CD-101-14

BLF881 at 88-108 MHz

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AMPLEON

Application Measurement Report

Document information

Info	Content
Keywords	BLF881, FM, 140W CW
Abstract	This test report describes an amplifier that outputs more than 140 W from 88 to 108 MHz, using the BLF881 LDMOS transistor.

Revision history

Rev	Date	Description
1	20140120	Initial version
2	20150424	Update for web publication
3	20151005	The format of this document has been redesigned to comply with the new identity guidelines of Ampleon. Legal texts have been adapted to the new company name where appropriate.

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1. Introduction

This report describes a FM amplifier based on Ampleon's BLF881, which works from 88 to 108 MHz, outputs more than 140 W CW power, with very good 2nd and 3rd harmonics.

1.1 Summary

The RF performance can be summarised as follows:

Specified frequency range	88 to 108 MHz
Drain voltage	50 V
Quiescent drain current	100 mA typ
CW power capability	≥ 140 W(88-108MHz)
2nd harmonics	<-39dBc
3rd harmonics	<-53.5dBc

Table 1. Summary of RF performance

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2. RF performance

2.1 Return loss Sweep

The plot below shows return loss as a function of frequency. The network analyzer is using a swept CW signal at 0dBm of input power.

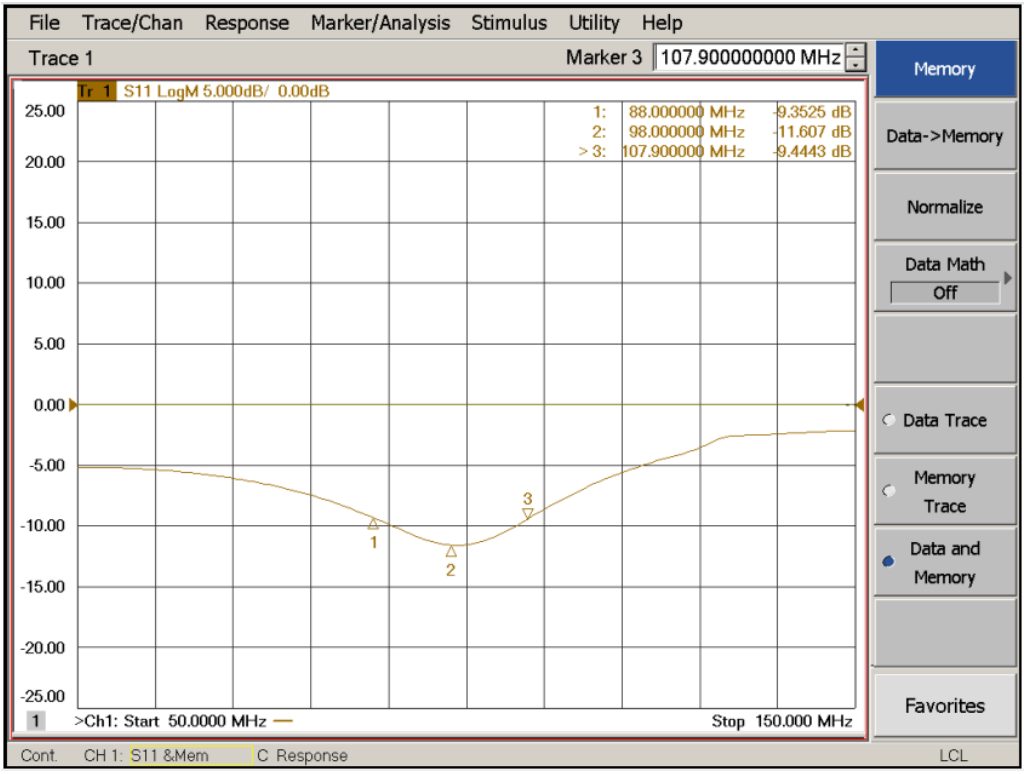

Fig 1. Return loss as a function of frequency

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2.2 Gain Sweep

The plot below shows small signal gain as a function of frequency. The network analyzer is using a swept CW signal at 0dBm of input power. The bias is 50V, 350mA.

