CD-102-13

BLF188XR 72.5 MHz 1400 W power amplifier

Rev. 1.0----March 18 2013 **Application lab report**

Document information

Info	Content
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Keywords	BLF188XR, High power, CW
Abstract	This test report describes a High power amplifier that works more than 1400 W at 72.5MHz; using the BLF188XR LDMOS transistor.

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Revision history

Rev.	Date	Description
1.0	20130318	Initial version

Contact information

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1. Introduction

This report describes a broadband amplifier based on NXP's BLF188XR, which works more than 1400 W at 72.5MHz.

Summary

The RF performance may be summarised as follows:

Table 1. Summary of RF performance

Specified frequency range	72.5 MHz
Drain voltage	50 V
Quiescent drain current	200 mA typ
Peak CW power	≥ 1450 W
Efficiency at CW Peak power(1456W)	83.1%
3dB compression power	1350W
Power Gain at P3dB	23.1dB
I drain at P3dB	33A

2. RF performance

2.1 CW Gain and Efficiency as a Function of Output Power

The plot below shows gain and efficiency as a function of output power. The bias point is 50V and 200mA. The signal is a CW signal at 72.5MHz.

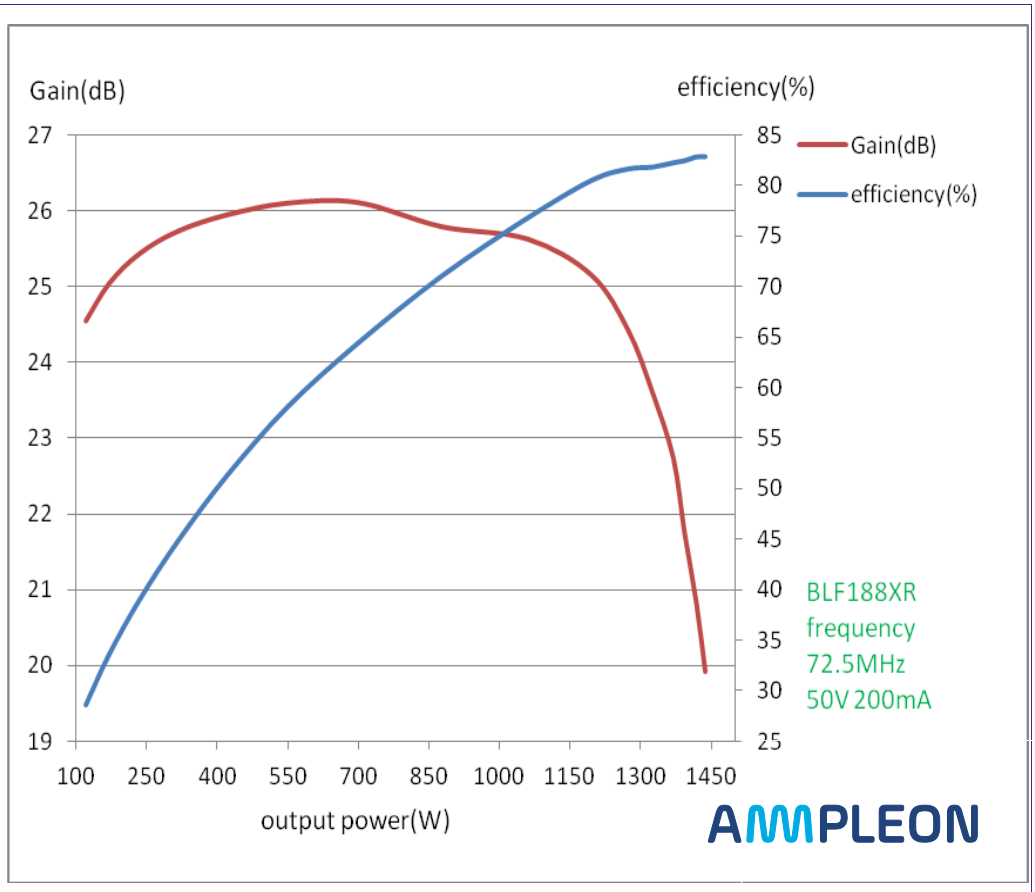


Fig 1. CW gain and efficiency as a function of output power 72.5MHz

2.2 Harmonics

The plot below shows harmonics while the device output power is being swept from low power to 1400W at 13.56MHz. 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.

