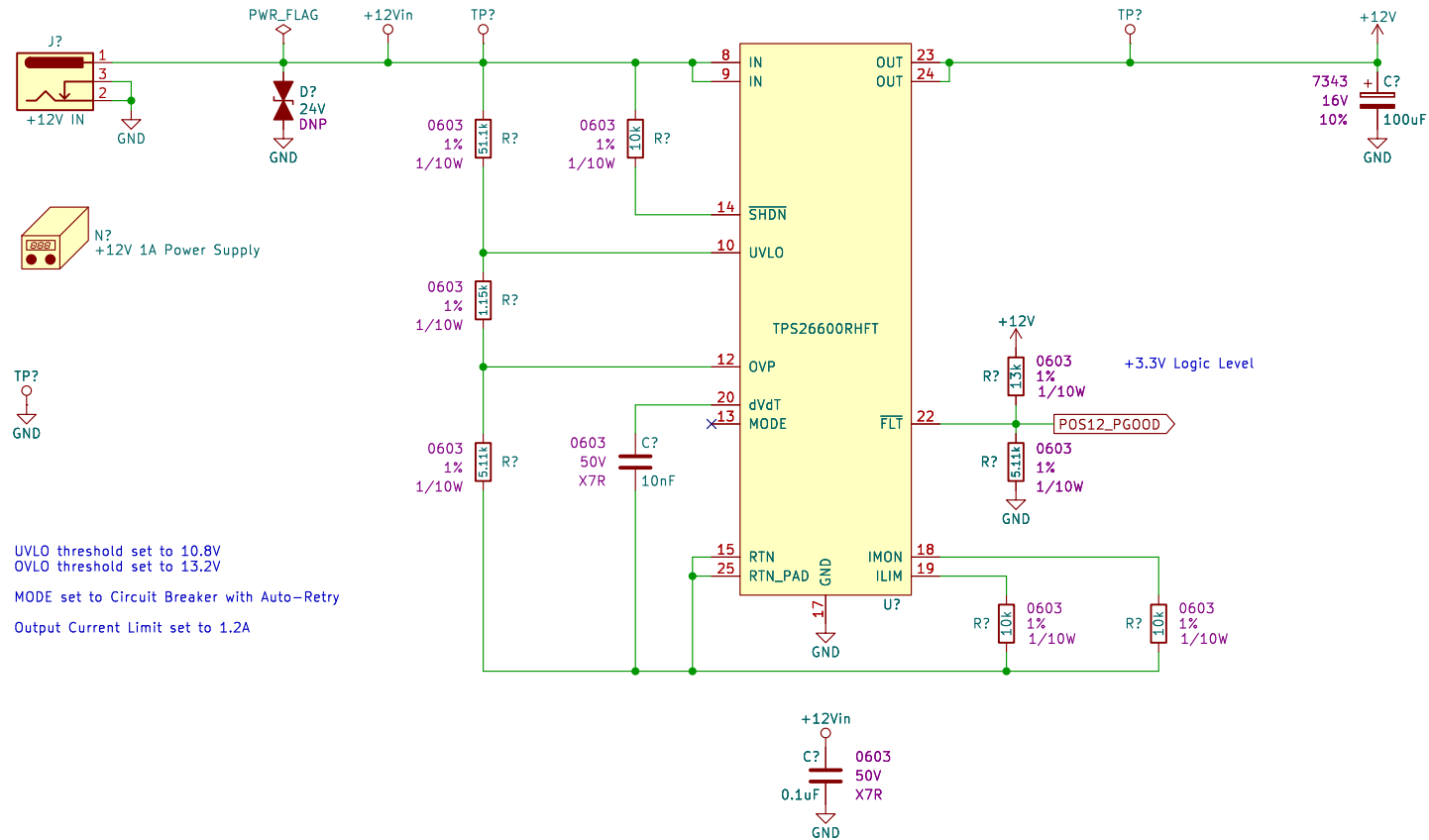


1						2						3						4						5																				
Thermal Camera																																												
https://github.com/drewsum/Thermal_Camera																																												
01. Table of Contents																																												
02. POS12 Input										POS12_Input					14. Battery Management										Battery Management					26. PGOOD LEDs										PGOOD LEDs				
03. POS12 Telemetry										POS12 Telemetry					15. PIC32MZ DA Programming										PIC32MZ DA Programming					27. Status LEDs										Status LEDs				
04. POS3P0 Power Supply										POS3P0 Power Supply					16. PIC32MZ DA Clocking										PIC32MZ DA Clocking					28. Mechanical										Mechanical				
05. POS3P0 Telemetry										POS3P0 Telemetry					17. PIC32MZ DA Power										PIC32MZ DA Power																			
06. POS1P8 Power Supply										POS1P8 Power Supply					18. PIC32MZ DA 1										PIC32MZ DA 1																			
07. POS1P8 Telemetry										POS1P8 Telemetry					19. PIC32MZ DA 2										PIC32MZ DA 2																			
08. POS2P8 Power Supply										POS2P8 Power Supply					20. External Storage										External Storage																			
09. POS2P8 Telemetry										POS2P8 Telemetry					21. Graphic LCD										Graphic LCD																			
10. POS1P2 Power Supply										POS1P2 Power Supply					22. USB UART										USB UART																			
11. POS1P2 Telemetry										POS1P2 Telemetry					23. Elapsed Time Counter										Elapsed Time Counter																			
12. LCD Backlight Power Supply										LCD Backlight Power Supply					24. FLIR Lepton Sensor										FLIR Lepton Sensor																			
13. LCD Backlight Telemetry										LCD Backlight Telemetry					25. USB Hub										USB Hub																			
Drew Maatman and Michael Laffin																																												
Sheet: /																																												
File: Thermal_Camera.kicad_sch																																												
Title: Thermal Camera																																												
Size: A															Date: 2023-11-13															Rev: PRELIM														
KiCad E.D.A. kicad 7.0.9																														Id: 1/28														
1						2						3						4						5																				

Switch to +3.0V logic?



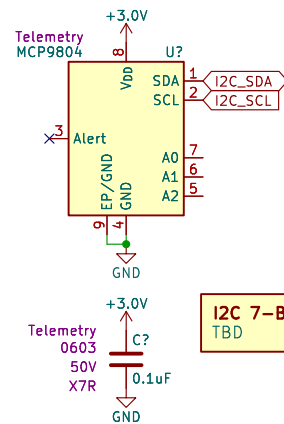
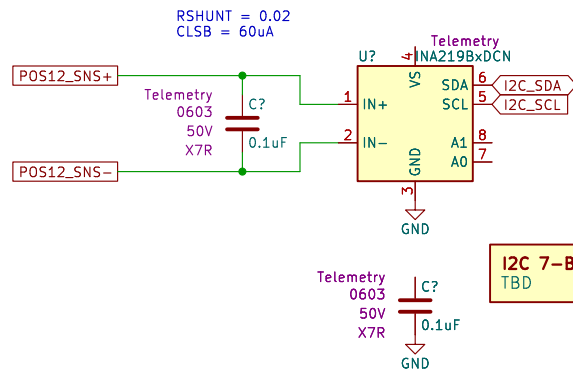
Drew Maatman and Michael Laffin

Sheet: /POS12_Input/
 File: POS12_Input.kicad_sch

Title: Thermal Camera

Size: A Date: 2023-11-13
 KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
 Id: 2/28



