THE DATASHEET OF

BLF8G27LS-150GVQ

BLF8G27LS-150V; BLF8G27LS-150GV

Power LDMOS transistor

AMPLEON

Rev. 4 — 1 September 2015

Product data sheet

1. Product profile

1.1 General description

150W LDMOS power transistor with improved video bandwidth for base station applications at frequencies from 2500 MHz to 2700 MHz.

Table 1. Typical performance

Typical RF performance at T_{case} = 25 °C in a common source class-AB production test circuit.

Test signal	f (MHz)	I_{Dq} (mA)	V_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	$ACPR_{5M}$ (dBc)
2-carrier W-CDMA	2600 to 2700	1300	28	45	18	30	–30[1]

[1] 3GPP test model 1; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on CCDF; carrier spacing 5 MHz. Channel bandwidth is 3.84 MHz.

1.2 Features and benefits

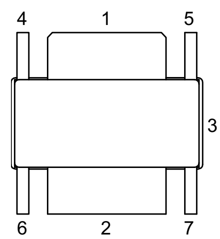
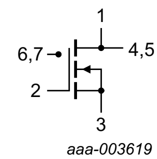
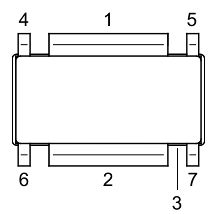
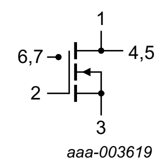
- Excellent ruggedness
- High efficiency
- Low R_{th} providing excellent thermal stability
- Decoupling leads to enable improved video bandwidth (60 MHz typical)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent digital pre-distortion capability
- Internally matched for ease of use
- Integrated ESD protection
- Design optimized for gull-wing
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- RF power amplifiers for W-CDMA base stations and multi carrier applications in the 2500 MHz to 2700 MHz frequency range

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BLF8G27LS-150V (SOT1244B)			
1	drain		
2	gate		
3	source [1]		
4	decoupling lead		
5	decoupling lead		
6	n.c.		
7	n.c.		
BLF8G27LS-150GV (SOT1244C)			
1	drain		
2	gate		
3	source [1]		
4	decoupling lead		
5	decoupling lead		
6	n.c.		
7	n.c.		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF8G27LS-150V	-	earless flanged ceramic package; 6 leads	SOT1244B
BLF8G27LS-150GV	-	earless flanged ceramic package; 6 leads	SOT1244C

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.

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 = 45 W	0.30	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 = 2.16 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 216 mA	1.5	1.9	2.3	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	4.5	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	-	40	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	450	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 10.8 A	-	16	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 7.56 A	-	0.06	-	Ω

Table 7. RF characteristics

Test signal: 2-carrier W-CDMA, 3GPP test model; 64 DPCH; PAR = 8.4 dB at 0.01 % probability on the CCDF, carrier spacing 5 MHz; f_1 = 2602.5 MHz; f_2 = 2607.5 MHz; f_3 = 2692.5 MHz; f_4 = 2697.5 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 1300 mA; T_{case} = 25 °C; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 45 W	16.8	18	-	dB
RL_{in}	input return loss	$P_{L(AV)}$ = 45 W	-	−10	−7	dB
η_D	drain efficiency	$P_{L(AV)}$ = 45 W	26	30	-	%
$ACPR_{5M}$	adjacent channel power ratio (5 MHz)	$P_{L(AV)}$ = 45 W	-	−30	−26	dBc

7. Test information

7.1 Ruggedness in class-AB operation

The BLF8G27LS-150V and BLF8G27LS-150GV are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 28 V; I_{Dq} = 1300 mA; P_L = 150 W (CW); f = 2600 MHz.

7.2 Impedance information

Table 8. Typical impedance

Measured load-pull data; I_{Dq} = 1300 mA; V_{DS} = 28 V.

f (MHz)	Z_S [1] (Ω)	Z_L [1] (Ω)
BLF8G27LS-150V		
2500	0.70 – j3.50	2.68 – j1.86
2600	1.10 – j4.40	2.86 – j2.03
2700	2.00 – j4.90	3.27 – j1.87
BLF8G27LS-150GV		
2500	1.00 – j5.70	2.35 – j4.04
2600	1.50 – j6.90	2.52 – j4.32
2700	2.10 – j8.00	3.21 – j4.36

[1] Z_S and Z_L defined in Figure 1.

