AR182075

BLF0910H9LS-600, 902-928 MHz

AMPLEON

V3.0 — 22 April 2022

Application Report

Document information

Info	Content
Status	General Publication
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Abstract	Measurement results of the BLF0910H9LS_600LDMOS Device in Board #AR182075 tuned for the 902-928MHz band at 50V

1 Revision History

Table 1. Report revisions

Revision No.	Date	Description	Author
1.0	20180706	Initial document	Bill Goumas
2.0	20180709	Added IR scan info	Bill Goumas
3.0	20220422	Changed to General Publication	Bill Goumas

2 Contents

3 List of Figures

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5 General Description

This report presents the measurement results of the Class AB Demo board AR182075 using the BLF0910H9LS-600. The demo achieves >600W across 902-928MHz.

Gain is 17-18dB and Efficiency is 60-65% at Pout=600W.

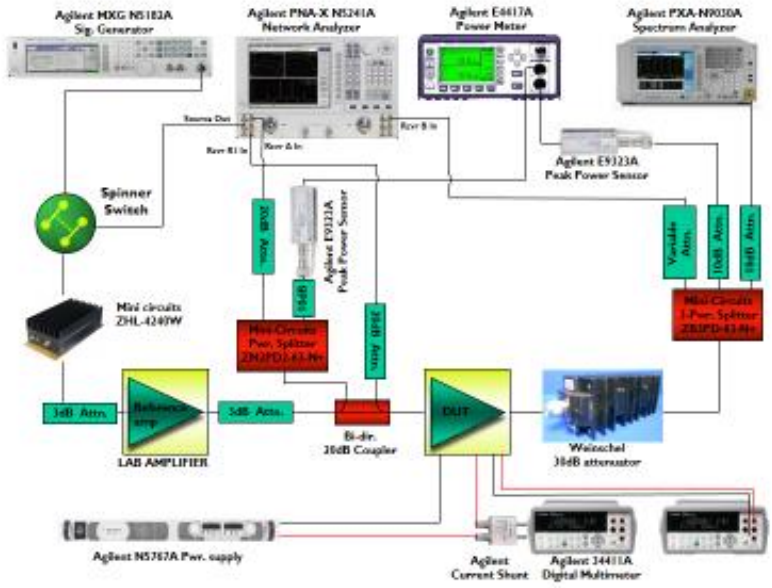
6 Biasing

6.1 Bias Details

The transistor/demo requires a separate gate voltage. Slowly increase the gate voltage until the transistor draws ~100mA. Vgs should be ~1.7-1.8V.

7 Test Bench Set Up

Figure 1.Test Bench Equipment set up



8 Summary

The circuit achieves >600 W at 915MHz with gain of 17-18dB. Efficiency is 60-65% at Pout=600W.

The small signal graph shown in section 9.1 shows a relatively high gain peak near ~100MHz, but no oscillations/spurs were seen during testing of this demo.

