

AR174005

BLP0427M9S20, 30-512MHz

V1.0---23 May 2017

Application
Measurement
Report

Document information

Status Public

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Abstract Measurement results of CW design with BLP0427M9S20, this circuit works at 30-512MHz

1. Revision History

Table 1: *Report revisions*

Revision	Date	Description	Author
1.0	20170523	Initial document	Rock Qiu

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General description

This report presents the measurement results of the CW demo AR174005. The device is BLP9G0722-20 LDMOS plastic package. The presented demo is tuned for the frequency 30-512MHz. this circuit can output >20W CW.

5. Biasing

The biasing is as follows:

$$V_{DS} = 28V$$

$$I_{dq} = 150mA$$

6. Performance Indication

Table 2: *Performance indication*

Parameter	Condition	Unit	CW
V _{DD}		V	50
S11 at input		dB	-8
P _{1dB}	G _{MAX} -1dB	W	20
P _{3dB}	G _{MAX} -3dB	W	28
P _{OUT} of operation	P _o	W	20
Gain	@P _o	dB	19
Drain Efficiency	@P _o	%	60

7. Performance Details

7.1 Return loss at input side

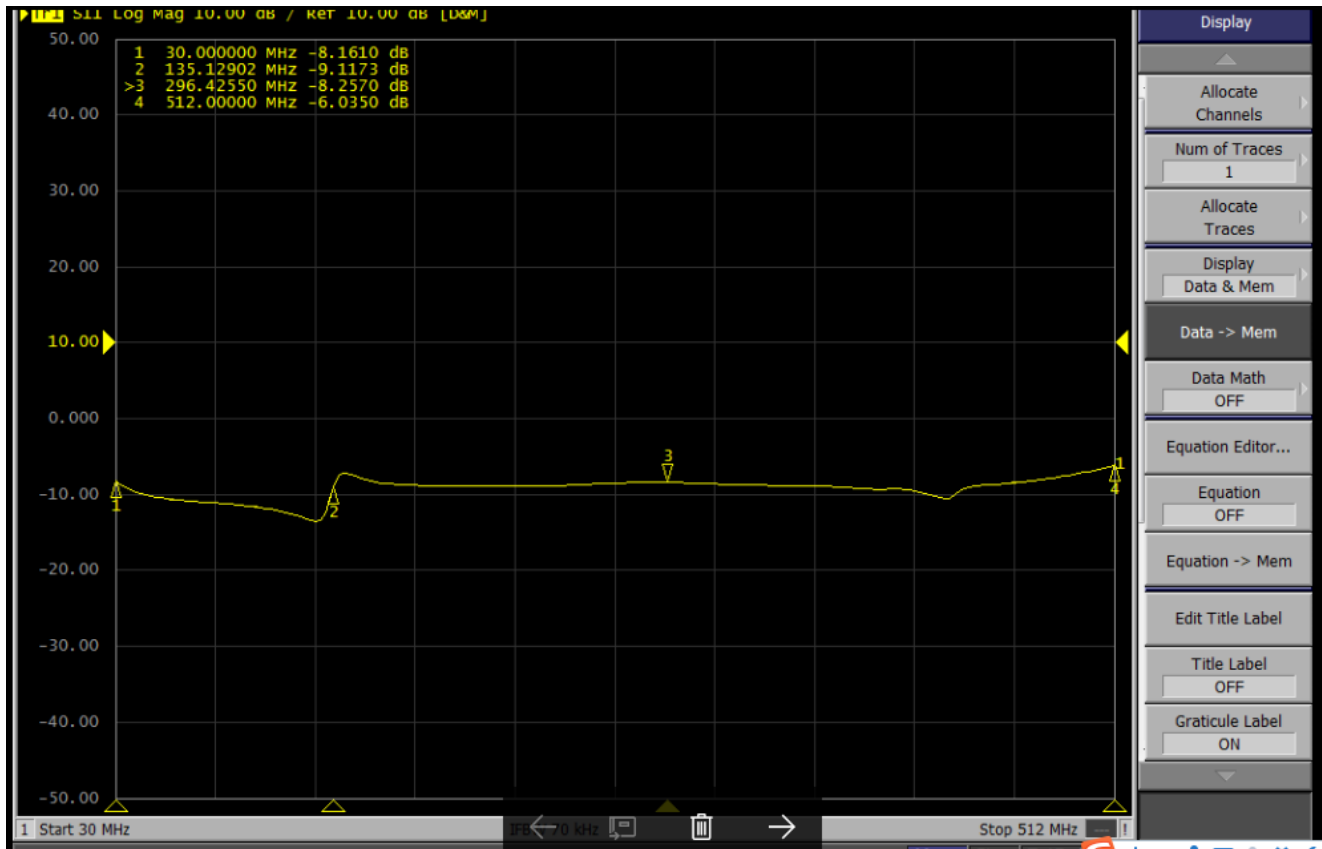


Figure 1 return loss

7.2 Test data:

7.2.1 CW P1dB and P3dB test (150mA bias)

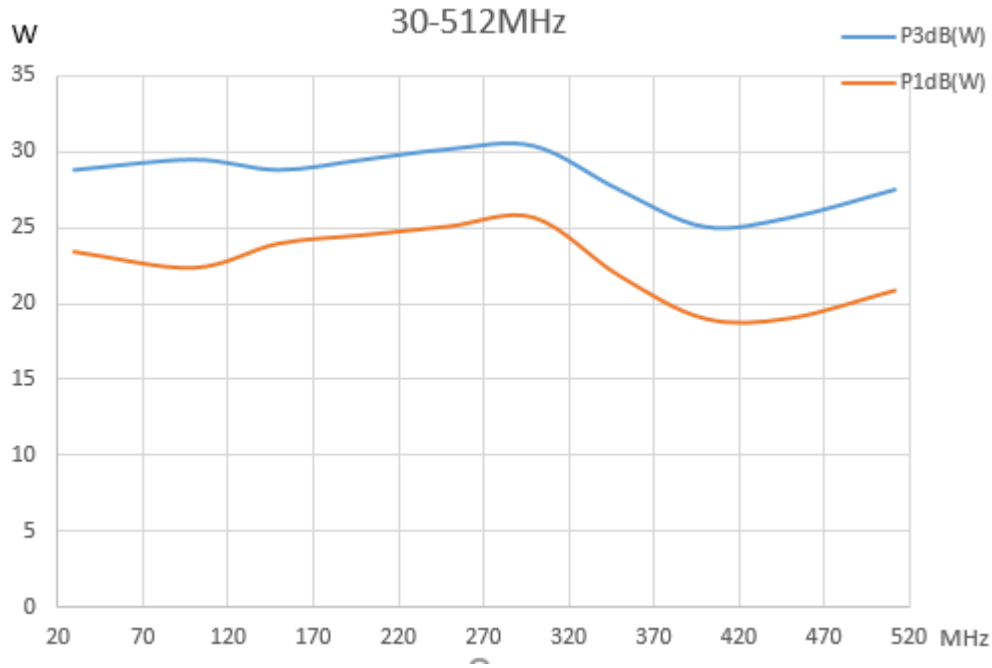


Figure 2 CW P1dB and P3dB vs frequency(30-512MHz)

