BLL6H1214P2S-250

LDMOS L-band radar power module

Rev. 1 — 12 August 2014 Product data sheet

1. Product profile

1.1 General description

250 W LDMOS power module intended for L-band radar applications in the frequency range from 1.2 GHz to 1.4 GHz.

Table 1. Test information

Typical RF performance at T_{case} = 25 °C; t_p = 1.8 ms; δ = 30 %; I_{Dq} = 200 mA; P_i = 26 dBm; in a class-AB production test circuit.

Test signal	f	V_{DS}	P_L	G_p	η_{add}	t_r	t_f
	(MHz)	(V)	(W)	(dB)	(%)	(ns)	(ns)
pulsed RF	1195 to 1405	45	190 to 290	27	48	15	5

1.2 Features and benefits

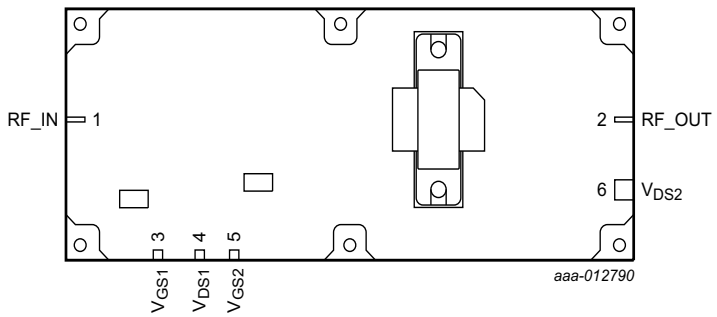
- Input/output 50 Ω matched
- High flexibility with respect to pulse formats
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- Designed for broadband operation (1.2 GHz to 1.4 GHz)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

1.3 Applications

- L-band radar applications in the frequency range 1.2 GHz to 1.4 GHz

2. Pinning information

2.1 Pinning



Top view.

Fig 1. Pin configuration

2.2 Pin description

Table 2. Pin description

Symbol	Pin	Description
RF_IN	1	RF input
RF_OUT	2	RF output
V_{GS1}	3	gate-source voltage 1
V_{DS1}	4	drain-source voltage 1
V_{GS2}	5	gate-source voltage 2
V_{DS2}	6	drain-source voltage 2

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLL6H1214P2S-250	-	pallet LDMOS; 6 mounting holes; 6 terminations	SOM039

4. Block diagram

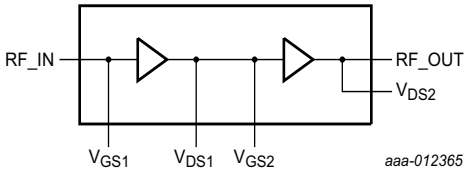


Fig 2. Block diagram

5. 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		-	50	V
V_{GS}	gate-source voltage		–0.5	+13	V
T_{amb}	ambient temperature		5	60	°C
T_{mb}	mounting base temperature		0	50	°C
T_{stg}	storage temperature		–20	+70	°C
T_j	junction temperature	[1]	-	225	°C

[1] Continuous use at maximum temperature will affect the reliability, for details refer to the on-line MTF calculator.

6. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$Z_{th(j-c)}$	transient thermal impedance from junction to case	T_{case} = 50 °C; P_i = 26 dBm; t_p = 1.8 ms; δ = 30 %	0.39	K/W

7. Characteristics

Table 6. RF characteristics

Test signal: pulsed RF; P_i = 26 dBm; t_p = 1.8 ms; δ = 30 %; RF performance at V_{DS} = 45 V; I_{Dq} = 200 mA; T_{case} = 25 °C; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency		1210	1300	1405	MHz
V_{DD}	supply voltage		44.7	45	45.3	V
V_{GS}	gate-source voltage		-	5	6.5	V
$P_{L(sat)}$	saturated output power		52.8	53.0	54.3	dBm
FL	flatness of frequency response	[1]	-	-	1.2	dB
ΔP_L	output power variation	P_i = 26 dBm ± 0.4 dBm	–0.2	-	+0.2	
$P_{droop(pulse)}$	pulse droop power		-	-	0.5	dB
G_p	power gain	3 dB gain compression	-	27	-	dB
η_{add}	power added efficiency		45	48	-	%
t_r	rise time		-	-	50	ns
t_f	fall time		-	-	50	ns
$\alpha_{resp(sp)}$	spurious response		-	-	–60	dBc
$\alpha_{sup(H)}$	harmonic suppression		-	-	–40	dBc
MTTF	mean time to failure		1×10^6	-	-	h

