

Project:STM32L4 Quadcopter

Description: Quadcopter Control Board

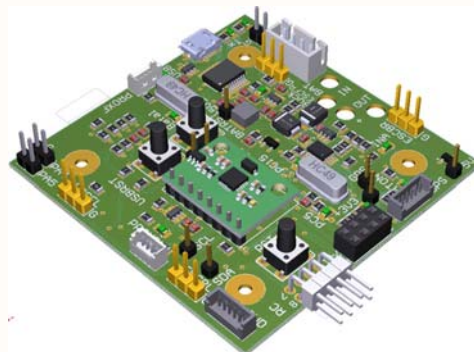
7/20/2019

Rev00

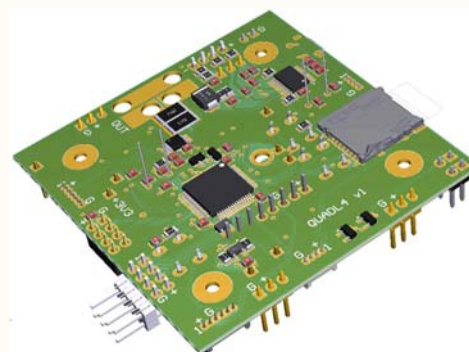
Built on Dec-2017

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TOP VIEW



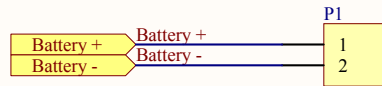
BOTTOM VIEW



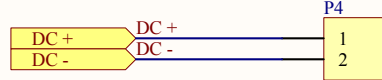
Title				[01] - Cover Page.SchDoc		
Size	Number		Revision			
A3	STM32L4 Quadcopter		00			
Date:	7/20/2019		Sheet 1	1 of 1		
File:	\\.\[01] - Cover Page.SchDoc		Drawn By: GC			

Battery Input

Passthrough for current/voltage measurement

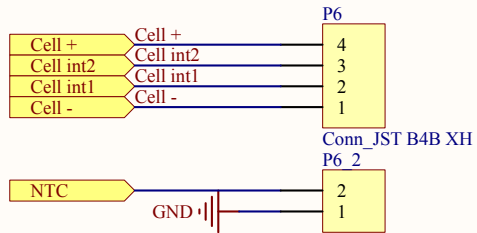


Battery Output



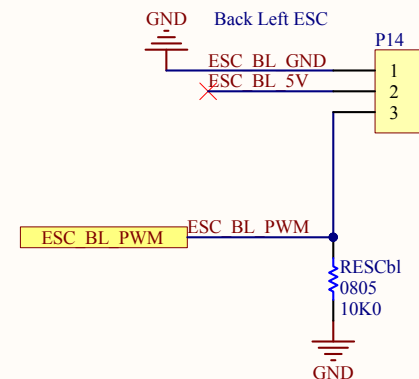
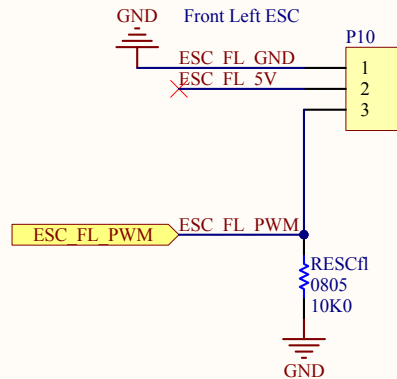
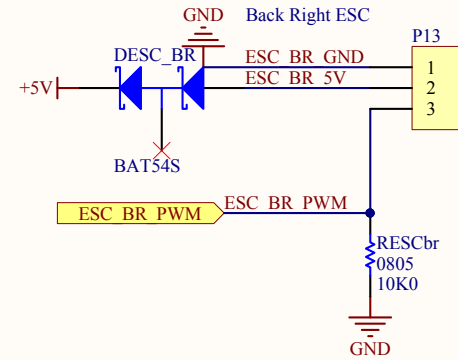
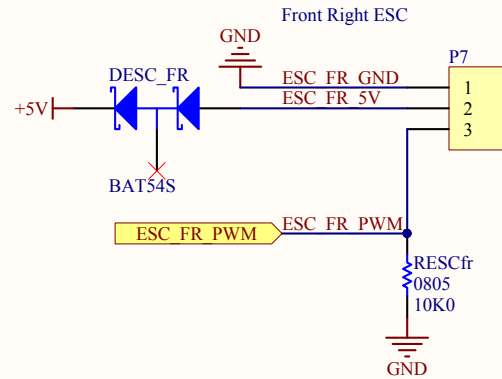
Battery Monitor

Connect to power board and 10k NTC



ESC Command

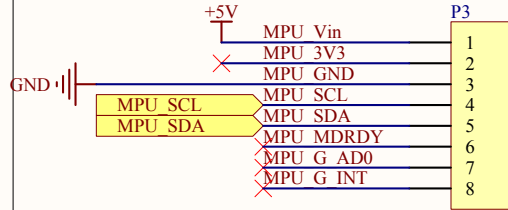
Period: 8ms, Control: 1ms to 2ms



Title			
[02] - Battery and ESC Connections.SchDoc			
Size	Number		Revision
A	STM32L4 Quadcopter		00
Date:	7/20/2019	Sheet 2	10f
File:	\\.\[02] - Battery and ESC Connections.SchDoc		
Drawn By: GC			

