BLP7G22-10

LDMOS driver transistor

Rev. 1 — 13 February 2012 Objective data sheet

1. Product profile

1.1 General description

The BLP7G22-10 is low power driver using NXP's state of the art GEN7 LDMOS technology. This device is perfectly suited as general purpose driver in the frequency range from 700 MHz to 2200 MHz.

Table 1. Application performance (multiple frequencies)

Typical RF performance at T_{case} = 25 °C; I_{Dq} = 50 mA; in a class-AB application circuit.

Test signal	f (MHz)	I_{Dq} (mA)	V_{DS} (V)	$P_{L(AV)}$ (W)	G_p (dB)	η_D (%)	IMD3 (dBc)	ACPR (dBc)
1-carrier W-CDMA	748	110	28	0.7	27	16	–	–45[1]
	748	110	28	2	27	26	–	–43
2-carrier W-CDMA	2140	90	28	0.7	17	16	–46	–48[2]
	2140	90	28	2	17	26	–40	–43

[1] Single carrier; Test signal: 3GPP; test model 1; 64 DPCH; PAR = 8.7 dB at 0.01 % probability on CCDF per carrier.

[2] Test signal: 3GPP; test model 1; 64 DPCH; PAR = 7.2 dB at 0.01 % probability on CCDF per carrier. Carrier spacing 10 MHz

1.2 Features and benefits

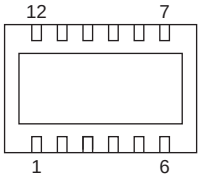
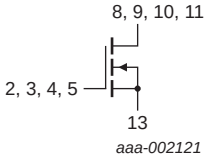
- Typical 1-carrier W-CDMA performance at frequency 748 MHz:
  - Average output power = 0.7 W
  - Power gain = 27 dB
  - Efficiency = 16 %
  - Ruggedness at least 10 : 1, P_L = 10 W
- Typical 2-carrier W-CDMA performance at frequency 2140 MHz:
  - Average output power = 0.7 W
  - Power gain = 17 dB
  - Efficiency = 16 %
  - Ruggedness at least 10 : 1, P_L = 10 W
- Integrated ESD protection
- Excellent thermal stability
- High power gain
- Designed for broadband operation (700 MHz to 2200 MHz)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- GSM/EDGE
- TDS/CDMA
- W-CDMA

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1, 6, 7, 12	n.c.	 Transparent top view	 aaa-002121
2, 3, 4, 5	gate		
8, 9, 10, 11	drain		
13	source [1]		

[1] Connected to flange.

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLP7G22-10	HVSON12	plastic thermal enhanced very thin small outline package; no leads; 12 terminals; body 4 x 6 x 0.85 mm	SOT1179-1

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
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		-	150	°C

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$Z_{th(j-c)}$	transient thermal impedance from junction to case	T_{case} = 70 °C; P_L = 2 W	3.0	K/W

6. Characteristics

Table 6. DC 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 = 0.18 mA	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	V_{DS} = 10 V; I_D = 18 mA	1.4	<tbd>	2.4	V
V_{GSq}	gate-source quiescent voltage	V_{DS} = 28 V; I_D = <tbd> mA	<tbd>	<tbd>	<tbd>	V
I_{DSS}	drain leakage current	V_{GS} = 0 V; V_{DS} = 28 V	-	-	2.8	μA
I_{DSX}	drain cut-off current	V_{GS} = $V_{GS(th)}$ + 3.75 V; V_{DS} = 10 V	-	3.5	-	A
I_{GSS}	gate leakage current	V_{GS} = 11 V; V_{DS} = 0 V	-	-	280	nA
g_{fs}	forward transconductance	V_{DS} = 10 V; I_D = 18 mA	107	160	210	mS
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = $V_{GS(th)}$ + 3.75 V; I_D = 630 mA	0.32	0.79	1.26	mΩ

Table 7. RF characteristics

Test signal: 1-tone pulsed; t_p = 20 μs; δ = 10 %; f_1 = 2110 MHz; f_2 = 2170 MHz; RF performance at V_{DS} = 28 V; I_{Dq} = <tbd>mA; T_{case} = 25 °C; unless otherwise specified, in a production circuit.

