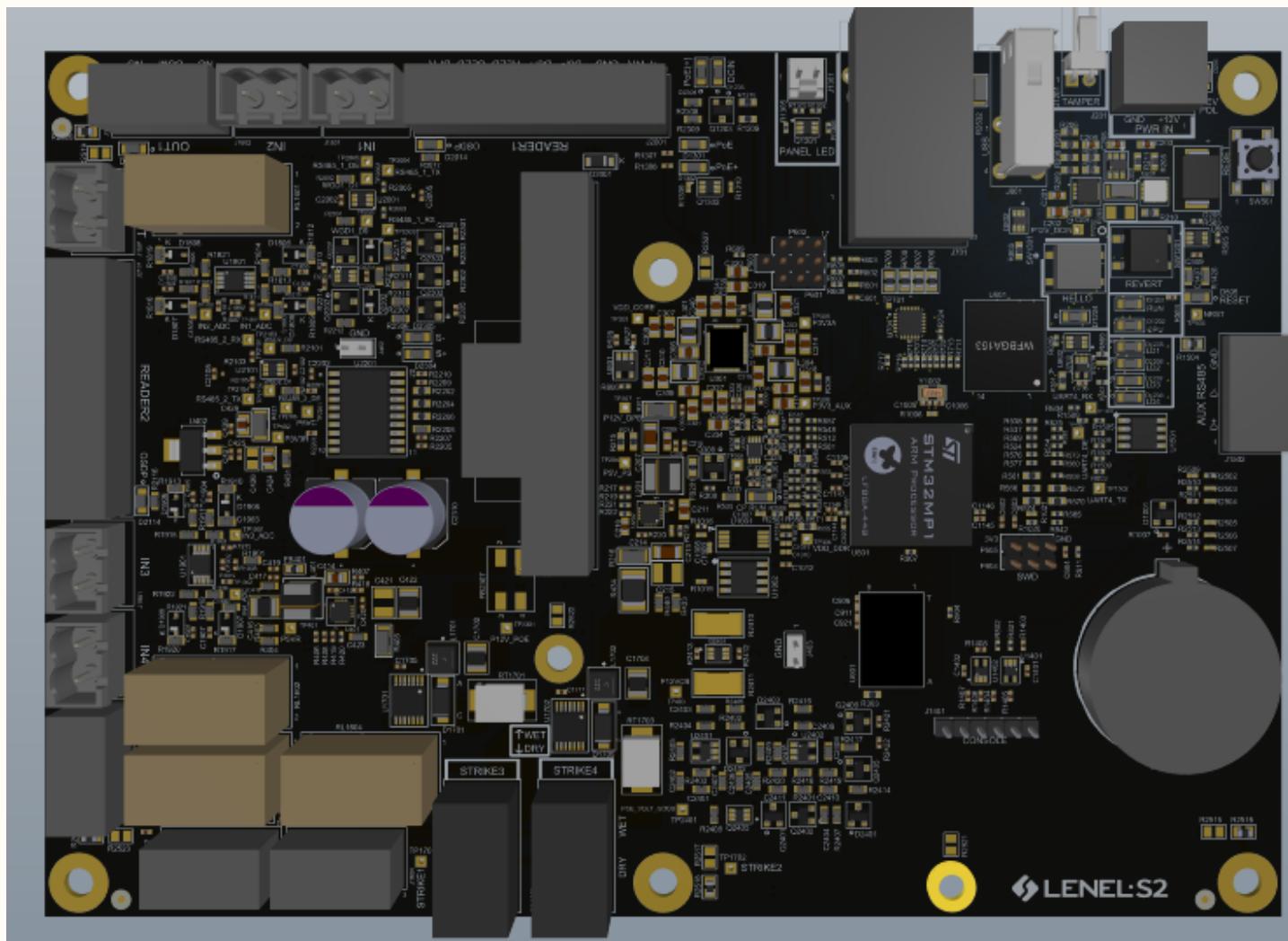


# MNP V3 SCHEMATIC REV 1

## SCHEMATIC INDEX



CIRCUIT TITLE

INFO

DESIGN NOTES  
IN GRAY ARE  
INFORMATION NOTES

CIRCUIT LABEL

DESIGN NOTES  
IN BLUE ARE  
SILKSCREEN TEXT

SILKSCREEN

DESIGN NOTES  
IN RED ARE  
CRITICAL LAYOUT  
AND PCB NOTES

PCB LAYOUT

© LenelS2 SECURITY CORPORATION 2024  
MNP V3 PN# S2-PC-0032 REV 1

S2-PC-0032



S2-SCH-0032

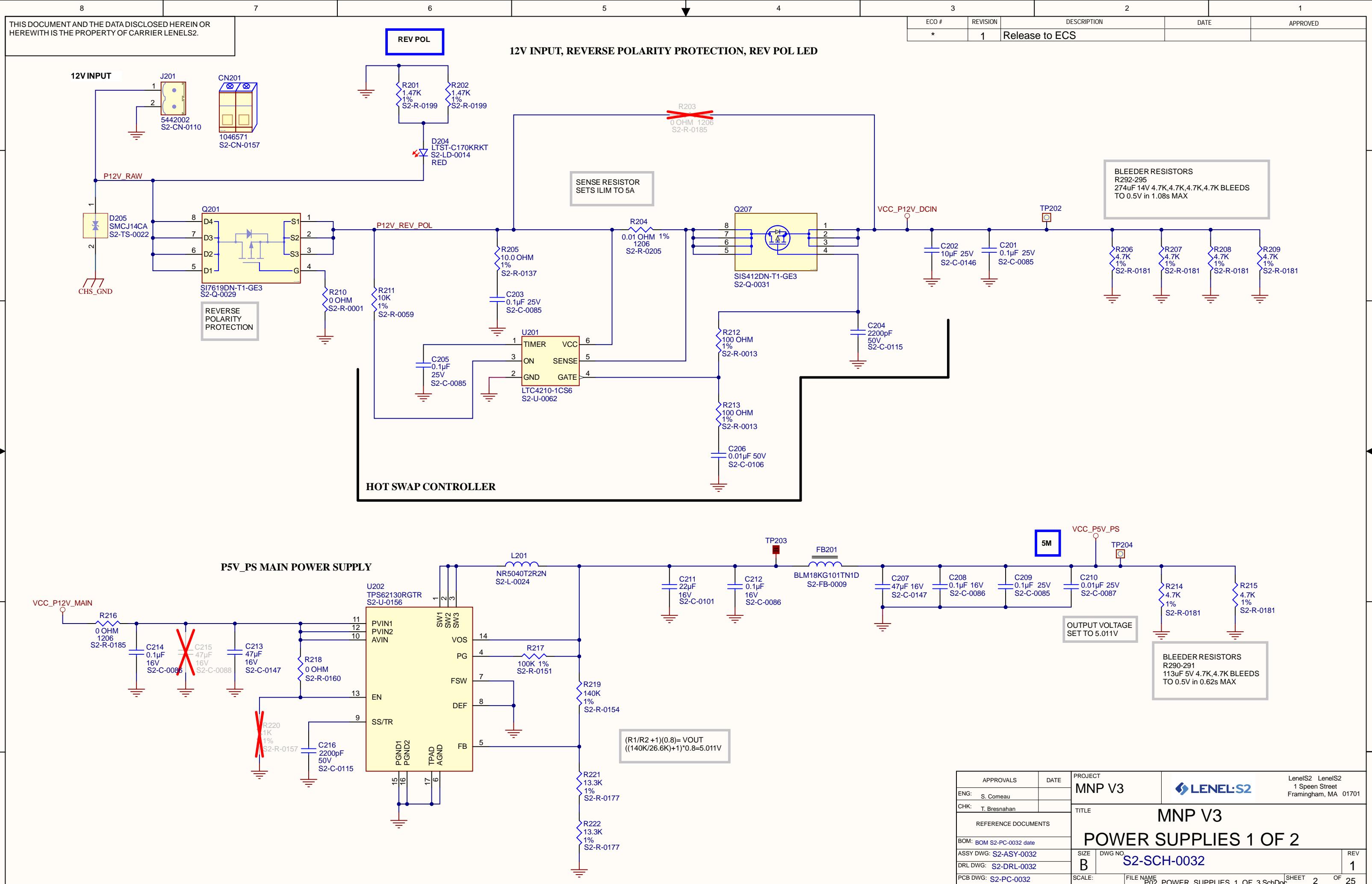


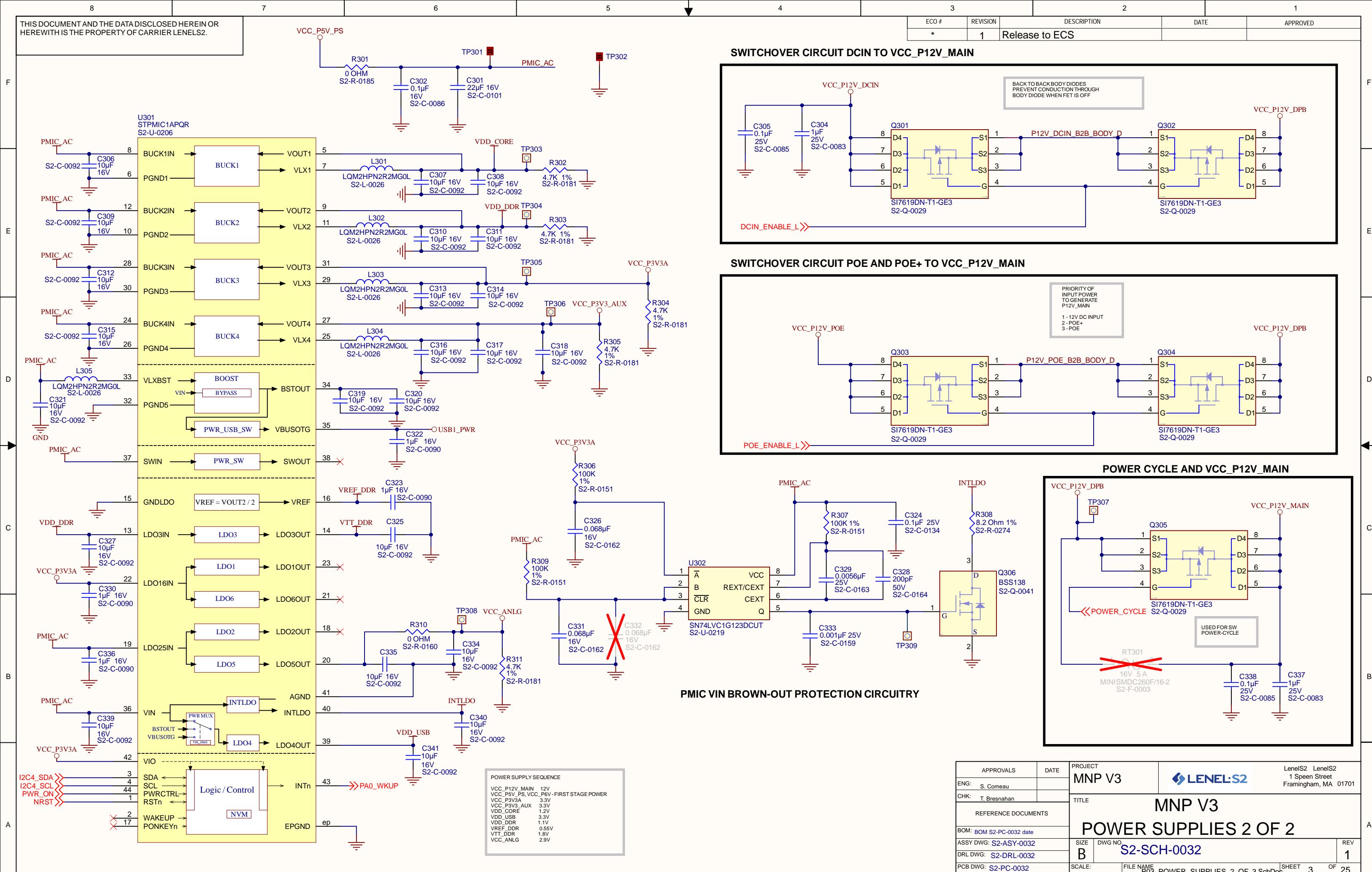
S2-ASY-0032

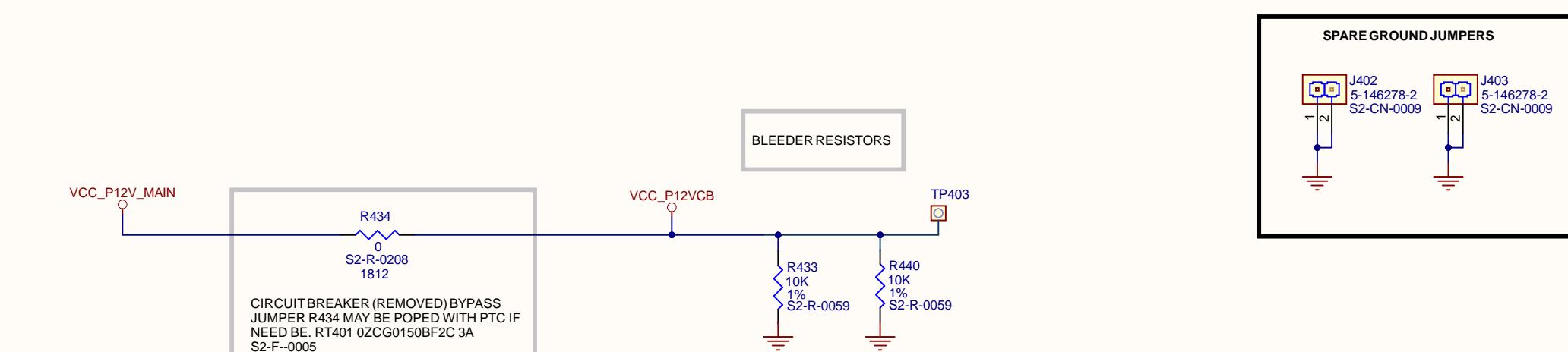
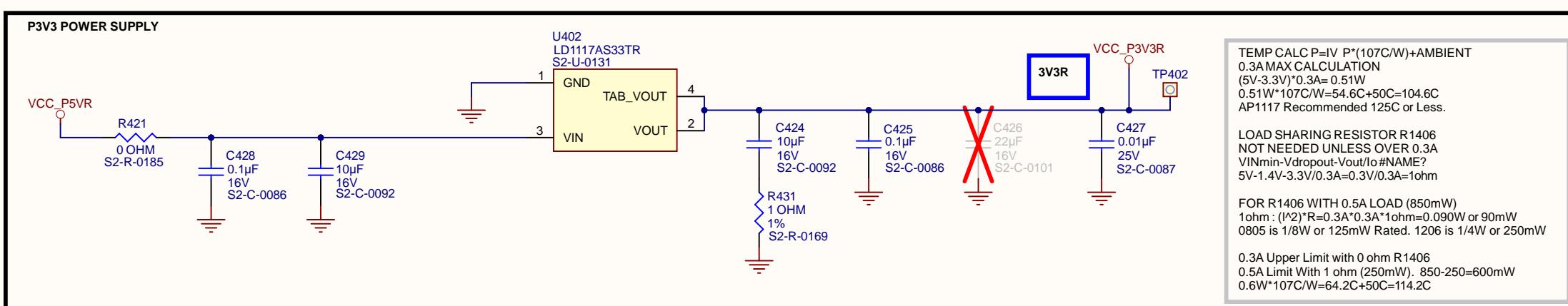
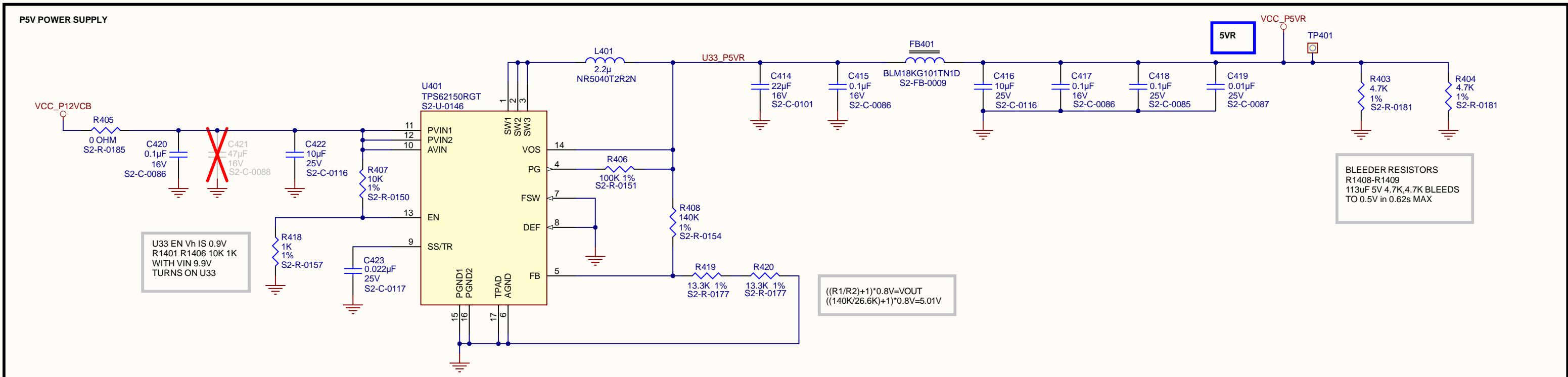


S2-DRL-0027

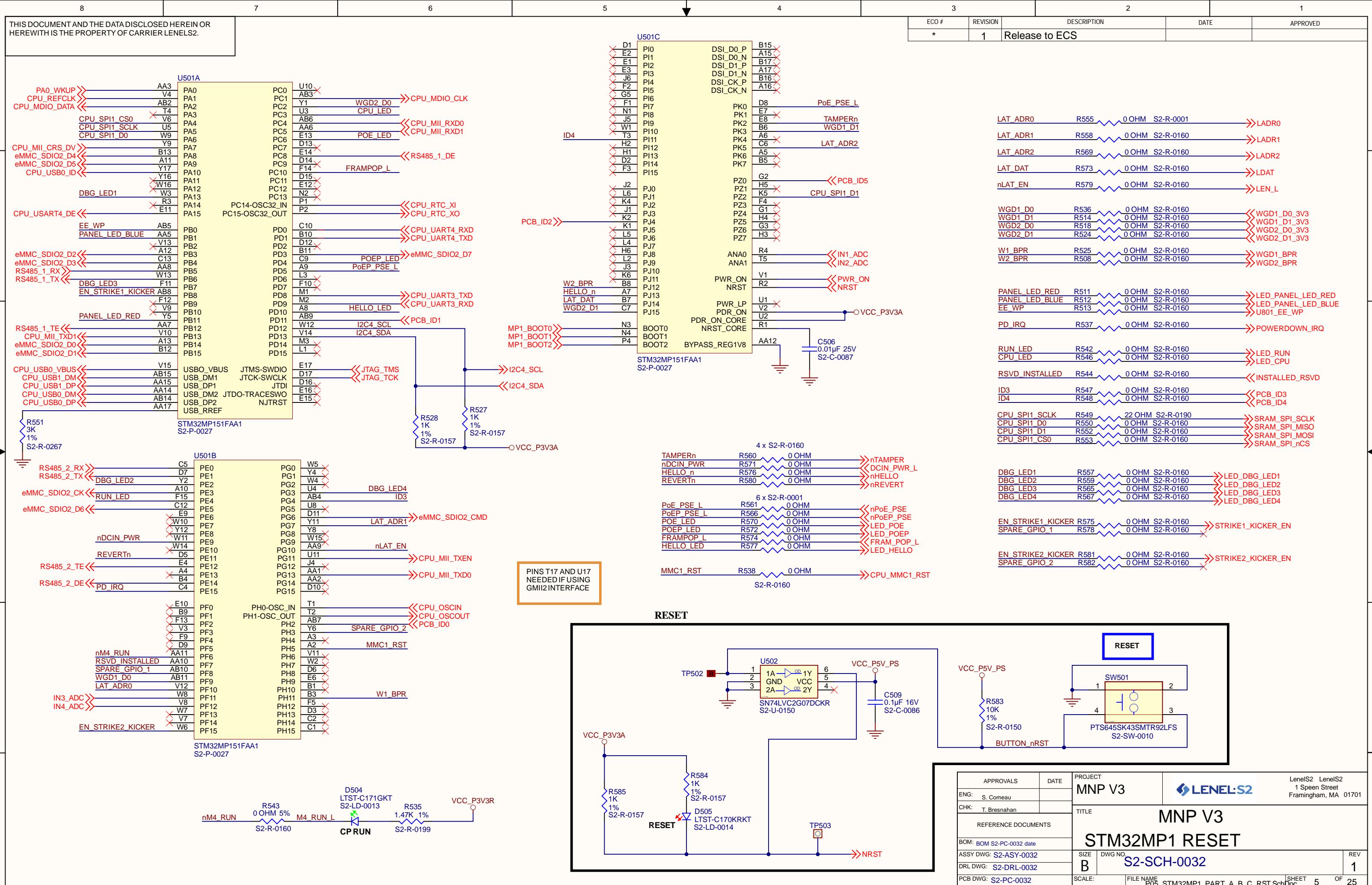
APPROVALS		DATE	PROJECT	LENEL-S2	
ENG:	S. Comeau		MNP V3		
CHK:	T. Bresnahan				
REFERENCE DOCUMENTS					
BOM:	BOM S2-PC-0032 date				
ASSY DWG:	S2-ASY-0032				
DRL DWG:	S2-DRL-0032				
PCB DWG:	S2-PC-0032		SCALE:	FILE NAME	P01_INDEX.SchDoc
SIZE	DWG NO	S2-SCH-0032	REV		1
A					



