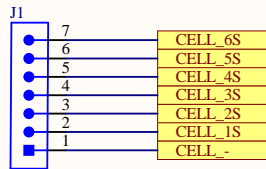
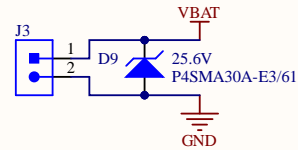




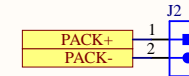
## Battery Balancing



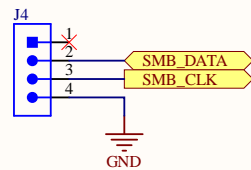
## Battery In



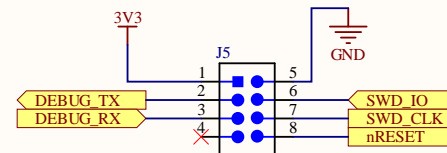
## Pack Out



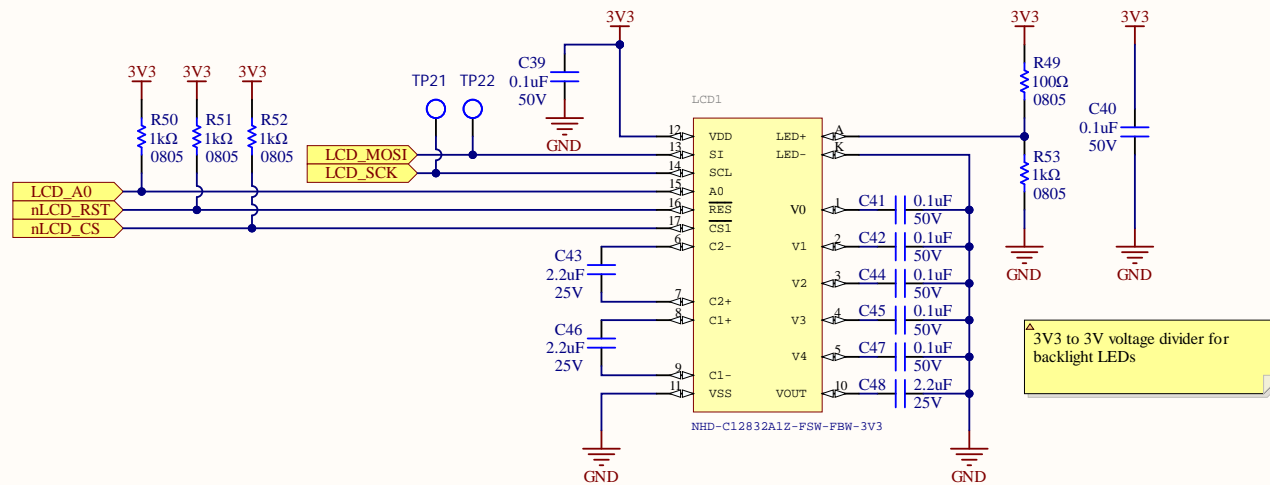
## EV2400



## Debug/Programing

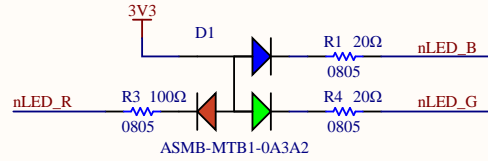


# LCD



Title LCD		
Size: Letter	Drawn By: Ayesha Ebrahim	
Date: 2020-05-27	Sheet 1 of 1	
File: C:\Users\ayesh\Documents\GitHub\MarsRover2020-PCB\Projects\BMS\Rev1\LCD.SchDoc		

