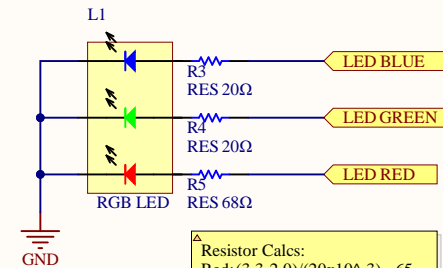
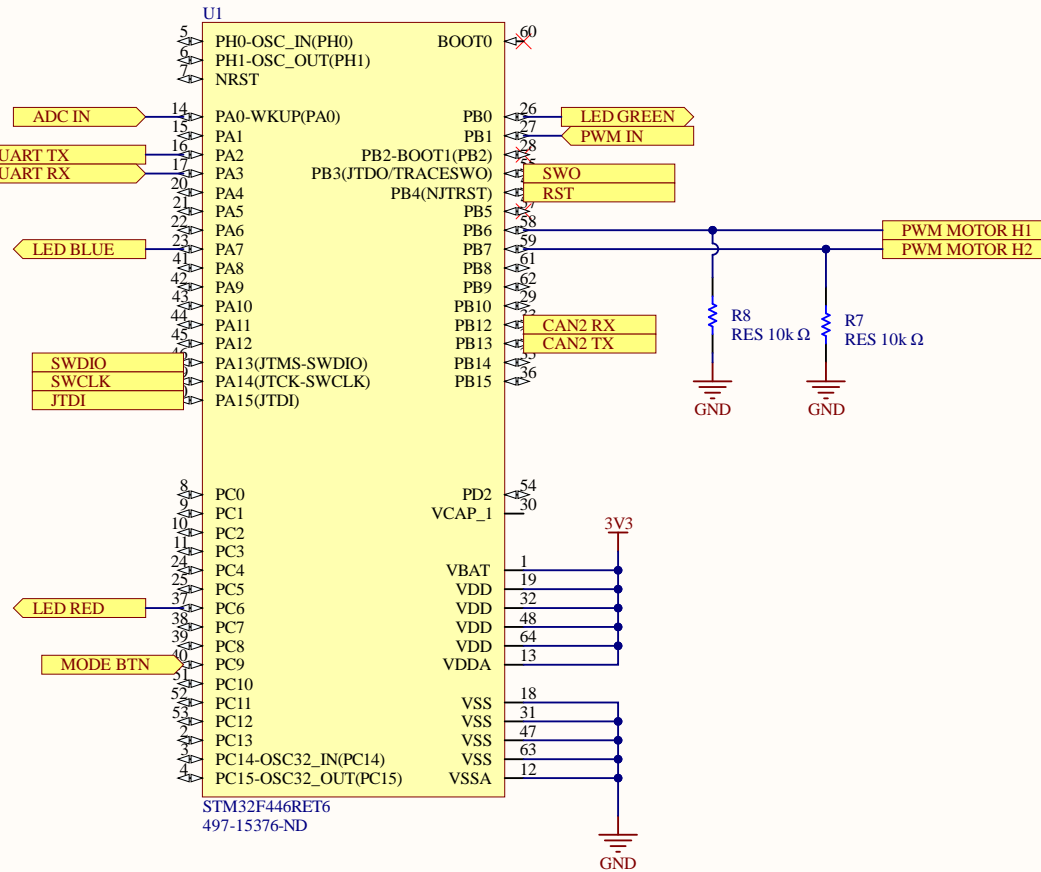
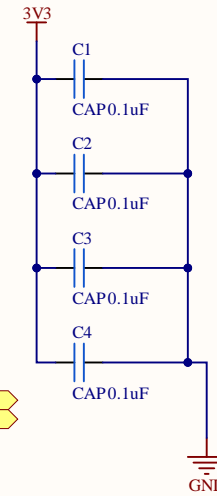


Decoupling Capacitors



Resistor Calcs:

