Sheet: Power Distribution
File: PowerDist.sch
+5V
+3.3V
GND

Isolated +5V and +3.3V.
Use GND as common gnd for electronic components.
Connect GNDPWR when using +12V.

Sheet: CAN
File: CAN.sch
CAN_TX
CAN_RX
CAN1_TX
CAN1_RX

Sheet: Contactor Driver
File: Contactor.sch
CONTACTOR_EN
CONTACTOR_CHECK
PB0
PB1

Sheet: I2C
– EEPROM
– IMU
File: I2C.sch
SCL
SDA
I2C3_SCL
I2C3_SDA

Sheet: SPI
– Display
– Volt Slave
– Temp Slave
File: SPI.sch
SCK
MOSI
MISO
VOLTCS
DISPCS
TEMPCS[1..6]
SPI1_CLK
SPI1_MOSI
SPI1_MISO
LTC6811_CS
DISPLAY_CS
TEMP_CS[1..6]

Sheet: Misc
File: Misc.sch
PC[0..5]
PA[5..7]
RUN
FAULT

U1
STM32F413RHTx
NRST
BOOT0
VCAP_1
PWR_FLAG
C8
2.2uF
OSC_IN
OSC_OUT
PA[5..7]
PC[0..5]
TEMP_CS4
TEMP_CS5
TEMP_CS6
I2C3_SDA
RUN
ADC1_CH2
ADC1_CH3
I2C3_SCL
UART1_TX
UART1_RX
SWDIO
SWCLK
PB0
PB1
SPI1_CLK
SPI1_MISO
SPI1_MOSI
LTC6811_CS
DISPLAY_CS
CAN1_RX
CAN1_TX
FAULT
TEMP_CS1
TEMP_CS2
TEMP_CS3

Y1
NX8045GB-8.000M-STD-CSJ-1
C13 6pF
C14 6pF
The crystal and caps have to be as close to the uC as possible.

TEMP_CS[1..6]
TEMP_CS1
TEMP_CS2
TEMP_CS3
TEMP_CS4
TEMP_CS5
TEMP_CS6

Bypass Capacitors

Place these capacitors as close to mcu as possible for correct operation.
VDD/VSS
C1 0.1uF
C2 0.1uF
C3 0.1uF
C4 0.1uF
C5 0.1uF
C6 0.1uF
C7 4.7uF

VDDA/VSSA (VREF+/VREF−)
C9 0.1uF
C10 1uF

C11 0.1uF
SW1
B3SL-1002P

Programming Pins.
SWCLK
SWDIO
J1
SWD

Debug

J2
Logic Analyzer
UART1_TX
UART1_RX
CAN1_TX
CAN1_RX
SPI1_CLK
SPI1_MISO
SPI1_MOSI

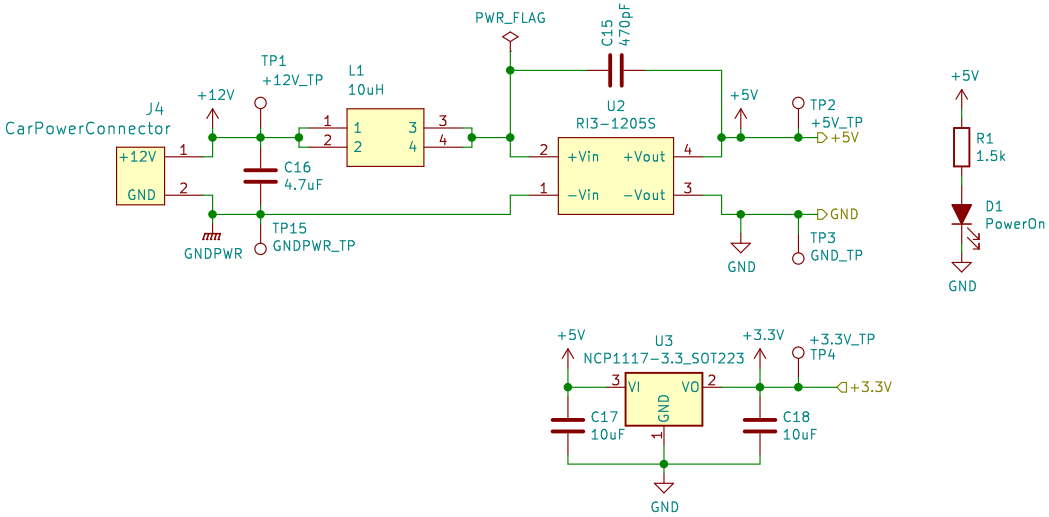
MH1 MountingHole
MH2 MountingHole
MH3 MountingHole
MH4 MountingHole

