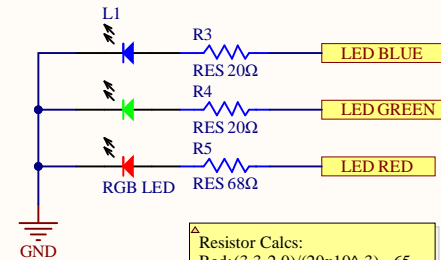
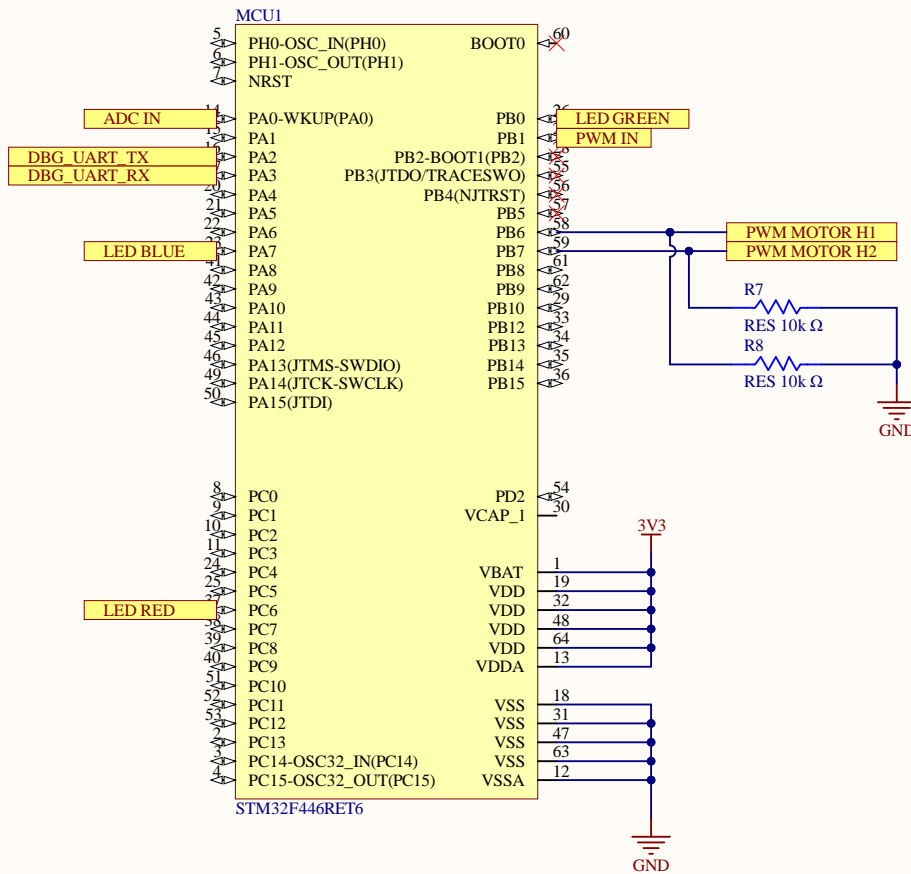
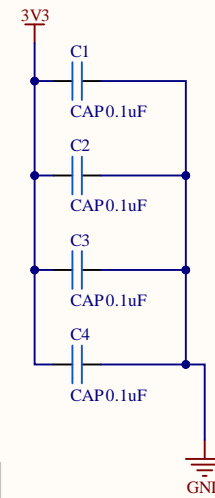
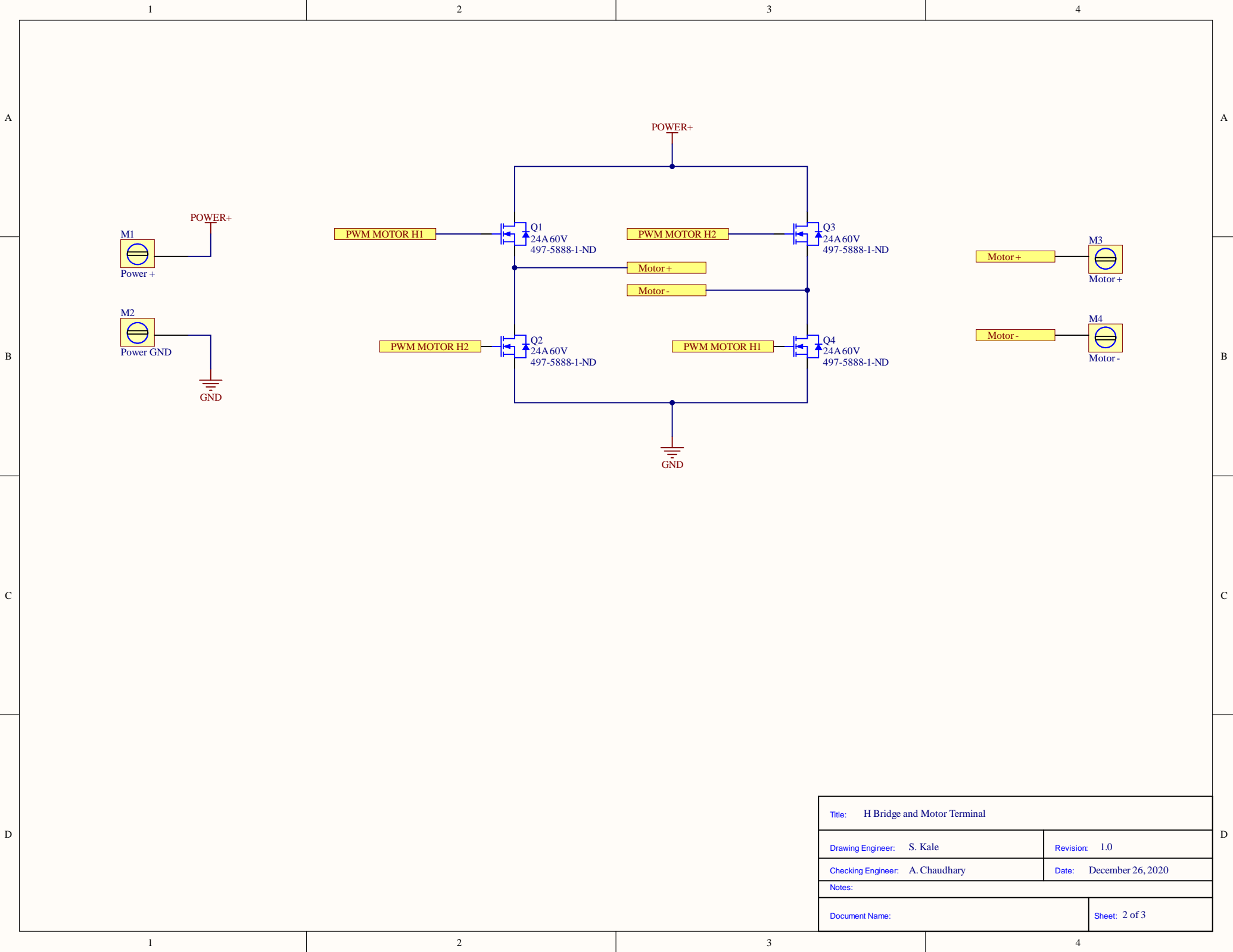