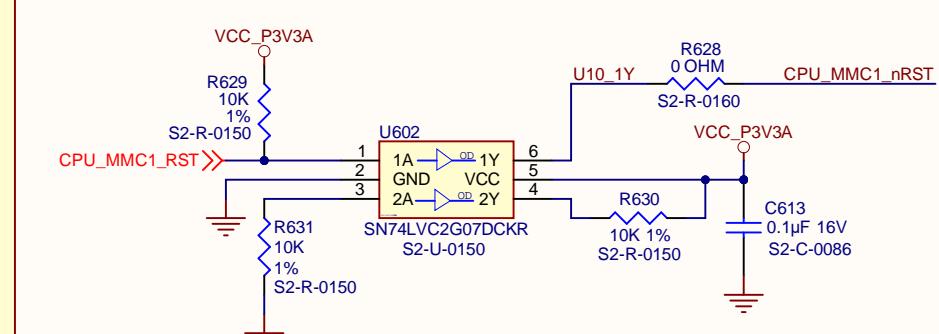
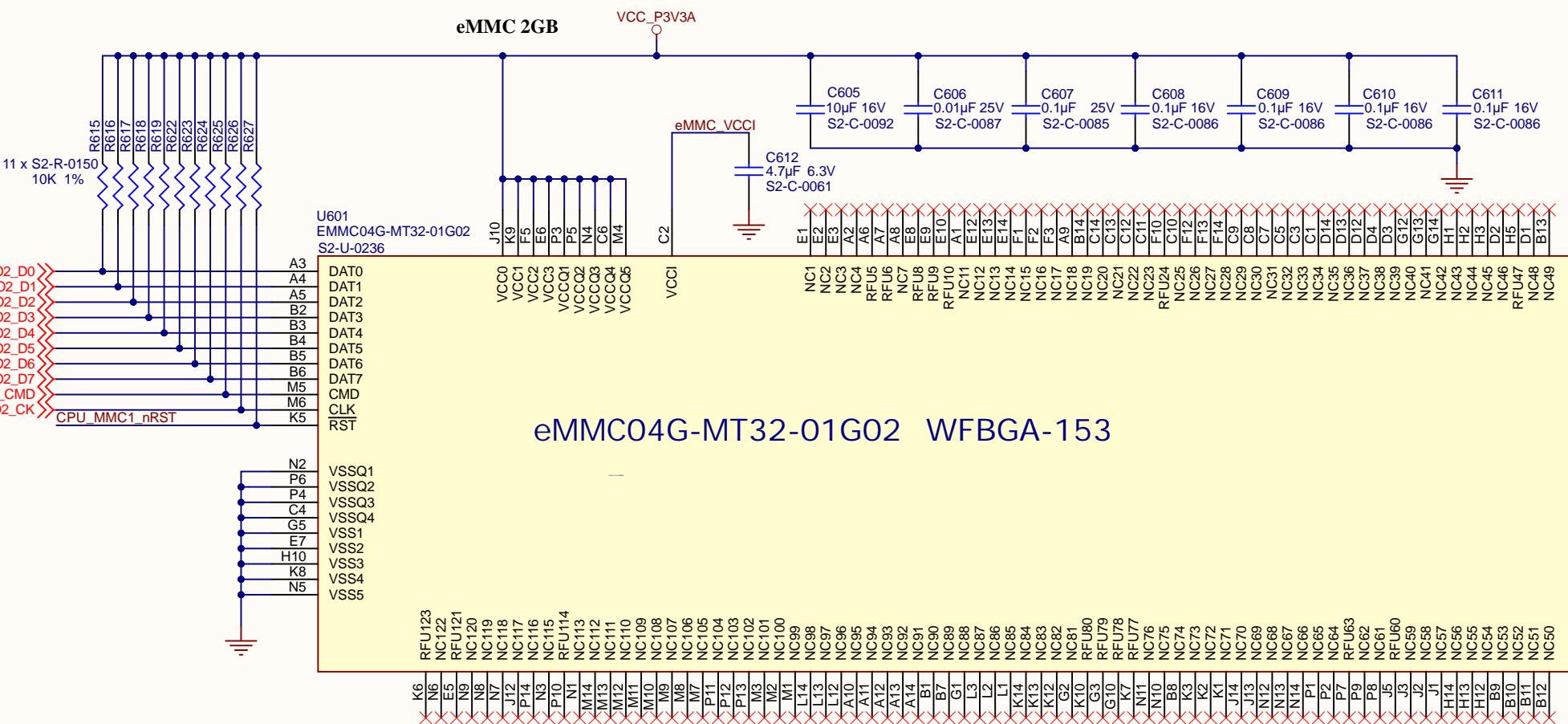
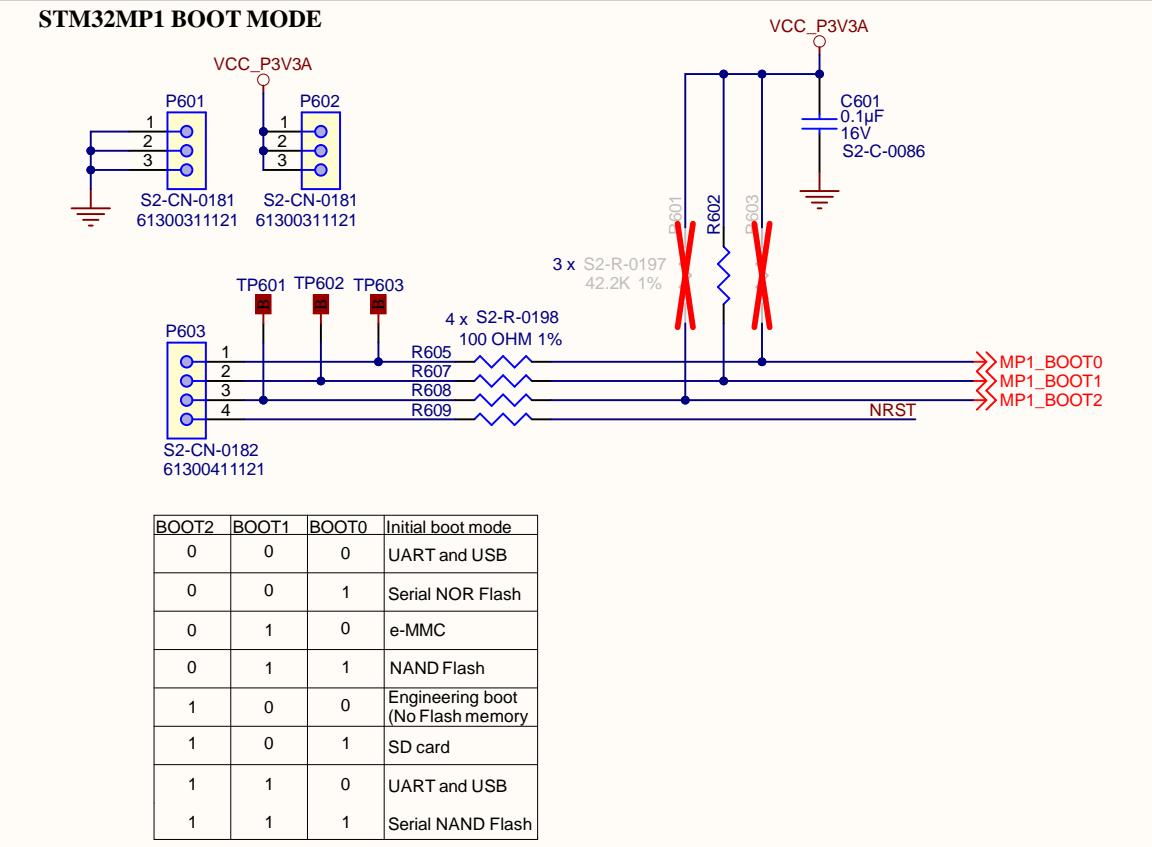
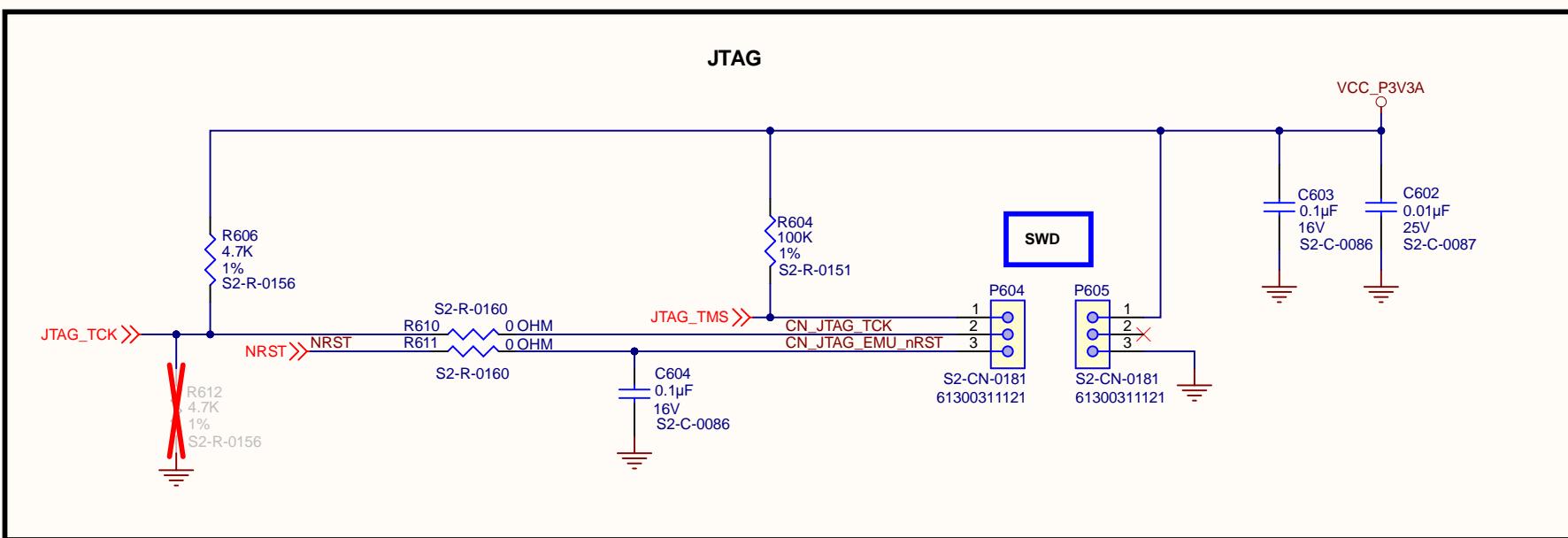




APPROVALS		DATE	PROJECT	LENEL-S2			
ENG:	S. Comeau		MNP V3				
CHK: T. Bresnahan							
REFERENCE DOCUMENTS							
BOM:	BOM S2-PC-0032 date		SIZE	DWG NO	REV		
ASSY DWG:	S2-ASY-0032		B	S2-SCH-0032	1		
DRL DWG:	S2-DRL-0032						
PCB DWG:	S2-PC-0032		SCALE:	FILE NAME	Sheet 4 of 25		
P04 POWER SUPPLIES 3 OF 3.SchDoc							

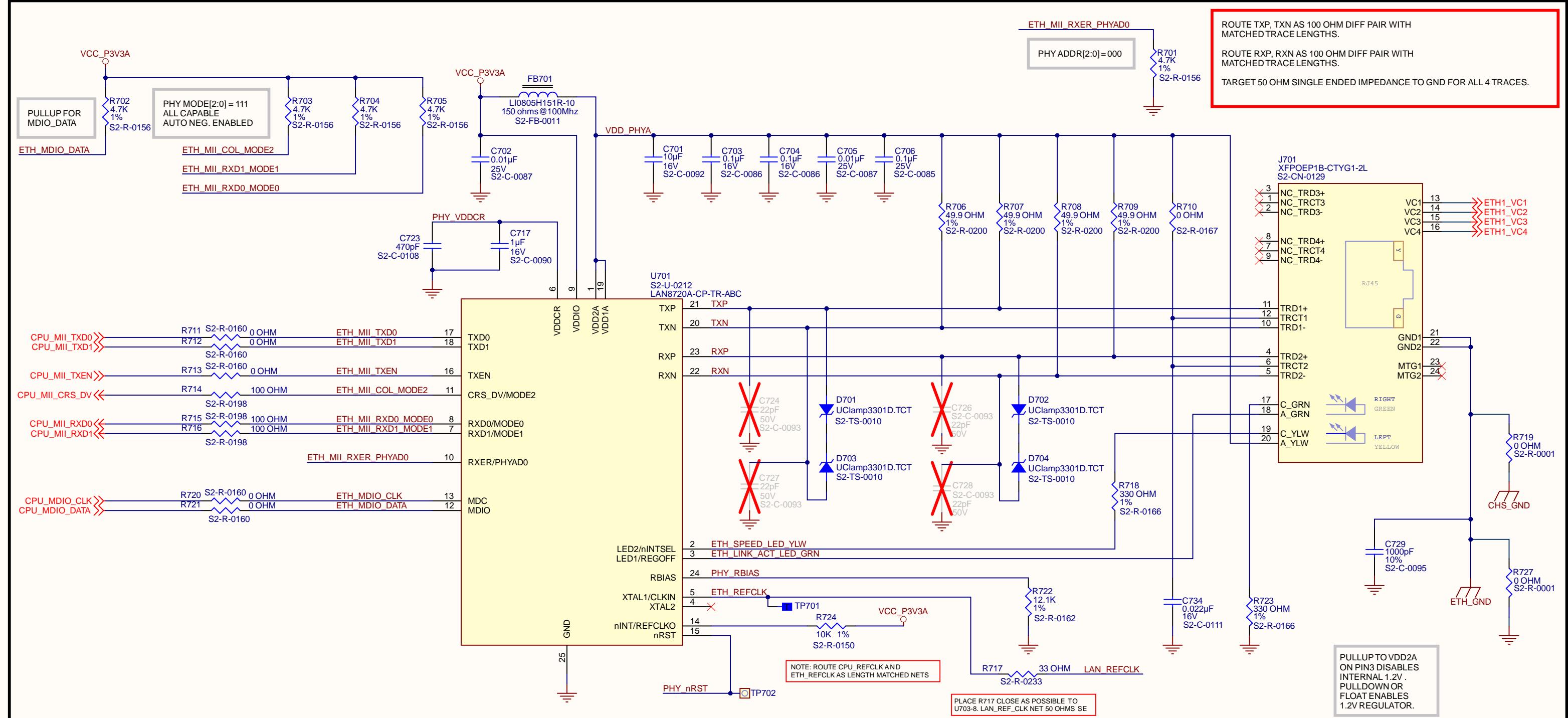


ECO #	REVISION	DESCRIPTION	DATE	APPROVED
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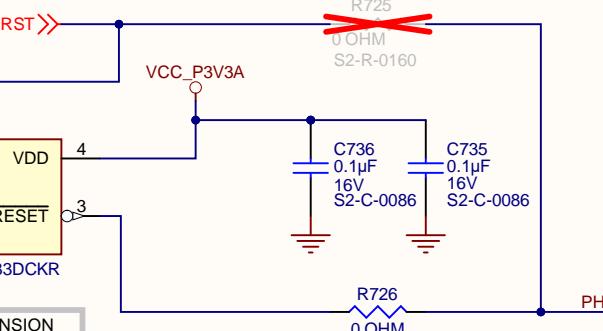


APPROVALS	DATE	PROJECT	LENEL-S2
ENG: S. Comeau		MNP V3	LenelS2 LenelS2 1 Speen Street Framingham, MA 01701
CHK: T. Bresnahan			
REFERENCE DOCUMENTS			LENEL-S2
BOM: BOM S2-PC-0032 date		TITLE	MNP V3
ASSY DWG: S2-ASY-0032			STM32MP1 BOOT, JTAG, eMMC
DRL DWG: S2-DRL-0032		SIZE	B
PCB DWG: S2-PC-0032		DWG NO	S2-SCH-0032
SCALE:	FILE NAME	REV	1
P06 STM32MP1 BOOT eMMC JTAG.SchDoc			
6	OF	25	

