

# AR122227

CLF1G0060-30, 1500-4000 MHz

V3.0 30 March 2016

**AMPLEON**

Application Report

## Document information

Info	Content
Status	Ampleon Internal
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Abstract	RF Performance CLF1G0060-30; 1500-4000 MHz; Board 2021

## 1 Revision History

Table 1. Report revisions

Revision No.	Date	Description	Author
1.0	20120831	Initial document	Tom Kelly
2.0	20130501	Changed 30W to 10W (P4.) not found on P4.	Tom Kelly
3.0	20160330	Update to Ampleon Template from CA-227-12	Bob Bartola

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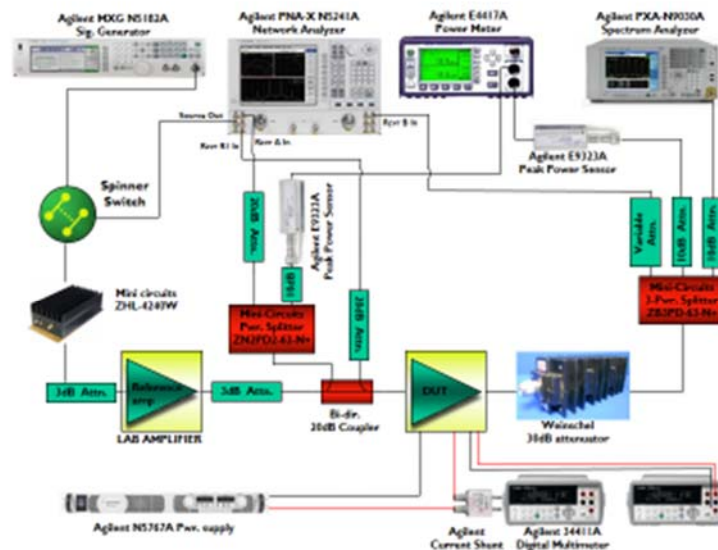
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## 5 General Description

This report presents the measurement results of the Class AB demo AR122227. The device used is a CLF1G0060-30, 1'st generation GaN in a single ended package, the Device. The presented demo is wideband tuned for the frequency band of 1500-4000 MHz. and delivers a saturated power of 30 watts.

