
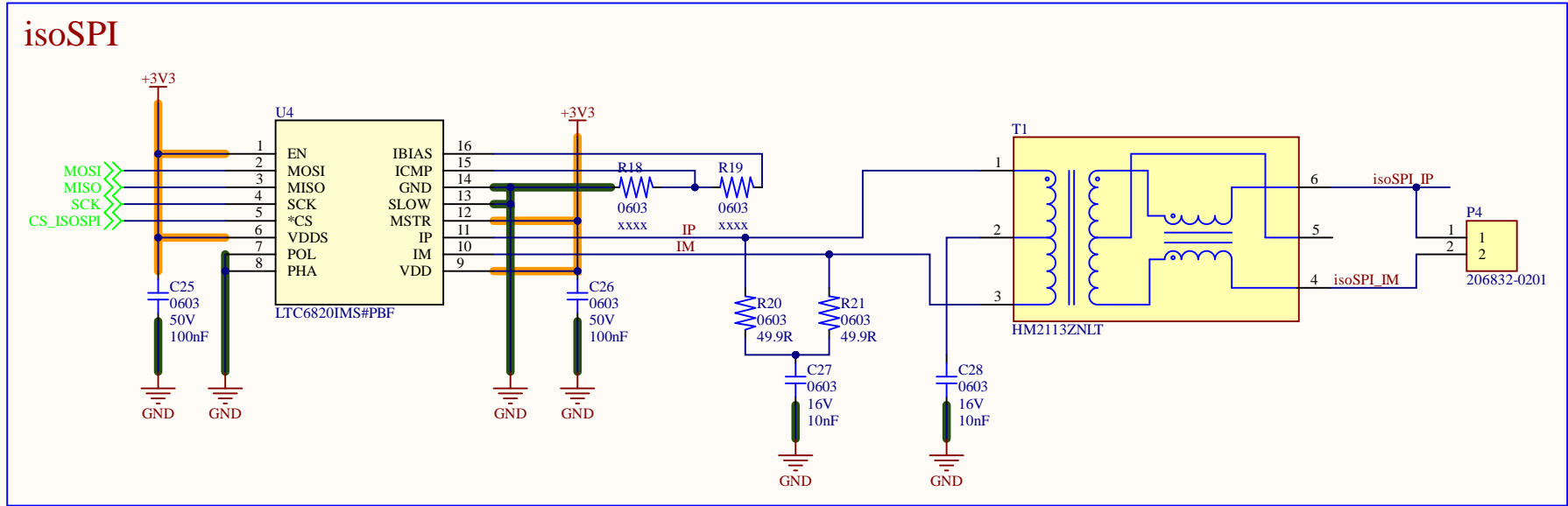
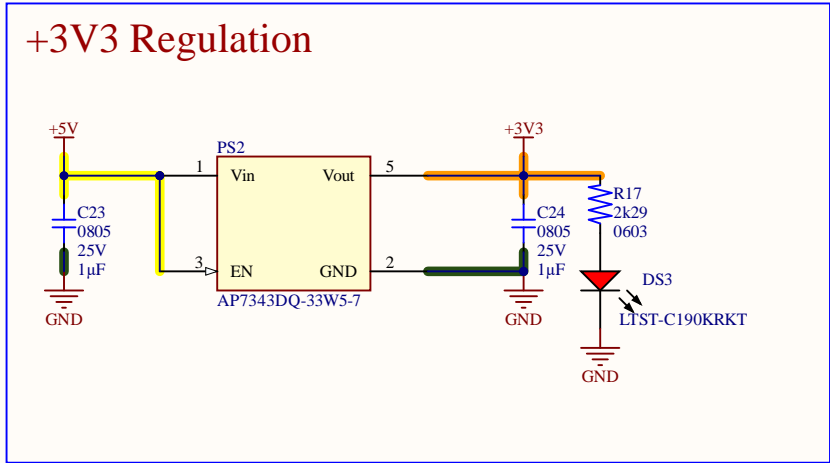
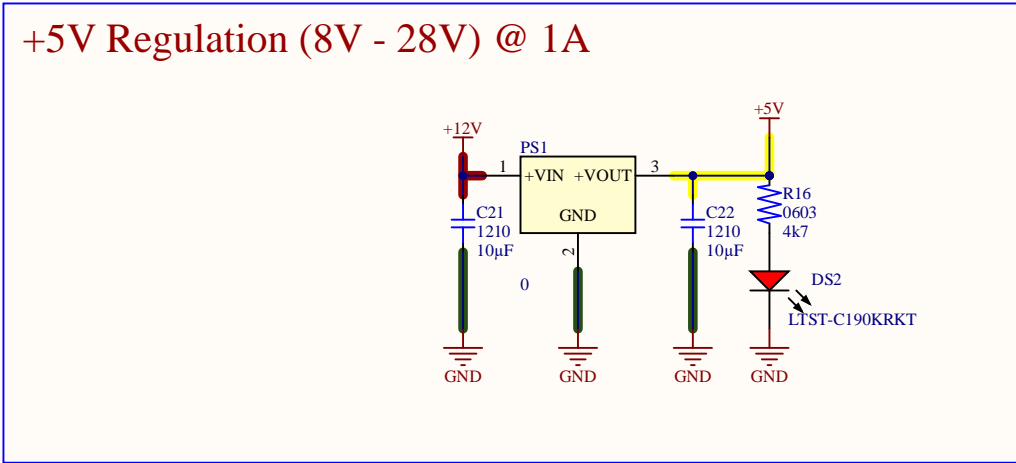


