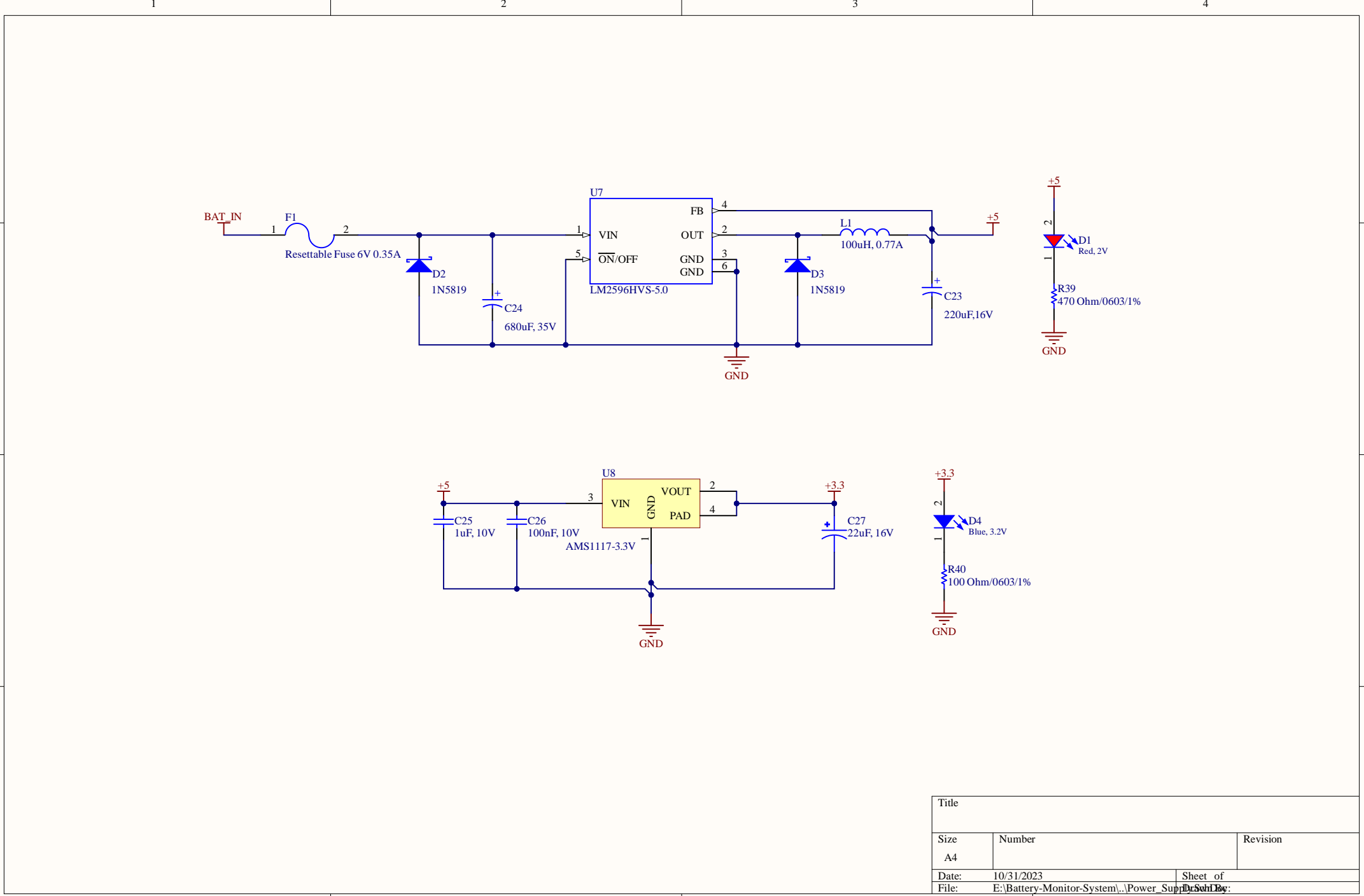
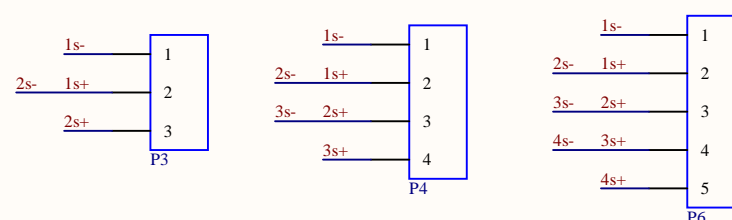
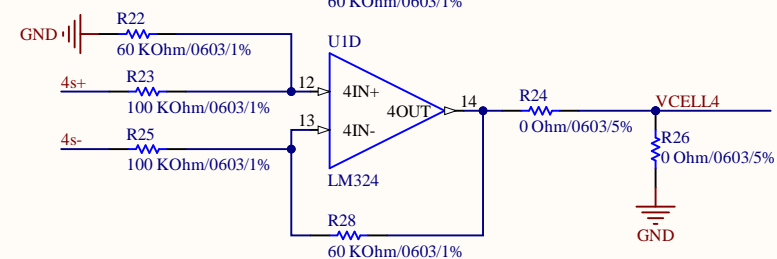
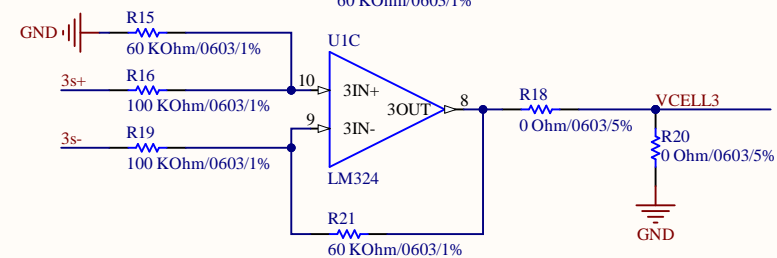
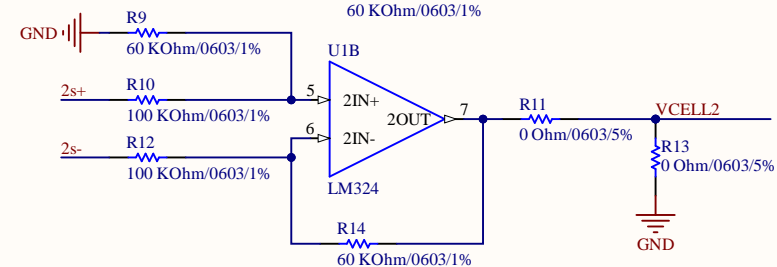
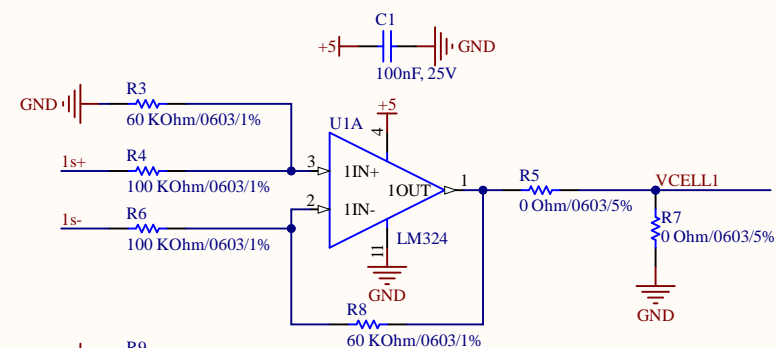


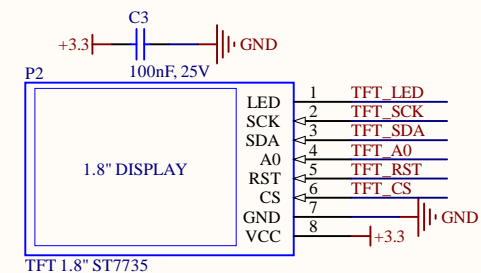
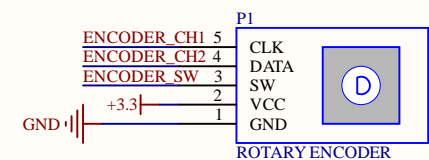
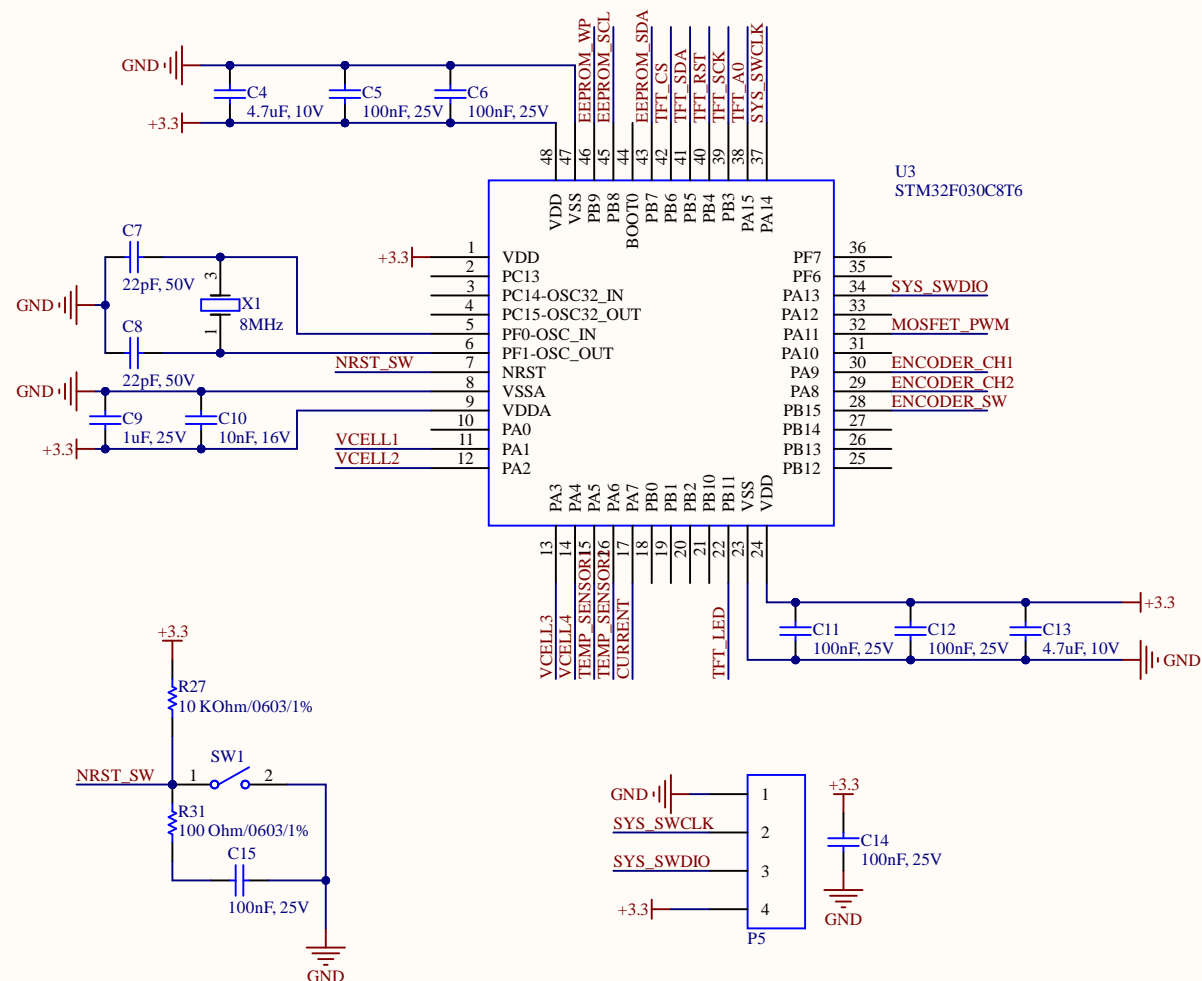
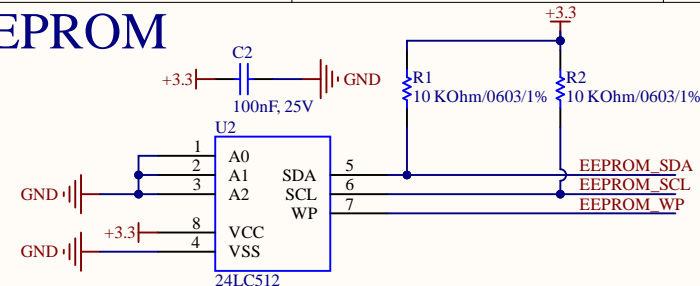
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|-------|--|----------------------|
| Title |  |                      |
| Size  | Number   | Revision             |
| A4    |  |                      |
| Date: | 10/31/2023                                     | Sheet of             |
| File: | E:\Battery-Monitor-System\Power_Diagram_SchDoc | Power_Diagram_SchDoc |



| Title |  |            |
|-------|--|------------|
| Size  | Number                                 | Revision   |
| A4    |  |            |
| Date: | 10/31/2023                             | Sheet of   |
| File: | E:\Battery-Monitor-System\Power_Supply | Dr. Sun By |