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9 Performance Details

9.1 Small Signal Results

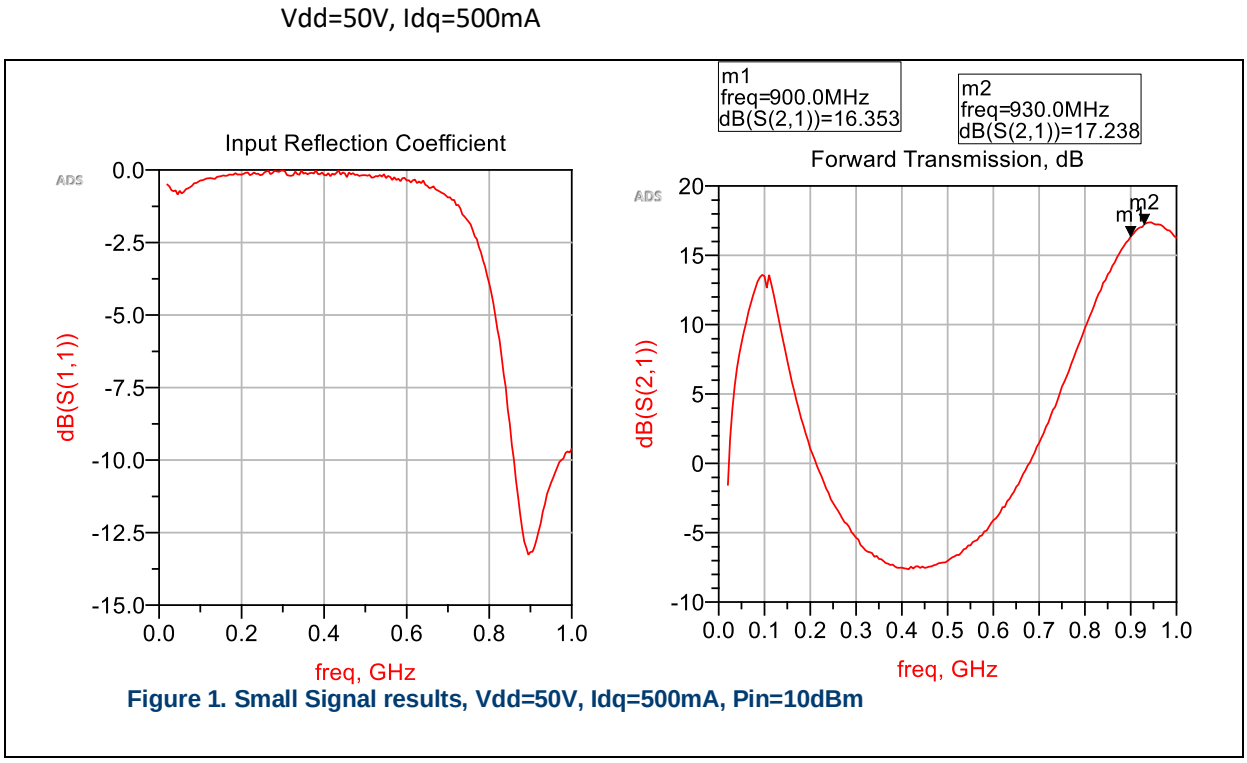

Figure 1. Small Signal results, Vdd=50V, Idq=500mA, Pin=10dBm