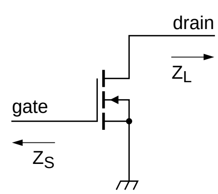
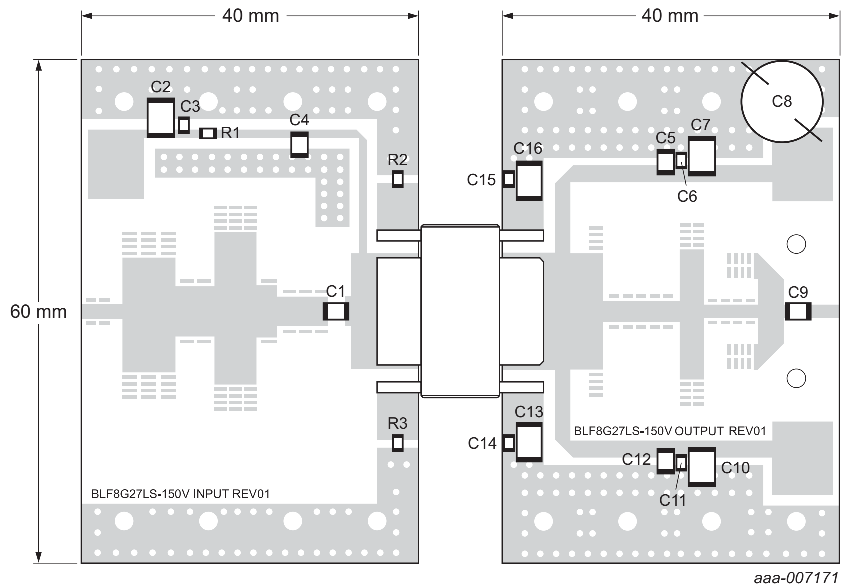


Fig 1. Definition of transistor impedance

7.3 Test circuit



Printed-Circuit Board (PCB): Rogers 4350B. See Table 9 for a list of components.

Fig 2. Component layout

Table 9. List of components

See Figure 2 for component layout.

The used PCB material is Rogers RO4350B with a thickness of 0.76 mm.

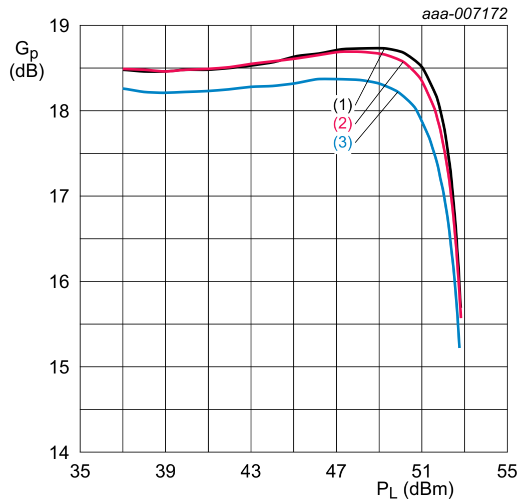
Component	Description	Value		Remarks
C1	multilayer ceramic chip capacitor	0.7 μF	[1]	ATC800B
C2	multilayer ceramic chip capacitor	1 μF	[2]	Murata
C3	multilayer ceramic chip capacitor	100 nF	[2]	Murata
C4, C5, C9, C12	multilayer ceramic chip capacitor	24 pF	[1]	ATC800B
C6, C11, C14, C15	multilayer ceramic chip capacitor	220 nF	[2]	Murata
C7, C10, C13, C16	multilayer ceramic chip capacitor	4.7 μF, 50 V	[2]	Murata
C8	electrolytic capacitor	> 470 μF, 63 V		
R1	chip resistor	4.7 Ω, 1 % tolerance		SMD 1206
R2, R3	chip resistor	0 Ω		SMD 1206

[1] American Technical Ceramics type 800B or capacitor of same quality.

[2] Murata or capacitor of same quality.

7.4 Graphical data

7.4.1 Pulsed CW



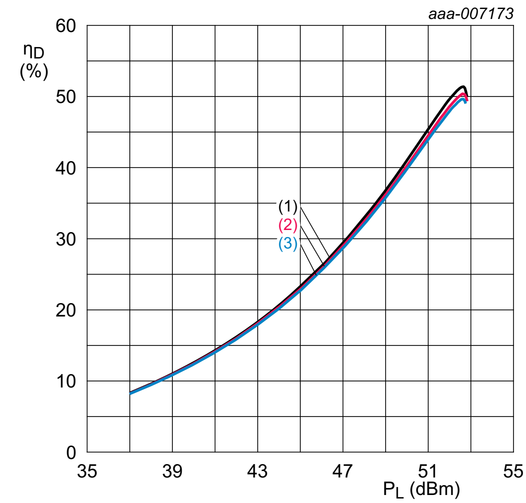
V_{DS} = 28 V; I_{Dq} = 1300 mA; t_p = 100 μs; δ = 10 %.