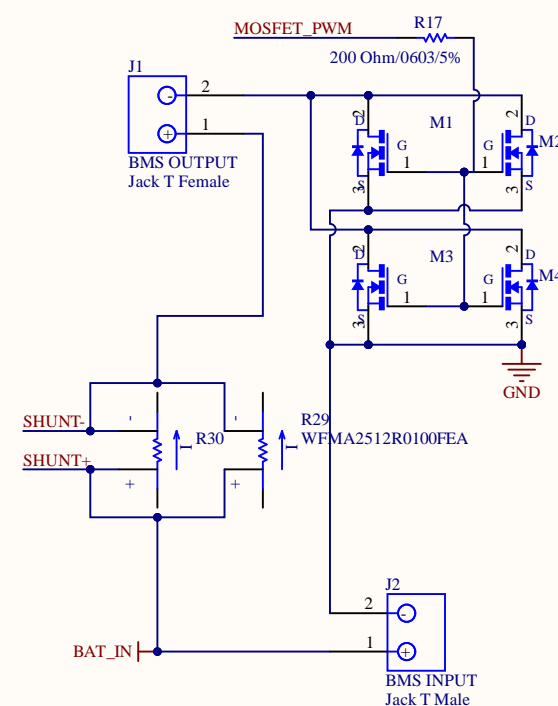


## BATTERY VOLTAGE MEASURE

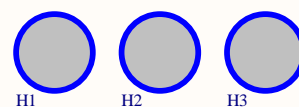
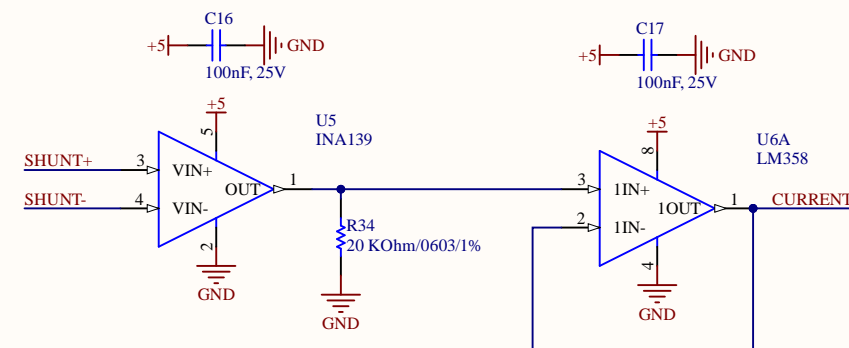
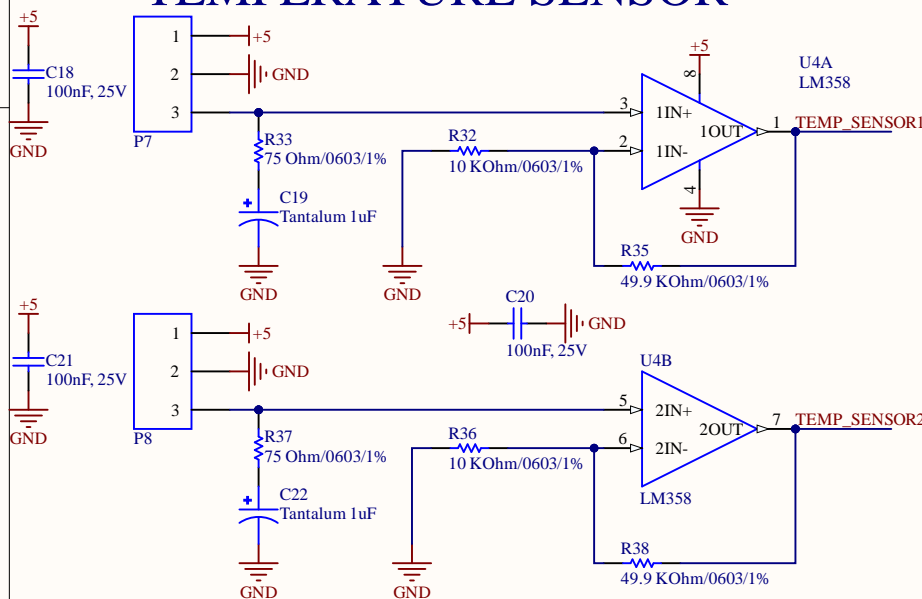


## USER INTERACTION

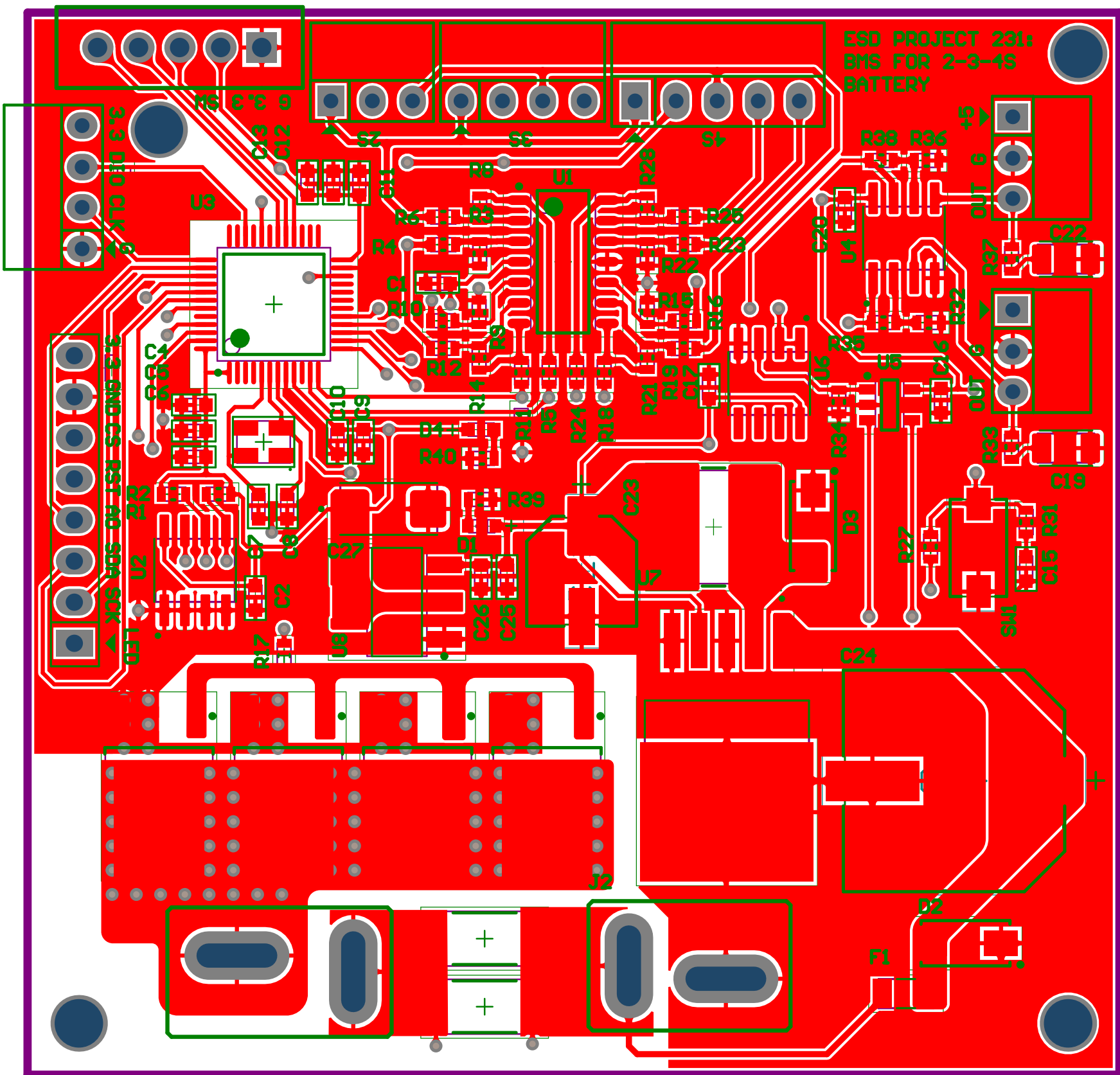
## SWITCHING CIRCUIT

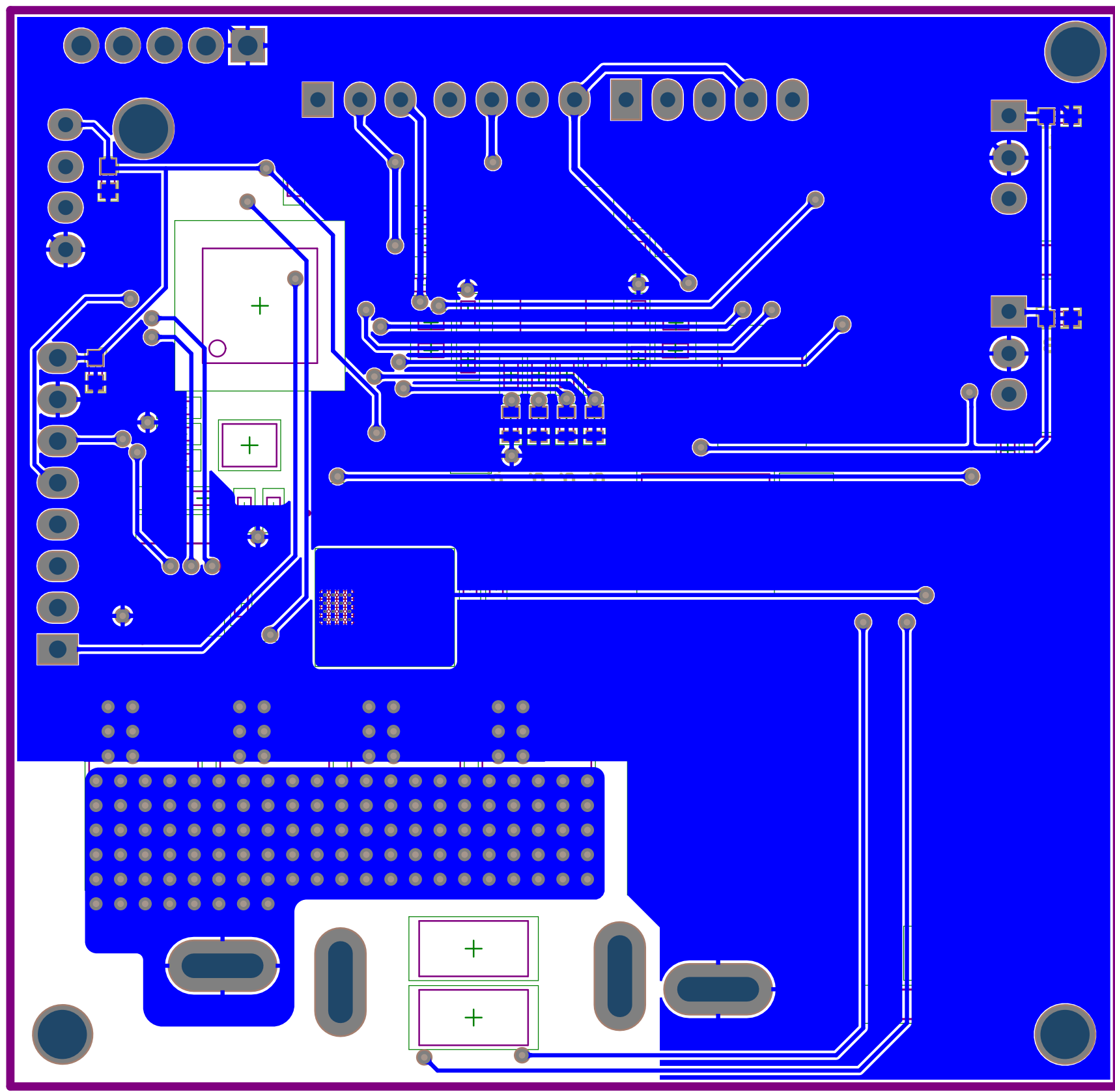


## TEMPERATURE SENSOR



|  |                                |          |
|--|--------------------------------|----------|
| Title                                  |                                |          |
| Size<br>A3                             | Number                         | Revision |
| Date:<br>10/31/2023                    | Sheet of<br>Drawings           |          |
| File:<br>E:\Battery-Monitor-System\... | Voltage_Battery_Monitor_SchDoc |          |





| Designator   | Comment                       | Description   | LibRef                        | Quantity |
|--|-------------------------------|---|-------------------------------|----------|
