

Safety & Servo Control Board

BD642A_V03

History

- [01] 1'st Version Design Completed(: 2022.08)
- [02] 2'nd Version Design Completed(: 2022.11)
- [03] 3'nd Version Design Completed(: 2023.06)

Abbreviations

NOP : Not Operation(: Not assembly)

Schematic Contents

01. TITLE & HISTORY

02. PWR PN15V EXTERNAL

03. PWR MCU ZYNQ

04. MCU PWR

05. MCU JTAG OSC ADC

006 MCU SCI FSI GPIO 7SEG

07. MCU EMIF1 SDRAM

08. MCU1 EtherCAT

09. ZYNQ EtherCAT

10. ZYNQ PWR

11. ZYNQ JTAG SCI QSPI

12. ZYNQ DDR3L

13. ZYNQ PL GPIO
14. I/F STO

15. I/F TP

16. I/F SI

17. I/F SI & SO

18. I/F OPAMP1

19. I/F OPAMP2

20. I/F OPAMP3 & TEMP.

21. I/F PWM BUF

22. I/F ENCODER

23. I/F BRAKE

24. I/F EX. CONNECTOR

[Design Note]

D-1200 Series Information

Item	Series	D-1200
Pitch		2.5mm
Voltage rating		250V AC/DC
Current rating (Max)		1 pos: 5A (In use of AWG18)
Contact Resistance		20[mOhm]
Dielectric Withstanding		1,500V AC
Temperature		-55 ~ 105

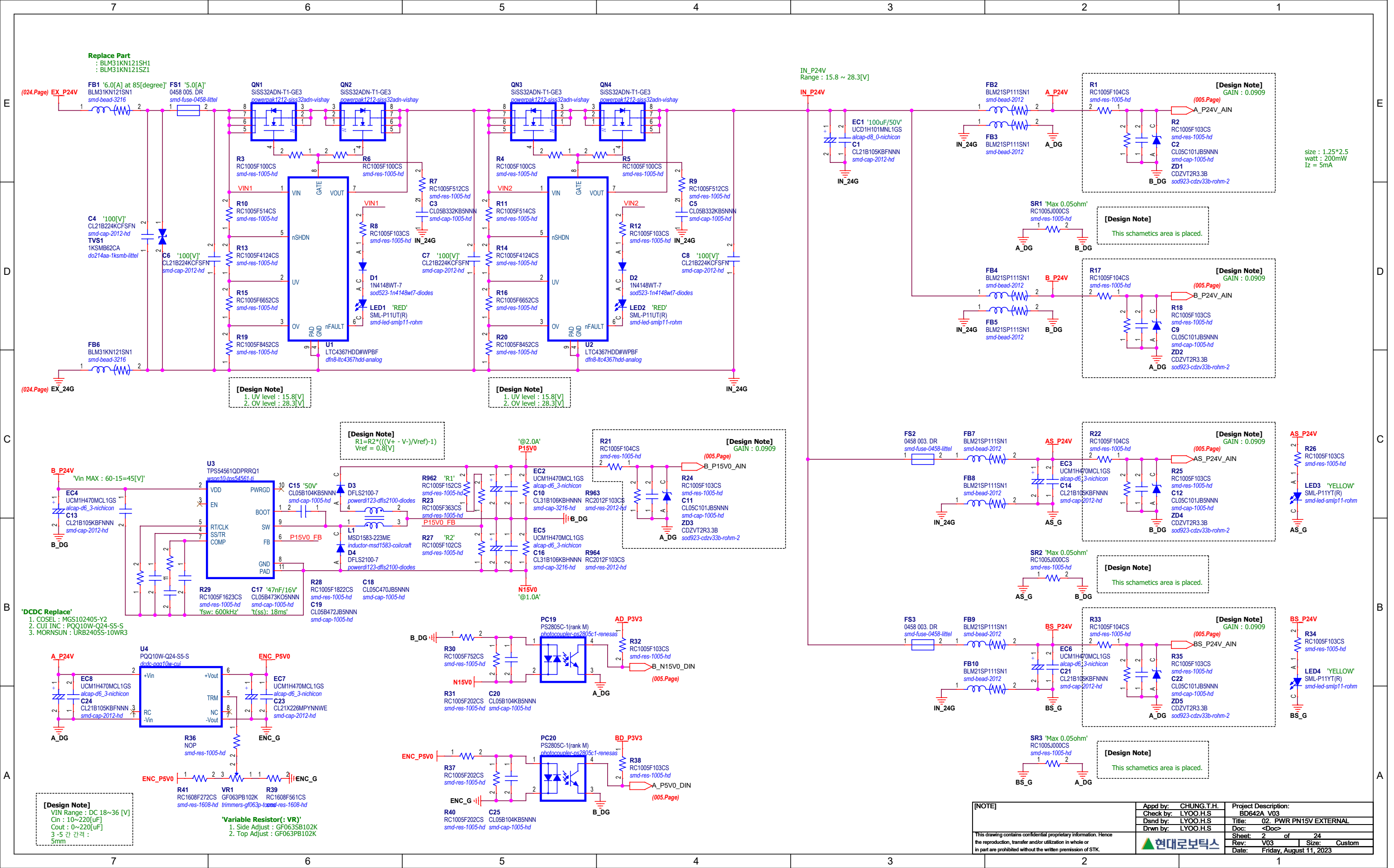
AWG	A(1pos)
18	5
20	4
22	3
24	2.5
26	2
28	1.5
30	

Designer Recommend

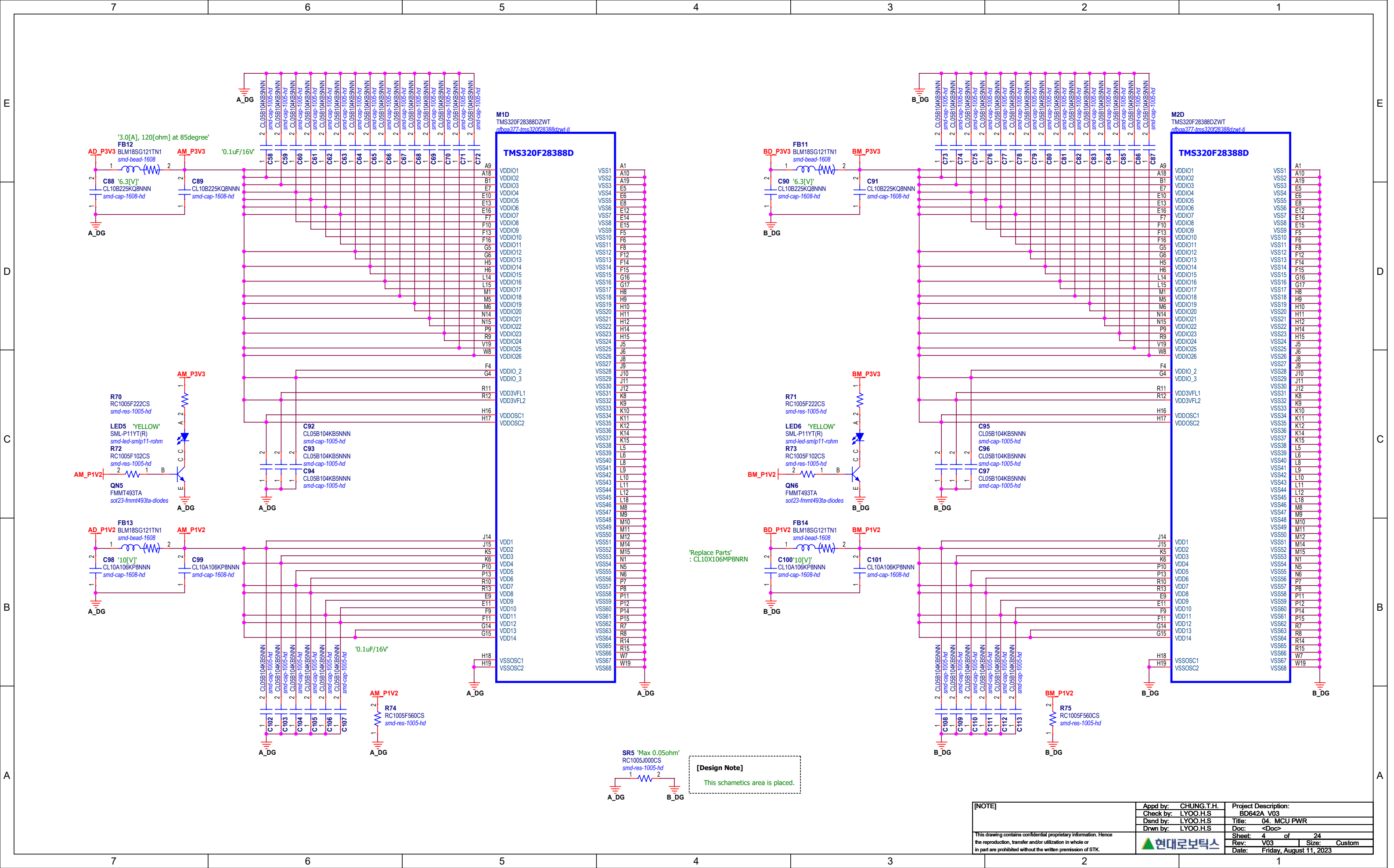
AWG : 22, 24, 26
PIN : 1871304-1

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	Check by: LYOO.H.S	BD642A_V03	
	Dsnd by: LYOO.H.S	Title: 01. TITLE & HISTORY	
	Drwn by: LYOO.H.S	Doc: <Doc>	
		Sheet: 1 of 24	Rev: V03 Size: Custom
		Date: Wednesday, August 16, 2023	

