01. Table of Contents

Electronic Display Logic Board

Marquette Universiy Senior Design 2018, Group E44

Drew Maatman, Kevin Etta, Logan Wedel, Caroline Gilger, Tuoxuan Ren

To Do List:
* Draw custom footprints (SRAM, power supply ICs, etc)
* Assign footprints
* Assign Digi-Key Partnumbers
* Run ERC, resolve errors
* Generate netlist
* Generate BOM
* Layout PCB

Note: If component footprints, tolerances, and power ratings are hidden, components are:
0603 case size, 1% tolerance, 1/10W power rating

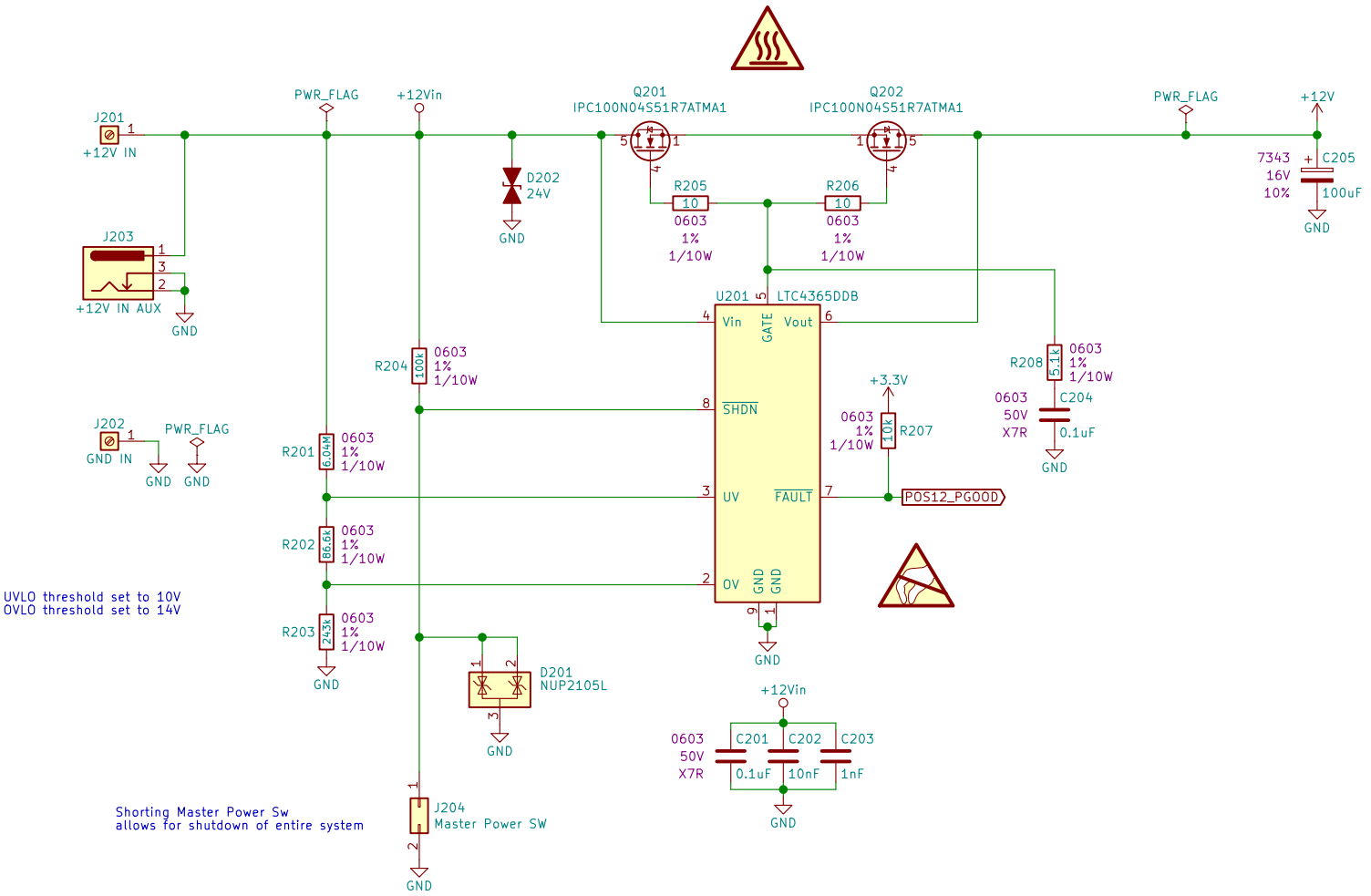
Marquette University Senior Design 2018/2019 Group E44

Sheet: /
File: LED_Display_Controller.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 1/31

