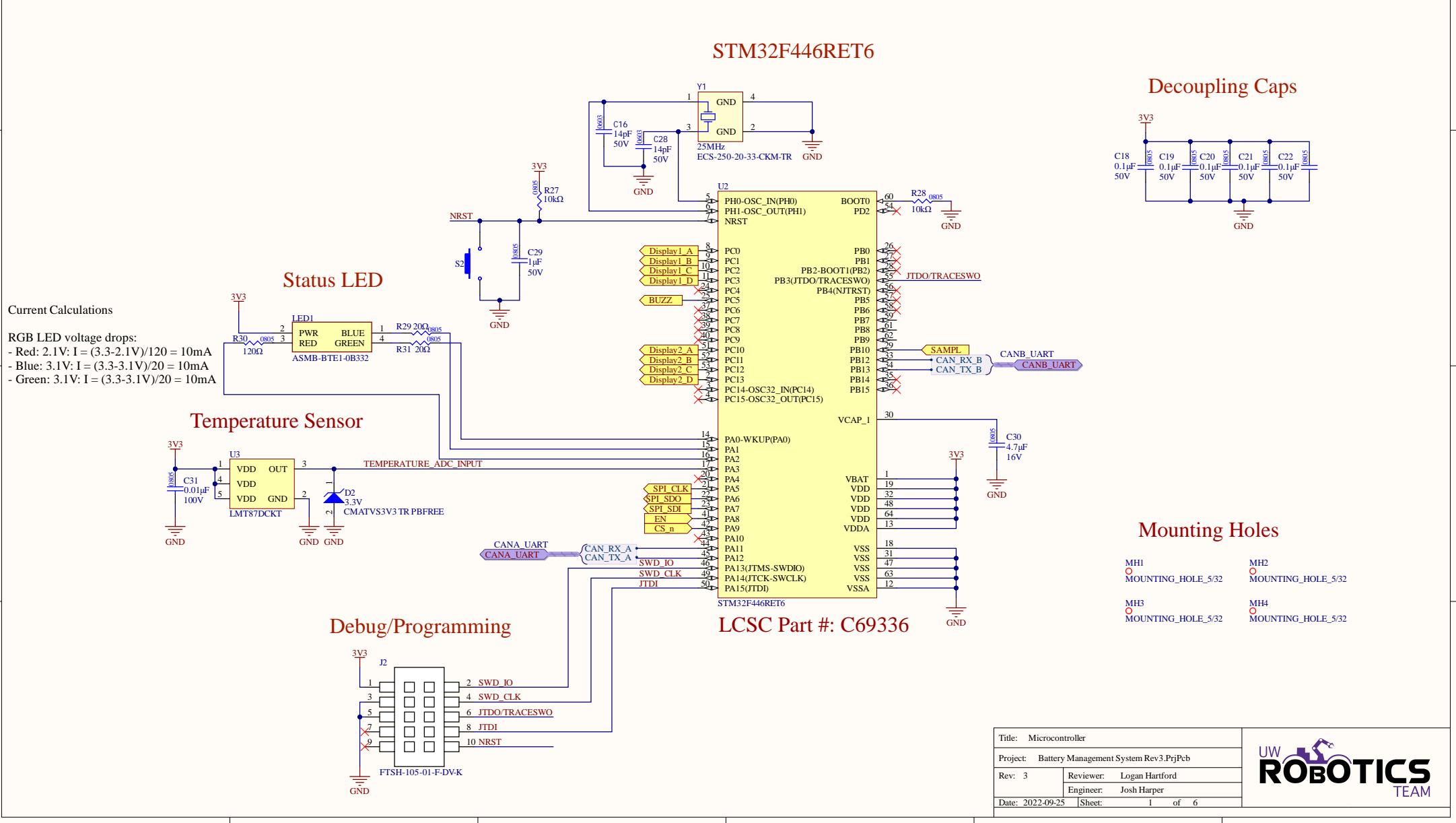


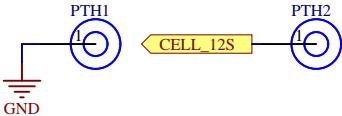
Microcontroller

STM32F446RET6



BMS

CUSTOM BATTERY CONNECTION



BMS IC

Set EN to low to put device into shutdown and reset SPI registers

CV₋ voltages are tracked when SAMPL is high

3V3

50V
0.1μF

GND

AOUT

AGND

VA

LDOIN

VP

CV16

BA16

CT16

CB16

CV15

BA15

CT15

CB15

CV14

BA14

CT14

CB14

CV13

BA13

CT13

CB13

CV12

BA12

CT12

CB12

CV11

BA11

CT11

CB11

CV10

BA10