Red: $(3.3-2.0)/(20 \times 10^{-3}) = 65$

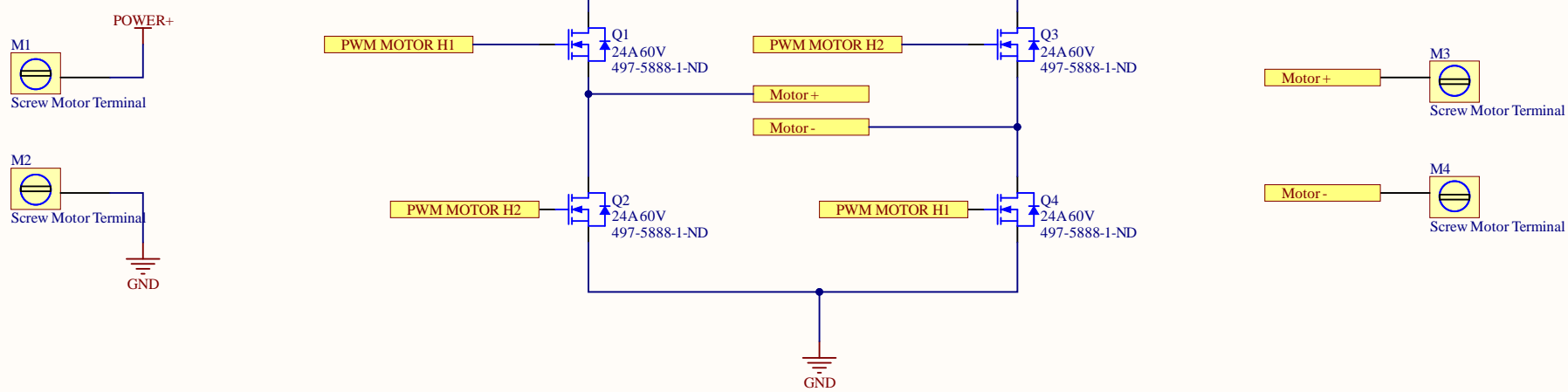
Green: $(3.3-2.9)/(20 \times 10^{-3}) = 20$

Blue: $(3.3-2.9)/(20 \times 10^{-3}) = 20$

| | |
|---------------------------------|-------------------------|
| Title: Microcontroller | |
| Drawing Engineer: S. Kale | Revision: 1.0 |
| Checking Engineer: A. Chaudhary | Date: December 26, 2020 |
| Notes: | |
| Document Name: | Sheet: 1 of 4 |

