Sheet: PowerDist
+3.3V
+5VD
GNDD
File: PowerDist.sch
+3.3V
+5V
GND

Sheet: ExteriorLights
LEFT_BLINK
RIGHT_BLINK
BK_LIGHT
Headlight_ON
File: ExteriorLights.sch
LEFT_BLINK
RIGHT_BLINK
BK_LIGHT
Headlight_ON

Sheet: IgnitionSwitch
IG1
IG2
BPS_PWR
File: IgnitionSwitch.sch
IG1
IG2
BPS_PWR

Sheet: USB
UART_TX
UART_RX
File: USB.sch
UART2_Tx
UART2_Rx

Sheet: Car_CAN
CAN_RX
CAN_TX
File: CAN.sch
CAN_Rx
CAN_Tx

Sheet: Motor_CAN
CAN_RX
CAN_TX
File: Motor_CAN.sch
MotorCAN_Rx
MotorCAN_Tx

Sheet: Potentiometers
Accel_Pot
Accel_Pot2
Brake_Pot
Brake_Pot2
File: Potentiometers.sch
Accel_Pot
Accel_Pot2
Brake_Pot
Brake_Pot2

Sheet: PwrStateIndicators
M_CNCTR
M_PRCHG
A_CNCTR
A_PRCHG
File: PwrStateIndicators.sch
M_CNCTR
M_PRCHG
A_CNCTR
A_PRCHG

Sheet: MinionBrdInterface
CS
CLK
MISOD
MOSI
UART_Rx
UART_Tx
File: MinionBrdInterface.sch
CS
CLK
MISO
MOSI
UART3_Rx
UART3_Tx

+3.3V
VDDA
C6 100nF
C9 100nF
C11 100nF
C12 100nF
C13 4.7uF
C14 100nF
C15 1uF
GND

SW10 RESET
C5 100nF
R18 10k
NRST
GND
GND
4.7uF
C10
PWR_FLAG
GND
C7 12pF
Y1 8M Crystal
C8 12pF
GND
Brake_Pot2
A_PRCHG
A_CNCTR
M_CNCTR
M_PRCHG
UART3_Rx
Headlight_ON
BK_LIGHT
RIGHT_BLINK
LEFT_BLINK
Accel_Pot
Brake_Pot
Accel_Pot2
PC13
PC14
PC15

U7
STM32F413RHTx

+3.3V
VBAT VDD VDD VDD VDD VDDA
VSS VSS VSS VSS VSSA
GND GNDA

PA0 IG2
PA1 IG1
PA2 UART2_Tx
PA3 UART2_Rx
PA4 CS
PA5 CLK
PA6 MISO
PA7 MOSI
PA11 CAN_Rx
PA12 CAN_Tx
PA13 SWDIO
PA14 SWCLK
PA15 JTDI
PB3 JTDO
PB4
PB5
PB6
PB7
PB10 UART3_Tx
PB12 MotorCAN_Rx
PB13 MotorCAN_Tx

+3.3V
SWDIO
JTDI
JTDO
SWCLK
J8 JTAG
GND

PB4
PB5
PB6
PB7
PC13
PC14
PC15
J24 ExtraGPIO_Conn
GND

UART2_Tx
UART2_Rx
J25 UART_TP
GND

TODO: Assign pins for
1. BPS Fault
2. Control Fault
3. The Reserved Pin
The currently assigned pins should be considered temporary.

All of these are negative logic LEDs

TODO: make labels consistent.
Should they be all UPPERCASE
or Camel Case?

TODO: verify that this is all that needs to be done. Read the code to ensure all ports that are used are on here.

Look at all the other comments.

Also check over all the footprints again.

