

# BLF6G20-180P

UHF power LDMOS transistor

Rev. 01 — 19 April 2006

Objective data sheet

## 1. Product profile

### 1.1 General description

180 W LDMOS power transistor for base station applications at frequencies from 1800 MHz to 2000 MHz.

**Table 1: Typical performance**

RF performance at  $T_{case} = 25\text{ }^{\circ}\text{C}$  in a common source class-AB production test circuit.

Mode of operation	f (MHz)	V <sub>DS</sub> (V)	P <sub>L(AV)</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)	ACPR (dBc)
2-carrier W-CDMA	1805 to 1880	32	50	17.5	27.5	-35 <sup>[1]</sup>

[1] Test signal: 3GPP; test model 1; 64 DPCH; PAR = 7.5 dB at 0.01 % probability on CCDF per carrier; carrier spacing 5 MHz

#### CAUTION



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

### 1.2 Features

- Typical 2-carrier W-CDMA performance at frequencies of 1805 MHz and 1880 MHz, a supply voltage of 32 V and an I<sub>DQ</sub> of 1600 mA:
  - ◆ Average output power = 50 W
  - ◆ Power gain = 17.5 dB (typ)
  - ◆ Efficiency = 27.5 %
  - ◆ ACPR = -35 dBc
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (1800 MHz to 2000 MHz)
- Internally matched for ease of use

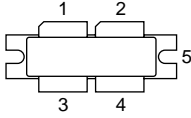
### 1.3 Applications

- RF power amplifiers for W-CDMA base stations and multi carrier applications in the 1800 MHz to 2000 MHz frequency range.

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## 2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
1	drain1		<td>
2	drain2		
3	gate1		
4	gate2		
5	source		

[1] Connected to flange

## 3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BLF6G20-180P	-	flanged balanced LDMOST ceramic package; 2 mounting holes; 4 leads	SOT539A

## 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		-	<td>	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	$T_{case} = 80\text{ °C};$ $P_{L(AV)} = 50\text{ W}$	0.45	K/W

## 6. Characteristics

**Table 6: Characteristics**

$T_j = 25\text{ °C}$  per section; unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 0.5\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 144\text{ mA}$	<td>	1.6	<td>	V
$V_{GSq}$	gate-source quiescent voltage	$V_{DS} = 28\text{ V}; I_D = 950\text{ mA}$	<td>	2	<td>	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	5	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $V_{DS} = 10\text{ V}$	-	26	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 8.5\text{ V}; V_{DS} = 0\text{ V}$	-	-	450	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 7.2\text{ A}$	-	13	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $I_D = 5\text{ A}$	-	0.1	<td>	$\Omega$
$C_{rs}$	feedback capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V};$ $f = 1\text{ MHz}$	-	<td>	-	pF

## 7. Application information

**Table 7: Application information**

Mode of operation: 2-carrier W-CDMA; PAR 7.5 dB at 0.01 % probability on CCDF; 3GPP test model 1; 1 to 64 PDPCH;  $f_1 = 1802.5\text{ MHz}; f_2 = 1807.5\text{ MHz}; f_3 = 1872.5\text{ MHz}; f_4 = 1877.5\text{ MHz};$  RF performance at  $V_{DS} = 32\text{ V}; I_{Dq} = 1600\text{ mA}; T_{case} = 25\text{ °C};$  unless otherwise specified; in a class-AB production test circuit

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		-	50	-	W
$G_p$	power gain	$P_{L(AV)} = 50\text{ W}$	<td>	17.5	-	dB
$\eta_D$	drain efficiency	$P_{L(AV)} = 50\text{ W}$	<td>	27.5	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)} = 50\text{ W}$	-	-35	<td>	dBc

### 7.1 Ruggedness in class-AB operation

The BLF6G20-180P is capable of withstanding a load mismatch corresponding to  $V_{SWR} = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 28\text{ V}; I_{Dq} = 1600\text{ mA}; P_L = 180\text{ W (CW)}; f = 1880\text{ MHz}.$

