

Revisions and Modifications for version 5:

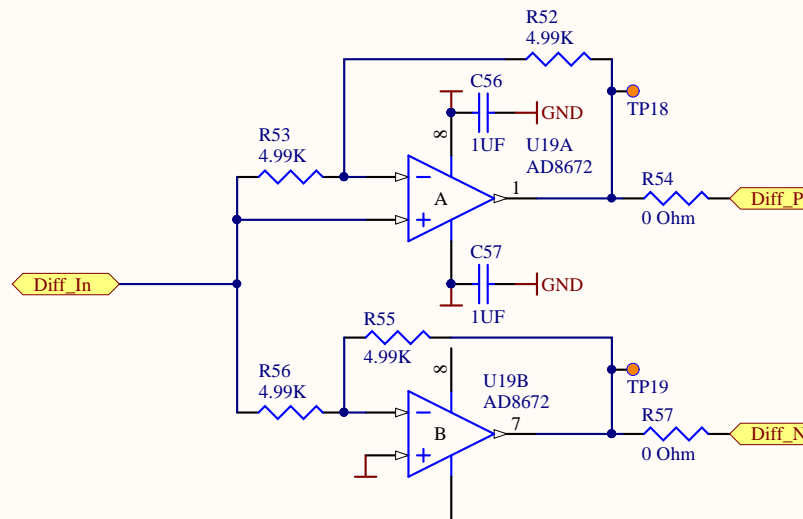
1. Used shorter heat sinks for regulators so it will fit in a 1U chassis.
2. Ensured voltage reference is a 10V part. The bill of materials had this as 5V.
3. R42 changed from 750 to 2.2k to provide about 15VDC regulated power for the laser driver.
4. Added a 490k resistor to pick up the Vref connection, thus improving the accuracy of the current monitor.
5. Put a FET back onto the base drive of the main current modulator to eliminate base current error.
6. Changed R44 to 10k to make current readout more reasonable.
7. Diode protection of U9 by back-to-back diodes across positive and negative inputs.
8. Change C14 from 68pF to 27pF for less compensation of the AD829.
9. Add provision to drive the chassis rear panel LEDs for +/- 15VDC.
10. Change C39 to 100pF.
11. Change C35 to from 10nF to 1uF; should update footprint to leaded plastic capacitor.
12. Q1 E-B Backwards on PCB.
13. Change R31 from 100 to 50 ohms to increase the current range.
14. Added protection diode to Q1 base (D12).

Version 6:

1. Due to several MHz oscillation in the high frequency current source, R40 changes from 1k to zero ohms.

Version 7:

1. The input noise of U9 sets the sensing noise for the output of the slow path; replaced the OP27 with a lower noise LT1128.
2. Added protection circuit across pins 7 and 3 of the DB9 laser connector J2. The serial diodes D17, D18, D19, D20 limit the voltage drop to -4V.
3. The slow feedback path was displaying excess noise at the crossover frequency of the two feedback loops (M1 and Q2) in the slow path. In contrast, a single Power-MOSFET at location Q2 was found to be stable and sufficiently quiet.
4. Omitted M1.
5. The purpose of D16 is to protect M1, so it was omitted.
6. Changed R60 value to omit, as it serves no purpose without M1 installed.
7. Changed R22 to 0 Ohms and added R63=0Ohms to connect output of U9 to gate of Q2.
8. Omitted C35, as it was found to not be required with the power Mosfet installed.



Typical LIGO differential driver circuit for the monitor signals.

