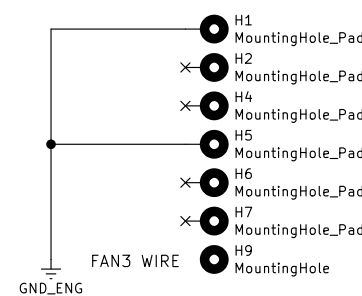


MOUNTING HOLES



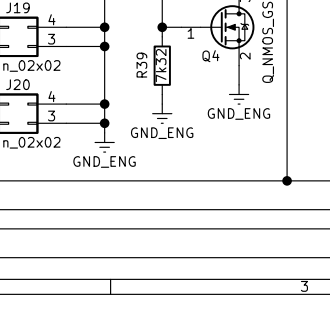
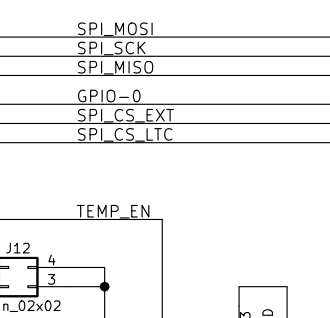
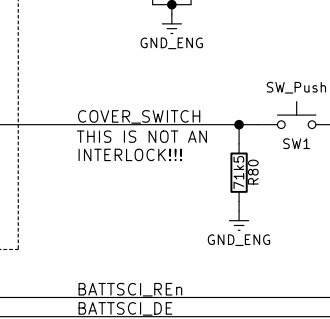
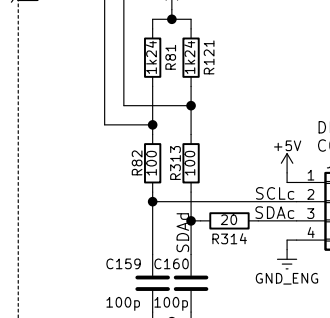
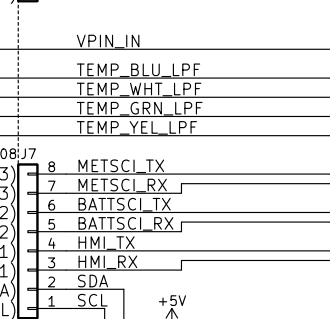
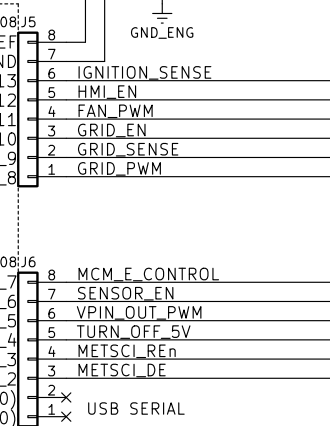
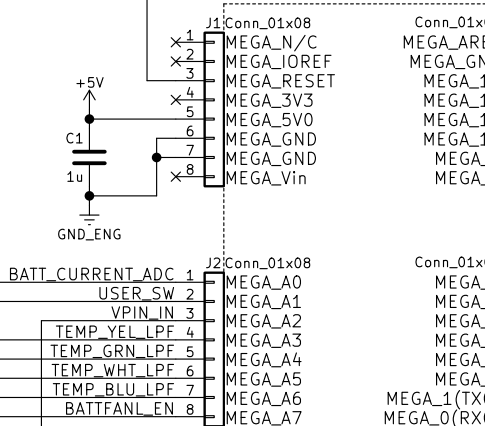
CLOSED:
USB CANNOT UPDATE FIRMWARE
NO RESET ON USB ENUMERATION

