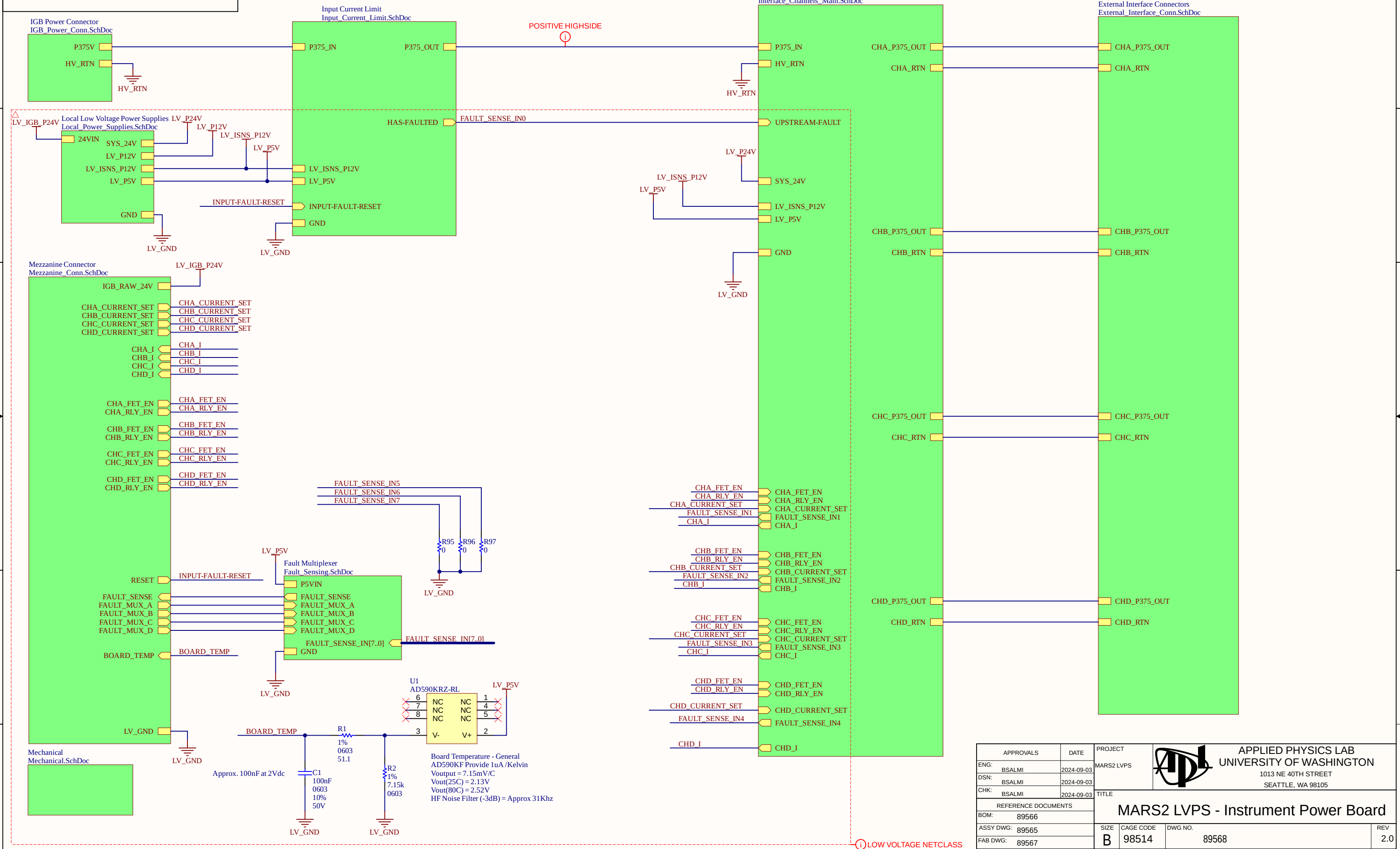
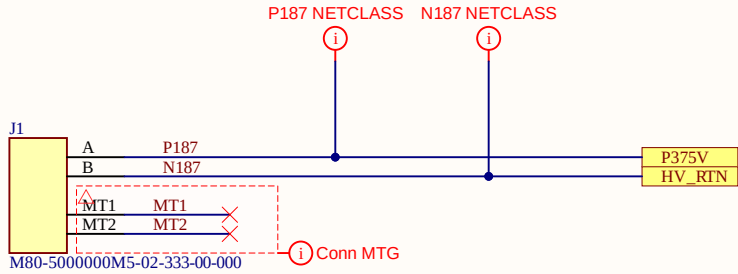


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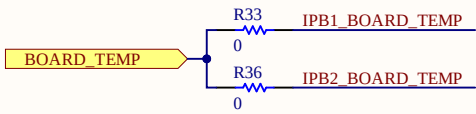
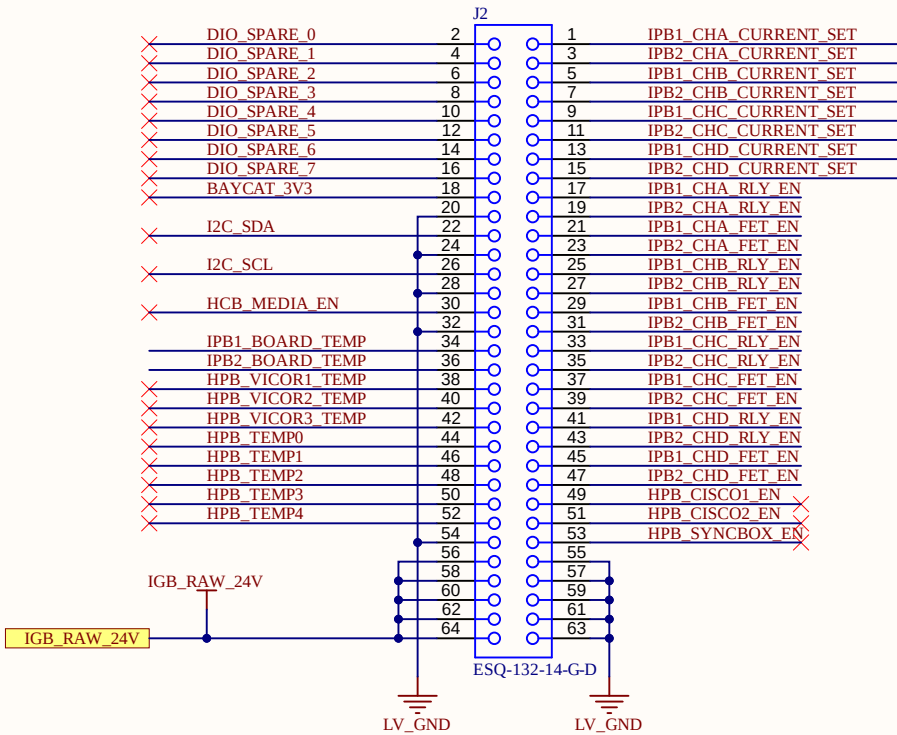


APPROVALS		DATE		PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
ENG:	BSALMI	2024-09-03		MARS2 LVPS			
DSN:	BSALMI	2024-09-03					
CHK:	BSALMI	2024-09-03		TITLE			
REFERENCE DOCUMENTS				MARS2 LVPS - Instrument Power Board			
BOM:	89566						
ASSY DWG:	89565						
FAB DWG:	89567						
PCB DWG:	89564						
				SIZE	CAGE CODE	DWG NO.	REV
				B	98514	89568	2.0
FILE NAME						SHEET	
Top.SchDoc						1 OF 23	

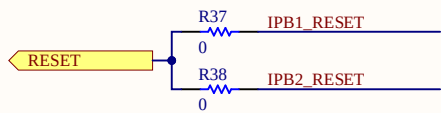
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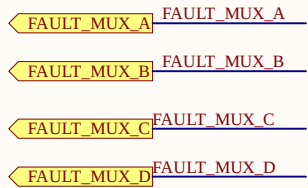
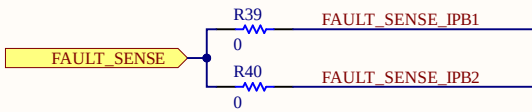
PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105		
MARS2 LVPS				
TITLE				
MARS2 - IPB - IGB Power Conn				
SIZE	CAGE CODE	DWG NO.		REV
B	98514	89568		2.0
FILE NAME			SHEET	OF
IGB_Power_Conn.SchDoc			2	23



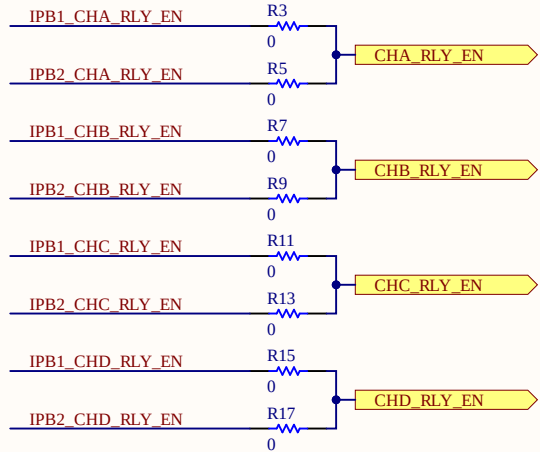
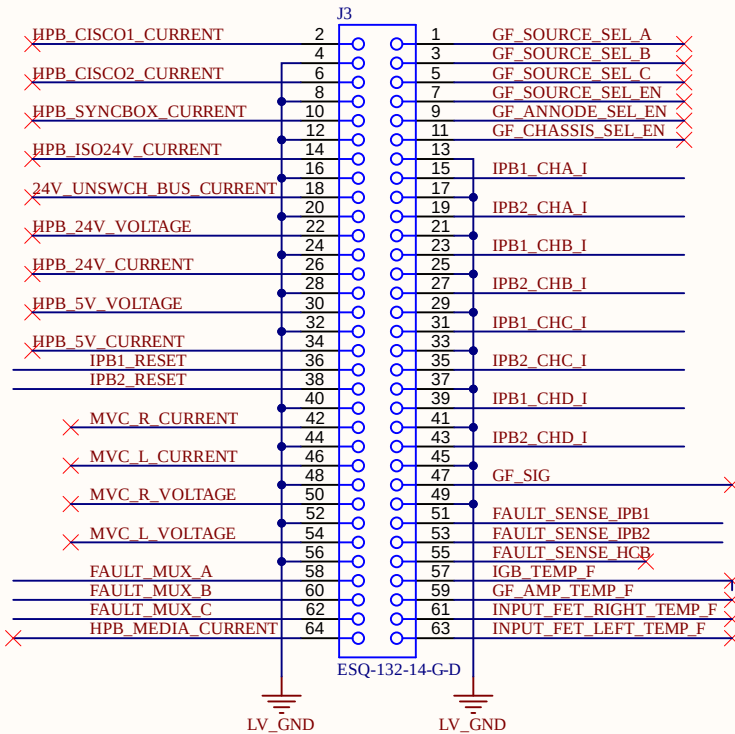
Analog temperature sensing inputs



