BLF573; BLF573S

HF / VHF power LDMOS transistor

Rev. 3 — 8 July 2010 Product data sheet

1. Product profile

1.1 General description

A 300 W LDMOS RF power transistor for broadcast applications and industrial, scientific and medical applications in the HF to 500 MHz band.

Table 1. Production test information

Mode of operation	f (MHz)	V_{DS} (V)	P_L (W)	G_p (dB)	η_D (%)
CW	225	50	300	27.2	70

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

1.2 Features and benefits

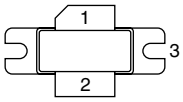
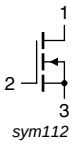
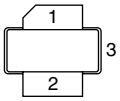
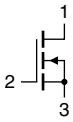
- Typical CW performance at frequency of 225 MHz, a supply voltage of 50 V and an I_{Dq} of 900 mA:
  - Average output power = 300 W
  - Power gain = 27.2 dB
  - Efficiency = 70 %
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (HF and VHF band)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- Industrial, scientific and medical applications
- Broadcast transmitter applications

2. Pinning information

Table 2. Pinning

Pin	Description		Simplified outline	Graphic symbol
BLF573 (SOT502A)				
1	drain			
2	gate			
3	source	[1]		
BLF573S (SOT502B)				
1	drain			
2	gate			
3	source	[1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLF573	-	flanged LDMOST ceramic package; 2 mounting holes; 2 leads	SOT502A
BLF573S	-	earless flanged LDMOST 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		-	110	V
V_{GS}	gate-source voltage		−0.5	+11	V
I_D	drain current		-	42	A
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 = 300 W	[1]	0.21	K/W

[1] $R_{th(j-c)}$ is measured under RF conditions.

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

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 = 3.75 mA	110	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 375 mA	1.25	1.7	2.25	V
V_{GSq}	gate-source quiescent voltage	V_{DS} = 50 V; I_D = 900 mA	1.45	1.95	2.45	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 50 V	-	-	4.2	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	44	56	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	420	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 18.75 A	-	20	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 12.49 A	-	0.09	-	Ω
C_{rs}	feedback capacitance	V_{GS} = 0 V; V_{DS} = 50 V; f = 1 MHz	-	2.3	-	pF
C_{iss}	input capacitance	V_{GS} = 0 V; V_{DS} = 50 V; f = 1 MHz	-	300	-	pF
C_{oss}	output capacitance	V_{GS} = 0 V; V_{DS} = 50 V; f = 1 MHz	-	103	-	pF

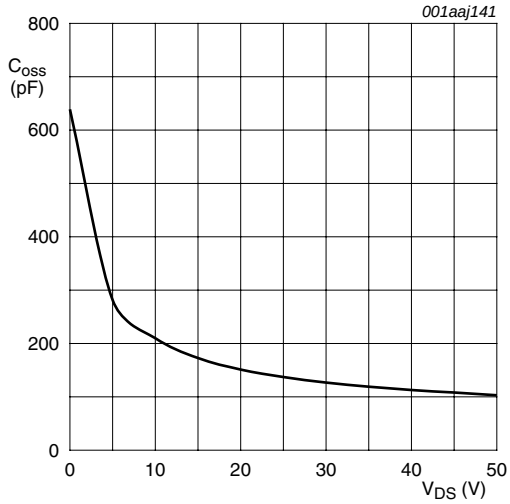
Table 7. RF characteristics

Mode of operation: CW; f = 225 MHz; RF performance at V_{DS} = 50 V; I_{Dq} = 900 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 = 300 W	26	27.2	28.4	dB
RL_{in}	input return loss	P_L = 300 W	10	13	-	dB
η_D	drain efficiency	P_L = 300 W	67	70	-	%

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.



V_{GS} = 0 V; f = 1 MHz.

Fig 1. Output capacitance as a function of drain-source voltage; capacitance value without internal matching

6.1 Ruggedness in class-AB operation

The BLF573 and BLF573S are capable of withstanding a load mismatch corresponding to VSWR = 13 : 1 through all phases under the following conditions: V_{DS} = 50 V; I_{Dq} = 900 mA; P_L = 300 W; f = 225 MHz.