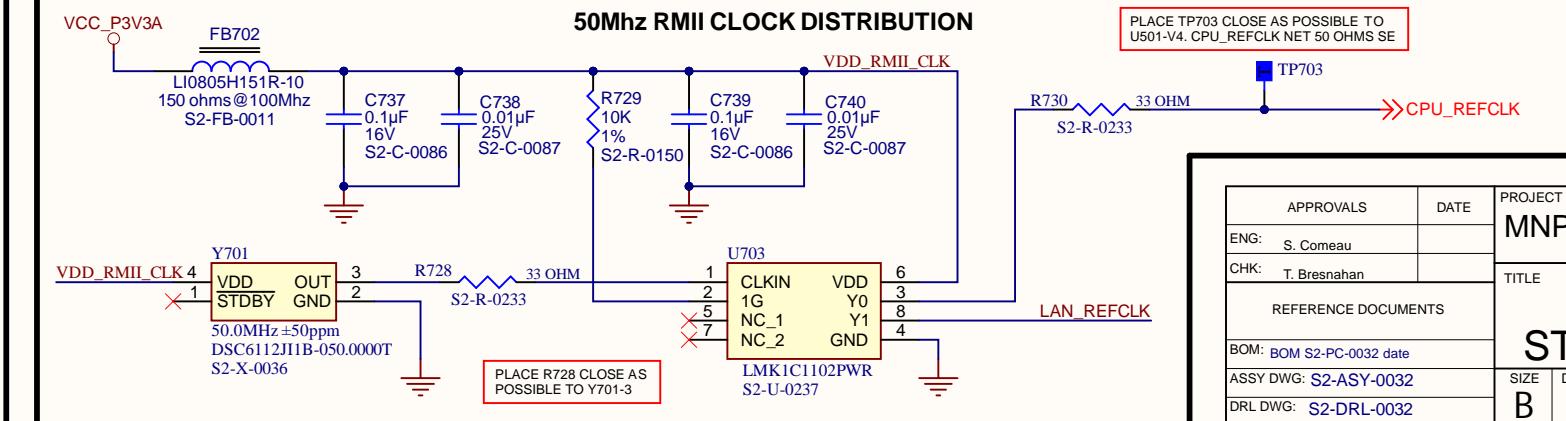
## ETHERNET 10/100



## PHY RESET EXTENDER

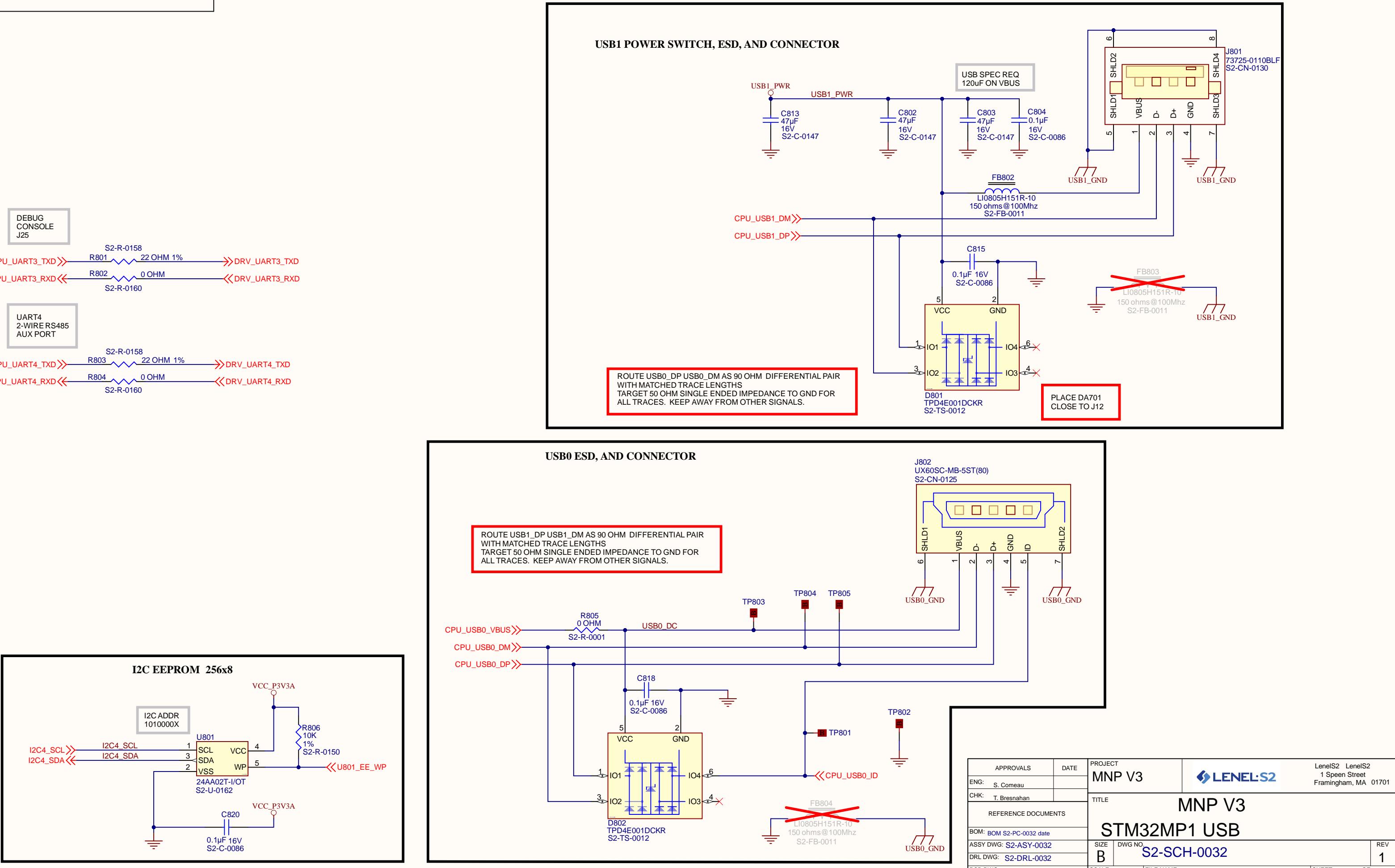


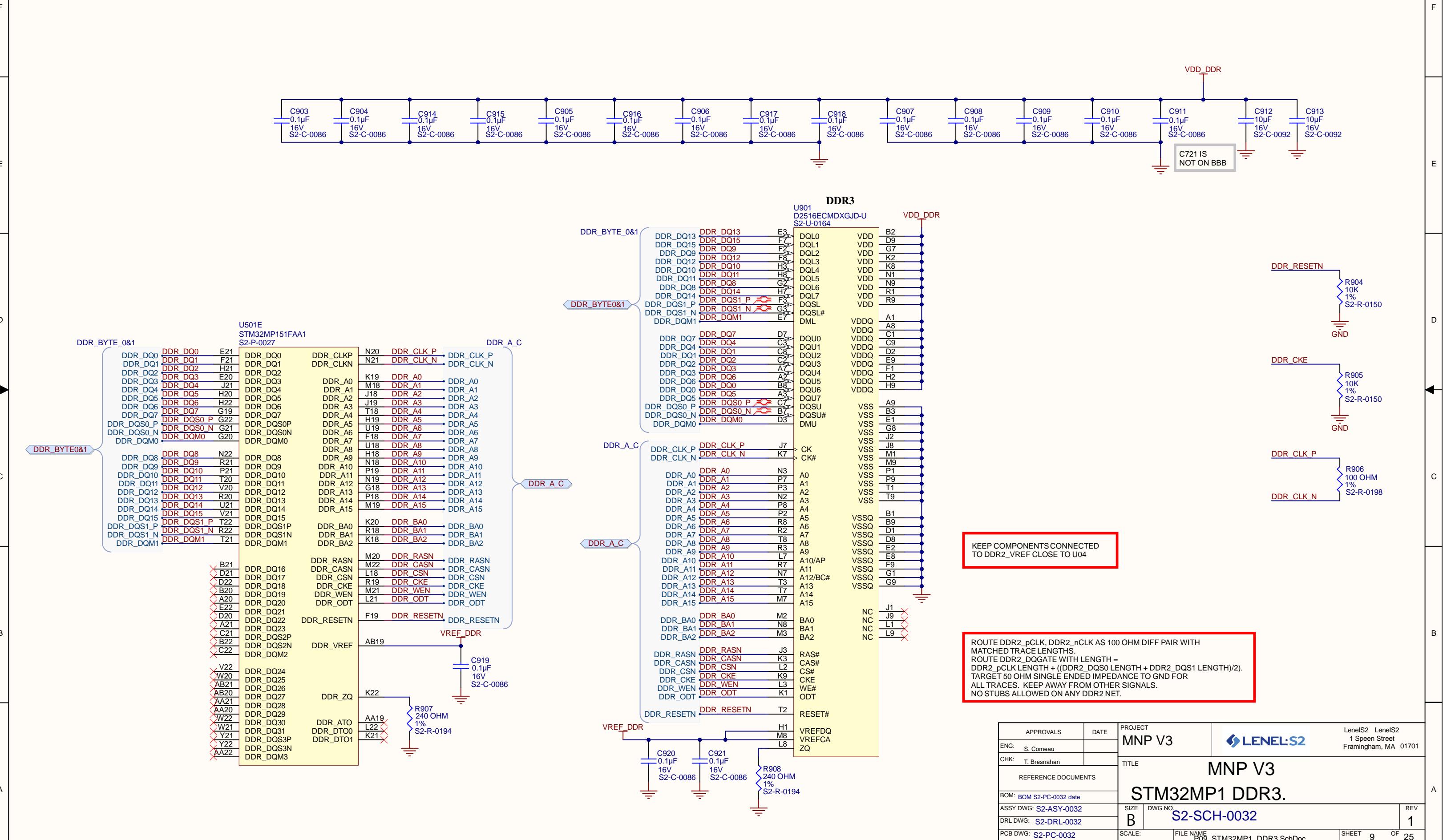
## 50Mhz RMII CLOCK DISTRIBUTION



APPROVALS		DATE	PROJECT
ENG:	S. Comeau		MNP V3
CHK:	T. Bresnahan		<b>LENEL-S2</b>
REFERENCE DOCUMENTS			
BOM: BOM_S2-PC-0032 date			
ASSY DWG: S2-ASY-0032			
DRL DWG: S2-DRL-0032			
PCB DWG: S2-PC-0032			
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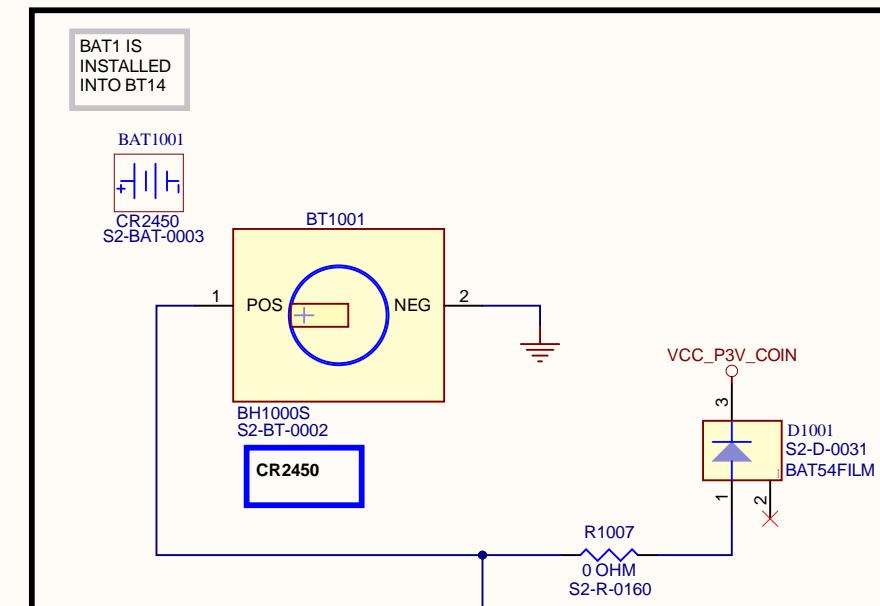
**MNP V3**  
**STM32MP1 ETHERNET**



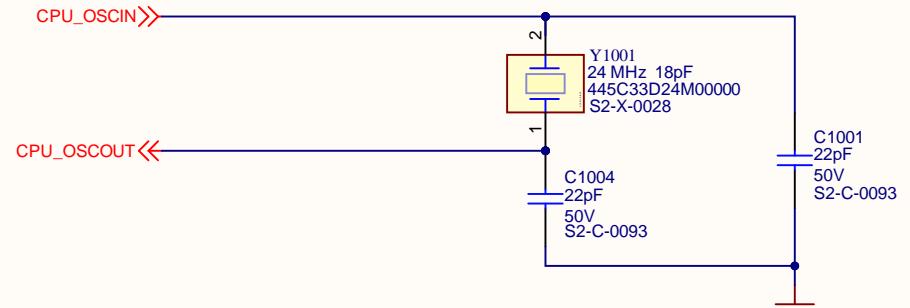


APPROVALS		DATE	PROJECT	LENEL-S2					
ENG:	S. Comeau		MNP V3						
CHK:	T. Bresnahan		TITLE						
REFERENCE DOCUMENTS									
BOM:	BOM: S2-PC-0032 date								
ASSY DWG:	ASSY DWG: S2-ASY-0032								
DRL DWG:	DRL DWG: S2-DRL-0032								
PCB DWG:	PCB DWG: S2-PC-0032								
SCALE:	FILE NAME: P09 STM32MP1 DDR3.SchDoc								
SHEET	9 OF 25								
REV	1								

## BATTERY BACKED UP RTC POWER SUPPLY



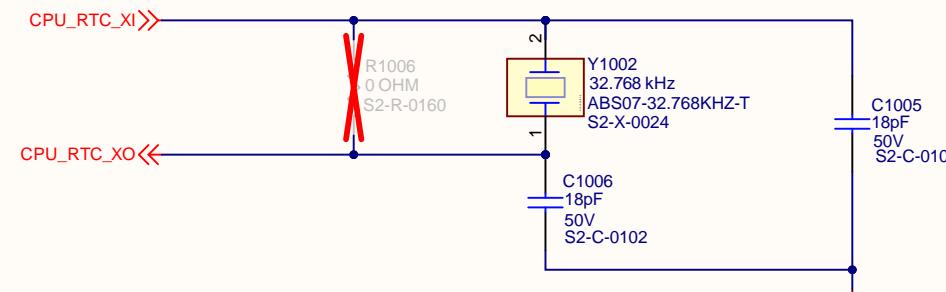
## CRYSTAL CIRCUITS



TWO RESISTORS ARE OPTIONAL IF CRYSTAL CIRCUIT TWEAKING IS NECESSARY

24MHz CRYSTAL SPECS AS PER DATASHEET SPRS717F APRIL 2013 CAPS 12pF-24pF (18pF EVM). SHUNT 5pF MAX FREQ TOL 50PPM MAX FREQ STABILITY 50PPM MAX ESR 48 OHM MAX

ALL EVMs USE CRYSTALS WITH 18pF LOAD CAP (NOT SPEC'D)  
 $((22*22)/(22+22))+5pF = 16pF$   
ESTIMATE 5pF in PCB EQUATION RESULT CLOSE TO 18pF

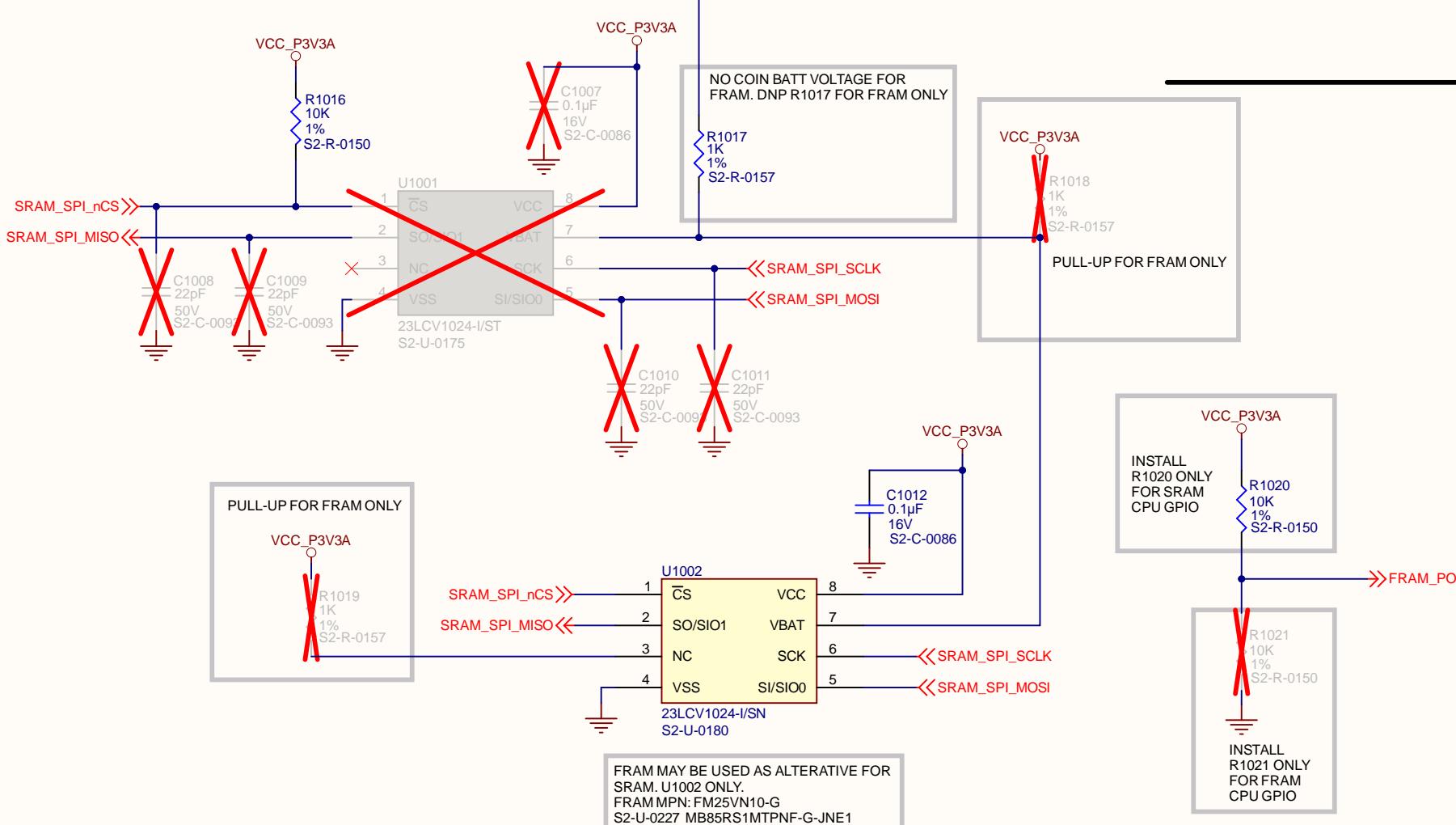


TWO RESISTORS ARE OPTIONAL IF CRYSTAL CIRCUIT TWEAKING IS NECESSARY

32.768KHz CRYSTAL SPECS AS PER DATASHEET SPRS717F APRIL 2013 CAPS 12pF-24pF (18pF EVM). SHUNT 1.5pF MAX FREQ TOL 20PPM MAX FREQ STABILITY 20PPM MAX (MAX ERROR 10.512 MIN/YR) ESR 80 KOHM MAX

ALL EVMs USE CRYSTALS WITH 12.5pF LOAD CAP (NOT SPEC'D)

## BATTERY BACKED UP SPI SRAM BUFFER 1024-BIT(128KB) FRAM OPTIONAL

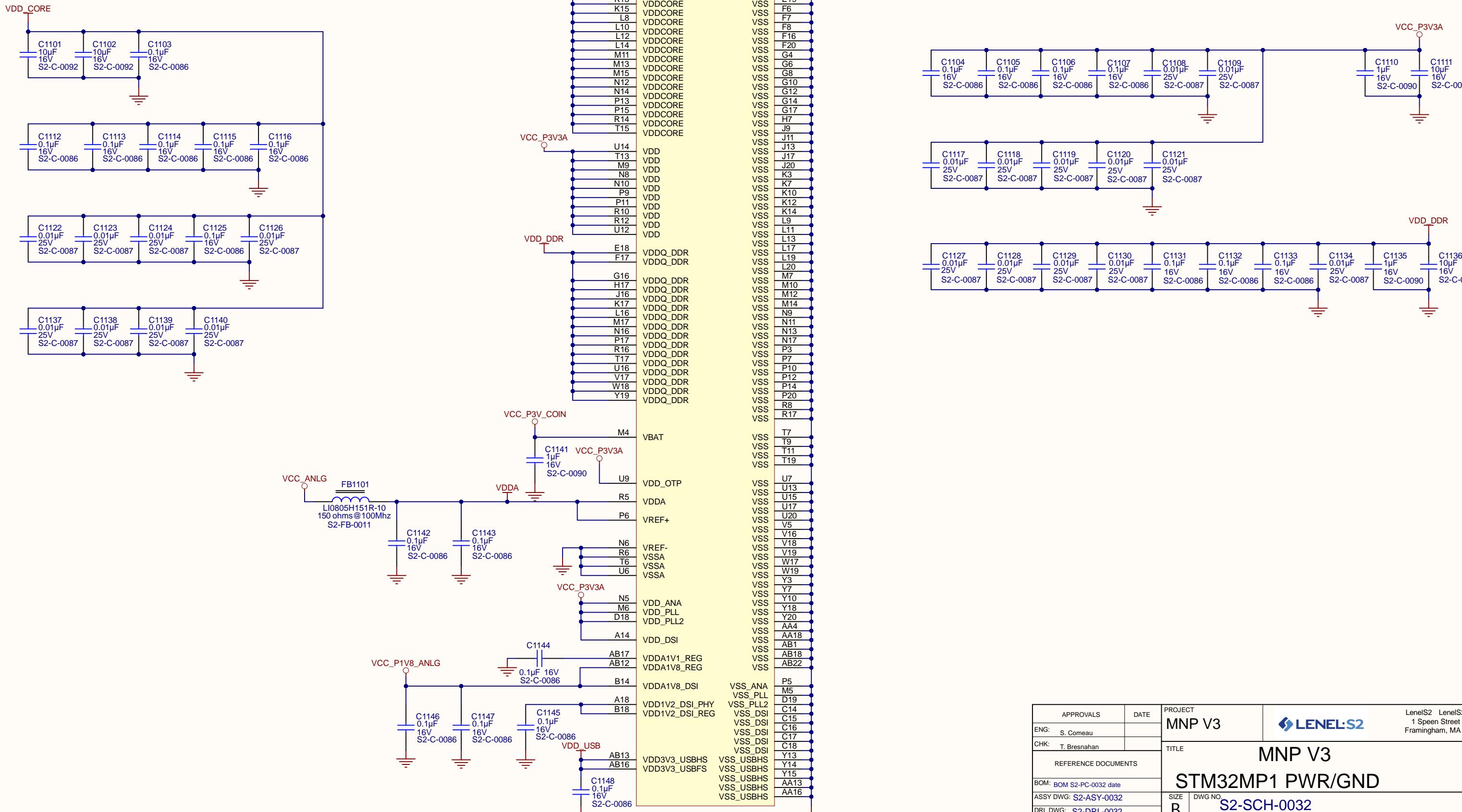


APPROVALS	DATE	PROJECT	Carrier Lenel'S2
ENG: S. Comeau		MNP V3	1 Speen Street Framingham, MA 01701
CHK: T. Bresnahan		LENEL'S2	
REFERENCE DOCUMENTS			
BOM: BOM S2-PC-0032 date			
ASSY DWG: S2-ASY-0032			
DRL DWG: S2-DRL-0032			
PCB DWG: S2-PC-0032			
SCALE:	FILE NAME: P10 STM32MP1_XTAL_RTC.SchDoc	SHEET 10 OF 25	REV 1

THIS DOCUMENT AND THE DATA DISCLOSED HEREIN OR HEREWITH IS THE PROPERTY OF CARRIER LENELS2.

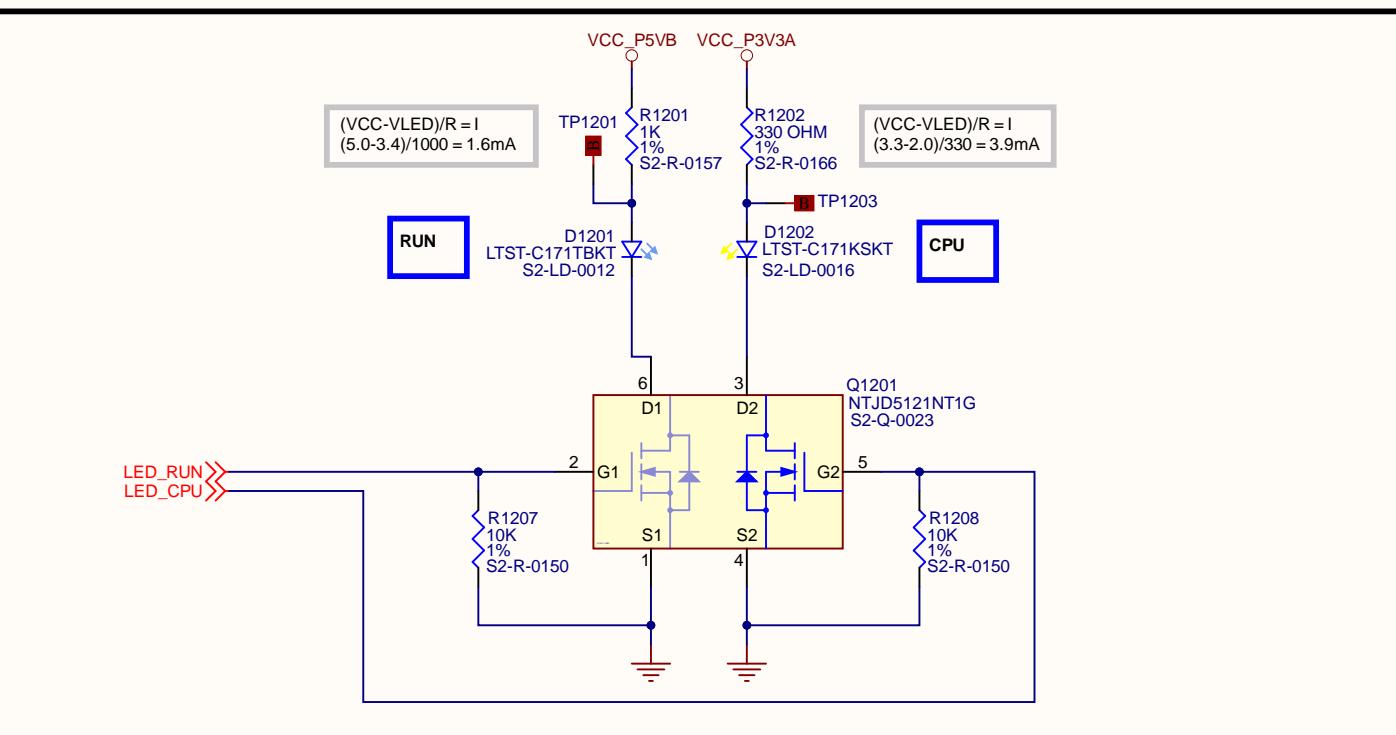
ECO #	REVISION	DESCRIPTION	DATE	APPROVED
*	1	Release to EGS		

