

BLC6G22-100; BLC6G22LS-100

UHF power LDMOS transistor

Rev. 01 — 30 January 2006

Objective data sheet

1. Product profile

1.1 General description

100 W LDMOS power transistor for base station applications at frequencies from 2000 MHz to 2200 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_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	IMD3 (dBc)	ACPR (dBc)
2-carrier W-CDMA	2110 to 2170	28	25	18	32	-37 [1]	-40 [1]

[1] Test signal: 3GPP; test model 1; 64 DPCH; PAR = 7 dB at 0.01 % probability on CCDF per carrier; carrier spacing 10 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 2110 MHz and 2170 MHz, a supply voltage of 28 V and an I_{DQ} of 950 mA:
 - ◆ Output power = 25 W (AV)
 - ◆ Gain = 18 dB
 - ◆ Efficiency = 32 %
 - ◆ IMD3 = -37 dBc
 - ◆ ACPR = -40 dBc
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (2000 MHz to 2200 MHz)
- Internally matched for ease of use

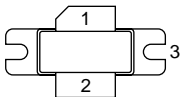
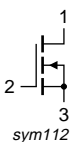
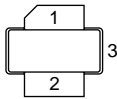
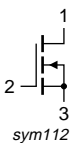
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1.3 Applications

- RF power amplifiers for W-CDMA base stations and multi carrier applications in the 2000 MHz to 2200 MHz frequency range.

2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
BLC6G22-100 (SOT895-1)			
1	drain		 sym112
2	gate		
3	source		
BLC6G22LS-100 (SOT896-1)			
1	drain		 sym112
2	gate		
3	source		

[1] Connected to flange

3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BLC6G22-100	-	plastic flanged cavity package; 2 mounting slots; 2 leads	SOT895-1
BLC6G22LS-100	-	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		-	<tbid>	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
$R_{th(j-case)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C};$ $P_L = 25\text{ W}$	BLC6G22-100	<tbid>	<tbid>	<tbid>	K/W
			BLC6G22LS-100	<tbid>	0.45	0.54	K/W

6. Characteristics

Table 6: Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 0.5\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 150\text{ mA}$	<tbid>	2	<tbid>	V
V_{GSq}	gate-source quiescent voltage	$V_{DS} = 28\text{ V}; I_D = 950\text{ mA}$	<tbid>	<tbid>	<tbid>	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	5	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $V_{DS} = 10\text{ V}$	23	27	-	A
I_{GSS}	gate leakage current	$V_{GS} = 13\text{ V}; V_{DS} = 0\text{ V}$	-	-	450	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 7.5\text{ A}$	-	10.5	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $I_D = 5.25\text{ A}$	-	0.1	-	Ω
C_{rs}	feedback capacitance	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V};$ $f = 1\text{ MHz}$	-	<tbid>	-	pF

7. Application information

Table 7: Application information

Mode of operation: 2-carrier W-CDMA; PAR 7 dB at 0.01 % probability on CCDF; 3GPP test model 1; 1-64 PDPCH; $f_1 = 2112.5\text{ MHz}; f_2 = 2122.5\text{ MHz}; f_3 = 2157.5\text{ MHz}; f_4 = 2167.5\text{ MHz};$ RF performance at $V_{DS} = 28\text{ V}; I_{Dq} = 950\text{ mA}; T_{case} = 25\text{ °C};$ unless otherwise specified; in a class-AB production test circuit

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(AV)}$	average output power		-	25	-	W
G_p	power gain	$P_{L(AV)} = 25\text{ W}$	<tbid>	18	-	dB
IRL	input return loss	$P_{L(AV)} = 25\text{ W}$	-	-9	<tbid>	dB
η_D	drain efficiency	$P_{L(AV)} = 25\text{ W}$	<tbid>	32	-	%
IMD3	third order intermodulation distortion	$P_{L(AV)} = 25\text{ W}$	-	-37	<tbid>	dBc
ACPR	adjacent channel power ratio	$P_{L(AV)} = 25\text{ W}$	-	-40	<tbid>	dBc

7.1 Ruggedness in class-AB operation

The BLC6G22-100 and BLC6G22LS-100 are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: $V_{DS} = 28\text{ V}; I_{Dq} = 950\text{ mA}; P_L = 100\text{ W (CW)}; f = 2170\text{ MHz}.$