(1) f = 2600 MHz

(2) f = 2655 MHz

(3) f = 2700 MHz

Fig 3. Power gain as a function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 1300 mA; t_p = 100 μs; δ = 10 %.

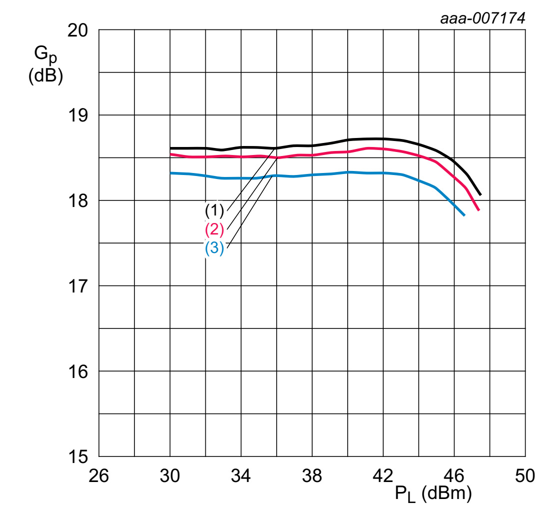
(1) f = 2600 MHz

(2) f = 2655 MHz

(3) f = 2700 MHz

Fig 4. Drain efficiency as a function of out power; typical values

7.4.2 IS-95



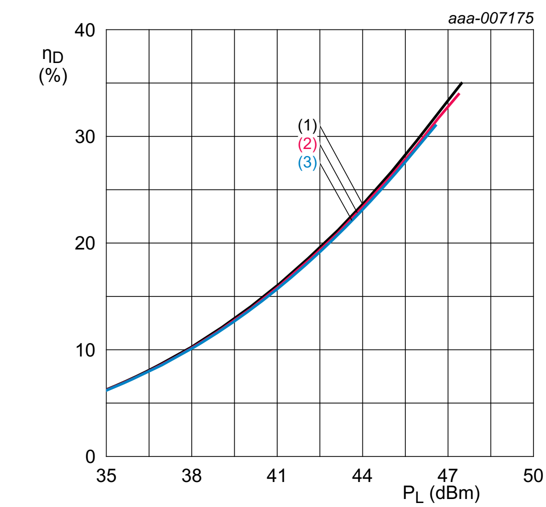
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 5. Power gain as a function of output power; typical values



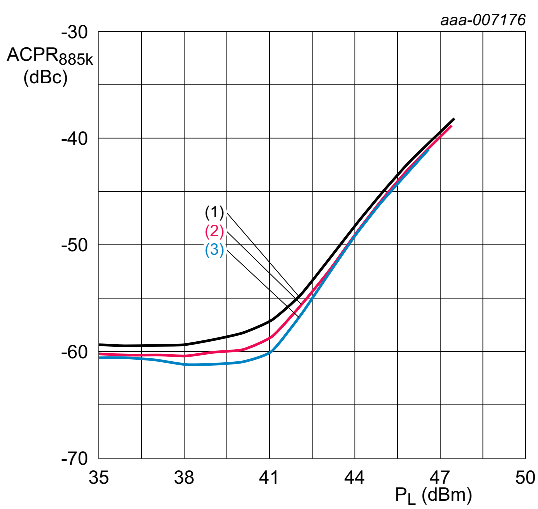
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 6. Drain efficiency as a function of output power; typical values



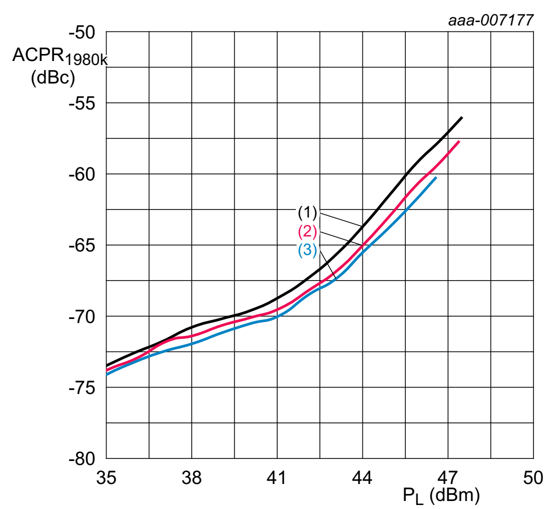
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 7. Adjacent channel power ratio (885 kHz) as a function of output power; typical values



