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Electronic Display Logic Board

Marguette University Senior Design 2018, Group E44 Drew Maatman, Kevin Etta, Logan Wedel, Caroline Gilger, Tuoxuan Ren

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Panel Data Connectors.sch

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Test_Points.sch

Mechanical

Mechanical.sch

Additional Capacitance

Additional_Capacitance.sch

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Sheet: /

File: LED_Display_Controller.sch

Title: Electronic Display Logic Board

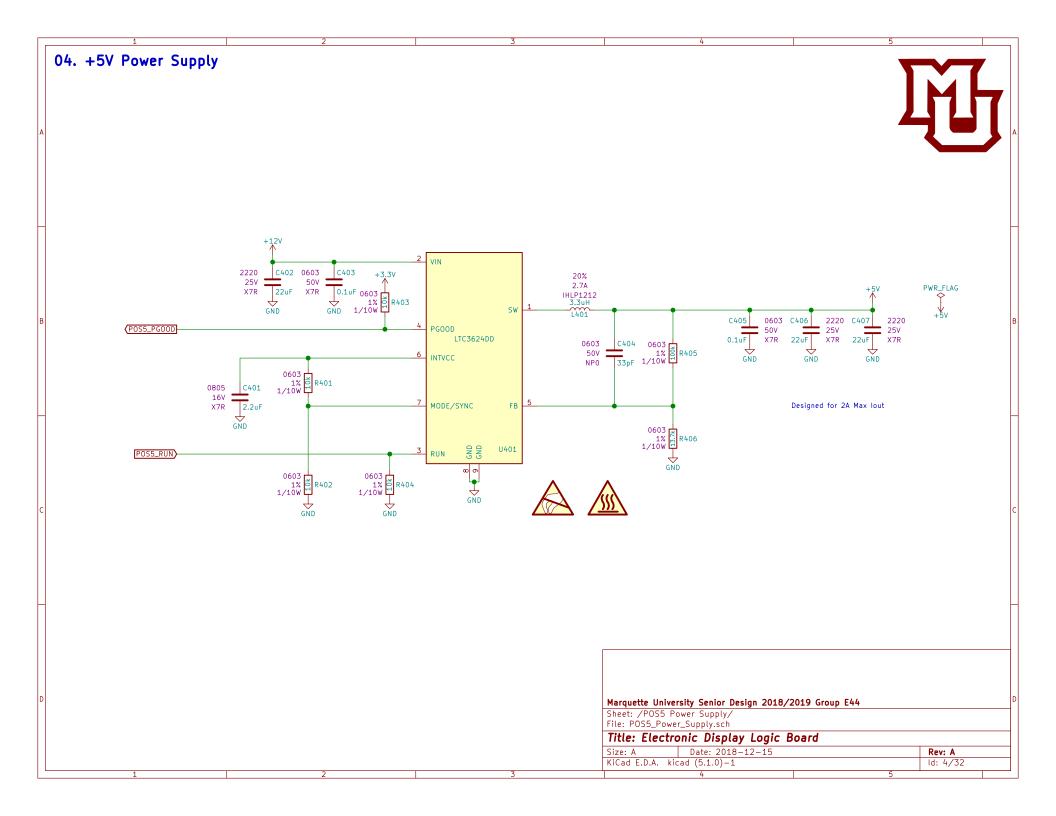
Date: 2018-12-15 Size: A

Rev: A KiCad E.D.A. kicad (5.1.0)-1ld: 1/32

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

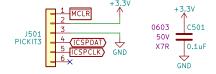
02. Power Input Q201 IPC100N04S51R7ATMA1 Q202 IPC100N04S51R7ATMA1 PWR_FLAG +12Vin PWR_FLAG +12V J201 1 +12V IN + C205 7343 D202 24V GND 16V R205 R206 10% 10 10 GND 0603 0603 J203 1% 1% 1/10W 1/10W U201 u LTC4365DDB Pout Vout Vin 0603 PWR_FLAG GND GND SHDN 0603 1% 1/10W 50V J202 Ø 1 GND IN X7R GND FAULT POS12_PGOOD) DO NOT power the logic board using the auxillary input power jack and input power shanks at the same time 0603 1% 1/10W OV GND UVLO threshold set to 10V OVLO threshold set to 14V 6ND D201 NUP2105L C201 C202 C203 0603 50V X7R GND Shorting Master Power Sw allows for shutdown of entire system Master Power SW GND Marquette University Senior Design 2018/2019 Group E44 Sheet: /Power Input/ File: Power_Input.sch Title: Electronic Display Logic Board Size: A Date: 2018-12-15 Rev: A KiCad E.D.A. kicad (5.1.0)-1 ld: 2/32

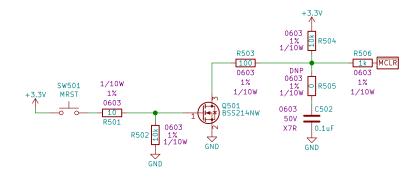
03. +3.3V Power Supply INTVCC 18 C309 0805 MODE C301 2220 2220 C303 C302 2220 1% 1/10W D301 MBR0530 16V R304 PHMODE 25V X7R 25V X7R 25V X7R 2.2uF X7R 22uF GND 22uF 22uF GND BOOST GND GND 20% 0603 C307 0603 50V C305 14A PWR_FLAG +3.3V 50V IHLP2020 0.47uH L301 0.1uF X7R X7R 0603 1% 1/10W Turn on threshold set to 6.6V SW SW SW SW +3.30 1210 C311 1210 C312 6.3V X7R 6.3٧ 47uF GND 47uF 0603 R307 | 0603 1% 1/10W X7R 50V NP0 0603 1% 1/10W 0603 GND SW 1% T R303 LTC3605A_UF GND VON (POS3P3_PGOOD FB PGOOD Designed for 5A Max lout GND 24 CLKOUT 23× CLKIN GNDS TRACK/SS 0603 1% 1/10W GNDS GND 0603 C304 50V X7R 0603 1% 1/10W 10nF 0603 C308 GNDS 50V GNDS 15pF NP0 0603 GNDS 50V GNDS GND 62pF Switching frequency set to 2.5 MHz NP0 GNDS Marquette University Senior Design 2018/2019 Group E44 Sheet: /POS3P3 Power Supply/ File: POS3P3_Power_Supply.sch Title: Electronic Display Logic Board Date: 2018-12-15 Size: A Rev: A KiCad E.D.A. kicad (5.1.0)-1 ld: 3/32



05. Microcontroller Programming







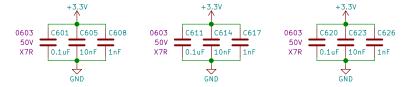
Marquette University Senior Design 2018/2019 Group E44

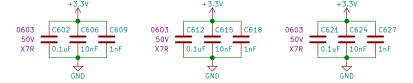
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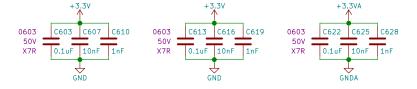
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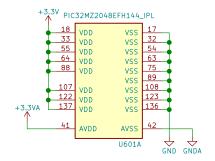
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06. Microcontroller Power



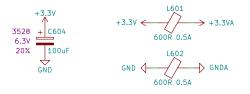














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Sheet: /Microcontroller Power/ File: Microcontroller_Power.sch

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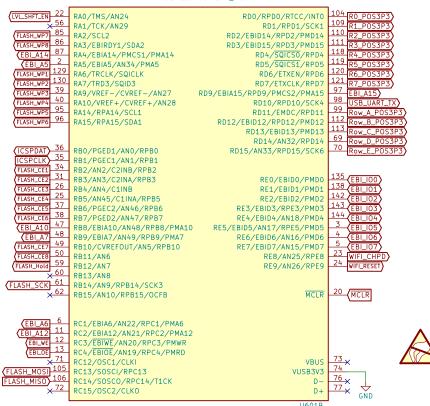
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07. Microcontroller IO Bank 1