INA219 NOT +3.0V VDD TOLER

Drew Maatman and Michael Laffin

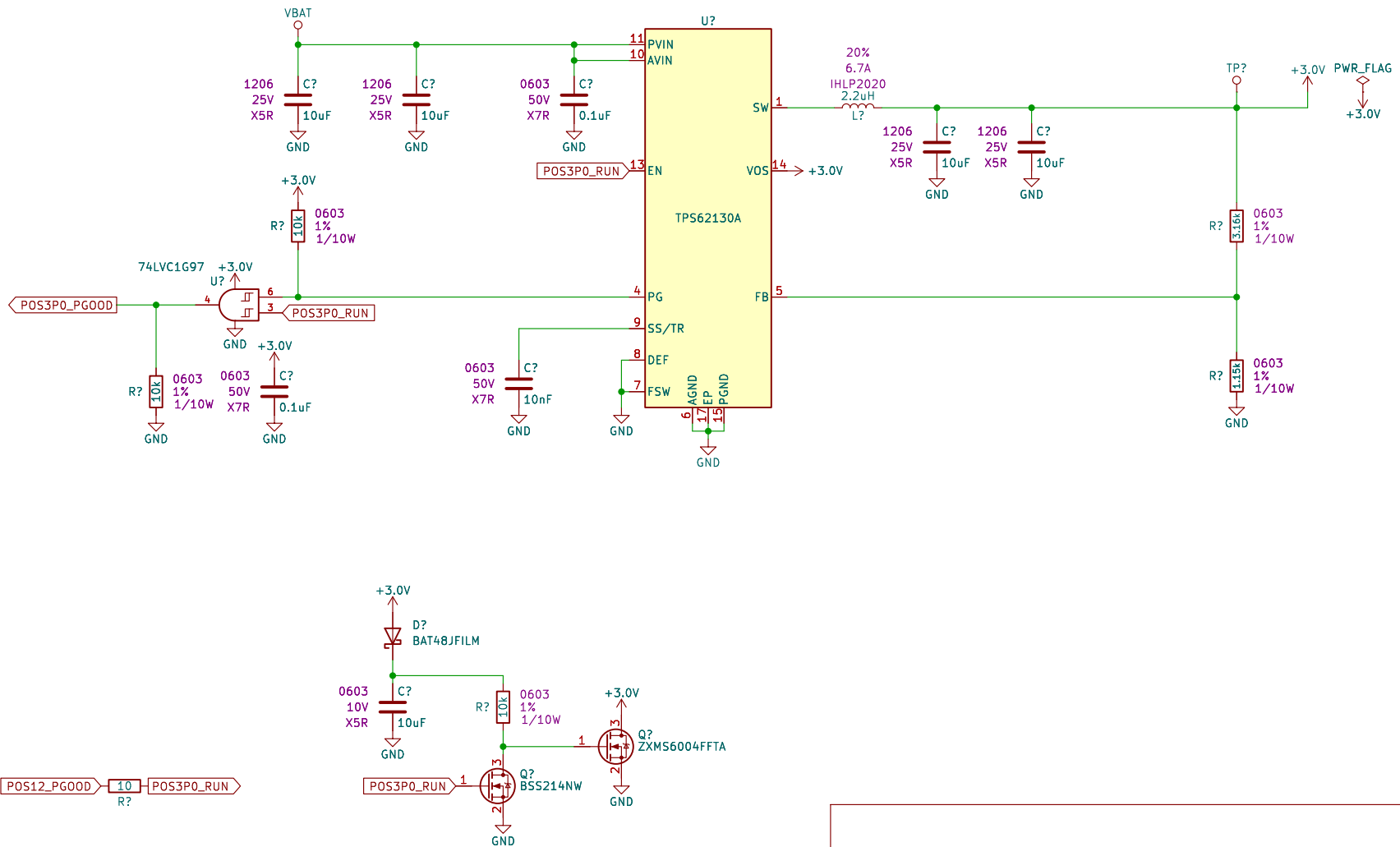
Sheet: /POS12 Telemetry/
File: POS12_Telemetry.kicad_sch

Title: Thermal Camera

Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 3/28

figure out sequencing



Drew Maatman and Michael Laffin

Sheet: /POS3P0 Power Supply/

File: POS3P0_Power_Supply.kicad_sch

Title: Thermal Camera

Size: A	Date: 2023-11-13
---------	------------------

KiCad E.D.A.	kicad 7.0.9
--------------	-------------

Rev: PRELIM

Id: 4/28

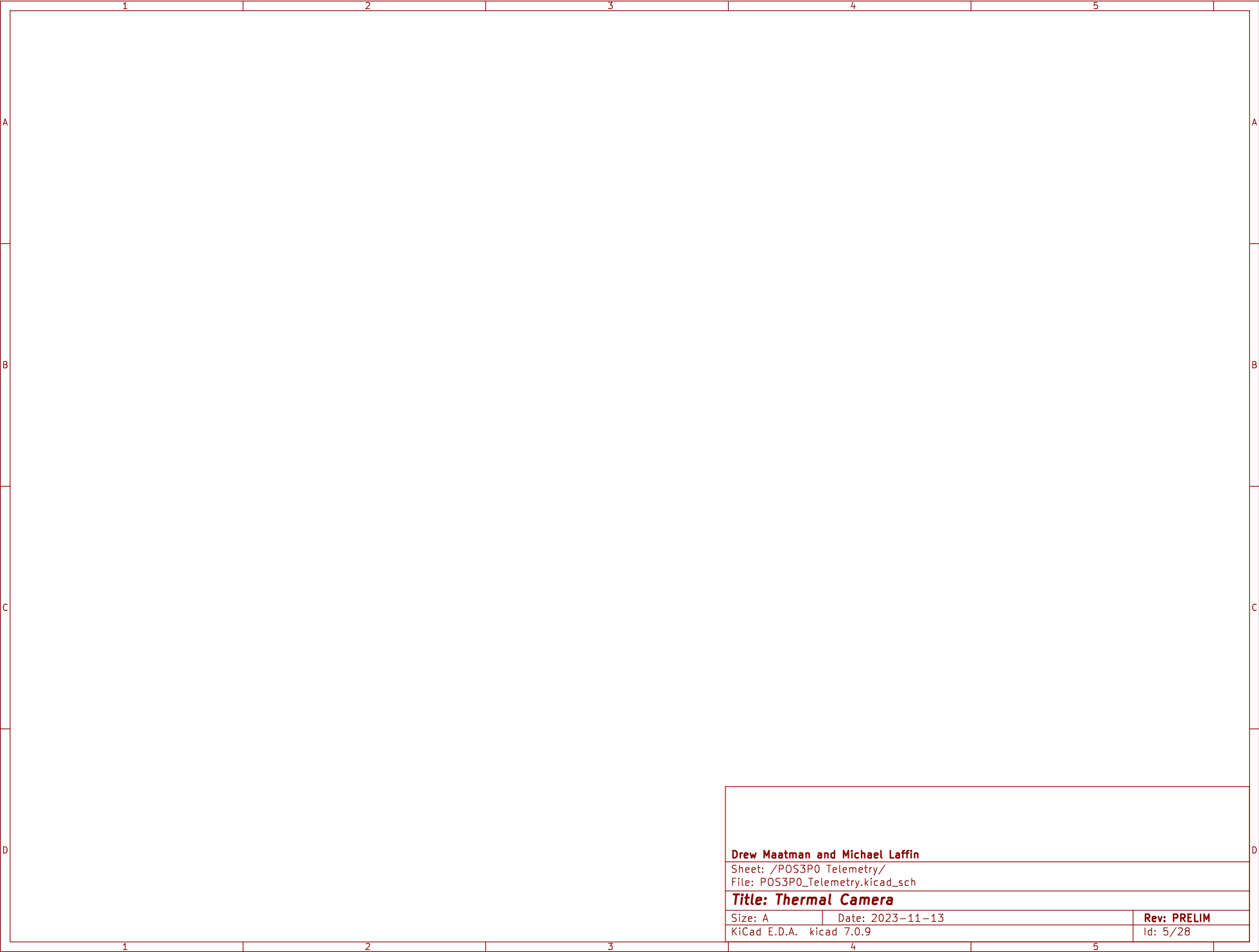
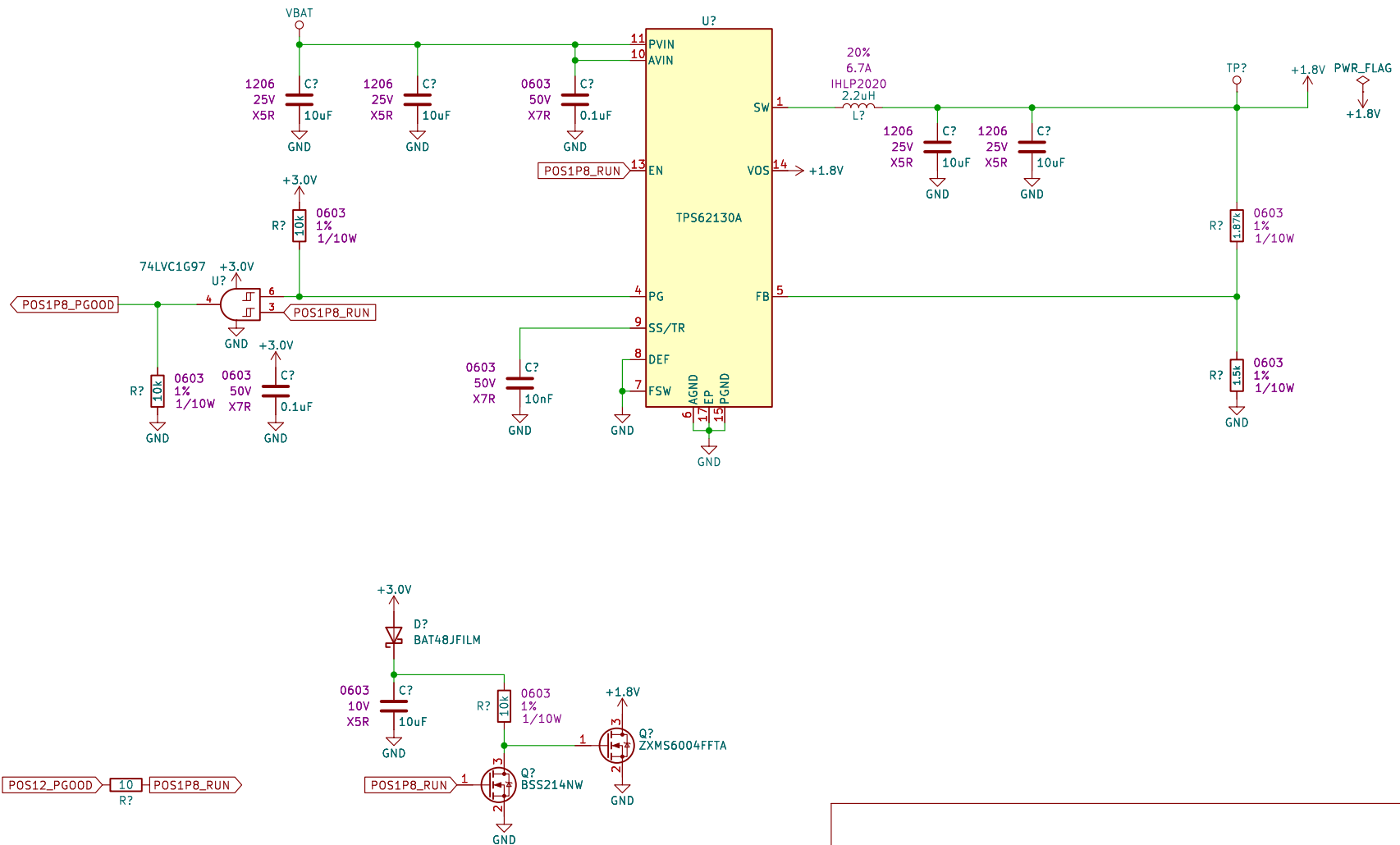


