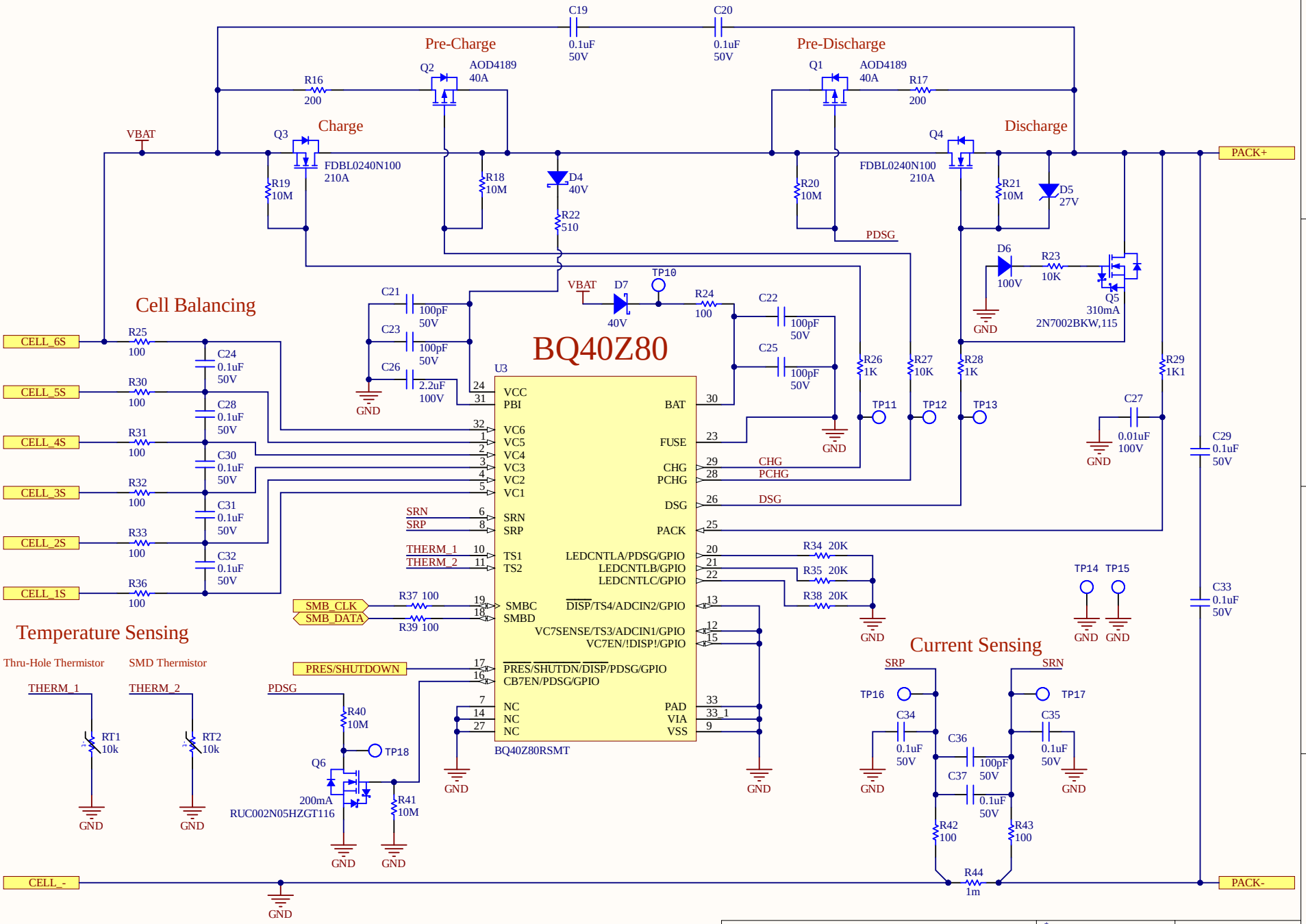
Pre-Charge
Pre-Discharge
Charge
Discharge
Cell Balancing
Temperature Sensing
Current Sensing
BQ40Z80
BQ40Z80RSMT
VBAT
PACK+
PACK-
CELL_6S
CELL_5S
CELL_4S
CELL_3S
CELL_2S
CELL_1S
CELL_-
SMB_CLK
SMB_DATA
PRES/SHUTDOWN
PDSG
CHG
PCHG
DSG
SRP
SRN
THERM_1
THERM_2
Thru-Hole Thermistor
SMD Thermistor
FDBL0240N100
210A
AOD4189
40A
RUC002N05HZGT116
200mA
2N7002BKW,115
310mA
GND
U3
VCC
PBI
VC6
VC5
VC4
VC3
VC2
VC1
SRN
SRP
TS1
TS2
SMBC
SMBD
CB7EN/PDSG/GPIO
NC
NC
NC
BAT
FUSE
CHG
PCHG
DSG
PACK
LEDCNTLA/PDSG/GPIO
LEDCNTLB/GPIO
LEDCNTLC/GPIO
DISP/TS4/ADCIN2/GPIO
VC7SENSE/TS3/ADCIN1/GPIO
VC7EN/!DISP!/GPIO
PRES/SHUTDN/DISP/PDSG/GPIO
PAD
VIA
VSS
Title Battery Manager
Size: Letter
Drawn By: Ayesha Ebrahim
Date: 2020-05-12
Sheet * of *
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\Battery Manager.SchDoc
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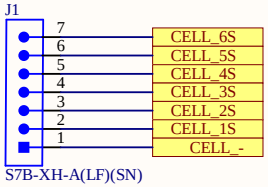
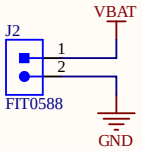
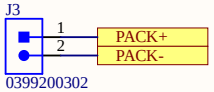
Battery Balancing



