BLC6G10-160; BLC6G10LS-160

UHF power LDMOS transistor

Rev. 01 — 12 May 2006 Objective data sheet

1. Product profile

1.1 General description

160 W LDMOS power transistor for base station applications at frequencies from 800 MHz to 1000 MHz.

Table 1: Typical performance

Typical RF performance at T_{case} = 25 °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)
2-carrier W-CDMA	920 to 960	32	32	23	28	–40[1]

[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 920 MHz and 960 MHz, a supply voltage of 32 V and an I_{Dq} of 1200 mA:
  - Average output power = 32 W
  - Power gain = 23 dB
  - Efficiency = 28 %
  - ACPR = –40 dBc
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (800 MHz to 1000 MHz)
- Internally matched for ease of use

1.3 Applications

- RF power amplifiers for GSM, GSM EDGE, W-CDMA and CDMA base stations and multi carrier applications in the 800 MHz to 1000 MHz frequency range.

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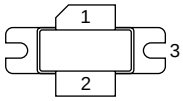
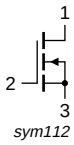
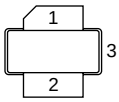
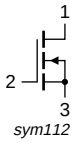
2. Pinning information

Table 2: Pinning

Pin	Description		Simplified outline	Symbol
BLC6G10-160 (SOT895-1)				
1	drain			
2	gate			
3	source	[1]		
BLC6G10LS-160 (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
BLC6G10-160	-	plastic flanged cavity package; 2 mounting slots; 2 leads	SOT895-1
BLC6G10LS-160	-	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		-	200	°C

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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 = 32 W	BLC6G10-160	<tbd>	<tbd>	<tbd>	K/W
			BLC6G10LS-160	<tbd>	0.43	0.52	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 = 150 mA	<tbd>	2	<tbd>	V
V_{GSq}	gate-source quiescent voltage	V_{DS} = 28 V; I_D = 950 mA	<tbd>	<tbd>	<tbd>	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	5	µA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	32	39	-	A
I_{GSS}	gate leakage current	V_{GS} = 13 V; V_{DS} = 0 V	-	-	450	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 7.5 A	-	13.5	-	S
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 5.25 A	-	0.07	-	Ω
C_{rs}	feedback capacitance	V_{GS} = 0 V; V_{DS} = 28 V; f = 1 MHz	-	<tbd>	-	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; 1-64 PDPCH; f_1 = 922.5 MHz; f_2 = 927.5 MHz; f_3 = 952.5 MHz; f_4 = 957.5 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = 1200 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		-	32	-	W
G_p	power gain	$P_{L(AV)}$ = 32 W	21.5	23	24.5	dB
IRL	input return loss	$P_{L(AV)}$ = 32 W	-	–6.5	–4.7	dB
η_D	drain efficiency	$P_{L(AV)}$ = 32 W	26	28	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)}$ = 32 W	-	–40	–37	dBc

7.1 Ruggedness in class-AB operation

The BLC6G10-160 and BLC6G10LS-160 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} = 1200 mA; P_L = 160 W (CW); f = 960 MHz.

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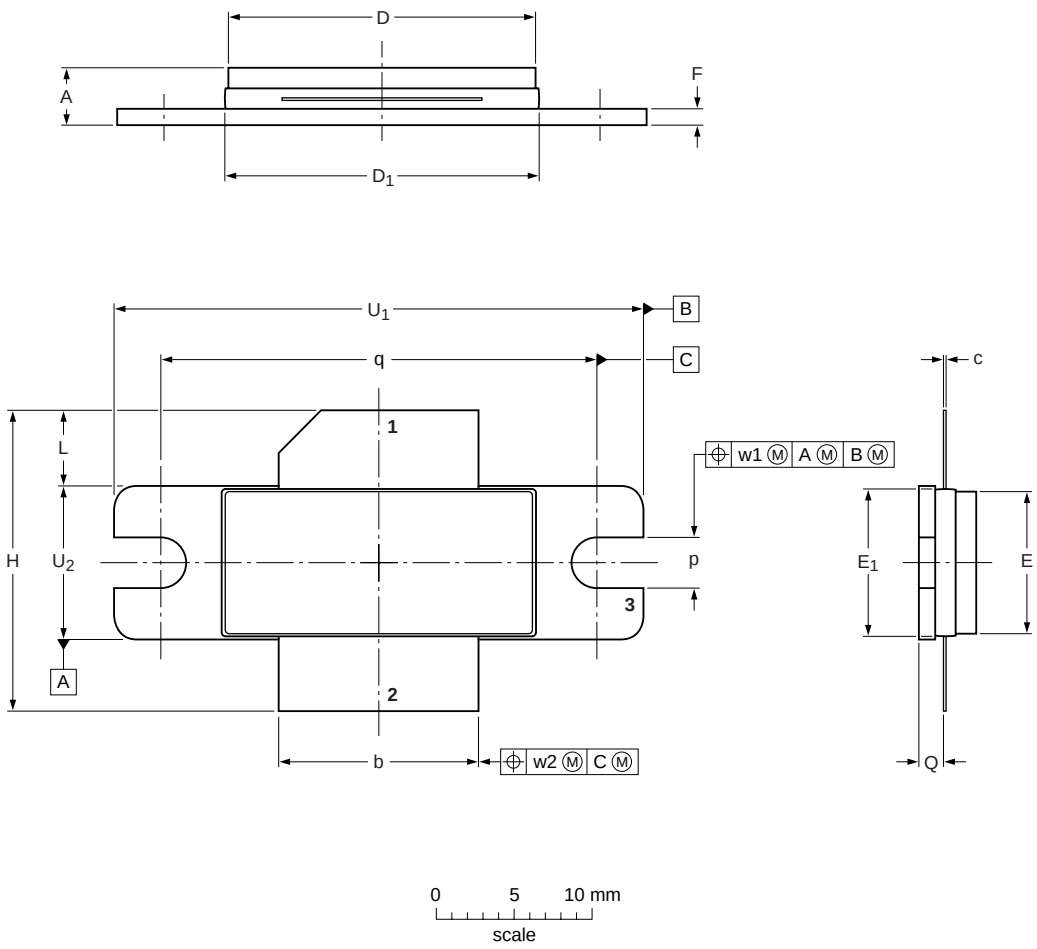
8. Package outline