## 6 Test Bench Set Up

Figure 1. Test Bench Equipment set up



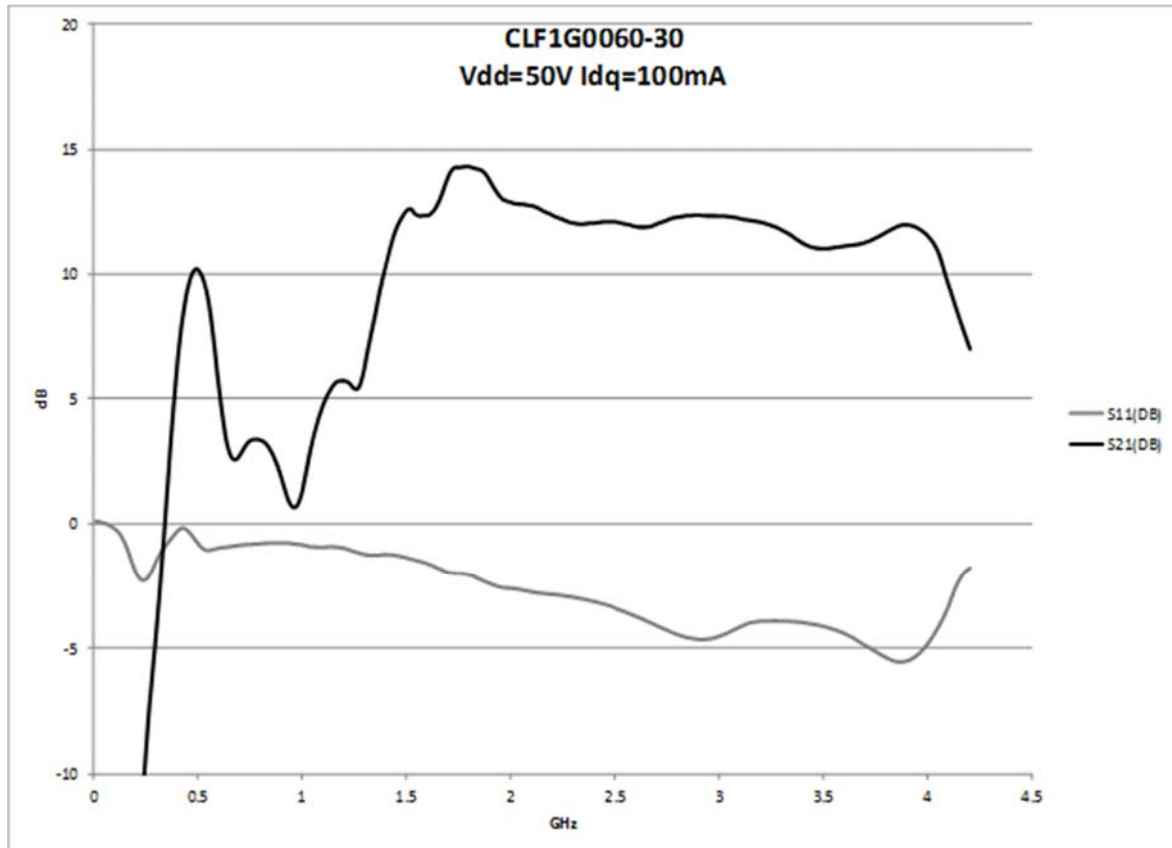
## 7 RF Performance

Table 2. . RF Performance Vds=50V Idq=100mA. 1500-4000 MHz.

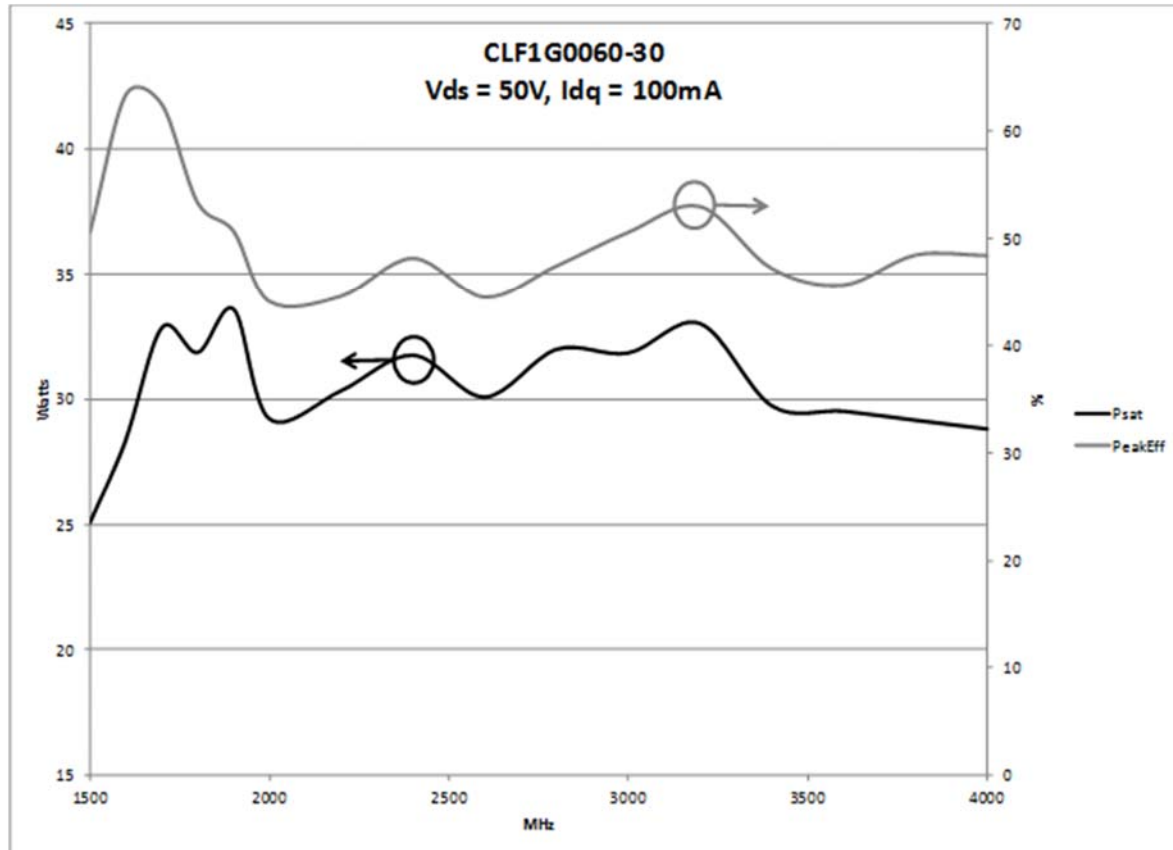
Parameter	Pload=+20dBm. CW		Pload=P-3dB. PW=50uS. DF=25%
Gain (dB)	+11dB. typ.		+7dB typ.
Drain Efficiency (dB.)	N/A		45% typ.