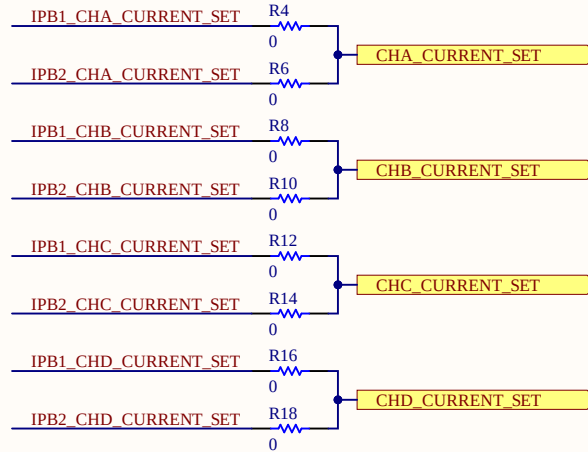
Used to RESET the IPB Input current limit circuit



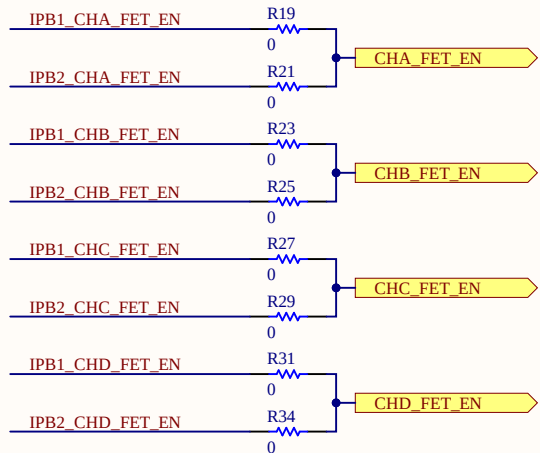
4-Bit GPIO Mux for FAULT detection



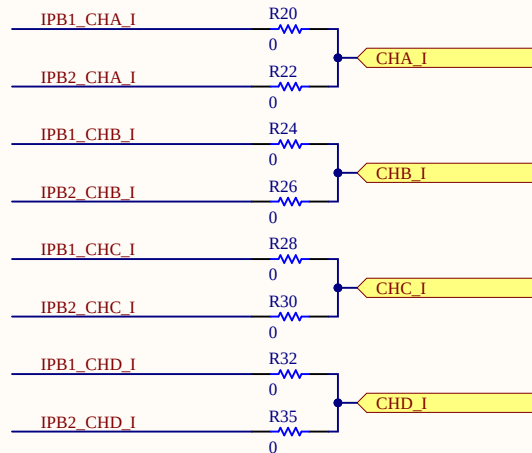
GPIO control output for channel FET Enable/Disable



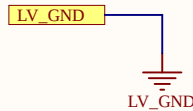
Analog OUTPUT voltage to set channel current limit



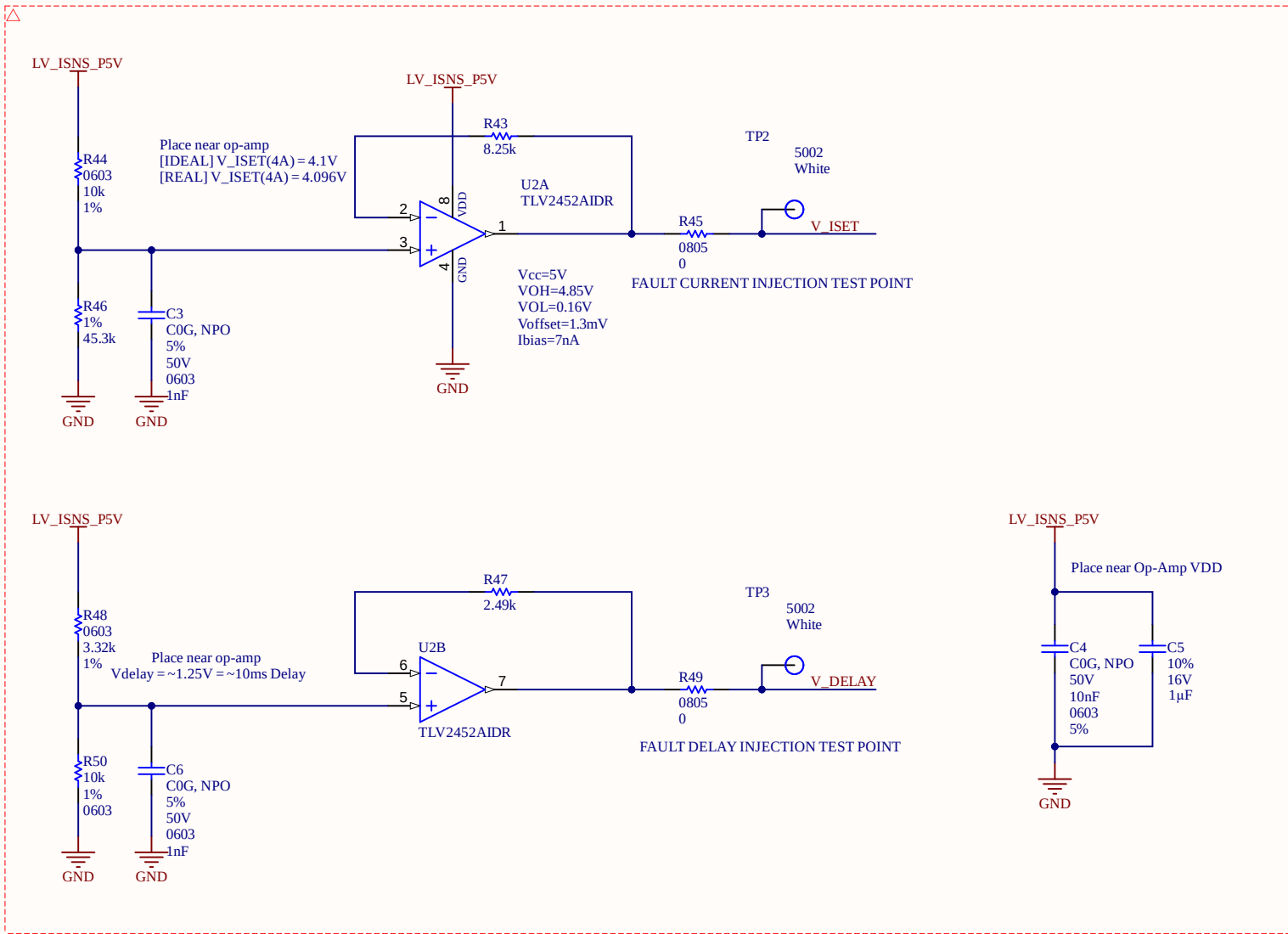
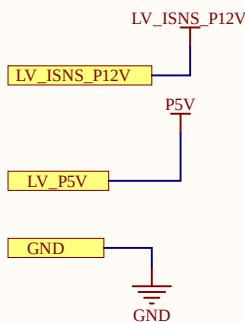
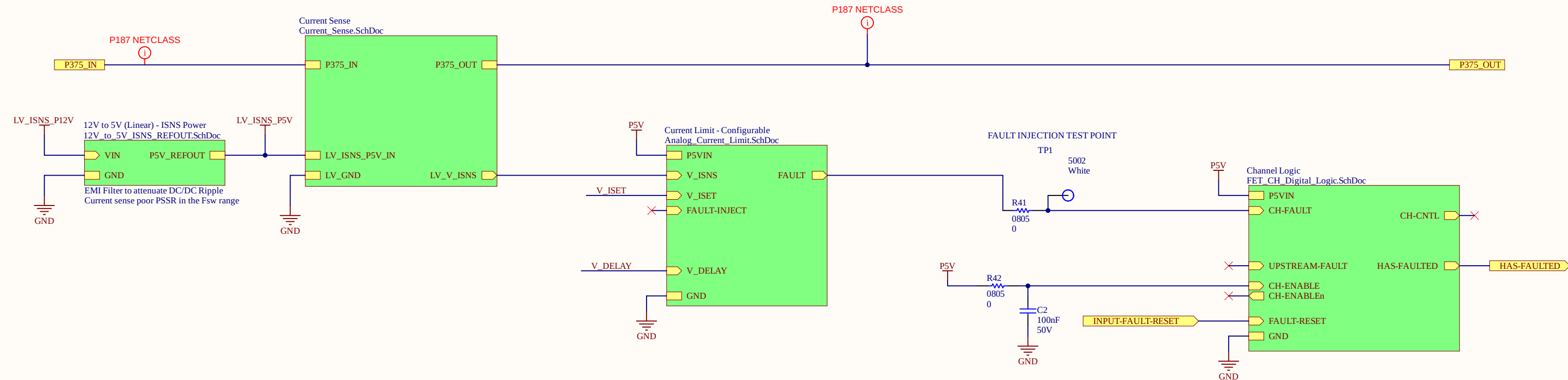
GPIO control output for channel RELAY Enable/Disable