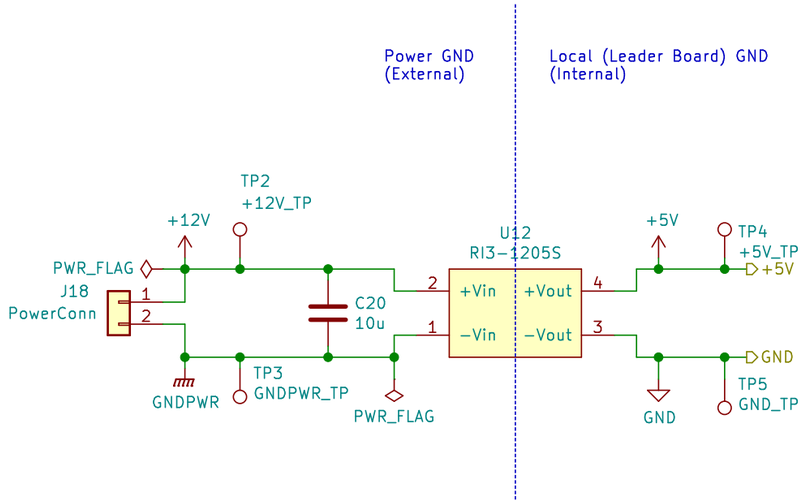
Also look at all the bodge wires running around the twins' board.

Logo Placeholders
Dr. Hallock
UTSVT

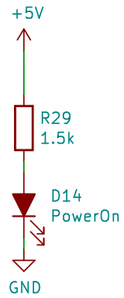
For the boad itself
H1 MountingHole
H2 MountingHole
H3 MountingHole
H4 MountingHole

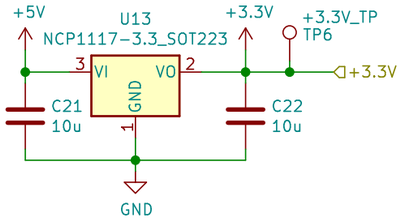
Author: Chase Block
UTSVT
Sheet: /
File: Dashboard.sch
Title: Dashboard
Size: A3 | Date: 2020-06-06 | **Rev: 2.0**
KiCad E.D.A. kicad (5.1.5)-3 | Id: 1/10

ISOLATED



Isolated DC-DC Converter to step down +12V power to an isolated +5V. The input gnd (Power GND) is different from the output gnd (Local GND)

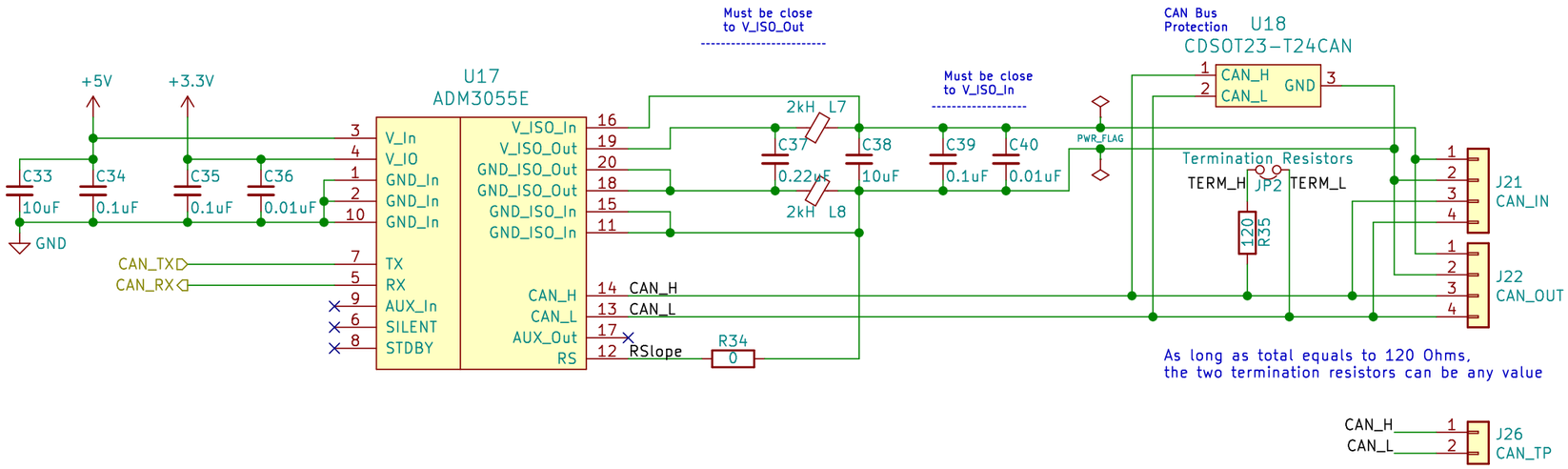




+5V is already isolated so no need to isolate +3.3V

Linear Regulator to step down +5V to +3.3V.
An isolated converter was not used for the +3.3V line because of price and space. May need to change this to DC-DC converter if we really want to make the BPS more energy efficient.