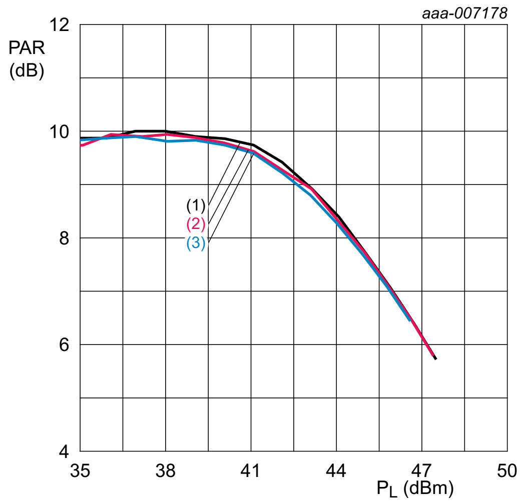
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 8. Adjacent channel power ratio (1980 kHz) as a function of output power; typical values



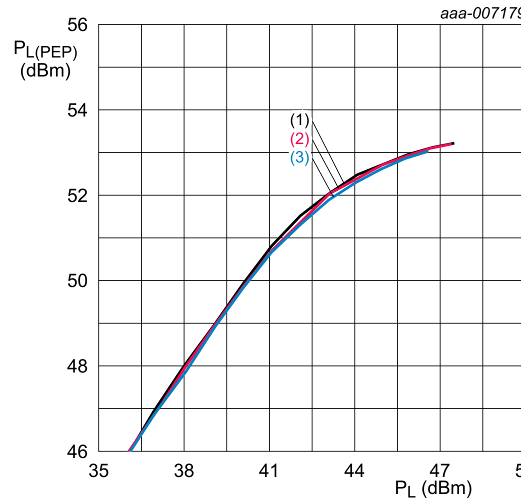
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 9. Peak-to-average power ratio as a function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 1300 mA.

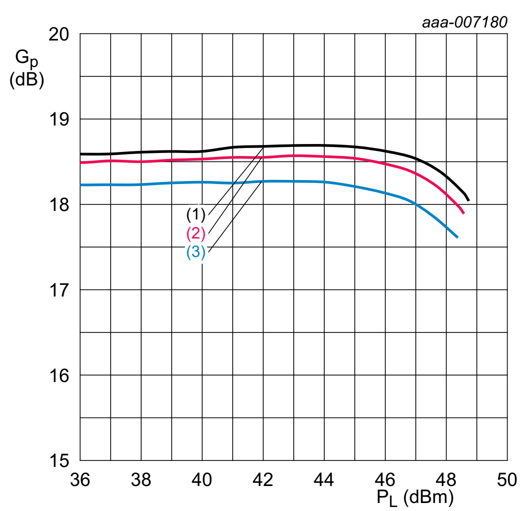
(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 10. Peak envelope power load power as a function of output power; typical values

7.4.3 1-Carrier W-CDMA



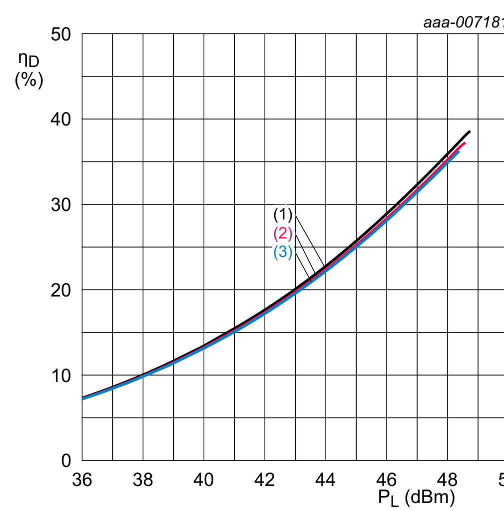
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2602.5 MHz

(2) f = 2655 MHz

(3) f = 2697.5 MHz

Fig 11. Power gain as a function of output power; typical values



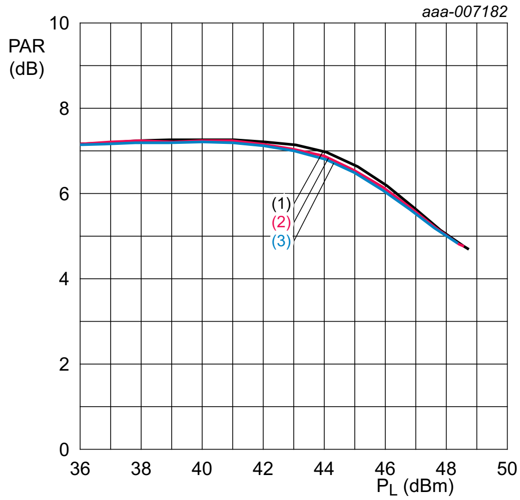
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2602.5 MHz

