

E1100044-v1

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

Design document

The I & Q RF demodulator is described in more detailed on the IQ_Demodulator page of the 4 channel version and the FetIqDemodulatorPrototype page which describes the original prototype.

Fast option

The modifications for a fast readout on the demodulator board D0902745-v4 are:

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.

Drawings

Assembly

Schematics (rev A)	D1000181-v2
Assembly files (rev A)	D1000181-v2
1U chassis (rev A)	D070012-A
1U chassis files (rev A)	D070012-A
Test Procedure	in the mail

Panel

Front panel drawing (rev A)	D1000182-v2
Front panel CAD (rev A)	D1000182-v2
Rear panel drawing (rev A)	D1000183-v1
Rear panel CAD (rev A)	D1000183-v1

Boards

Single channel block diagram	D0902346-v3
Demodulator schematic (rev 1)	D0902745-v4
Demodulator file (rev 1)	D0902745-v4
Demodulator breakout schematics (rev A)	D1000184-A
Demodulator breakout files (rev A)	D1000184-A
Demodulator power interface schematics (rev A)	D1000185-B
Demodulator power interface files (rev A)	D1000185-B

Low Noise Power Module

Wiki page	Low_Noise_Power_Module
Low noise power board schematics (rev C)	D0901846-D
Low noise power board files (rev C)	D0901846-D
Power module bracket drawing (rev A)	D0901853-v1
Power module bracket CAD (rev A)	D0901853-v1

