BPC10M6X2S200

LDMOS 433 MHz power module

Rev. 1 — 29 March 2018

AMPLEON

Product data sheet

1. Product profile

1.1 General description

200 W LDMOS power module intended for plasma lighting, RF cooking, defrosting and ISM applications driving at the frequency of 433 MHz.

Table 1. Test information

Typical RF performance at T_{mb} = 25 °C; CW and pulsed mode (δ = 90 %; repetition 100 kHz); V_{DS} = 28 V; I_{Dq1} = 50 mA; I_{Dq2} = 100 mA; unless otherwise specified.

Test signal	f	P_L	RL_{in}	G_p	η_{add}
	(MHz)	(W)	(dB)	(dB)	(%)
pulsed RF	433	200	13	38	74
CW	433	200	13	38	74

1.2 Features and benefits

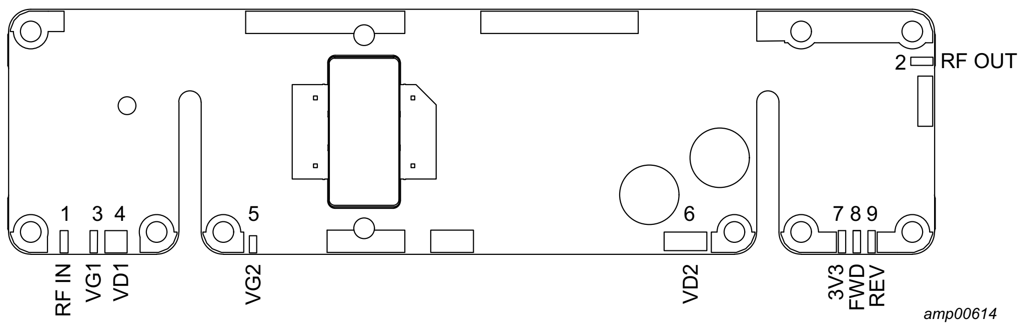
- 200 W pulsed RF power
- Small size: 125 × 33 mm
- Low weight: 85 g
- Sensing forward and reflected power
- Excellent ruggedness, VSWR 10 : 1
- High gain
- Input/output 50 Ω matched
- High efficiency
- Excellent thermal stability
- 100 % RF testing in production
- For RoHS compliance see the product details on the Ampleon website

1.3 Applications

- Plasma lighting, industrial heating, RF cooking and defrosting, medical and scientific

2. Pinning information

2.1 Pinning



Top view.

Fig 1. Pin configuration

2.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
RF IN	1	RF input
RF OUT	2	RF output
VG1	3	gate voltage driver stage
VD1	4	drain voltage driver stage
VG2	5	gate voltage final stage
VD2	6	drain voltage final stage
3V3	7	detector power supply
FWD	8	video output of the forward power detector
REV	9	video output of the reverse (reflected) power detector

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BPC10M6X2S200	-	pallet; 12 mounting holes; 9 terminations	-

