

1030MHz 1090MHz amplifier

BLA9G1011L(S)-300 (G), 1030-1090MHz

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Application Report
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Document information

Status Ampleon

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Abstract Simulations and measurement results of a ClassAB design for the 1030-1090MHz with the BLA9G1011L(S)-300 (G)

1. Revision History

Table 1: Report revisions

Revision	Date	Description	Author
1.0	2016.08.18	Initial document	Víctor Martínez
2.0	2016.11.16	New pictures	Víctor Martínez

2. Contents

- 1. Revision History..... 2
- 2. Contents 2
- 3. List of figures 2
- 4. List of tables..... 2
- 5. General description 3
- 6. Biasing..... 4
- 7. Performance Indication 5
- 8. Performance Details 6
- 9. Hardware..... 7
 - 9.1 Board Image 7
 - 9.2 Copper Layout 7
 - 9.3 Bill of materials..... 8
 - 9.4 Board material..... 9
 - 9.5 Device markings..... 9
 - 9.6 DC board interfaces 10
- 10. Legal information 11
 - 10.1 Definitions 11
 - 10.2 Disclaimers 11
 - 10.3 Trademarks 11
 - 10.4 Contact information 11

3. List of figures

- Figure 1 App board.....Front view..... 3
- Figure 2 Output power as a function of input power 6
- Figure 3 Power gain as a function of output power 6
- Figure 4 Drain efficiency as a function of output power 6
- Figure 5 App board.....General view 7
- Figure 6 App board.....Layout & components..... 7
- Figure 7 App board.....DC Interfaces 10

4. List of tables

- Table 1:Report revisions 2
- Table 2:Performance indication, typical values 5
- Table 3:Bill of Materials 8
- Table 4:Board specifications 9
- Table 5:Device specifics..... 9
- Table 6:DC Interfaces 10

5. General description

This report presents the measurement results of the ClassAB demo 1030MHz 1090MHz amplifier. The device used is the 9th generation LDMOS in the SOT502 package, the BLA9G1011L(S)-300 (G). The presented demo is tuned for the frequency band 1030-1090MHz.

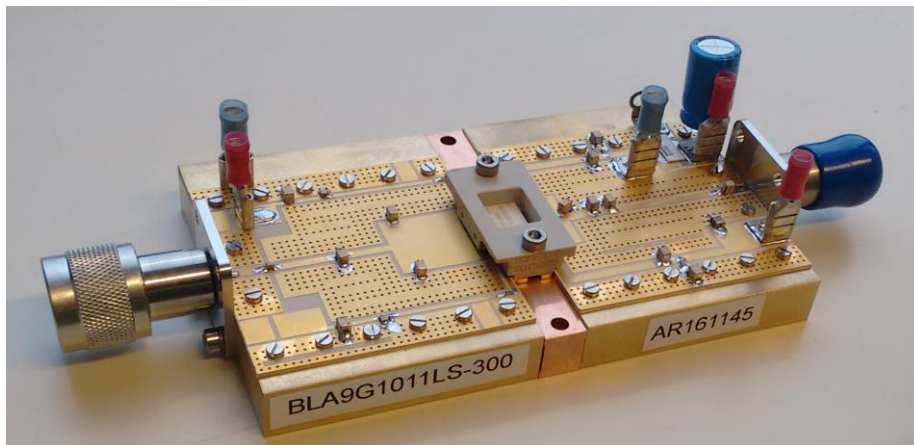


Figure 1 App board Front view

6. Biasing

The efficiencies presented are based on the currents of the drain feeds only. I.e. the biasing currents for the gate circuitry has not been included.