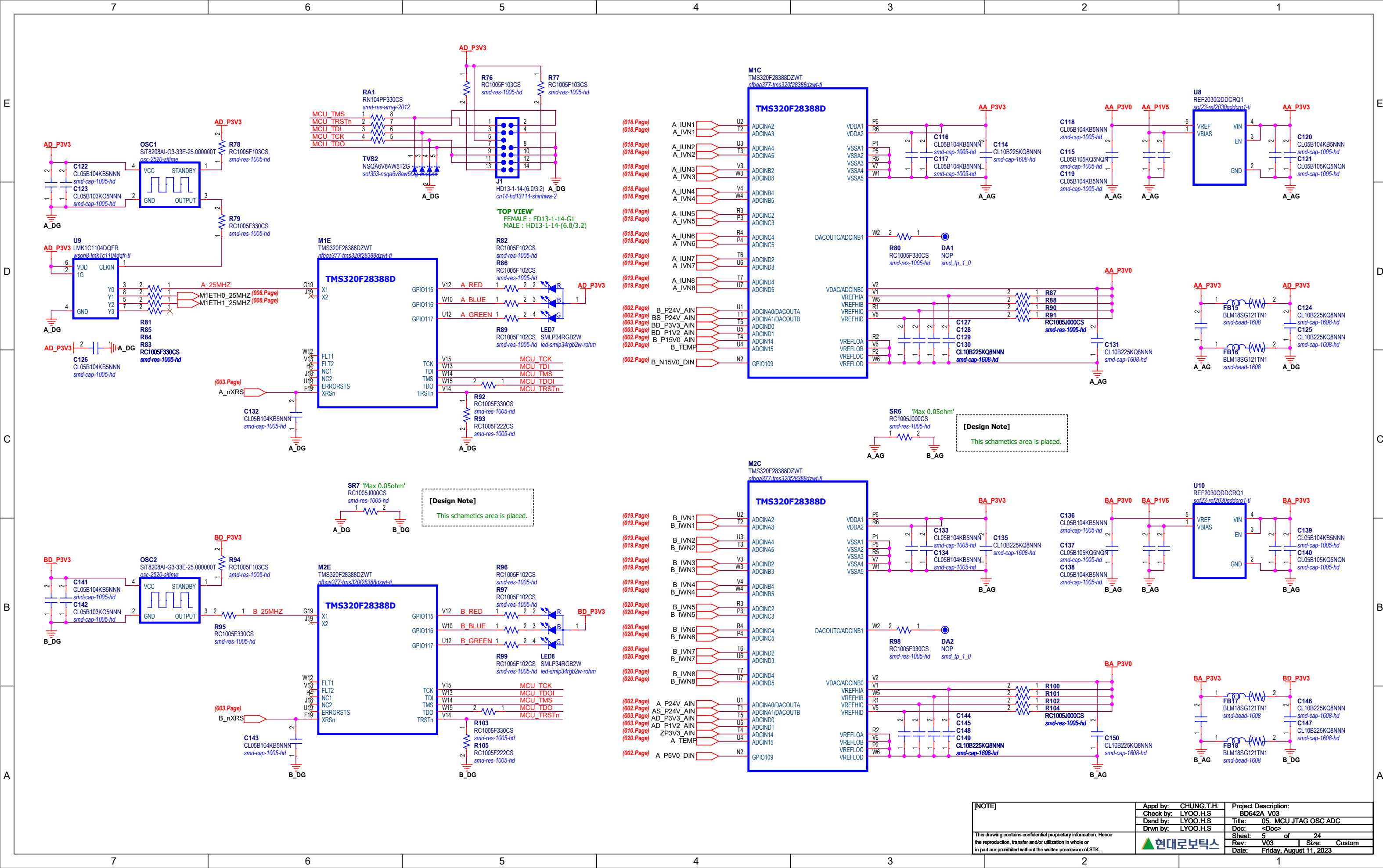




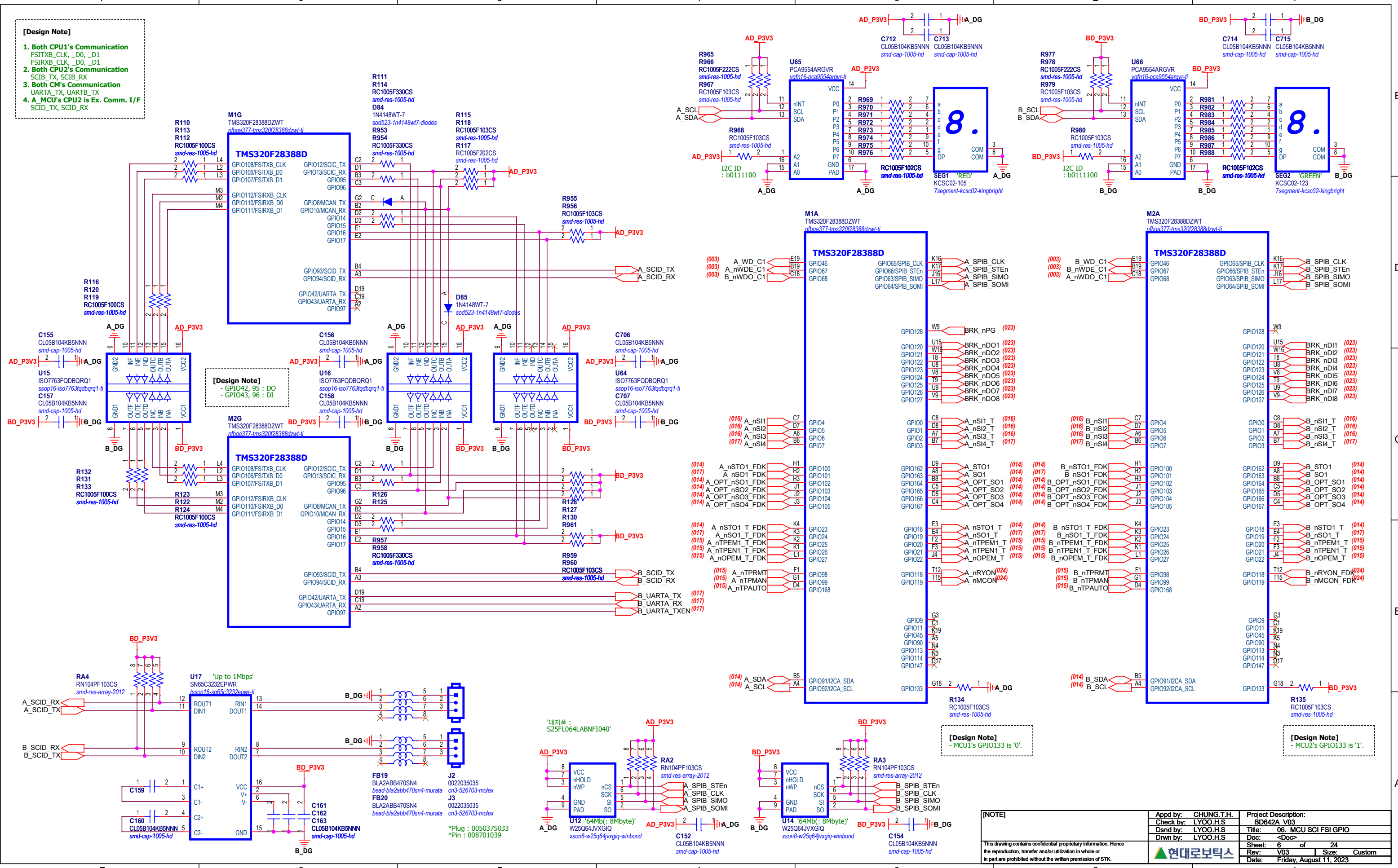
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	Dsmd by:	LYOO.H.S	Title: 02_PWR PN15V EXTERNAL	
	Drwn by:	LYOO.H.S	Doc: <Doc>	
			Sheet: 2 of 24	
			Rev: V03	
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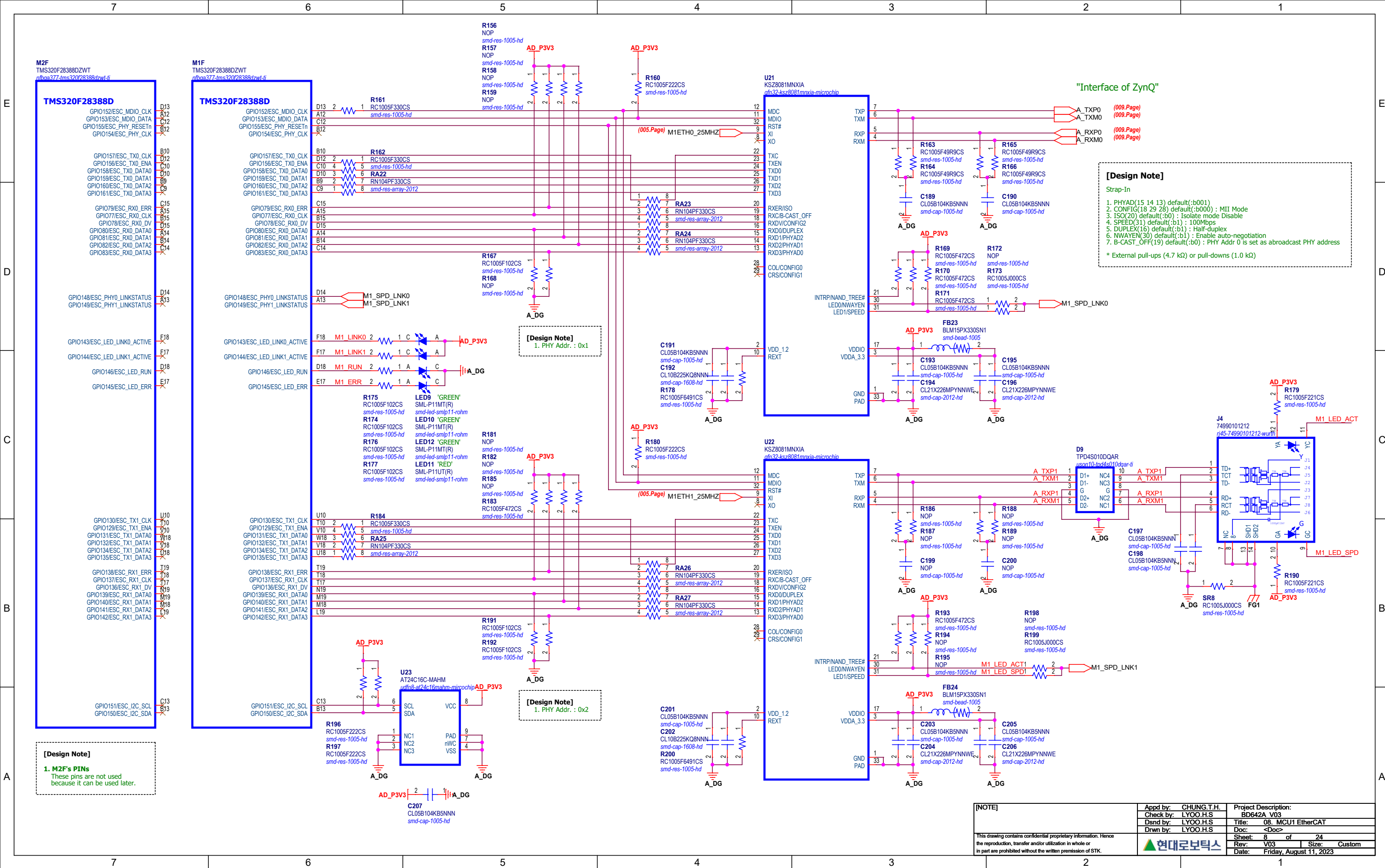



