CA-203-13

BLP7G22-05 at 2400-2500 MHz

Rev. 3 — 05 October 2015

AMPLEON

Application Measurement Report

Document information

Info	Content
Keywords	BLP7G22-05, Class AB, IS95, Pulse
Abstract	Test Report BLP7G22-05, 2400-2500 MHz

Revision history

Rev	Date	Description
1	20130627	Original SB
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.

1. Introduction

This amplifier is designed with Ampleon's BLP7G22-05 N-channel enhancement-mode laterally diffused MOSFET. The BLP7G22-05 uses Ampleon's 7th generation process, and has a total P_{1dB} of over 10 Watts. This report describes the performance of a BLP7G22-05 in a class AB circuit.

2. Demo and Transistor Details

Frequency Band : 2400-2500 MHz
Test Signal : CW
Transistor : BLP7G22-05
Date code : TSD1231 x
Board # : 2351
PCB : 30 mil. Rogers RO4350

The amplifier has been characterized under the following conditions:

- Network analyzer plots for gain and input return loss at P_{IN} = 15 dBm.
- IS95 gain, efficiency, and ACPR.
- Pulse gain, efficiency and Power out vs. F

Note: The PA is tested with a supply voltage of V_{DS}=28V and I_{Dq}=65mA for all measurements unless otherwise noted. There is approximately 20mA due to the gate temperature compensation circuit. This gate bias circuit current should be subtracted from the drain current when calculating the drain efficiency.