The biasing is as follows:

$$V_{ds} = 32V$$

$$V_{GS} = 1.85V, \text{ leading to an } I_{DQ}=100mA$$

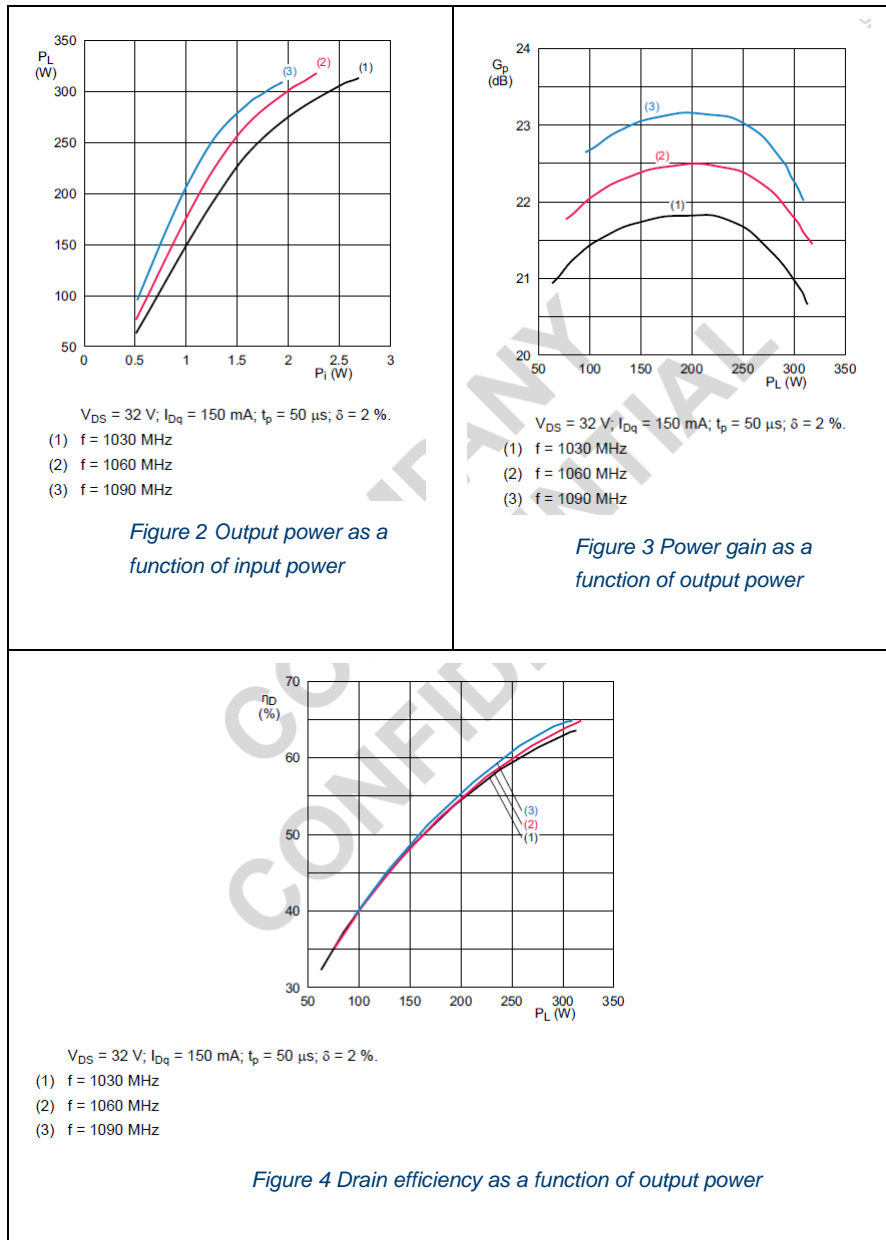
7. Performance Indication

Table 2: Performance indication, typical values

Parameter	Condition	1030 MHz	1060 MHz	1090 MHz	Unit
V _{DS}			32		V
V _{gs}	I _{dq} =100mA		1.85		V
S11 at connector	PL _(P1dB)	12	12.3	10.5	dB
P _{1dB} (*)			>300		W
P _{OUT} of operation(*)	PL _(P1dB)		>54.77		dBm
Gain(*)	PL _(P1dB)	20.6	21.5	21.8	dB
Drain Efficiency(*)	PL _(P1dB)	63.5	64.8	64.8	%