7.2.2 Efficiency @ P1dB (150mA bias)

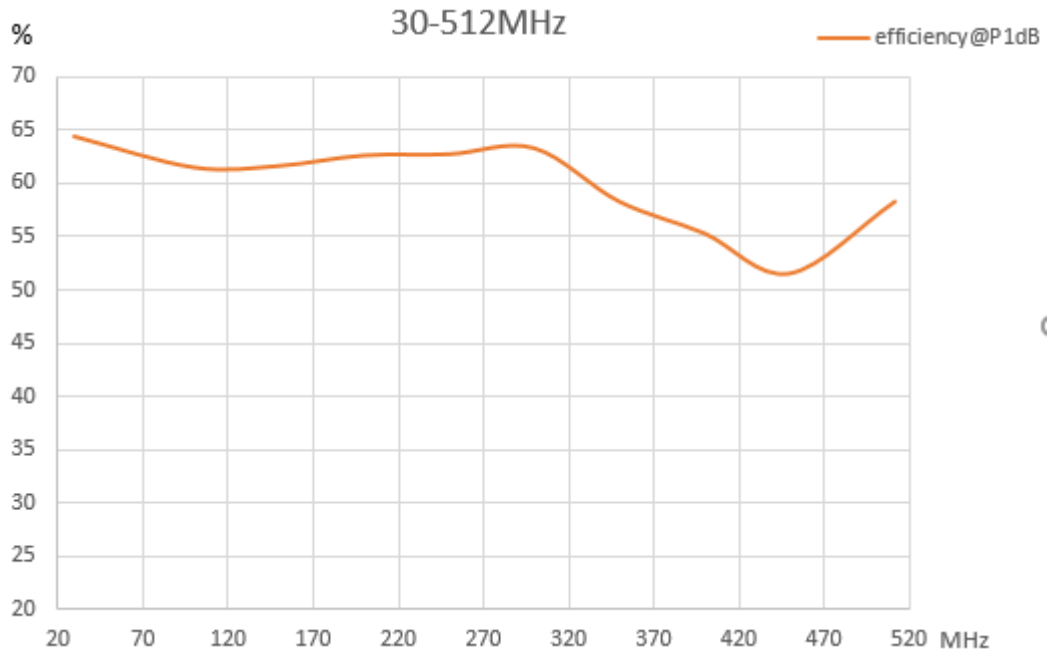


Figure 3 CW efficiency @ P1dB (30-512MHz)