figure out sequencing



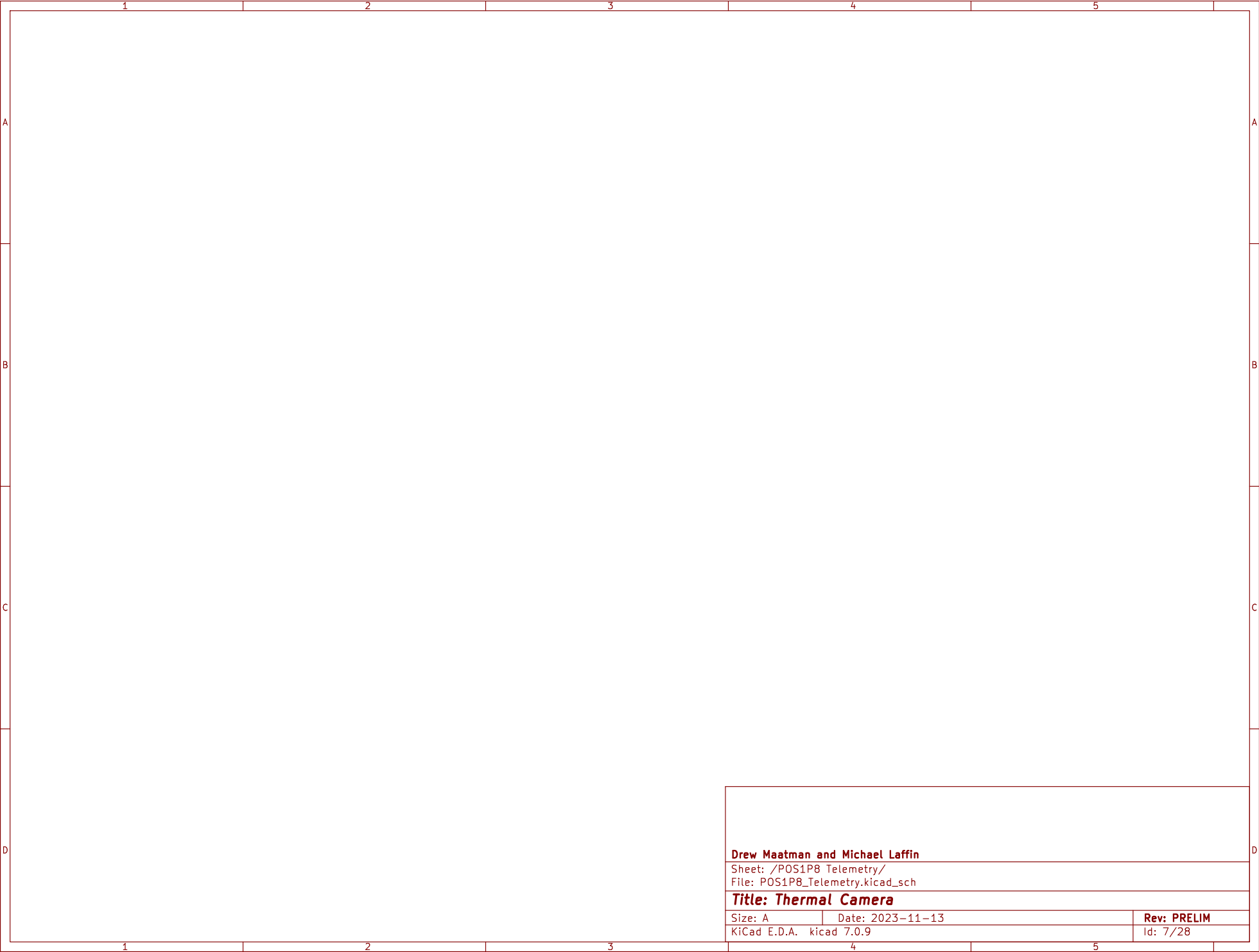
Drew Maatman and Michael Laffin

Sheet: /POS1P8 Power Supply/
File: POS1P8_Power_Supply.kicad_sch

Title: Thermal Camera

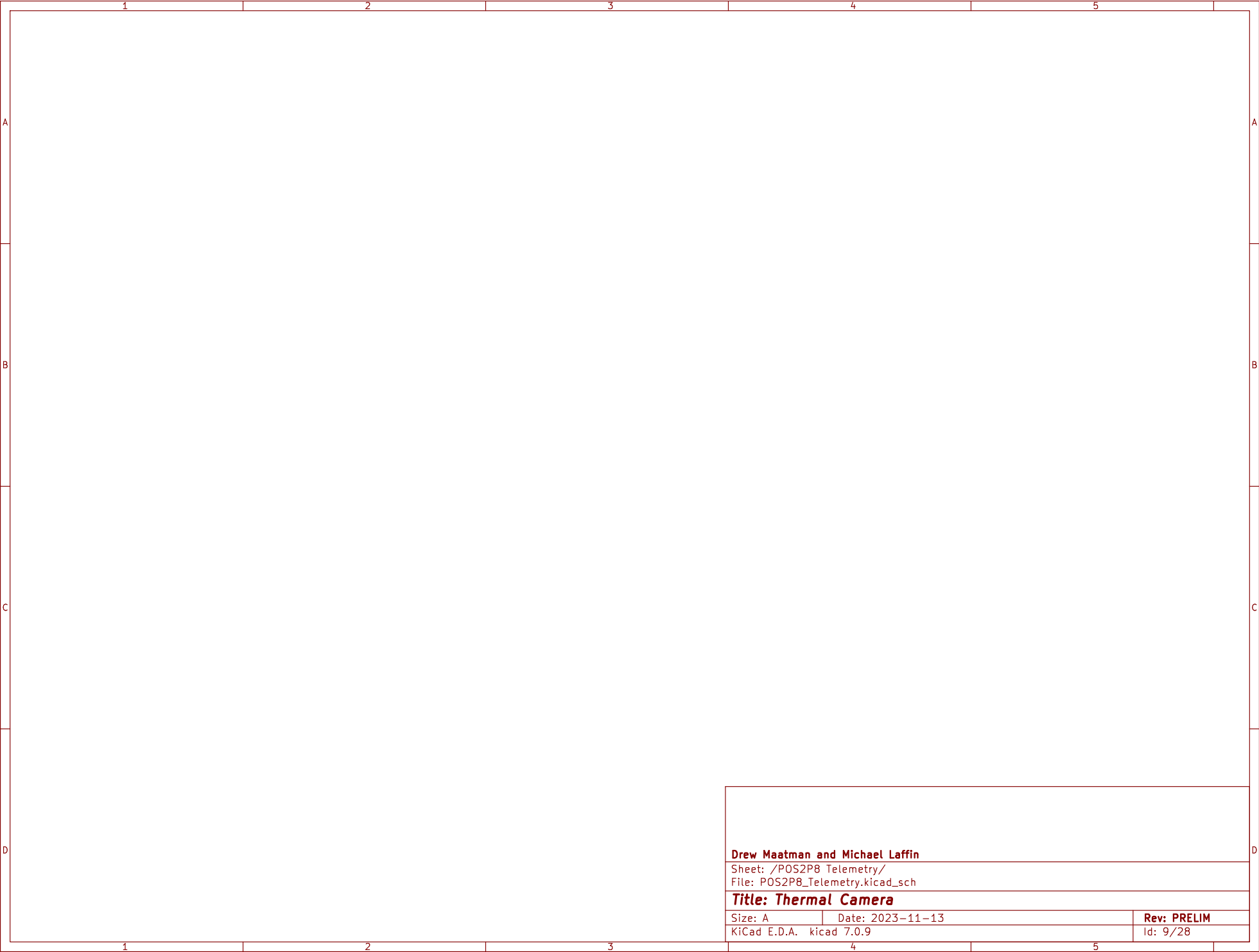
Size: A	Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9	