## Test LEDs

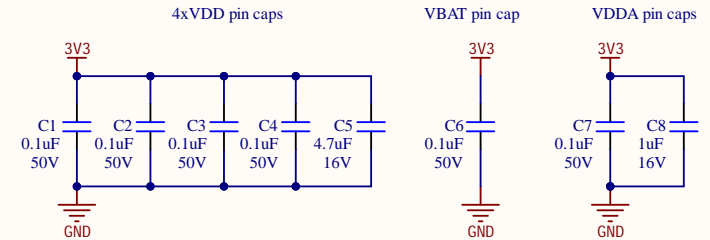


**Current Calculations**

Green LED voltage drop: 2.2V  
 $I = (3.3 - 2.2V) / 100 = 11mA$

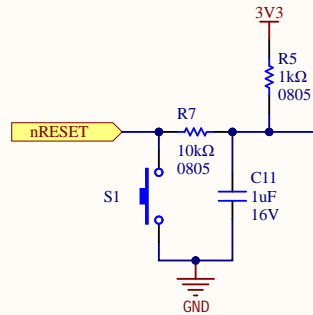
RGB LED voltage drops:  
 - Red: 2.1V:  $I = (3.3 - 2.1V) / 100 = 12mA$   
 - Blue: 3.1V:  $I = (3.3 - 3.1V) / 20 = 10mA$   
 - Green: 3.1V:  $I = (3.3 - 3.1V) / 20 = 10mA$

## Decoupling Caps



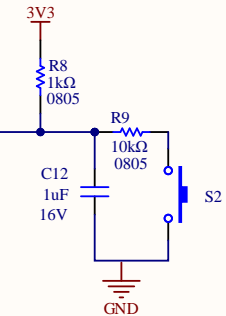
## STM32F446RET6

## Reset Button



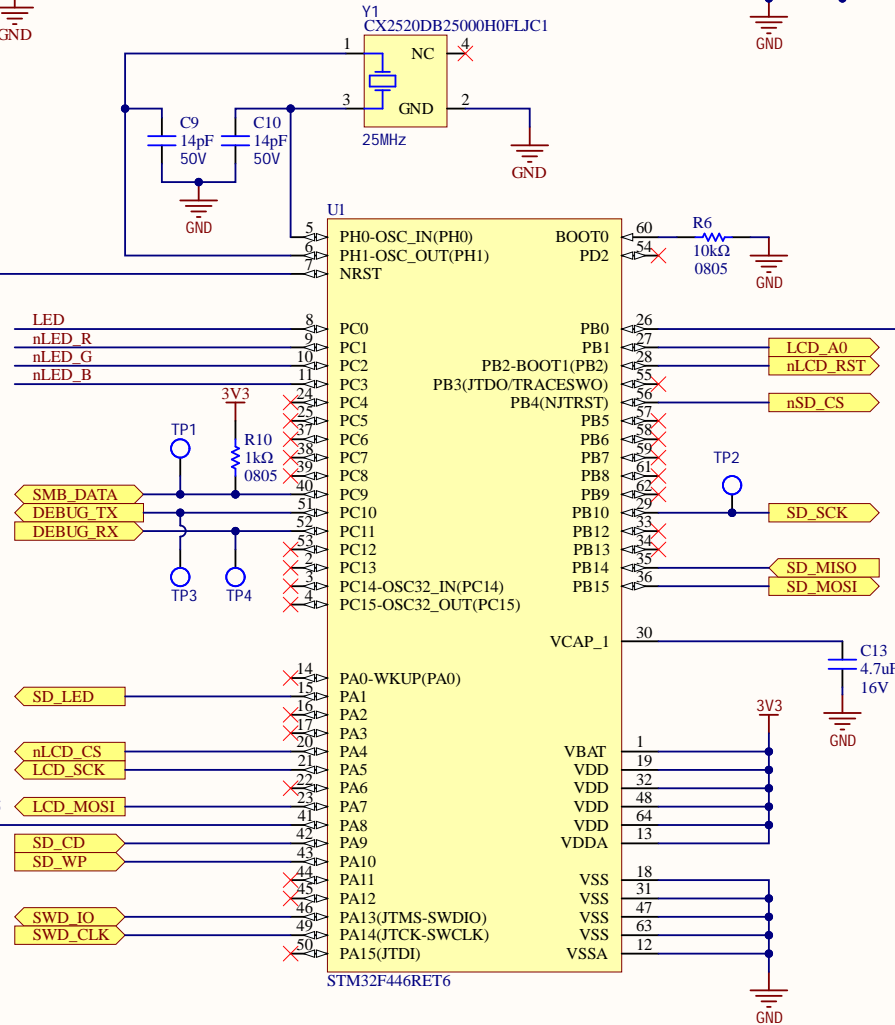
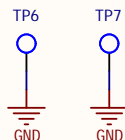
**For Debounce Circuit:**  
 $T = RC \rightarrow C = T/R$   
 $C = 10ms / 10kOhms = 1uF$

