AR191123

BLU9H0408L-800P, 410 to 460 MHz

AMPLEON

v1.0 — 23 October 2019

Application Report

410 to 460 MHz	Document information
Status	Company Public
Author(s)	Minghao Koh
Abstract	Measurement results of a Class AB design for the 410 to 460 MHz band with the BLU9H0408L-800P

1. Revision History

Table 1: Report revisions

Revision	Date	Description	Author
1.0	20191023	Initial document	Minghao Koh

2. Contents

3. List of figures

4. List of tables

5. General description

This report presents the measurement results of the Class AB demo AR191123. The device used is a 800W, 9th generation LDMOS in a SOT539A3N, the BLU9H0408L-800P. The presented demo is tuned for the frequency band 410 to 460 MHz.

The PCB has been designed with Rogers RO4350B, h=0.762mm (30 mils), ε_R = 3.66 and 35µm double sided copper. Supply voltage (drain-source) is 50V. 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} becomes 1300mA.

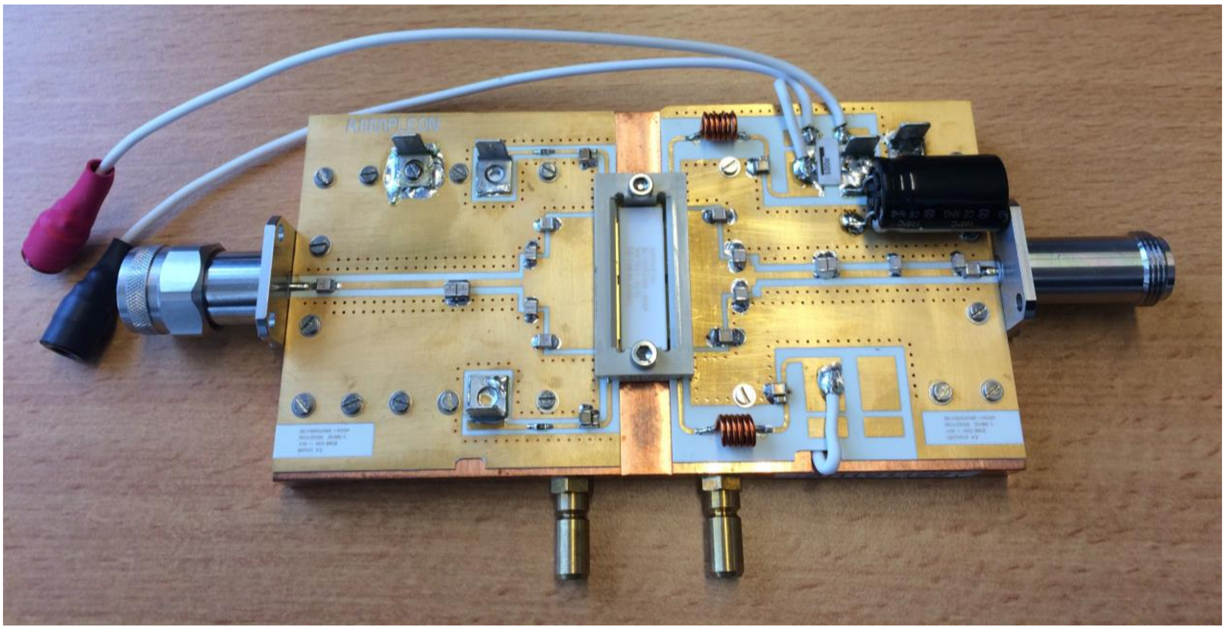

Figure 1 BLU9H0408L-800P application board tuned for 410 to 460 MHz (Top view)

