

# 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)	$\eta_D$ (%)	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

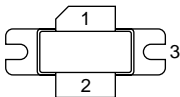
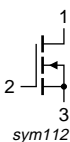
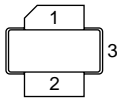
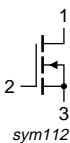
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## 1.3 Applications

- 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
<b>BLC6G22-100 (SOT895-1)</b>			
1	drain		 sym112
2	gate		
3	source		
<b>BLC6G22LS-100 (SOT896-1)</b>			
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	$\mu\text{A}$
$I_{DSX}$	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	-	$\Omega$
$C_{rs}$	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
$\eta_D$	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

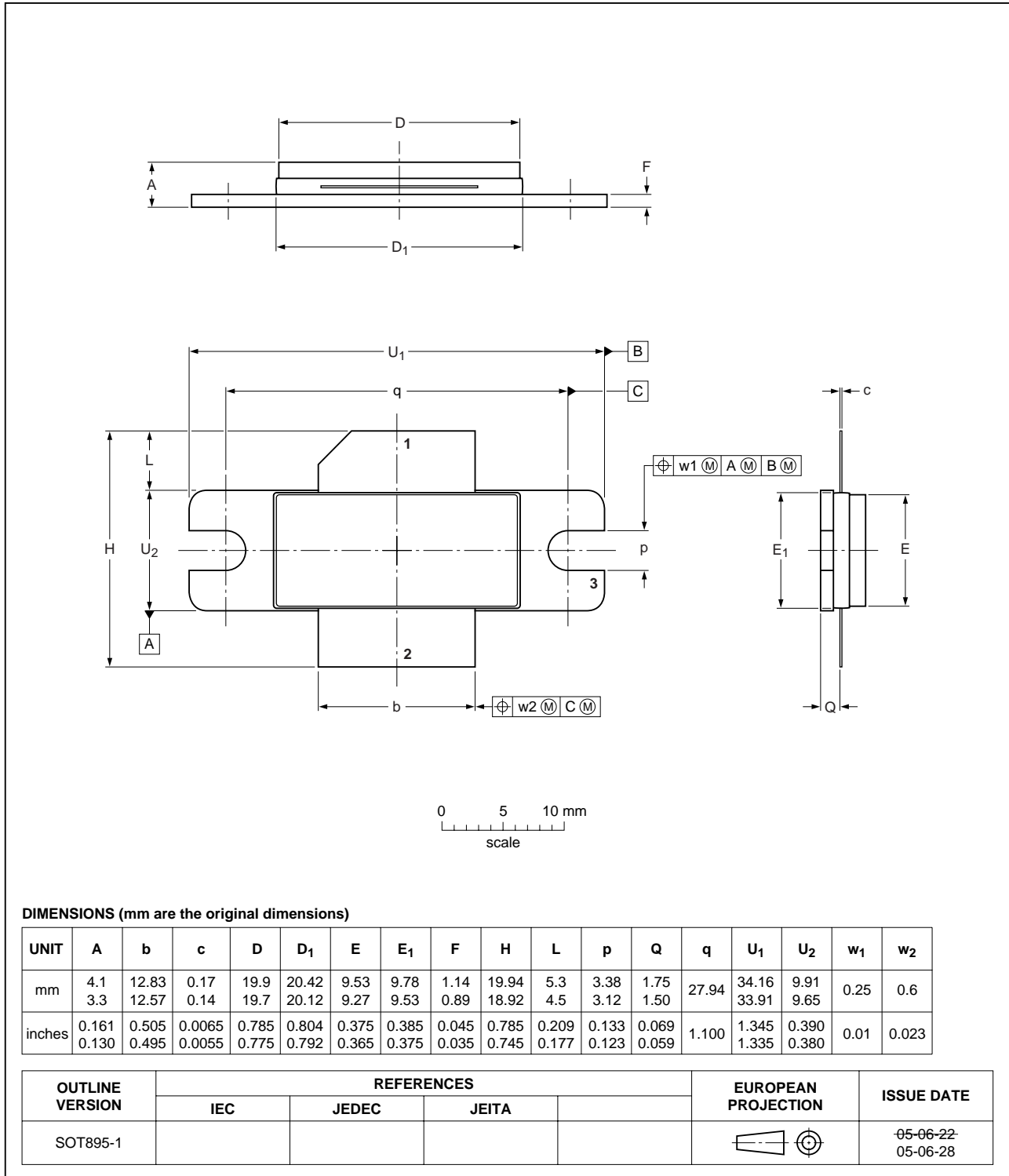


Fig 1. Package outline SOT895-1

Plastic earless flanged cavity package; 2 leads

SOT896-1

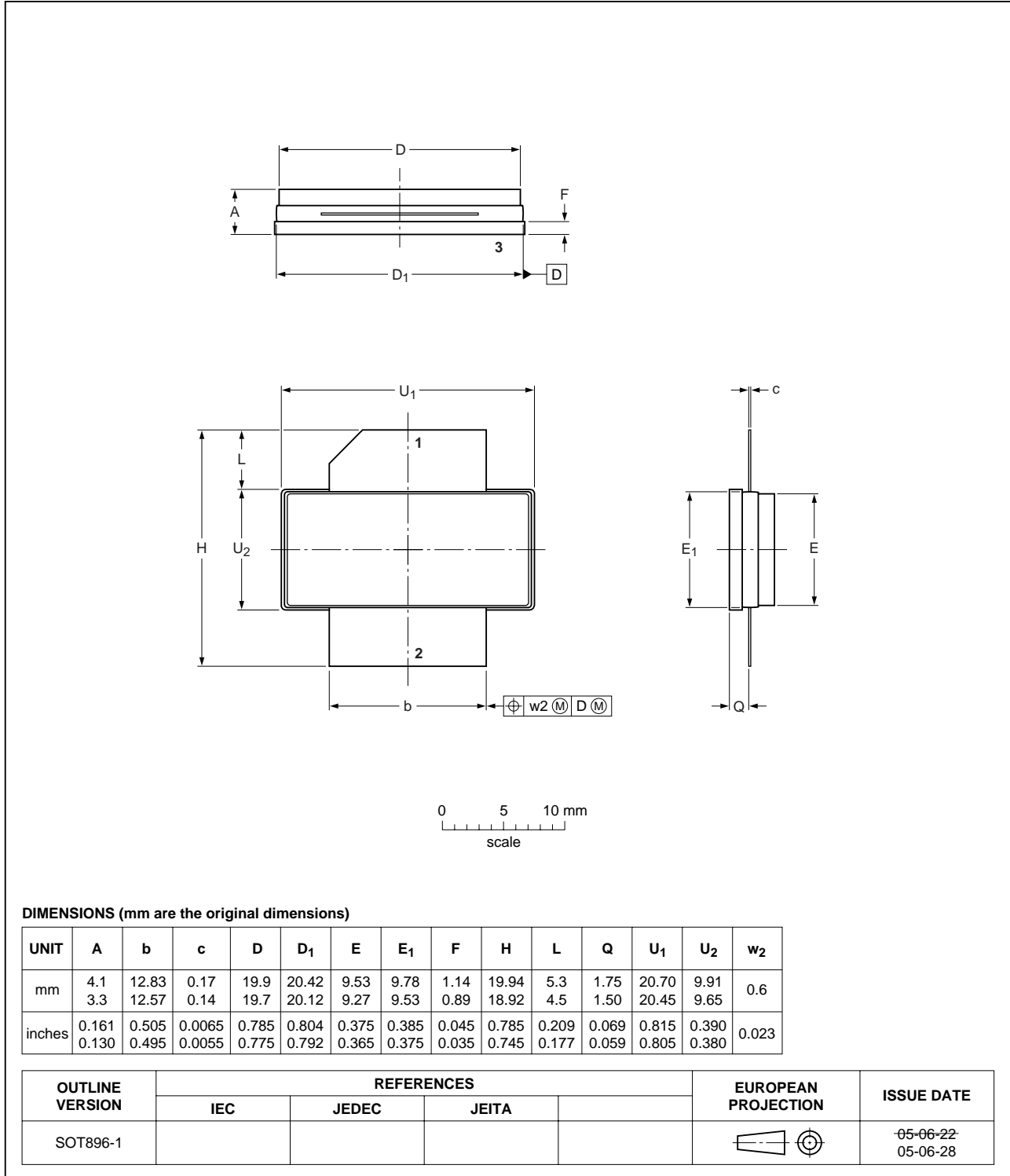


Fig 2. Package outline SOT896-1

## 9. Abbreviations

**Table 8: Abbreviations**

<b>Acronym</b>	<b>Description</b>
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	-	-	-

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Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	Definition
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