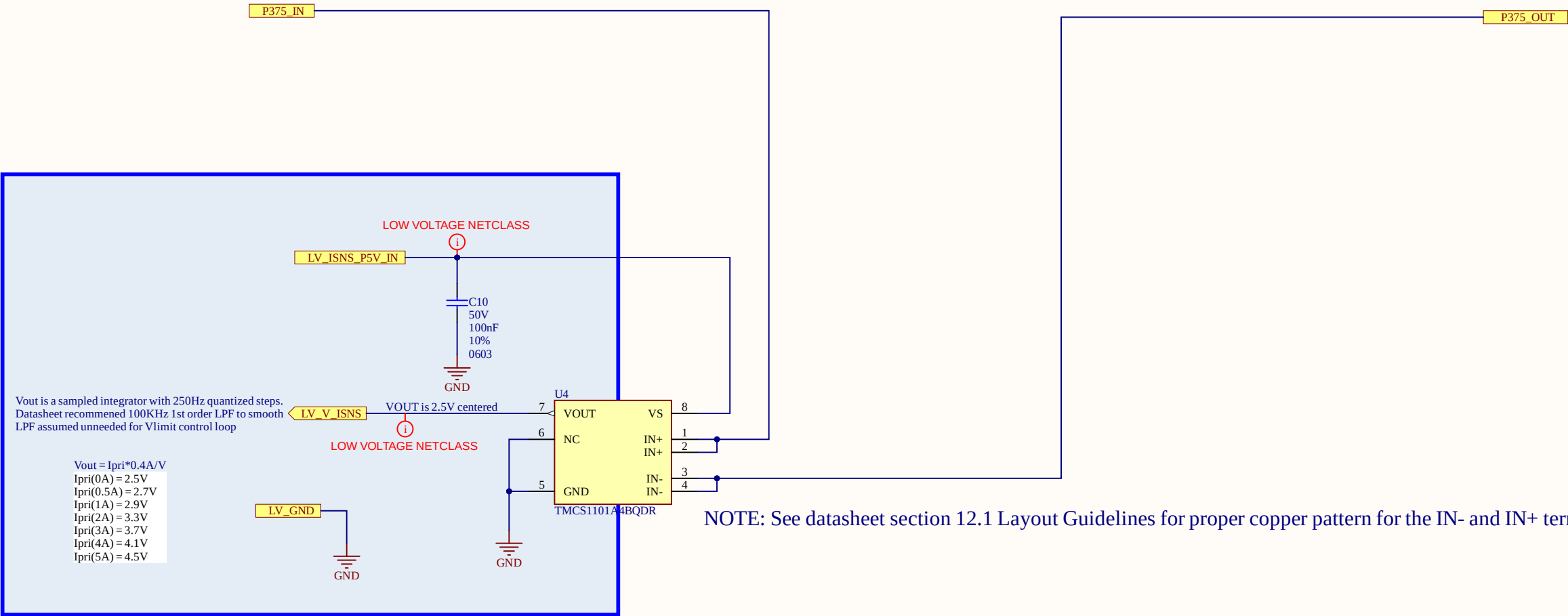


Analog INPUT to measure channel current



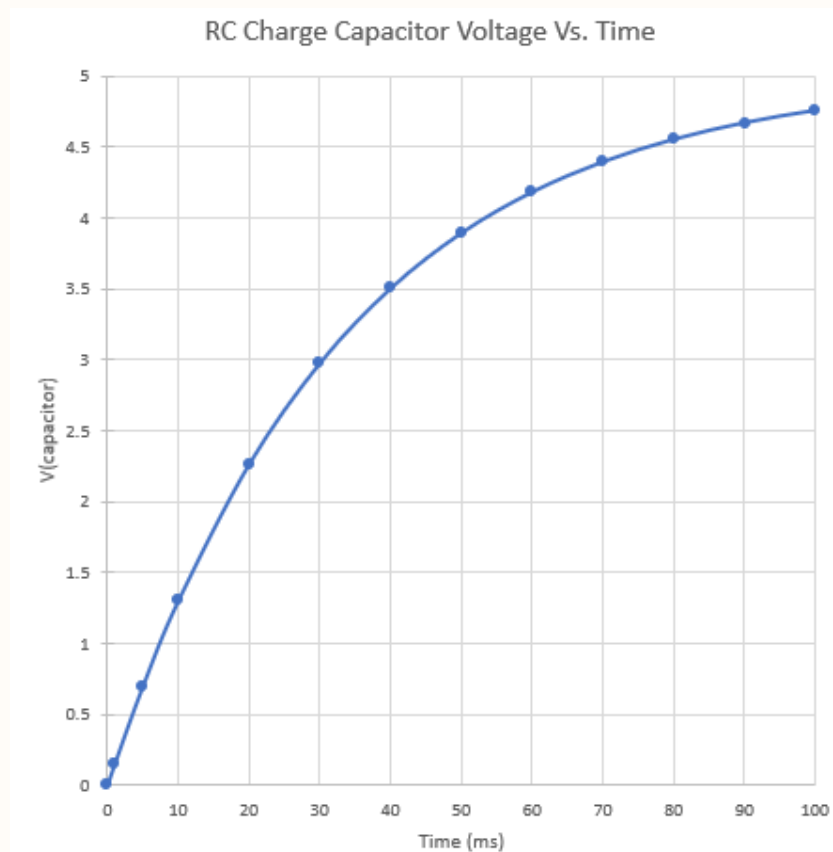
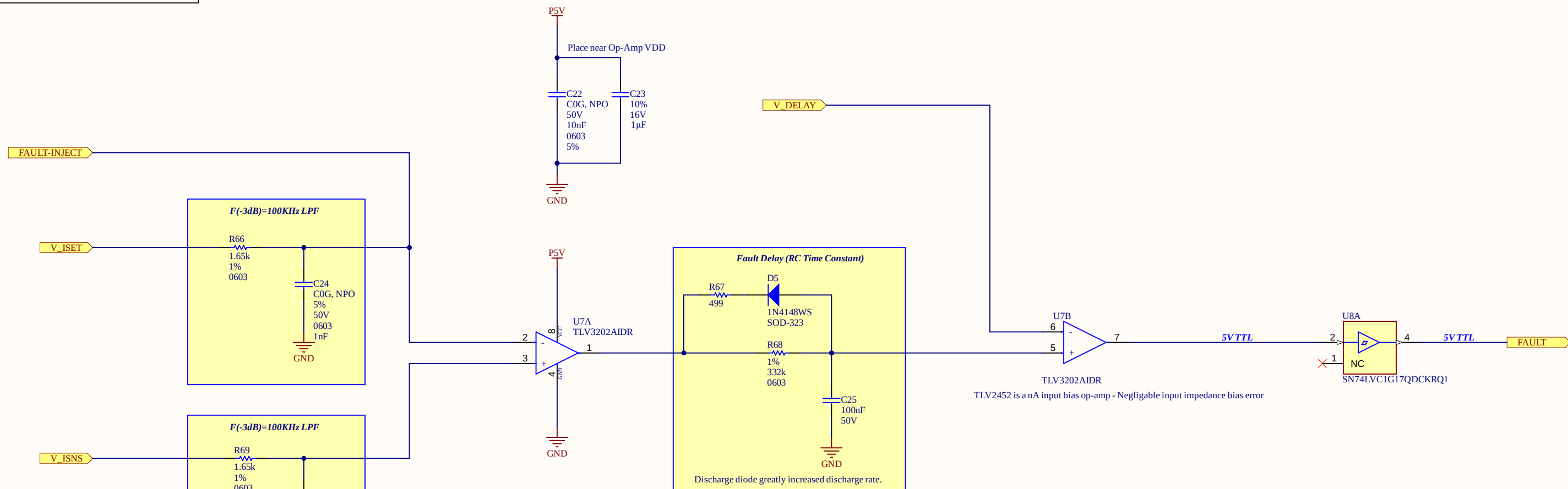
PROJECT	APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105		
MARS2 LVPS			
TITLE	MARS2 - IPB - Mezzanine Connector		
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME	Mezzanine_Conn.SchDoc		SHEET 3 OF 23



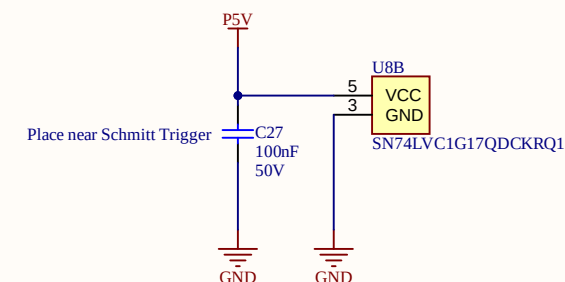


NOTE: See datasheet section 12.1 Layout Guidelines for proper copper pattern for the IN- and IN+ terminals.

