

Lightning - PMC PEB

PCB P/N: 15105

Version: 1

Project Code: BPD00Q010001


		Lightning PMC PEB -1 8F, 90, Sec.1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22102, Taiwan (R.O.C.) http://www.wiwynn.com	
Title COVER PAGE			
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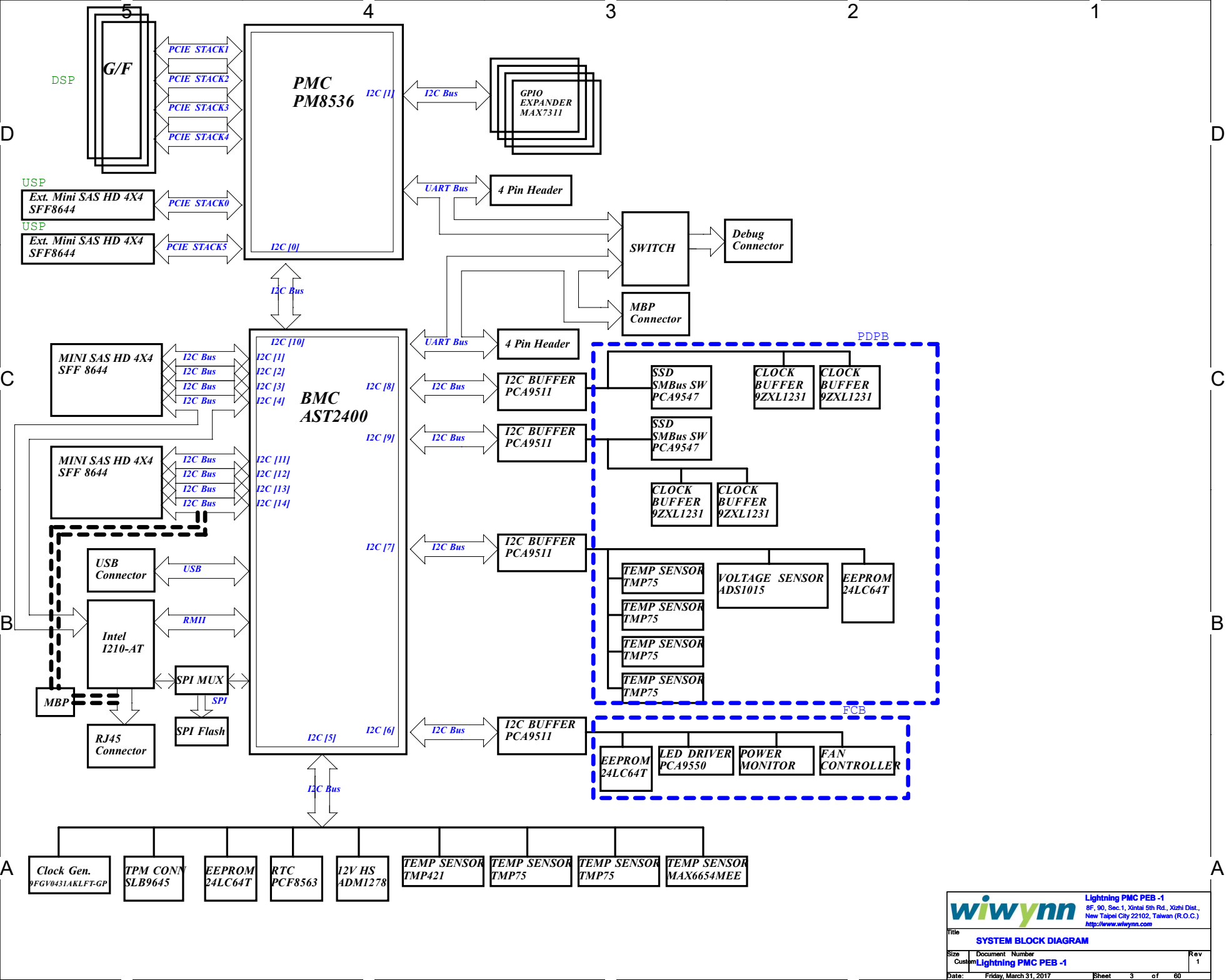
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NOPOP=no populated

562R2F-GP
 562 = 562 ohm, (2K2R means 2.2K ohm)
 2 = size 0402
 F = 1% tolerance
 GP= Green Part (RoHS)
 Wiwynn RC size code as below:
 1 = 0201
 2= 0402
 3= 0603
 5= 0805
 6= 1206
 Wiwynn R tolerance code as below:
 D=0.5%
 F= 1%
 J= 5%

SCD1U10V2KX-5GP
 D1U = 0.1uF (2D2U means 2.2uF)
 10Voltage (6D3V means 6.3V)
 2 = size 0402, K tolerance
 K=tolerance
 [Wiwynn C code as below:]
 G=2%
 J=5%
 K=10%
 M=20%
 X=temp characteristics
 [(RoHS) Wiwynn C Series/Temp]
 N=NPO
 X=X7R/X5R
 Y=Y5V
 -5=different symbol/customer
 GP= Green Part (RoHS)



Power Rail Name	COMPONENT	V	Current (Max) Peak (Ipk) (A)	A(peak)	W	P/N	Location	Quantity
P12V_PCIE	ADM1278-2ACPZ-RL-1-GP	12.00	0.240	0.240	2.880	074.01278.0A7Z	U2	1
P12V	TPS53355ADQPR-GP	12.00	0.081	0.162	1.944	074.53355.0073	PU1,PU3	2
P12V	TPS53318DQPR-GP	12.00	0.081	0.081	0.972	74.53318.073	PU2	1
				0.483				
P5V_STBY	TPS2065DBVT-GP	5.00	0.001	0.001	0.005	74.02065.07F	U194	1
P5V_STBY	USB connector	5.00	0.900	0.900	4.500	22.10254.181	skt1	1
P5V_STBY	LEDs	5.00	0.050	0.100	0.500	83.01221.170	LED	2
				1.001				
P0V9_E	PM8536A-FEIP	0.92	26.320	26.320	24.214	071.08536.000U	U1	1
P0V9	PM8536A-FEIP	0.92	0.250	0.250	0.230	071.08536.000U	U1	1
P0V9	PM8536A-FEIP	0.92	12.030	12.030	11.068	071.08536.000U	U1	1
P0V9	PM8536A-FEIP	0.92	4.420	4.420	4.066	071.08536.000U	U1	1
				16.700				
P3V3_STBY	SLB9645TT1-2FW133-32-GP	3.30	0.025	0.025	0.083	071.09645.000W	TPM Module	1
P3V3_STBY	SN74CBTLV3257RGYR-1-GP	3.30	0.128	0.128	0.422	73.03257.003	U50	1
P3V3_STBY	24LC64-I-SN-GP	3.30	0.003	0.003	0.010	72.02464.A01	U16	1
P3V3_STBY	TMP75AIDGKR-GP	3.30	0.010	0.020	0.066	74.00075.B79	U136,134	2
P3V3_STBY	TMP421AIDCNRG4-GP	3.30	0.010	0.010	0.033	74.04214.079	U15	1
P3V3_STBY	W25Q256FVFIQ-GP	3.30	0.025	0.050	0.165	72.25635.A01	U19,U36	2
P3V3_STBY	W25Q80DVSSIG-1-GP	3.30	0.025	0.025	0.083	072.25Q80.0A01	U44	1
P3V3_STBY	OSC-48MHZ-28-GP	3.30	0.013	0.013	0.043	82.20013.291	OSC1	1
P3V3_STBY	SN74LVC1G07DCKRG4-2-GP	3.30	0.100	0.700	2.310	73.01G07.01H	U25,U35,U42,U45,U49,U52,U53	7
P3V3_STBY	WGI210AT-2-GP	3.30	0.242	0.242	0.800	71.05221.003	U20	1
P3V3_STBY	OSC-50MHZ-8-GP-U	3.30	0.025	0.025	0.083	82.20043.111	X1	1
P3V3_STBY	ICS551MLFT-GP	3.30	0.018	0.018	0.059	71.00551.00A	U21	1
P3V3_STBY	PCA9511ADP-T-GP	3.30	0.006	0.036	0.119	71.P9511.00W	U30,U33,U24,U31,U29,U34	6
P3V3_STBY	TCA9554APWR-GP	3.30	0.160	0.480	1.584	071.09554.000W	U54,U55,U56	3
P3V3_STBY	PCF8563T-1-GP	3.30	0.001	0.001	0.003	71.08563.A0A	U43	1
P3V3_STBY	LM393ADR-1-GP	3.30	0.001	0.002	0.007	74.00393.I21	U36,U41	2
P3V3_STBY	TS5A23157DGSR-GP	3.30	0.100	0.100	0.330	74.23157.A99	U27	1
P3V3_STBY	SN74LVC1G08DCKR-GP	3.30	0.100	1.700	5.610	73.01G08.L03	U64,U65,U66,U67,U68,U69,U70,U71,U72,U73,U74,U75,U76,U77,U78,U46,U48-U63,U38	17
P3V3_STBY	SNLVC8T245DGVR-GP	3.30	0.001	0.002	0.007	73.8T245.B29	U5,U6	2
P3V3_STBY	TPS74801DRCR-1-GP-U	3.30	0.002	0.006	0.020	074.74801.0033	PU4,PU5,PU6	3
P3V3_STBY	MAX6654MEE-1-GP	3.30	0.001	0.001	0.003	74.06654.ABS	U4	1
P3V3_STBY	MAX7311AUG-GP	3.30	0.250	1.000	3.300	071.07311.000W	U198~201	4
P3V3_STBY	CAT24C128WI-GT3-GP	3.30	0.003	0.003	0.010	72.24128.J01	U10	1
P3V3_STBY	AST2400A1-GP	3.30	0.191	0.191	0.630	71.24001.00U	U40	1
P3V3_STBY	LEDs	3.30	0.050	0.800	2.640	83.01921.570	LED	16
P3V3_STBY	3.3V pull up	3.30	0.001	0.232	0.764	64.47015.6DL	R	330
				5.813				
P1V8_STBY	9FGV0431AKLFT-GP	1.80	0.008	0.008	0.014	071.90431.0003	U196	1
P1V8_STBY	N25Q128A11ESE40F-GP	3.30	0.020	0.020	0.066	072.25128.0A01	U9	1
P1V8_STBY	PM8536A-FEIP	1.80	0.015	0.015	0.026	071.08536.000U	U1	1
P1V8_STBY	1.8V pull up	1.80	0.000	0.012	0.022	64.47015.6DL	R	32
				0.055				
P1V53_STBY	NT5CC64M16GP-DI-GP	1.53	0.210	0.210	0.321	072.56416.0F0U	U18	1
P1V53_STBY	AST2400A1-GP	1.53	0.452	0.452	0.692	71.24001.00U	U40	1
				0.662				
P1V26_STBY	AST2400A1-GP	1.26	0.766	0.766	0.965	71.24001.00U	U40	1

Change list :

- P3V3_STBY:

* Remove MCP2210T-I-MQ-GP (U202) -- 0.095 A

* Remove BCM5221A4KMLG-GP (U20) -- 0.11 A

* Remove OSC-125MHZ-3-GP (X10) -- 0.06 A

* Remove ADS1015IDGSR-GP (U14,U17) -- 0.2 A

* Remove USB2514B-AEZC-TR-GP (U3) -- 0.065 A

* Add SLB9645TT1-2FW133-32-GP (TPM though CN11) -- 0.025 A

* Add WGI210AT-2-GP (U20) -- 0.242 A

* Add W25Q256FVFIQ-GP (U36) -- 0.025 A

* Add W25Q80DVSSIG-1-GP (U44) -- 0.025 A

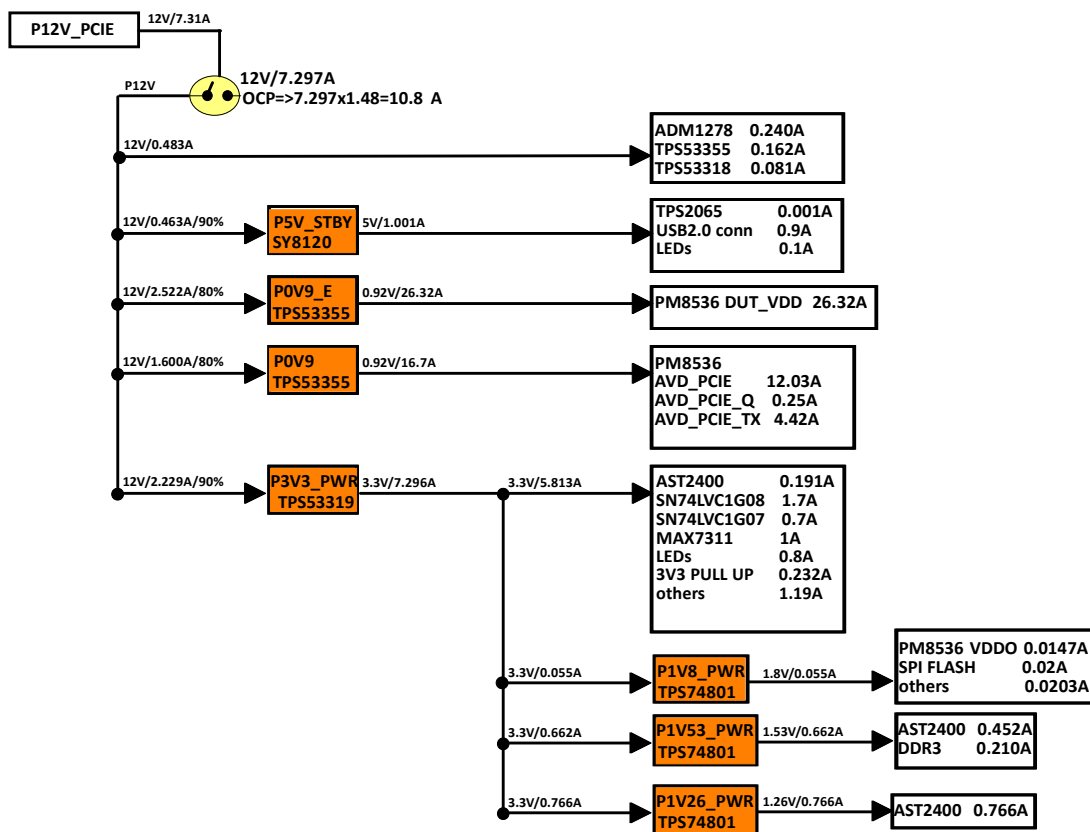
* Add TCA9554APWR-GP (U54,U55,U56) -- 0.48 A

* Add SN74AUP1T97DCKR-GP (U45 U49) -- 0.1 A

* Add SN74LVC1G07DCKRG4-2-GP (U42 U52 U53) -- 0.3 A

- P1V8_STBY

* Remove N25Q128A13BSF40F-GP (U26) -- 0.02 A



System Power sequence



AST2400



PM8536 (Dev2 FW)

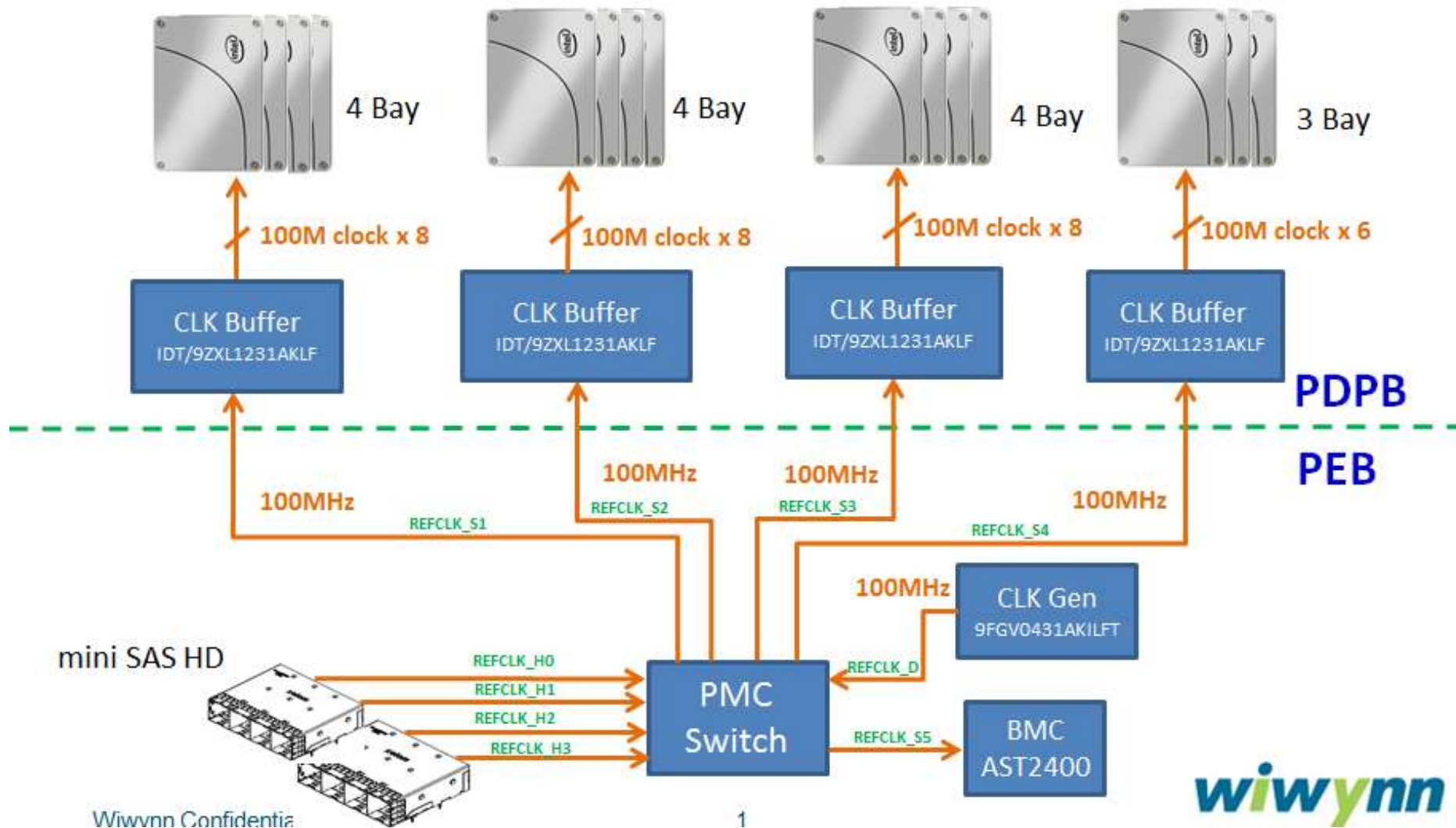



13.1.3 Power supply sequencing

There are no power supply sequencing requirements on this device.