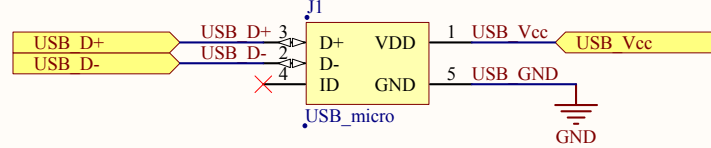
MPU Connector

Soldered to TOP



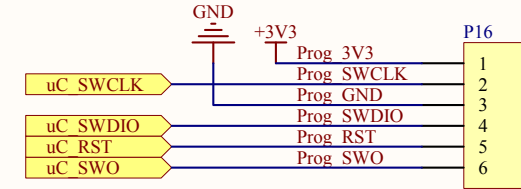
USB Mini Connector

used for power/comms



Programming Header

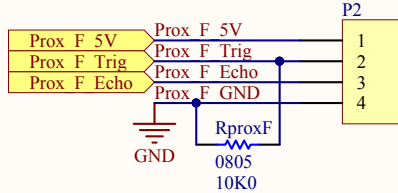
1.25mm 6way Picoblade



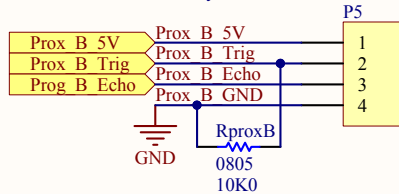
Proximity Sensors

1.25mm 4way Picoblade

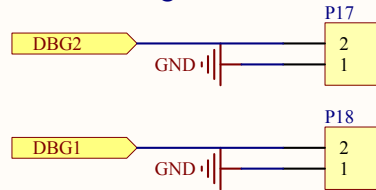
Front Proximity Sensor Connector



Bottom Proximity Sensor Connector

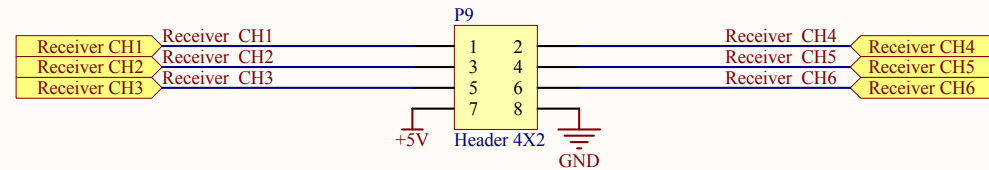


Debug Connectors



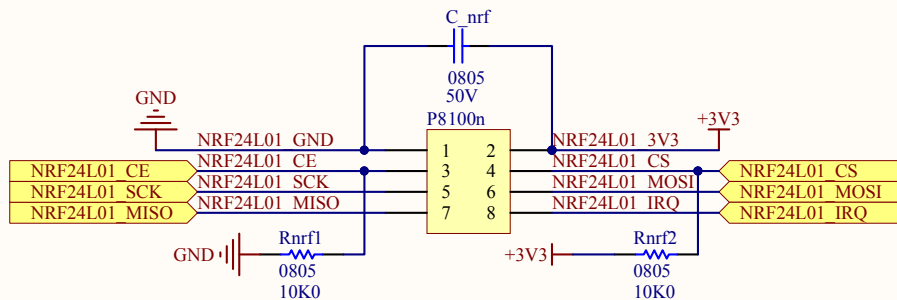
Receiver Connectors

2.54mm 2x4 Dupont, 3.3V I/O



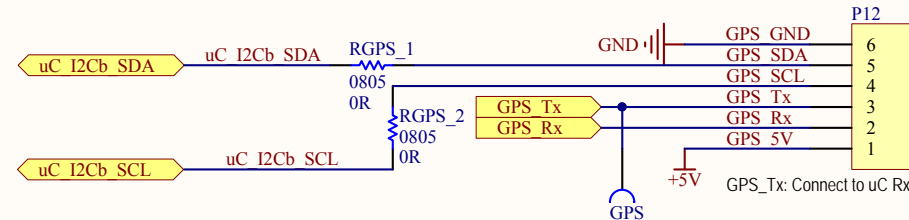
NRF24L01+ Connector

2.54mm 2x4 Dupont, 3.3V I/O



uBlox GPS Connector

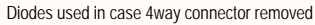
1.25mm 6way Picoblade



Title		
[03] - LV connections.SchDoc		
Size	Number	Revision
A	STM32L4 Quadcopter	00
Date:	7/20/2019	Sheet 3 of 4
File:	\\.\[03] - LV connections.SchDoc	Drawn By: GC

