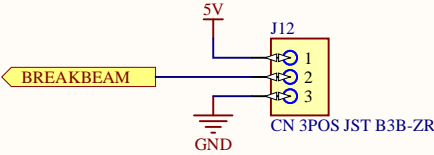
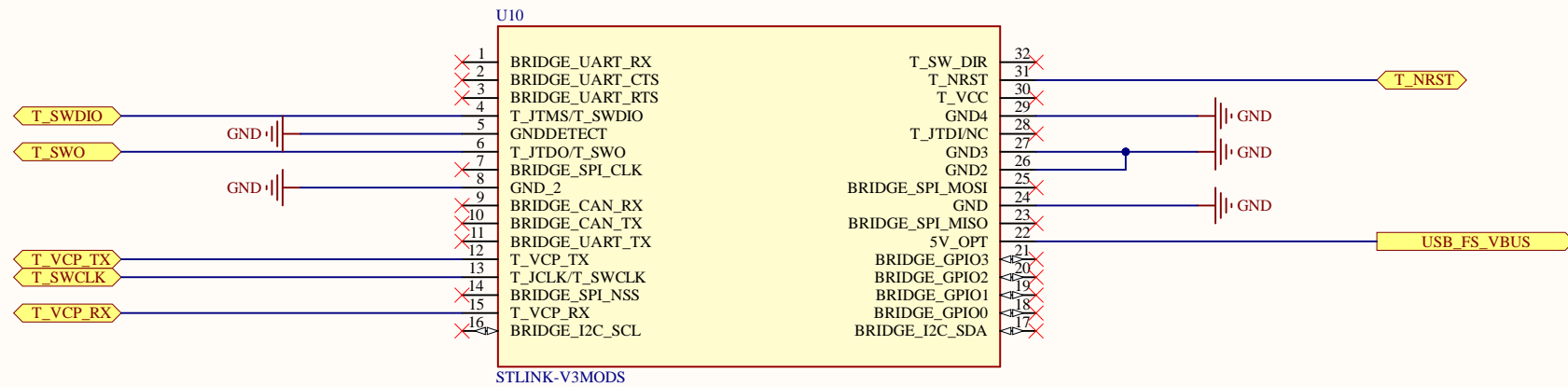


Breakbeam Interface



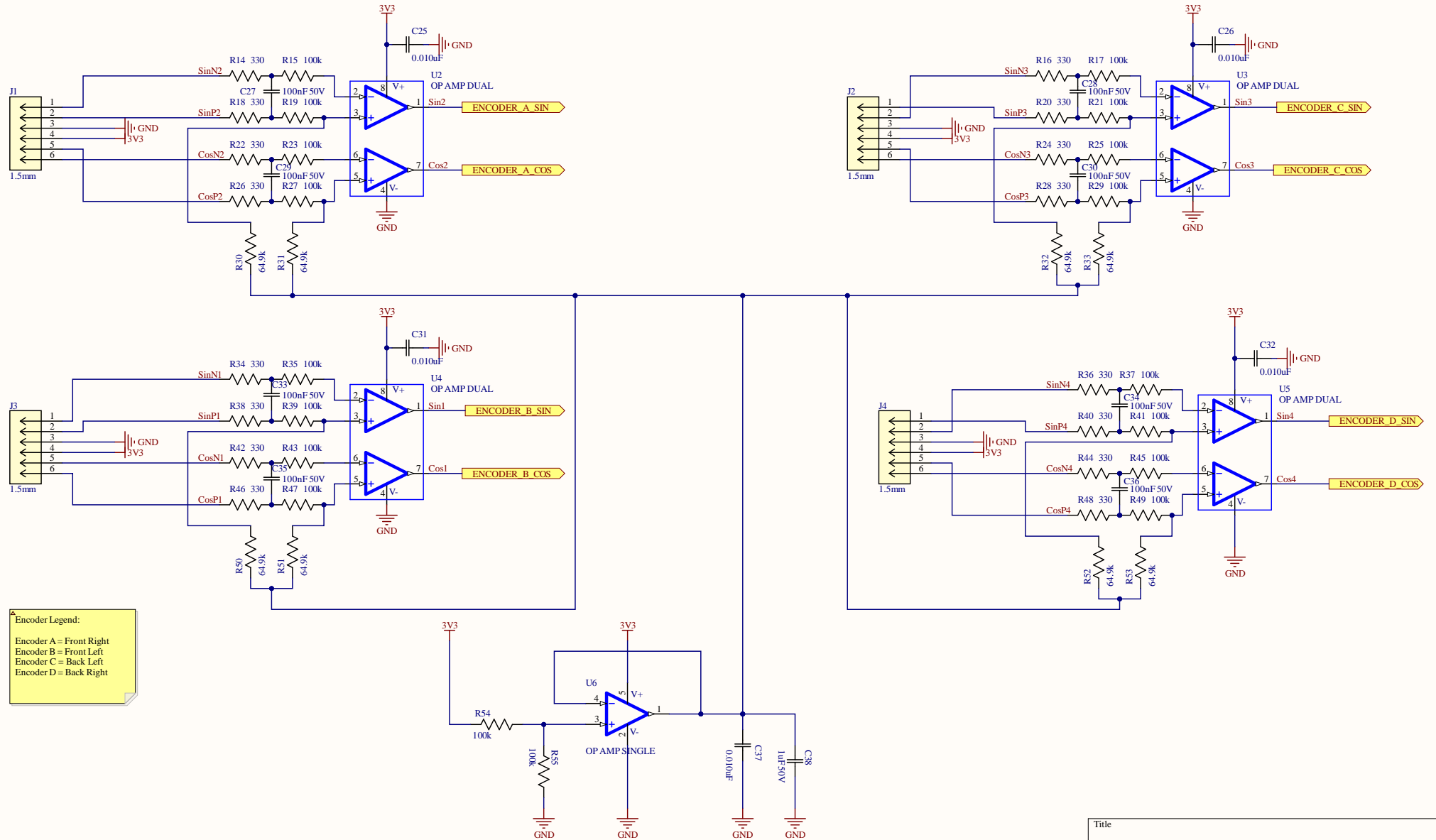
Title		
Size A4	Number	Revision
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\...\Mainboard_Breakbeam Interface.SchDoc	