02. Power Input



Marquette University Senior Design 2018/2019 Group E44

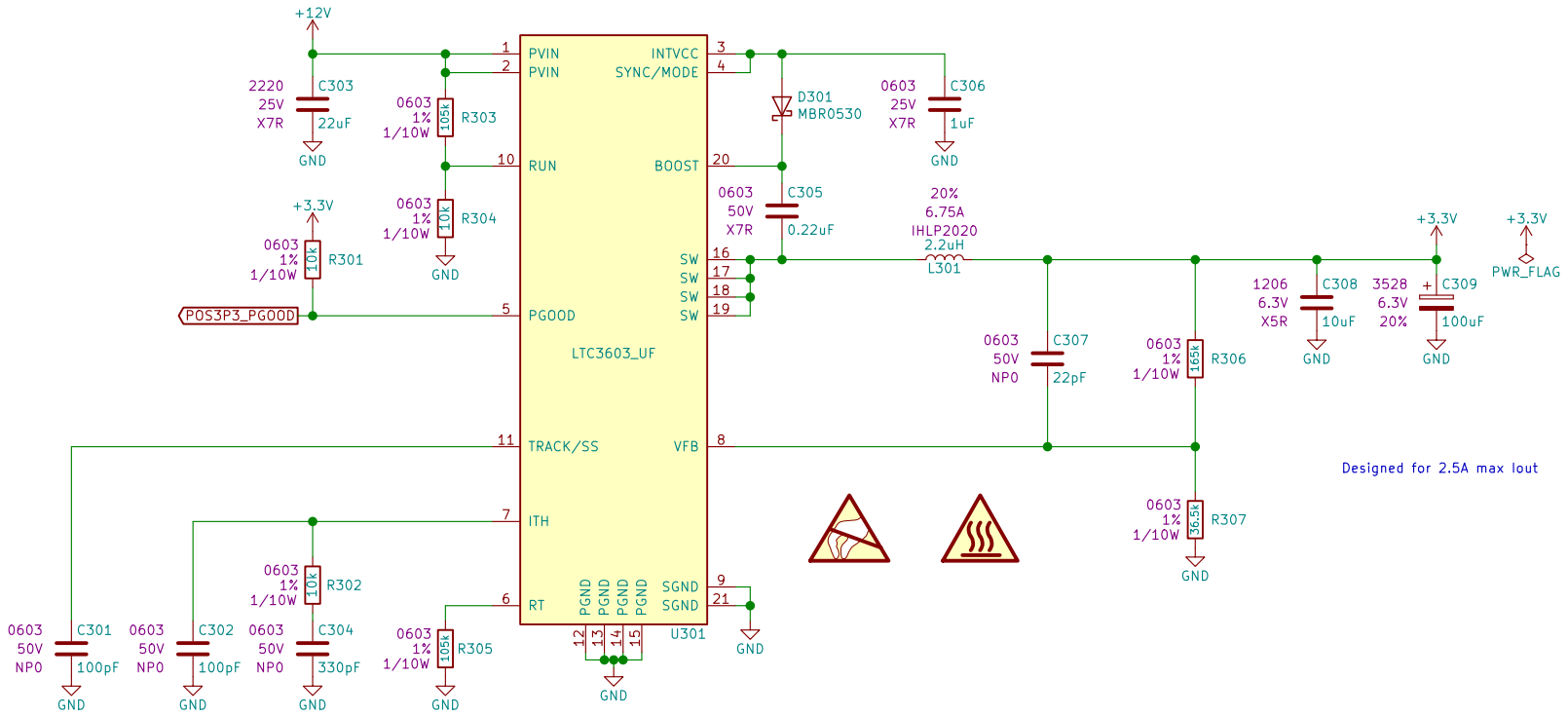
Sheet: /Power Input/

File: Power_Input.sch

Title: Electronic Display Logic Board

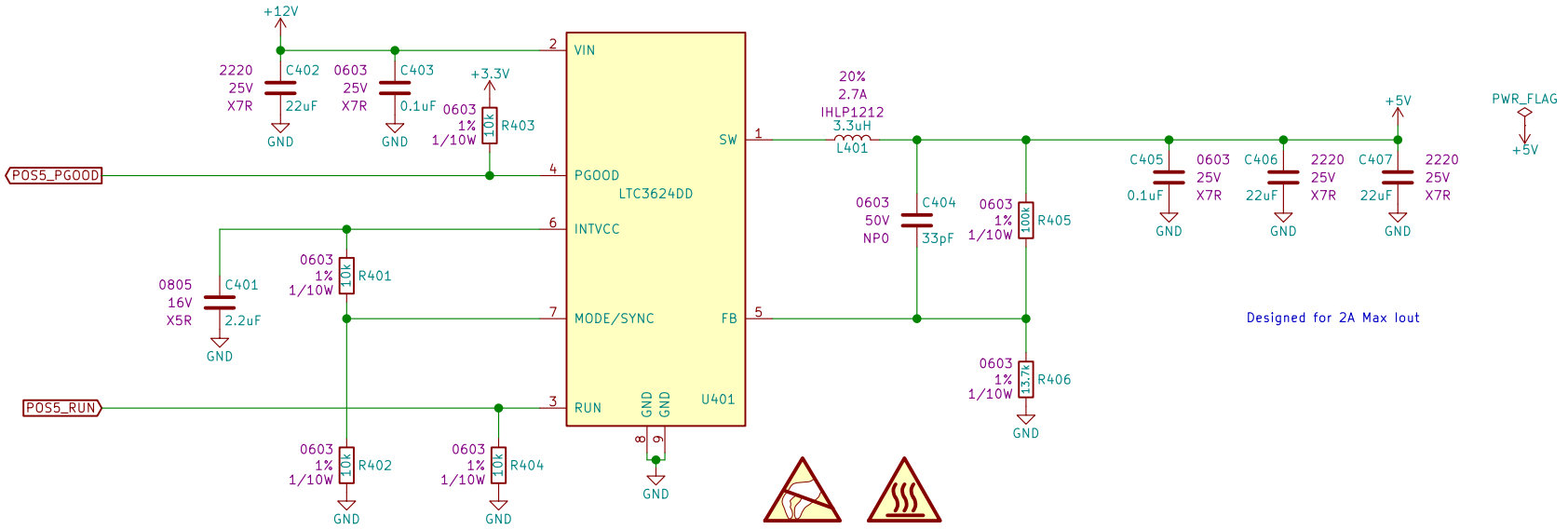
Size: A	Date: 2018-11-28	Rev: A
KiCad E.D.A. kicad (5.0.1)-3		Id: 2/31

03. +3.3V Power Supply



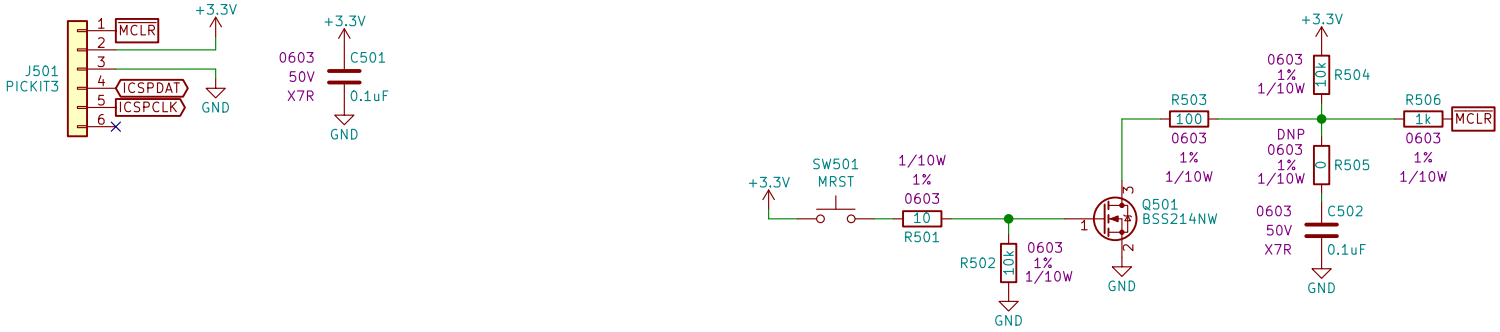
Marquette University Senior Design 2018/2019 Group E44		
Sheet: /POS3P3 Power Supply/		
File: POS3P3_Power_Supply.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 3/31

04. +5V Power Supply



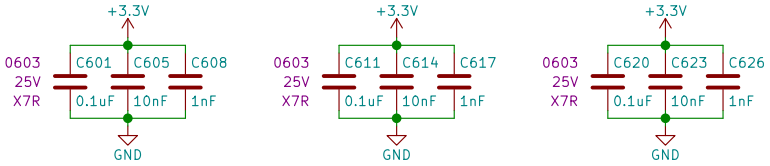
Marquette University Senior Design 2018/2019 Group E44		
Sheet: /POS5 Power Supply/		
File: POS5_Power_Supply.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 4/31

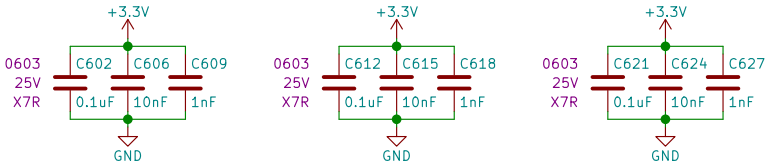
05. Microcontroller Programming

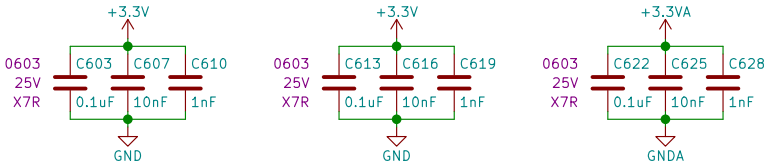


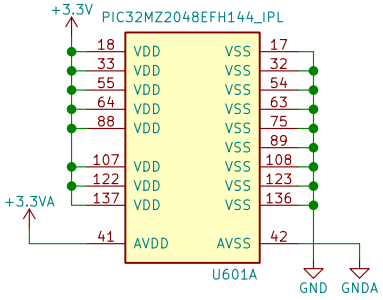
Marquette University Senior Design 2018/2019 Group E44		
Sheet: /Microcontroller Programming/		
File: Microcontroller_Programming.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 5/31

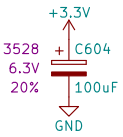
06. Microcontroller Power

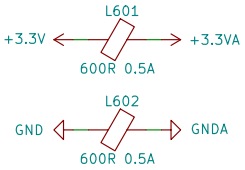












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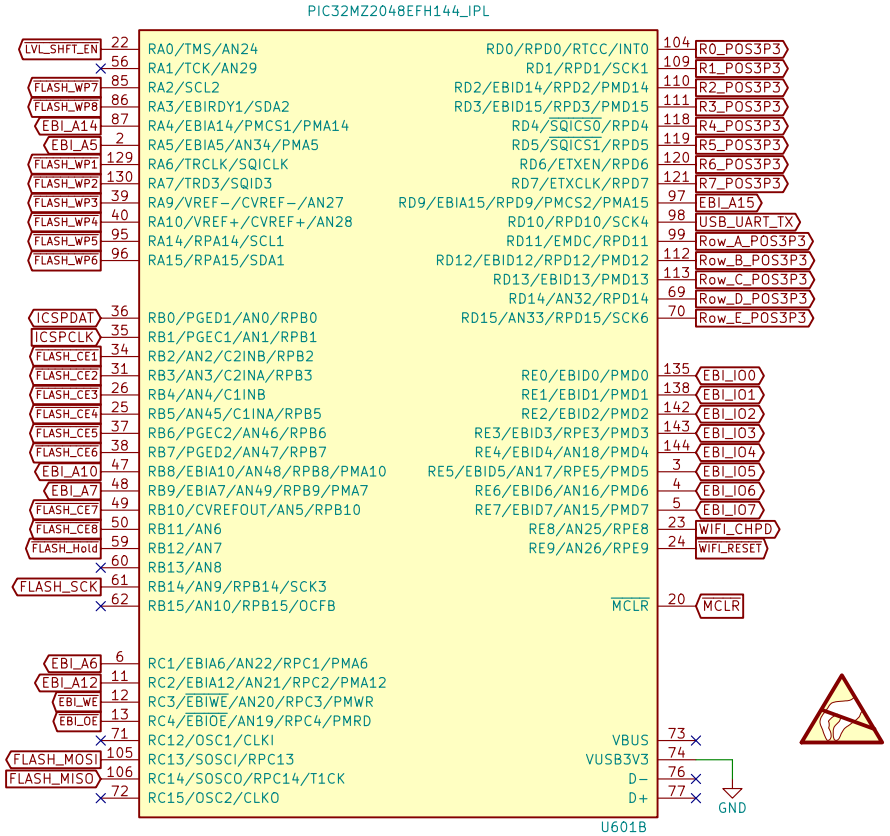
Sheet: /Microcontroller Power/

File: Microcontroller_Power.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 6/31

07. Microcontroller IO Bank 1



Row A is Least Significant Bit

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Sheet: /Microcontroller 1/

File: Microcontroller_1.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 7/31

08. Microcontroller IO Bank 2

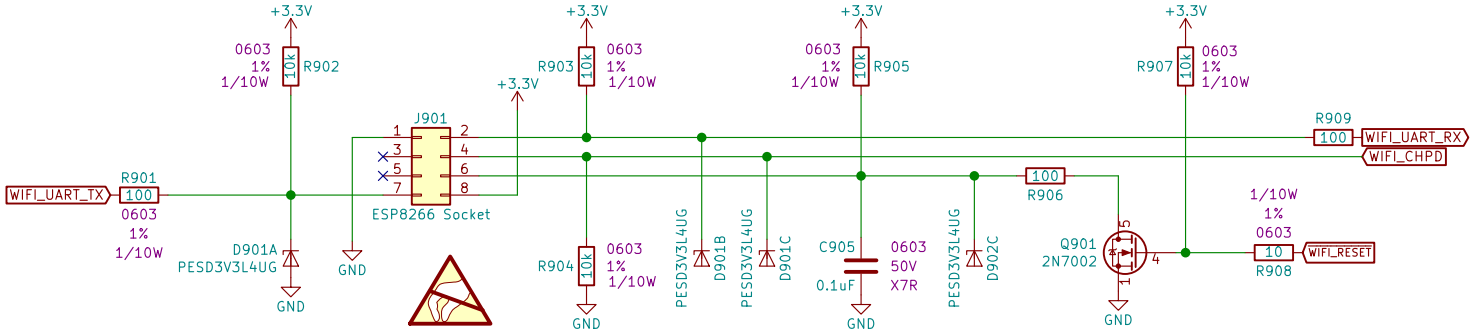
Marquette University Senior Design 2018/2019 Group E44