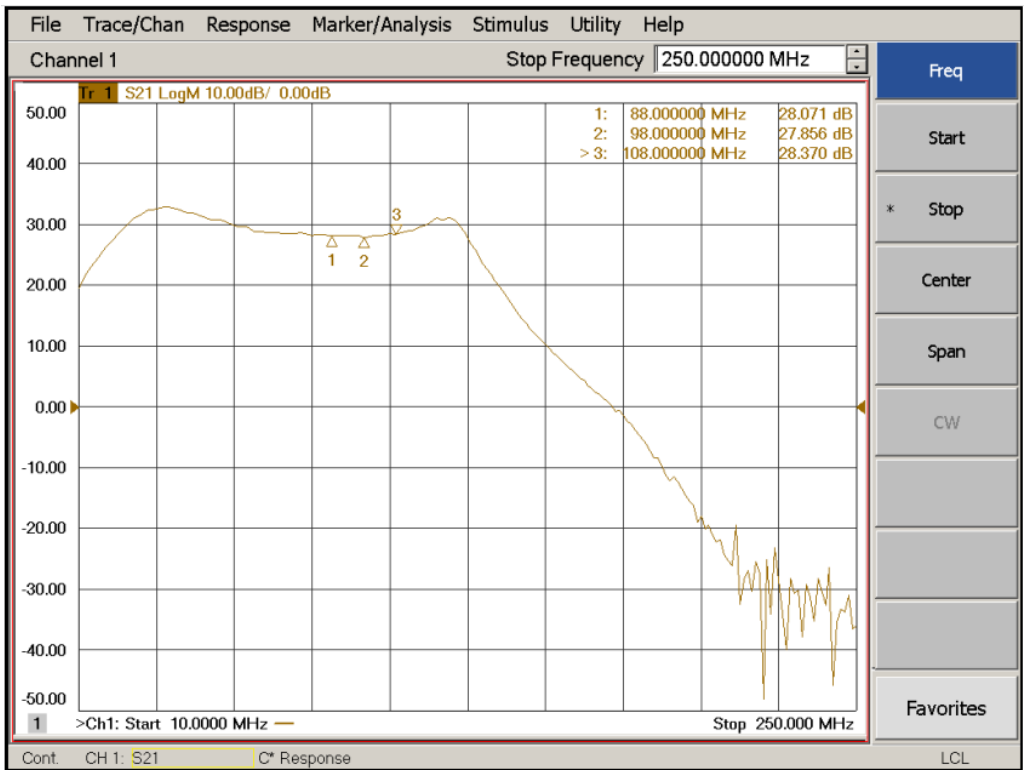

Fig 2. Small signal Gain as a function of frequency

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2.3 CW Gain as a Function of Output Power

The plot below shows gain as a function of output power. The bias point is 50V and 100mA. The signal is a CW signal at 88MHz, 98MHz, 108MHz.

