

NXP BLF8G27LS-100 transistor datasheet

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

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BLF8G27LS-100

Power LDMOS transistor

Rev. 2 — 5 March 2014

Product data sheet

1. Product profile

1.1 General description

100 W 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 $T_{case} = 25\text{ °C}$ in a common source class-AB production test circuit.

Test signal	f	I_{Dq}	V_{DS}	$P_{L(AV)}$	G_p	η_D	ACPR _{5M}
	(MHz)	(mA)	(V)	(W)	(dB)	(%)	(dBc)
2-carrier W-CDMA	2500 to 2700	900	28	25	17	28	-32 [1]

[1] Test signal: 3GPP test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF per carrier; 5 MHz carrier spacing.

1.2 Features and benefits

- Excellent ruggedness
- High efficiency
- Low thermal resistance providing excellent thermal stability
- Designed for broadband operation (2500 MHz to 2700 MHz)
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent pre-distortability
- Internally matched for ease of use
- Integrated ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

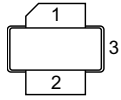
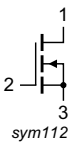
1.3 Applications

- RF power amplifiers for 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
1	drain		 sym112
2	gate		
3	source [1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF8G27LS-100	-	earless flanged ceramic package; 2 leads	SOT502B

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, for details refer to the on-line MTF calculator.

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 100\text{ W}$	0.292	K/W

6. Characteristics

Table 6. DC characteristics

$T_j = 25\text{ °C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 1\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 153\text{ mA}$	1.5	1.9	2.3	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	4.2	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	29	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	420	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 153\text{ mA}$	-	1.27	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 5.35\text{ A}$	-	0.1	-	Ω

Table 7. RF characteristics

Test signal: 2-carrier W-CDMA; 3GPP test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on the CCDF; $f_1 = 2502.5\text{ MHz}; f_2 = 2507.5\text{ MHz}; f_3 = 2692.5\text{ MHz}; f_4 = 2697.5\text{ MHz};$
RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}; T_{case} = 25\text{ °C};$ unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)} = 25\text{ W}$	15.8	17	-	dB
η_D	drain efficiency	$P_{L(AV)} = 25\text{ W}$	23	28	-	%
RL_{in}	input return loss	$P_{L(AV)} = 25\text{ W}$	-	-12	-8	dB
$ACPR_{5M}$	adjacent channel power ratio (5 MHz)	$P_{L(AV)} = 25\text{ W}$	-	-32	-27	dBc

7. Test information

7.1 Ruggedness in class-AB operation

The BLF8G27LS-100 is capable of withstanding a load mismatch corresponding to $V_{SWR} = 10 : 1$ through all phases under the following conditions: $V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}; P_L = 100\text{ W (CW)}; f = 2500\text{ MHz}.$

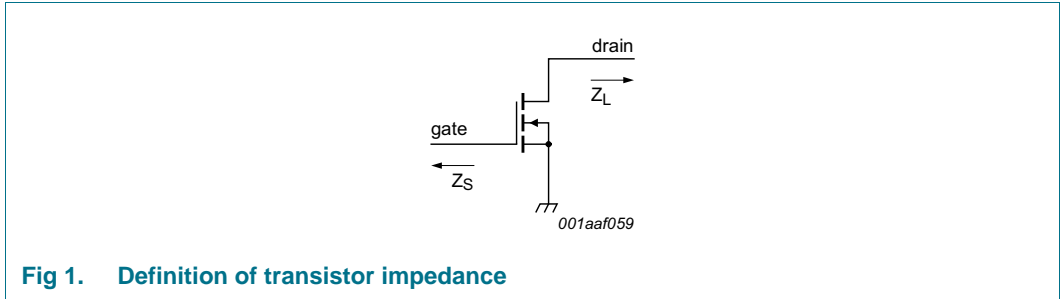
7.2 Impedance information

Table 8. Typical impedance

Measured load-pull data; $V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$

f (MHz)	Z_S ^[1] (Ω)	Z_L ^[1] (Ω)
2500	1.2 - j4.6	2.7 - j2.7
2600	2.3 - j5.5	2.5 - j2.5
2700	3.8 - j5.2	2.1 - j2.6

[1] Z_S and Z_L defined in [Figure 1](#).