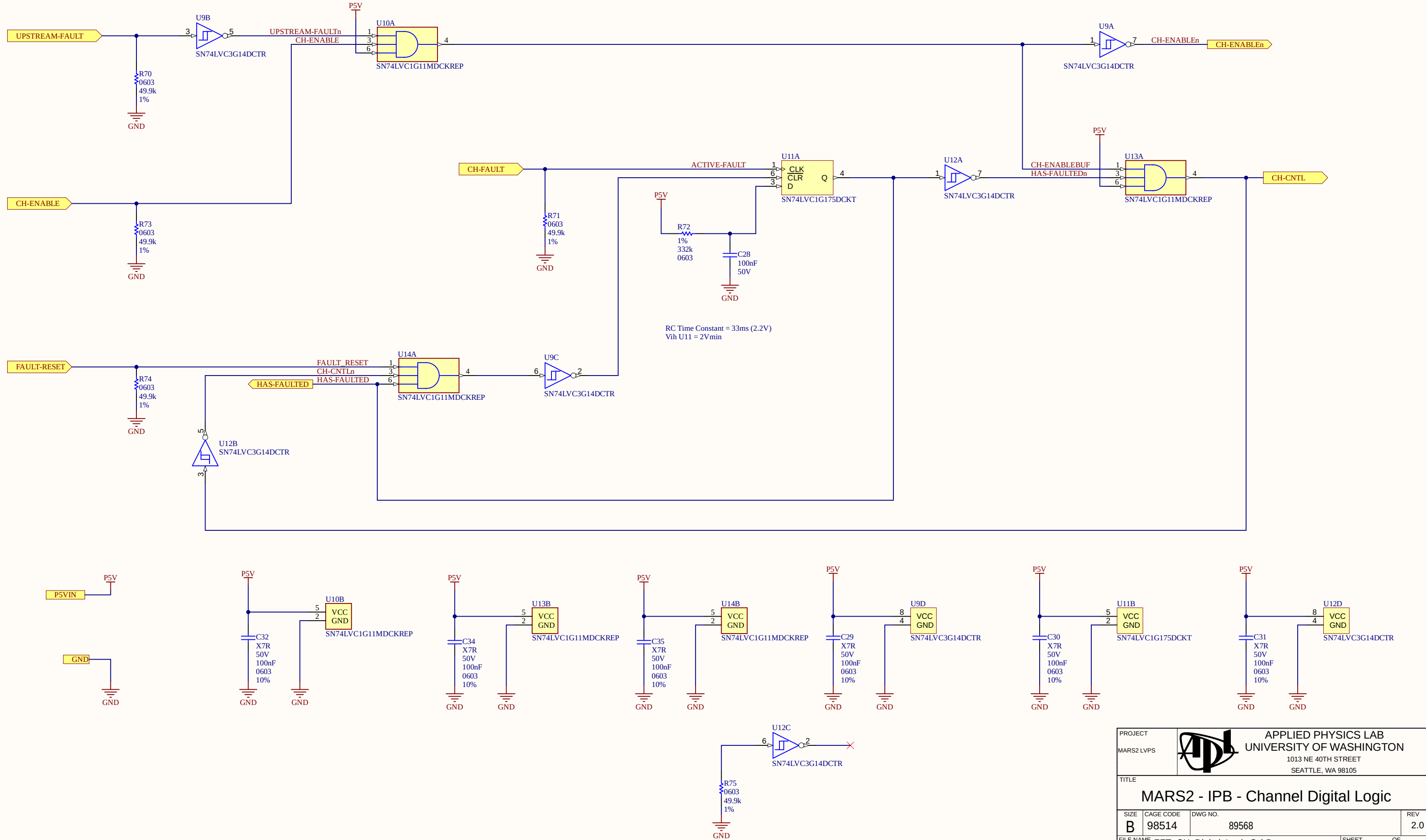
Isolated HALL Effect current sensor

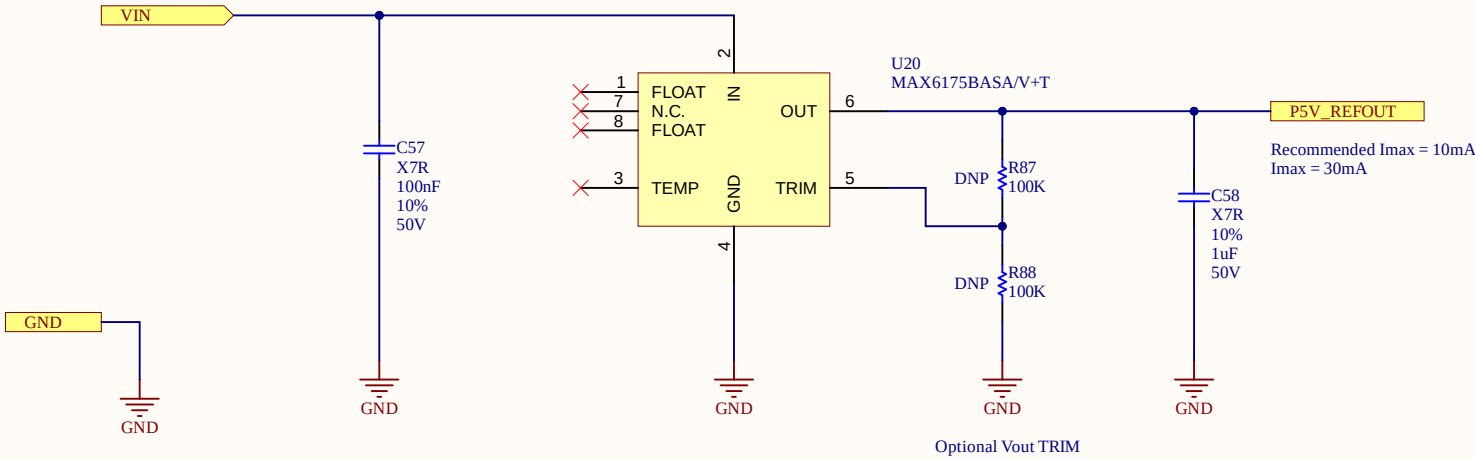


V_Delay Voltage Vs. Time (Approximate)

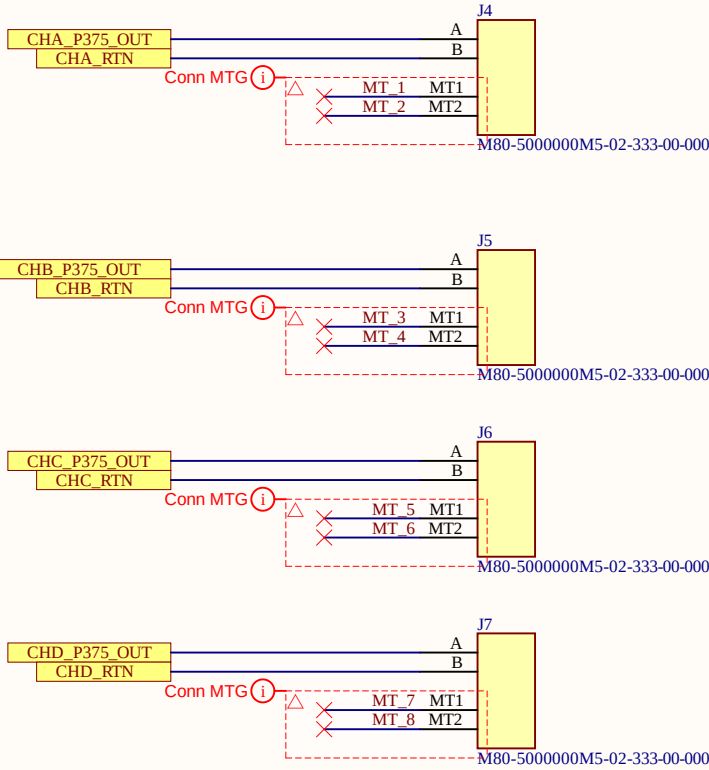


PROJECT				APPLIED PHYSICS LAB	
MARS2 LVPS				UNIVERSITY OF WASHINGTON	
				1013 NE 40TH STREET	
				SEATTLE, WA 98105	
TITLE					
MARS2 - IPB - Analog Current Limit					
SIZE	CAGE CODE	DWG NO.			REV
B	98514	89568			2.0
FILE NAME	Analog Current Limit.SchDoc			SHEET	6 OF 23





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PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
MARS2 LVPS			
TITLE			
MARS2 - IPB - Instrument Channel Conn			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME		SHEET	OF
External_Interface_Conn.SchDoc		9	23

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FAULT_SENSE

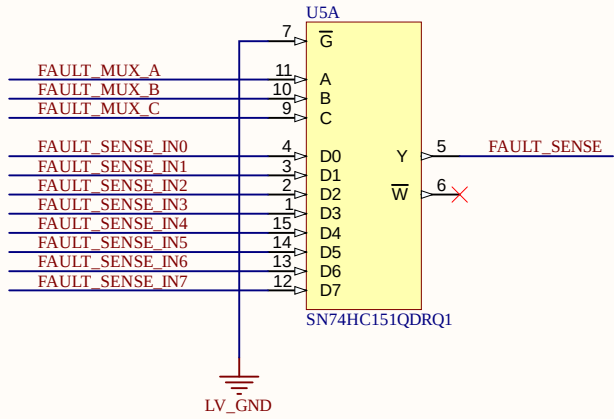
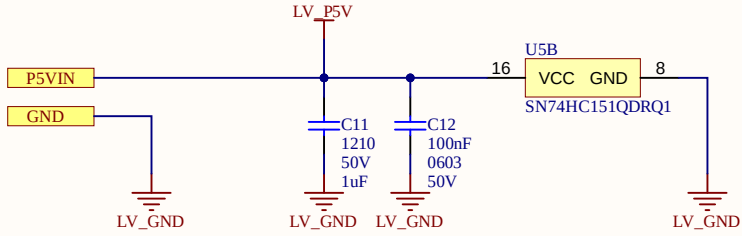
FAULT_MUX_A

FAULT_MUX_B

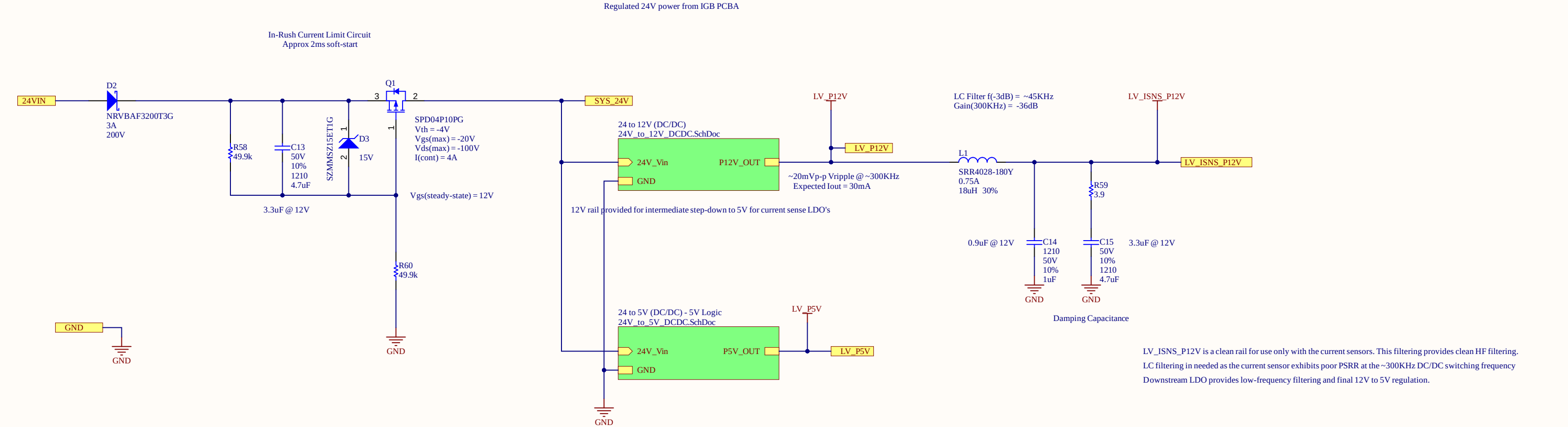
FAULT_MUX_C

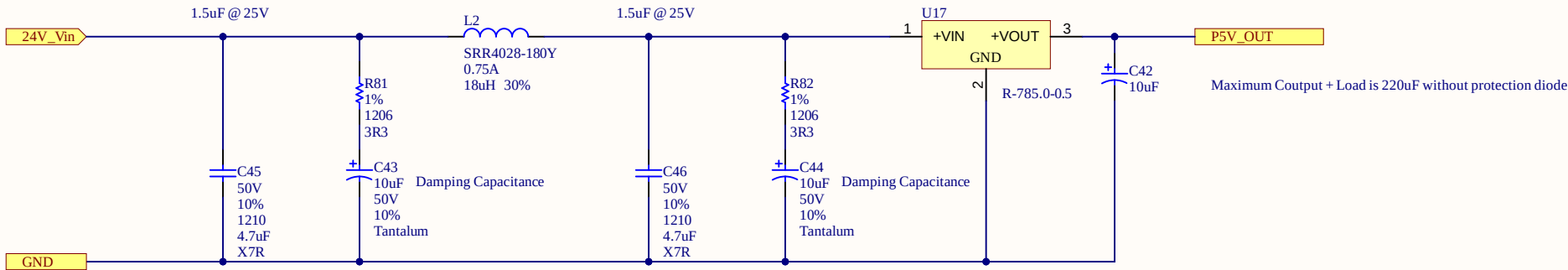
FAULT_MUX_D

FAULT_SENSE_IN[7..0]