A

A



B

B

C

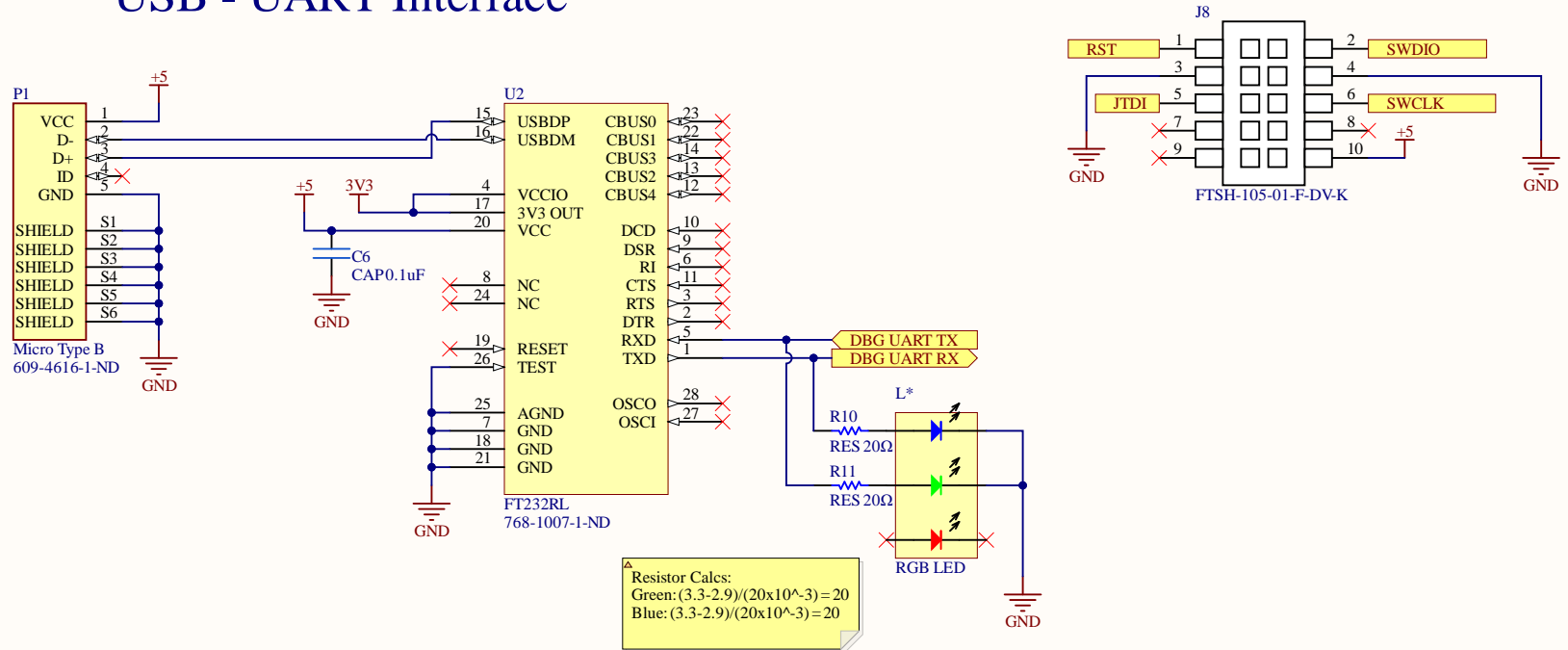
C

D

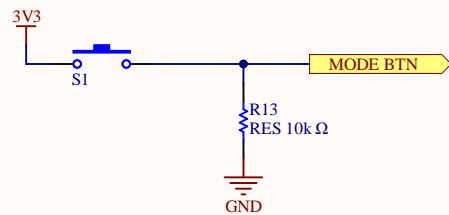
D

| | |
|------------------------------------|-------------------------|
| Title: H Bridge and Motor Terminal | |
| Drawing Engineer: S. Kale | Revision: 1.0 |
| Checking Engineer: A. Chaudhary | Date: December 26, 2020 |
| Notes: | |
| Document Name: | Sheet: 2 of 4 |

USB - UART Interface

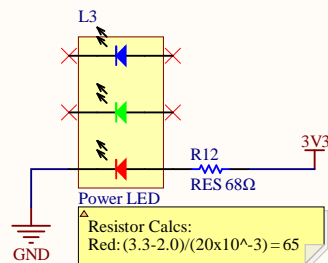


BUTTON MODE PUSH

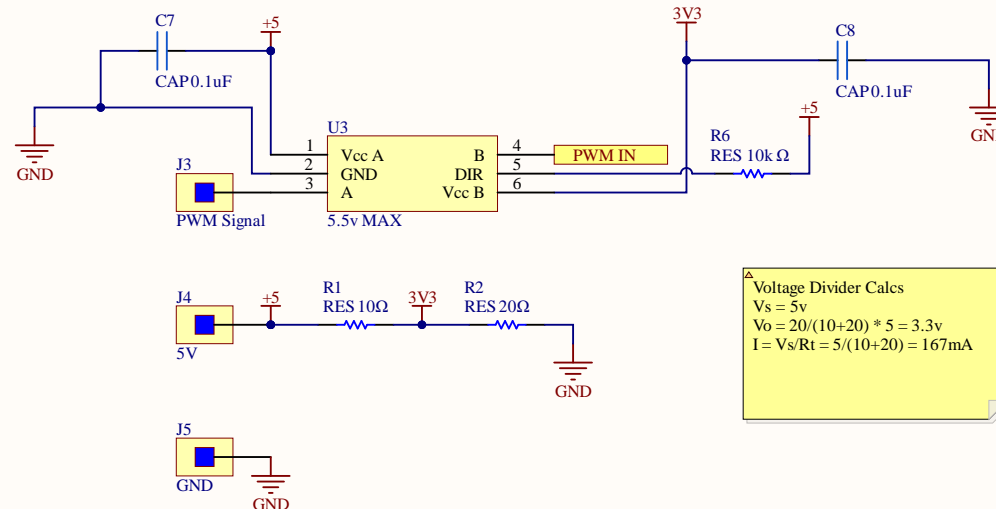


| | |
|---------------------------------|-------------------------|
| Title: Debug Communication | |
| Drawing Engineer: S. Kale | Revision: 1.0 |
| Checking Engineer: A. Chaudhary | Date: December 26, 2020 |
| Notes: | |
| Document Name: | Sheet: 3 of 4 |

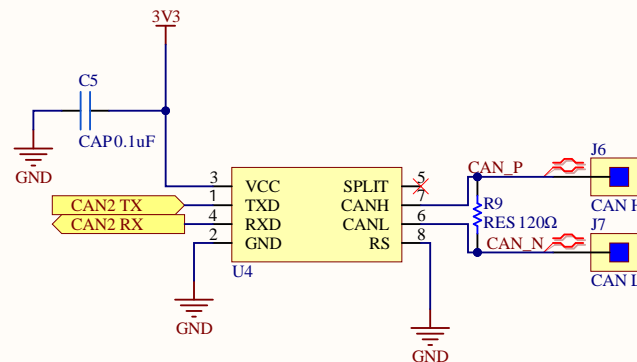
POWER IN LED



PWM IN



CAN BUS CONNECTORS



| | |
|---------------------------------|-------------------------|
| Title: PWM + CAN Headers | |
| Drawing Engineer: S. Kale | Revision: 1.0 |
| Checking Engineer: A. Chaudhary | Date: December 26, 2020 |
| Notes: | |
| Document Name: | Sheet: 4 of 4 |