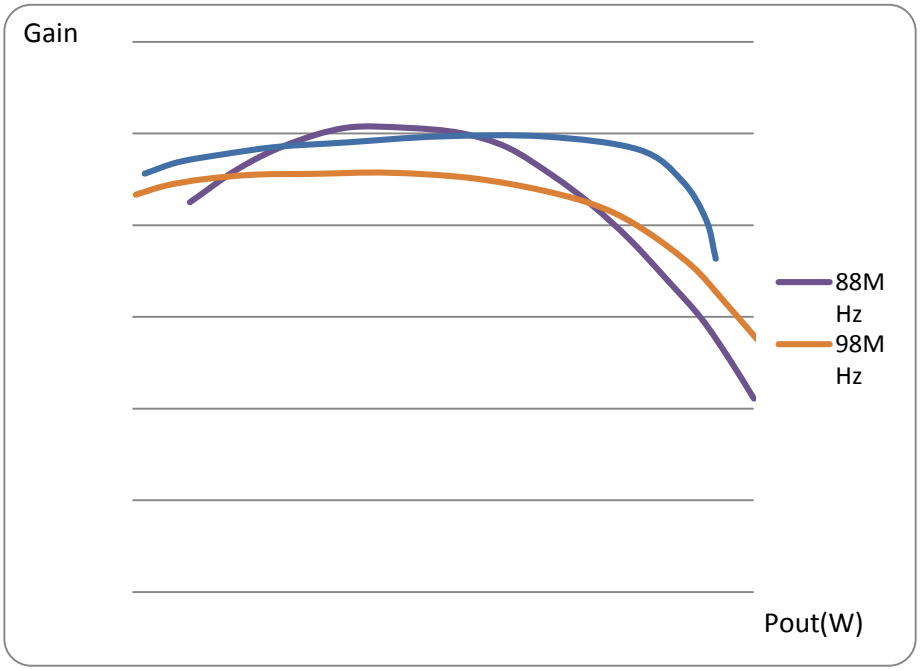

Fig 3. CW gain as a function of output power 88-108MHz

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2.4 CW Efficiency as a Function of Output Power

The plot below shows efficiency as a function of output power. The bias point is 50V and 100mA. The signal is a CW signal at 88MHz, 98MHz, 108MHz.

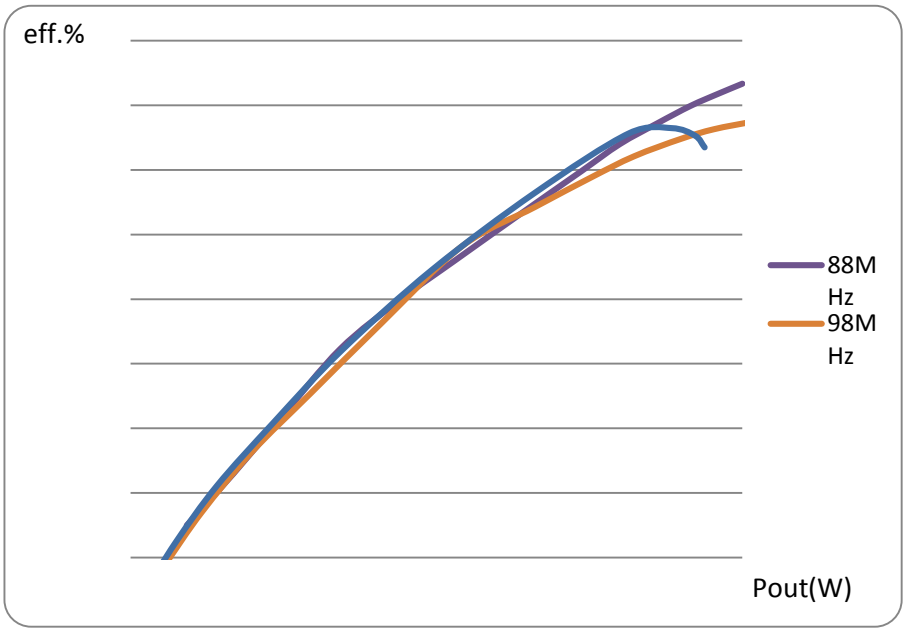

Fig 4. CW efficiency as a function of output power 88-108MHz

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2.5 Harmonics

The plot below shows harmonics while the device output power is fixed at 140W CW, and the frequency is swept from 88-108MHz. Max hold is being used on the spectrum analyzer to catch the peak of all the signals. The spectrum is monitored through the circuit, and after the 50 ohm load.

