

A

A

B

B

C

C

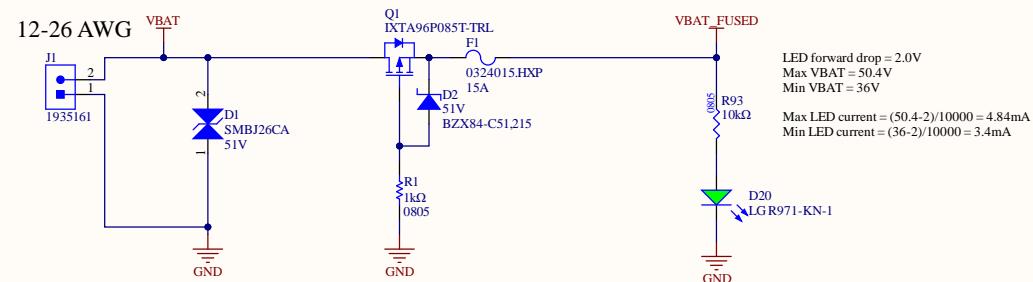
D

D

### Battery Input (12s1p)

Input voltage range: 36-50.4V

### Reverse Polarity Protection



LED forward drop = 2.0V  
Max VBAT = 50.4V  
Min VBAT = 36V

Max LED current =  $(50.4-2)/10000 = 4.84\text{mA}$   
Min LED current =  $(36-2)/10000 = 3.4\text{mA}$