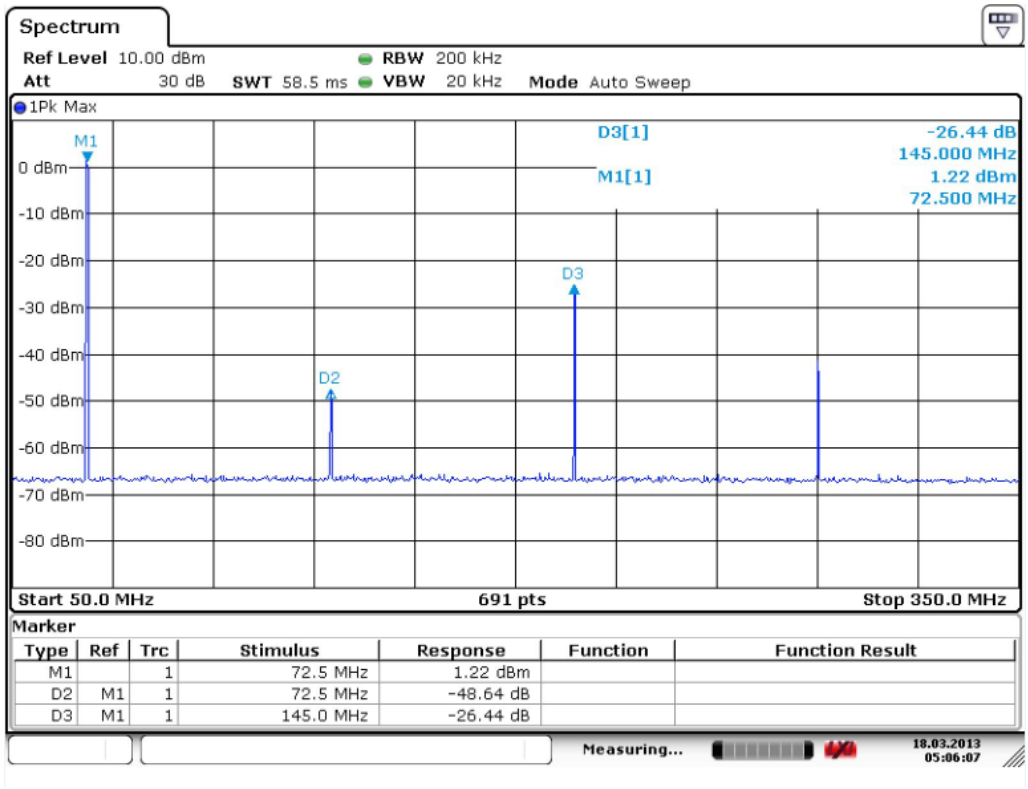
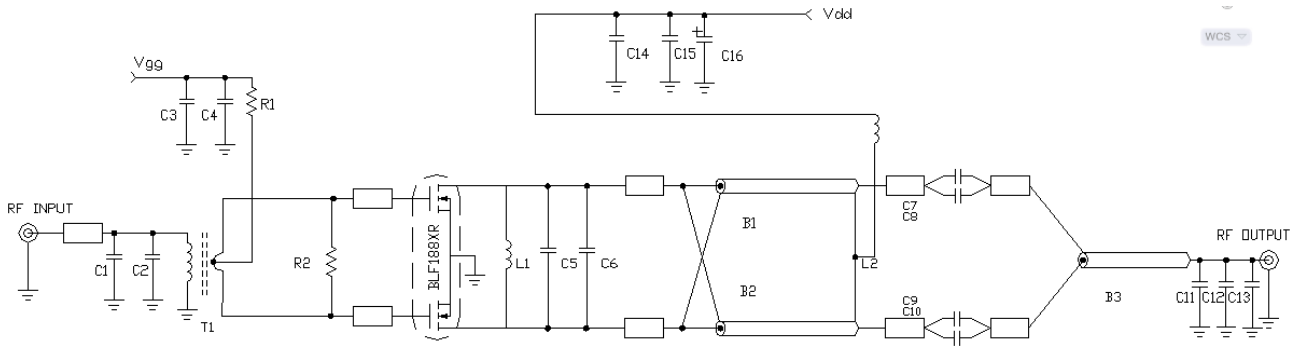