(2) f = 2655 MHz

(3) f = 2697.5 MHz

Fig 12. Drain efficiency as a function of output power; typical values



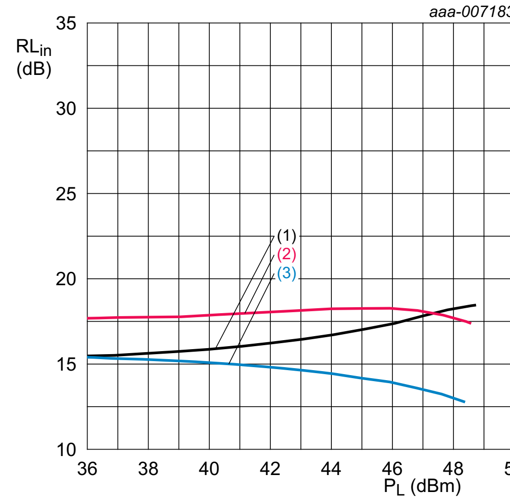
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2602.5 MHz

(2) f = 2655 MHz

(3) f = 2697.5 MHz

Fig 13. Peak-to-average power ratio as a function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 1300 mA.

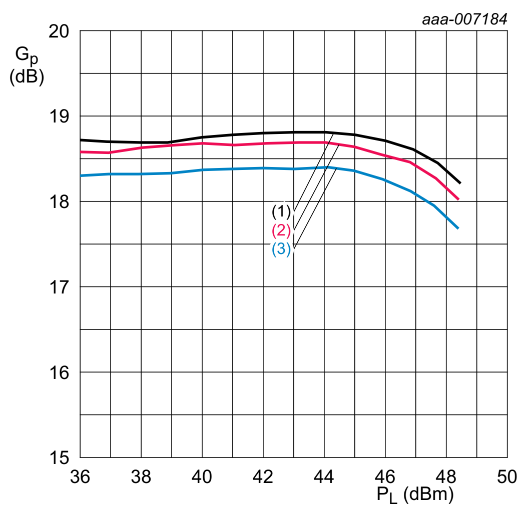
(1) f = 2602.5 MHz

(2) f = 2655 MHz

(3) f = 2697.5 MHz

Fig 14. Input return loss as a function of output power; typical values

7.4.4 2-Carrier W-CDMA



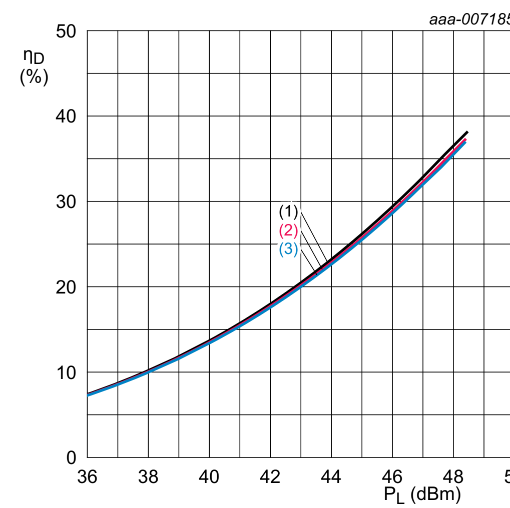
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 15. Power gain as a function of output power; typical values



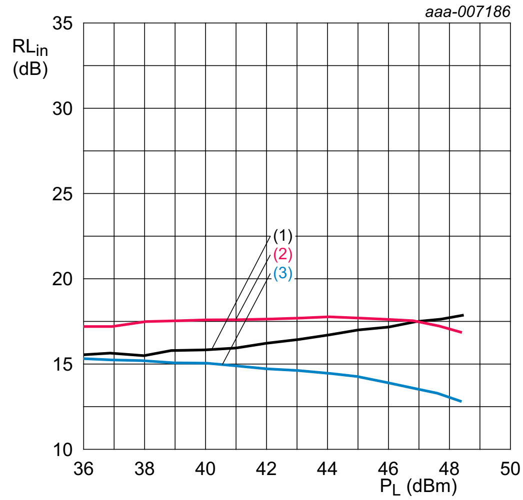
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 16. Drain efficiency as a function of output power; typical values



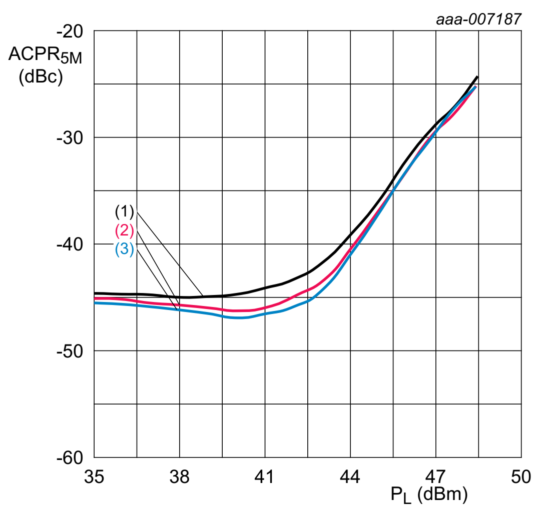
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 17. Input return loss as a function of output power; typical values