PIC32MZ2048EFH144_IPL



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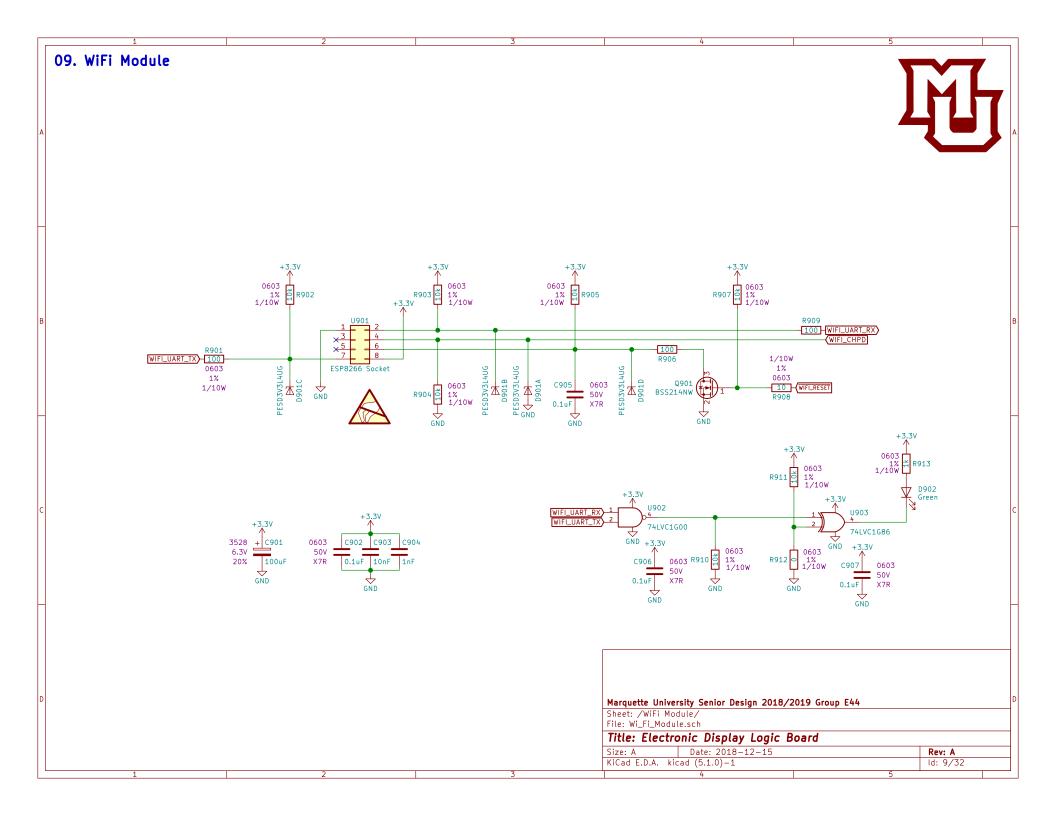
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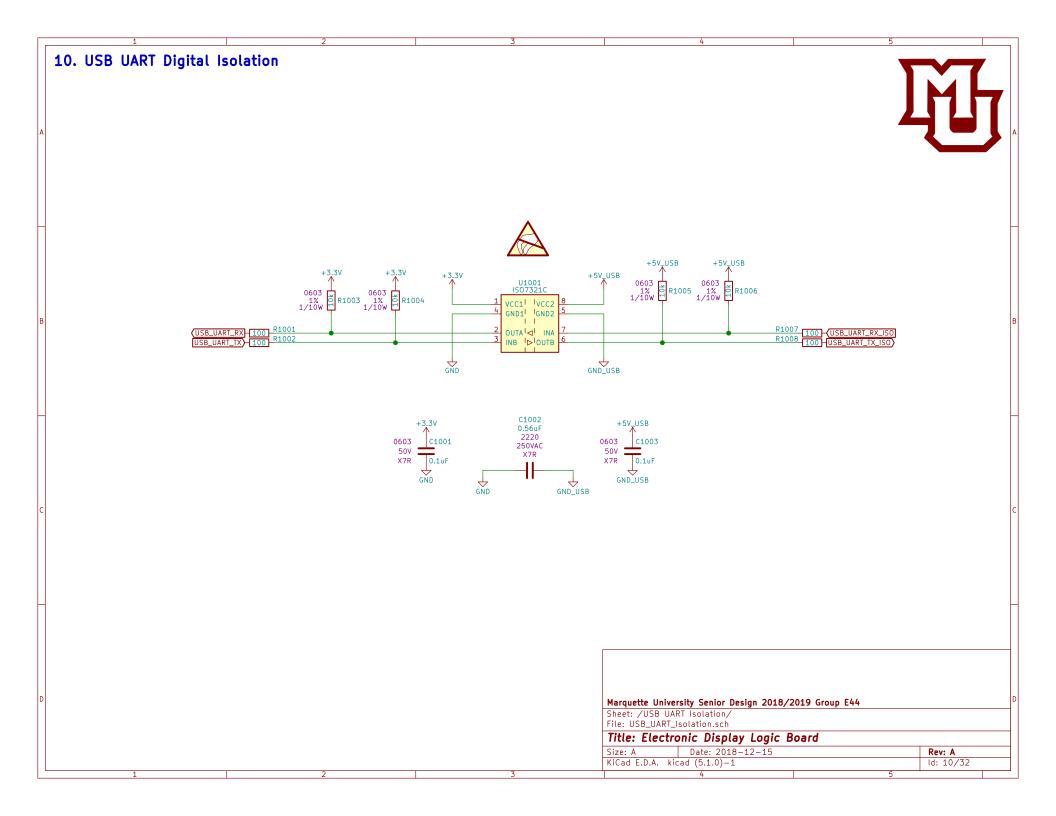
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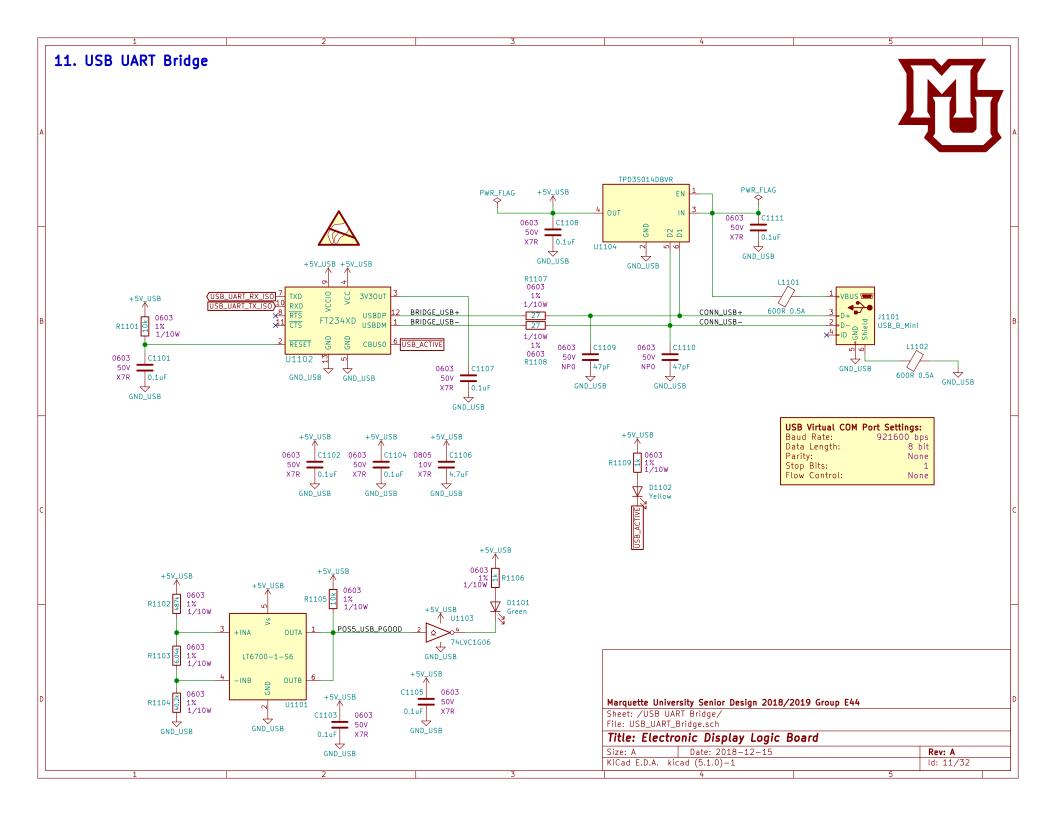
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 Rev: A