[illegible]

PEB



		Lightning PMC PEB -1 8F, 90, Sec.1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22102, Taiwan (R.O.C.) http://www.wiwynn.com	
Title			
CLOCK TREE			
Size	Document Number		Rev
Custom	Lightning PMC PEB -1		1
Date:	Friday, March 31, 2017	Sheet	7 of 60
2		1	

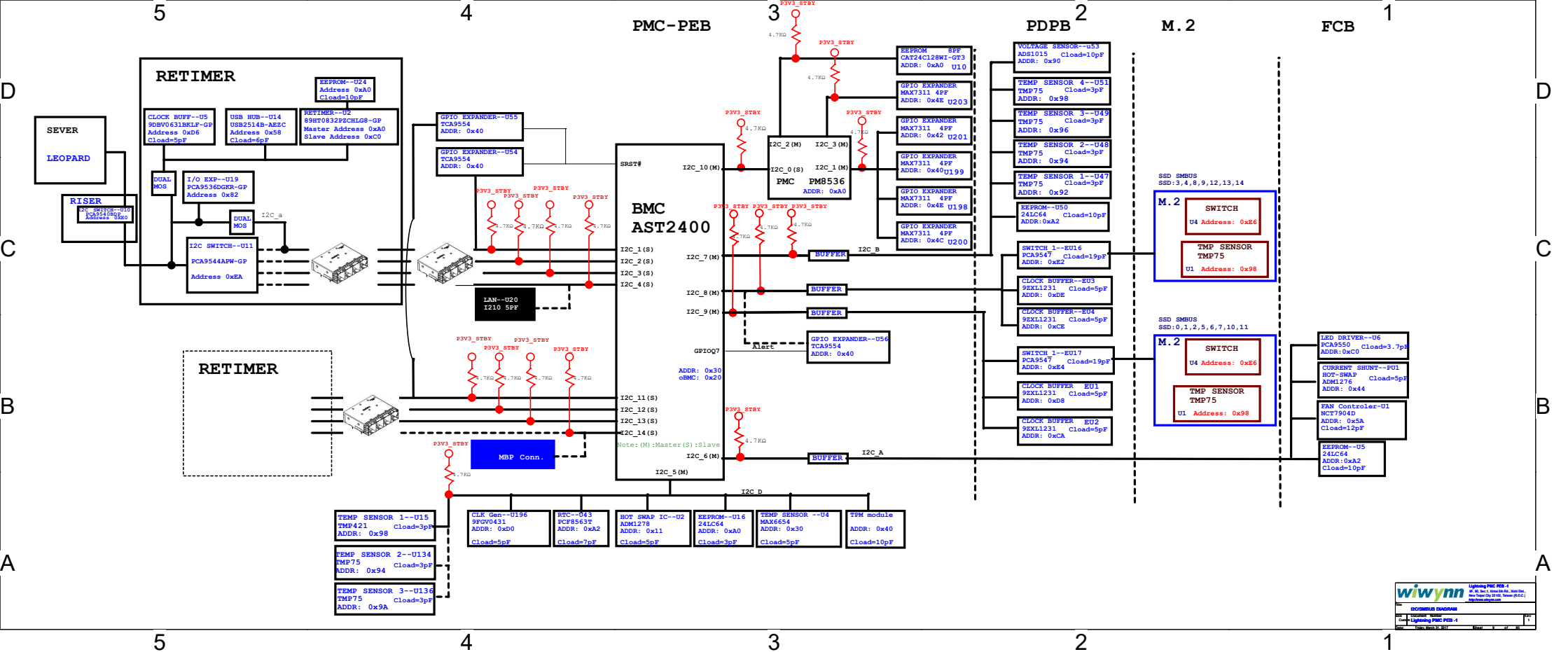
STACK-UP INFORMATION

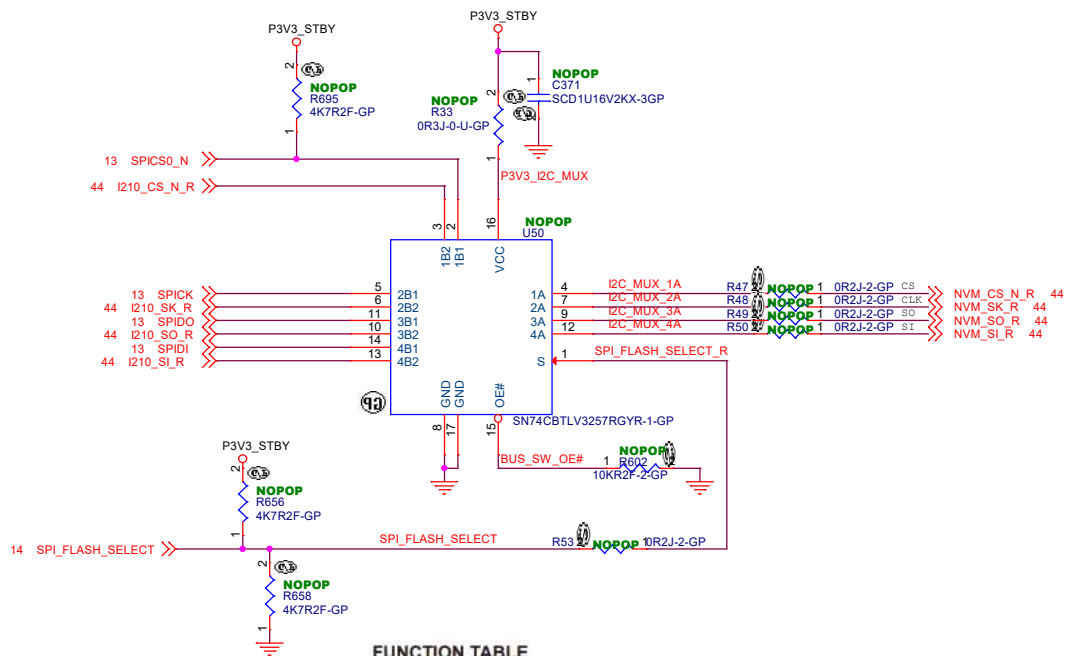
Board Number: 15105-1
Project name: Lightning_PMC
Model Name: PEB
Layer Count: 8 Layer
Date: 2016/10/19
Material: TU883+VLP / NPG171+VLP
Gold Finger(Y/N): Y
Customer: XXXXX
EE engineer: Leon Du
SI Engineer: Eason YS Chen

Version
02

Single Ended Type(mil)										Differential Type(mil)													
Layer		Cu oz	Thickness		Glass/Copper Style	Er	Df(1G)	Type Layers	1,3,6,8		Type Layers	1,3,6,8		1,3,6,8		1,3,6,8							
			Wiwynn						Wiwynn	Imp	Width	Imp	Wiwynn	Space	Imp	Wiwynn	Space	Imp					
Top	Mask		0.5					S1	4.75(L2)	50.46			5.38(L2)	6.62	85.36	4.13(L2)	9.37	101.06					
	Signal	0.5 oz+plating	2.1					P2	reference layer				reference layer			reference layer							
	Prepreg		3					S3	5(L2/L4)	49.19			5.5(L2/L4)	7.5	84.85	4(L2/L4)	8	97.55					
L2	GND	1 oz	1.3					P4	reference layer				reference layer			reference layer							
	Core		4					P5	reference layer				reference layer			reference layer							
L3	Signal	1 oz	1.3					S6	5(L5/L7)	49.19			5.5(L5/L7)	7.5	84.85	4(L5/L7)	8	97.55					
	Prepreg		16					P7	reference layer				reference layer			reference layer							
L4	POWER	1 oz	1.3					S8	4.75(L7)	50.46			5.38(L7)	6.62	85.36	4.13(L7)	9.37	101.06					
	Core		4																				
L5	POWER	1 oz	1.3	0.0	0	0																	
	Prepreg		16	0	0	0																	
L6	Signal	1 oz	1.3	0	0	0																	
	Core		4	0	0	0																	
L7	GND	1 oz	1.3	0	0	0																	
	Prepreg		3	0	0	0																	
Bottom	Signal	0.5 oz+plating	2.1	0	0	0																	
	Mask		0.5	0	0	0																	
Thickness requirement: 1.6 ± 10% mm		mil	63																				
		mm	1.60																				

- Note:
- Unit is mil
 - The total thickness includes trace and solder mask
 - Min hole copper thickness is 1.0 mil
 - Min surface copper thickness 1.5 mil
 - Impedance Cpk requirement: ≥ 1.33 (Report should be provided)
 - PCB supplier should design Delta-L coupon and provide measurement results meeting following criteria:
 - 0.65dB/inch at 4GHz for stripline routing
 - 0.69dB/inch at 4GHz for microstrip routing

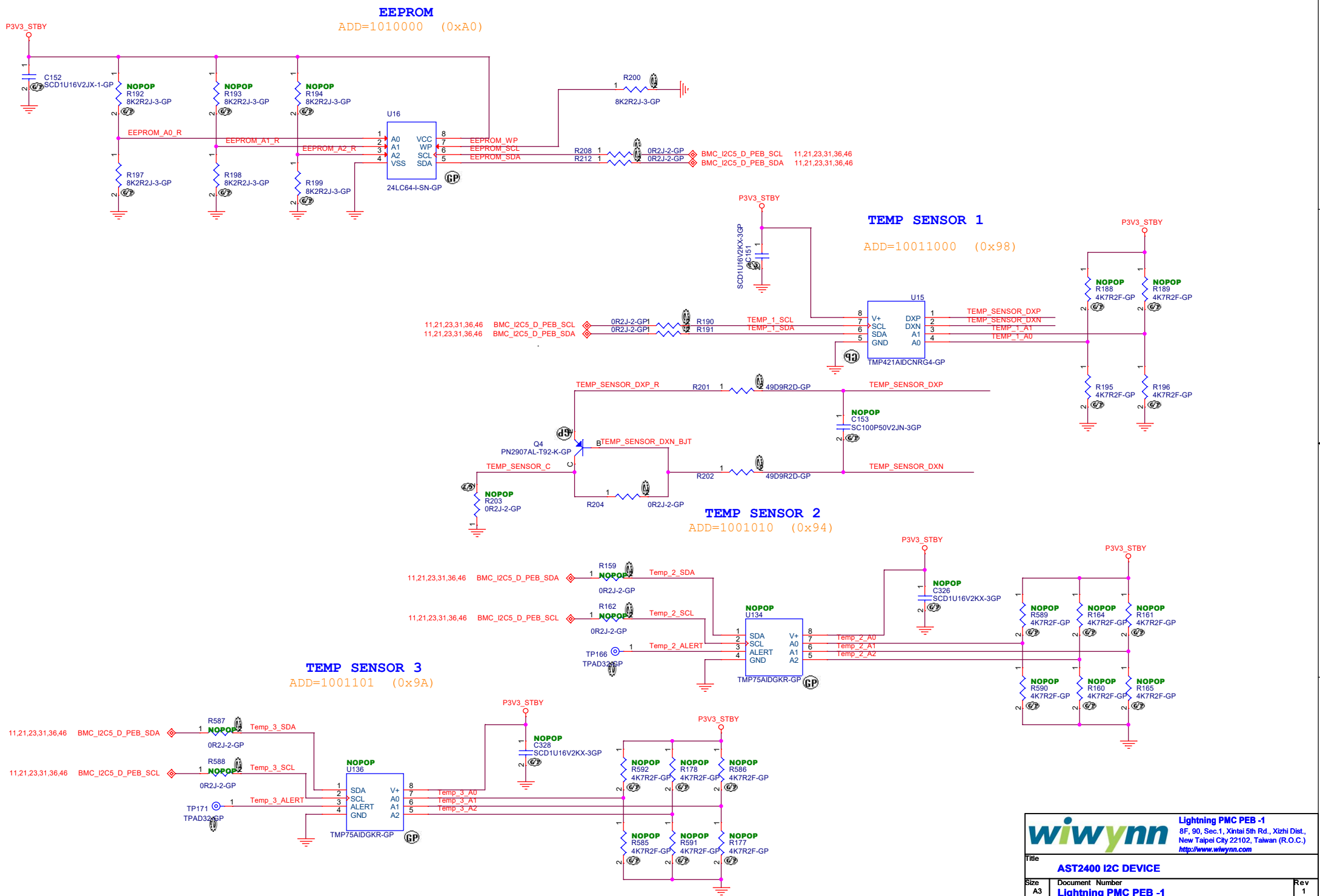


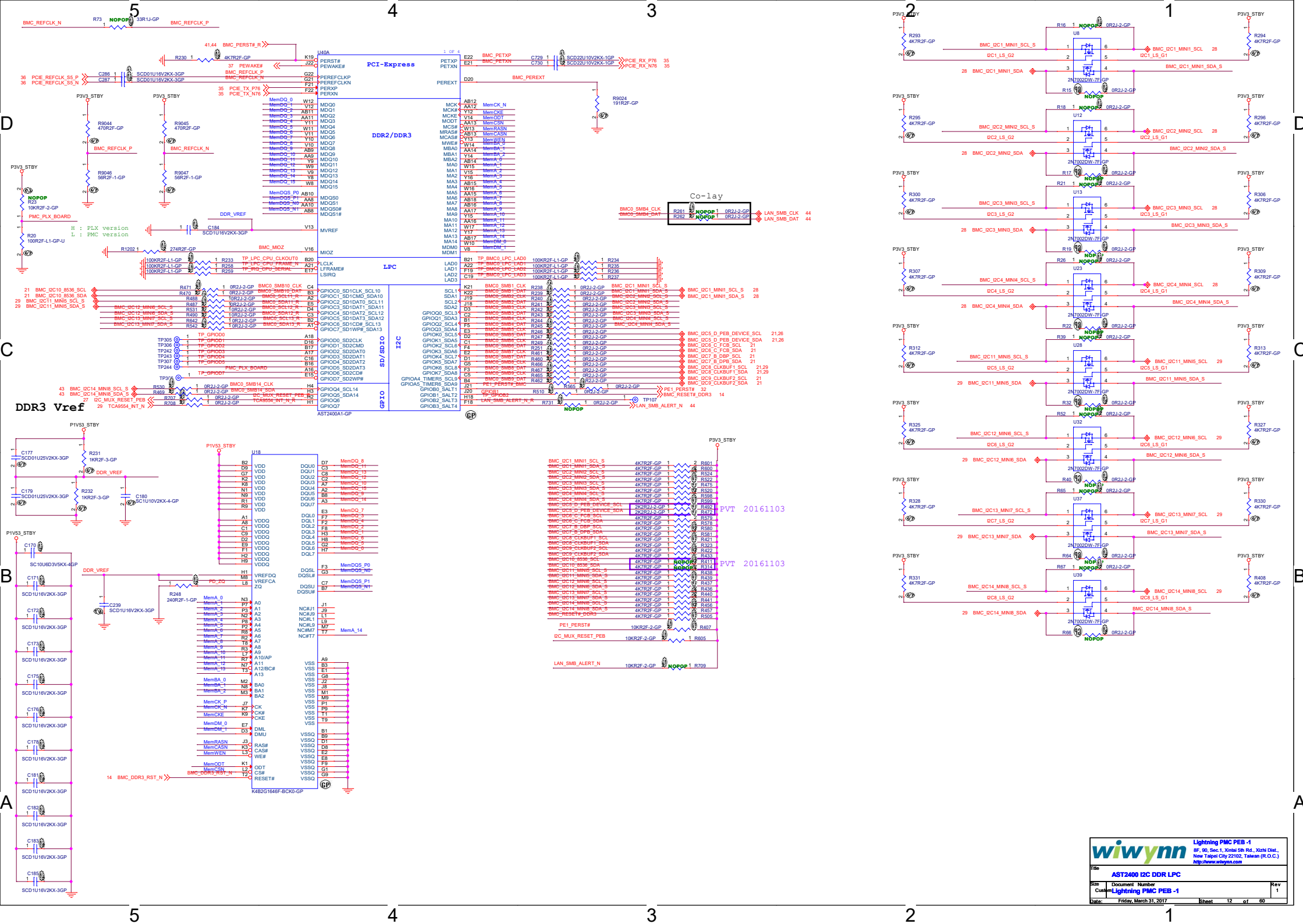


FUNCTION TABLE

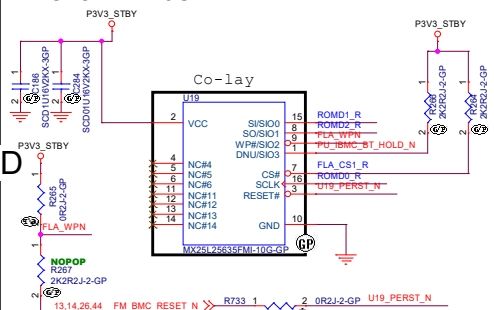
INPUTS		FUNCTION
OE	S	
L	L	A port = B1 port
L	H	A port = B2 port
H	X	Disconnect

L A to B1 (BMC)
H A to B2 (I210) default

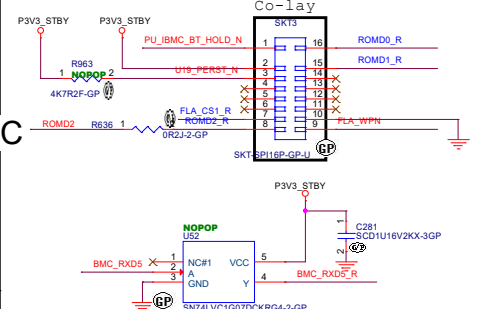




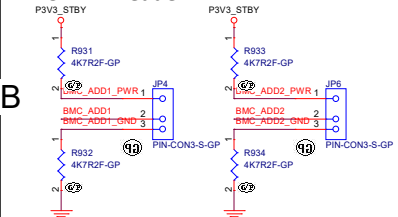
BMC SPI Flash 5



BMC Flash SKT



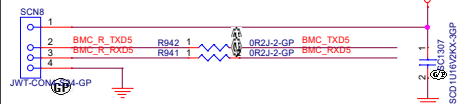
BMC ADD header



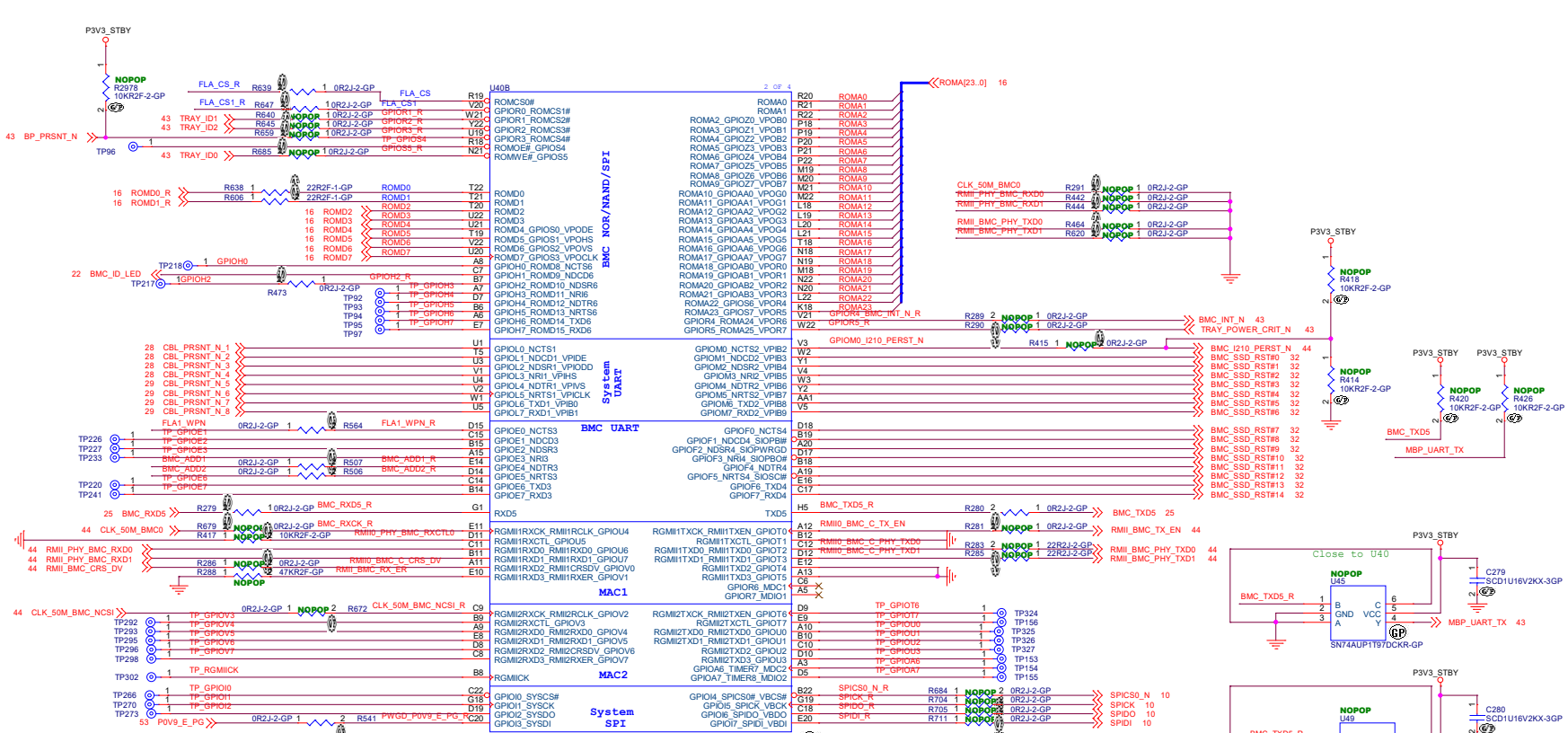
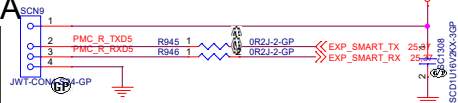
JP4 header	JP6 header
1-2 (Default)	1-2 (Default)
2-3	2-3