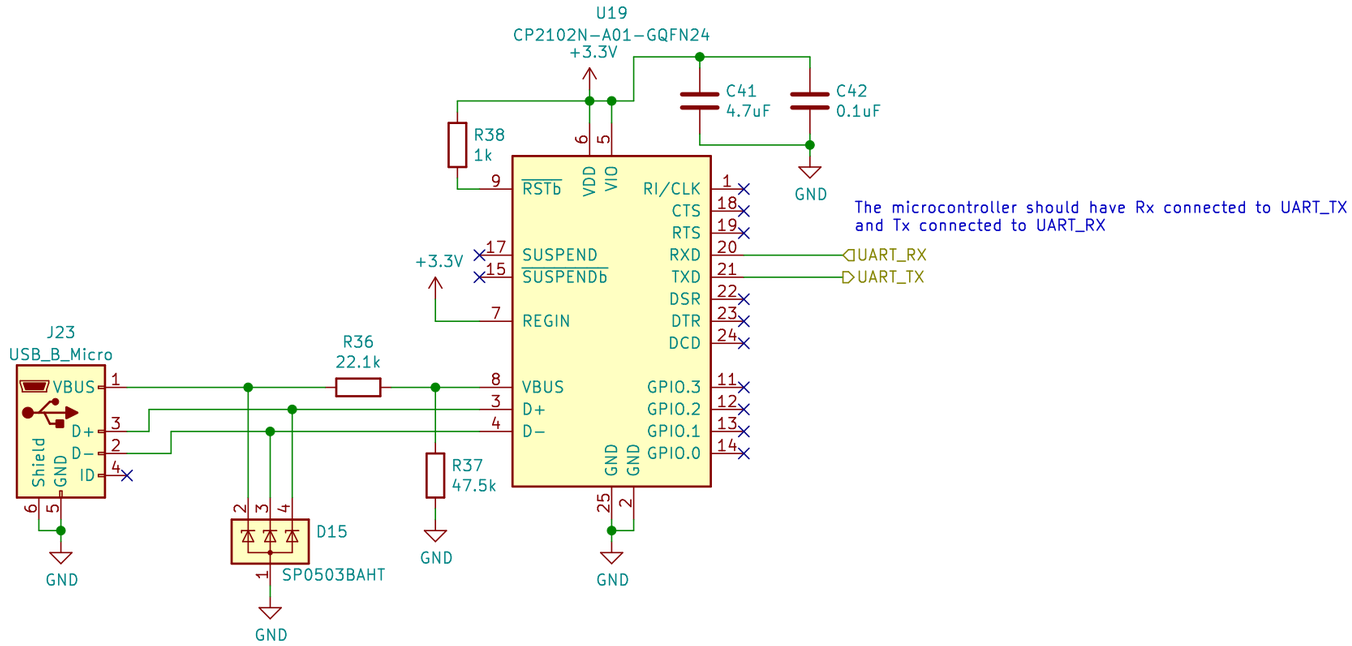
Sheet: /PowerDist/		
File: PowerDist.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 2/10



