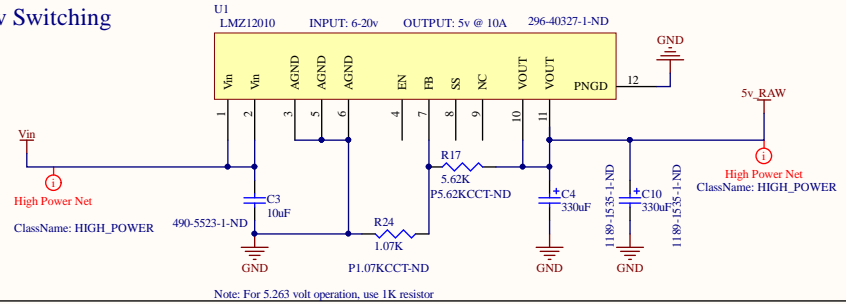
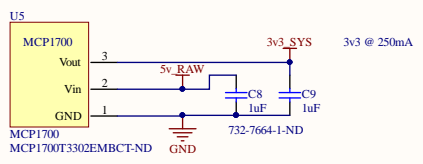


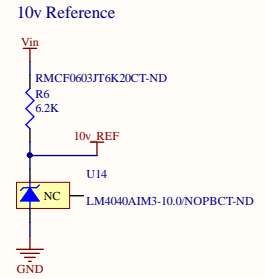
SYS 5v Switching



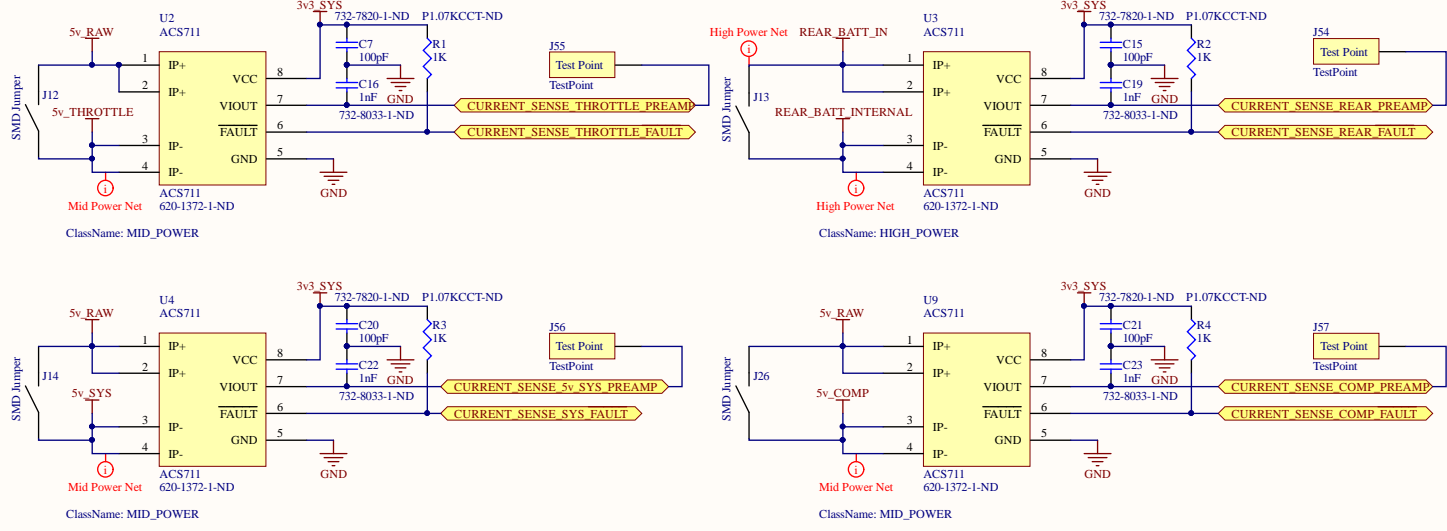
3v3 Linear



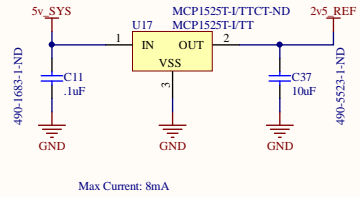
Precision Voltage References



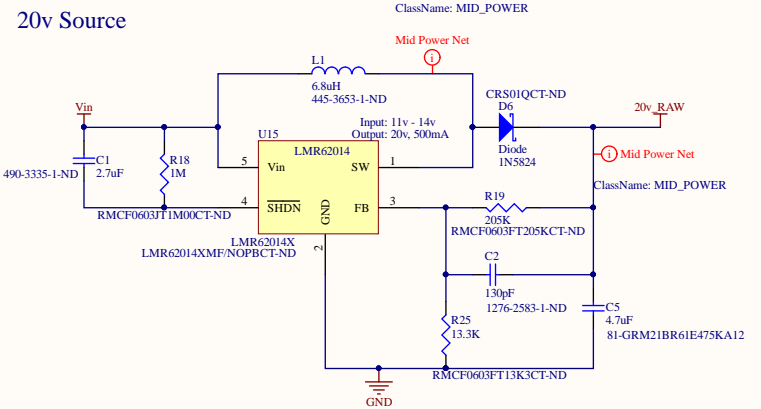
Current Sensing



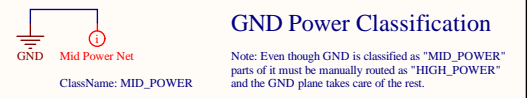
2v5v Reference

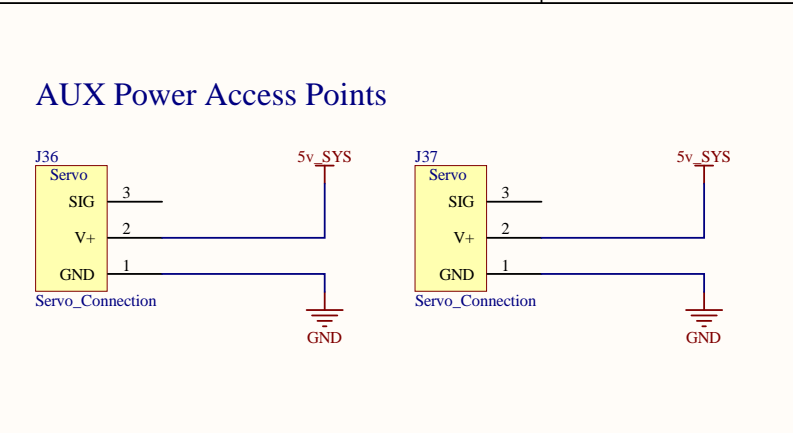