Connection	JP4	JP6
1 Leopard to 1 Lightning	1-2	1-2
1 Leopard to 2 Lightning	2-3	1-2
1 Leopard to 3 Lightning	1-2	2-3
1 Leopard to 4 Lightning	2-3	2-3

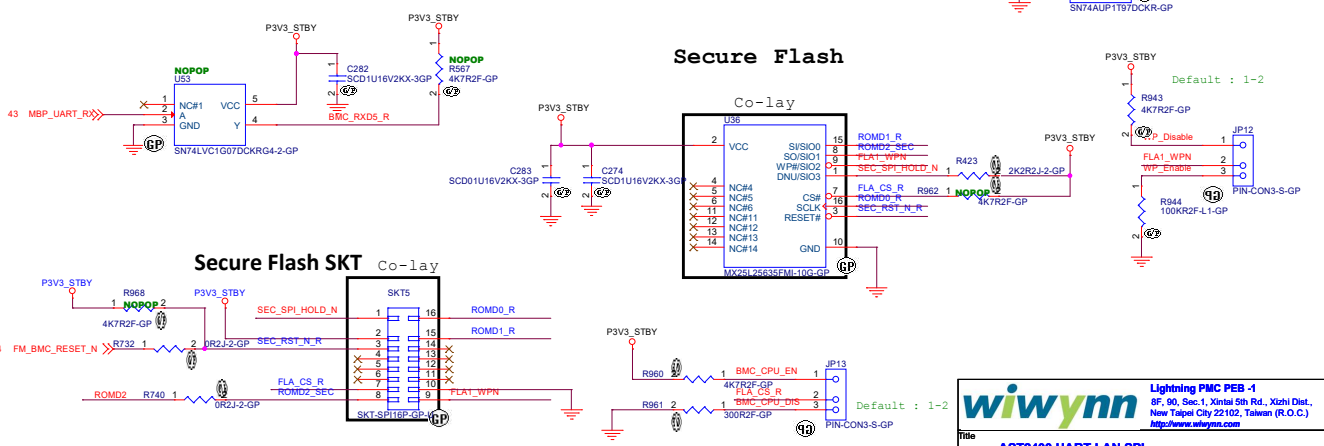
BMC UART header

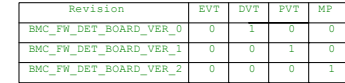


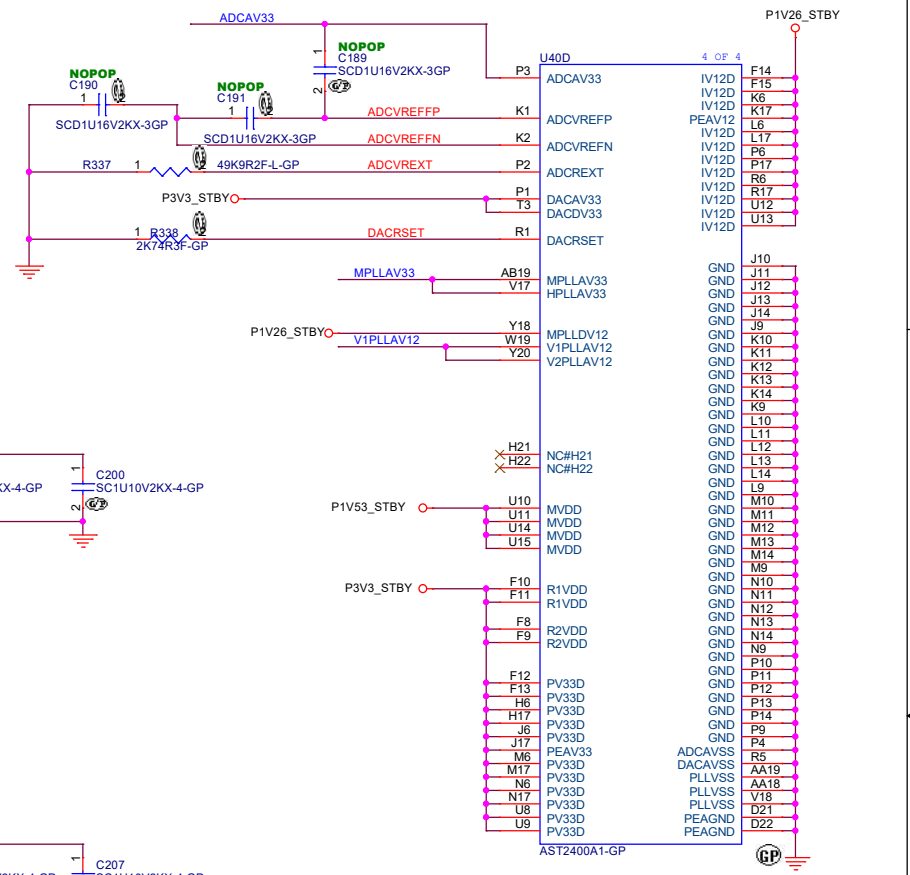
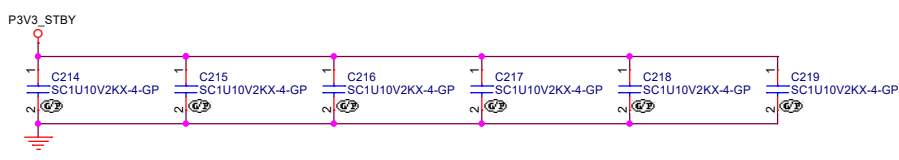
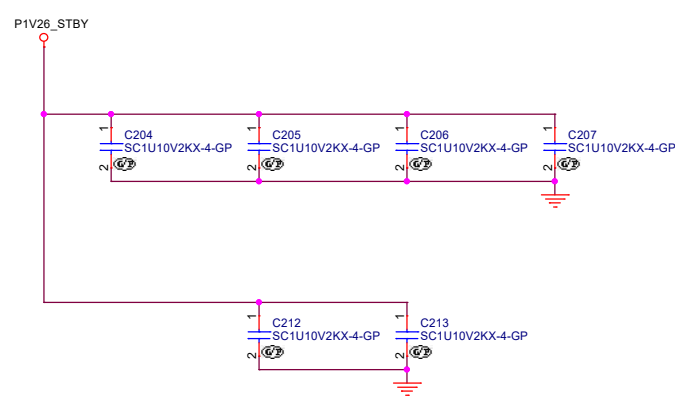
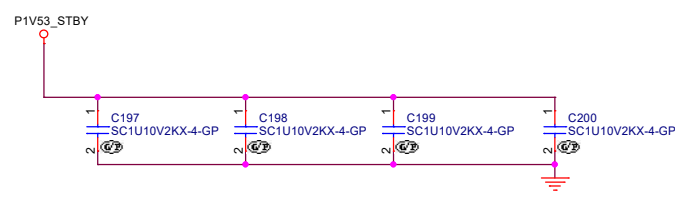
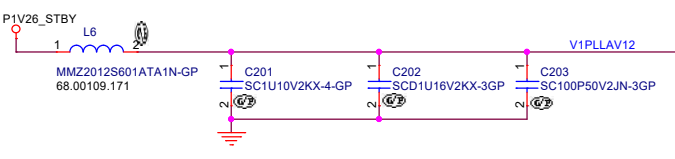
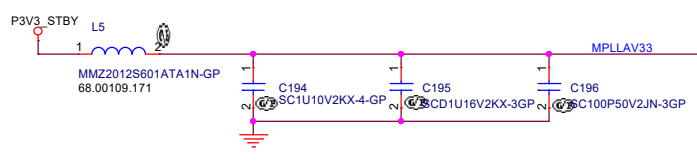
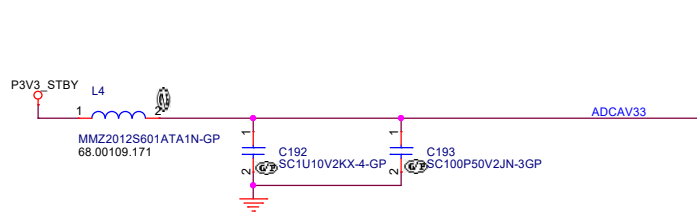
PMC UART header

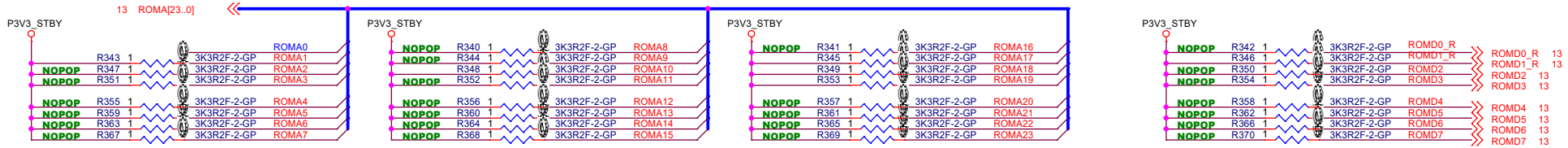
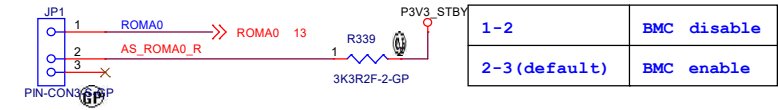


Secure Flash

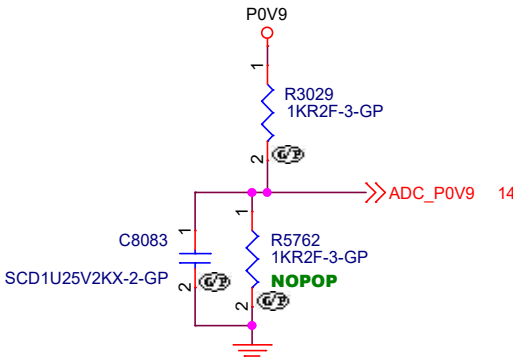
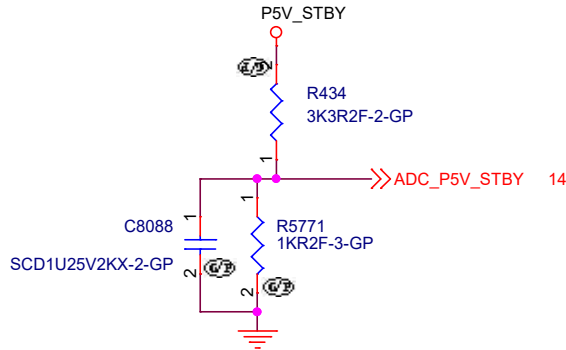
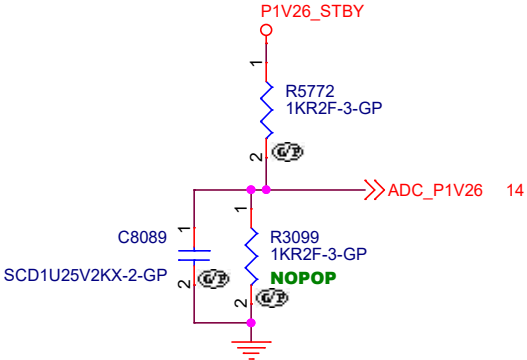
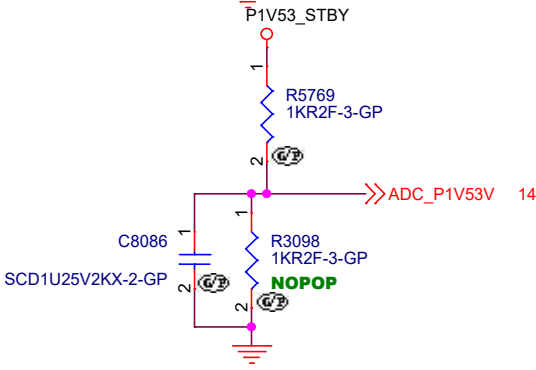
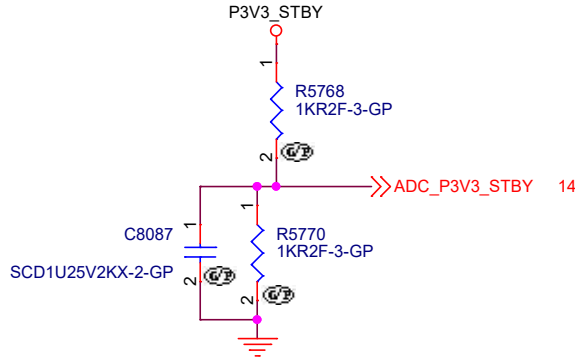
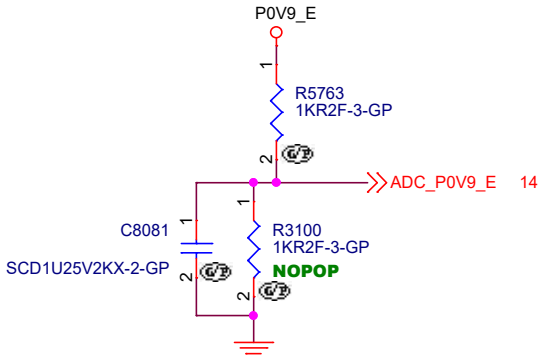
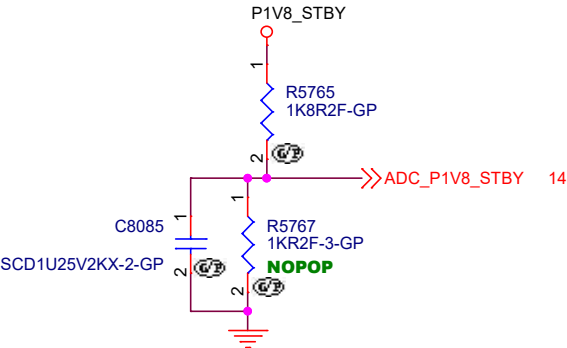
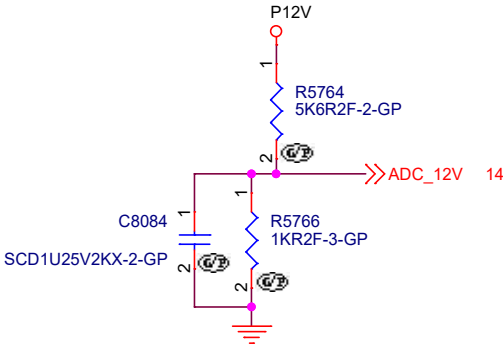





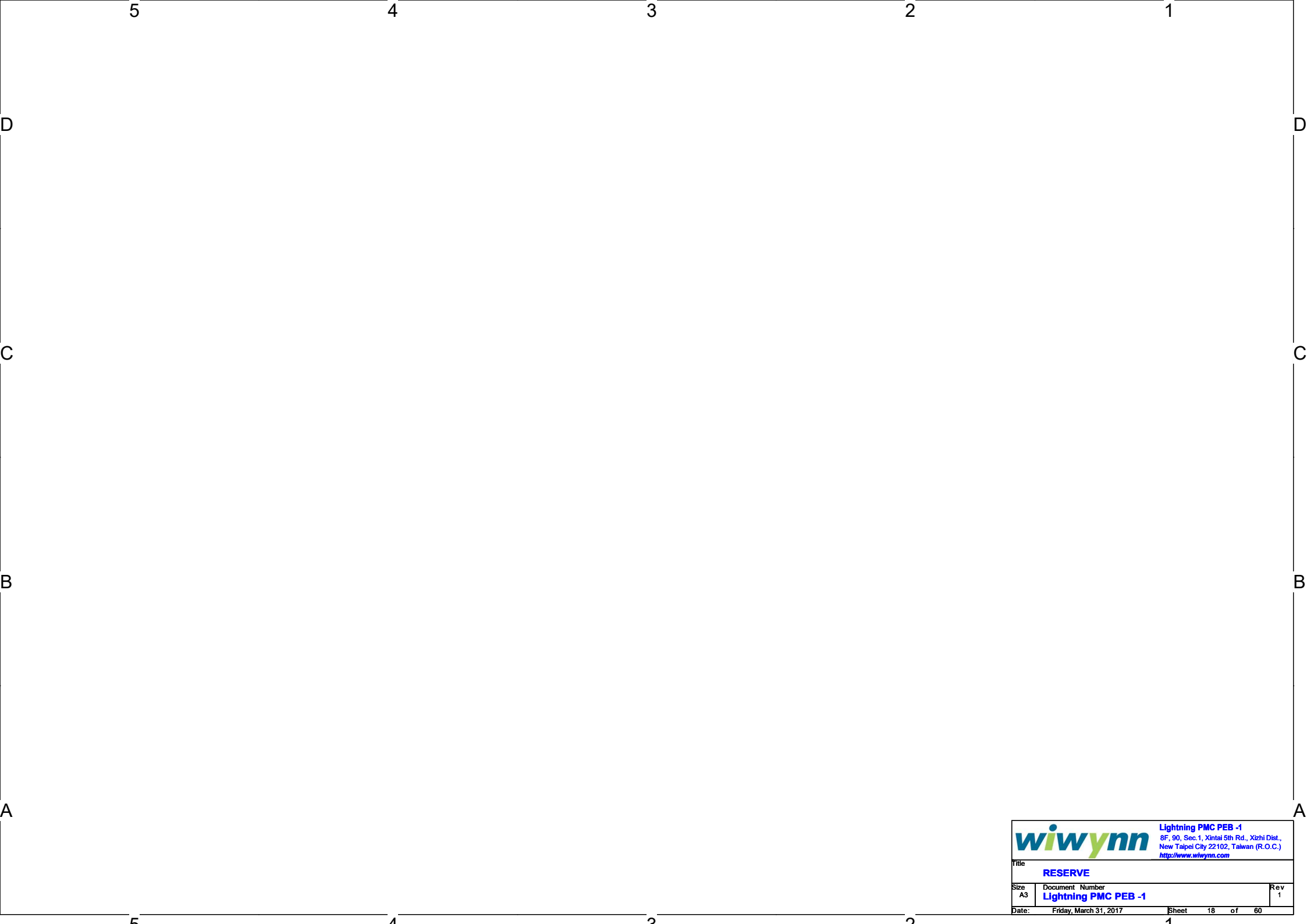




ADC Voltage Divider



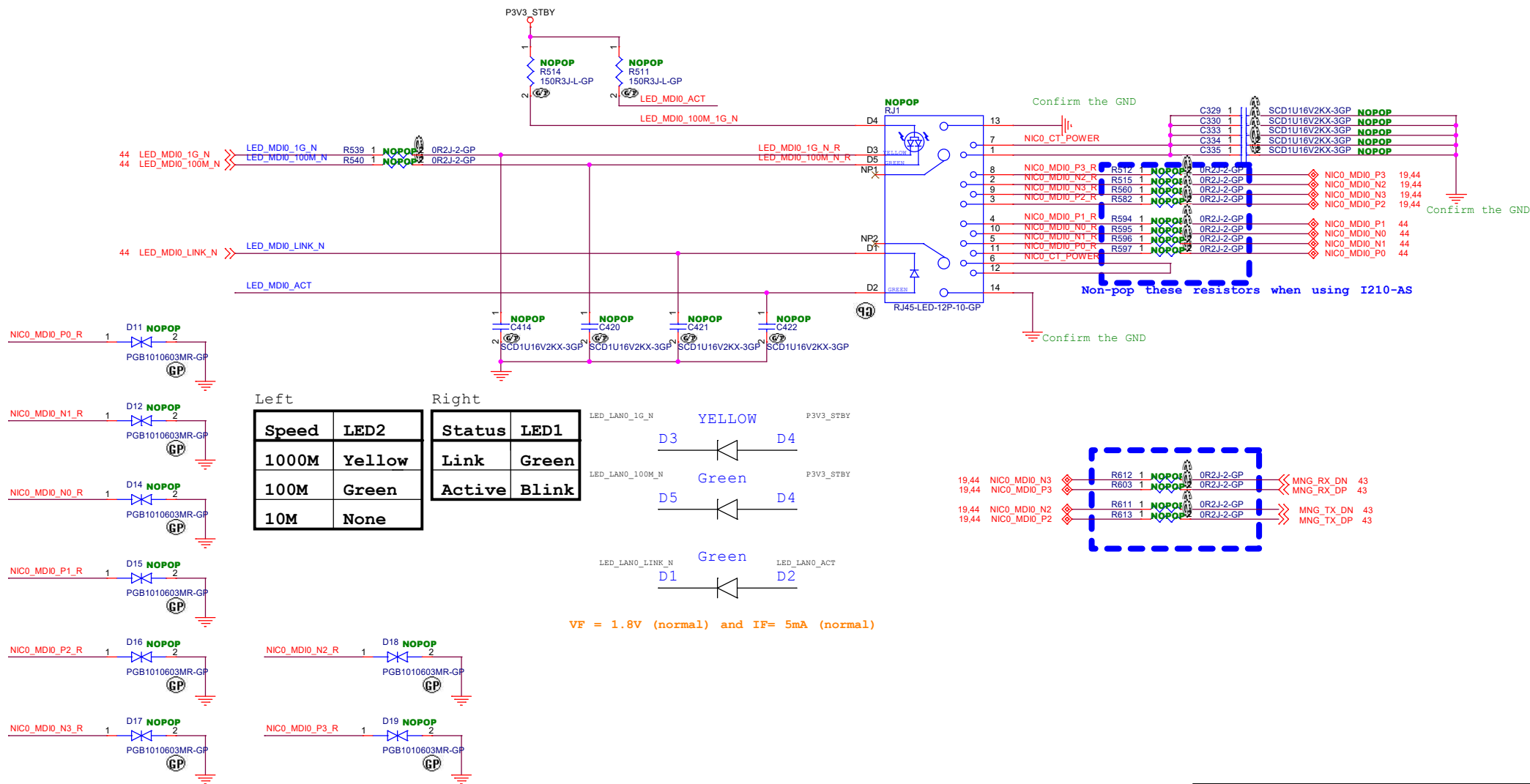
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Title			
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Size	Document Number		Rev
Custom	Lightning PMC PEB -1		1
Date:	Friday, March 31, 2017	Sheet 17 of 60	

