BLC6G20-75; BLC6G20LS-75

UHF power LDMOS transistor

Rev. 01 — 30 January 2006 Objective data sheet

1. Product profile

1.1 General description

75 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 °C in a common source class-AB production test circuit.

Mode of operation	f (MHz)	V_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	$ACPR_{400}$ (dBc)	$ACPR_{600}$ (dBc)	EVM_{rms} (%)
CW	1930 to 1990	28	63	19	52	-	-	-
GSM EDGE	1930 to 1990	28	29.5	19	38.5	–62.5	–72	1.5

CAUTION

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

1.2 Features

- Typical GSM EDGE performance at frequencies of 1930 MHz and 1990 MHz, a supply voltage of 28 V and an I_{Dq} of 550 mA:
  - Output power = 29.5 W (AV)
  - Gain = 19 dB
  - Efficiency = 38.5 %
  - $ACPR_{400}$ = –62.5 dBc
  - $ACPR_{600}$ = –72 dBc
  - EVM_{rms} = 1.5 %
- 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

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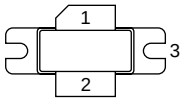
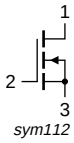
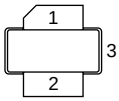
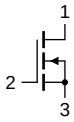
1.3 Applications

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

2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
BLC6G20-75 (SOT895-1)			
1	drain		
2	gate		
3	source [1]		
BLC6G20LS-75 (SOT896-1)			
1	drain		
2	gate		
3	source [1]		

[1] Connected to flange

3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BLC6G20-75	-	plastic flanged cavity package; 2 mounting slots; 2 leads	SOT895-1
BLC6G20LS-75	-	plastic earless flanged cavity package; 2 leads	SOT896-1

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		-	**<tbd>**	A
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		-	225	°C

5. Thermal characteristics

Table 5: Thermal characteristics

Symbol	Parameter	Conditions	Type	Min	Typ	Max	Unit
$R_{th(j\text{-}case)}$	thermal resistance from junction to case	T_{case} = 80 °C; P_L = 75 W	BLC6G20-75	<tbd>	<tbd>	<tbd>	K/W
			BLC6G20LS-75	<tbd>	<tbd>	<tbd>	K/W

6. Characteristics

Table 6: 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 = 0.5 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 100 mA	<tbd>	2	<tbd>	V
V_{GSq}	gate-source quiescent voltage	V_{DS} = 28 V; I_D = 550 mA	<tbd>	<tbd>	<tbd>	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	3	µA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	15.5	18	-	A
I_{GSS}	gate leakage current	V_{GS} = 13 V; V_{DS} = 0 V	-	-	300	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 5 A	-	7	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 3.5 A	-	0.15	0.185	Ω
C_{rs}	feedback capacitance	V_{GS} = 0 V; V_{DS} = 28 V; f = 1 MHz	-	1.6	-	pF

7. Application information

Table 7: Application information

Mode of operation: GSM EDGE; f = 1930 MHz and 1990 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 550 mA; T_{case} = 25 °C; unless otherwise specified; in a class-AB production test circuit