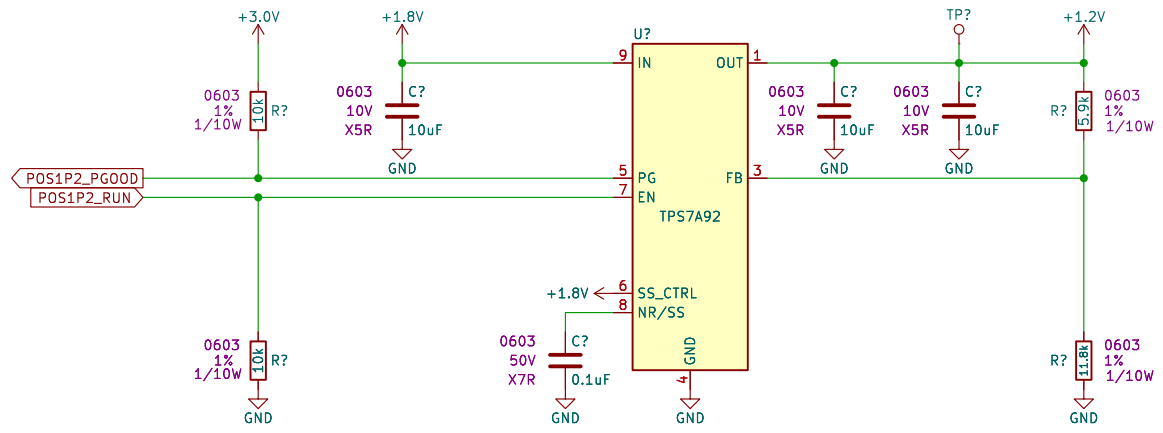
Rev: PRELIM
Id: 6/28



Drew Maatman and Michael Laffin		
Sheet: /POS1P8 Telemetry/ File: POS1P8_Telemetry.kicad_sch		
Title: Thermal Camera		
Size: A	Date: 2023-11-13	Rev: PRELIM
KiCad E.D.A. kicad 7.0.9		Id: 7/28

Id: 8/28





Drew Maatman and Michael Laffin

Sheet: /POS1P2 Power Supply/
File: POS1P2_Power_Supply.kicad_sch

Title: Thermal Camera

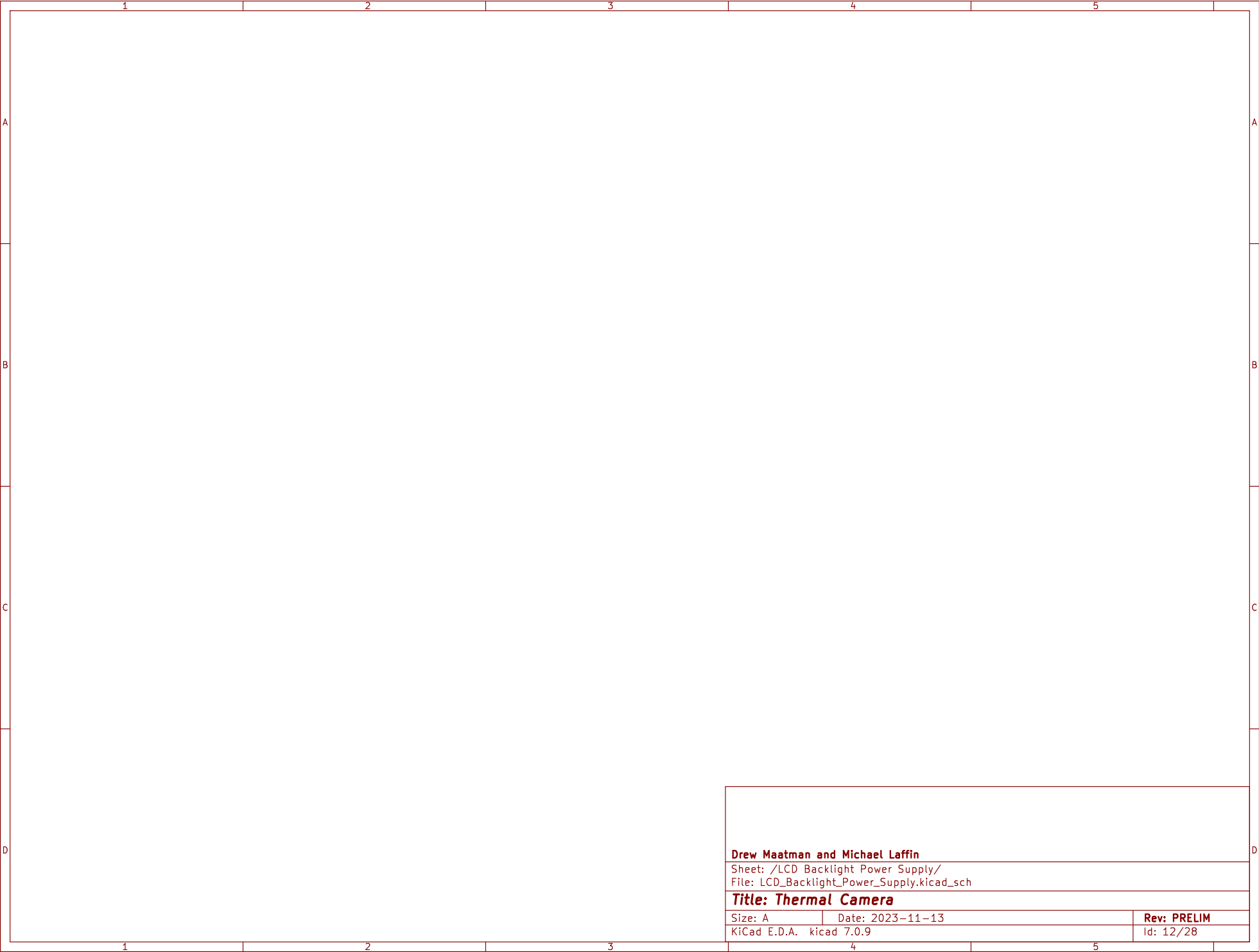
Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 10/28

1					2					3					4					5					
A																									A
B																									B
C																									C
D																									D
1					2					3					4					5					

</

Drew Maatman and Michael Laffin		
Sheet: /POS1P2 Telemetry/ File: POS1P2_Telemetry.kicad_sch		
Title: Thermal Camera		
Size: A	Date: 2023-11-13	Rev: PRELIM
KiCad E.D.A. kicad 7.0.9		Id: 11/28



Drew Maatman and Michael Laffin

Sheet: /LCD Backlight Power Supply/
File: LCD_Backlight_Power_Supply.kicad_sch

Title: Thermal Camera

Size: A	Date: 2023-11-13	Rev: PRELIM
KiCad E.D.A. kicad 7.0.9	Id: 12/28	

A

B

C

D

1

2

3

4

5

Drew Maatman and Michael Laffin

Sheet: /LCD Backlight Telemetry/
File: LCD_Backlight_Telemetry.kicad_sch

Title: Thermal Camera

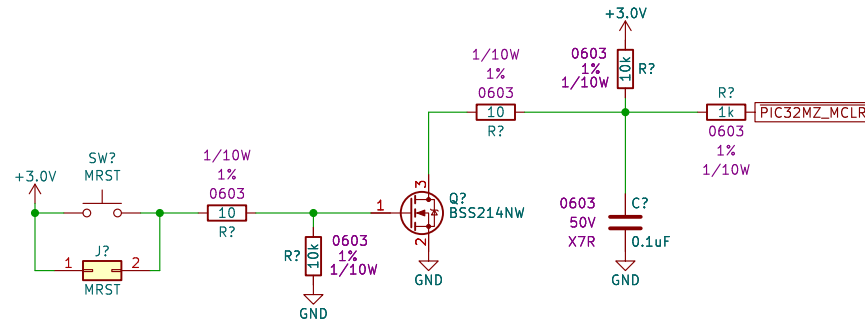
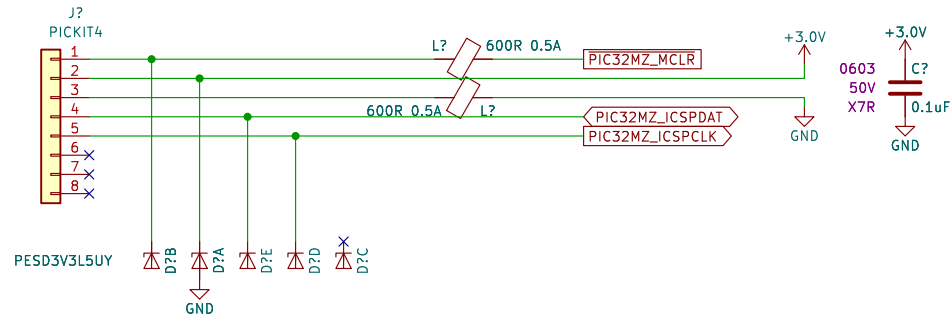
Size: A	Date: 2023-11-13	Rev: PRELIM
KiCad E.D.A.	kicad 7.0.9	Id: 13/28