7.2.3 Small signal gain(150mA bias)

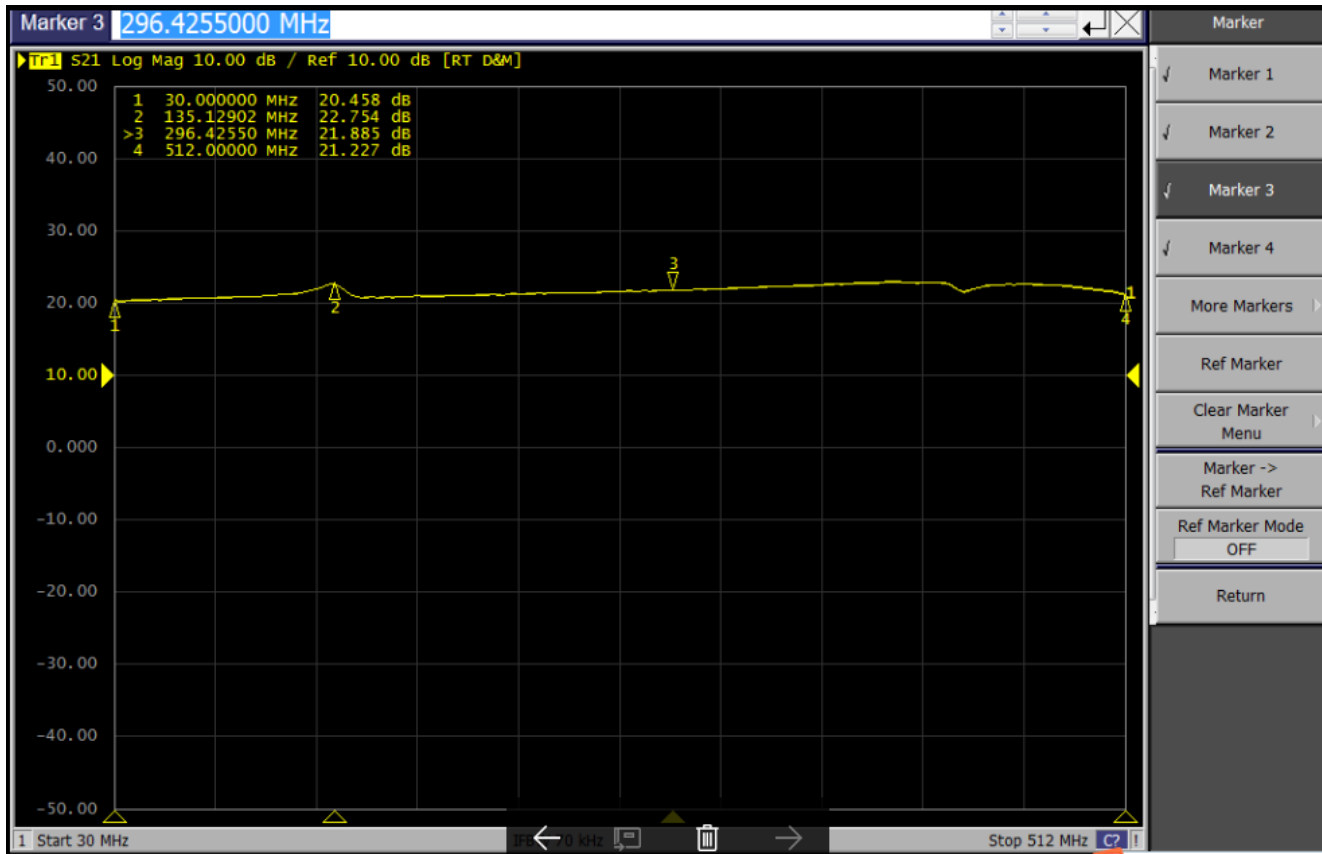


Figure 4 small signal Gain

7.2.4 Harmonics (10W and 20W output)

freq(MHz)	10w 2nd harmonics(dBC)	10w 3rd harmonics(dBC)	20w 2nd harmonics(dBC)	20w 3rd harmonics(dBC)
30	-8.7	-53	-8.6	-26.5
100	-8	-35	-8.4	-27.1
200	-8.4	-25.7	-9	-21.1
300	-9	-23.4	-9.5	-19
400	-8.7	-30	-11	-21.5
512	-13.9	-37.1	-16.1	-29.1

Figure 5 2nd&3rd harmonics

7.2.5 linearity (IMD3)