Title: Power

Project: Power Distribution Board.PnjPcb

Rev: 3 Reviewer: Lance Bantoto

Engineer: Farris Matar

Date: 2021-10-21 Sheet: 1 of 9

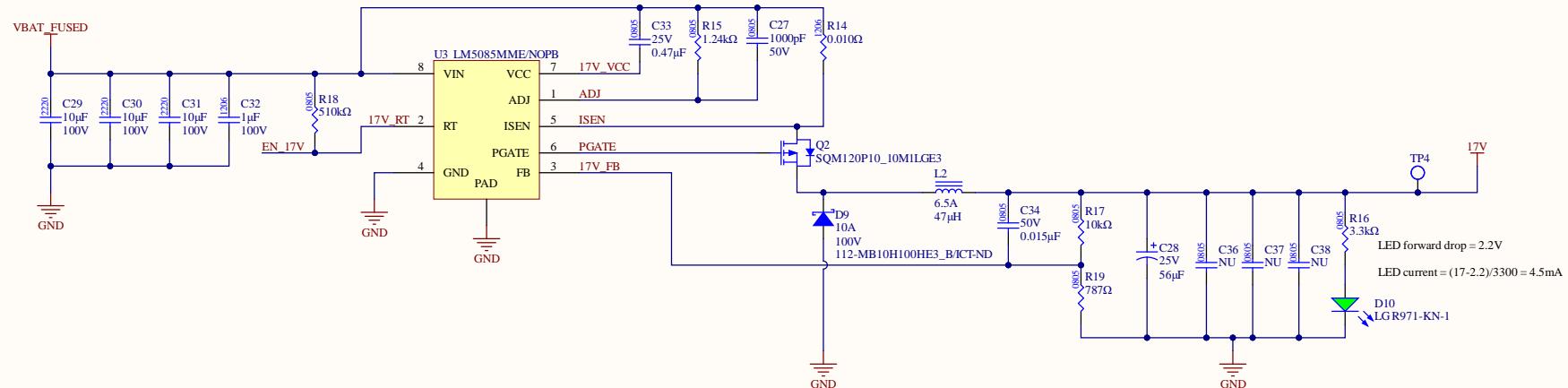


A

A

## 17V Regulator @ 4A Max

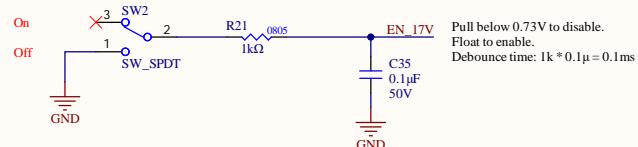
Input voltage range: 36-50.4V



C

C

## On/Off Switch



D

D

Title: 17V Buck Converter

Project: Power Distribution Board.PnjPcb

Rev: 3 Reviewer: Lance Bantoto

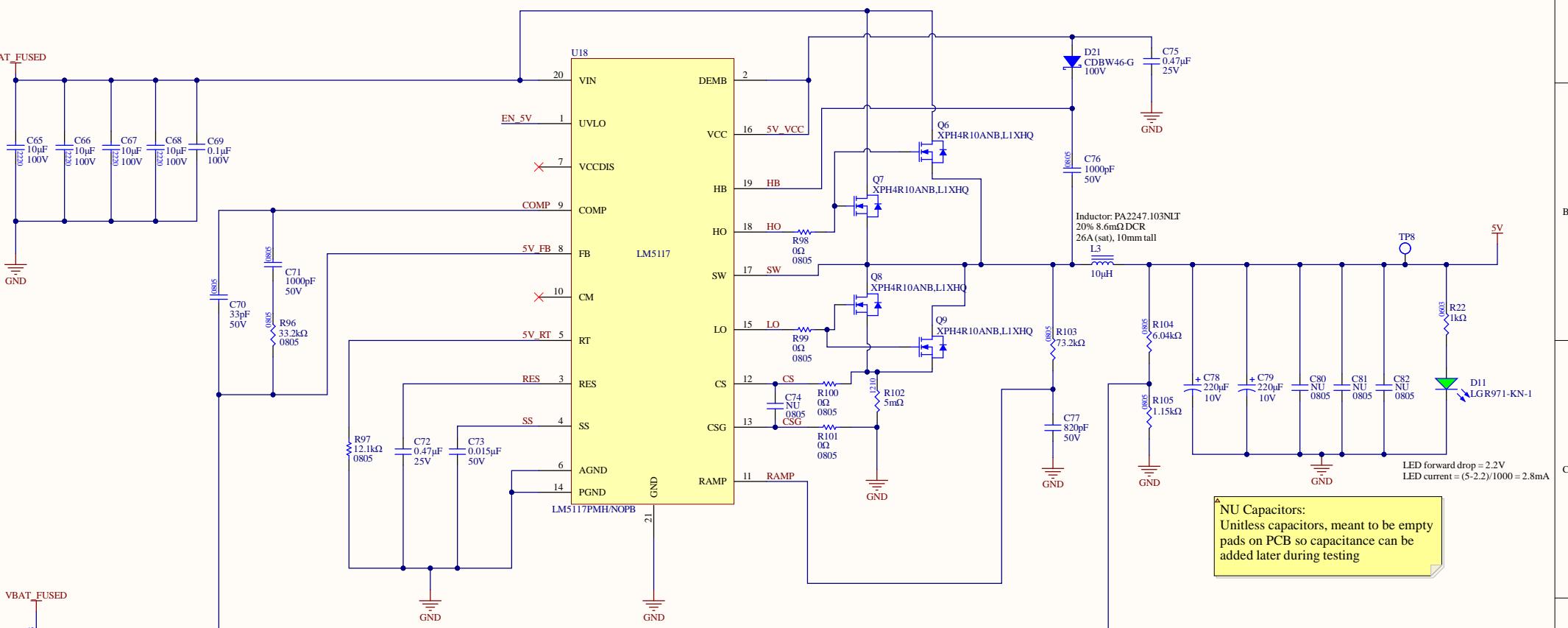
Engineer: Farris Matar

Date: 2021-10-21 Sheet: 2 of 9



## 48-5V Buck Converter @ 16A Max

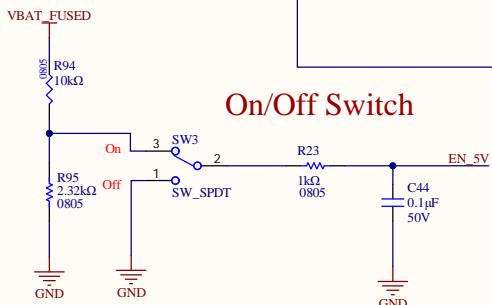
Input voltage range: 36-50.4V



**NU Capacitors:**  
Unitless capacitors, meant to be empty pads on PCB so capacitance can be added later during testing

### On/Off Switch

Pull below 1.25V to disable  
Connect to VIN to enable (max 15V)  
Debounce time:  $1k \cdot 0.1\mu = 0.1ms$