Last Edited: 2016-02-19

Title
Differential Driver

LIGO Laboratory
California Institute of Technology
Massachusetts Institute of Technology



Size: A

DCC Number: *

Revision: V5

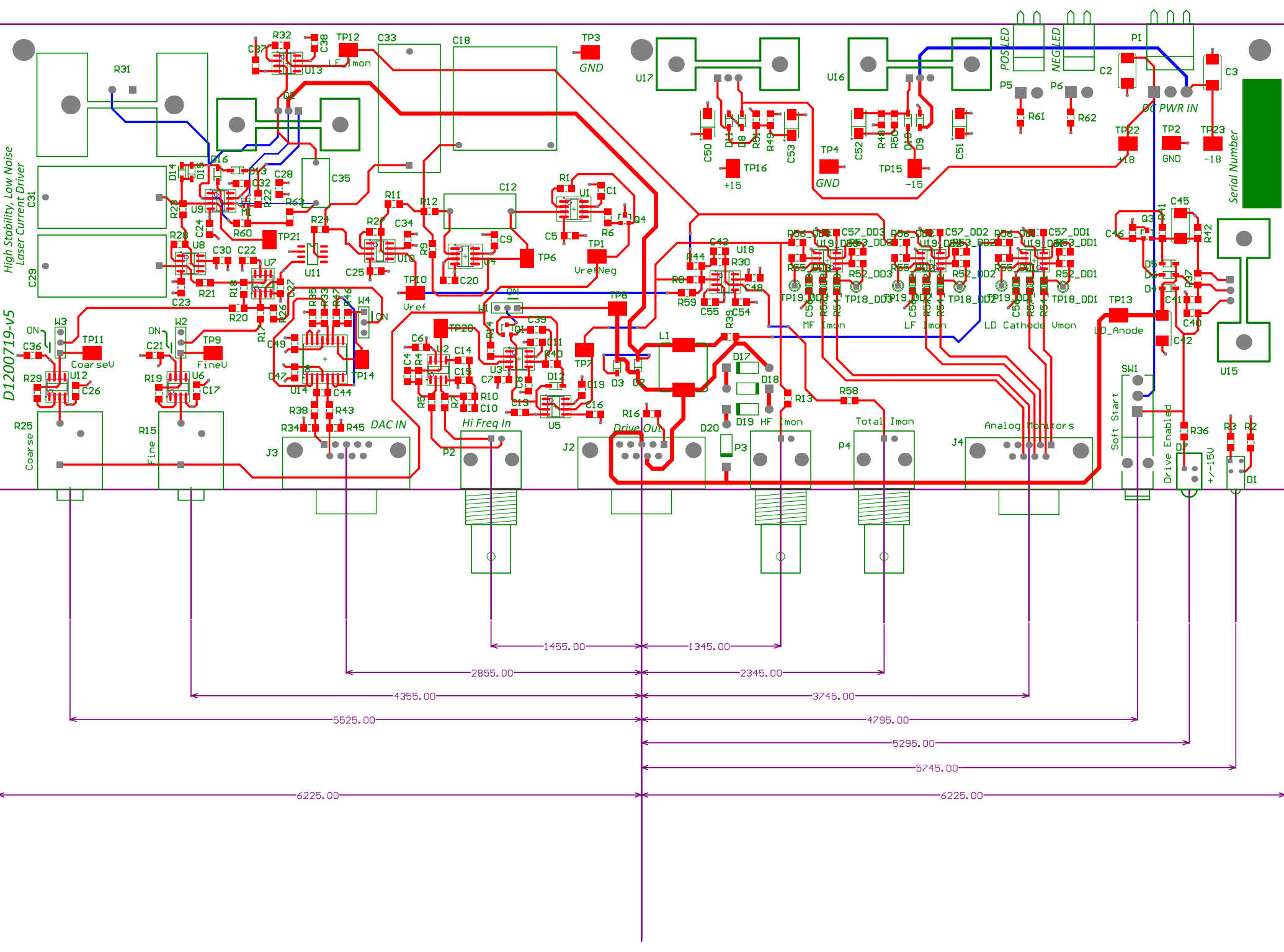
Engineer: R.S. Abbott

Date: 2019-04-07

Time: 18:39:25

Sheet 2 of 2

D1200719-v5
High Stability, Low Noise
Laser Current Driver



Serial Number