## Test Button

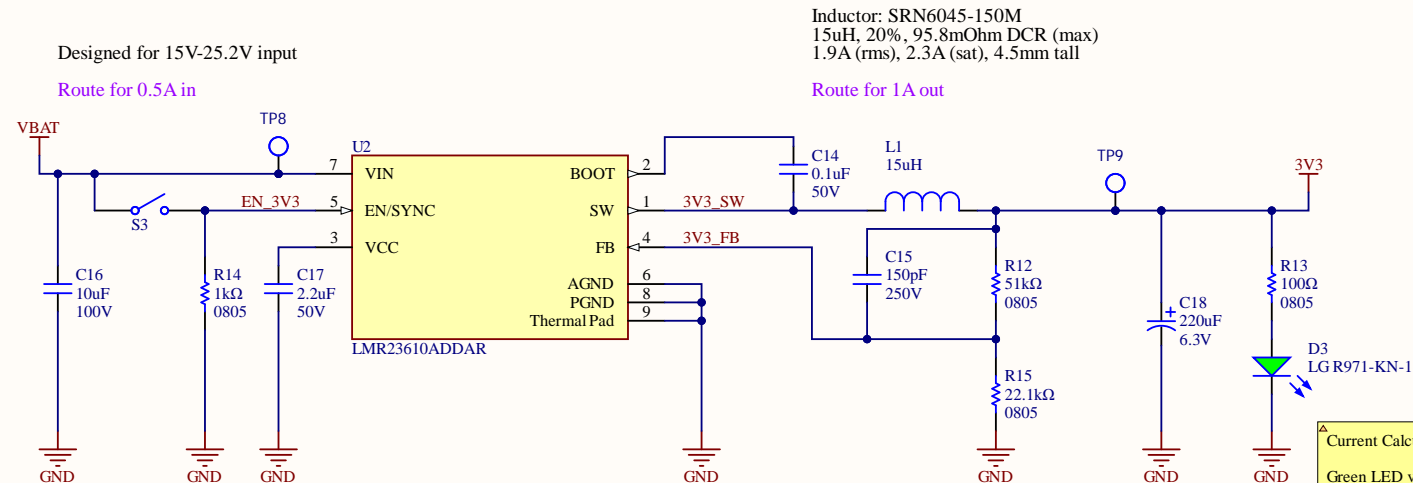


**For Debounce Circuit:**  
 $T = RC \rightarrow C = T/R$   
 $C = 10ms / 10kOhms = 1uF$

## GND Test Points



# Battery Voltage to 3V3 Buck @ 1A Max

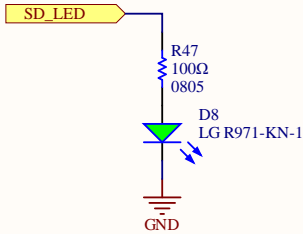


**Current Calculations**

Green LED voltage drop: 2.2V  
 $I = (3.3 - 2.2V) / 100 = 11mA$

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

## SD Card Connector



### LED Current Calculation

Green LED voltage drop: 2.2V  
-  $I = (3.3 - 2.2V) / (100\Omega) = 11\text{mA}$