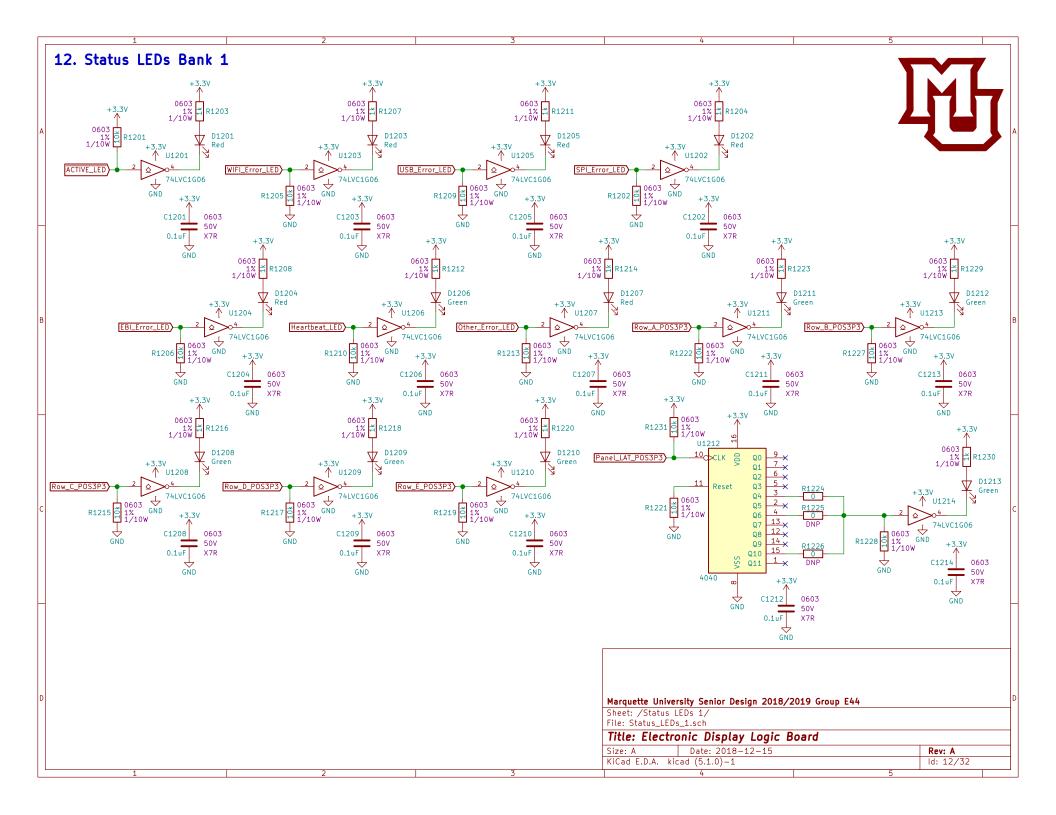
 KiCad E.D.A. kicad (5.1.0)-1
 Id: 7/32

08. Microcontroller IO Bank 2 PIC32MZ2048EFH144_IPL USB_UART_RX) 124 RF0/EBID11/RPF0/PMD11 114 Panel_CLK_POS3P3 RJ0/ETXERR POS12_PGOOD 125 RF1/EBID10/RPF1/PMD10 115 Panel_LAT_POS3P3 RJ1/EMDIO (POS5_RUN 79 RF2/SDA3/RPF2 116 Panel_OE_POS3P3 RJ2/EBIRDY3 POS5_PGOOD 78 RF3/RPF3/USBID RJ3/EBIA22 EBLA9 90 RF4/EBIA9/RPF4/SDA5/PMA9 RF5/EBIA8/RPF5/SCL5/PMA8 RJ4/EBICSO 132 G0_P0S3P3 RJ5/EBICS1 POS5P_FGOOD 80 RF8/SCL3/RPF8 RF12/TD0/AN31/RPF12 RJ6/EBICS2 RJ7/EBICS3 G2_POS3P3 POS5P_RUN 57 RF13/TDI/AN30/RPF13/SCK5 RJ8/AN35/ETXD0 8 G4_P0S3P. RJ9/AN36/ETXD1 10 G5_P0S3P3 RJ10/EBIBS1 27 G6_P0S3P3 Panel_Dim_PWM 128 RGO/EBID8/RPGO/PMD8 RJ11/AN37/ERXCLK/EREFCLK EBI_Error_LED 127 RG1/EBID9/RPG1/PMD9 RJ12/EBIBSO 9 G7_POS3P SPI_Error_LED 14 RG6/AN14/C1IND/RPG6/SCK2 RJ13/EBIA13/PMA13 28 EBI_A13 WIFI_UART_TX 15 RG7/AN13/C1INC/RPG7/SDA4 RJ14/EBIA11/PMA11 29 EBI_A11 WIFI_UART_RX 16 RG8/AN12/C2IND/RPG8/SCL4 RJ15/EBIAO/PMAO 30 EBI_AO EBLA2 21 RG9/EBIA2/AN11/C2INC/RPG9/PMA2 Heartbeat_LED 140 RG12/TRD1/SQID1 WIFLError_LED 141 RG13/TRD0/SQID0 RKO/EBIA16 19 EBI_A16 USB_Error_LED 139 RG14/TRD2/SQID2 ACTIVE_LED 1 RG15/AN23 53 EBI_A17 RK3/EBIA17 92 Display_Enable RK4/EBIA18 POS3P3_ADC) 43 RHO/AN38/ETXD2 RK5/EBIA19 93 ENCODER_STEP POS12_ADC 44 RH1/AN39/ETXD3 94 ENCODER_DIR RK6/EBIA20 RH2/EBIRP RK7/EBIA21 Other_Error_LED 46 RH3 POSSP5_ADC 65 RH4/AN40/ERXERR POS5_ADC 66 RH5/AN41/ERXD1 POS5_ADC 67 RH6/AN42/ERXD2 (EBI_A4 68 B0_POS3P3 81 RH8/ERXD0 B1_P0S3P3 82 RH9/ERXD3 B2_P0S3P3 83 RH10/ECOL B3_P0S3P3 84 RH11/EBIRDY2 B4 POS3P3 100 RH12/ECRS B5_POS3P3 101 RH13/ERXDV/ECRSDV B6_P0S3P3 102 RH14 B7_P0S3P3 103 RH15/EBIA23 U601C Marquette University Senior Design 2018/2019 Group E44 Sheet: /Microcontroller 2/ File: Microcontroller_2.sch Title: Electronic Display Logic Board Date: 2018-12-15 Size: A Rev: A KiCad E.D.A. kicad (5.1.0)-1ld: 8/32

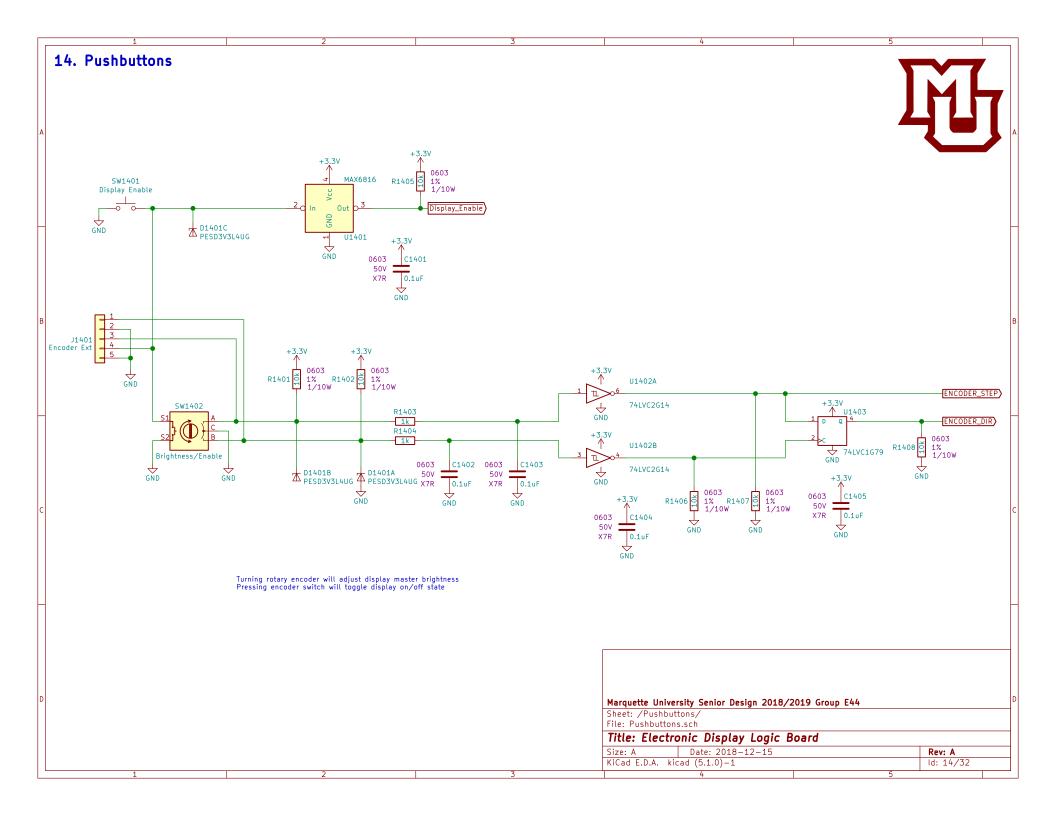






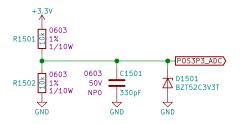


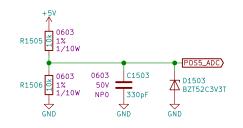
13. Status LEDs Bank 2 D1303 Green D1301 D1302 Green D1304 Green +3.3V ↑ U1301 +3.3V ↑ U1304 Green +3.3V ↑ U1302 +3.3V ↑ U1303 74LVC1G06 74LVC1G06 74LVC1G06 74LVC1G06 GND +3.3V +3.3V 0.1uF 0.1uF 0.1uF 0.1uF 0603 50V 0603 0603 50V 500 50V GND GND GND GND Marquette University Senior Design 2018/2019 Group E44 Sheet: /Status LEDs 2/ File: Status_LEDs_2.sch Title: Electronic Display Logic Board Size: A Date: 2018-12-15 Rev: A KiCad E.D.A. kicad (5.1.0)-1 ld: 13/32