## 8 Performance Details

### 8.1 Gain RL pin = 20dBm CW

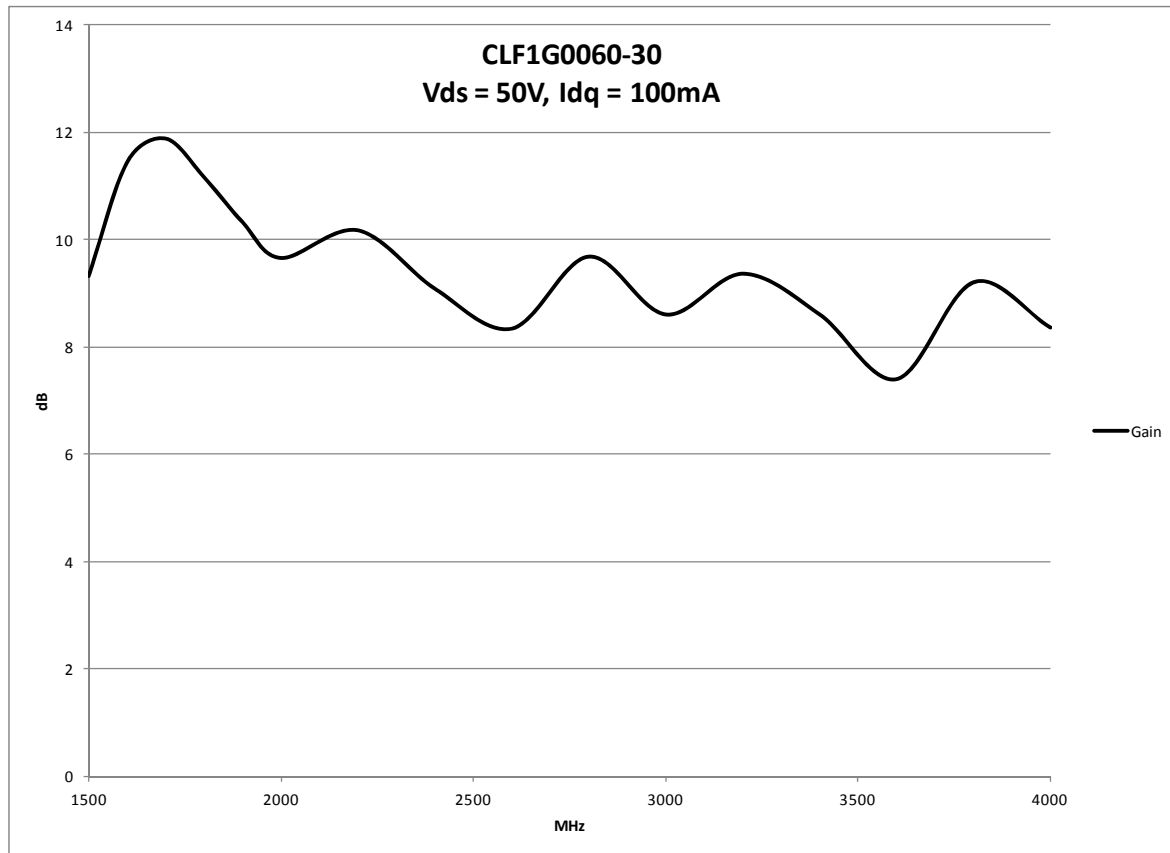


## 8.2 P-3dB Power and efficiency



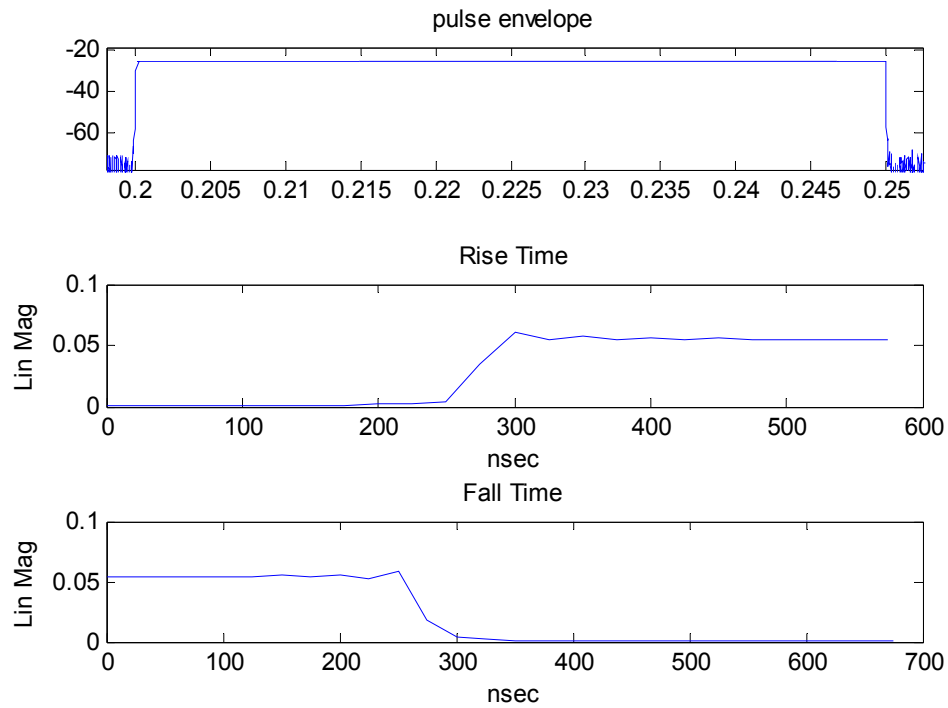
PW=50uS. DF=25%

### 8.3 Gain @ P-3dB.



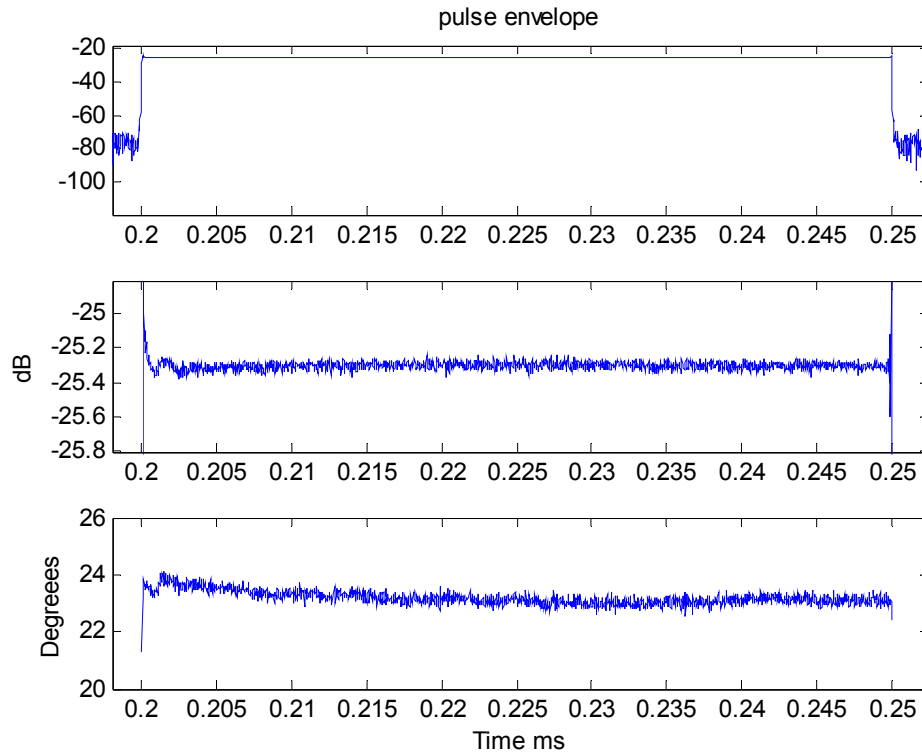
PW=50uS. DF=25%

## 8.4 Pulse Profile 3GHz. 30 Watts Rise/Fall Time





## 8.5 Pulse Profile 3GHz. 30 Watts Droop/Phase



## 9 Hardware

### 9.1 Board photograph

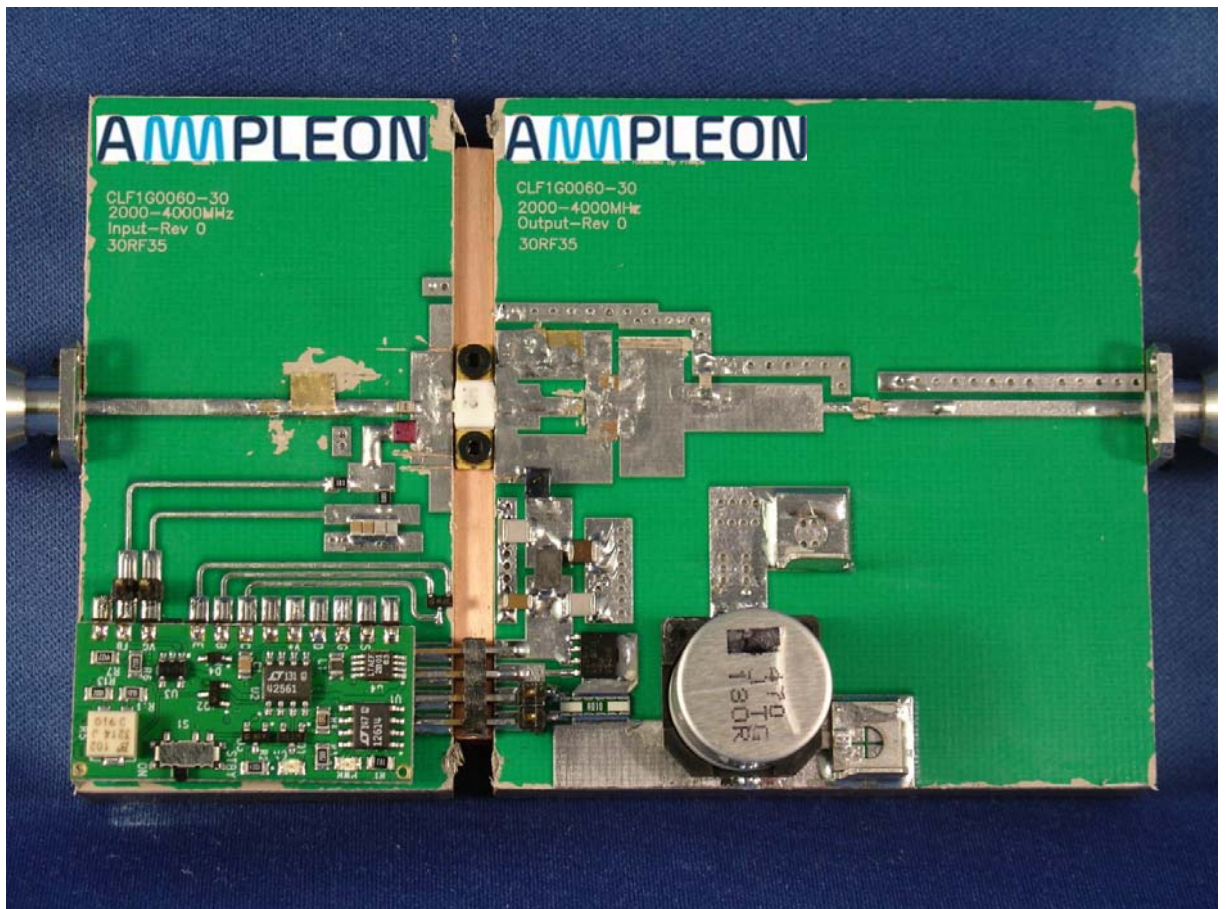


Figure 2. 30W 1500-3000 MHz GaN 50V Demo Amplifier 2021

