

CA-038-13

BLF574 at 420-450 MHz

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AMPLEON

Application Measurement
Report

Document information

Info	Content
Keywords	BLF574, AB, Pulse
Abstract	RF Performance BLF574; 420-450MHz; Board 2202

Revision history

Rev	Date	Description
1	20130212	Original
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. Demo and Transistor Details

Frequency Band	420-450 MHz
Modulation	Pulsed 16ms 28%,
Transistor	BLF574
Date Code	M1015
Board Number	2202

2. Introduction

This report gives the test results for a BLF574, 500W, LDMOS, push-pull class AB demo amplifier. Ground

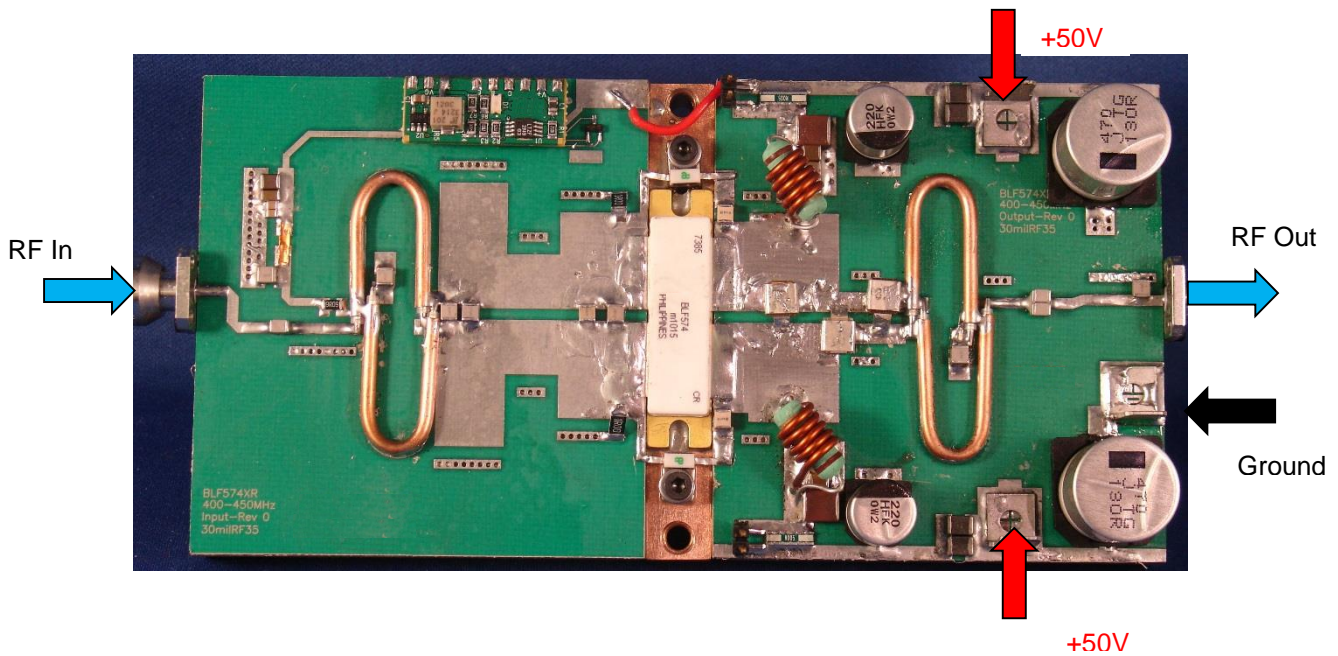


Fig 1. Board

The following tests have been performed:

- NWA - Gain/ Return loss (CW)
- Pulsed Peak Power sweep

All testing has been performed at $V_{DS} = 50V$, $I_{DQ} = 120mA$, and $T_H = 25^{\circ}C$ unless otherwise specified

3. Test Circuit

A description of this circuit can be found in **chapter 5**. The test circuit has been designed on Taconic RF35 30mil $\epsilon_r=3.5$

Supply voltage (drain-source) is typically 50V. An external bias module supplies the gate bias voltage and can be found in CA-330-11