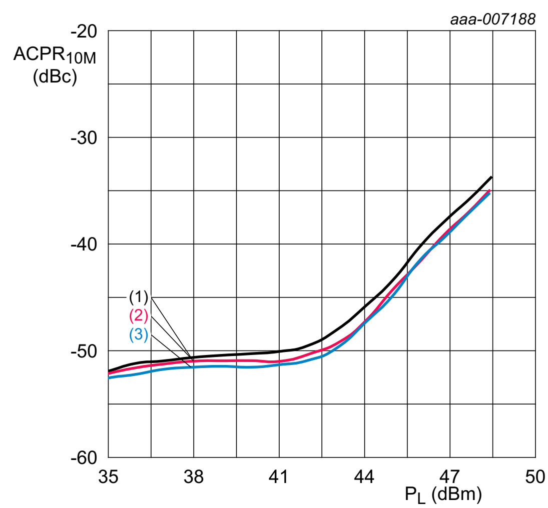
V_{DS} = 28 V; I_{Dq} = 1300 mA.

(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 18. Adjacent channel power ratio (5 MHz) as a function of output power; typical values



V_{DS} = 28 V; I_{Dq} = 1300 mA.

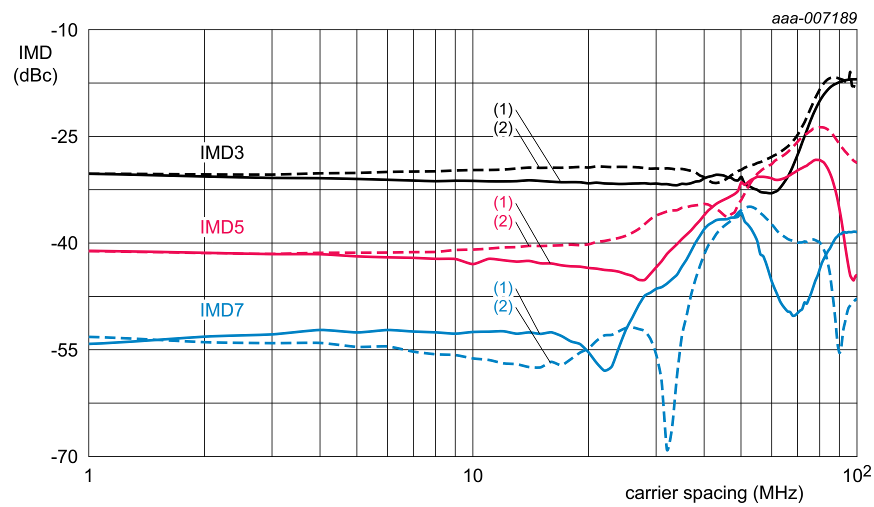
(1) f = 2605 MHz

(2) f = 2655 MHz

(3) f = 2695 MHz

Fig 19. Adjacent channel power ratio (10 MHz) as a function of output power; typical values

7.4.5 2-Tone VBW



V_{DS} = 28 V; I_{Dq} = 1300 mA.