CT10

CB10

CV9

BA9

CT9

CB9

CV8

BA8

CT8

CB8

CV7

BA7

CT7

CB7

CV6

BA6

CT6

CB6

CV5

BA5

CT5

CB5

CV4

BA4

CT4

CB4

CV3

BA3

CT3

CB3

CV2

BA2

CT2

CB2

CV1

BA1

CT1

CB1

CV0

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

C7

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

SAMPL

3V3

0603

50V

0.1μF

GND

EN

CS_n

SPI_CLK

SPI_SDI

SPI_SDO

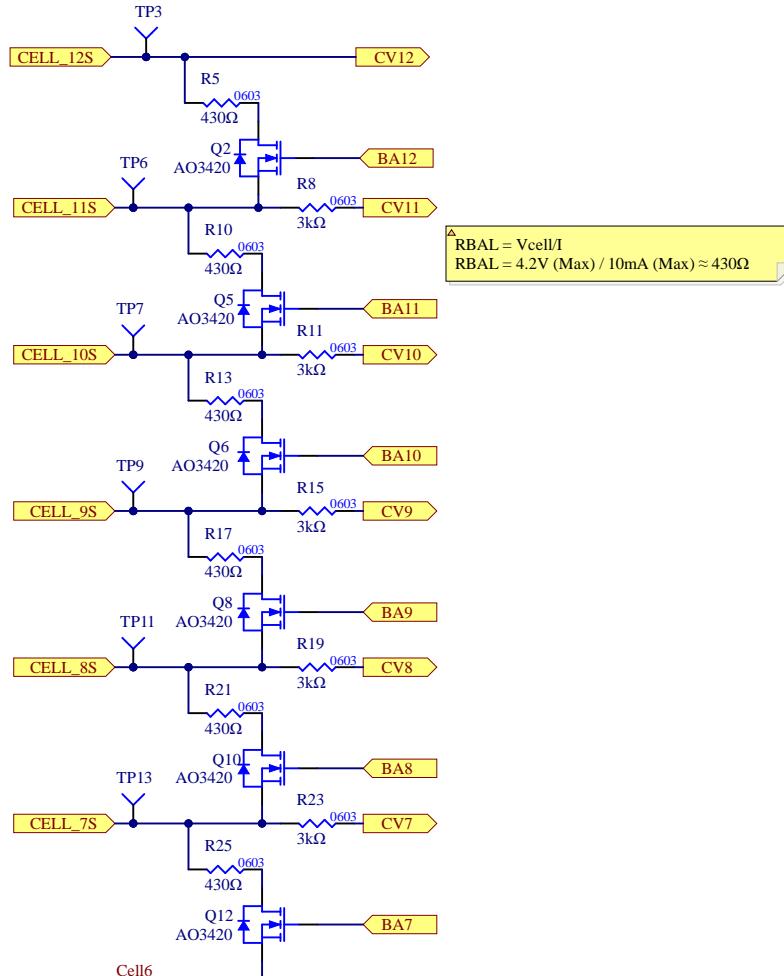
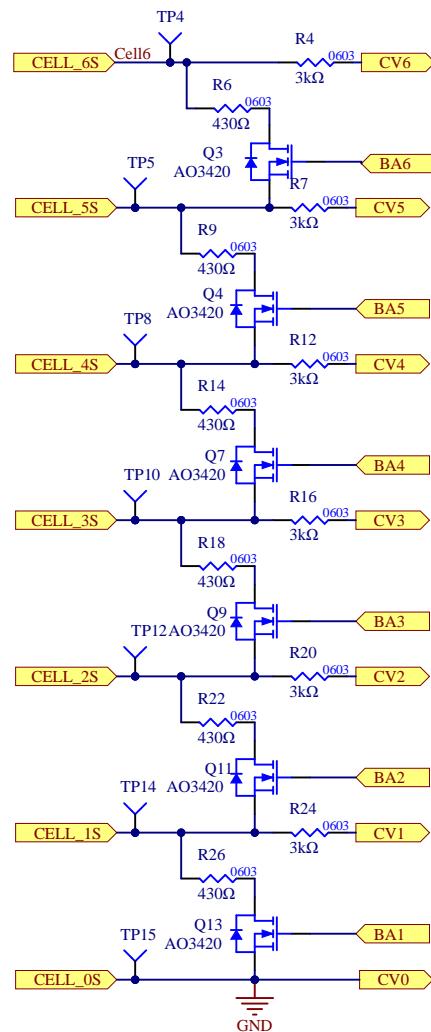
SAMPL