Debug Interface



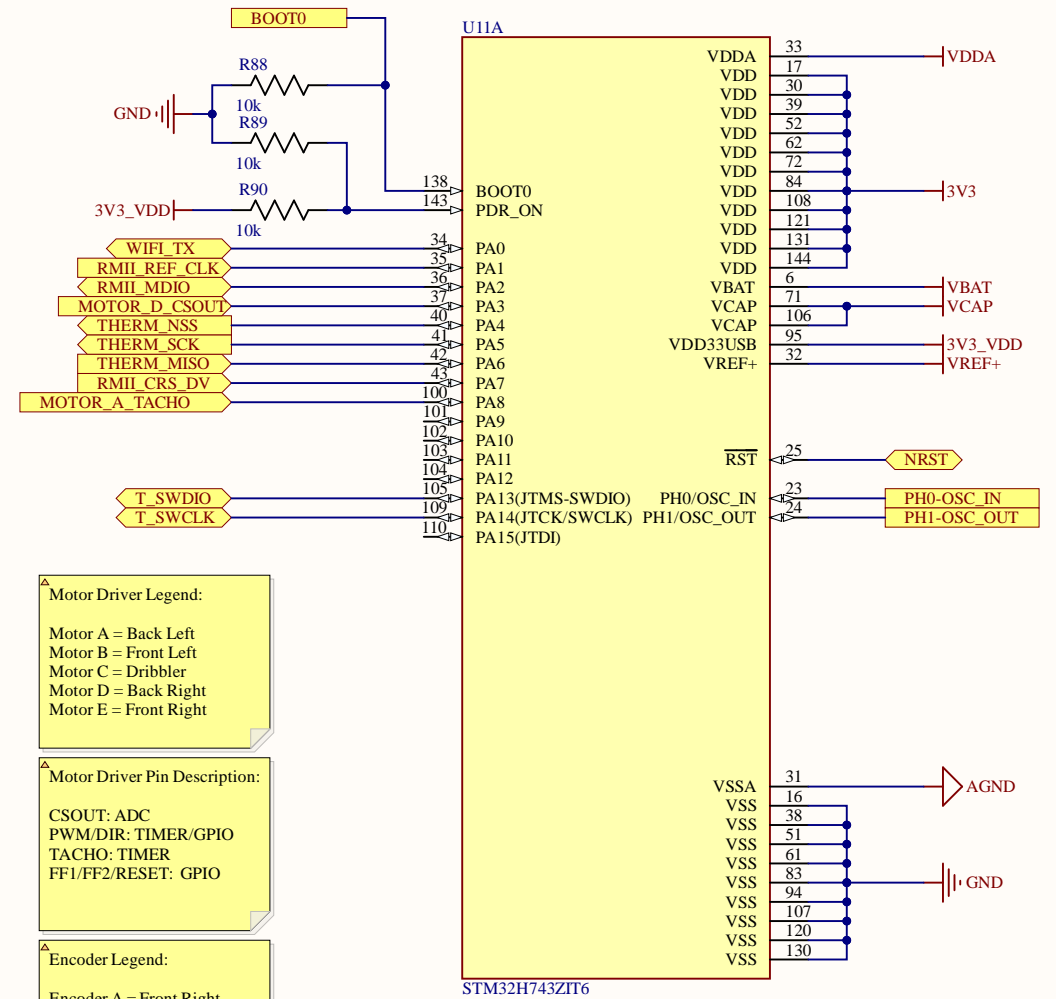
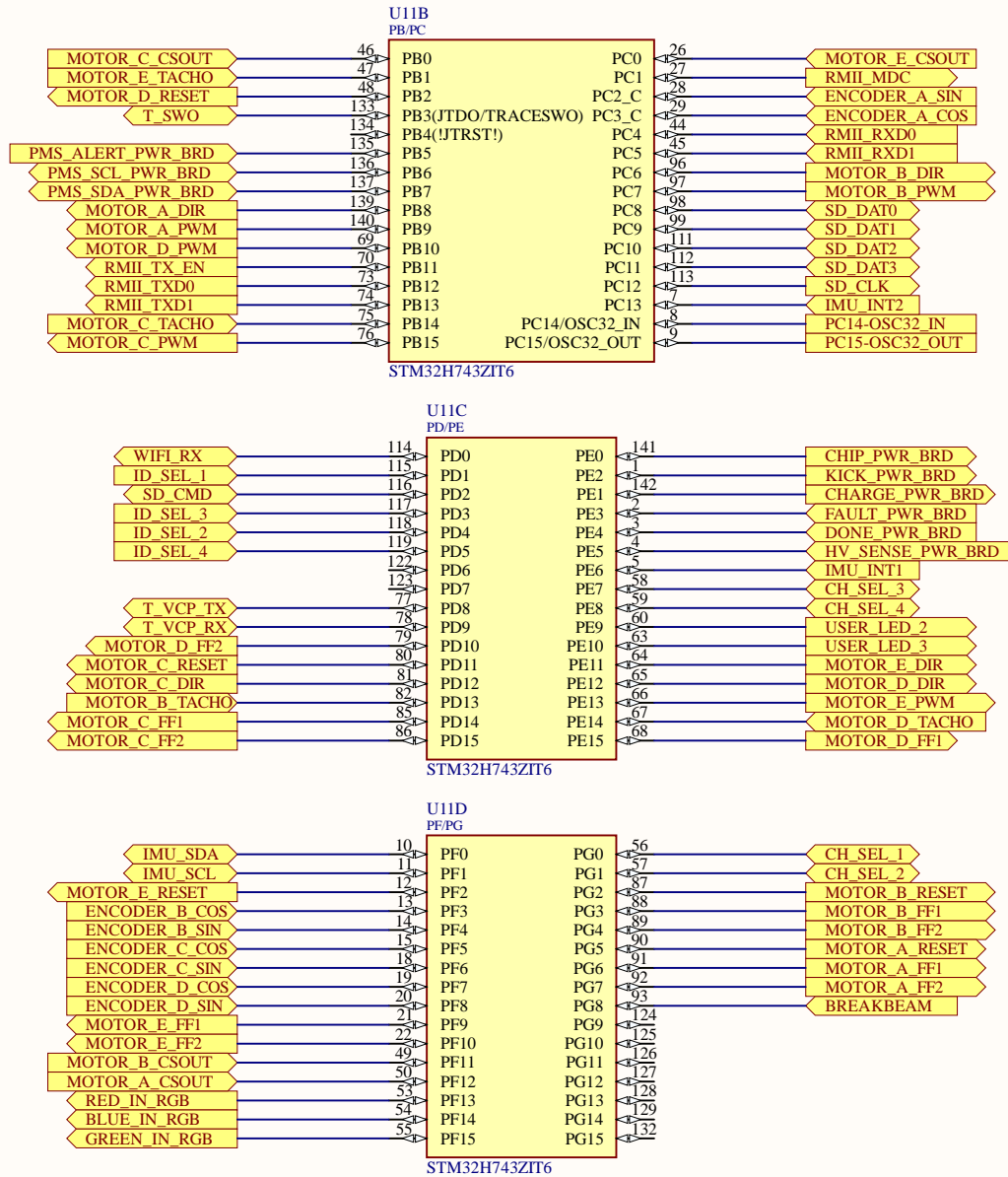
Title		
Size A4	Number	Revision
Date: 2-20-2021	Sheet of	
File: D:\UBC-Thunderbots\..\Mainboard_Debug\Printed\MainBoard_SchDoc		