Current Board

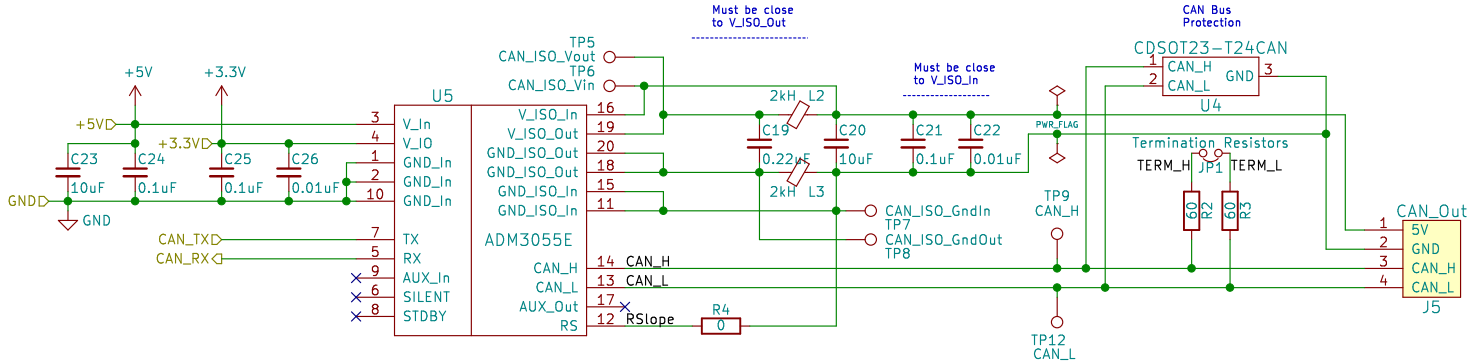
C12 0.1uF
ADC1_CH3
ADC1_CH2
220k R57
220k R58
L5 600
L6 600
J3
CurrentSlaveConnector
C53 1uF
C54 1uF
PA2 high precision hall effect sensor.
PA3 low precision hall effect sensor.

Sheet: /
File: BPSMaster.sch
Title:
Size: A4
Date:
Rev:
KiCad E.D.A. kicad (5.1.2)-2
Id: 1/7

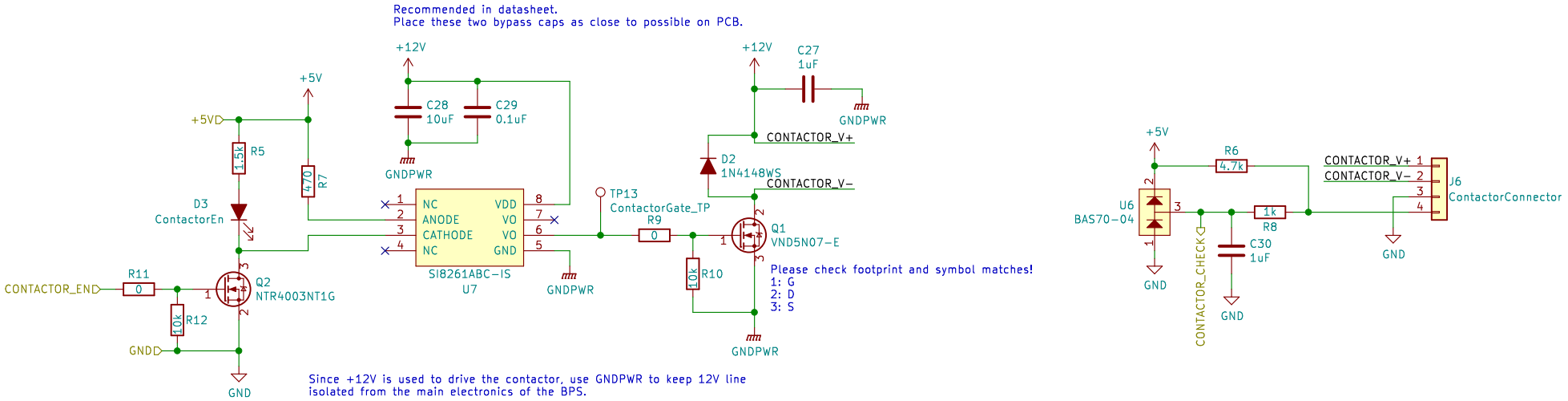
Two separate converters would cause more noise on the board but less power waste.
If too much noise, add 5 to 3.3V regulator.



