

# BLP7G07S-140P

Power LDMOS transistor

Rev. 1 — 21 June 2012

Objective data sheet

## 1. Product profile

### 1.1 General description

140 W LDMOS power transistor for base station applications at frequencies from 700 MHz to 1000 MHz.

Table 1. Typical performance

Test signal	f (MHz)	V <sub>DS</sub> (V)	P <sub>L(AV)</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)	ACPR (dBc)
2-carrier W-CDMA						
700 MHz band	726.5	28	35	20.6	29.0	−35.5 [1]
	766.5	28	35	20.6	29.0	−35.5 [1]
800 MHz band	793.5	28	35	20.4	29.0	−35.5 [1]
	818.5	28	35	20.1	29.0	−35.5 [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.

### 1.2 Features and benefits

- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (700 MHz to 1000 MHz)
- Internally matched for ease of use
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

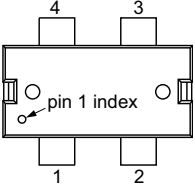
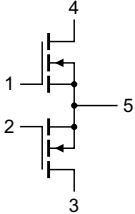
### 1.3 Applications

- RF power amplifiers for W-CDMA base stations and multi carrier applications in the 700 MHz to 1000 MHz frequency range.



## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	gate 1		
2	gate 2		
3	drain 2		
4	drain 1		
5	source		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLP7G07S-140P	HSOP4F	plastic, heatsink small outline package; 4 leads (flat)	SOT1223-1

## 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		-	225	°C

## 5. Thermal characteristics

Table 5. Thermal characteristics

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

## 6. Characteristics

**Table 6. Characteristics**

$T_j = 25\text{ }^{\circ}\text{C}$  per section; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 1\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 100\text{ mA}$	1.5	1.9	2.3	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	1.4	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $V_{DS} = 10\text{ V}$	-	18	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	140	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 3.5\text{ A}$	-	6.7	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V};$ $I_D = 3.5\text{ A}$	-	0.19	-	$\Omega$

**Table 7. RF characteristics**

Test signal: 2-carrier W-CDMA; PAR 7.5 dB at 0.01 % probability on CCDF; 3GPP test model 1; 1-64 PDPCH;  $f_1 = 724\text{ MHz}$ ;  $f_2 = 729\text{ MHz}$ ;  $f_3 = 764\text{ MHz}$ ;  $f_4 = 769\text{ MHz}$ ; RF performance at  $V_{DS} = 28\text{ V}$ ;  $I_{DQ} = 1200\text{ mA}$ ;  $T_{case} = 25\text{ }^{\circ}\text{C}$ ; unless otherwise specified; in a broadband class-AB production test circuit from 724 MHz to 821 MHz.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_{L(AV)} = 35\text{ W}$	<td>	20.6	-	dB
$RL_{in}$	input return loss	$P_{L(AV)} = 35\text{ W}$	-	-11	<td>	dB
$\eta_D$	drain efficiency	$P_{L(AV)} = 35\text{ W}$	<td>	29.0	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)} = 35\text{ W}$	-	-35.5	<td>	dBc

### 6.1 Ruggedness in class-AB operation

The BLP7G07S-140P is capable of withstanding a load mismatch corresponding to  $VSWR = <td>$  through all phases under the following conditions:  $V_{DS} = 28\text{ V}$ ;  $I_{DQ} = 1200\text{ mA}$ ;  $P_L = 140\text{ W}$ ;  $f = 724\text{ MHz}$  to  $821\text{ MHz}$ .



## 8. Abbreviations

**Table 8. Abbreviations**

Acronym	Description
3GPP	3rd Generation Partnership Project
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Waveform
DPCH	Dedicated Physical CHannel
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal Oxide Semiconductor
PAR	Peak-to-Average Ratio
PDPCH	transmission Power of the Dedicated Physical CHannel
VSWR	Voltage Standing-Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

## 9. Revision history

**Table 9. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLP7G07S-140P v.1	20120621	Objective data sheet	-	-

## 10. Legal information

### 10.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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Product [short] data sheet	Production	This document contains the product specification.

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