7. Application information

7.1 Impedance information

Table 8. Typical impedance

Measured Z_S and Z_L test circuit impedances.

f	Z_S	Z_L
MHz	Ω	Ω
225	0.7 + j2.0	1.95 + j2.0

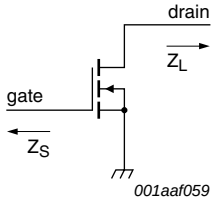
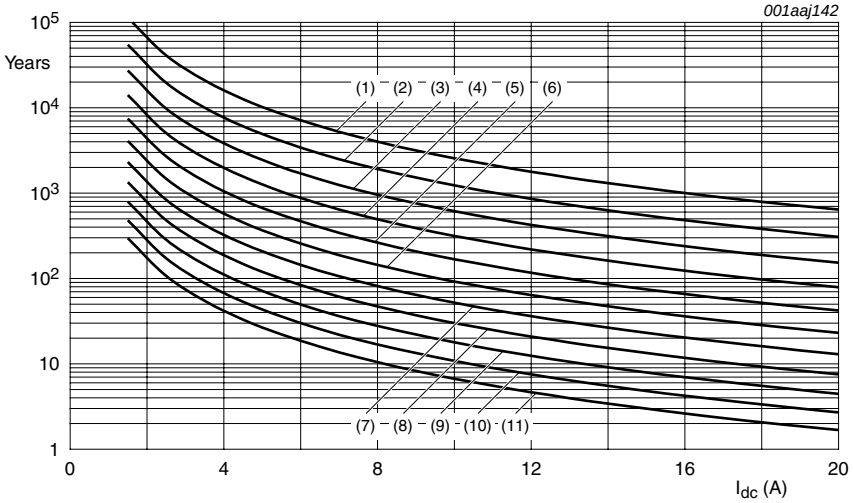


Fig 2. Definition of transistor impedance

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

7.2 Reliability



TTF (0.1 % failure fraction).

(1) T_j = 100 °C
(2) T_j = 110 °C
(3) T_j = 120 °C
(4) T_j = 130 °C
(5) T_j = 140 °C
(6) T_j = 150 °C
(7) T_j = 160 °C
(8) T_j = 170 °C
(9) T_j = 180 °C
(10) T_j = 190 °C
(11) T_j = 200 °C

Fig 3. BLF573 and BLF573S electromigration (I_D, total device)

All information provided in this document is subject to legal disclaimers.

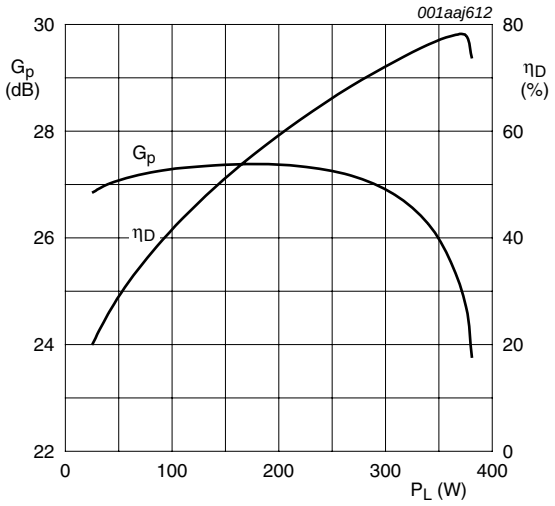
© NXP B.V. 2010. All rights reserved.

8. Test information

8.1 RF Performance

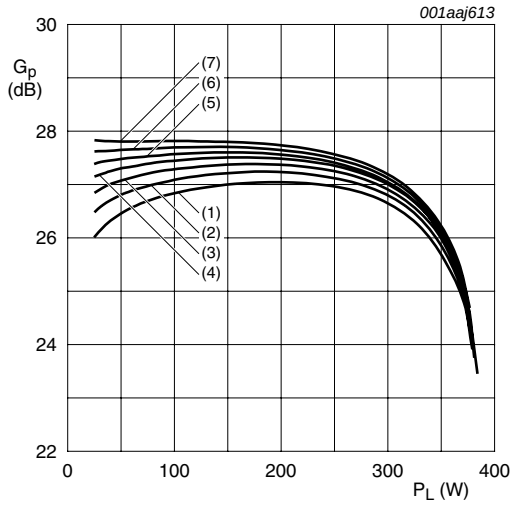
The following figures are measured in a class-AB production test circuit.

8.1.1 1-Tone CW



V_{DS} = 50 V; I_{Dq} = 900 mA; f = 225 MHz.