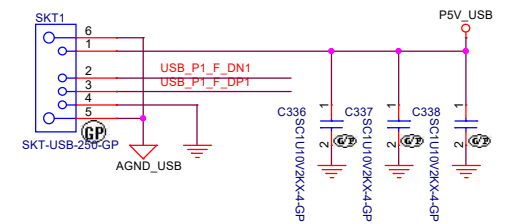
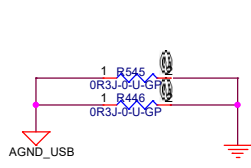
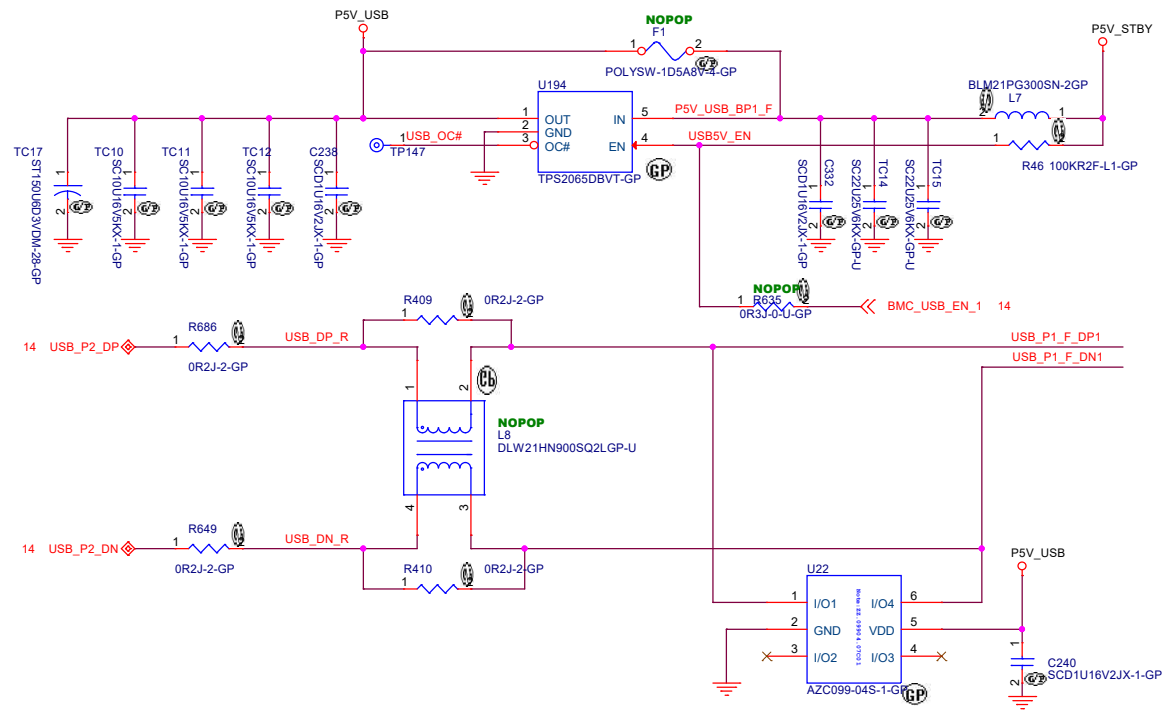




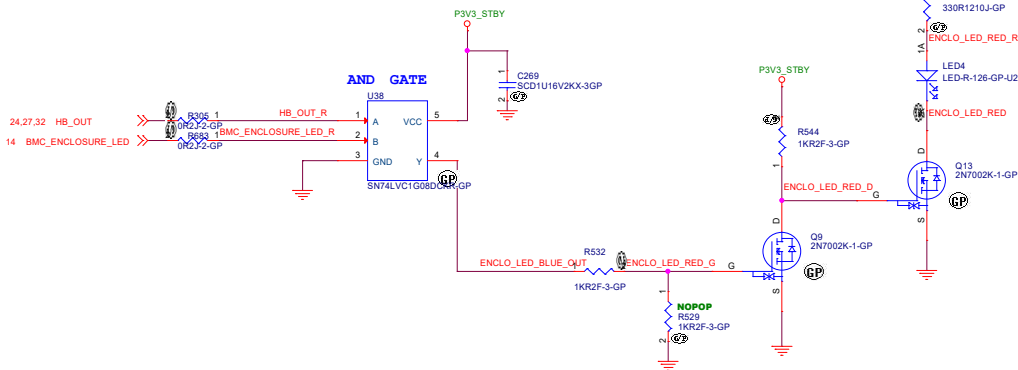
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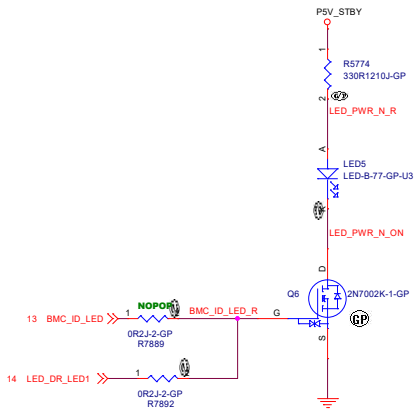




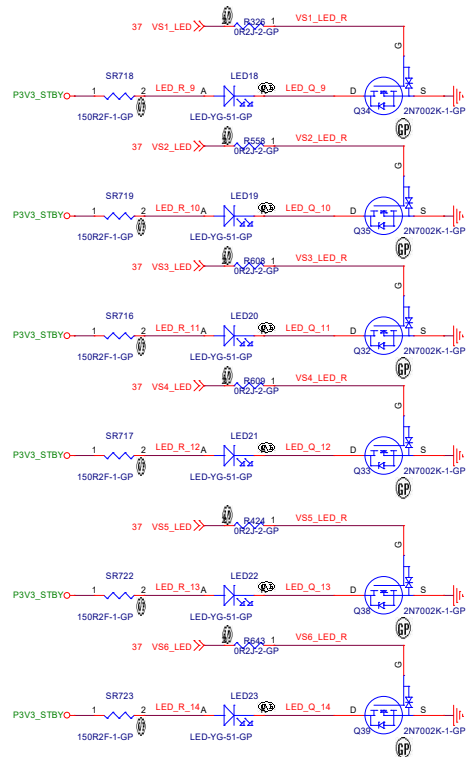
ENCLOSURE STATUS LED - R



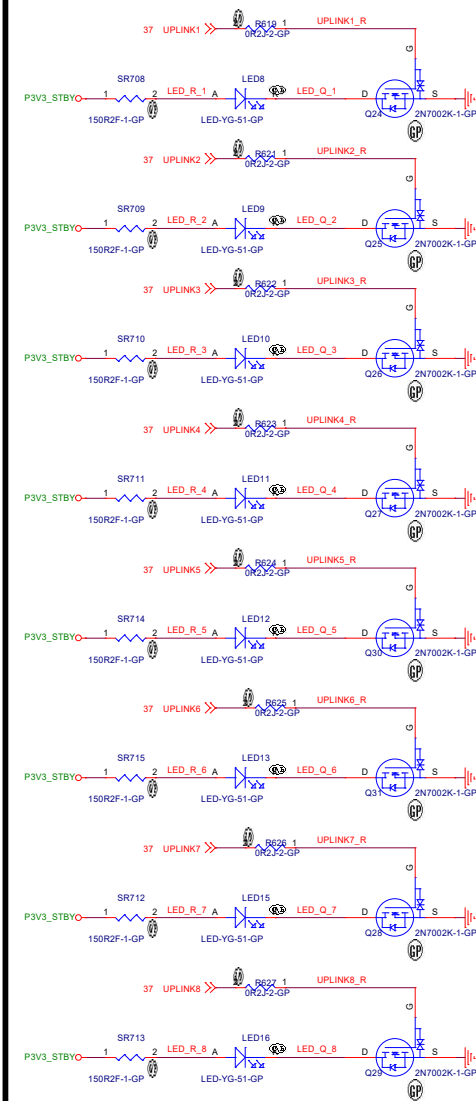
Power identify - B



Virtual SW Zoning indicator - G



UPLINK indicator - G

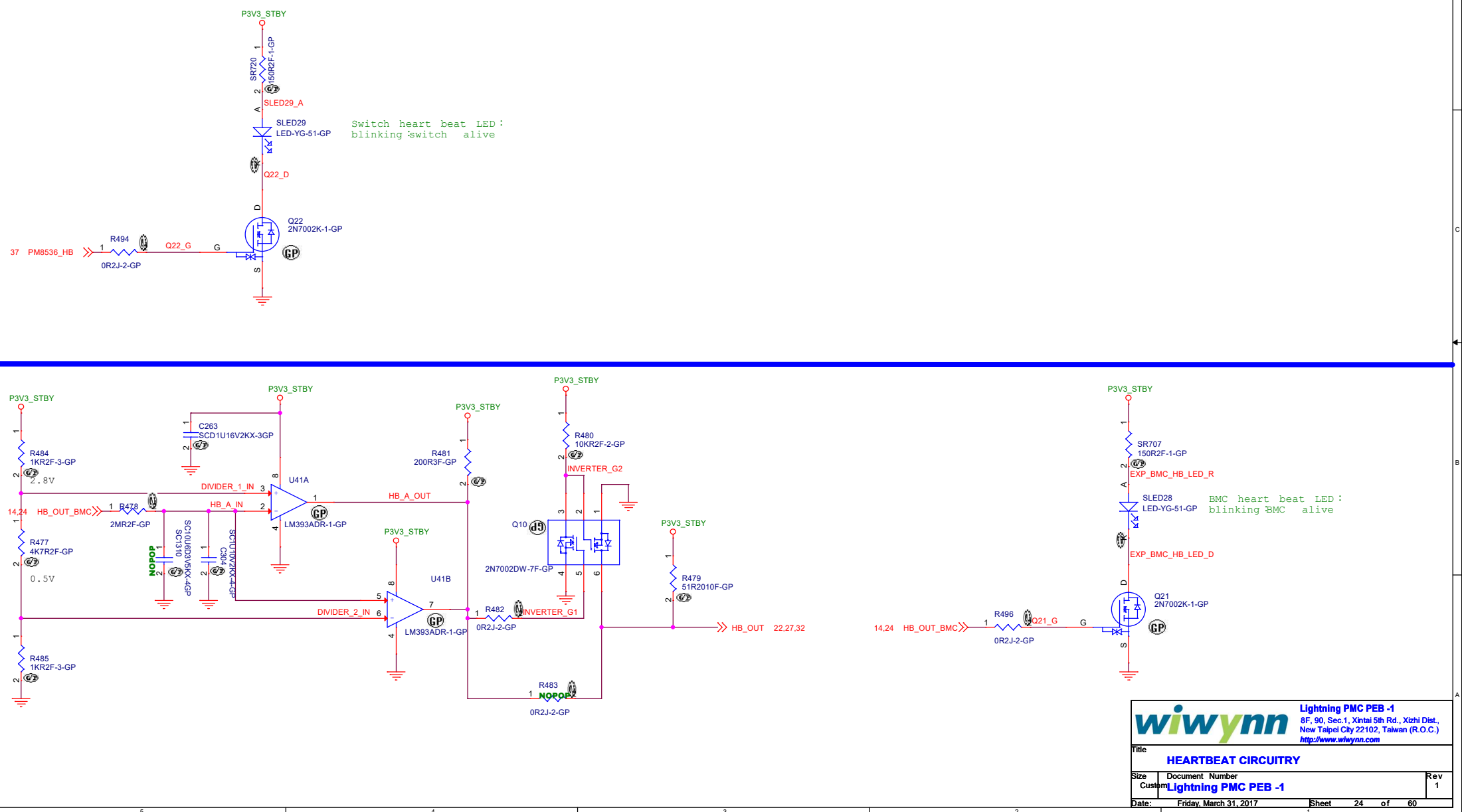


SW zoning:	[LED18]	[LED19]	[LED20]	[LED21]	[LED22]	[LED23]
MODE	ON	OFF	OFF	OFF	OFF	OFF
X16	ON	OFF	OFF	OFF	OFF	OFF
X28	ON	OFF	OFF	OFF	OFF	OFF
X44	ON	OFF	OFF	OFF	OFF	OFF
X216	ON	OFF	OFF	OFF	OFF	OFF
X48	ON	OFF	OFF	OFF	OFF	OFF
X64	ON	OFF	OFF	OFF	OFF	OFF

Uplink Indication:	[LED8]	[LED9]	[LED10]	[LED11]
MODE	ON	OFF	OFF	OFF
X16	ON	OFF	OFF	OFF
X28	ON	OFF	OFF	OFF
X44	ON	OFF	OFF	OFF