Sheet: /Power Distribution/		
File: PowerDist.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.2)-2		Id: 2/7

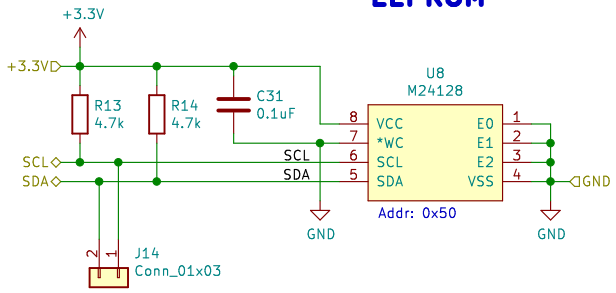


Sheet: /CAN/		
File: CAN.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.2)-2		Id: 3/7



Sheet: /Contactor Driver/		
File: Contactor.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.2)-2		Id: 4/7

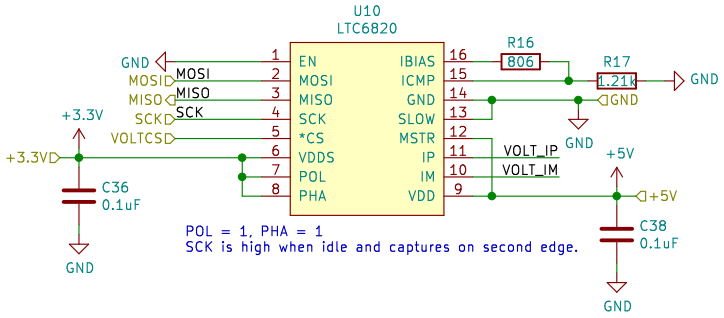
EEPROM

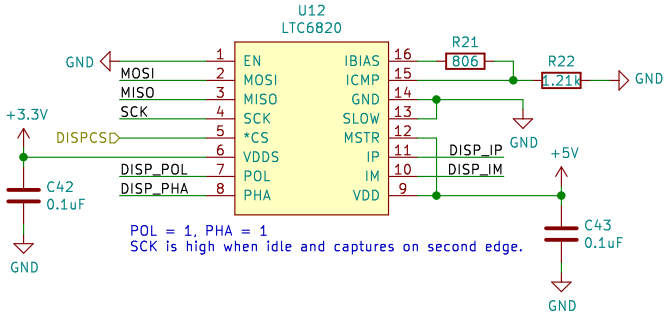


Sheet: /I2C/ File: I2C.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.2)-2		Id: 5/7

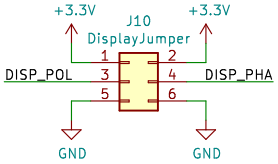
Isolated SPI

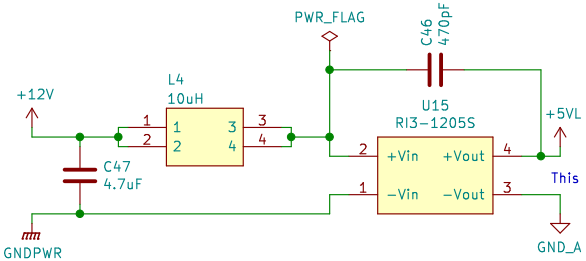
If the wires lengths are short and you want to save more power, change IBIAS resistor to be 2.8k. Look in LTC6820 datasheet for more information on calculating these BIAS resistors.





This jumper connector is for changing the LTC6820's SPI configuration to match to whatever the didplay you're using specifies.

