

Microcontroller

STM32F446RET6

Decoupling Caps

A

A

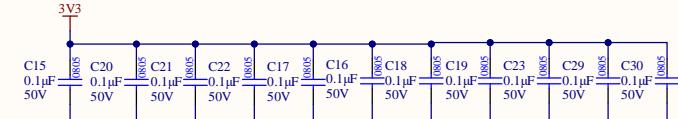
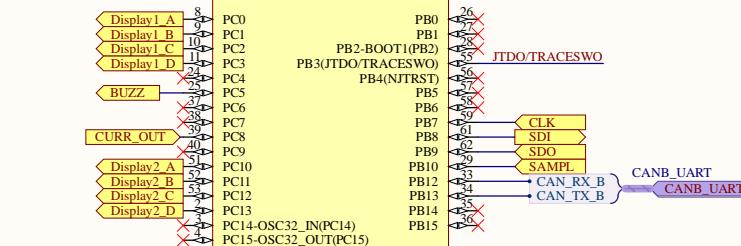
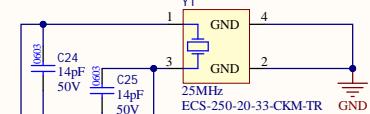
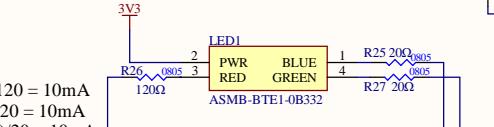
B

B

Current Calculations

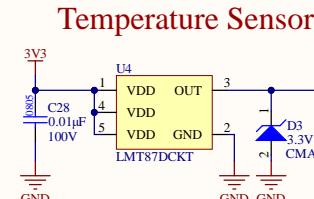
- RGB LED voltage drops:
 - Red: $2.1V = (3.3-2.1V)/120 = 10mA$
 - Blue: $3.1V = (3.3-3.1V)/20 = 10mA$
 - Green: $3.1V = (3.3-3.1V)/20 = 10mA$

Status LED

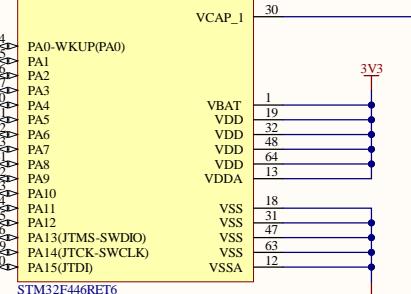
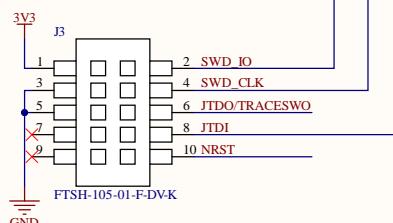