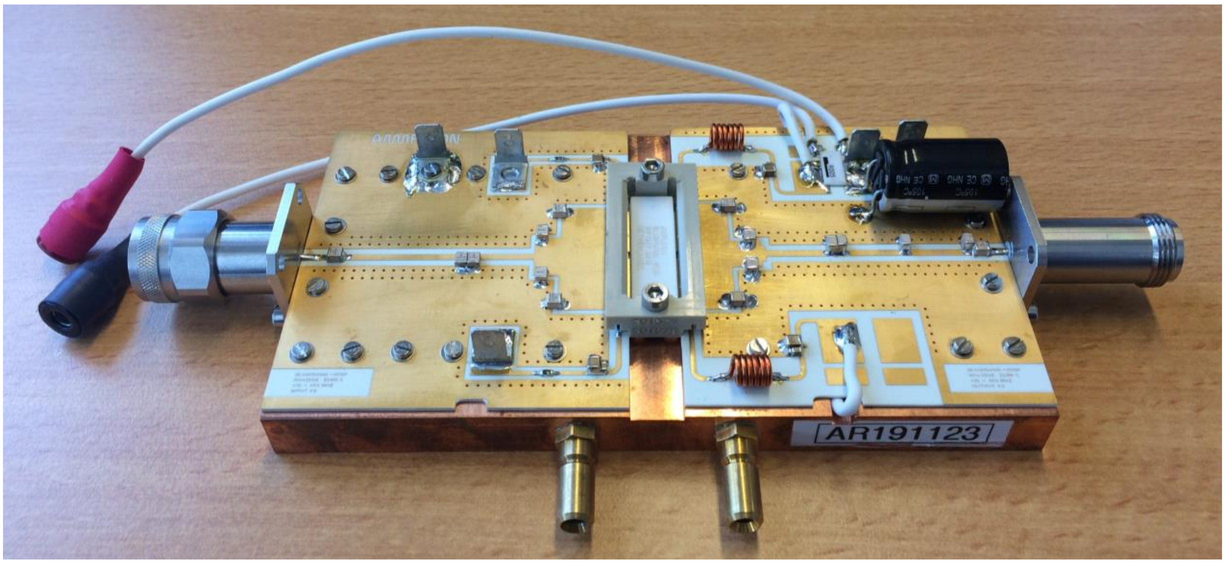

Figure 2 BLU9H0408L-800P application board tuned for 410 to 460 MHz (Side view)

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.

A Pulsed CW test signal is used with a Pulse width = 100µs and Duty cycle = 10%

The biasing is as follows:

V_{DD} = 50V

V_{GS} = 2.09V, leading to an I_{DQ} = 1300mA

7. Performance Details – Pulsed CW

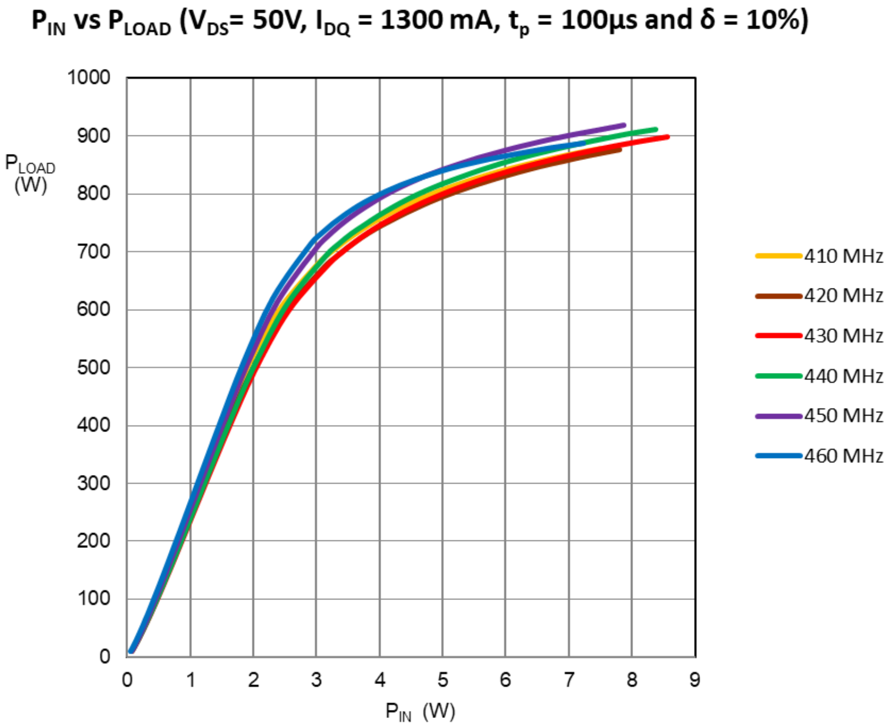

Figure 3 P_{LOAD} vs P_{IN} under pulsed conditions

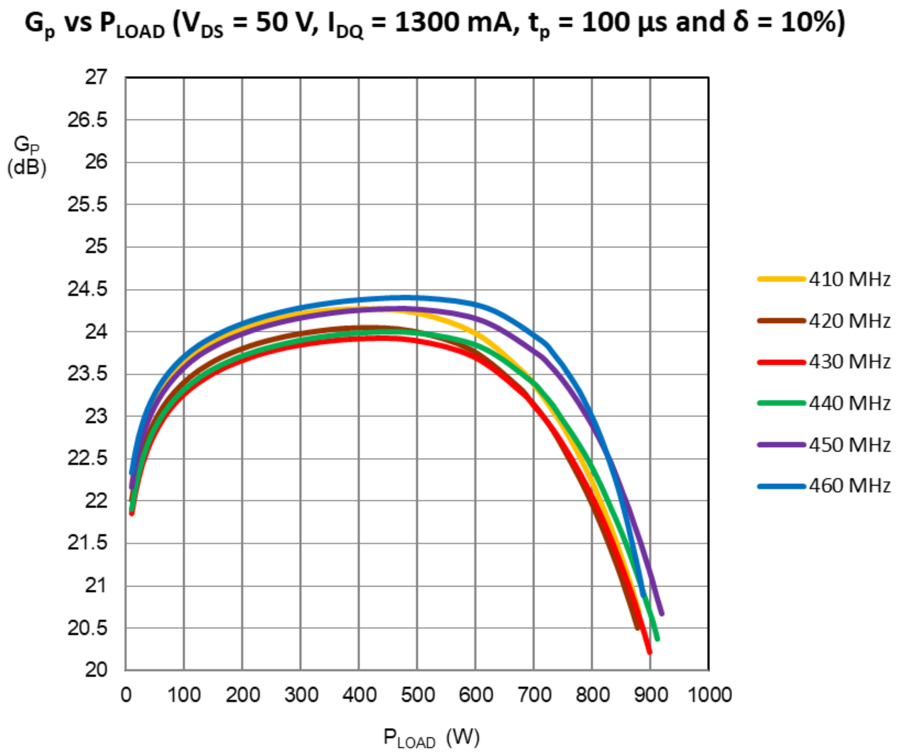