Encoder Interface



Title		
Size	Number	Revision
A4		
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\Mainboard_End-Office-SchDoc	

MCU Breakout



Motor Driver Legend:

- Motor A = Back Left
- Motor B = Front Left
- Motor C = Dribbler
- Motor D = Back Right
- Motor E = Front Right

Motor Driver Pin Description:

CSOUT: ADC
PWM/DIR: TIMER/GPIO
TACHO: TIMER
FF1/FF2/RESET: GPIO

Encoder Legend:

Encoder A = Front Right
Encoder B = Front Left
Encoder C = Back Left
Encoder D = Back Right

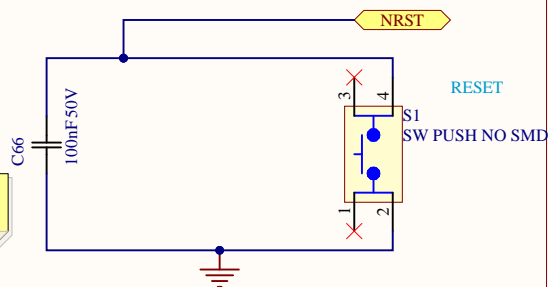
Title		
Size A4	Number	Revision
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\Mainboard_MCU\Break for SchDoc	

MCU Function

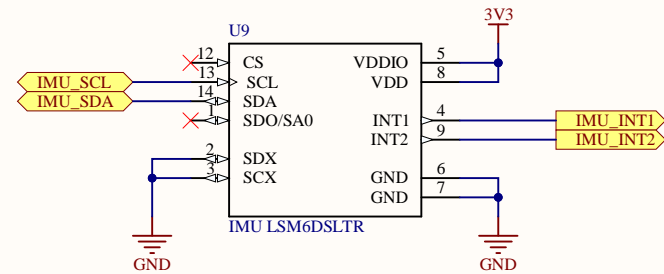
RESET FUNCTION

NRST

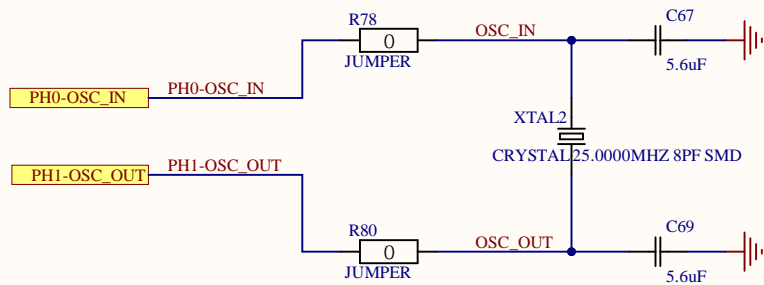
Place capacitor close to MCU pad



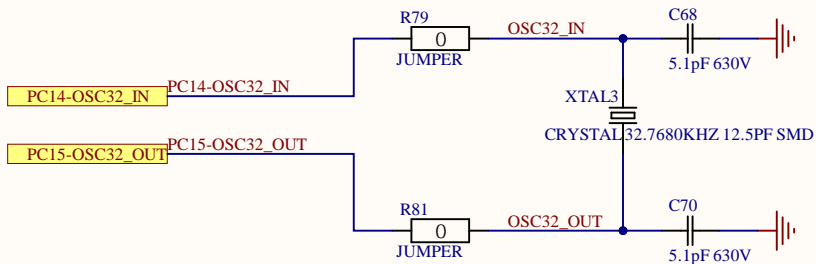
ACCELEROMETER, GYROSCOPE, THERMOMETER + OTHER SENSORS



EXTERNAL HSE CLK



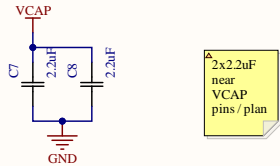
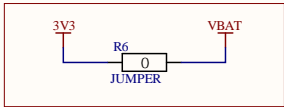
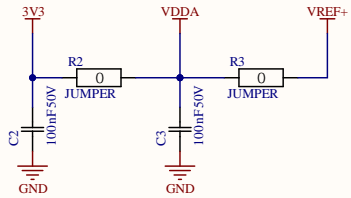
EXTERNAL LSE CLK



Title		
Size	Number	Revision
A4		
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\...\Mainboard_MCU_Function_SchDoc	1 of 1

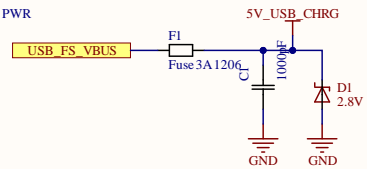
MCU Power

MCU PWR SUPPLIES

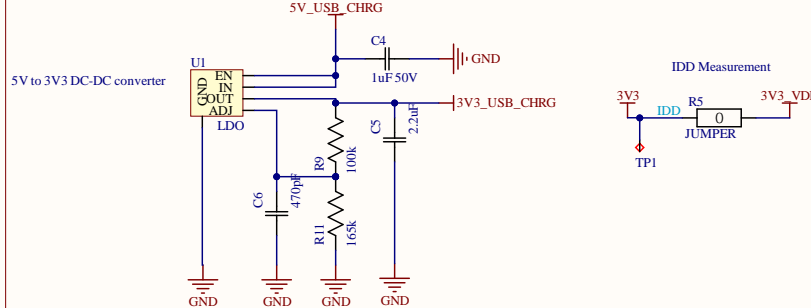


2x2.2uF
near
VCAP
pins / plan

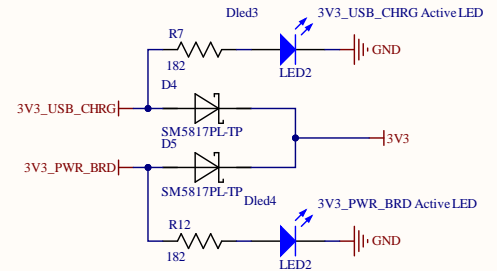
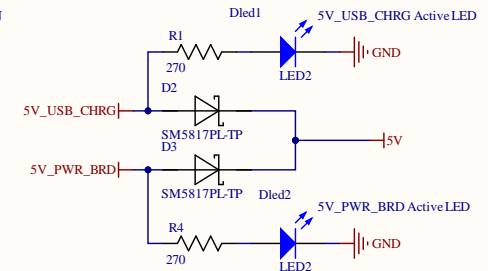
5V USB PWR