MODE	[LED12]	[LED13]	[LED15]	[LED16]
X16	ON	OFF	OFF	OFF
X28	ON	OFF	OFF	OFF
X44	ON	OFF	OFF	OFF

Heart Beat Circuitry

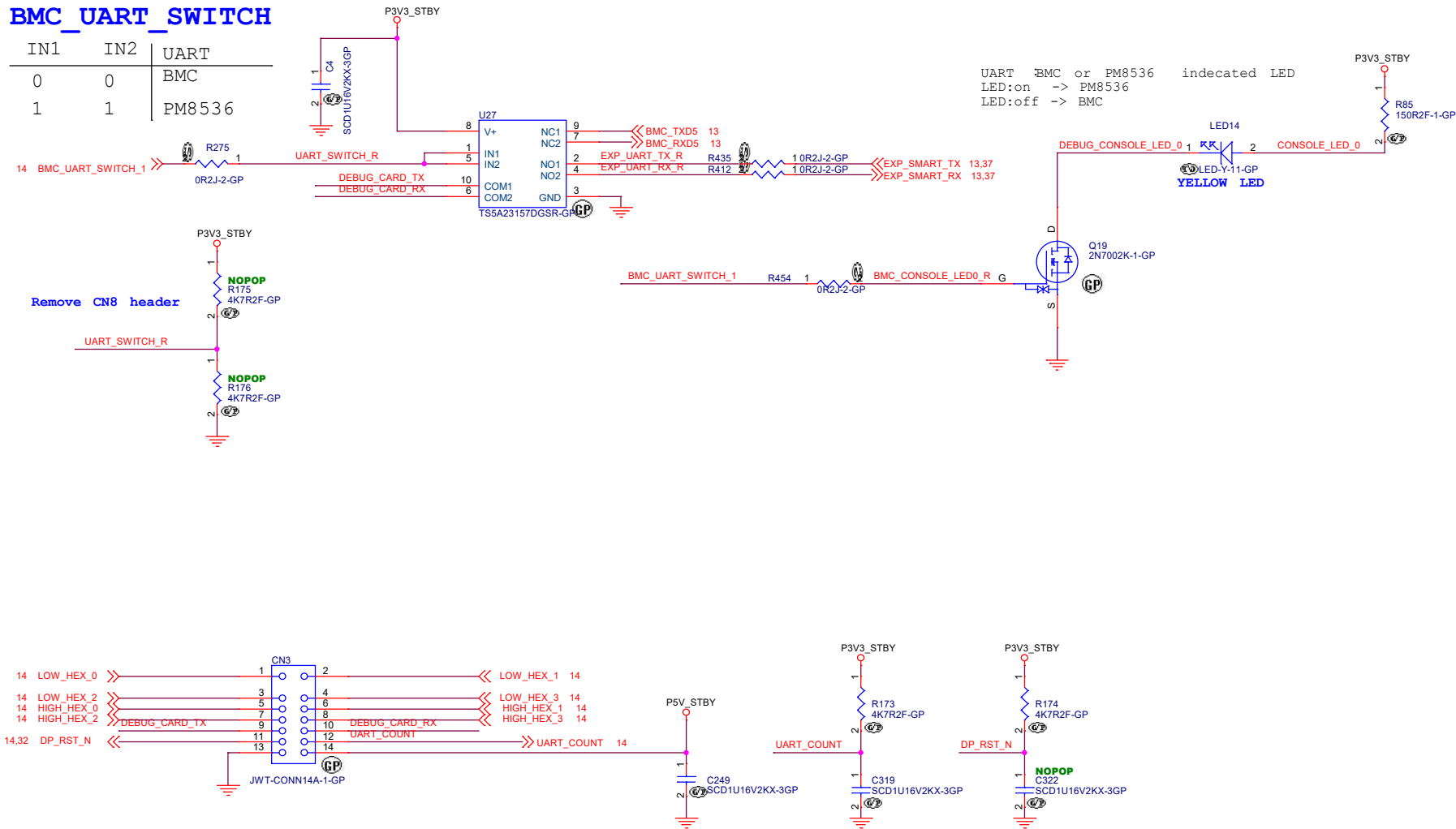


Debug Port

Default : Switch to BMC

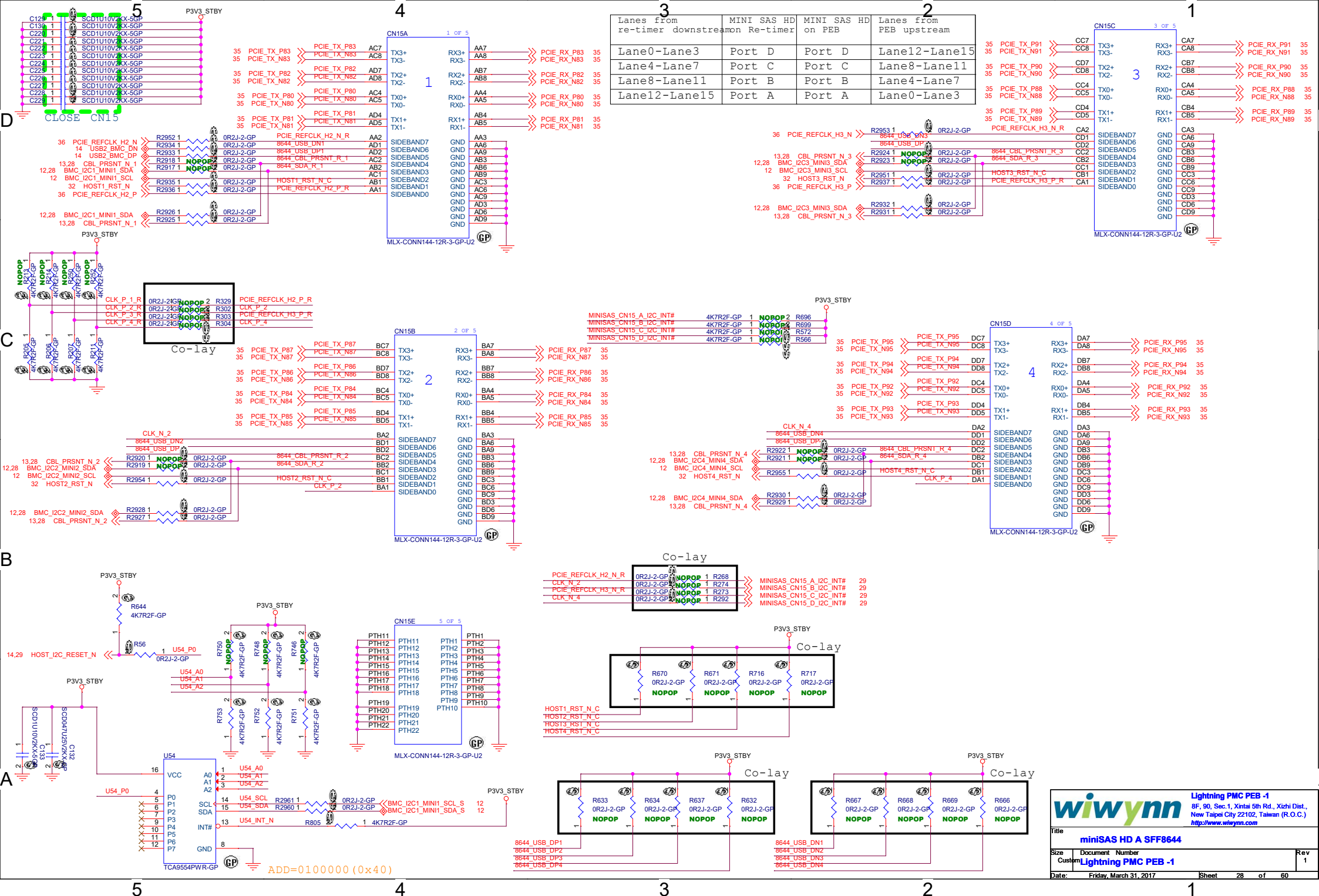
BMC UART SWITCH

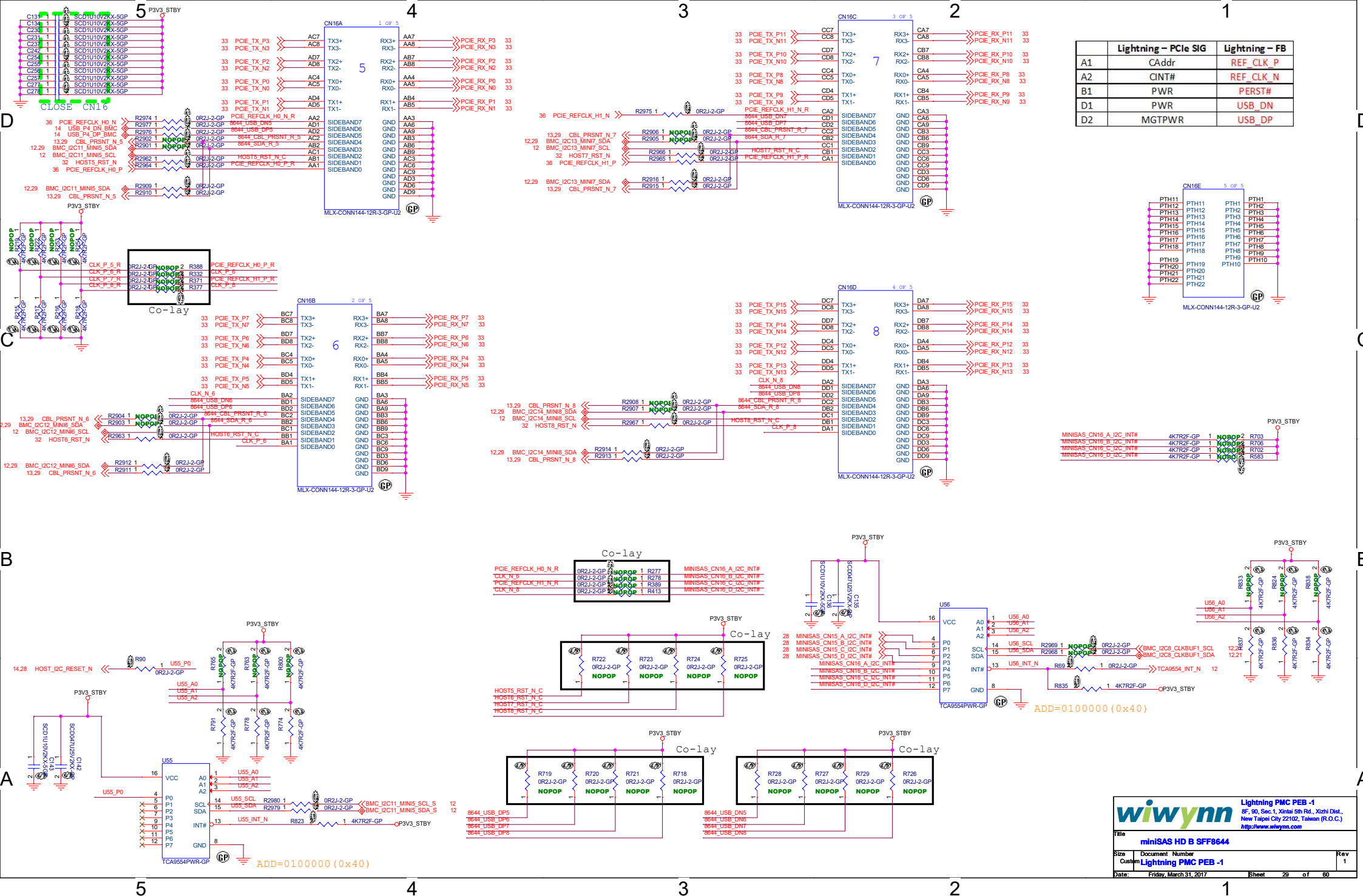
IN1	IN2	UART
0	0	BMC
1	1	PM8536











5

4

3

2


1

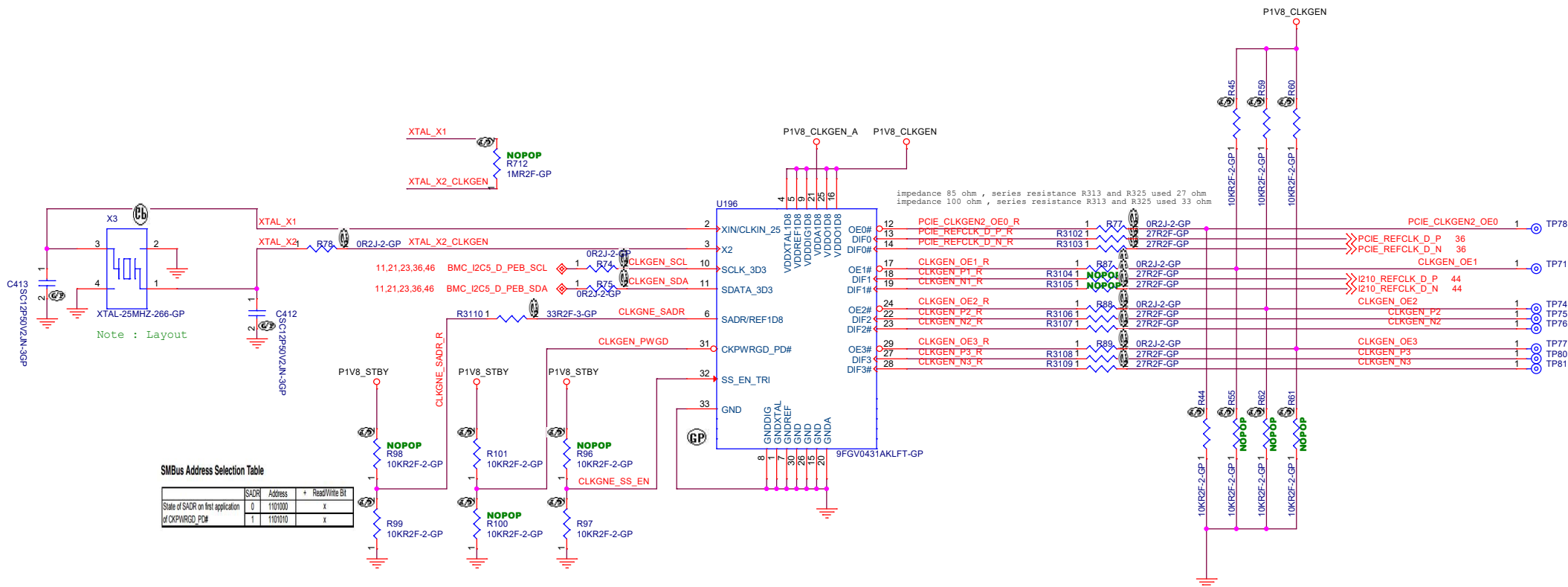
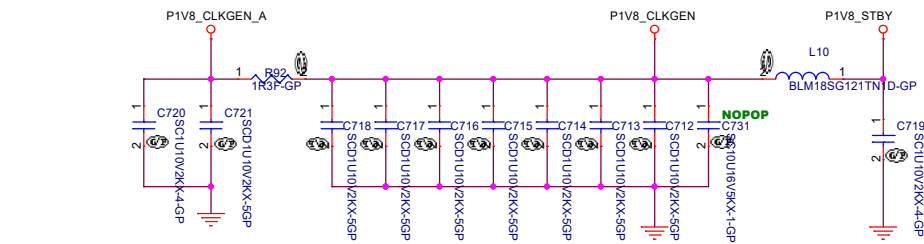
D

C

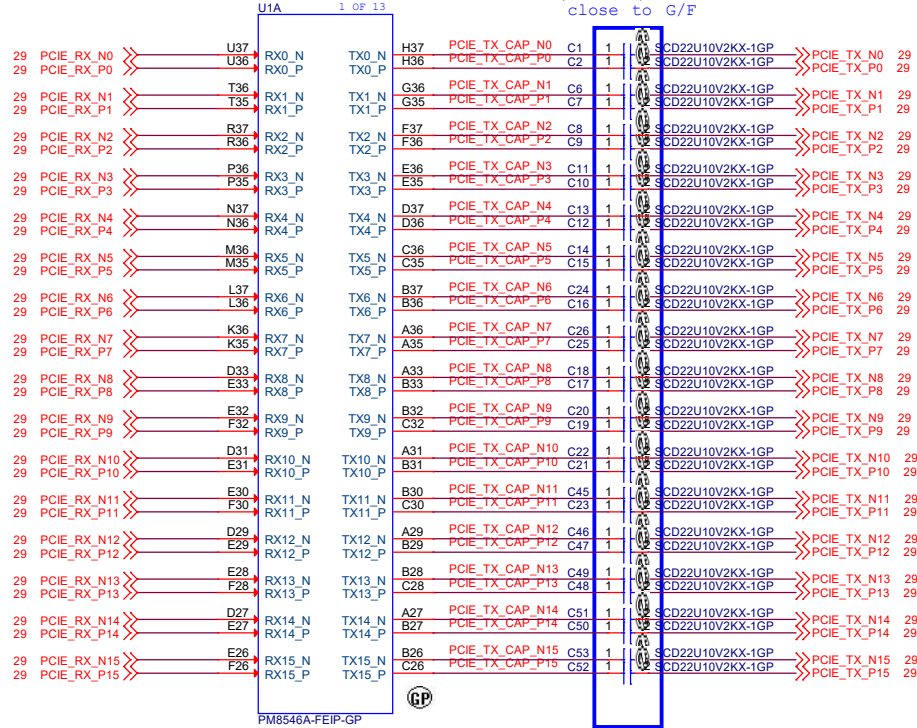
B

A

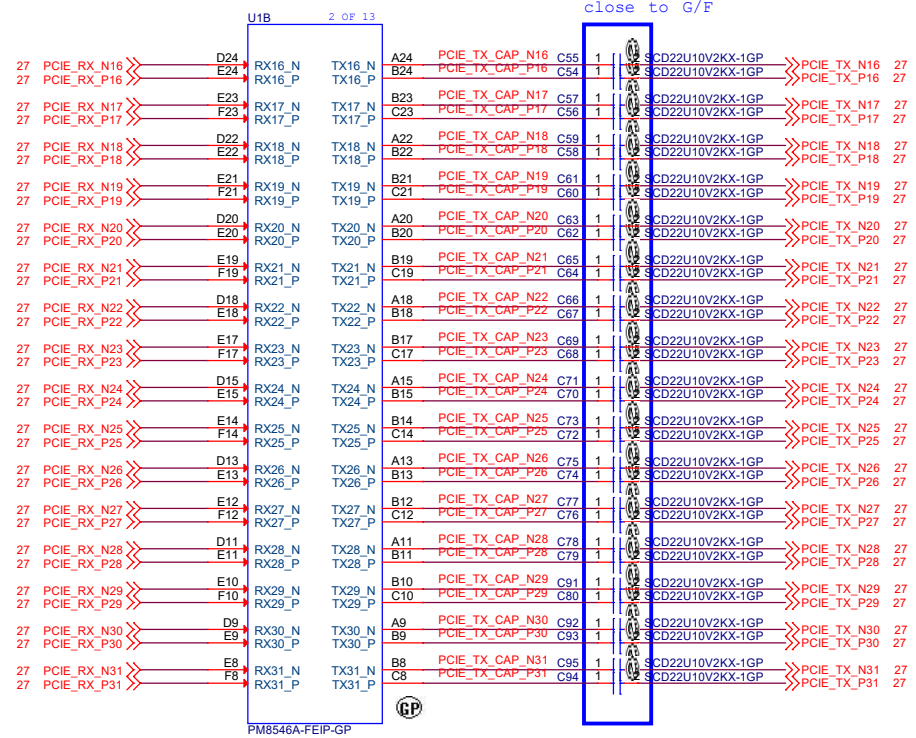
		Lightning PMC PEB -1 8F, 90, Sec.1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22102, Taiwan (R.O.C.) http://www.wiwynn.com	
Title RESERVE			
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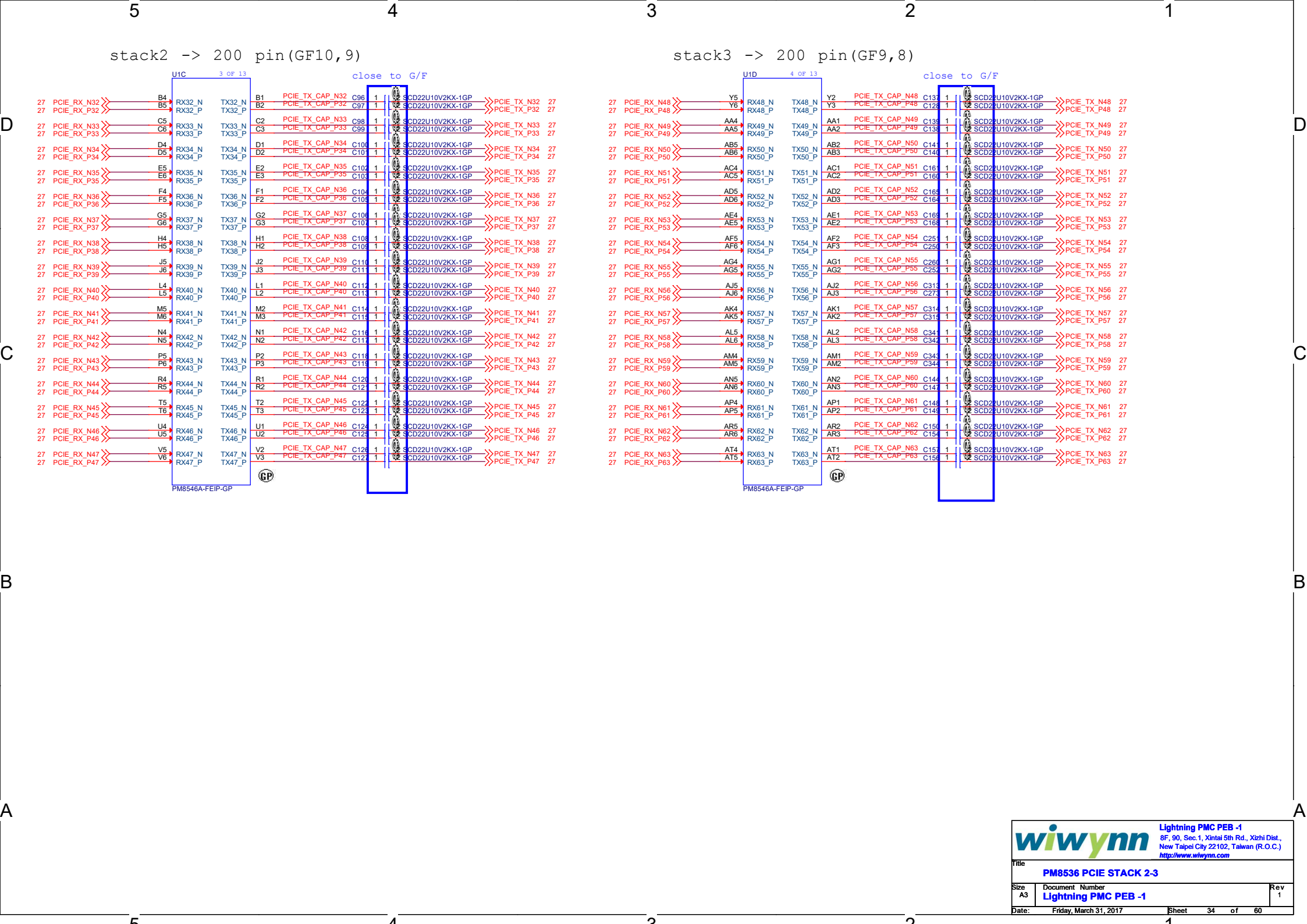


stack0 -> miniSAS HD B(CN16)