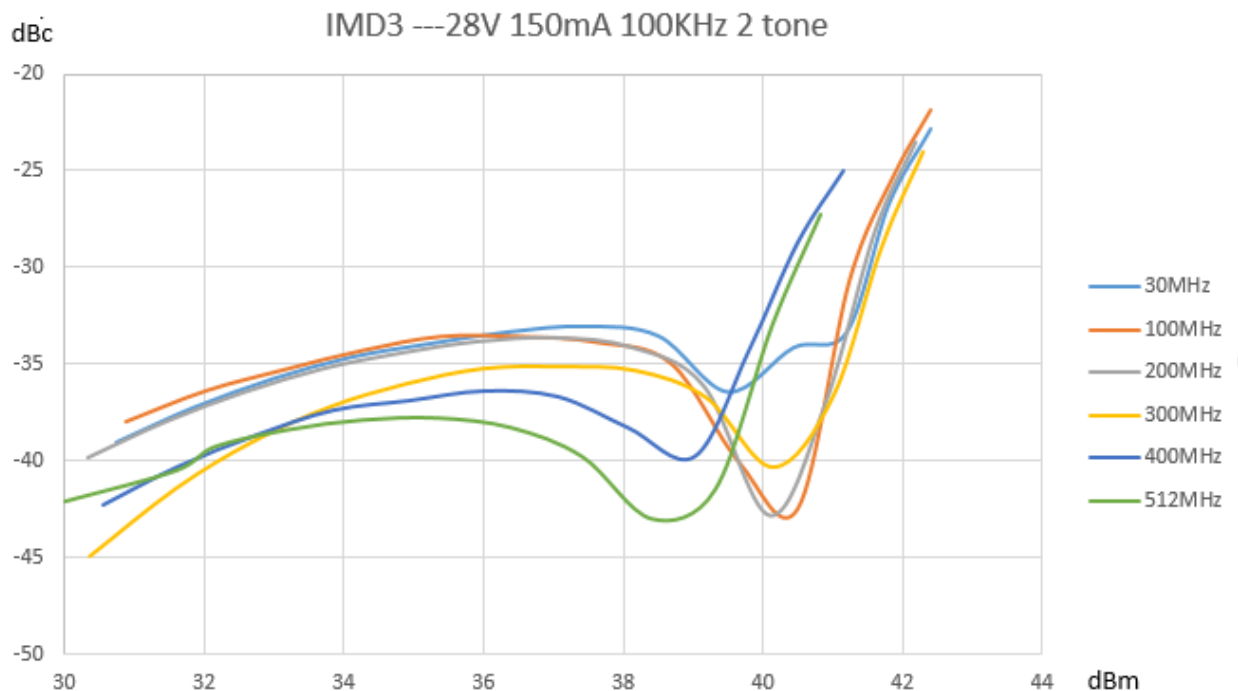


Figure 6 IMD3(left) ---28V 150mA 100KHz 2 tone