Figure 4 Gain vs P_{LOAD} under pulsed conditions

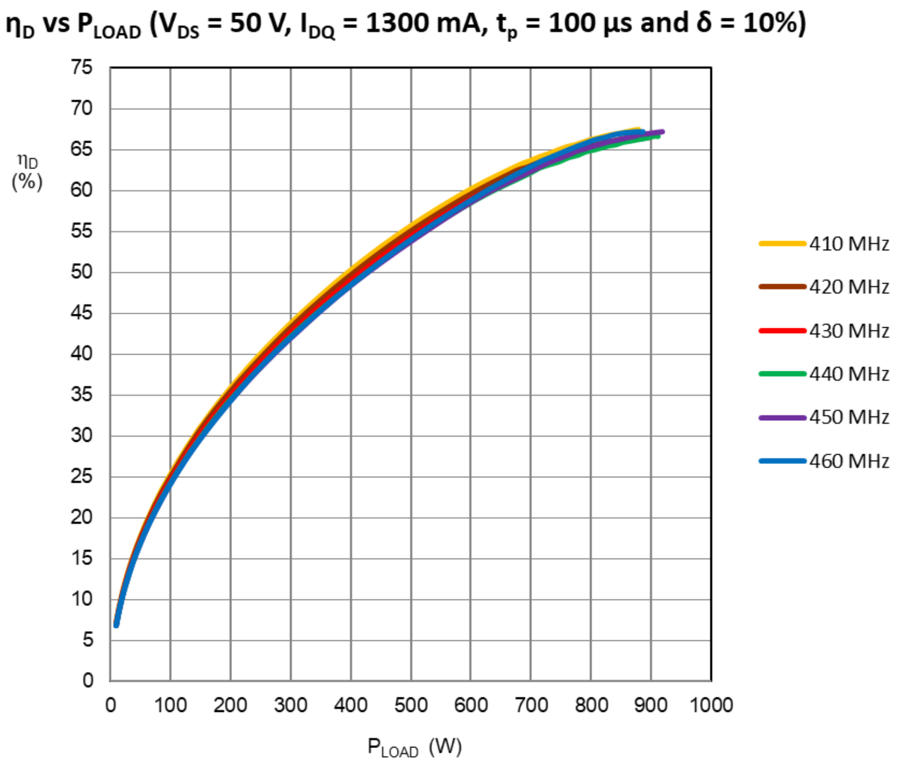

Figure 5 Drain Efficiency vs P_{LOAD} under pulsed conditions

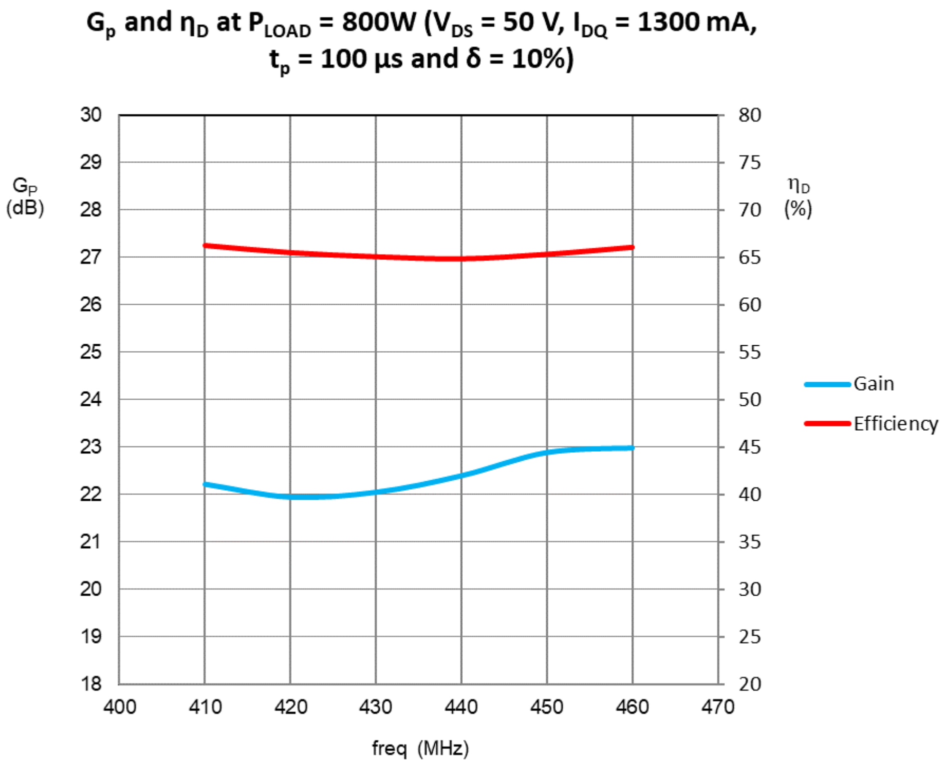

Figure 6 Gain and Drain Efficiency at P_{LOAD} = 800W under pulsed conditions