A	1	2	3	4	5		6										
					REVISION	DATE	DRAWN BY	COMMENT									
					AA	5/17/2024	Ethan Zi fzal	Ini tial Release of Schematic									
					B					Notes							
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				SHEET SIZE	TITLE		PART NUMBER	REVI SION									
				ANSI B	STM32F405 MCU Templ ate		EL#####	AA									
					LAST UPDATE	2/17/2025 11: 42: 09 PM			SHEET 1 of 4								
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Tractive System Reset

Tractive_System_Reset

D2

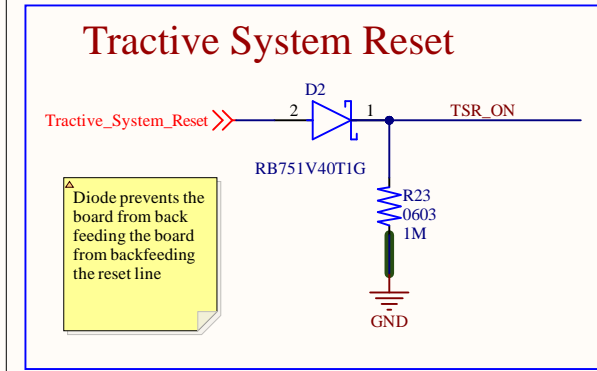
TSR_ON

RB751V40T1G

R23
0603
1M

GND

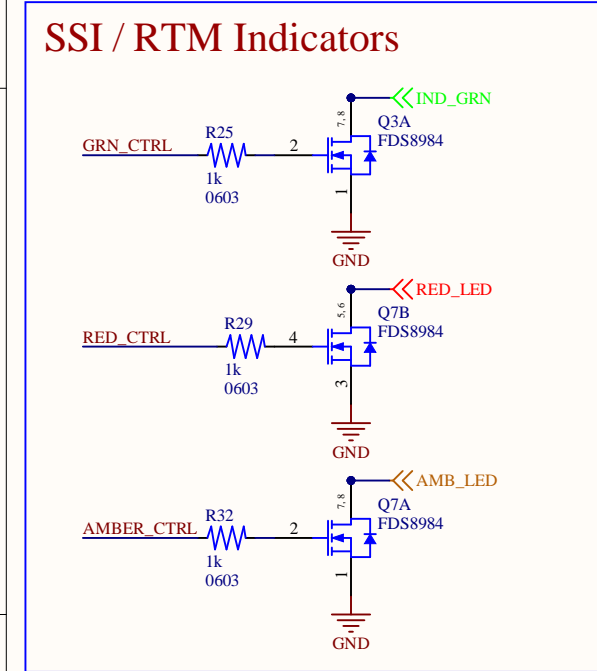
▲
Diode prevents the board from back feeding the board from backfeeding the reset line