4. RF Performance

Frequency (MHz)	Gain (dB)		Eff(%)	P _{2dB} (dBm)	P _{2dB} (W)
	@ P _{out} = 630W (58dBm)				
420	17		58	58.08	642
435	17.8		62.8	58.35	685
450	18		68.5	58.21	663

Table 1. RF Performance Summary V_{ds} = 50V, I_{dq} = 120mA, Pulsed 16msec 28% duty cycle

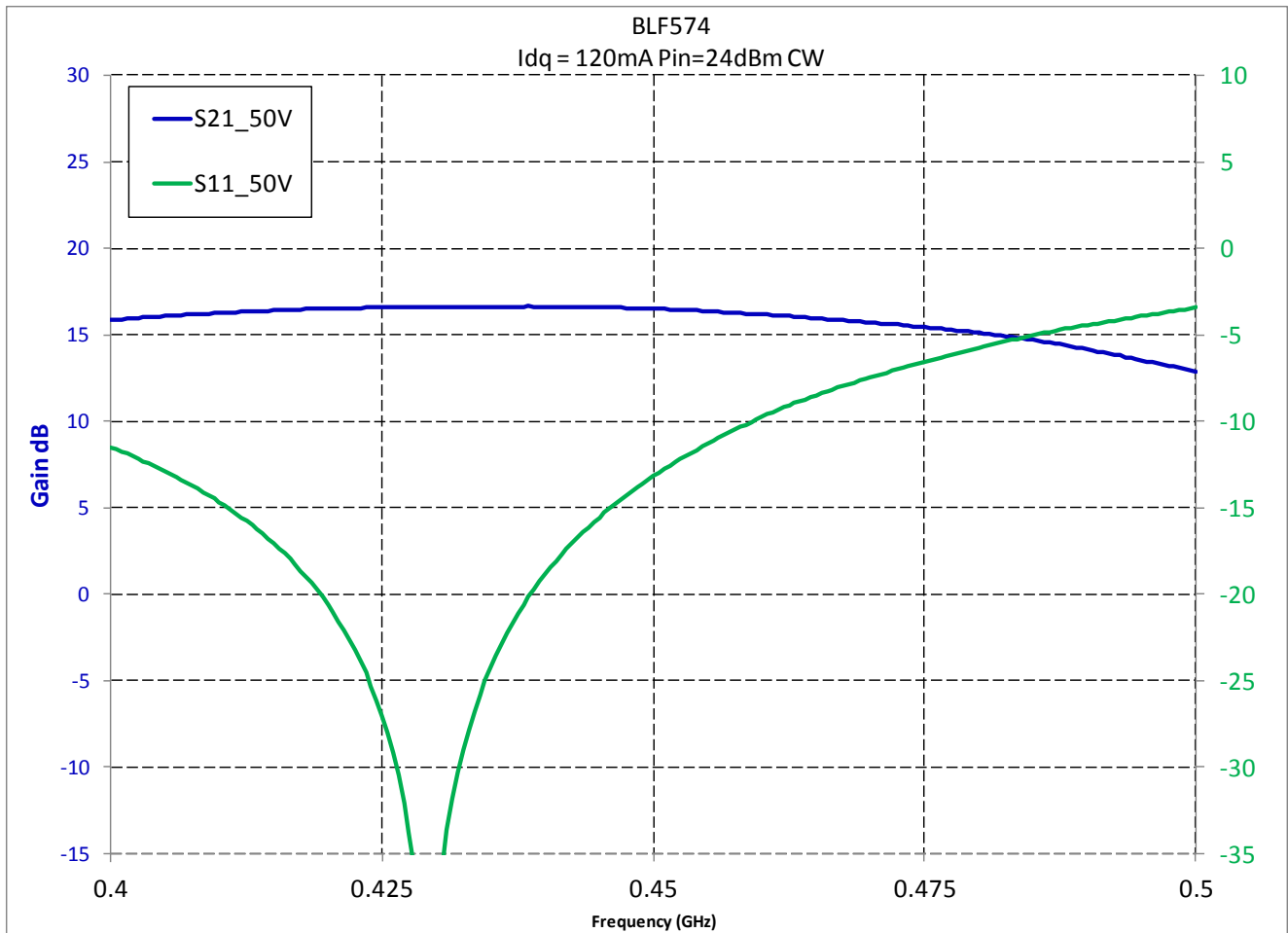


Fig 2. Gain RL pin = 24dBm CW 50V

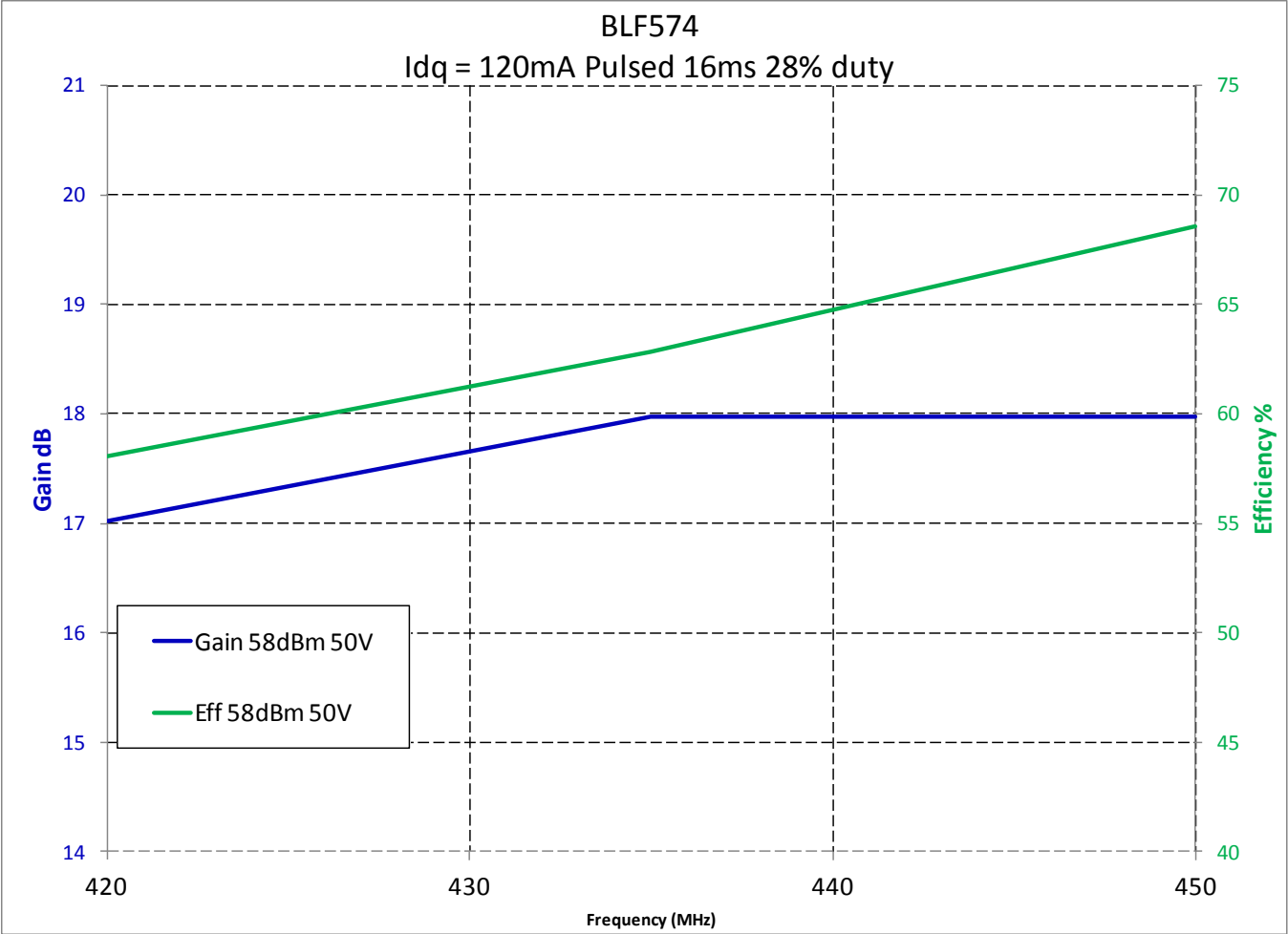


Fig 3. Gain and efficiency at Pout = 58dBm

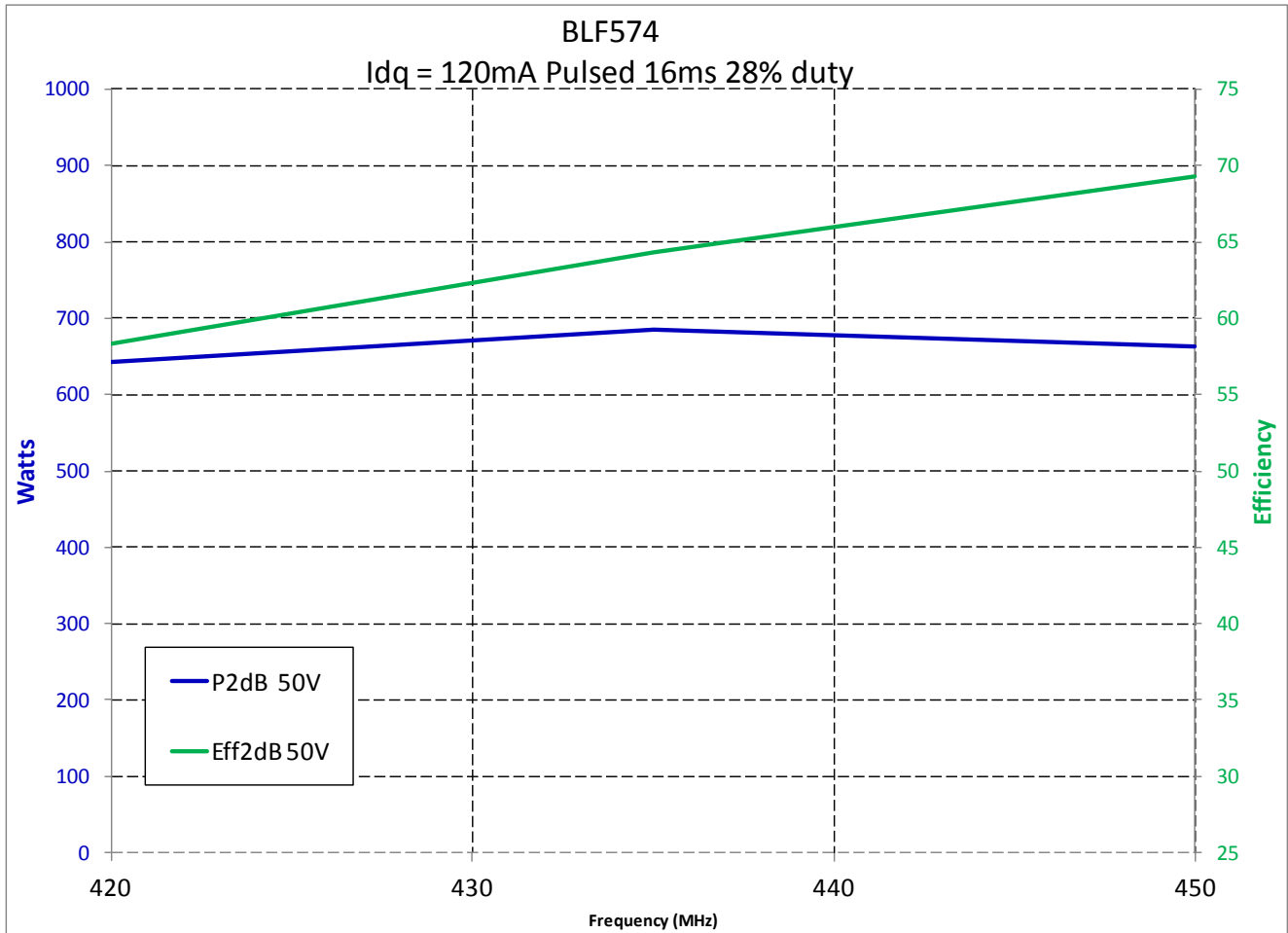


Fig 4. P2dB Power / peak efficiency

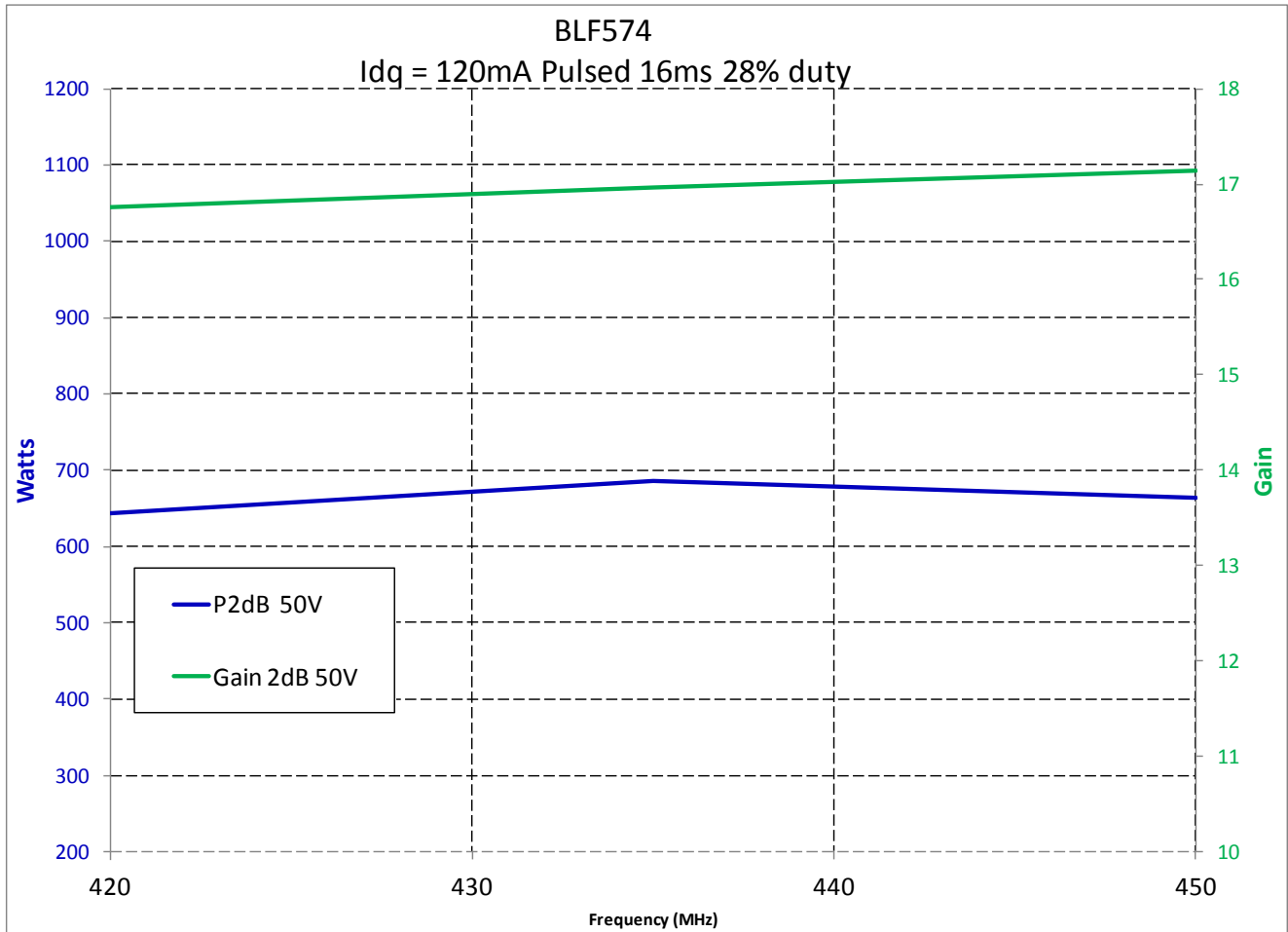


Fig 5. Gain and Power at P3dB

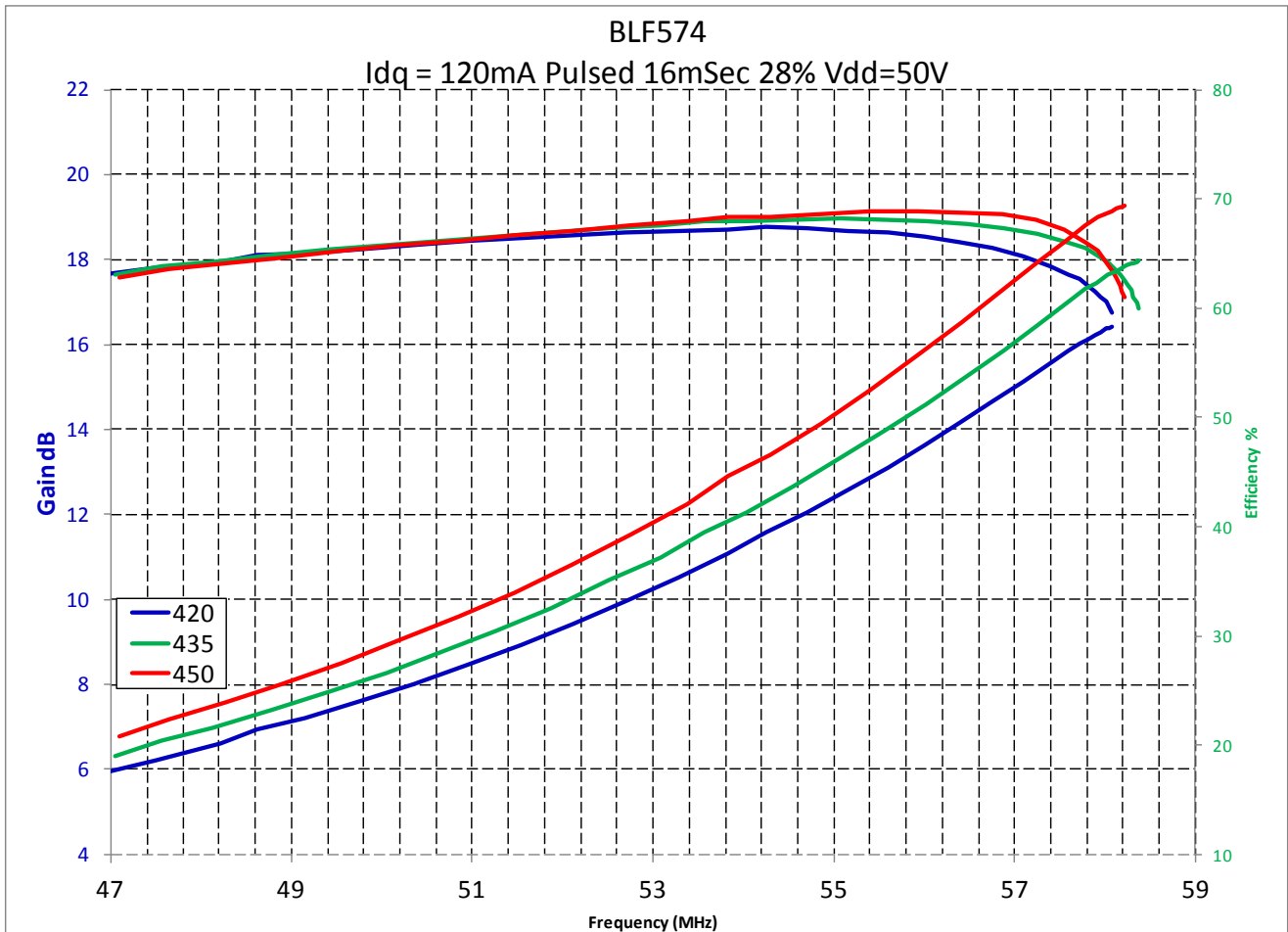


Fig 6. AM-AM 50V Idq = 120mA Pulsed 16mSec 28% duty

freq	zin(S(1,1),50)
350.0 MHz	49.481 + j3.119
360.0 MHz	49.837 + j2.999
370.0 MHz	50.370 + j2.775
380.0 MHz	51.044 + j2.654
390.0 MHz	51.736 + j2.616
400.0 MHz	52.136 + j2.565
410.0 MHz	52.304 + j2.363
420.0 MHz	52.346 + j1.871
430.0 MHz	52.502 + j1.162
440.0 MHz	52.752 + j0.426
450.0 MHz	53.096 - j0.066
460.0 MHz	53.236 - j0.328
470.0 MHz	53.049 - j0.408
480.0 MHz	52.531 - j0.579
490.0 MHz	51.908 - j0.951
500.0 MHz	51.425 - j1.407