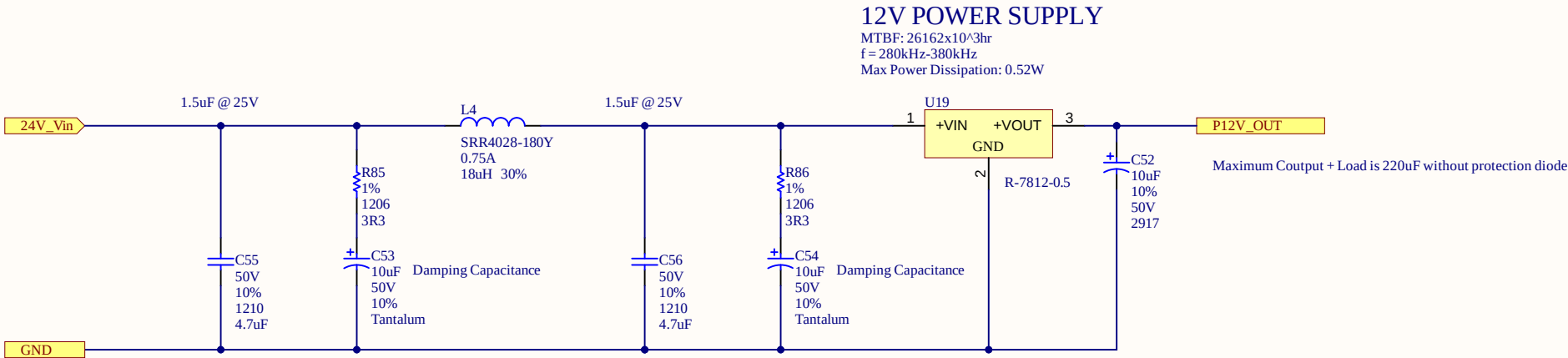
PROJECT				APPLIED PHYSICS LAB	
MARS2 LVPS				UNIVERSITY OF WASHINGTON	
				1013 NE 40TH STREET	
				SEATTLE, WA 98105	
TITLE					
MARS2 - IPB - Fault Multiplexing					
SIZE	CAGE CODE	DWG NO.			REV
B	98514	89568			2.0
FILE NAME				SHEET	OF
Fault_Sensing.SchDoc				10	23





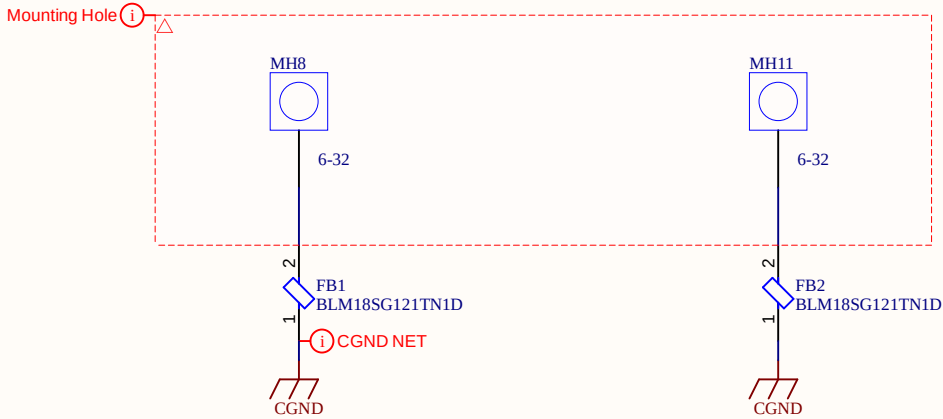
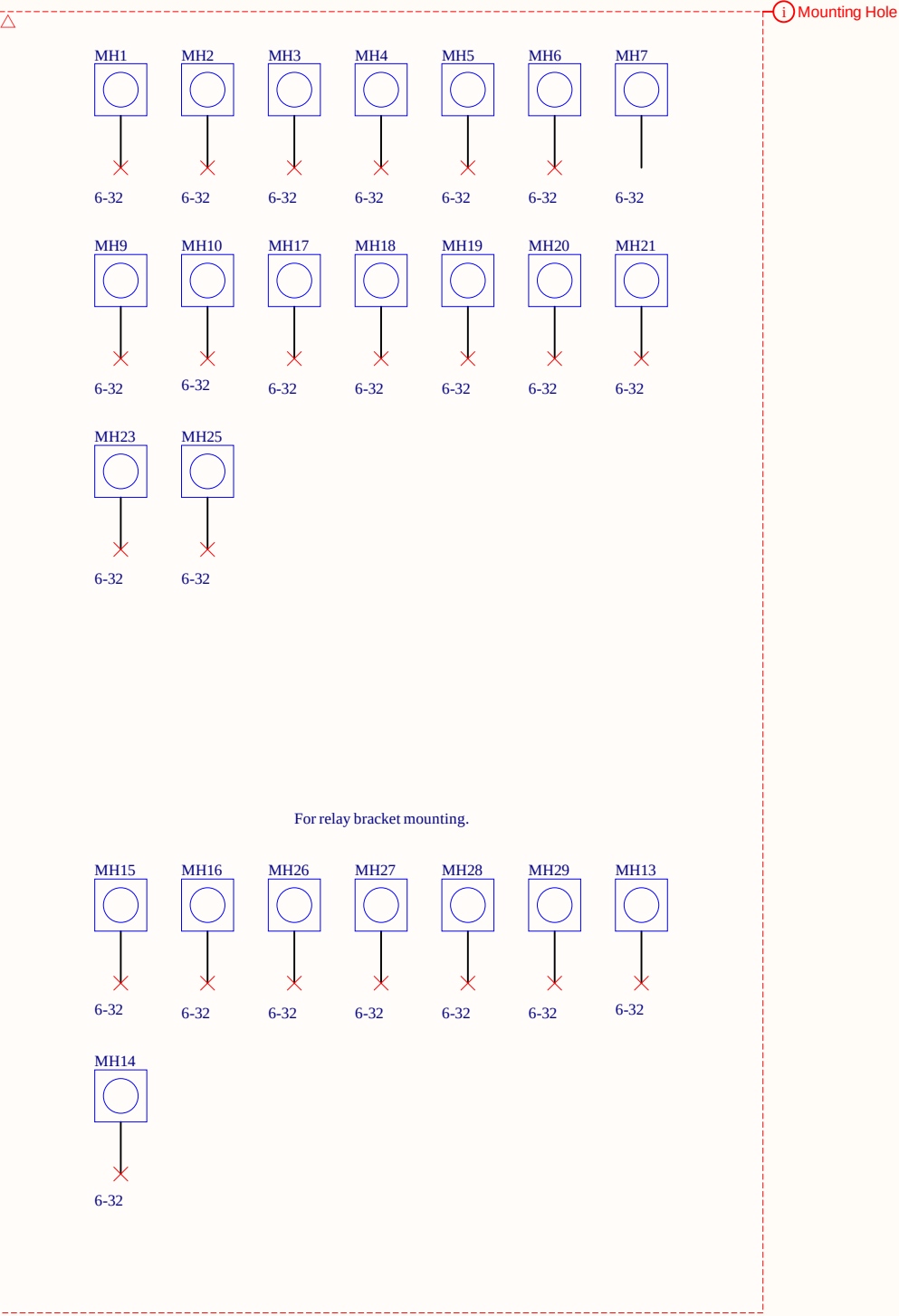
LC Filter f(-3dB) = ~24KHz
Gain(300KHz) = -40dB
Damping provide for entire PI filter - Peaks approximately 2dB

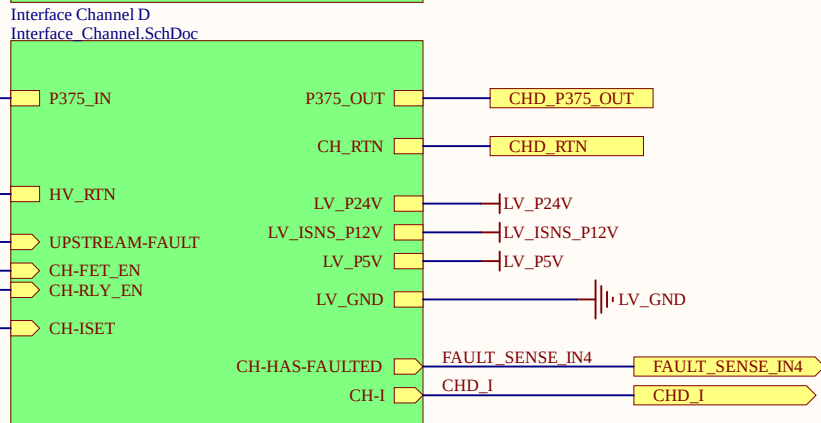
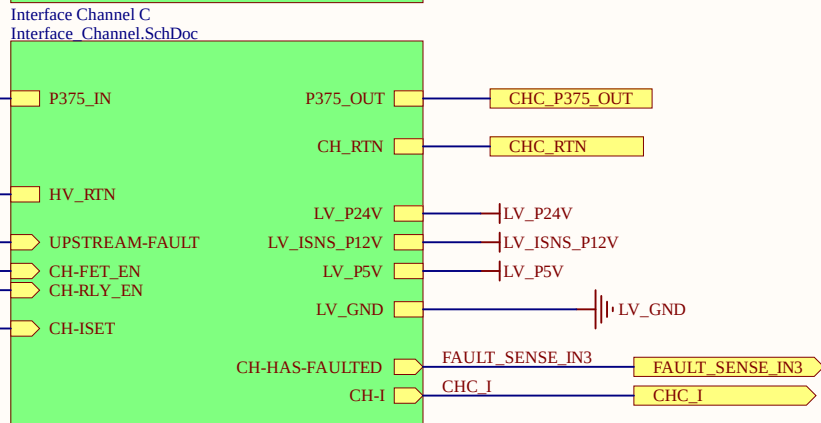
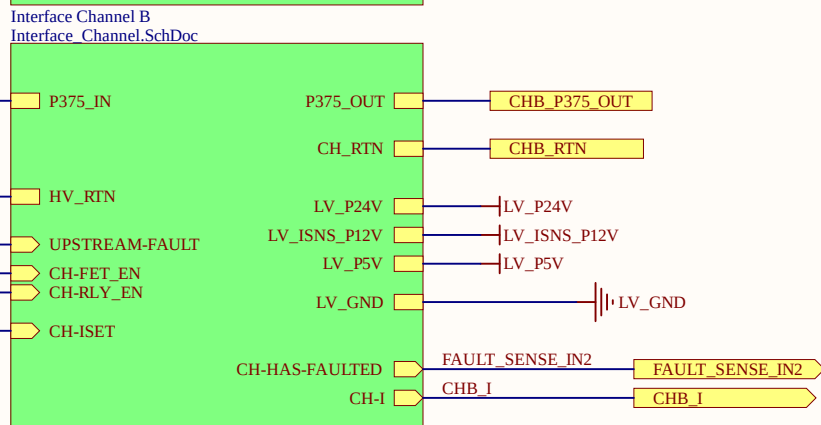
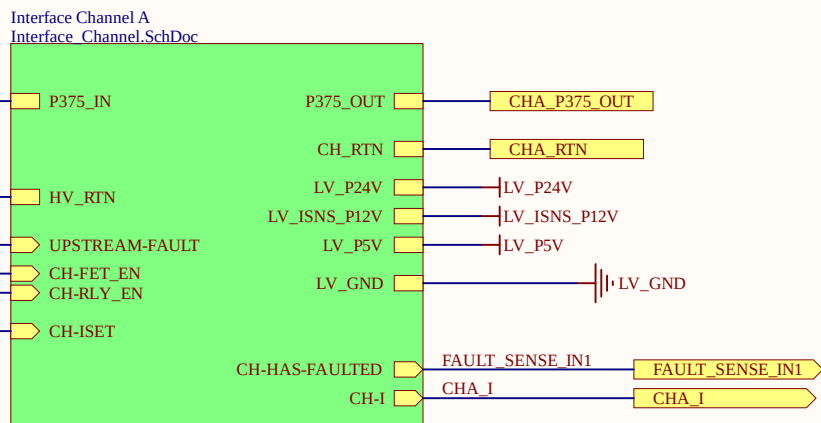
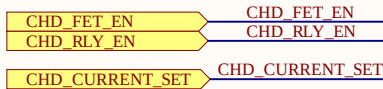
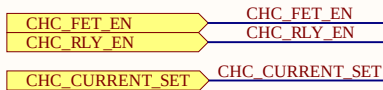
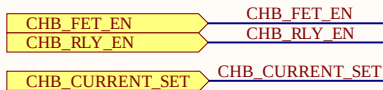
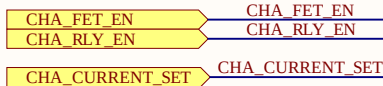
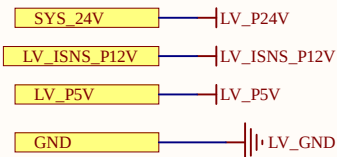
PROJECT			*
MARS2 LVPS			*
			*
			*
TITLE			
MARS2 - IPB - 24V to 5V DC/DC			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME 24V to 5V DCDC.SchDoc			SHEET 12 OF 23



