BLP8G27-10

Power LDMOS transistor

Rev. 2 — 1 September 2015

AMPLEON

Product data sheet

1. Product profile

1.1 General description

10 W plastic LDMOS power transistor for base station applications at frequencies from 700 MHz to 2700 MHz.

Table 1. Application performance (multiple frequencies)

Typical RF performance at T_{case} = 25 °C; I_{Dq} = 110 mA; in a class-AB application circuit.

Test signal	f (MHz)	I_{Dq} (mA)	V_{DS} (V)	$P_{L(AV)}$ (dBm)	G_p (dB)	η_D (%)	$ACPR_{5M}$ (dBc)
Pulsed CW	2700	110	28	33	17	19	-
2-carrier W-CDMA [1]	2700	110	28	33	17	22	–47.3

[1] Test signal: 2-carrier W-CDMA; carrier spacing = 5 MHz. PAR = 8.4 dB at 0.01 % probability on CCDF.

1.2 Features and benefits

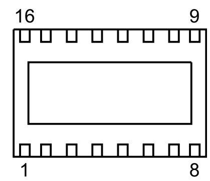
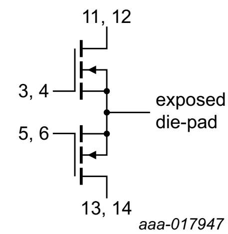
- High efficiency
- Excellent ruggedness
- Designed for broadband operation
- Excellent thermal stability
- High power gain
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- CDMA
- W-CDMA
- GSM EDGE
- MC-GSM
- LTE
- WiMAX

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol [1]
1, 2, 7, 8, 9, 10, 15, 16	n.c.	 Transparent top view	
3, 4, 5, 6	gate		
11, 12, 13, 14	drain		
exposed die-pad	source [2]		

[1] To be used in single ended applications only.

[2] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLP8G27-10	HVSON16	plastic thermal enhanced very thin small outline package; no leads;16 terminals; body 4 × 6 × 0.85 mm	SOT1371-1

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		-	225	°C

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	T_{case} = 80 °C; P_L = 2 W	3.2	K/W

6. Characteristics

Table 6. DC characteristics

T_j = 25 °C; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	V_{GS} = 0 V; I_D = 0.18 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 18 mA	1.5	1.9	2.3	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	−1.4	-	+1.4	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V	-	3.2	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	140	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 18 mA	-	160	-	mS
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V; I_D = 630 mA	-	1000	-	mΩ

Table 7. RF characteristics

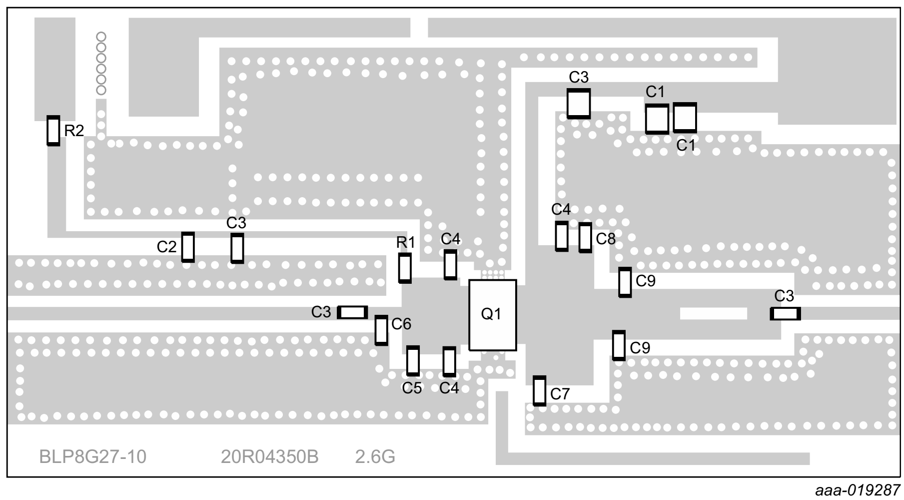
A derivative functional RF test is performed in production. The performance as mentioned below is verified by design and characterization in an NXP class-AB application board.