7.3 Test circuit information

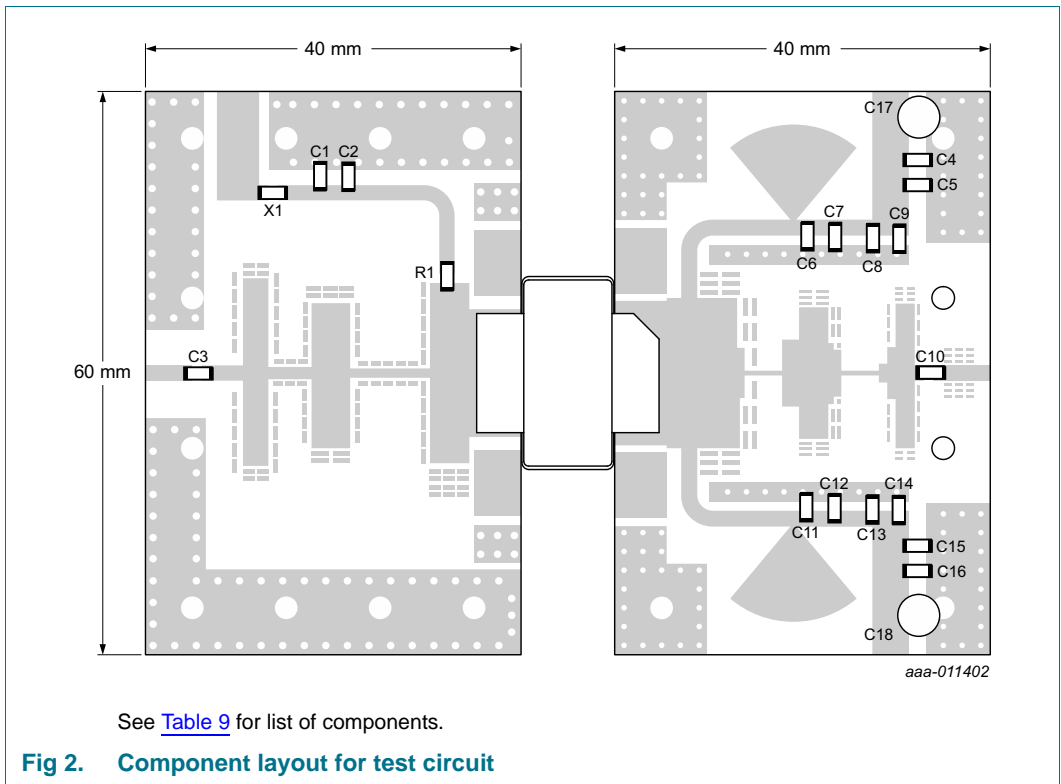


Table 9. List of components

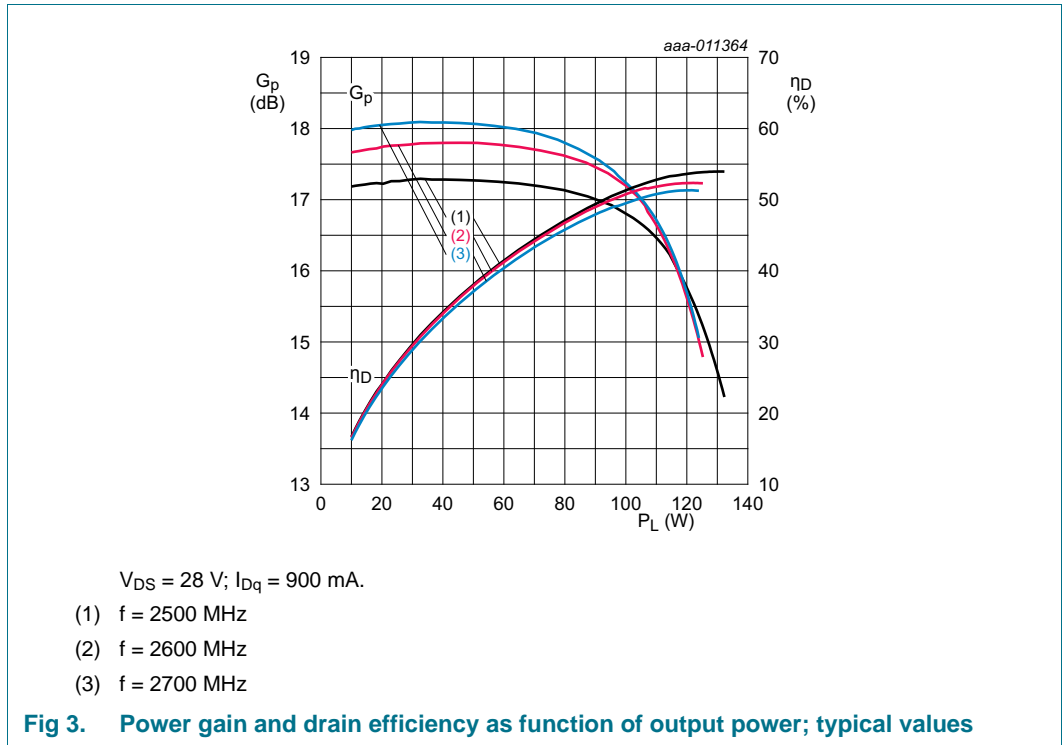
See [Figure 2](#) for component layout.

The used PCB (Printed-Circuit Board) material is Rogers RO4350B with a thickness of 0.762 mm.

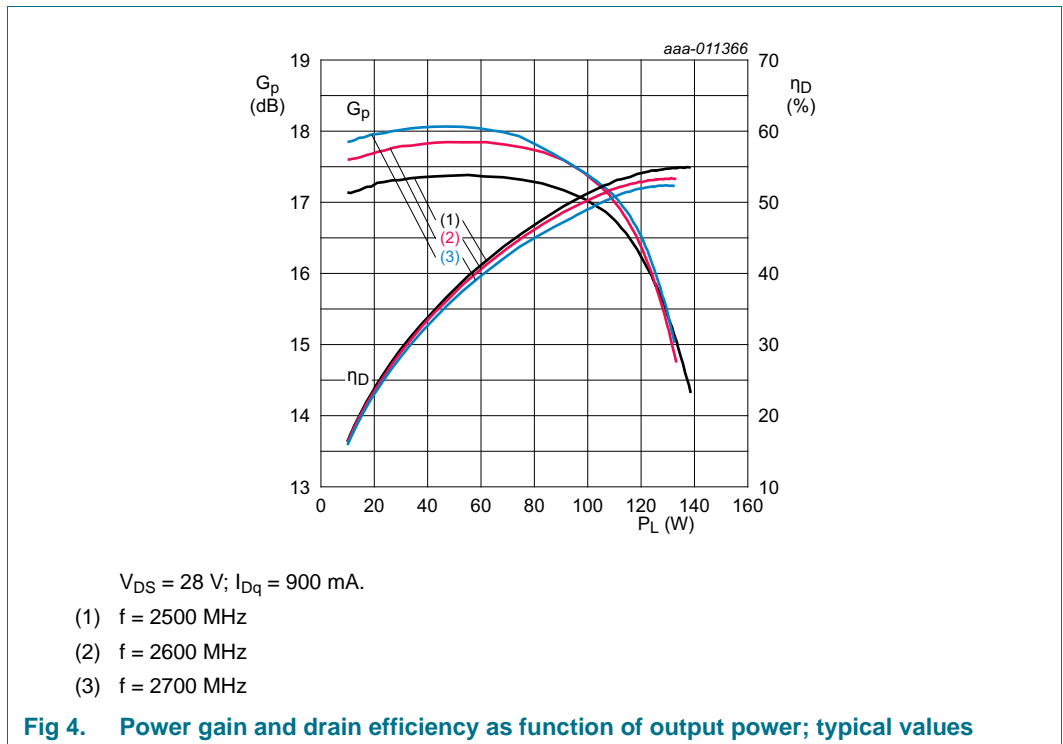
Component	Description	Value	Remarks
C1, C2, C3, C6, C7, C10, C11, C12	multilayer ceramic chip capacitor	22 pF	ATC600F
C4, C5, C8, C9, C13, C14, C15, C16	multilayer ceramic chip capacitor	4.7 μF, 50 V	Murata
C17, C18	electrolytic capacitor	2200 μF; 50 V	
R1	chip resistor	9.1 Ω	SMD 0603
X1	copper foil strip	-	

