

BLF6G05LS-200RN

Power LDMOS transistor

Rev. 2 — 8 November 2011

Product data sheet

1. Product profile

1.1 General description

200 W LDMOS power transistor for base station applications at frequencies from 460 MHz to 470 MHz.

Table 1. Typical performance

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

Mode of operation	f (MHz)	V _{DS} (V)	P _{L(AV)} (W)	G _p (dB)	η _D (%)	ACPR (dBc)
1-carrier W-CDMA	460 to 470	28	40	24	33	-43 ^[1]

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

1.2 Features and benefits

- Typical 1-carrier W-CDMA performance at frequencies of 460 MHz and 470 MHz, a supply voltage of 28 V and an I_{Dq} of 1400 mA:
 - ◆ Average output power = 40 W
 - ◆ Power gain = 24 dB
 - ◆ Efficiency = 33 %
 - ◆ ACPR = -43 dBc
- Easy power control
- Integrated ESD protection
- Enhanced ruggedness
- High efficiency
- Excellent thermal stability
- Internally matched for ease of use
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

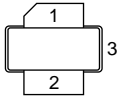
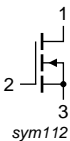
1.3 Applications

- RF power amplifiers for W-CDMA and CDMA base stations and multicarrier applications in the 460 MHz to 470 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
BLF6G05LS-200RN	-	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		-	65	V
V_{GS}	gate-source voltage		-0.5	+13	V
I_D	drain current		-	49	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
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 40\text{ W}$	0.33	K/W

6. Characteristics

Table 6. Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 0.9\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 270\text{ mA}$	1.4	2.0	2.4	V
V_{GSq}	gate-source quiescent voltage	$V_{DS} = 28\text{ V}; I_D = 1620\text{ mA}$	1.7	2.2	2.7	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	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	40	44	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	420	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 9.45\text{ A}$	11	18	26	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 9.45\text{ A}$	0.018	0.07	0.114	Ω

7. Application information

Table 7. Application information

Mode of operation: 1-carrier W-CDMA; PAR 7.2 dB at 0.01 % probability on CCDF; 3GPP test model 1; 1-64 PDPCH; $f = 465\text{ MHz}$; RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 1400\text{ mA}; T_{case} = 25\text{ }^\circ\text{C}$; unless otherwise specified; in a class-AB production test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		39.2	40	40.8	W
G_p	power gain	$P_{L(AV)} = 40\text{ W}$	22.8	24	-	dB
IRL	input return loss	$P_{L(AV)} = 40\text{ W}$	-	-7.5	-4	dB
η_D	drain efficiency	$P_{L(AV)} = 40\text{ W}$	30	33	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)} = 40\text{ W}$	-	-43	-41	dBc