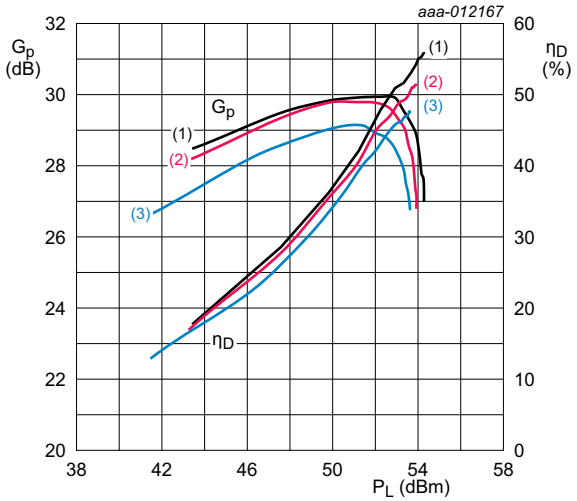
[1] Power flatness; testing at fixed P_i.

7.1 Ruggedness in class-AB operation

The BLL6H1214P2S-250 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 45 V; I_{Dq} = 200 mA; P_i = 26 dBm; t_p = 1.8 ms; δ = 30 %.

8. Test information

8.1 Graphical data



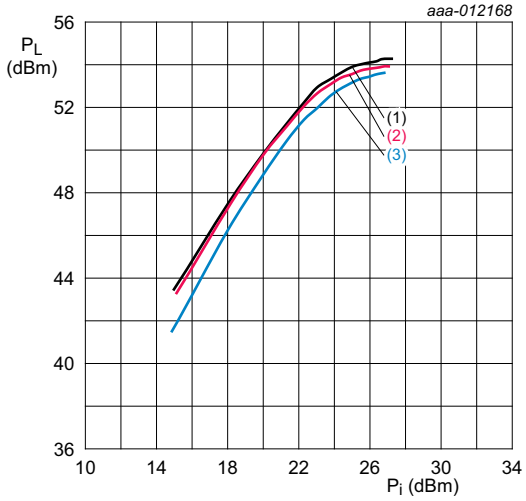
V_{DS} = 45 V; I_{Dq} = 200 mA.

(1) f = 1195 MHz

(2) f = 1300 MHz

(3) f = 1405 MHz

Fig 3. Power gain and drain efficiency as function of output power; typical values



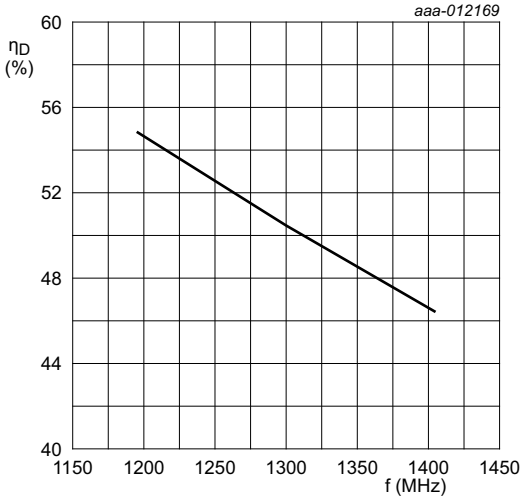
V_{DS} = 45 V; I_{Dq} = 200 mA; t_p = 1.8 ms; δ = 30 %.

(1) f = 1195 MHz

(2) f = 1300 MHz

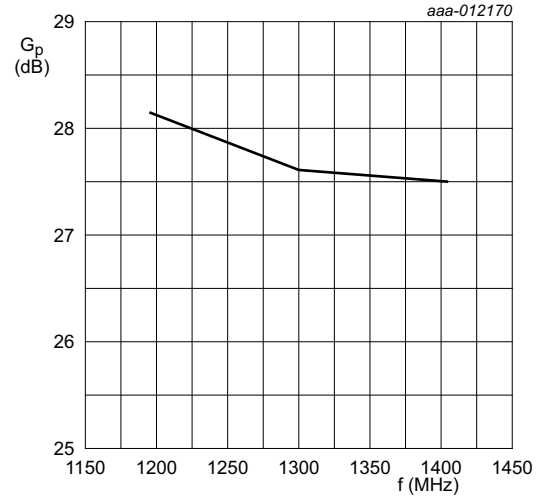
(3) f = 1405 MHz

Fig 4. Output power as a function of input power; typical values



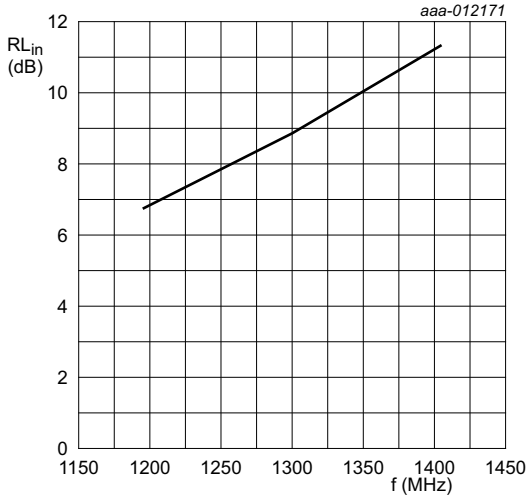
V_{DS} = 45 V; I_{Dq} = 200 mA; t_p = 1.8 ms; δ = 30 %; P_i = 26 dBm.