7.4 Graphical data

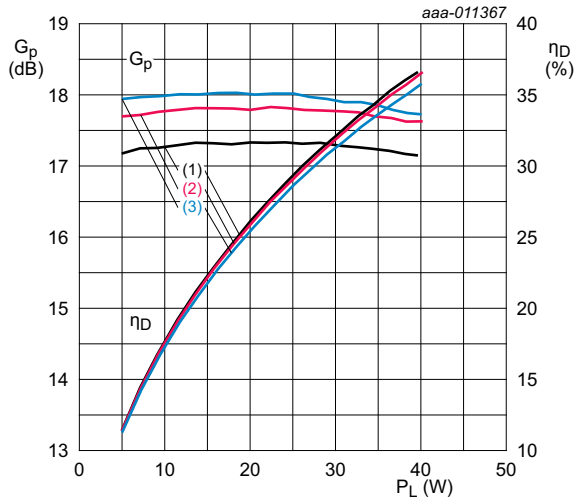
7.4.1 CW



7.4.2 CW pulsed

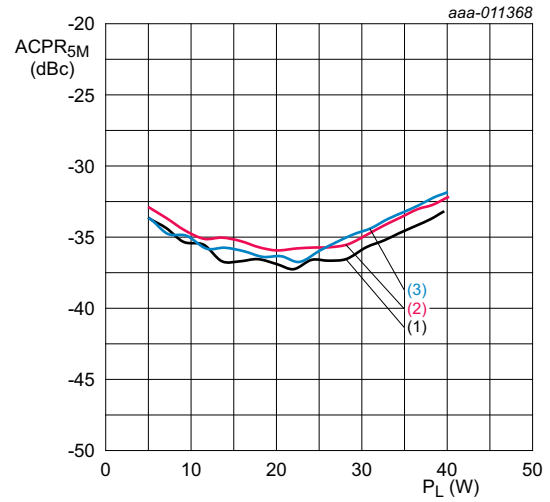


7.4.3 1-Carrier W-CDMA



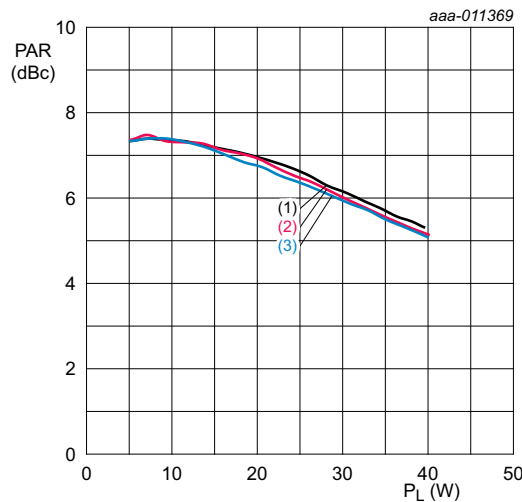
$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