3V3 USB PWR

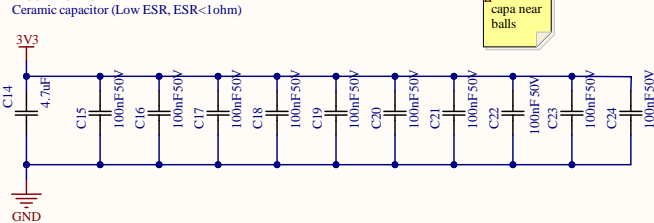


PWR SELECTION

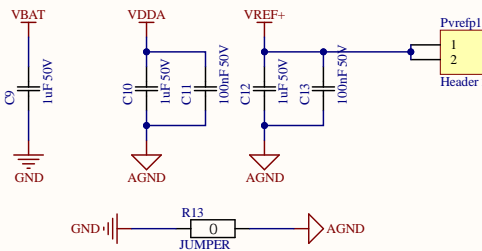


MCU DECAPS

Ceramic capacitor (Low ESR, ESR<1ohm)



capa near
balls

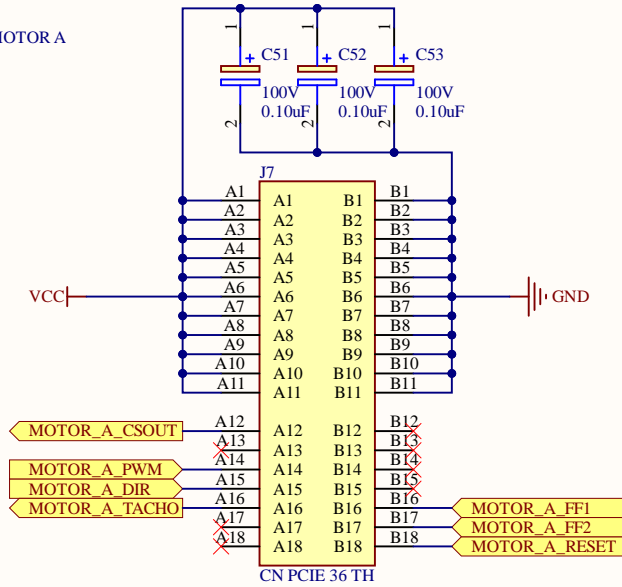


Pvrefp1
1
2
Header 2

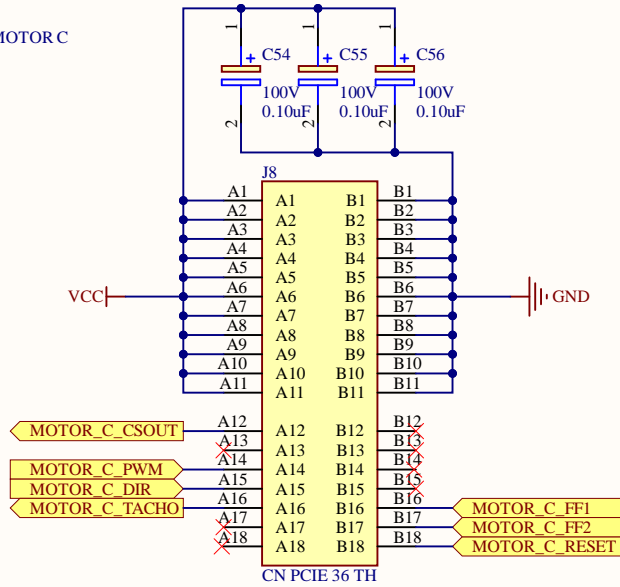
Title		
Size B	Number	Revision
Date: 2-20-2021	Sheet of	
File: D:\UBC-Thunderbots\MainBoard_MCU Power\BschDoc	MCU Power	