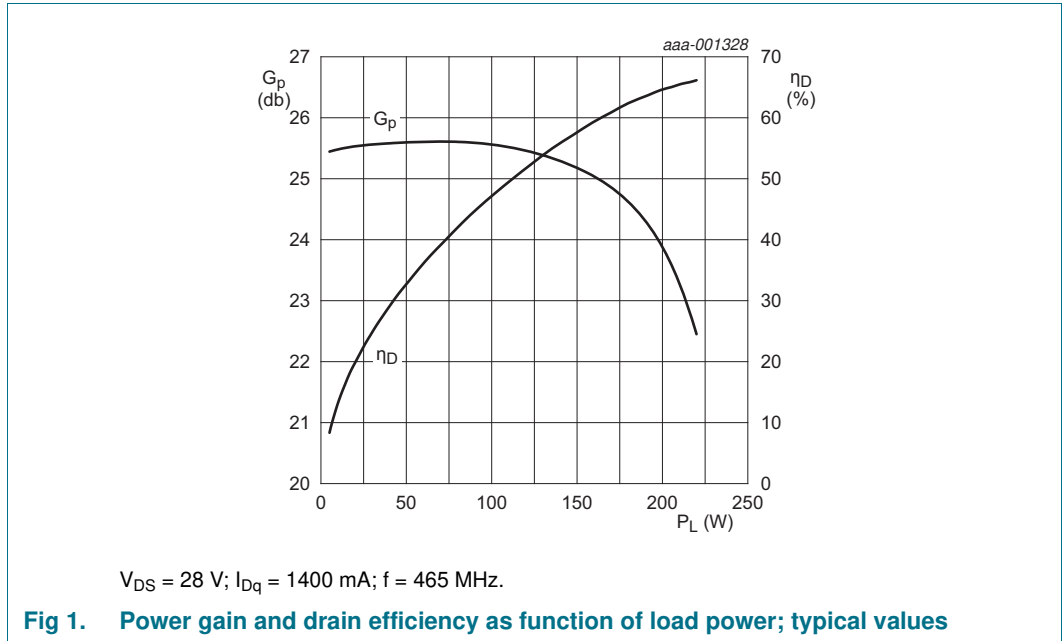
7.1 Ruggedness in class-AB operation

The BLF6G05LS-200RN is an enhanced rugged device and is capable of withstanding a load mismatch corresponding to $VSWR = 10 : 1$ through all phases under the following conditions: $V_{DS} = 28\text{ V}; I_{Dq} = 1400\text{ mA}; P_L = 200\text{ W}; f = 465\text{ MHz}$.