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



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

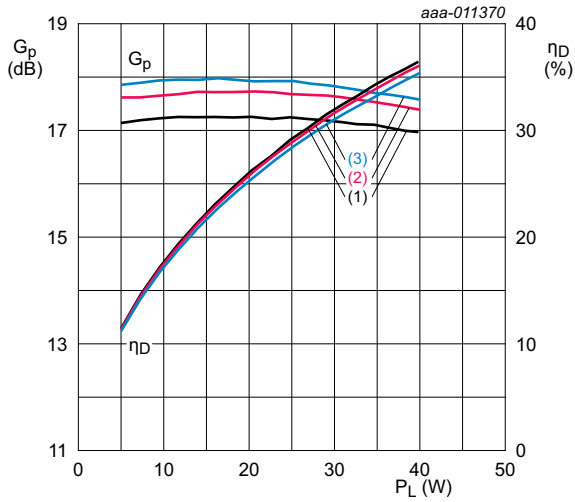
Fig 6. Adjacent power channel ratio (5 MHz) as a function of output power; typical values



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

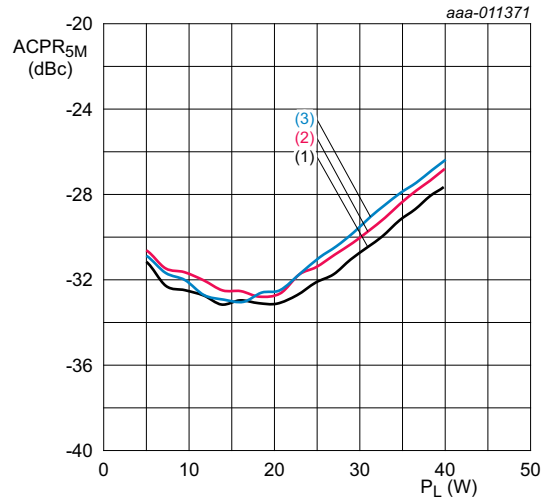
Fig 7. Peak-to-average ratio as a function of output power; typical values

7.4.4 2-Carrier W-CDMA



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

Fig 8. Power gain and drain efficiency as function of output power; typical values



$V_{DS} = 28\text{ V}; I_{Dq} = 900\text{ mA}.$
 (1) $f = 2500\text{ MHz}$
 (2) $f = 2600\text{ MHz}$
 (3) $f = 2700\text{ MHz}$

Fig 9. Adjacent power channel ratio (5 MHz) as a function of output power; typical values