Motordriver Interface

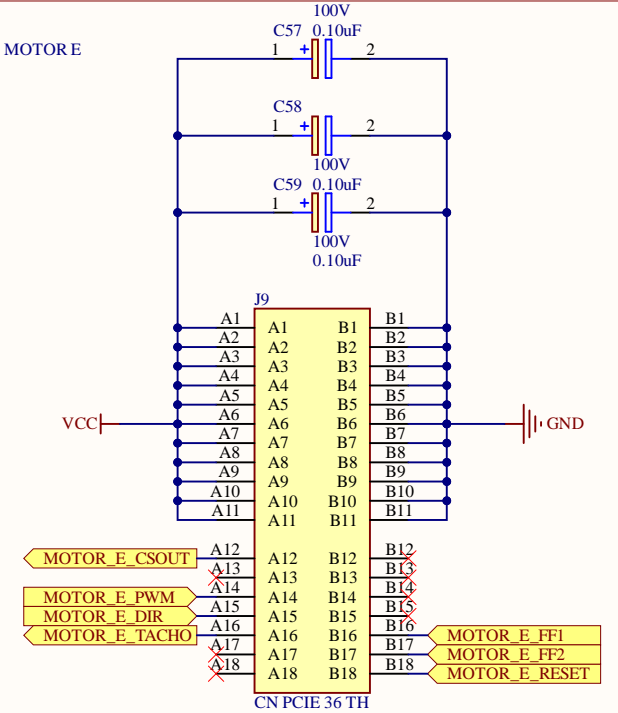
MOTOR A



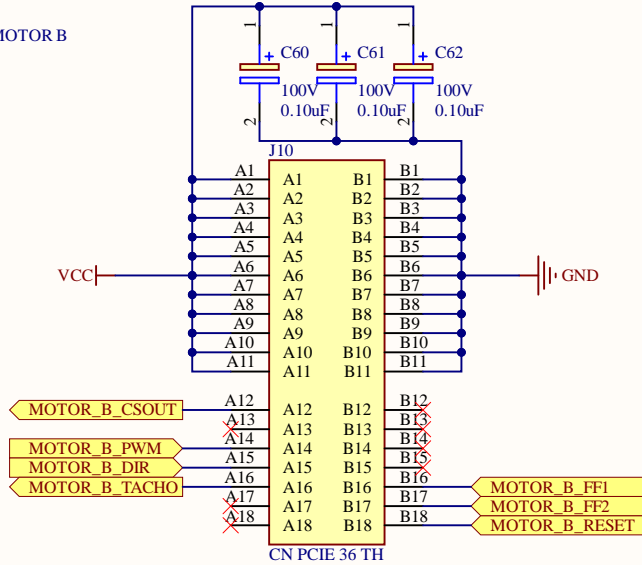
MOTOR C



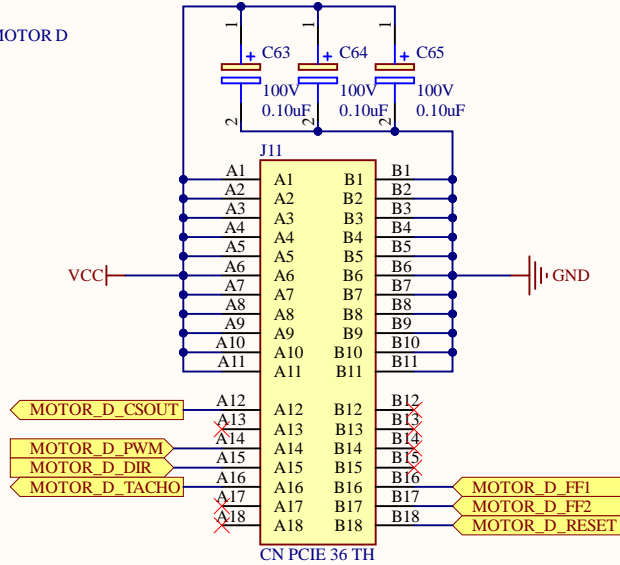
MOTOR E



MOTOR B



MOTOR D



Motor Driver Legend:

Motor A = Back Left
Motor B = Front Left
Motor C = Dribbler
Motor D = Back Right
Motor E = Front Right

Pin Description:

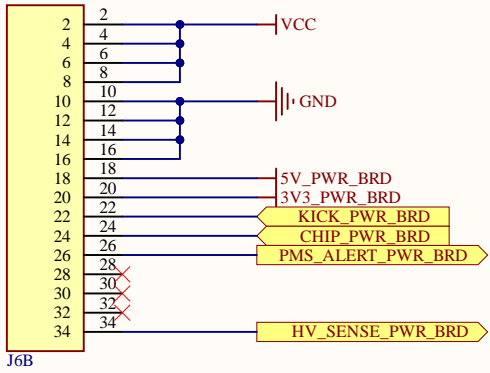
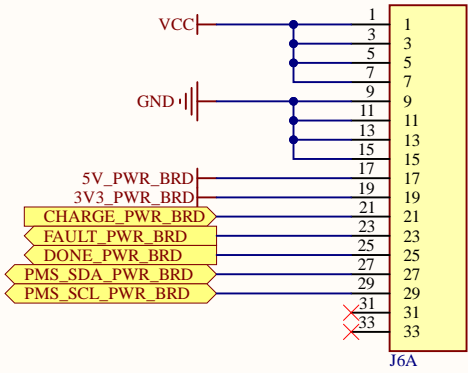
CSOUT: ADC
PWM/DIR: TIMER/GPIO
TACHO: TIMER
FF1/FF2/RESET: GPIO

Title		
Size A4	Number	Revision
Date: 2-20-2021	Sheet of	
File: D:\UBC-Thunderbots\...\Mainboard_MotordriverInterface.SchDoc		

Power Board Interface

CHARGE/FAULT/DONE 3.3V logic signals. From charge control IC. Send to MCU.

PMS_SDA/SCL I2C communication wires. Send to MCU.



Battery voltage for the motordrivers.