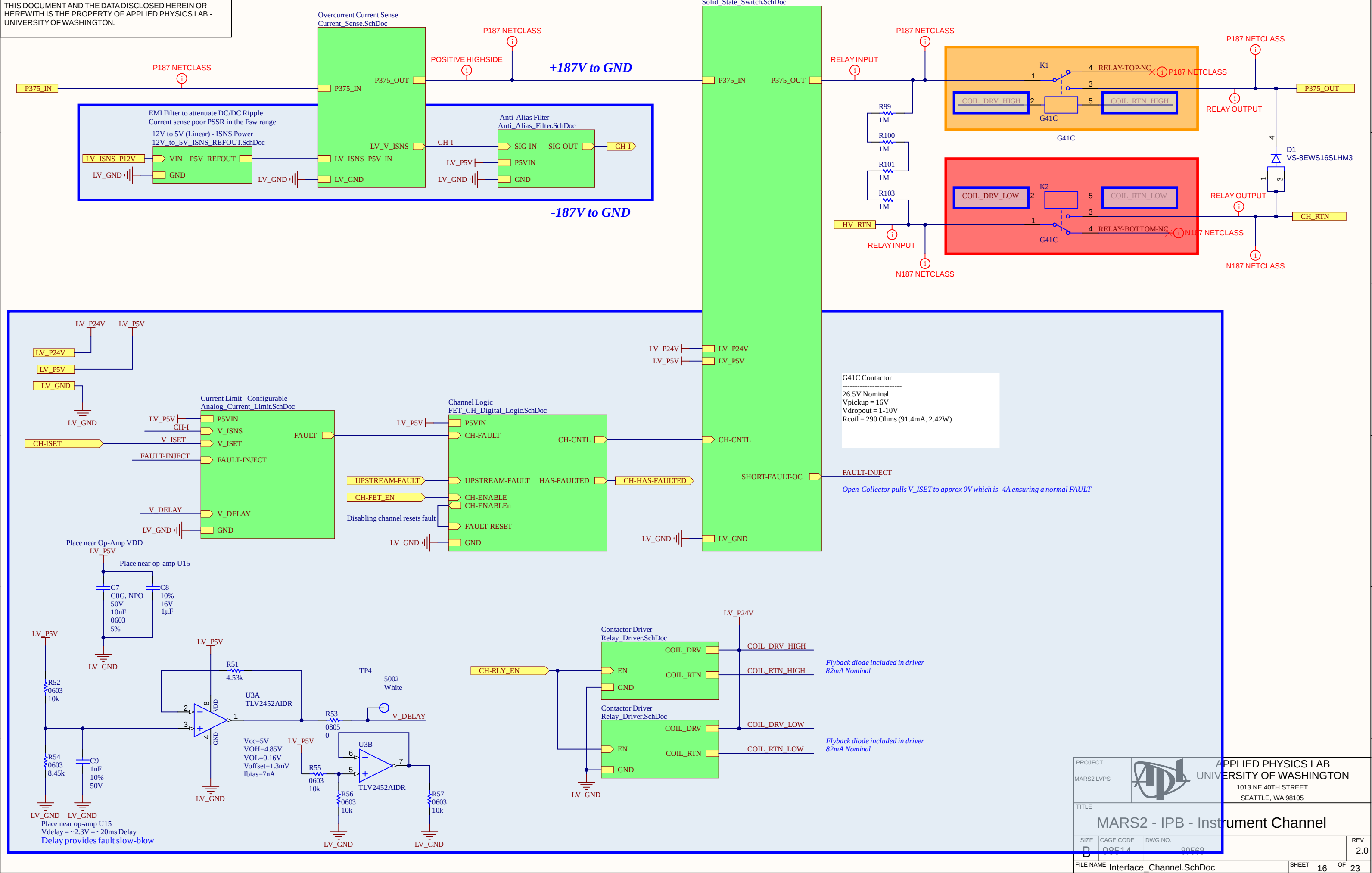
LC Filter f(-3dB) = ~24KHz
Gain(300KHz) = -40dB
Damping provide for entire PI filter - Peaks approximately 2dB

PROJECT			*
MARS2 LVPS			*
			*
			*
TITLE			
MARS2 - IPB - 24V to 12V DC/DC			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME 24V to 12V DCDC.SchDoc			SHEET 13 OF 23

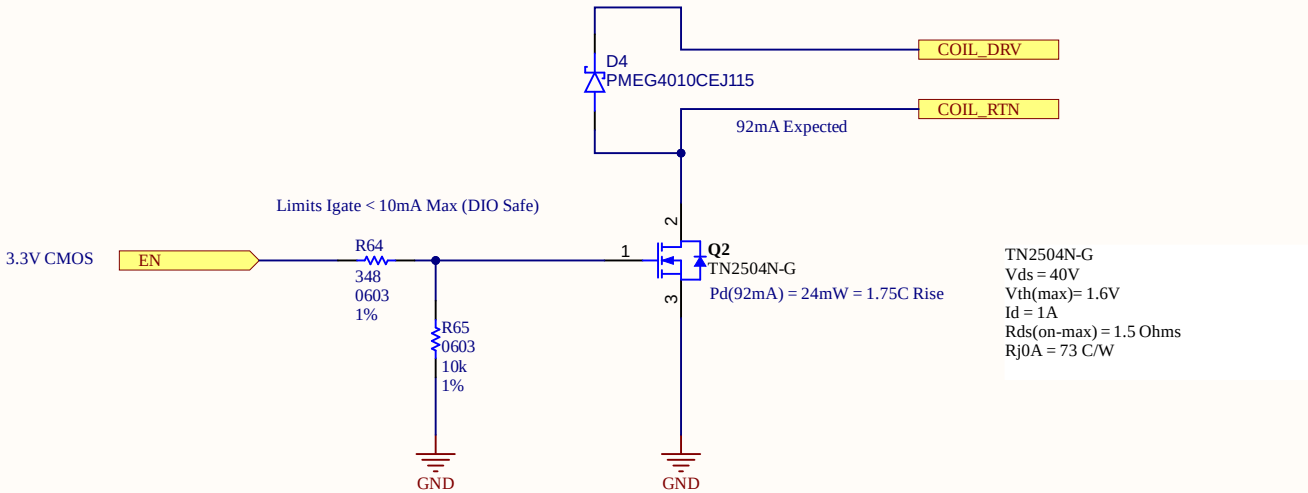
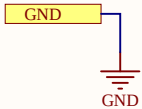




PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
MARS2 LVPS			
TITLE			
Interface Channel - High Level			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME	Interface Channels Main.SchDoc		SHEET 15 OF 23



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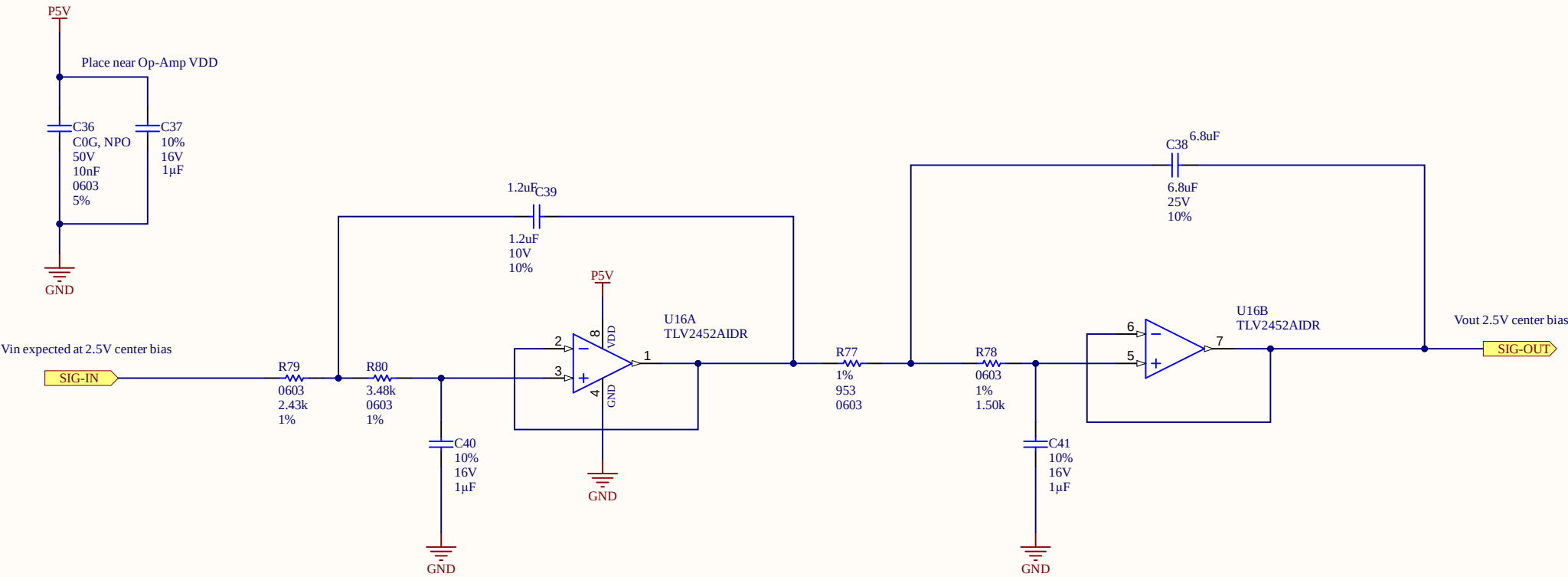
TN2504N-G
Vds = 40V
Vth(max)= 1.6V
Id = 1A
Rds(on-max) = 1.5 Ohms
Rj0A = 73 C/W