Sheet: /Microcontroller 2/
File: Microcontroller_2.sch

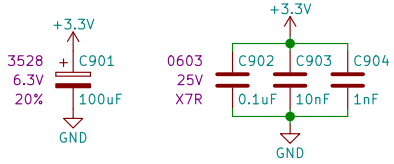
Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	Rev: A
KiCad E.D.A. kicad (5.0.1)-3		Id: 8/31

09. WiFi Module

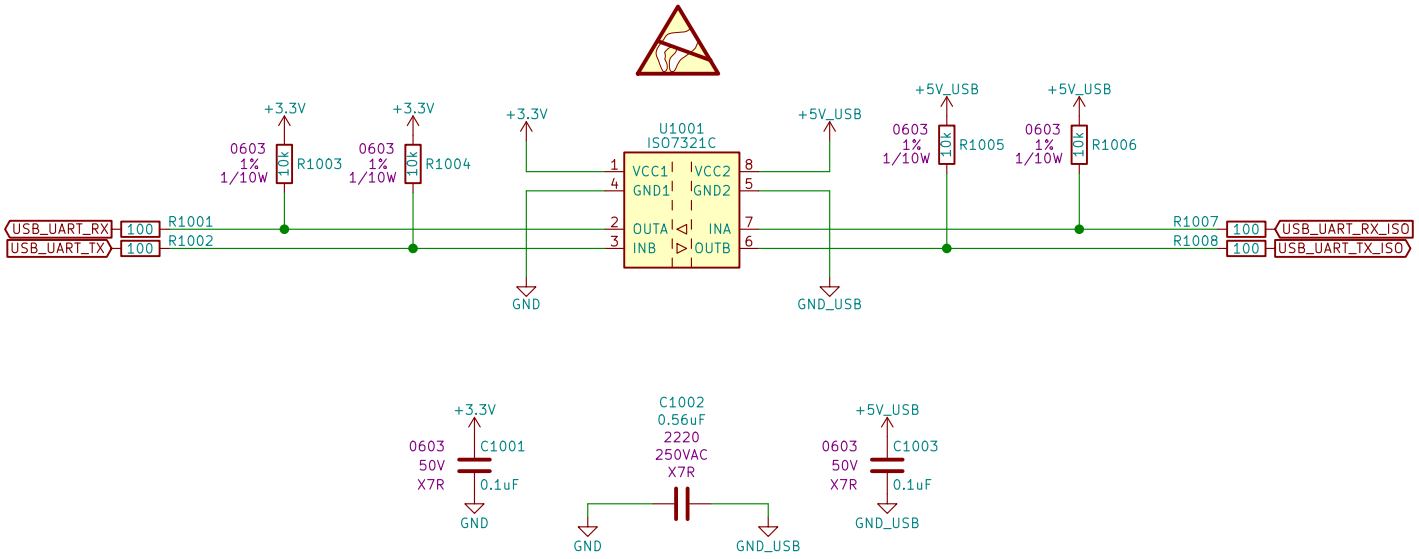


ESP8266 Pinout does not match default KiCad pin socket footprint.
Use a custom footprint



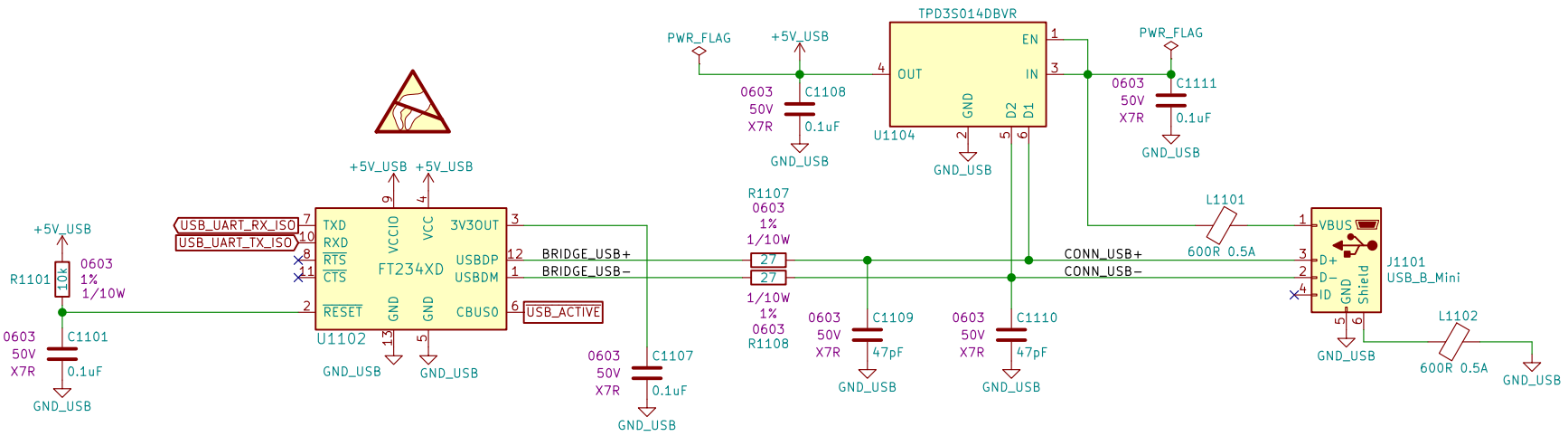
Marquette University Senior Design 2018/2019 Group E44		
Sheet: /WiFi Module/		
File: Wi_Fi_Module.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 9/31

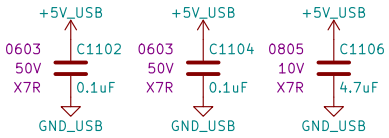
10. USB UART Digital Isolation

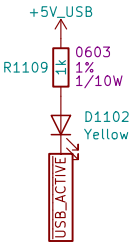


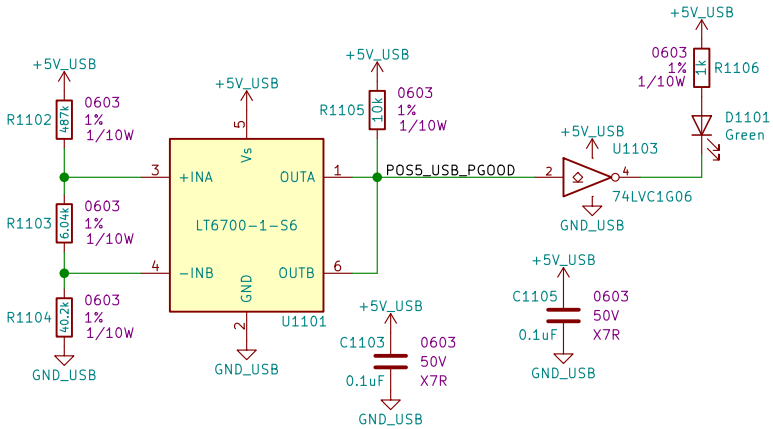
Marquette University Senior Design 2018/2019 Group E44		
Sheet: /USB UART Isolation/		
File: USB_UART_Isolation.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 10/31

11. USB UART Bridge









USB Virtual COM Port Settings:

Baud Rate:	921600 bps
Data Length:	8 bit
Parity:	None
Stop Bits:	1
Flow Control:	None

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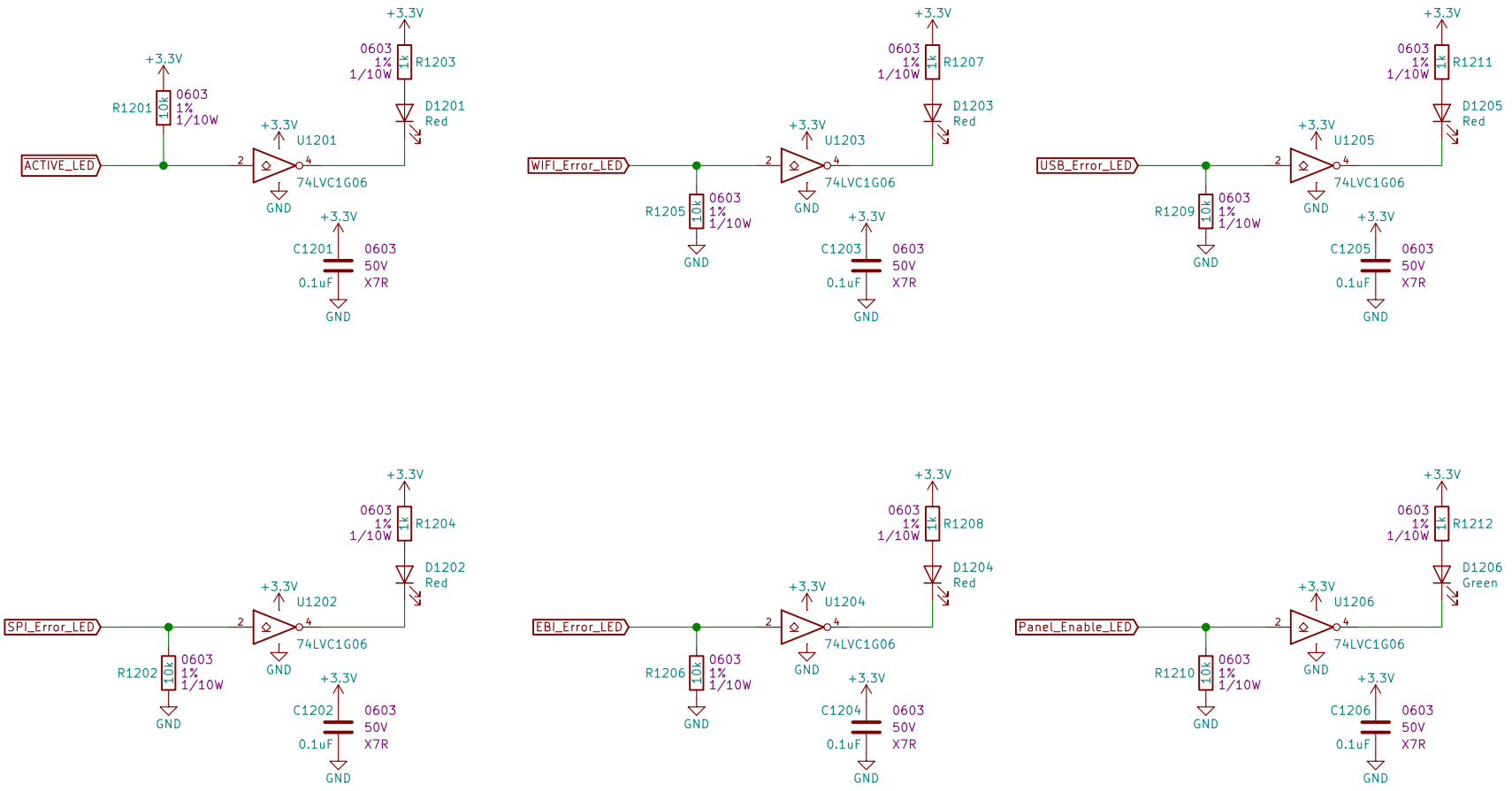
Sheet: /USB UART Bridge/
File: USB_UART_Bridge.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018−11−28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)−3		Id: 11/31