## 9.2 PCB layout

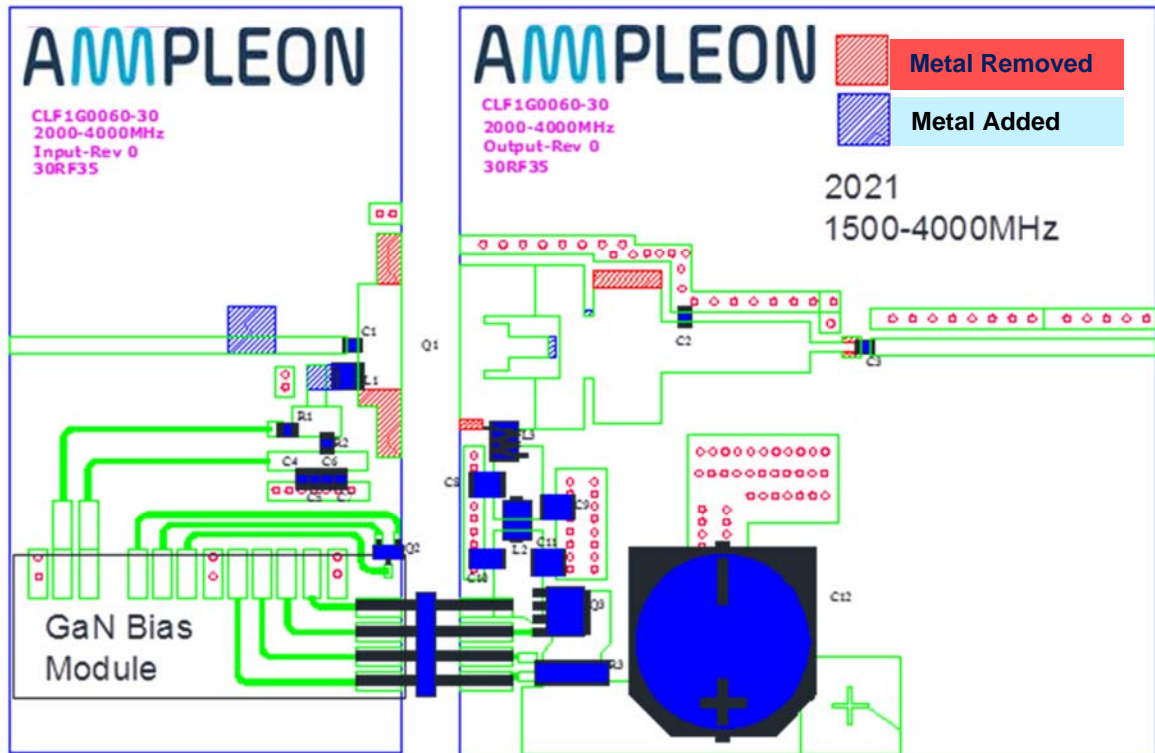


Figure 3. PCB Layout 30W 1500-4000 MHz GaN 50V Demo Amplifier #2021

## 9.3 Bill of materials

Table 3. BOM

<u>Designator</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Part #</u>
Input PCB	CLF1G3060-30 2000-4000 Input Rev0	Avanti	
Output PCB	CLF1G3060-30 2000-4000Output Rev0	Avanti	
Q1	30W GaN	Ampleon	CLF1G0060-30
Q2	Transistor, PNP 45V 100mA GP	NXP	BC857B
Q3	Transistor, N-ch MOS 80V 80A	NXP	BSMN8R2-80YS
R1	10k $\Omega$	Vishay Dale	0805
R2	10 $\Omega$	Vishay Dale	0805