Test signal: pulsed CW; δ = 10%; t_p = 100 μs; V_{DS} = 28 V; I_{Dq} = 110 mA; T_{case} = 25 °C; f = 2140 MHz

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 2 W	16	17	-	dB
η_D	drain efficiency	$P_{L(AV)}$ = 2 W	17	19	-	%
$P_{L(1dB)}$	output power at 1 dB gain compression		10	-	-	W

7. Application information

7.1 Application circuit



Printed-Circuit Board (PCB): Rogers RO4350B; ε_r = 3.5; thickness = 0.508 mm; thickness copper plating = 35 μm.

See Table 8 for list of components.

Fig 1. Component layout

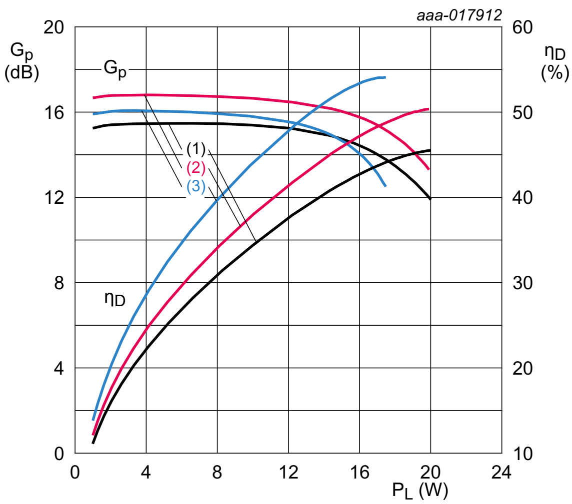
Table 8. List of components

See Figure 1 for component layout.

Component	Description	Value	Remarks
C1	multilayer ceramic chip capacitor	10 μF	Murata
C2	multilayer ceramic chip capacitor	1 μF	Murata
C3	multilayer ceramic chip capacitor	15 pF	ATC 600F
C4	multilayer ceramic chip capacitor	2 pF	ATC 600F
C5	multilayer ceramic chip capacitor	1.3 pF	ATC 600F
C6	multilayer ceramic chip capacitor	0.5 pF	ATC 600F
C7	multilayer ceramic chip capacitor	1.8 pF	ATC 600F
C8	multilayer ceramic chip capacitor	0.3 pF	ATC 600F
C9	multilayer ceramic chip capacitor	0.9 pF	ATC 600F
R1	chip resistor	5.1 Ω	
R2	chip resistor	0 Ω	
Q1	transistor	-	BLP8G27-10

7.2 Graphical data

7.2.1 Pulsed CW



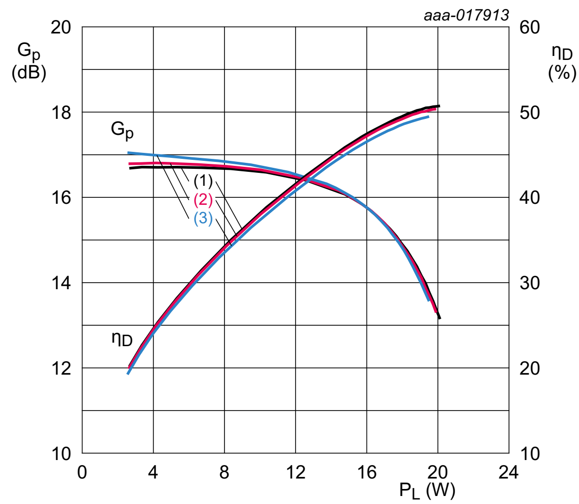
V_{DS} = 28 V; I_{Dq} = 110 mA; T_{case} = 25 °C; δ = 10 %; t_p = 100 μs.