3V3

0603

Passive Cell Balancing Circuit

A



B

A

B

C

C



University of Waterloo Robotics Team
200 University Ave W
Waterloo, Ontario, Canada
N2L 3G1

REV
3

PROJECT

Battery Management System Rev3.PjrPcb, [No Variations]

DOCUMENT

BatteryBalancingRev3.SchDoc

MODIFIED

2022-09-24

ENGINEER

Josh Harper

REVIEWER

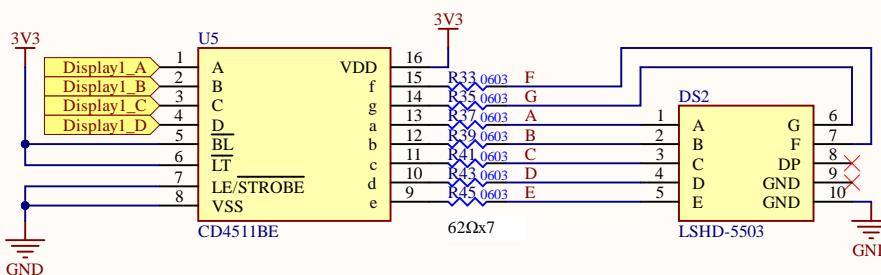
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SHEET

3 OF 6

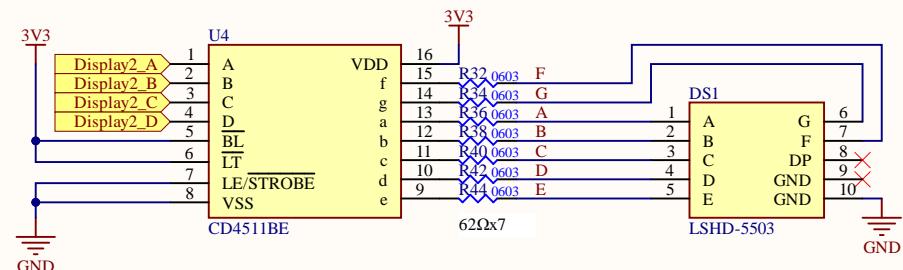
Display

DISPLAY 1

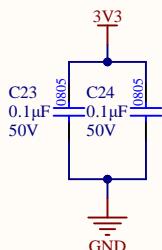


Resistor Calculations
 $(3.3V - 2.1V) / 20mA = 60\Omega$
 (62Ω based on availability)

DISPLAY 2



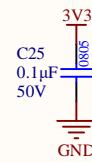
Decoupling Caps



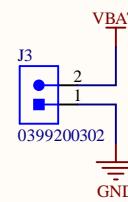
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A4		
Date: 9-25-2022	Sheet of	
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Power