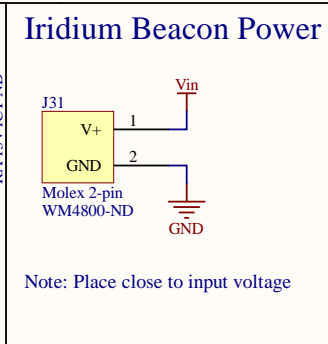
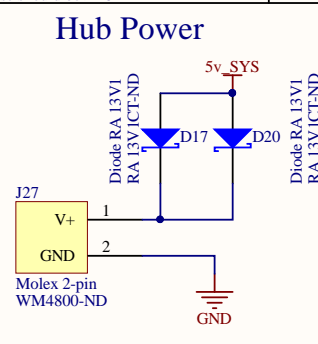
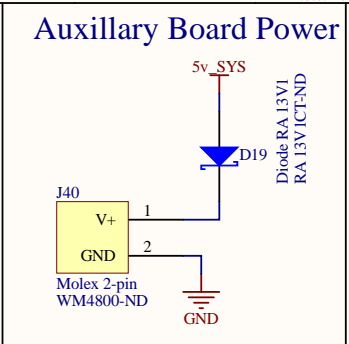
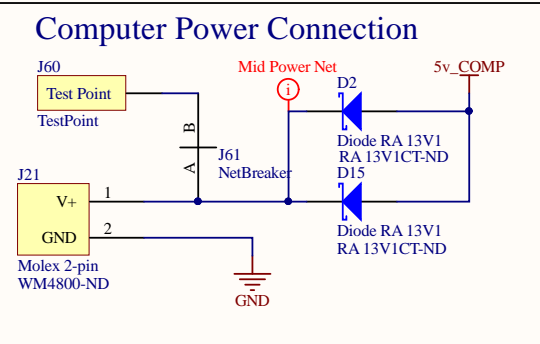
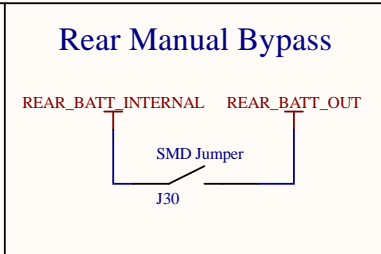
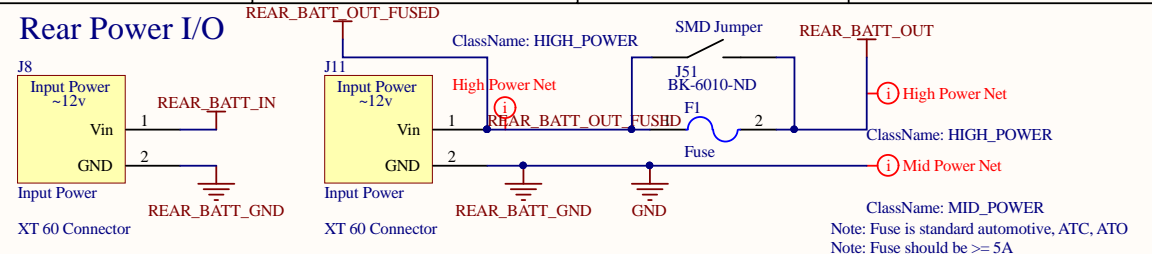
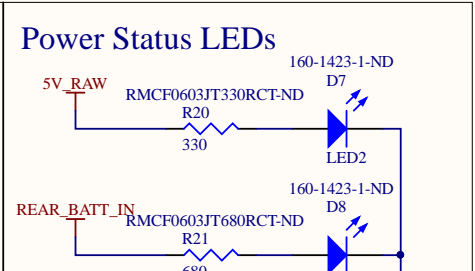
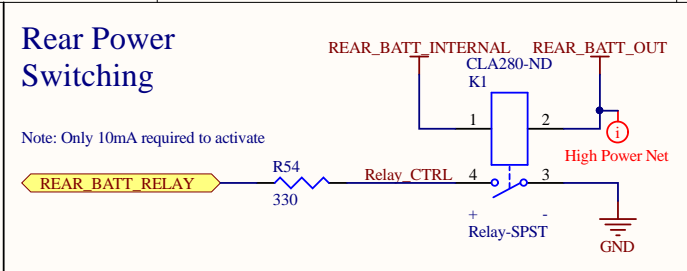
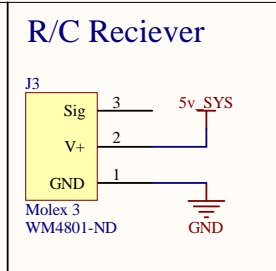
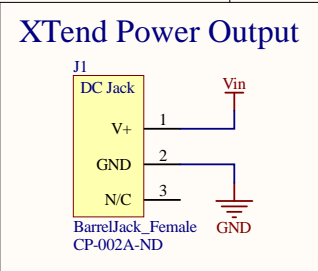
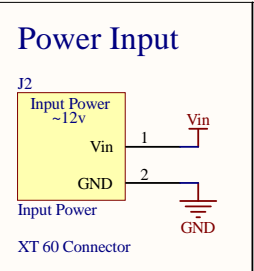