8. Package outline

Earless flanged ceramic package; 2 leads

SOT502B

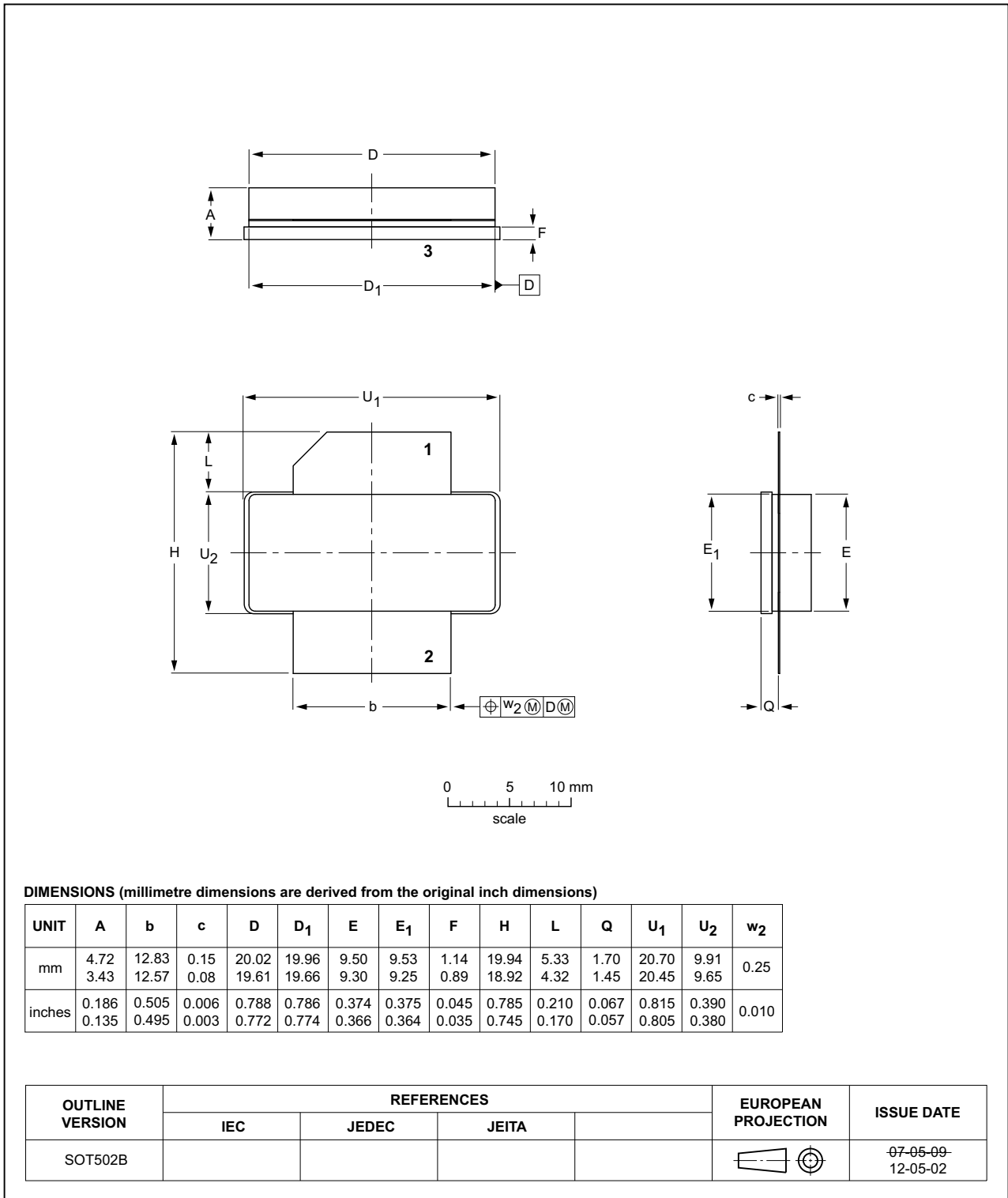


Fig 10. Package outline SOT502B

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 Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal Oxide Semiconductor
MTF	Median Time to Failure
PAR	Peak-to-Average Ratio
SMD	Surface Mounted Device
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-100 v.2	20140305	Product data sheet	-	BLF8G27LS-100 v.1
Modifications	<ul style="list-style-type: none"> • Table 7 on page 3: table updated • Section 7 on page 3: section added 			
BLF8G27LS-100 v.1	20131219	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.

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

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14. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	1
1.3	Applications	1
2	Pinning information	2
3	Ordering information	2
4	Limiting values	2
5	Thermal characteristics	2
6	Characteristics	3
7	Test information	3
7.1	Ruggedness in class-AB operation	3
7.2	Impedance information	3
7.3	Test circuit information	4
7.4	Graphical data	5
7.4.1	CW	5
7.4.2	CW pulsed	5
7.4.3	1-Carrier W-CDMA	6
7.4.4	2-Carrier W-CDMA	7
8	Package outline	8
9	Handling information	9
10	Abbreviations	9
11	Revision history	9
12	Legal information	10
12.1	Data sheet status	10
12.2	Definitions	10
12.3	Disclaimers	10
12.4	Trademarks	11
13	Contact information	11
14	Contents	12

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