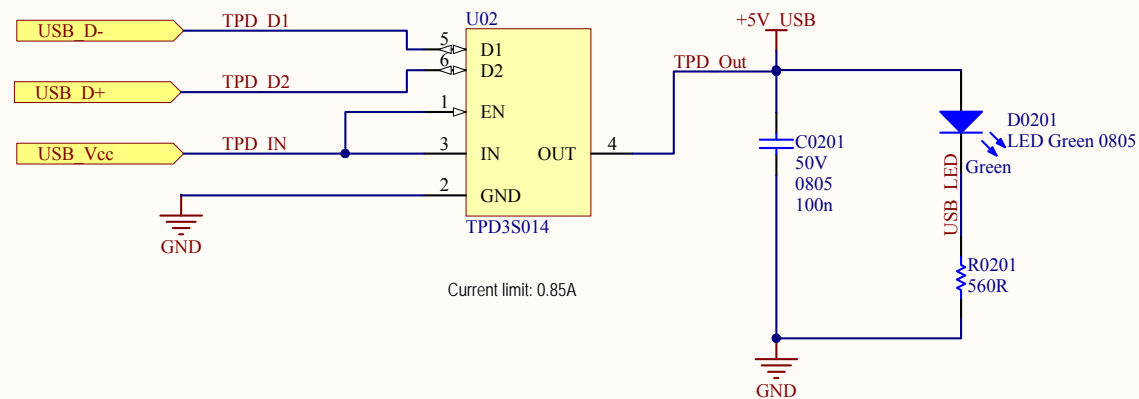
DESIGN NOTE:
Recommended for 5V:
Rh = 54K9
Rl = 10K
L = 4u7
Cout = 20u to 68u
Cbst = 100n

Expected: 5.07V



Title				[04] - Battery Power.SchDoc			
Size		Number				Revision	
A		STM32L4 Quadcopter				00	
Date:		7/20/2019				Sheet 4 of 18	
File:		\\.\[04] - Battery Power.SchDoc				Drawn By: GC	

USB ESD protection and current limit



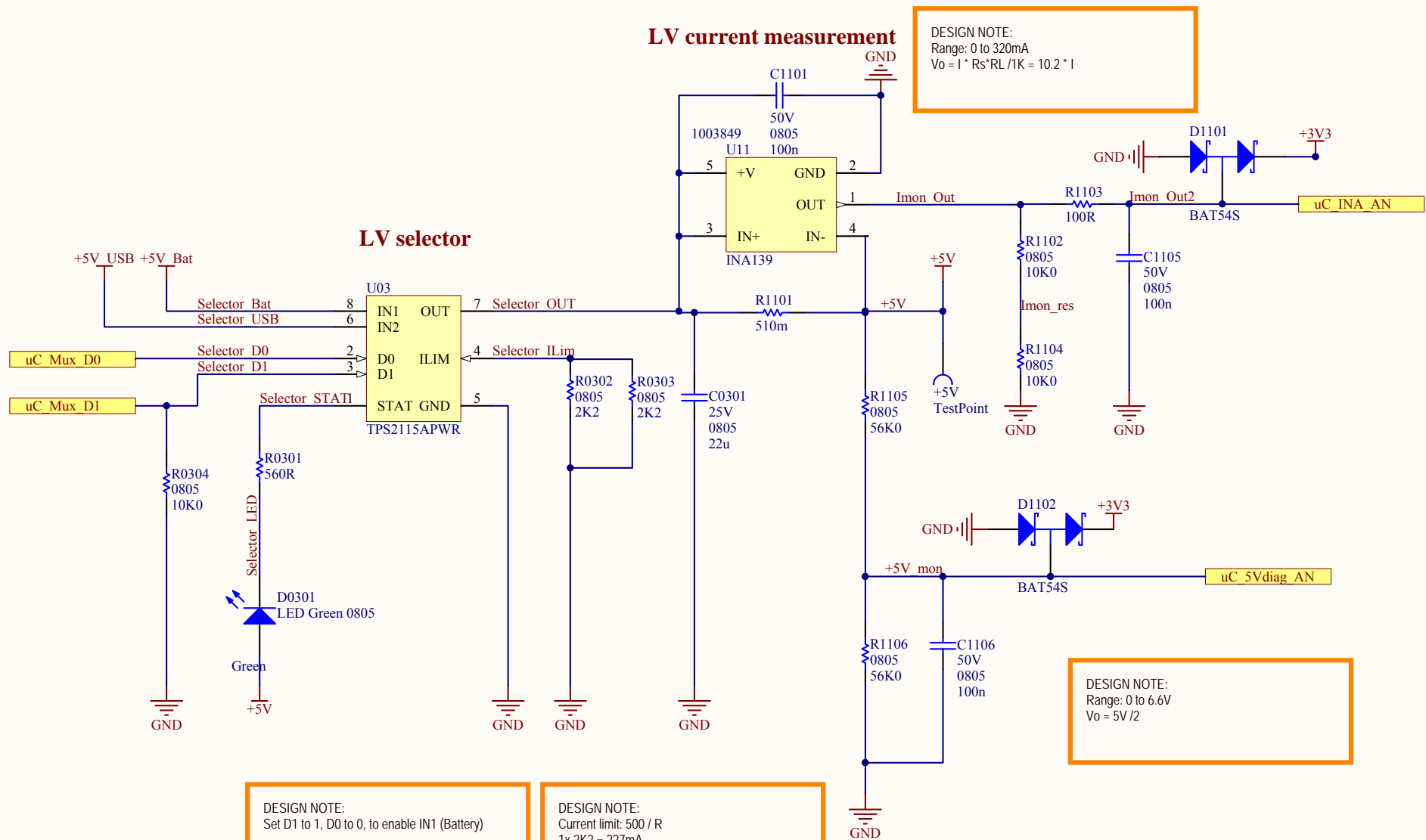
Title			
[05] - USB Power.SchDoc			
Size	Number		Revision
A	STM32L4 Quadcopter		00
Date:	7/20/2019	Sheet 5	10f
File:	\\.\[05] - USB Power.SchDoc		Drawn By: GC