| C25  | 1uF, 10V                      | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, X5R, 1uF,<br>10V   | 885012106010                  | 1        |
| C9   | 1uF, 25V                      | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, X5R, 1uF,<br>25V   | 885012106022                  | 1        |
| C4, C13  | 4.7uF, 10V                    | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, X5R, 4.7uF,<br>10V | 885012106012                  | 2        |
| C10  | 10nF, 16V                     | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, X7R, 10nF,<br>16V  | 885012206040                  | 1        |
| C7, C8   | 22pF, 50V                     | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, NP0, 22pF,<br>50V  | 885012006053                  | 2        |
| U2   | 24LCxx                        | EEPROM  | 24LCxx                        | 1        |
| C26  | 100nF, 10V                    | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, X7R, 100nF,<br>10V | 885012206020                  | 1        |
| C1, C2, C3, C5, C6,<br>C11, C12, C14, C15,<br>C16, C17, C18, C20,<br>C21 | 100nF, 25V                    | WCAP-CSGP<br>Multilayer Ceramic<br>Chip Capacitor,<br>General Purpose,<br>size 0603, X7R, 100nF,<br>25V | 885012206071                  | 14       |
| L1   | 100uH, 0.77A                  | WE-PD2A SMT Power<br>Inductor, size 7850,<br>100uH, 0.77A   | 78477520                      | 1        |
| C23  | 220uF                         | WCAP-ASLI<br>Aluminum<br>Electrolytic<br>Capacitor, V-Chip,<br>D6.3 x H7.7mm,<br>220uF, 16V             | 865080345012                  | 1        |
| C24  | 680uF                         | WCAP-ASLI<br>Aluminum<br>Electrolytic<br>Capacitor, V-Chip,<br>D12.5 x H14mm,<br>680uF, 35V             | 865080562017                  | 1        |
| SW1  | 434123050816                  | WS-TASV J-Bend SMT<br>Tact Switch, 12VDC,<br>50mA, 160g, height<br>5mm                                  | 434123050816                  | 1        |
| U8   | AMS1117-3.3V                  |   | AMS1117-3.3V                  | 1        |