SSI / RTM Indicators

The diagram illustrates three separate LED driver circuits, each consisting of a control input, a resistor, a MOSFET, and an LED.

- IND_GRN:** The control input is `GRN_CTRL`, connected to a 1k resistor (R25, 0603). The other end of the resistor is connected to the gate of MOSFET Q3A (FDS8984). The MOSFET's source is connected to GND, and its drain is connected to the `IND_GRN` LED. The LED's other terminal is connected to GND.
- RED_LED:** The control input is `RED_CTRL`, connected to a 1k resistor (R29, 0603). The other end of the resistor is connected to the gate of MOSFET Q7B (FDS8984). The MOSFET's source is connected to GND, and its drain is connected to the `RED_LED` LED. The LED's other terminal is connected to GND.
- AMB_LED:** The control input is `AMBER_CTRL`, connected to a 1k resistor (R32, 0603). The other end of the resistor is connected to the gate of MOSFET Q7A (FDS8984). The MOSFET's source is connected to GND, and its drain is connected to the `AMB_LED` LED. The LED's other terminal is connected to GND.



Amber Indicator

TSAL_Vo

OSC

IMD_FLT_L

BMS_FLT_L

+5V

U6

VCC

1

2

4

IMD_OR

GND

3

SN74LVC1G32DBVR

C32

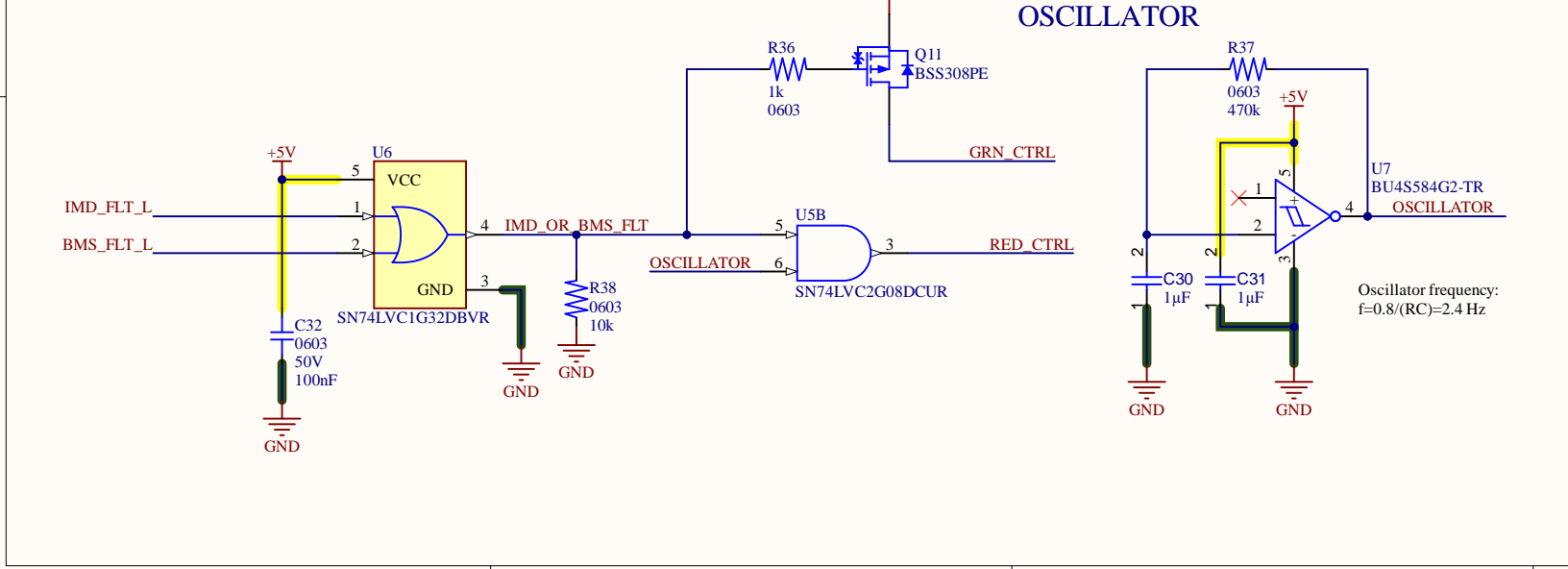
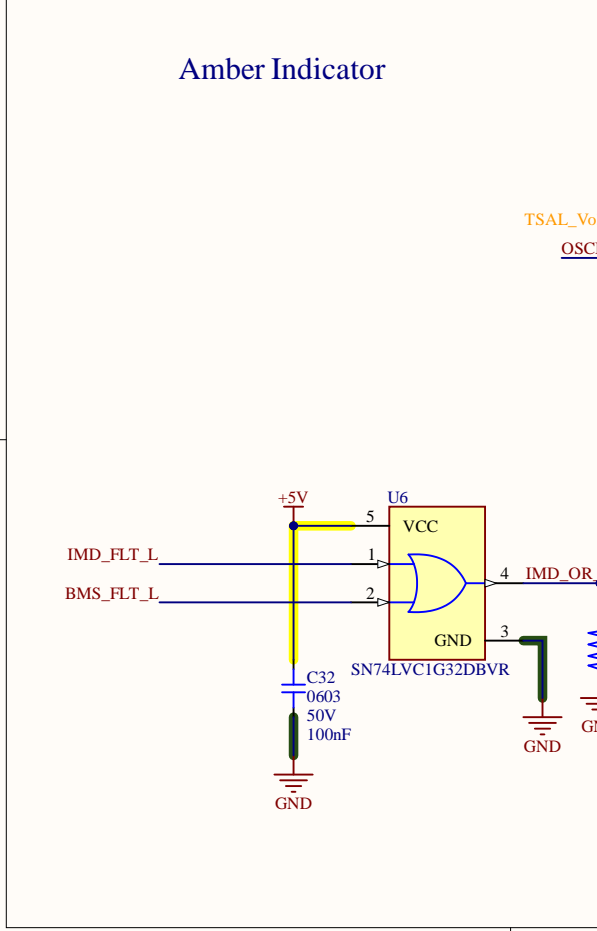
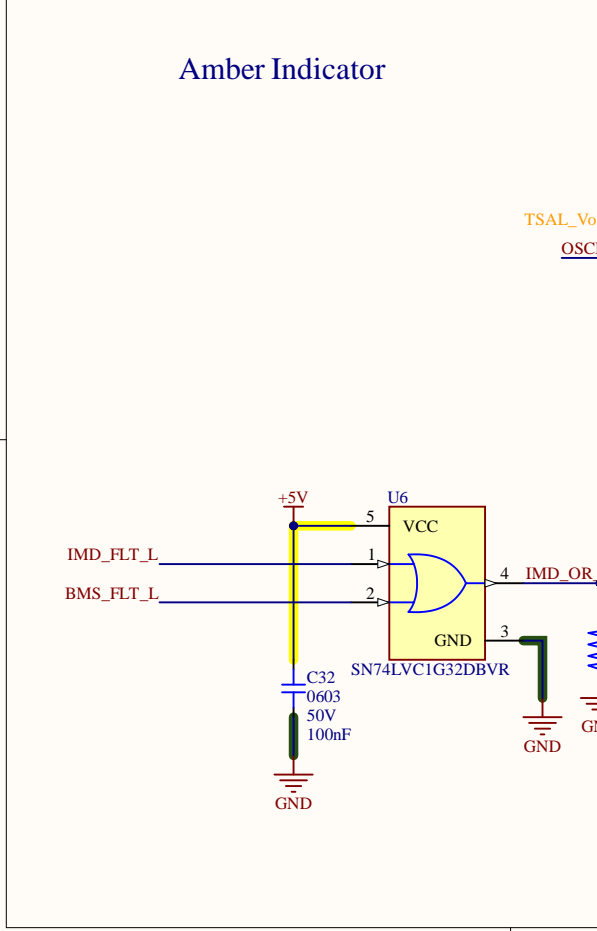
0603