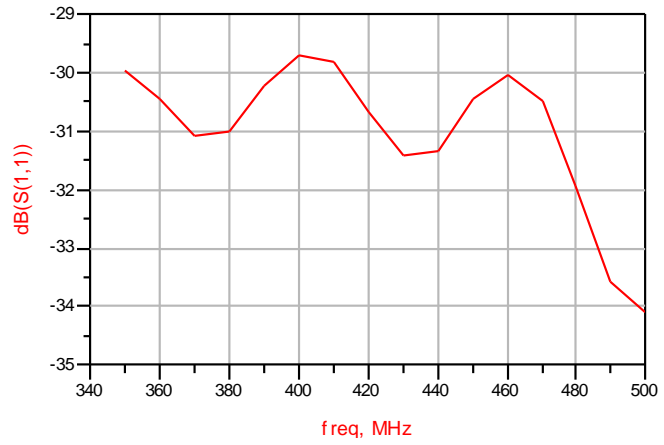


Fig 7. Test Attenuator Load impedance

5. Test Circuit and Component List

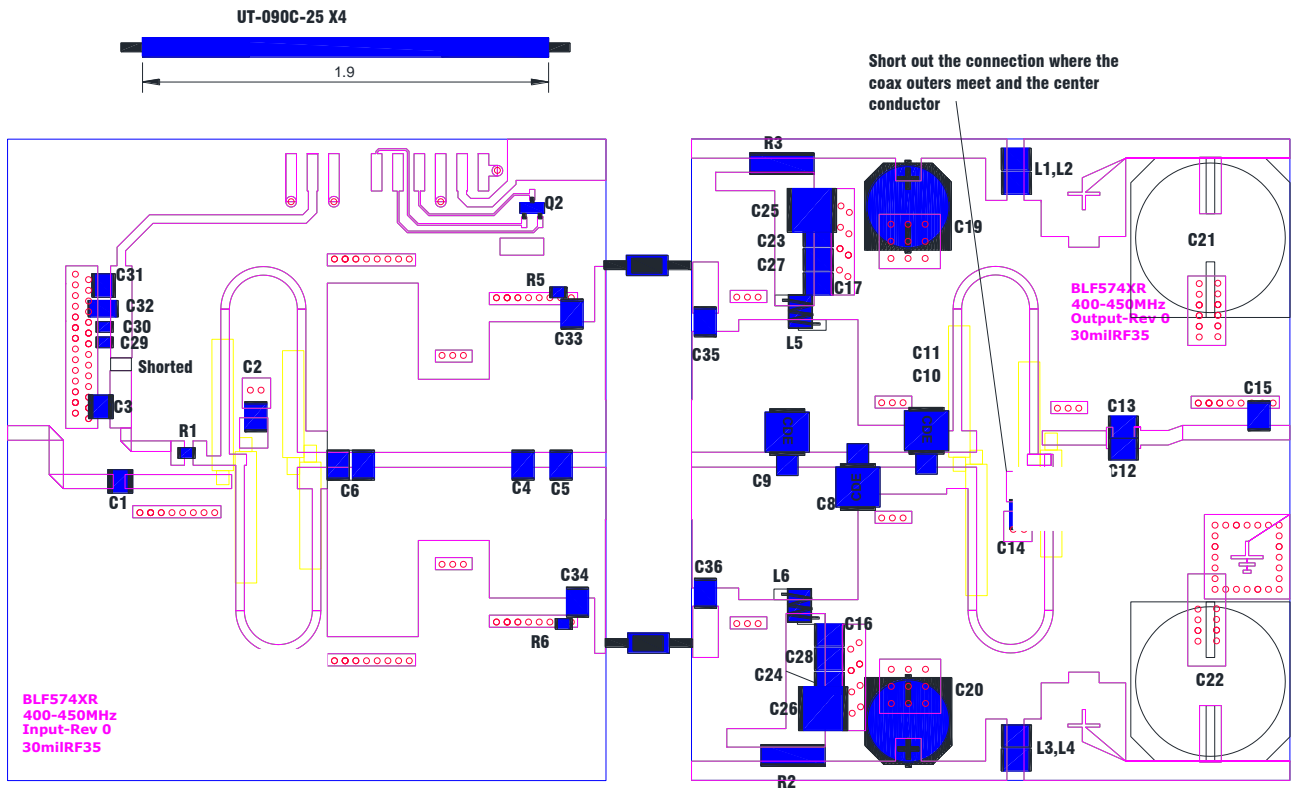


Fig 8. Test Circuit

Designator	Description	Manufacturer	Part #
Input PCB	BLF574XR 400-450MHz Rev 0	Avanti	
Output PCB	BLF574XR 400-450MHz Rev 0	Avanti	
Q1	600W LDMOS	Ampleon	BLF574
Q2	Transistor, NPN 2N2222	NXP	BC847
R1	9.1Ω	Vishay Dale	0805
R2,R4	0.005Ohm sense Resistor	*Shorted On this board*	
R5,R6	1.0Ω	Vishay Dale	0805
C19,C20	220uF, Electrolytic SM	Panasonic	PCE3474CT-ND
C21,C22	470uF, Electrolytic SM	Panasonic	EEE-TK1J471AM
C1,C2,C14	120pF	Passive Plus / ATC	1111P / 100B
C3	100pF	Passive Plus / ATC	1111P / 100B
C4	36pF	Passive Plus / ATC	1111P / 100B
C6	24pF	Passive Plus / ATC	1111P / 100B
C5	68pF	Passive Plus / ATC	1111P / 100B
C35,C36	390pF	Passive Plus / ATC	1111P / 100B
C8	15pF	CDE	MIN02-002