(*)T_{case}=25 °C; T_p=50us; δ=2 %; I_{DQ}= 100mA

8. Performance Details



9. Hardware

9.1 Board Image

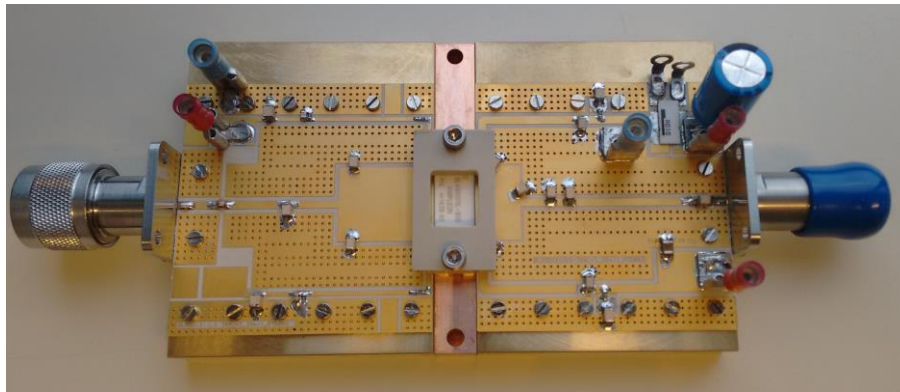


Figure 5 App board General view

9.2 Copper Layout

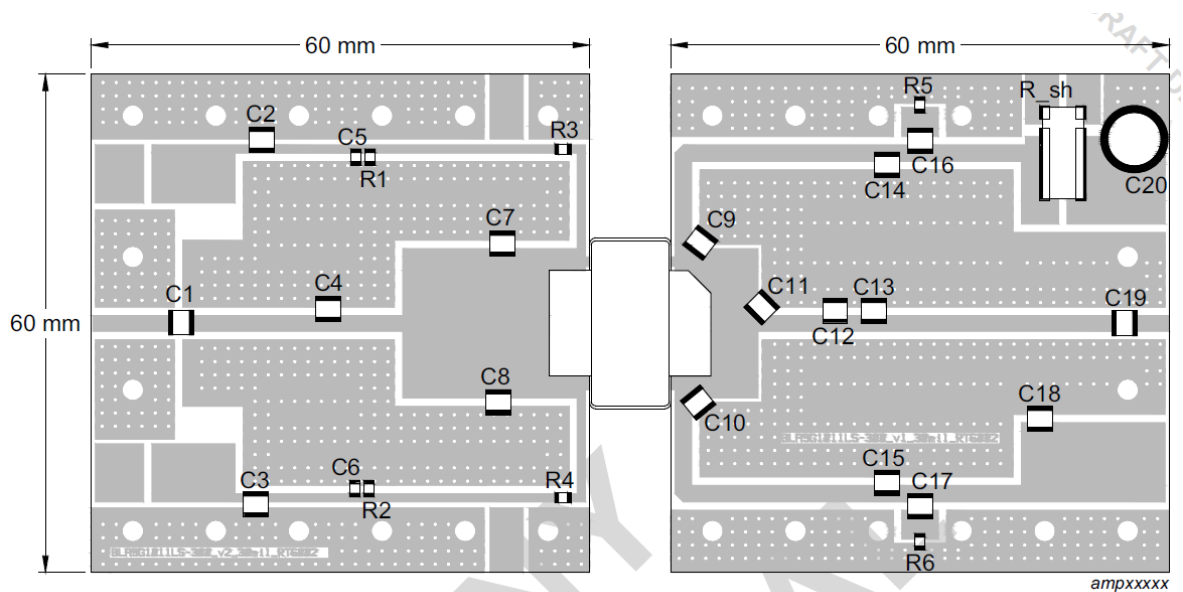


Figure 6 App board Layout & components

9.3 Bill of materials

Component	Description	Value	Remarks
C1	multilayer ceramic chip capacitor	56 pF	ATC: ATC100A560FT150XTV
C2, C3	multilayer ceramic chip capacitor	750 pF	ATC: ATC100B750FT500XTV
C4	multilayer ceramic chip capacitor	2.4 pF	ATC: ATC100B2R4BT500XTV
C5, C6	multilayer ceramic chip capacitor	62 pF	ATC: ATC100A620FT150XTV
C7, C8	multilayer ceramic chip capacitor	3.3 pF	ATC: ATC100B3R3BT500XTV
C9	multilayer ceramic chip capacitor	11 pF	ATC: ATC100A110FT150XTV
C10	multilayer ceramic chip capacitor	10 pF	ATC: ATC100A100FT150XTV
C11	multilayer ceramic chip capacitor	0.9 pF	ATC: ATC100B0R9BT500XTV
C12, C13	multilayer ceramic chip capacitor	3 pF	ATC: ATC100B3R0BT500XTV
C14, C15	multilayer ceramic chip capacitor	62 pF	ATC: ATC100B620FT500XTV