(1) f = 2500 MHz

(2) f = 2600 MHz

(3) f = 2700 MHz

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



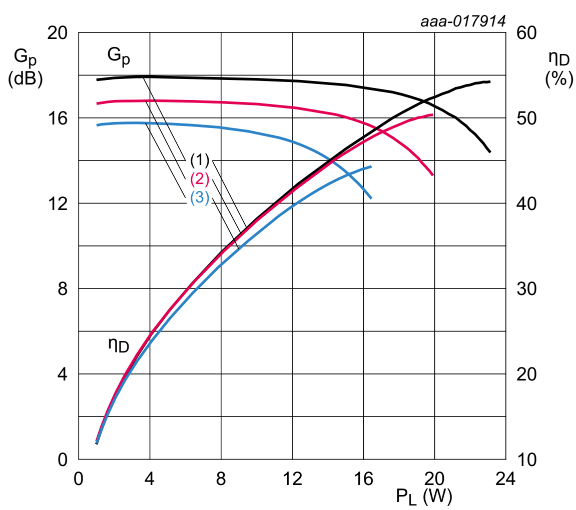
V_{DS} = 28 V; T_{case} = 25 °C; f = 2600 MHz; δ = 10 %; t_p = 100 μs.

(1) I_{Dq} = 90 mA

(2) I_{Dq} = 110 mA

(3) I_{Dq} = 130 mA

Fig 3. Power gain and drain efficiency as function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 110 mA; f = 2600 MHz; δ = 10 %; t_p = 100 μs.

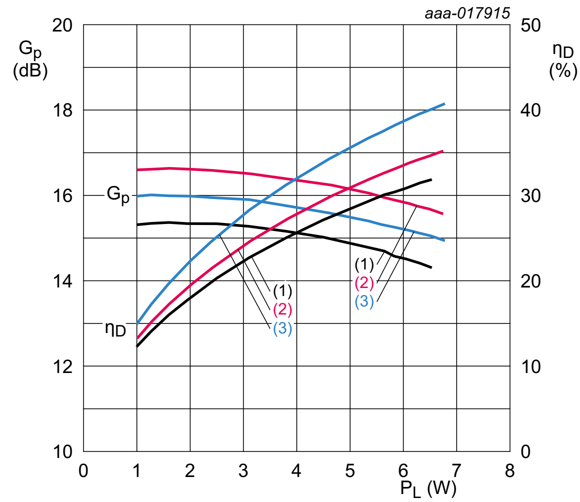
(1) T_{case} = −37 °C

(2) T_{case} = +25 °C

(3) T_{case} = +85 °C

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

7.2.2 2-Carrier W-CDMA



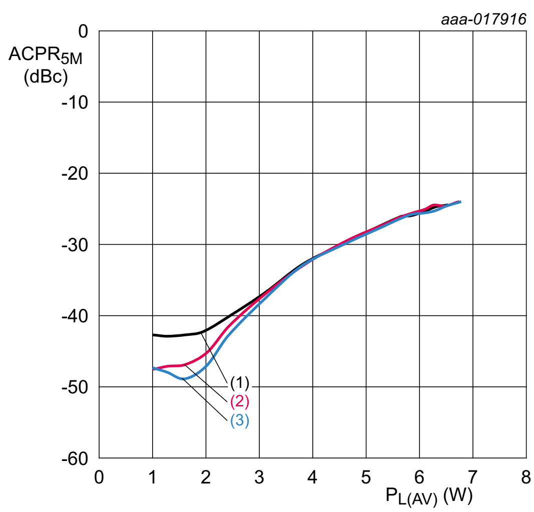
V_{DS} = 28 V; I_{Dq} = 110 mA; T_{case} = 25 °C; carrier spacing = 5 MHz; 46 % clipping; PAR = 8.4 dB at 0.01 % probability on CCDF.