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	9.98 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	0.392 0.380	0.01	0.023

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT895-1						~~05-06-28~~ 06-02-21

Fig 1. Package outline SOT895-1

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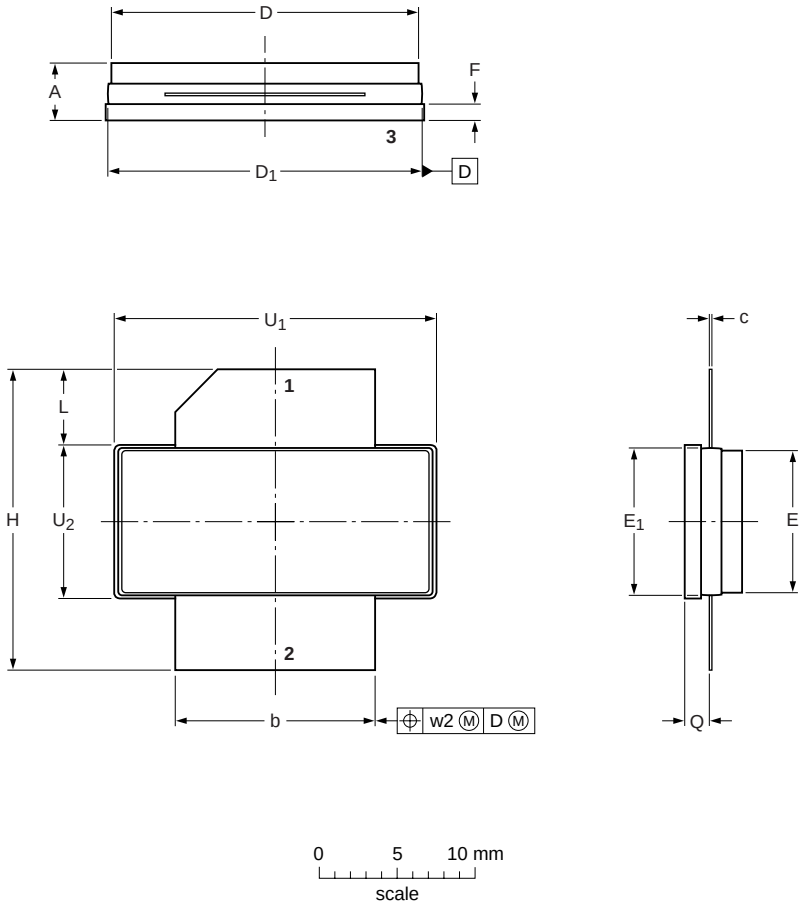
Plastic earless flanged cavity package; 2 leads **SOT896-1**



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	9.98 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	0.392 0.380	0.023

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT896-1						~~05-06-28~~ 06-02-21

Fig 2. Package outline SOT896-1

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9. Abbreviations

Table 8: 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
EDGE	Enhanced Data rates for GSM Evolution
GSM	Global System for Mobile communications
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

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10. Revision history

Table 9: Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLC6G10-160_6G10LS-160_1	20060512	Objective data sheet	-	-

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11.1 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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