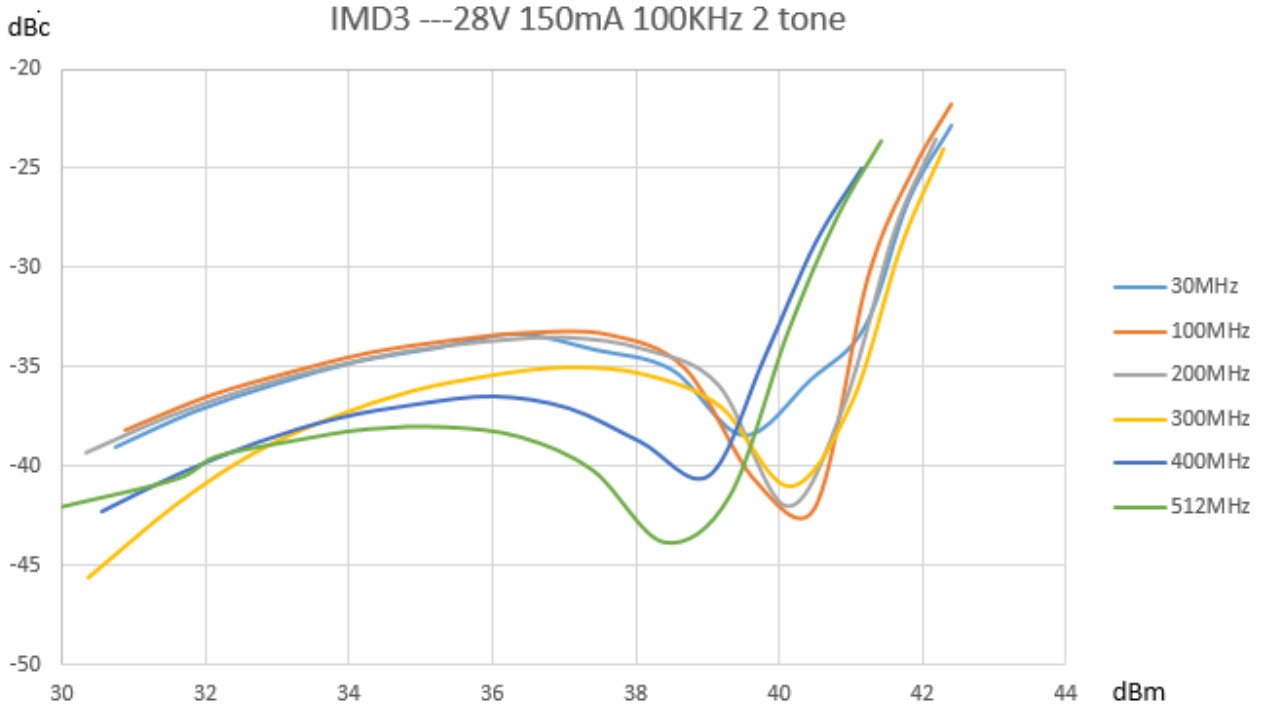
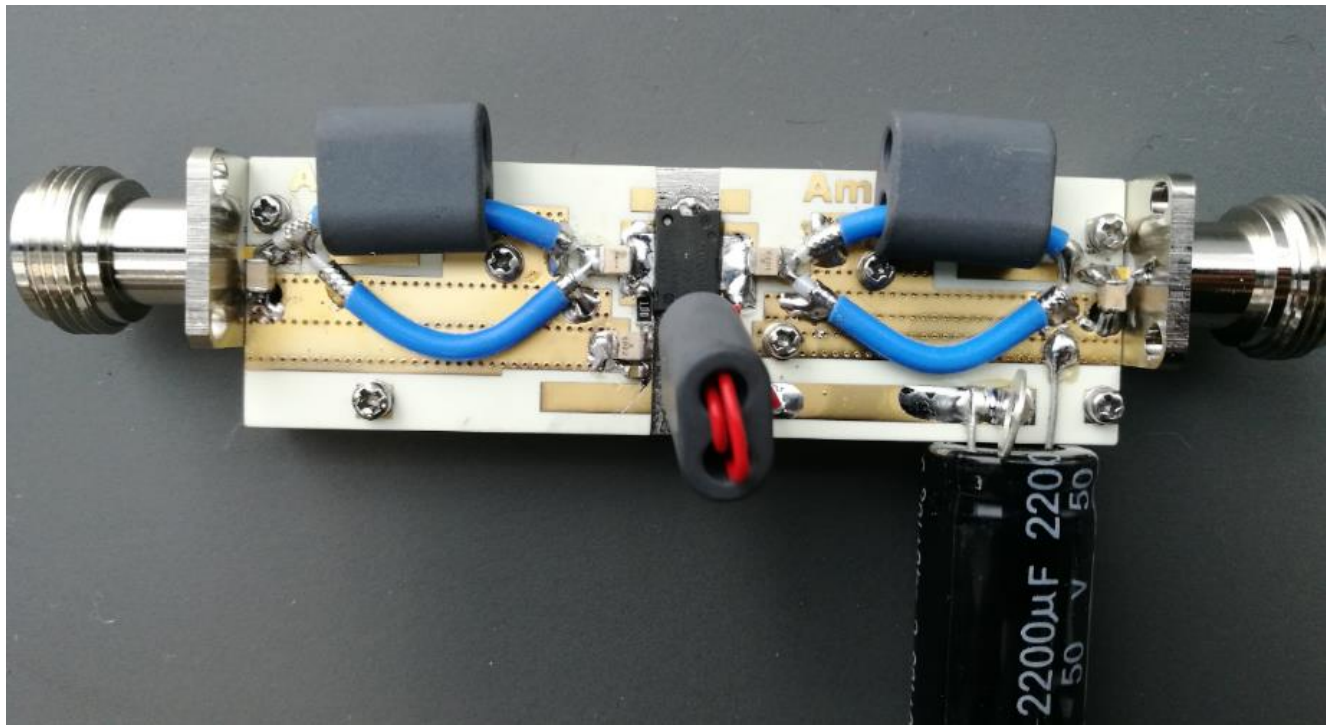