C

C

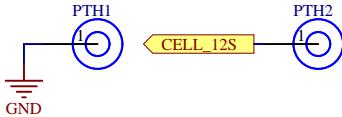


Debug/Programming



BMS

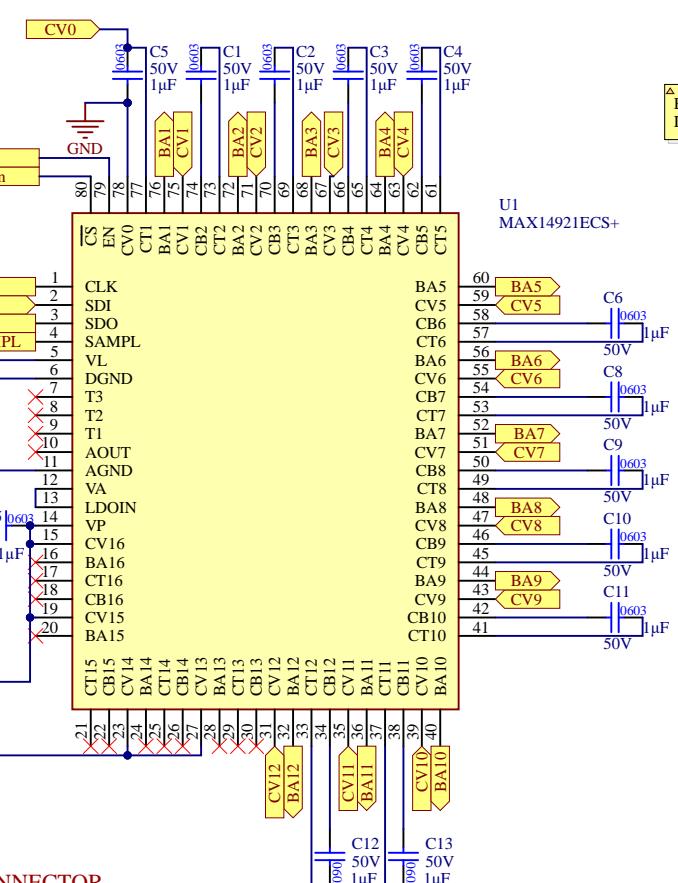
CUSTOM BATTERY CONNECTION



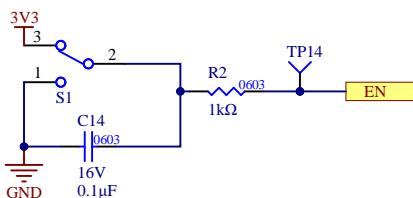
Set EN to low to put device into shutdown and reset SPI registers

CV₋ voltages are tracked when SAMPL is high

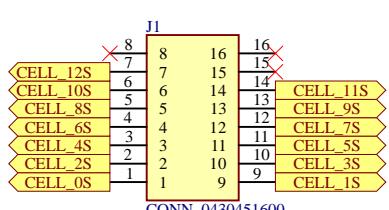
BMS IC



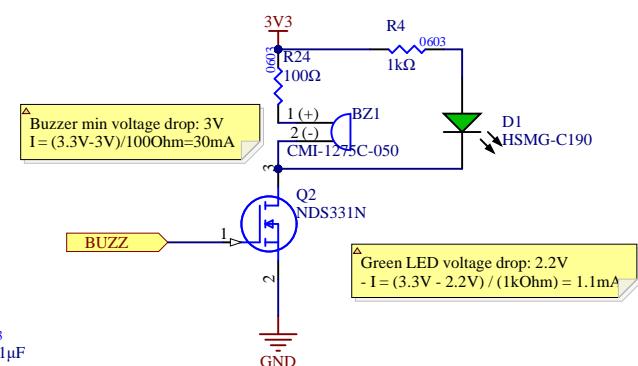
RESET SWITCH



BATTERY CONNECTOR



BUZZER



Buzzer min voltage drop: 3V
I = (3.3V - 3V) / 100Ω = 30mA

Green LED voltage drop: 2.2V
- I = (3.3V - 2.2V) / (1kΩ) = 1.1mA



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REV
3

PROJECT
Battery Management System Rev3.PjrPcb, [No Variations]