## Decoupling Capacitors



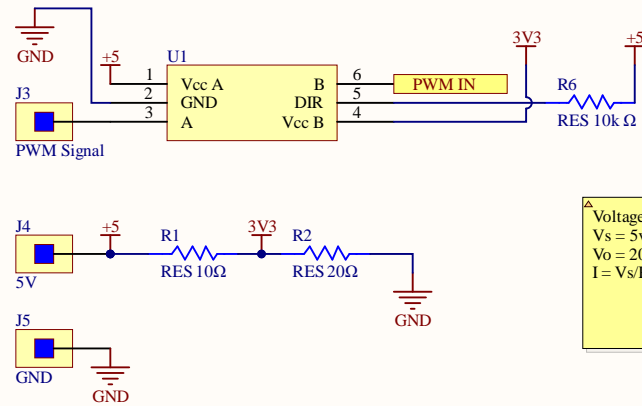
Resistor Calcs:  
 Red:  $(3.3-2.0)/(20 \times 10^{-3}) = 65$   
 Green:  $(3.3-2.9)/(20 \times 10^{-3}) = 20$   
 Blue:  $(3.3-2.9)/(20 \times 10^{-3}) = 20$

Title: Microcontroller	
Drawing Engineer: S. Kale	Revision: 1.0
Checking Engineer: A. Chaudhary	Date: December 26, 2020
Notes:	
Document Name:	Sheet: 1 of 3



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 3

- △
- Todo on this page:
  - Add in USB/UART chip
  - Add in CAN jumpers
  - Add in Programmers
  - Add in Push Button for Modes



△

Voltage Divider Calcs  
 $V_s = 5v$   
 $V_o = 20/(10+20) * 5 = 3.3v$   
 $I = V_s/R_t = 5/(10+20) = 167mA$

Title: USB/UART Communication	
Drawing Engineer: S. Kale	Revision: 1.0
Checking Engineer: A. Chaudhary	Date: December 26, 2020
Notes:	
Document Name:	Sheet: 3 of 3

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	CAP0.1uF	CAP 0.1uF	4
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
RGB LED	Triple Color LED	L1	UHD1110-FKA-CL1A13R3Q1BBQFMF3	LED_RGB	1
Power +	PCB Terminal	M1		MOTOR TERMINAL	1
Power GND	PCB Terminal	M2		MOTOR TERMINAL	1
Motor +	PCB Terminal	M3		MOTOR TERMINAL	1
Motor -	PCB Terminal	M4		MOTOR TERMINAL	1
STM32F446RET6		MCU1		STM32F446RET6	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	SDR03EZPJ200	RES 20Ω	3
RES 68Ω	VISCRCW120668ROJN EAC Res Thick Film 1206	R5		RES 68Ω	1
RES 10k Ω	Fixed Resistor, Metal Glaze/thick Film, 0.25W, 10000ohm, 200V, 1% +/-Tol, 50ppm/Cel, Surface Mount, 1206	R6, R7, R8		RES 10k Ω	3
74LVC1T45Z6-7	Bus Transceiver, LVC/LCX/Z Series, 1-Func, 1-Bit, True Output, CMOS, PDSO6	U1		74LVC1T45Z6-7	1