| M1, M2, M3, M4   | AOD472                        | MOSFET 25V 55A N-<br>Channel  | AOD472                        | 4        |
| D4   | Blue, 3.2V                    | WL-SMCW SMT Mono-<br>color Chip LED<br>Waterclear, size<br>0603, Blue, 3.2V,<br>140deg                  | 150060BS75000                 | 1        |
| J2   | BMS INPUT                     | Jack T 120A   | Jack T Male                   | 1        |
| J1   | BMS OUTPUT                    | Jack T 120A   | Jack T Female                 | 1        |
| R29, R30   | Current Sense<br>Resistor     | Shunt Resistor  | Current Sense<br>Resistor     | 2        |
| D2, D3   | D Schottky                    | Schottky Diode  | D Schottky                    | 2        |
| P3, P7, P8   | Header 3H                     | Header, 3-Pin, Right<br>Angle   | Header 3H                     | 3        |
| P4, P5   | Header 4H                     | Header, 4-Pin, Right<br>Angle   | Header 4H                     | 2        |
| P6   | Header 5H                     | Header, 5-Pin, Right<br>Angle   | Header 5H                     | 1        |
| H1, H2, H3   | Hole                          | Hole 3mm  | Hole                          | 3        |
| U5   | INA139                        | High-Side<br>Measurement<br>Current Shunt<br>Monitor  | INA139                        | 1        |
| U1   | LM324                         | OPAMP General<br>Purpose Amplifier 4<br>Circuit 1.2MHz  | LM324                         | 1        |
| U4, U6   | LM358                         | General Purpose<br>Amplifier 2 Circuit<br>1.1MHz  | LM358                         | 2        |
| U7   | LM2596                        | Simple Switcher<br>Power Converter 150-<br>kHz 4V to 60V, 3A<br>Step-Down Voltage<br>Regulator          | LM2596                        | 1        |
| D1   | Red, 2V                       | WL-SMCW SMT Mono-<br>color Chip LED<br>Waterclear, size 0603<br>dome, Red, 2V,<br>60deg                 | 150060RS86000                 | 1        |
