

## Advanced LIGO I & Q RF Demodulator (2 channel version)

DCC: [E1200113](#)

### Design document

The I & Q RF demodulator is described in more detail on the IQ\_Demodulator page of the 4 channel version and the FetIqDemodulatorPrototype page which describes the original prototype. For the MC servo, and Common Mode Servo, the slew rate and bandwidth requirements are such that the baseline LIGO RF demodulator design is not sufficient. This set of modifications optimizes the demodulator design for these, and similar applications.

### Fast option

The modifications for high bandwidth operations of the demodulator board D0902745-v4 can be found in [E1100044-v1](#):

Designator	Old Value	New Value	Footprint	Distributor	Part Number	Qty
C11/C16	47nF	4.7nF	SMD 0805	Mouser	77-VJ0805A472FXJTBC	4
L3/L4	2.2uH	220nH	SMD 1206	Coilcraft	1206CS-221XGLB	4
R18/R27	0 Ohm	omit	SMD 0805			0
R40/R41	omit	0Ohm	SMD 0805	Mouser	71-CRCW0805-0-E3	4

Since there are two channels, each designator is used twice.

### Serial Numbers

The assignment of serial numbers and frequencies for the advanced LIGO units can be found in [E1100273-v1](#).

### Drawings

### Assembly

Description	Revision	pdf	files
Schematics	2	<a href="#">D1000181-v2</a>	<a href="#">zip</a>
1U chassis	1	<a href="#">D070012-v1</a>	<a href="#">dwg</a>
Test procedure	2	<a href="#">E1100114-v2</a>	<a href="#">doc</a>
Test results (S1000771-S1000788)	1	<a href="#">E1200074-v1</a>	<a href="#">xlsx</a>

## Panels

Description	Revision	pdf	files
Front panel	2	<a href="#">D1000182-v2</a>	<a href="#">fpd</a>
Rear panel	1	<a href="#">D1000183-v1</a>	<a href="#">fpd</a>

## Boards

Description	Revision	pdf	files
Single channel block diagram	3	<a href="#">D0902346-v3</a>	
Demodulator	4	<a href="#">D0902745-v4</a>	<a href="#">zip</a>
Demodulator breakout	A	<a href="#">D1000184-A</a>	<a href="#">zip</a>
Demodulator power interface	B	<a href="#">D1000185-B</a>	<a href="#">zip</a>
Low Noise Power Board	Low_Noise_Power_Module		

## Test Rig

Description	Revision	pdf	files
Demodulator tester	1	<a href="#">D1101141-v1</a>	<a href="#">zip</a>
Demodulator tester front panel	1	<a href="#">D1101975-v1</a>	<a href="#">fpd</a>
Demodulator tester rear panel	1	<a href="#">D1101976-v1</a>	<a href="#">fpd</a>

## Images

### Front

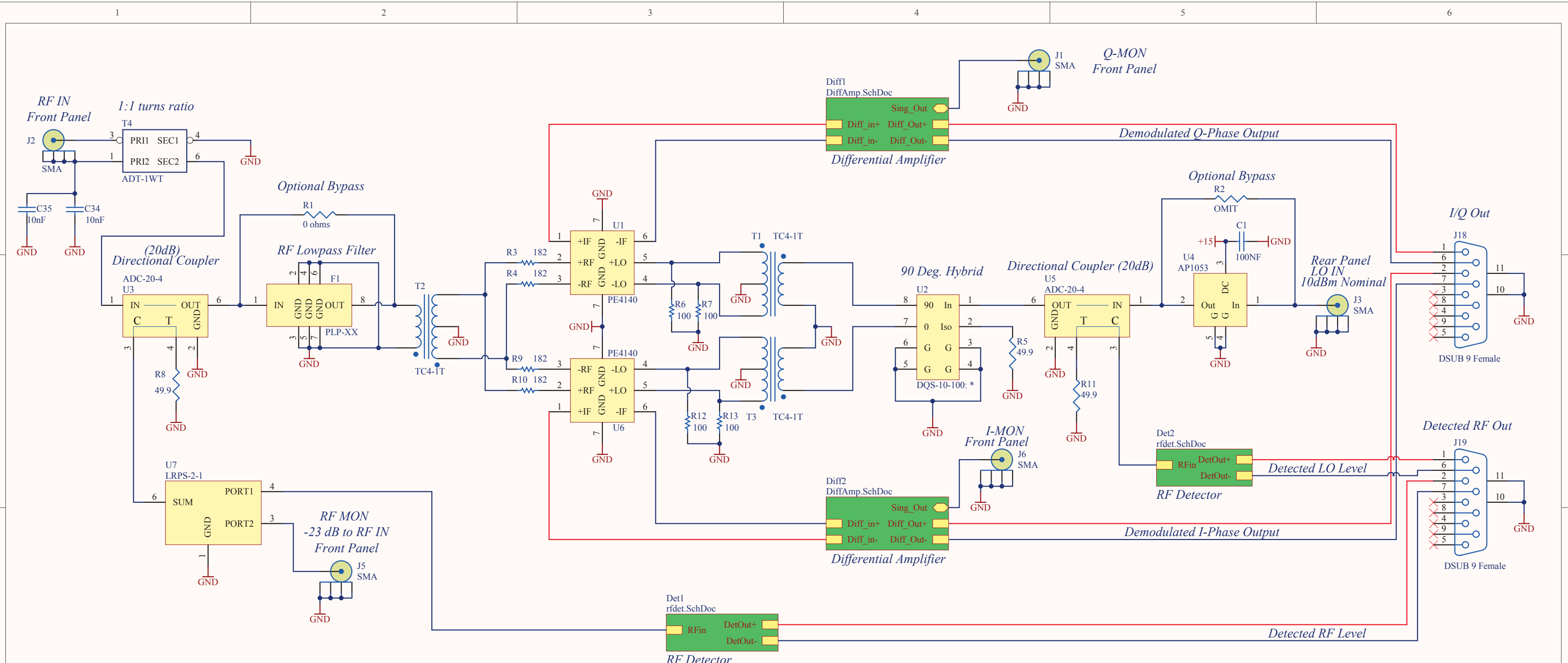


### Rear



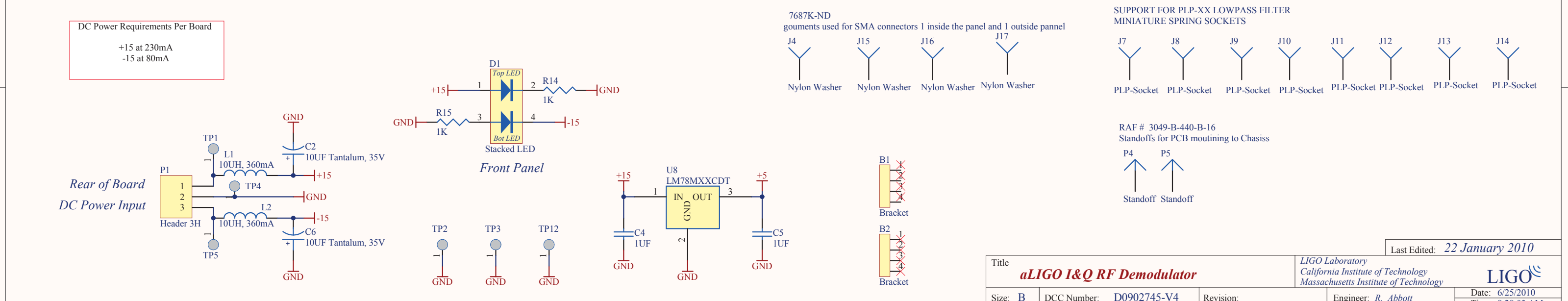
Front above





**DC Power Requirements Per Board**

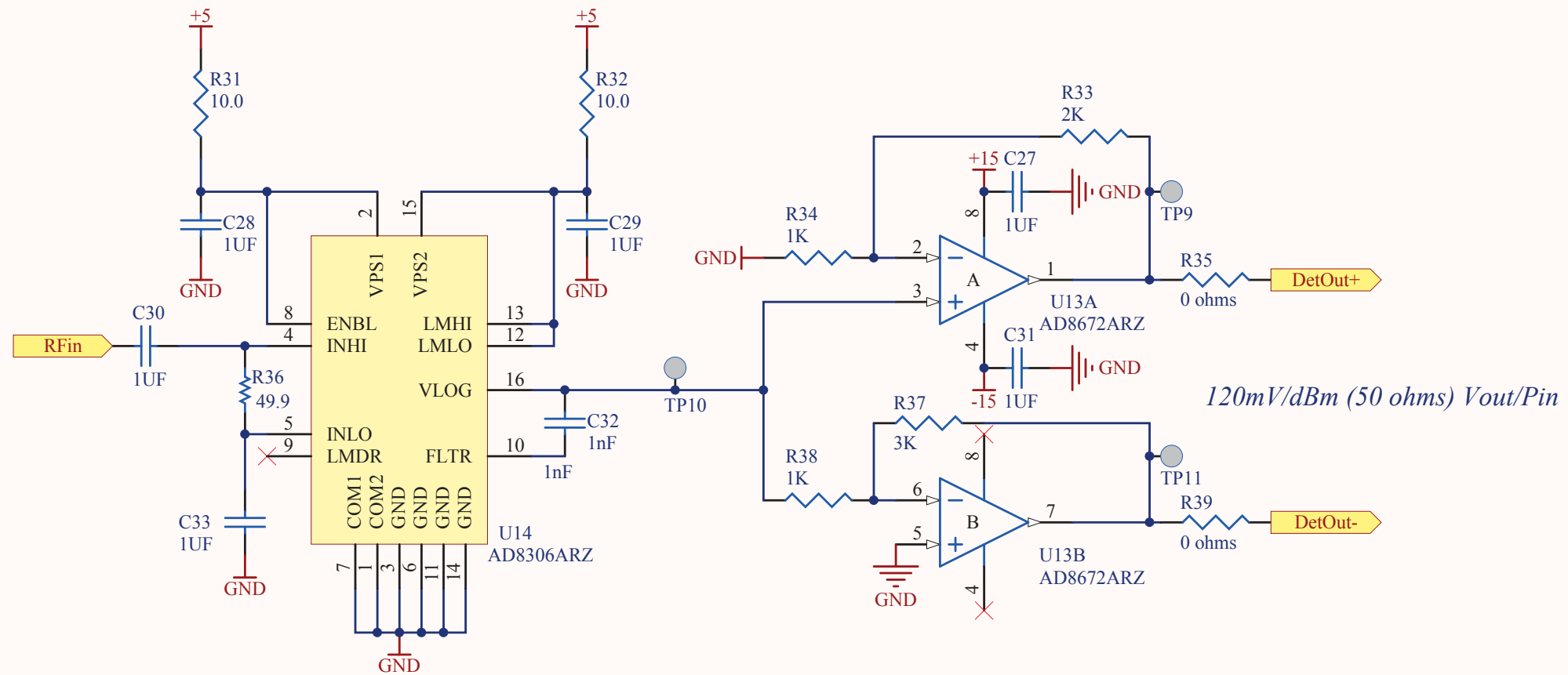
+15 at 230mA  
-15 at 80mA



Last Edited: 22 January 2010

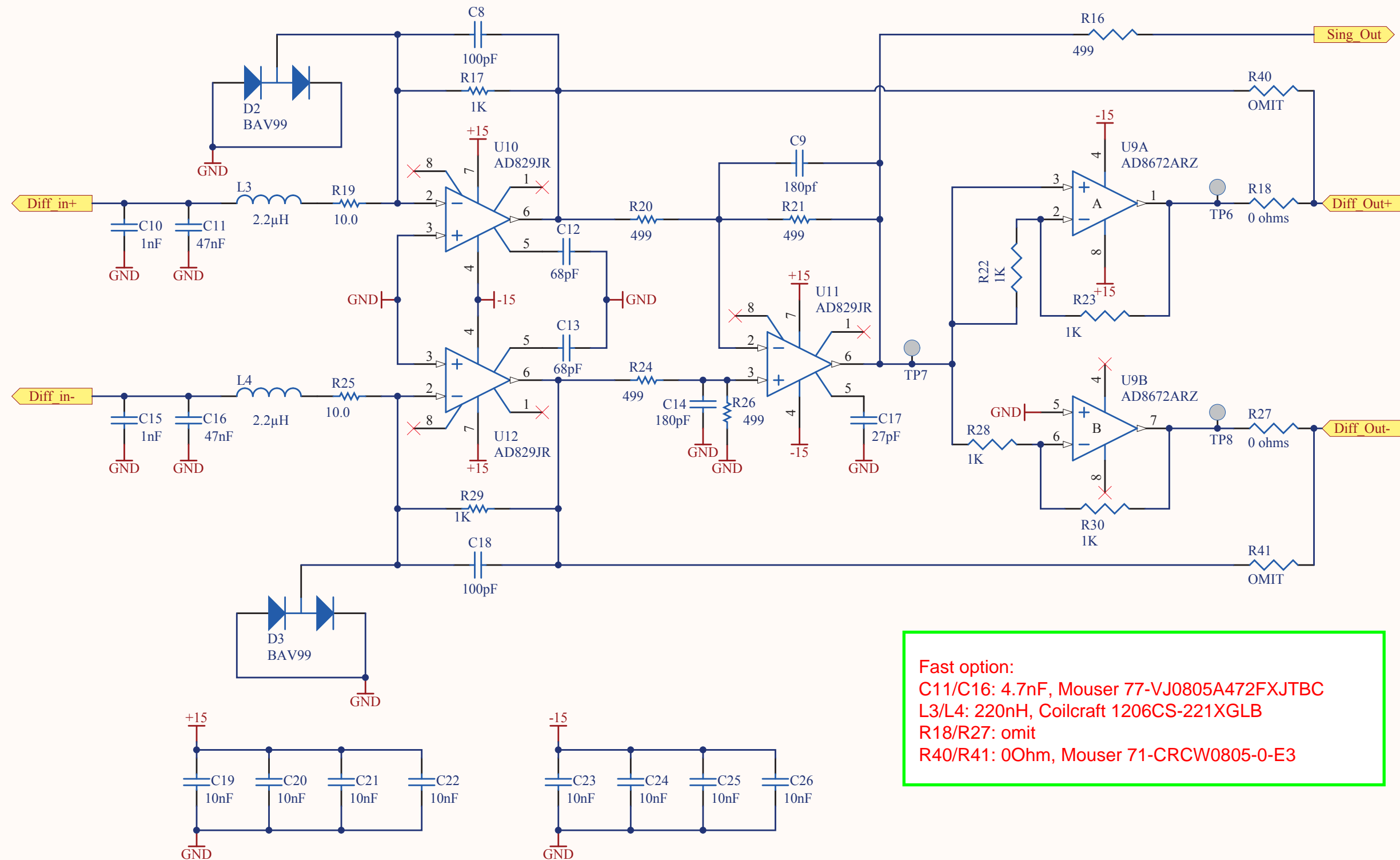
Title		aLIGO I&Q RF Demodulator		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		LIGO	
Size: B	DCC Number: D0902745-V4	Revision:	Engineer: R. Abbott	Date: 6/25/2010	Time: 8:28:03 AM		
File: C:\Documents and Settings\costheld\My Documents\chub_ligo_files\ChubAltium\project_files\Adl_demod\D0902745_v4_SchDoc							

5 to 400 MHz Log Detector  
 90 dB Dynamic Range, 10dBm Max RF



Last Edited: 22 January 2010

Title <b>RF Logarithmic Detector</b>		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		LIGO
Size: A	PCB DCC # D0902745	SCH DCC # D0902745-V4	Engineer: R. Abbott	
File: C:\Documents and Settings\costheld\My Documents\chub_ligo_files\ChubAltium\project_files\Adl_demo\rfdet_v4.SchDoc				Time: 8:28:03 AM
				Sheet 2 of 3