9.2 CW Gain and Efficiency Sweeps

Vdd=50V, Idq=100mA

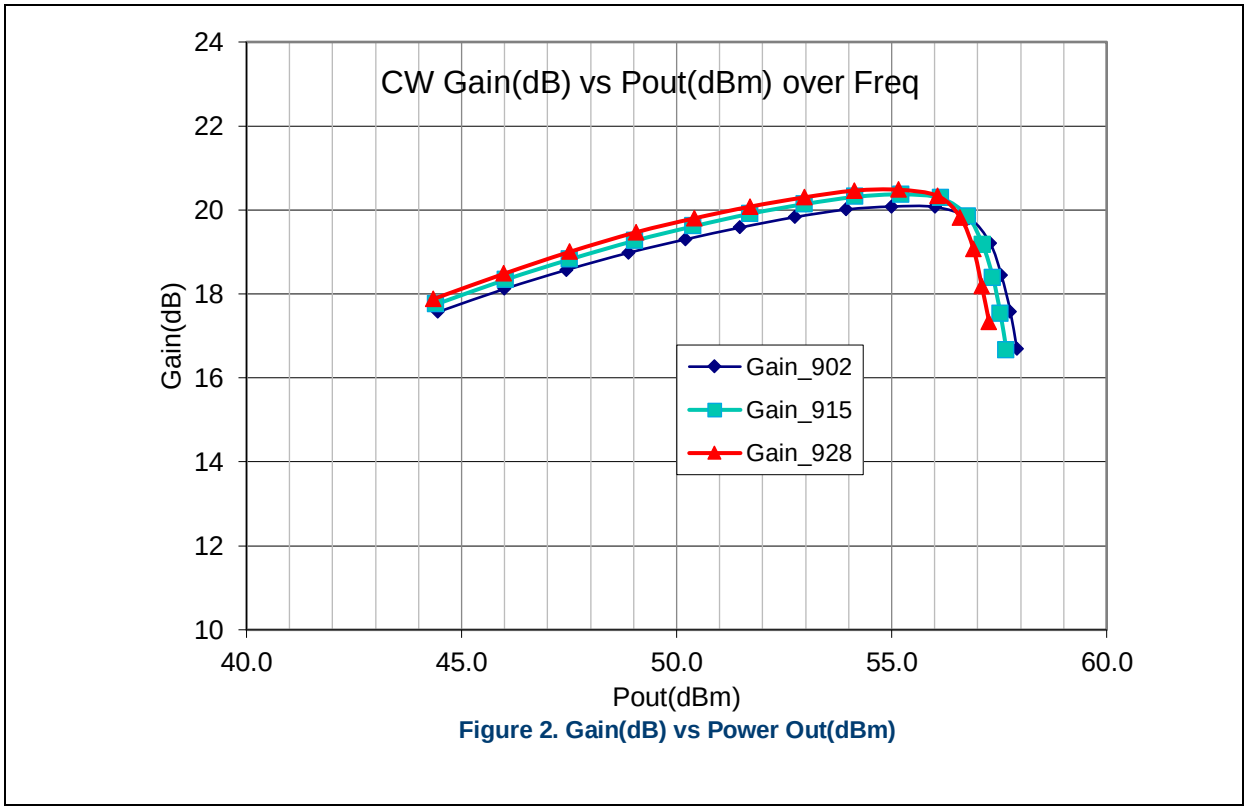

Figure 2. Gain(dB) vs Power Out(dBm)

9.3 CW Efficiency

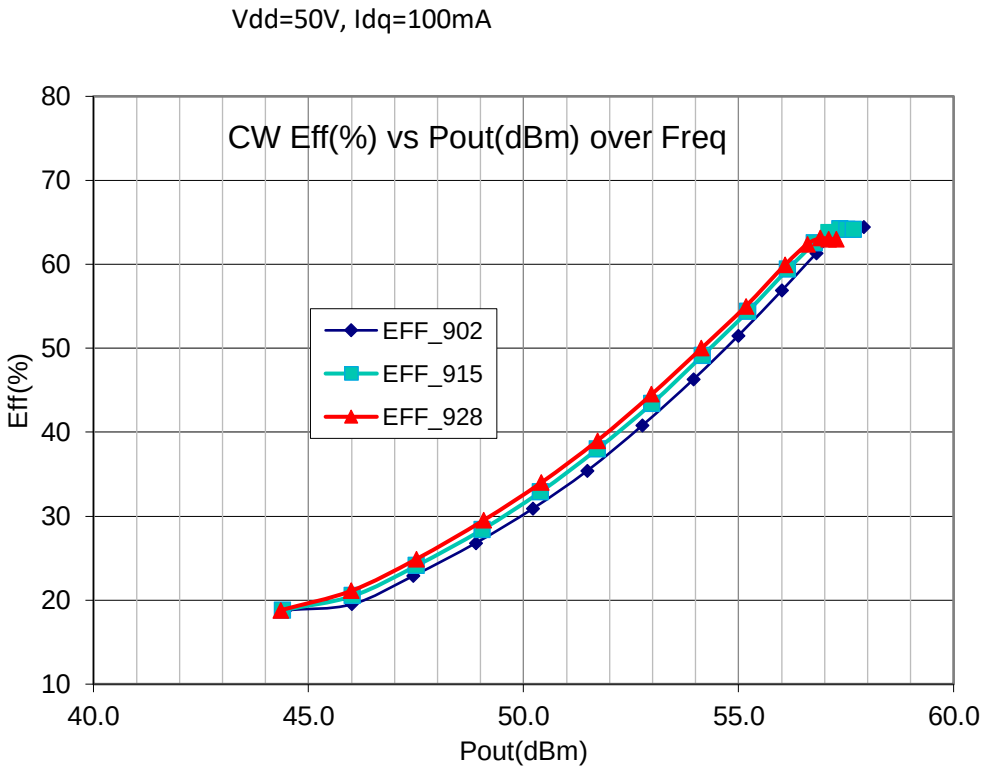

Figure 3. Efficiency(%) vs Power Out(dBm)