12. Status LEDs Bank 1



Marquette University Senior Design 2018/2019 Group E44

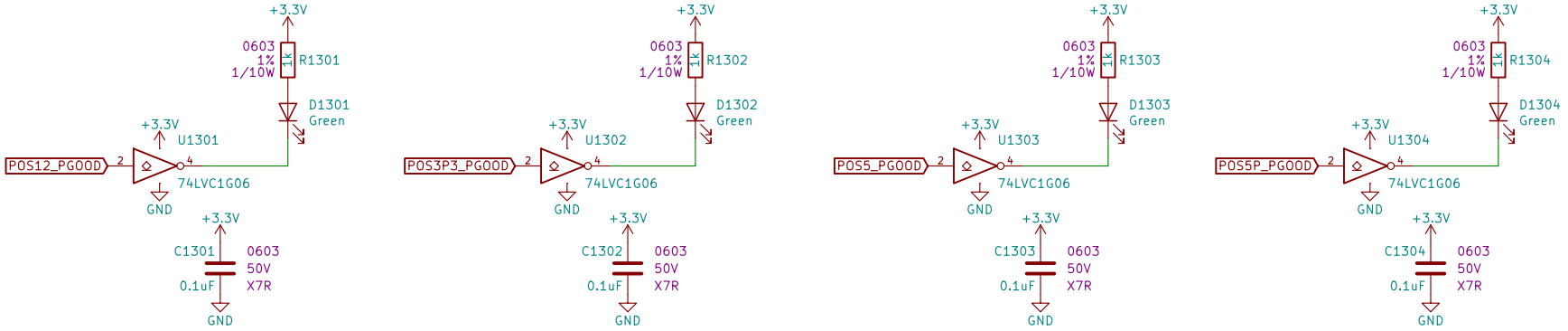
Sheet: /Status LEDs 1/

File: Status_LEDs_1.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 12/31

13. Status LEDs Bank 2



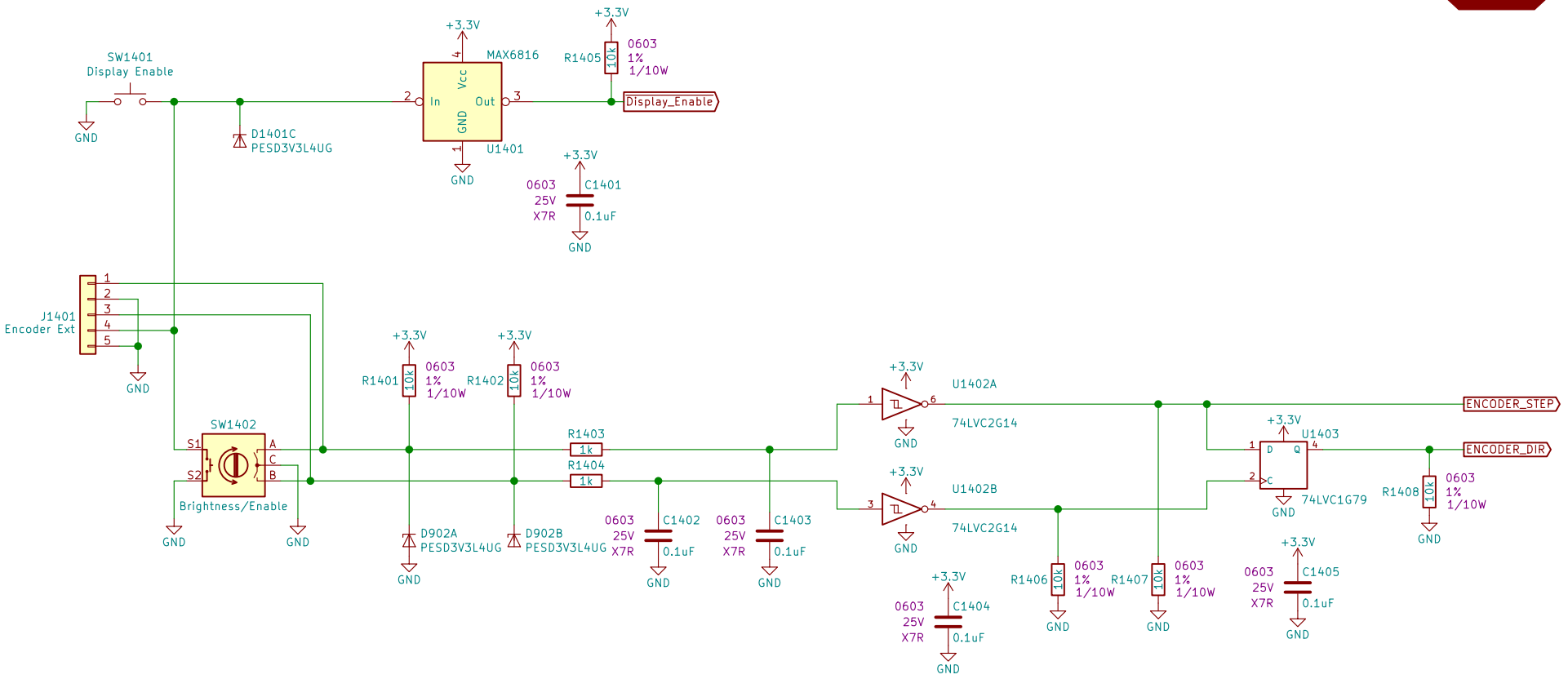
Marquette University Senior Design 2018/2019 Group E44

Sheet: /Status LEDs 2/
File: Status_LEDs_2.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 13/31

14. Pushbuttons



Turning rotary encoder will adjust display master brightness
Pressing encoder switch will toggle display on/off state

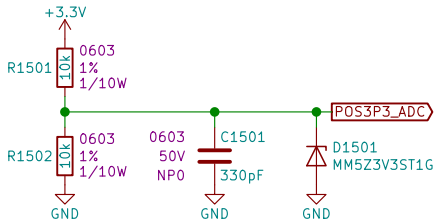
Marquette University Senior Design 2018/2019 Group E44

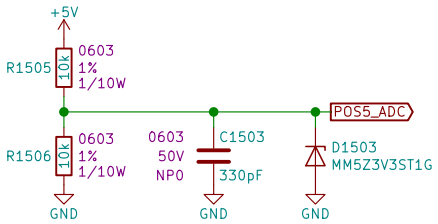
Sheet: /Pushbuttons/
File: Pushbuttons.sch

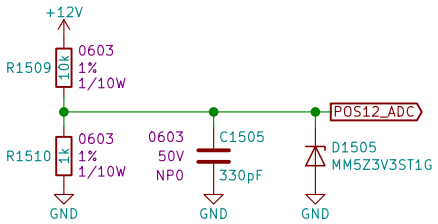
Title: Electronic Display Logic Board

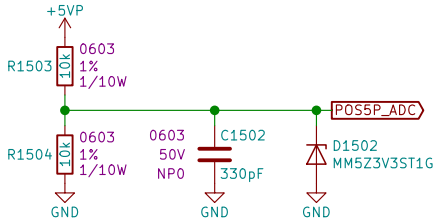
Size: A	Date: 2018-11-28	Rev: A
KiCad E.D.A. kicad (5.0.1)-3		Id: 14/31