(1) f = 2500 MHz

(2) f = 2600 MHz

(3) f = 2700 MHz

Fig 5. Power gain and drain efficiency as function of output power; typical values



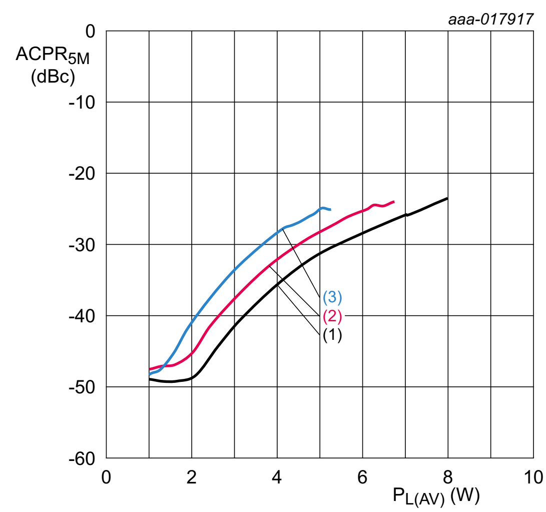
V_{DS} = 28 V; I_{Dq} = 110 mA; T_{case} = 25 °C; carrier spacing = 5 MHz; 46 % clipping; PAR = 8.4 dB at 0.01 % probability on CCDF.

(1) f = 2500 MHz

(2) f = 2600 MHz

(3) f = 2700 MHz

Fig 6. Adjacent channel power ratio (5 MHz) as a function of average output power; typical values



V_{DS} = 28 V; I_{Dq} = 110 mA; f = 2600 MHz; carrier spacing = 5 MHz; 46 % clipping; PAR = 8.4 dB at 0.01 % probability on CCDF.

(1) T_{case} = −37 °C

(2) T_{case} = +25 °C

(3) T_{case} = +85 °C

Fig 7. Adjacent channel power ratio (5 MHz) as a function of average output power; typical values