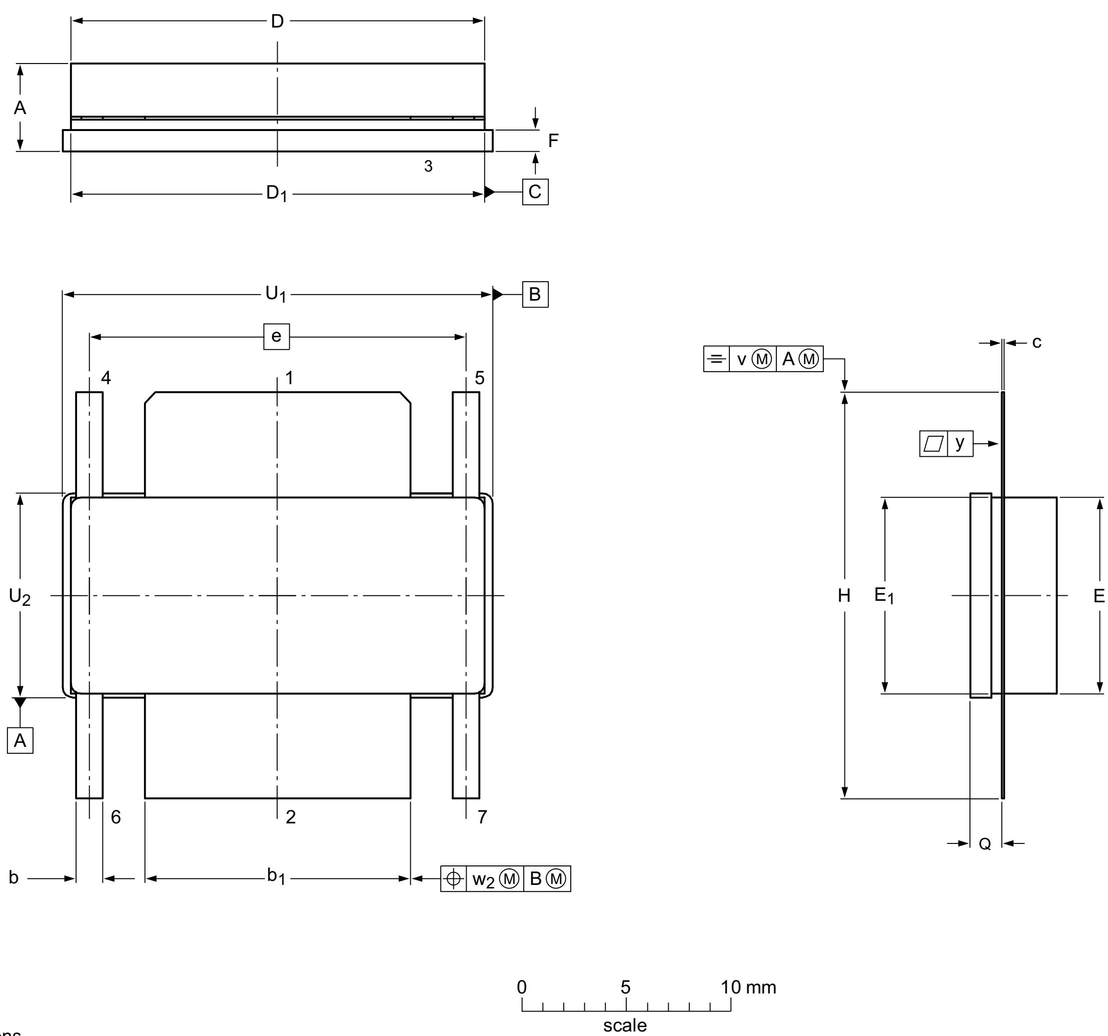
(1) low

(2) high

Fig 20. VBW capacity in class-AB test circuit

8. Package outline

Earless flanged ceramic package; 6 leads **SOT1244B**



Dimensions

Unit(1)		A	b	b_1	c	D	D_1	e	E	E_1	F	H	Q(2)	U_1	U_2	v	w_2	y
mm	max	4.75	1.41	12.83	0.18	20.02	19.96		9.53	9.53	1.14	19.94	1.70	20.70	9.91	0.25	0.25	0.25
	nom							18.03										
	min	3.45	1.14	12.57	0.10	19.61	19.66		9.27	9.27	0.89	18.92	1.45	20.45	9.65			
inches	max	0.187	0.055	0.505	0.007	0.788	0.786		0.375	0.375	0.045	0.785	0.067	0.815	0.39	0.01	0.01	0.01
	nom							0.710										
	min	0.136	0.045	0.495	0.004	0.772	0.774		0.365	0.365	0.035	0.745	0.057	0.805	0.38			