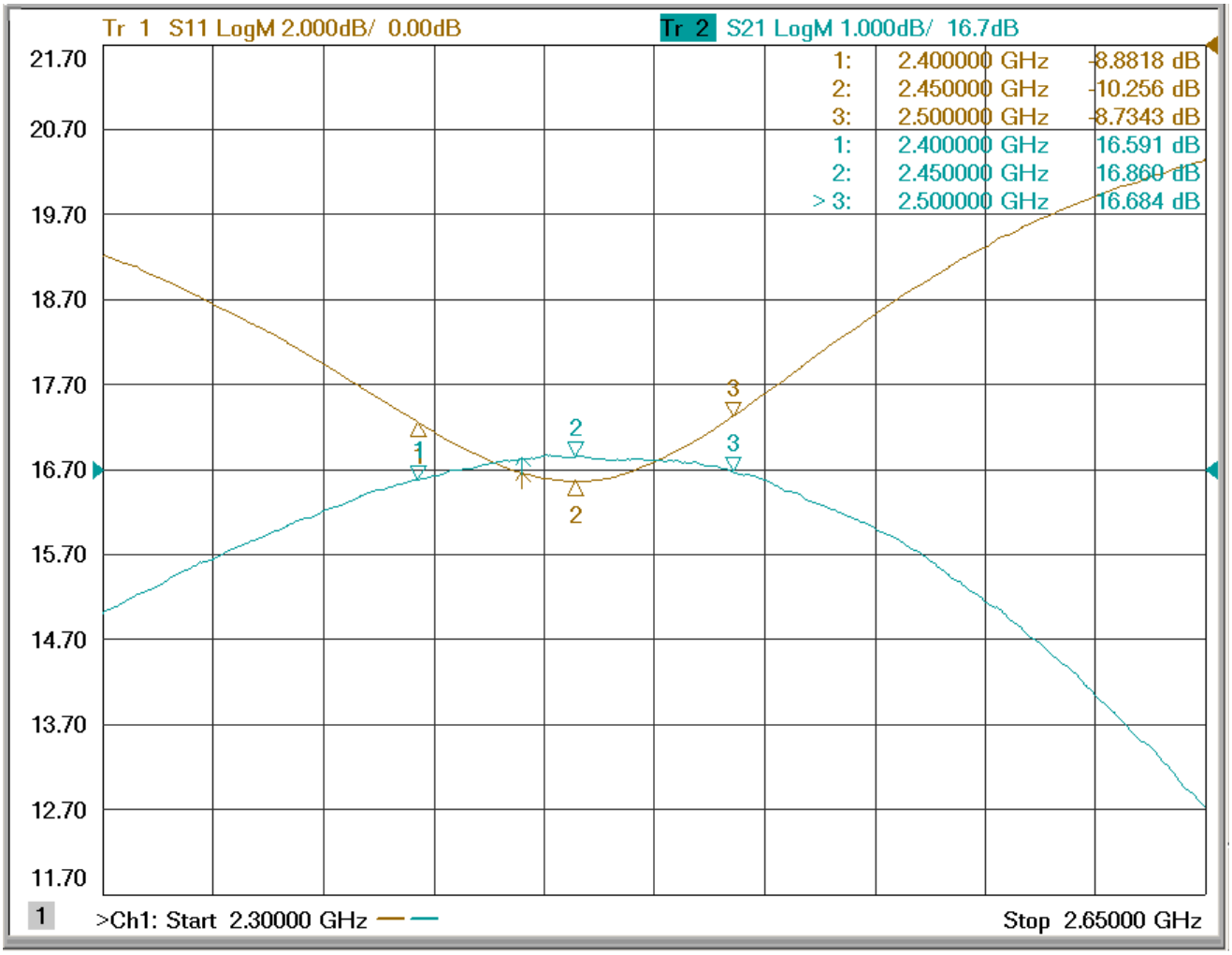
3. RF Performance Summary

3.1 CW Test Signal. V_{DS}=28V, I_{DQ}=65mA, T_H=25°C.

Freq(MHz)	P1dB CW (dBm)	P1dB CW (W)	P3dB-CW(dBm)	P3dB- CW (W)