Fig 5. Drain efficiency as a function of frequency; typical values



V_{DS} = 45 V; I_{Dq} = 200 mA; t_p = 1.8 ms; δ = 30 %; P_i = 26 dBm.

Fig 6. Power gain as a function of frequency; typical values

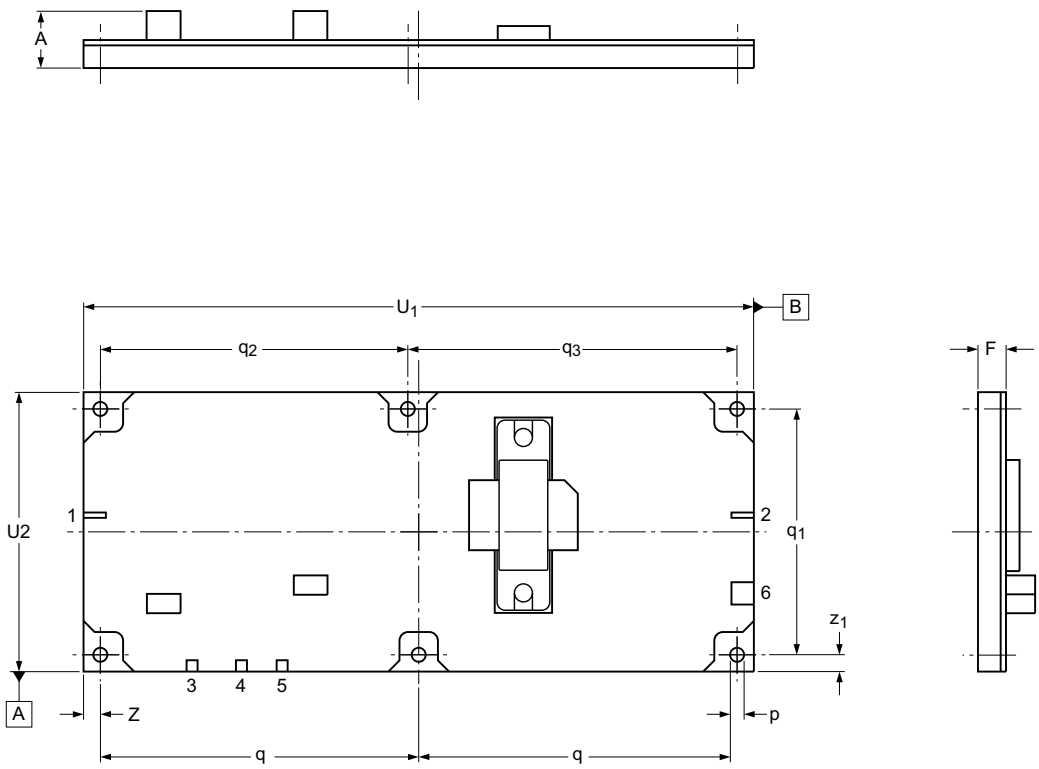


V_{DS} = 45 V; I_{Dq} = 200 mA; t_p = 1.8 ms; δ = 30 %; P_i = 26 dBm.

Fig 7. Input return loss as a function of frequency; typical values

9. Package outline

Pallet LDMOS; 6 mounting holes; 6 terminations **SOM039**



Dimensions (mm are the original dimensions)

Unit		A	F	p	U_1	U_2	q	q_1	q_2	q_3	Z	Z_1
mm	max	10.4	5.0	2.7	120.0	50.0	57.1	44.1	55.1	59.1	3.1	3.1
	nom											
	min	10.1	4.9	2.5	119.8	49.8	56.9	43.9	54.9	58.9	2.9	2.9

som039_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOM039						~~14-03-27~~ 14-04-02

Fig 8. Package outline SOM039

10. 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.

11. Abbreviations

Table 7. Abbreviations

Acronym	Description
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
L-band	Long wave band
MTF	Median Time to Failure
VSWR	Voltage Standing-Wave Ratio

12. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLL6H1214P2S-250 v.1	20140812	Product data sheet	-	-

13. Legal information

13.1 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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15. Contents

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