R3	0.010 $\Omega$ 1% 100ppm MF, 2W, 3008	Susumu	RL7520WT-R010-F
C12	470uF, 63V Electrolytic SM	Panasonic	PCE3667CT-ND
C1	5.6pF	Passive Plus	0805
C2	0.8pF	Passive Plus	0805
C3	1.5pF	Passive Plus	0805
C7	22pF	Passive Plus	0805
C4	100nF Capacitor, 50V 10% X7R, 0805	Generic	
C5	10nF Capacitor, 50V 10% X7R, 0805	Generic	
C6	1nF Capacitor, 100V 5% NP0, 0805	Generic	
CC8,C11	10nF Capacitor, 200V 5% NP0, 1210	Generic	
C9	10uF Capacitor, 100V 10% X7S, 2220	TDK	C5750X7S2A106M
C10	1uF	TDK	C3216X7R1H105K
L1	22nH	Coil Craft	0805CS-220X
L2	Ferrite bead, 5A	Fair Rite	2743019447
L3	2.5nH	Coil Craft	AO1T
PC-board Material: Taconic RF35, $\epsilon_r = 3.5$ , thickness 30mils, 1oz copper each side			

## 9.4 PCB materials

**Table 4. Board Specifications**

Parameter	Value
Manufacturer	Taconic
Type	RF35, $\epsilon_r = 3.5$
Thickness	30mils, 1oz. copper
Layers	2, top/bottom. Bottom all copper

## 9.5 Device markings

**Table 5. Device Specifications**

Parameter	Value
Manufacturer	Ampleon
Device	CLF1G0060-30
Date Code	H2

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