10 Pulse Results

10.1 Pulse Gain, Efficiency vs Frequency

Vdd=50V,Idq=100mA

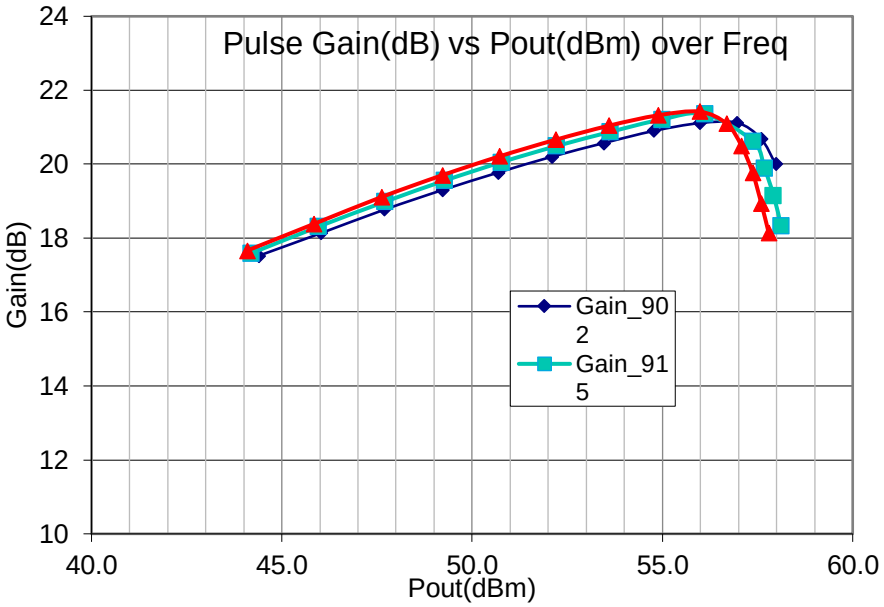

Figure 4. Gain(dB) vs Power Out(dBm), Duty Cycle=10%, 100usec PW

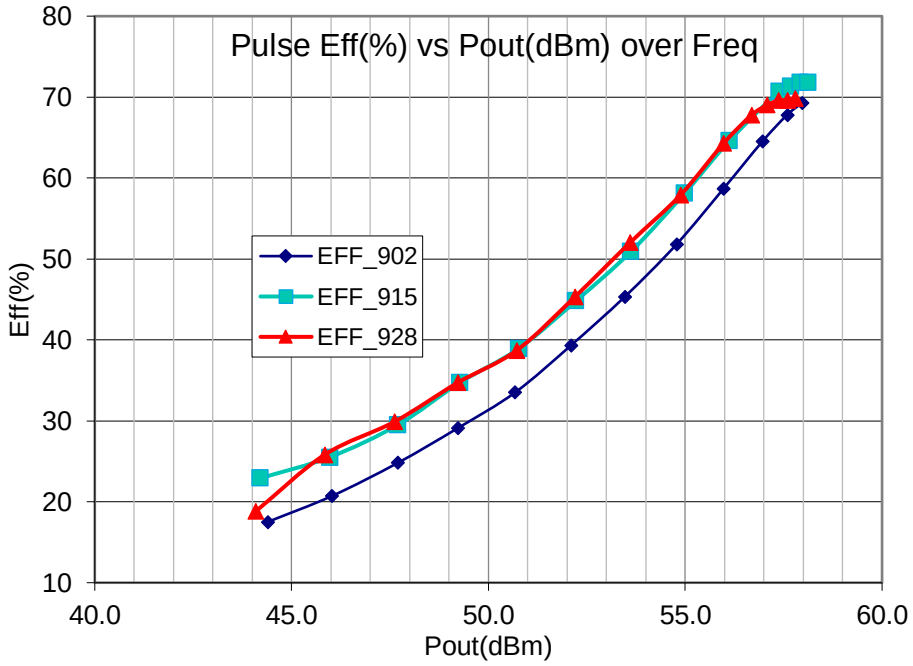

Figure 5. Efficiency (%) vs Power Out(dBm), Duty=10%, PW=100usec

11 Harmonics

11.1 2nd Harmonic. Pout=58dBm

Vdd=50V, Idq=100mA, Pout=58dBm freq=902,915,928MHz