1					2					3					4					5					
A																									A
B																									B
C																									C
D																									D
1					2					3					4					5					

</

Drew Maatman and Michael Laffin		
Sheet: /Battery Management/ File: Battery_Management.kicad_sch		
Title: Thermal Camera		
Size: A	Date: 2023-11-13	Rev: PRELIM
KiCad E.D.A. kicad 7.0.9		Id: 14/28

COPIED FROM PIC32MZ EF FIX FOR PIC32MZ DA CONSIDER REMOVING BEADS



Drew Maatman and Michael Laffin

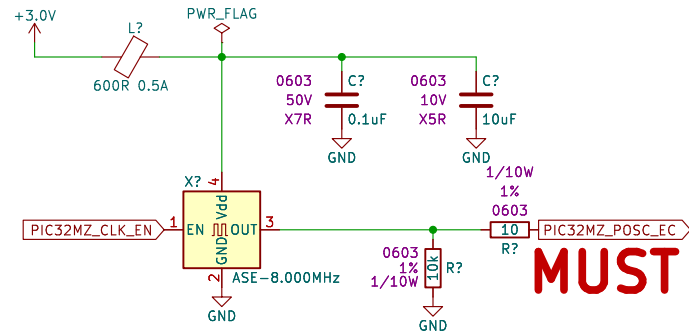
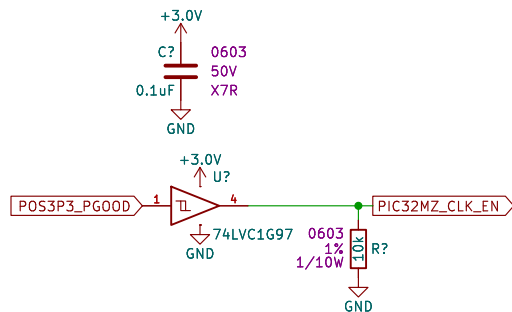
Sheet: /PIC32MZ DA Programming/
File: PIC32MZ_DA_Programming.kicad_sch

Title: Thermal Camera

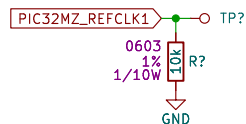
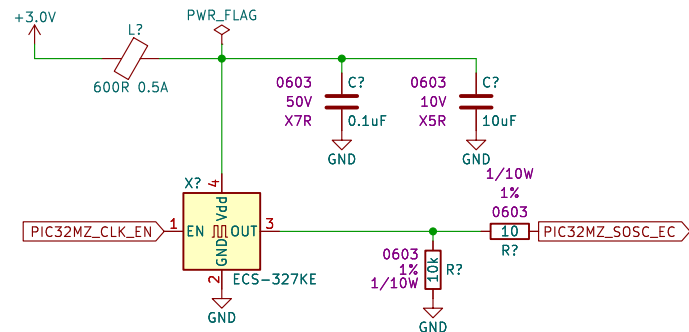
Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 15/28

COPIED FROM PIC32MZ EF FIX FOR PIC32MZ DA CHANGE TO +3.0V CLOCKS



MUST BE 24MHZ



Drew Maatman and Michael Laffin

Sheet: /PIC32MZ DA Clocking/

File: PIC32MZ_DA_Clocking.kicad_sch

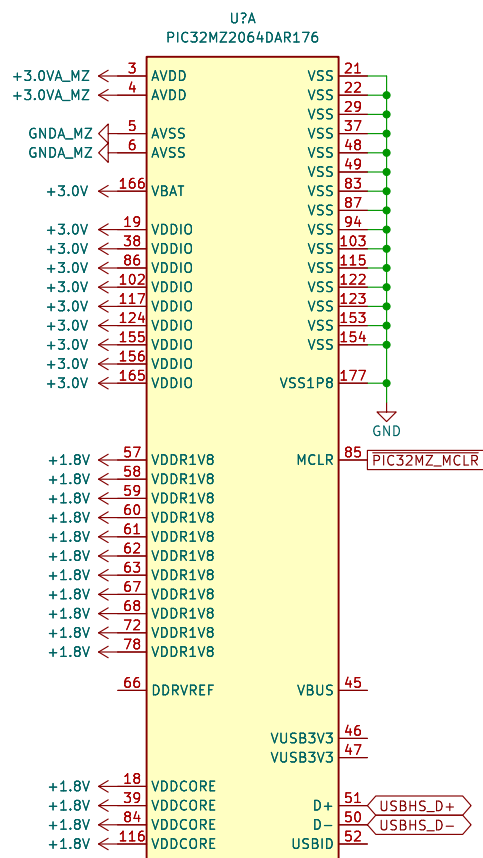
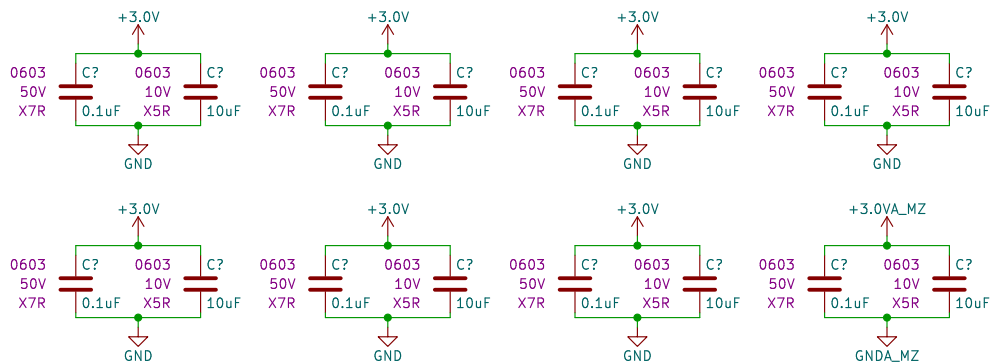
Title: Thermal Camera