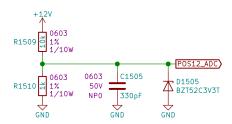


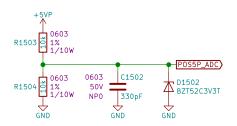
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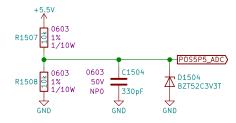










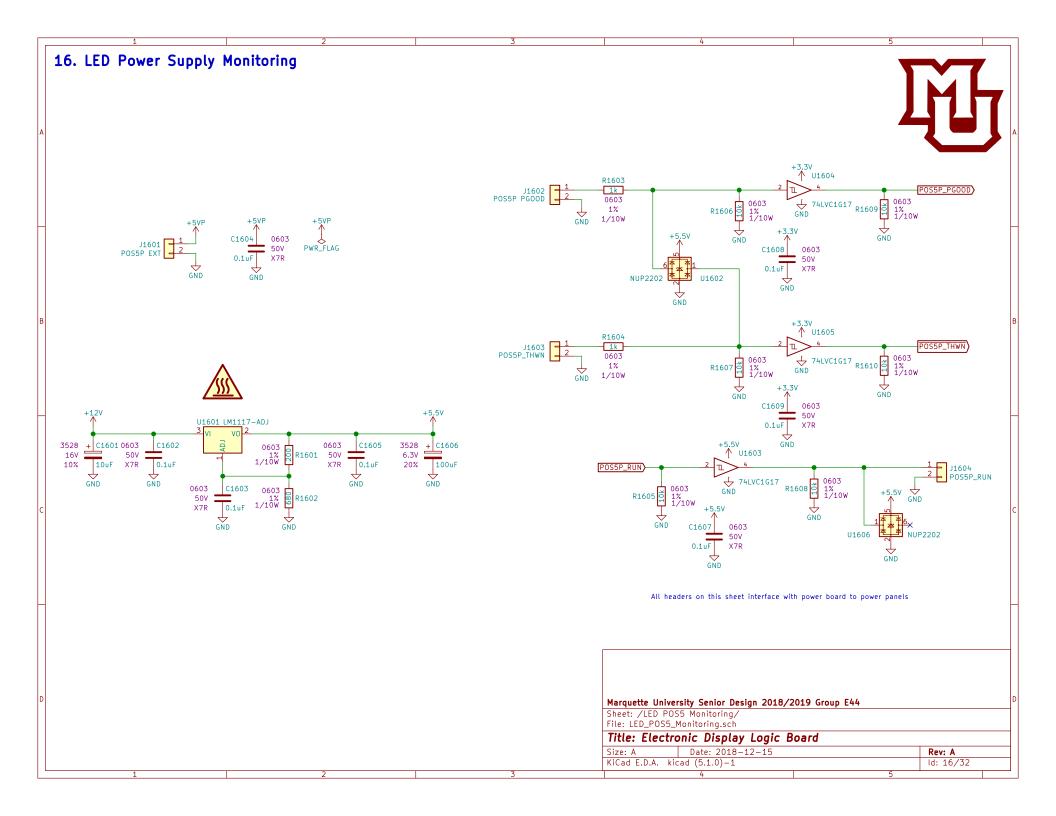


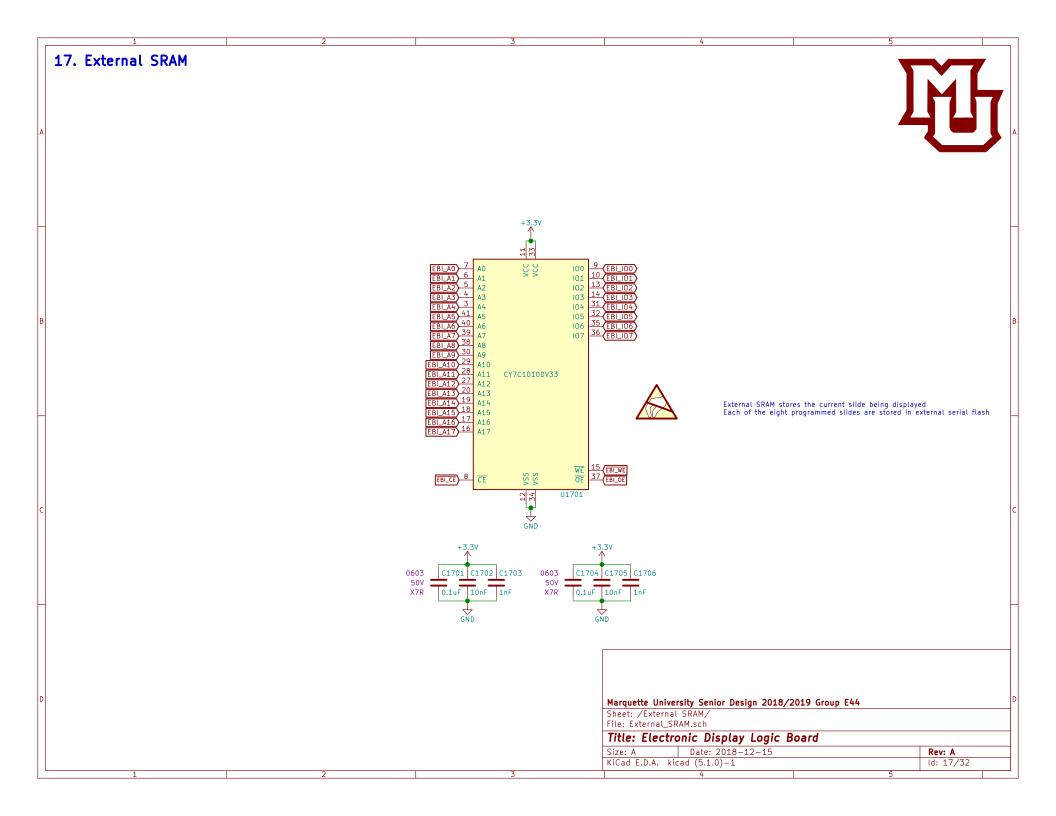
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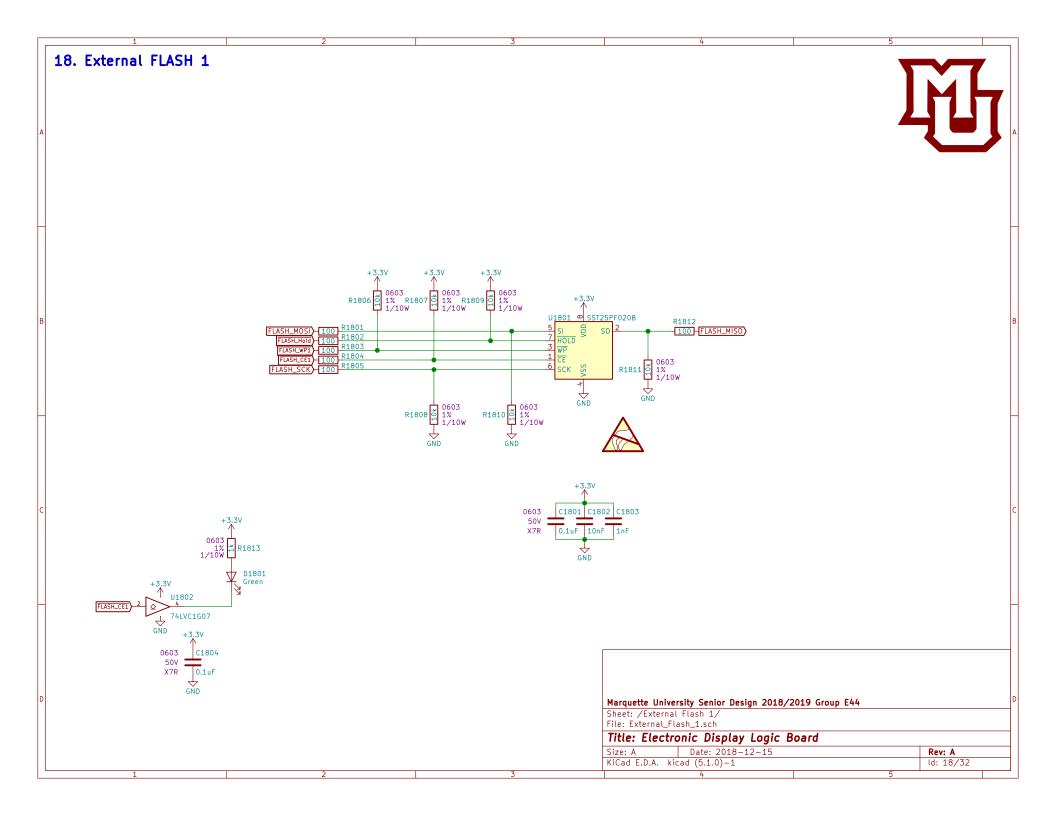