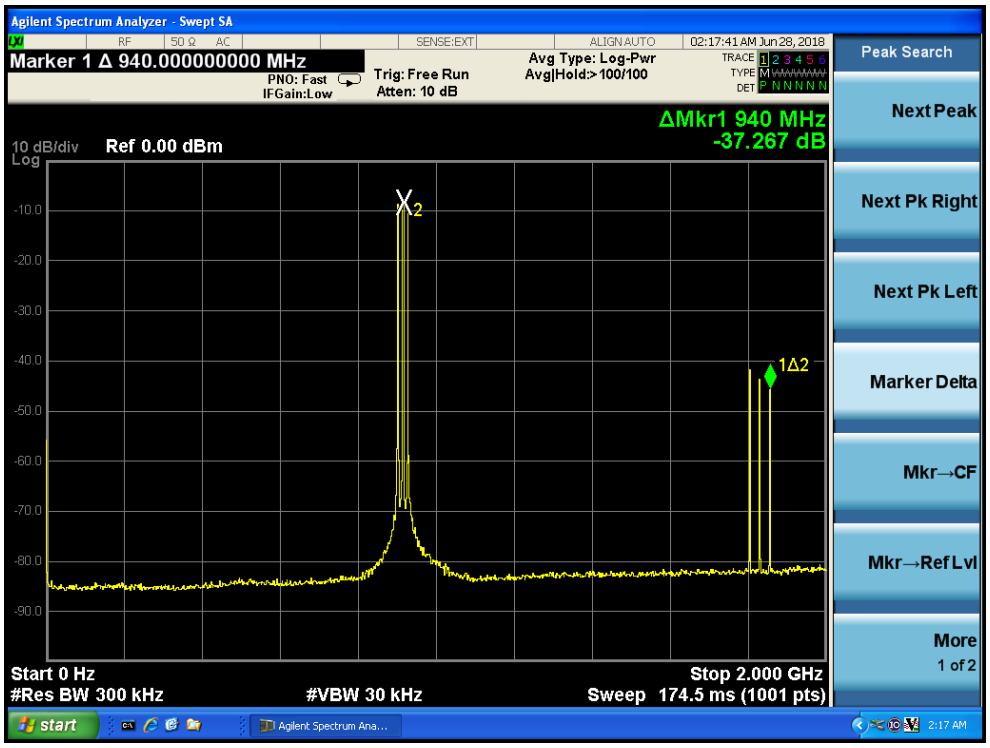

Figure 6. Gain(dB) vs Frequency, Pout=60dBm, Duty=10%, PW=100usec

12 Thermal

12.1 IR Scan of Demo

Vdd=50V, Idq=100mA, Pout=600W freq=915MHz

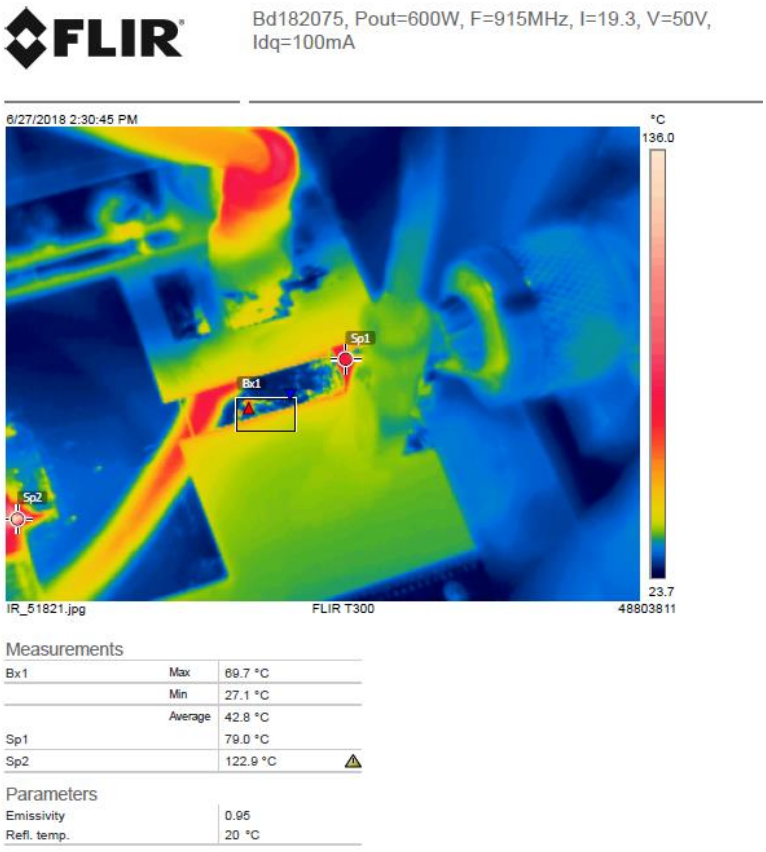

Figure 7. IR scan, Pout=600W CW, Freq=915MHz

Worst case component is the blocking caps on output at 80°C. Transistor is at ~94°C