2400	38.69	7.4	39.33	8.57
2450	38.41	6.93	39.07	8.07
2500	38.01	6.32	38.73	7.46

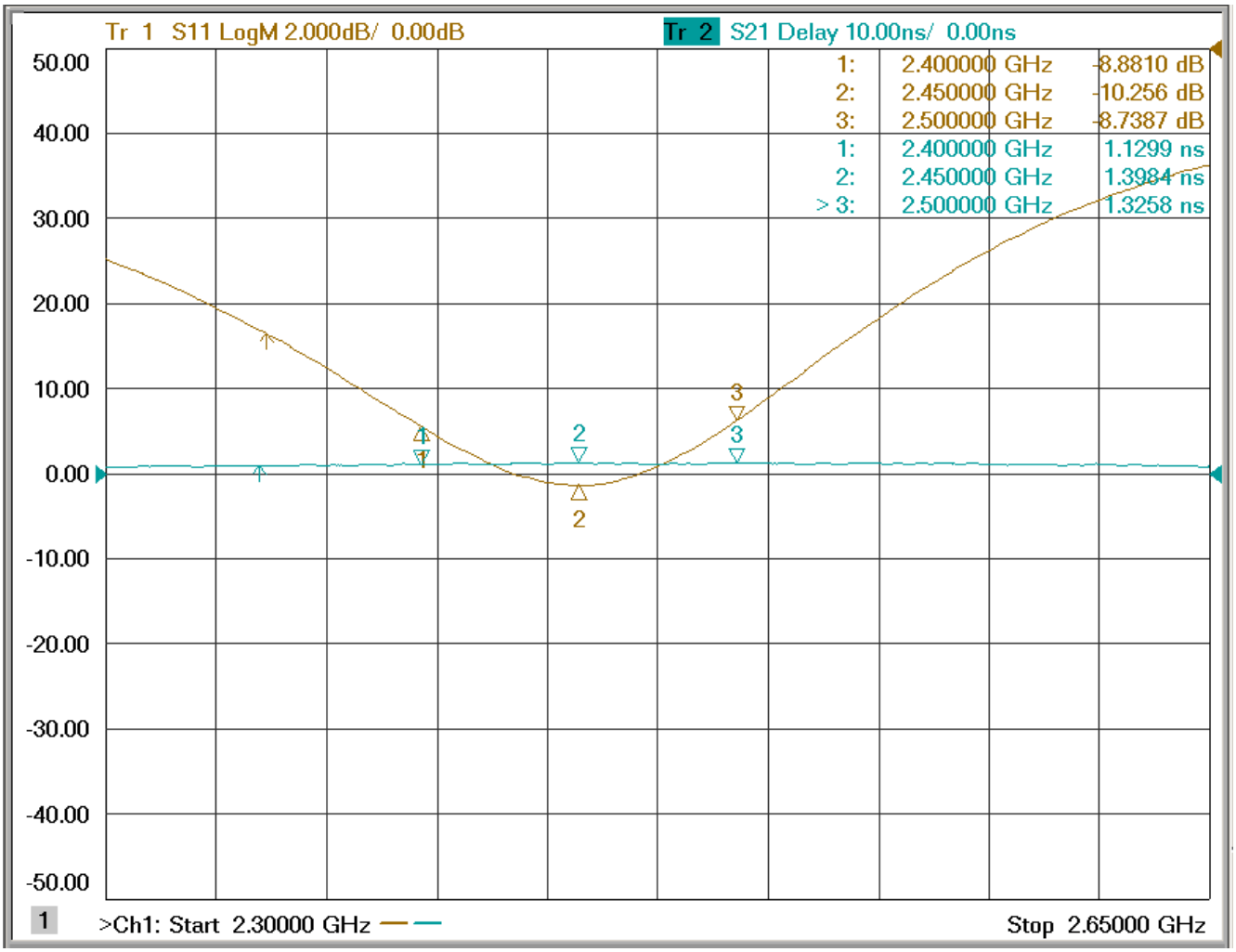
Table 1. RF Peak Power Performance Summary