DOCUMENT
BMSRev3.SchDoc

MODIFIED
2022-09-23

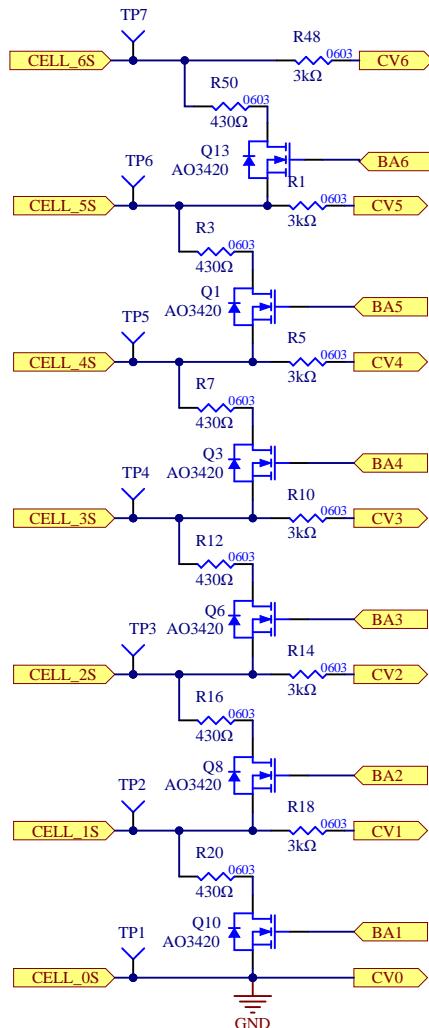
ENGINEER
Josh Harper

REVIEWER
Farris Matar

SHEET 2 OF 6

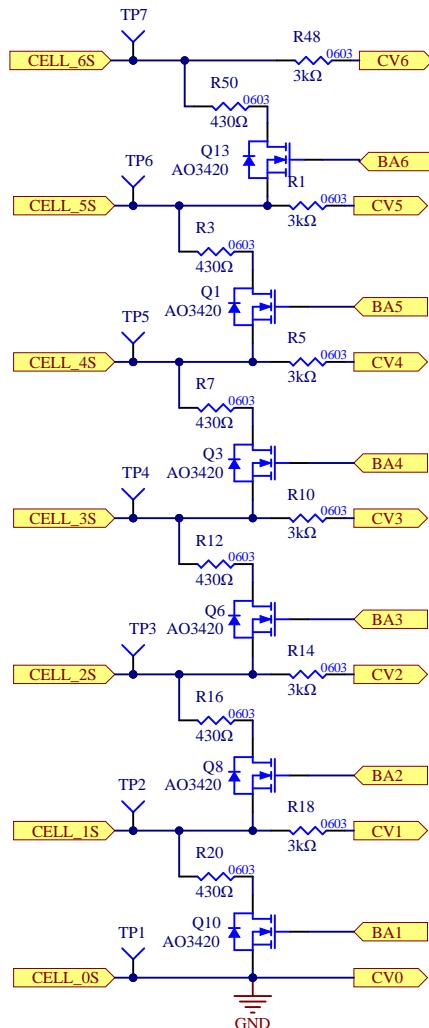
Passive Cell Balancing Circuit

A



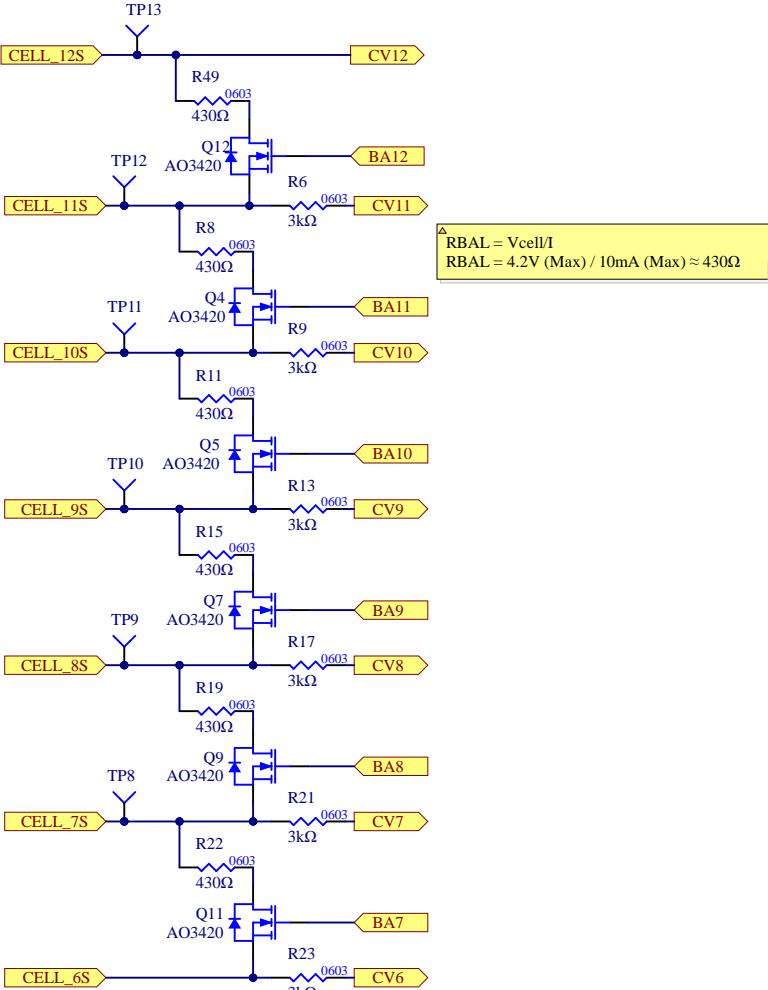
A

B



B

C



C



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Waterloo, Ontario, Canada
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REV
3

PROJECT
Battery Management System Rev3.PjrPcb, [No Variations]