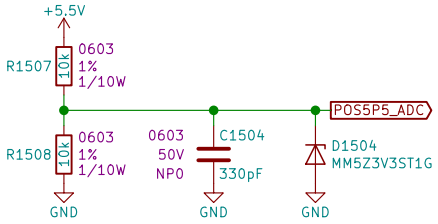
15. Internal Rail Monitoring











Marquette University Senior Design 2018/2019 Group E44

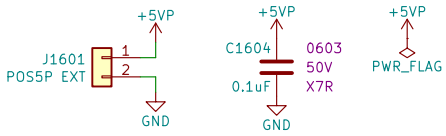
Sheet: /Internal Rail Monitoring/

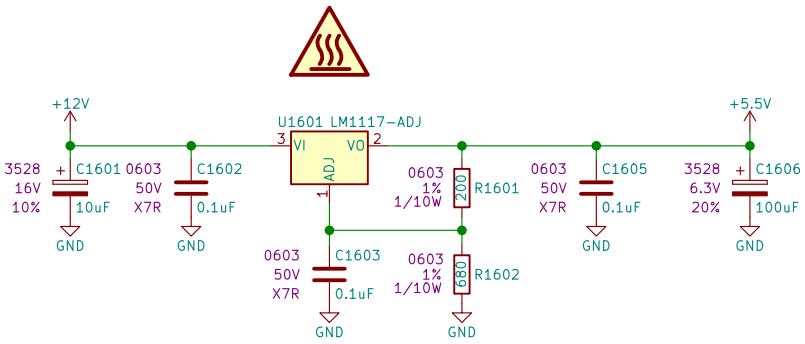
File: Internal_Rail_Monitoring.sch

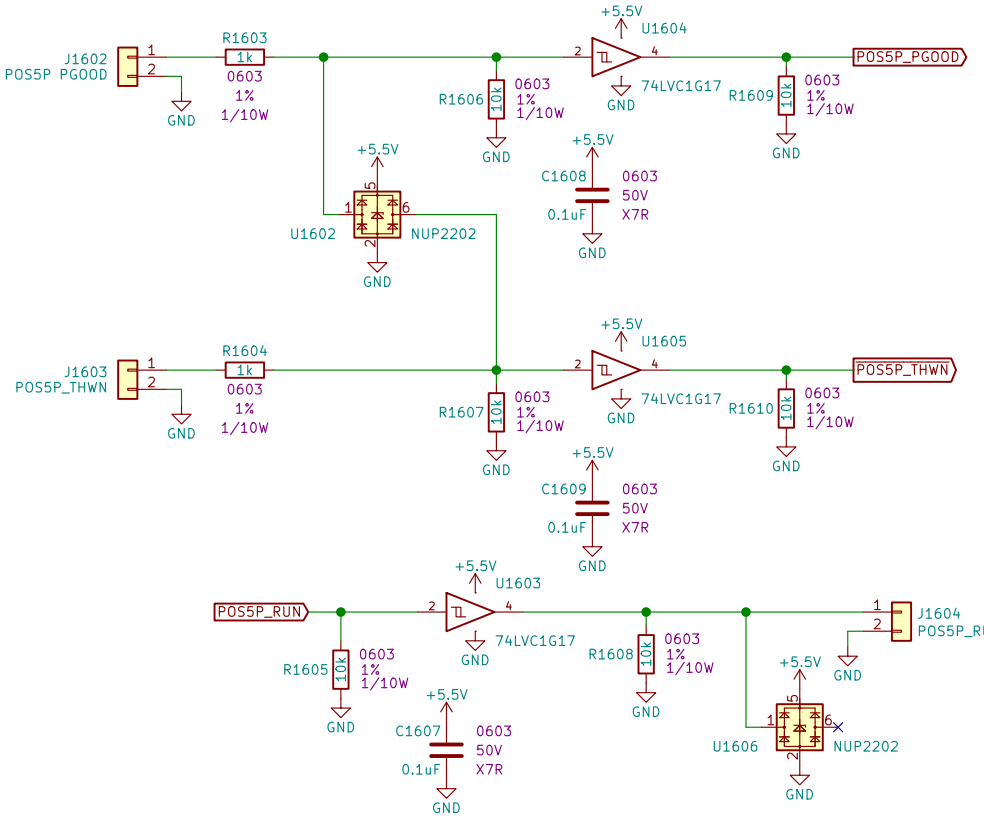
Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 15/31

16. LED Power Supply Monitoring



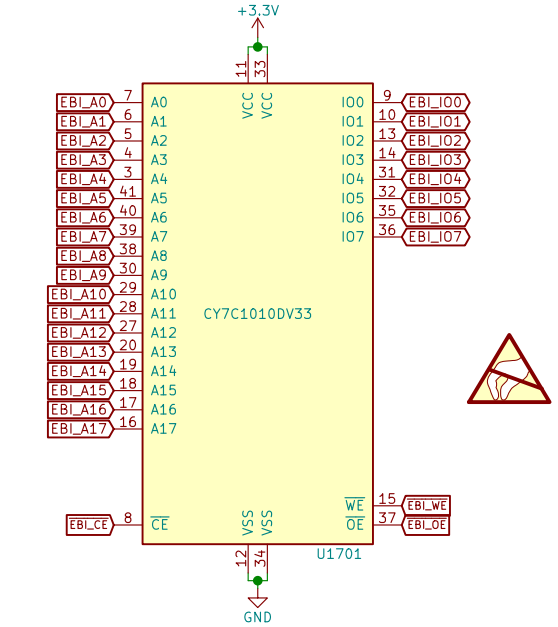




All headers on this sheet interface with power board to power panels

Marquette University Senior Design 2018/2019 Group E44		
Sheet: /LED POS5 Monitoring/ File: LED_POS5_Monitoring.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 16/31

17. External SRAM



External SRAM stores the current slide being displayed
Each of the eight programmed slides are stored in external serial flash

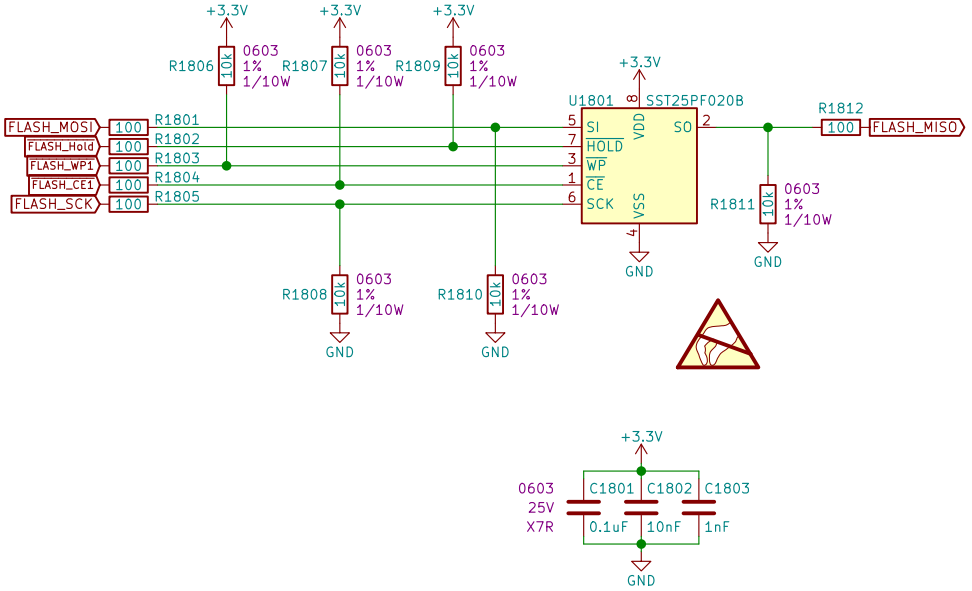
Marquette University Senior Design 2018/2019 Group E44

Sheet: /External SRAM/
File: External_SRAM.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 17/31

18. External FLASH 1



Marquette University Senior Design 2018/2019 Group E44

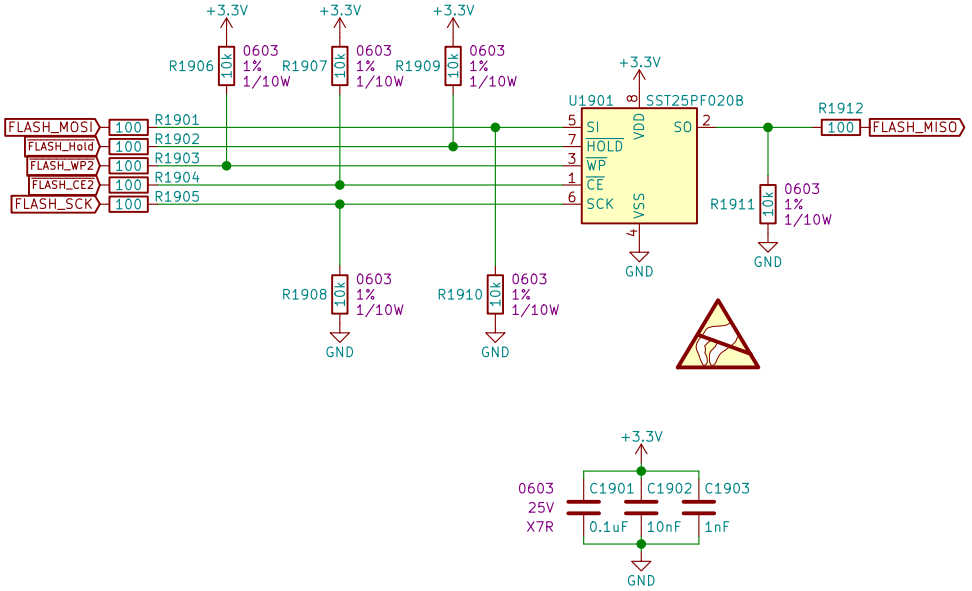
Sheet: /External Flash 1/

File: External_Flash_1.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 18/31