| F1   | RESETTABLE FUSE<br>1206       | Polymeric PTC<br>Resettable Fuse 6V<br>350mA 1h Surface<br>Mount 1206_3216<br>Metric, Concave           | RESETTABLE FUSE<br>1206       | 1        |
| R5, R7, R11, R13, R18,<br>R20, R24, R26                                  | Resistor 0 Ohm 0603<br>5%     | Code 0R, 1/10W  | Resistor 0 Ohm 0603<br>5%     | 8        |
| R1, R2, R27, R32, R36  | Resistor 10 KOhm<br>0603 1%   | Code 103, 1/10W   | Resistor 10 KOhm<br>0603 1%   | 5        |
| R34  | Resistor 20 KOhm<br>0603 1%   | Code 203, 1/10W   | Resistor 20 KOhm<br>0603 1%   | 1        |
| R35, R38   | Resistor 49.9 KOhm<br>0603 1% | Code (4992, 68C),<br>1/10W  | Resistor 49.9 KOhm<br>0603 1% | 2        |
| R3, R8, R9, R14, R15,<br>R21, R22, R28                                   | Resistor 60 KOhm<br>0603 1%   | Code 603, 1/10W   | Resistor 60 KOhm<br>0603 1%   | 8        |
| R33, R37   | Resistor 75 Ohm 0603<br>1%    | Code 750, 1/10W   | Resistor 75 Ohm 0603<br>1%    | 2        |
| R4, R6, R10, R12, R16,<br>R19, R23, R25                                  | Resistor 100 KOhm<br>0603 1%  | Code 104, 1/10W   | Resistor 100 KOhm<br>0603 1%  | 8        |
| R31, R40   | Resistor 100 Ohm<br>0603 1%   | Code 1000, 1/10W  | Resistor 100 Ohm<br>0603 1%   | 2        |
| R17  | Resistor 200 Ohm<br>0603 5%   | Code 201, 1/10W   | Resistor 200 Ohm<br>0603 5%   | 1        |
| R39  | Resistor 470 Ohm<br>0603 1%   | Code 471, 1/10W   | Resistor 470 Ohm<br>0603 1%   | 1        |
| P1   | Rotary Encoder                | KY-040  | MODULE ROTARY<br>ENCODER      | 1        |
| U3   | STM32F030C8T6                 |   | STM32F030C8T6                 | 1        |
| C19, C22   | Tantalum Capacitor            | Code 105 10%, 1206<br>(3216 Metric)   | Tantalum Capacitor            | 2        |
| C27  | Tantalum Capacitor            | Code 226 10%, 2312<br>(6032 Metric)   | Tantalum Capacitor            | 1        |
| P2   | TFT 1.8" ST7735               | LCD 1.8inch 160x128<br>TFT ST7735   | TFT 1.8" ST7735               | 1        |
| X1   | XTAL                          |   | XTAL                          | 1        |