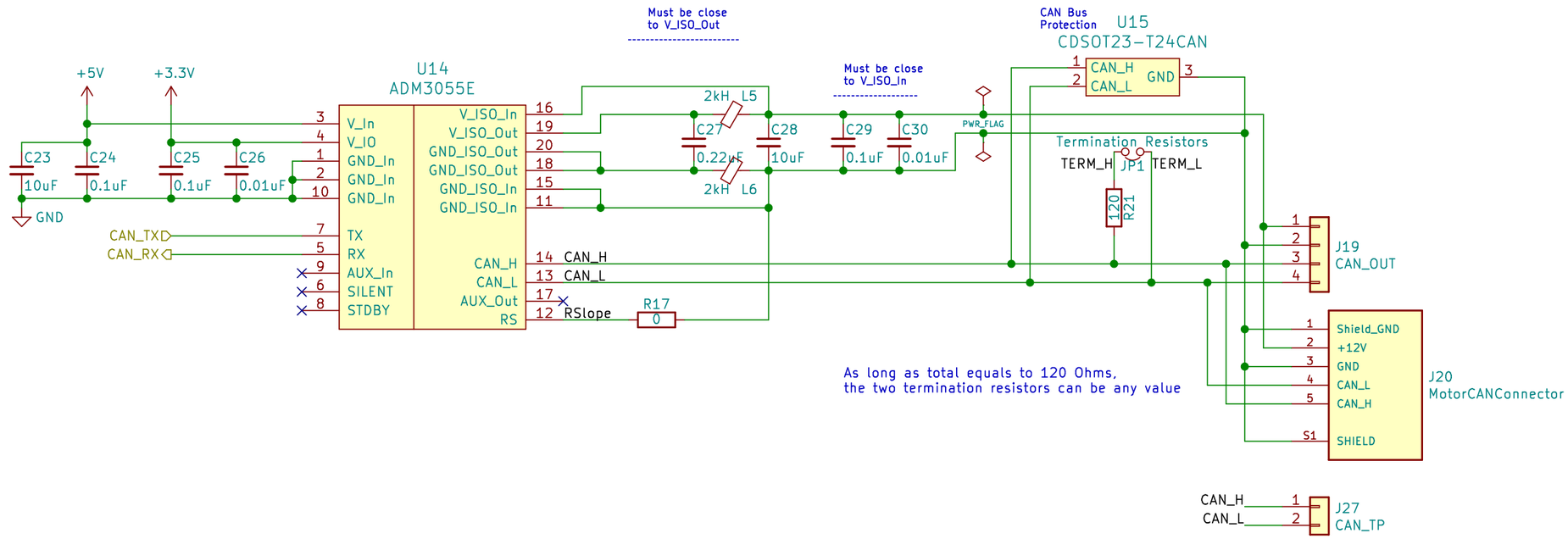
Sheet: /Car_CAN/
File: CAN.sch

Title:

Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 3/10

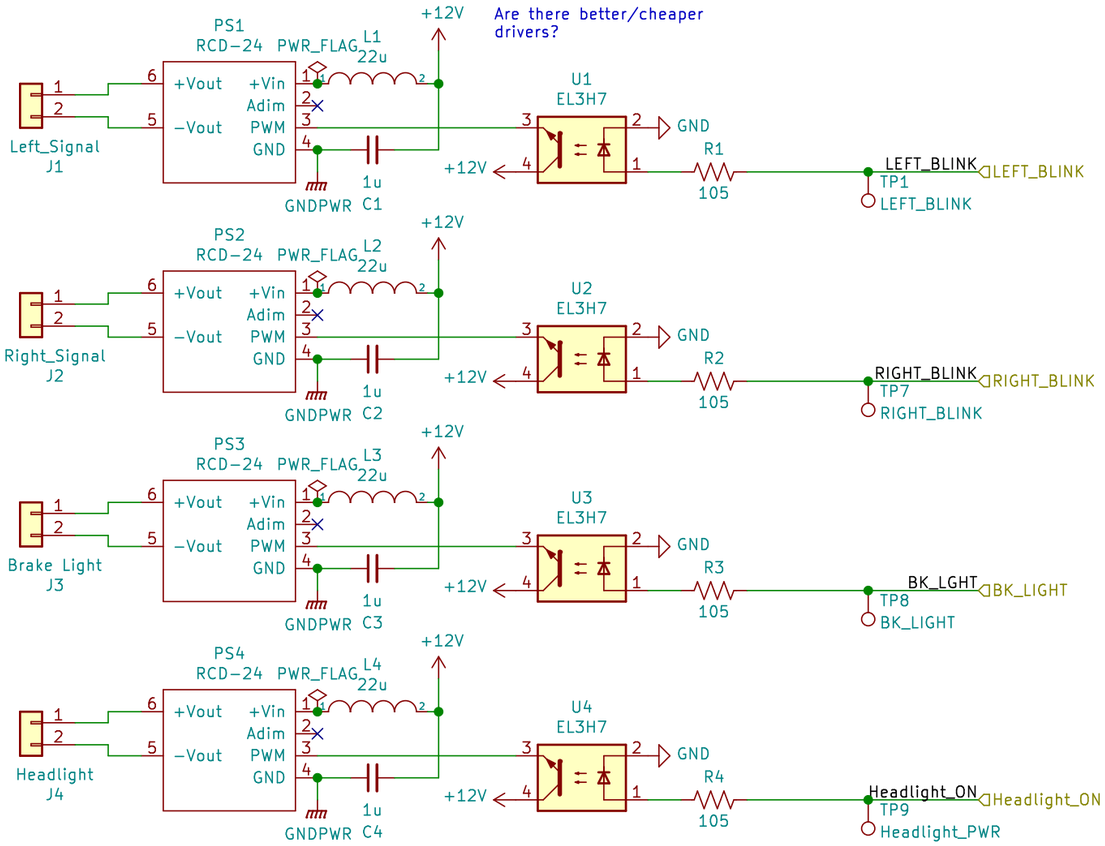


Sheet: /USB/		
File: USB.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 4/10



Sheet: /Motor_CAN/		
File: Motor_CAN.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 5/10

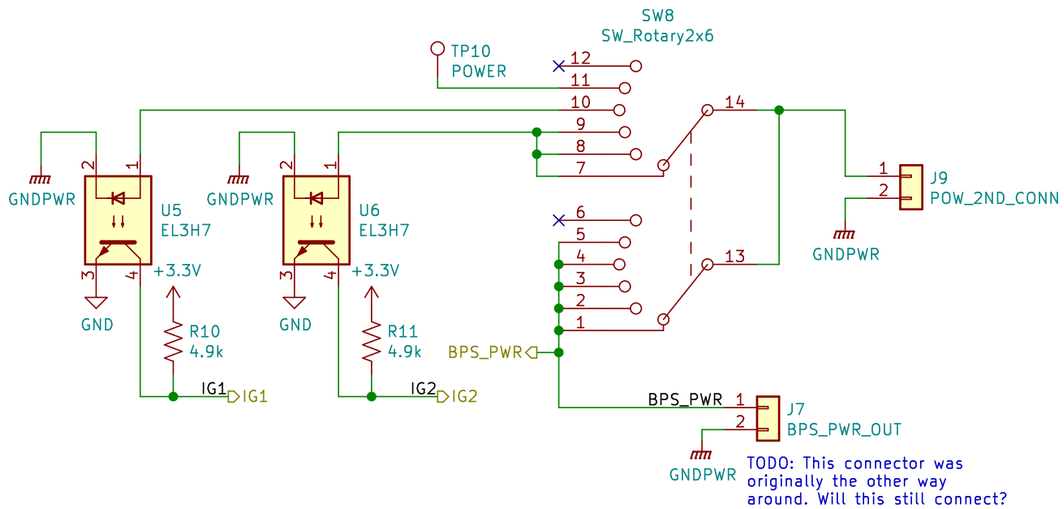
Exterior Lights



These are negative-logic signals that are software controlled. The microcontroller turns on the light by sending a low voltage signal, which turns off the EL3H7, driving the PWM pin of the RCD-24 to a low. When PWM is low, the RCD-24 outputs +12V to the exterior lights, turning them on.