4. Block diagram

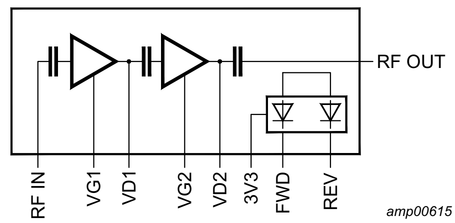


Fig 2. Block diagram

5. Internal circuitry

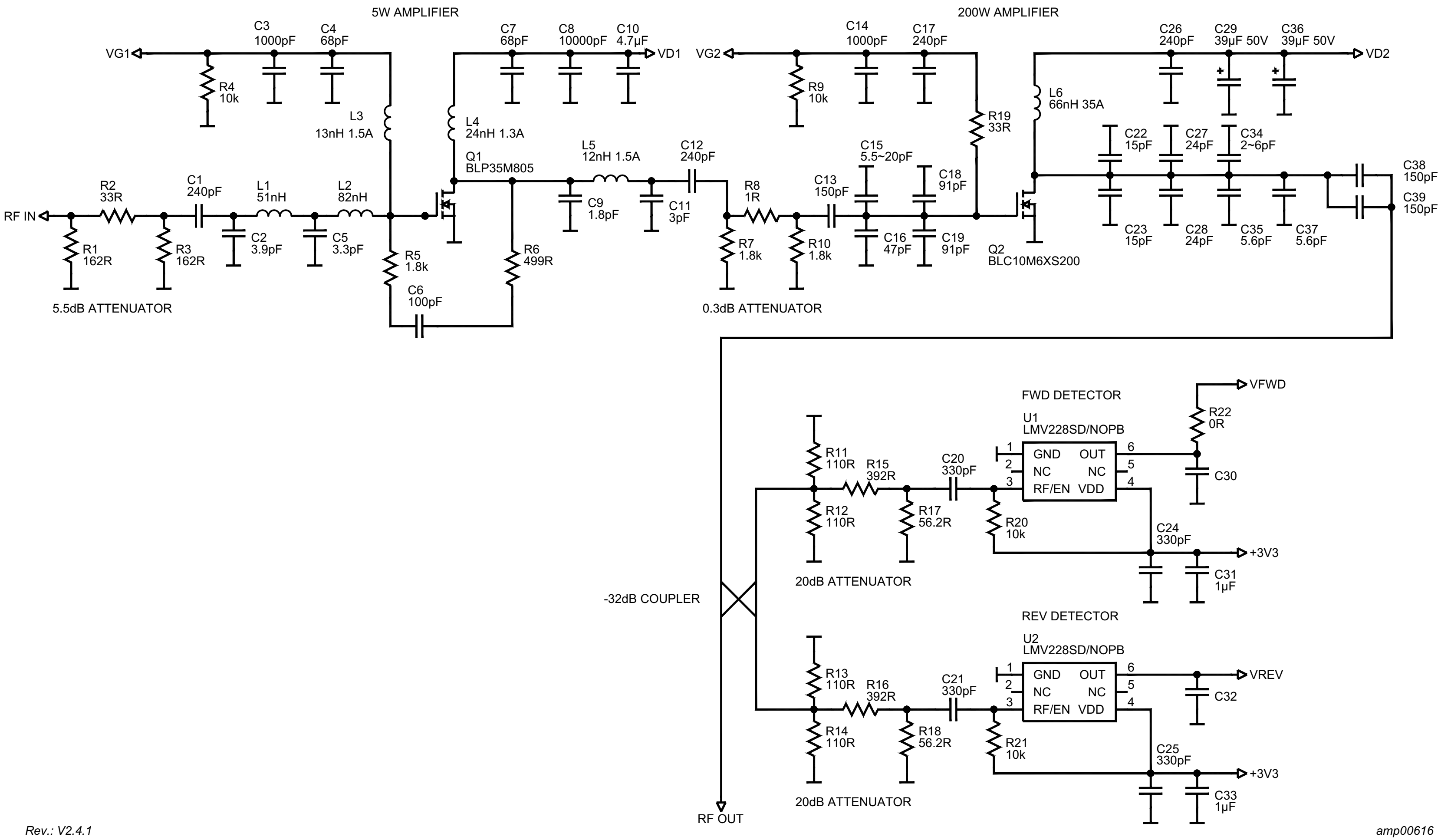


Fig 3. Electric schematic

6. 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		0	65	V
V_{GS}	gate-source voltage		–6	+3	V
T_{stg}	storage temperature		–40	+60	°C
T_{mb}	mounting base temperature		–40	+80	°C

7. Characteristics

Table 5. RF characteristics

Test signal: CW; V_{DS} = 28 V; I_{Dq1} = 50 mA; I_{Dq2} = 100 mA.; T_{mb} = 25 °C; unless otherwise specified.

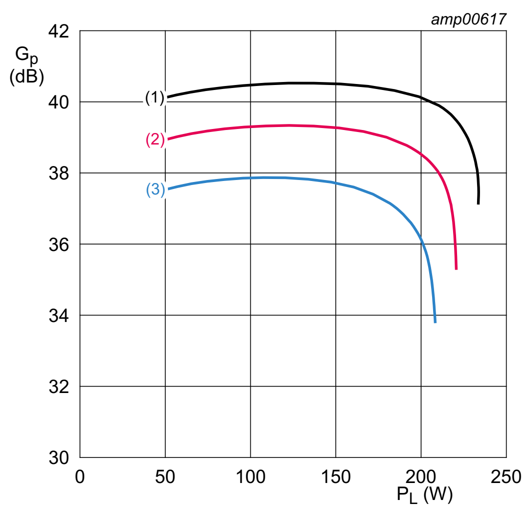
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency	operating	423	433	443	MHz
P_L	output power		-	200	-	W
P_i	input power		-	15	23	dBm
G_p	power gain		30.3	38	42.5	dB
η_D	drain efficiency		69	74	80	%
$\alpha_{sup(H)}$	harmonic suppression		-	–30	-	dBc
P_{cons}	power consumption	DC	-	270	-	W
D_{cpl}	coupler directivity		-	28	-	dB

7.1 Ruggedness

The BPC10M6X2S200 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases for an output power of 200 W CW and pulsed mode (90 % DC, repetition 100 kHz).