50V

100nF

GND

GND



Shutdown Circuit Latching

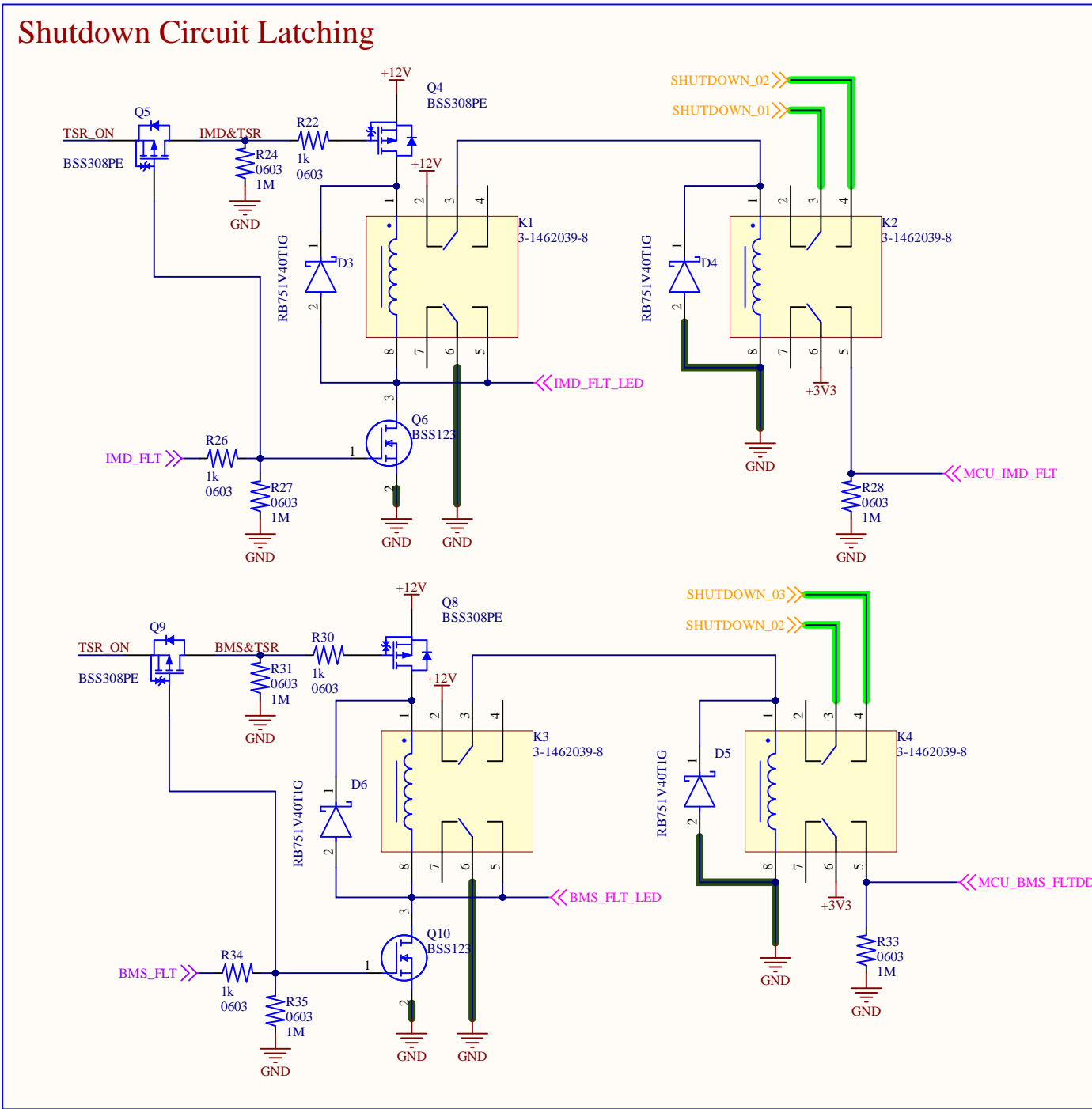
The diagram illustrates a Shutdown Circuit Latching system for two channels: IMD (Intrusion Detection Module) and BMS (Battery Management System). Each channel is controlled by a microcontroller (MCU) and features a latching relay to maintain the shutdown state.