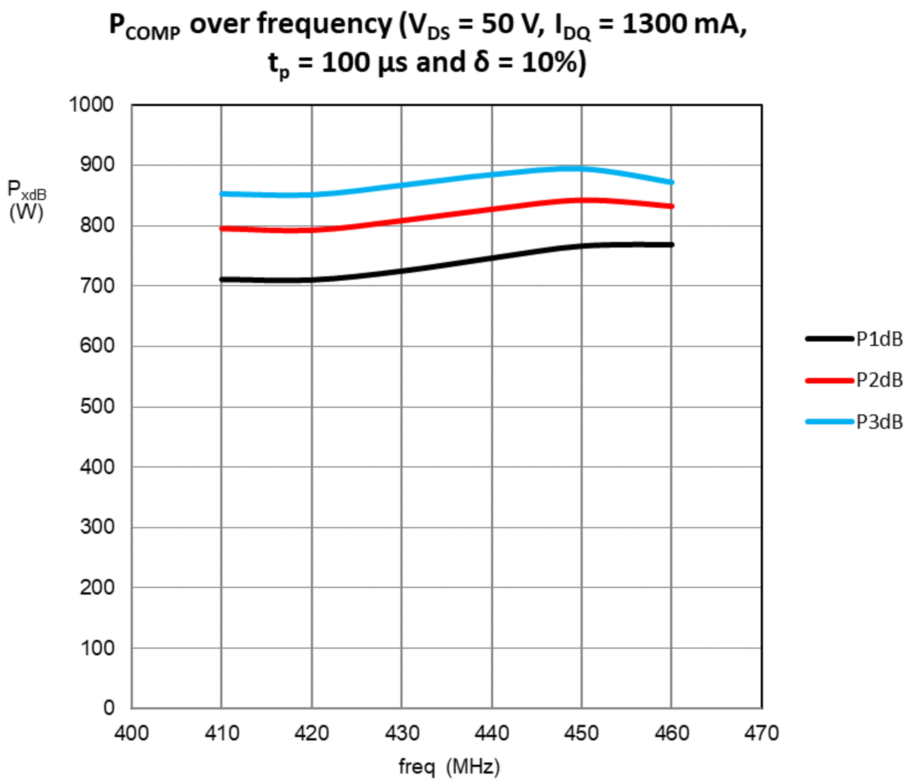

Figure 7 P_{COMP} as a function of frequency

8. Hardware

8.1 Board Image

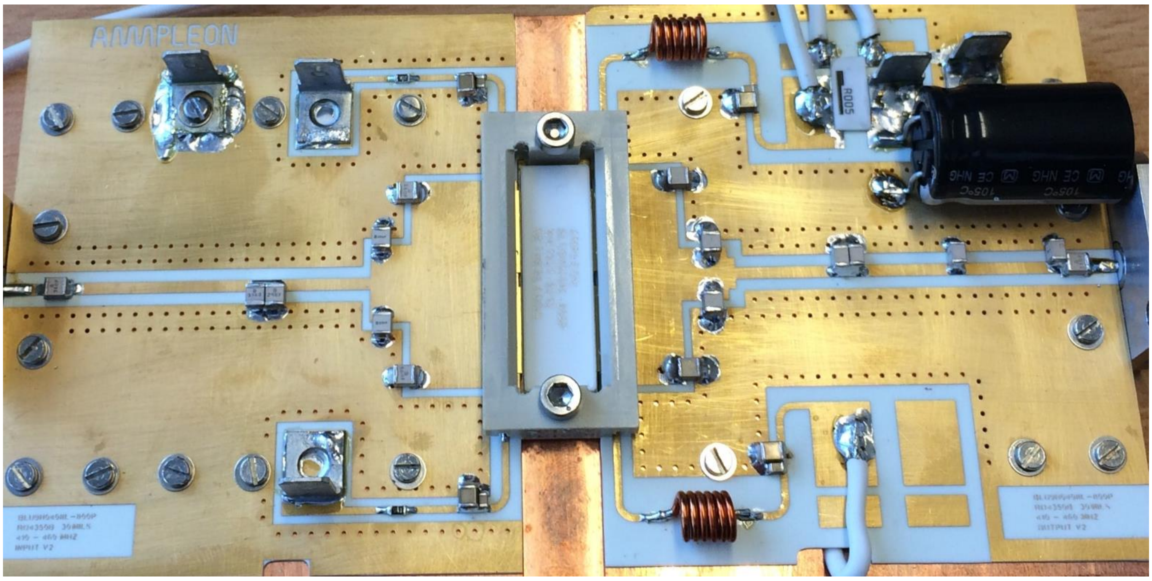

Figure 8 Application board photo (zoomed)