Fig 4. Power gain and drain efficiency as functions of load power; typical values



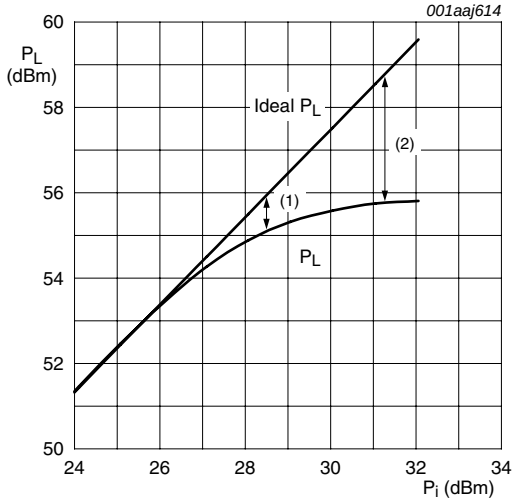
V_{DS} = 50 V; f = 225 MHz.

(1) I_{Dq} = 500 mA
(2) I_{Dq} = 700 mA
(3) I_{Dq} = 900 mA
(4) I_{Dq} = 1100 mA
(5) I_{Dq} = 1300 mA
(6) I_{Dq} = 1500 mA
(7) I_{Dq} = 1700 mA

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

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.



V_{DS} = 50 V; I_{Dq} = 900 mA; f = 225 MHz.

(1) $P_{L(1dB)}$ = 55.2 dBm (330 W)

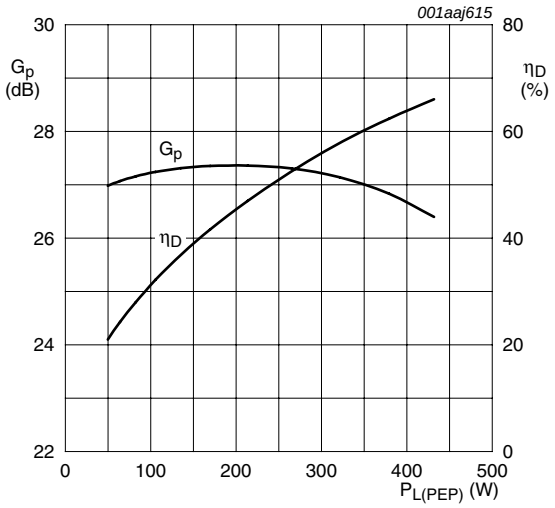
(2) $P_{L(3dB)}$ = 55.8 dBm (380 W)

Fig 6. Load power as function of input power; typical values

All information provided in this document is subject to legal disclaimers.

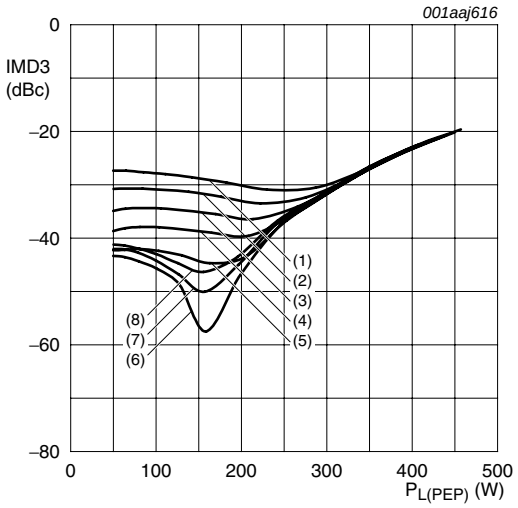
© NXP B.V. 2010. All rights reserved.

8.1.2 2-Tone CW



V_{DS} = 50 V; I_{Dq} = 900 mA; f_1 = 224.95 MHz; f_2 = 225.05 MHz.

Fig 7. Power gain and drain efficiency as functions of peak envelope load power; typical values



V_{DS} = 50 V; f_1 = 224.95 MHz; f_2 = 225.05 MHz.

(1) I_{Dq} = 500 mA
(2) I_{Dq} = 700 mA
(3) I_{Dq} = 900 mA
(4) I_{Dq} = 1100 mA
(5) I_{Dq} = 1300 mA
(6) I_{Dq} = 1500 mA
(7) I_{Dq} = 1700 mA
(8) I_{Dq} = 1800 mA

Fig 8. Third order intermodulation distortion as a function of peak envelope load power; typical values

8.2 Test circuit

Table 9. List of components

For production test circuit, see Figure 9 and Figure 10.
Printed-Circuit Board (PCB): Rogers 5880; ε_r = 2.2 F/m; height = 0.79 mm; Cu (top/bottom metallization); thickness copper plating = 35 μm.