DOCUMENT
BatteryBalancingRev3.SchDoc

MODIFIED
2022-09-22

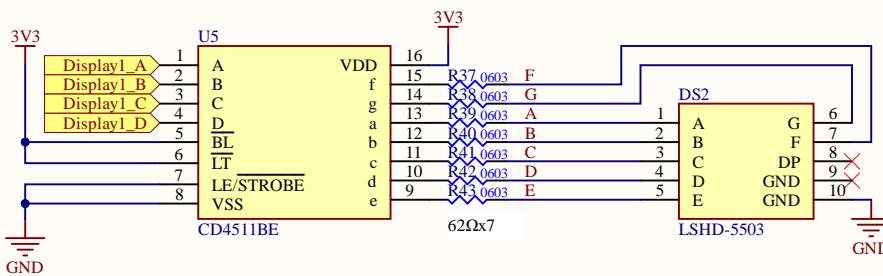
ENGINEER
Josh Harper

REVIEWER
*

SHEET 3 OF 6

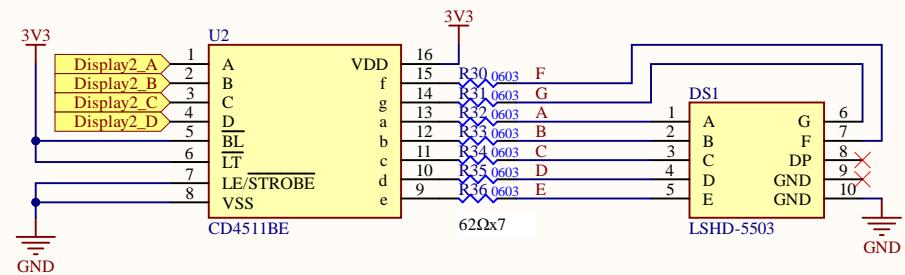
Display

DISPLAY 1



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

DISPLAY 2



Title

Size

A4

Number

Revision

Date: 9-22-2022

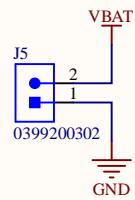
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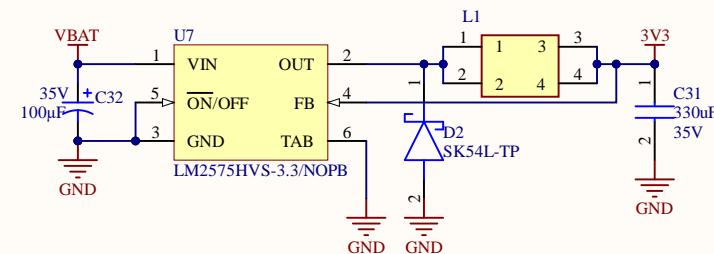
Drawn By:

Power

POWER CONNECTOR

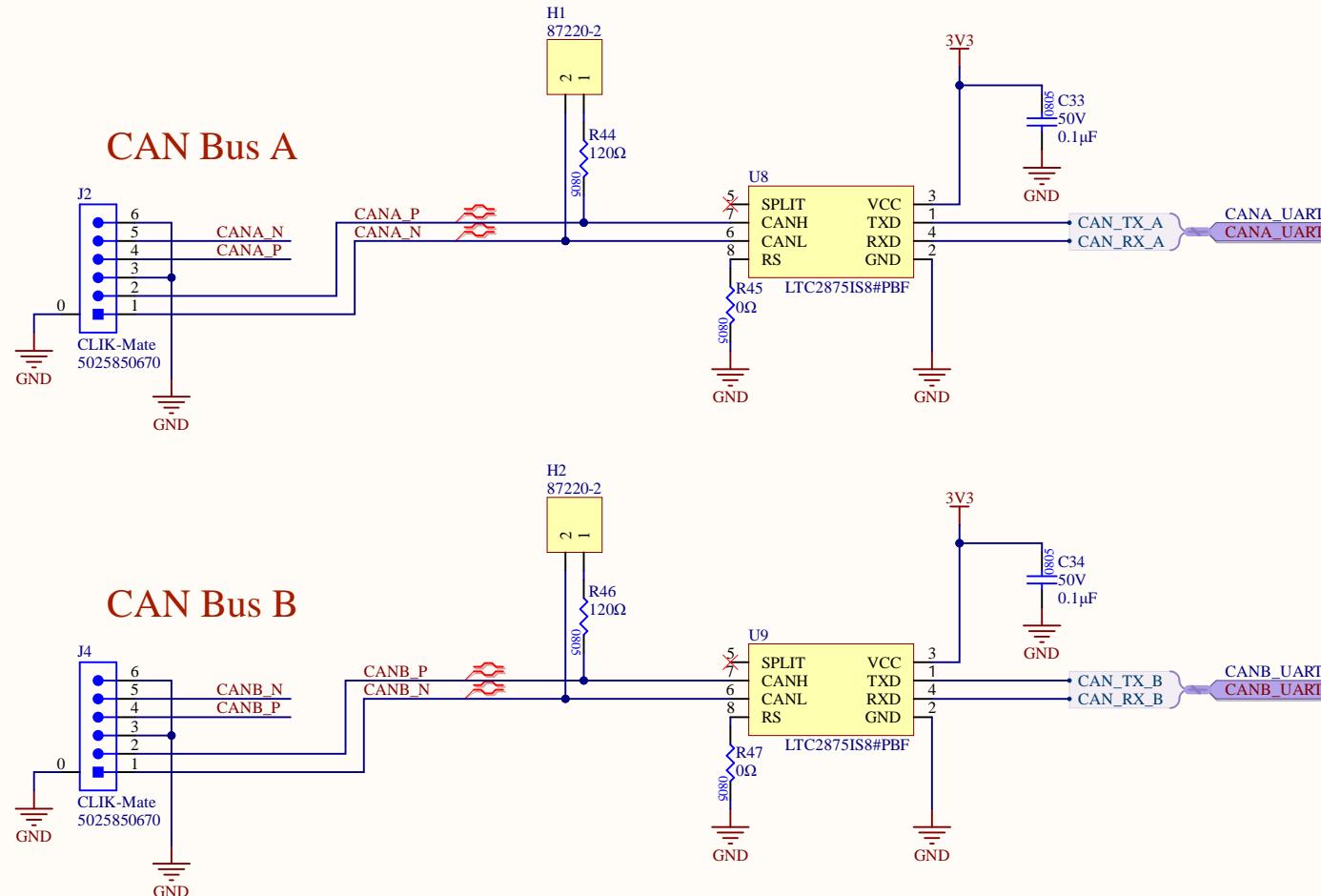


3.3V BUCK CONVERTER



Title		
Size	Number	Revision
A4		
Date: File:	9-22-2022 C:\Users.\Power.SchDoc	Sheet of Drawn By:

CAN Transceivers



Title		
Size	Number	Revision
A4		
Date: 9-22-2022	Sheet of	
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