Images

Front



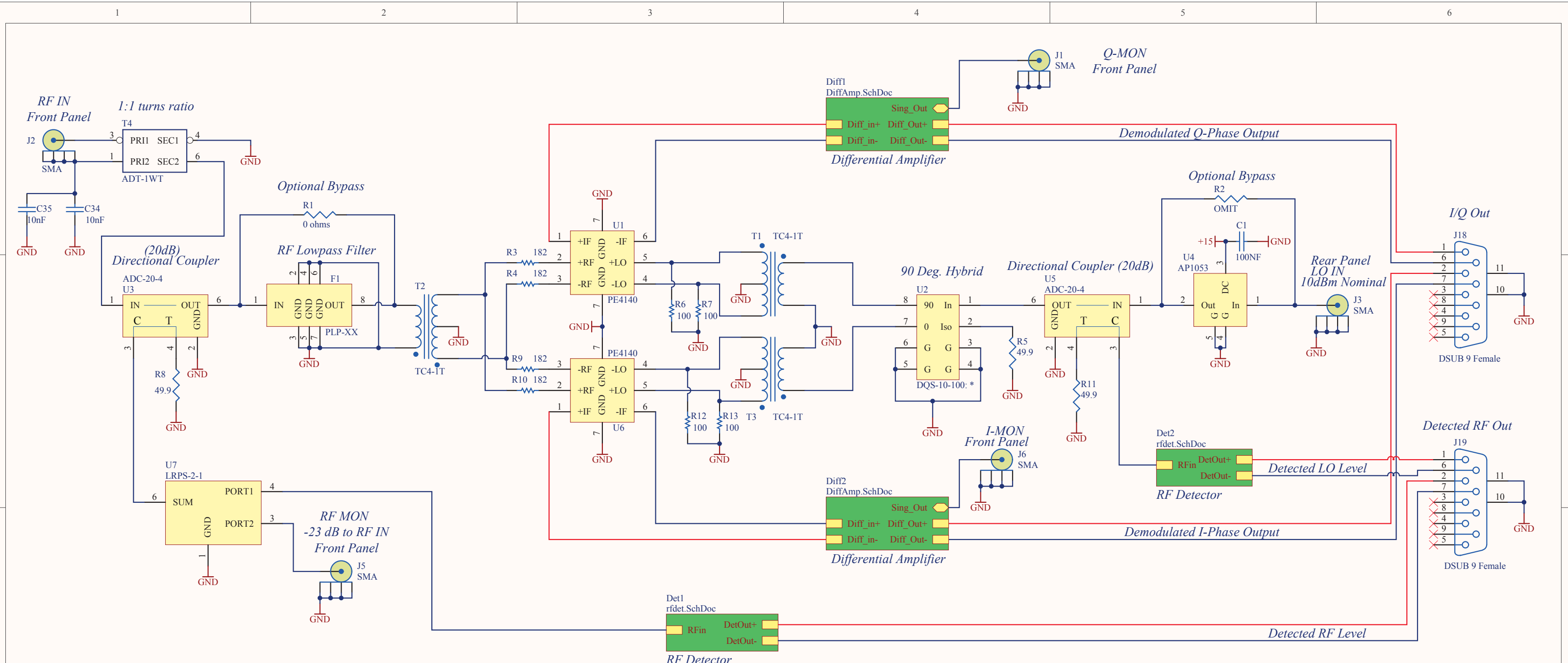
Rear



Front above

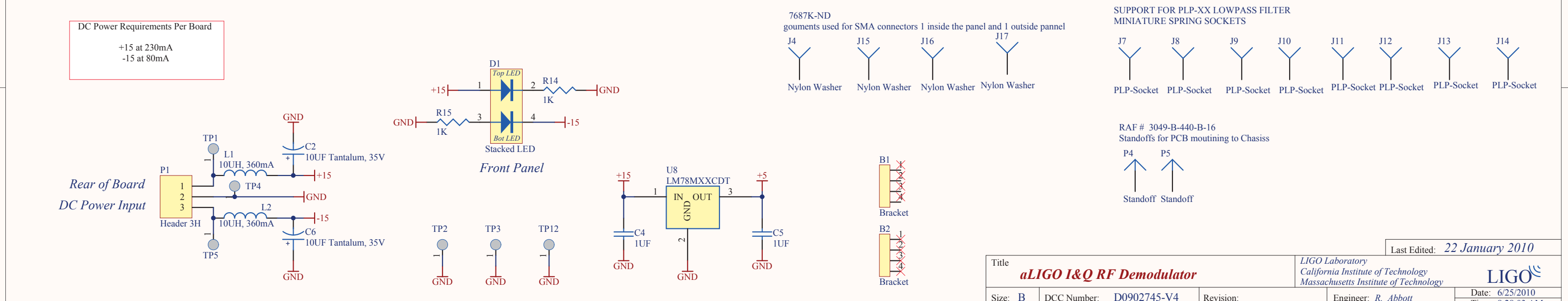


aLIGO: IQ_Demodulator_2-chn (last edited 2011-01-12 21:44:58 by DanielSigg)