Component	Description	Value		Remarks
B1	ferrite SMD bead	100 Ω; 100 MHz		Ferroxcube BDS3/3/8.9-4S2 or equivalent
C1, C18	multilayer ceramic chip capacitor	100 pF	[1]	
C2	multilayer ceramic chip capacitor	39 pF	[1]	
C3, C4	multilayer ceramic chip capacitor	180 pF	[1]	
C5, C6, C7	multilayer ceramic chip capacitor	220 pF	[1]	
C8, C20	multilayer ceramic chip capacitor	1 nF	[1]	
C9	multilayer ceramic chip capacitor	4.7 μF		TDK C4532X7R1E475MT020U or equivalent
C10	multilayer ceramic chip capacitor	30 pF	[1]	
C11, C12, C13	multilayer ceramic chip capacitor	51 pF	[1]	
C14	multilayer ceramic chip capacitor	43 pF	[1]	

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

Table 9. List of components *...continued*

For production test circuit, see Figure 9 and Figure 10.
Printed-Circuit Board (PCB): Rogers 5880; ε_r = 2.2 F/m; height = 0.79 mm; Cu (top/bottom metallization); thickness copper plating = 35 μm.

Component	Description	Value		Remarks
C15	multilayer ceramic chip capacitor	33 pF	[1]	
C16	multilayer ceramic chip capacitor	36 pF	[1]	
C17	multilayer ceramic chip capacitor	16 pF	[1]	
C19	electrolytic capacitor	220 μF; 63 V		

L1	2 turns enamelled copper wire	D = 3 mm;
		d = 1 mm;
		length = 2 mm;
		leads = 2 × 6 mm		

L2	4 turns enamelled copper wire	D = 2 mm;
		d = 1 mm;
		length = 13 mm;
		leads = 2 × 5 mm		

L3	stripline	-		(L × W) 96 mm × 3 mm
L4, L5	stripline	-		(L × W) 15 mm × 8 mm
L6	stripline	-		(L × W) 105 mm × 6 mm
L7	stripline	-		(L × W) 3 mm × 6 mm
L8	stripline	-		(L × W) 12 mm × 6 mm
R1	metal film resistor	100 Ω; 0.6 W		

[1] American Technical Ceramics type 100B or capacitor of same quality.