LV source selector and current Measurement

LV current measurement

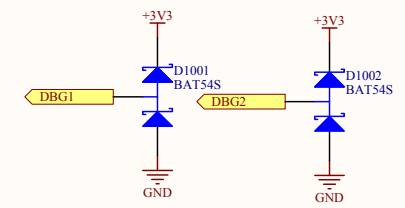
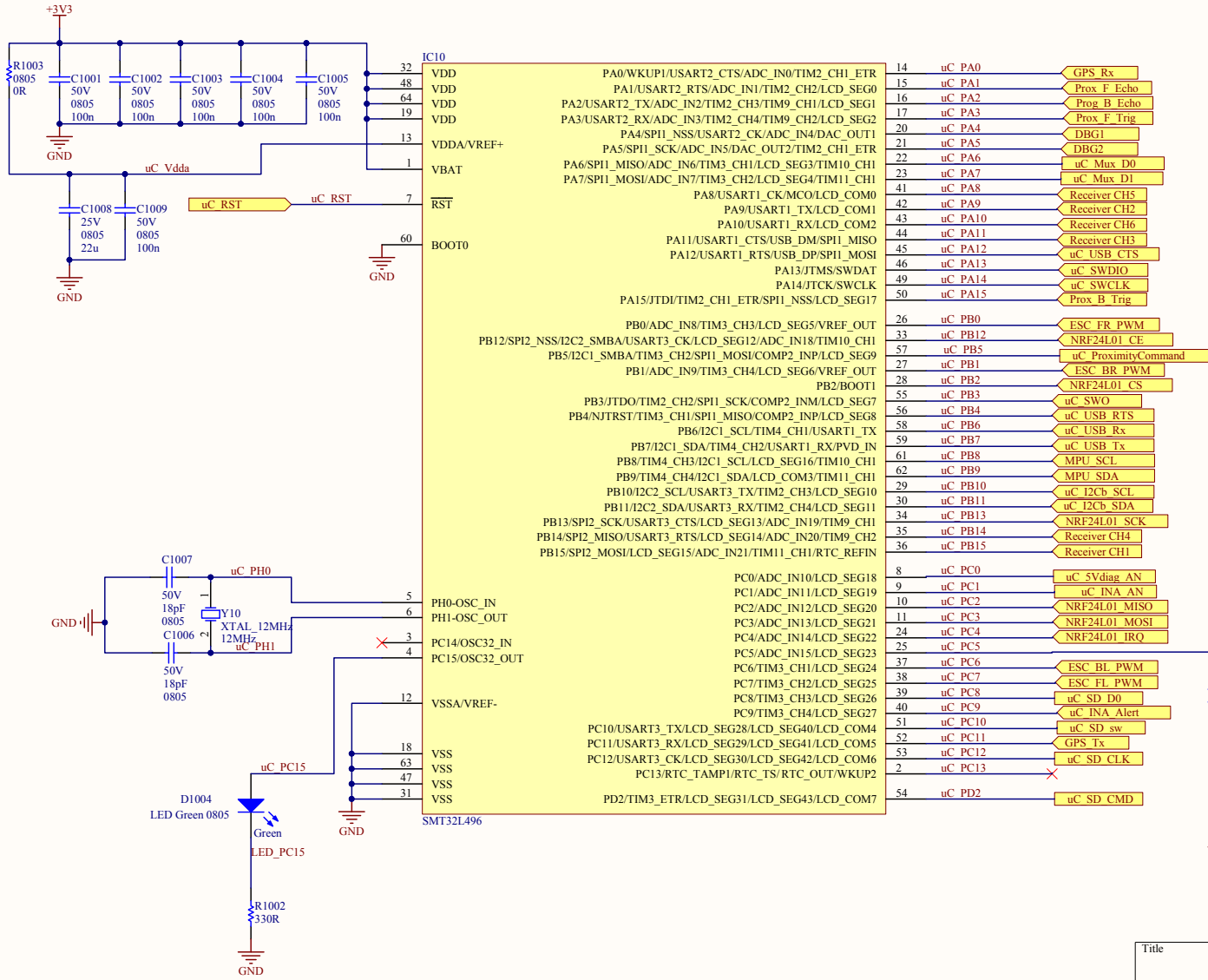
DESIGN NOTE:
Range: 0 to 320mA
 $V_o = I \cdot R_s \cdot R_L / 1K = 10.2 \cdot I$

LV selector



Title		
[06] - Power Selector.SchDoc		
Size	Number	Revision
A	STM32L4 Quadcopter	00
Date:	7/20/2019	Sheet 6 10f
File:	\\.\[06] - Power Selector.SchDoc	Drawn By: GC