8. Test information

8.1 Graphical data



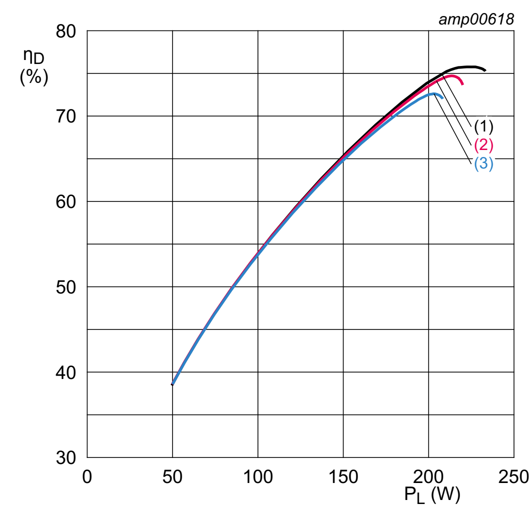
I_{Dq1} = 50 mA; I_{Dq2} = 100 mA; V_{DS} = 28 V; f = 433 MHz.

(1) T_{mb} = –40 °C

(2) T_{mb} = +25 °C

(3) T_{mb} = +80 °C

Fig 4. Power gain as a function of output power; typical values



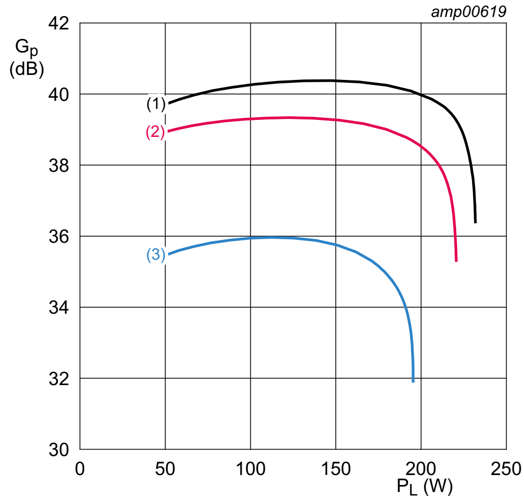
I_{Dq1} = 50 mA; I_{Dq2} = 100 mA; V_{DS} = 28 V; f = 433 MHz.

(1) T_{mb} = –40 °C

(2) T_{mb} = +25 °C

(3) T_{mb} = +80 °C

Fig 5. Drain efficiency as a function of output power; typical values



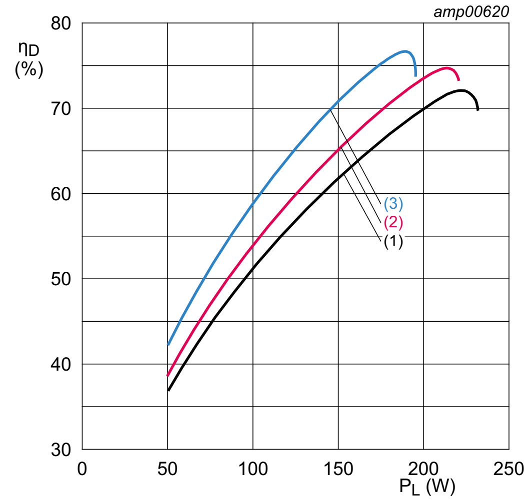
I_{Dq1} = 50 mA; I_{Dq2} = 100 mA; V_{DS} = 28 V; T_{mb} = 25 °C.

(1) f = 423 MHz

(2) f = 433 MHz

(3) f = 443 MHz

Fig 6. Power gain as a function of output power; typical values



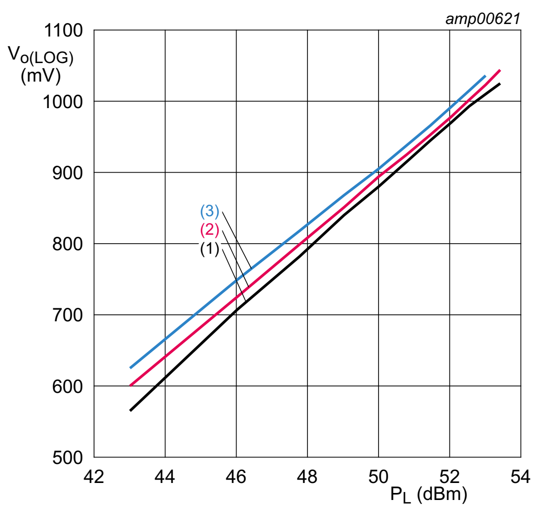
I_{Dq1} = 50 mA; I_{Dq2} = 100 mA; V_{DS} = 28 V; T_{mb} = 25 °C.