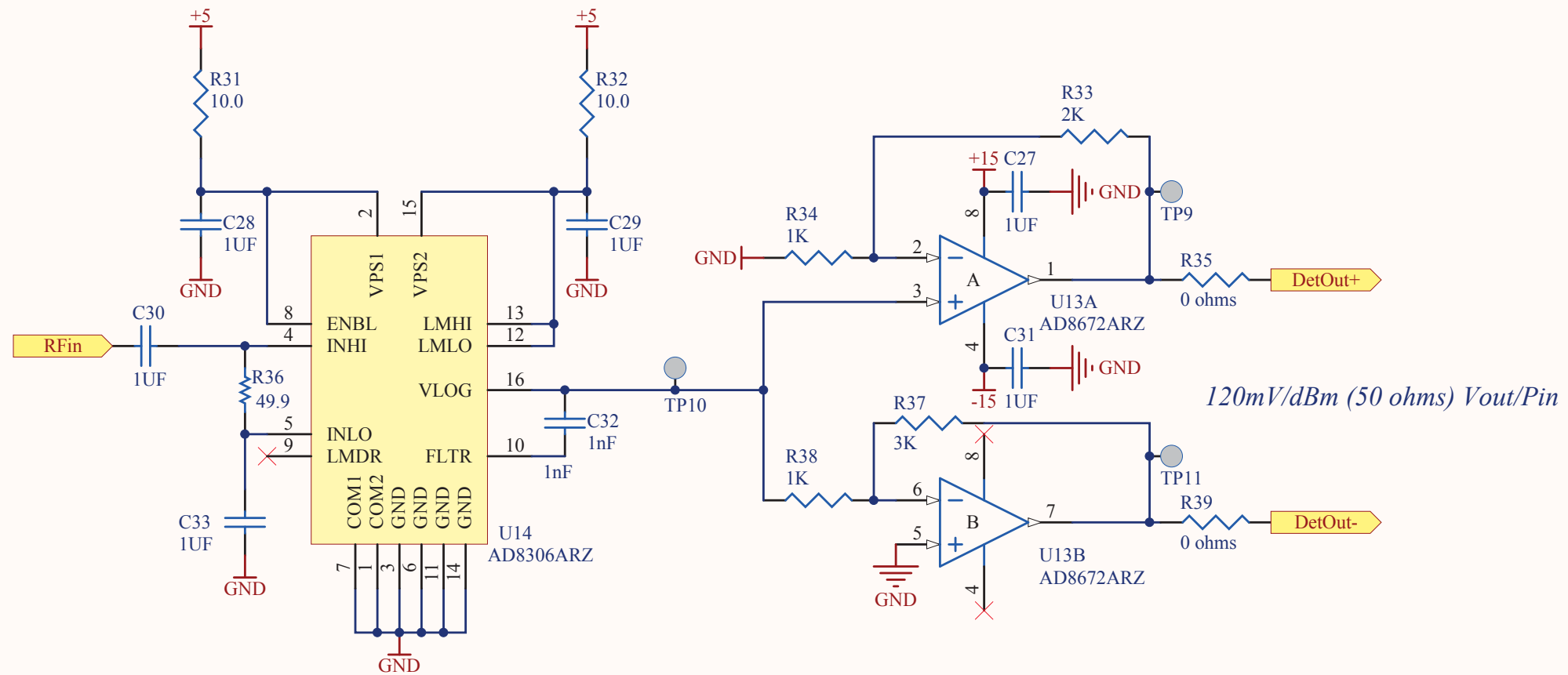
DC Power Requirements Per Board

+15 at 230mA
-15 at 80mA



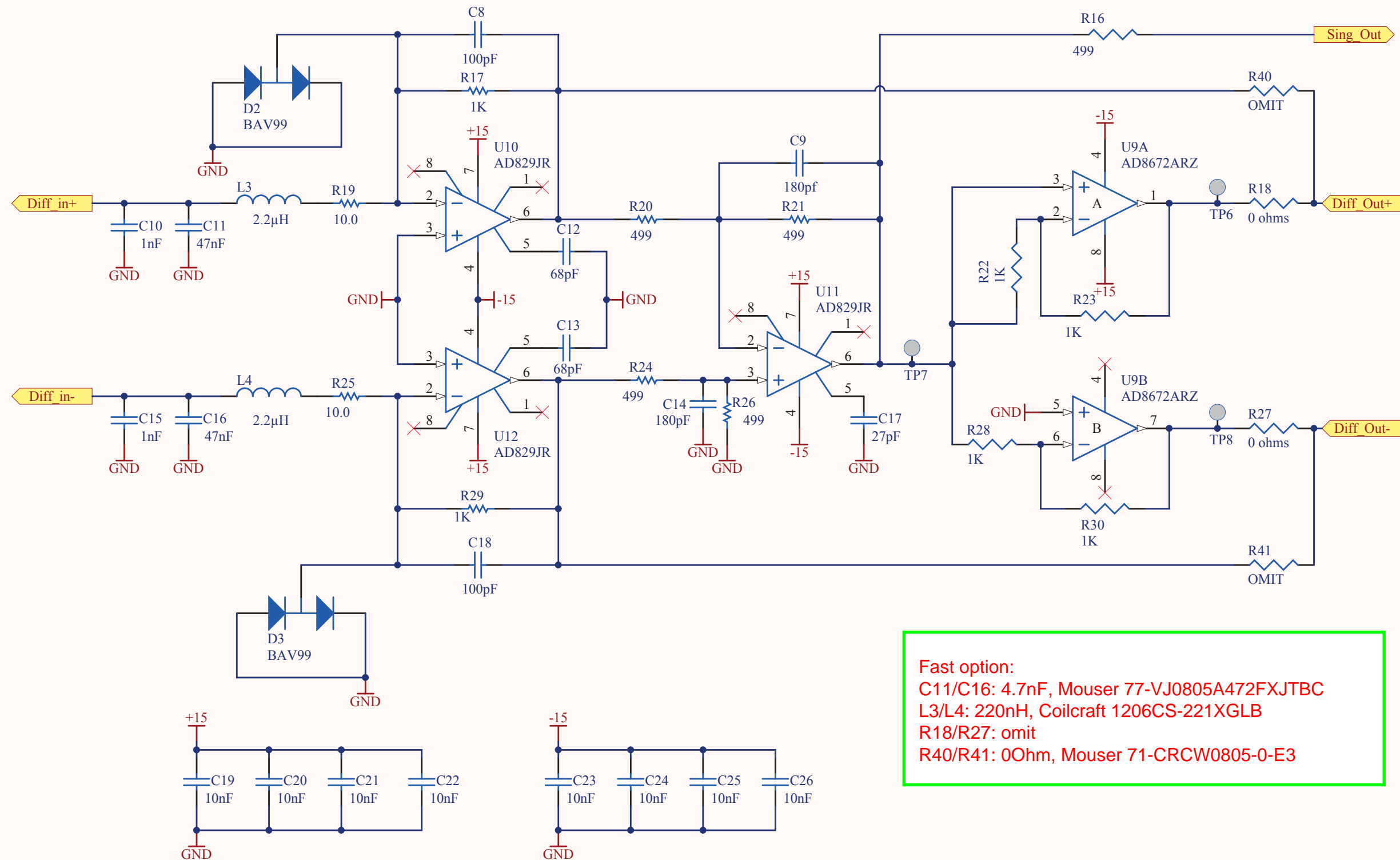
Title		Last Edited: 22 January 2010	
aLIGO I&Q RF Demodulator		LIGO Laboratory California Institute of Technology Massachusetts Institute of Technology	
Size: B	DCC Number: D0902745-V4	Revision:	Engineer: R. Abbott
File: C:\Documents and Settings\costheld\My Documents\chub_ligo_files\ChubAltium\project_files\Adl_demod\D0902745_v4		Date: 6/25/2010 Time: 8:28:03 AM	

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

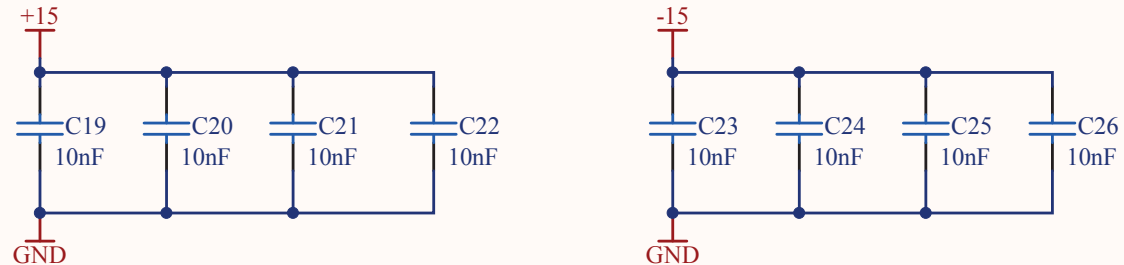


Last Edited: 22 January 2010

Title RF Logarithmic Detector		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