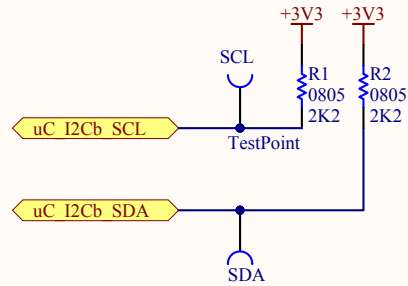
Microcontroller



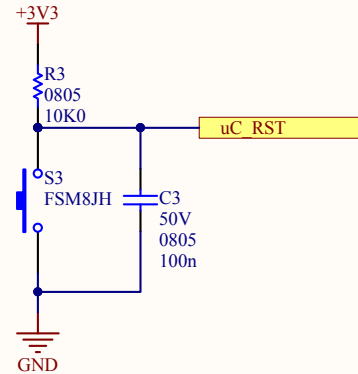
Title		
[07] - Microcontroller.SchDoc		
Size	Number	Revision
B	STM32L4 Quadcopter	00
Date:	7/20/2019	Sheet 7 of 10
File:	\\.\[07] - Microcontroller.SchDoc	Drawn By: GC

Microcontroller Peripherals

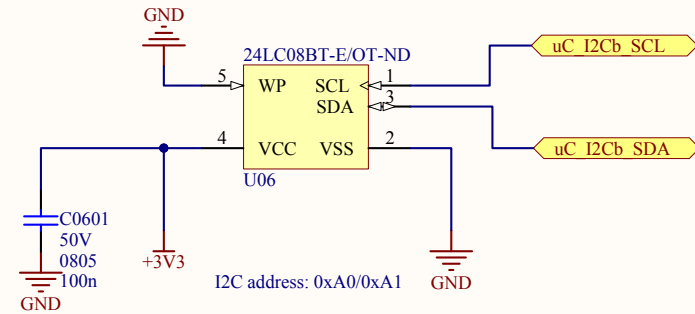