3.2 Network Analyzer Gain, Return Loss



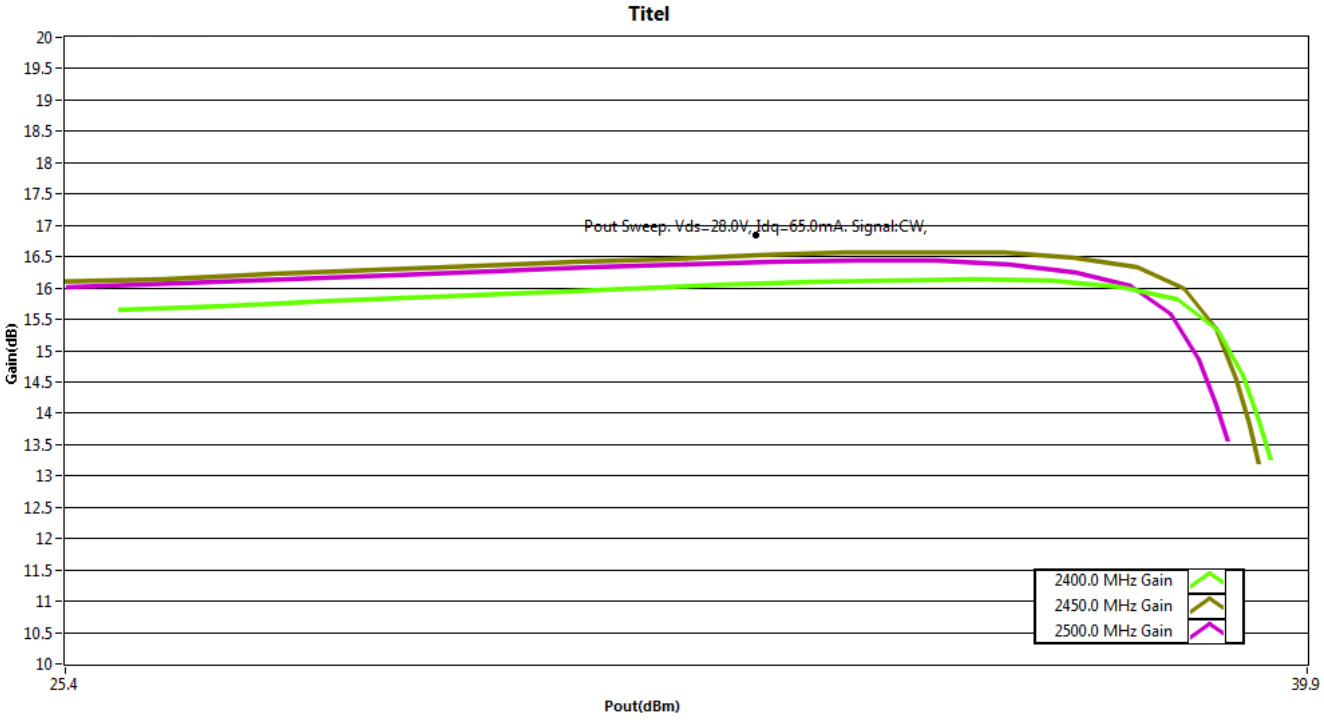
Network Analyzer Gain & Return Loss @ P_{IN} = 20 dBm