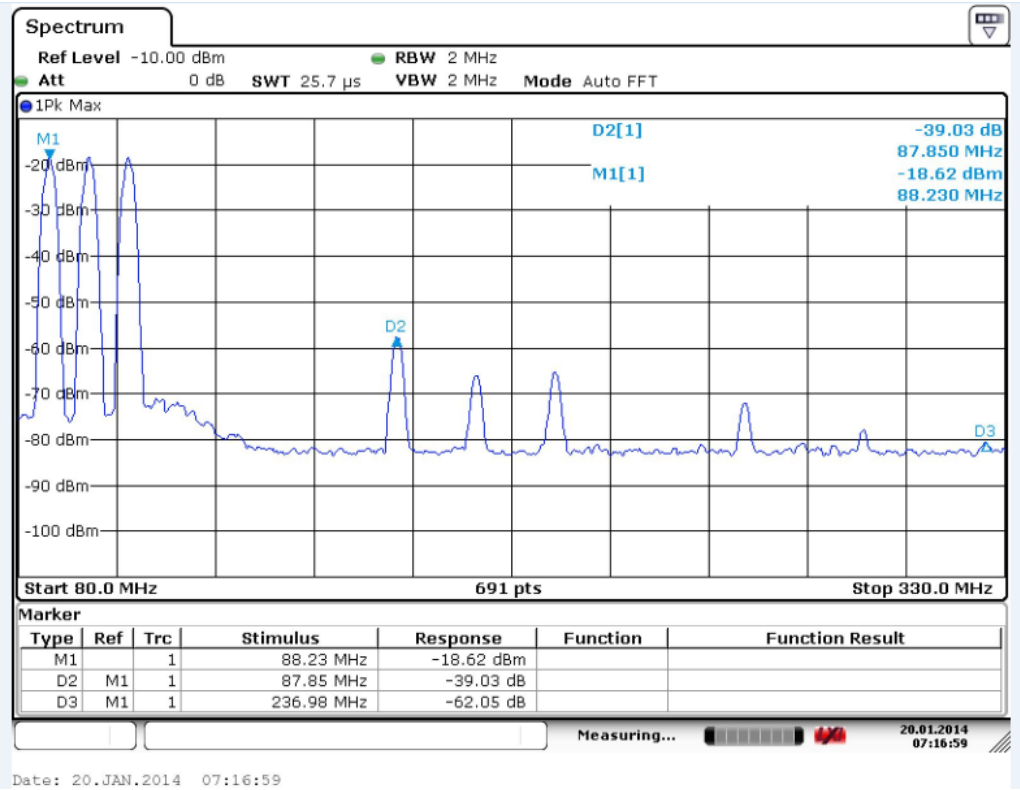

Fig 5. Harmonics at 140W CW 88-108MHz

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3. Circuits information

The PCB layout drawing is attached to this report, please find it in the attachment button.