I2Cb pullups



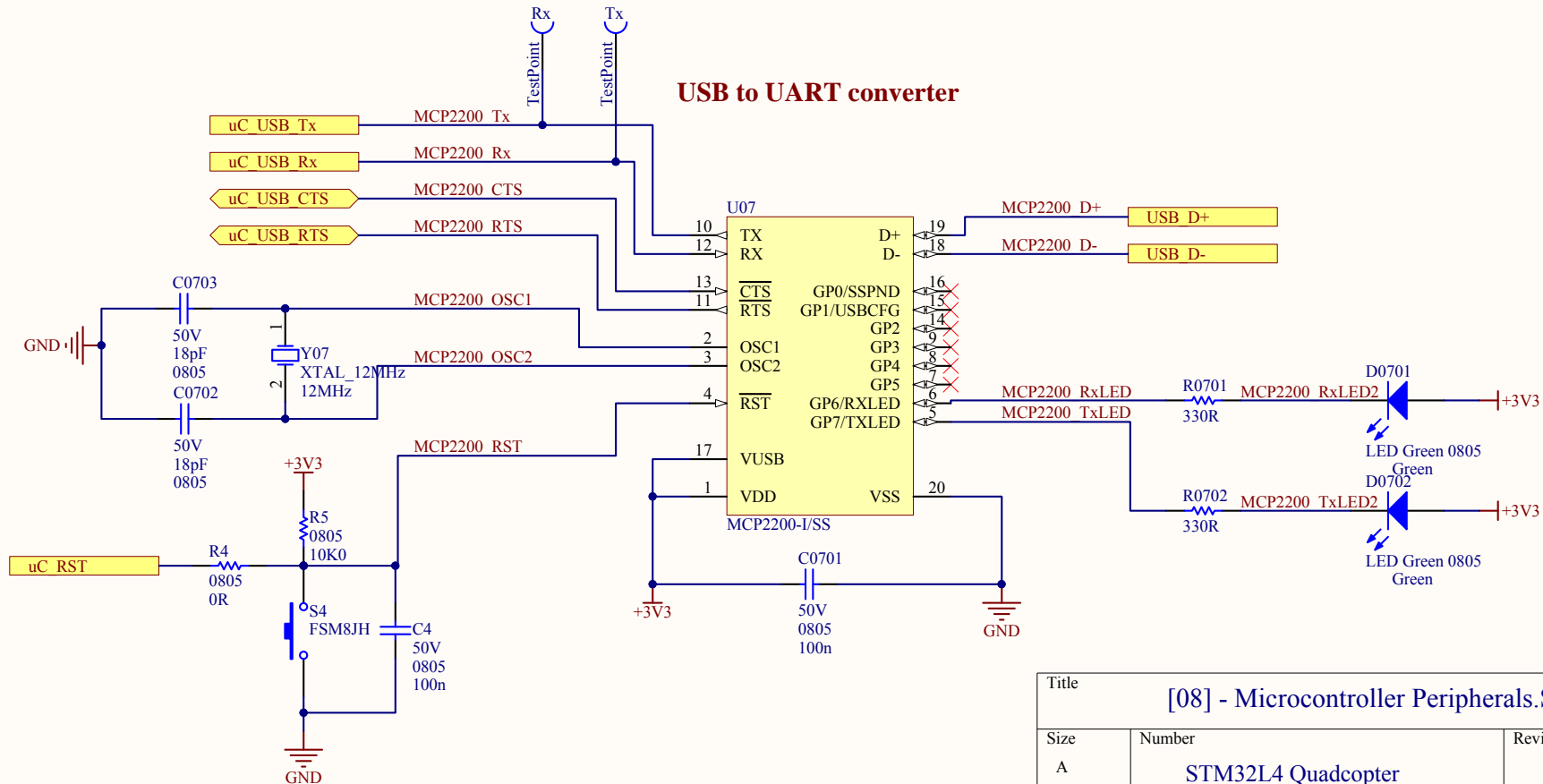
Reset



8kbit I2C EEPROM

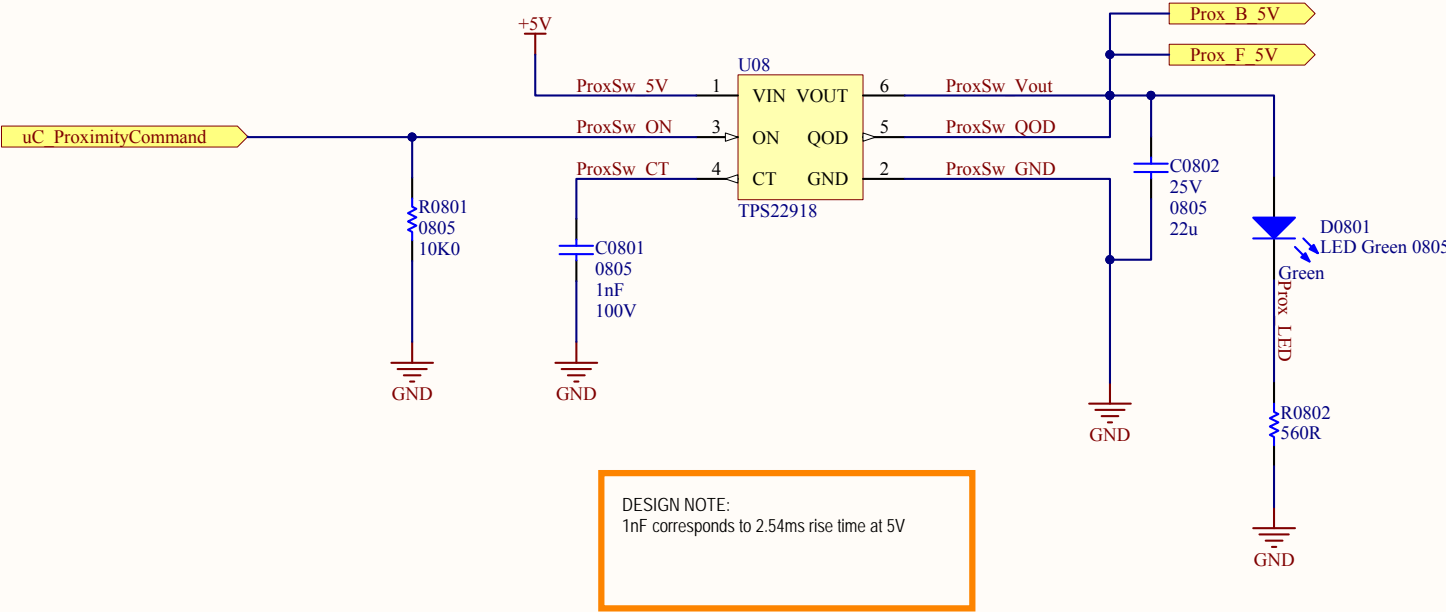


USB to UART converter



Title		
[08] - Microcontroller Peripherals.SchDoc		
Size	Number	Revision
A	STM32L4 Quadcopter	00
Date:	7/20/2019	Sheet 8 of 10
File:	\\.\[08] - Microcontroller Peripherals.SchDoc Drawn By: GC	