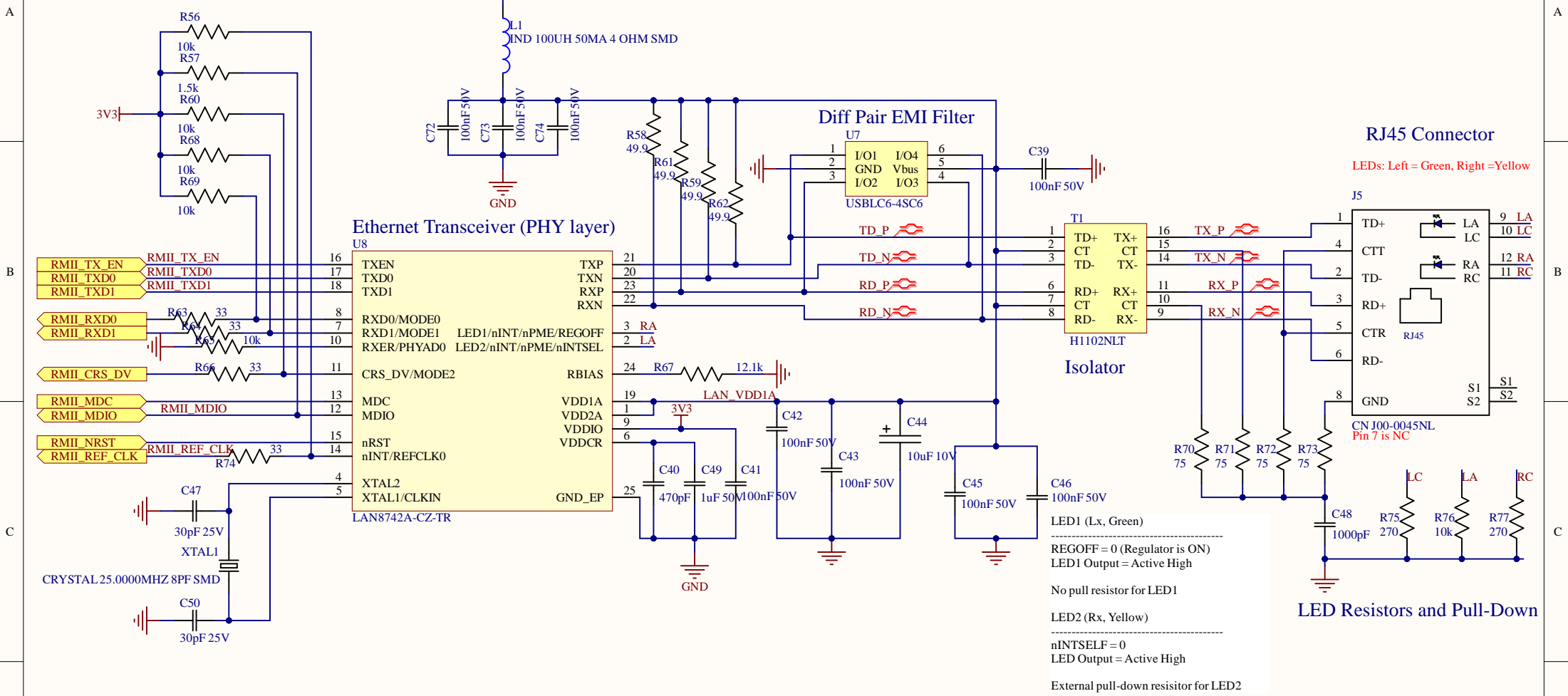
KICK/CHIP_PWR_BRD logic level signals. Send to MCU.

PMS_ALERT_PWR_BRD logic level fault pin. Send to MCU.

HV_SENSE analog feedback from the cap bank voltage (0-3.3V). Send to MCU.

Title		
Size	Number	Revision
A4		
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\Mainboard_PowerBoard\Mainboard_PowerBoard_SchDoc	

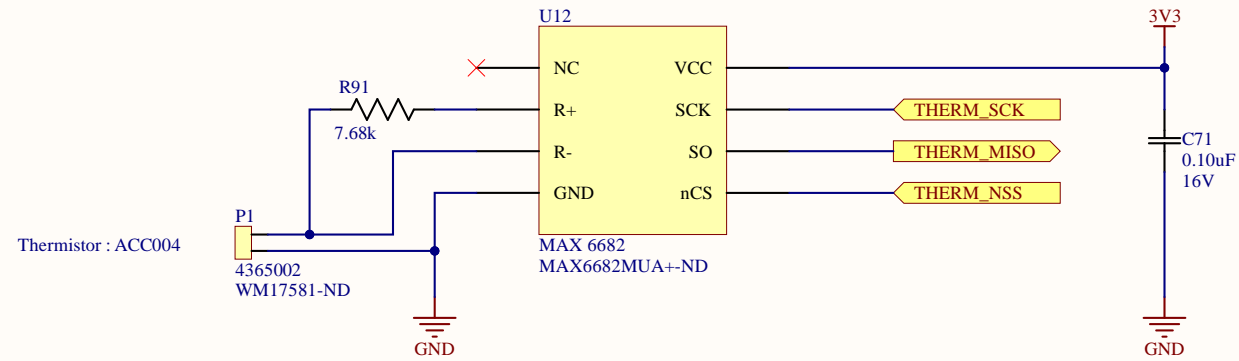
RMII Interface



LED Resistors and Pull-Down

Title		
Size	Number	Revision
A4		
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\...\Mainboard_RMII Interface.SchDoc	