8.2 Copper Layout

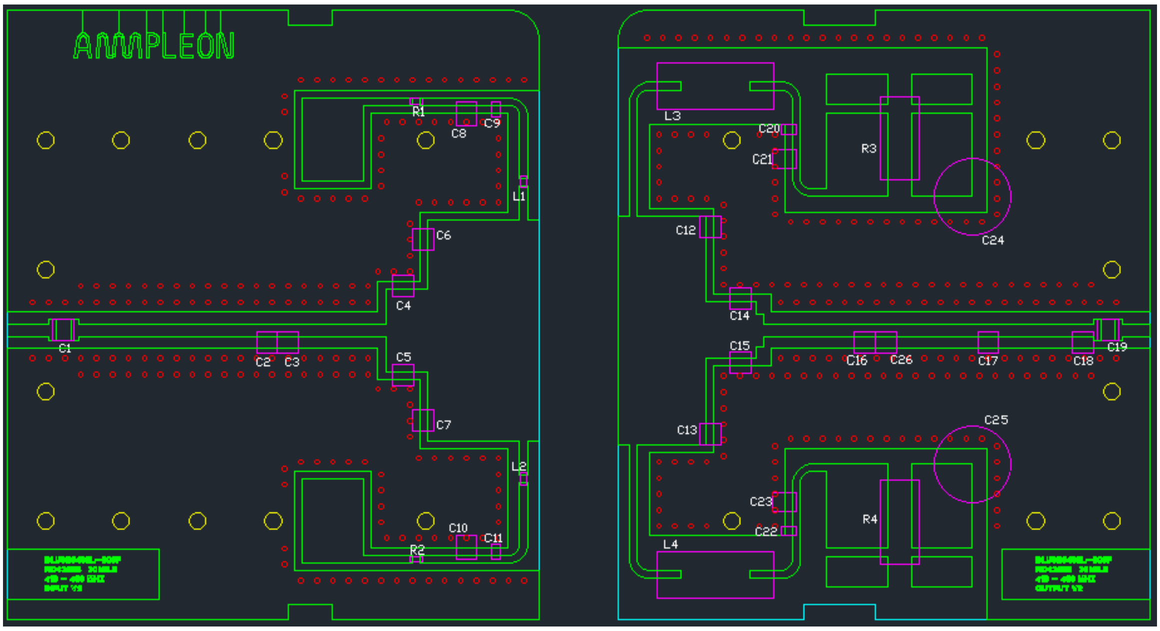

Figure 9 Layout of Application board in DXF

8.3 Bill of materials

Table 2: Bill of Materials

Description	Value	Manufacturer
C1	36 pF	ATC 100B
C2	3.6 pF	ATC 100B
C3	24 pF	ATC 100B
C4, C5	33 pF	ATC 100B
C6, C7	56 pF	ATC 100B
C8, C10, C21, C23	4.7 µF	GRM42256X7S475K100H530
C9, C11, C20, C22	0.1 µF	GRM21BR71H104KA01
C12, C13	13 pF	ATC 100B
C14, C15	56 pF	ATC 100B
C16	18 pF	ATC 100B
C26	1.5 pF	ATC 100B
C17	1.0 pF	ATC 100B
C18	1.8 pF	ATC 100B
C19	11 pF	ATC 100B
C24, C25	1000 µF	63 V Electrolytic capacitor
L1, L2	56 nH	LQW18AN56NG80
L3, L4	53 nH	6 turn inductor air core
R1, R2	5 Ω	0603 SMD Resistor
R3, R4	5 mΩ	FC4L110R005FER

8.4 Board material

Table 3: Board specifications

Parameter	Value
Manufacturer	Rogers
Type	RO4350B
Thickness	30mil, 0.762mm
Layers	2, top/bottom. Bottom all copper

8.5 Device markings

Table 4: Device specifics

Parameter	Value
Manufacturer	Ampleon
Device	BLU9H0408L-800P
Marking	BLU9H0408L-800P, STR WK1927-9212
Comments	Engineering sample

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