19. External FLASH 2



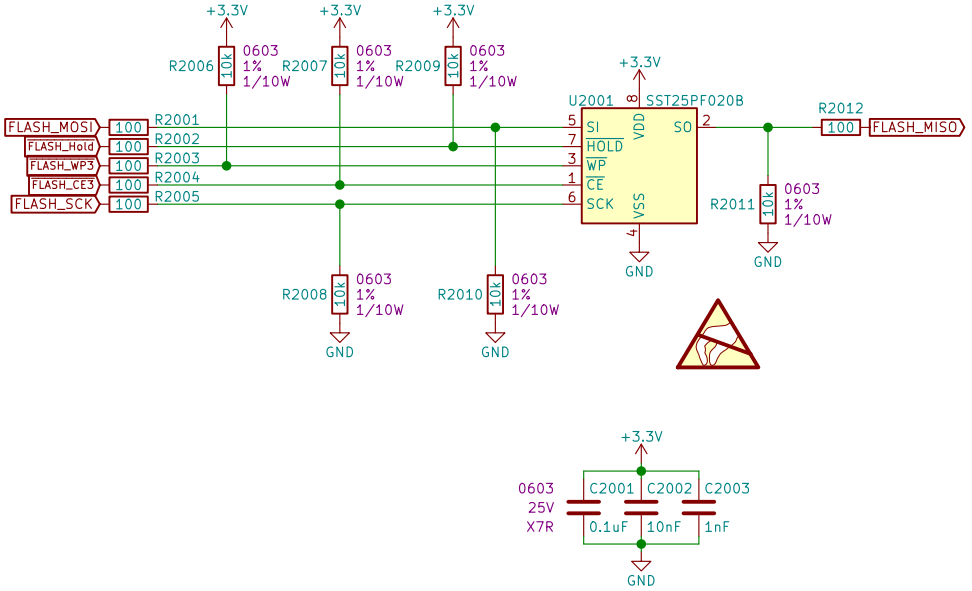
Marquette University Senior Design 2018/2019 Group E44

Sheet: /External Flash 2/
File: External_Flash_2.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 19/31

20. External FLASH 3



Marquette University Senior Design 2018/2019 Group E44

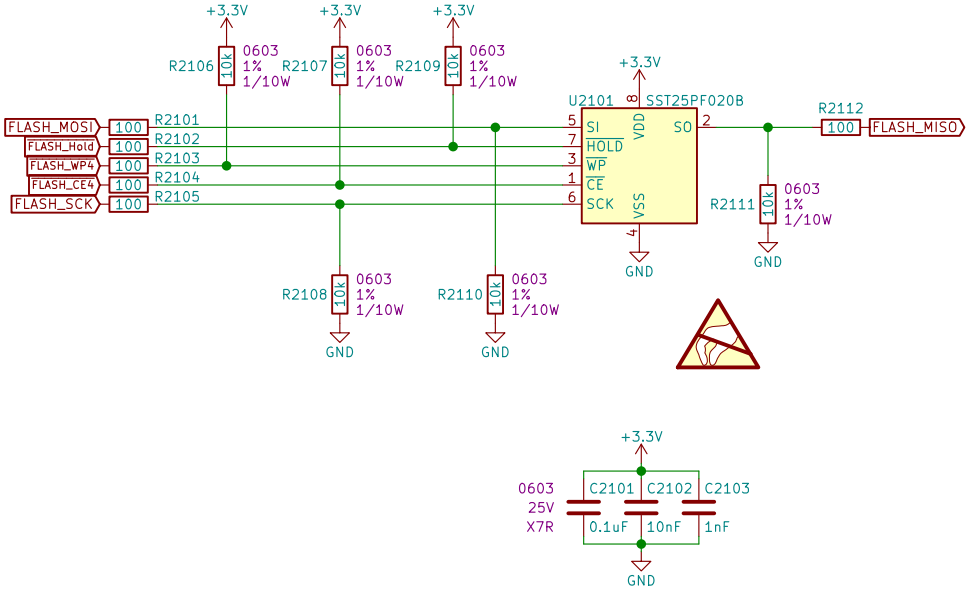
Sheet: /External Flash 3/

File: External_Flash_3.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 20/31

21. External FLASH 4



Marquette University Senior Design 2018/2019 Group E44

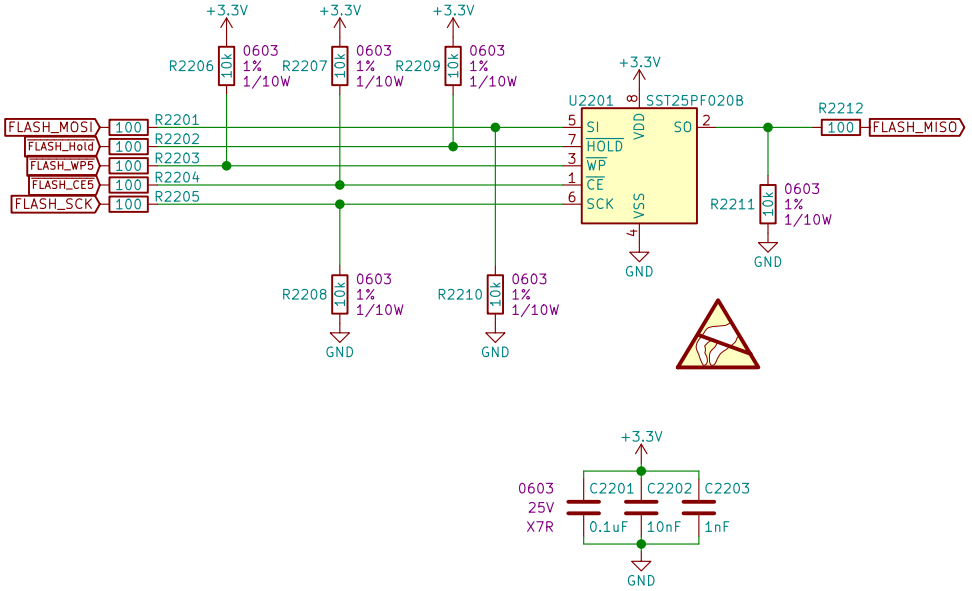
Sheet: /External Flash 4/

File: External_Flash_4.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	Rev: A
KiCad E.D.A. kicad (5.0.1)-3		Id: 21/31

22. External FLASH 5



Marquette University Senior Design 2018/2019 Group E44

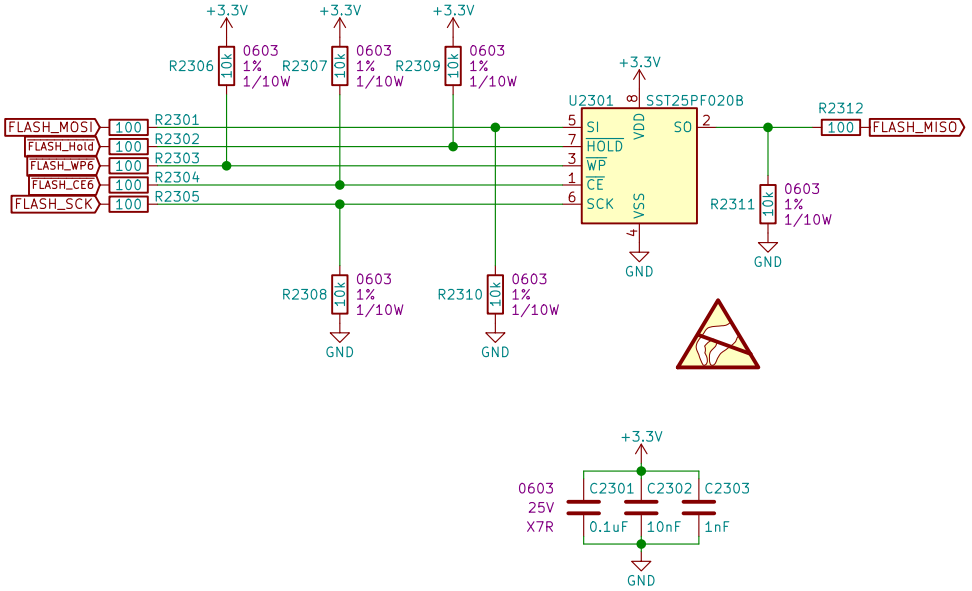
Sheet: /External Flash 5/

File: External_Flash_5.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 22/31