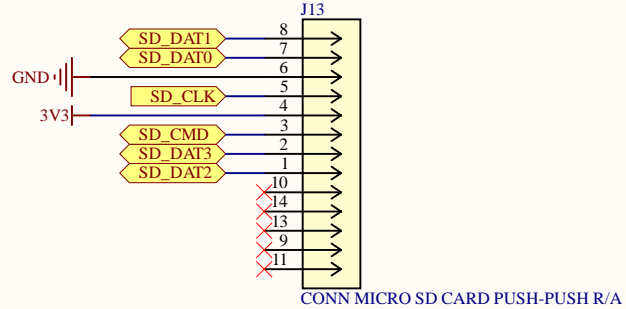
Thermistor Amplifier



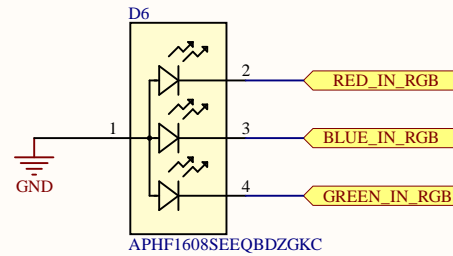
Title		
Size	Number	Revision
A		
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\Mainboard_Thermistor\Drawings\Thermistor_SchDoc	

User Interface

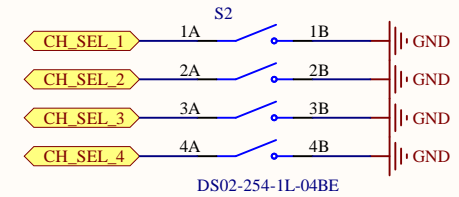
SD Connector



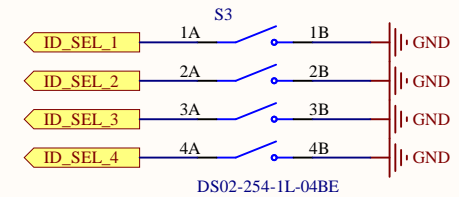
RGB LED



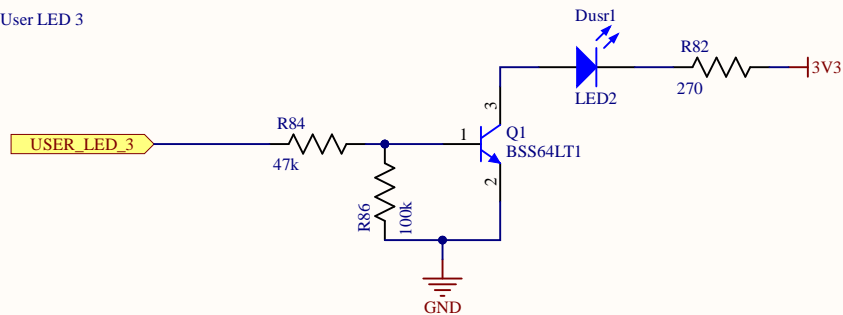
Channel Select



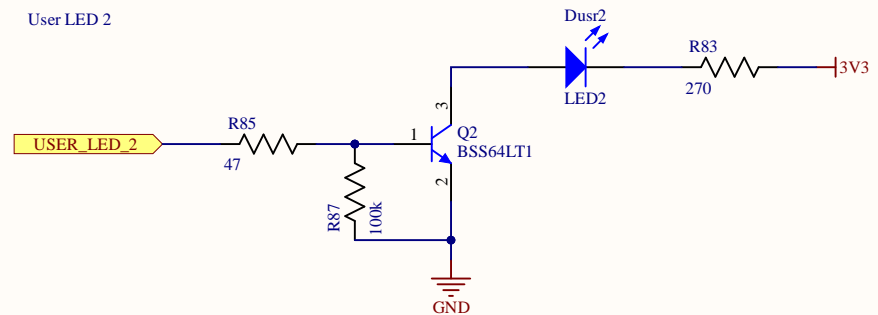
Robot ID Select



User LED 3

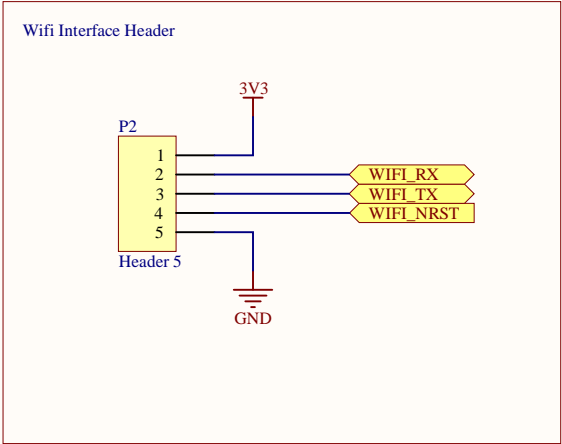


User LED 2



Title		
Size A4	Number	Revision
Date:	2-20-2021	Sheet of
File:	D:\UBC-Thunderbots\...\Mainboard_User Interface.SchDoc	

Wifi Interface



Title		
Size A4	Number	Revision
Date:	2-20-2021	Sheet of 3
File:	D:\UBC-Thunderbots\...\Mainboard_Wifi_Interface_SchDoc	