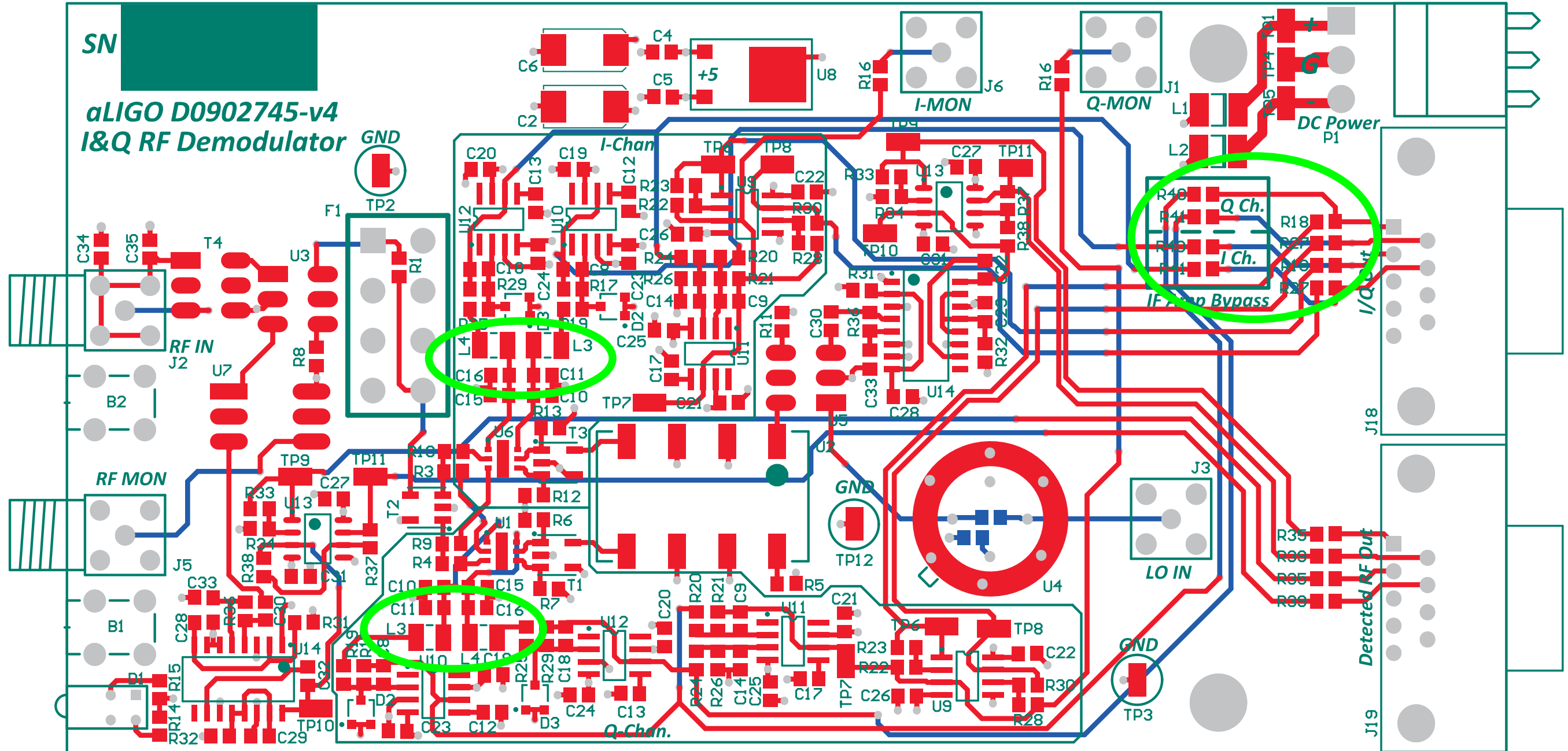
Fast option:  
 C11/C16: 4.7nF, Mouser 77-VJ0805A472FXJTBC  
 L3/L4: 220nH, Coilcraft 1206CS-221XGLB  
 R18/R27: omit  
 R40/R41: 0Ohm, Mouser 71-CRCW0805-0-E3

Last Edited: 22 January 2010

Title <b>Audio Differential IF Amplifier</b>			LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology		LIGO	
Size: A	PCB DCC # D0902745	SCH DCC # D0902745-V4	Engineer: R. Abbott	Date: 6/25/2010	Time: 8:28:03 AM	
File: C:\Documents and Settings\costheld\My Documents\chub_ligo_files\ChubAltium\project_files\Adl_demo\DiffAmp_v4.SchDoc 3 of 3						

SN

# aLIGO D0902745-v4 I&Q RF Demodulator



Fast option