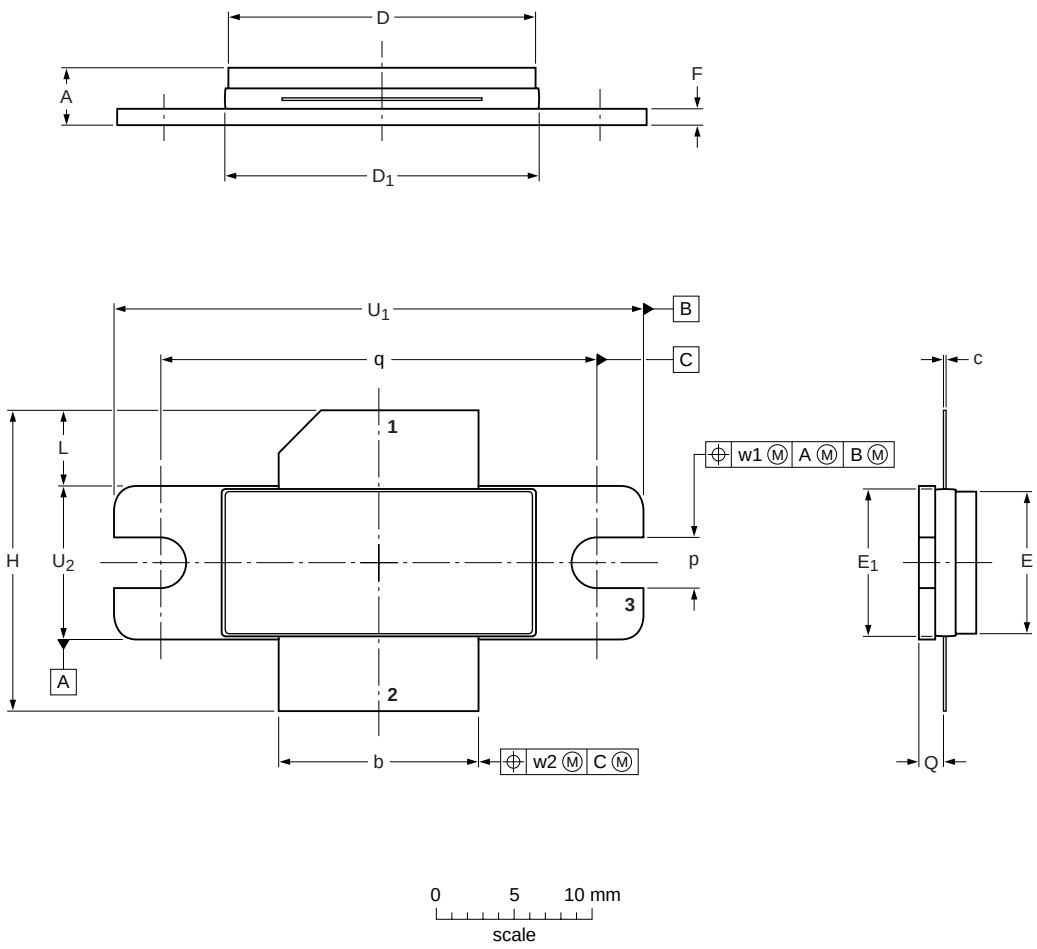
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		-	29.5	-	W
G_p	power gain	$P_{L(AV)}$ = 29.5 W	17.5	19	20	dB
IRL	input return loss	$P_{L(AV)}$ = 29.5 W	-	–10	–7	dB
η_D	drain efficiency	$P_{L(AV)}$ = 29.5 W	36.5	38.5	-	%
$ACPR_{400}$	adjacent channel power ratio (400 kHz)	$P_{L(AV)}$ = 29.5 W	-	–62.2	–60	dBc
$ACPR_{600}$	adjacent channel power ratio (600 kHz)	$P_{L(AV)}$ = 29.5 W	-	–72	–70	dBc
EVM_{rms}	RMS EDGE signal distortion error	$P_{L(AV)}$ = 29.5 W	-	1.5	2.3	%
EVM_M	peak EDGE signal distortion error	$P_{L(AV)}$ = 29.5 W	-	4.8	8	%

7.1 Ruggedness in class-AB operation

The BLC6G20-75 and BLC6G20LS-75 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} = 550 mA; P_L = 75 W (CW); f = 1990 MHz.