20v Source

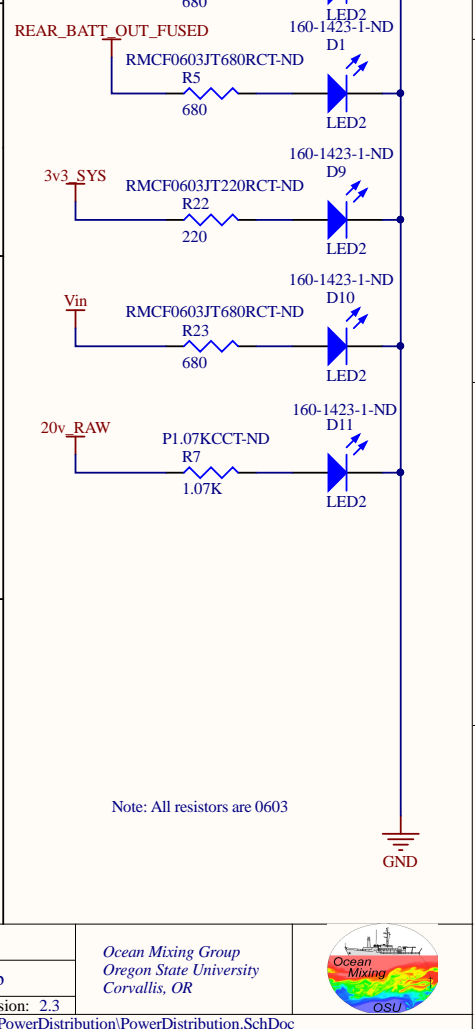


GND Power Classification

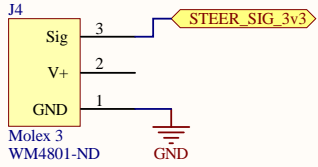




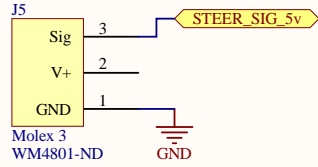
NOTE: This document uses OLD molex pinouts



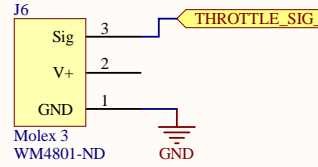
Steering Input



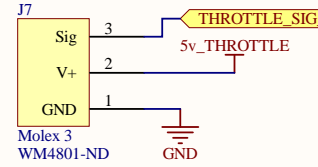
Steering Output



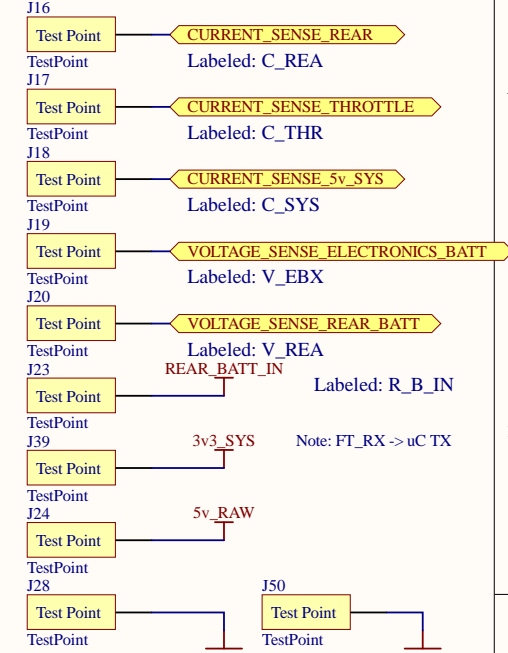
Throttle Input



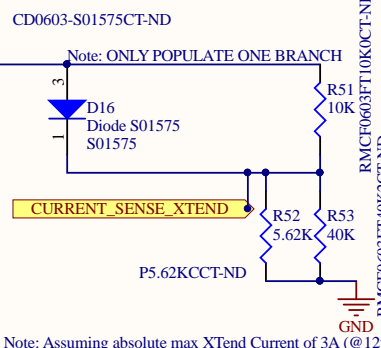
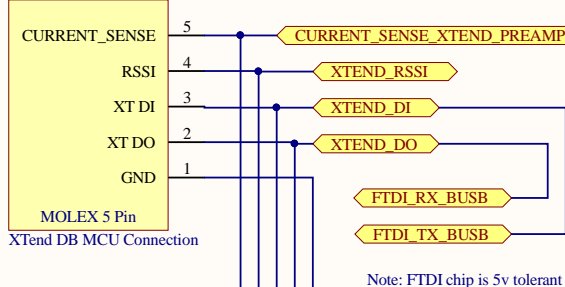
Throttle Output