## STM32MP1 POWER, GROUND, BYPASS CAPS

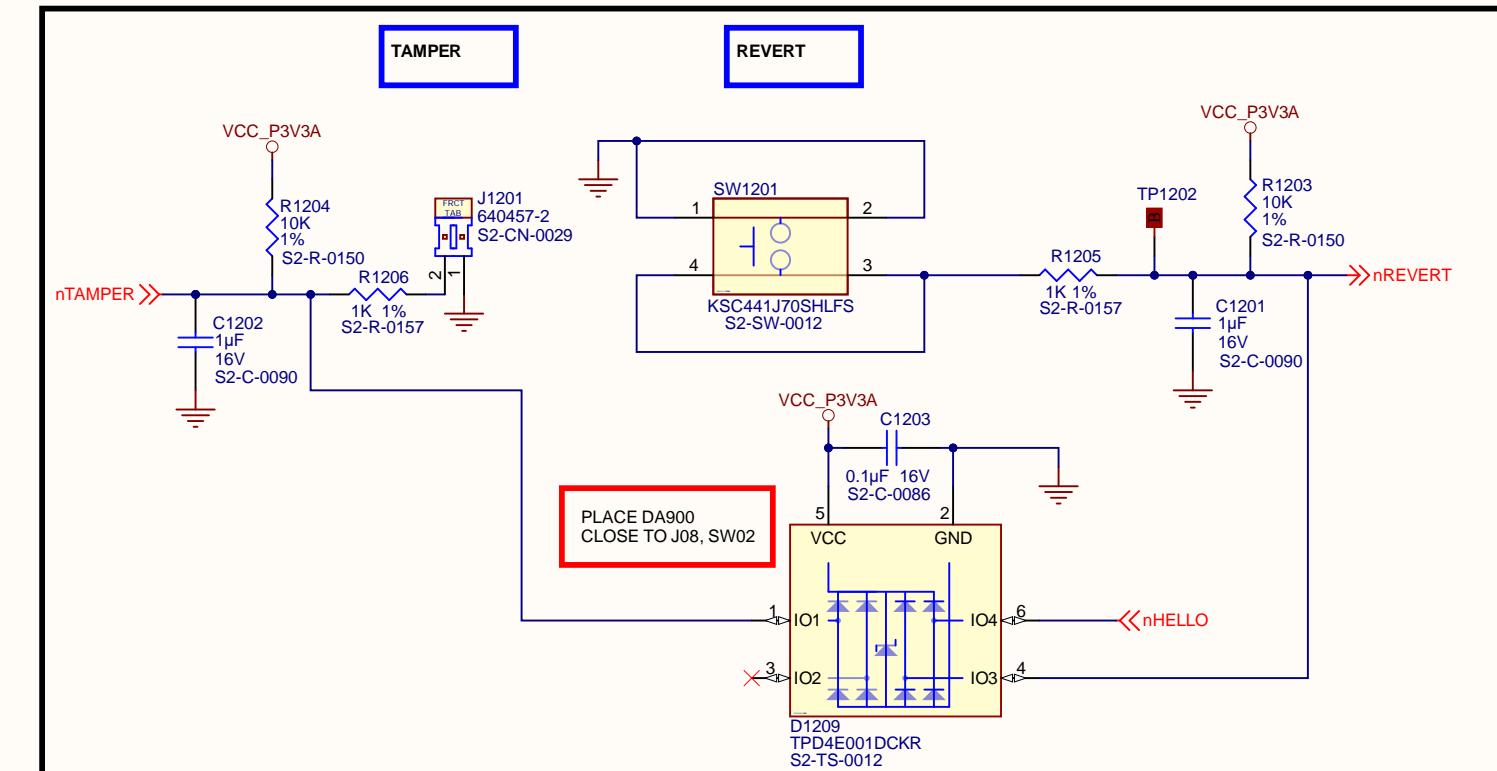


APPROVALS	DATE	PROJECT MNP V3	 LENEL-S2	LenelS2 1 Speen Street Framingham, MA 01701
ENG: S. Comeau				
CHK: T. Bresnahan				
REFERENCE DOCUMENTS		TITLE MNP V3 STM32MP1 PWR/GND		
BOM: <a href="#">BOM S2-PC-0032 date</a>		SIZE B	DWG NO. <a href="#">S2-SCH-0032</a>	REV 1
ASSY DWG: <a href="#">S2-ASY-0032</a>		SCALE:	FILE NAME <a href="#">P11 STM32MP1_PWR_GND.SchDoc</a>	SHEET 11 OF 25
DRL DWG: <a href="#">S2-DRL-0032</a>				
PCB DWG: <a href="#">S2-PC-0032</a>				

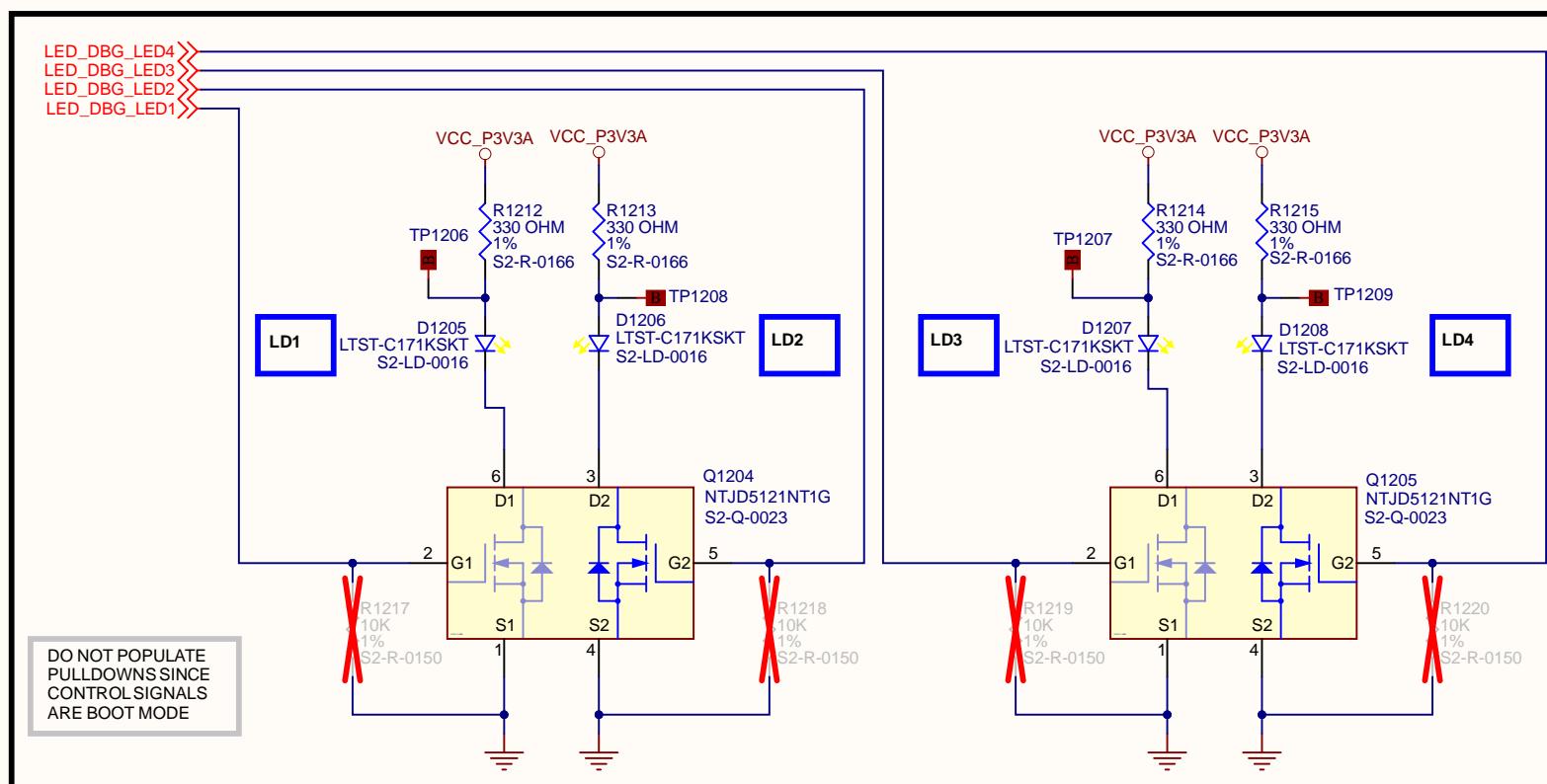
## STATUS LEDs



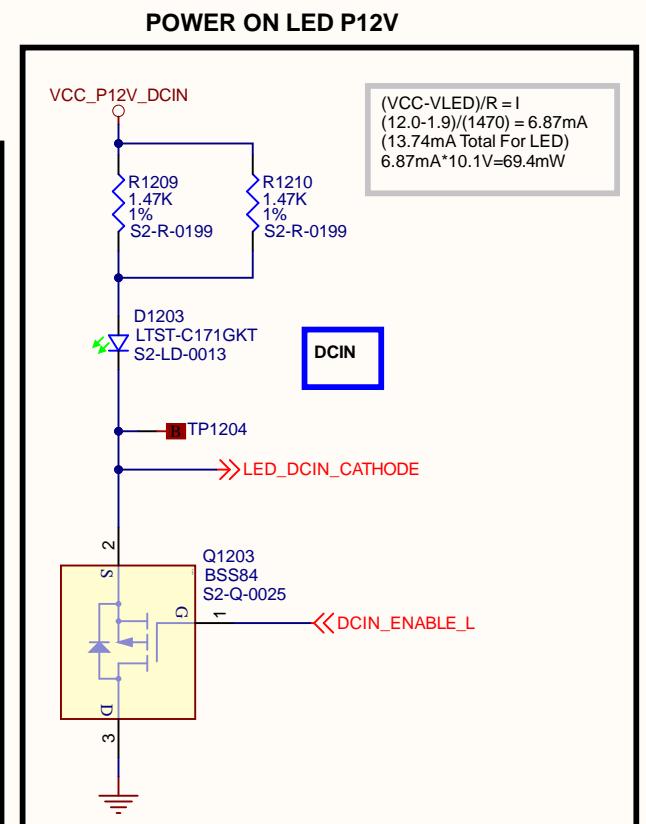
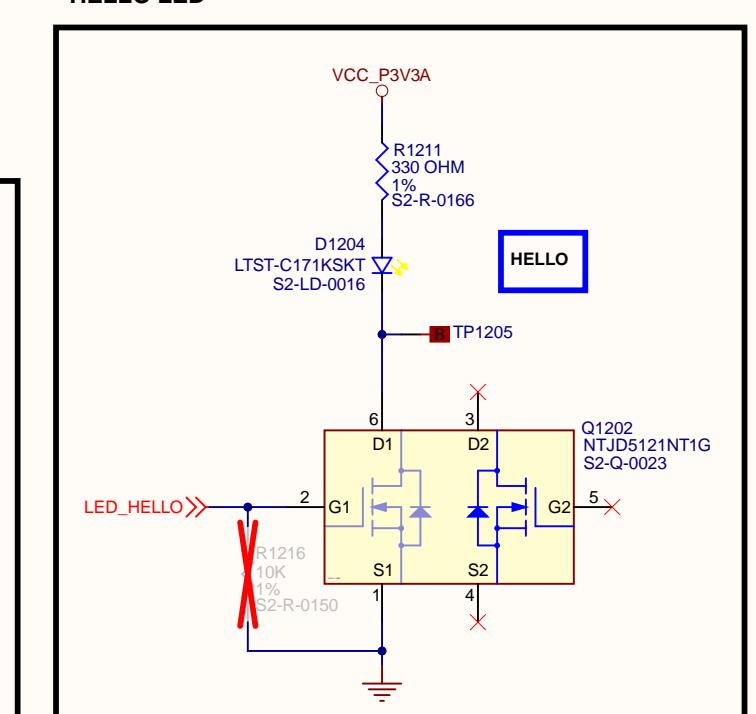
## TAMPER CONN AND REVERT SWITCH



## DEBUG LEDs



## HELLO LED

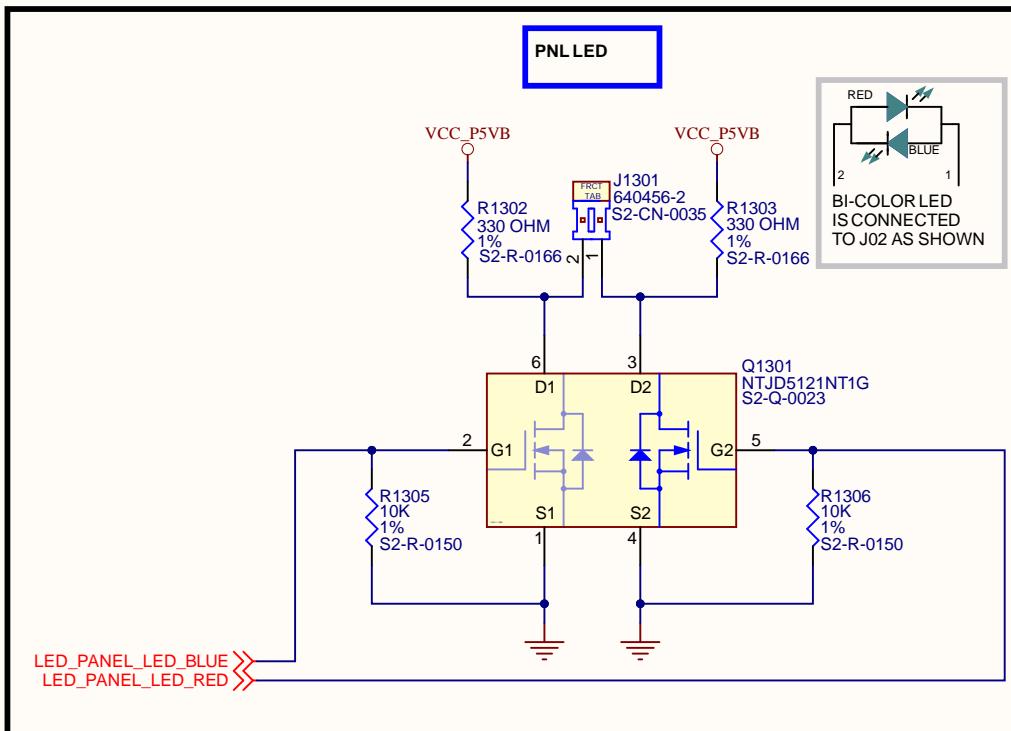


APPROVALS	DATE	PROJECT	LENEL-S2	
ENG:	S. Comeau	MNP V3	LENEL-S2	
CHK:	T. Bresnahan	1 Speen Street		
REFERENCE DOCUMENTS				
BOM:	BOM S2-PC-0032 date	SIZE	DWG NO	
ASSY DWG:	S2-ASY-0032	B	S2-SCH-0032	
DRL DWG:	S2-DRL-0032	REV	1	
PCB DWG:	S2-PC-0032	SCALE:	FILE NAME	
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			Sheet 12 of 25	

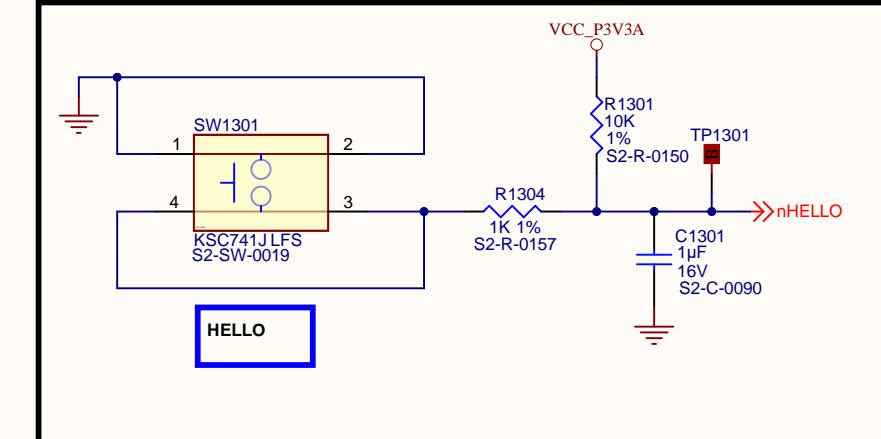
THIS DOCUMENT AND THE DATA DISCLOSED HEREIN  
HEREWITH IS THE PROPERTY OF CARRIER LENELSS

ECO #	REVISION	DESCRIPTION	DATE	APPROVED
*	1	Release to ECS		

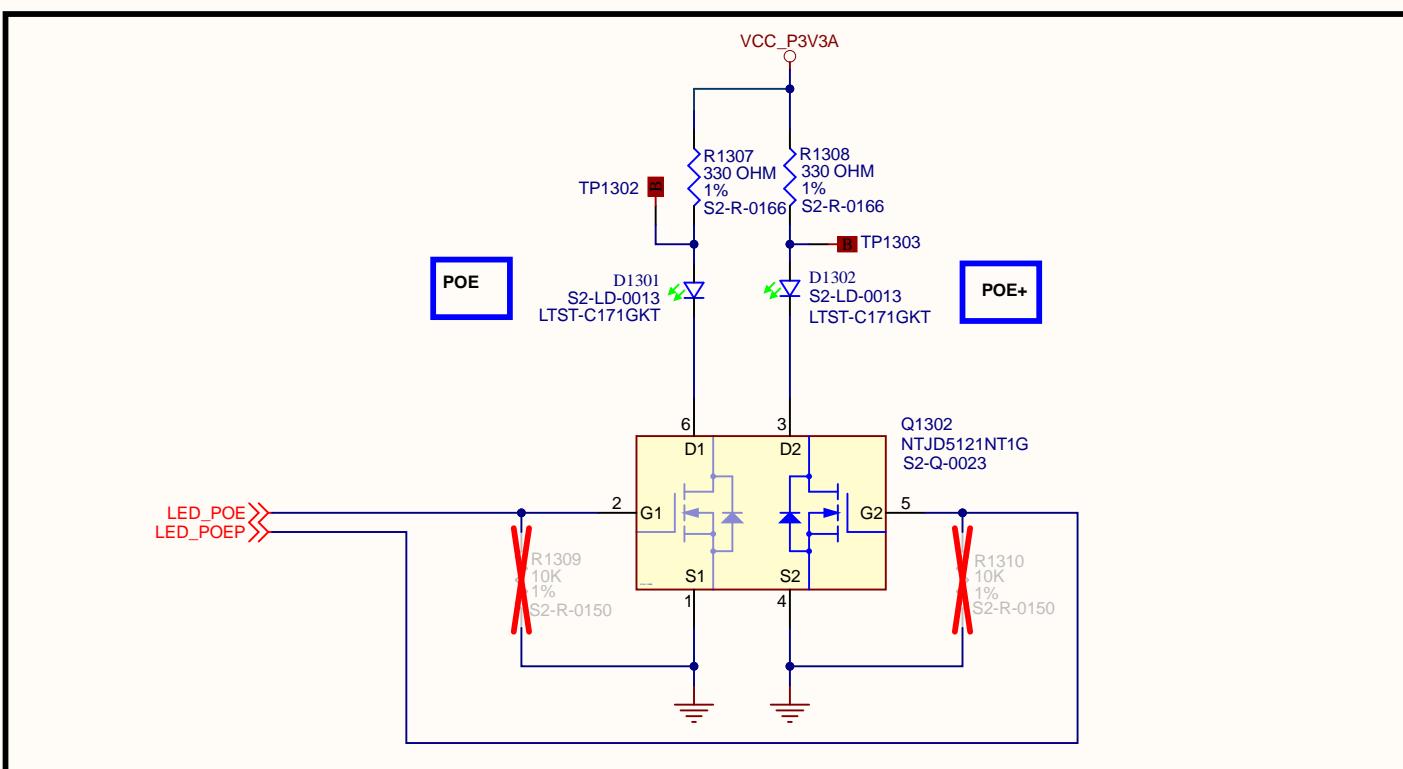
PANEL LED



## HELLO BUTTOM

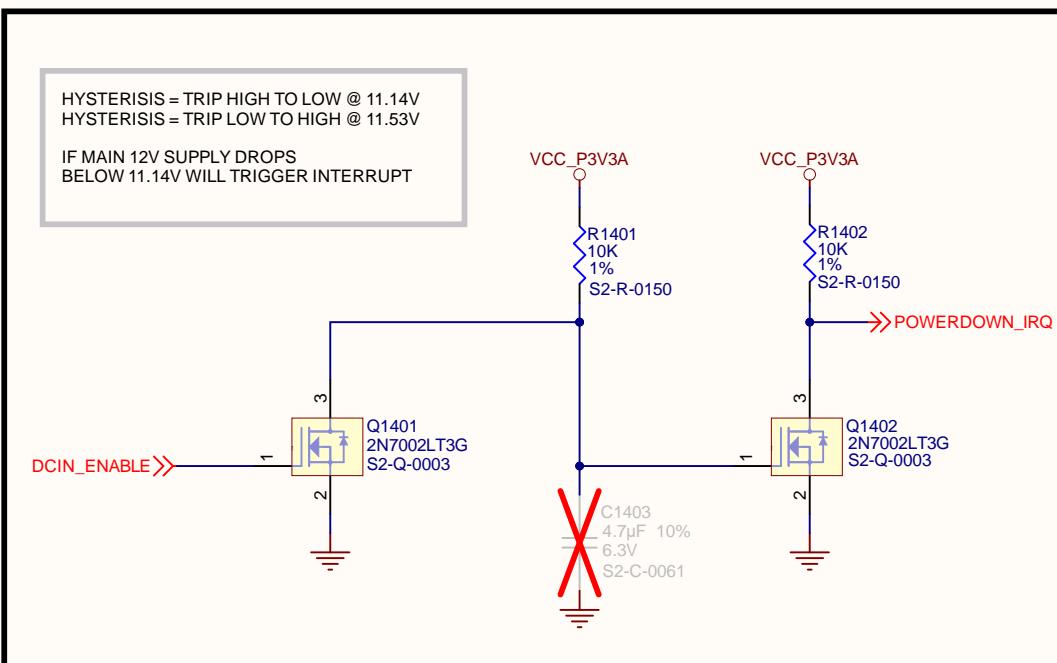


POE AND POE+ LEDS CPU SW CONTROLLI

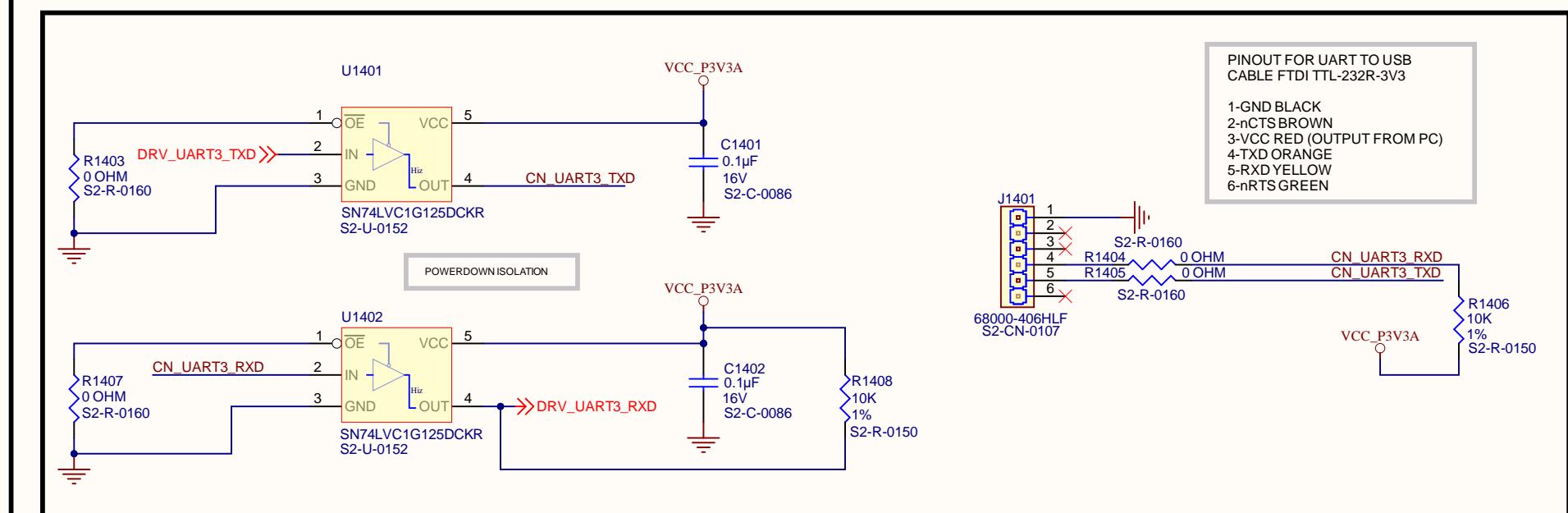


APPROVALS	DATE	PROJECT <b>MNP V3</b>		Carrier LelenS2 1 Speen Street Framingham, MA 01701
ENG: S. Comeau				 LENEL:S2
CHK: T. Bresnahan		TITLE		<b>MNP V3</b>
REFERENCE DOCUMENTS		<b>LEDS BUTTONS PAGE 2</b>		
BOM: BOM S2-PC-0032 date		SIZE	DWG NO.	REV
ASSY DWG: S2-ASY-0032		B	<b>S2-SCH-0032</b>	1
DRL DWG: S2-DRL-0032				
PCB DWG: S2-PC-0032		SCALE:	FILE NAME	SHEET 13 OF 25
			P13.LEDS.BUTTONS.PAGE.2.SchDoc	