G41C Contactor

26.5V Nominal
Vpickup = 16V
Vdropout = 1-10V
Rcoil = 290 Ohms (91.4mA, 2.42W)

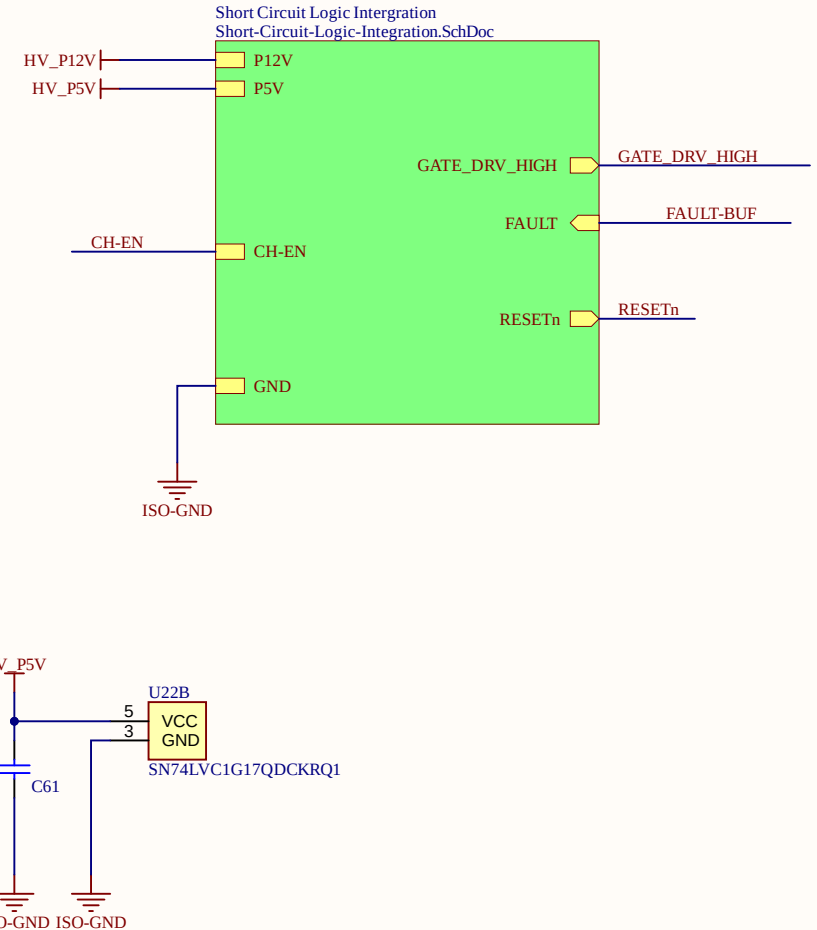
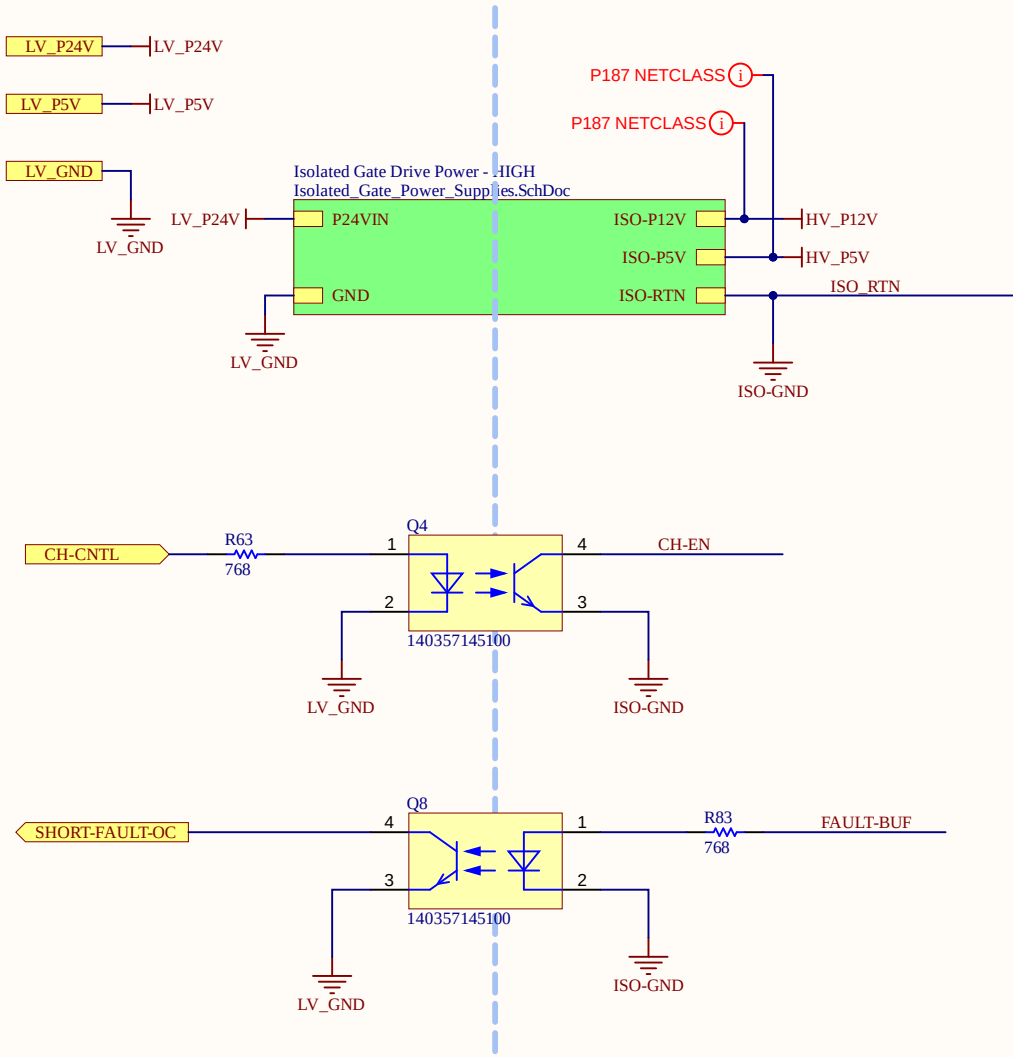
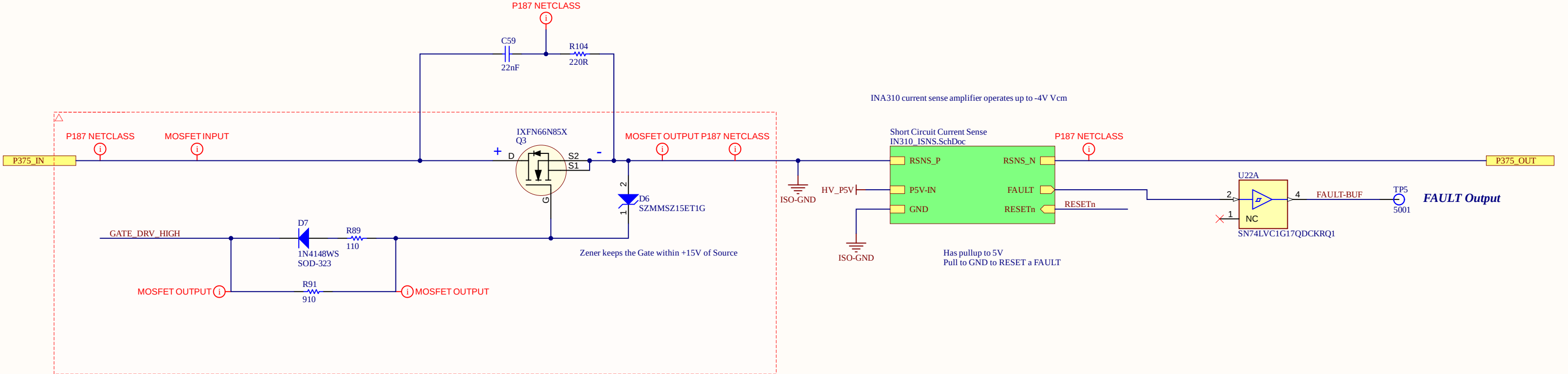
PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
MARS2 LVPS			
TITLE			
MARS2 - IPB - Relay Driver			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME		SHEET	OF
Relay_Driver.SchDoc		17	23

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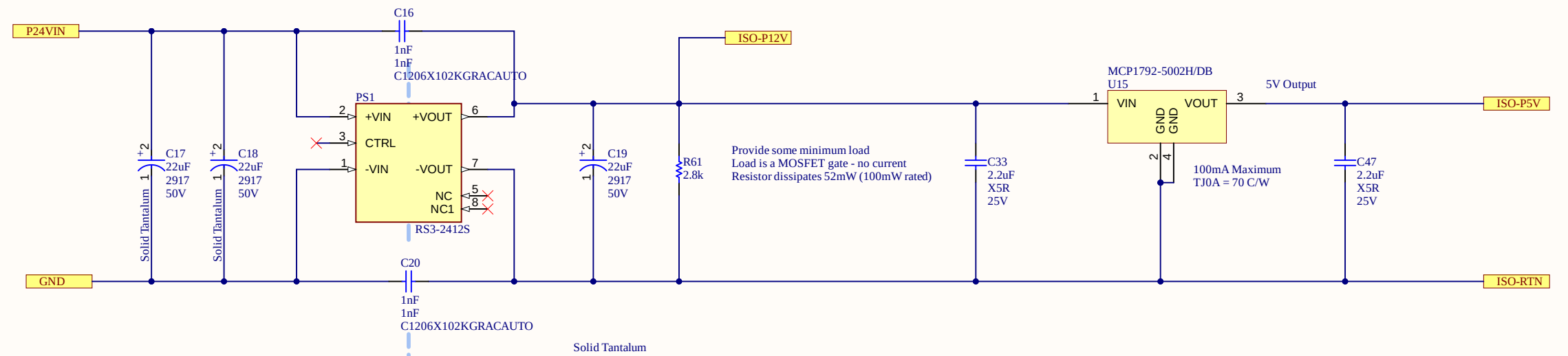


PROJECT				APPLIED PHYSICS LAB	
MARS2 LVPS				UNIVERSITY OF WASHINGTON	
				1013 NE 40TH STREET	
				SEATTLE, WA 98105	
TITLE					
MARS2 - IPB - Anti-Alias Filter					
SIZE	CAGE CODE	DWG NO.			REV
B	98514	89568			2.0
FILE NAME				SHEET	OF
Anti_Alias_Filter.SchDoc				18	23