**8. Package outline**

Flanged balanced LDMOST ceramic package; 2 mounting holes; 4 leads

SOT539A

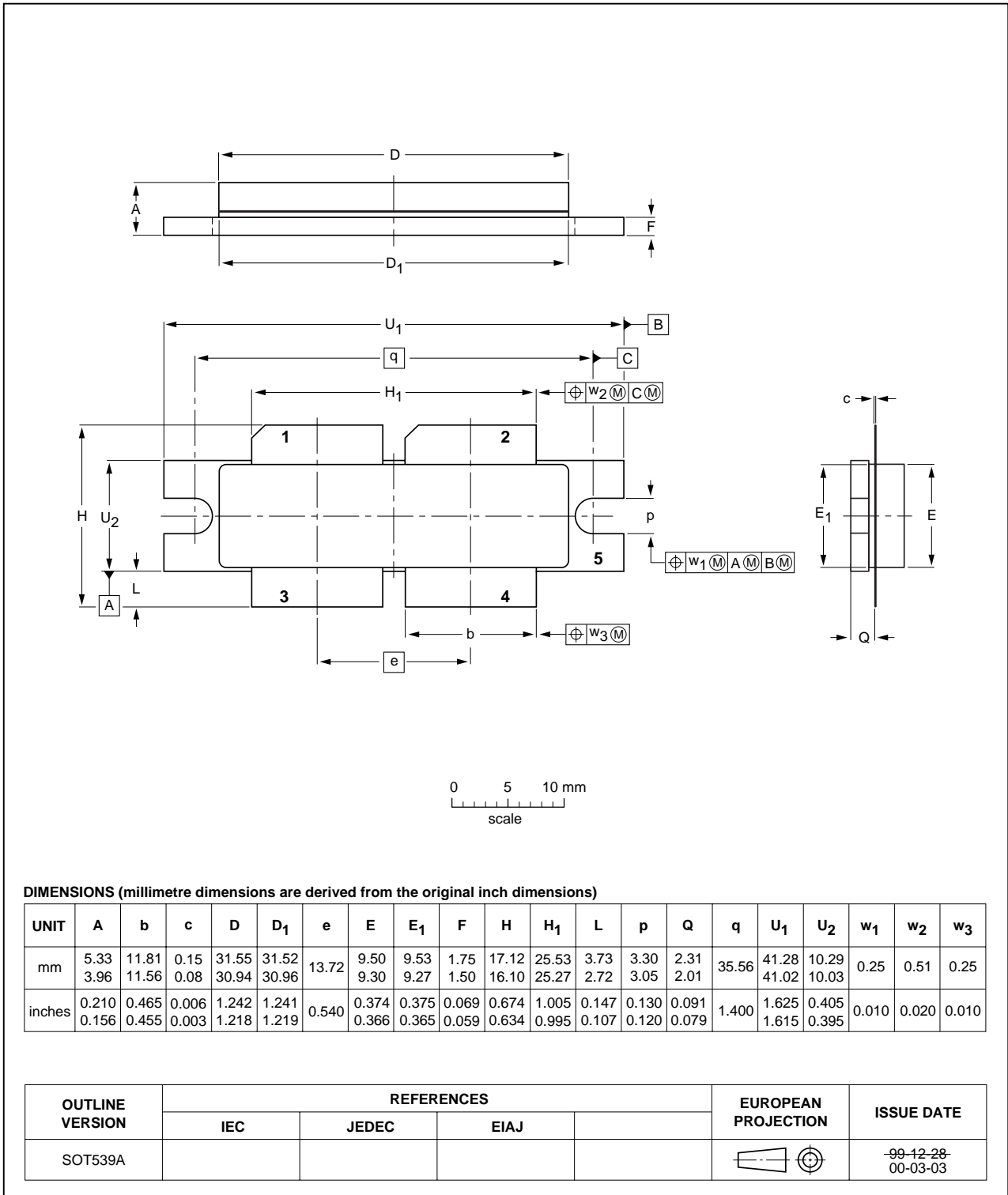


Fig 1. Package outline SOT539A

## 9. Abbreviations

**Table 8: Abbreviations**

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

## 10. Revision history

**Table 9: Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLF6G20-180P_1	20060419	Objective data sheet	-	-

## 11. Legal information

### 11.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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