8. Package outline

Plastic flanged cavity package; 2 mounting slots; 2 leads

SOT895-1

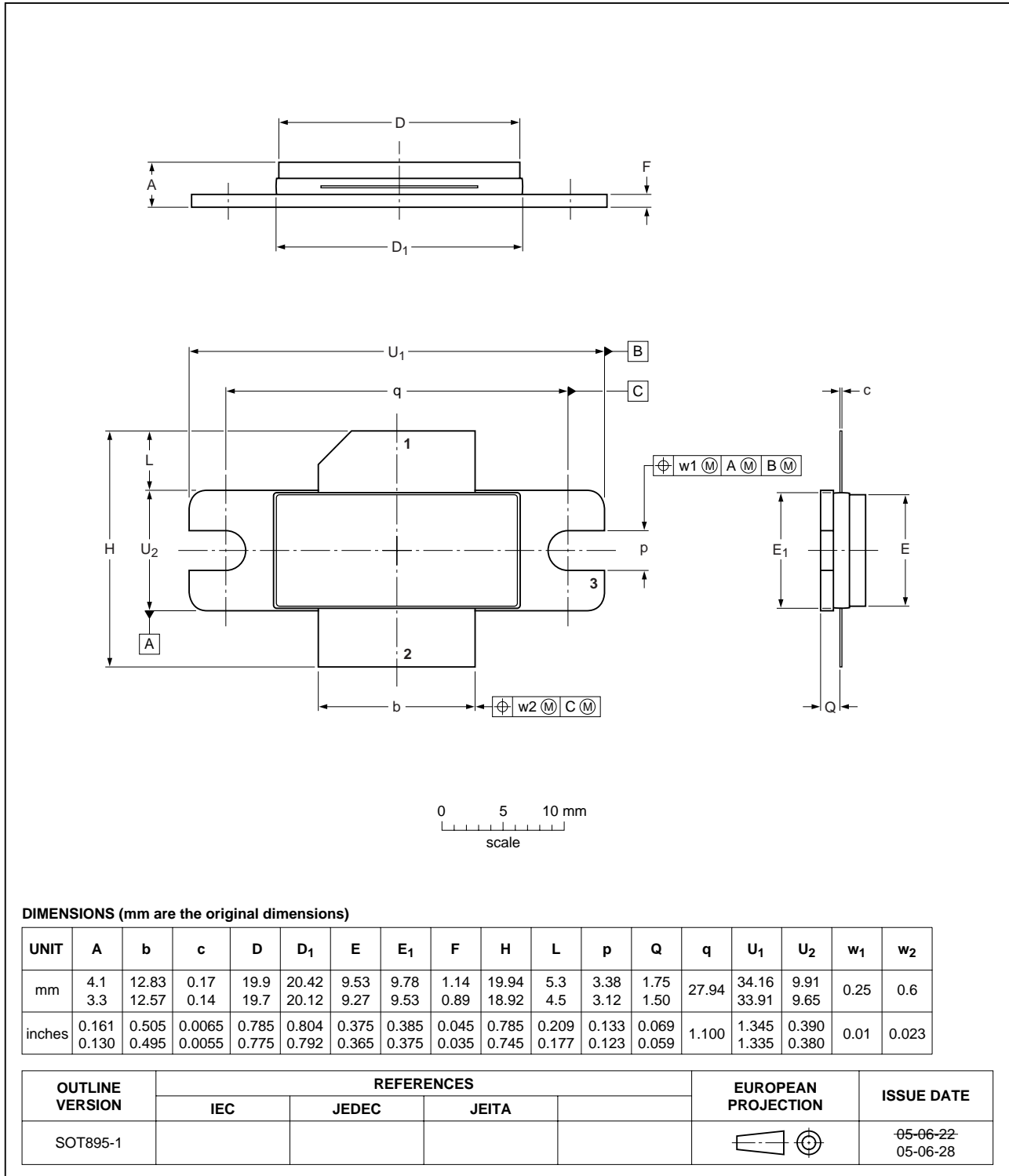


Fig 1. Package outline SOT895-1

Plastic earless flanged cavity package; 2 leads

SOT896-1

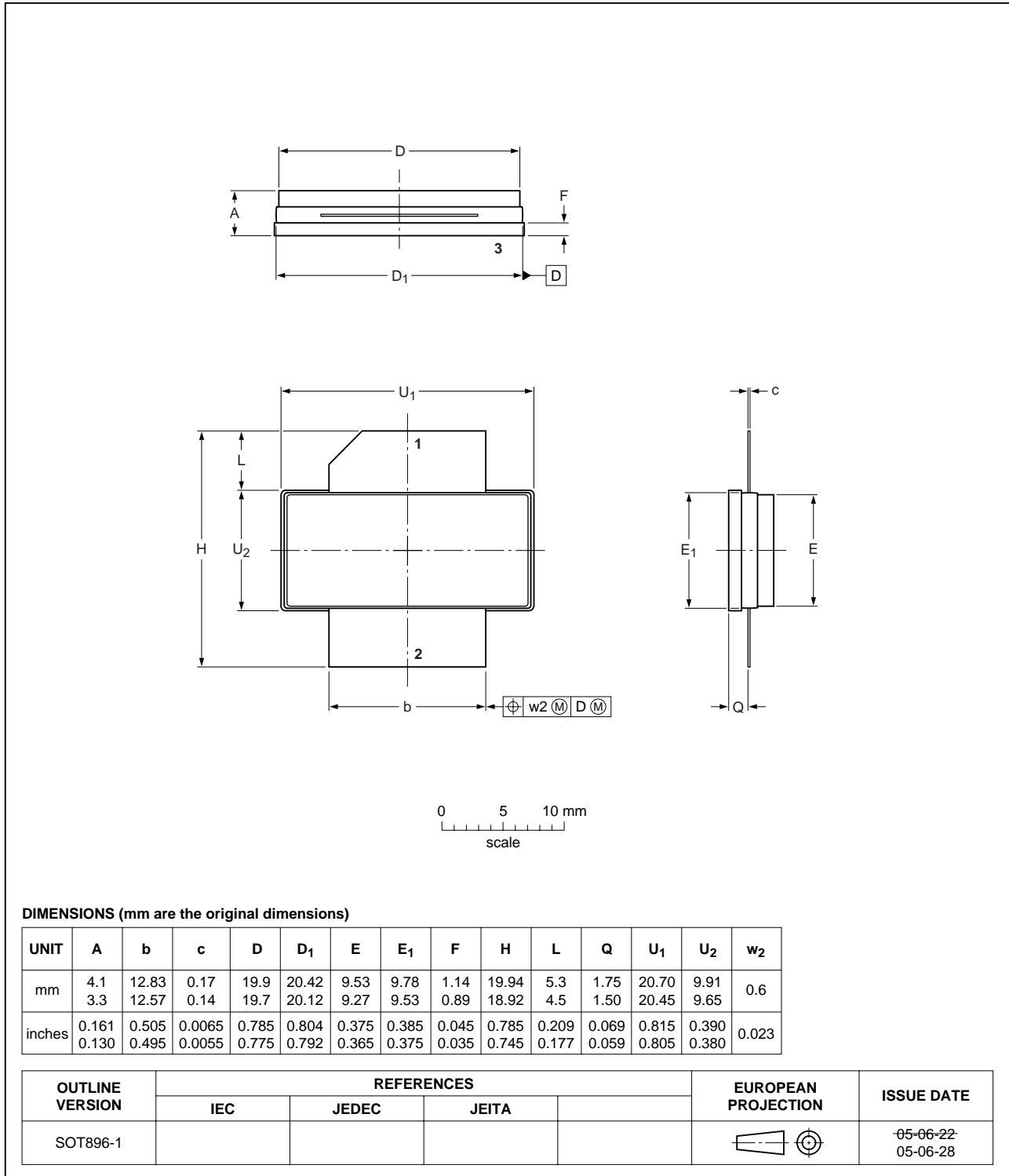


Fig 2. Package outline SOT896-1

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	Doc. number	Supersedes
BLC6G22-100_6G22 LS-100_1	20060130	Objective data sheet	-	-	-

11. Data sheet status

Level	Data sheet status ^[1]	Product status ^[2] ^[3]	Definition
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Date of release: 30 January 2006

Document number: BLC6G22-100_6G22LS-100_1

Published in The Netherlands