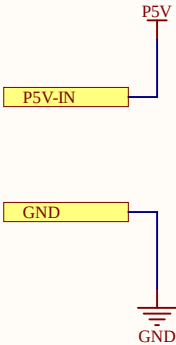
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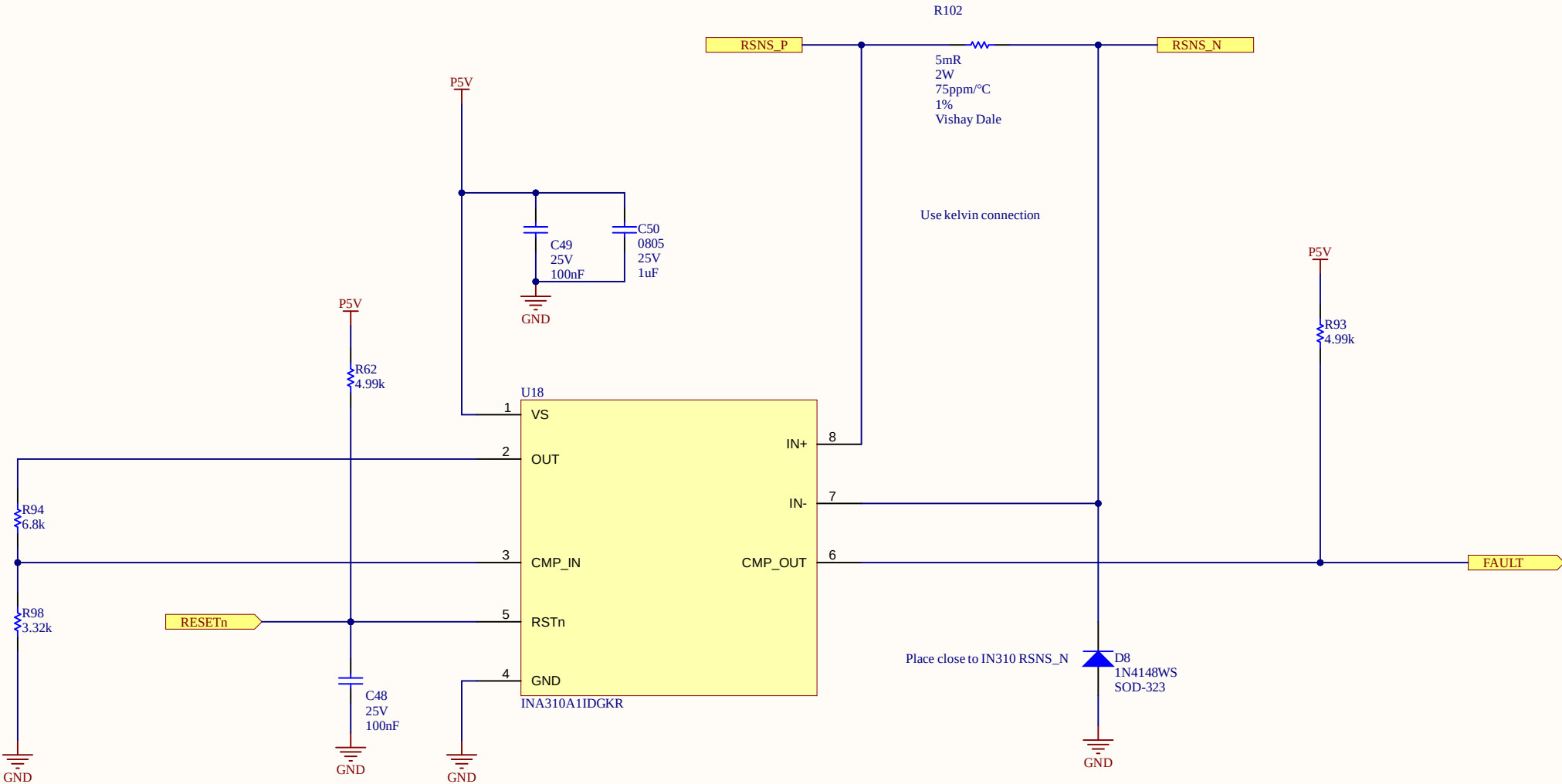
PROJECT	APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105		
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME	Solid_State_Switch.SchDoc		SHEET 19 OF 23



PROJECT MARS2 LVPS		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
TITLE MARS2 - IPB - HV ISO Gate PSU			
SIZE B	CAGE CODE 98514	DWG NO. 89568	REV 2.0
FILE NAME	Isolated Gate Power Supplies.SchDoc		SHEET 20 OF 23

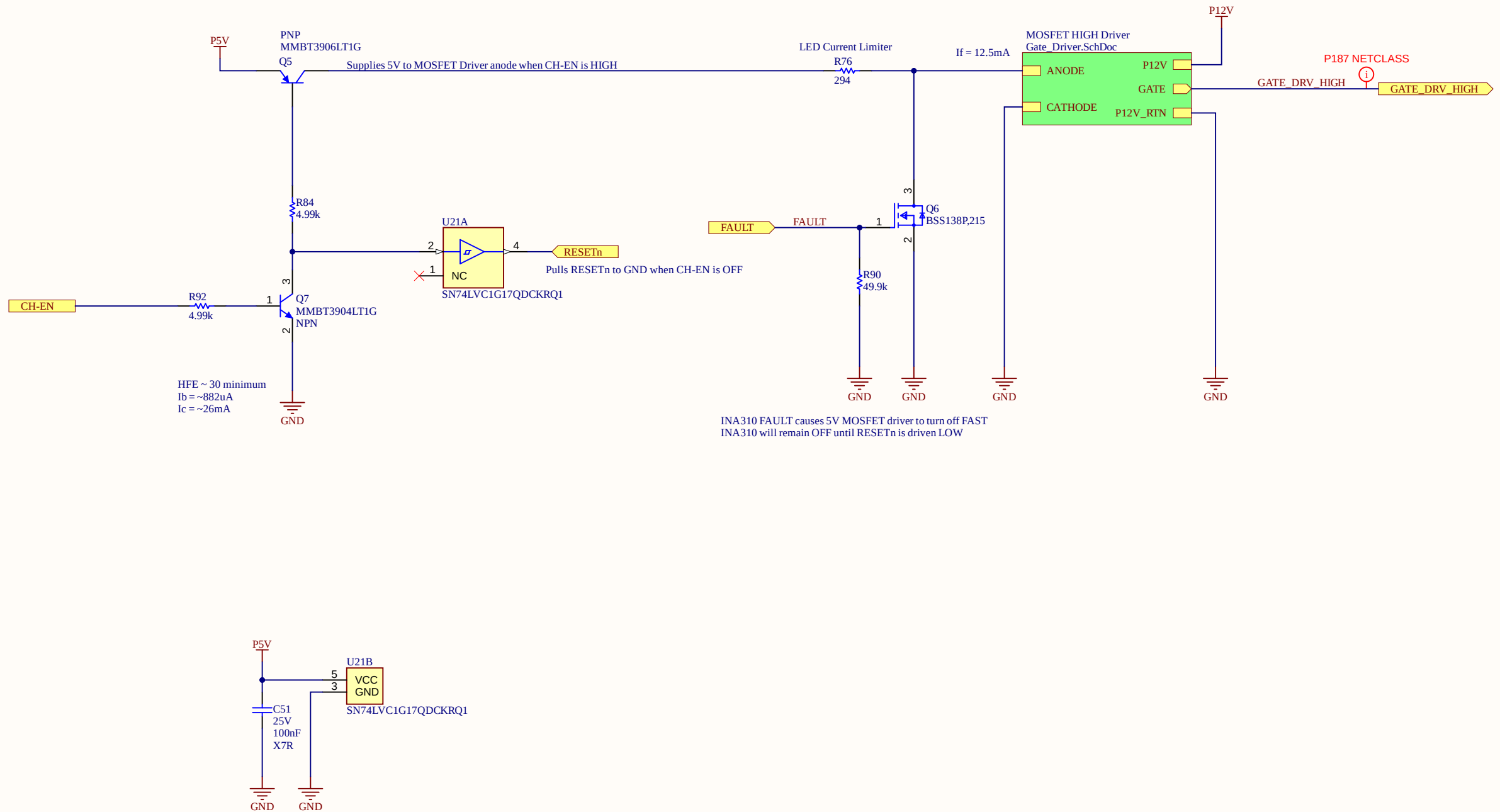
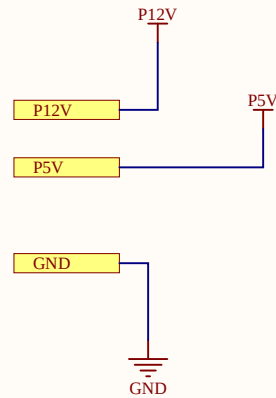


V_{cmp} = 0.6V
Threshold set to ~18A

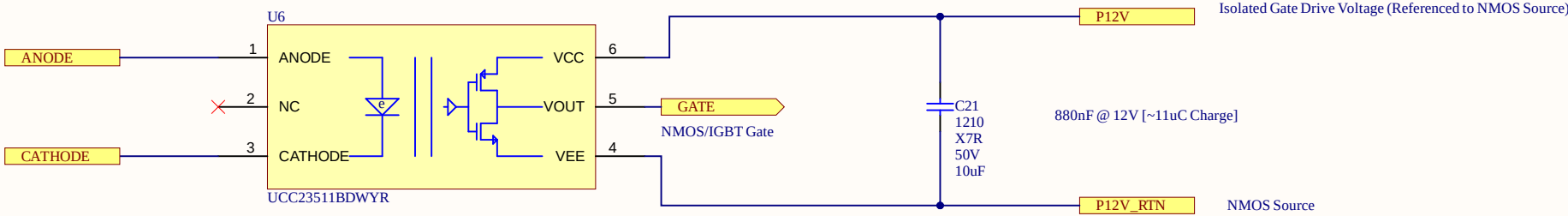


PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
MARS2 LVPS			
TITLE			
INA310 Latching Current Sense Amplifier			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME		SHEET	OF
IN310 ISNS.SchDoc		21	23

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PROJECT		 APPLIED PHYSICS LAB UNIVERSITY OF WASHINGTON 1013 NE 40TH STREET SEATTLE, WA 98105	
MARS2 LVPS			
TITLE			
Short Circuit System Integration			
SIZE	CAGE CODE	DWG NO.	REV
B	98514	89568	2.0
FILE NAME		SHEET	OF
Short-Circuit-Logic-Integration.SchDoc		22	23



eDiode Ith = 7-16mA (Recommended 10mA)
VF = 1.8V to 2.4V at typ 2.1V (1.35mV/C)

A
Vf nom= 2.1V -> 290
Ohms for 10mA

If(Vf=1.8V) = 11.0mA
If(Vf=2.4V) = 8.8mA

PROJECT				APPLIED PHYSICS LAB	
MARS2 LVPS				UNIVERSITY OF WASHINGTON	
				1013 NE 40TH STREET	
				SEATTLE, WA 98105	
TITLE					
MARS2 - IPB - Isolated Gate Driver					
SIZE	CAGE CODE	DWG NO.			REV
B	98514	89568			2.0
FILE NAME				SHEET	OF
Gate_Driver.SchDoc				23	23