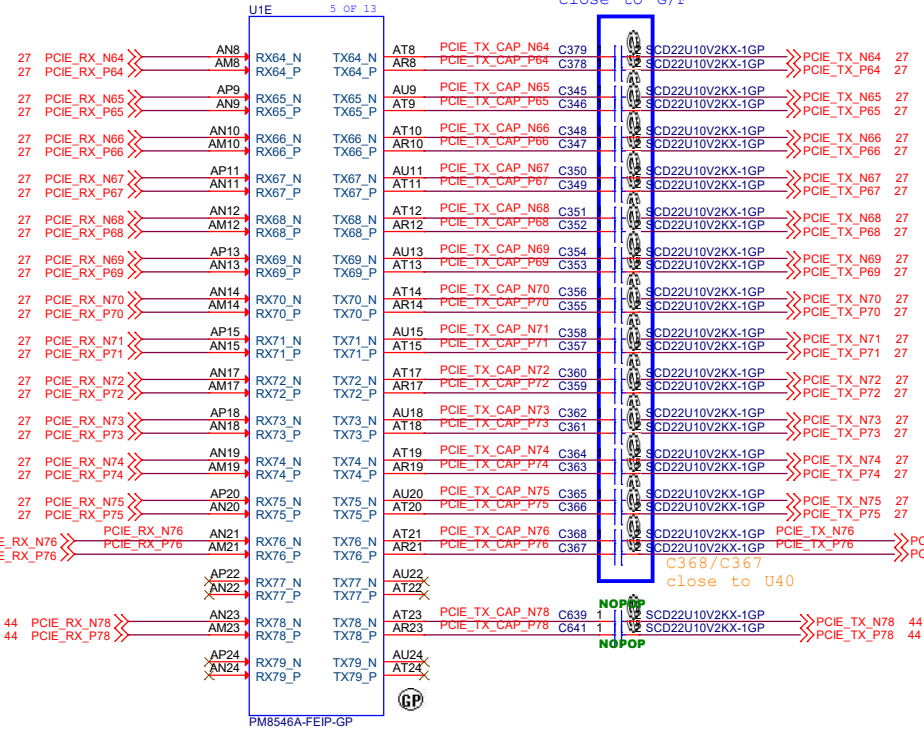
stack1 -> 200 pin(GF10)





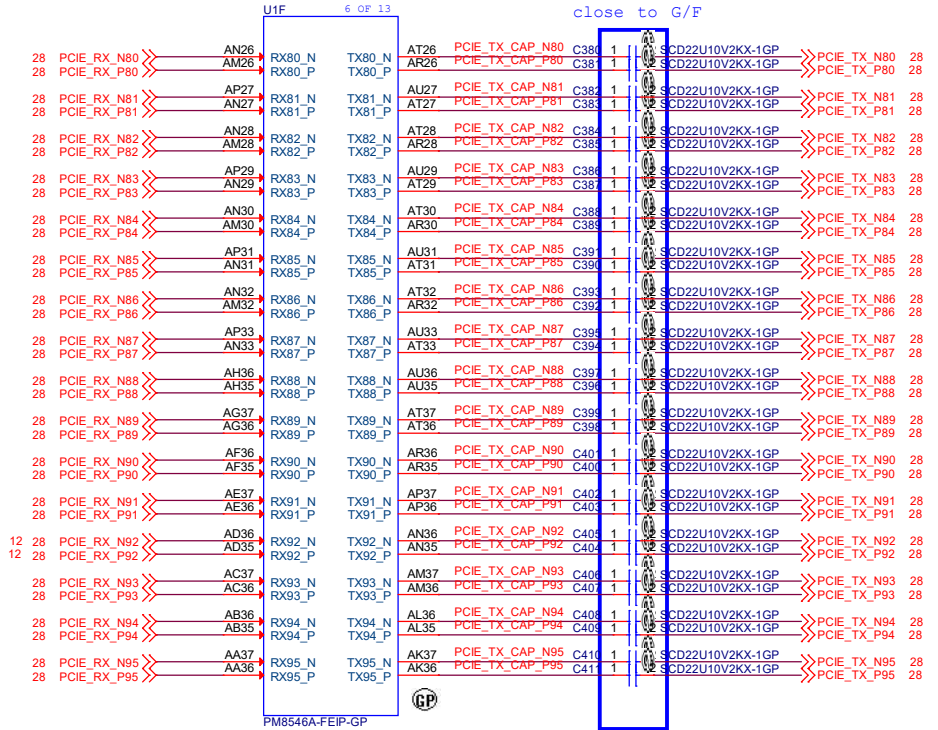
stack4 -> 200 pin(GF8)

close to G/F



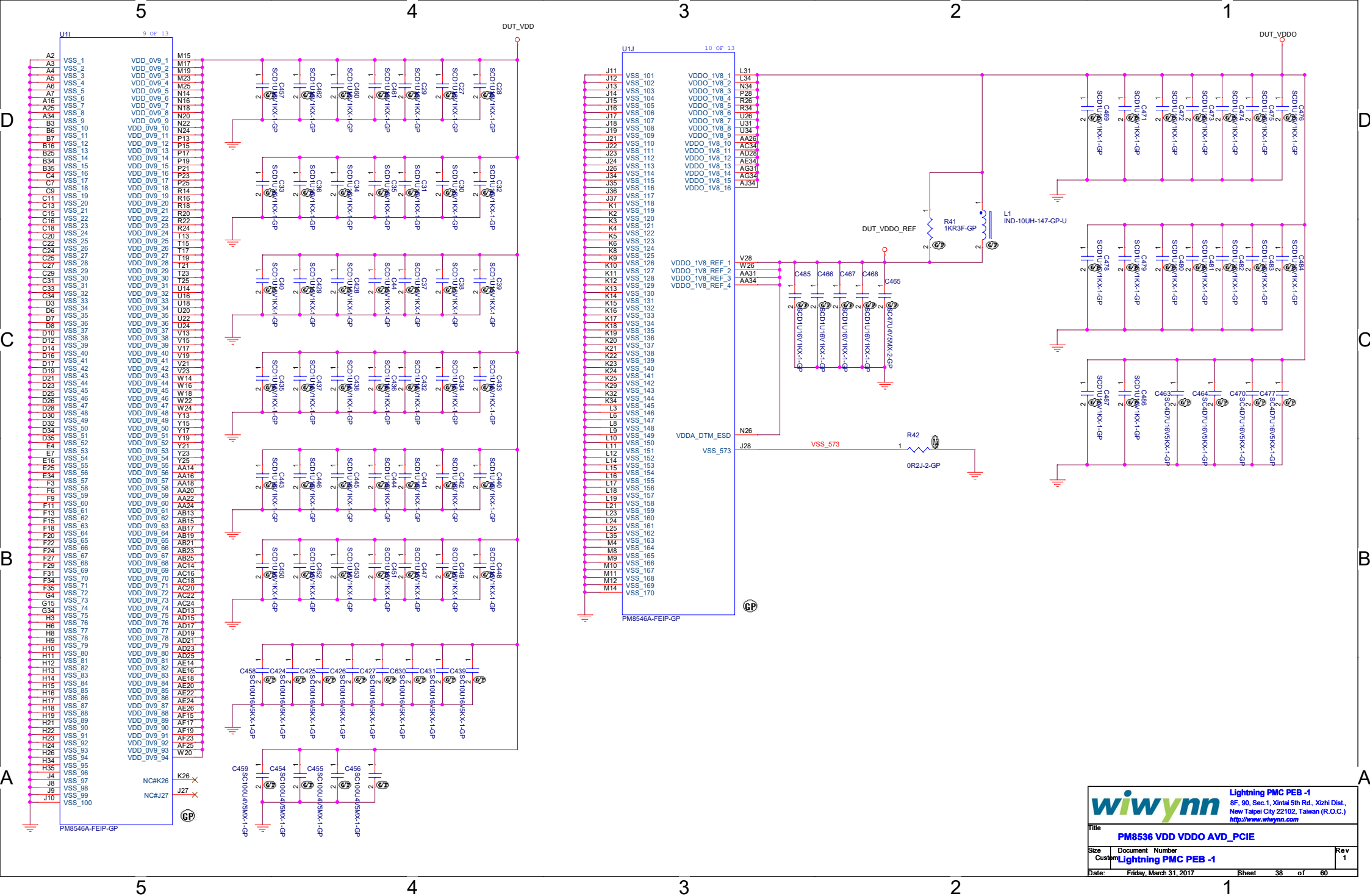
stack5 -> miniSAS HD A(CN15)

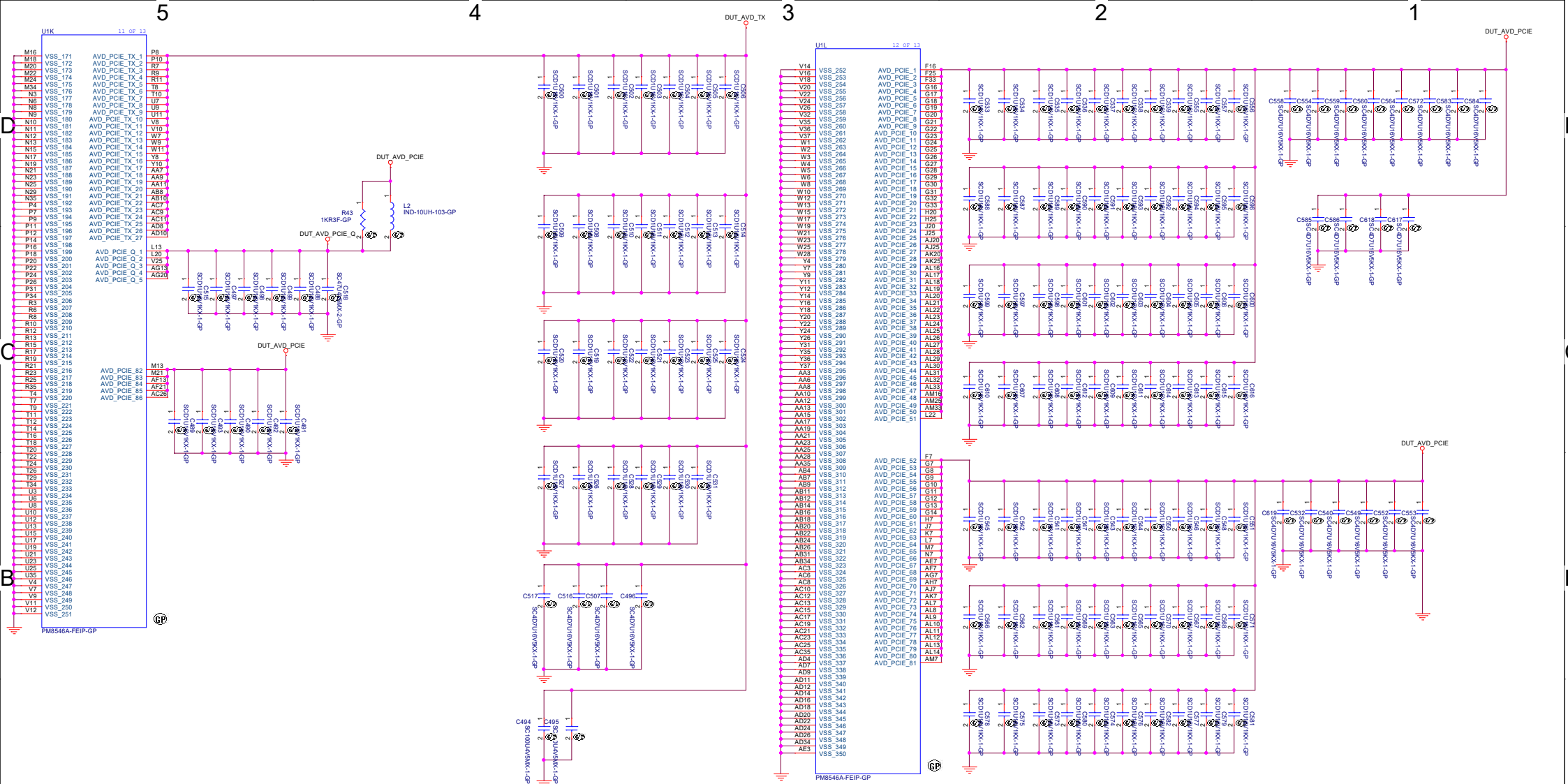
close to G/F

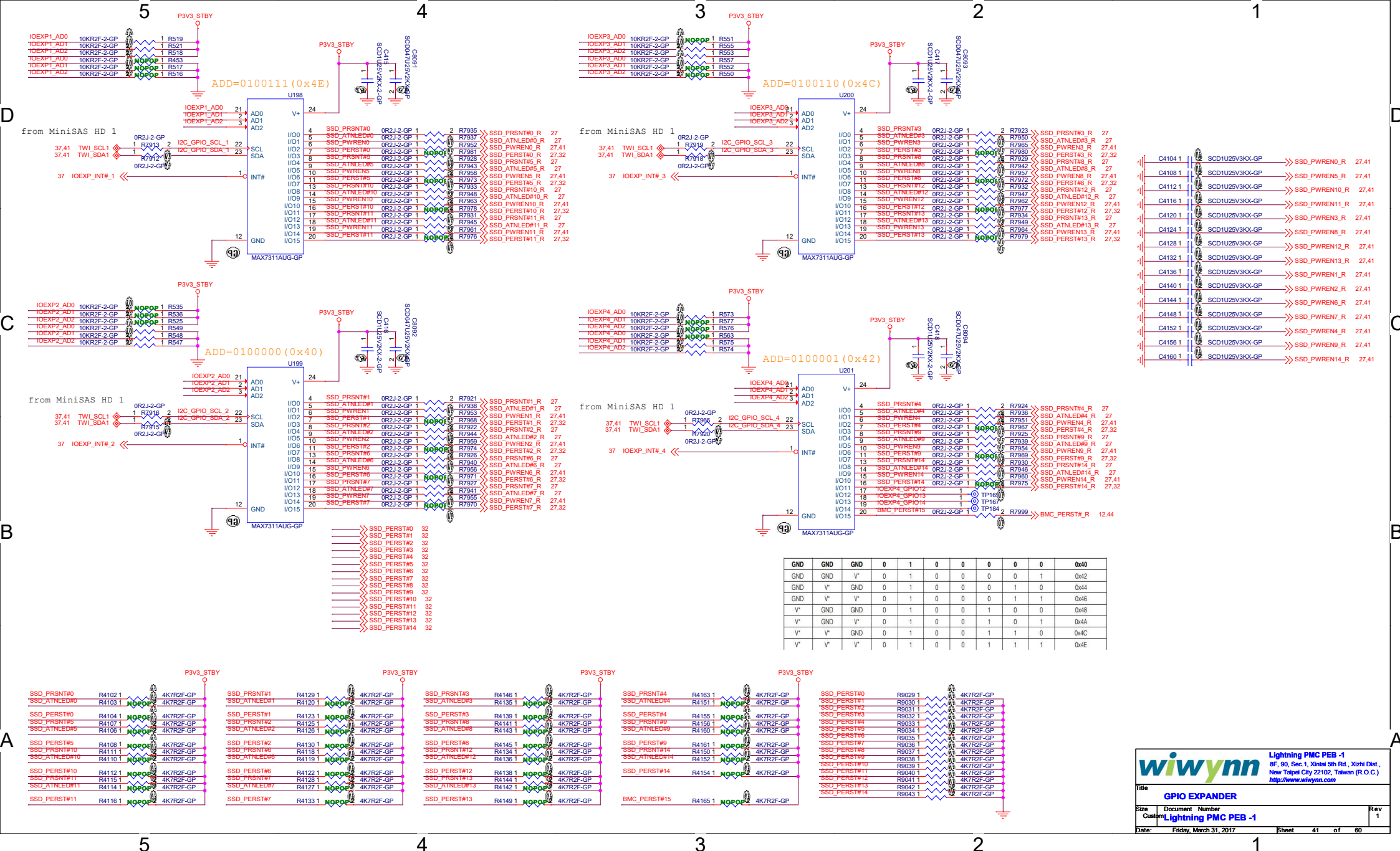









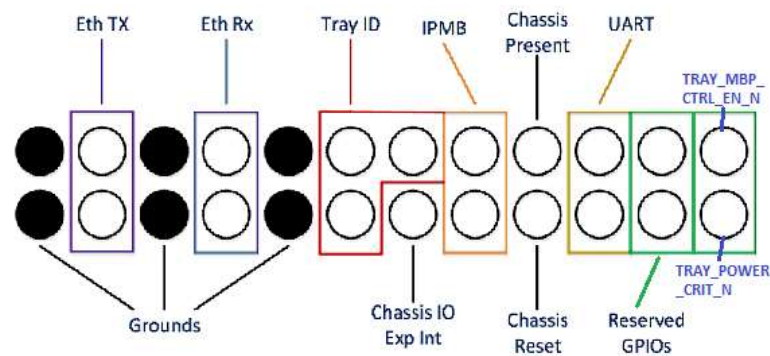
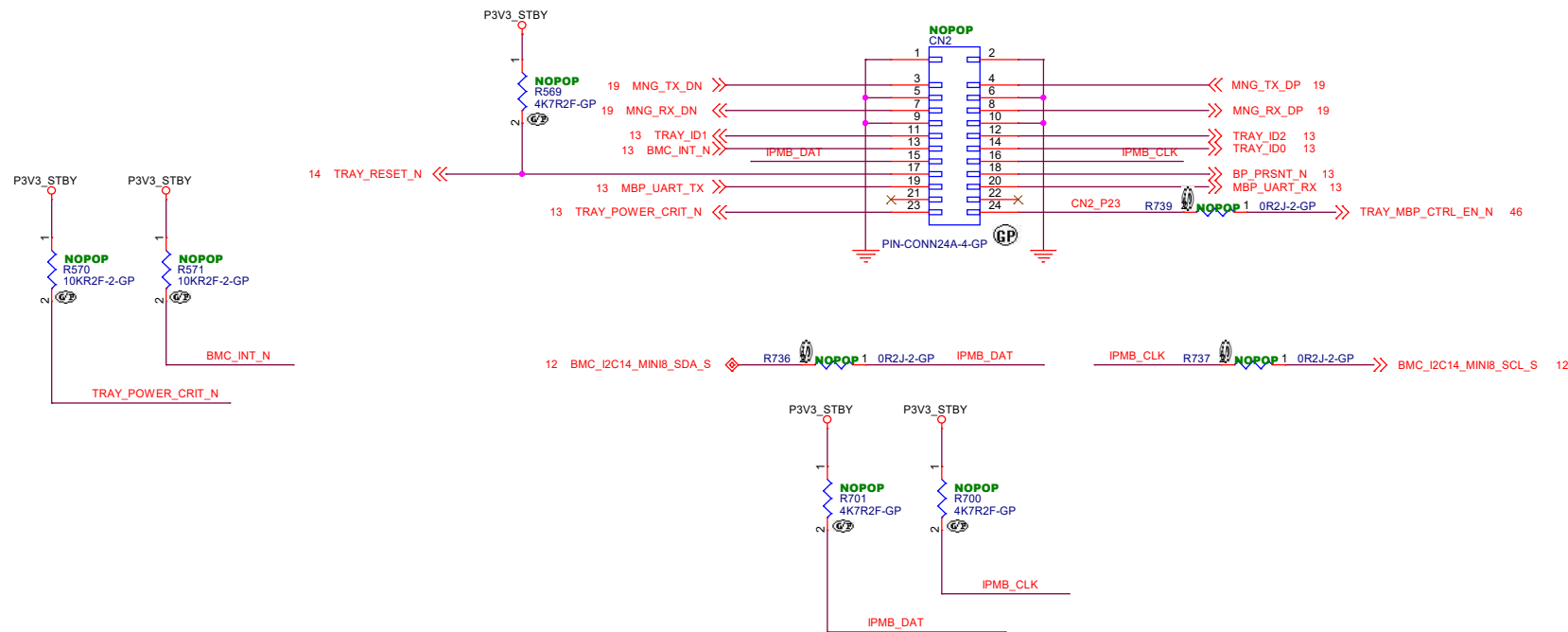