Fig 2. Harmonics at 1400W CW 72.5MHz

3. Circuits information

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



(1) PCB is RF35; ϵ_R = 3.5; height = 30mil; Cu thickness = 35 µm

Fig 3. DEMO Schematic

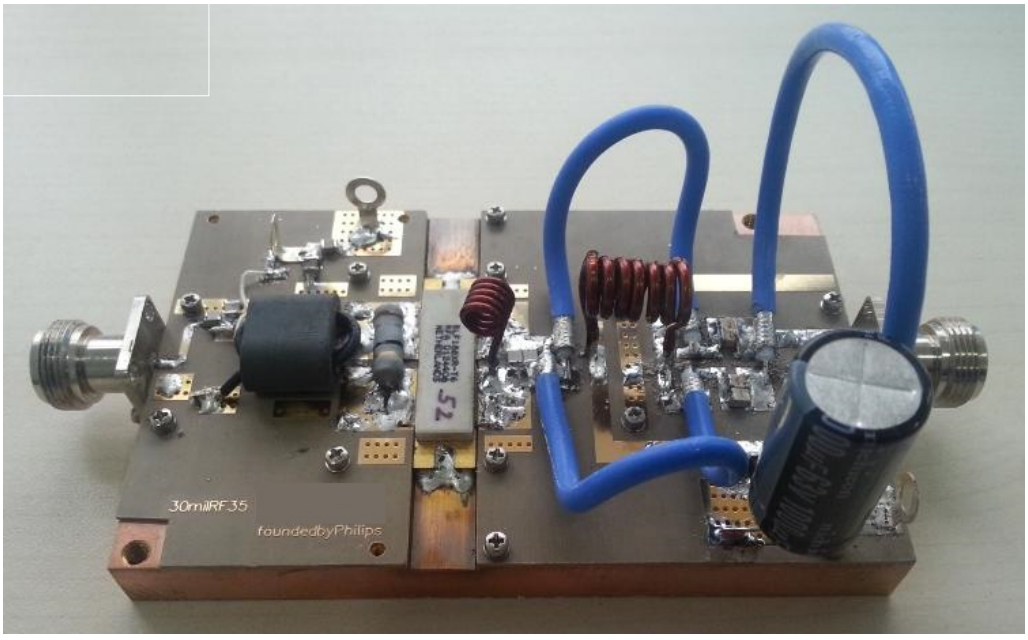
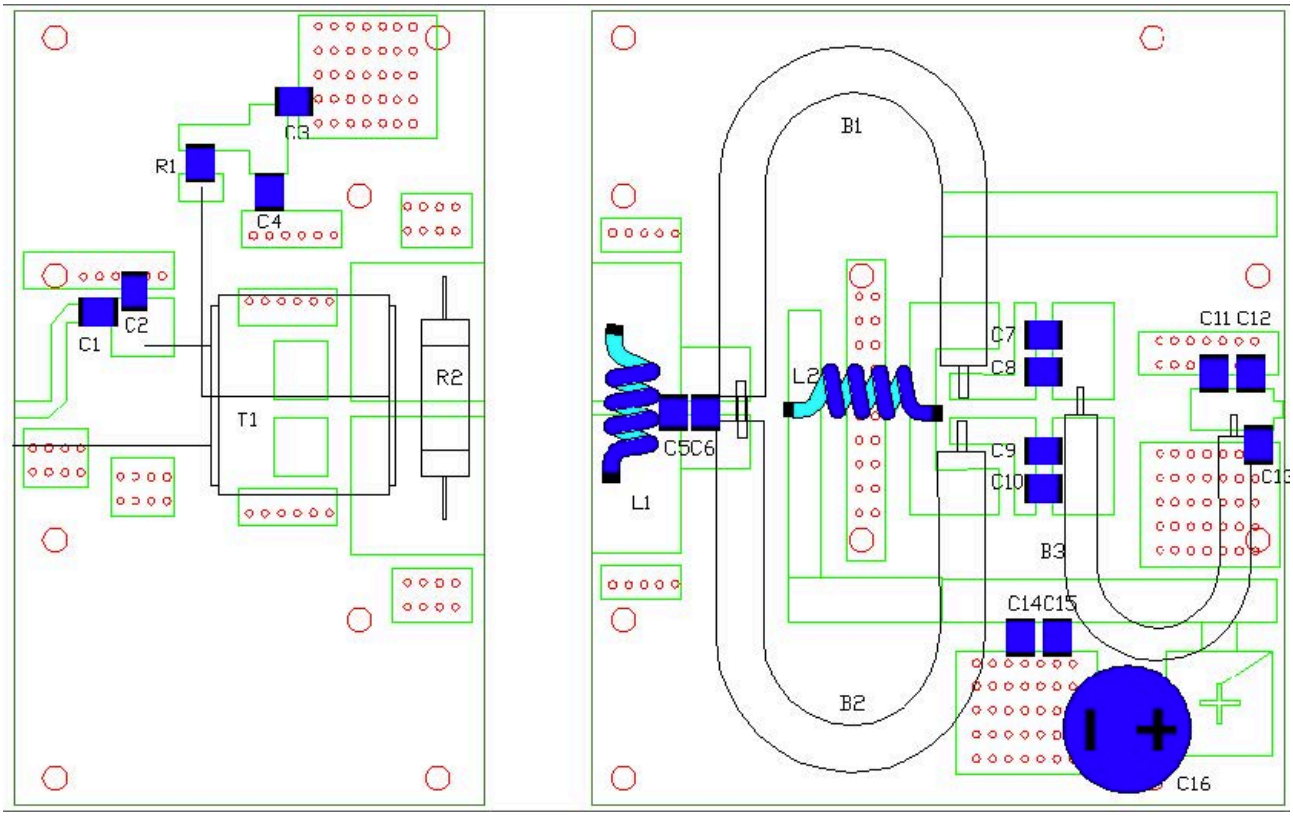