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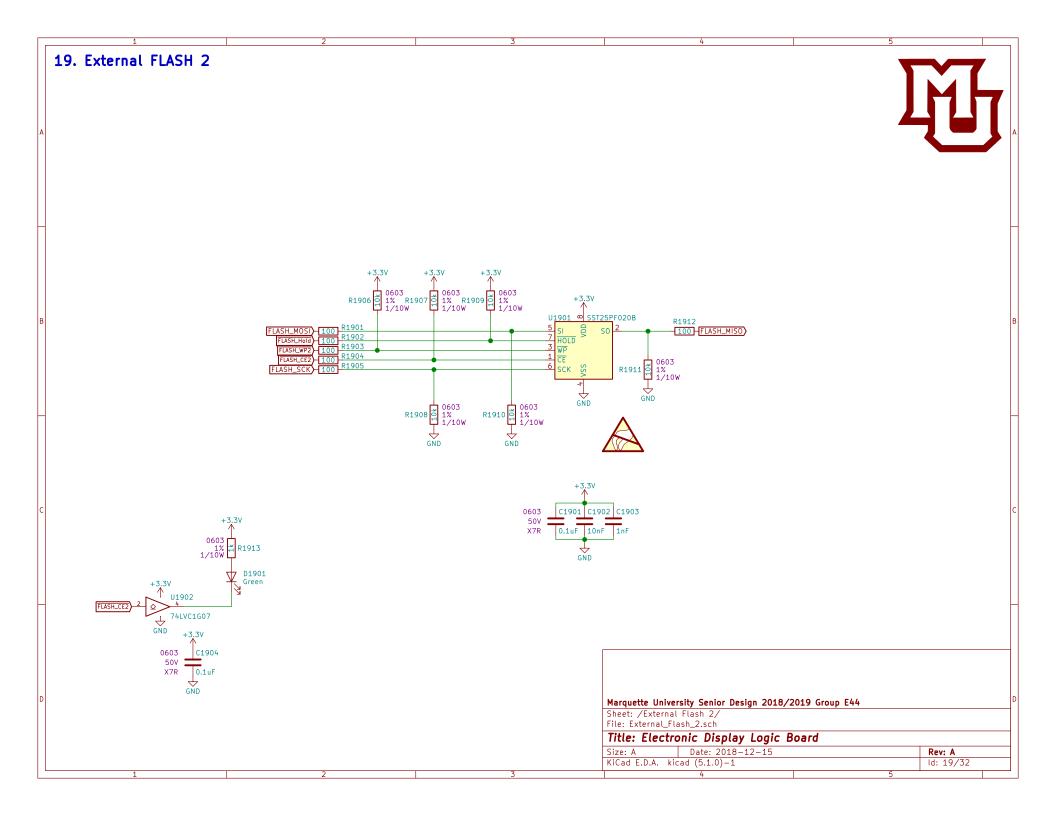
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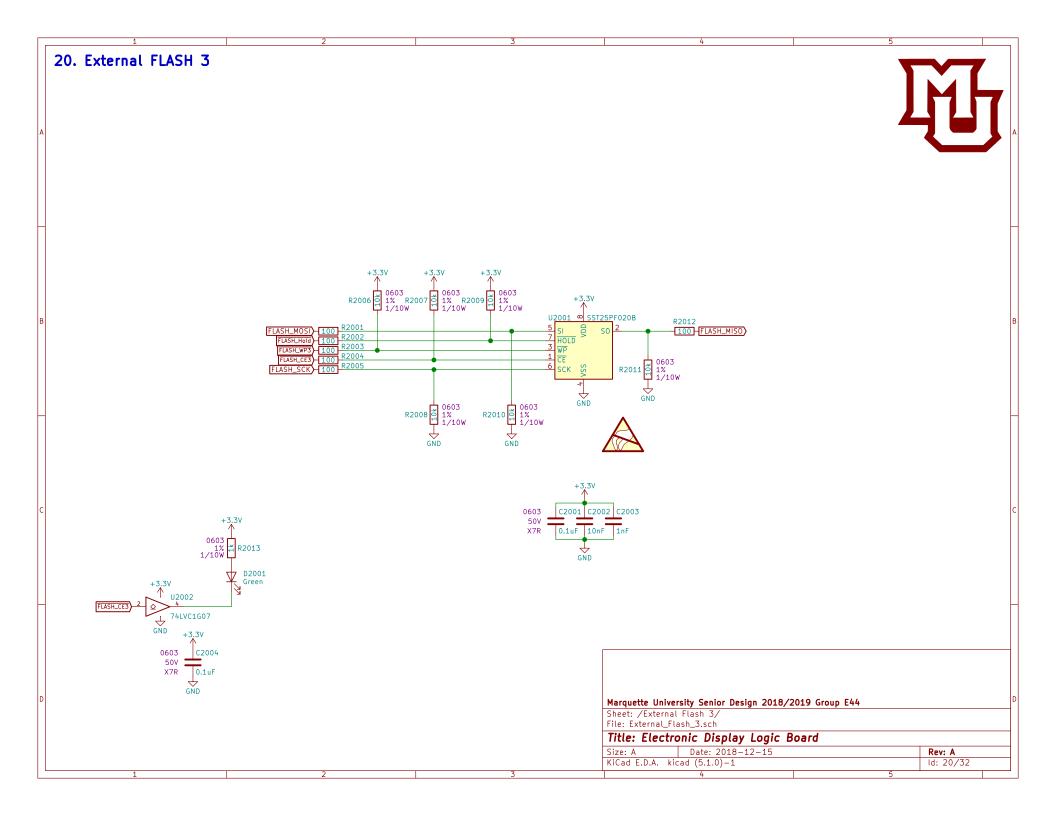
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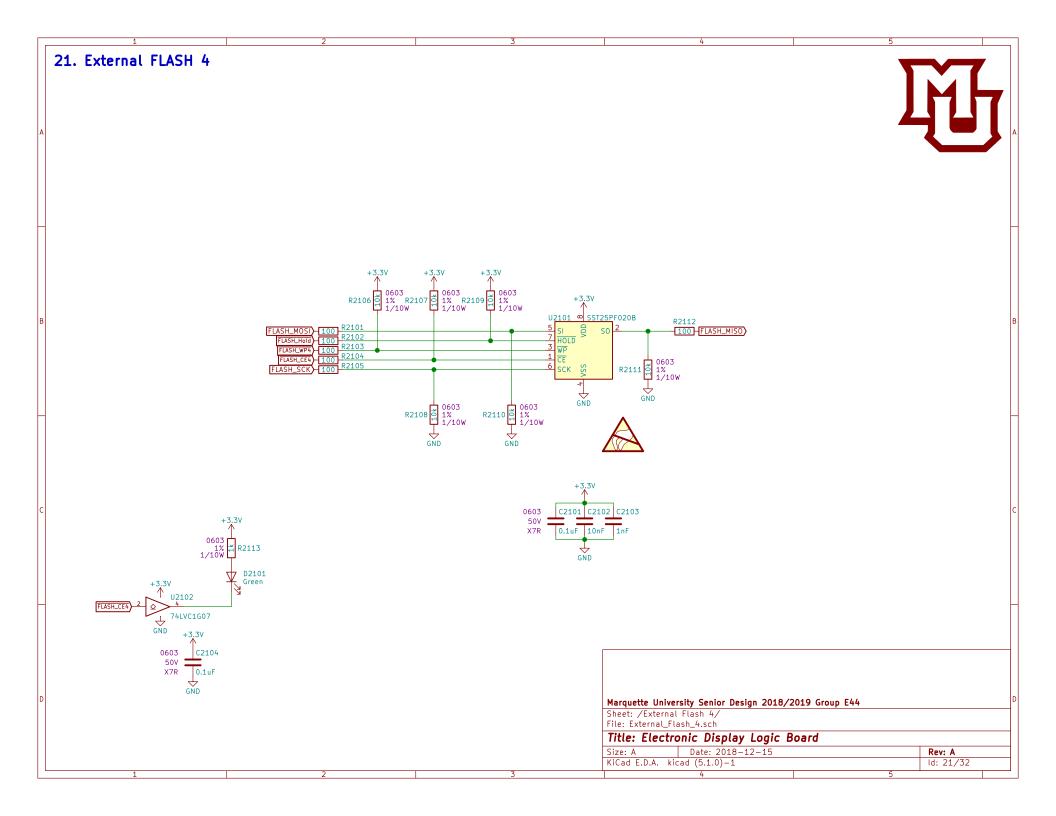