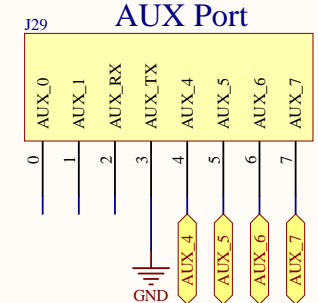
Test Points



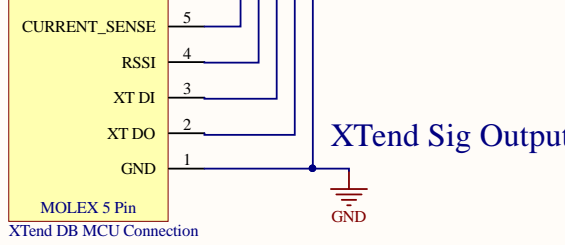
XTend Sig Input



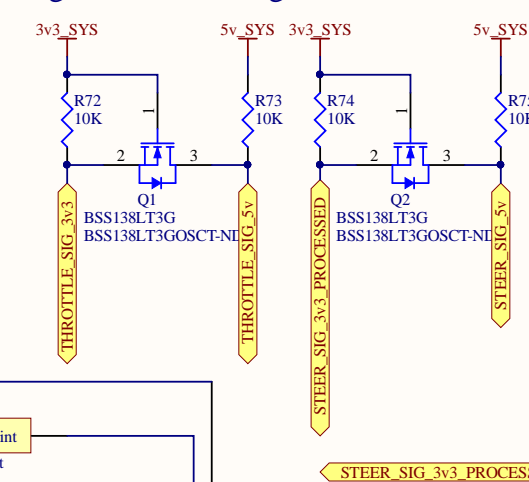
Aux Port



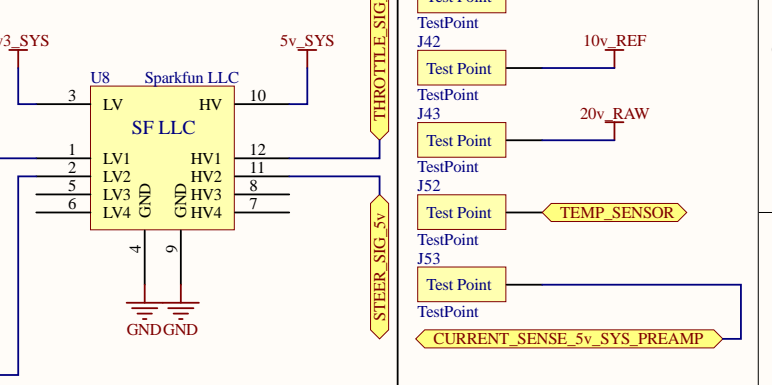
XTend Sig Output



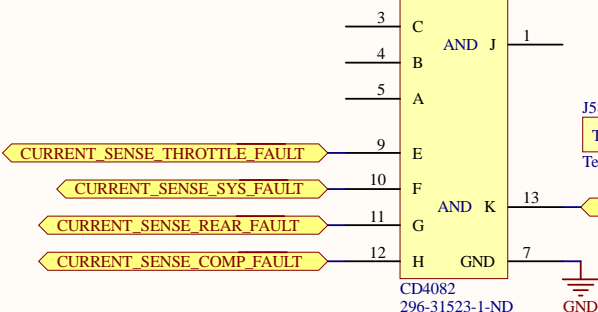
Logic Level Shifting

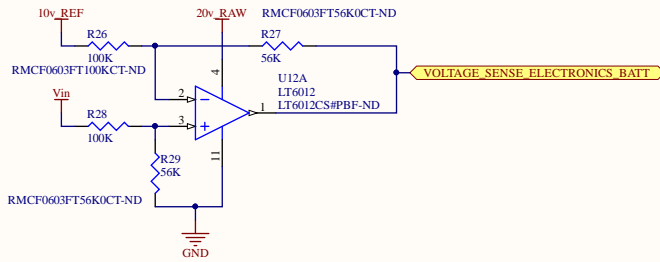


Backup implementation/test points

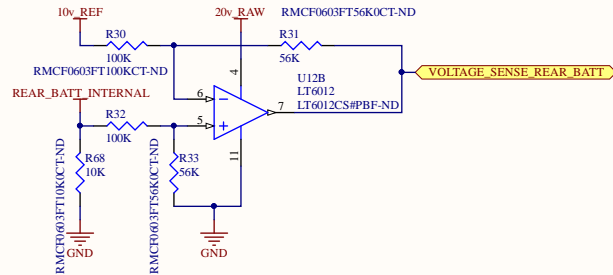
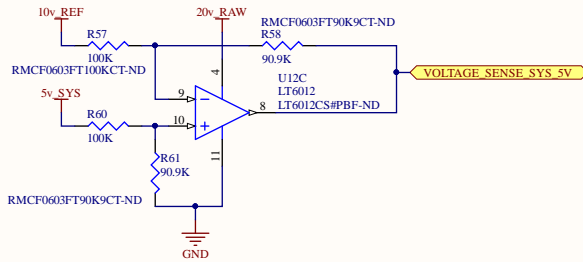