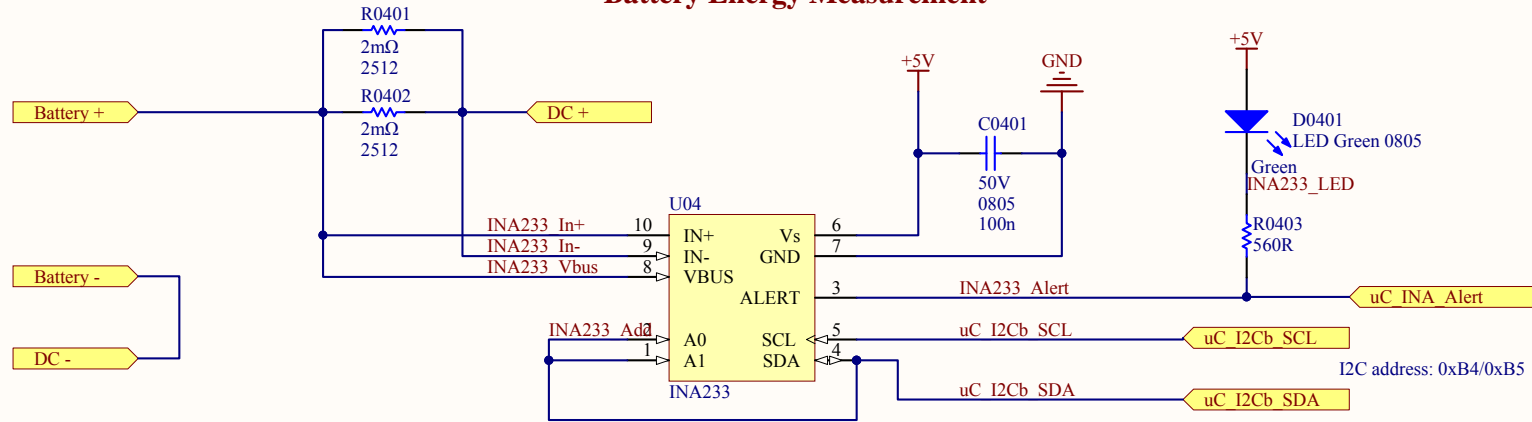
Proximity Sensors Switch



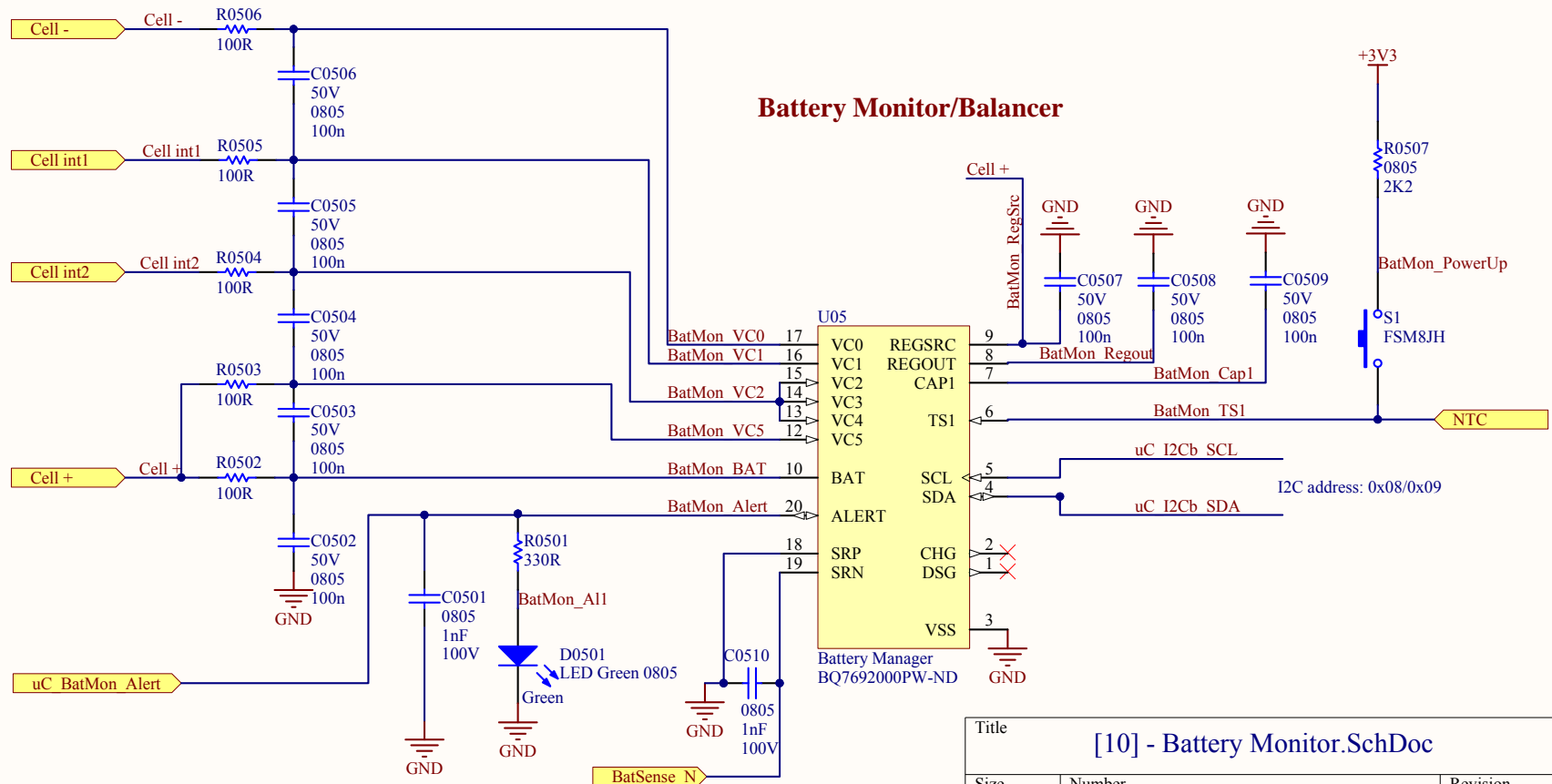
Title			[09] - Proximity Sensor Control.SchDoc
Size	Number		Revision
A	STM32L4 Quadcopter		00
Date:	7/20/2019	Sheet 9	10f
File:	\\.\[09] - Proximity Sensor Control.SchDoc		
		Drawn By: GC	