| Comment | Description | Designator | Footprint | LibRef | Quantity |
|---------------------------|---|--------------------------------|-------------------------------|--------------------------------|----------|
| CAP 0.1uF | Ceramic Capacitor, Multilayer, Ceramic, 16V, 10% +Tol, 10% - Tol, X7R, 15% TC, 0.1uF, Surface Mount, 0402 | C1, C2, C3, C4, C5, C6, C7, C8 | CAP0.1uF | CAP 0.1uF | 8 |
| ENCODER IN | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J1 | PIN_HEADER | PIN_HEADER | 1 |
| ENCODER GND | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J2 | PIN_HEADER | PIN_HEADER | 1 |
| PWM Signal | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J3 | PIN_HEADER | PIN_HEADER | 1 |
| 5V | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J4 | PIN_HEADER | PIN_HEADER | 1 |
| GND | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J5 | PIN_HEADER | PIN_HEADER | 1 |
| CAN H | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J6 | PIN_HEADER | PIN_HEADER | 1 |
| CAN L | Board Connector, 1 Contact(s), 1 Row(s), Male, Straight, Solder Terminal | J7 | PIN_HEADER | PIN_HEADER | 1 |
| CON_STM32_PROGRA MMING | CONN HEADER SMD 10POS 1.27MM | J8 | FTSH-105-01-F-DV-K-P-TR | CON_STM32_PROGRA MMING | 1 |
| RGB LED | Triple Color LED | L1, L* | UHD1110-FKA-CL1A13R3Q18BQFMF3 | LED_RGB | 2 |
| Power LED | Triple Color LED | L3 | UHD1110-FKA-CL1A13R3Q18BQFMF3 | LED_RGB | 1 |
| Screw Motor Terminal | PCB Terminal | M1, M2, M3, M4 | 8191 | MOTOR TERMINAL | 4 |
| Micro Type B | USB Connector, 5 Contact(s), Female, Right Angle, Solder Terminal, Locking, Receptacle | P1 | FCL_10118193-0001LF | USB Connector | 1 |
| 24A 60V | Power Field-Effect Transistor, 24A I(D), 60V, 0.05ohm, 1-Element, N-Channel, Silicon, Metal-oxide Semiconductor FET, TO-252AA | Q1, Q2, Q3, Q4 | STD20NF06LT4 | MOSFET | 4 |
| RES 10Ω | Fixed Resistor, Metal Glaze/thick Film, 0.1W, 10ohm, 75V, 1% +/-Tol, 50ppm/Cel, Surface Mount, 0603 | R1 | RE0603FRE0710RL | RES 10Ω | 1 |
| RES 20Ω | Fixed Resistor, 0.1W, 20ohm, 50V, 5% +/-Tol, 200ppm/Cel, Surface Mount, 0603 | R2, R3, R4, R10, R11 | SDR03EZPJ200 | RES 20Ω | 5 |
| RES 68Ω | VISCRCW120668R0JNEAC Res Thick Film 1206 | R5, R12 | CRCW120668R0JNEAC | RES 68Ω | 2 |
| RES 10k Ω | Fixed Resistor, Metal Glaze/thick Film, 0.25W, 10000ohm, 200V, 1% +/-Tol, 50ppm/Cel, Surface Mount, 1206 | R6, R7, R8, R13 | 13-RE1206FRE0710KLC1-ND | RES 10k Ω | 4 |
| RES 120Ω | Fixed Resistor, 0.1W, 120ohm, 50V, 5% +/-Tol, 200ppm/Cel, Surface Mount, 0603 | R9 | SDR03EZPJ200 | RES 120 | 1 |
| SW_SPST_NO | SWITCH TACTILE SPST-NO 0.05A 12V | S1 | B3U-1000P | SW_SPST_NO | 1 |
| STM32F446RET6 | RISC Microcontroller, 32-Bit, FLASH, CORTEX-M4F CPU, 180MHz, CMOS, PQFP64 | U1 | STM_LQFP64_N | STM32F446RET6 | 1 |
| FT232RL | USB Bus Controller, CMOS, PDSO28 | U2 | FT232RL | FT232RL | 1 |
| 5.5v MAX | Bus Transceiver, LVC/LCX/Z Series, 1-Func, 1-Bit, True Output, CMOS, PDSO6 | U3 | 74LVC1T45Z6-7 | Bi-Directional Logic Converter | 1 |
| IC_CAN_TRANSCIVER | IC TXRX CAN 4MBPS 8SO | U4 | LT-S8_N | IC_CAN_TRANSCIVER | 1 |