Size: A Date: 2023-11-13

KiCad E.D.A. kicad 7.0.9

Rev: PRELIM

Id: 16/28



COPIED FROM PIC32MZ EF
FIX FOR PIC32MZ DA
CHANGE TO +3.0V

FIGURE OUT HOW TO USE THIS

Drew Maatman and Michael Laffin

Sheet: /PIC32MZ DA Power/
File: PIC32MZ_DA_Power.kicad_sch

Title: Thermal Camera

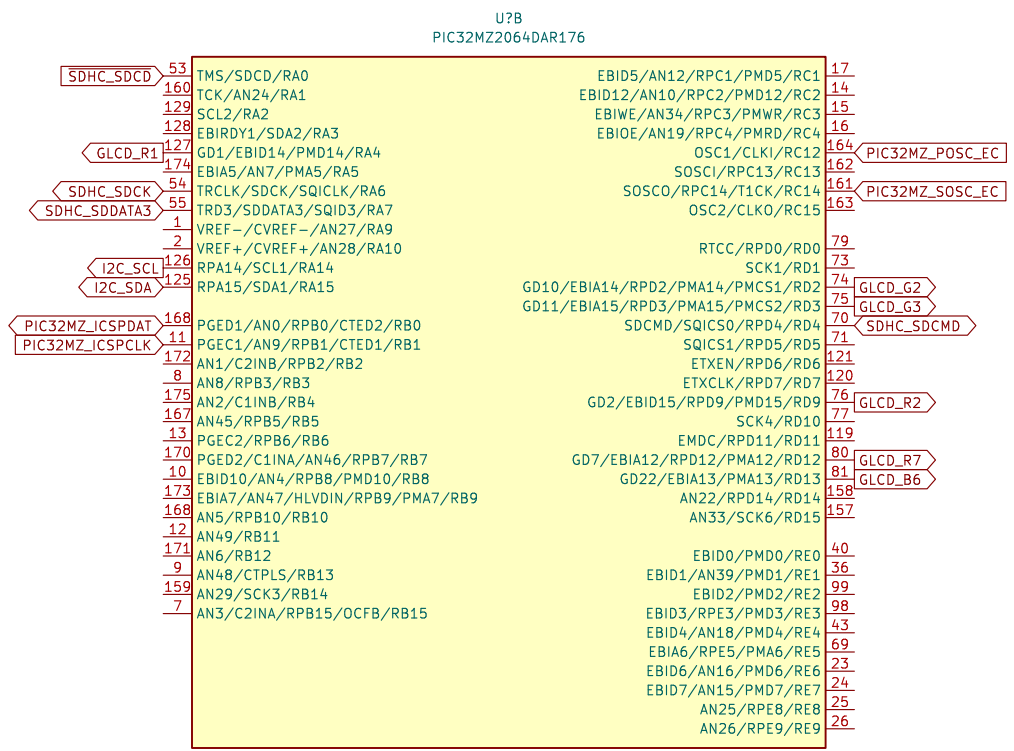
Size: A Date: 2023-11-13

KiCad E.D.A. kicad 7.0.9

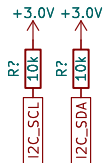
Rev: PRELIM

Id: 17/28

See TABLE 36-1:RGB COLOR MAPPING for Graphic LCD Pin Mapping



DOUBLE CHECK
SOSC PIN



Drew Maatman and Michael Laffin

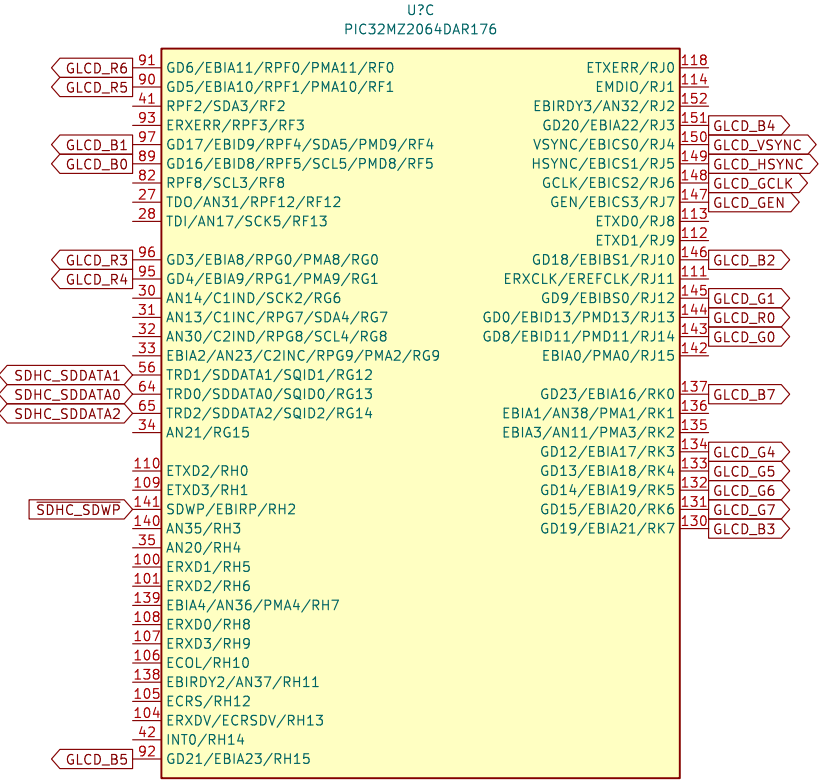
Sheet: /PIC32MZ DA 1/
File: PIC32MZ_DA_1.kicad_sch

Title: Thermal Camera

Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 18/28

See TABLE 36-1:RGB COLOR MAPPING for Graphic LCD Pin Mapping



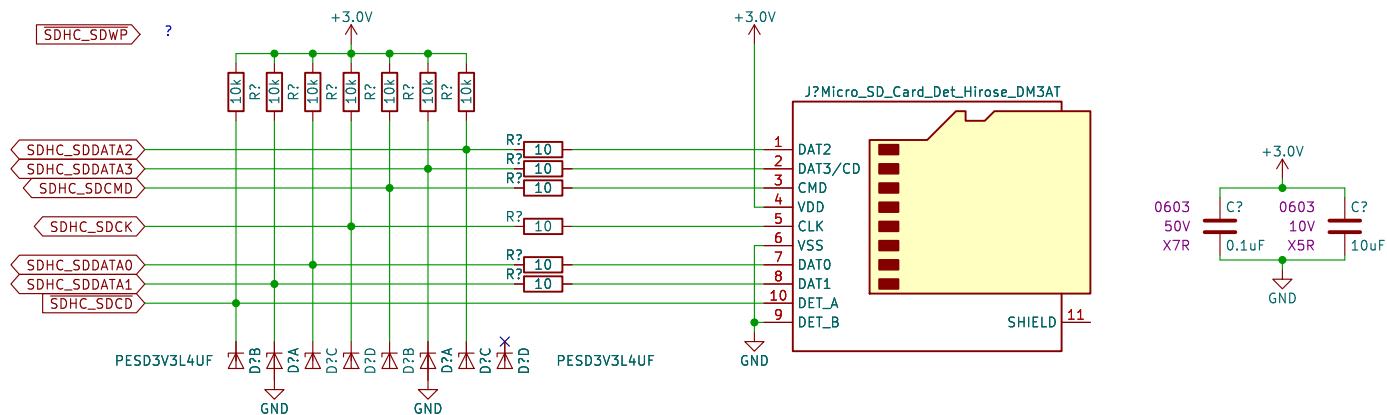
Drew Maatman and Michael Laffin

Sheet: /PIC32MZ DA 2/
File: PIC32MZ_DA_2.kicad_sch

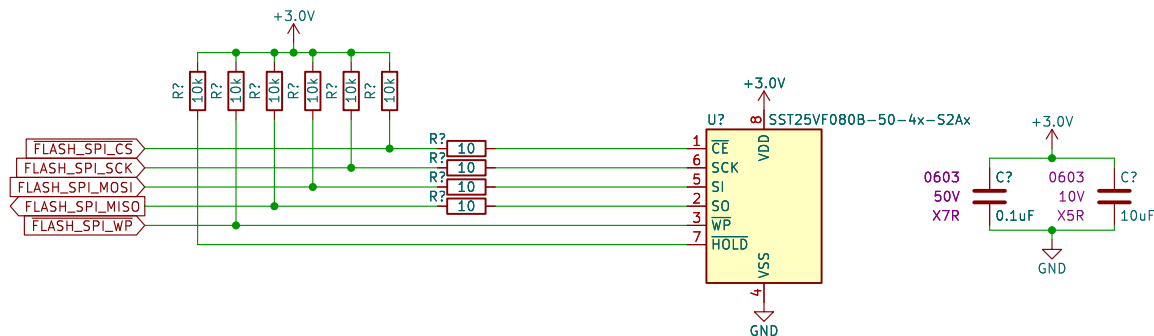
Title: Thermal Camera

Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 19/28



Add SD card power switching?