OPEN:
USB FIRMWARE UPDATES ALLOWED
USB ENUMERATION RESETS MEGA

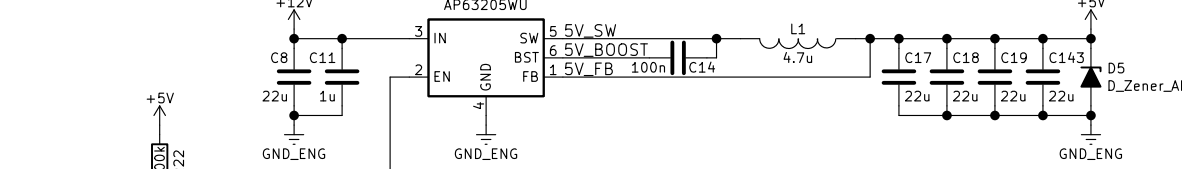
CLOSED:
OPERATION DEFINED IN FIRMWARE

OPEN:
OPERATION DEFINED IN FIRMWARE

ARDUINO MEGA2560



12V->5V BUCK

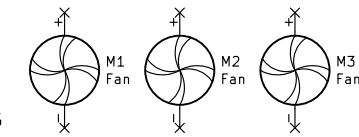


THIS CIRCUIT ALLOWS LIBCM TO TURN OFF ENTIRE 5V RAIL (INCLUDING ITSELF) UNTIL THE NEXT KEY ON EVENT.
INTENDED USE: PREVENT DRAIN ON DISCHARGED IMA BATTERY.