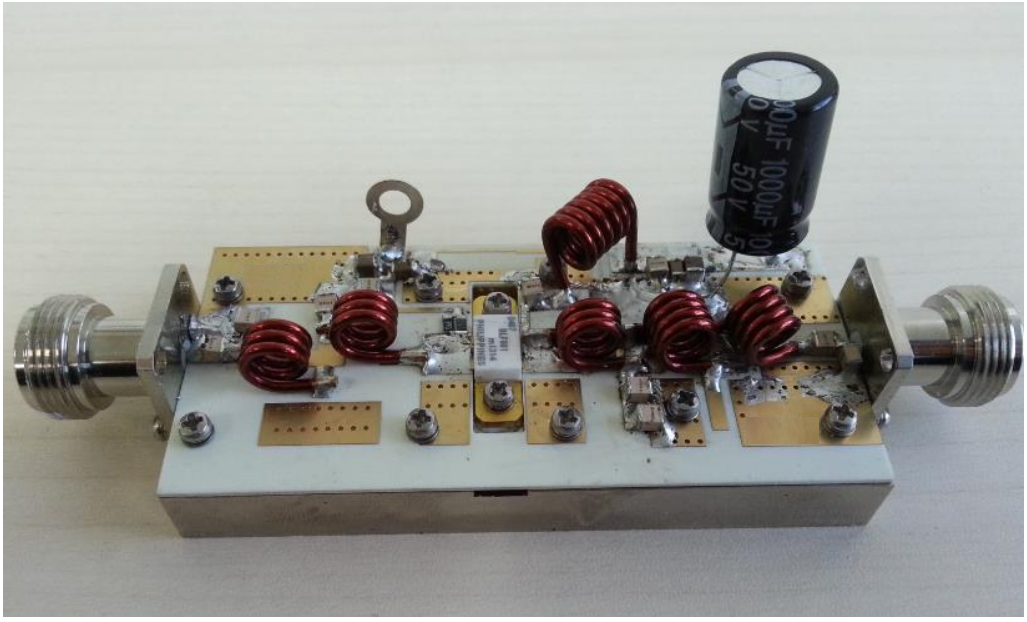
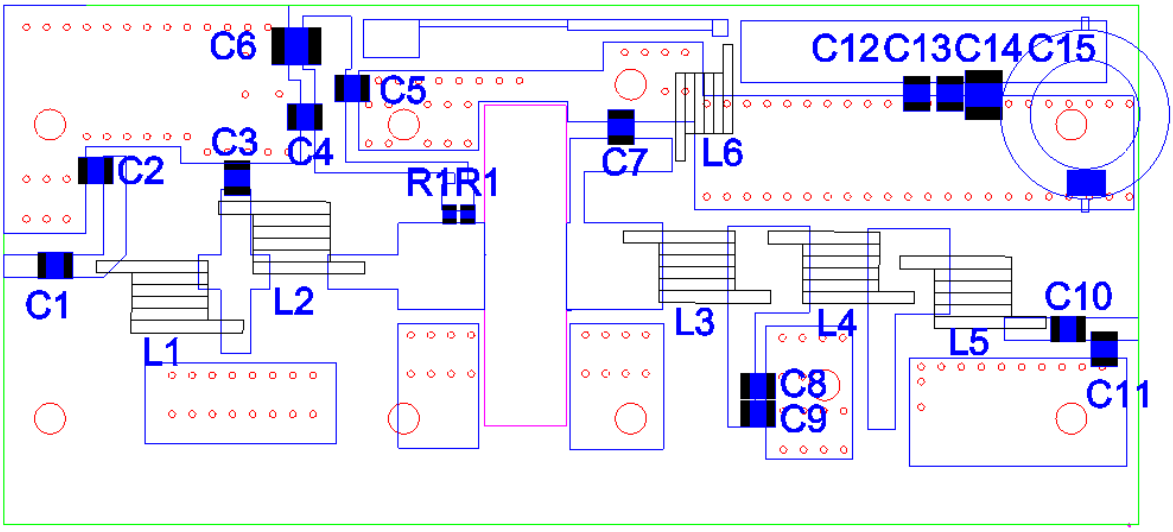


Fig 6. BLF881 88-108 MHz 140W amplifier



(1) PCB is Rogers Ro4350B; ϵ_R = 3.5; height = 30mil; Cu thickness = 35 µm

Fig 7. PCB layout

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Table 2. Bill of materials

Quantity	Description	Part Number	Manufacturer
R1	39ohm 0805 Resistor leaded		
R2	75ohm 0805 Resistor leaded		
C1,C4,C10,C12	1000P	100B	
C2	30P	100B	ATC
C3,C7	56P	100B	ATC
C8	75P	100B	ATC
C9	6.8P	100B	ATC
C11	24P	100B	ATC
C5,C13	0.1uF 50V Ceramic Capacitor		Kemet
C6,C14	10uF 50V Ceramic Capacitor		Kemet
C15	470 uF 63V Electrolytic Capacitor	MCRH63V477M13X26-RH	MULTICOMP
L1,L2,L3	Handwound 3 turn 5mm diameter with15AWG		Handwound
L4,L5	Handwound 4 turn 5mm diameter with15AWG		Handwound
L6	Handwound 6 turn 5mm diameter with15AWG		Handwound
PCB	Er=3.5, 30mil, 1OZ	RO4350B	ROGERS

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