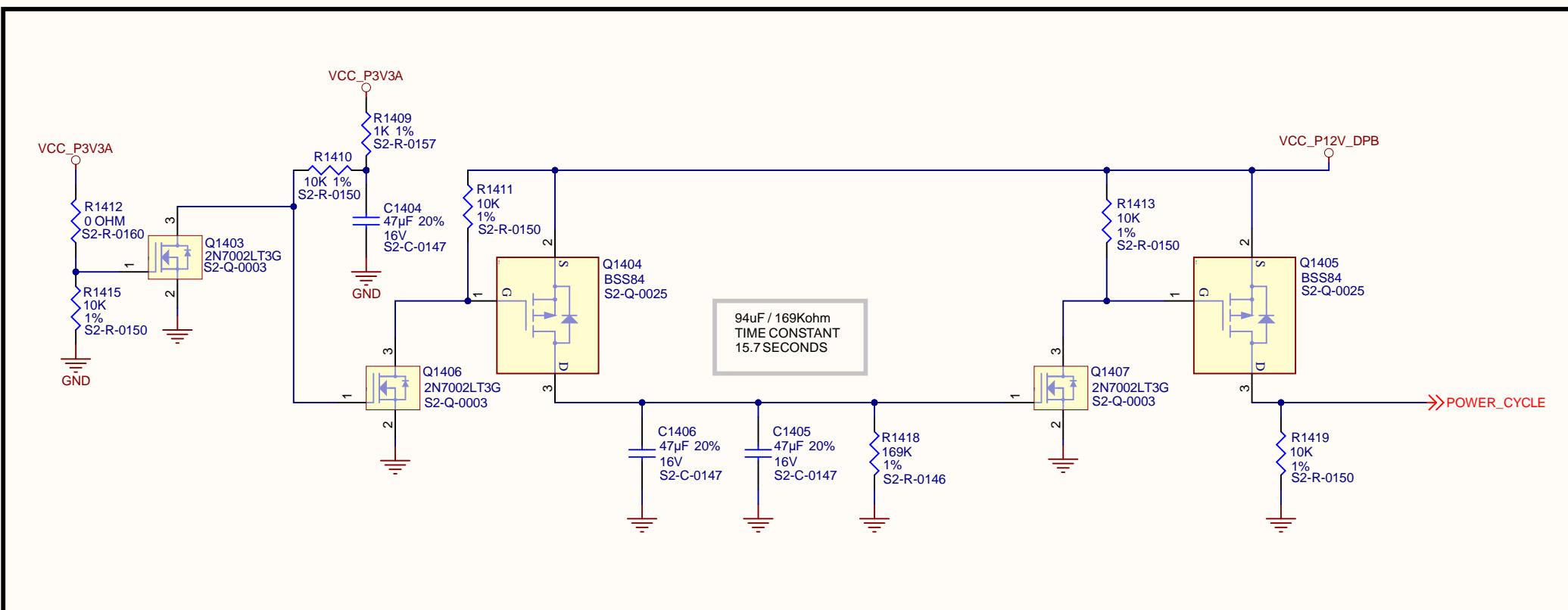
## POWERDOWN INTERRUPT CIRCUIT



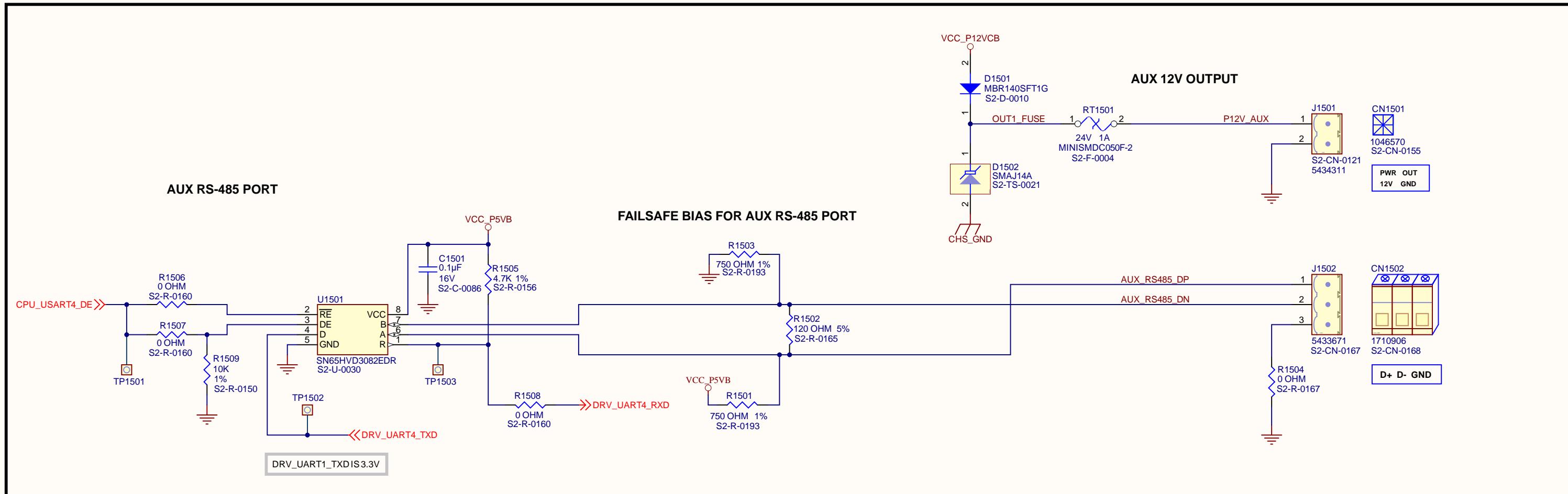
## POWERDOWN ISOLATION AND UART3 CONSOLE CONNECTOR



## POWER CYCLE CONTROL

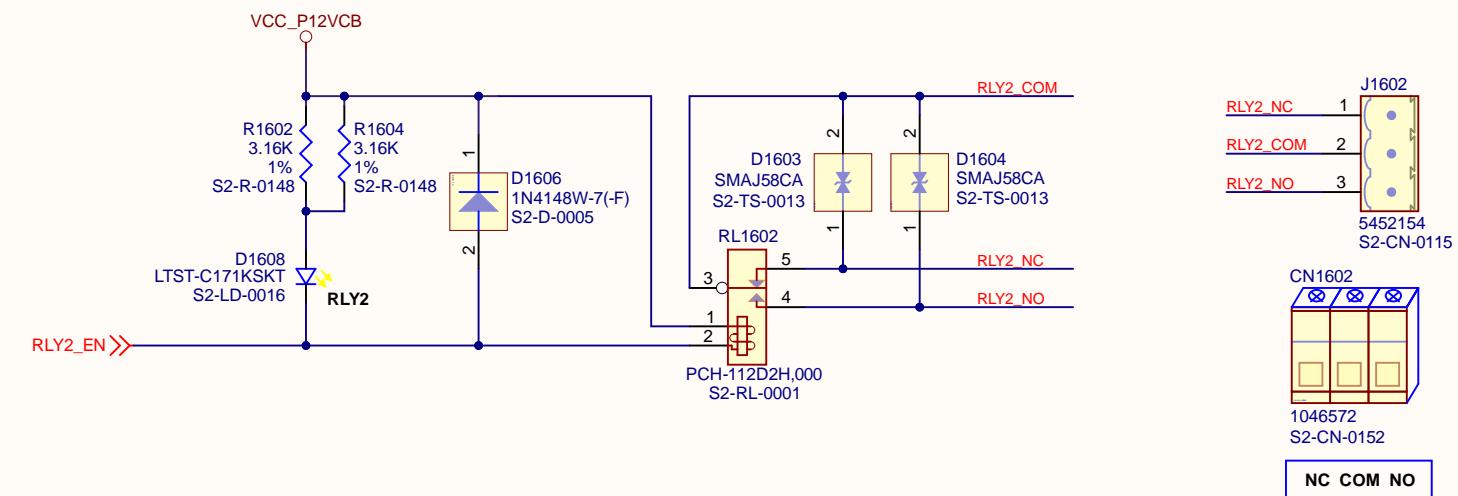
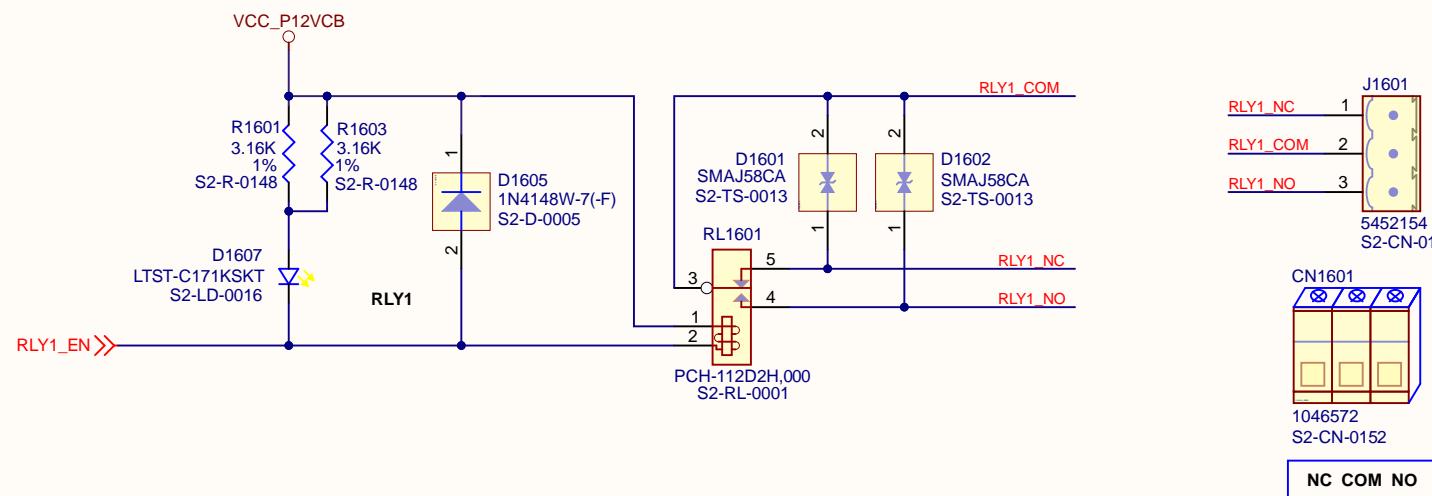


APPROVALS	DATE	PROJECT	LENEL'S2
ENG:	S. Comeau	MNP V3	LENEL'S2
CHK:	T. Bresnahan	TITLE	
REFERENCE DOCUMENTS			
BOM:	BOM S2-PC-0032 date	SIZE	DWG NO
ASSY DWG:	S2-ASY-0032	B	S2-SCH-0032
DRL DWG:	S2-DRL-0032	REV	1
PCB DWG:	S2-PC-0032	SCALE:	FILE NAME P14_POWERDOWN_POWER_CYCLE.SchDoc
SHEET 14 OF 25			

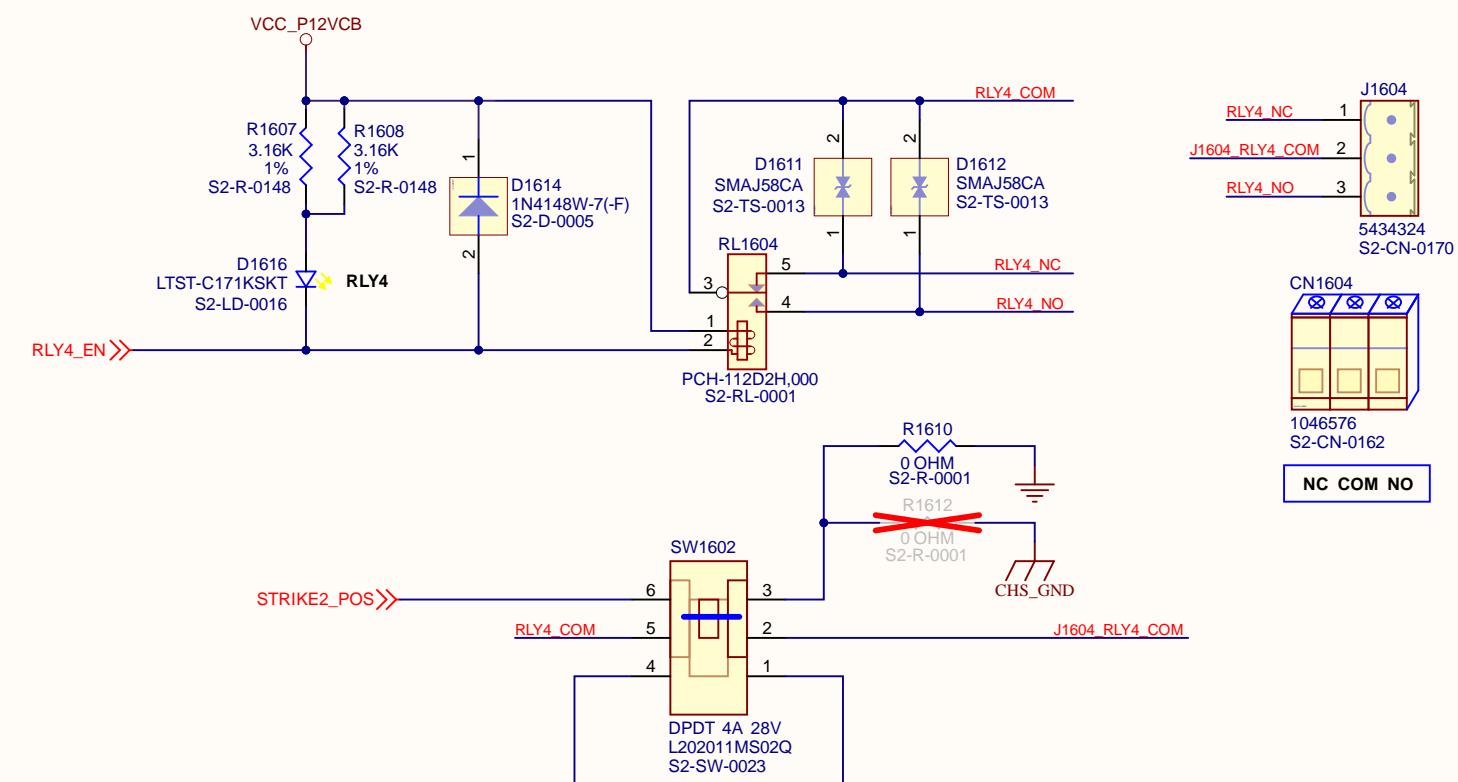
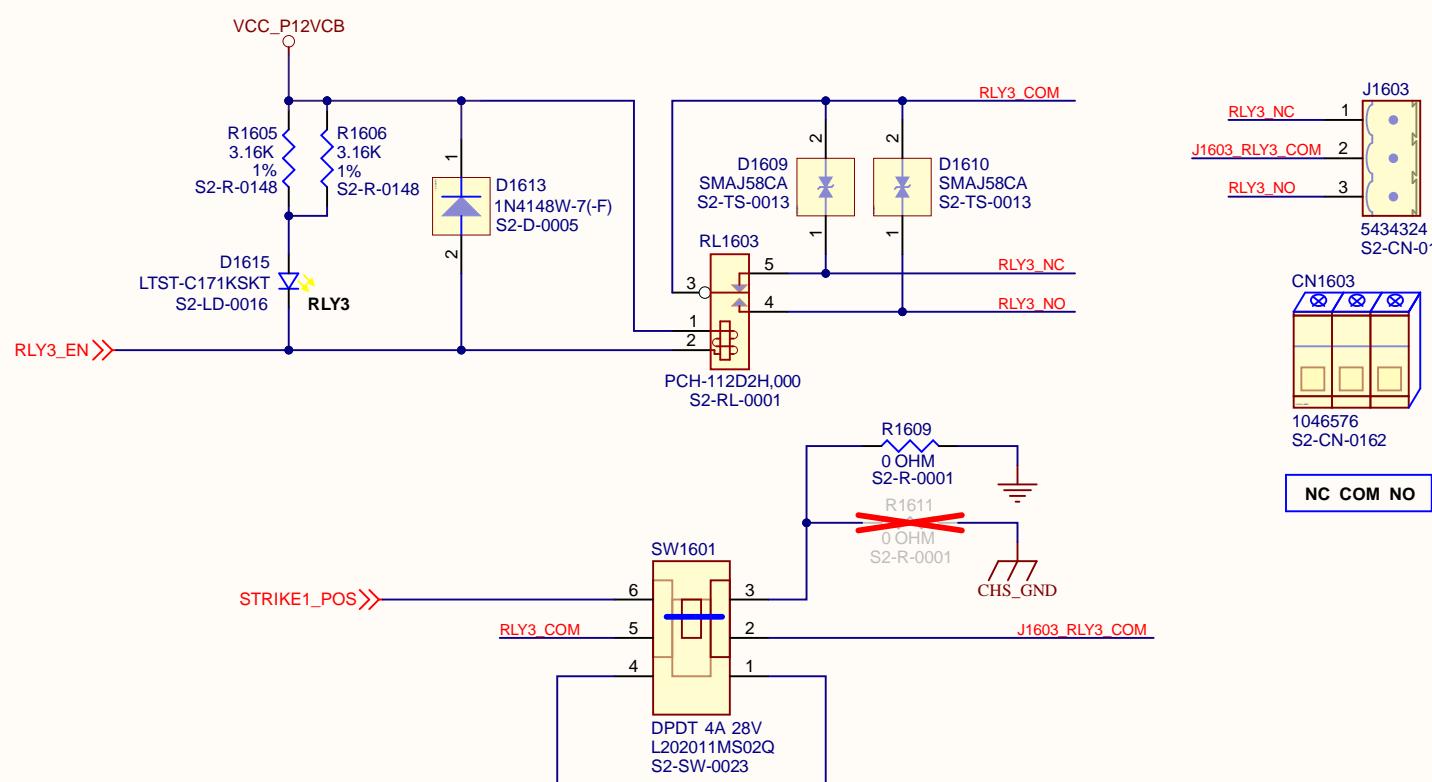


APPROVALS		DATE	PROJECT	MNP V3	LENEL-S2	LenelS2 LenelS2
ENG:	S. Comeau		CHK:	T. Bresnahan		1 Speen Street
REFERENCE DOCUMENTS						Framingham, MA 01701
BOM:	BOM S2-PC-0032 date		SIZE	DWG NO	S2-SCH-0032	REV
ASSY DWG:	S2-ASY-0032		B			1
DRL DWG:	S2-DRL-0032					
PCB DWG:	S2-PC-0032		SCALE:	FILE NAME	P15_RS485_AUX_IO_CONN.SchDoc	SHEET 15 OF 25