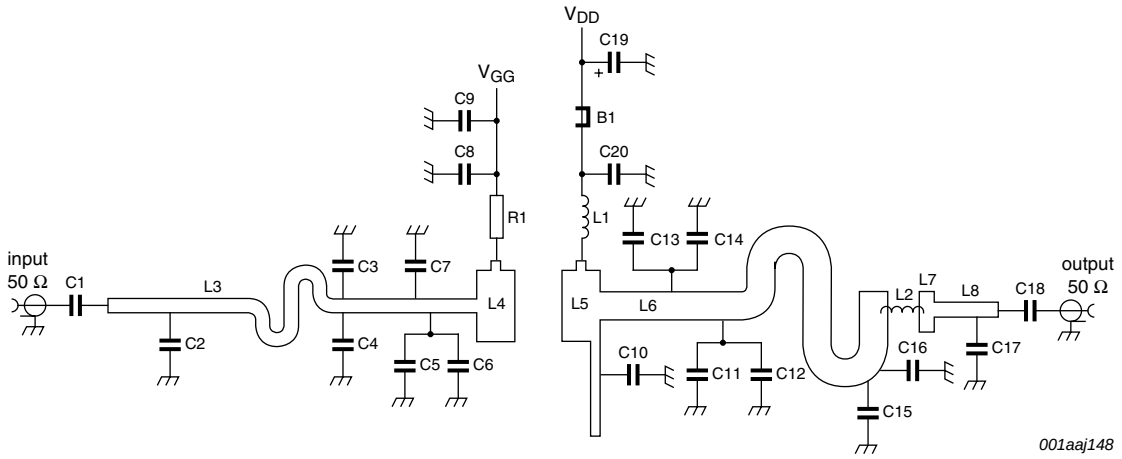


Fig 9. Class-AB common-source production test circuit

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

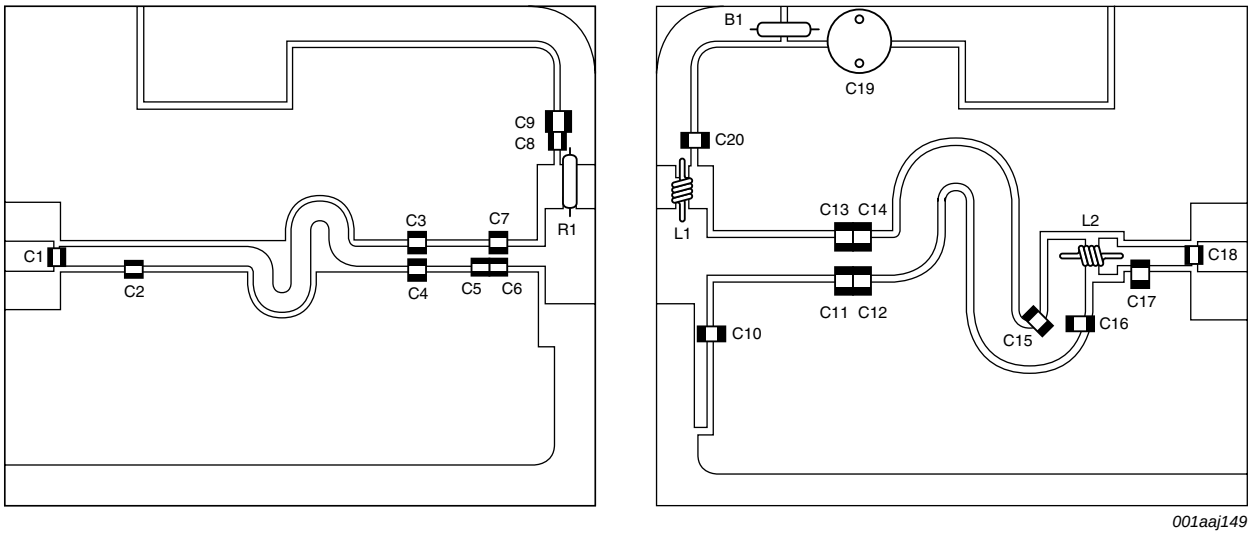


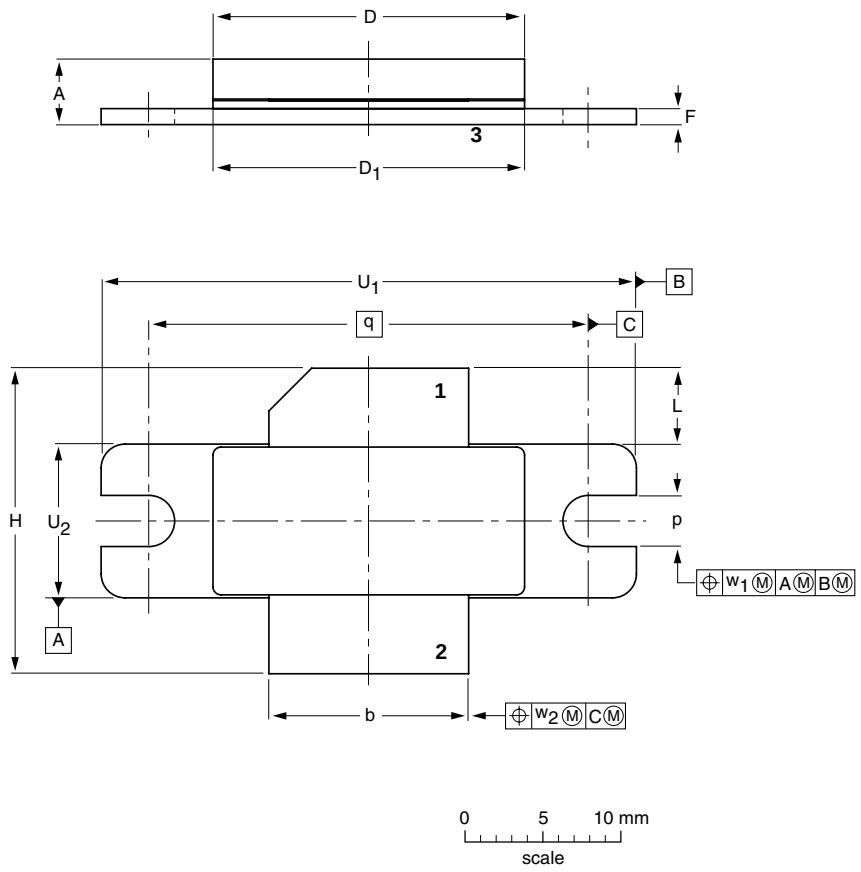
Fig 10. Component layout for class-AB production test circuit