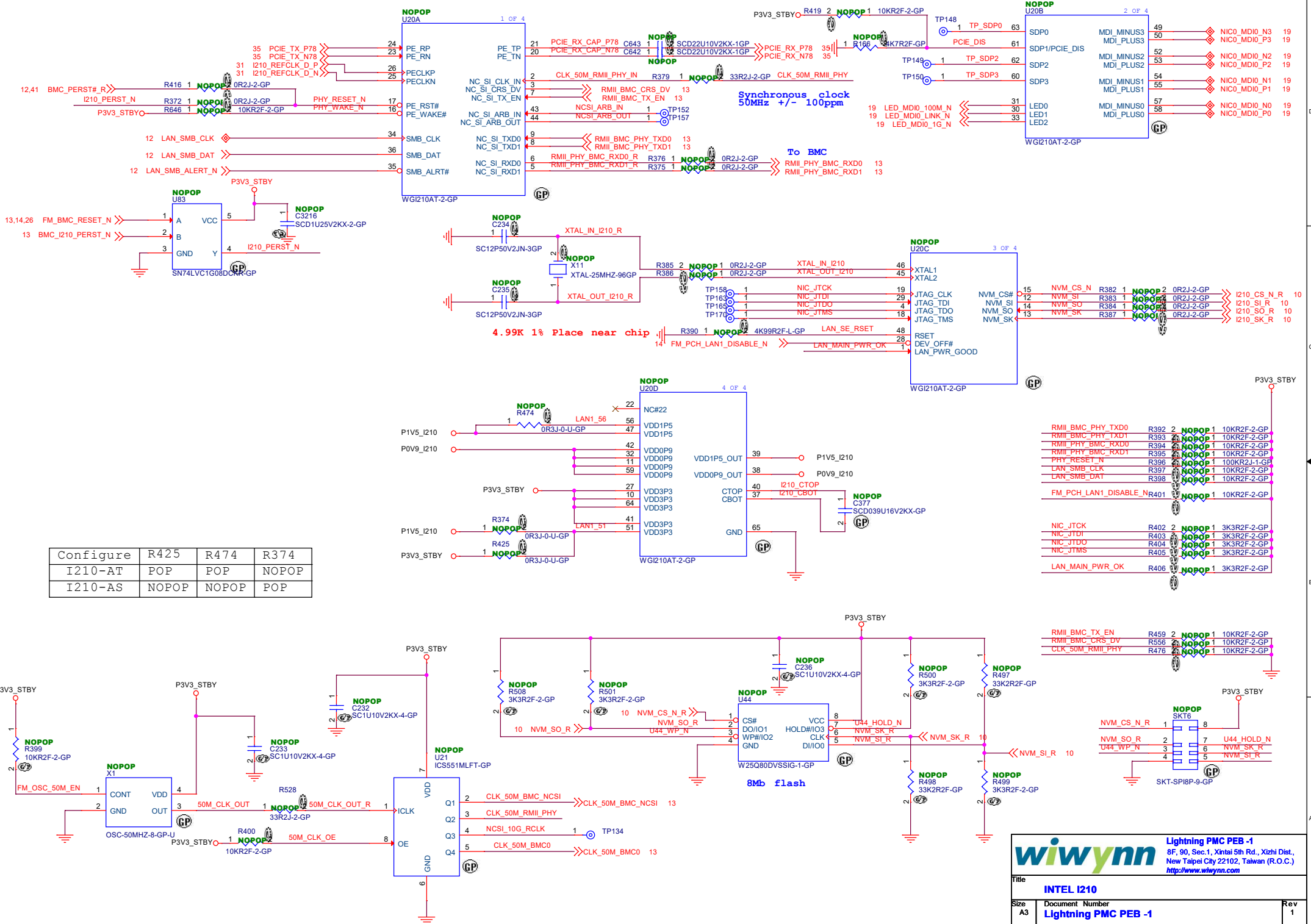




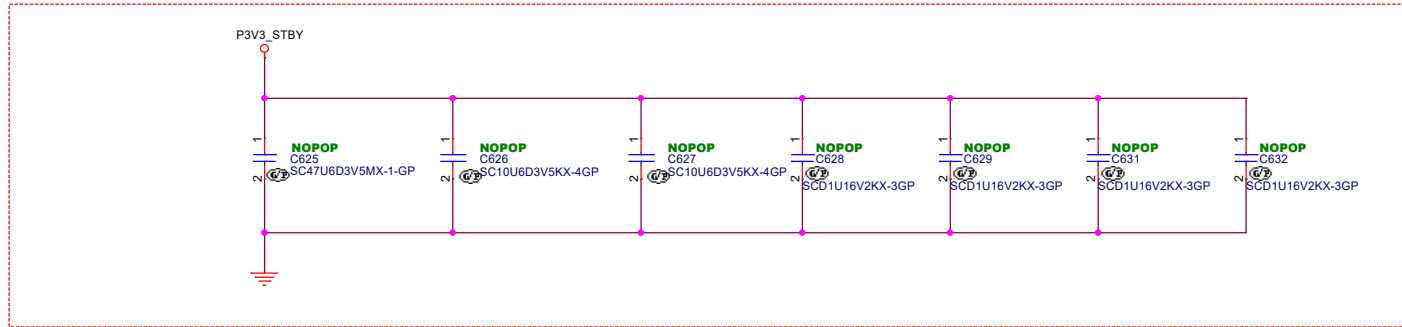
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Title		GPIO EXPANDER	
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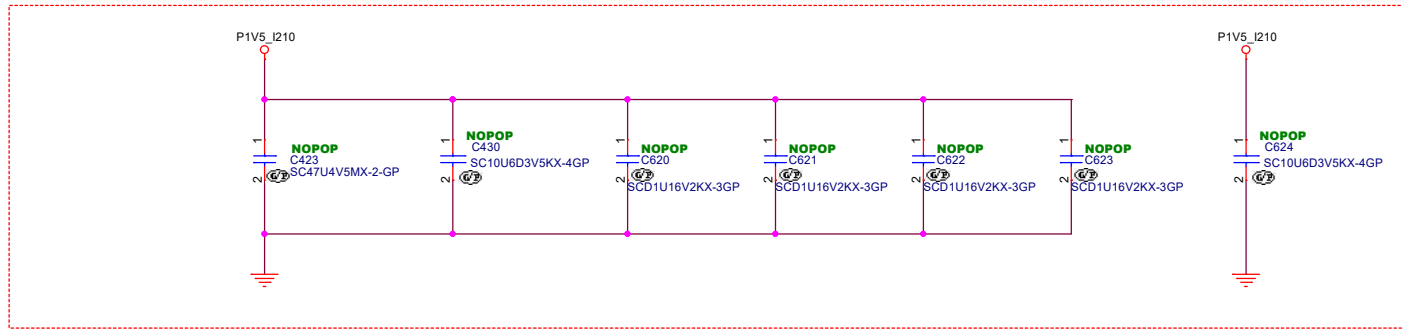




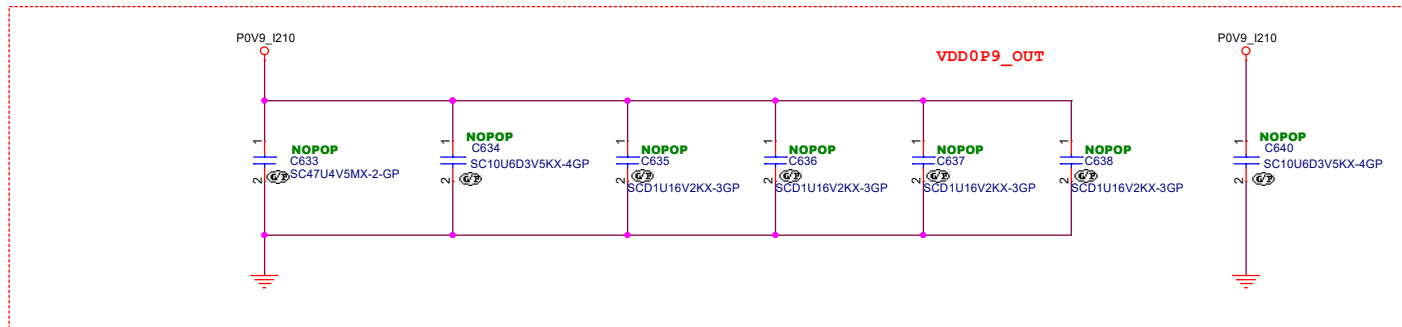
VDD3P3 DECOUPLING



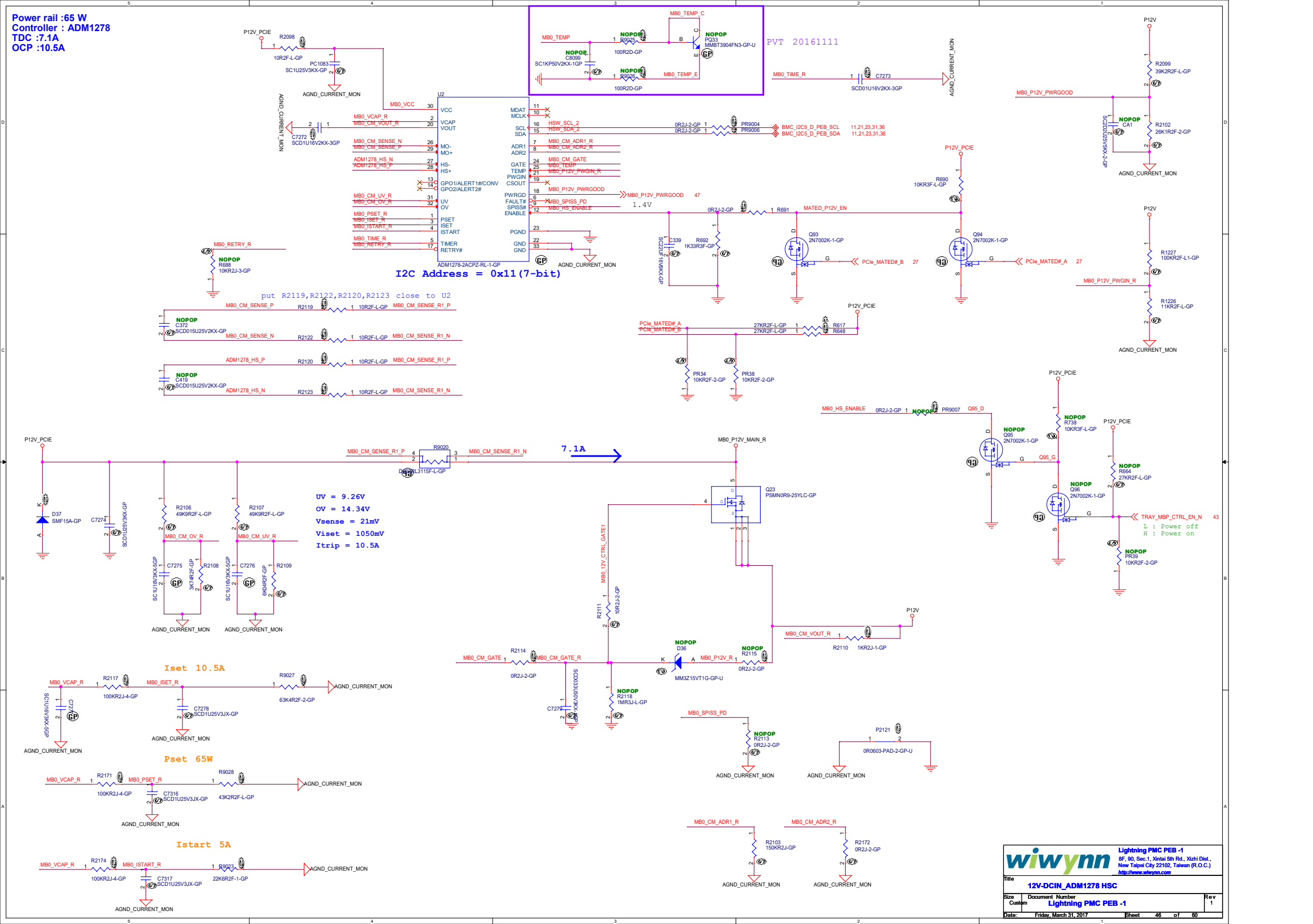
VDD1P5 DECOUPLING



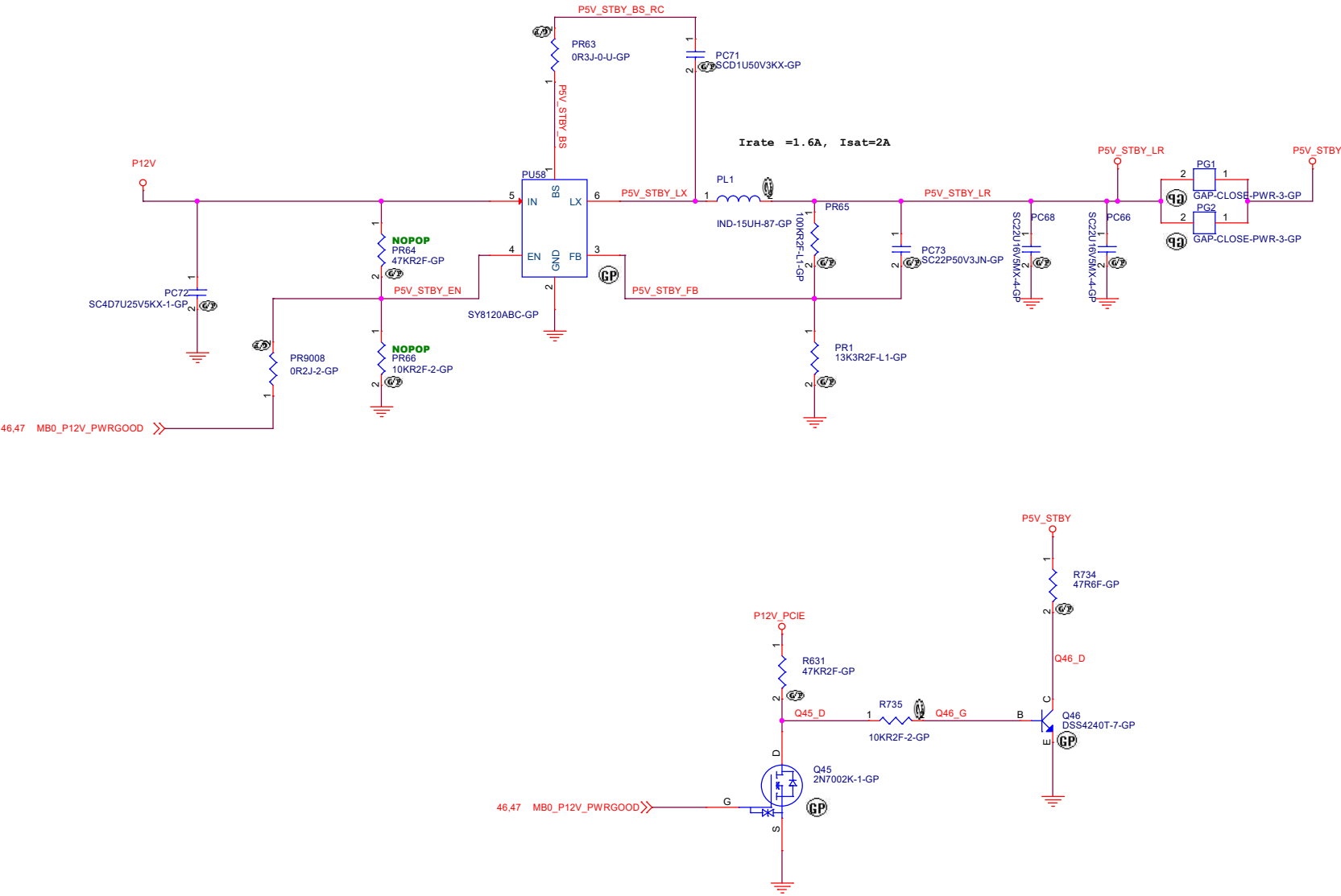
VDD0P9 DECOUPLING



Power rail :65 W
Controller : ADM1278
TDC :7.1A
OCP :10.5A

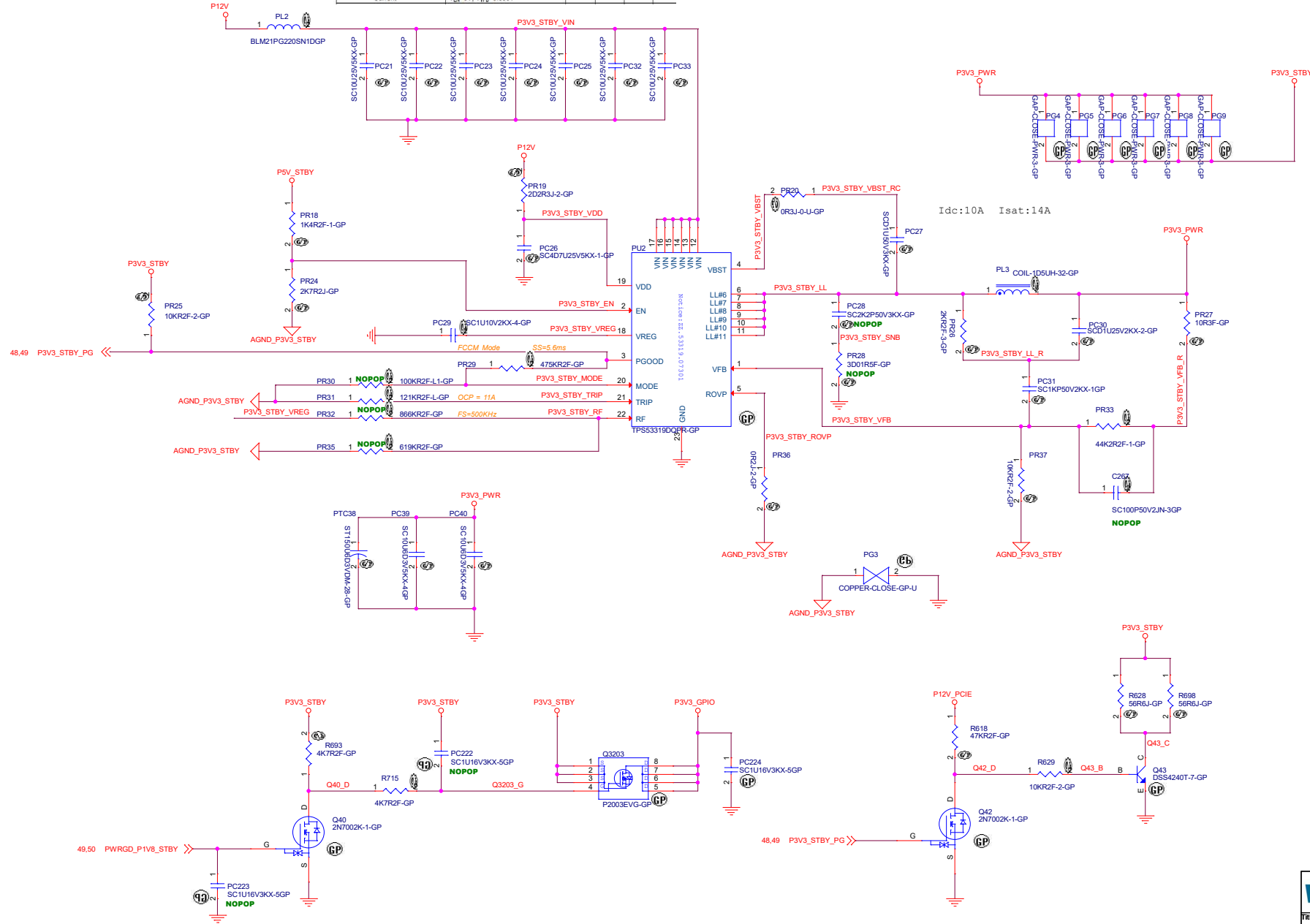


Power rail :P5V_STBY
Controller : SY8120(Fswitching=500KHz)
TDC :1.001A (USB 2.0 STANDARD)
MAX :1.001A
OCP :1.5A