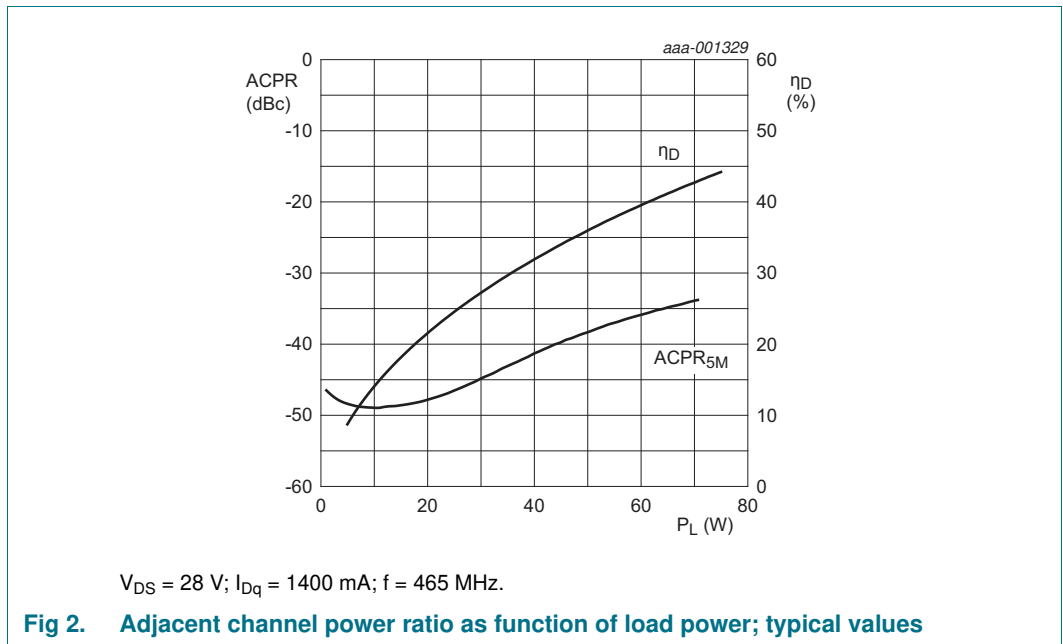
8. Test information

8.1 Performance curves

8.1.1 One-Tone Pulsed-CW



8.1.2 1-carrier W-CDMA

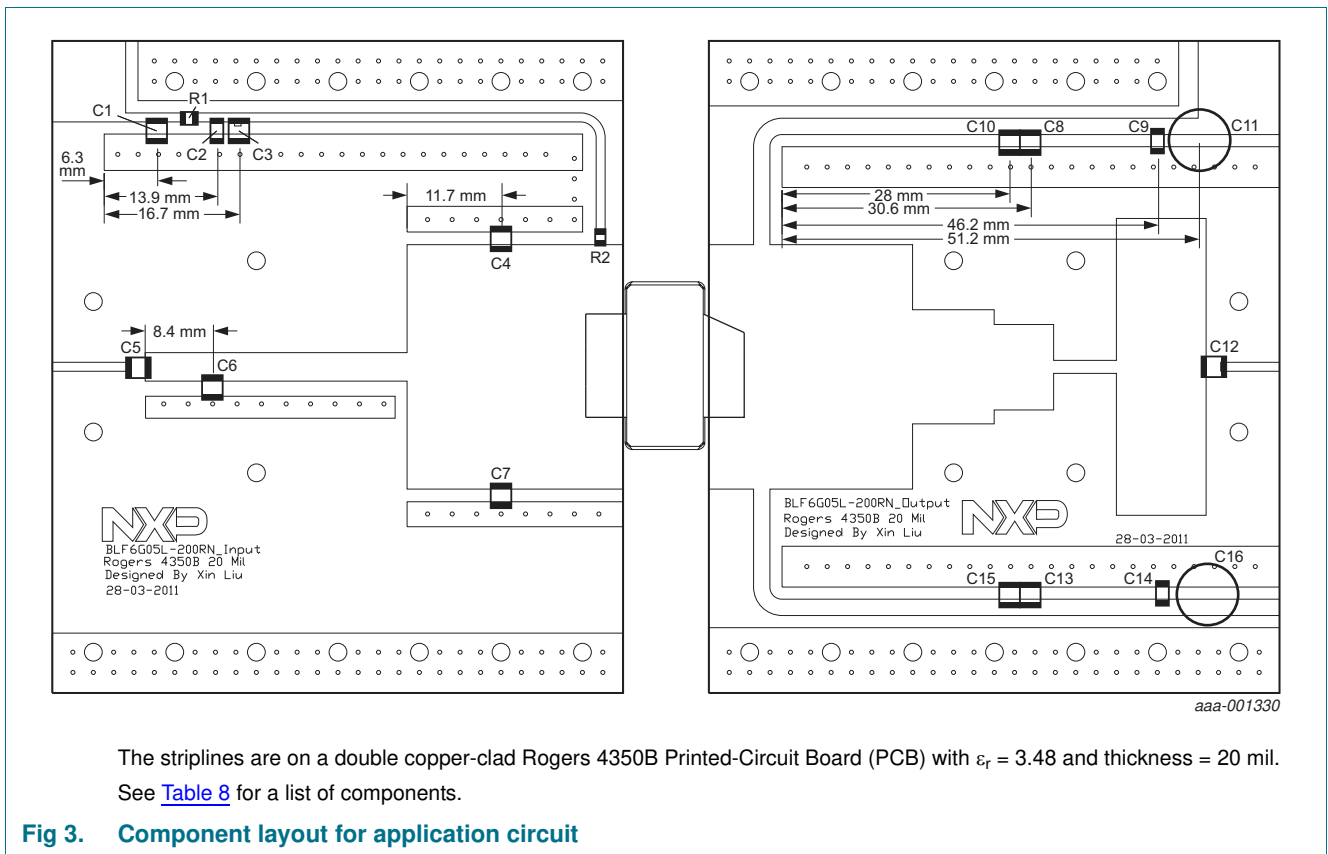


8.2 Circuit information

Table 8. List of components
For application circuit see Figure 3.

Component	Description	Value	Remarks
C1, C10, C15	multilayer ceramic chip capacitor	10 μ F	Murata
C2, C9, C14	multilayer ceramic chip capacitor	0.1 μ F	Murata
C3, C12	multilayer ceramic chip capacitor	270 pF	[1]
C4, C7	multilayer ceramic chip capacitor	56 pF	[1]
C5	multilayer ceramic chip capacitor	220 pF	[1]
C6	multilayer ceramic chip capacitor	18 pF	[1]
C8, C13	multilayer ceramic chip capacitor	390 pF	[1]
C11, C16	electrolytic capacitor	2200 μ F; 50 V	
R1, R2	SMD resistor	9.1 Ω	

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



The striplines are on a double copper-clad Rogers 4350B Printed-Circuit Board (PCB) with $\epsilon_r = 3.48$ and thickness = 20 mil. See Table 8 for a list of components.