C10	3.5pF	CDE	MIN02-002
C11	35pF	CDE	MIN02-002
C9	6.8pF	CDE	MIN02-002
C12,C13	56pF	Passive Plus / ATC	1111P / 100B
C15	4.7pF	Passive Plus / ATC	1111P / 100B
C16,C17	47pF	Passive Plus / ATC	1111P / 100B
C27,C28	100nF	Murata	GRM31CR72E104KW03L
C23,C24	2.2uF	Murata	GRM32ER72A225KA35L
C25,C26	10uF Capacitor, 100V 10% X7S, 2220	TDK	C5750X7S2A106M
C30	100nF Capacitor, 50V 10% X7R, 0805	Generic	
C29	10nF Capacitor, 50V 10% X7R, 0805	Generic	
C31	10uF Capacitor, 50V	Murata	GRM32DF51H106ZA01L
C32,C33,C34	1uF Capacitor, 50V	Murata	GRM31CR72A105KA01L
L1,L2,L3,L4	Ferrite Bead (10A)	Laird	HI1612X560R-10
L5,L6	12nH 16G, 3T,3.7mm		
Balun	1.9" x 4	Microcoax	UT-090C-25
PC-board Material: Taconic RF35, εr = 3.5 , thickness 30mils, 1oz copper each side			

Table 2. BOM

6. Attachments

Please see the attachment for the support files.

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