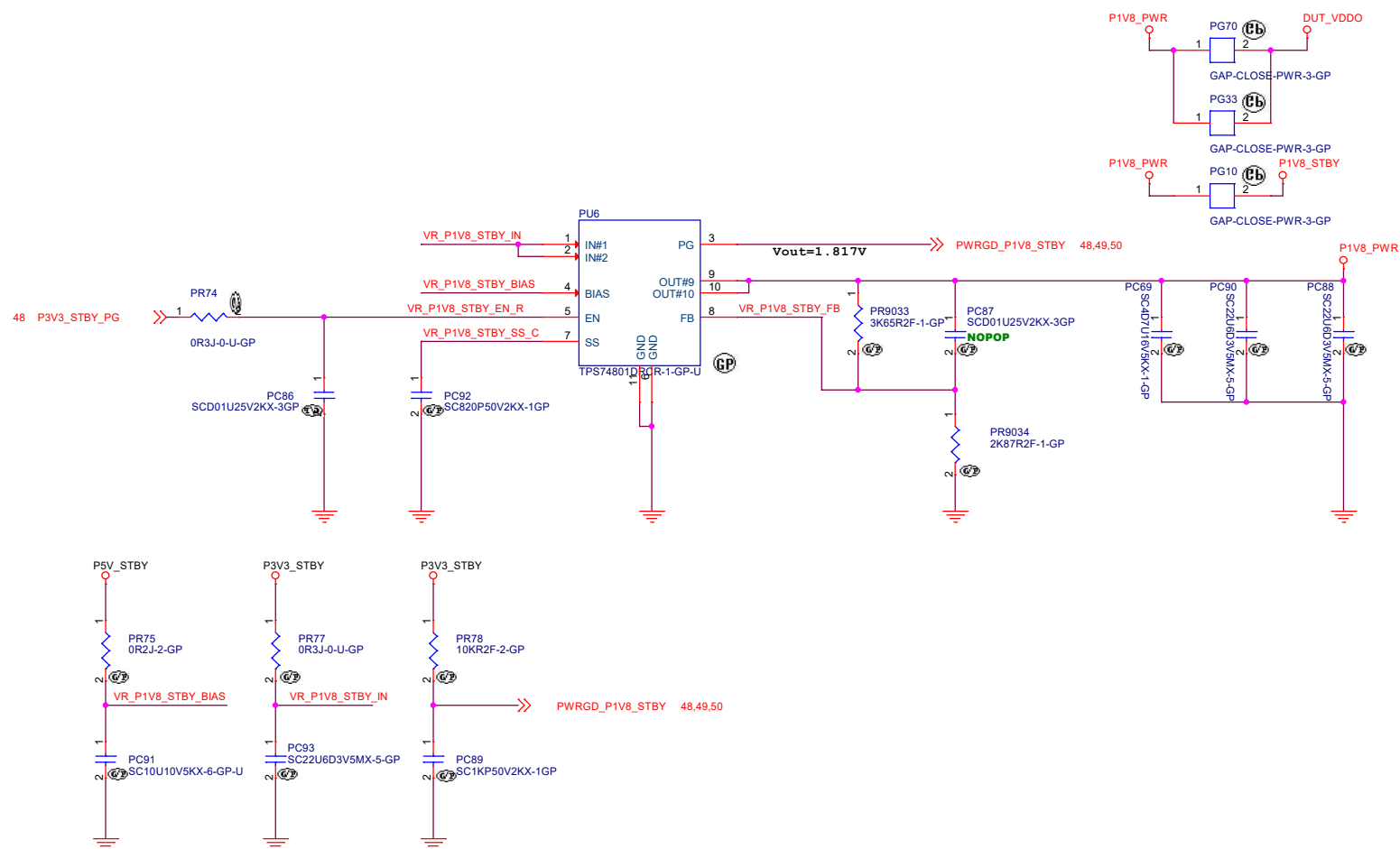


Power rail : P3V3_PWR
Controller : TPS53319 (Fswitching=500KHz)
TDC : 7.296A
MAX : 7.296A
OCP : 11A

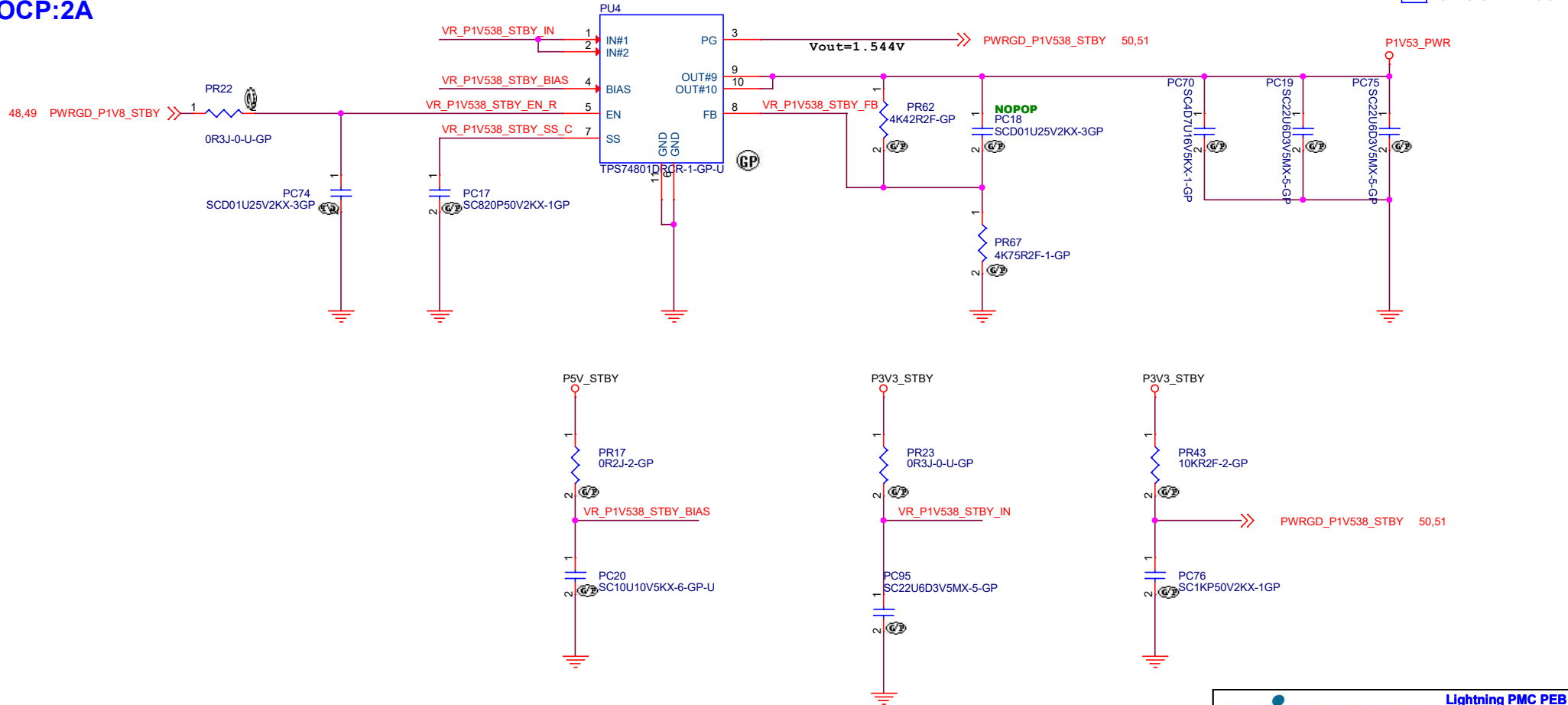
I_{DD}	VDD Supply Current	VDD current, $T_A=25^{\circ}\text{C}$, No Load, $V_{EN}=5\text{V}$, $V_{IFB}=0.630\text{V}$	420	590	μA
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Power rail :P1V8_PWR
Controller :TPS74801
TDC :0.055A
Max :0.055A
OCP:2A

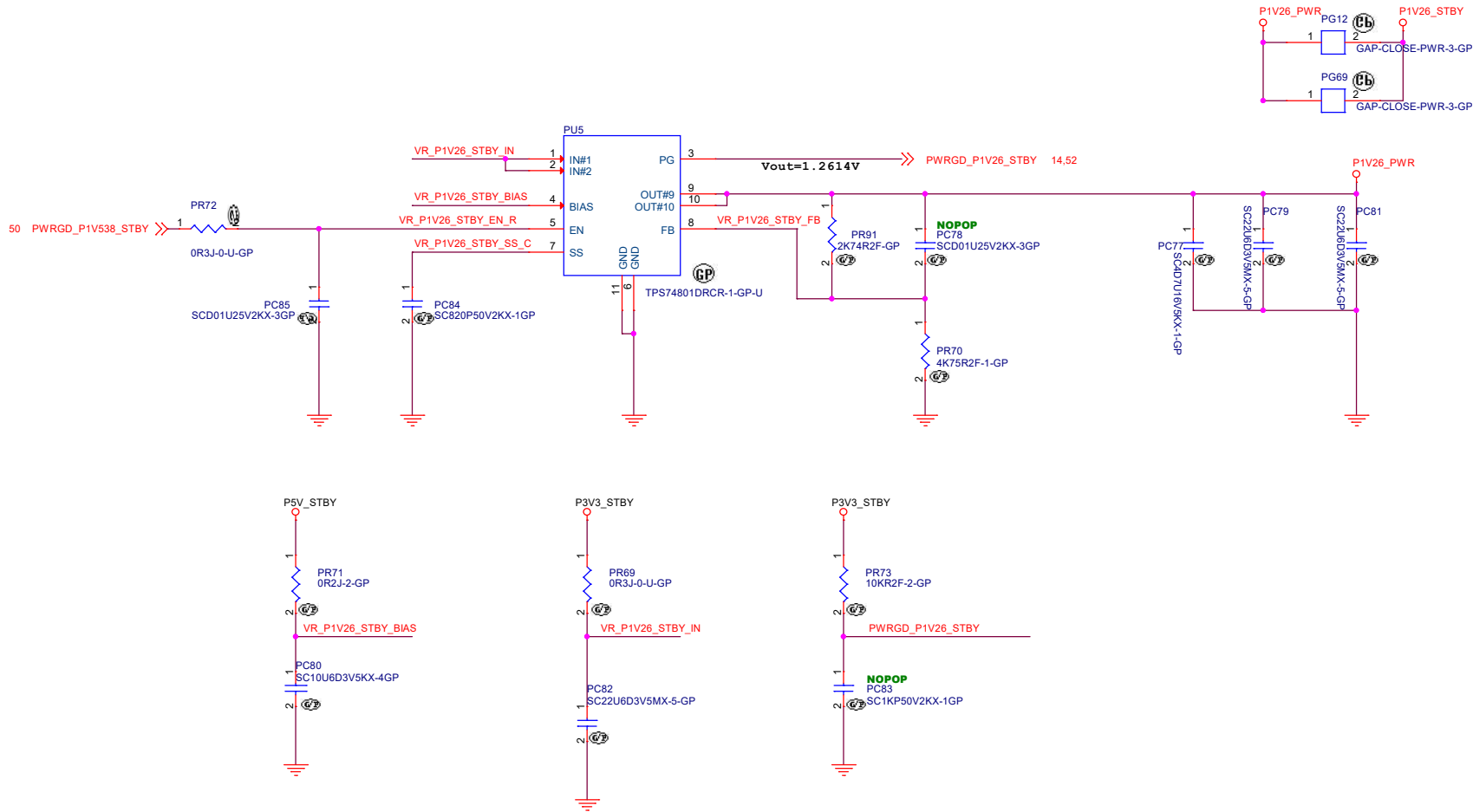


Power rail :P1V53_PWR
TDC :0.662A
Max :0.662A
OCP:2A

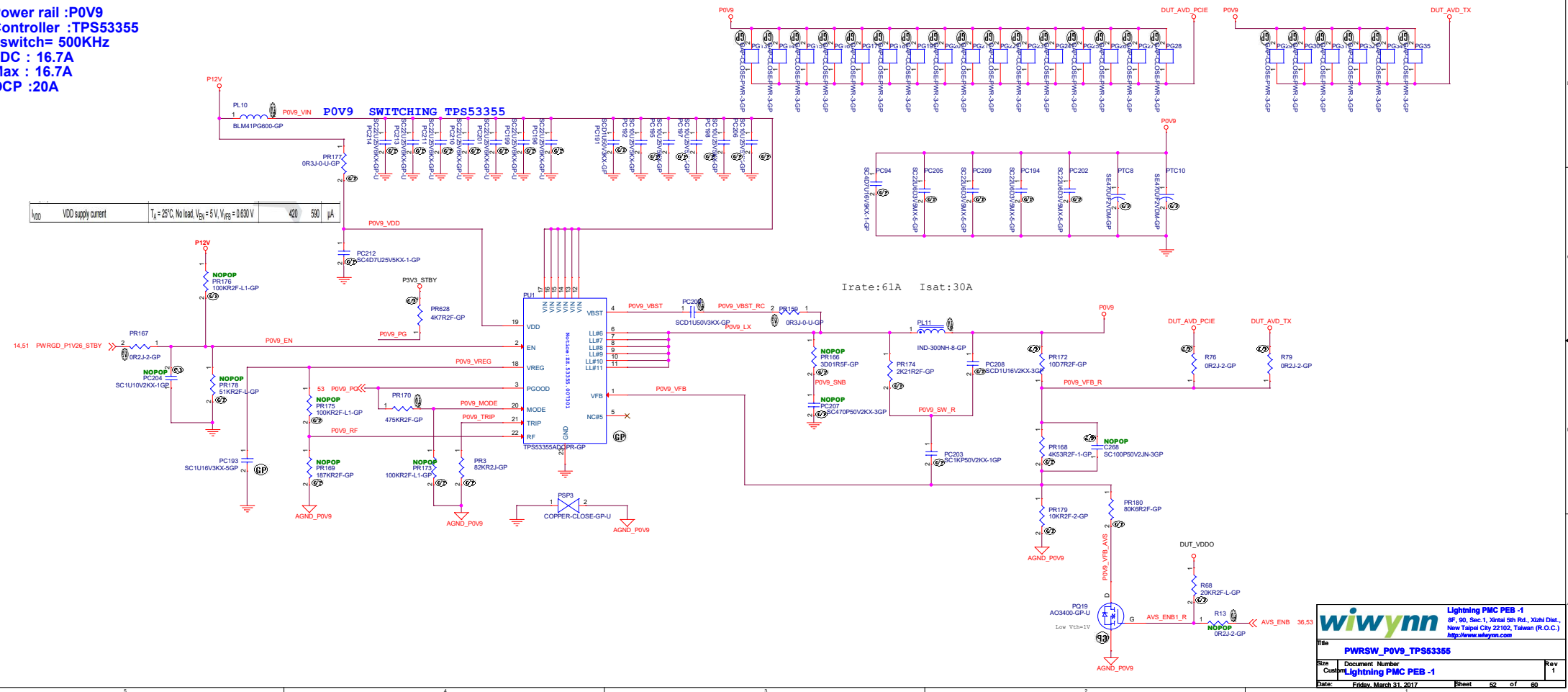


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Title			
PWRLDO_P1V53_PWR_TPS74801			
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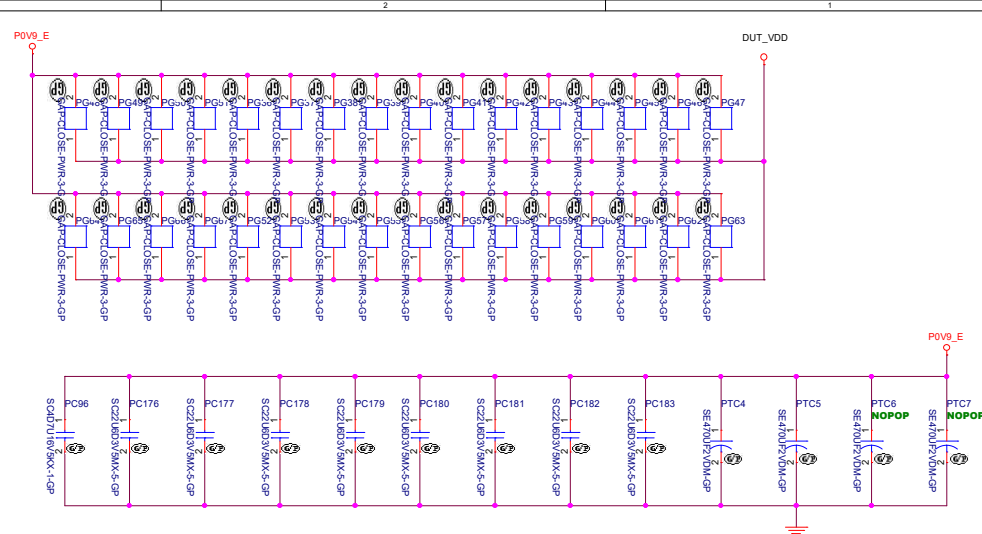
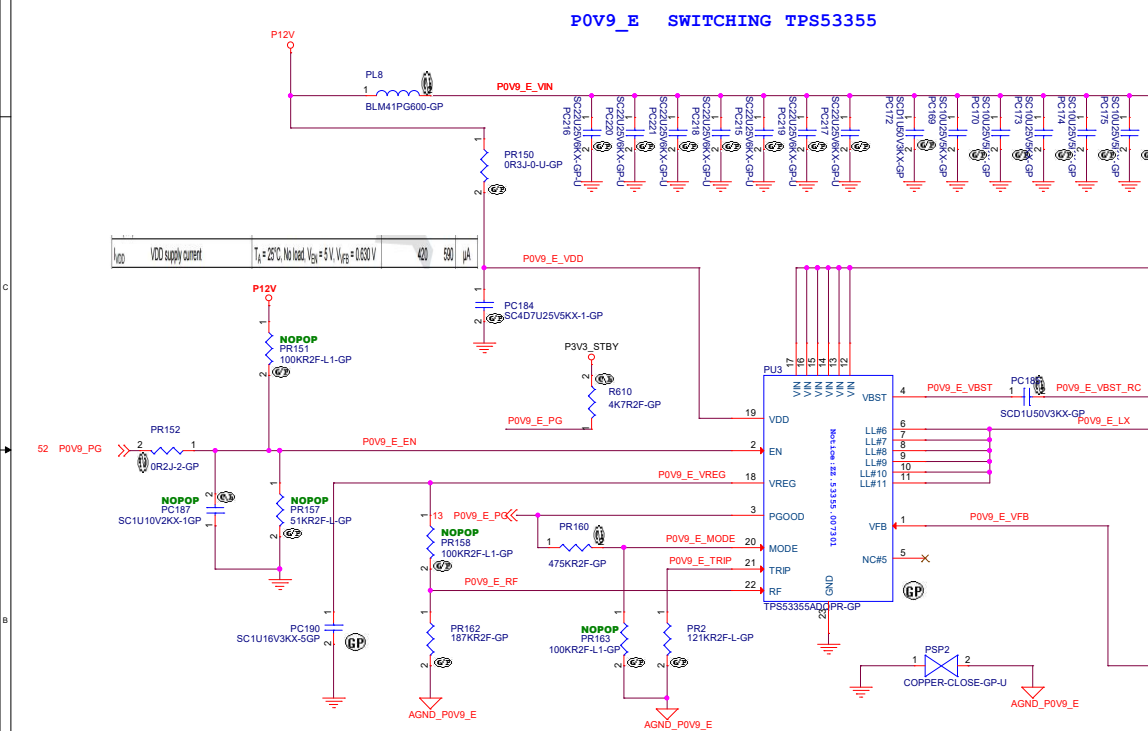
Power rail :P1V26_PWR
Controller :TPS74801
TDC :0.766A
Max :0.766A
OCP:2A



Power rail :P0V9
Controller :TPS53355
Fswitch= 500KHz
TDC : 16.7A
Max : 16.7A
OCP :20A



5
Power rail :P0V9_E
Controller :TPS53355
Fswitch= 300KHz
TDC : 26.32A
Max : 26.32A
OCP :30A



Irate:61A Isat:40A