8. Package outline

Plastic flanged cavity package; 2 mounting slots; 2 leads **SOT895-1**



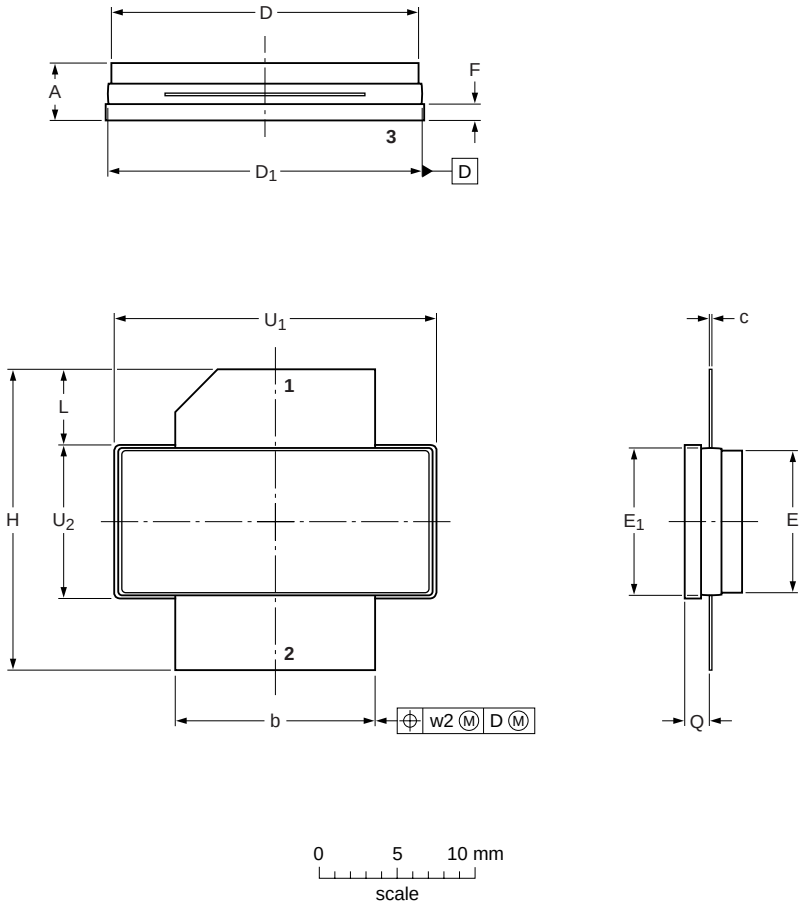
DIMENSIONS (mm are the original dimensions)

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	4.1 3.3	12.83 12.57	0.17 0.14	19.9 19.7	20.42 20.12	9.53 9.27	9.78 9.53	1.14 0.89	19.94 18.92	5.3 4.5	3.38 3.12	1.75 1.50	27.94	34.16 33.91	9.91 9.65	0.25	0.6
inches	0.161 0.130	0.505 0.495	0.0065 0.0055	0.785 0.775	0.804 0.792	0.375 0.365	0.385 0.375	0.045 0.035	0.785 0.745	0.209 0.177	0.133 0.123	0.069 0.059	1.100	1.345 1.335	0.390 0.380	0.01	0.023

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT895-1						~~05-06-22~~ 05-06-28

Fig 1. Package outline SOT895-1

Plastic earless flanged cavity package; 2 leads **SOT896-1**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	c	D	D_1	E	E_1	F	H	L	Q	U_1	U_2	w_2
mm	4.1 3.3	12.83 12.57	0.17 0.14	19.9 19.7	20.42 20.12	9.53 9.27	9.78 9.53	1.14 0.89	19.94 18.92	5.3 4.5	1.75 1.50	20.70 20.45	9.91 9.65	0.6
inches	0.161 0.130	0.505 0.495	0.0065 0.0055	0.785 0.775	0.804 0.792	0.375 0.365	0.385 0.375	0.045 0.035	0.785 0.745	0.209 0.177	0.069 0.059	0.815 0.805	0.390 0.380	0.023

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT896-1						~~05-06-22~~ 05-06-28

Fig 2. Package outline SOT896-1

9. Abbreviations

Table 8: Abbreviations

Acronym	Description
CDMA	Code Division Multiple Access
CW	Continuous Wave
EDGE	Enhanced Data rates for GSM Evolution
EVM	Error Vector Magnitude
GSM	Global System for Mobile communications
LDMOS	Laterally Diffused Metal Oxide Semiconductor
RF	Radio Frequency
RMS	Root Mean Square
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	Doc. number	Supersedes
BLC6G20-75_6G20LS-75_1	20060130	Objective data sheet	-	-	-

11. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Date of release: 30 January 2006

Document number: BLC6G20-75_6G20LS-75_1

Published in The Netherlands