Battery Power/Energy Measurement, Monitor and Balancer

Battery Energy Measurement

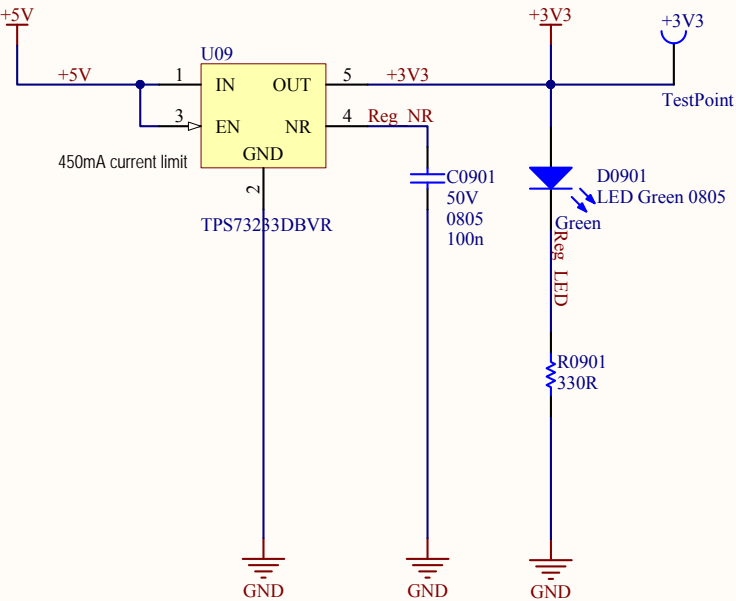


Battery Monitor/Balancer



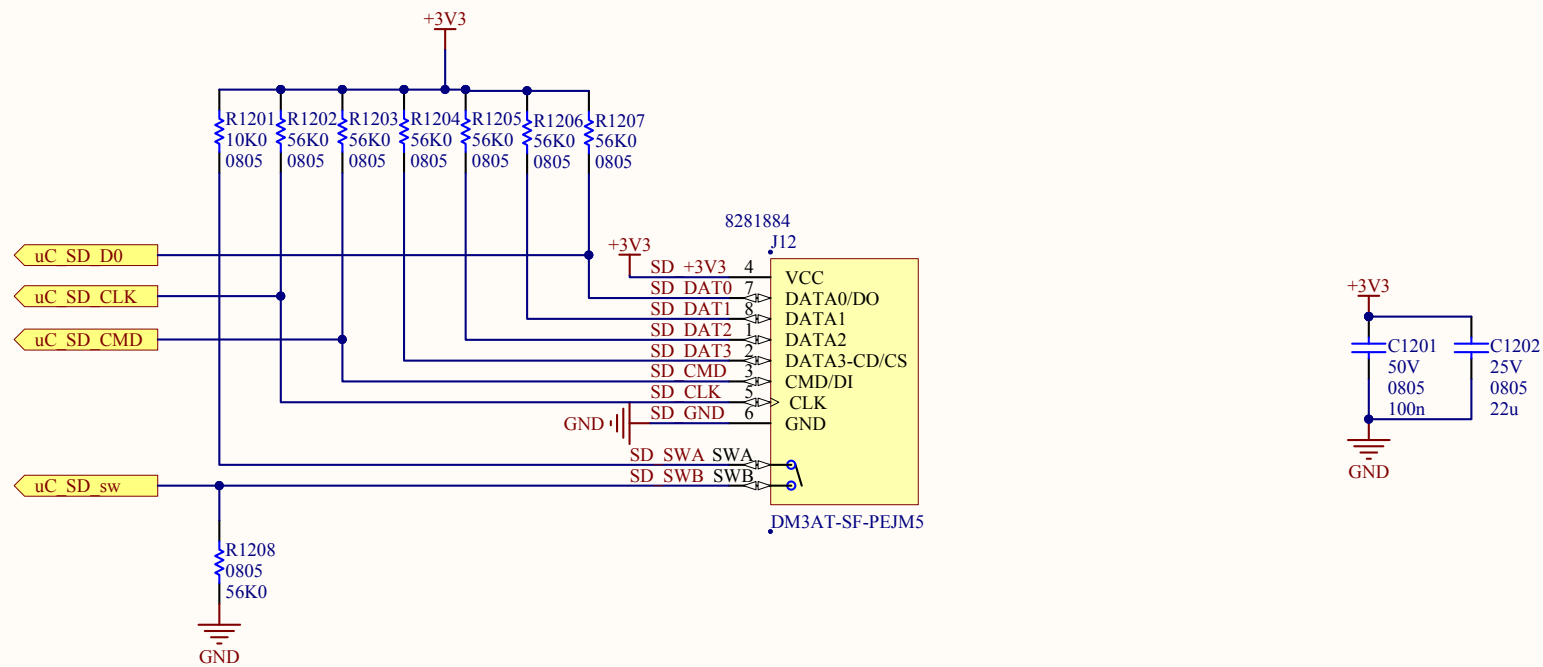
Title		
[10] - Battery Monitor.SchDoc		
Size	Number	Revision
A	STM32L4 Quadcopter	00
Date:	7/20/2019	Sheet10 12 of 12
File:	\\.\[10] - Battery Monitor.SchDoc	Drawn By:GC

3V3 Regulator



Title			[11] - 3V3 Regulator.SchDoc	
Size	Number		Revision	
A	STM32L4 Quadcopter		00	
Date:	7/20/2019		Sheet 11	10f
File:	\\.\[11] - 3V3 Regulator.SchDoc		Drawn By: GC	

SDCard Slot



Title			[12] - SDCard.SchDoc
Size	Number	Revision	
A	STM32L4 Quadcopter	00	
Date:	7/20/2019	Sheet 12	10f
File:	\\.\[12] - SDCard.SchDoc	Drawn By: GC	