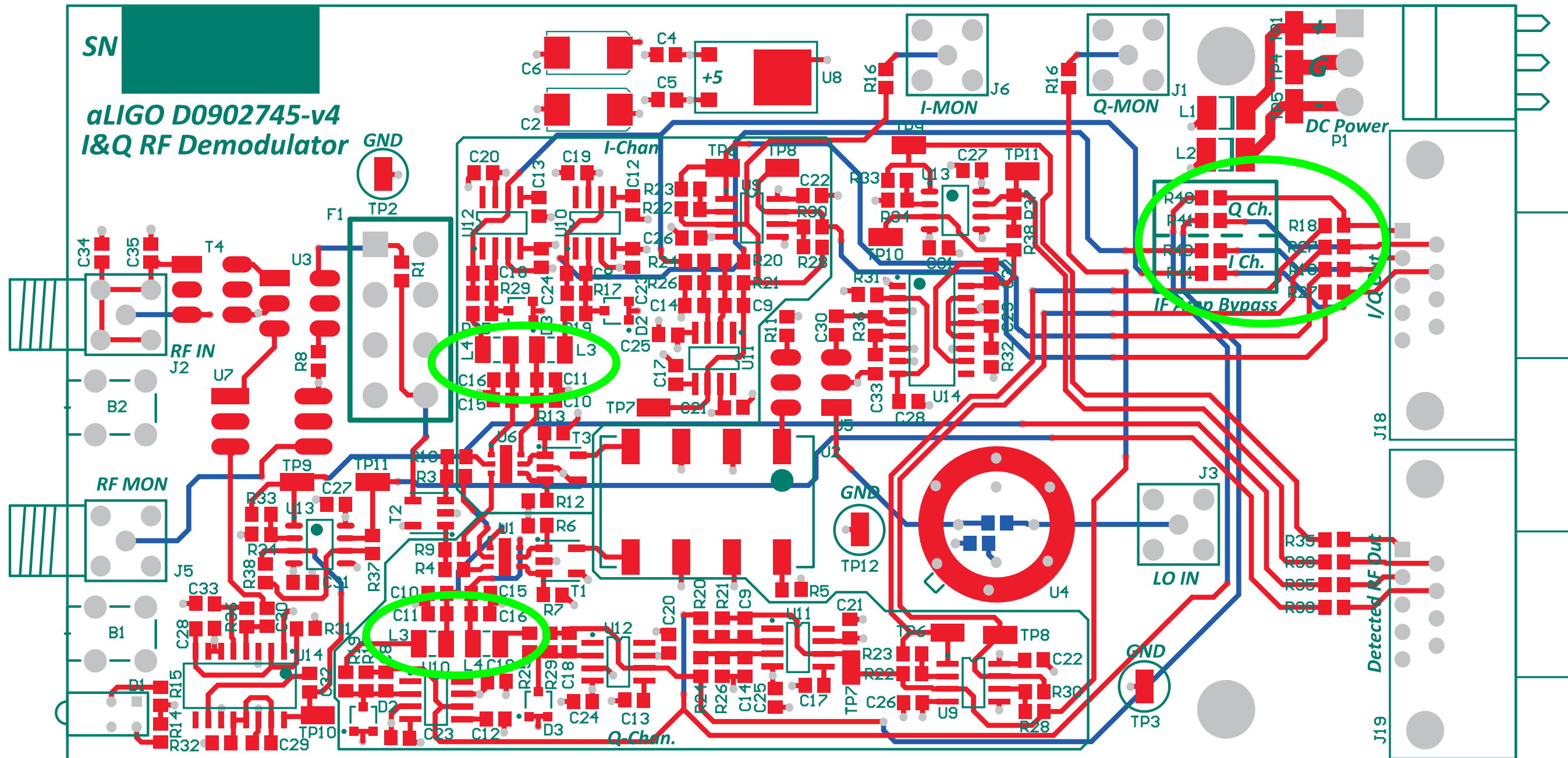


Last Edited: 22 January 2010

Title Audio Differential IF Amplifier			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