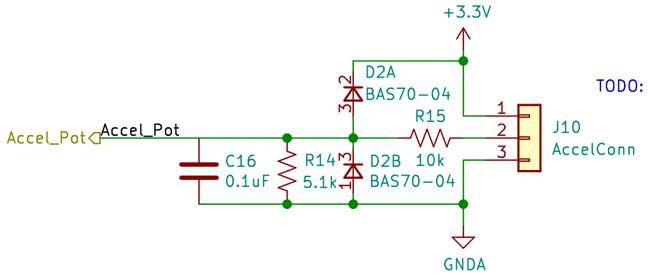
Sheet: /ExteriorLights/		
File: ExteriorLights.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 6/10

Ignition Switch

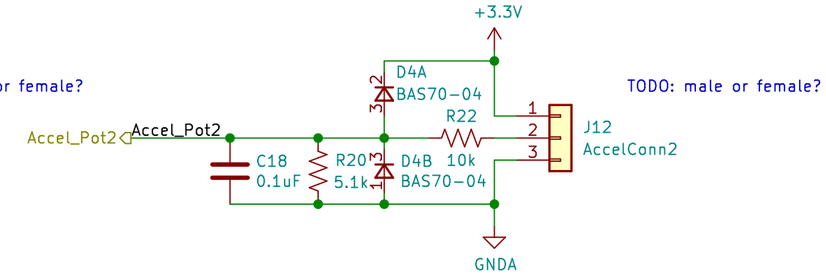


Sheet: /IgnitionSwitch/		
File: IgnitionSwitch.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 7/10

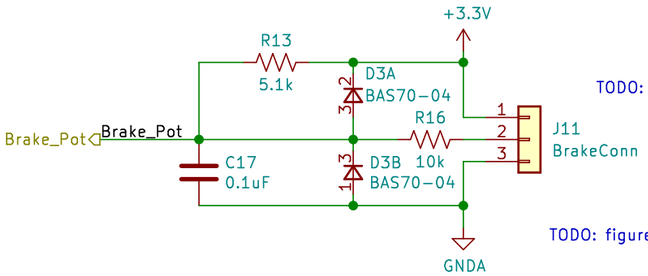
Potentiometers



TODO: male or female?

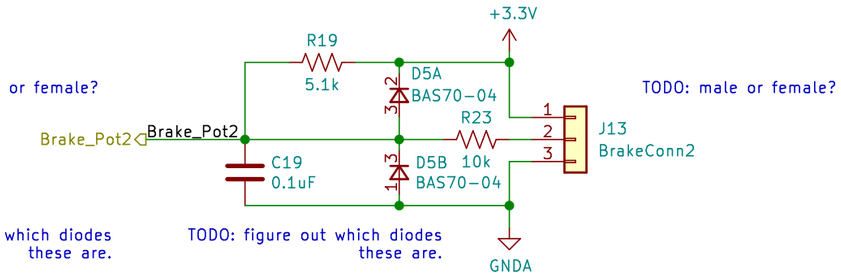


TODO: male or female?



TODO: male or female?

TODO: figure out which diodes these are.