C16, C17	multilayer ceramic chip capacitor	750 pF	ATC: ATC100B750FT500XTV
C18	electrolytic capacitor	1 μ F, 100 V	
C19	multilayer ceramic chip capacitor	56 pF	ATC: ATC100B560FT500XTV
C20	electrolytic capacitor	470 μ F, 63 V	
R1, R2	SMD resistor	1 Ω	0603
R3, R4	SMD resistor	5.1 Ω	0603
R5, R6	SMD resistor	3.9 Ω	0603
R_sh	SMD resistor	10 m Ω	FC4L110R010FER

Table 3: Bill of Materials

9.4 Board material

Table 4: Board specifications

Parameter	Value
Manufacturer	Rogers
Type	RT/duroid® 6002 $\epsilon_r = 2.94$
Thickness	30mil, 0.762mm
Layers	2, top/bottom. Bottom all copper

9.5 Device markings

Table 5: Device specifics

Parameter	Value
Manufacturer	Ampleon
Device	
Marking	BLA9G1011L(S)-300, NETHERLANDS
Comments	<Engineering sample>

9.6 DC board interfaces

Table 6: DC Interfaces

Interface	Description	Value
1	Vdd (+)	+32 V
2	Vdd (-)	0 V
3	Vgs (+)	+1.85 V (100mA Idq)
4	Vgs (-)	0 V
5 / 6	Vsensing (+) / Vsensing (-)	10 mV/A

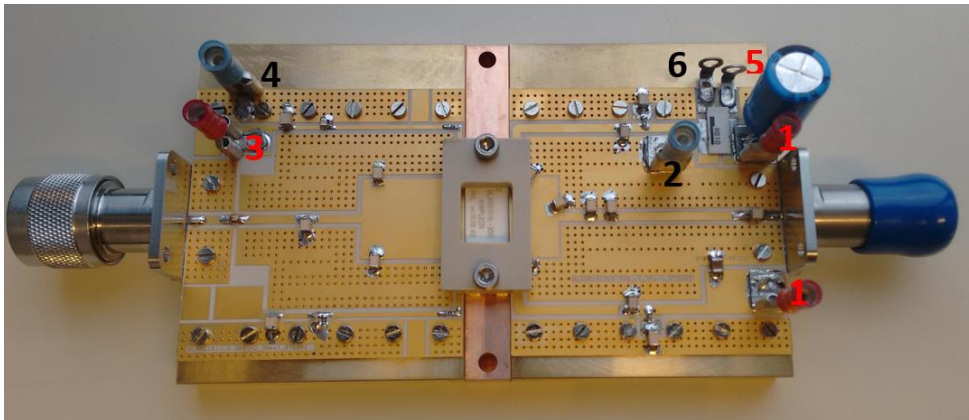


Figure 7 App board DC Interfaces

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