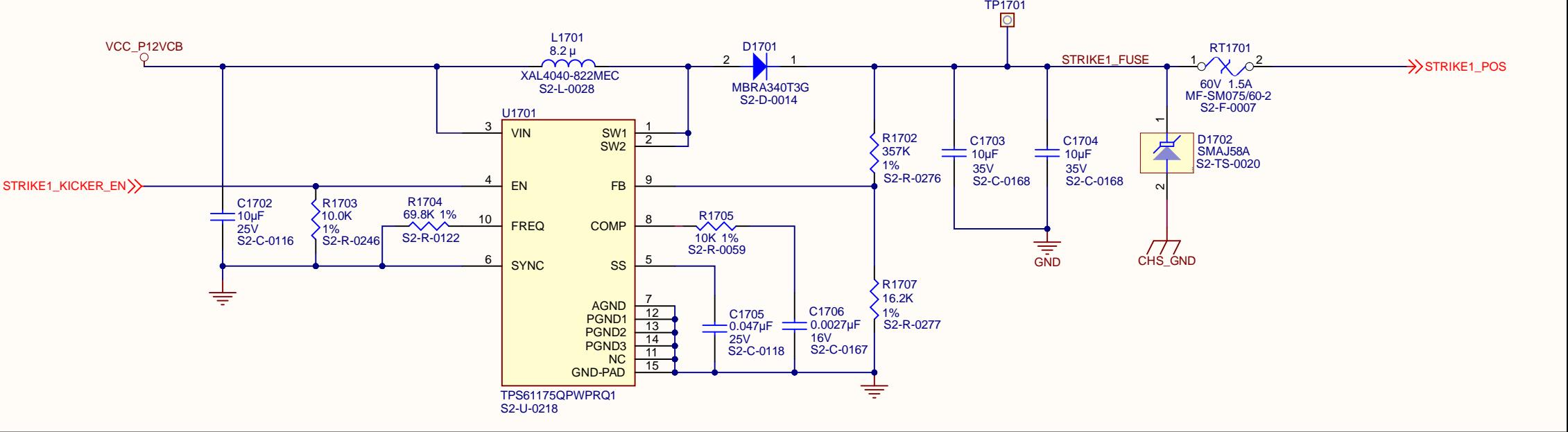
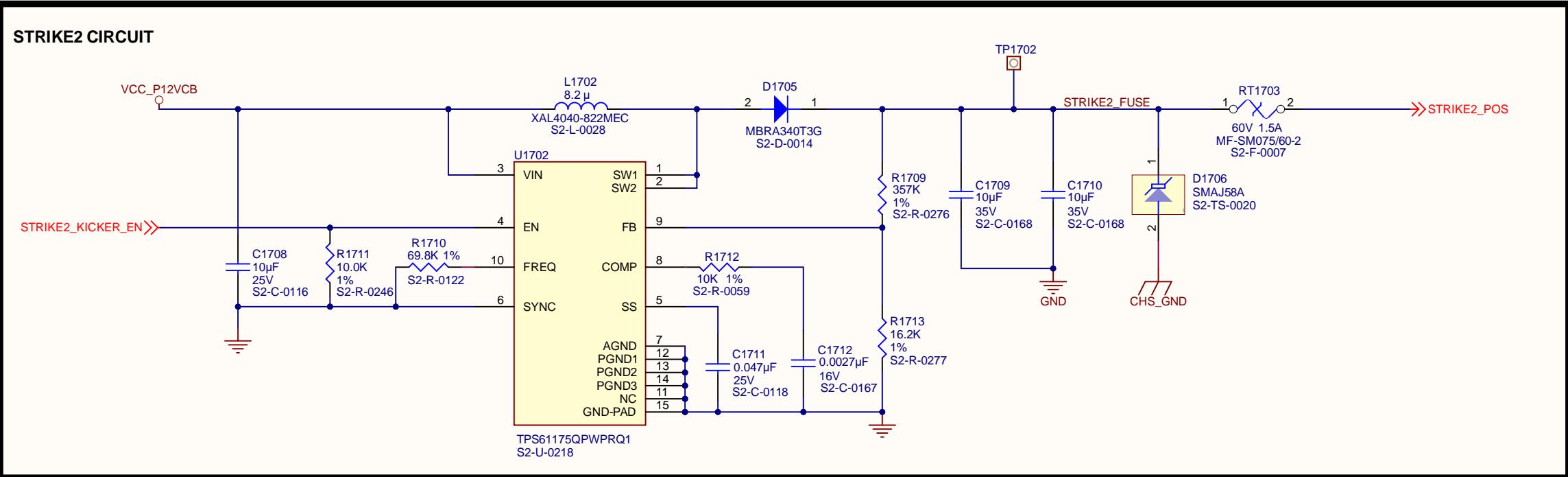
### DRY OUTPUT RELAYS 1 and 2



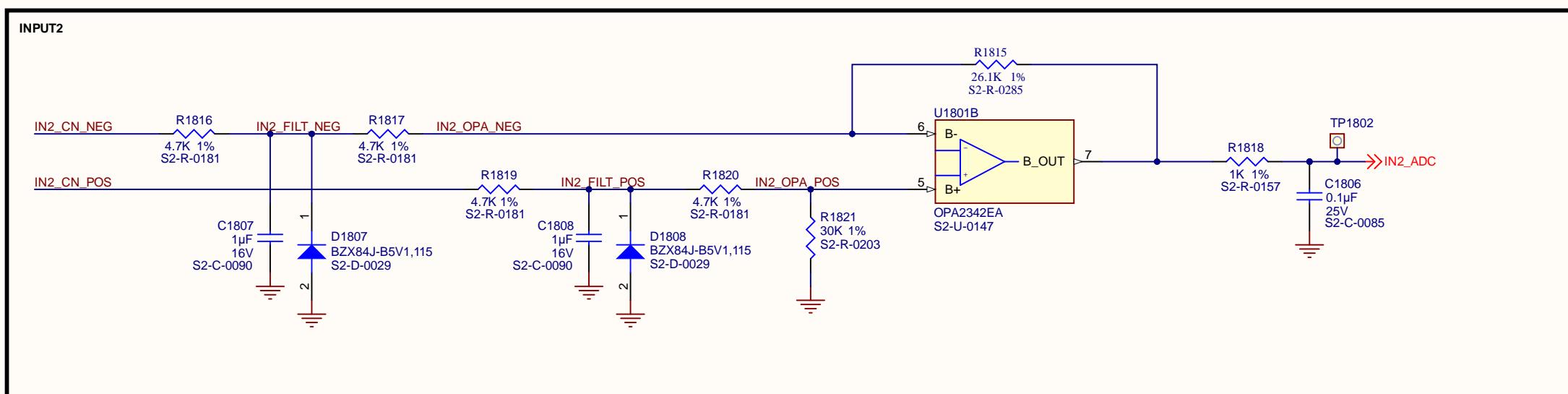
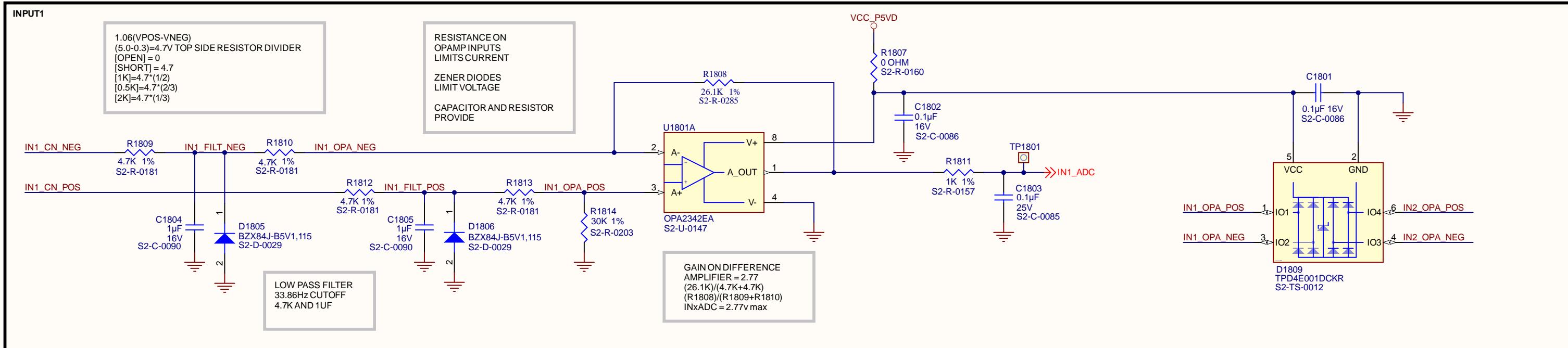
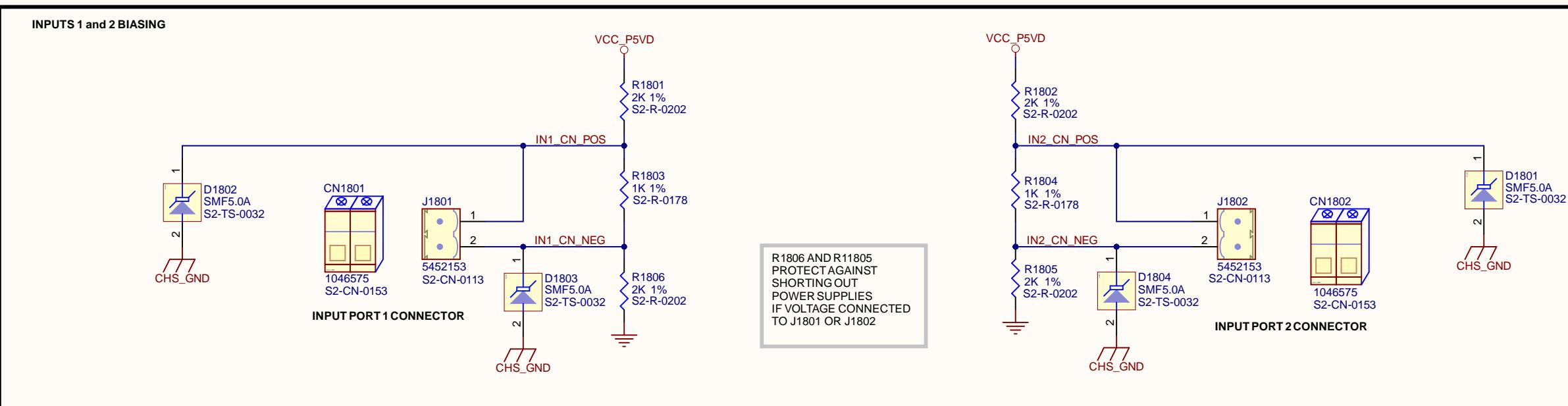
### WET/DRY OUTPUT RELAYS 3 and 4



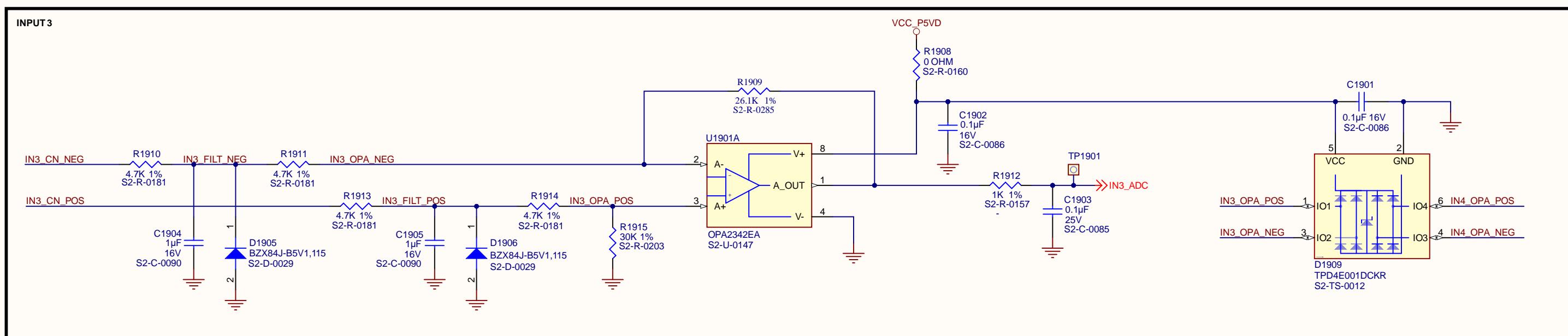
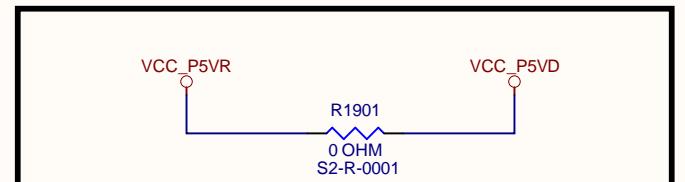
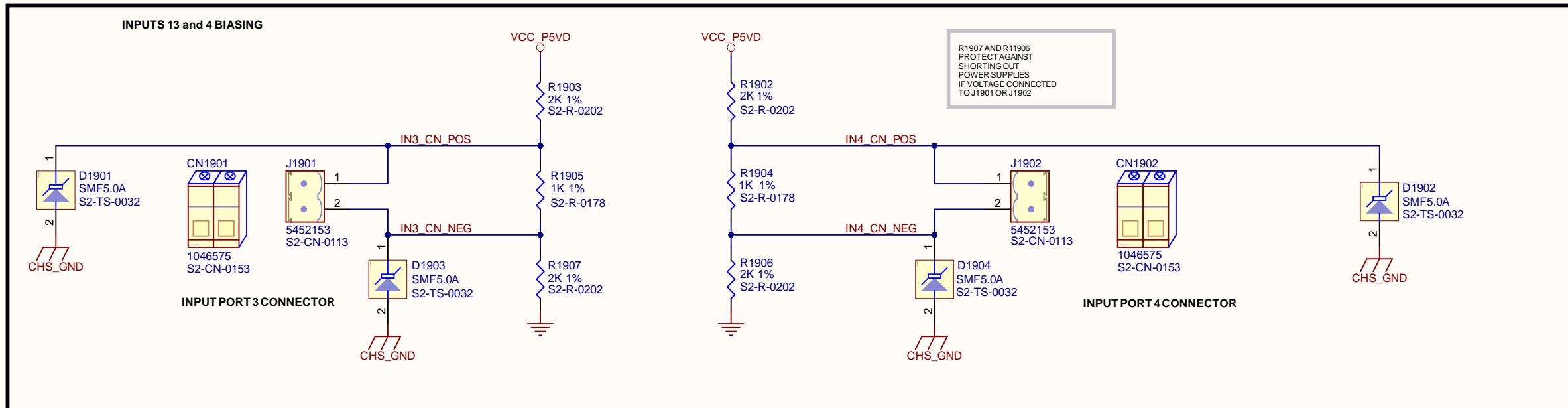
APPROVALS	DATE	PROJECT	MNP V3		Carrier Lenel's2
ENG: S. Comeau					1 Speen Street
CHK: T. Bresnahan					Framingham, MA 01701
REFERENCE DOCUMENTS					
BOM: BOM S2-PC-0032 date		TITLE	MNP V3		
ASSY DWG: S2-ASY-0032			OUTPUT RELAYS		
DRL DWG: S2-DRL-0032			SIZE	DWG NO	S2-SCH-0032
PCB DWG: S2-PC-0032			REV		1
SCALE:	FILE NAME	P16_OUTPUT_RELAYS.SchDoc	SHEET	16	OF 25

**STRIKE1 CIRCUIT****STRIKE2 CIRCUIT**

APPROVALS		DATE	PROJECT	LENEL-S2			
ENG:	S. Comeau		MNP V3	LENEL-S2			
CHK:	T. Bresnahan			1 Speen Street Framingham, MA 01701			
REFERENCE DOCUMENTS							
BOM: BOM S2-PC-0032 date							
ASSY DWG: S2-ASY-0032							
DRL DWG: S2-DRL-0032							
PCB DWG: S2-PC-0032							
SIZE	DWG NO	REV	MNP V3				
B	S2-SCH-0032	1	STRIKE POWER				
SCALE:	FILE NAME	17 OF 25	P17_STRIKE_POWER.SchDoc				

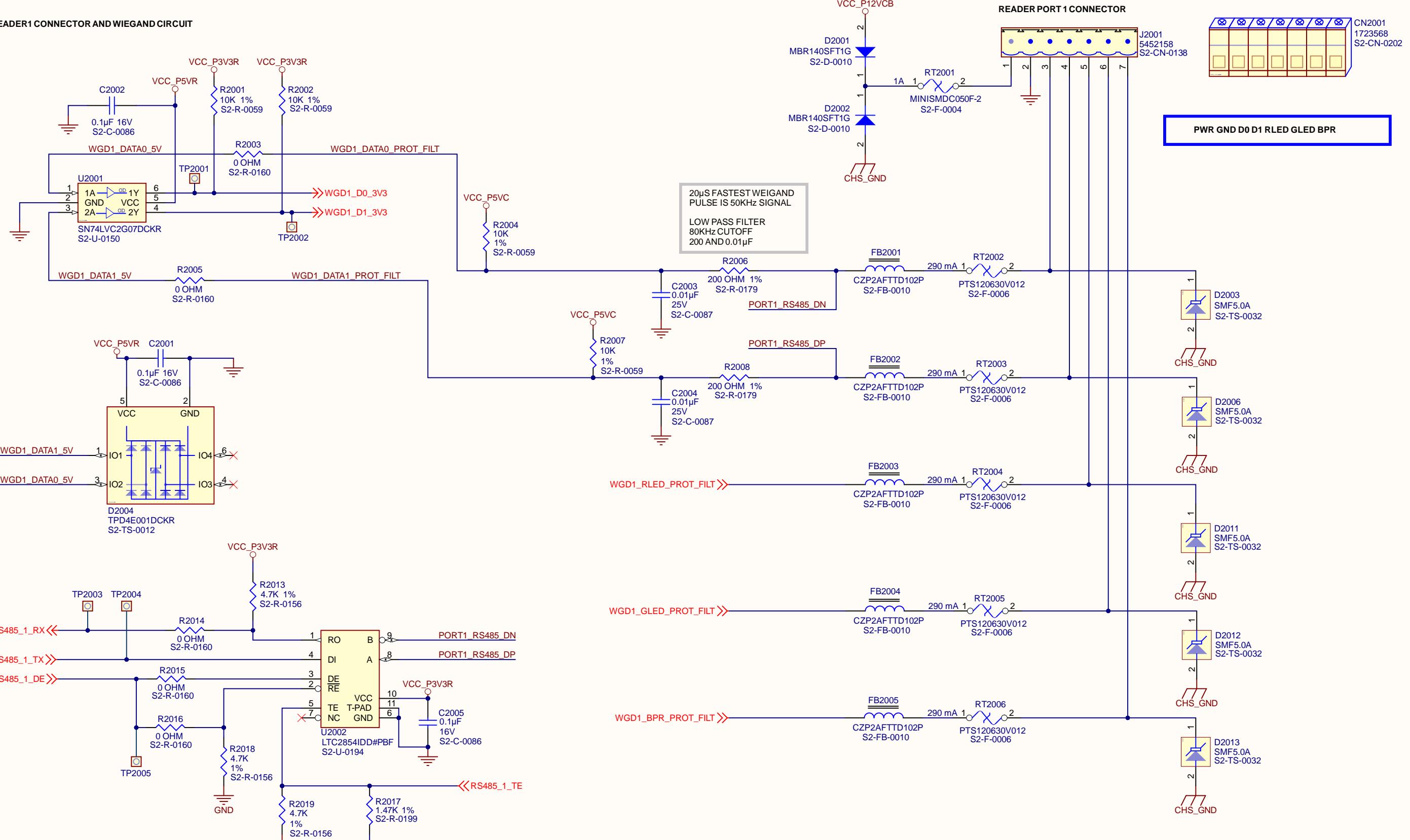
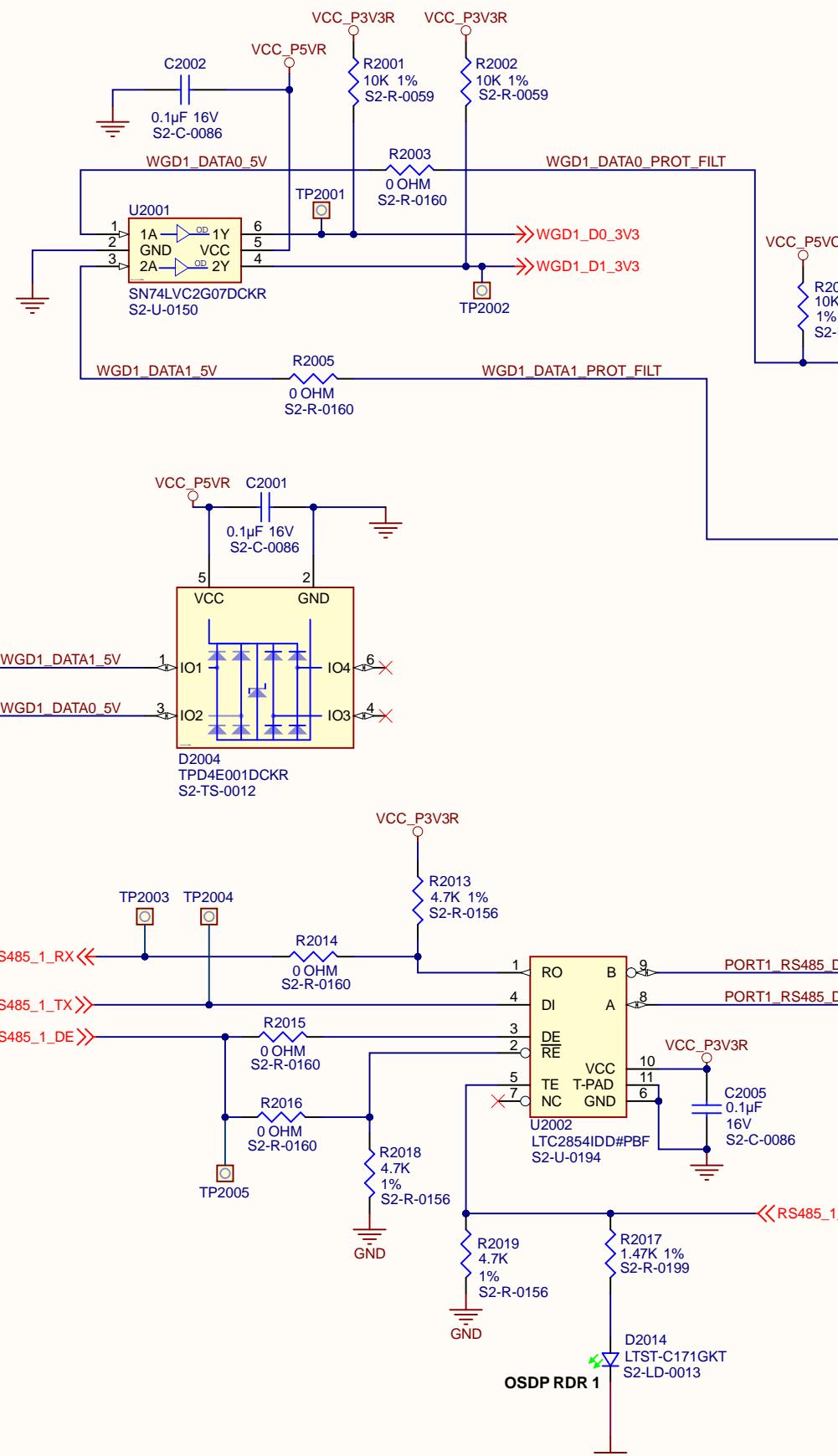