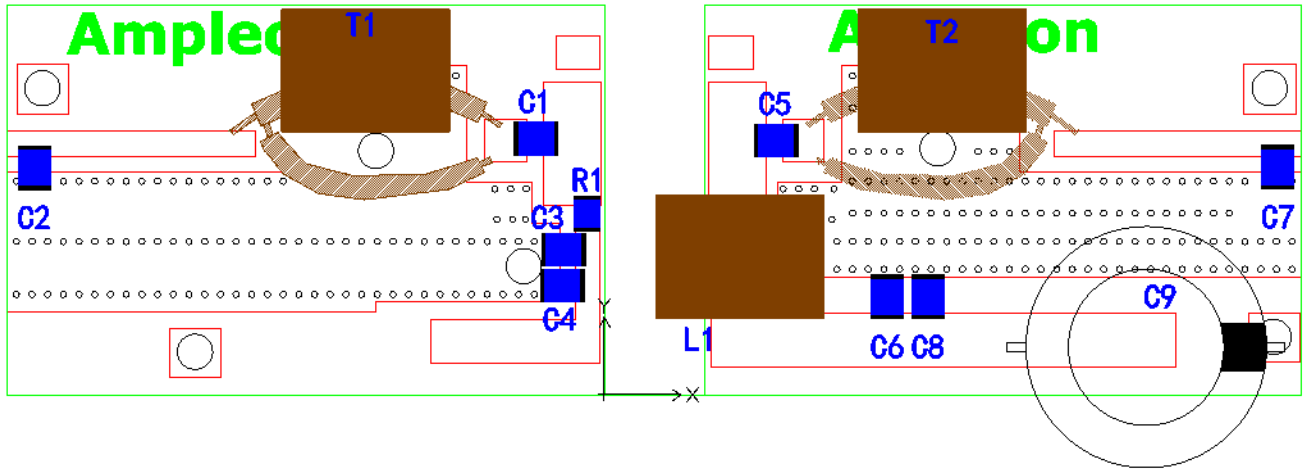
Figure 7 IMD3(right) ---28V 150mA 100KHz 2 tone

8. Hardware

8.1 Board Image



8.2 Copper Layout and components mapping(layout, BOM is attached in the PDF report)



8.3 Bill of materials

Table 3: *Bill of Materials*

Quantity	Description	Part Number	Manufacturer
R1	10 ohm Resistor	1206	
C8	10uF	GRM32DF51H106ZA01L	Murata
C1	470P	100B	ATC
C2	5.6P	100B	ATC
C3,C5,C6	1000P	100B	ATC
C7	2.7P	100B	ATC
C4	1uF	0805	Murata
C9	470 uF 63V Electrolytic Capacitor	MCRH63V477M13X26-RH	MULTICOMP
L1	2T coil, ferrite core BN61202		Handwound
T1,T2	ferrite core BN61202, 27mm coaxial cable 086-25		
PCB	RO4350B 30mil		Rogers

8.4 Board material

Table 4: *Board specifications*

Parameter	Value
Manufacturer	Rogers
Type	RO4350B
Thickness	30mil, 0.762mm
Layers	2, top/bottom. Bottom all copper

8.5 Device markings

Table 5: *Device specifics*

Parameter	Value
Manufacturer	Ampleon
Device	<i>BLP0427M9S20</i>

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