SD CARD, SPI FLASH

BREAK OUT A SPI TO SD CARD AS INSURANCE

BREAK OUT FLASH SPI TO A HEADER FOR PROGRAMMING

Drew: Michael and Michael

Sheet: /External Storage/

File: External_Storage.kicad_sch

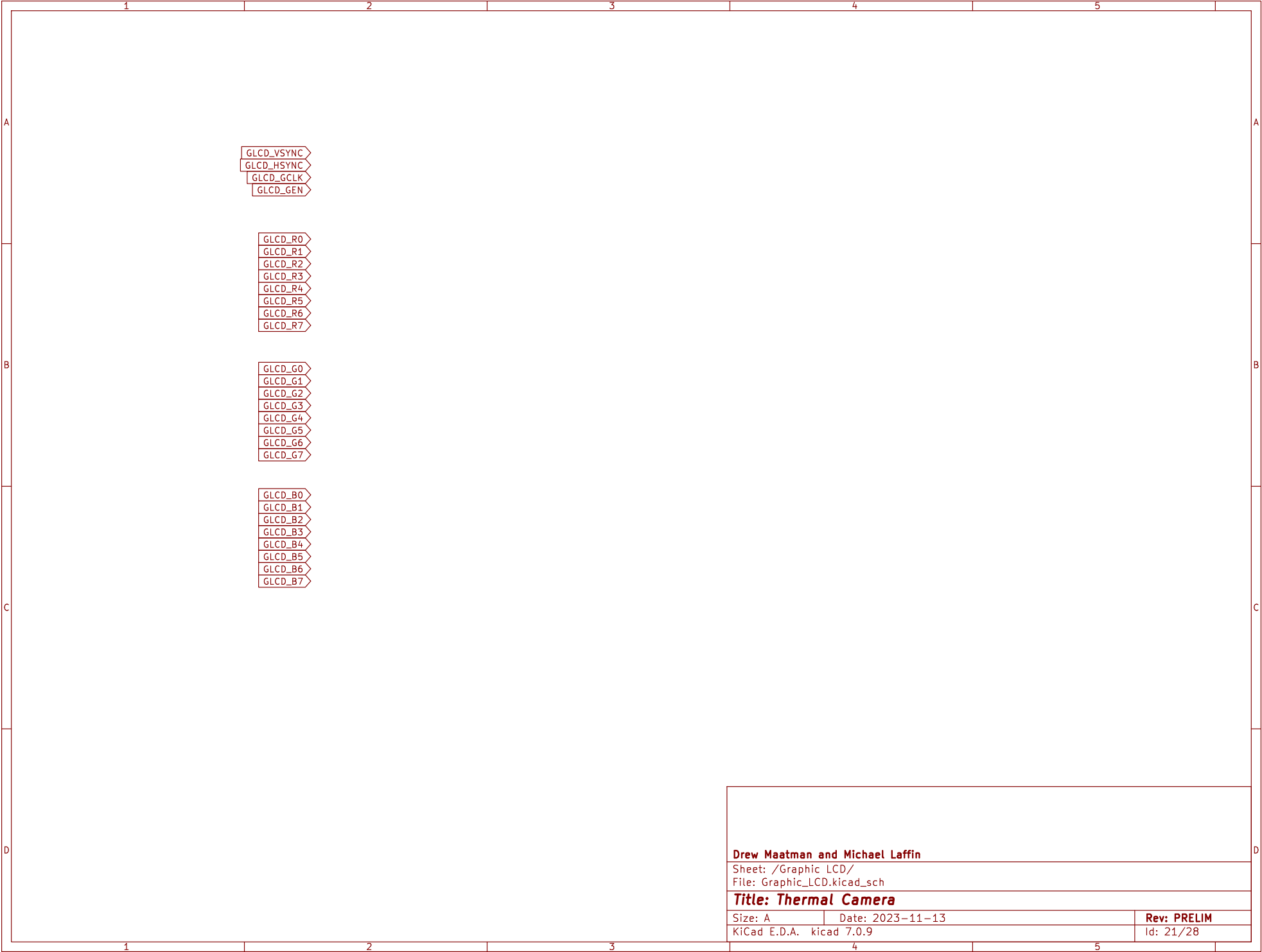
Title: Thermal Camera

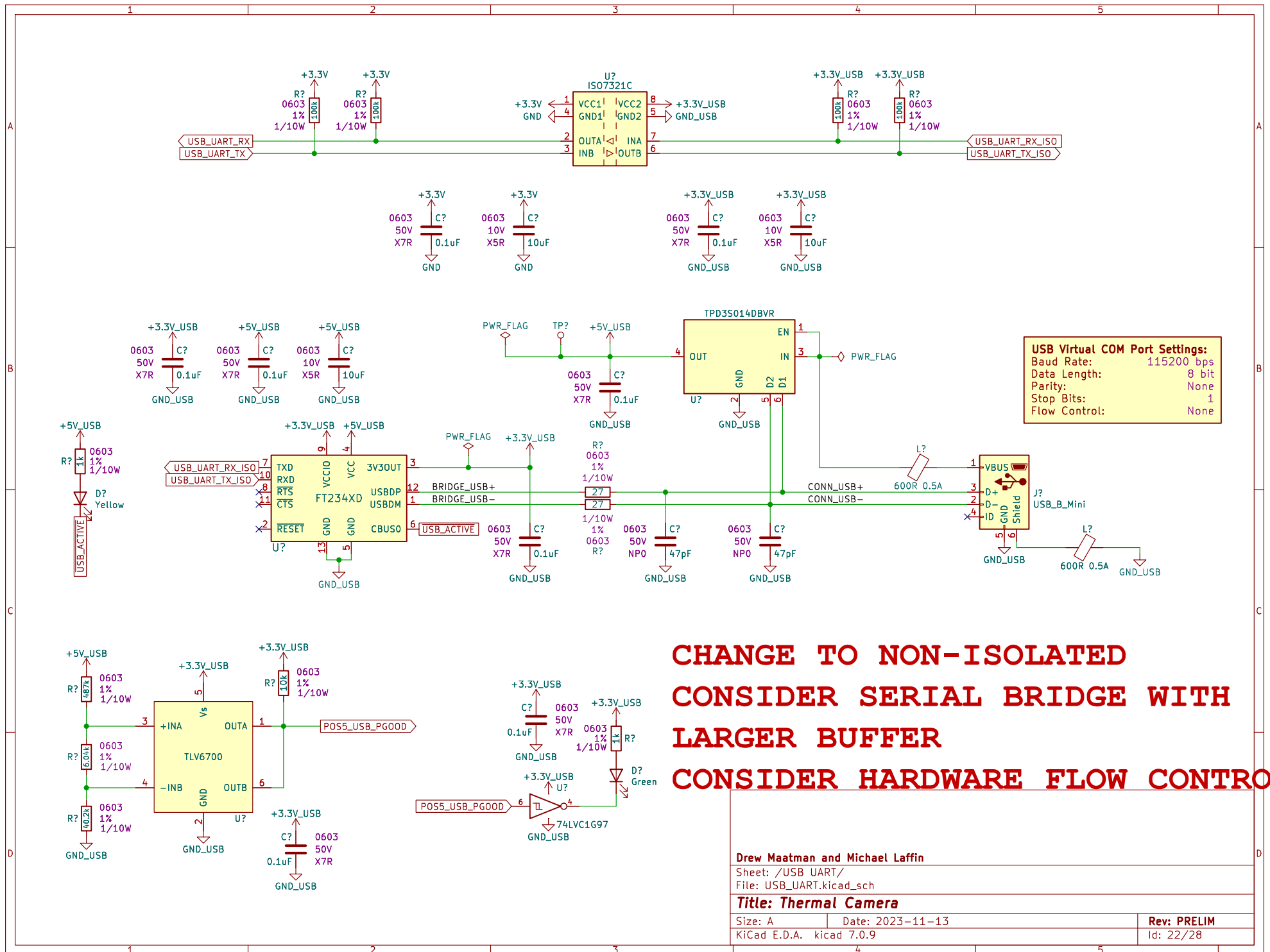
Size: A Date: 2023-11-13

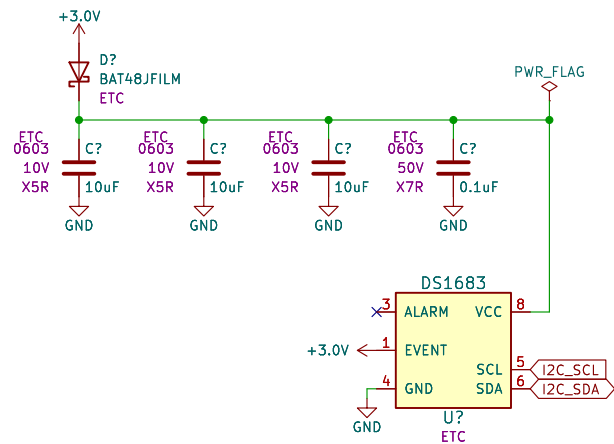
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM

Id: 20/28







I2C 7-Bit Address:
0x6B

Drew Maatman and Michael Laffin

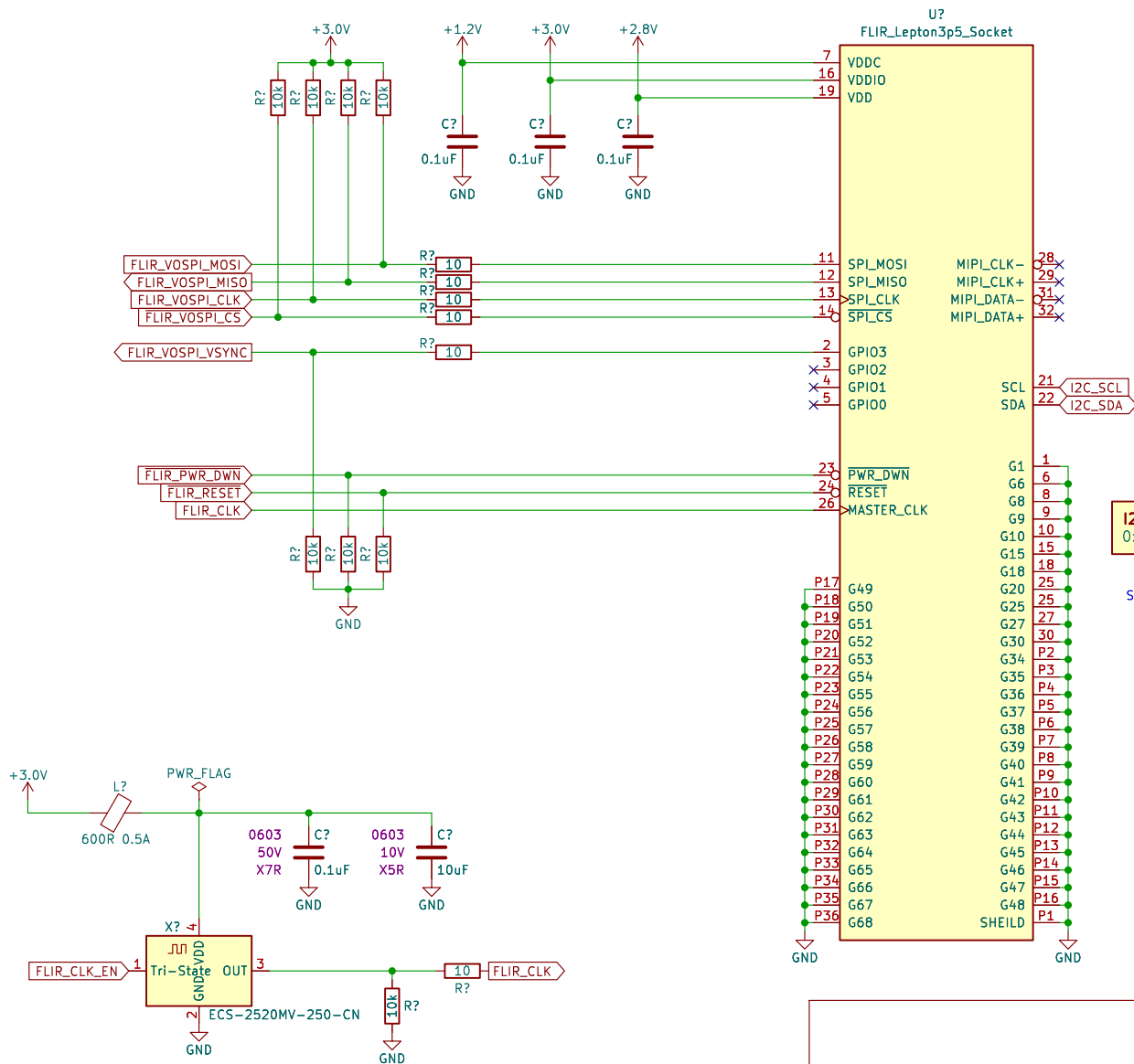
Sheet: /Elapsed Time Counter/
File: Elapsed_Time_Counter.kicad_sch