Fault Processing





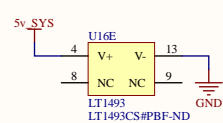
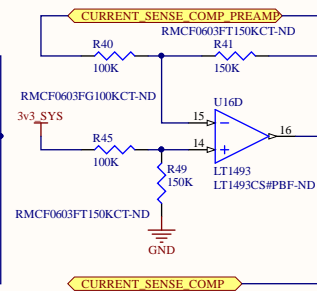
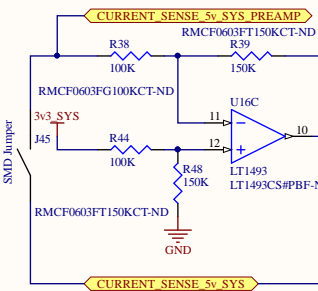
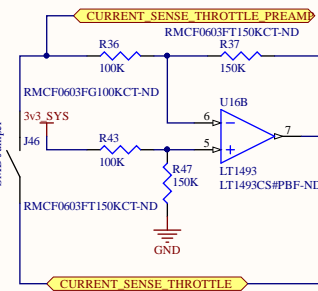
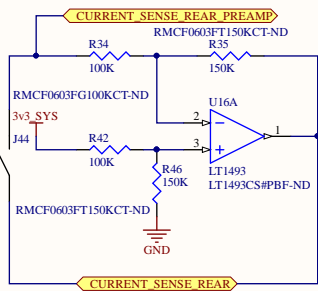
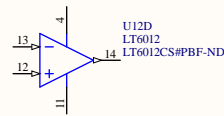
Note: VOLTAGE_SENSE_ELECTRONICS_BATT can be calculated as the following: $VEBAT = (Vin - 10.0v) * .56$



Note: VOLTAGE_SENSE_ELECTRONICS_BATT can be calculated as the following: $VEBAT = (Vin - 10.0v) * .56$

Note: Therefore $Vin = (VEBAT / .56) + 10.0v$

Note: R68 is to account for the usage case in which there is no rear battery

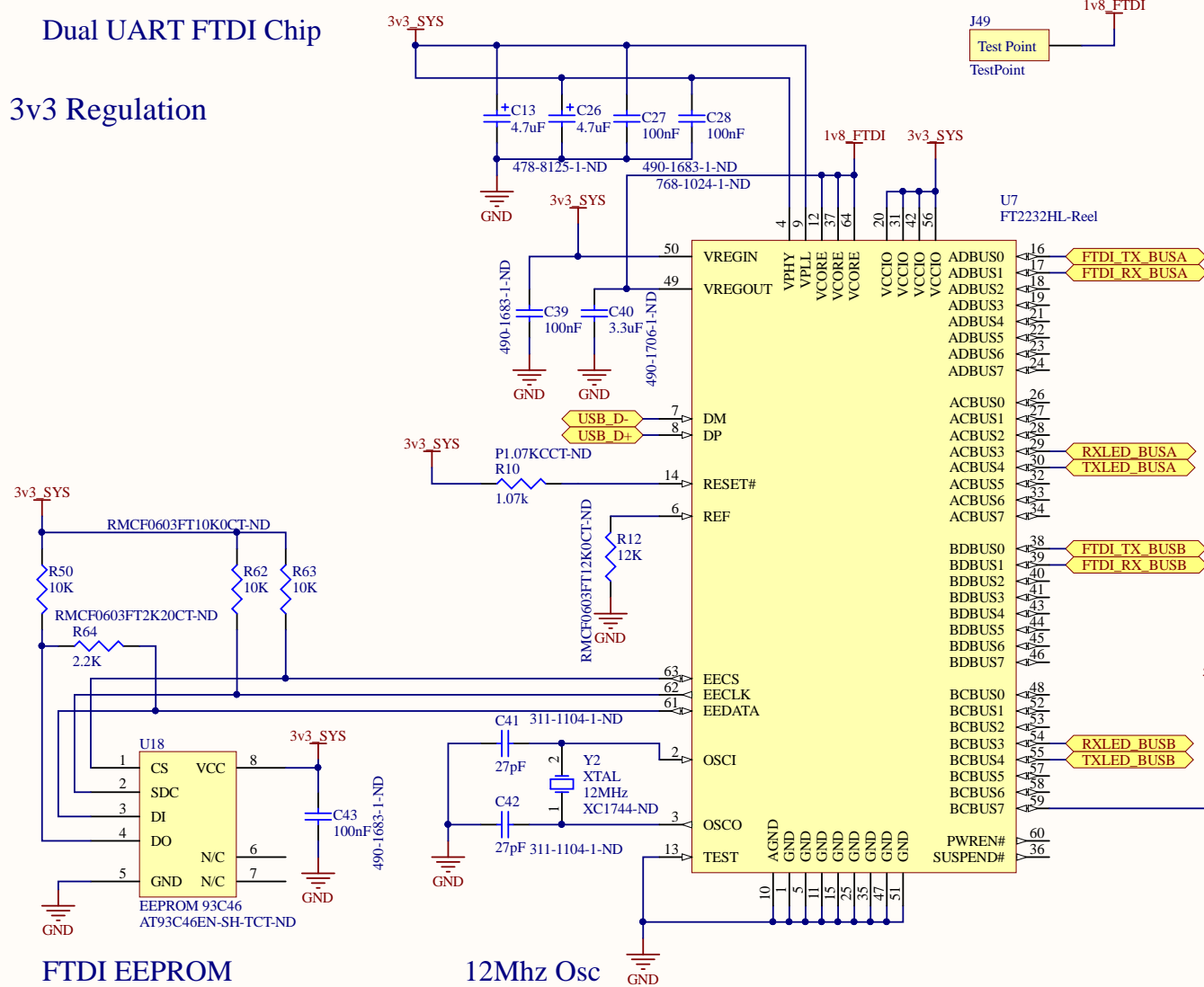


Note: CURRENT_SENSE_VOLTAGE can be calculated using $(3.3 - \text{PREAMP}) * (150/100)$