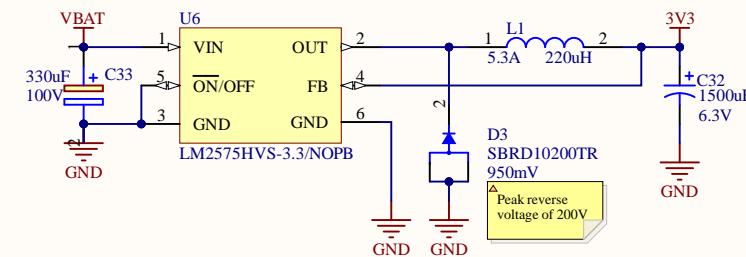
DECOUPLING CAP



POWER CONNECTOR



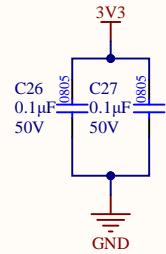
3.3V BUCK CONVERTER



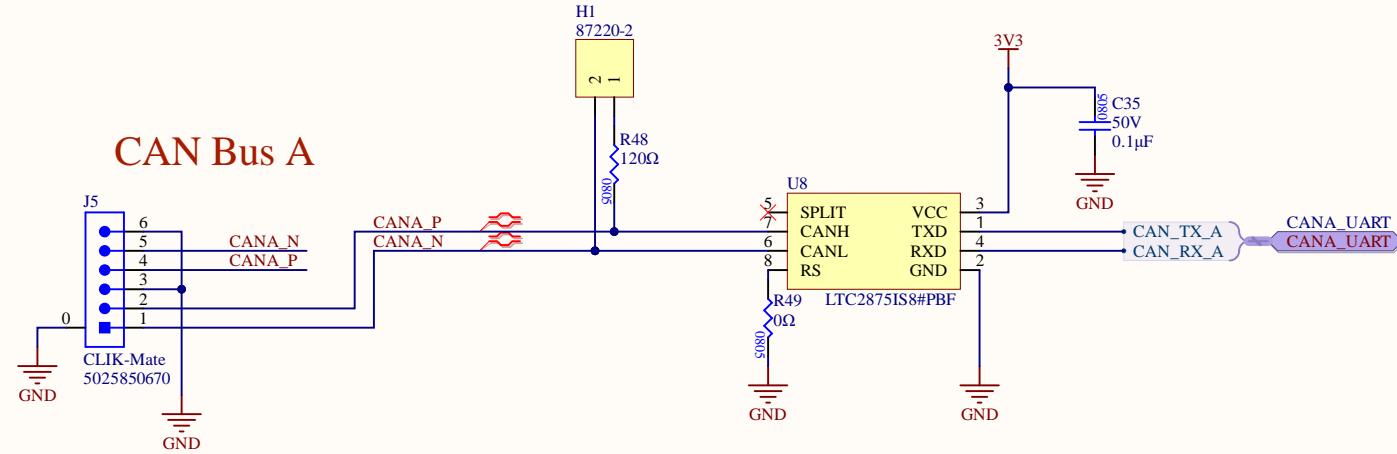
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CAN Transceivers

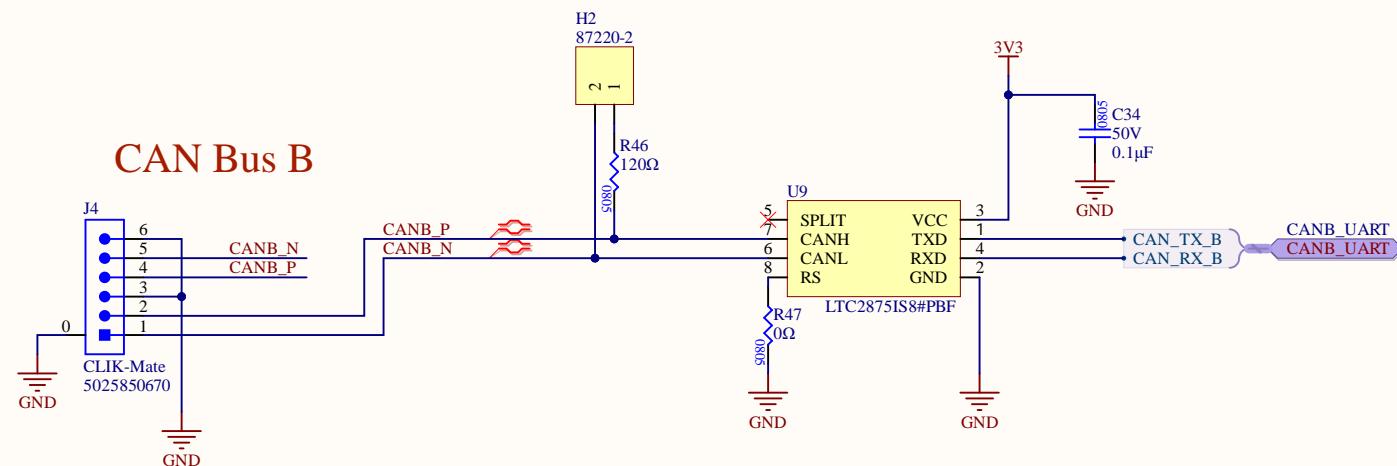
Decoupling Caps



CAN Bus A



CAN Bus B



Title		
Size	Number	Revision
A4		
Date: 9-25-2022	Sheet of	
File: C:\Users\.\CAN.SchDoc		Drawn By:

