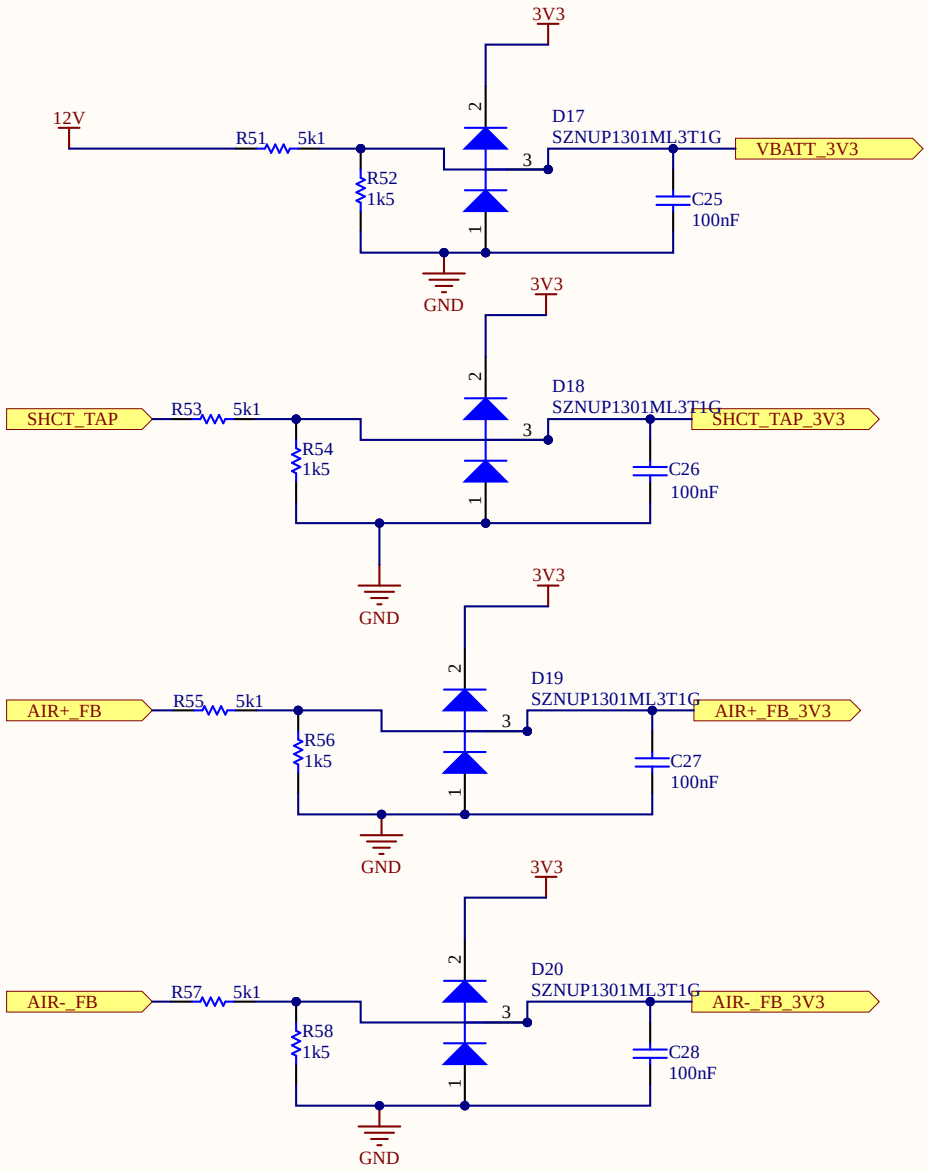

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File: C:\Users\..\10-Protections 2 of 2.SchDoc		Drawn By:

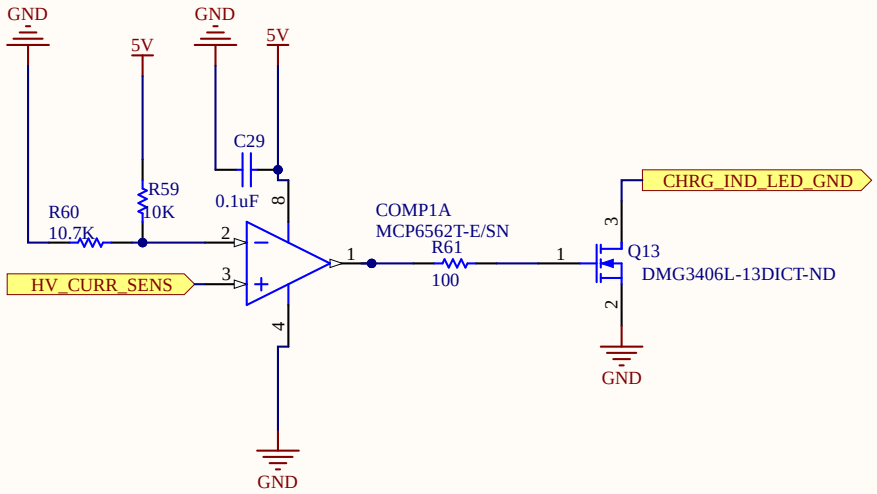
Add circuitry to output voltage to an external LED to indicate if we are charging or not. We will use the HV_CURR_SENS signal from the Auxiliary tray. This signal comes from the current sensor. Here's a link to the datasheet:

https://drive.google.com/open?id=1WvRi6qoPz6-c2d6WGo5_fqT_hi4PHz8B

You'll have to use that datasheet to see what the voltage of the sensor is when we are charging. We usually charge at 4A (2A probs). So if you have the LED turn on when the sensor reads something below this (but above 0A) that would work.

I've added circuitry below that is from our HV PCB. This circuitry has a comparator that compare two voltages. It outputs high when the voltage threshold is crossed. If you use this you'll have to change the resistor values and add a mosfet to control the ground to the LED (if it's an nmos) or power to the LED (if it's a pmos).

You can also chose another method if you have one in mind. Just give justication for why you chose it. For whatever method you choose, please simulate it in LTSpice.



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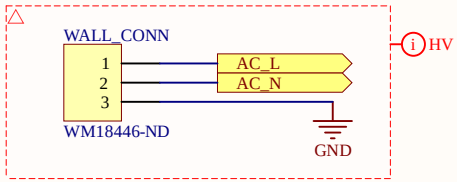
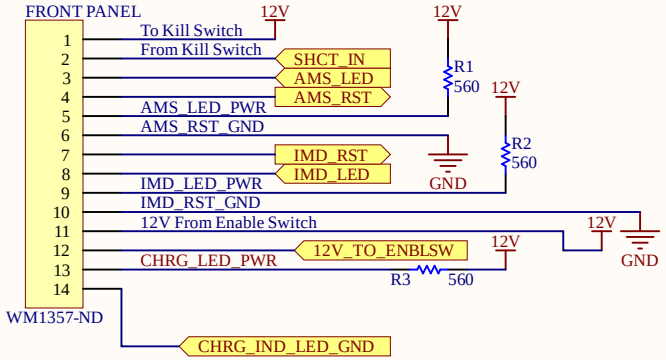
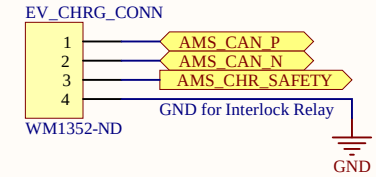
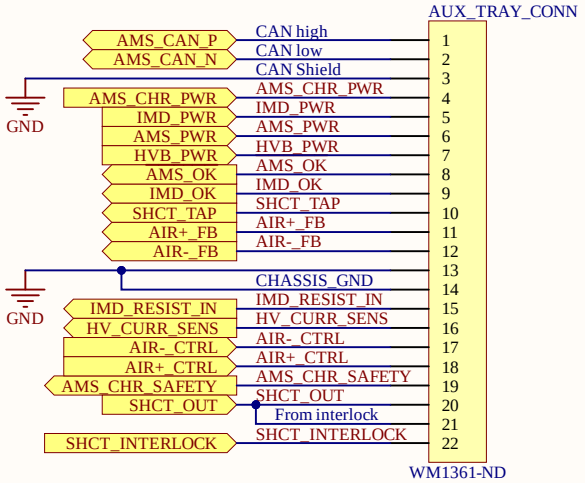
Date: 3-05-2022		Sheet of
File: C:\Users\..\12-Charging LED Indicator.SchDoc		Drawn By:

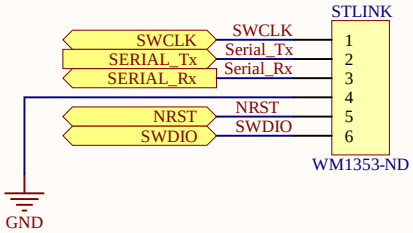
LEARN ABOUT YOUR HIGHVOLTAGE GROUND











I added connectors. Please ensure all connectors have footprints and supplier links. All connectors must be from the molex manufacturer with the Minifit-jr series. Search in th

WALL_CONN - 3 pin horizonal
FRONT_PANEL - 12 pin vertical
EV_CHRG_CONN - 4 pin horizonal
AUX_TRAY_CONN - 22 pin horizonal
STLINK - 6 pin horizonal

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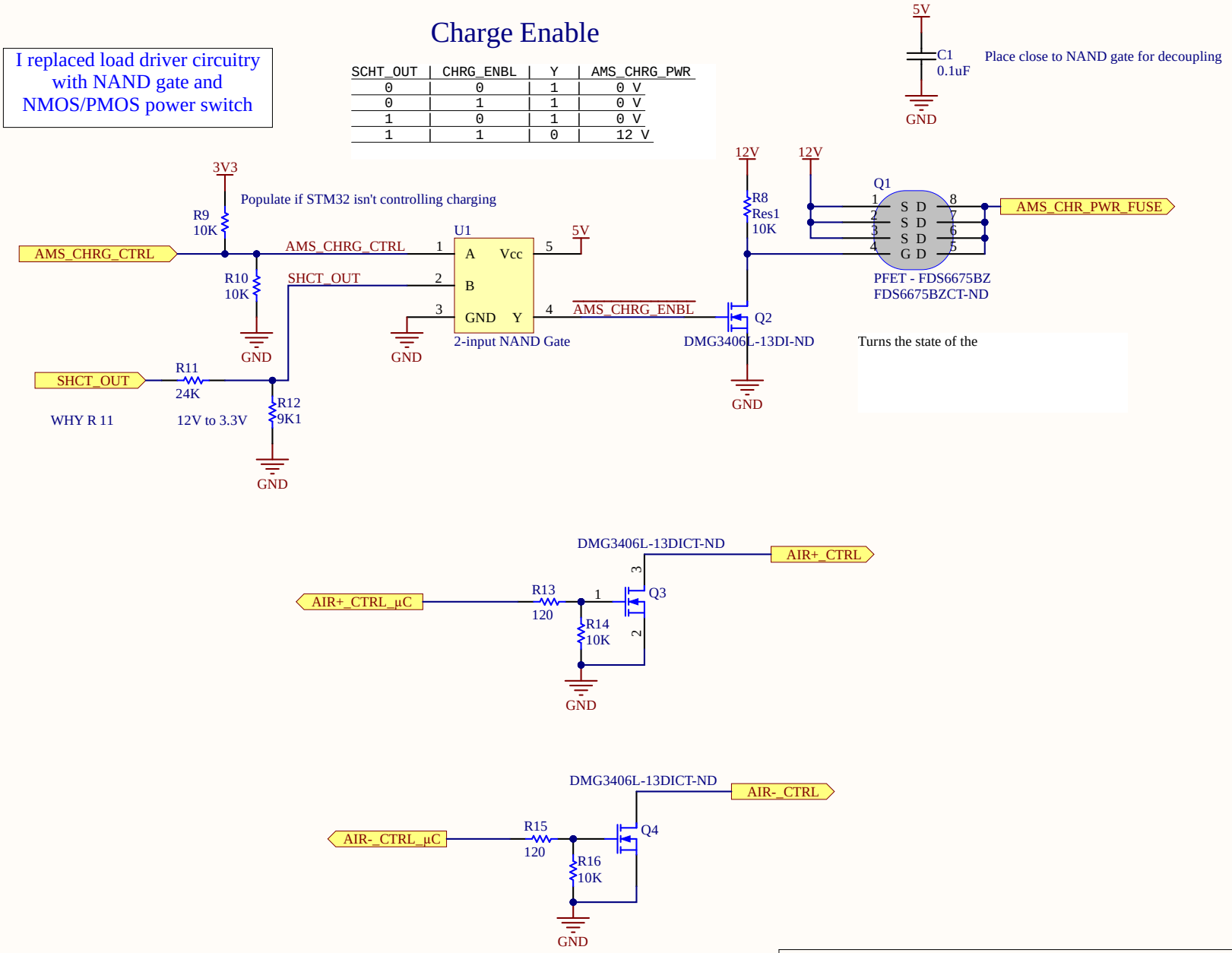
File: C:\Users\..\1-Connectors.SchDoc		Drawn By:

Charge Enable

I replaced load driver circuitry with NAND gate and NMOS/PMOS power switch

SCHT_OUT	CHRG_ENBL	Y	AMS_CHRG_PWR
0	0	1	0 V
0	1	1	0 V
1	0	1	0 V
1	1	0	12 V



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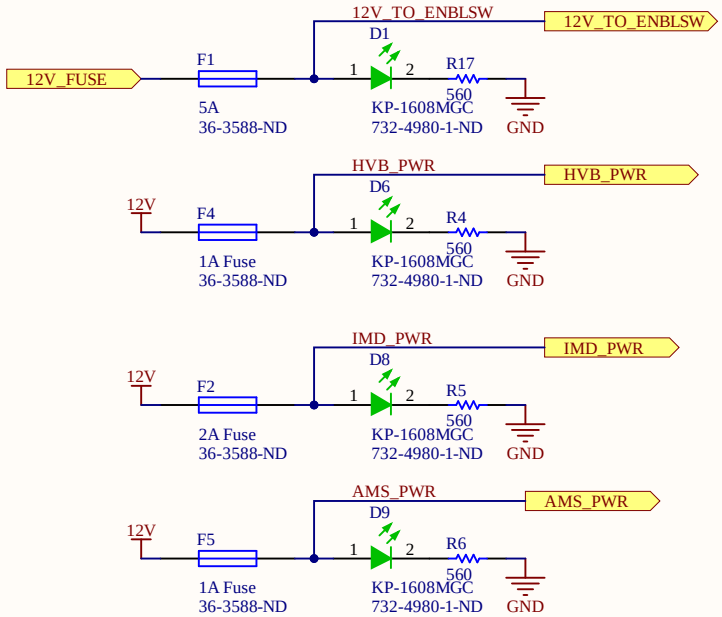
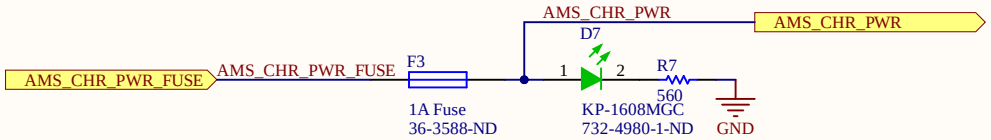
File: C:\Users\..\2-FET Control.SchDoc		Drawn By:

I added a fuse for 12V rectifier





Remove AC_FANS_FUSE circuitry. Lets just use power from the 12V rectifier.

Done. May have to re-connect fans to 12V fused power.

Title		
Size: A4	Number	Revision
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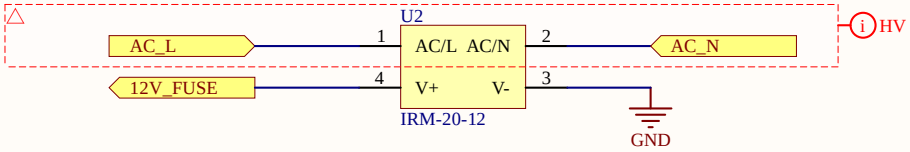
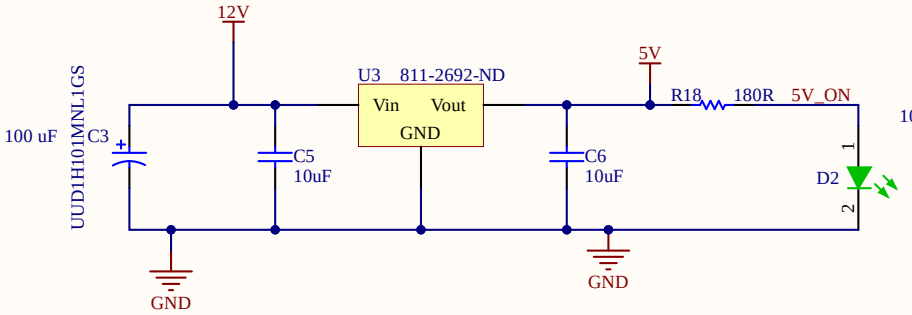
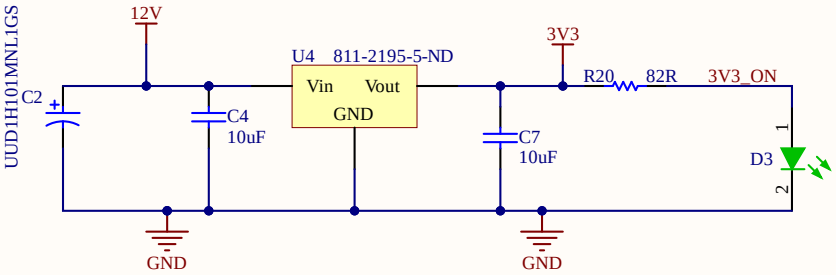
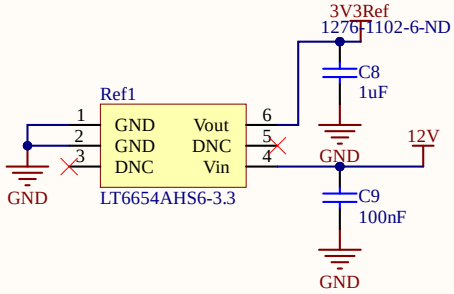
File: C:\Users\..\3-Fuses.SchDoc		Drawn By:

Added 120VAC
to 12V rectifier









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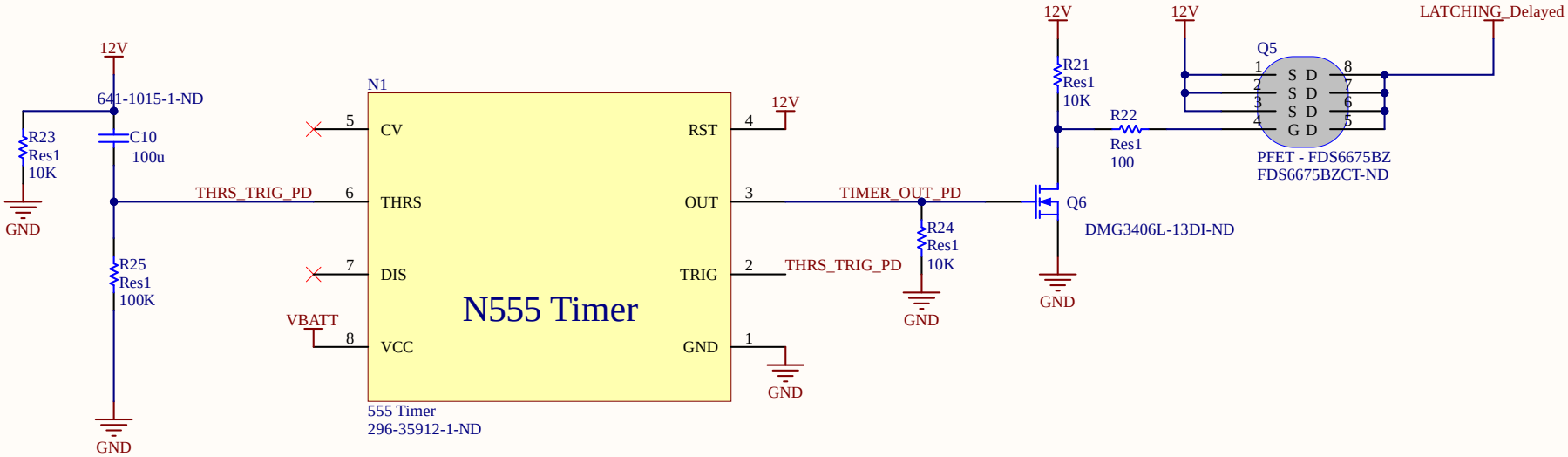
File: C:\Users\..\4-Power.SchDoc		Drawn By:

VBATT is delayed by 10 seconds to allow IMD to send OK signal



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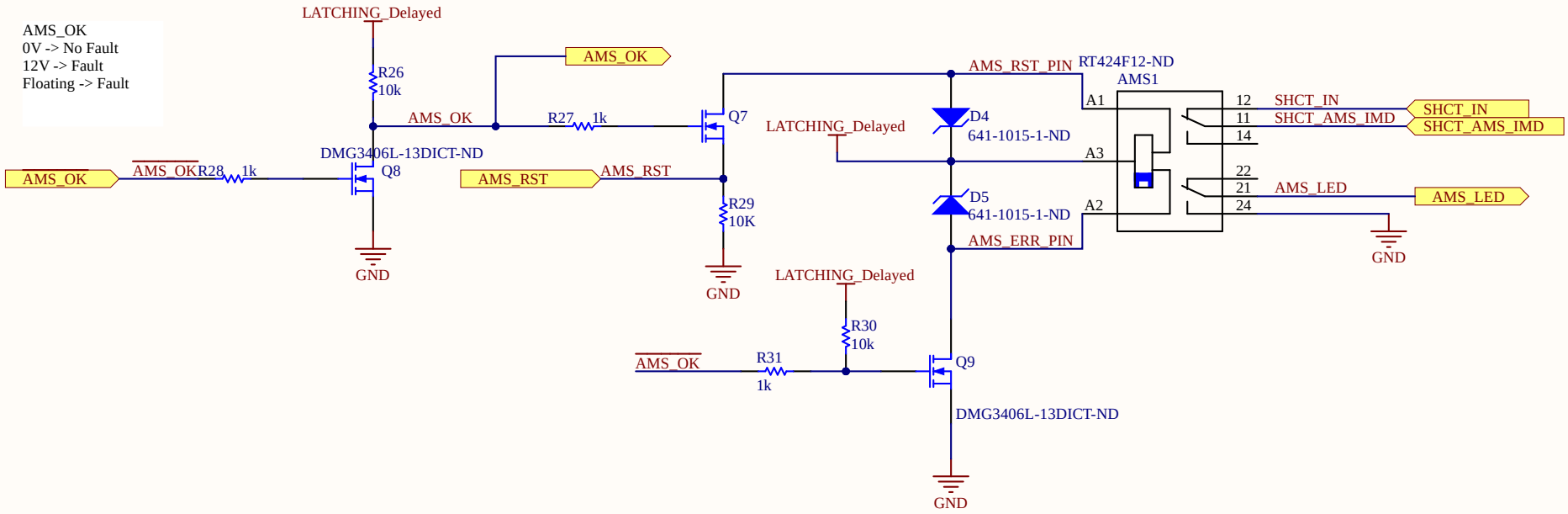
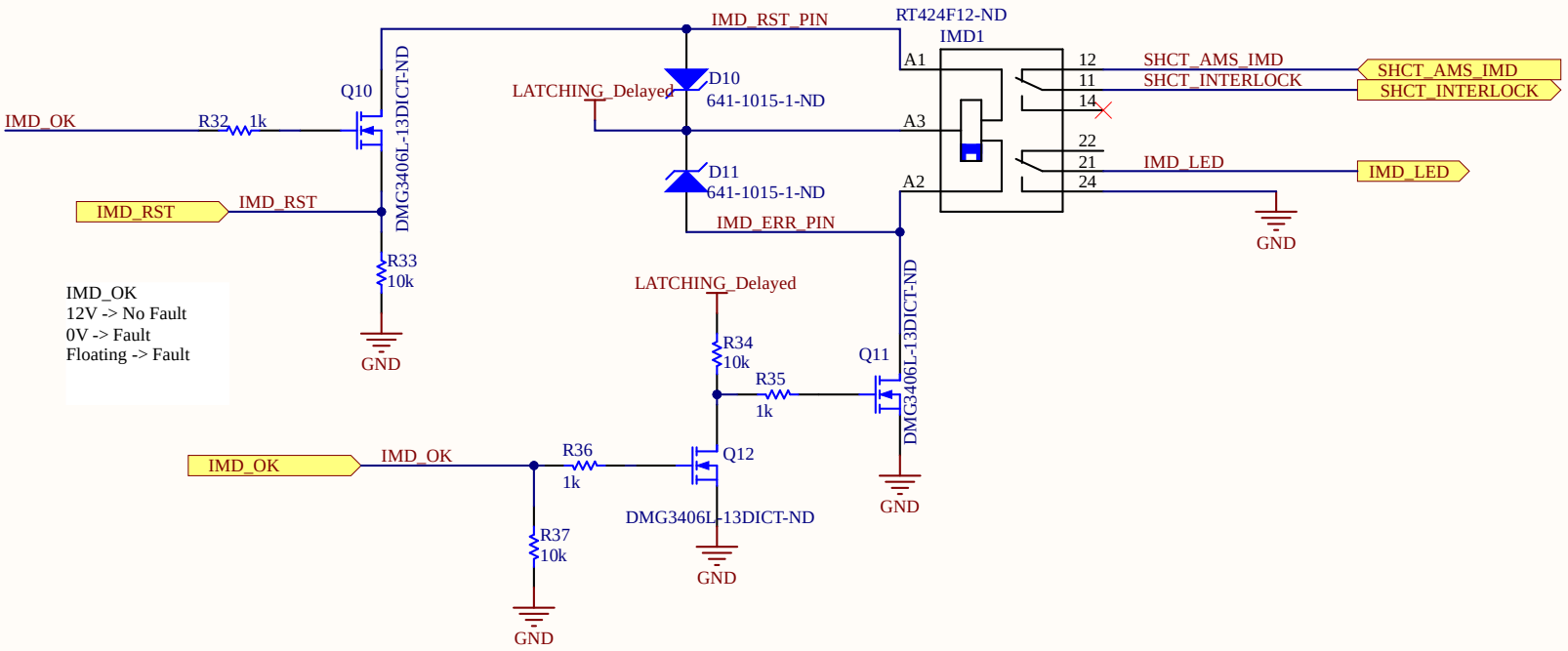
Size: A	Number	Revision
Date: 3-05-2022		Sheet of
File: C:\Users\..\5-Latching Delay.SchDoc		Drawn By:



Title		
Size: A	Number	Revision
Date: 3-05-2022		Sheet of
File: C:\Users\..\6-Latching AMS.SchDoc		Drawn By:



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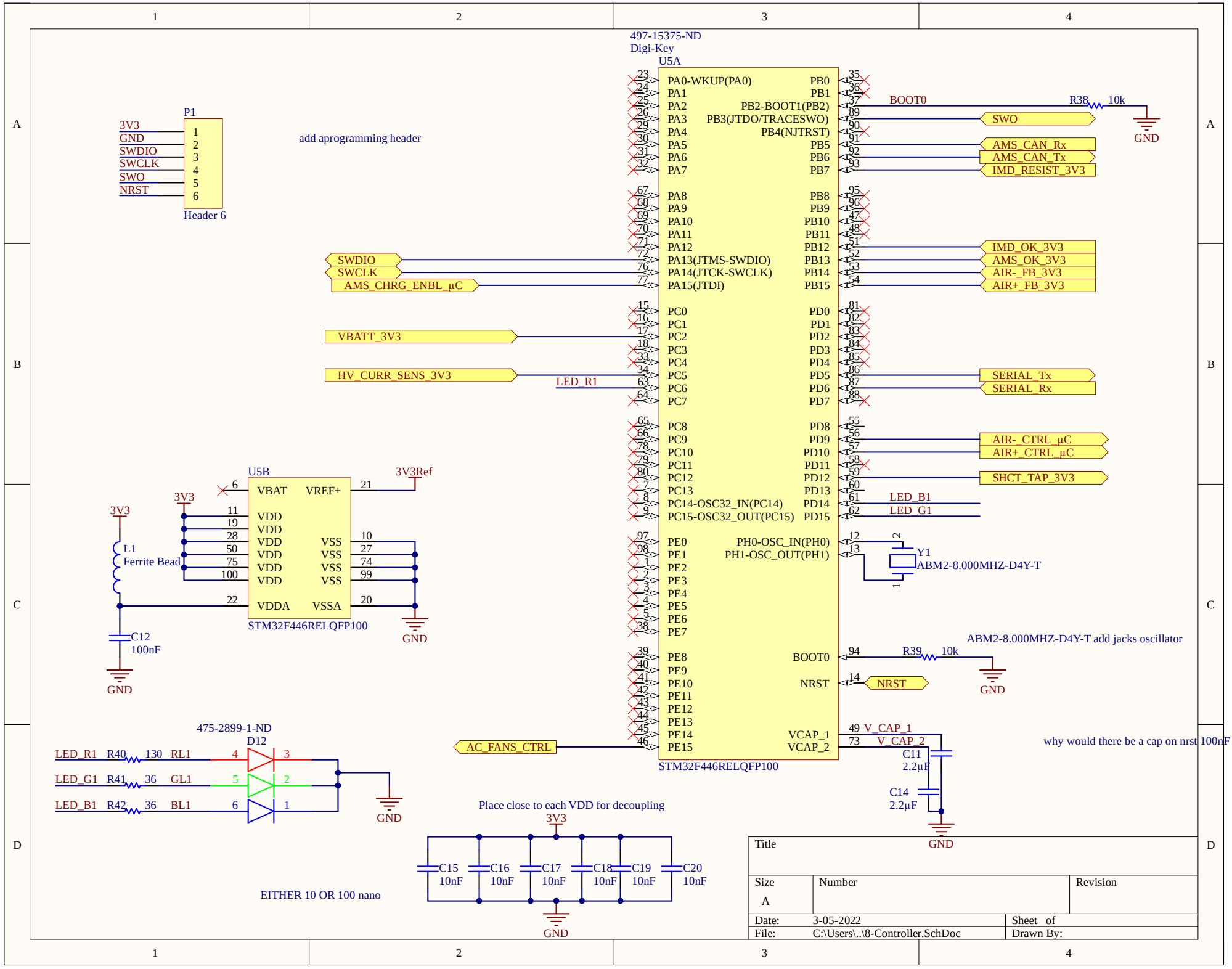
File: C:\Users\..\7-Latching IMD.SchDoc		Drawn By:


497-15375-ND
Digi-Key
U5A
P1
3V3
GND
SWDIO
SWCLK
SWO
NRST
Header 6
add aprogramming header
PA0-WKUP(PA0)
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13(JTMS-SWDIO)
PA14(JTCK-SWCLK)
PA15(JTDI)
PB0
PB1
PB2-BOOT1(PB2)
PB3(JTDO/TRACESWO)
PB4(NJTRST)
PB5
PB6
PB7
PB8
PB9
PB10
PB11
PB12
PB13
PB14
PB15
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
PC11
PC12
PC13
PC14-OSC32_IN(PC14)
PC15-OSC32_OUT(PC15)
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
PD8
PD9
PD10
PD11
PD12
PD13
PD14
PD15
PE0
PE1
PE2
PE3
PE4
PE5
PE6
PE7
PE8
PE9
PE10
PE11
PE12
PE13
PE14
PE15
PH0-OSC_IN(PH0)
PH1-OSC_OUT(PH1)
BOOT0
NRST
VCAP_1
VCAP_2
STM32F446RELQFP100
BOOT0
R38
10k
GND
SWO
AMS_CAN_Rx
AMS_CAN_Tx
IMD_RESIST_3V3
SWDIO
SWCLK
AMS_CHRG_ENBL_µC
IMD_OK_3V3
AMS_OK_3V3
AIR-_FB_3V3
AIR+_FB_3V3
VBATT_3V3
HV_CURR_SENS_3V3
LED_R1
SERIAL_Tx
SERIAL_Rx
AIR-_CTRL_µC
AIR+_CTRL_µC
SHCT_TAP_3V3
LED_B1
LED_G1
U5B
3V3Ref
VBAT
VREF+
VDD
VSS
VDDA
VSSA
STM32F446RELQFP100
3V3
L1
Ferrite Bead
C12
100nF
GND
Y1
ABM2-8.000MHZ-D4Y-T
ABM2-8.000MHZ-D4Y-T add jacks oscillator
R39
10k
NRST
why would there be a cap on nrst 100nF
V_CAP_1
V_CAP_2
C11
2.2µF
C14
2.2µF
AC_FANS_CTRL
475-2899-1-ND
D12
LED_R1
R40
130
RL1
LED_G1
R41
36
GL1
LED_B1
R42
36
BL1
Place close to each VDD for decoupling
C15
C16
C17
C18
C19
C20
10nF
EITHER 10 OR 100 nano
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C:\Users\..\8-Controller.SchDoc
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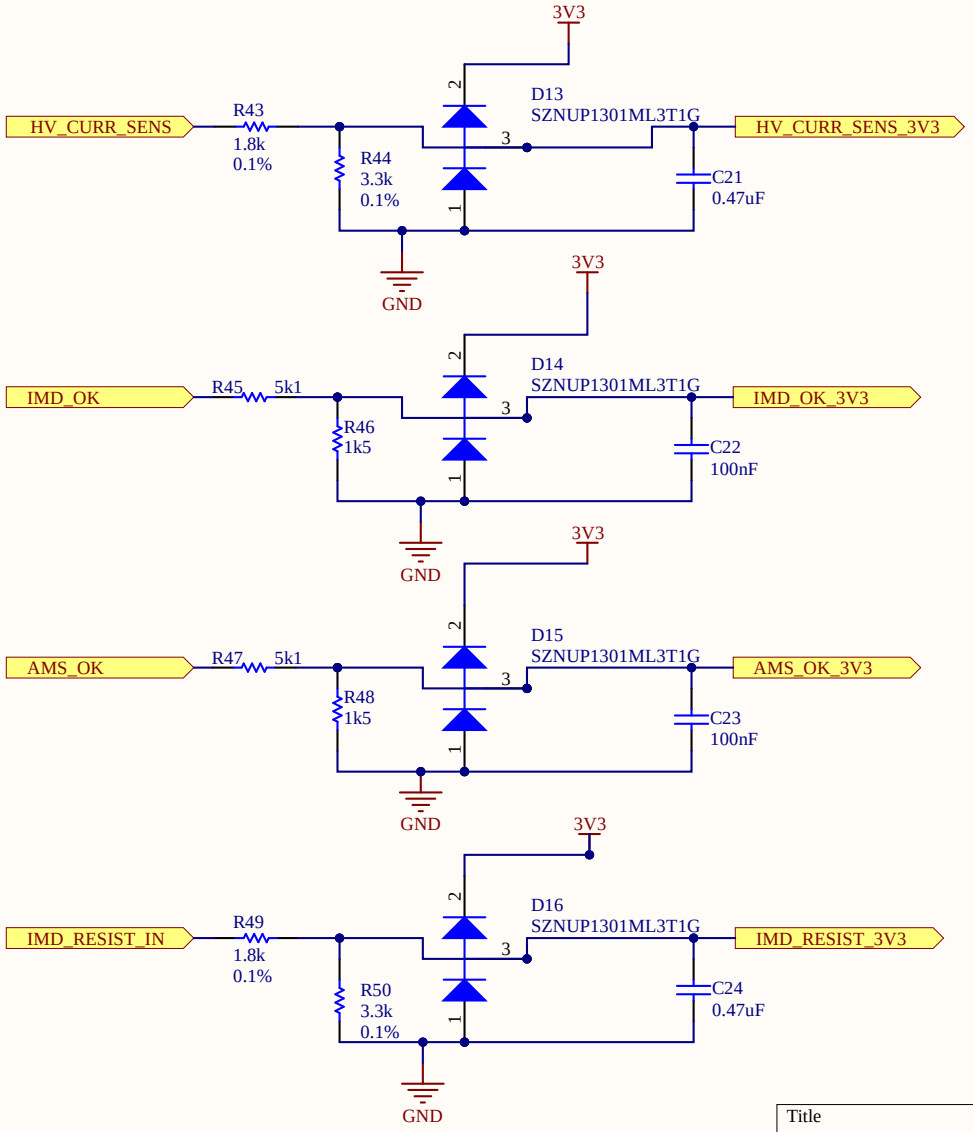

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Date: 3-05-2022		Sheet of
File: C:\Users\..\9-Protections 1 of 2.SchDoc		Drawn By: