AR171061

BLL9G1214LS-600, 1200 to 1400MHz

v1.0 — 25th July 2017

AMPLEON

Application Report

BLL9G1214LS-600Document information	
Status	Company public
Author(s)	Hans Mollee
Abstract	Measurement results of a Class-AB design for the 1200 to 1400MHz band with the BLL9G1214LS-600

1. Revision History

Table 1: Report revisions

Revision	Date	Description	Author
1.0	20170704	Initial document	Hans Mollee

2. Contents

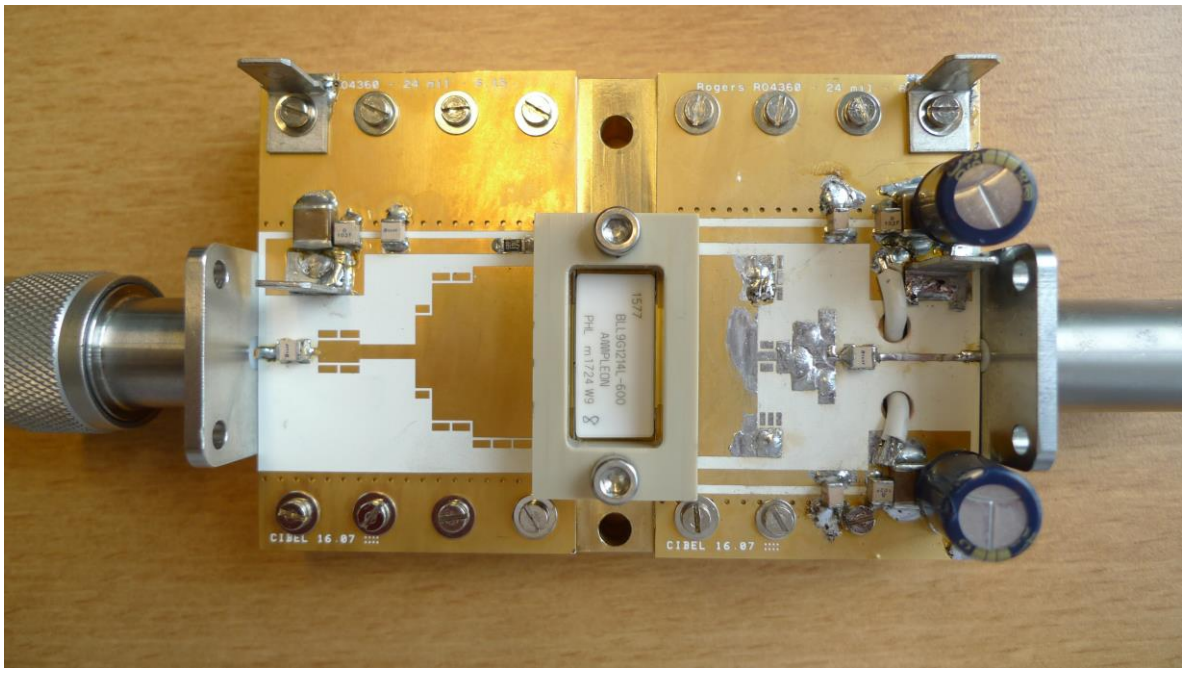
3. List of figures

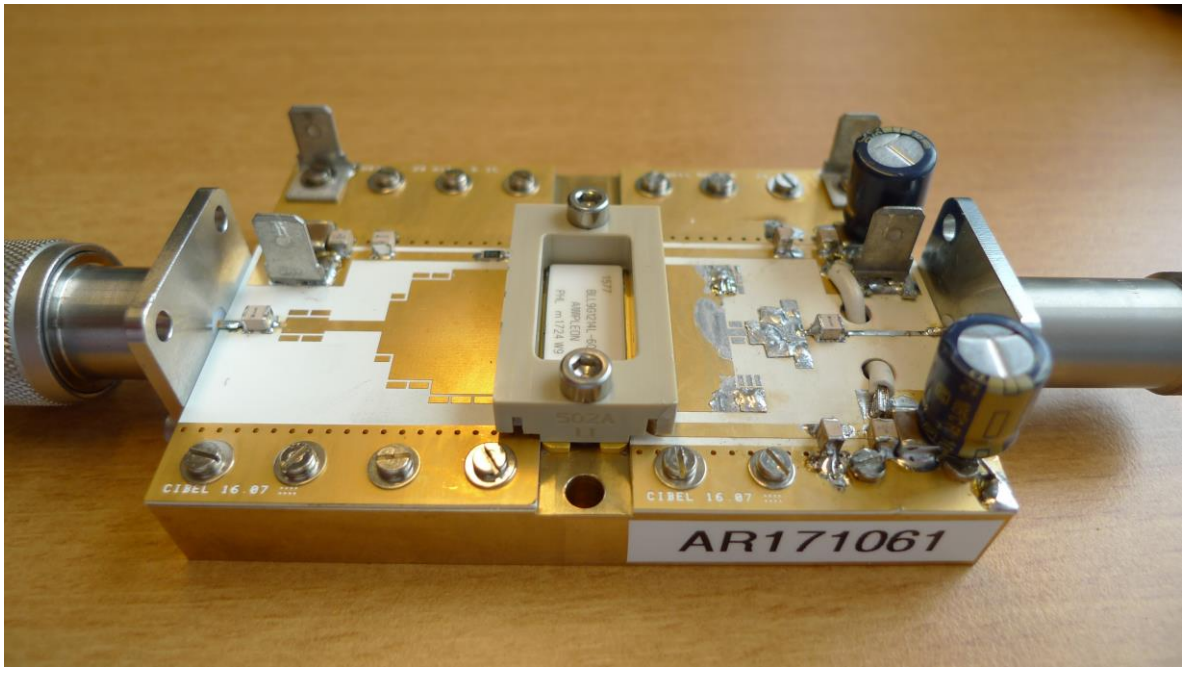
4. List of tables

5. General description

This report presents the measurement results of the Class-AB demo AR171061. The device used is a BLL9G1214LS-400, 9th generation LDMOS single ended package, the BLL9G1214LS-600. The presented demo is designed for the frequency band 1200 to 1400MHz

The PCB has been designed on Rodgers RO4360, h=0.64mm, ε_R=6.2, 35um double sided copper. Supply voltage (drain-source) is 32V. Gate bias voltage is connected to the Vg terminals on the input board. To set the drain quiescent current, slowly increase V_{GS} until the I_{DQ} will be 400 mA, starting at about 1V.





When switching of the RF-pulse a spike may appear on the drain supply due to the inductance and the fall time of the pulse. When using signal with a rapid fall time this spike may become (too) large. By placing two 10µF SMD capacitors (C8 and C12) on the drain supply to limit these spikes, but fall times need to be controlled. Save value is ≈50 – 100ns.

Performance Details

The pulse format used is a 300 μs pulse with a duty cycle of 10%. The power sweep was performed up to 3 dB gain compression.

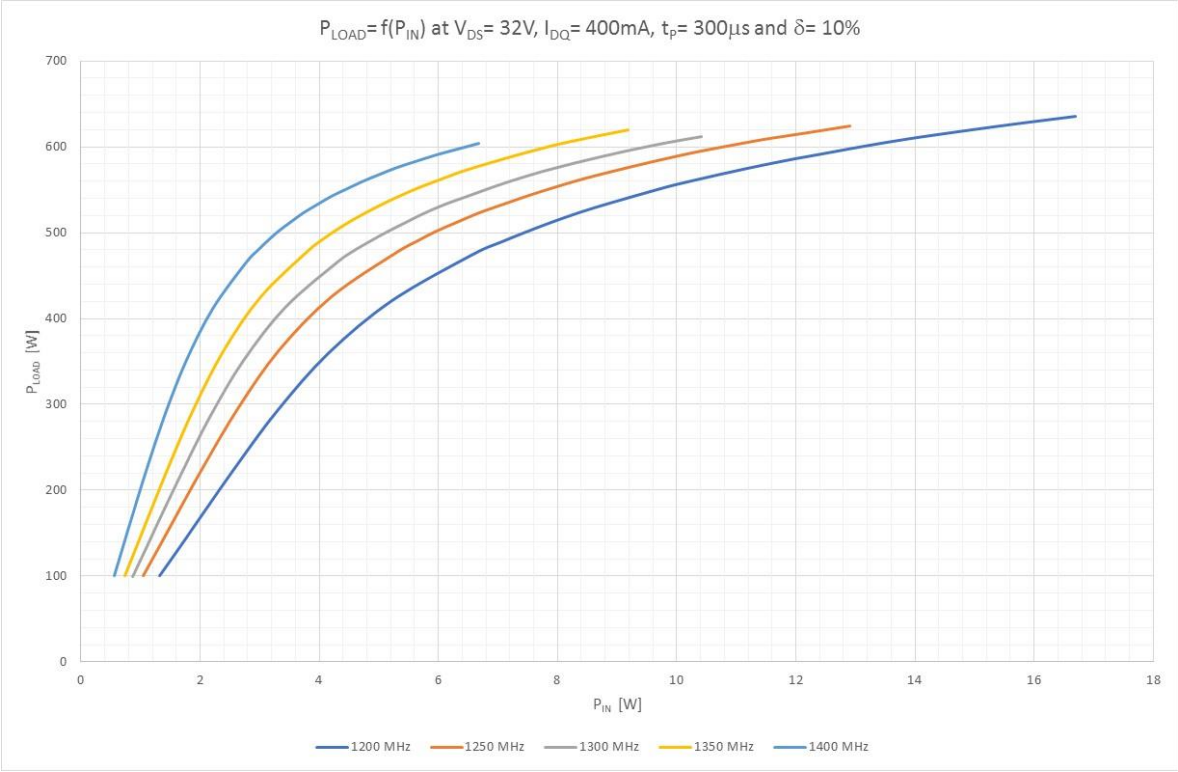


Figure 1 P_{LOAD} vs P_{IN}

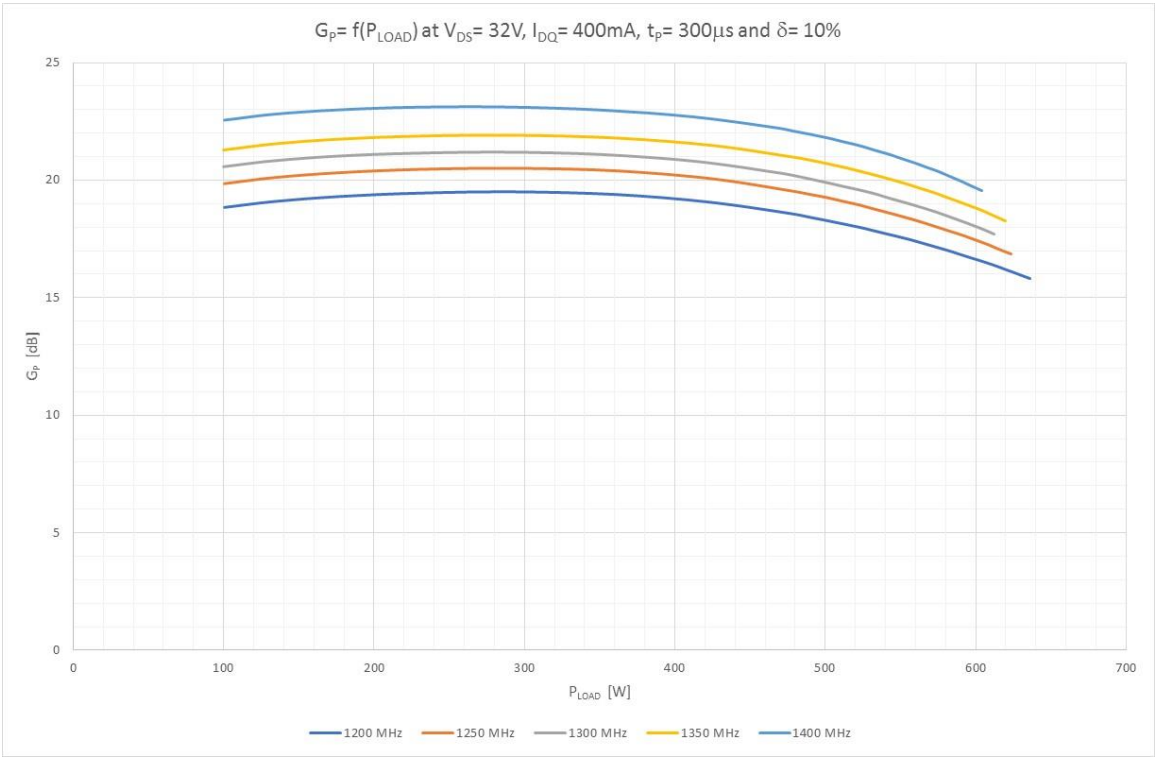


Figure 2 Gain vs P_{LOAD}

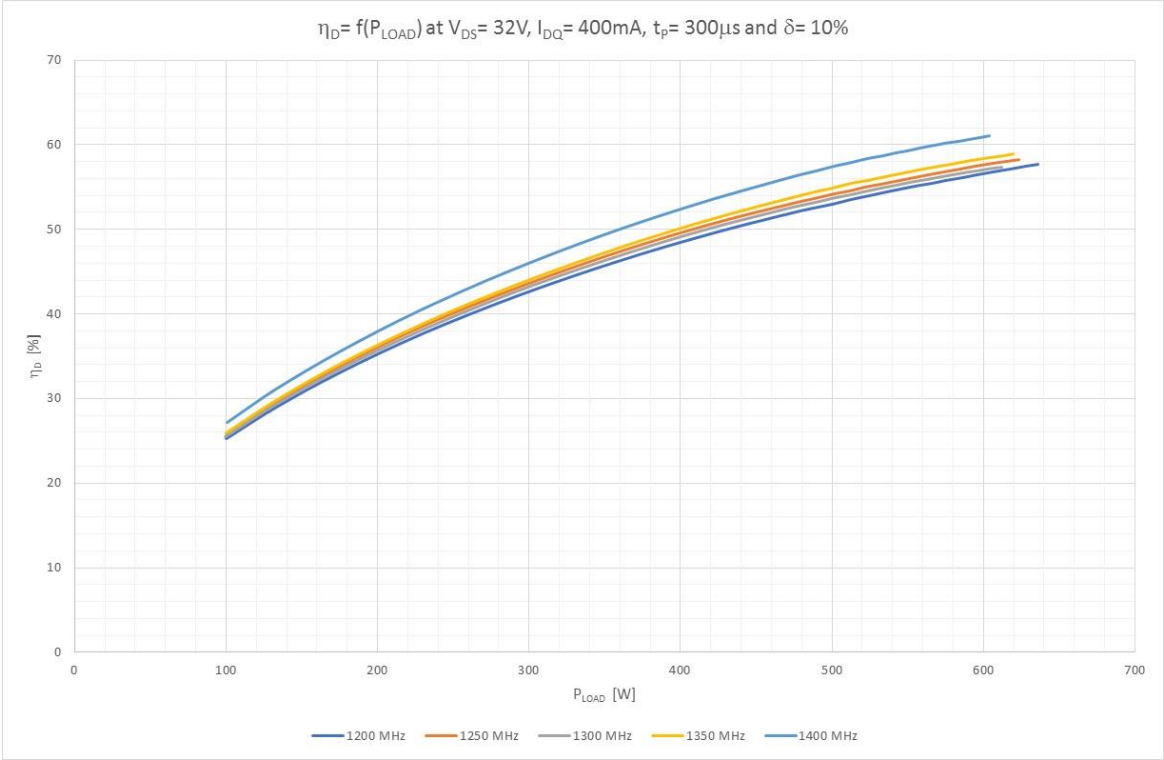


Figure 3 Drain efficiency vs P_{LOAD}

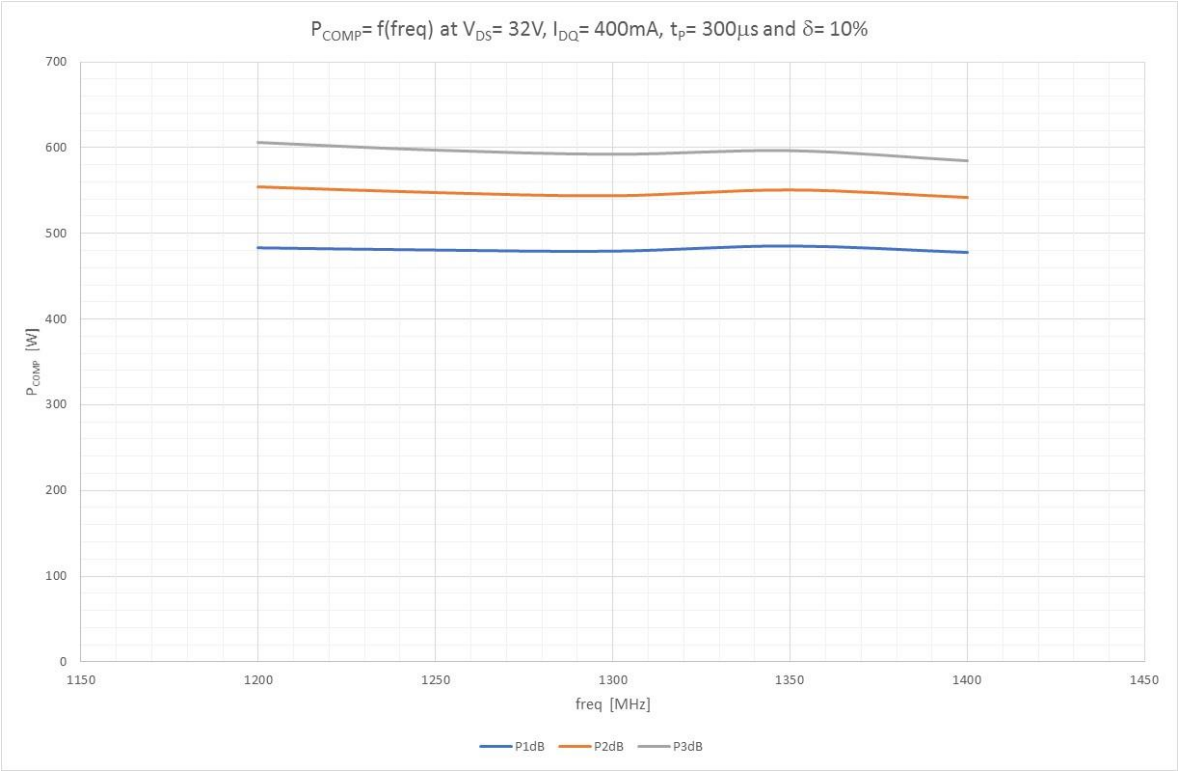


Figure 4 Compressed Power

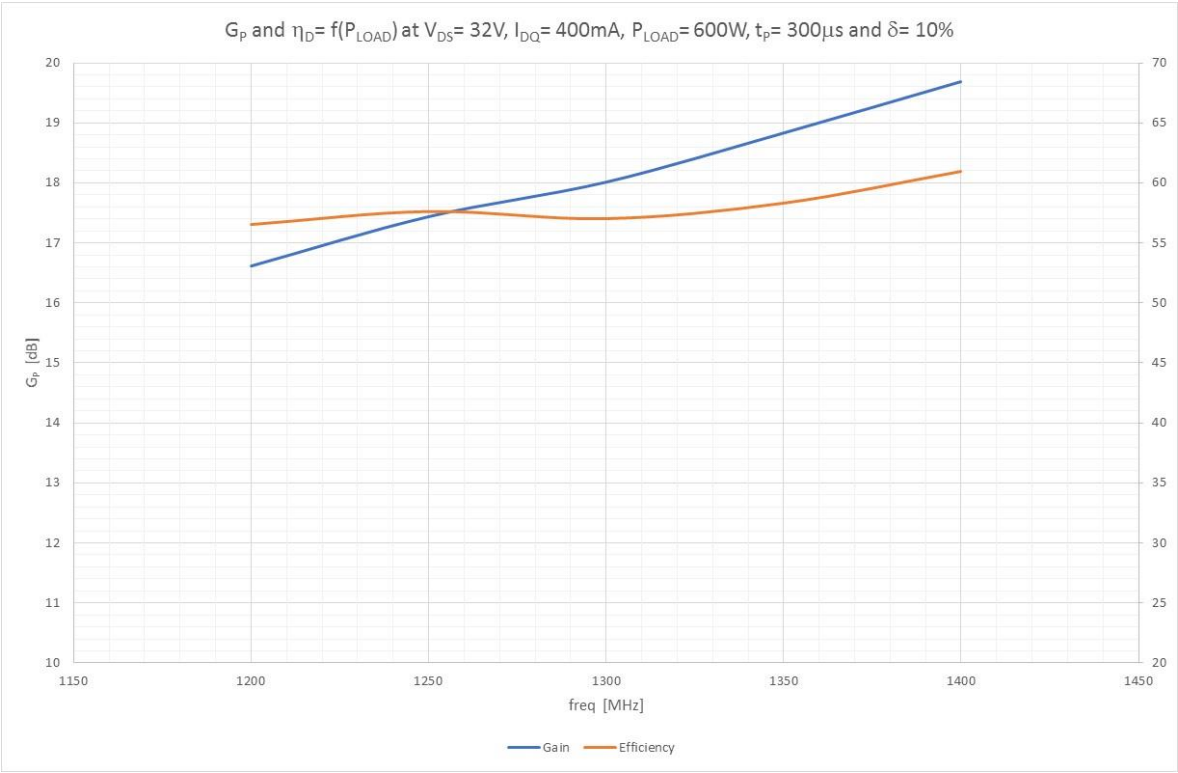
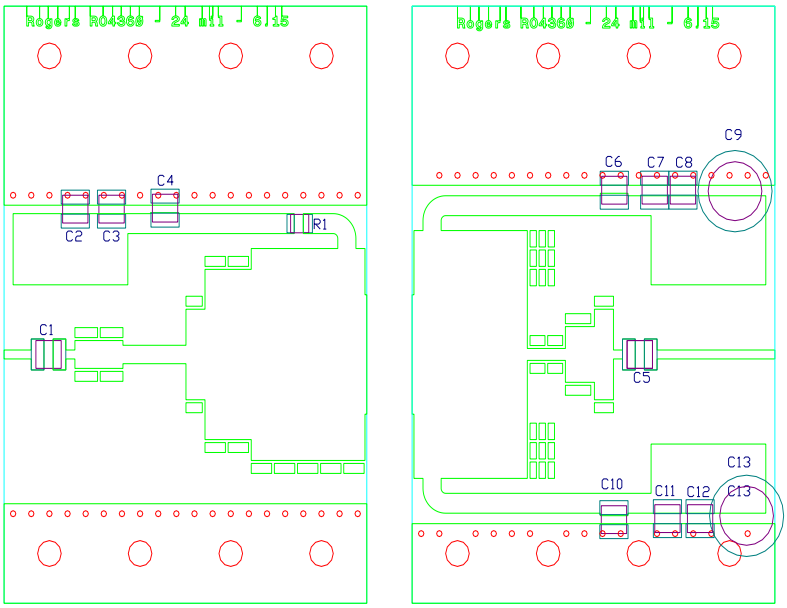


Figure 5 Performance at 600W

5.1 Hardware



Components list application circuit.

C1, C4, C5, C6, C10	56 pF	ATC100B
C3, C7, C11	910 pF	ATC100B
C2, C8, C12	10 μF	Murata GRM55DR61H106KA88L
C9, C13	100 μF	63 V, Electrolytic capacitor
R1	5 Ω	0603 SMD Resistor

PCB Material: Rogers 4360, thickness 0.61 mm (24 mil) or equivalent, ε_R = 6.15, Cu = 35 micron

5.2 Board material

Table 2: Board specifications

Parameter	Value
Manufacturer	Rogers
Type	RO4360G2
Thickness	24 mil, 0.61 mm
Layers	2, top/bottom. Bottom all copper

5.3 Device markings

Table 3: Device specifics

Parameter	Value
Manufacturer	Ampleon
Device	BLL9G1214LS-600
Marking	BLL9G1214LS-600, m1724 w9, Philippines
Comments	Engineering sample

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