(1) f = 423 MHz

(2) f = 433 MHz

(3) f = 443 MHz

Fig 7. Drain efficiency as a function of output power; typical values

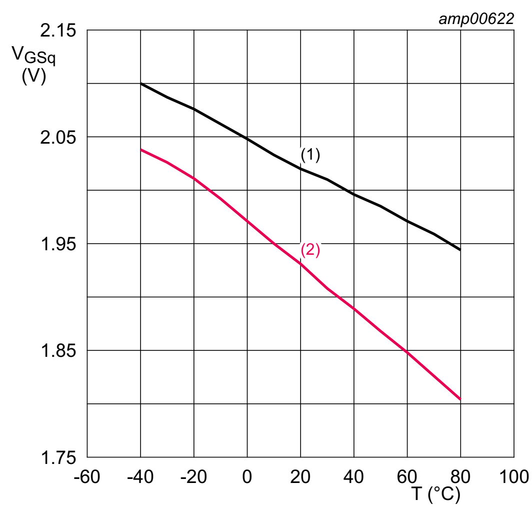


(1) T_{mb} = –40 °C

(2) T_{mb} = +25 °C

(3) T_{mb} = +80 °C

Fig 8. LOG detector output voltage as a function of output power; typical values



V_{DS} = 28 V; T_{mb} = 25 °C.

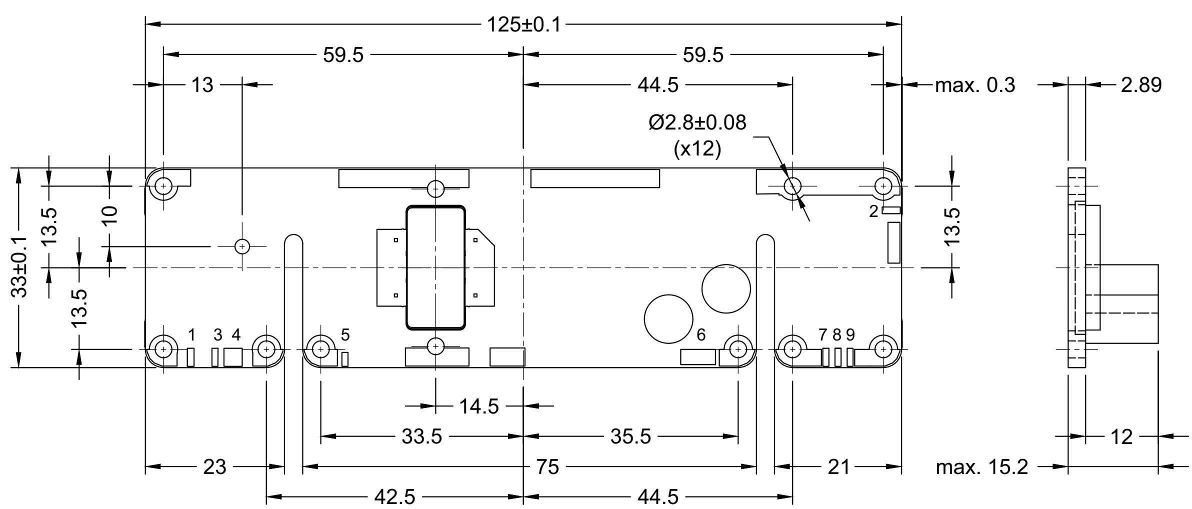
(1) V_{GS1} at I_{DQ1} = 50 mA

(2) V_{GS2} at I_{DQ2} = 100 mA

Fig 9. Gate-source quiescent currents as a function of temperature; typical values

9. Package outline

Pallet; 12 mounting holes; 9 terminations BPC10M6X2S200



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Outline version	units in mm	Tolerances unless otherwise stated: Dimensions: ± 0.15 Angle: ± 1°	European projection	Issue date
BPC10M6X2S200				2018-03-22

Fig 10. Package outline

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 6. 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 7. Abbreviations

Acronym	Description
CW	Continuous Wave
ISM	Industrial, Scientific and Medical
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
RoHS	Restriction of Hazardous Substances
VSWR	Voltage Standing Wave Ratio

12. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BPC10M6X2S200 v.1	20180329	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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.ampleon.com.

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15. Contents

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