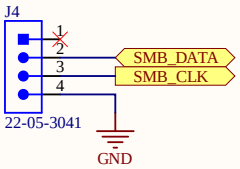
Battery In



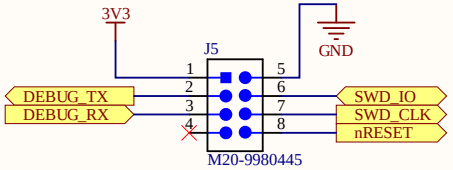
Pack Out



EV2400

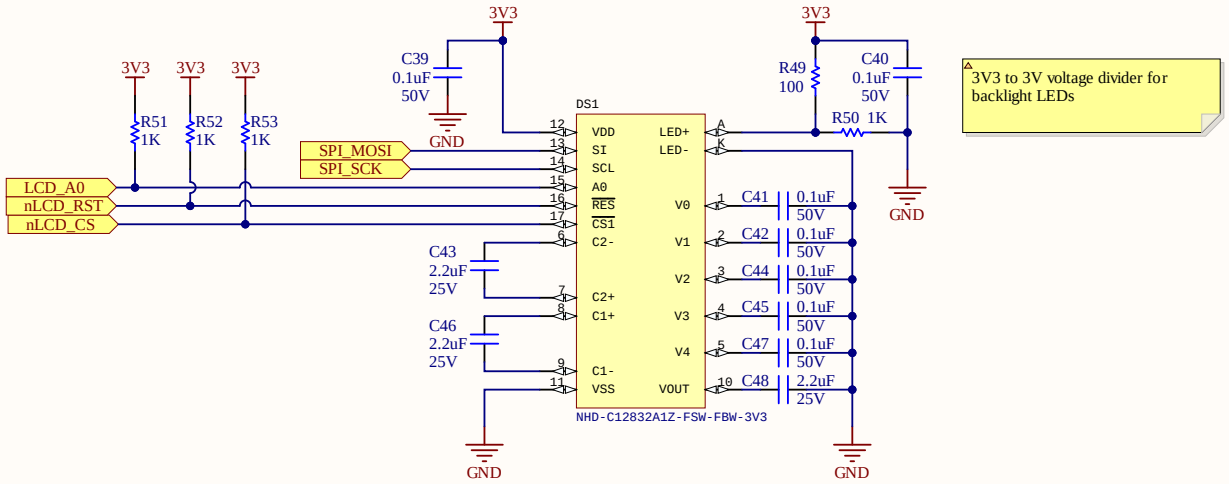


Debug/Programing



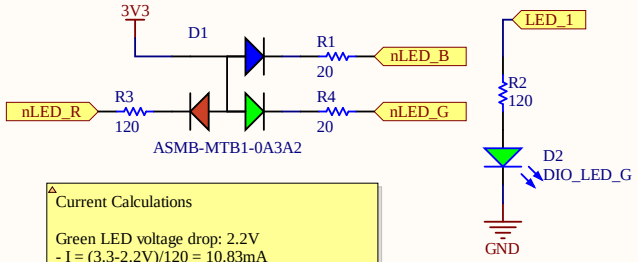
Title Connectors		UW Robotics 200 University Avenue Waterloo Ontario Canada N2L 3G6
Size: Letter	Drawn By: Ayesha Ebrahim	
Date: 2020-05-12	Sheet of	
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\Connectors.SchDoc		

LCD



Title LCD			
Size: Letter	Drawn By: Ayesha Ebrahim		
Date: 2020-05-12	Sheet * of *		
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\LCD.SchDoc			