Title: Thermal Camera

Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 23/28

Power Supply Considerations:
VDDC: 1.20V (1.14V min, 1.26V max), 50mVpp max ripple, 110mA max draw
VDD: 2.80V (2.72V min, 2.88V max), 30mVpp max ripple, 16mA max draw
VDDIO: 2.8V min, 3.1V max, 50mVpp max ripple, 310mA max draw



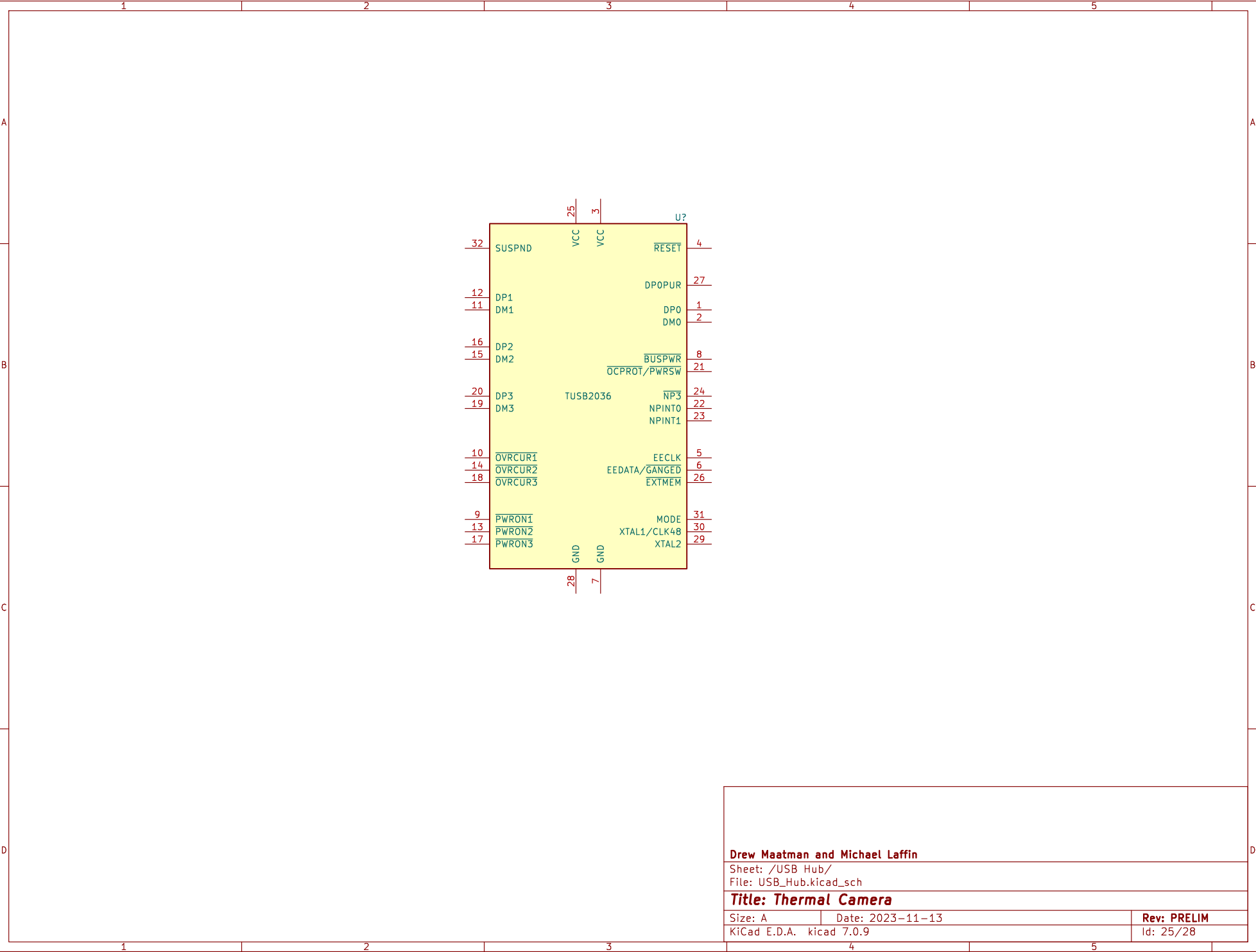
Drew Maatman and Michael Laffin

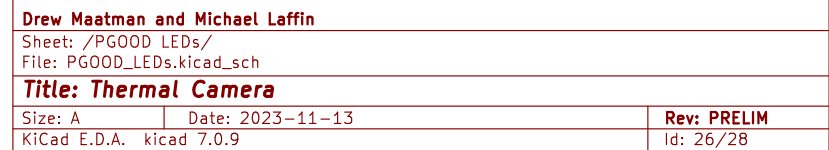
Sheet: /FLIR Lepton Sensor/
File: FLIR_Lepton_Sensor.kicad_sch

Title: Thermal Camera

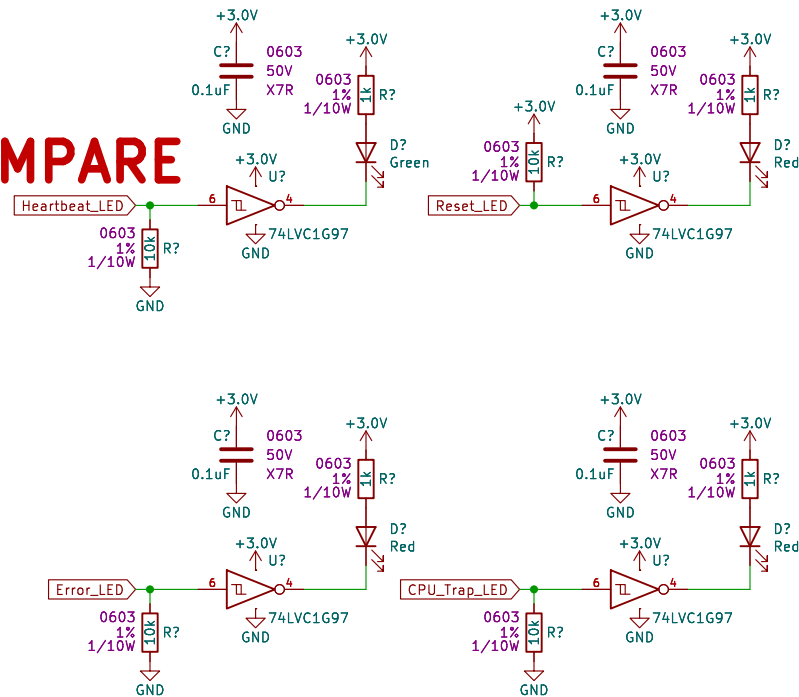
Size: A Date: 2023-11-13
KiCad E.D.A. kicad 7.0.9

Rev: PRELIM
Id: 24/28





**MUST USE
OUTPUT COMPARE
PIN**



Drew Maatman and Michael Laffin

Sheet: /Status_LEDs/

File: Status_LEDs.kicad_sch

Title: Thermal Camera

Size: A Date: 2023-11-13

KiCad E.D.A. kicad 7.0.9

Rev: PRELIM

Id: 27/28