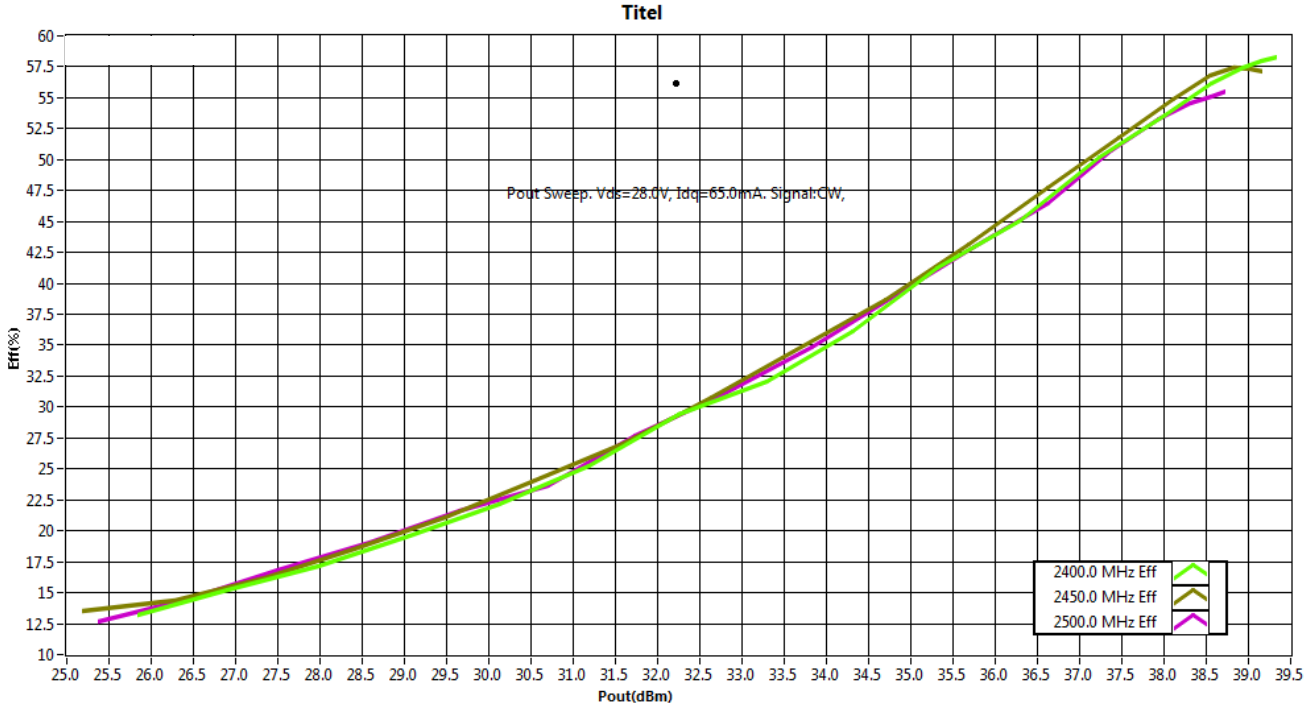
3.3 Network Analyzer Delay, Return Loss



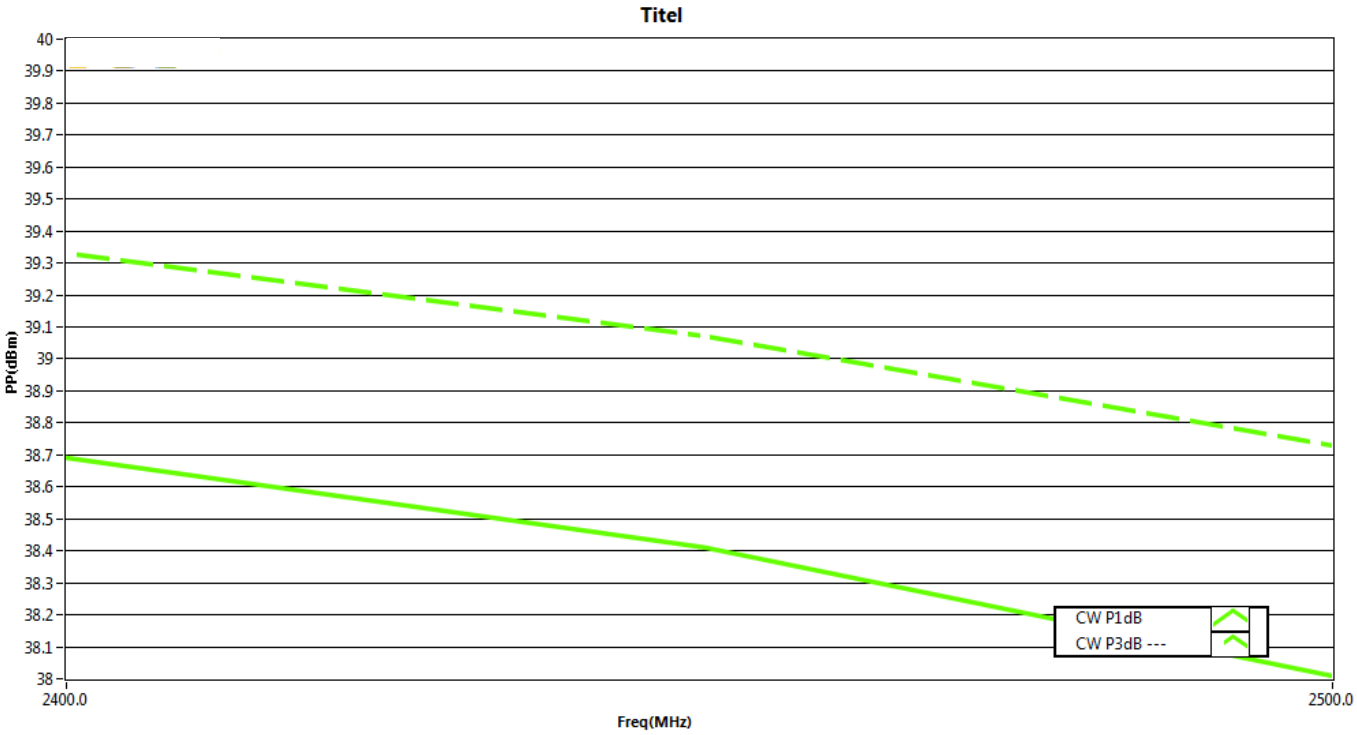
3.4 CW Gain and Efficiency as a function of Pout

28Vds, 65mA Idq.