Note: CURRENT_SENSE_***_PREAMP can be calculated using $-(vin/1.5) + 3.3$

Dual UART FTDI Chip

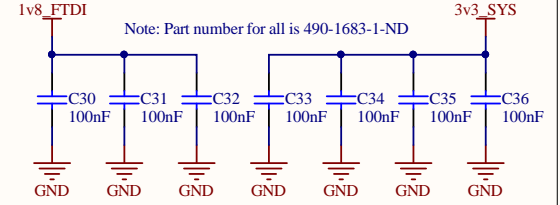
3v3 Regulation



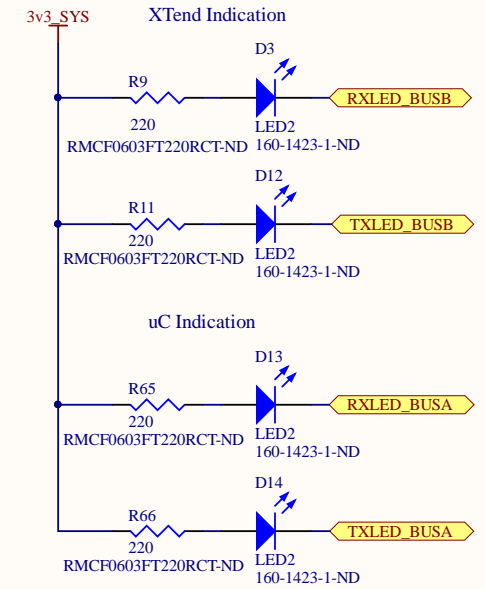
FTDI EEPROM

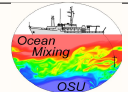
12Mhz Osc

Filtering Caps

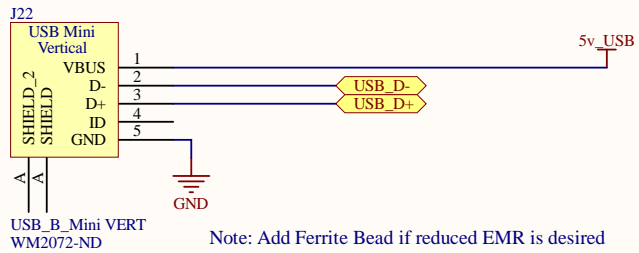
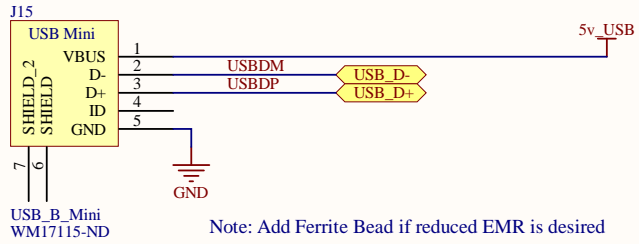


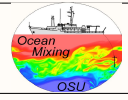
Status LEDs



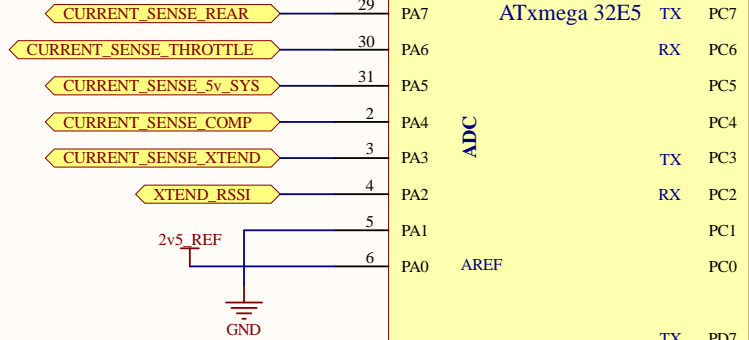
| | | | |
|--|------------------|-----------------------|---|
| Title FTDI.SchDoc | | |  Ocean Mixing Group Oregon State University Corvallis, OR |
| Size: A4 | Number: 5 | Engineer: Nick McComb | |
| Date: 7/12/2016 | Time: 1:00:42 PM | Sheet 5 of 8 | Revision: 2.3 |
| File: C:\Users\nrpc_000\Google Drive\PCB Designs\ROSSPowerDistribution\FTDI.SchDoc | | | |

Microcontroller USB Connection



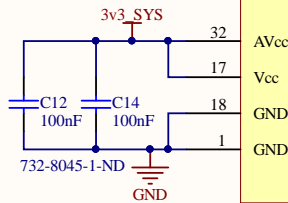
| | | | | |
|--|------------------|-----------------------|---|---|
| Title FTDI Aux.SchDoc | | | <i>Ocean Mixing Group</i> <i>Oregon State University</i> <i>Corvallis, OR</i> |  |
| Size: A4 | Number: 6 | Engineer: Nick McComb | | |
| Date: 7/12/2016 | Time: 1:00:42 PM | Sheet 6 of 8 | Revision: 2.3 | |
| File: C:\Users\nrpc_000\Google Drive\PCB Designs\ROSSPowerDistribution\FTDI Aux.SchDoc | | | | |