Title: 5V Buck Converter

Project: Power Distribution Board.PnjPcb

Rev: 3 Reviewer: Lance Bantoto

Engineer: Farris Matar

Date: 2021-10-21 Sheet: 3 of 9

A

A

B

B

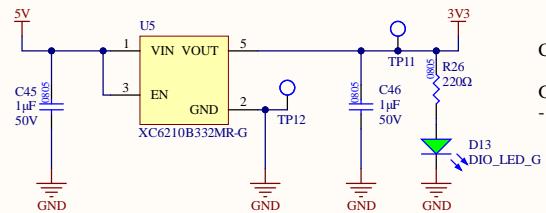
C

C

D

D

### 3.3V LDO @ 600mA Max



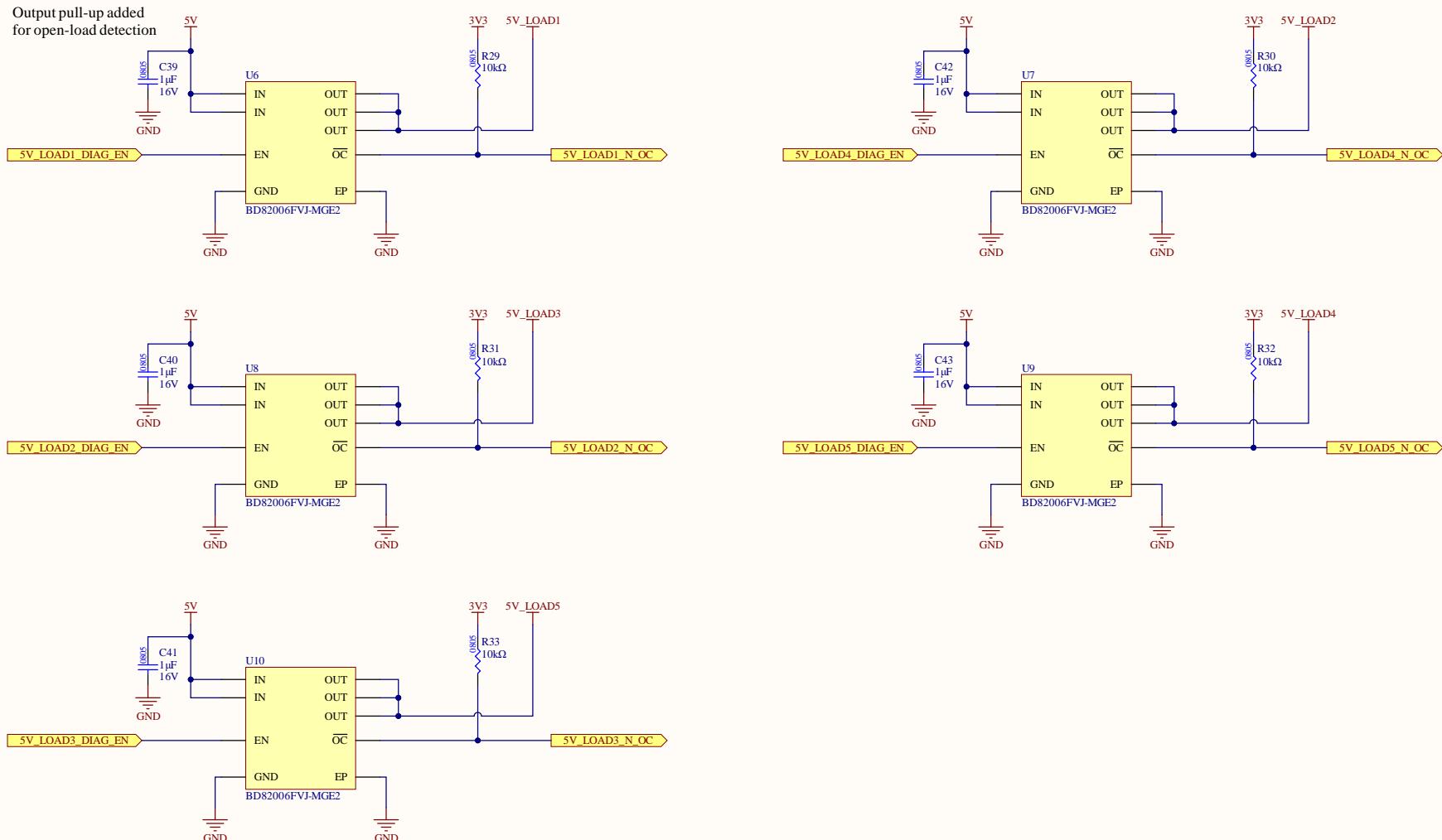
#### Current Calculations

Green LED voltage drop: 2.2V  
 $- I = (3.3 - 2.2V) / 220 = 5mA$

Title: 3.3V Linear Regulator	
Project: Power Distribution Board.PjPcb	
Rev: 3	Reviewer: Lance Bantoto
Engineer: Farris Matar	
Date: 2021-10-21	Sheet: 4 of 9