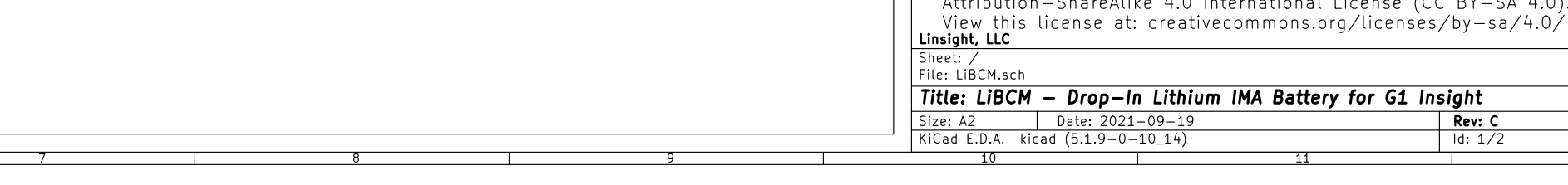
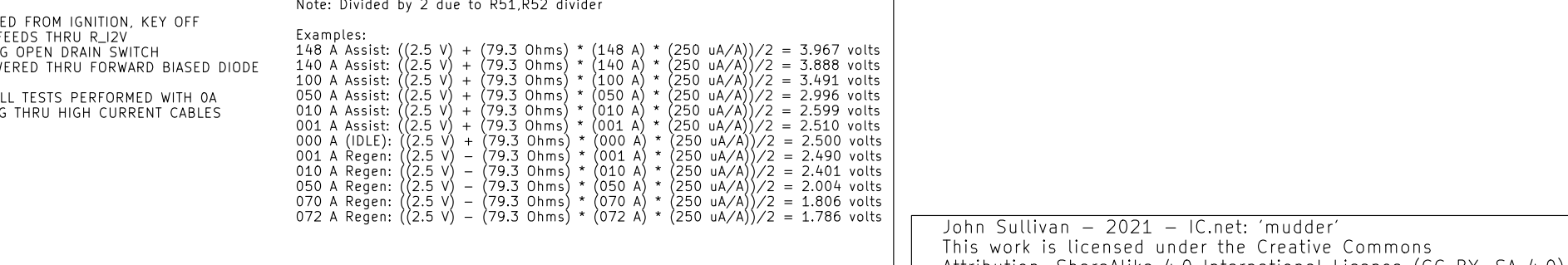
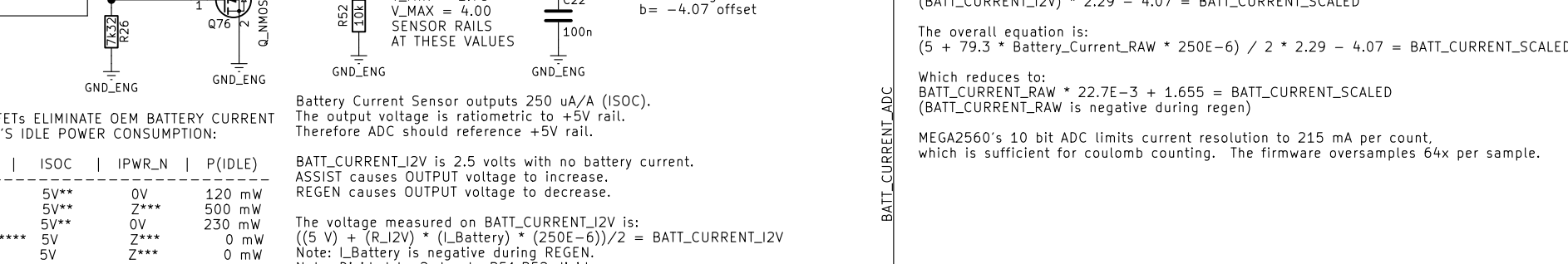
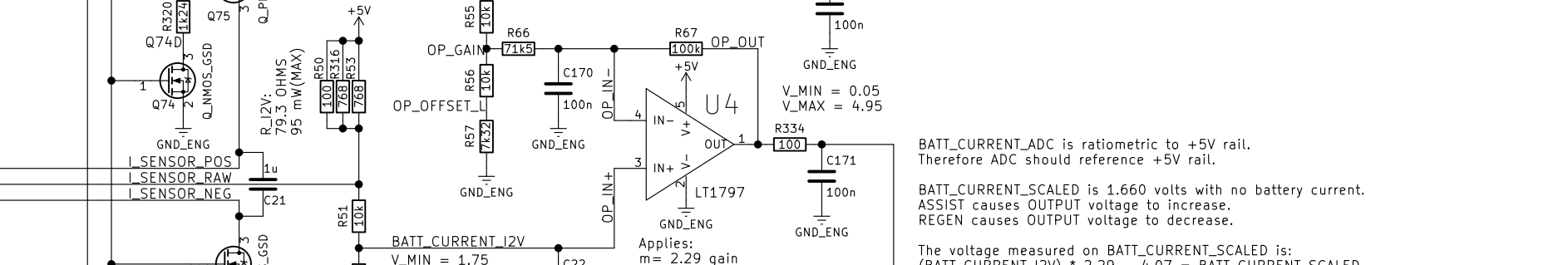
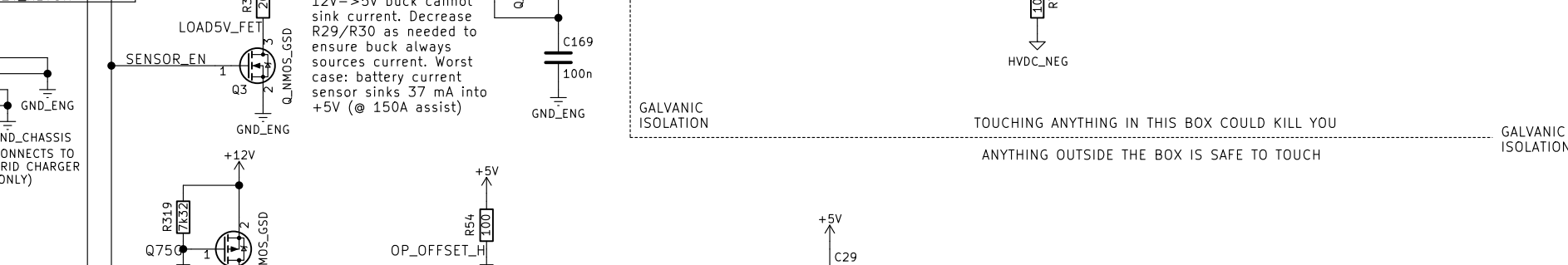
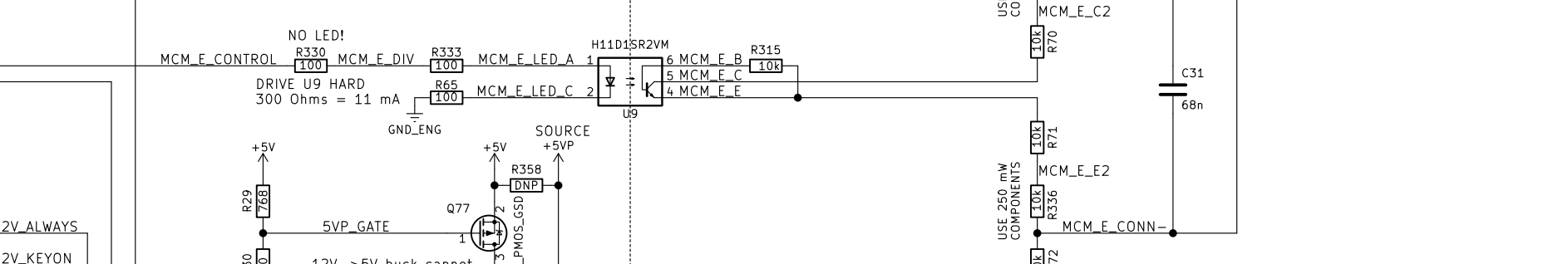
