

# Thermal Camera

[https://github.com/drewsum/Thermal\\_Camera](https://github.com/drewsum/Thermal_Camera)

## 01. Table of Contents

02. POS12 Input	POS12_Input	14. Battery Management	Battery Management	26. Upstream USB Port	Upstream USB Port File: Upstream_USB_Port.kicad_sch
03. POS12 Telemetry	POS12 Telemetry	15. PIC32MZ DA Programming	PIC32MZ DA Programming	27. PGOOD LEDs	PGOOD LEDs
04. POS3P0 Power Supply	POS3P0 Power Supply	16. PIC32MZ DA Clocking	PIC32MZ DA Clocking	28. Status LEDs	Status LEDs
05. POS3P0 Telemetry	POS3P0 Telemetry	17. PIC32MZ DA Power	PIC32MZ DA Power	29. Mechanical	Mechanical
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		

Add capacitive touch

Drew Maatman and Michael Laffin

Sheet: /

File: Thermal\_Camera.kicad\_sch

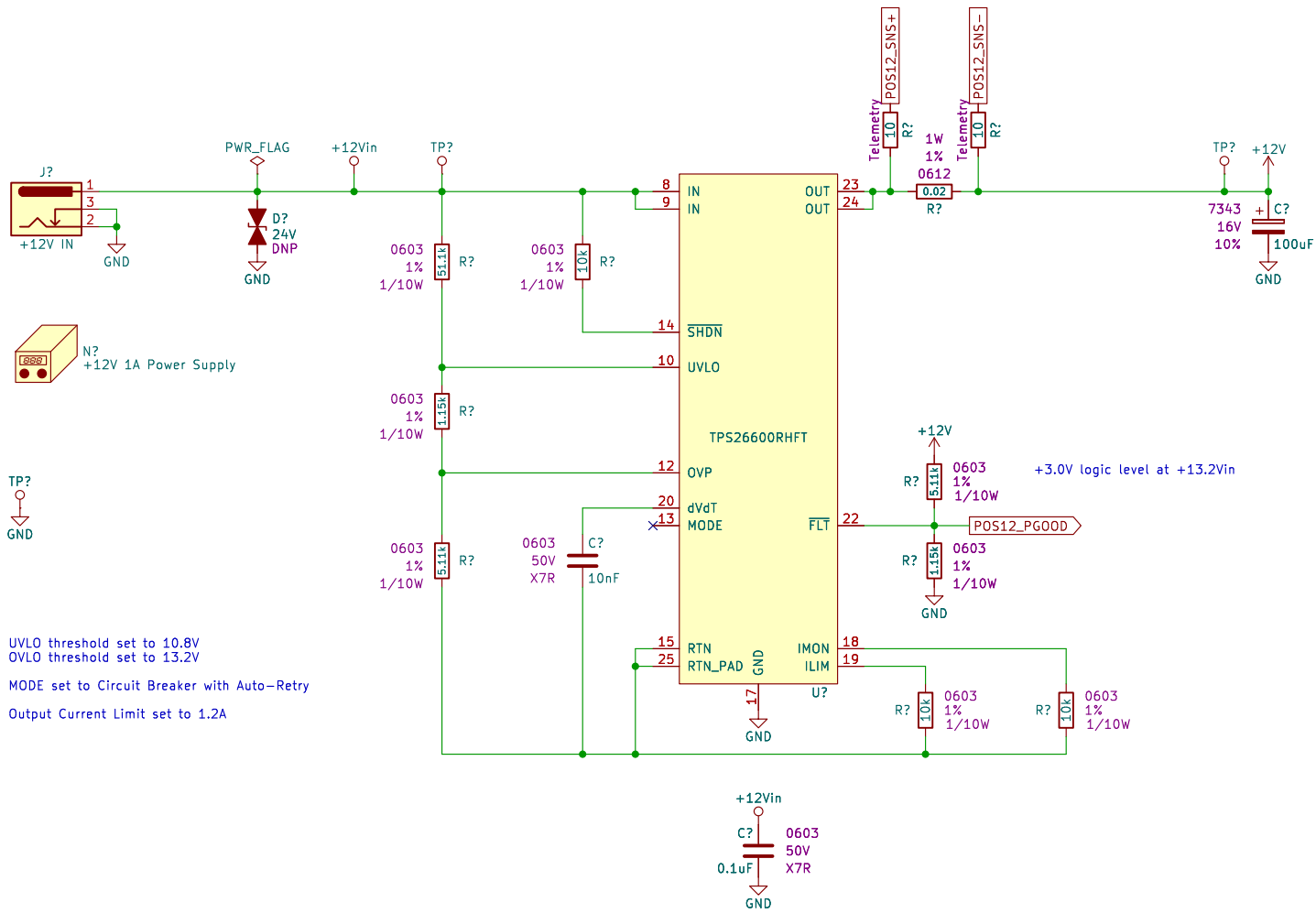
**Title: Thermal Camera**

Size: A Date: 2023-12-07

KiCad E.D.A. 8.0.1-rc1

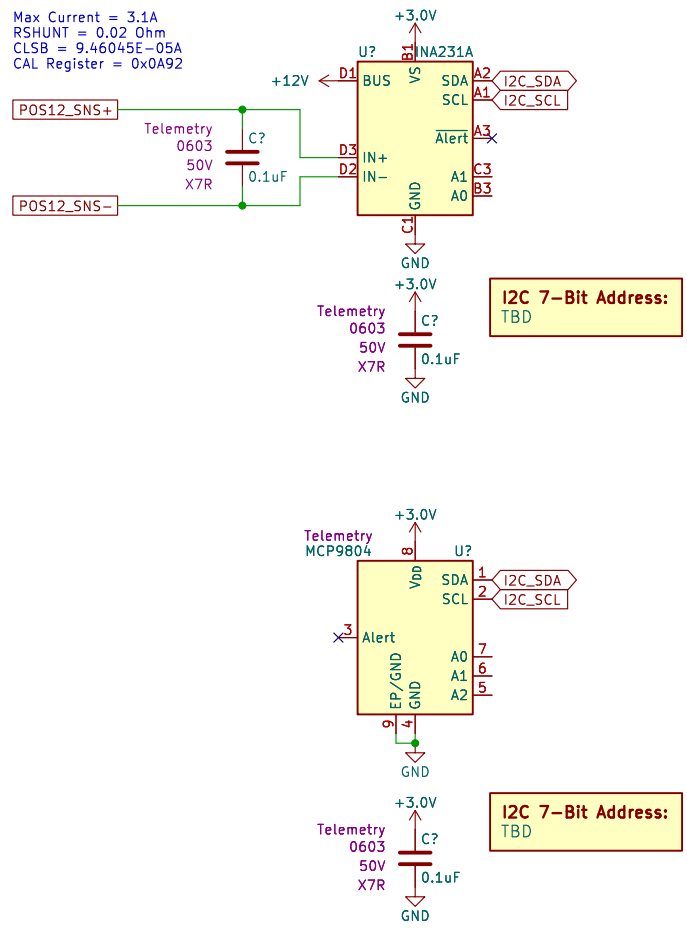
Rev: PRELIM

Id: 1/29



UVLO threshold set to 10.8V  
OVLO threshold set to 13.2V  
MODE set to Circuit Breaker with Auto-Retry  
Output Current Limit set to 1.2A

Drew Maatman and Michael Laffin		
Sheet: /POS12_Input/ File: POS12_Input.kicad_sch		
Title: Thermal Camera		
Size: A	Date: 2023-12-07	Rev: PRELIM
KiCad E.D.A. 8.0.1-rc1		Id: 2/29



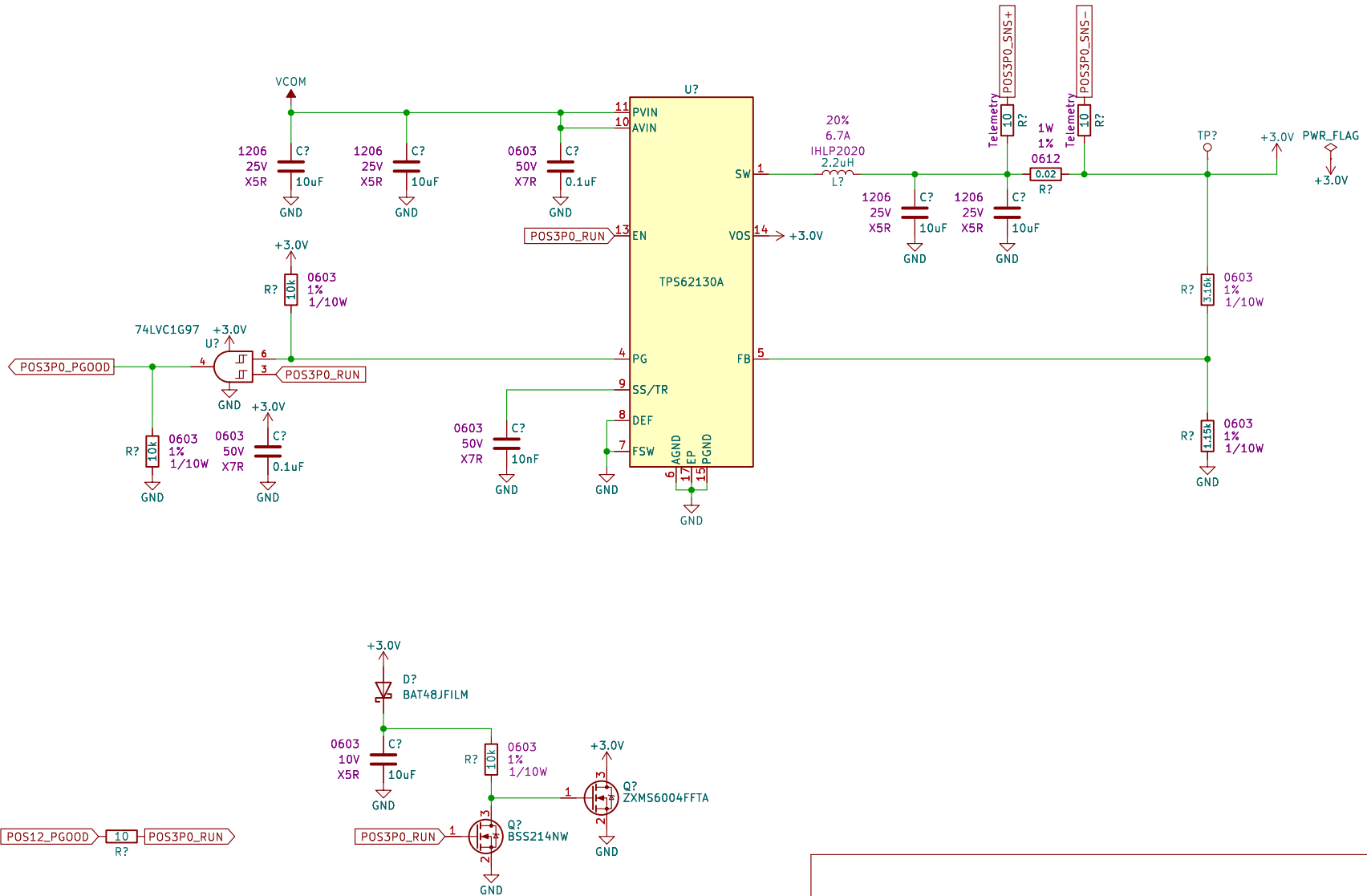
Drew Maatman and Michael Laffin

Sheet: /POS12 Telemetry/  
File: POS12\_Telemetry.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 3/29



Drew Maatman and Michael Laffin

Sheet: /POS3P0 Power Supply/

File: POS3P0\_Power\_Supply.kicad\_sch

**Title: Thermal Camera**

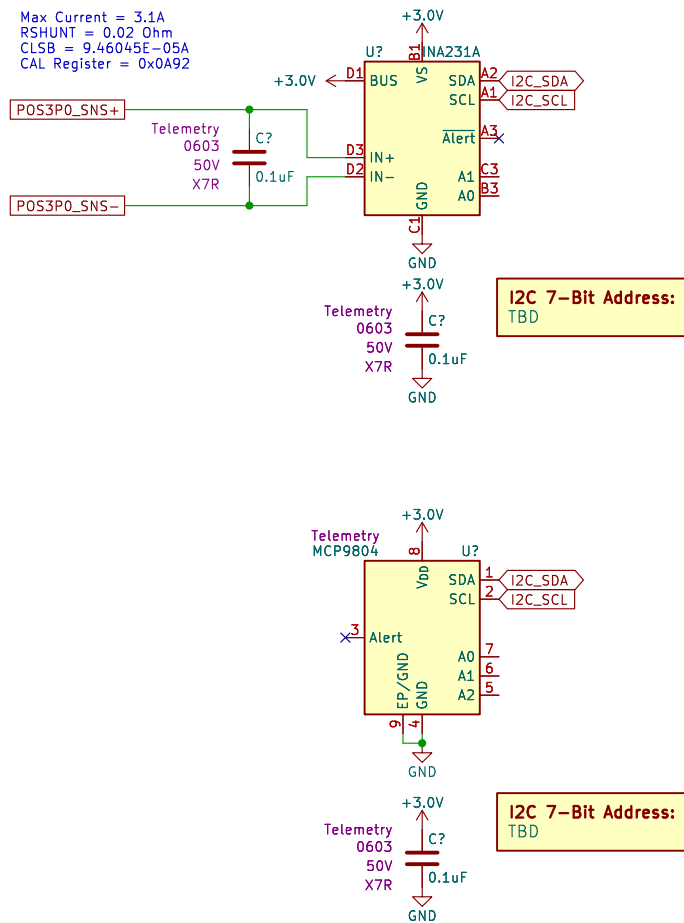
Size: A

Date: 2023-12-07

KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM

Id: 4/29



Drew Maatman and Michael Laffin

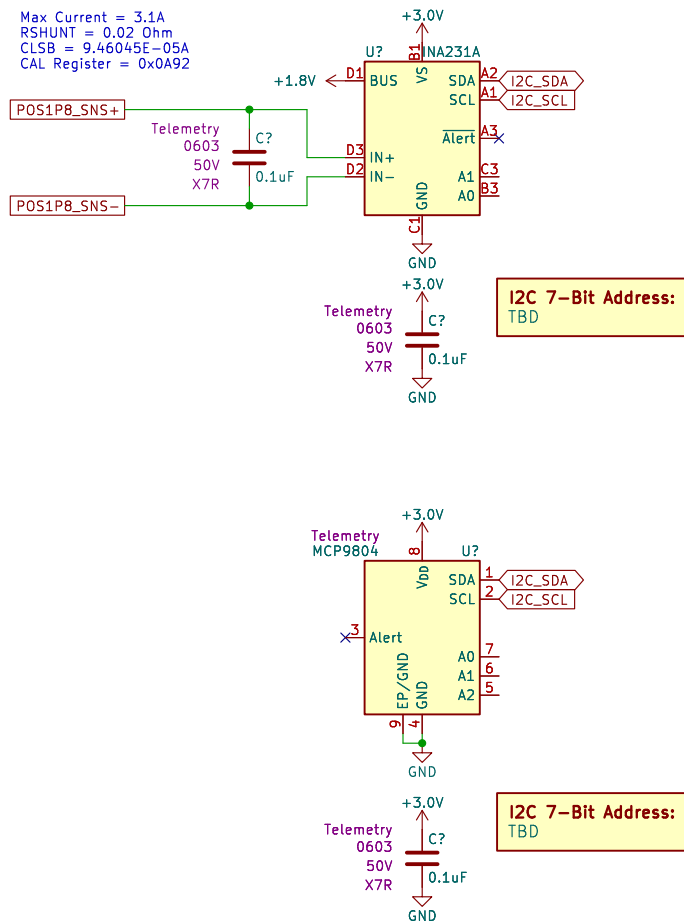
Sheet: /POS3P0 Telemetry/  
 File: POS3P0\_Telemetry.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07  
 KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
 Id: 5/29

Rev: PRELIM  
Id: 6/29



Drew Maatman and Michael Laffin

Sheet: /POS1P8 Telemetry/  
 File: POS1P8\_Telemetry.kicad\_sch

**Title: Thermal Camera**

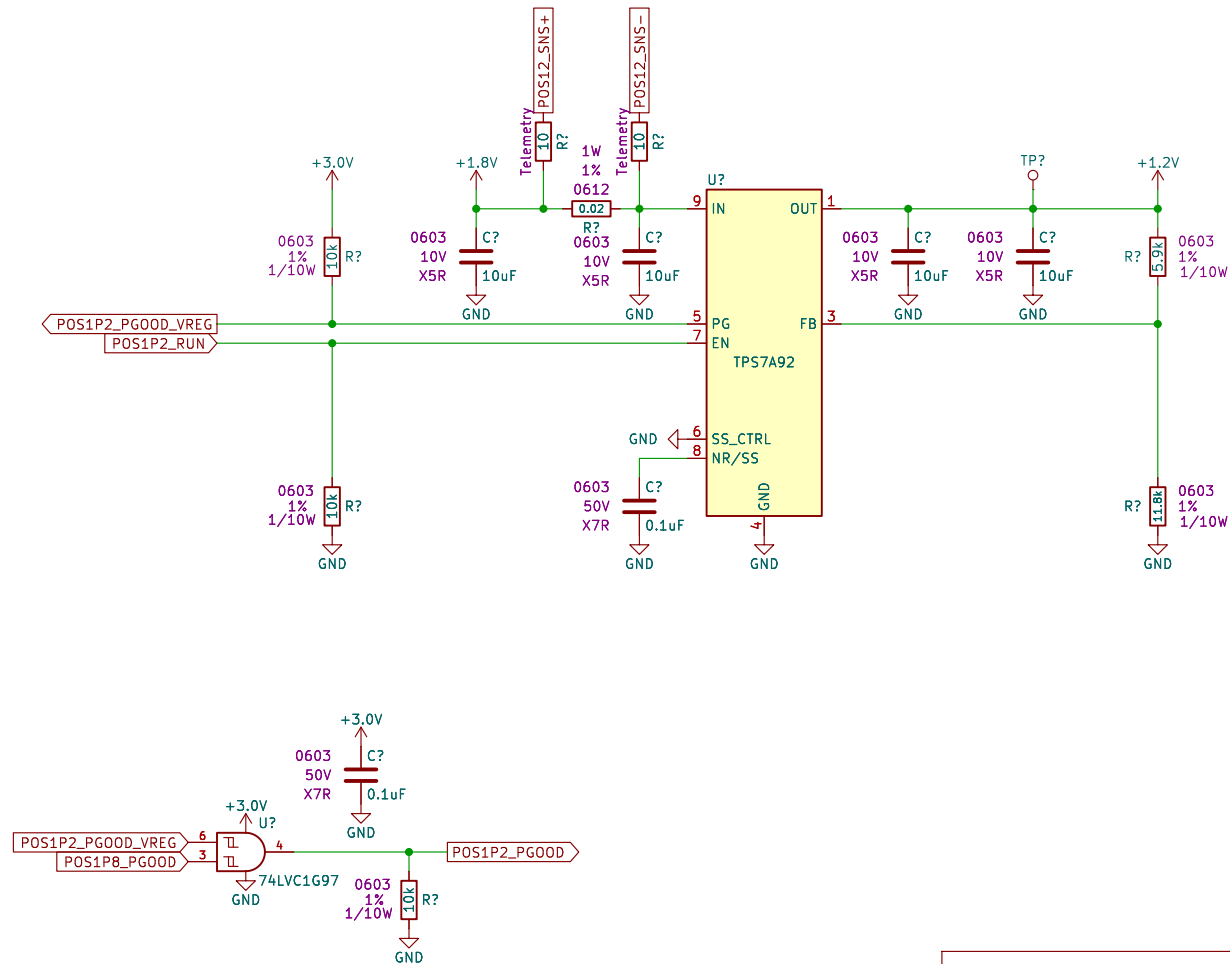
Size: A Date: 2023-12-07  
 KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
 Id: 7/29

Rev: PRELIM  
Id: 8/29







Drew Maatman and Michael Laffin

Sheet: /POS1P2 Power Supply/

File: POS1P2\_Power\_Supply.kicad\_sch

**Title: Thermal Camera**

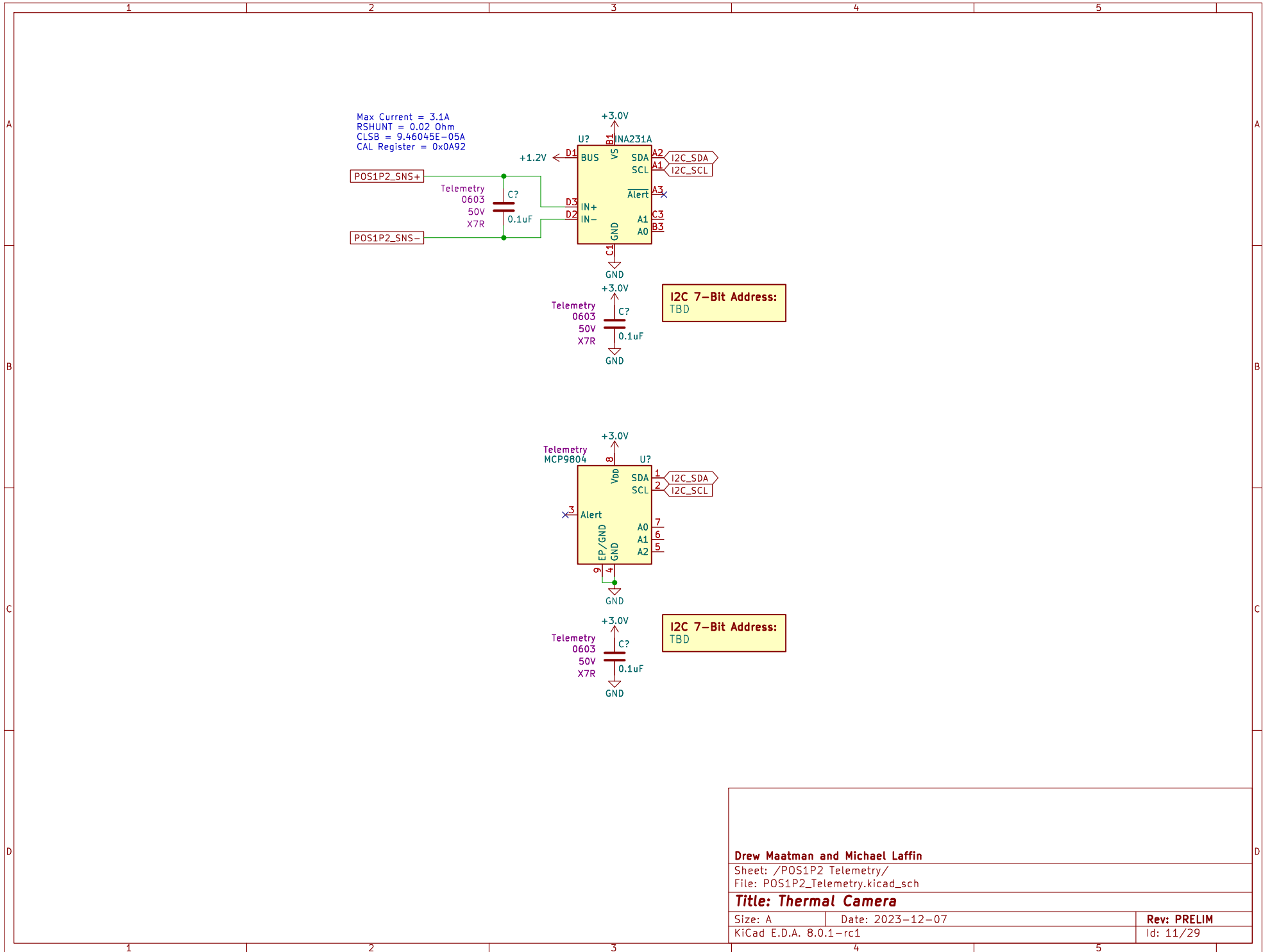
Size: A

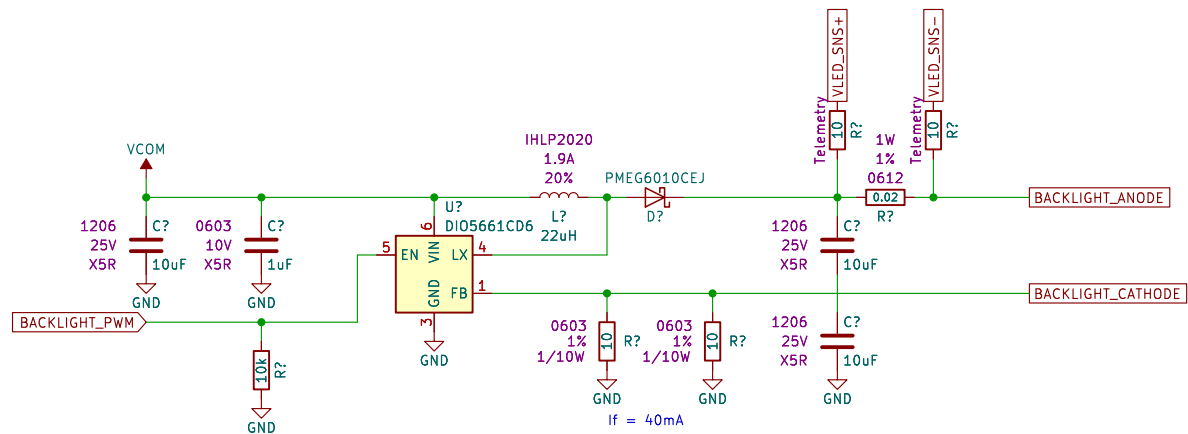
Date: 2023-12-07

KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM

Id: 10/29





**Drew Maatman and Michael Laffin**

Sheet: /LCD Backlight Power Supply/  
File: LCD\_Backlight\_Power\_Supply.kicad\_sch

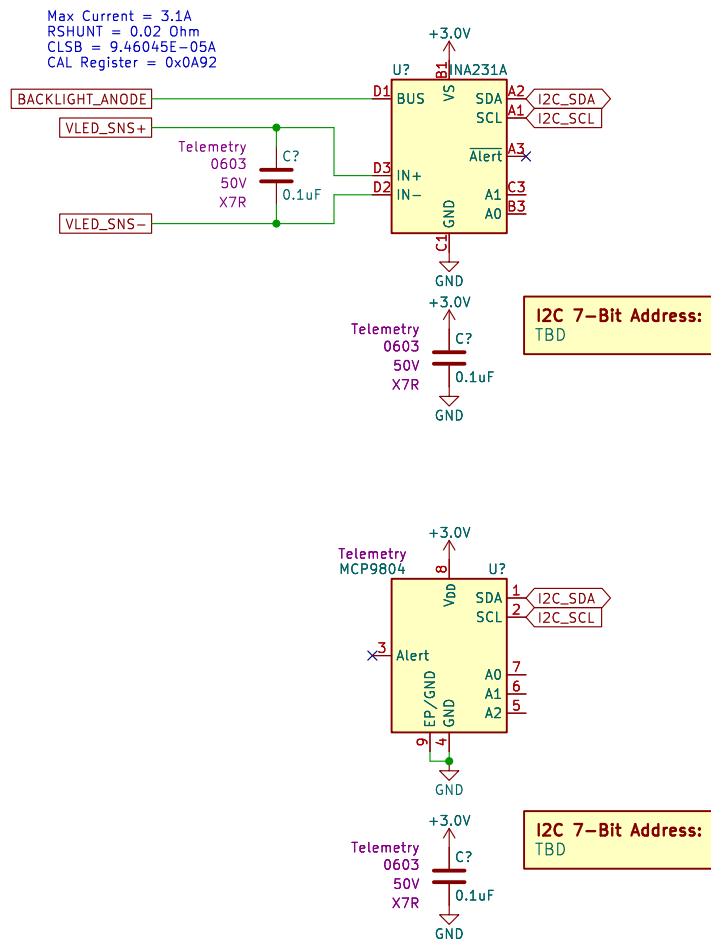
**Title: Thermal Camera**

Size: A Date: 2023-12-07

KiCad E.D.A. 8.0.1-rc1

**Rev: PRELIM**

Id: 12/29



Drew Maatman and Michael Laffin

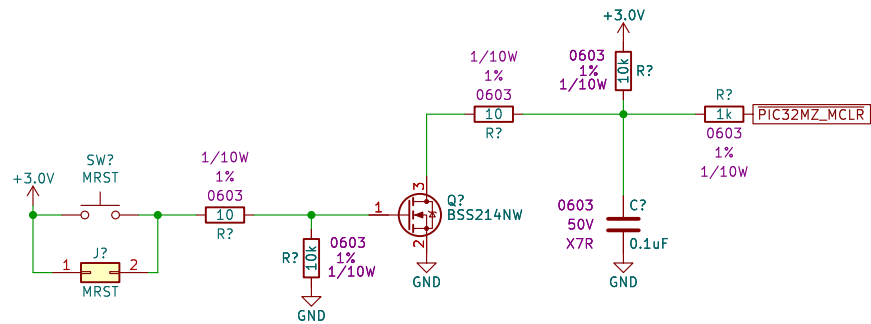
Sheet: /LCD Backlight Telemetry/  
File: LCD\_Backlight\_Telemetry.kicad\_sch

**Title: Thermal Camera**

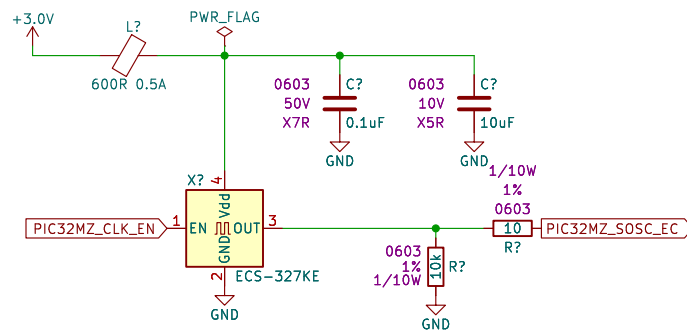
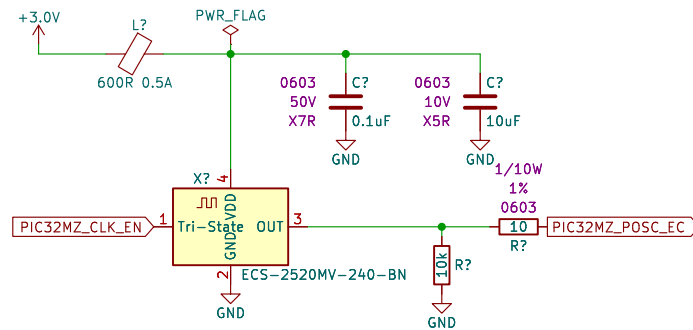
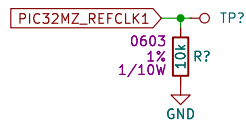
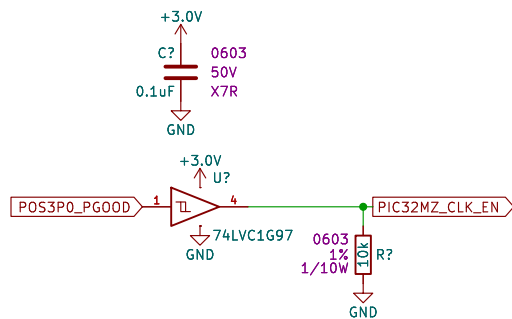
Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 13/29





Id: 15/29



Drew Maatman and Michael Laffin

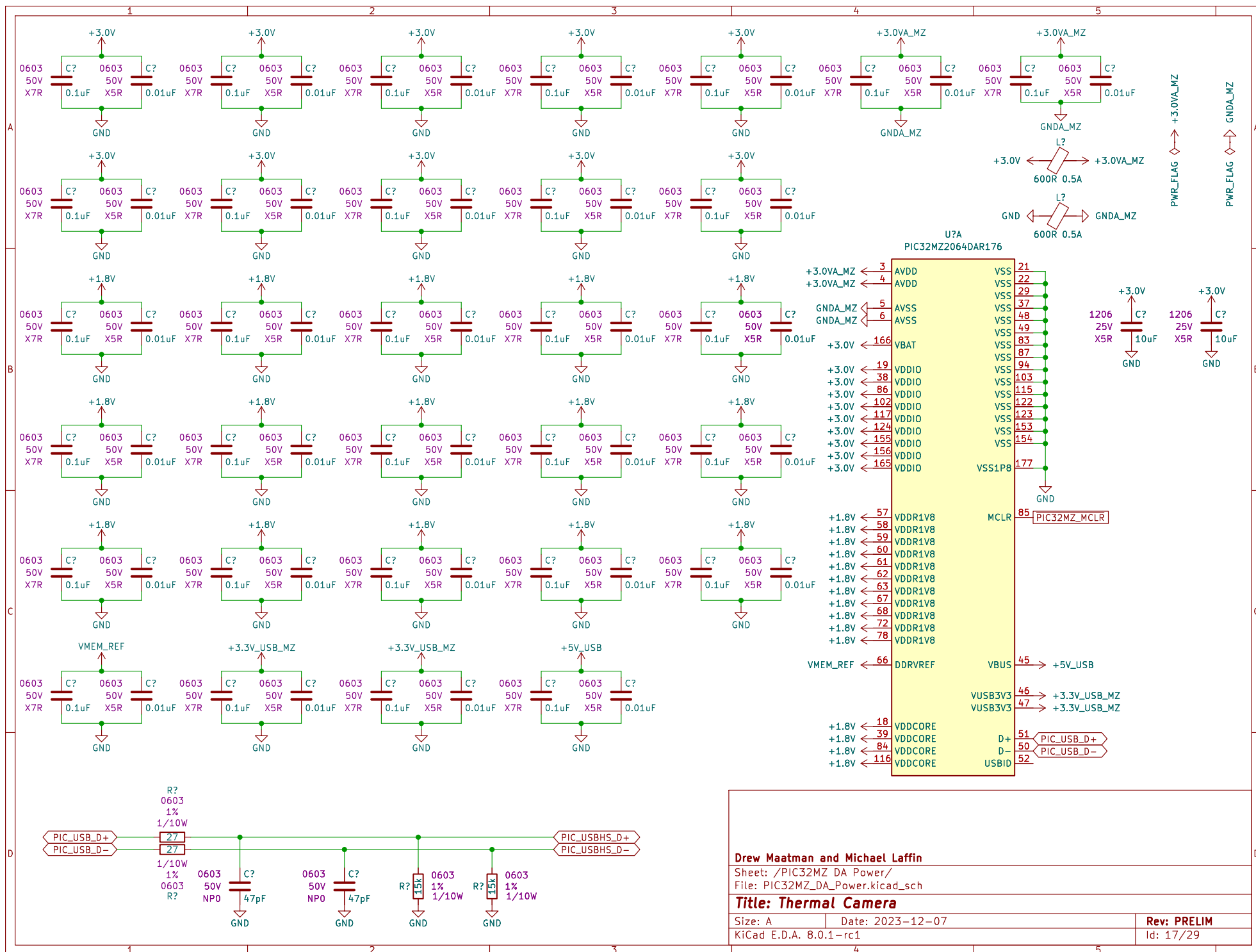
Sheet: /PIC32MZ DA Clocking/  
File: PIC32MZ\_DA\_Clocking.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 16/29





Drew Maatman and Michael Laffin

Sheet: /PIC32MZ DA Power/  
File: PIC32MZ\_DA\_Power.kicad\_sch

**Title: Thermal Camera**

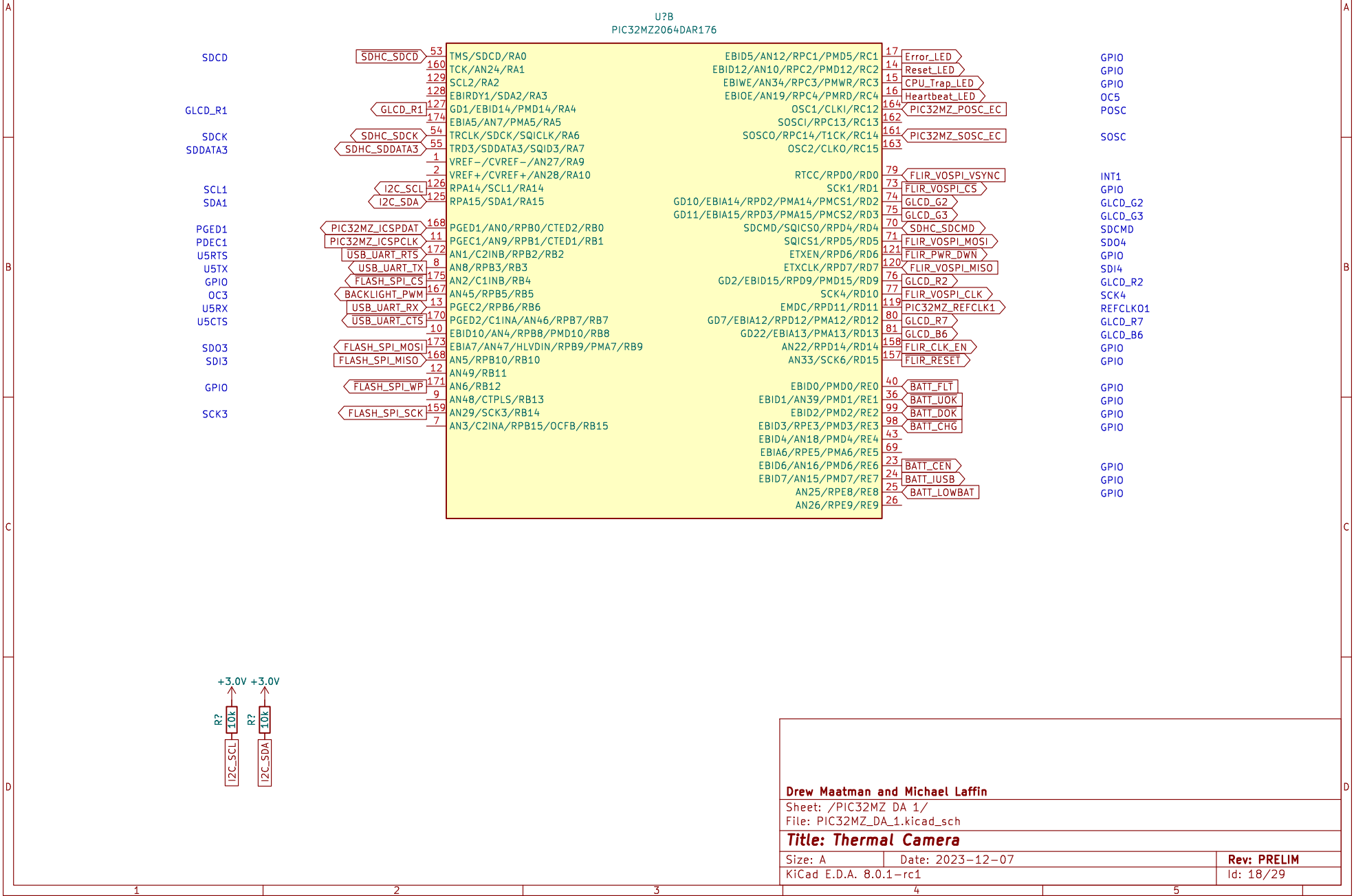
Size: A Date: 2023-12-07

KiCad E.D.A. 8.0.1-rc1

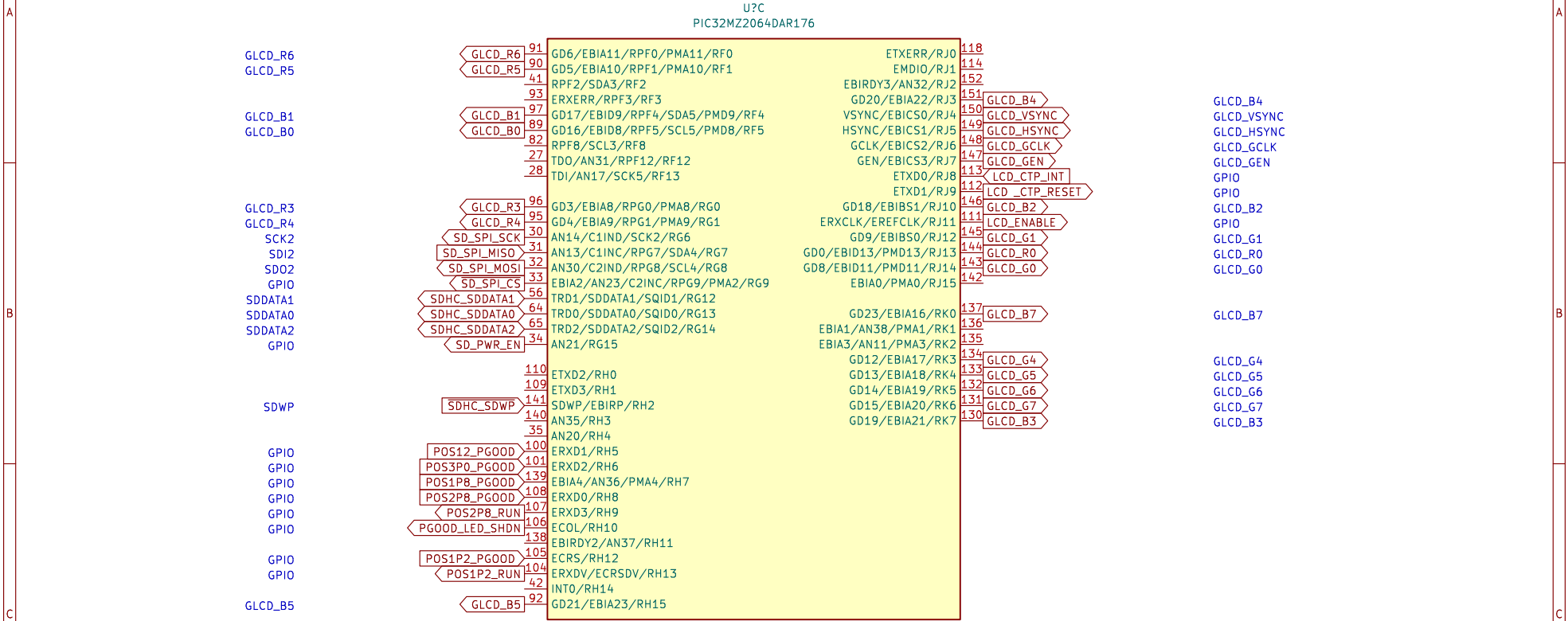
Rev: PRELIM

Id: 17/29

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



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



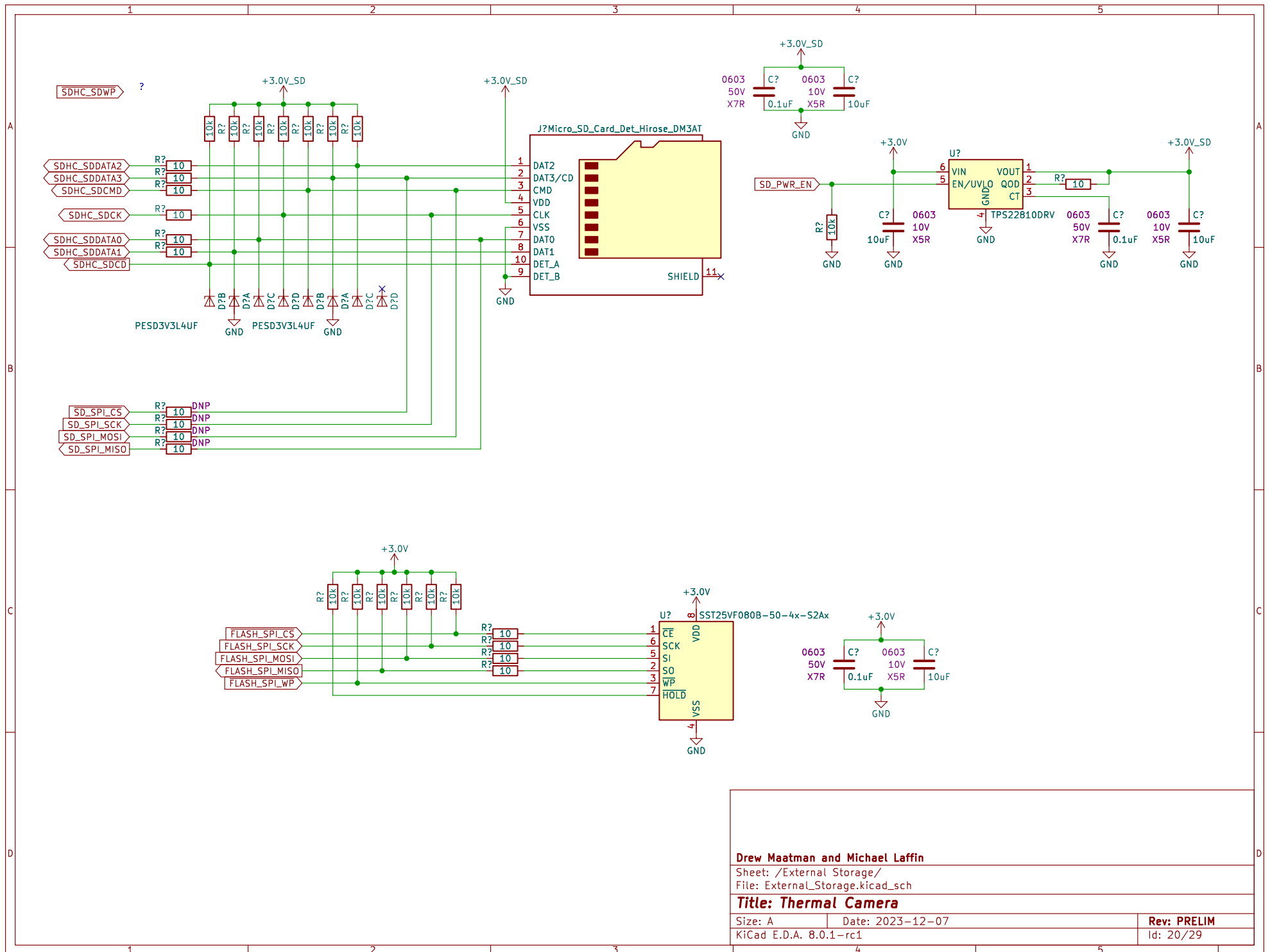
Drew Maatman and Michael Laffin

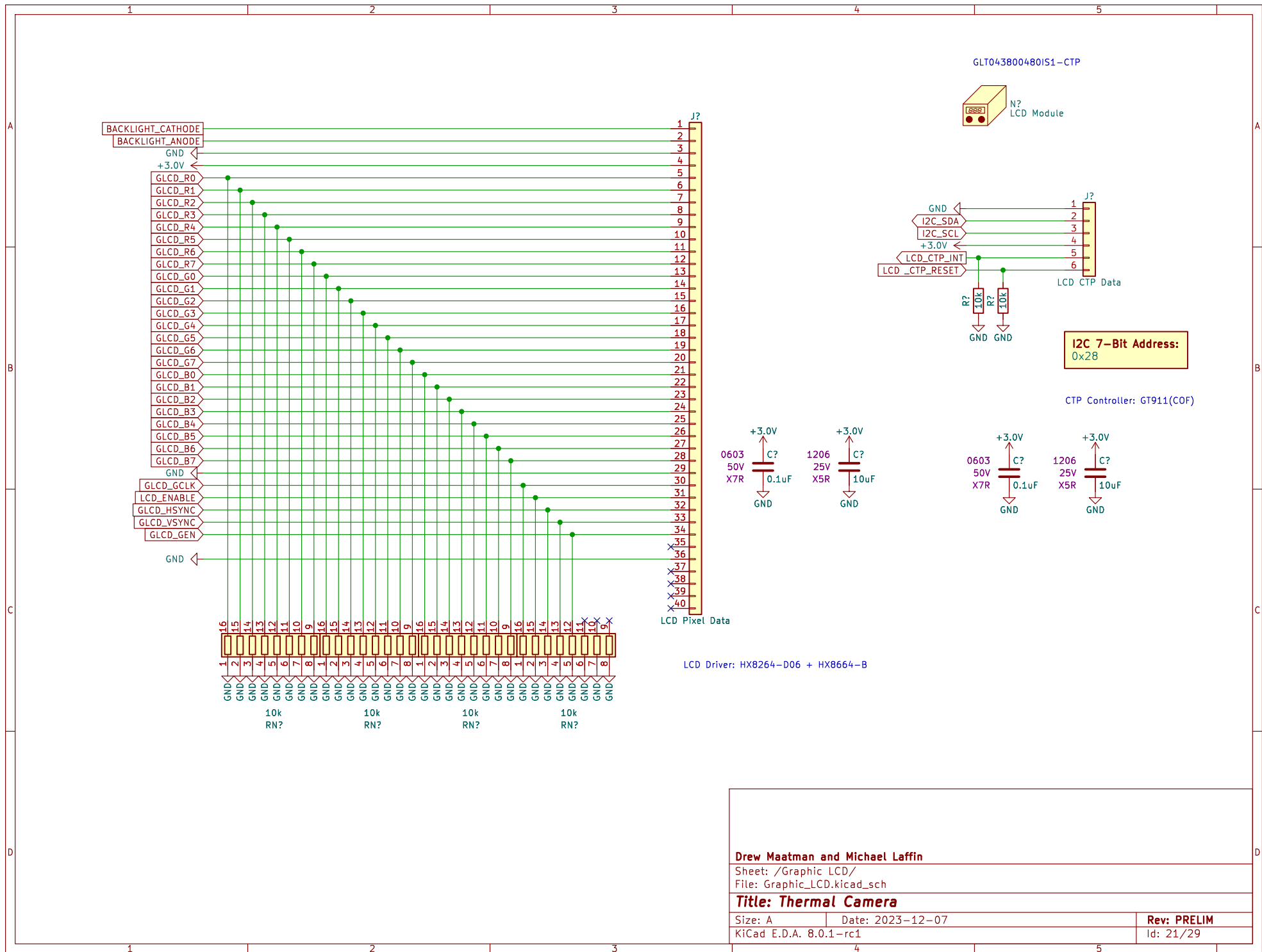
Sheet: /PIC32MZ DA 2/  
File: PIC32MZ\_DA\_2.kicad\_sch

Title: Thermal Camera

Size: A      Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 19/29





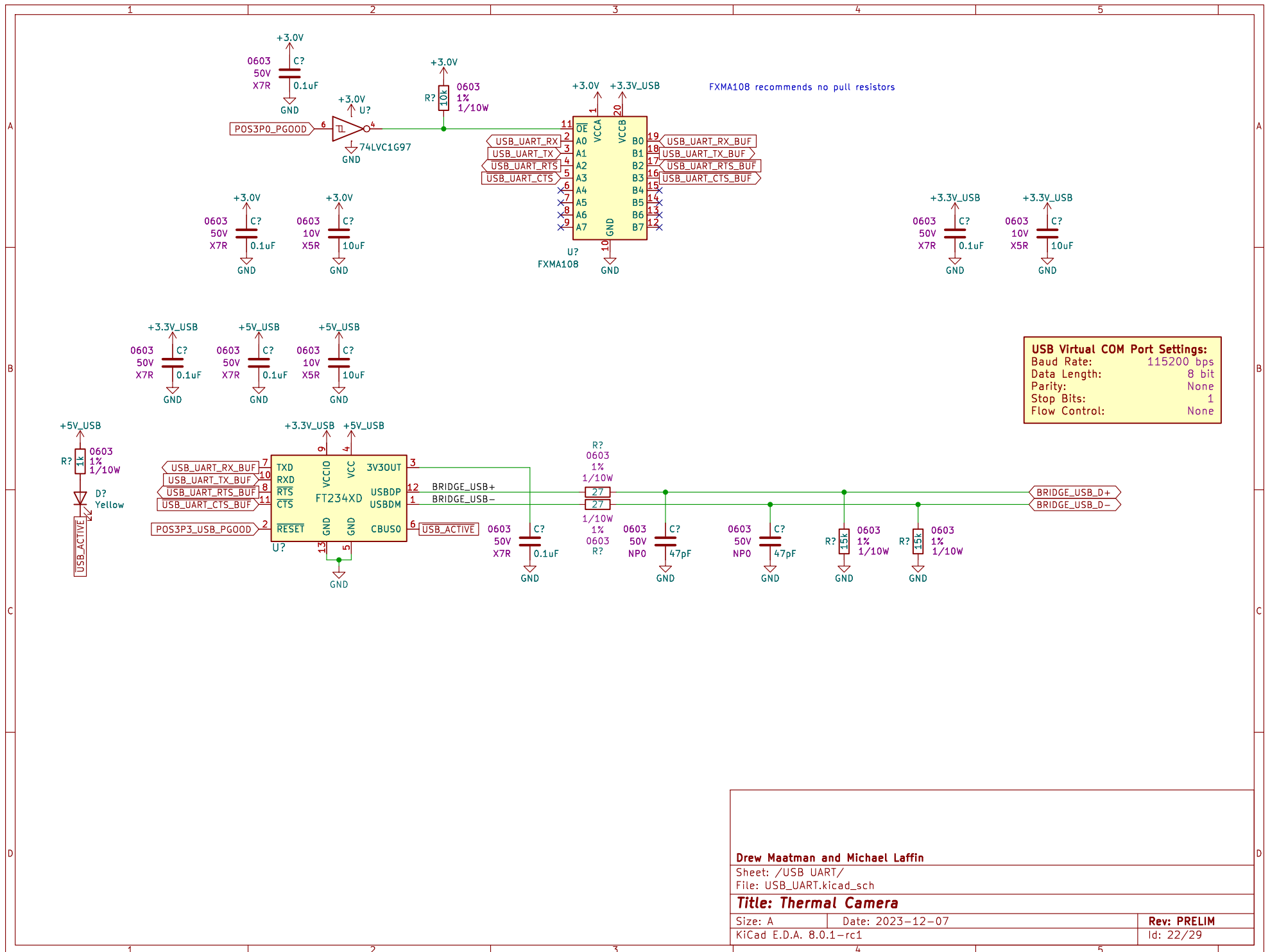
Drew Maatman and Michael Laffin

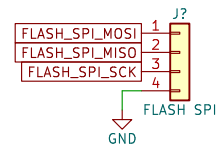
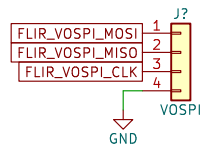
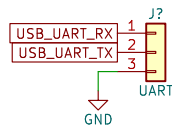
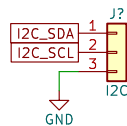
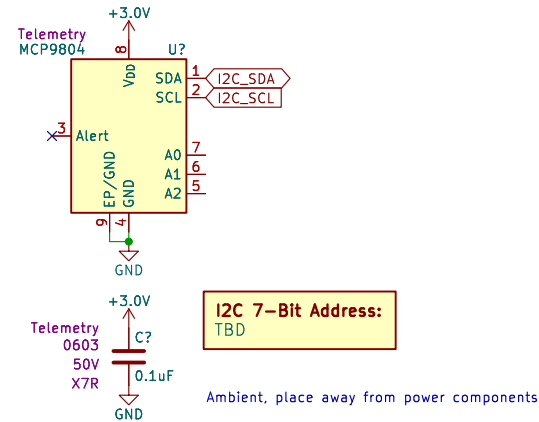
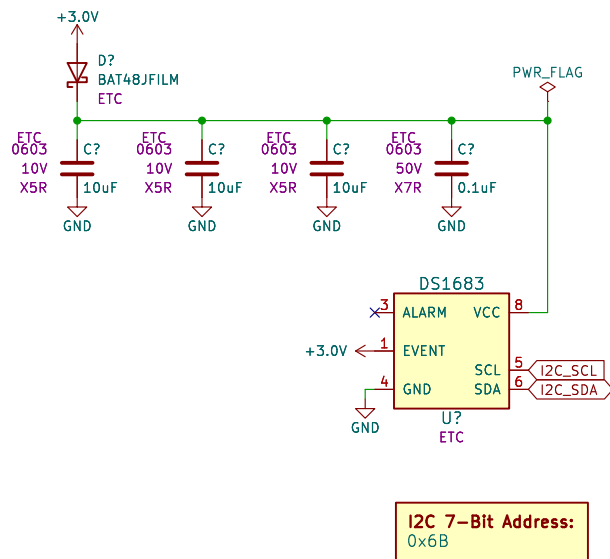
Sheet: /Graphic LCD/  
File: Graphic\_LCD.kicad\_sch

Title: Thermal Camera

Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 21/29





Drew Maatman and Michael Laffin

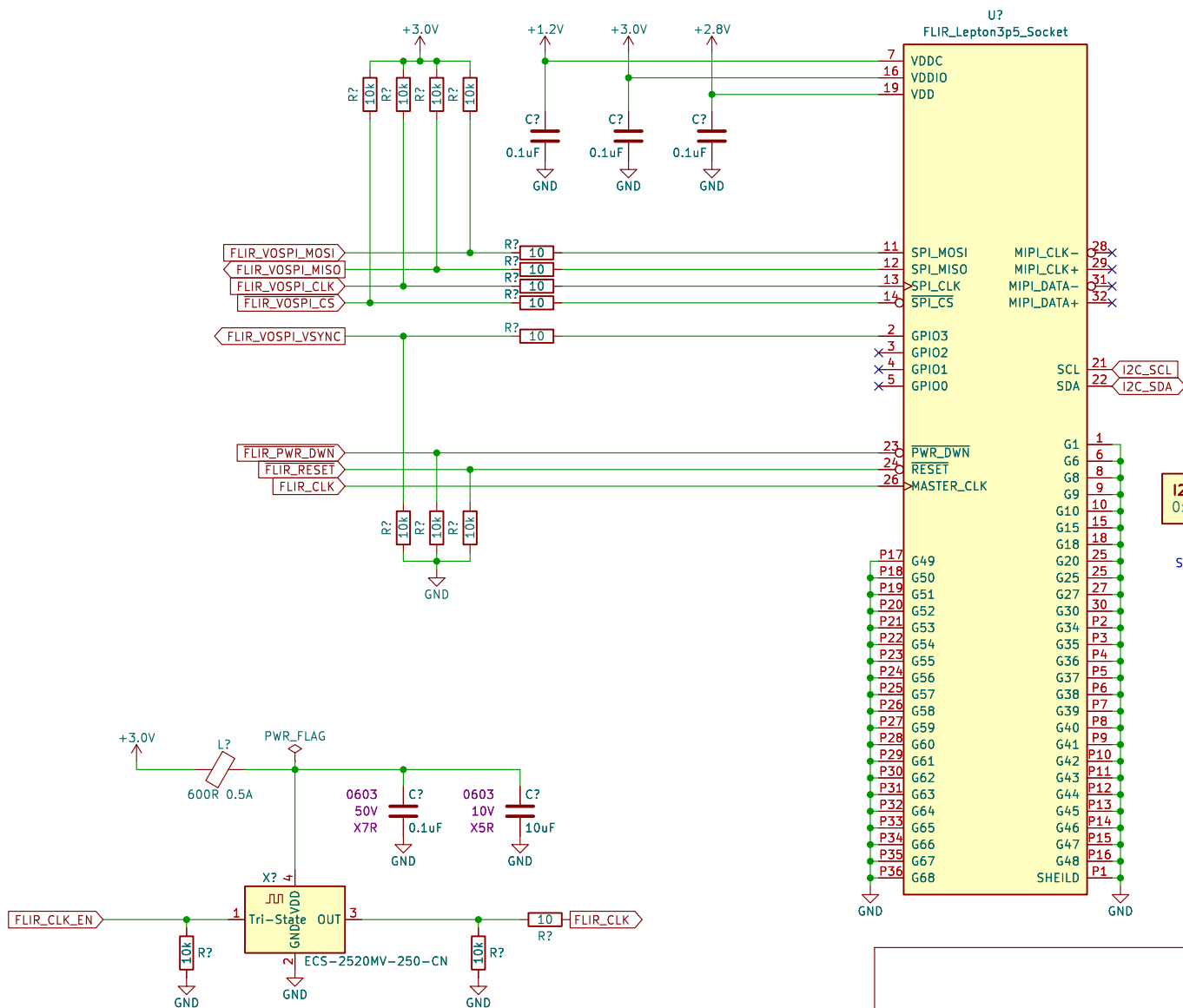
Sheet: /Elapsed Time Counter/  
File: Elapsed\_Time\_Counter.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 23/29

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



**I2C 7-Bit Address:**  
0x2A

See FLIR document #110-0144-04 for I2C register map



**Drew Maatman and Michael Laffin**

Sheet: /FLIR Lepton Sensor/  
File: FLIR\_Lepton\_Sensor.kicad\_sch

**Title: Thermal Camera**

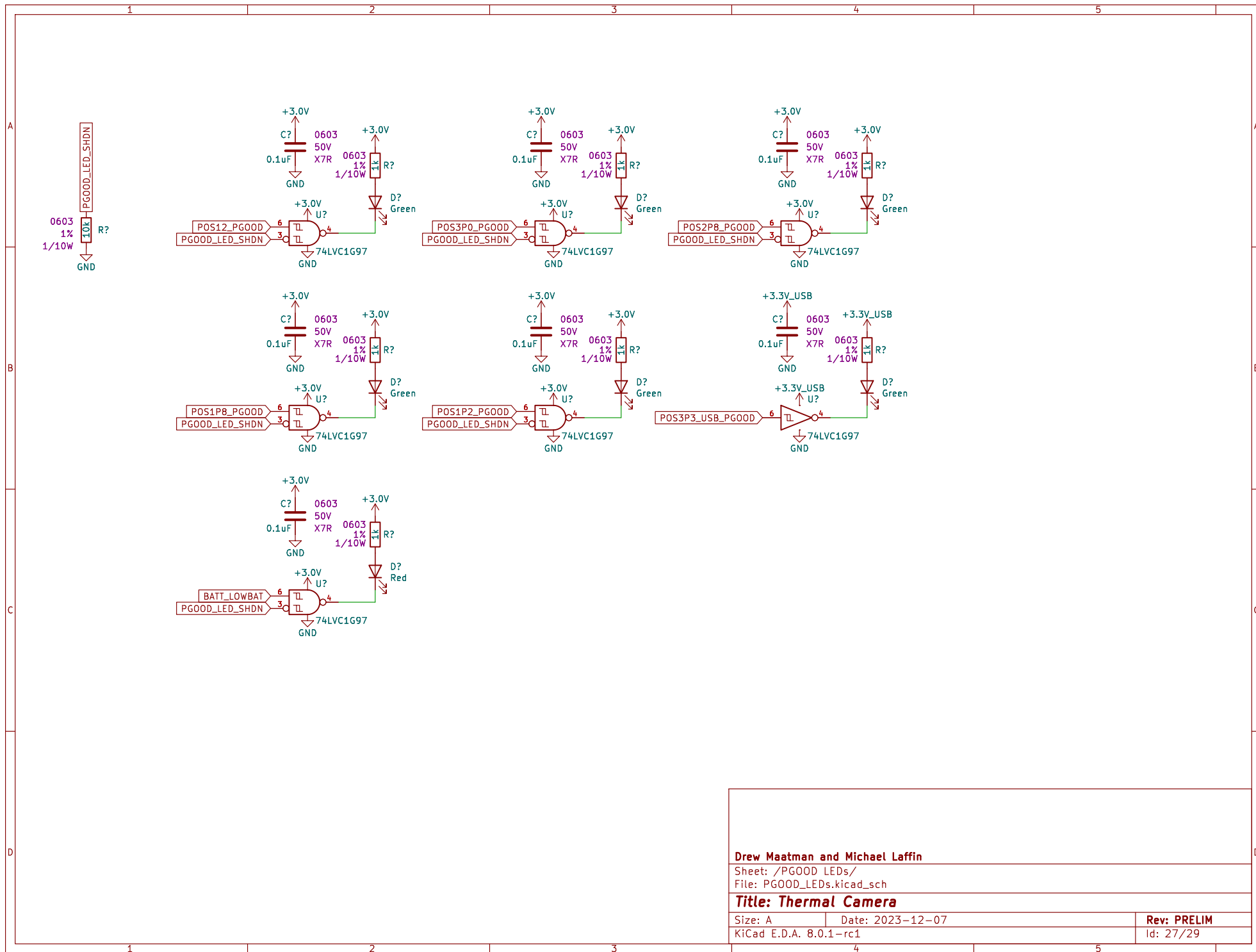
Size: A	Date: 2023-12-07
KiCad E.D.A. 8.0.1-rc1	

Rev: PRELIM  
Id: 24/29





Rev: PRELIM  
Id: 26/29



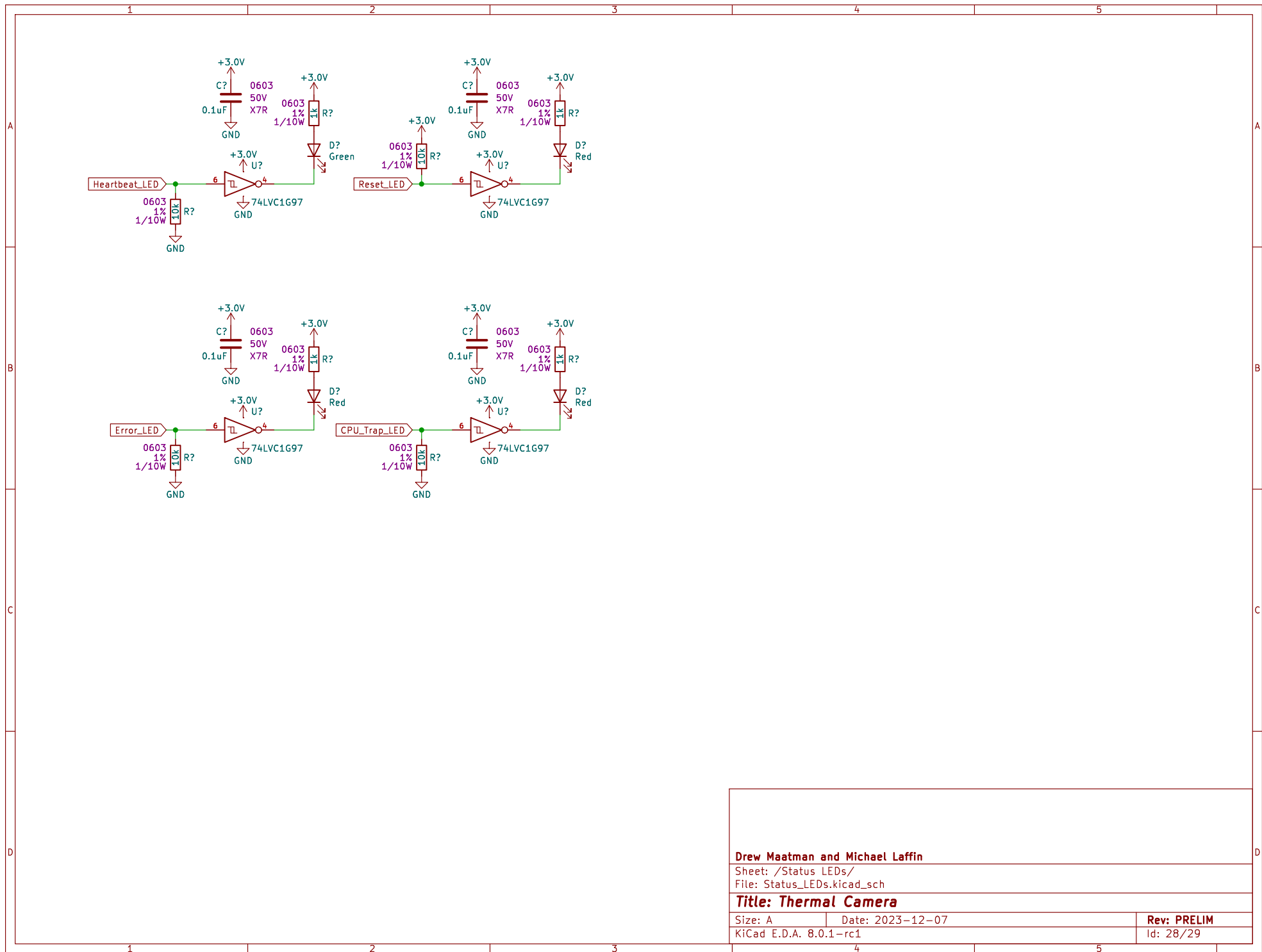
Drew Maatman and Michael Laffin

Sheet: /PGOOD LEDs/  
File: PGGOOD\_LEDs.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM  
Id: 27/29



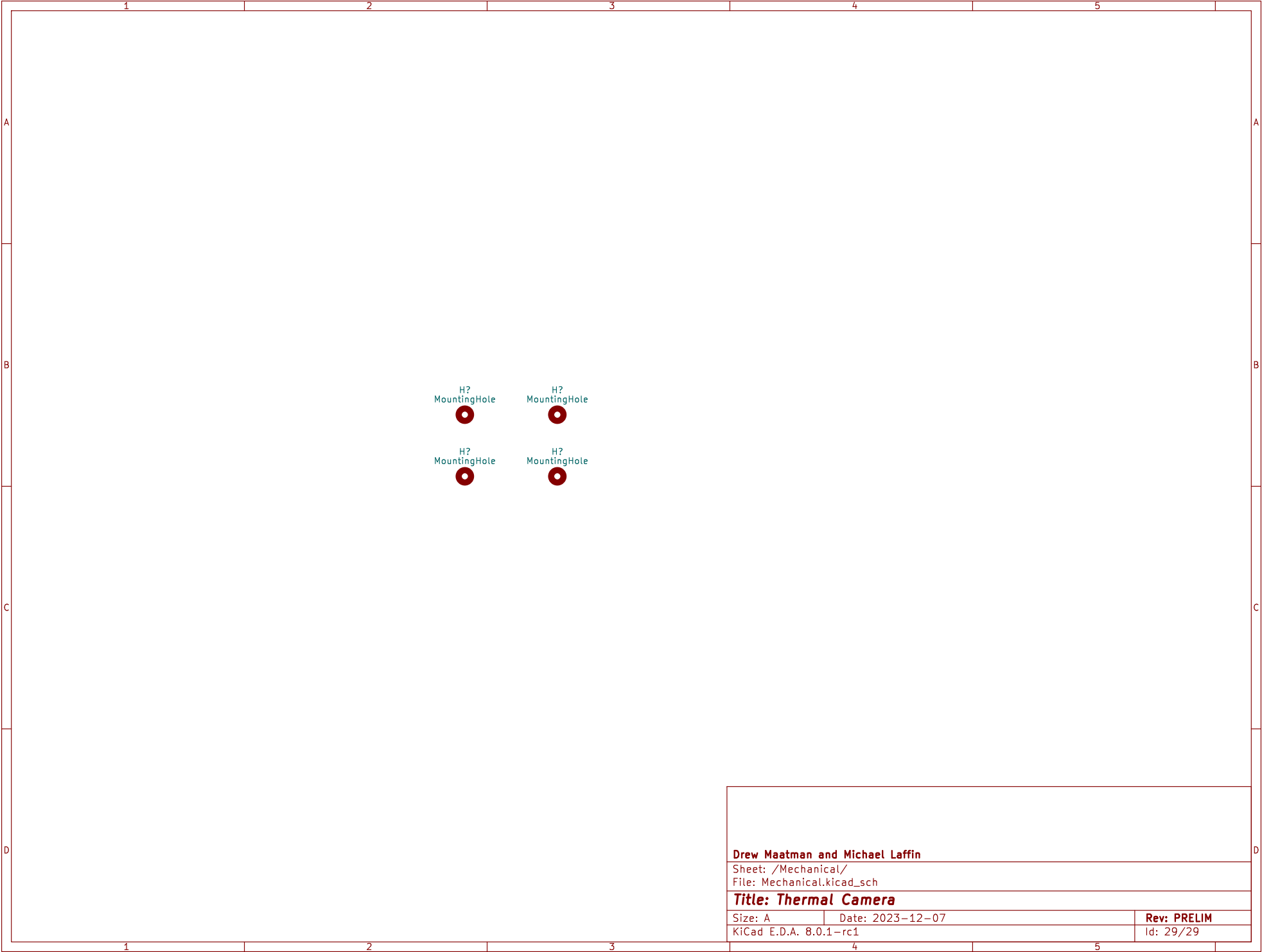
Drew Maatman and Michael Laffin

Sheet: /Status\_LEDs/  
File: Status\_LEDs.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07  
KiCad E.D.A. 8.0.1-rc1

**Rev: PRELIM**  
Id: 28/29



Drew Maatman and Michael Laffin

Sheet: /Mechanical/  
File: Mechanical.kicad\_sch

**Title: Thermal Camera**

Size: A Date: 2023-12-07

KiCad E.D.A. 8.0.1-rc1

Rev: PRELIM

Id: 29/29