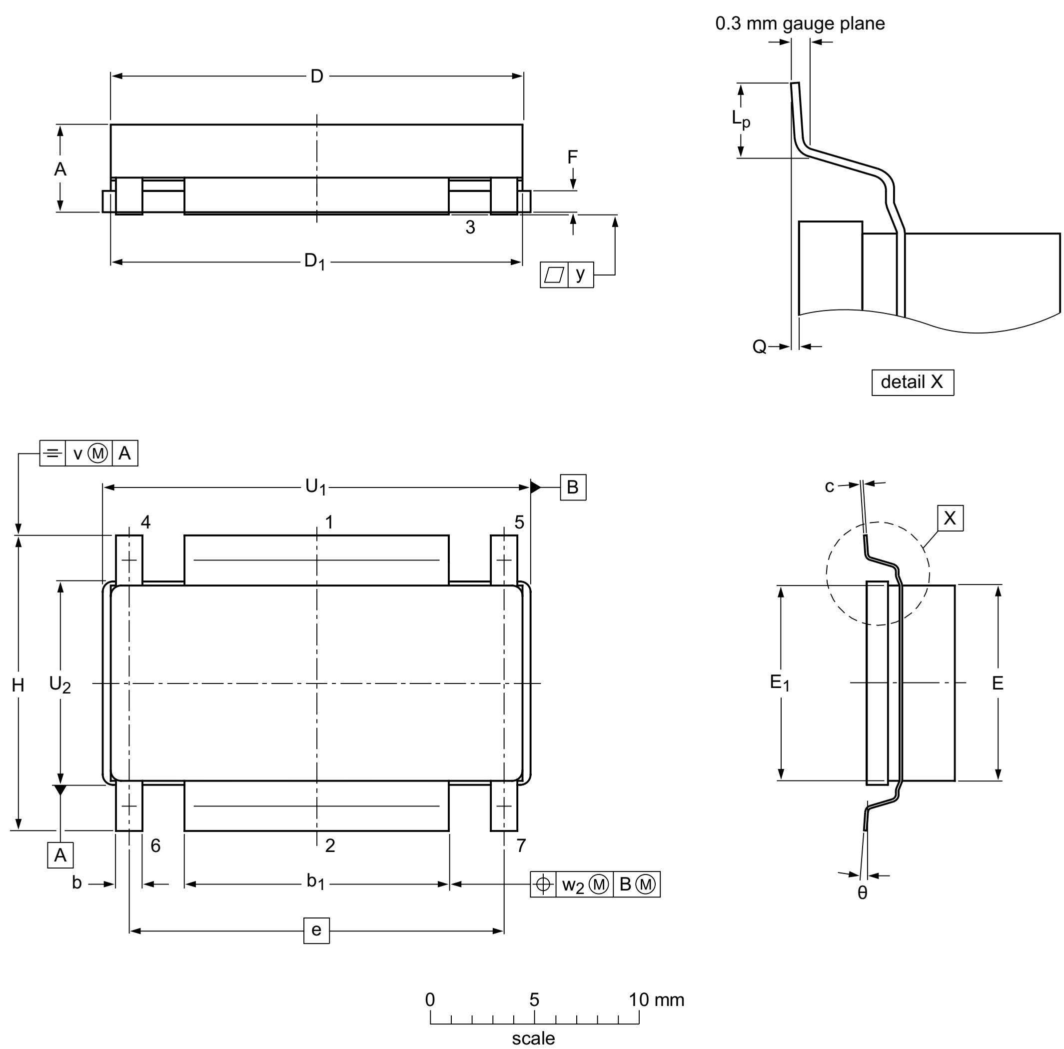
Note
1. Millimeter dimensions are derived from the original inch dimensions.
2. Dimension is measured 0.030 inch (0.76 mm) from body.

sot1244b_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1244B						~~12-04-18~~ 12-05-07

Fig 21. Package outline SOT1244B

Earless flanged ceramic package; 6 leads **SOT1244C**



Dimensions

Unit(1)		A	b	b_1	c	D	D_1	e	E	E_1	F	H	L_p	Q	U_1	U_2	v	w_2	y	θ
mm	max	4.75	1.41	12.83	0.18	20.02	19.96		9.53	9.53	1.14	14.3	1.38	0.195	20.70	9.91	0.25	0.25	0.15	7°
	nom							18.03												
	min	3.45	1.14	12.57	0.10	19.61	19.66		9.27	9.27	0.89	14.1	0.98	0.055	20.45	9.65				0°
inches	max	0.187	0.055	0.505	0.007	0.788	0.786		0.375	0.375	0.045	0.563	0.055	0.008	0.815	0.39	0.01	0.01	0.006	7°
	nom							0.710												
	min	0.136	0.045	0.495	0.004	0.772	0.774		0.365	0.365	0.035	0.555	0.039	0.002	0.805	0.38				0°

Note
1. Millimeter dimensions are derived from the original inch dimensions.

sot1244c_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1244C						~~12-05-10~~ 12-05-30

Fig 22. Package outline SOT1244C

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
3GPP	3rd Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
ESD	ElectroStatic Discharge
IS-95	Interim Standard 95
LDMOS	Laterally Diffused Metal Oxide Semiconductor
PAR	Peak-to-Average Ratio
SMD	Surface Mounted Device
VBW	Video BandWidth
VSWR	Voltage Standing Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF8G27LS-150V_8G27LS-150GV#4	20150901	Product data sheet		BLF8G27LS-150V_ 8G27LS-150GV v.3
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.			
BLF8G27LS-150V_8G27LS-150GV v.3	20130626	Product data sheet	-	BLF8G27LS-150V_ 8G27LS-150GV v.2
BLF8G27LS-150V_8G27LS-150GV v.2	20130422	Objective data sheet	-	BLF8G27LS-150V_ 8G27LS-150GV v.1
BLF8G27LS-150V_8G27LS-150GV v.1	20130129	Objective data sheet	-	-

12. Legal information

12.1 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.

12.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Ampleon does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Ampleon sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

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13. Contact information

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14. Contents

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

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