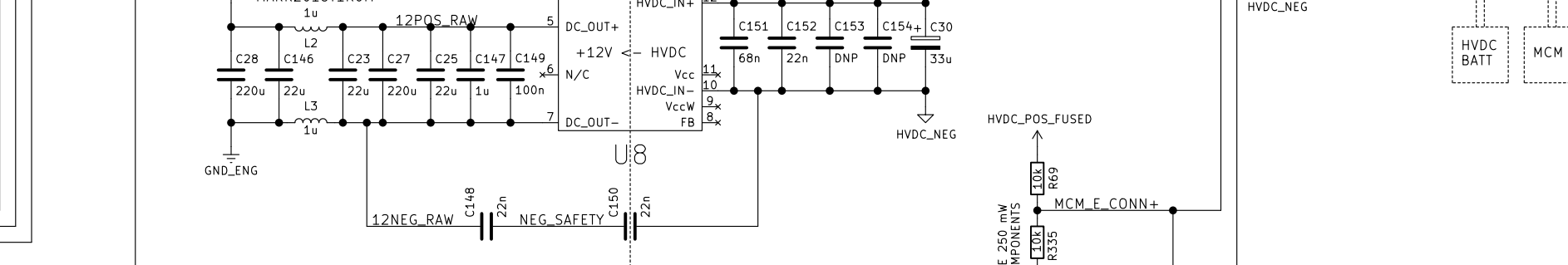
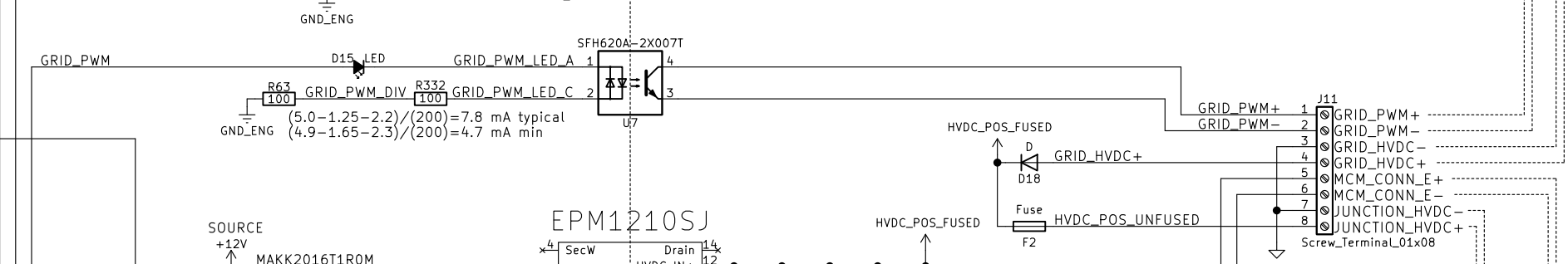
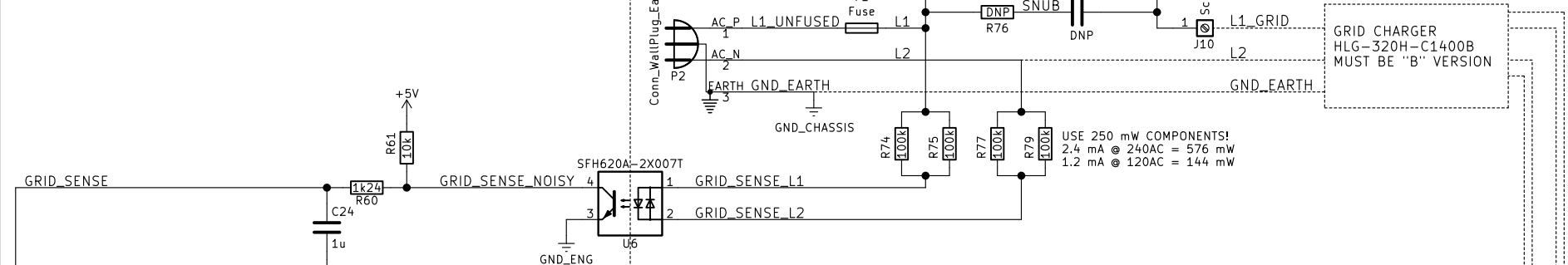
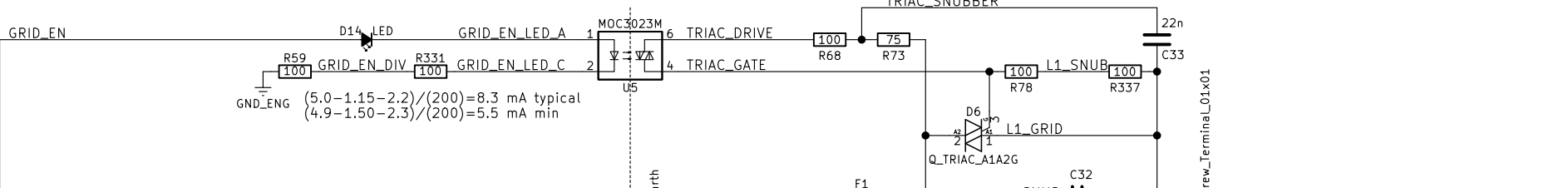
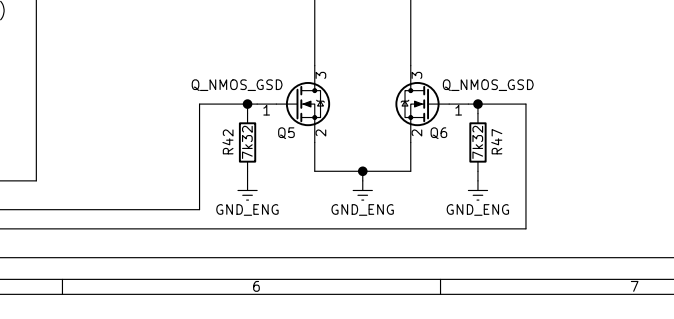