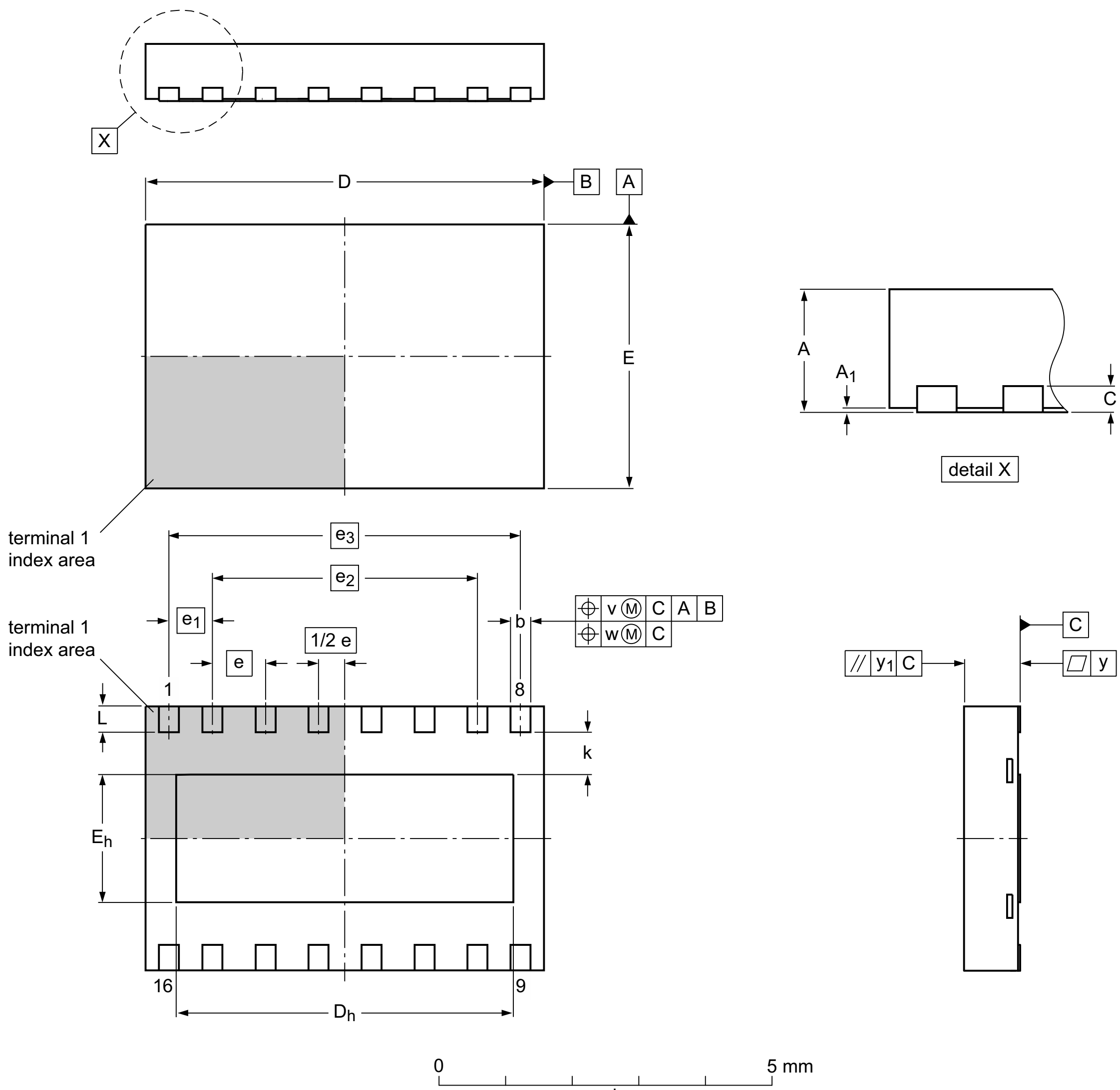
8. Test information

8.1 Ruggedness in class-AB operation

The BLP8G27-10 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 28 V; I_{Dq} = 110 mA; P_L = 2 W; frequency from 700 MHz to 2700 MHz.

9. Package outline

HVSON16: plastic thermal enhanced very thin small outline package; no leads; 16 terminals; body 4 x 6 x 0.85 mm **SOT1371-1**



Dimensions (mm are the original dimensions)

Unit		A	A_1	b	C	$D^{(1)}$	D_h	$E^{(1)}$	E_h	e	e_1	e_2	e_3	L	k	v	w	y	y_1
	max	1.00	0.05	0.35		6.1	5.2	4.1	2.0					0.5	0.70				
mm	nom	0.85	0.03	0.30	0.2	6.0	5.1	4.0	1.9	0.8	0.65	4.0	5.3	0.4	0.65	0.1	0.05	0.05	0.1
	min	0.80	0.00	0.25		5.9	5.0	3.9	1.8					0.3	0.60				

Note
1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

sot1371-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1371-1		MO-229				~~14-05-19~~ 14-08-26

Fig 8. Package outline SOT1371-1 (HVSON16)

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.

11. Abbreviations

Table 9. Abbreviations

Acronym	Description
CCDF	Complementary Cumulative Distribution Function
CDMA	Code Division Multiple Access
CW	Continuous Wave
EDGE	Enhanced Data rates for GSM Evolution
ESD	ElectroStatic Discharge
GSM	Global System for Mobile Communication
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LTE	Long Term Evolution
MC-GSM	Multi Carrier GSM
PAR	Peak-to-Average Ratio
VSWR	Voltage Standing-Wave Ratio
W-CDMA	Wideband Code Division Multiple Access
WiMAX	Worldwide Interoperability for Microwave Access

12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLP8G27-10 v.2	20150901	Product data sheet	-	BLP8G27-10 v.1
Modifications:	• The format of this document has been redesigned to comply with the new identity guidelines of Ampleon • Legal texts have been adapted to the new company name where appropriate			
BLP8G27-10 v.1	20150824	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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