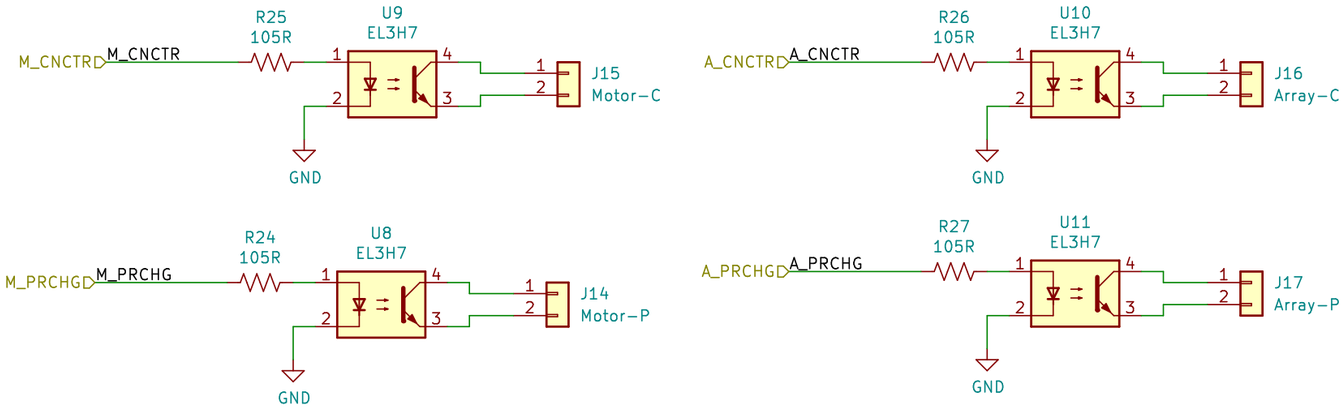


TODO: male or female?

TODO: figure out which diodes these are.

Sheet: /Potentiometers/ File: Potentiometers.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 8/10

Power State Indicators



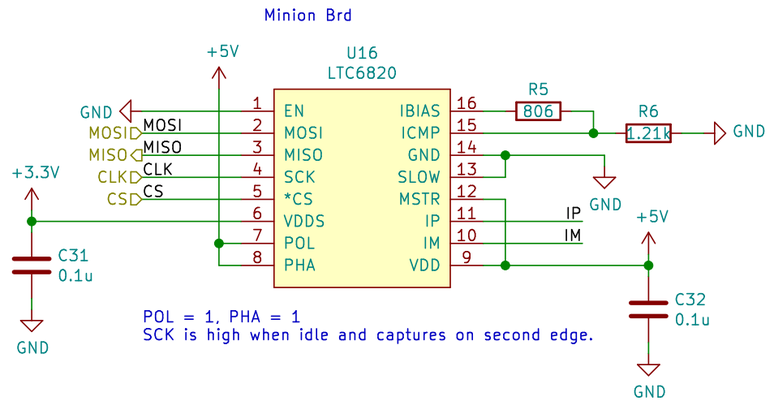
TODO: should this be male or femal?

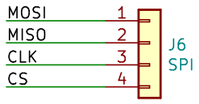
Sheet: /PwrStateIndicators/		
File: PwrStateIndicators.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 9/10

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.

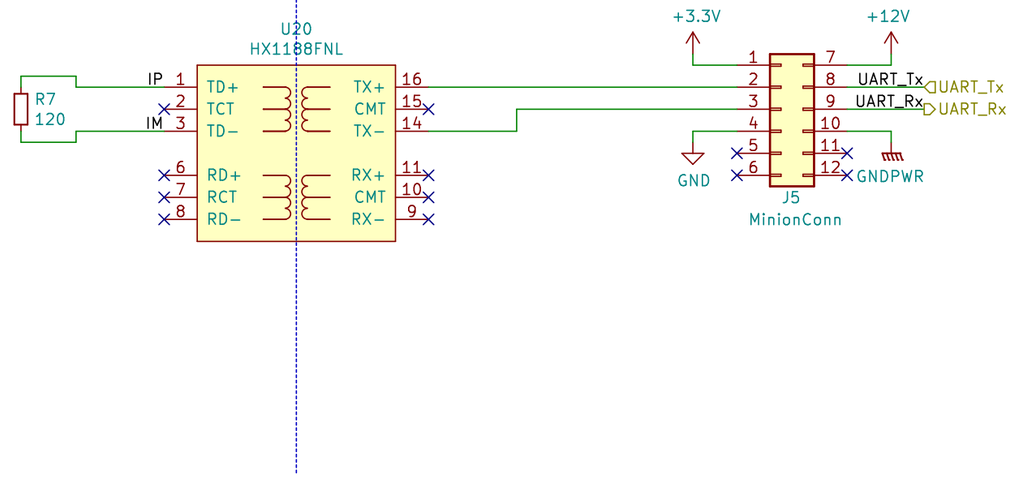
4-wire SPI to 2-wire Isolated SPI Converter ICs





ISOLATED

Connectors



Sheet: /MinionBrdInterface/		
File: MinionBrdInterface.sch		
Title:		
Size: A4	Date:	**Rev:**
KiCad E.D.A. kicad (5.1.5)-3		Id: 10/10