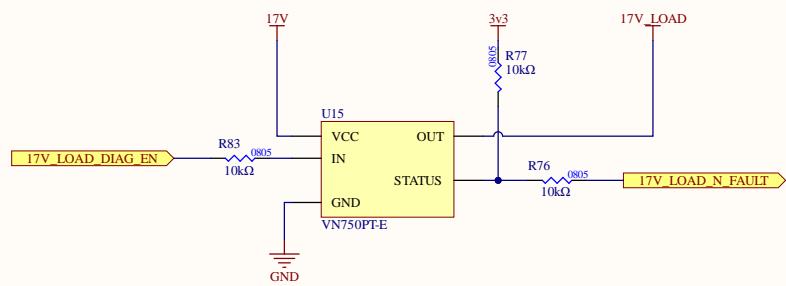
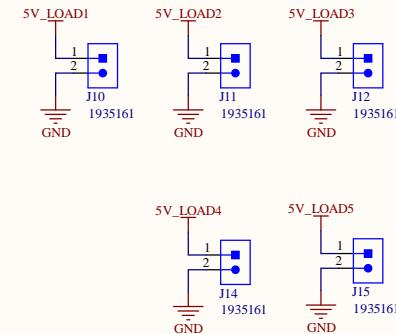
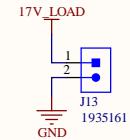


# 5V Smart High-Side Switches



Title: Load Monitoring 1	
Project: Power Distribution Board.PjPcb	
Rev: 3	Reviewer: Lance Bantoto
Engineer: Farris Matar	
Date: 2021-10-21	Sheet: 5 of 9

A

**17V Load Smart Switch****5V Outputs****17V Output**

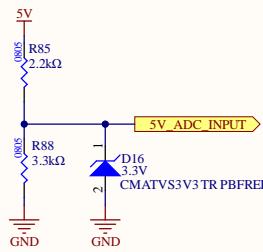
17V power to Nvidia Jetson board

5V power to Science, Gimbal, and Localization boards (plus two spare)