APPROVALS	DATE	PROJECT	Carrier Lenel's2
ENG: S. Comeau		MNP V3	<b>LENEL'S2</b>
CHK: T. Bresnahan		TITLE	MNP V3
REFERENCE DOCUMENTS		BOM:	BOM: S2-PC-0032 date
BOM: BOM: S2-PC-0032 date		ASSY DWG:	S2-ASY-0032
ASSY DWG: S2-ASY-0032		DRL DWG:	S2-DRL-0032
PCB DWG: S2-PC-0032		SCALE:	FILE NAME: P18 INPUTS 1 AND 2.SchDoc
		DWG NO:	<b>S2-SCH-0032</b>
		REV:	1



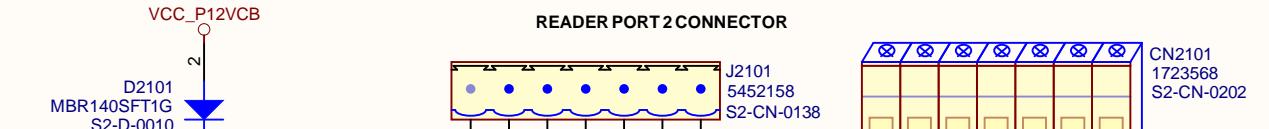
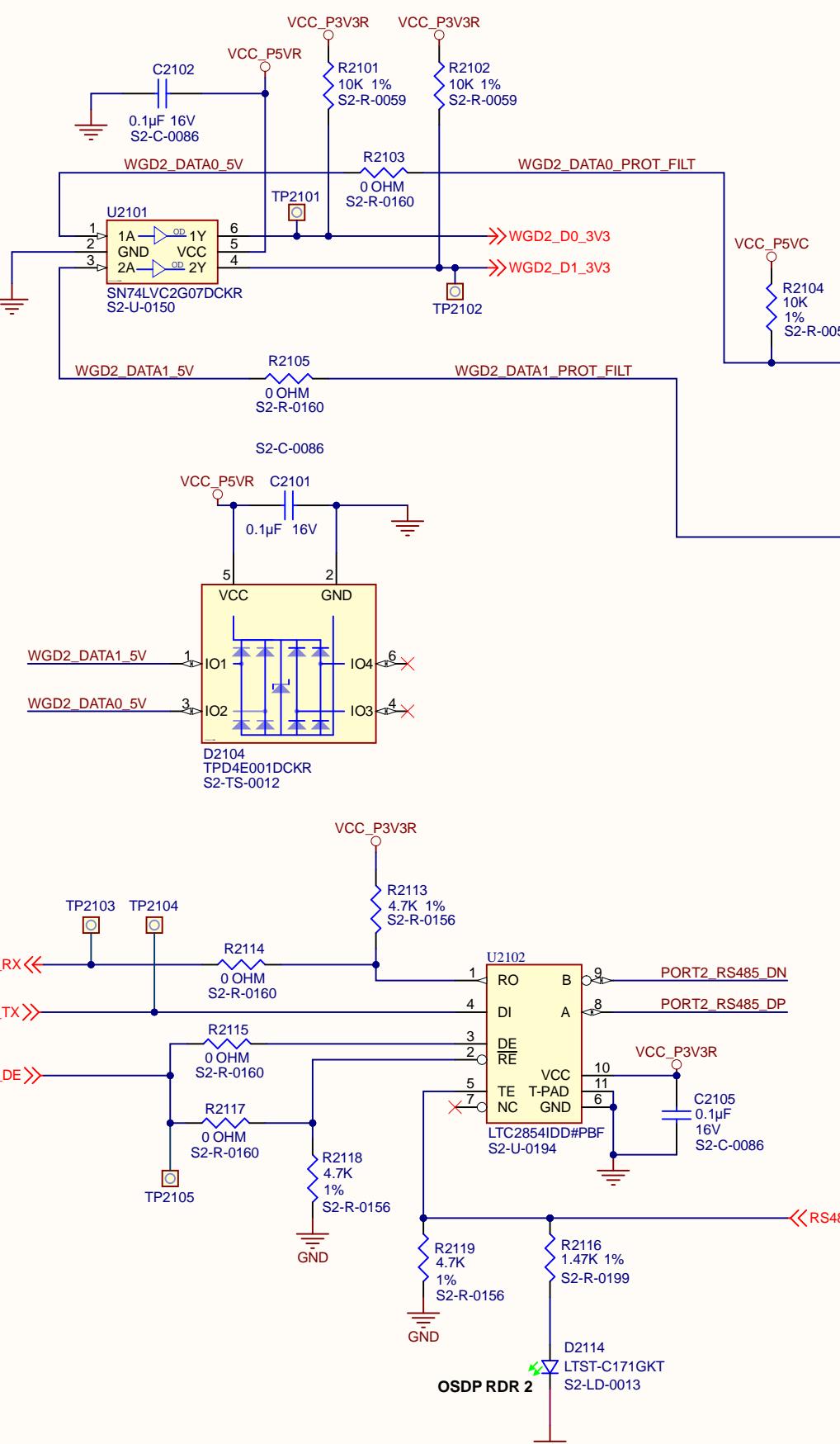
APPROVALS		DATE	PROJECT	LENEL S2	
ENG:	S. Comeau		MNP V3		
CHK:	T. Bresnahan		TITLE		MNP V3
REFERENCE DOCUMENTS					
BOM: BOM S2-PC-0032 date					
ASSY DWG: S2-ASY-0032					
DRL DWG: S2-DRL-0032					
PCB DWG: S2-PC-0032			SIZE:	DWG NO:	S2-SCH-0032
SCALE:			REV:		1
FILE NAME:		P19 INPUTS 3 AND 4.SchDoc		SHEET:	19 OF 25

## READER1 CONNECTOR AND WIEGAND CIRCUIT



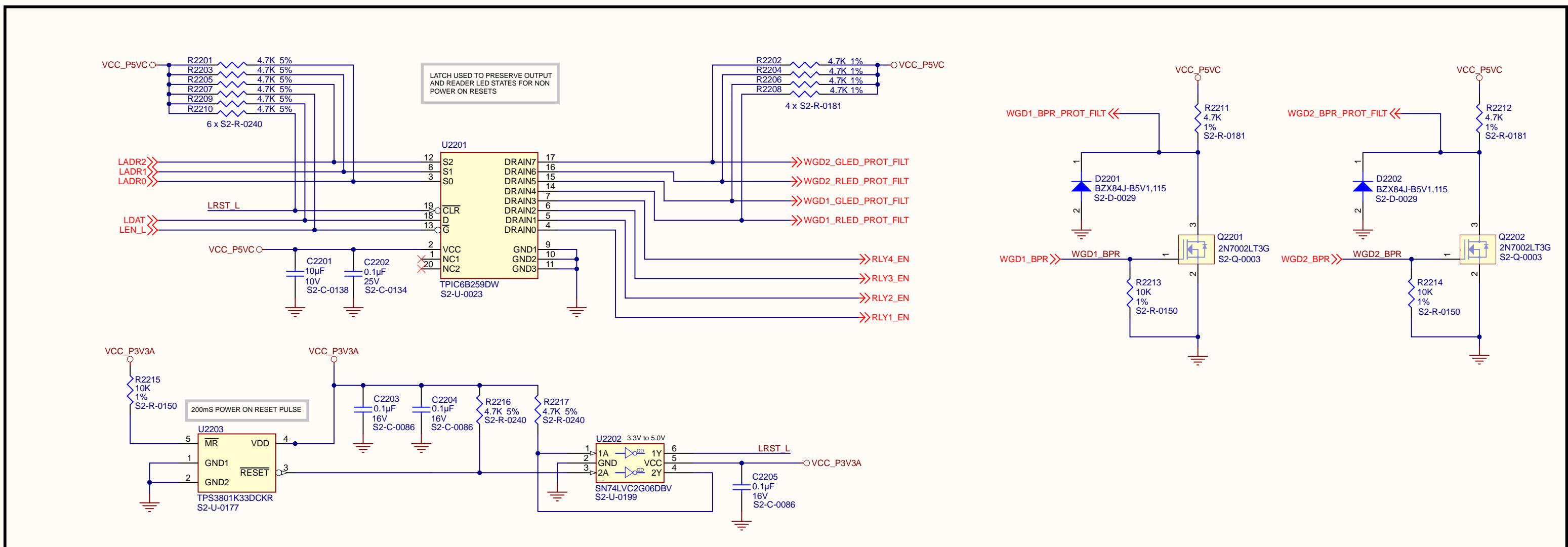
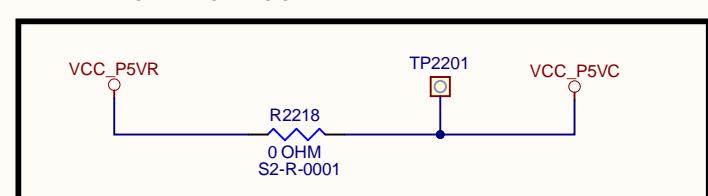
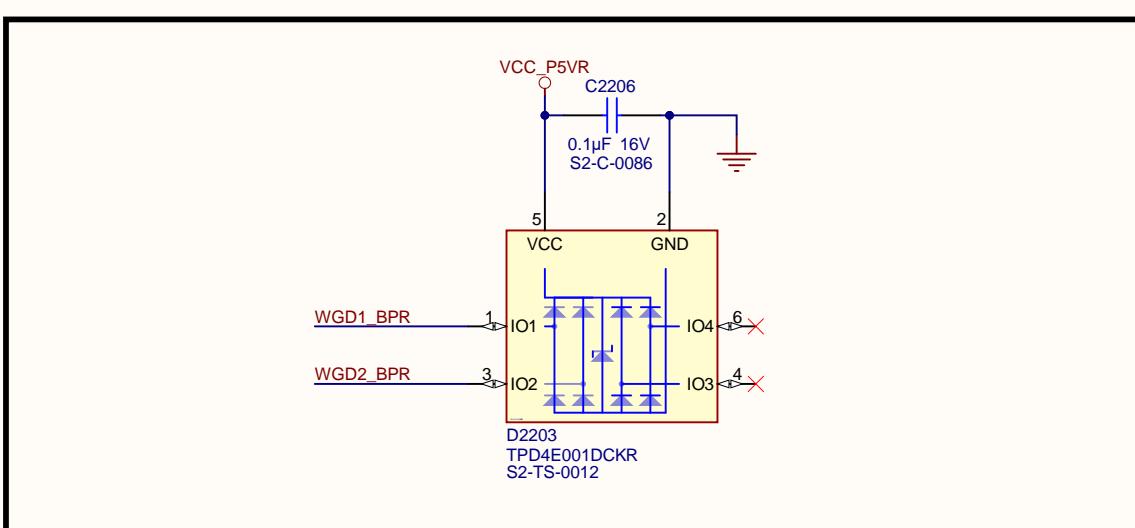
APPROVALS		DATE	PROJECT	MNP V3	LENEL-S2
ENG:	S. Comeau				LenelS2 LenelS2
CHK:	T. Bresnahan				1 Speen Street
REFERENCE DOCUMENTS					
BOM:	BOM S2-PC-0032 date				Framingham, MA 01701
ASSY DWG:	S2-ASY-0032				
DRL DWG:	S2-DRL-0032				
PCB DWG:	S2-PC-0032				
SCALE:	FILE NAME	P20 READERS 1.SchDoc			
SIZE	DWG NO	S2-SCH-0032	REV	1	