Fig 4. BLF188XR 72.5 MHz amplifier

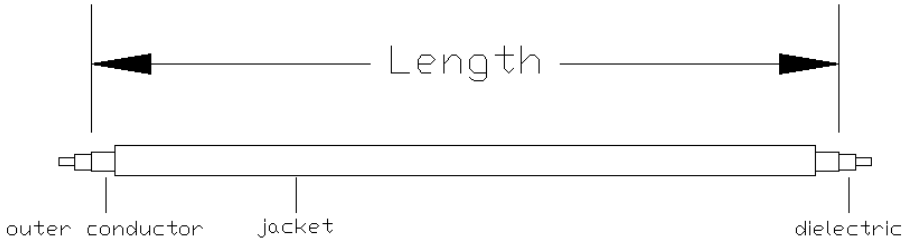


(2) PCB is Rf35; ϵ_R = 3.5; height = 30mil; Cu thickness = 35 µm

Fig 5. PCB layout

Table 2. Bill of materials

Quantity	Description	Part Number	Manufacturer
R1	39ohm 1/2W Resistor		
R2	18ohm 2W Resistor leaded		
C1	33P	100B330JT500X	ATC
C2	82P	100B820JT500X	ATC
C3,C14	1000P	100B102JT500X	ATC
C5,C6	36P	100B360JT500X	ATC
C7,C10	330P	100B331JT500X	ATC
C8,C9	560P	100B561JT500X	ATC
C11,C12.C13	15P	100B150JT500X	ATC
C4,C15	10 uF Ceramic Capacitor	CDR33BX106AKWS	Kemet
C16	470 uF 63V Electrolytic Capacitor	MCRH63V477M13X 26-RH	MULTICOM P
T1	4:1 Impedance Ratio 61 material		Handwound
B1	25OHM CABLE 4"	141-25	Whitmor/wire netics
B2	25OHM CABLE 4"	141-25	Whitmor/wire netics
B3	50OHM CABLE 7"	141-50	Whitmor/wire netics
L1	5mm inner diameter AWG 15 5T		Handwound
L2	6mm inner diameter AWG 12 7T		Handwound
PCB	RF35 30mil		Handwound



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