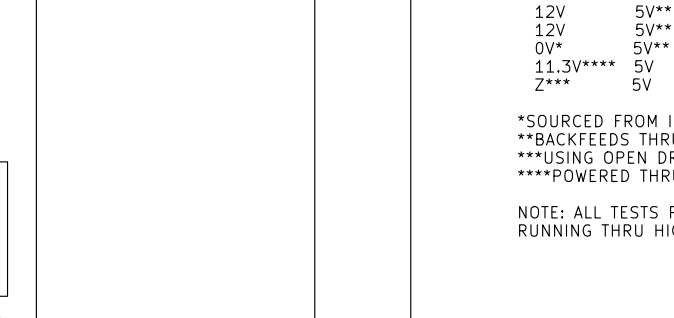
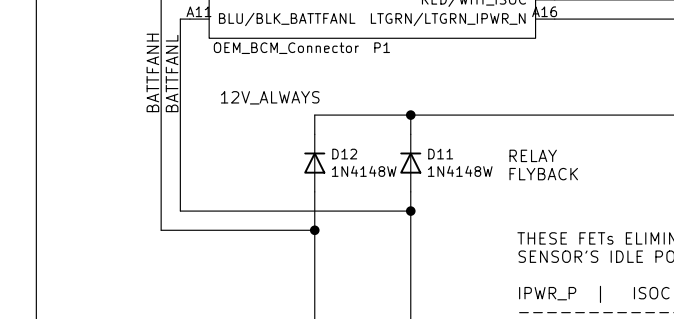
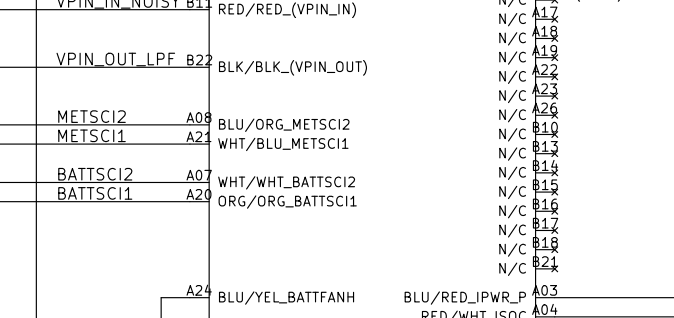
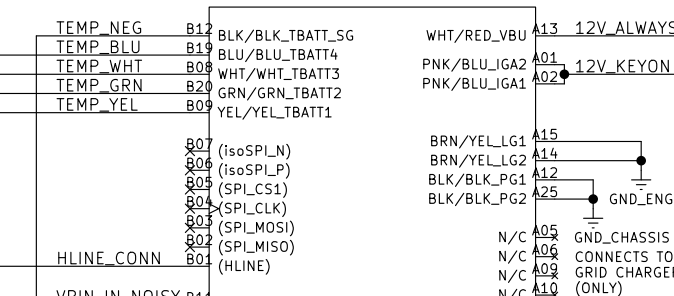
C165 PULSES 5V_ENABLE WHEN IMA SWITCH TURNED ON/OFF (TURNS ON LIBCM BUCK)