IMD Channel (Top):

- MCU Control:** The MCU sends a signal to the **IMD_FLT** pin, which is connected to a 1MΩ resistor (R26) and a 1MΩ resistor (R27) to ground. The **IMD_FLT** signal is also connected to the **IMD&TSR** pin.
- Transistor:** A BSS308PE MOSFET (Q4) is used to drive the relay. Its gate is connected to the **IMD&TSR** pin, and its source is connected to ground. The drain is connected to the **IMD_FLT** pin.
- Relay:** A 3-1462039-8 relay (K1) is used. The coil is connected to the **IMD_FLT** pin and ground. The relay has four contacts: 1, 2, 3, and 4. Contact 1 is connected to the **IMD_FLT** pin, and contact 2 is connected to ground. Contact 3 is connected to the **IMD_FLT** pin, and contact 4 is connected to ground.
- Diode:** A 1N4001 diode (D3) is connected in parallel with the relay coil, with the cathode to the **IMD_FLT** pin and the anode to ground.
- Zener Diode:** A BSS123 Zener diode (Q6) is connected in parallel with the relay coil, with the cathode to the **IMD_FLT** pin and the anode to ground.
- Power:** The circuit is powered by a +12V supply and a +3V3 supply. A 1MΩ resistor (R24) is connected between the +12V supply and the **IMD&TSR** pin. A 1MΩ resistor (R27) is connected between the +3V3 supply and the **IMD_FLT** pin.

BMS Channel (Bottom):

- MCU Control:** The MCU sends a signal to the **BMS_FLT** pin, which is connected to a 1MΩ resistor (R34) and a 1MΩ resistor (R35) to ground. The **BMS_FLT** signal is also connected to the **BMS&TSR** pin.
- Transistor:** A BSS308PE MOSFET (Q8) is used to drive the relay. Its gate is connected to the **BMS&TSR** pin, and its source is connected to ground. The drain is connected to the **BMS_FLT** pin.
- Relay:** A 3-1462039-8 relay (K3) is used. The coil is connected to the **BMS_FLT** pin and ground. The relay has four contacts: 1, 2, 3, and 4. Contact 1 is connected to the **BMS_FLT** pin, and contact 2 is connected to ground. Contact 3 is connected to the **BMS_FLT** pin, and contact 4 is connected to ground.
- Diode:** A 1N4001 diode (D6) is connected in parallel with the relay coil, with the cathode to the **BMS_FLT** pin and the anode to ground.
- Zener Diode:** A BSS123 Zener diode (Q10) is connected in parallel with the relay coil, with the cathode to the **BMS_FLT** pin and the anode to ground.
- Power:** The circuit is powered by a +12V supply and a +3V3 supply. A 1MΩ resistor (R31) is connected between the +12V supply and the **BMS&TSR** pin. A 1MΩ resistor (R35) is connected between the +3V3 supply and the **BMS_FLT** pin.