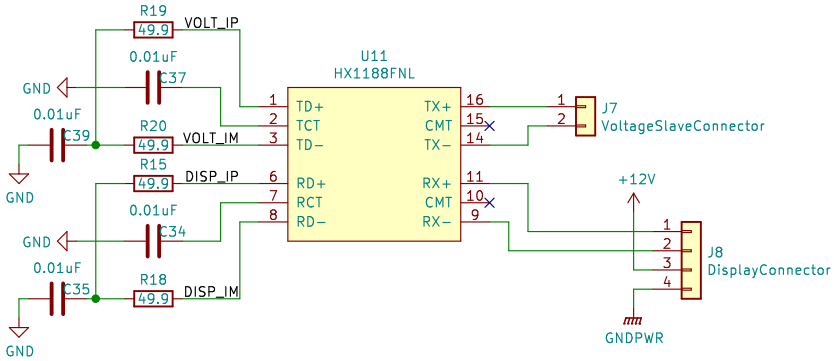


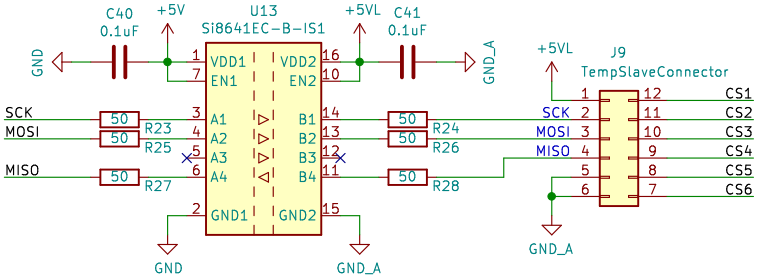


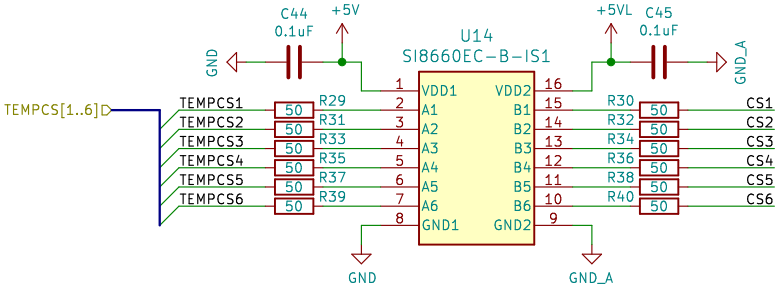
This regulator is to power the Temperature slave boards.

Connectors

Each connector is isolated from the maaster board components.







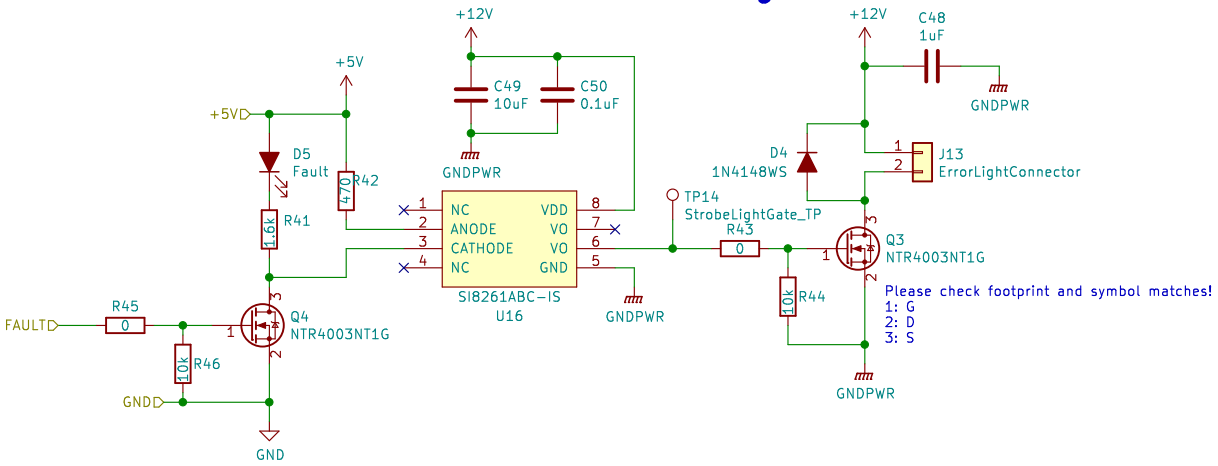
Sheet: /SPI/
File: SPI.sch

Title:

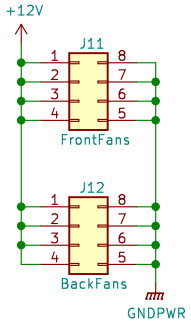
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.2)-2		Id: 6/7

This page hods other miscellenious connections that are required:
- Strobe/Error light indicator
- Fan connectors

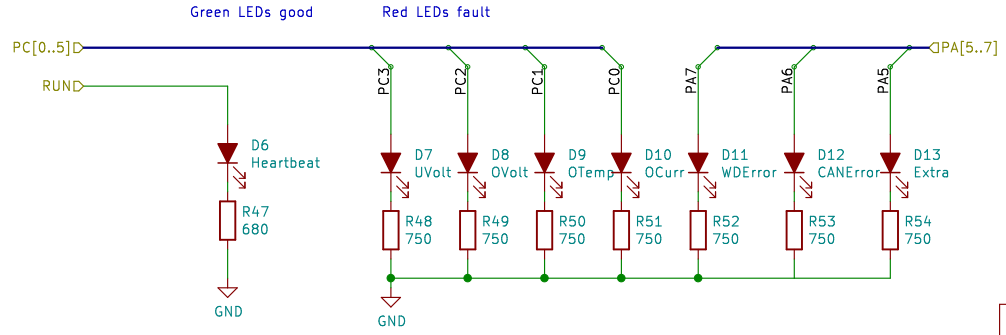
Error Light



Fans



Status LEDs



Sheet: /Misc/ File: Misc.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.2)-2		Id: 7/7