Fig 3. Component layout for application circuit

9. Package outline

Earless flanged LDMOST ceramic package; 2 leads

SOT502B

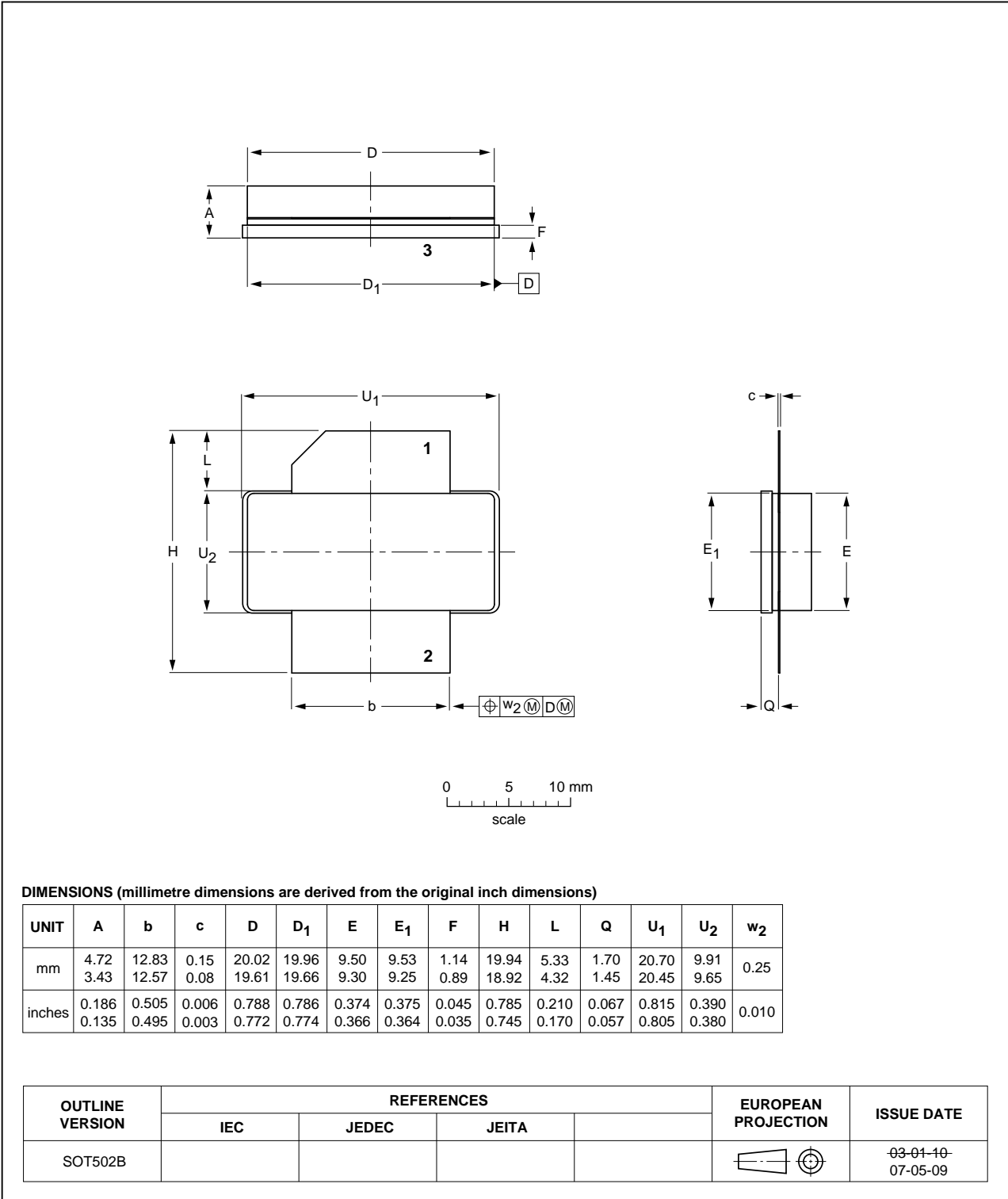


Fig 4. Package outline SOT502B

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
3GPP	Third Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CDMA	Code Division Multiple Access
CW	Continuous Wave
DPCH	Dedicated Physical CHannel
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
LDMOST	Laterally Diffused Metal-Oxide Semiconductor Transistor
PAR	Peak-to-Average power Ratio
PDPCH	transmission Power of the Dedicated Physical CHannel
RF	Radio Frequency
SMD	Surface Mount Device
VSWR	Voltage Standing-Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF6G05LS-200RN v.2.0	20111108	Product data sheet	-	BLF6G05LS-200RN v.1.0
Modifications:		<ul style="list-style-type: none"> The status of this data sheet has been changed to Product data sheet Table 1 on page 1: The value for G_p has been updated Section 1.2 on page 1: The value for power gain has been updated Table 6 on page 3: The typical value for I_{DSX} has been updated, row for C_{rs} has been removed Table 7 on page 3: Several values have been updated Section 8 on page 4: This section has been added 		
BLF6G05LS-200RN v.1.0	20110511	Objective 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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