3.5 CW Peak Power



4. Test Circuit

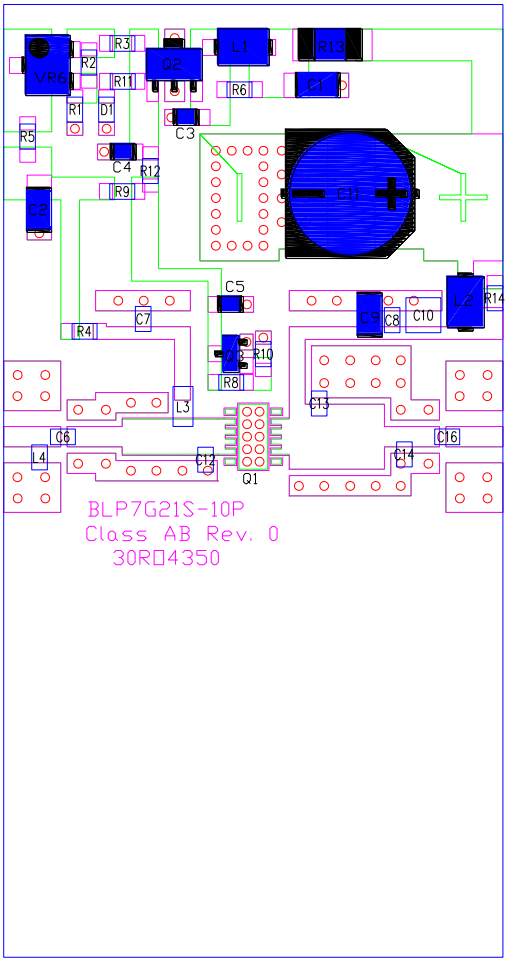


Fig 1. AutoCAD Layout

Designator	Description	Manufacturer	Part #
PCB	BLP7G21S-10P Class AB Rev. 0 30RO4350	Ohio Circuits	
Q1	BLP7G22S-10 (NOT SHOWN)	Ampleon	BLP7G21S-10P
Q2	78L08 voltage regulator	NJR	NJM#78L08UA-ND
Q3	2N2222 NPN transistor	Fairchild	MMBT2222
D1	LED, green	King Brght	APT2012CGCK
VR6	200Ω pot.	Bourns	3214-1-201E
R1	75Ω	Vishay Dale	CRCW080575R0FKTA
R2,R3	430Ω	Vishay Dale	CRCW0805432RFKEA
R4	5.1Ω	Vishay Dale	0805,1%
R5	1.3kΩ	Vishay Dale	0805,1%
R6,R14	9.1Ω	Vishay Dale	0805,1%
R8	5.1kΩ	Vishay Dale	CRCW08055K10FKTA
R9	11kΩ	Vishay Dale	CRCW080511K0FKEA
R10	910Ω	Vishay Dale	CRCW0805909RFKTA
R11	1.1kΩ	Vishay Dale	0805,1%
R13	499Ω,0.5W	Vishay Dale	CRCW2010499RFKEF
L1,L2	FerroxCube bead	Fair Rite	2743019447
L3	12nH	Coilcraft	0805CS
L4	5.1nH	Coilcraft	0603CS
C1,C2,C9	1uF,ceramic	muRata	GRM31CR71H105K
C3,C4,C5	100nF,ceramic	muRata	GRM21BR71H104K
C7,C8,C16	15pF	American Technical Ceramics	600F
C10	10uF,ceramic	muRata	GRM32DR71H106K
C11	220uF,electrolytic	Panasonic	EEV-FK1H221P
C12	2.1pF	Passive Plus	600F
C13	1.2pF	Passive Plus	600F
C14	1.6pF	Passive Plus	600F
C6	6.2pF	Passive Plus	600F
PC-Board Material: Rogers RO4350, ε_r=3.66, Thickness=30 mil., 1 oz. Cu Double-Sided			