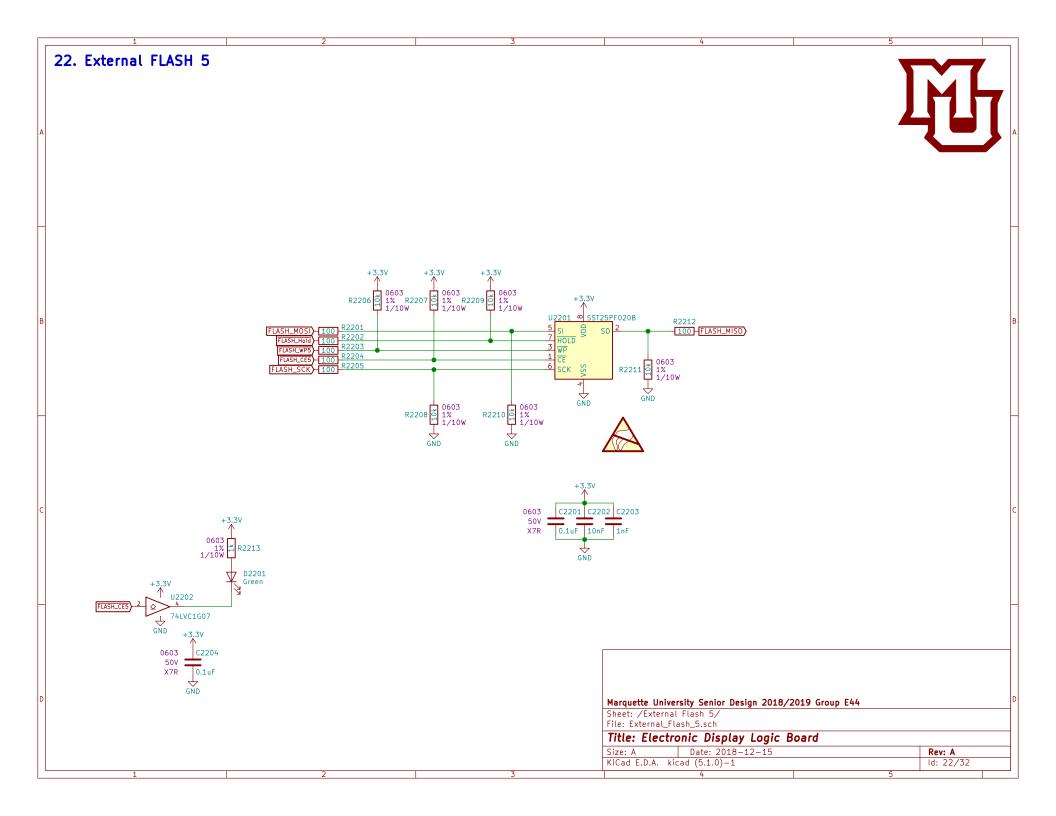


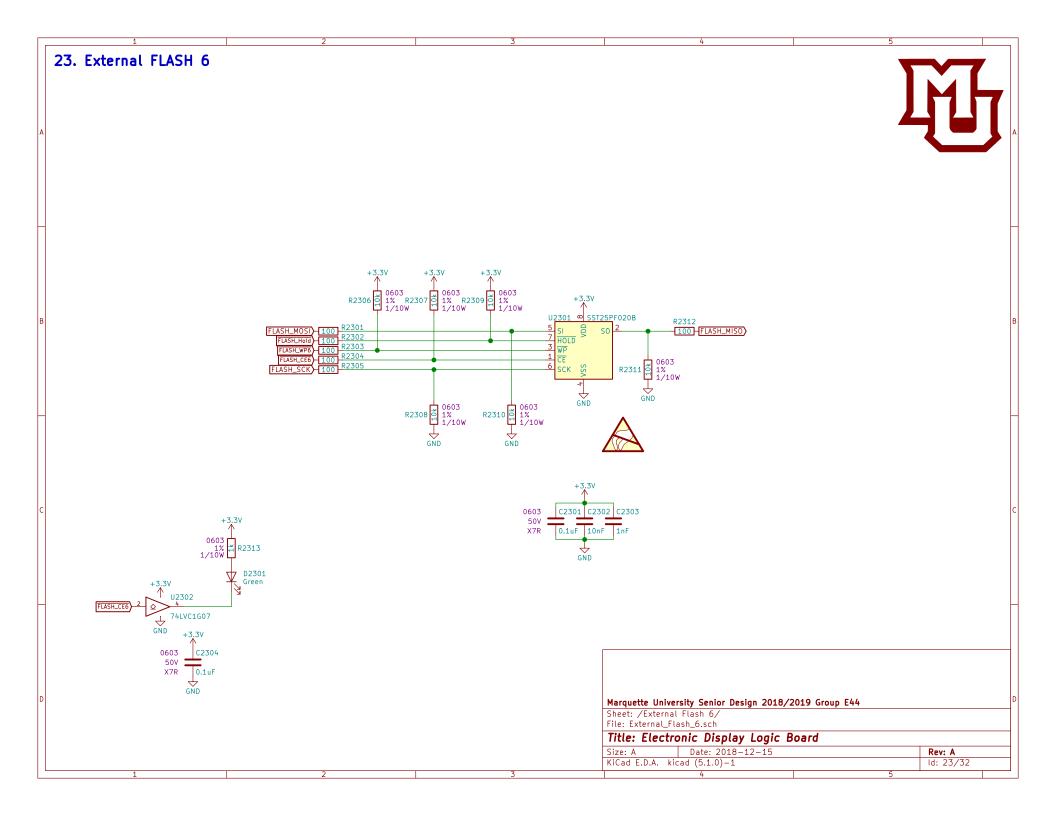


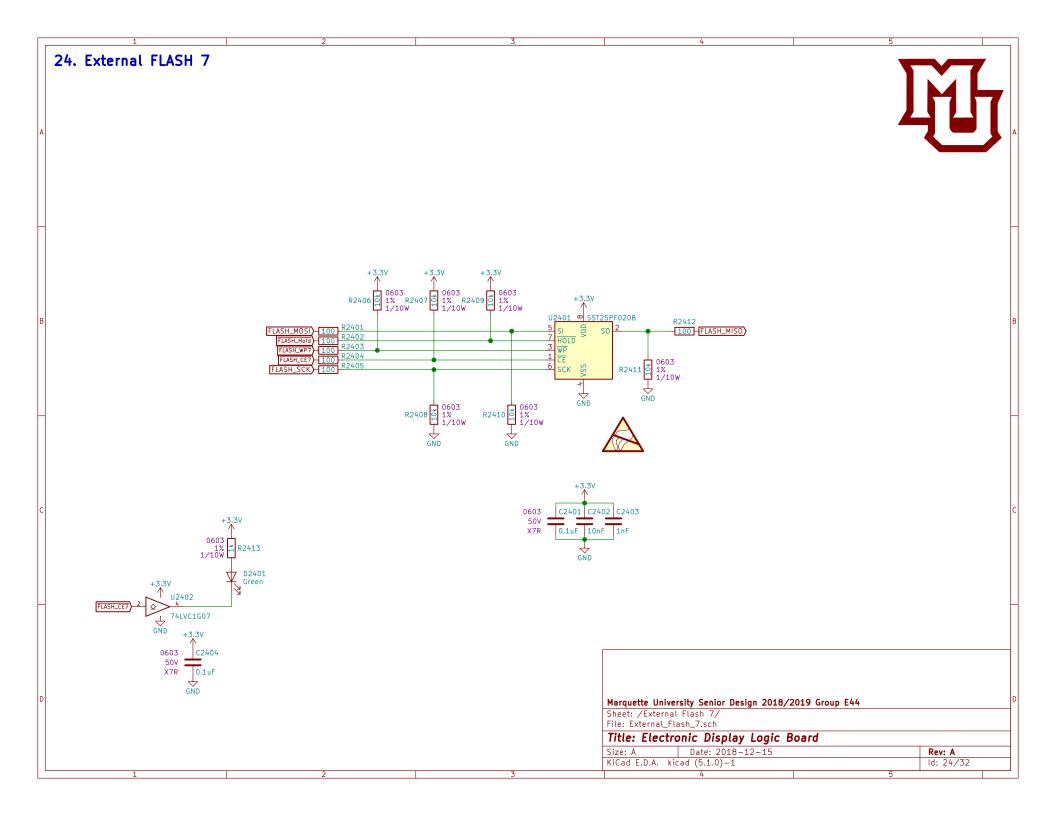


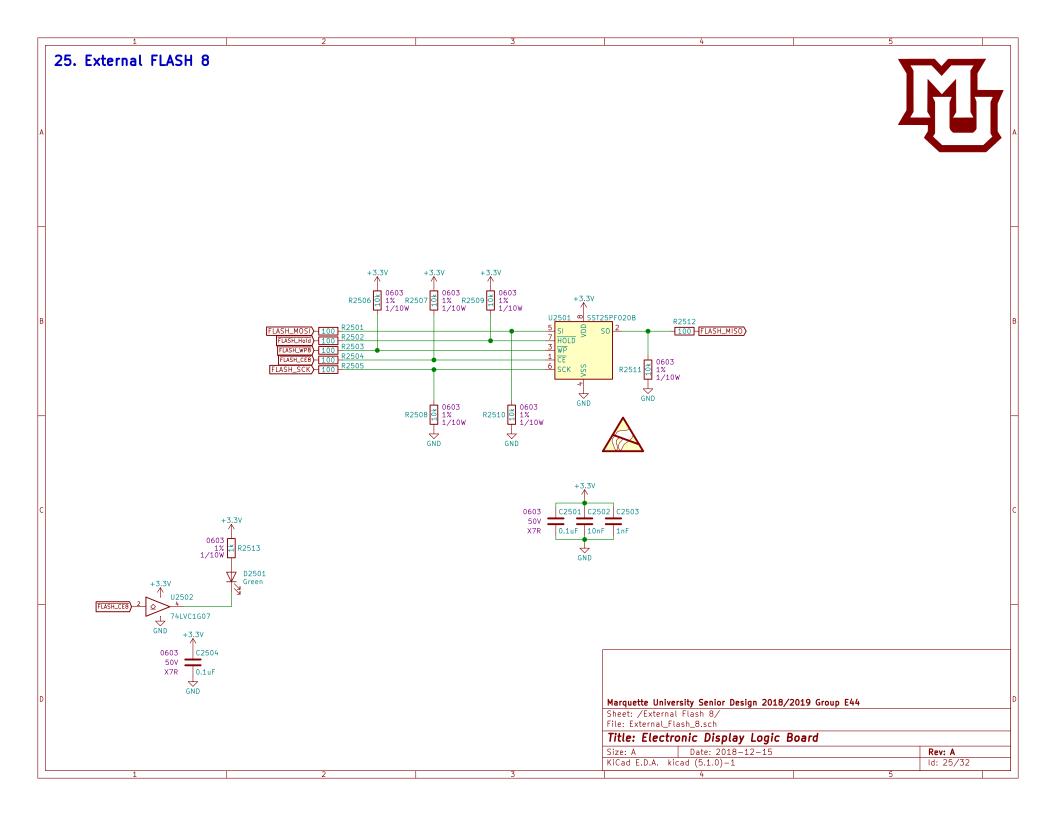


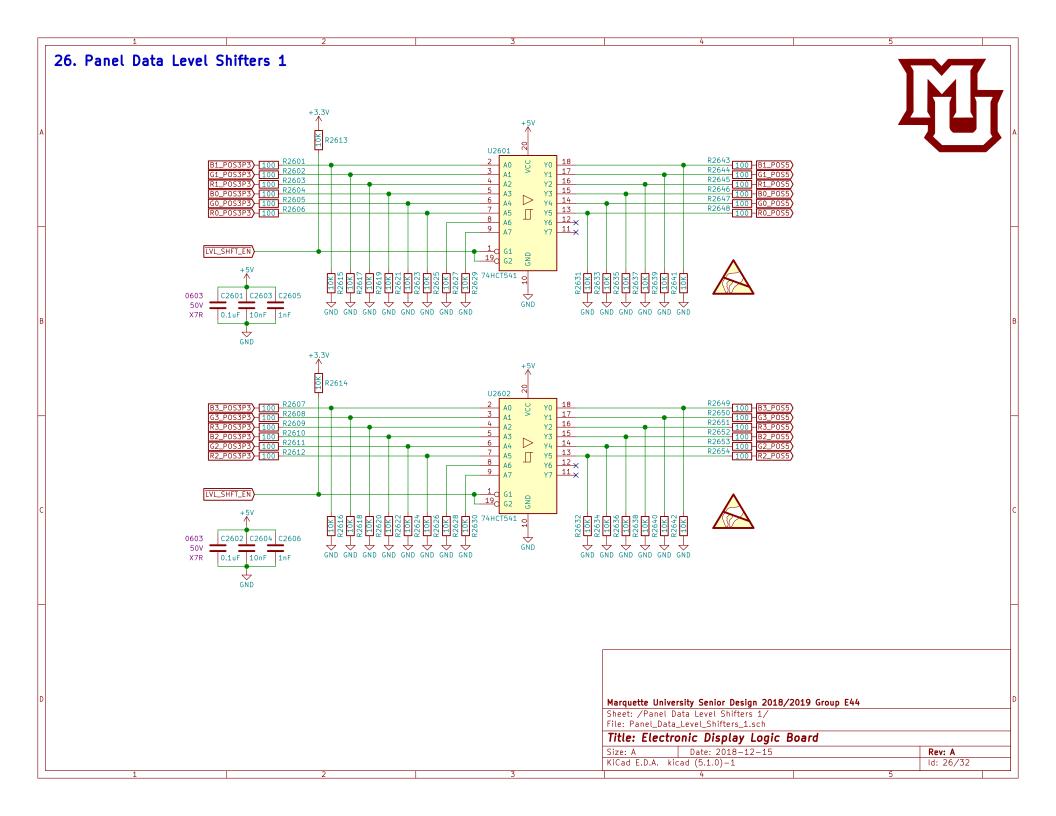


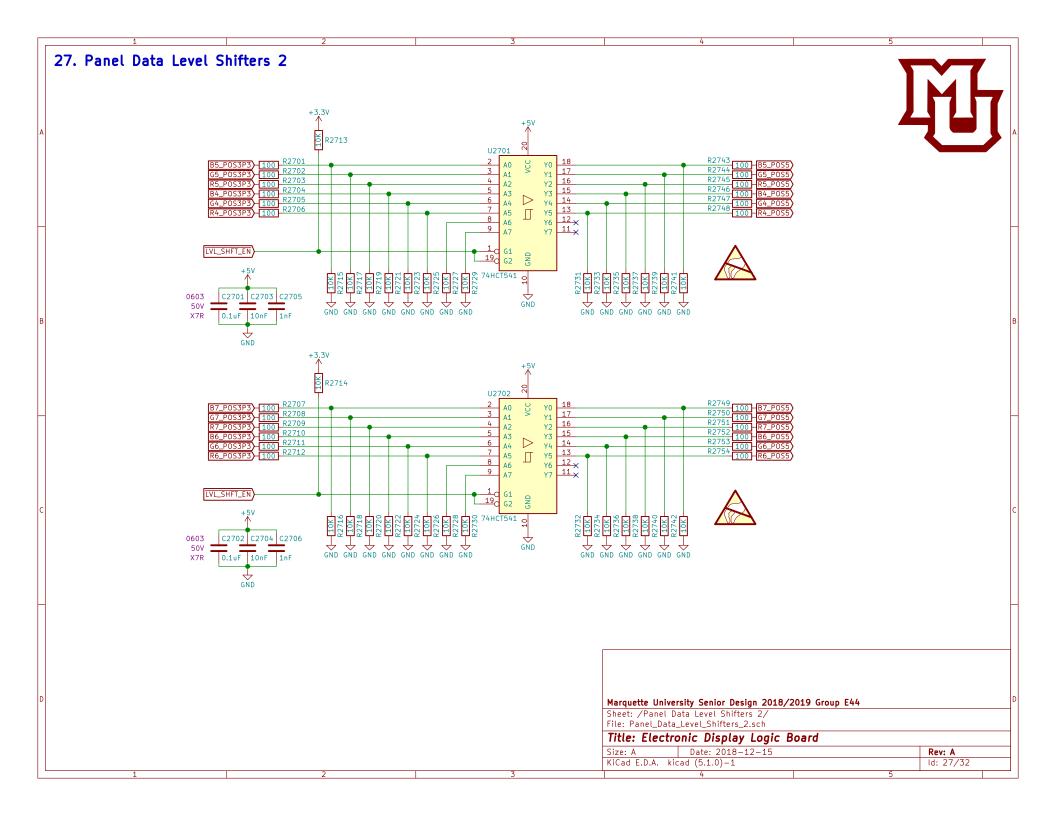


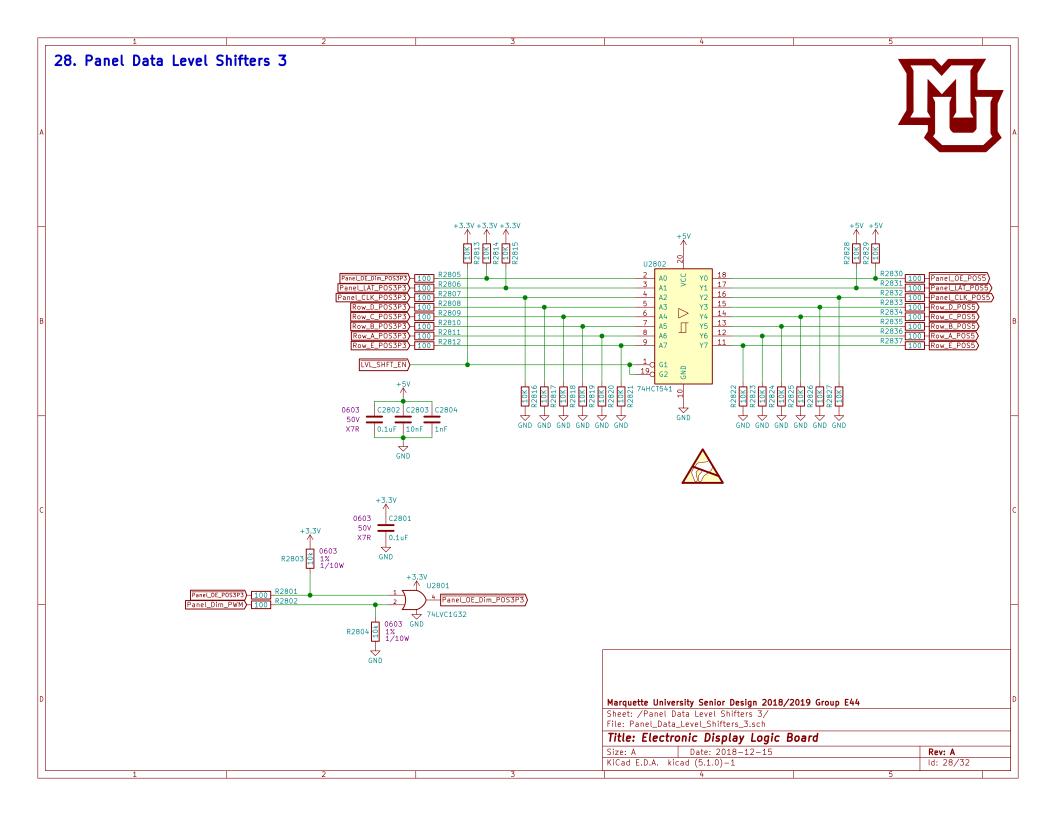


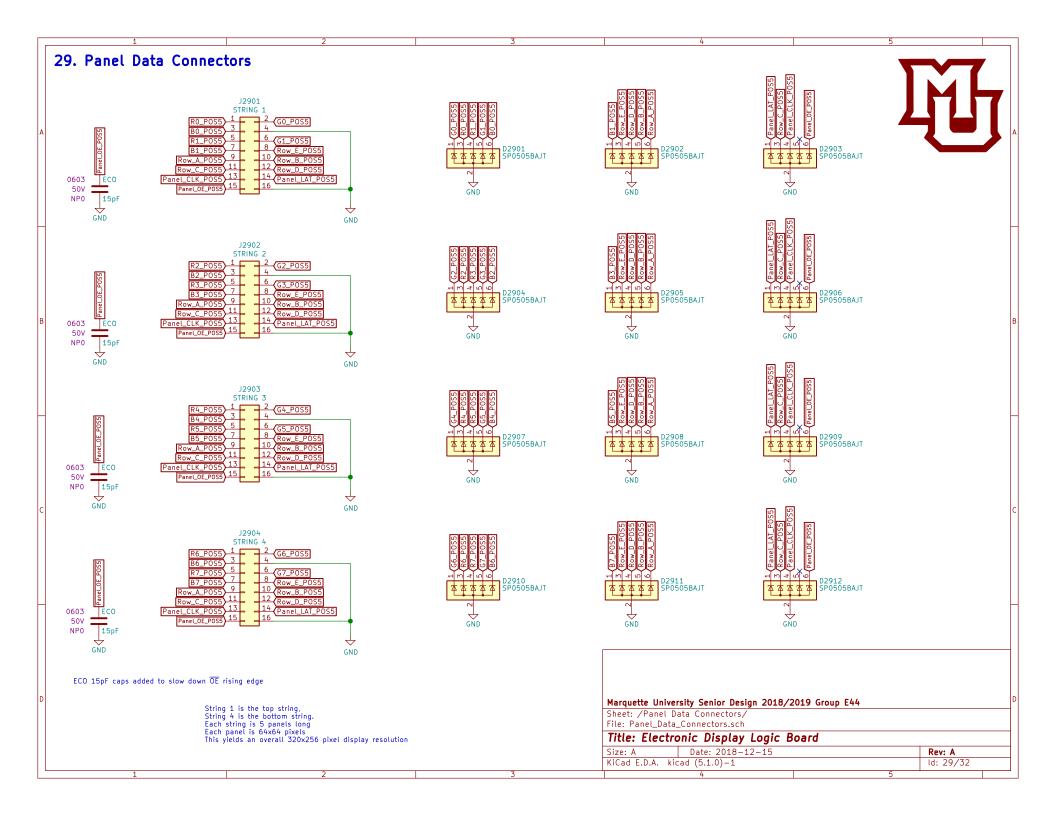












30. Test Points J3003 FLASH SPI WIFI UART TP3008 GND_USB +5V_USB Marquette University Senior Design 2018/2019 Group E44 Sheet: /Test Points/ File: Test_Points.sch Title: Electronic Display Logic Board

