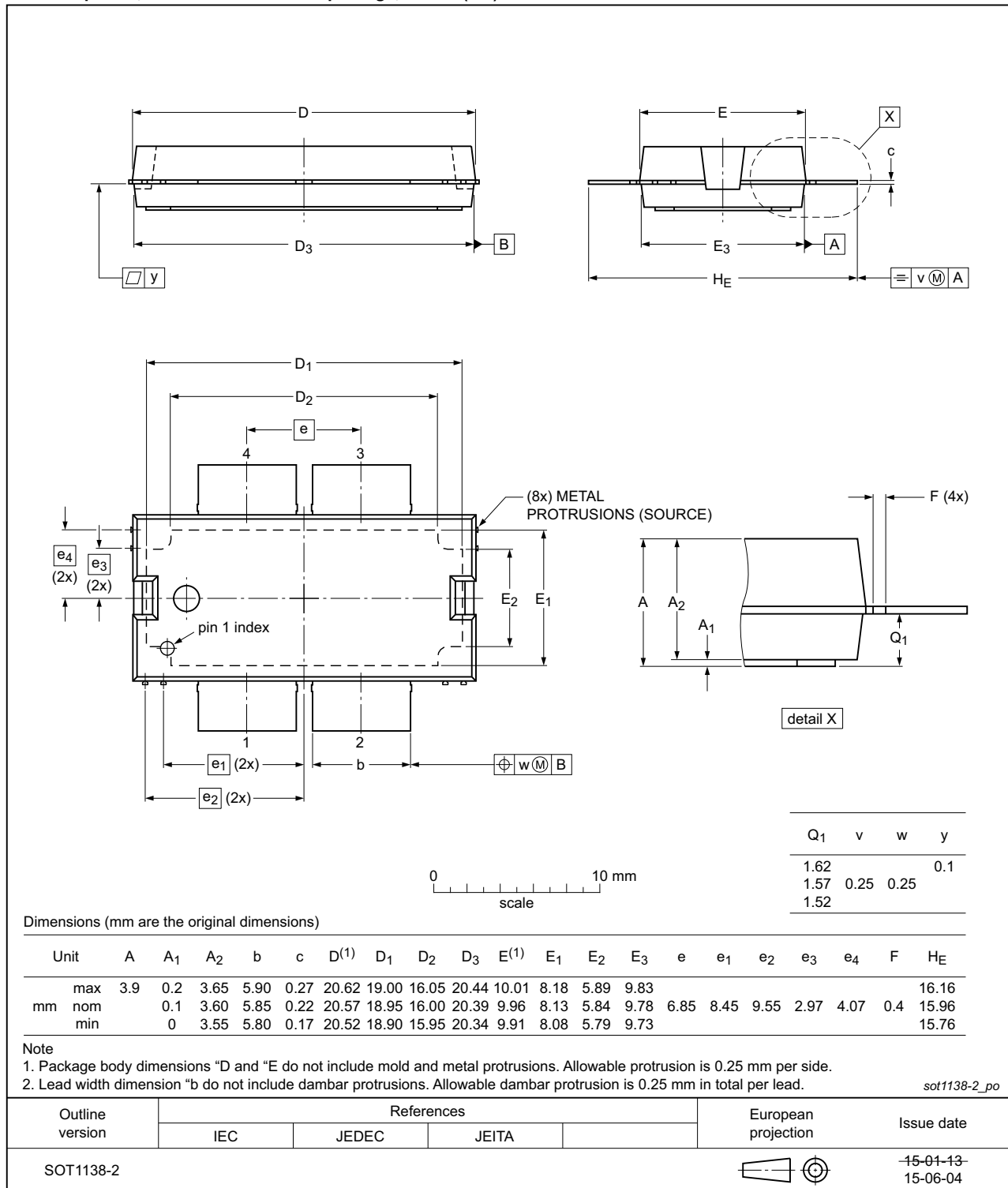


Fig 4. Package outline SOT1138-2 (HSOP4F)

## 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 10. Abbreviations

Acronym	Description
CW	Continuous Wave
ESD	ElectroStatic Discharge
ISM	Industrial, Scientific and Medical
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
SMD	Surface Mounted Device
VSWR	Voltage Standing-Wave Ratio

## 11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLP05M7200 v.4	20160226	Product data sheet		BLP05M7200 v.3
Modifications:	<ul style="list-style-type: none"> <li><a href="#">Table 2 on page 2</a>: The simplified outline has been changed to SOT1138-2</li> <li><a href="#">Table 3 on page 2</a>: Version has been changed to SOT1138-2</li> <li><a href="#">Figure 4 on page 6</a>: The package outline has been changed to SOT1138-2</li> </ul>			
BLP05M7200 v.3	20150901	Product data sheet		BLP05M7200 v.2
BLP05M7200 v.2	20131118	Product data sheet	-	BLP05M7200 v.1
BLP05M7200 v.1	20120906	Objective data sheet	-	-

## 12. Legal information

### 12.1 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.

[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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