LIBCM GENERATES +12V FROM HVDC BATTERY. 12V_KEYON ONLY TELLS LIBCM WHEN CAR IS ON

ONBOARD FANS



OEM BCM A+B CONNECTORS



BATT_CURRENT_ADC is ratiometric to +5V rail. Therefore ADC should reference +5V rail.

BATT_CURRENT_SCALED is 1.660 volts with no battery current. ASSIST causes OUTPUT voltage to increase. REGEN causes OUTPUT voltage to decrease.

The voltage measured on BATT_CURRENT_12V is: (BATT_CURRENT_12V) * 2.29 - 4.07 = BATT_CURRENT_SCALED

The overall equation is: (5 + 79.3 * Battery_Current_RAW * 250E-6) / 2 * 2.29 - 4.07 = BATT_CURRENT_SCALED

Which reduces to: BATT_CURRENT_RAW * 22.7E-3 + 1.655 = BATT_CURRENT_SCALED (BATT_CURRENT_RAW is negative during regen)

MEGA2560's 10 bit ADC limits current resolution to 215 mA per count, which is sufficient for coulomb counting. The firmware oversamples 64x per sample.

John Sullivan - 2021 - IC.net: 'mudder'
This work is licensed under the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0). View this license at: creativecommons.org/licenses/by-sa/4.0/

Sheet: /
File: LIBCM.sch
Title: LIBCM - Drop-In Lithium IMA Battery for G1 Insight
Size: A2 Date: 2021-09-19 Rev: C
KiCad E.D.A. kicad (5.1.9-0-10.14) Id: 1/2