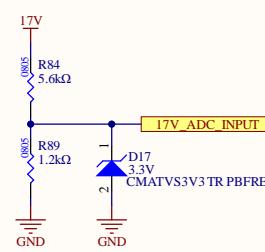
A

B

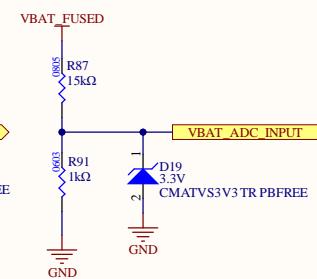
B

**Power Rail Voltage Monitoring**

Divides 5V to 3V



Divides 17V to 3V



Divides 48V to 3V

C

C

D

D

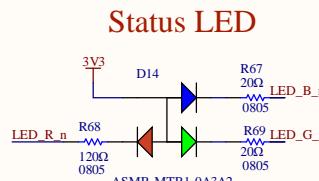
Title: Load Monitoring 2

Project: Power Distribution Board.PnjPcb

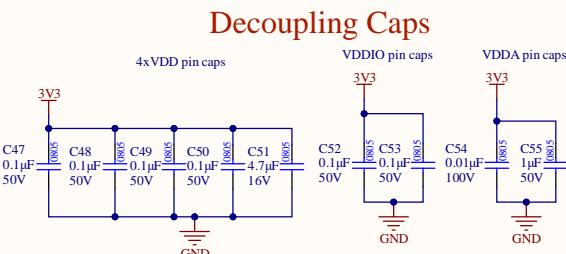
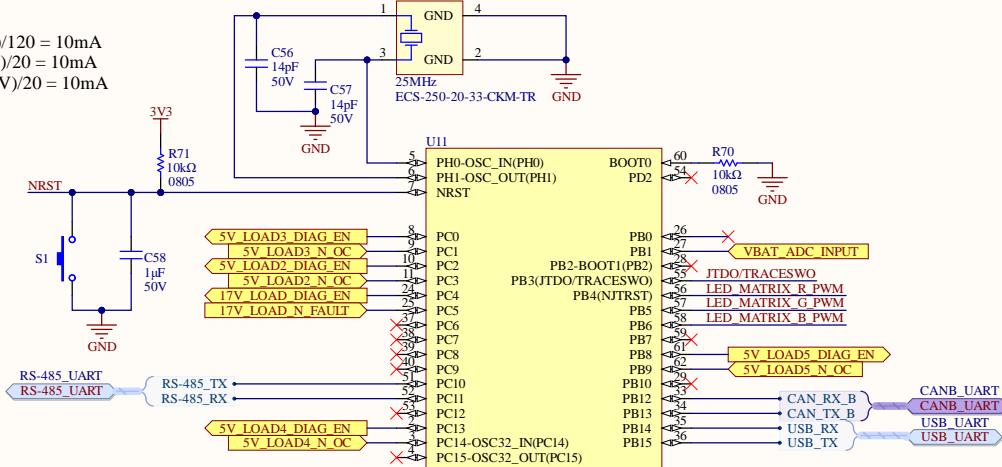
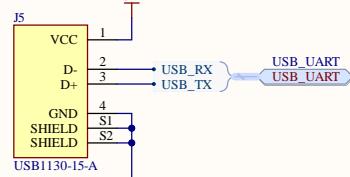
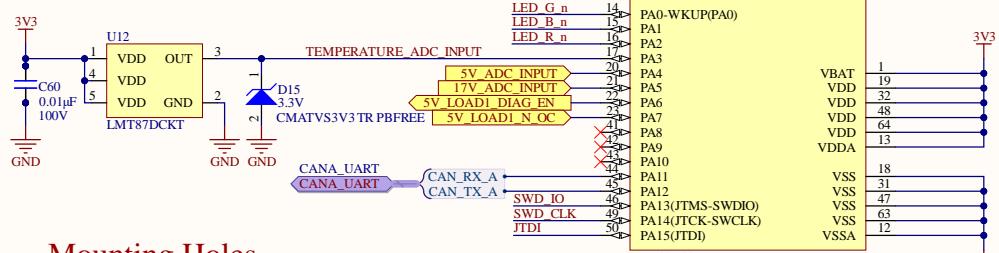
Rev: 3 Reviewer: Lance Bantoto

Engineer: Farris Matar

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**Current Calculations**

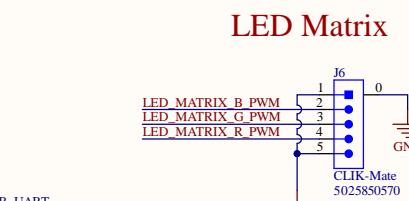
RGB LED voltage drops:  
 - Red:  $2.1V = (3.3-2.1V)/120 = 10mA$   
 - Blue:  $3.1V = (3.3-3.1V)/20 = 10mA$   
 - Green:  $3.1V = (3.3-3.1V)/20 = 10mA$