Table 2. BOM

5. Photo

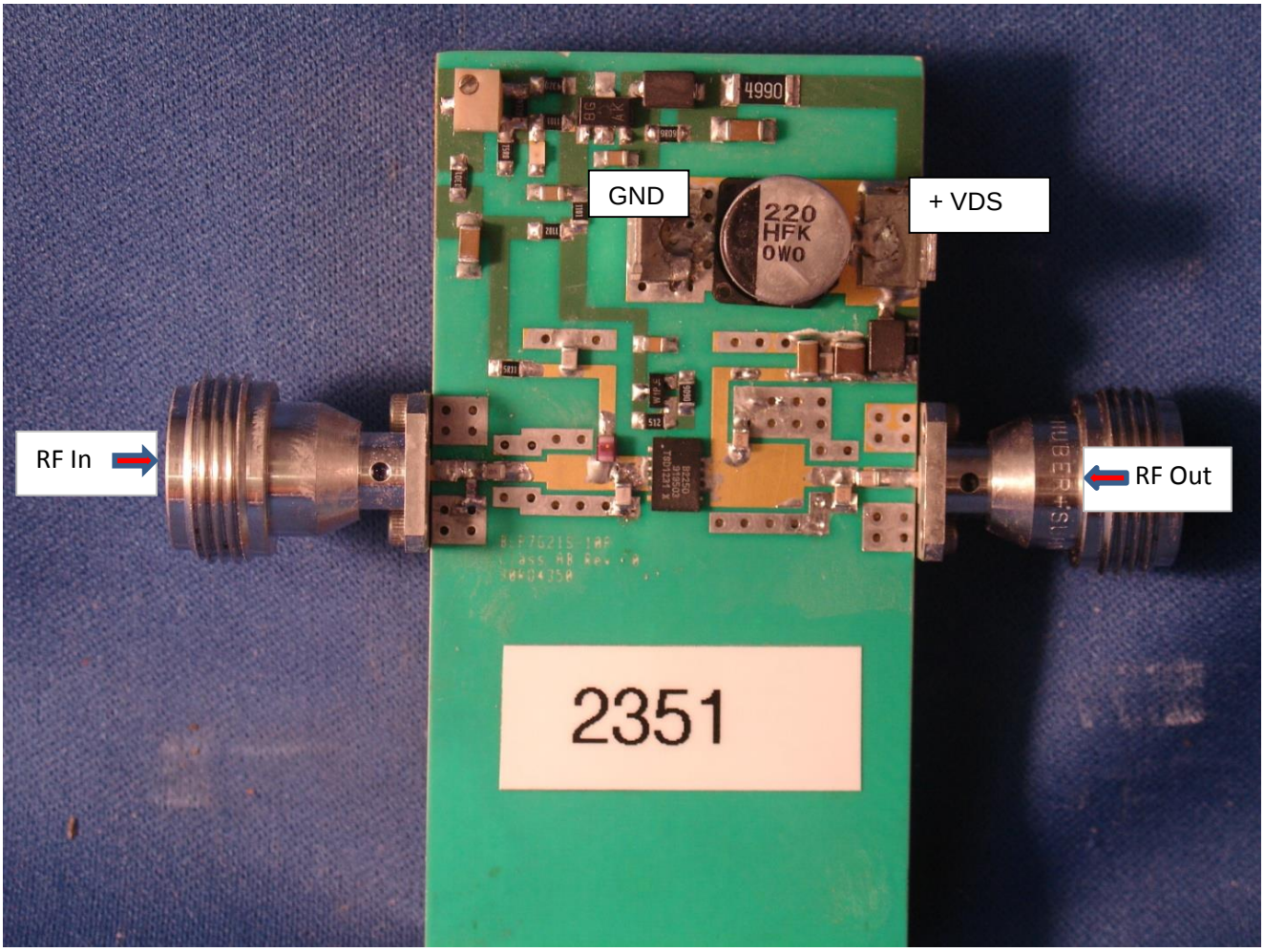


Fig 2. Photo

6. Attachments

Please see the attachment for the support files.

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Date of release: 05 October 2015
Document identifier: CA-203-13