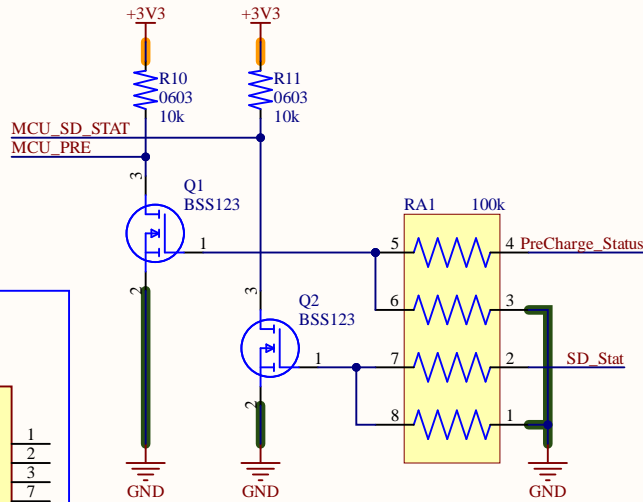


A

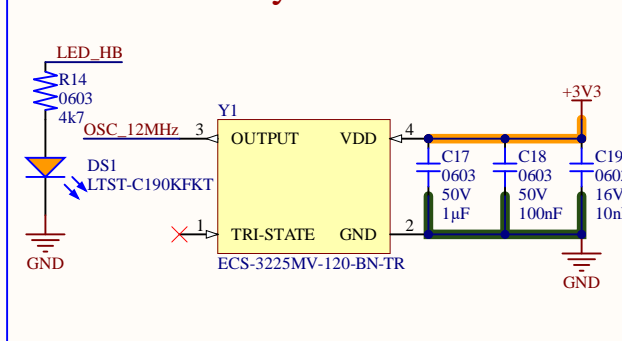
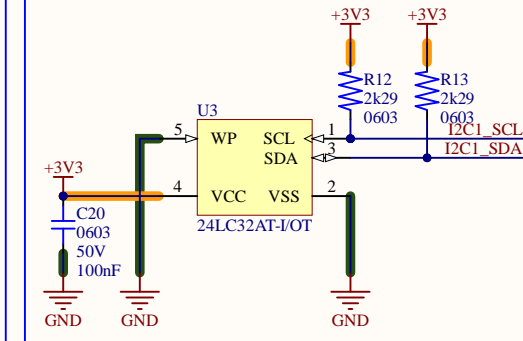
B



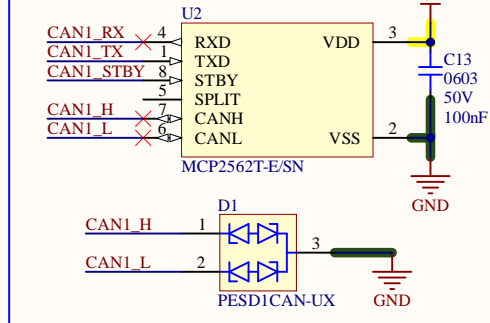
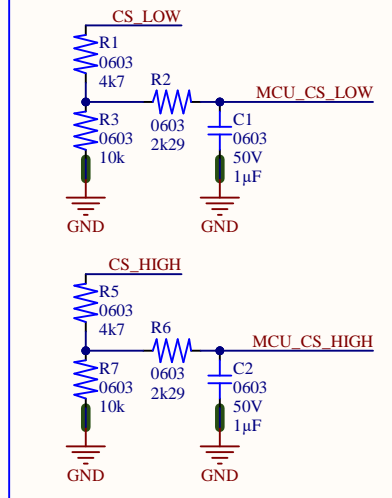
D



STM Accessory



CAN Transciever



Mounting Holes