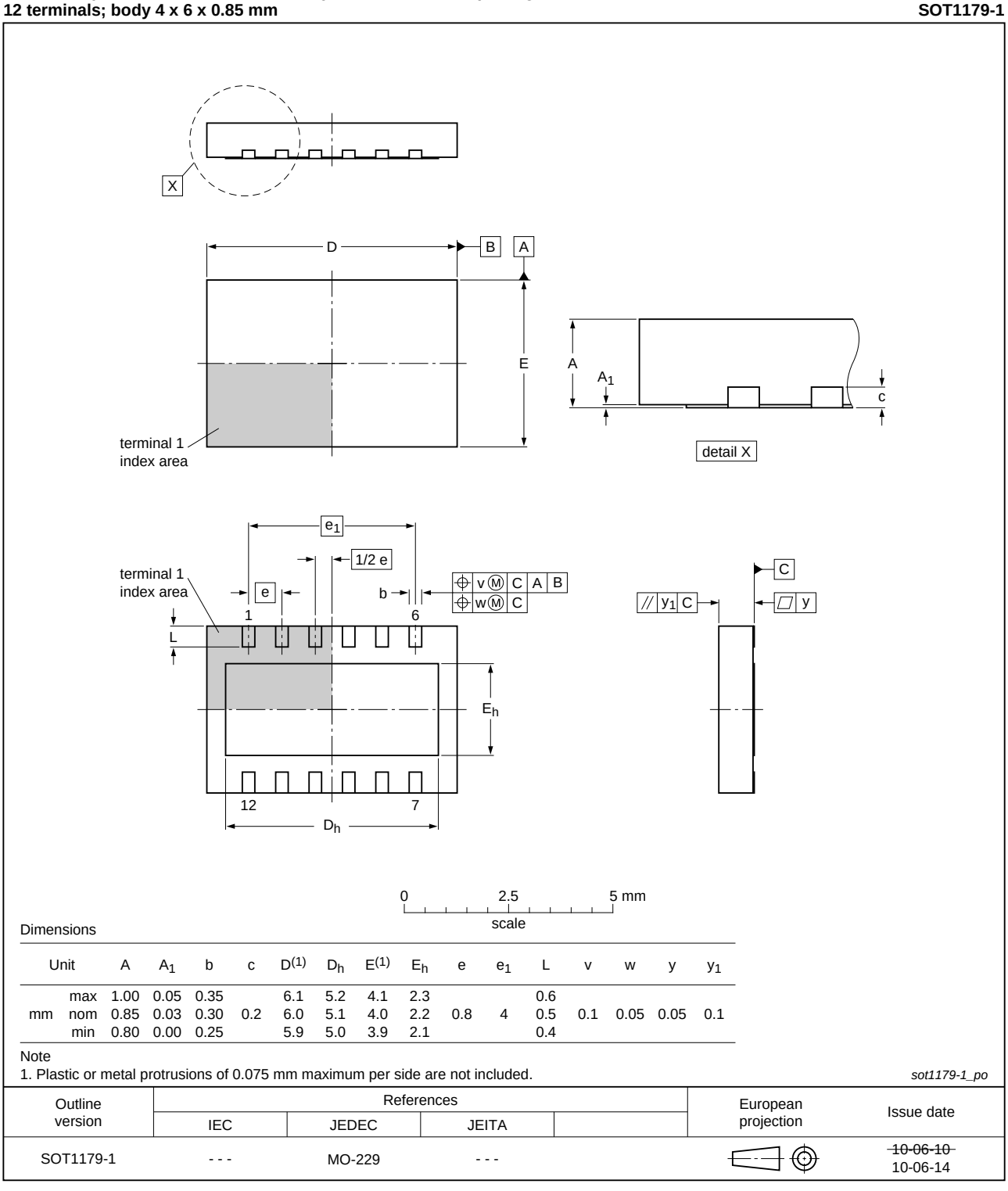
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	1-tone pulsed; $P_{L(AV)}$ = 2 W	<tbd>	17	<tbd>	dB
η_D	drain efficiency	$P_{L(AV)}$ = 2 W	<tbd>	25	-	%
RL_{in}	input return loss	$P_{L(AV)}$ = 2 W	-	<tbd>	<tbd>	dB

6.1 Ruggedness in class-AB operation

The BLP7G22-10 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 32 V; I_{Dq} = 110 mA; P_L = 10 W; frequency from 700 MHz to 2200 MHz.

7. Package outline

HVSON12: plastic thermal enhanced very thin small outline package; no leads; 12 terminals; body 4 x 6 x 0.85 mm **SOT1179-1**



Dimensions

Unit		A	A_1	b	c	$D^{(1)}$	D_h	$E^{(1)}$	E_h	e	e_1	L	v	w	y	y_1
	max	1.00	0.05	0.35		6.1	5.2	4.1	2.3			0.6				
mm	nom	0.85	0.03	0.30	0.2	6.0	5.1	4.0	2.2	0.8	4	0.5	0.1	0.05	0.05	0.1
	min	0.80	0.00	0.25		5.9	5.0	3.9	2.1			0.4				

Note

1. Plastic or metal protrusions of 0.075 mm maximum per side are not included.

sot1179-1_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT1179-1	- - -	MO-229	- - -			~~10-06-10~~ 10-06-14

Fig 1. Package outline SOT1179-1

8. Handling information

CAUTION

This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

9. Abbreviations

Table 8. Abbreviations

Acronym	Description
3GPP	Third Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CDMA	Code Division Multiple Access
DPCH	Dedicated Physical CHannel
EDGE	Enhanced Data rates for GSM Evolution
GEN7	seventh-generation
GSM	Global System for Mobile Communication
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
PAR	Peak-to-Average power Ratio
RF	Radio Frequency
TDS	Time Division Synchronous
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
BLP7G22-10 v.1	20120213	Objective data sheet	-	-

11. Legal information

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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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13. Contents

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