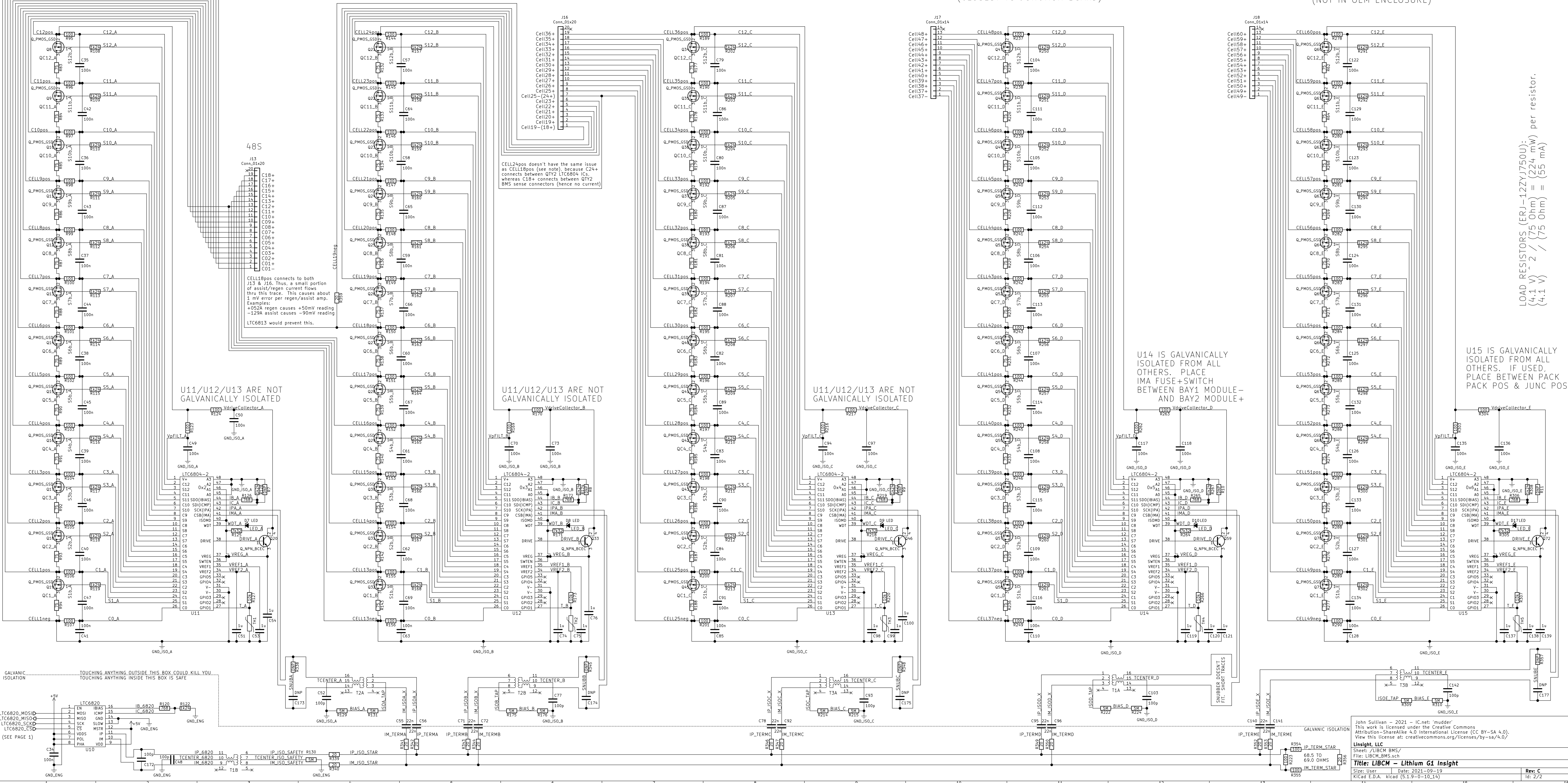
BATTERY BAY 3 (FURTHEST FROM JUNCTION BOARD): 18S

LOWEST 6 CELLS BATTERY BAY 2
HIGHEST 6 CELLS BATTERY BAY 3

BATTERY BAY 2 (MIDDLE BAY): 18S MODULE

BATTERY BAY 1: 12S MODULE
(CLOSEST TO JUNCTION BOARD)

AUX BATTERY: 12S
(NOT IN OEM ENCLOSURE)



LOAD RESISTORS (ERJ-12ZVJ750W):
(4.1 V) ~ 2 / (75 Ohm) = (224 mW) = (55 mA)
(4.1 V)

U15 IS GALVANICALLY ISOLATED FROM ALL OTHERS. IF USED, PLACE BETWEEN PACK POS & JUNC POS