13 Hardware

13.1 Board photograph

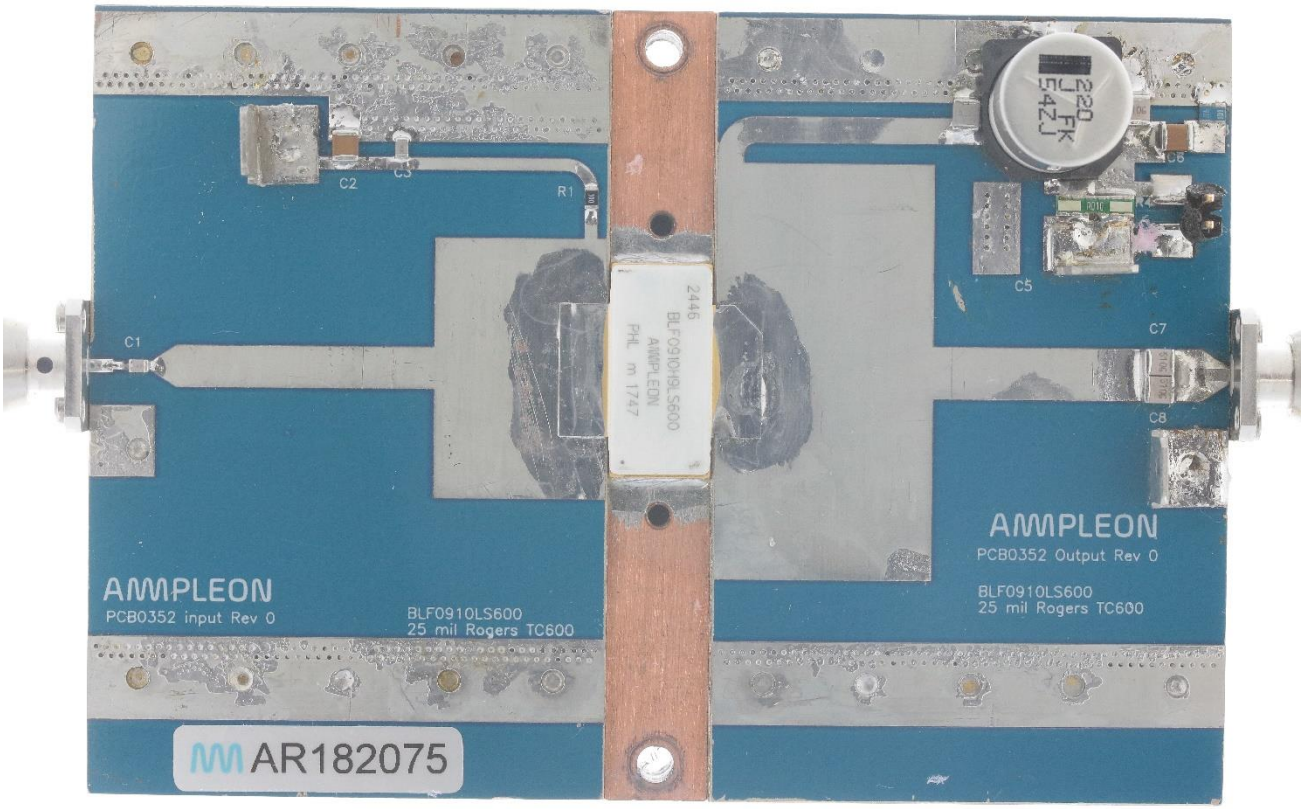

Figure 8. Board Photograph

13.2 PCB layout

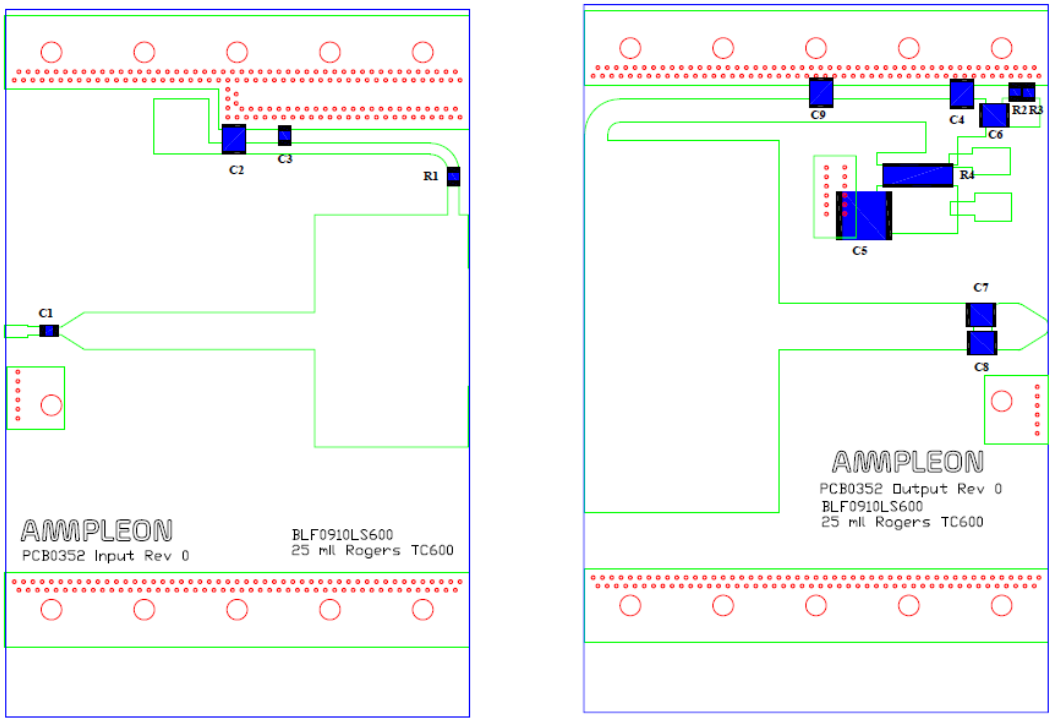

Figure 9.PCB Layout Board #AR182075

13.3 Bill of materials

Table 2. BOM

Designator	Description	Manufacturer	Part #
Input PCB	25 mil Rogers TC600	Avanti	PCB0352Input Rev0
Output PCB	25 mil Rogers TC600	Avanti	PCB0352Output Rev0
Q1	Transistor 600W LDMOS 900MHz	Ampleon	BLF0910H9LS600
R1	10Ω	Generic	0805
R2,R3	6.2Ω	Generic	0805
R4	Resistor, 0.01Ω 1% 100ppm MF,2W,3008	Susumu	RL7520WT-R010-F
C5	470uF, 63V Electrolytic SMT	Panasonic	PCE3667TR-ND
C1,C3	100pF	ATC or Passive Plus	600F
C2,C6	4.7uF 100V	Panasonic	C3225X7S2A475K200AE
C4,C7,C8	51pF	ATC or Passive Plus	800B
C9	56pF	ATC or Passive Plus	800B

13.4 PCB materials

Table 3. Board Specifications

Parameter	Value
Manufacturer	Rogers
Type	TC600
Thickness	25 mils, 1oz. copper
Layers	2, top/bottom. Bottom all copper

13.5 Device markings

Table 4. Device Specifications

Parameter	Value
Manufacturer	Ampleon
Device	BLF0910H9LS-600
Date Code	M1747

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