## READER2 CONNECTOR AND WIEGAND CIRCUIT

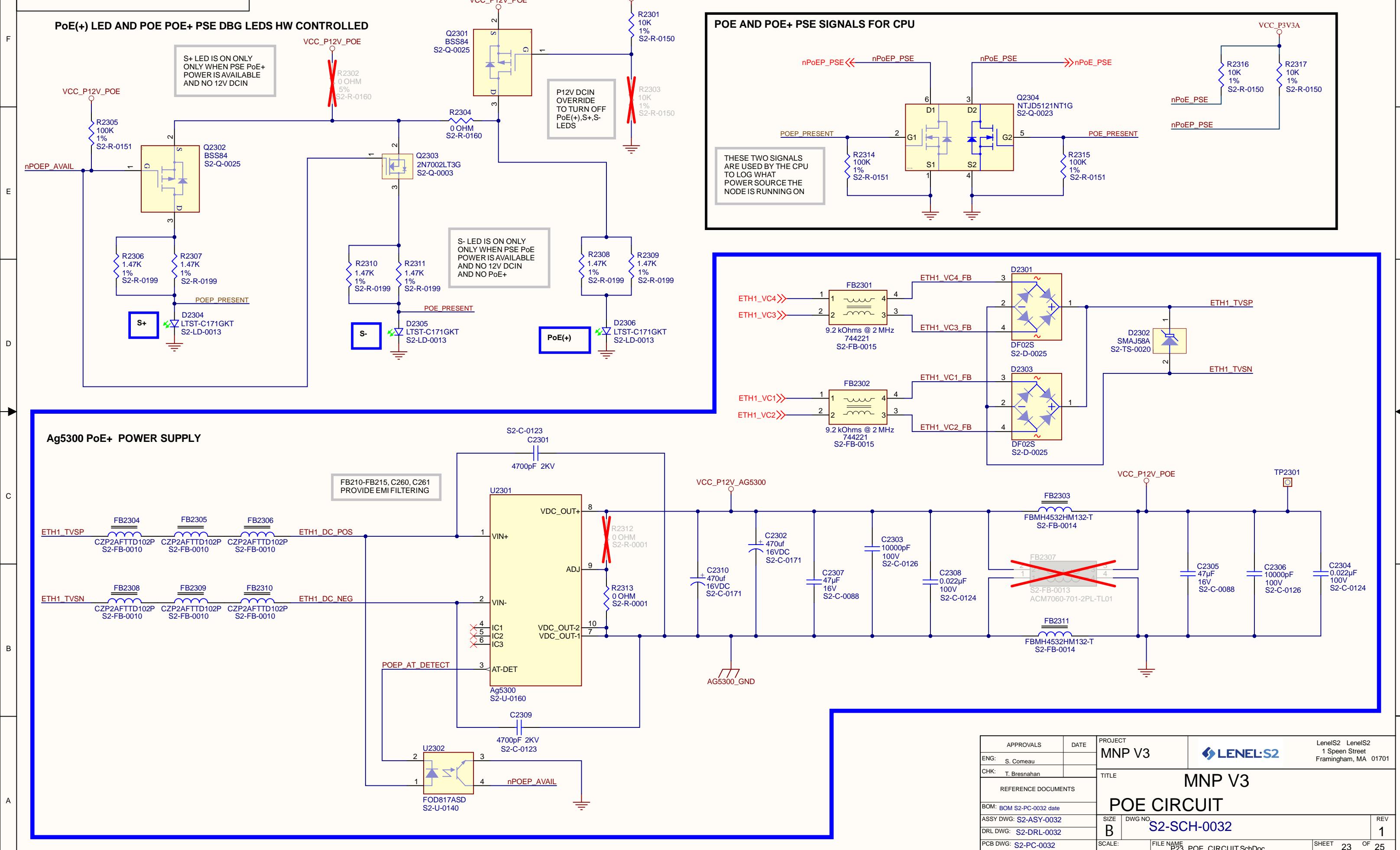


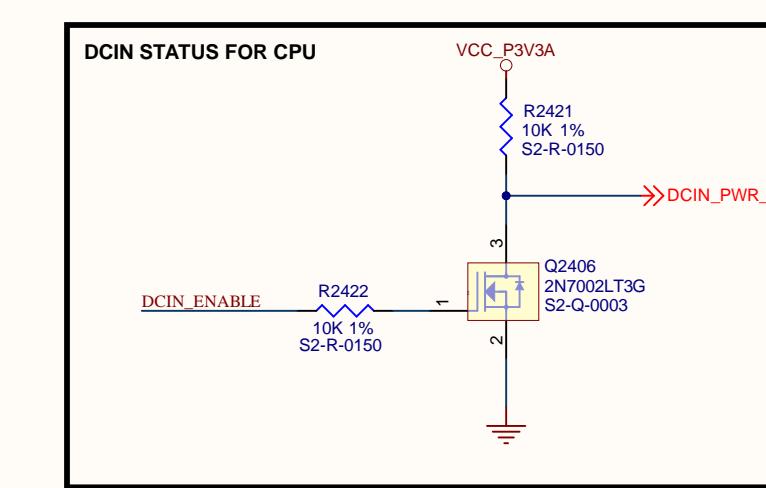
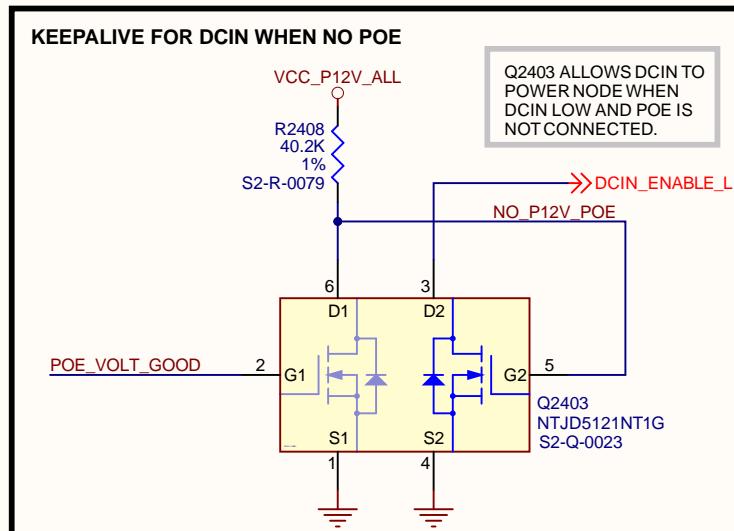
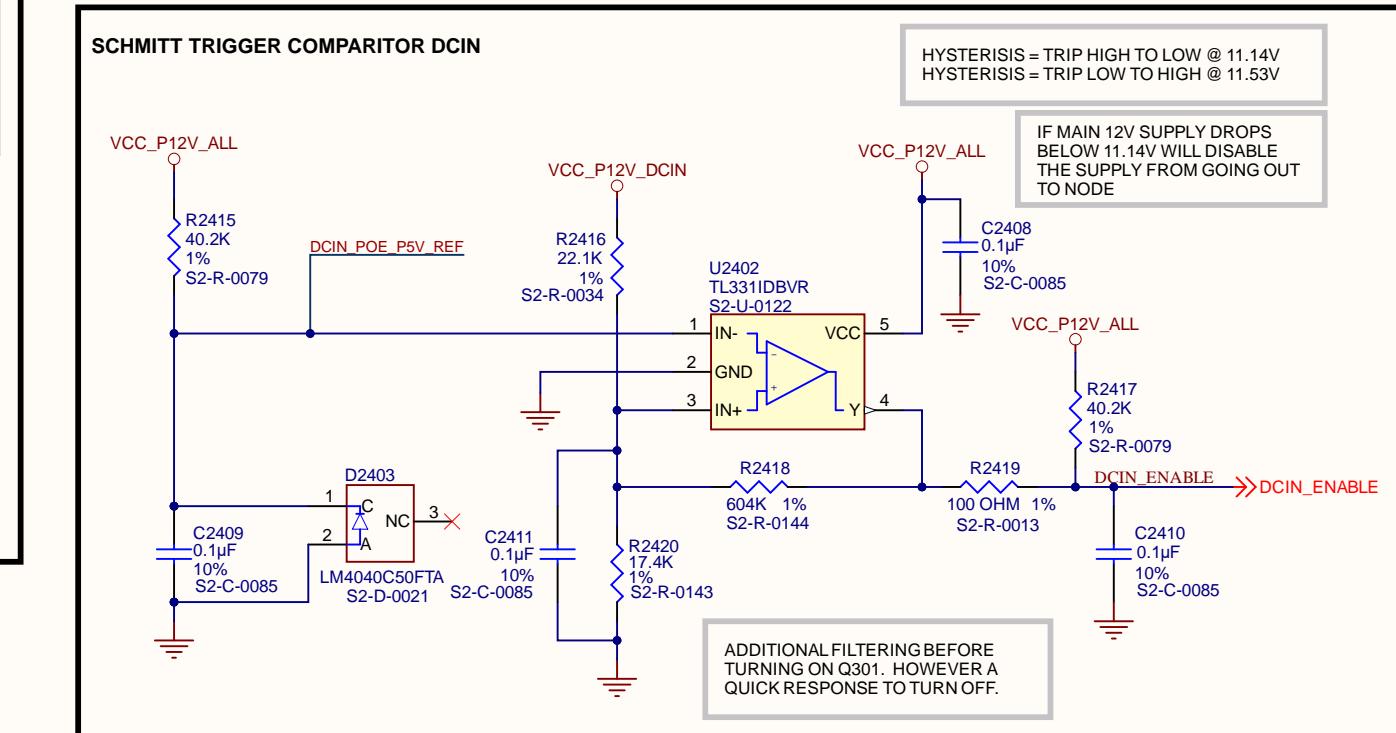
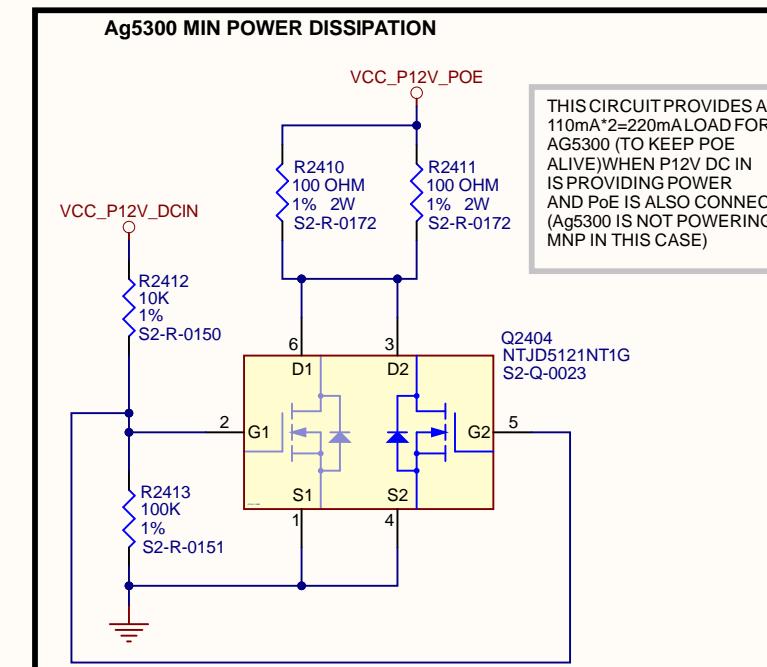
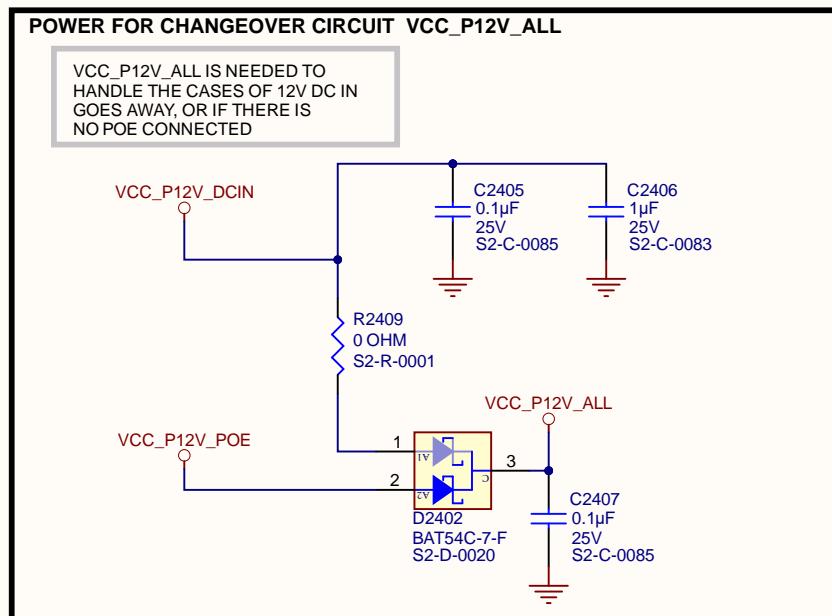
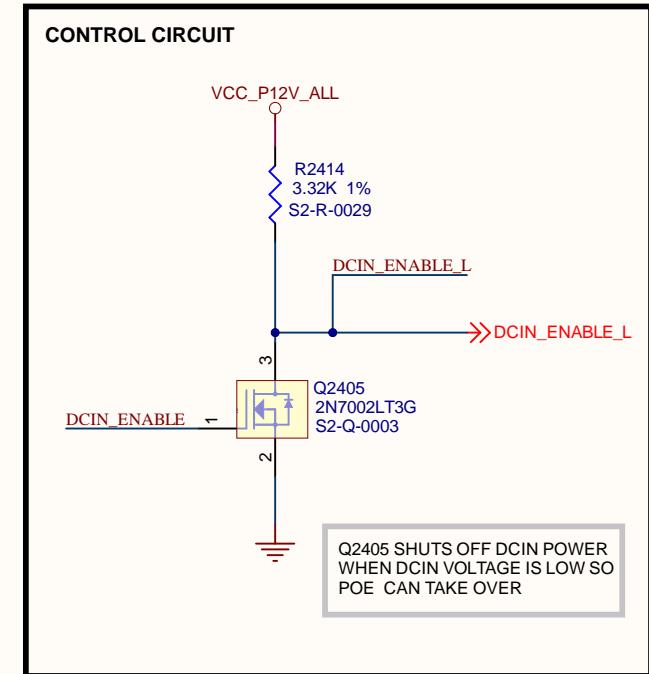
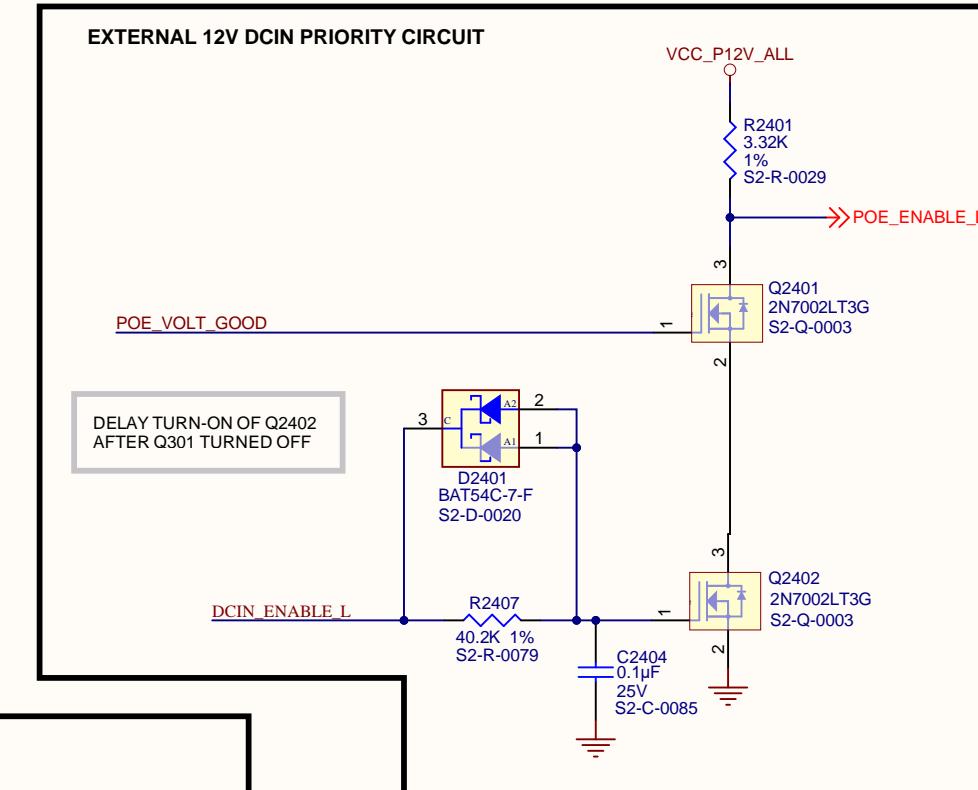
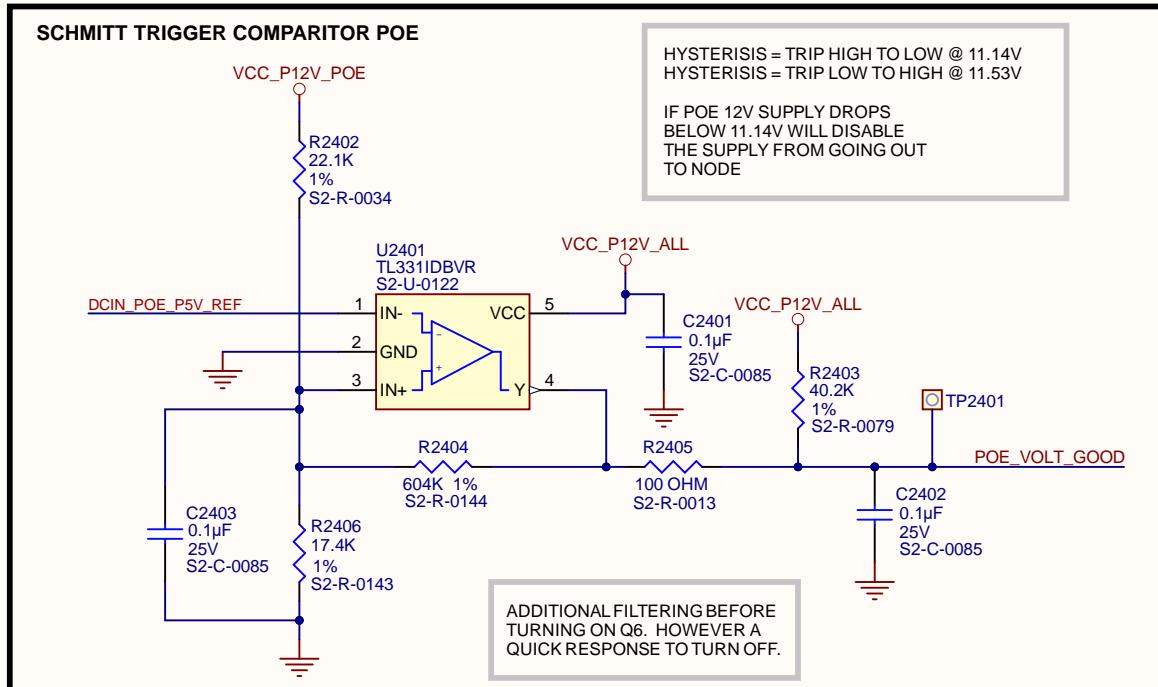
APPROVALS		DATE	PROJECT	MNP V3	Carrier Lenel's2
ENG:	S. Comeau		REFERENCE DOCUMENTS		1 Speen Street
CHK:	T. Bresnahan		BOM:	BOM S2-PC-0032 date	Framingham, MA 01701
			ASSY DWG:	ASSY DWG: S2-ASY-0032	
			DRL DWG:	DRL DWG: S2-DRL-0032	
			PCB DWG:	PCB DWG: S2-PC-0032	
SCALE:			FILE NAME	P21_READERS_2.SchDoc	REV 1
SHEET	21	OF 25			

## WIEGAND READER LEDs AND BEEPER OUTPUTS

BYPASS JUMPER R2213 FOR 5V READER PROTECTION CIRCUITY  
REMOVED FROM DESIGN

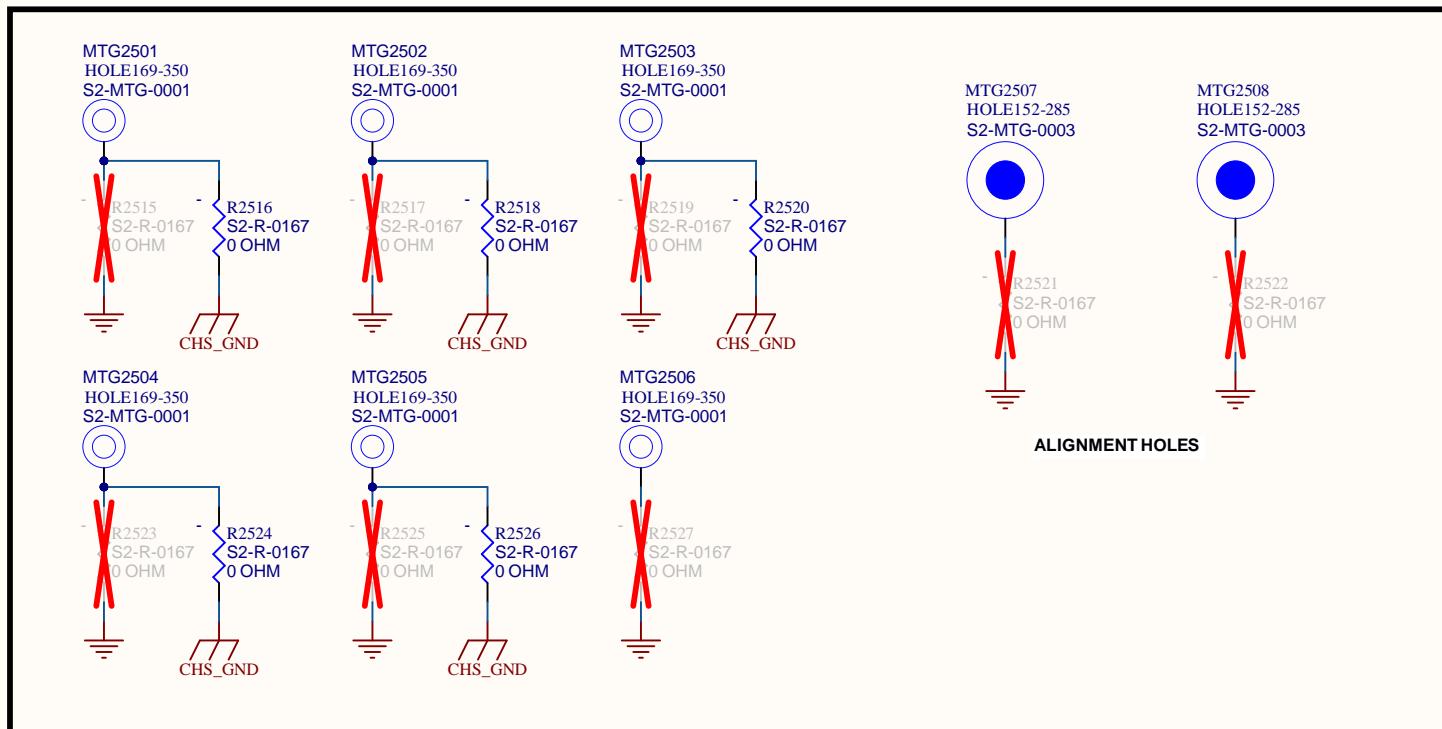
APPROVALS		DATE	PROJECT	MNP V3	Carrier Lenel S2
ENG:	S. Comeau		CHK:	T. Bresnahan	1 Speen Street
REFERENCE DOCUMENTS					
BOM: BOM S2-PC-0032 date		PROJECT		LENEL S2	
ASSY DWG: S2-ASY-0032		TITLE		MNP V3	
DRL DWG: S2-DRL-0032		SIZE		DWG NO	
PCB DWG: S2-PC-0032		B		S2-SCH-0032	
SCALE:		FILE NAME		P22 READERS_MISC.SchDoc	
REV		1			



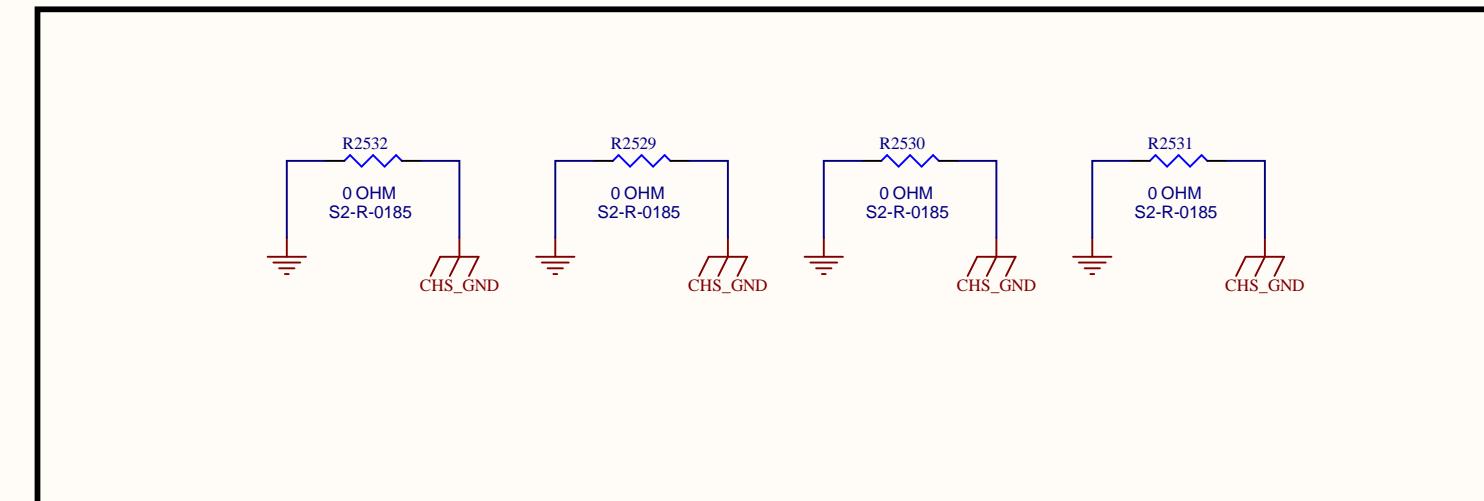


APPROVALS	DATE	PROJECT	LENEL S2
ENG: S. Comeau		MNP V3	Carrier Lenel S2 1 Speen Street Framingham, MA 01701
CHK: T. Bresnahan		TITLE	<b>MNP V3</b>
		REFERENCE DOCUMENTS	
BOM: BOM S2-PC-0032 date			
ASSY DWG: S2-ASY-0032			
DRL DWG: S2-DRL-0032			
PCB DWG: S2-PC-0032		SCALE:	REV 1
		FILE NAME: P24 DCIN POE SWTCH OVER CTRL SchDoc	24 OF 25

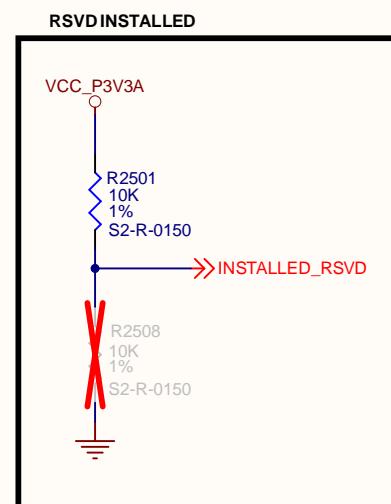
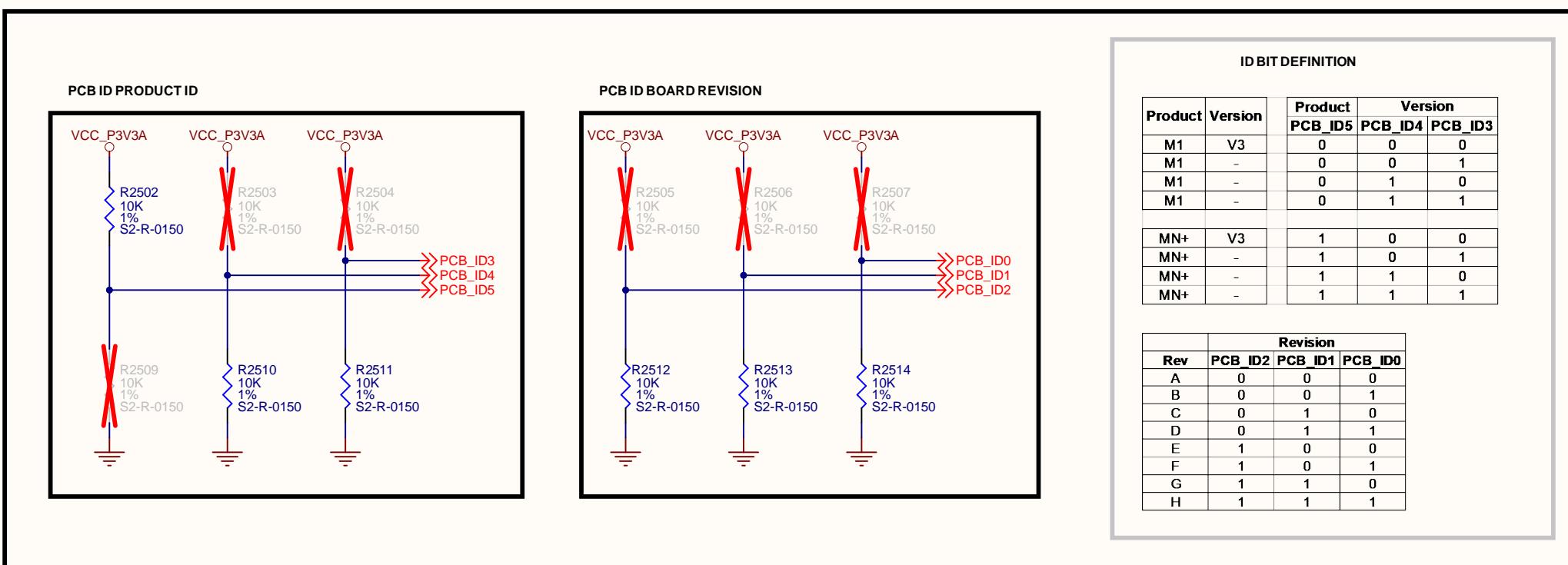
## MOUNTING AND ALIGNMENT HOLES



## ZERO OHM RESISTORS FOR CONNECTING GROUNDS TOGETHER



## M1 AND MN+ ID POP/DEPOP



APPROVALS	DATE	PROJECT		
ENG: S. Comeau		MNP V3	<b>LENEL-S2</b>	
CHK: T. Bresnahan				
REFERENCE DOCUMENTS				
BOM: BOM S2-PC-0032 date				
ASSY DWG: S2-ASY-0032				
DRL DWG: S2-DRL-0032				
PCB DWG: S2-PC-0032				
SIZE	DWG NO	S2-SCH-0032		REV
B				1
SCALE:	FILE NAME	P25_M1_MNP_POP_DNP.SchDoc		SHEET 25 OF 25