Date: 2018-12-15

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Size: A

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31. Mechanical 4-40 Standoff 4-40 Standoff 4-40 Standoff 4-40 Standoff 4-40 Standoff 4-40 Standoff MK3101 MK3105 MK3109 MK3113 MK3117 MK3121 4-40 Standoff 4-40 Standoff 4-40 Standoff 4-40 Standoff 4-40 Standoff 4-40 Standoff MK3102 MK3106 MK3110 MK3114 MK3118 MK3122 4-40 Screw 4-40 Screw 4-40 Screw 4-40 Screw 4-40 Screw 4-40 Screw MK3103 MK3107 MK3111 MK3115 MK3119 MK3123 1 4-40 Screw 4-40 Screw 4-40 Screw 4-40 Screw 4-40 Screw 4-40 Screw MK3108 MK3112 MK3116 MK3120 MK3124 MK3104 1 H3111 3mm Mounting Hole H3103 H3105 H3109 3mm Mounting Hole H3104 3mm Mounting Hole H3110 3mm Mounting Hole H3102 3mm Mounting Hole H3106 3mm Mounting Hole H3108 3mm Mounting Hole H3112 3mm Mounting Hole Marquette University Senior Design 2018/2019 Group E44 Sheet: /Mechanical/ File: Mechanical.sch Title: Electronic Display Logic Board Date: 2018-12-15 Size: A Rev: A ld: 31/32 KiCad E.D.A. kicad (5.1.0)-1