**STM32F446RET6****USB Connector****Temperature Sensor****Mounting Holes**

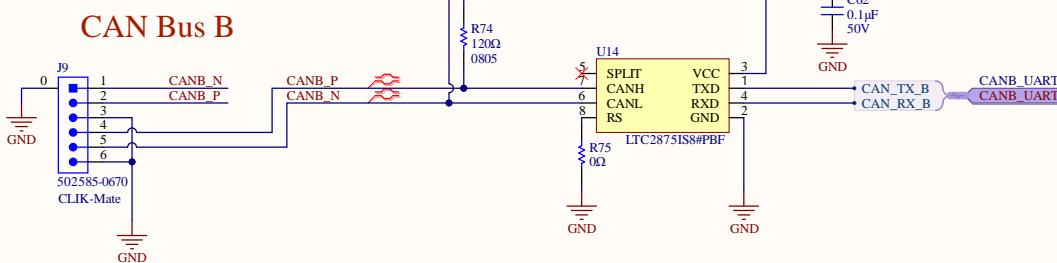
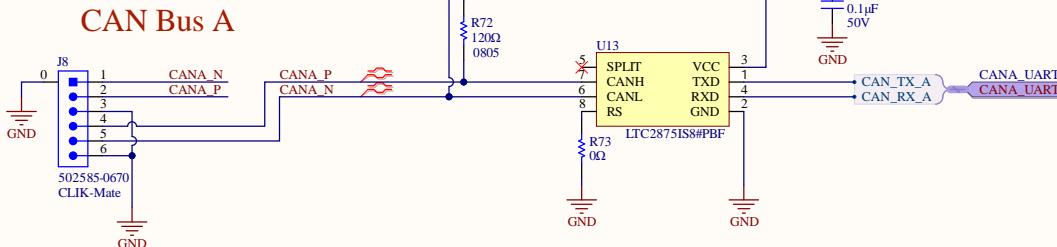
MH1 MOUNTING\_HOLE\_5/32  
 MH2 MOUNTING\_HOLE\_5/32  
 MH3 MOUNTING\_HOLE\_5/32  
 MH4 MOUNTING\_HOLE\_5/32

**LCSC Part #: C69336****Debug/Programming**

Title: Microcontroller	
Project: Power Distribution Board.PjPcb	
Rev: 3	Reviewer: Lance Bantoto
Engineer: Farris Matar	
Date: 2021-10-21	Sheet: 7 of 9

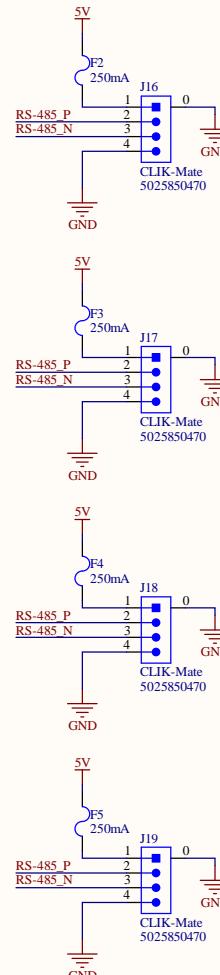
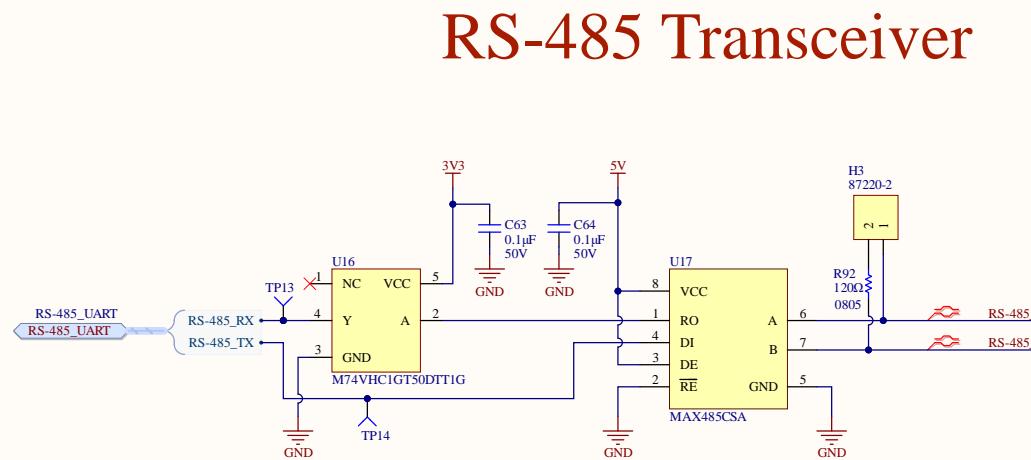


# CAN Transceivers



Title: CAN	
Project: Power Distribution Board.PjPcb	
Rev: 3	Reviewer: Lance Bantoto
Engineer: Farris Matar	
Date: 2021-10-21	Sheet: 8 of 9

# URM04 Ultrasonic Sensors



Title: RS-485	
Project: Power Distribution Board.PnjPcb	
Rev: 3	Reviewer: Lance Bantoto
Engineer: Farris Matar	
Date: 2021-10-21	Sheet: 9 of 9