23. External FLASH 6



Marquette University Senior Design 2018/2019 Group E44

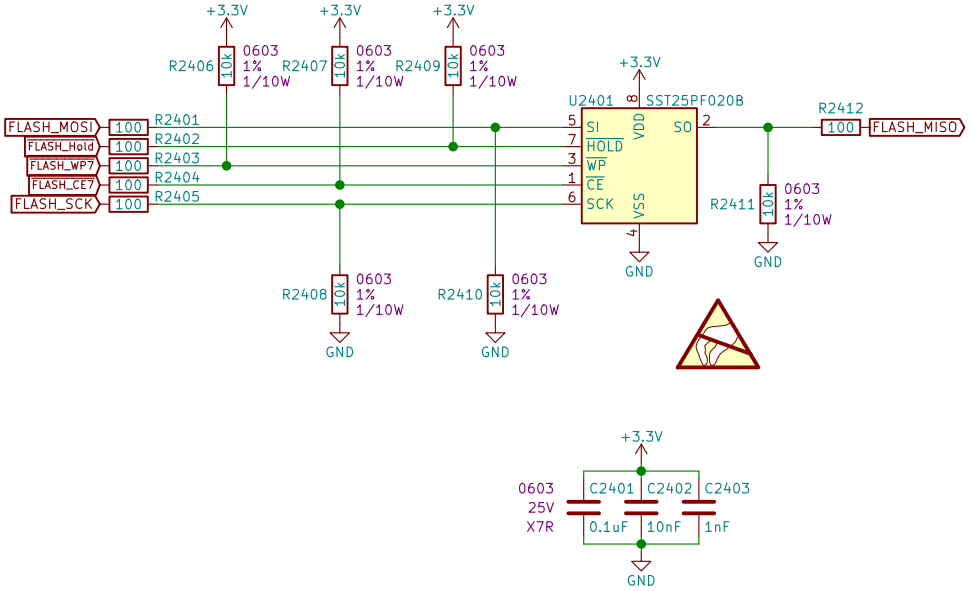
Sheet: /External Flash 6/

File: External_Flash_6.sch

Title: Electronic Display Logic Board

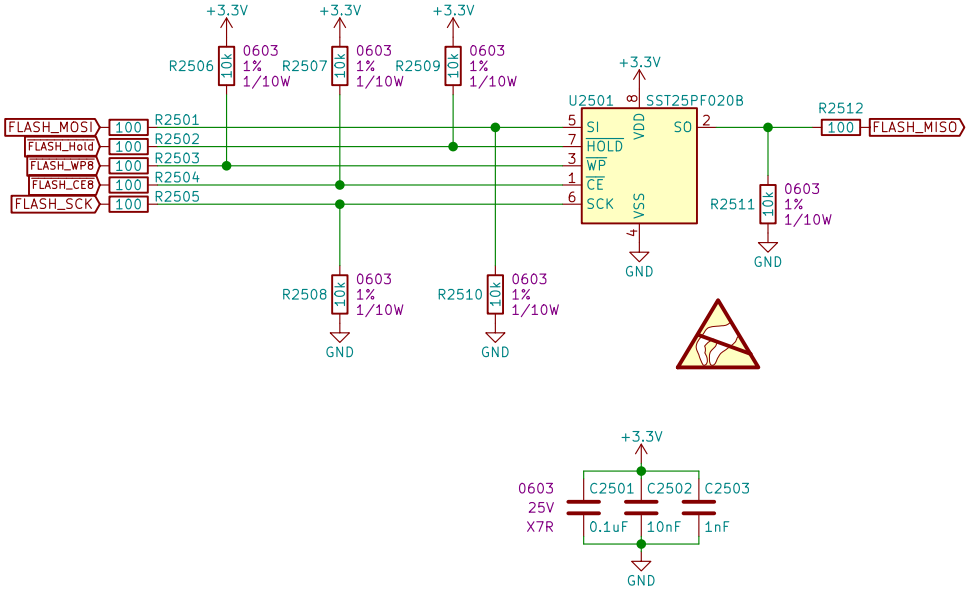
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 23/31

24. External FLASH 7



Marquette University Senior Design 2018/2019 Group E44		
Sheet: /External Flash 7/ File: External_Flash_7.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 24/31

25. External FLASH 8



Marquette University Senior Design 2018/2019 Group E44

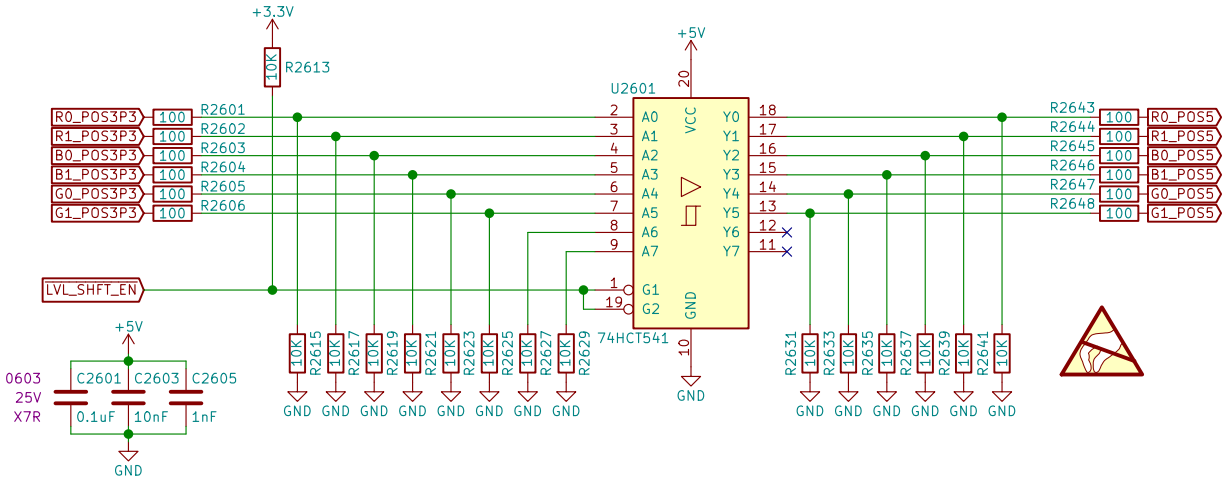
Sheet: /External Flash 8/

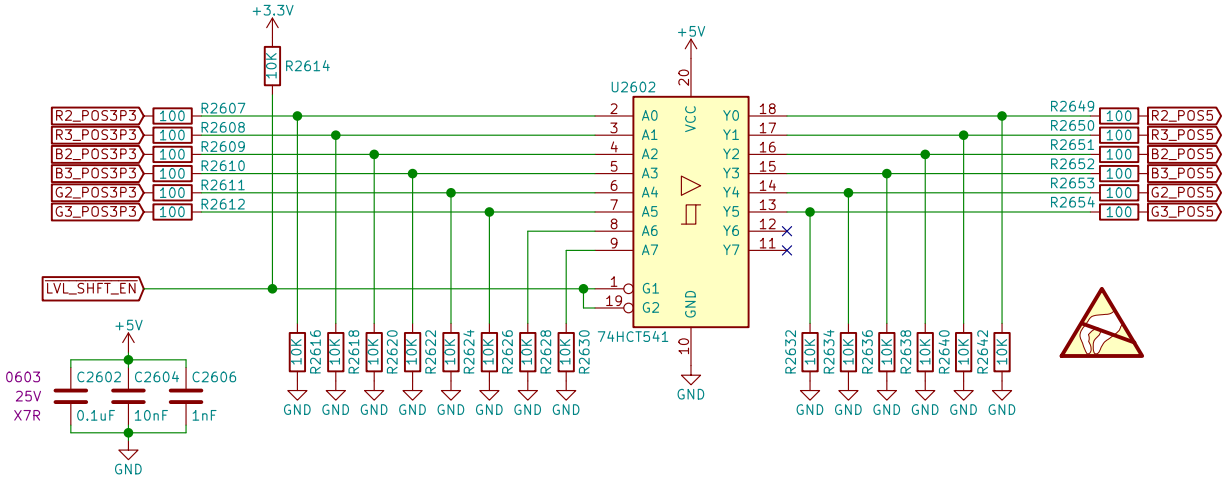
File: External_Flash_8.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 25/31

26. Panel Data Level Shifters 1





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Sheet: /Panel Data Level Shifters 1/

File: Panel_Data_Level_Shifters_1.sch

Title: Electronic Display Logic Board

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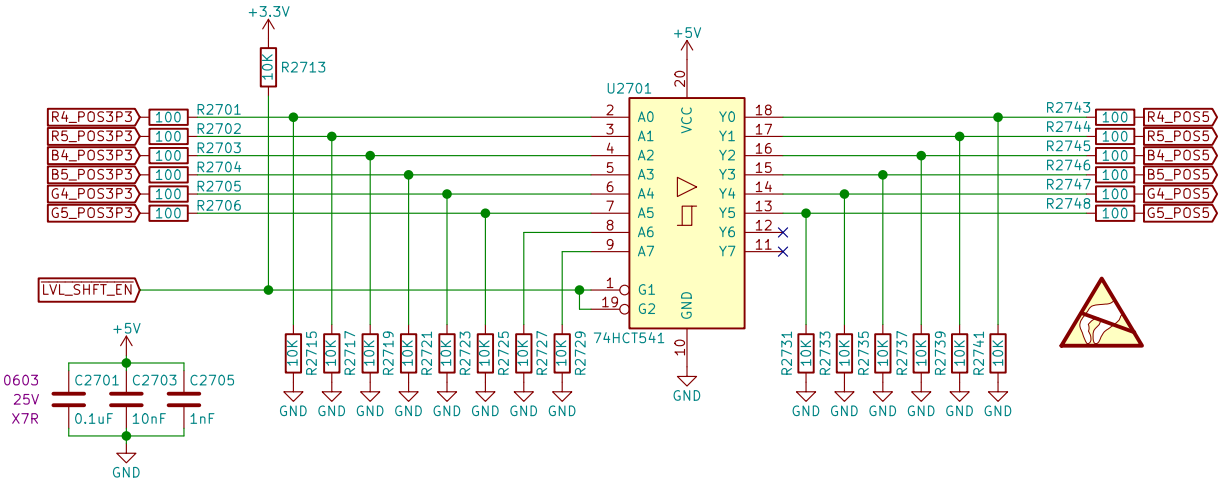
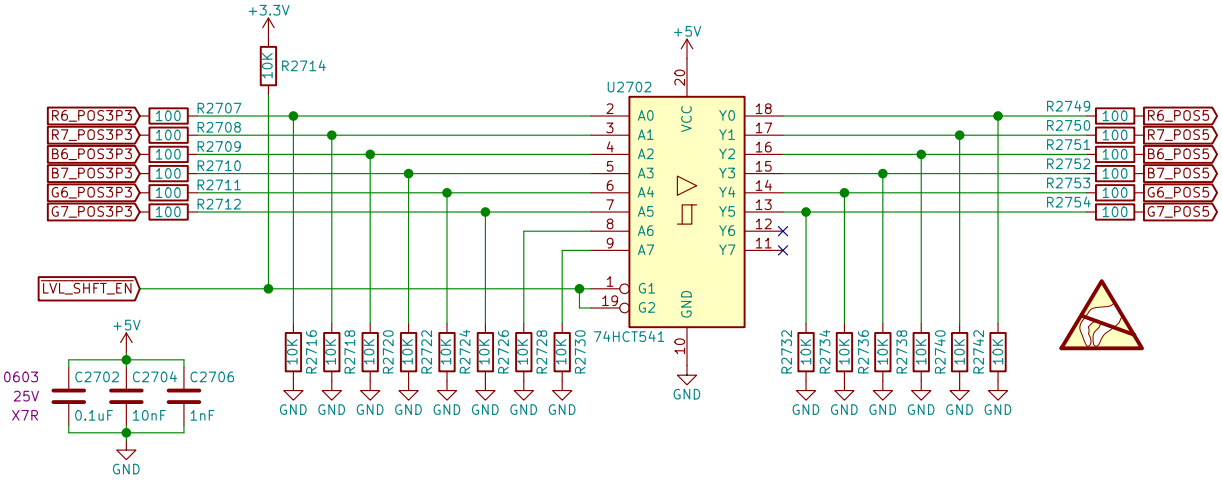
27. Panel Data Level Shifters 2