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

9. Package outline

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads **SOT502A**



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D_1	E	E_1	F	H	L	p	Q	q	U_1	U_2	w_1	w_2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	3.38 3.12	1.70 1.45	27.94	34.16 33.91	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.133 0.123	0.067 0.057	1.100	1.345 1.335	0.390 0.380	0.01	0.02

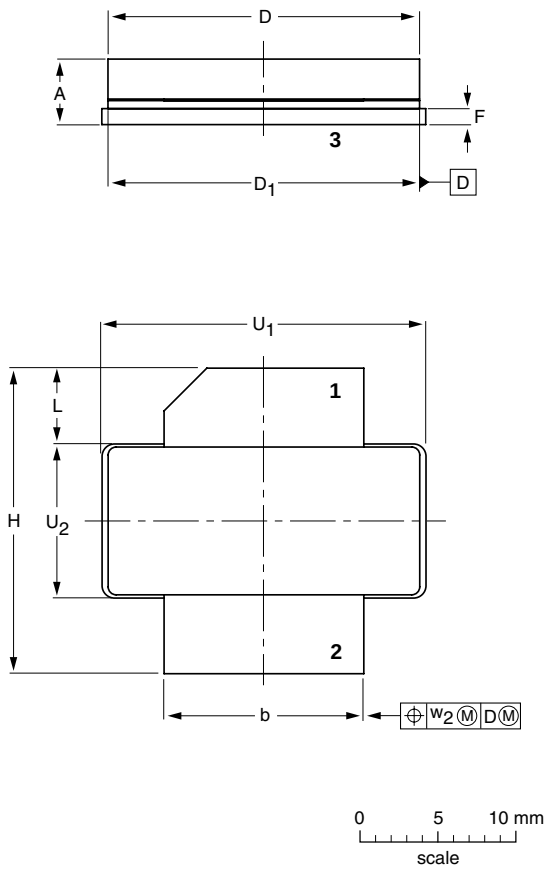
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502A						~~99-12-28~~ 03-01-10

Fig 11. Package outline SOT502A

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

Earless flanged LDMOST ceramic package; 2 leads **SOT502B**



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D_1	E	E_1	F	H	L	Q	U_1	U_2	w_2
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	1.70 1.45	20.70 20.45	9.91 9.65	0.25
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.067 0.057	0.815 0.805	0.390 0.380	0.010

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502B						~~03-01-10~~ 07-05-09

Fig 12. Package outline SOT502B

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

10. Abbreviations

Table 10. Abbreviations

Acronym	Description
CW	Continuous Wave
EDGE	Enhanced Data rates for GSM Evolution
GSM	Global System for Mobile communications
HF	High Frequency
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LDMOST	Laterally Diffused Metal-Oxide Semiconductor Transistor
RF	Radio Frequency
SMD	Surface Mount Device
TTF	Time To Failure
VHF	Very High Frequency
VSWR	Voltage Standing-Wave Ratio

11. Revision history

Table 11. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF573_BLF573S v.3	20100708	Product data sheet	-	BLF573S v.2
Modifications:	• The document now describes both the eared and earless version of this product: BLF573 and BLF573S respectively.			
BLF573S v.2	20090217	Product data sheet	-	BLF573S v.1
BLF573S v.1	20081208	Preliminary data sheet	-	-

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

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.nxp.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. NXP Semiconductors 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 NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

12.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

12.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

13. Contact information

For more information, please visit: **http://www.nxp.com**

For sales office addresses, please send an email to: **salesaddresses@nxp.com**

All information provided in this document is subject to legal disclaimers.

© NXP B.V. 2010. All rights reserved.

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
6.1 Ruggedness in class-AB operation 4
7 Application information 4
7.1 Impedance information 4
7.2 Reliability 5
8 Test information 6
8.1 RF Performance 6
8.1.1 1-Tone CW 6
8.1.2 2-Tone CW 8
8.2 Test circuit 8
9 Package outline 11
10 Abbreviations 13
11 Revision history 13
12 Legal information 14
12.1 Data sheet status 14
12.2 Definitions 14
12.3 Disclaimers 14
12.4 Trademarks 15
13 Contact information 15
14 Contents 16

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

© NXP B.V. 2010. **All rights reserved.**

For more information, please visit: http://www.nxp.com
For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 8 July 2010
Document identifier: BLF573_BLF573S

Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург, Промышленная ул, дом № 19, литера Н, помещение 100-Н Офис 331