Test LEDs

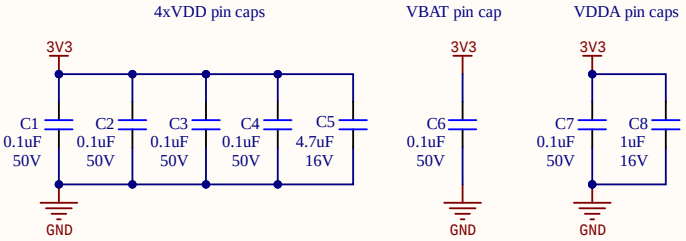


Current Calculations

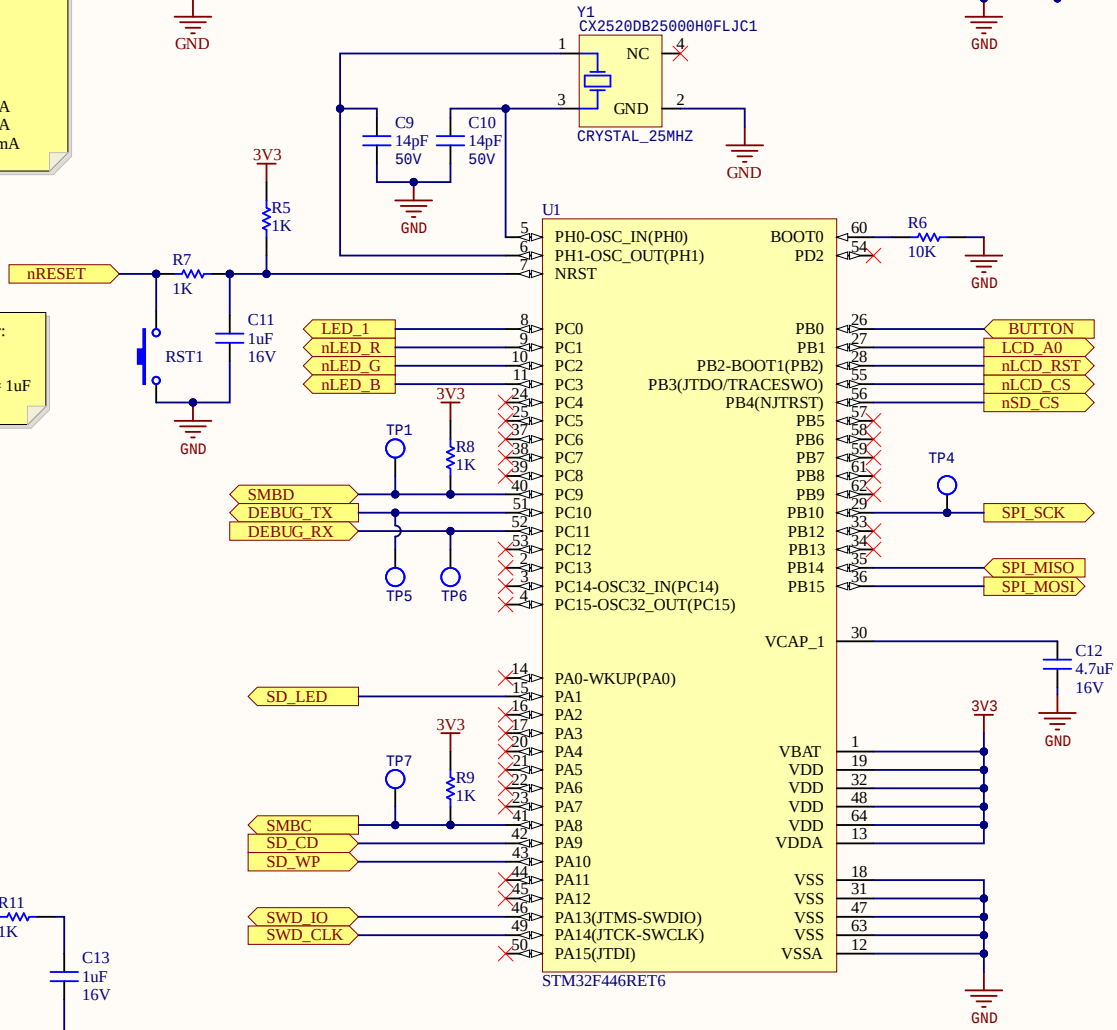
Green LED voltage drop: 2.2V
- I = (3.3-2.2V)/120 = 10.83mA

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

Decoupling Caps



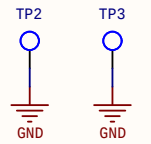
STM32F446RET6



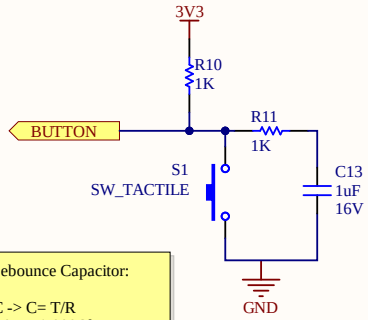
For Debounce Capacitor:

T=RC -> C= T/R
C=0.001ms/1000Ohms= 1uF

GND Test Points



Test Button



For Debounce Capacitor:

T=RC -> C= T/R
C=0.001ms/1000Ohms= 1uF

Title MCU			UW ROBOTICS TEAM
Size: Letter	Drawn By: Ayesha Ebrahim		
Date: 2020-05-12	Sheet * of *		
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\MCU.SchDoc			

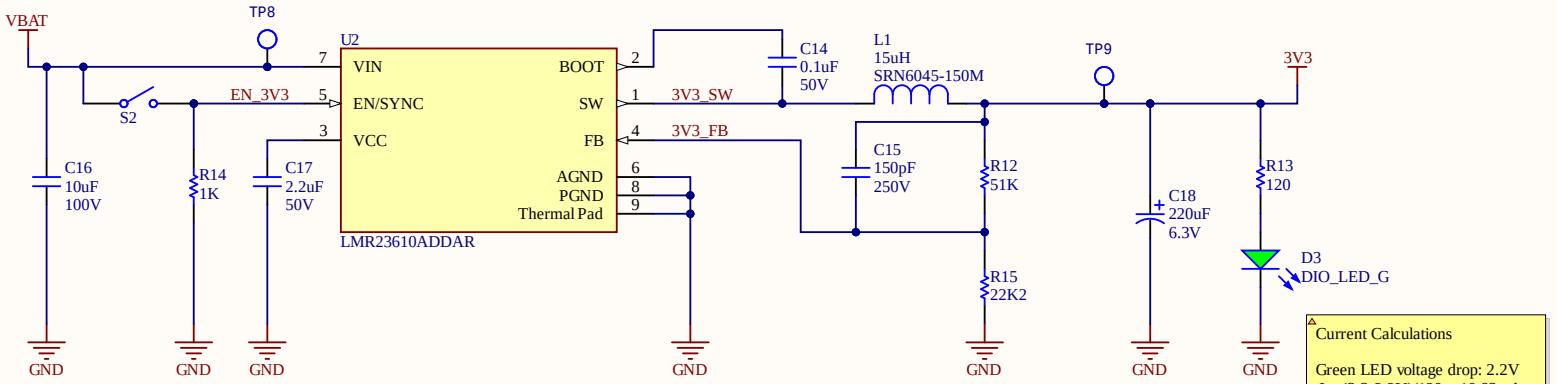
Battery Voltage to 3V3 Buck @ 1A Max

Designed for 15V-25.2V input

Route for 0.5A in

Inductor: SRN6045-150M
15uH, 20%, 95.8mOhm DCR (max)
1.9A (rms), 2.3A (sat), 4.5mm tall

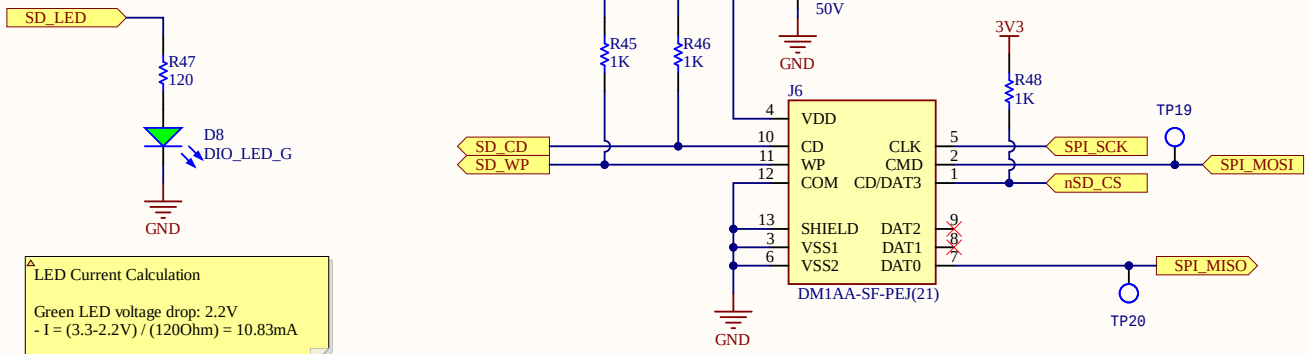
Route for 1A out



Max expected power on output = 1.65W
Max current = 0.5A
Expected Efficiency at 1A > 87.7%

Title Power		
Size: Letter	Drawn By: Ayesha Ebrahim	
Date: 2020-05-12	Sheet * of *	
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\Power.SchDoc		

SD Card Connector



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Date: 2020-05-12	Sheet * of *		
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\SD Card.SchDoc			