MCU

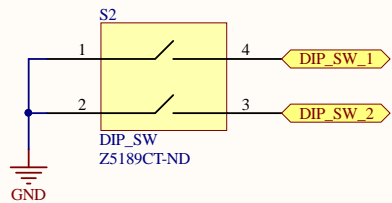


Source Code

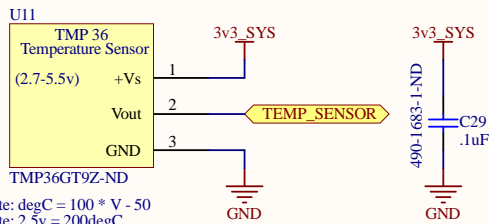
Note: Source code can be found at:
<https://github.com/Nrpickle/ROSS/tree/master/PDB/PowerDistribution>



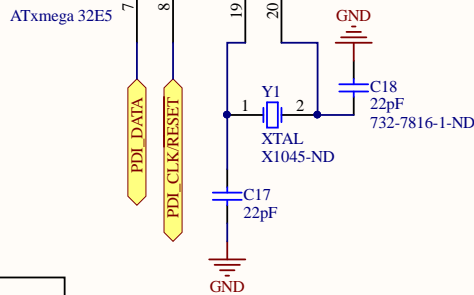
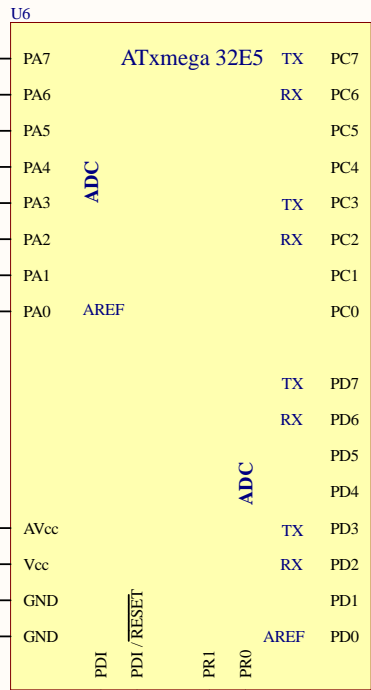
Settings Switch



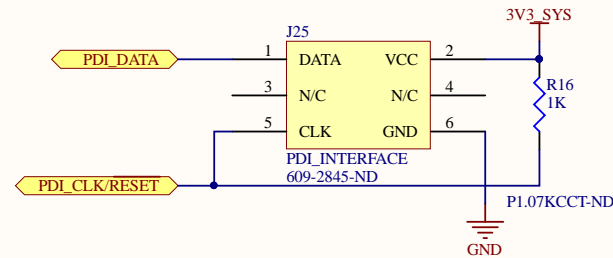
Temperature Sensor



Note: degC = 100 * V - 50
 Note: 2.5v = 200degC



MCU PDI

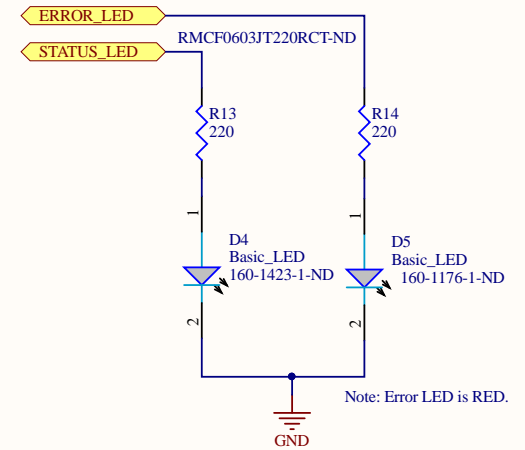


XMega ADC Application Notes

Note: One of the first 7 channels needs to be GND, for our reference
 Note: AREFA and AREFD are pin 0
 Note: They need to be fed 3.3-6 volts

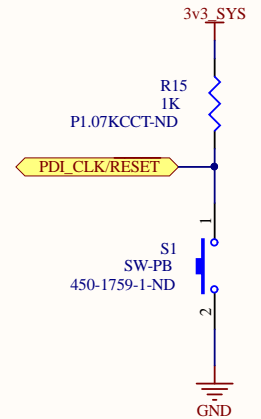
Note: Backup to Firmware Solution

MCU LEDs



Note: Error LED is RED.

MCU Reset



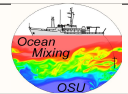
Title Microcontroller.SchDoc

Size: A4 Number: 7 Engineer: Nick McComb

Date: 7/12/2016 Time: 1:00:42 PM Sheet 7 of 8 Revision: 2.3

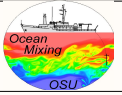
File: C:\Users\nrpickle\000\Google Drive\PCB Designs\ROSSPowerDistribution\Microcontroller.SchDoc