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Sheet: /Panel Data Level Shifters 2/		
File: Panel_Data_Level_Shifters_2.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
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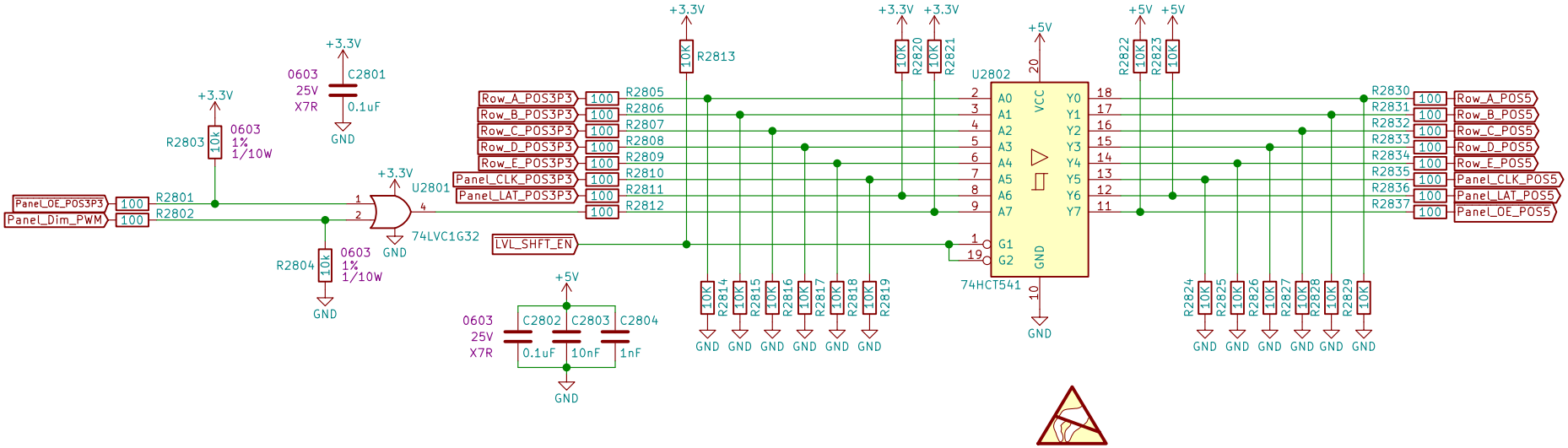
28. Panel Data Level Shifters 3



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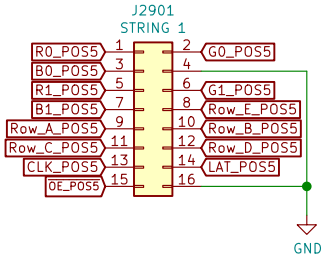
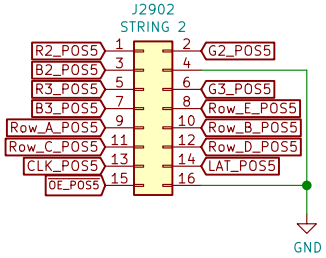
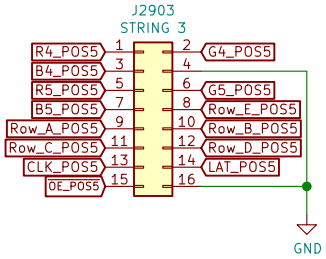
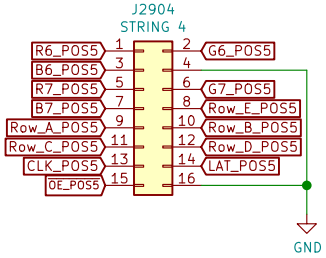
Sheet: /Panel Data Level Shifters 3/		
File: Panel_Data_Level_Shifters_3.sch		
Title: Electronic Display Logic Board		
Size: A	Date: 2018-11-28	**Rev: A**
KiCad E.D.A. kicad (5.0.1)-3		Id: 28/31

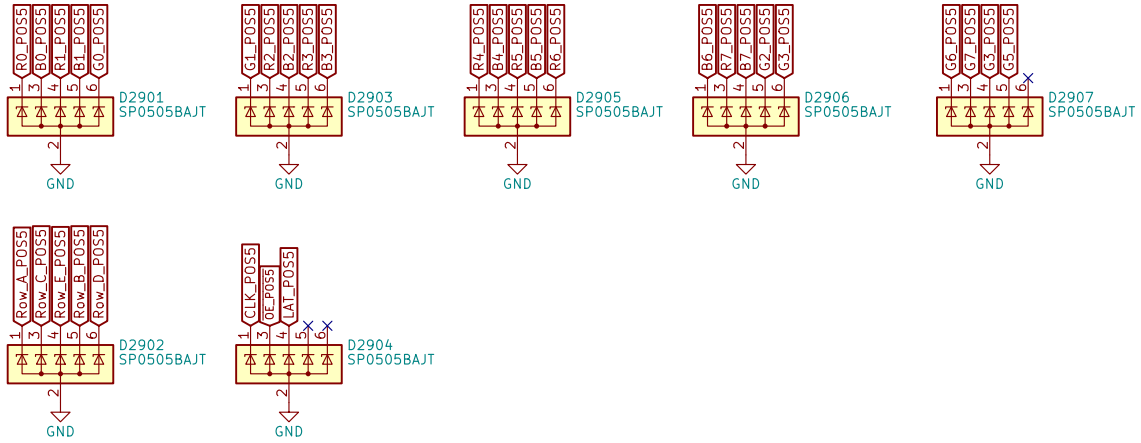
29. Panel Data Connectors











String 1 is the top string.
String 4 is the bottom string.
Each string is 5 panels long
Each panel is 64x64 pixels
This yields a 320x256 pixel overall display resolution

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Sheet: /Panel Data Connectors/
File: Panel_Data_Connectors.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
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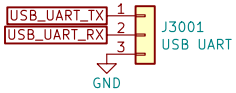
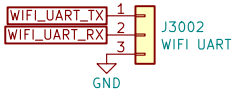
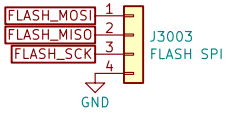
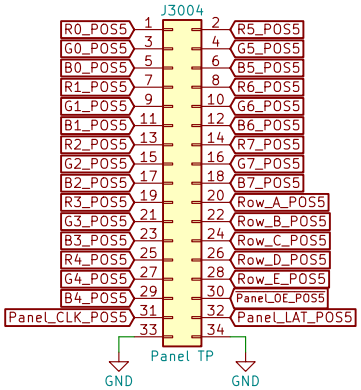
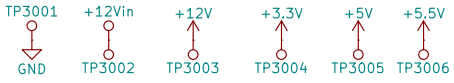
30. Test Points











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Sheet: /Test Points/

File: Test_Points.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
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31. Mechanical

4-40 Standoff
MK3101

4-40 Standoff
MK3105

4-40 Standoff
MK3109

4-40 Standoff
MK3113

4-40 Standoff
MK3117

4-40 Standoff
MK3121

4-40 Standoff
MK3102

4-40 Standoff
MK3106

4-40 Standoff
MK3110

4-40 Standoff
MK3114

4-40 Standoff
MK3118

4-40 Standoff
MK3122

4-40 Screw
MK3103

4-40 Screw
MK3107

4-40 Screw
MK3111

4-40 Screw
MK3115

4-40 Screw
MK3119

4-40 Screw
MK3123

4-40 Screw
MK3104

4-40 Screw
MK3108

4-40 Screw
MK3112

4-40 Screw
MK3116

4-40 Screw
MK3120

4-40 Screw
MK3124

H3101
3mm Mounting Hole

H3103
3mm Mounting Hole

H3105
3mm Mounting Hole

H3107
3mm Mounting Hole

H3109
3mm Mounting Hole

H3111
3mm Mounting Hole

H3102
3mm Mounting Hole

H3104
3mm Mounting Hole

H3106
3mm Mounting Hole

H3108
3mm Mounting Hole

H3110
3mm Mounting Hole

H3112
3mm Mounting Hole

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Sheet: /Mechanical/
File: Mechanical.sch

Title: Electronic Display Logic Board

Size: A	Date: 2018-11-28	**Rev: A**
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