Ocean Mixing Group
 Oregon State University
 Corvallis, OR



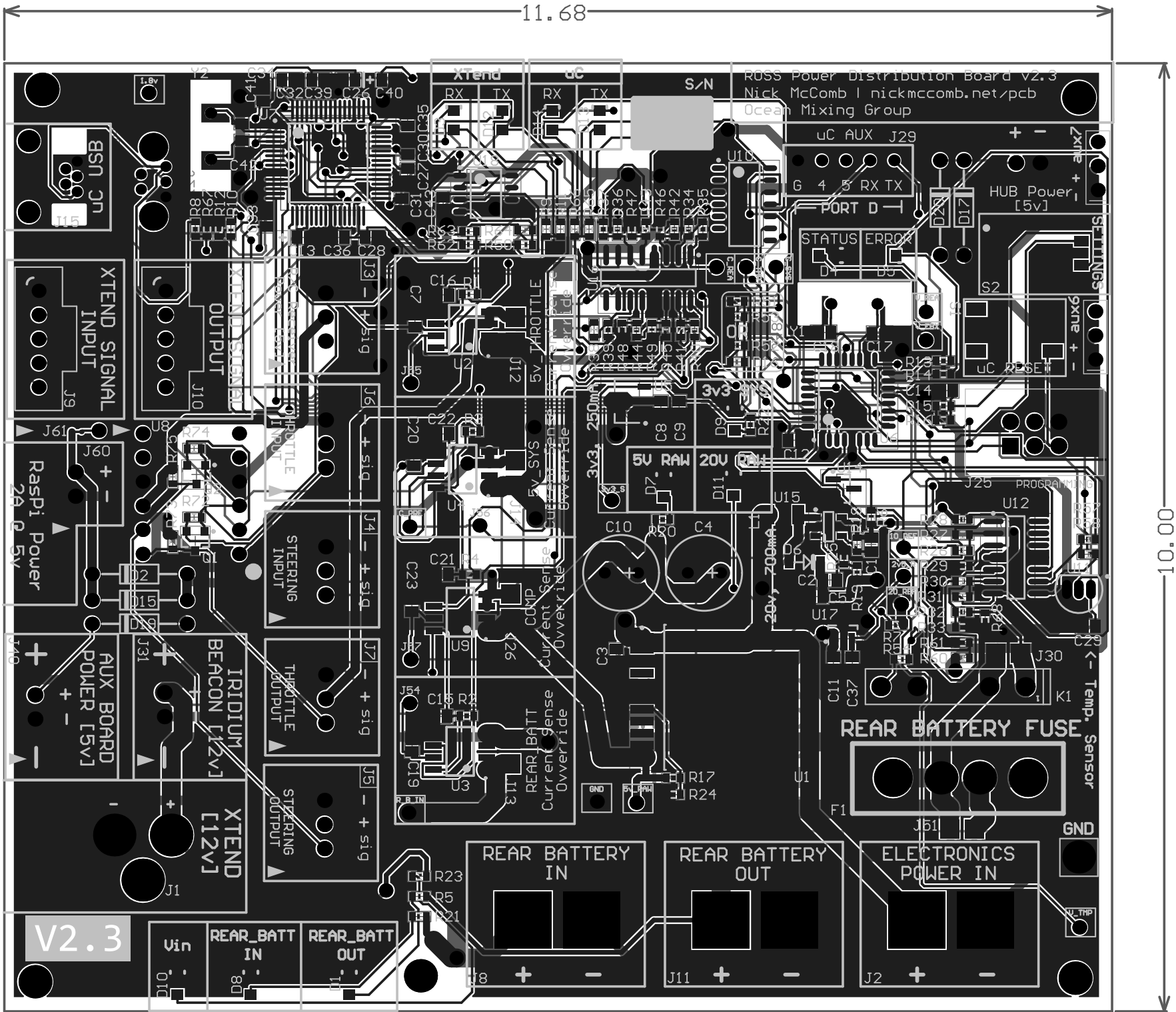
Mounting Hardware

- J32
Mounting Hole
MountingHoles
- J33
Mounting Hole
MountingHoles
- J38
Mounting Hole
MountingHoles
- J34
Mounting Hole
MountingHoles
- J35
Mounting Hole
MountingHoles

| | | | | |
|--|------------------|-----------------------|---|---|
| Title Hardware.SchDoc | | | <i>Ocean Mixing Group Oregon State University Corvallis, OR</i> |  |
| Size: A4 | Number: 8 | Engineer: Nick McComb | | |
| Date: 7/12/2016 | Time: 1:00:42 PM | Sheet 8 of 8 | Revision: 2.3 | |
| File: C:\Users\nrpc_000\Google Drive\PCB Designs\ROSSPowerDistribution\Hardware.SchDoc | | | | |

11.68

10.00



ROSS Power Distribution Board v2.3
 Nick McComb | nickmccomb.net/pcb
 Ocean Mixing Group

uC AUX J29
 6 4 5 RX TX
 PORT D
 STATUS ERROR
 D1 D5
 HUB Power [5v]
 + -
 2xpin

uC RESE#
 + -
 9xpin

J25 PROGRAMMING
 U12
 U15
 U17
 U1
 U2
 U3
 U4
 U5
 U6
 U7
 U8
 U9
 U10
 U11
 U13
 U14
 U16
 U18
 U19
 U20
 U21
 U22
 U23
 U24
 U25
 U26
 U27
 U28
 U29
 U30
 U31
 U32
 U33
 U34
 U35
 U36
 U37
 U38
 U39
 U40
 U41
 U42
 U43
 U44
 U45
 U46
 U47
 U48
 U49
 U50
 U51
 U52
 U53
 U54
 U55
 U56
 U57
 U58
 U59
 U60

REAR BATTERY FUSE
 F1
 Temp. Sensor
 K1
 GND

REAR BATTERY IN
 REAR BATTERY OUT
 ELECTRONICS POWER IN
 J11 + -
 J2 + -
 J1 + -
 J2 + -
 J11 + -
 J2 + -

V2.3
 V_{in}
 REAR_BATT IN
 REAR_BATT OUT