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	Dsnd by:	LYOO.H.S	Title: 04. MCU PWR	
	Drwn by:	LYOO.H.S	Doc: <Doc>	
			Sheet: 4 of 24	
			Rev: V03	Size: Custom
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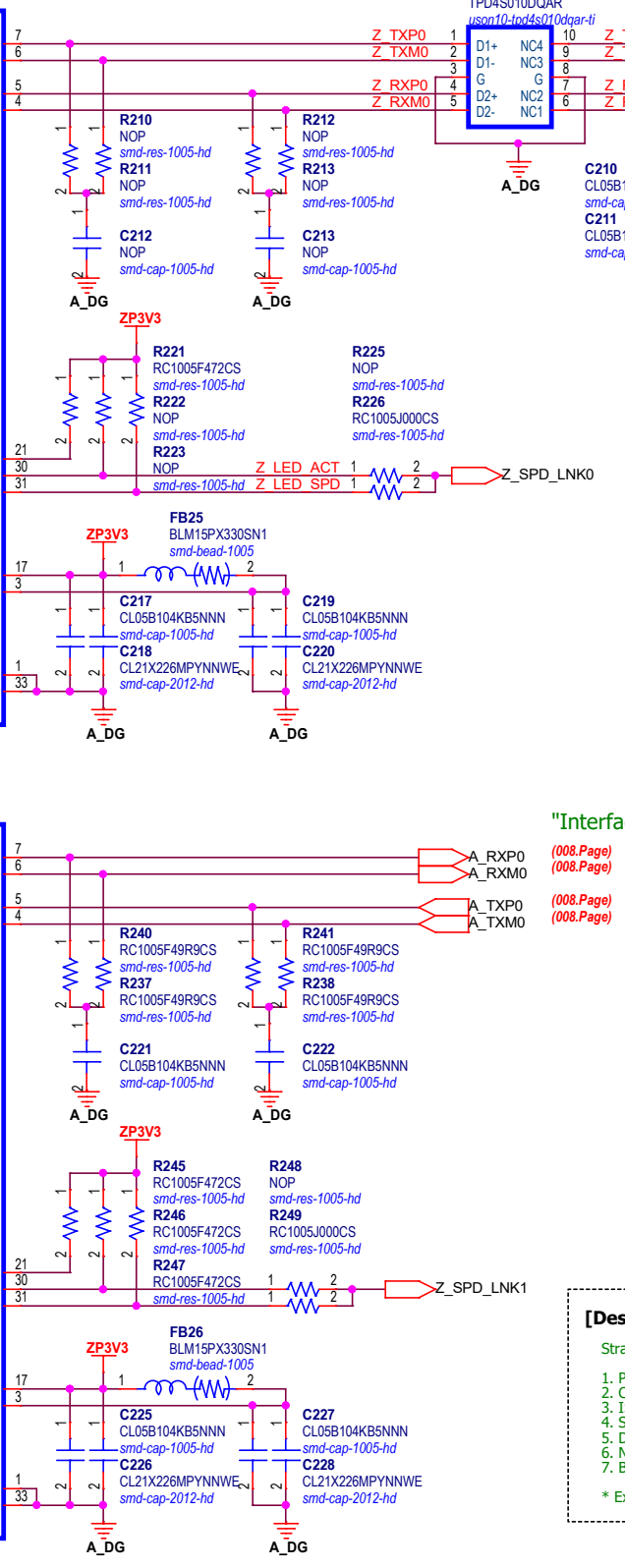
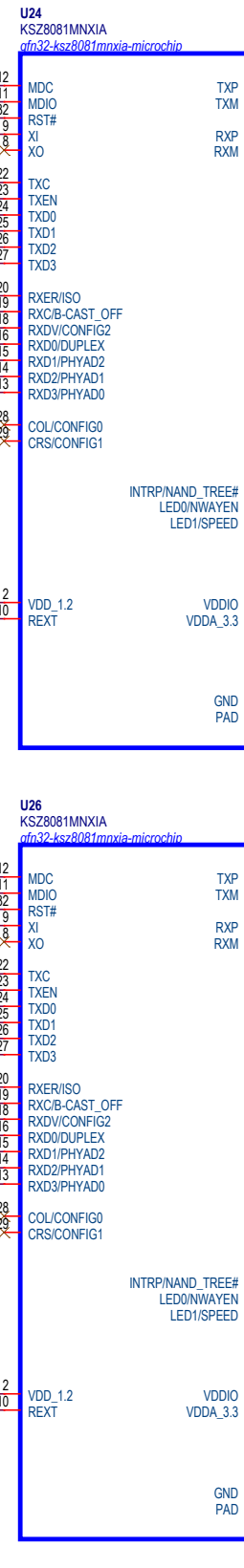
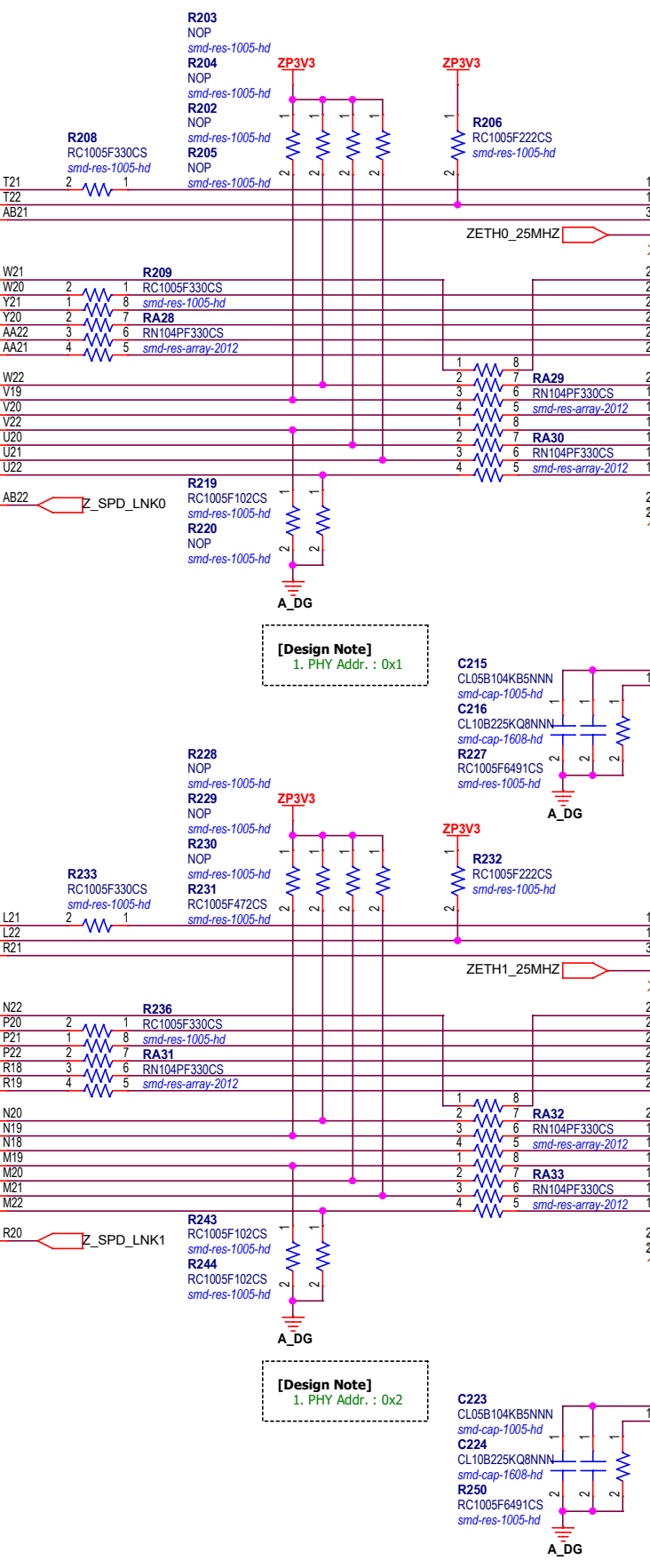
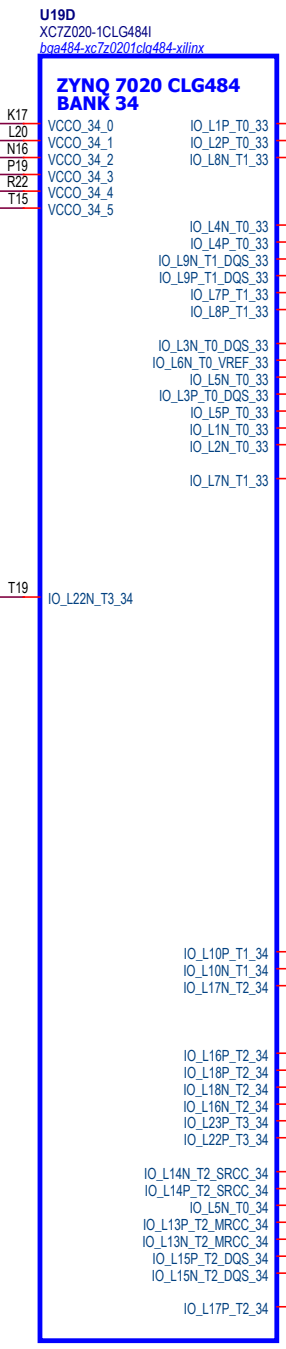
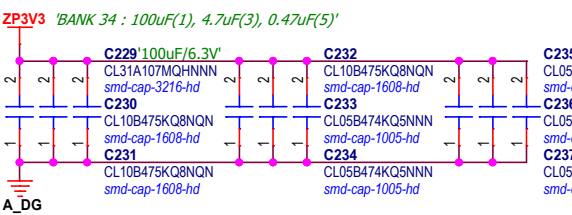
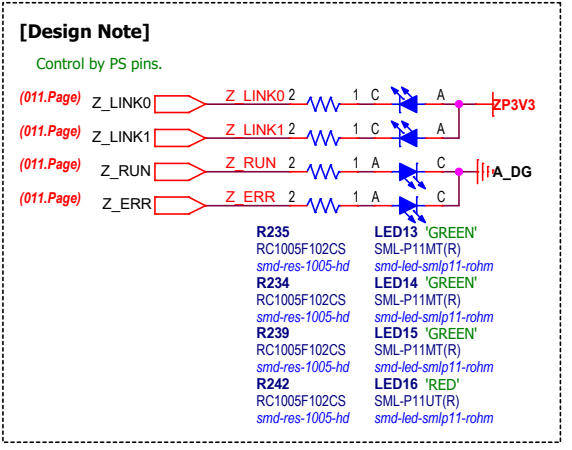
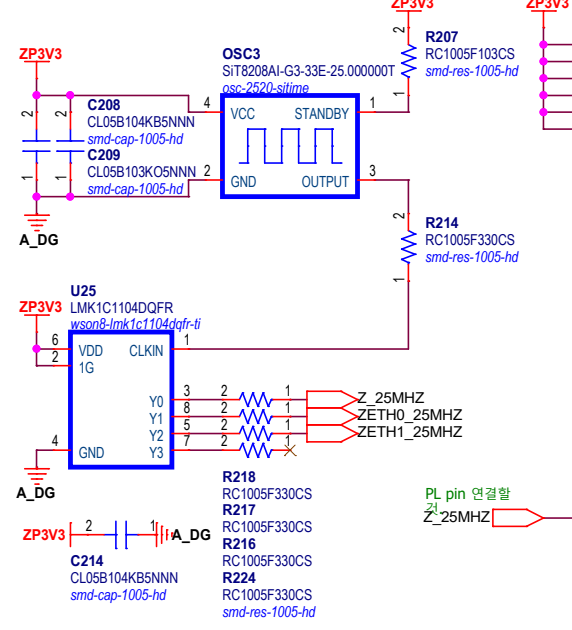
[Design Note]
1. Both CPU1's Communication
FSITXB_CLK, _D0, _D1
FSIRXB_CLK, _D0, _D1
2. Both CPU2's Communication
SCIB_TX, SCIB_RX
3. Both CM's Communication
UARTA_TX, UARTB_TX
4. A_MCU's CPU2 is Ex. Comm. I/F
SCID_TX, SCID_RX





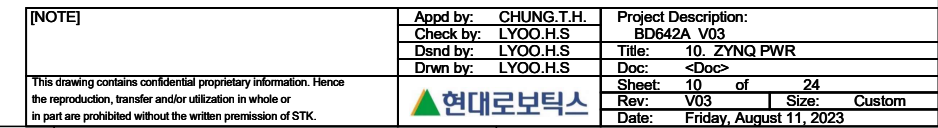
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	Check by: LYOO.H.S	BD642A V03	
	Dsnd by: LYOO.H.S	Title: 08. MCU1 EtherCAT	
	Drwn by: LYOO.H.S	Doc: <Doc>	
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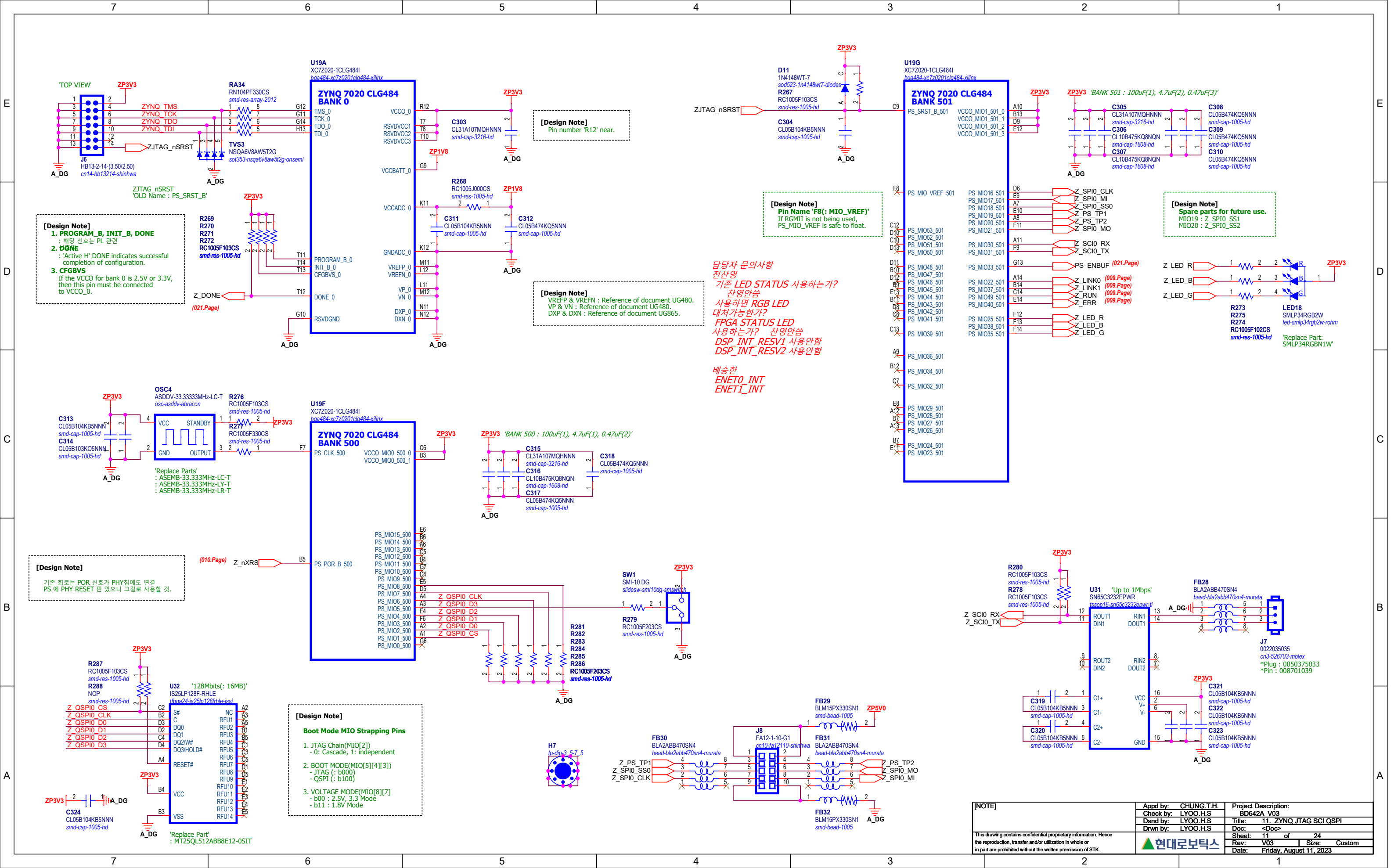
'Replace Parts'
1) SIT8008 Series
SIT8008BI-11-33E-25.0000T
SIT8008BI-12-33E-25.0000T
SIT8008BI-13-33E-25.0000T
2) SIT8208 Series
SIT8208AI-GF-33E-25.0000T
SIT8208AI-G1-33E-25.0000T
SIT8208AI-G2-33E-25.0000T



Power Build-Up
1.0[V] -> 1.8[V] -> 1.35[V] -> 3.3[V]

```
VCCPINT, VCCINT, VCCBRAM : 1.0V
VCCPAUX, VCCAUX : 1.8V
VCCPLL : 1.8V(: With FerriteBead VCCPAUX)
VCCO_DDR : 1.5V(: DDR3), 1.35V(: DDR3L)
```




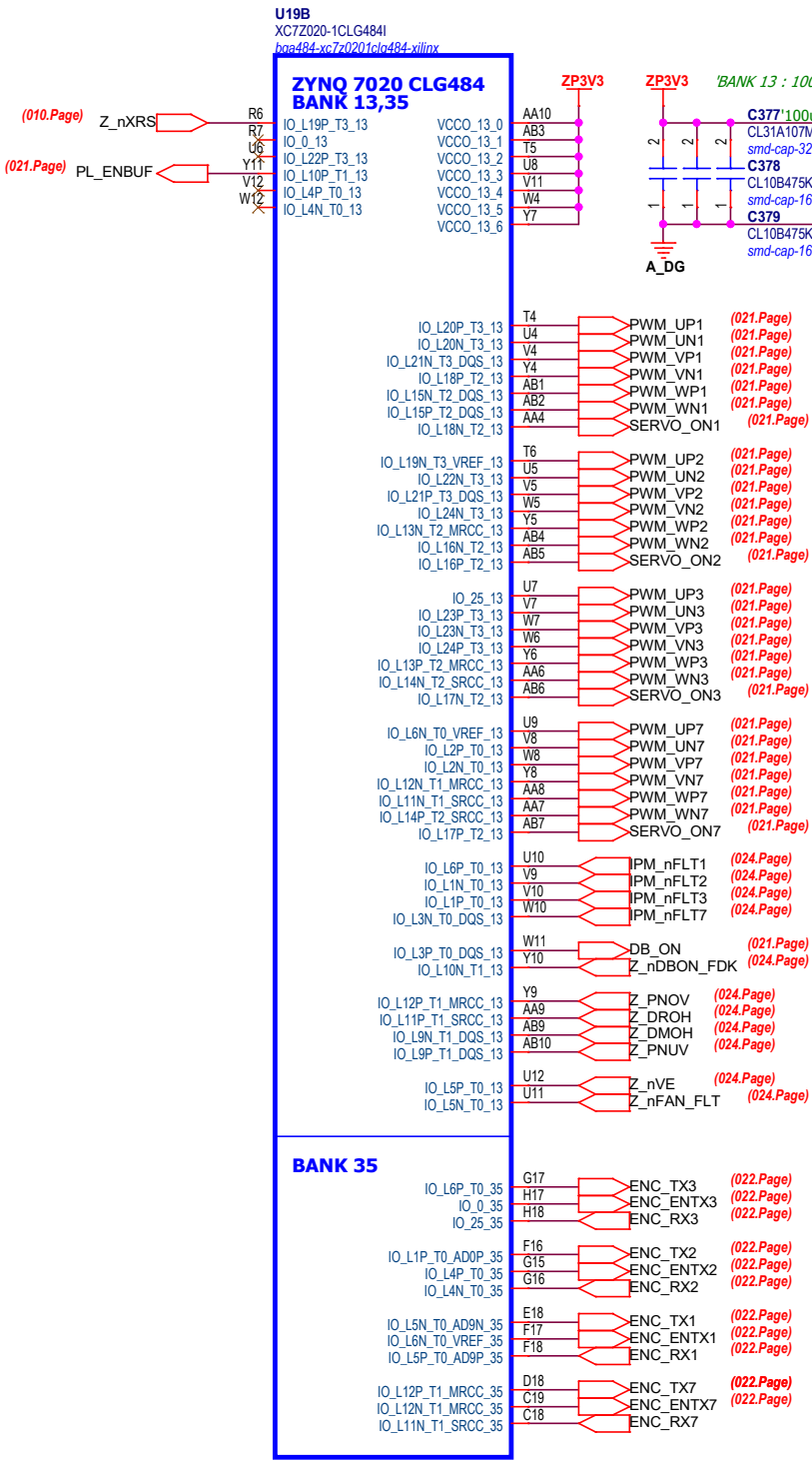


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	Check by: LYOO.H.S	BD642A V03	
	Dsmd by: LYOO.H.S	Title: 11. ZYNQ JTAG SCI QSPI	
	Drwn by: LYOO.H.S	Doc: <Doc>	
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1. BLOCK A
Layout : 100[ohm] Differential Pairs.

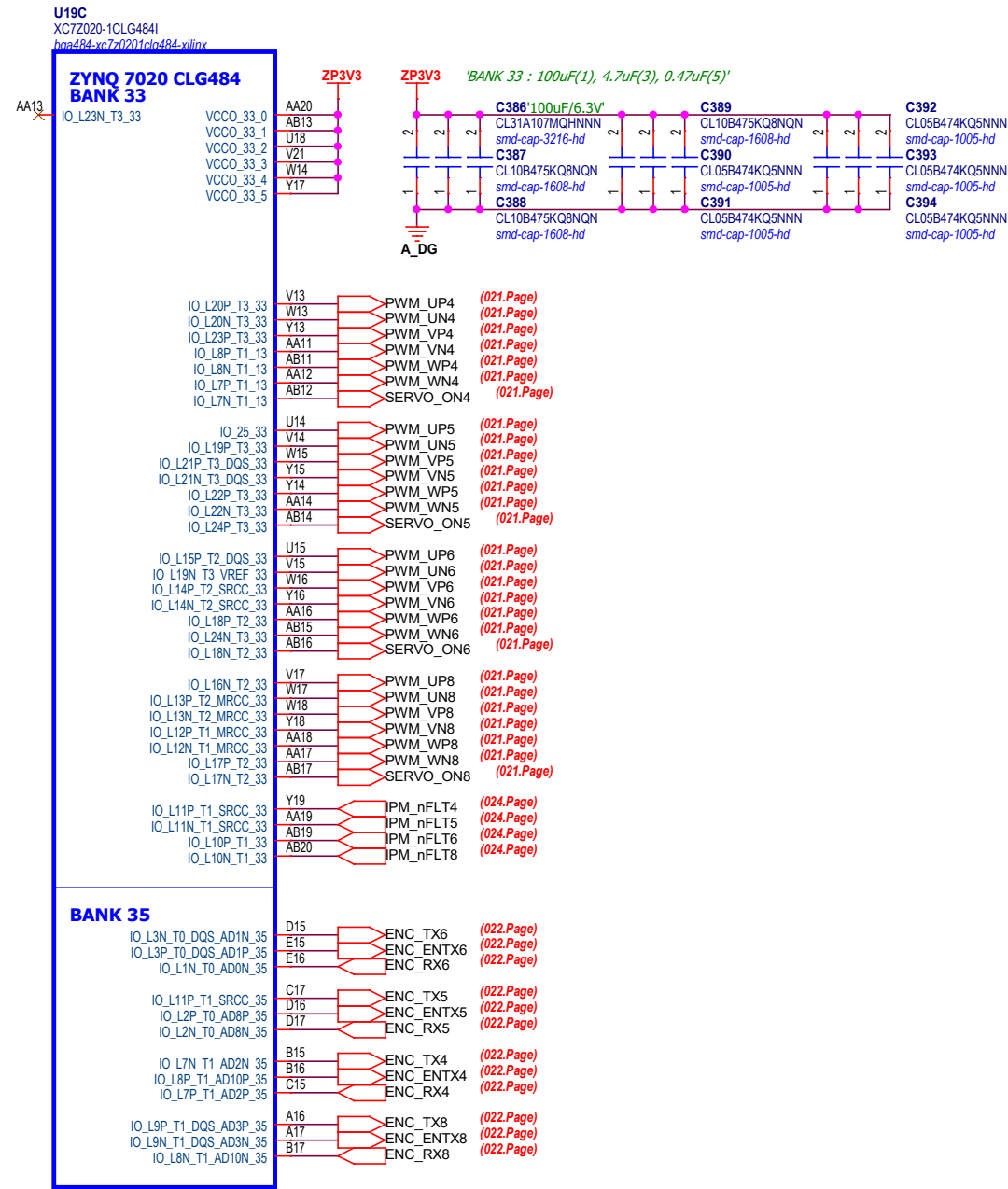



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	Check by: LYOO.H.S	BD642A V03	
	Dsnd by: LYOO.H.S	Title: 12. ZYNQ DDR3L	
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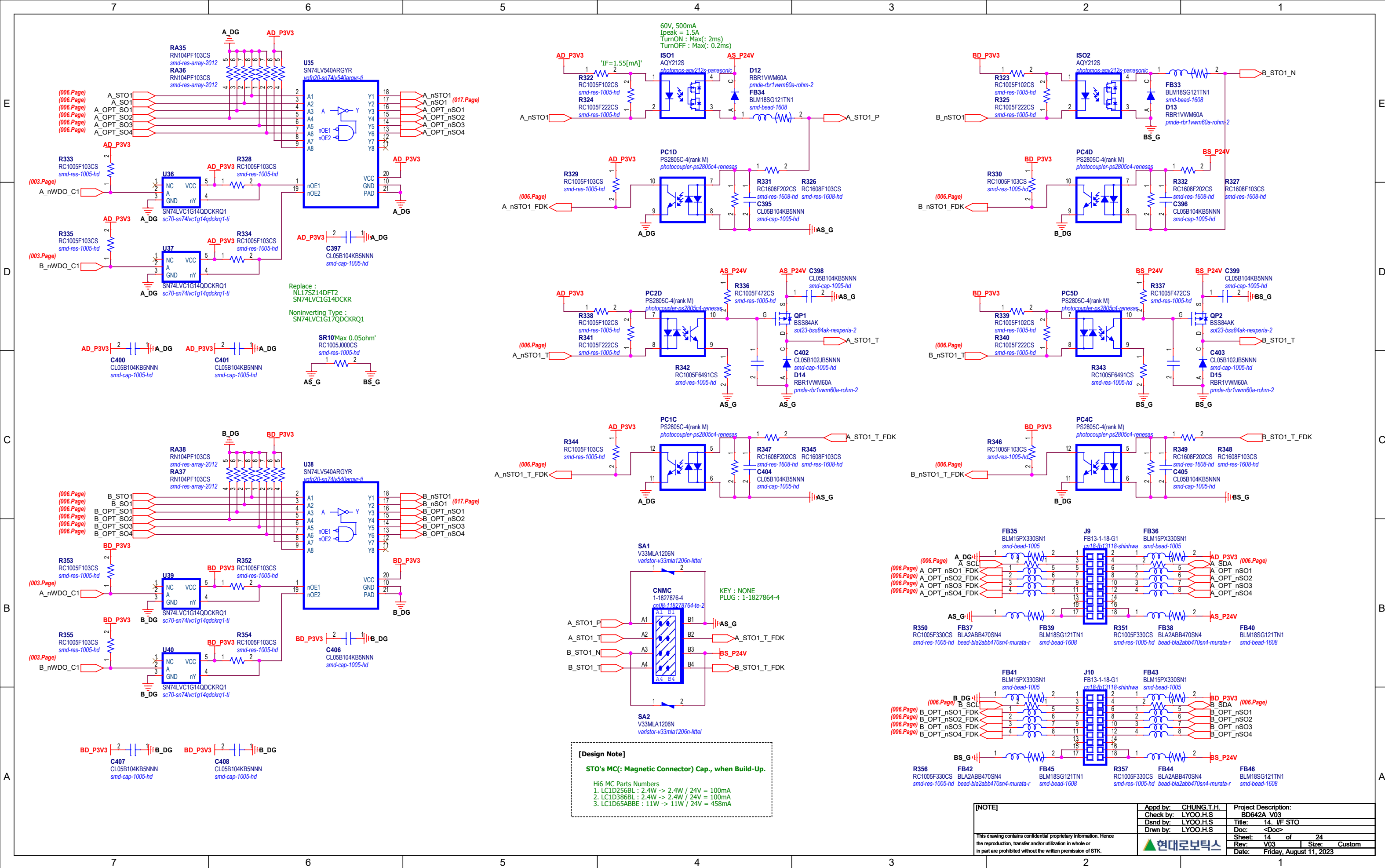
기준 :
FD1~8
회로 설계
1. DB : 1EA
2. PWM : 6EA * 8 = 48
3. ENC : 3EA * 8 = 24
4. IPM_nFLT : 1EA * 8 = 8
5. DB : 0EA
6. S_ON : 1EA * 8 = 8
-----SUM: 90

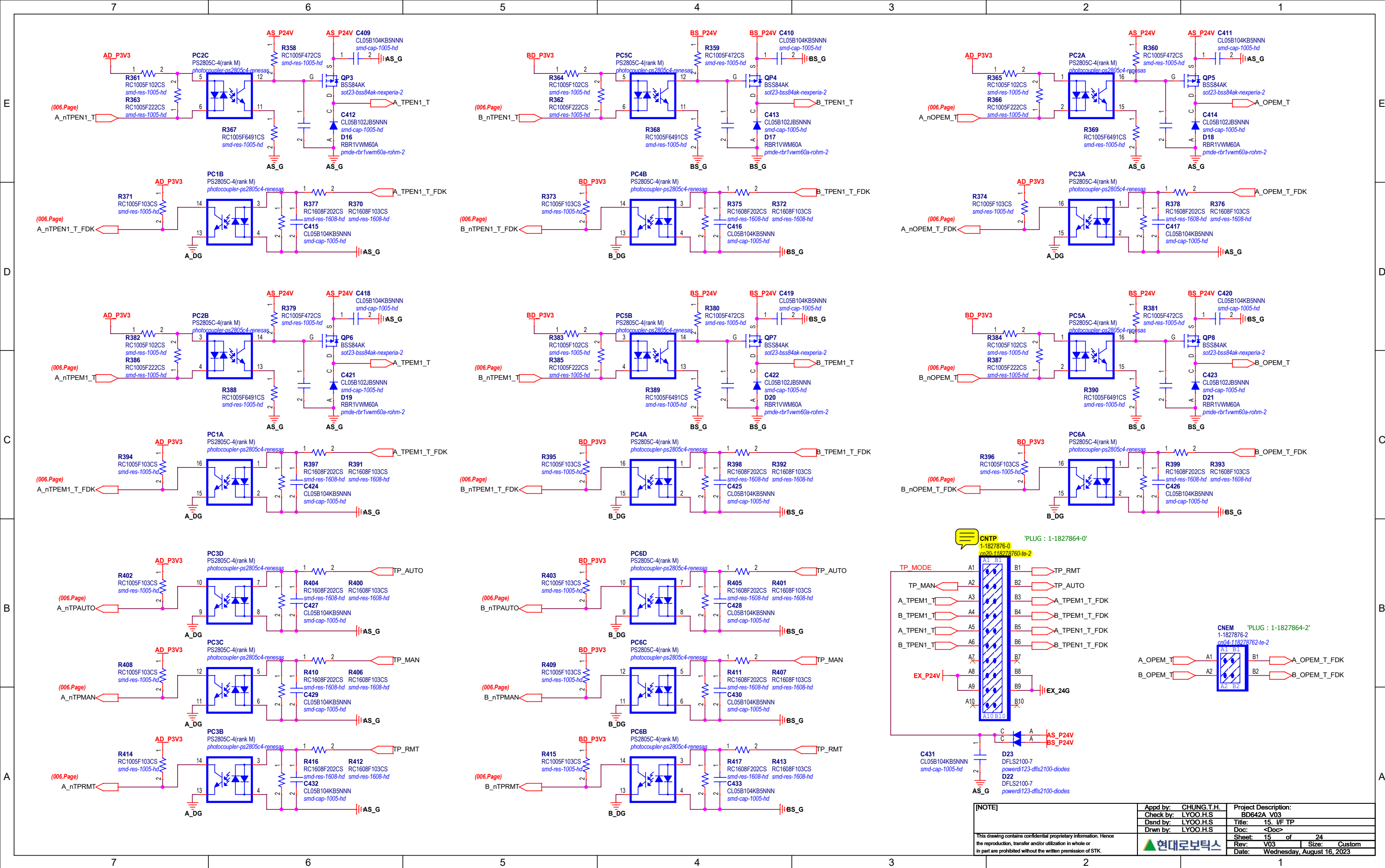
ETC 신호
BANK 13 : EMIF is used.
BANK 33 : EtherCAT



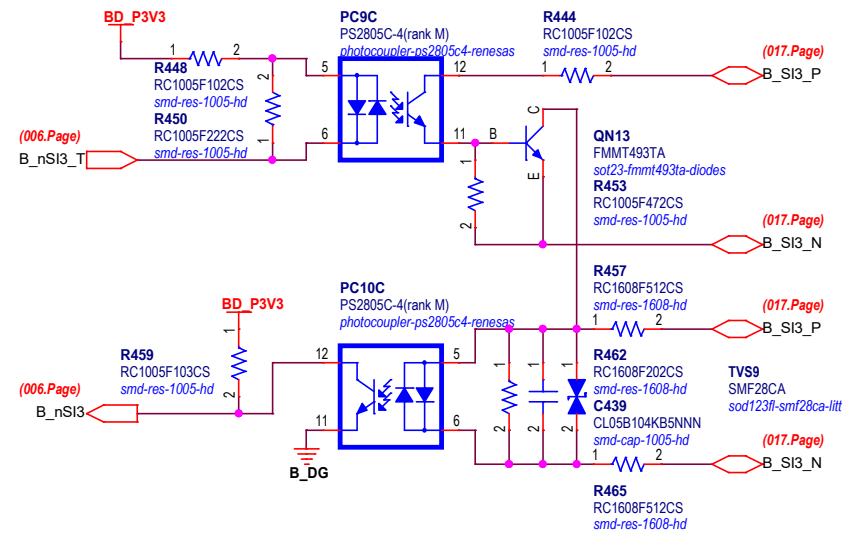
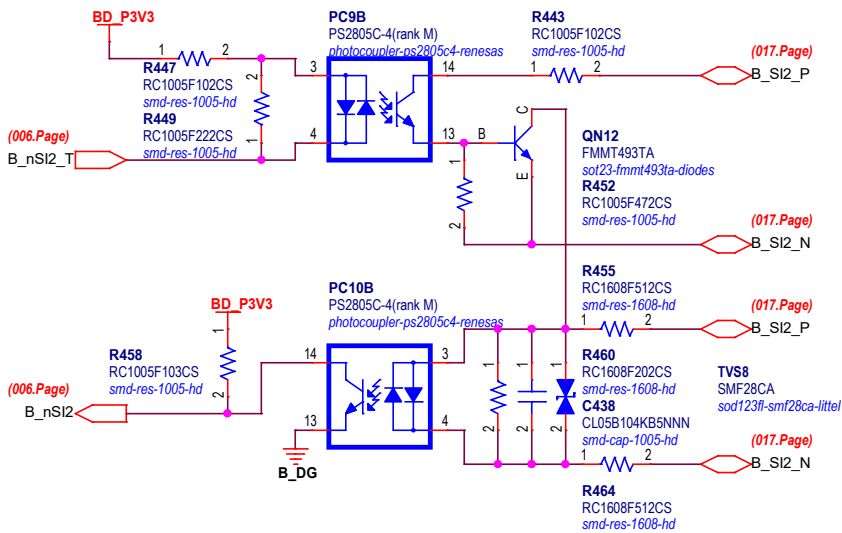
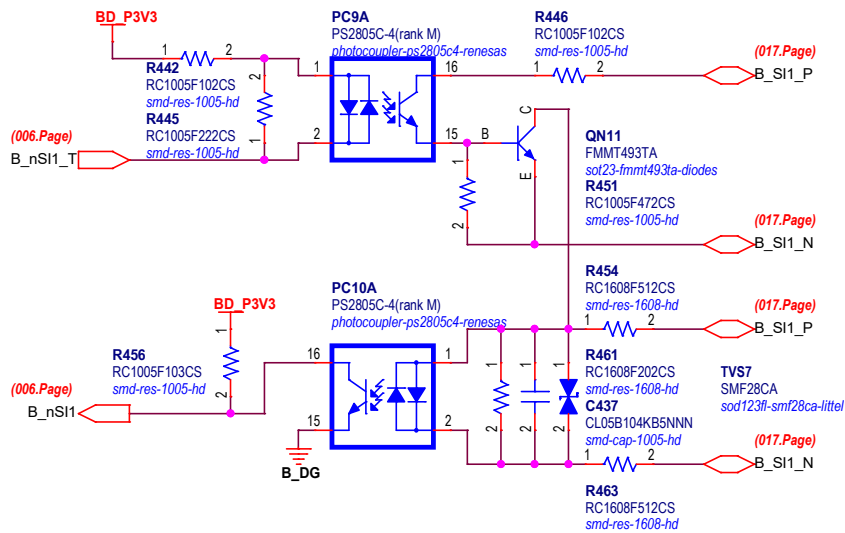
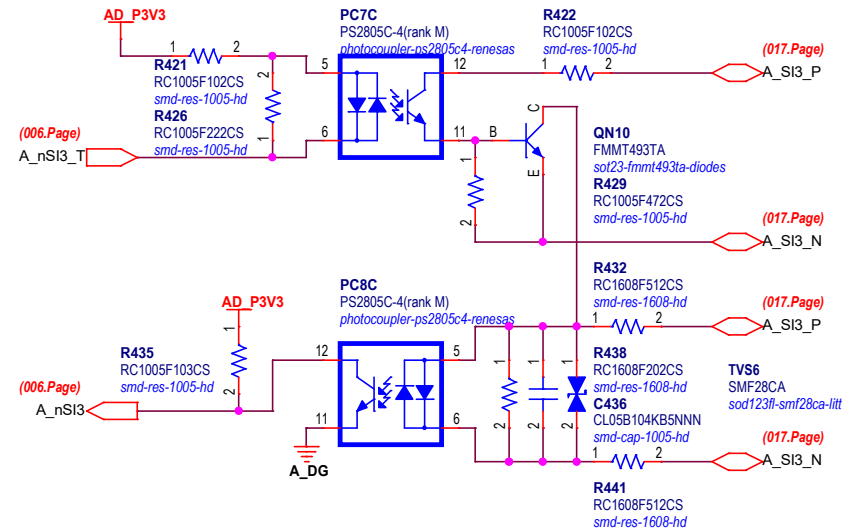
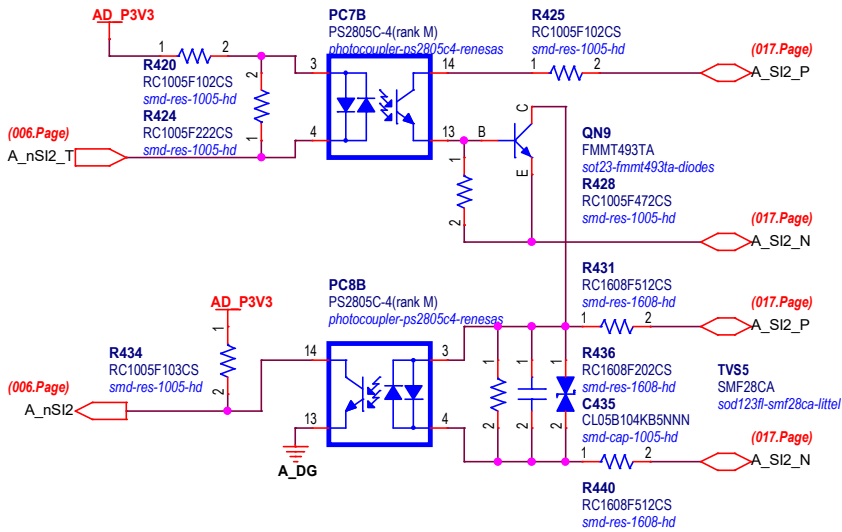
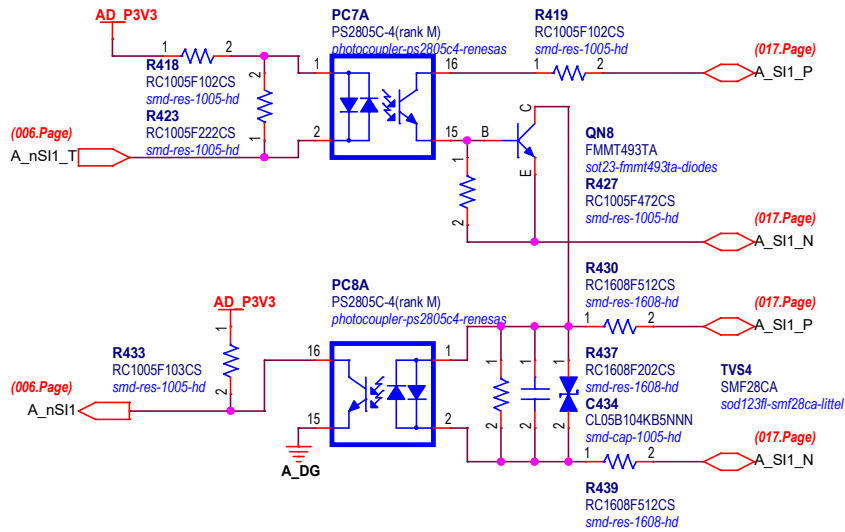
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	Desnd by: LYOO.H.S	Title: 13_ZYNQ PL GPIO	
	Drwn by: LYOO.H.S	Doc: <Doc>	
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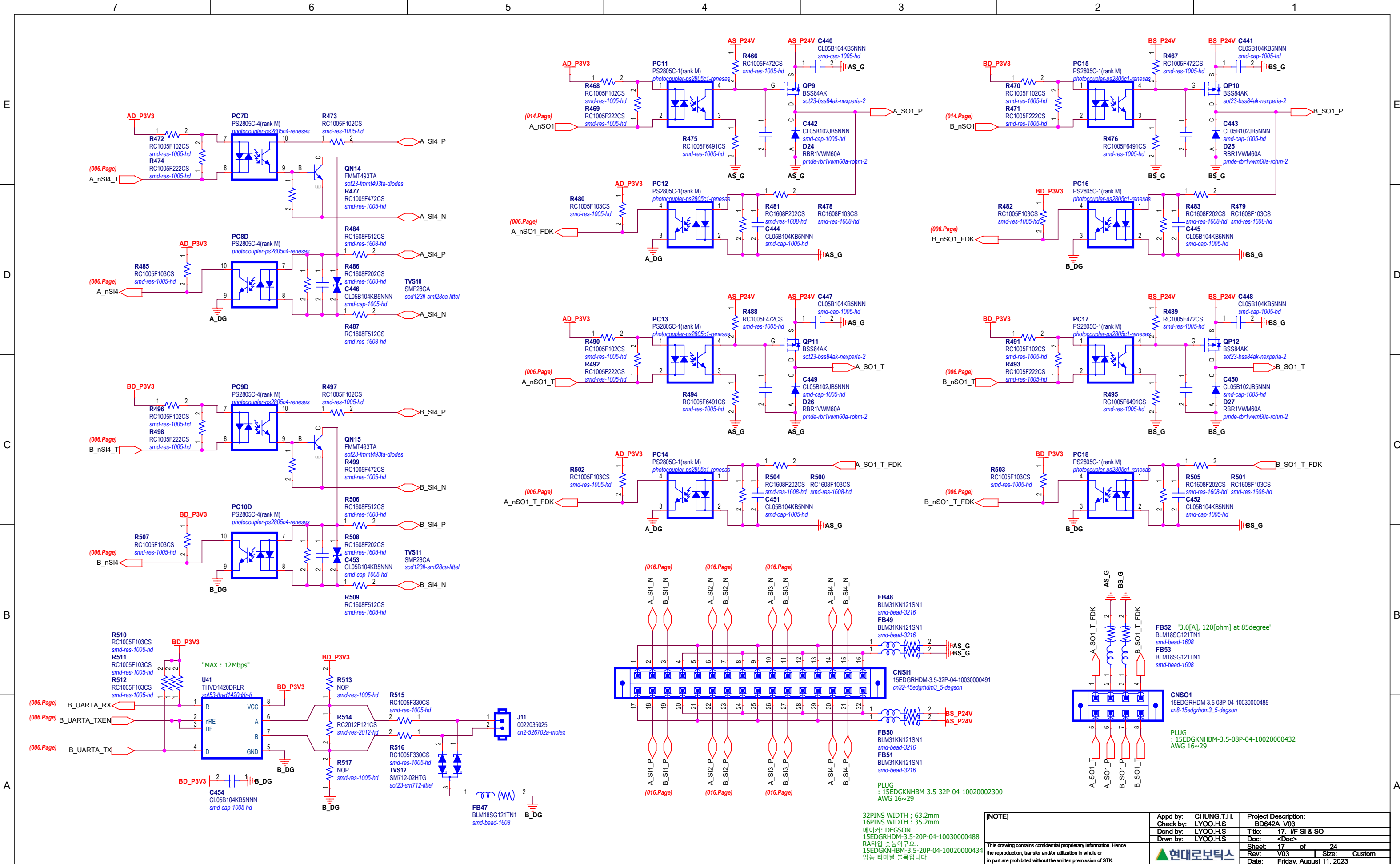


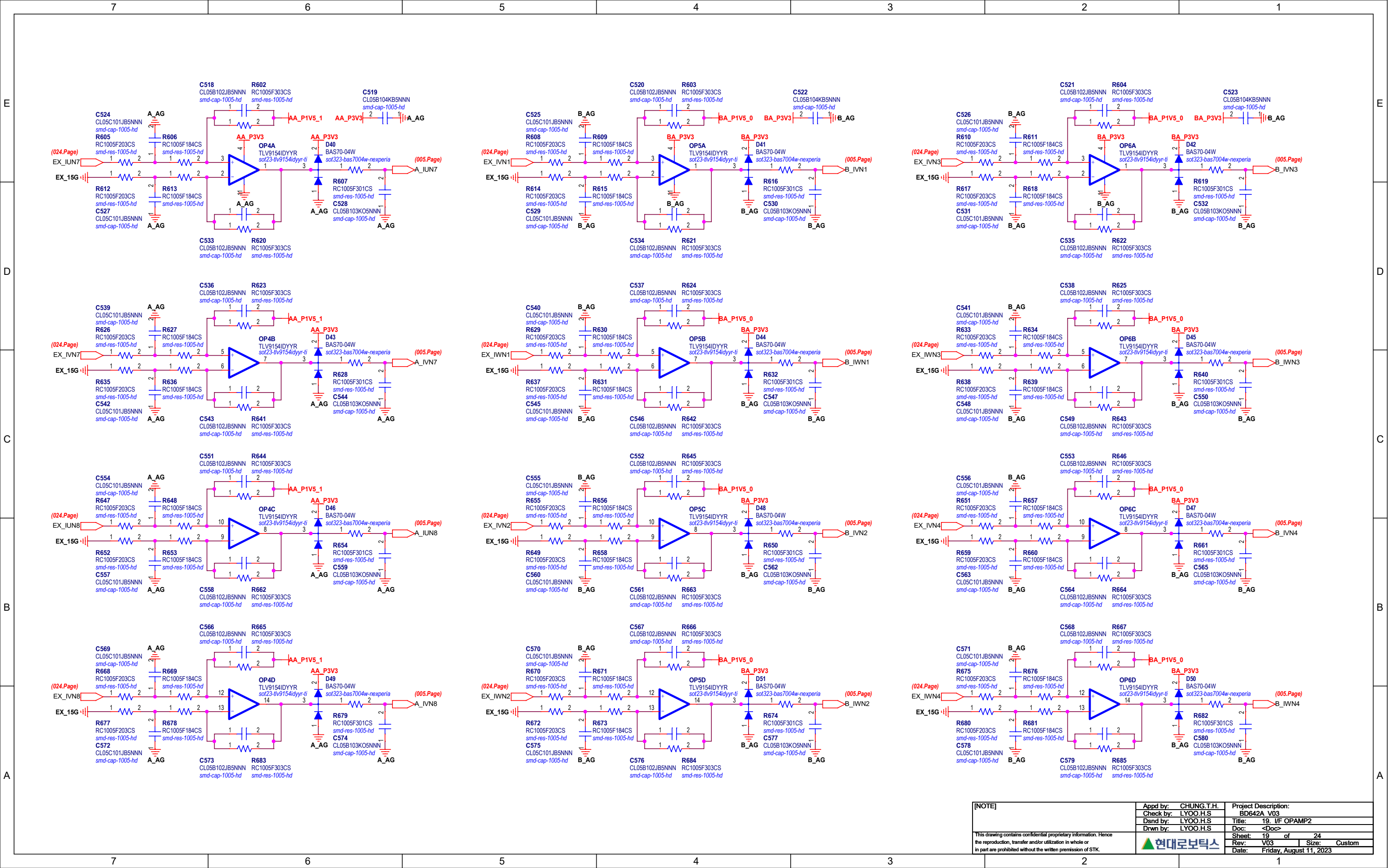
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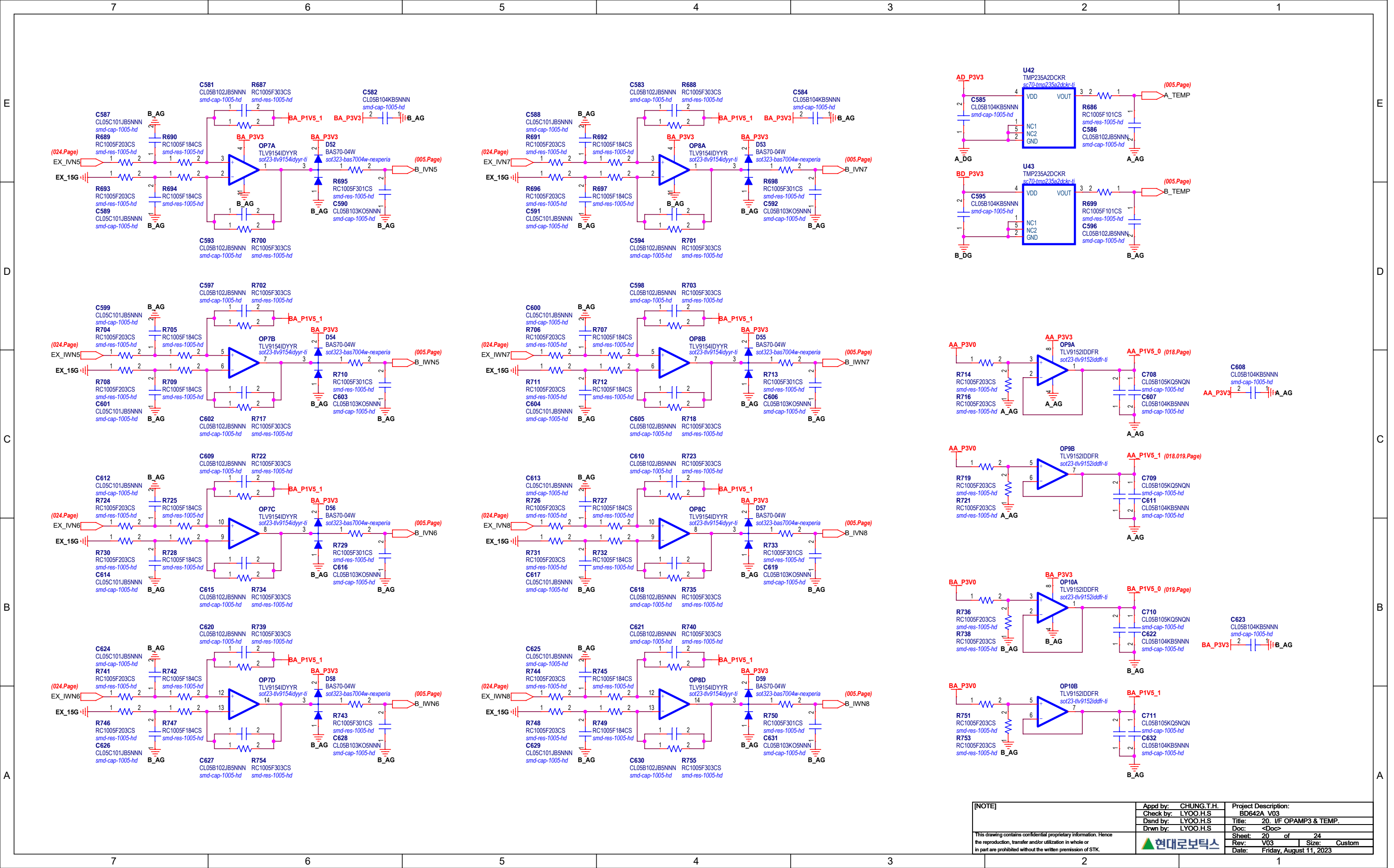
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	Dsmd by: LYOO.H.S	Title: 16_ I/F SI	
	Drwn by: LYOO.H.S	Doc: <Doc>	
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	Check by: LYOO.H.S	Title: 19_1/F OPAMP2
	Dsmd by: LYOO.H.S	Doc: <Doc>
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		Date: Friday, August 11, 2023

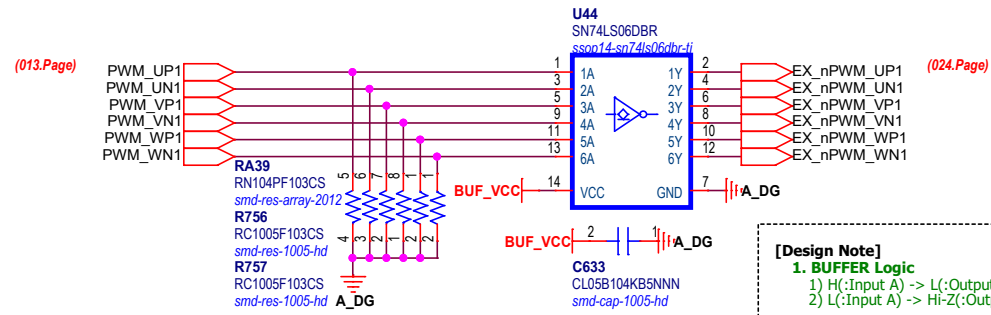


[Design Note]

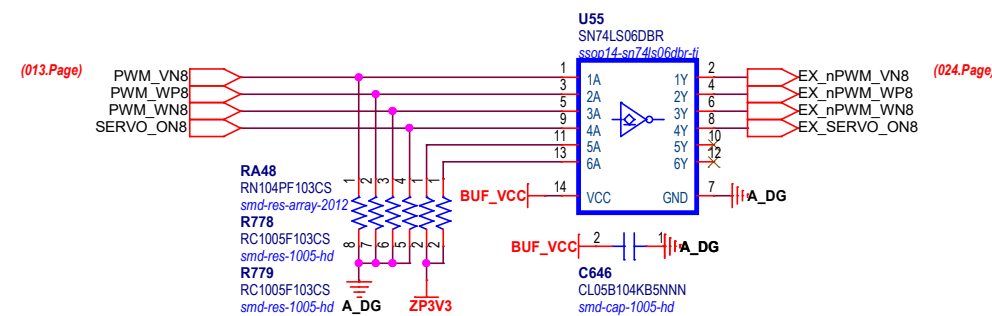
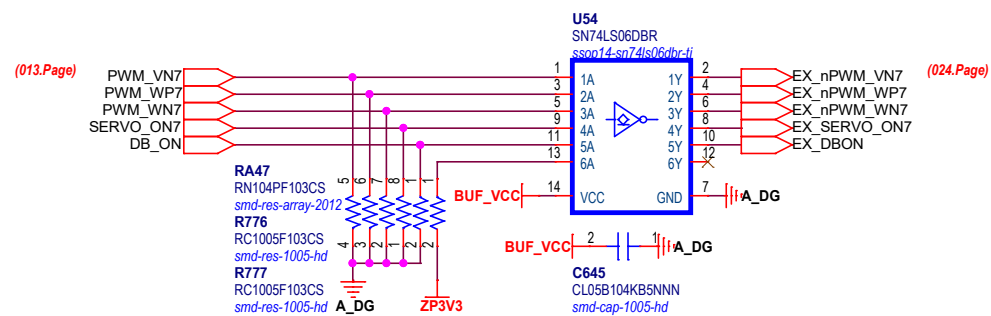
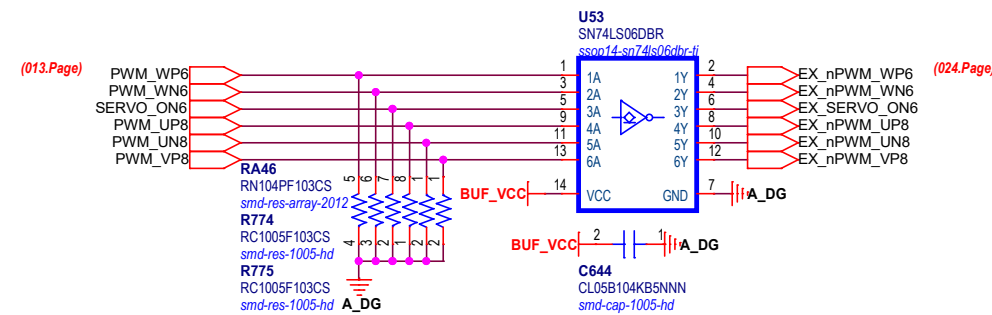
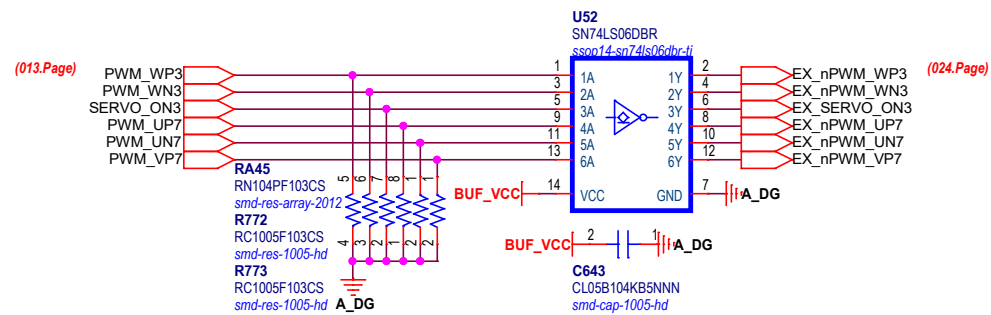
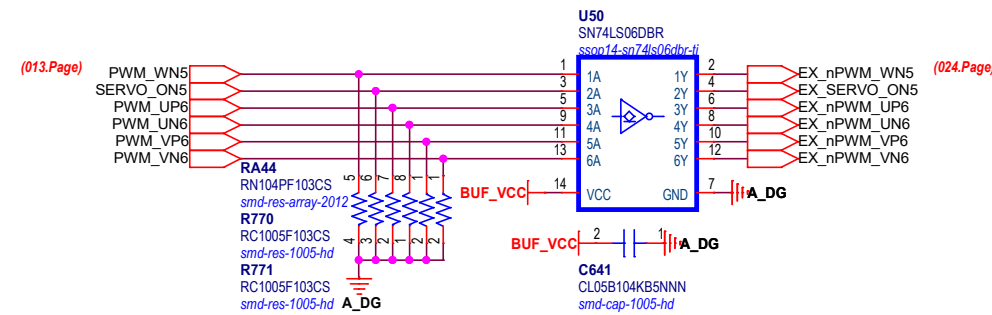
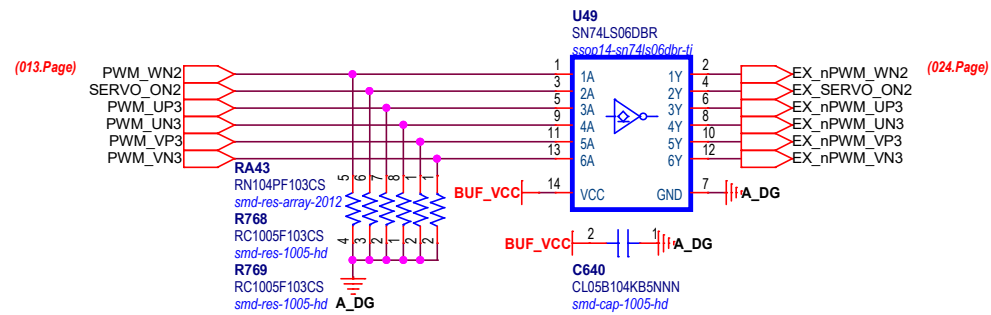
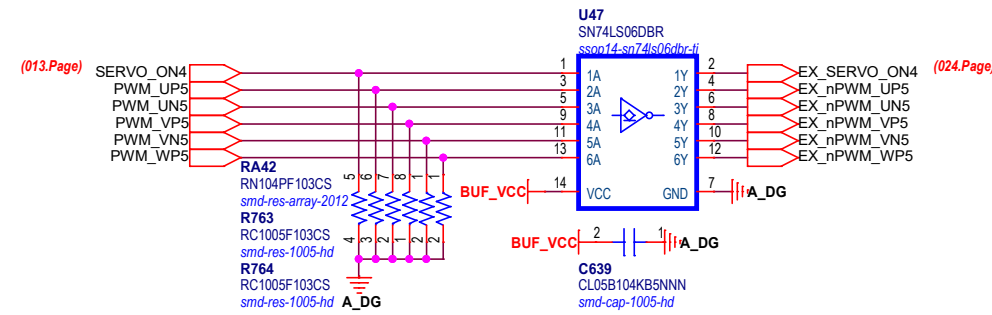
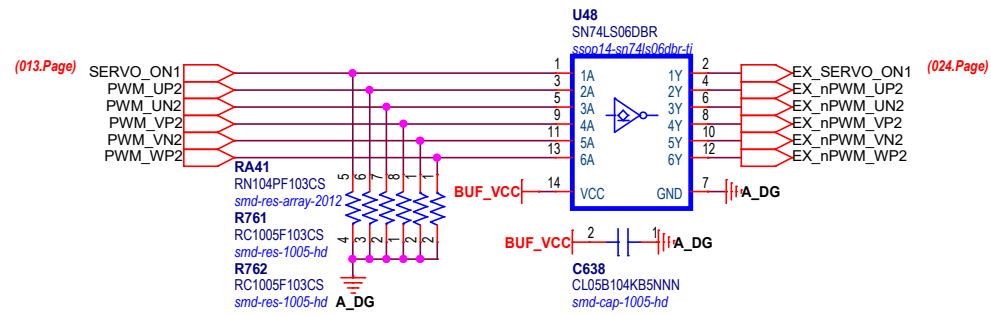
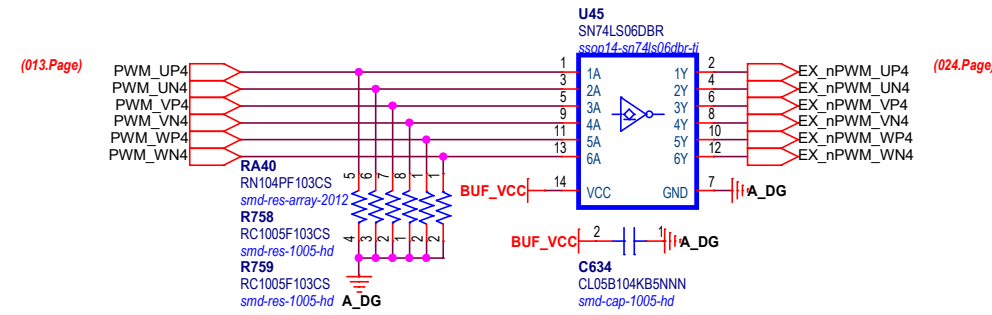
1. BUF_VCC Power Calculated
: max 60[mA] * 10 EA = 600[mA]

2. TPS22919 Logic
: ON Pin 'H' -> VOUT 'H'

3. SN74LVC1G11 Logic
1) A, B & C all 'H' : 'YH'
2) Other is : 'YL'



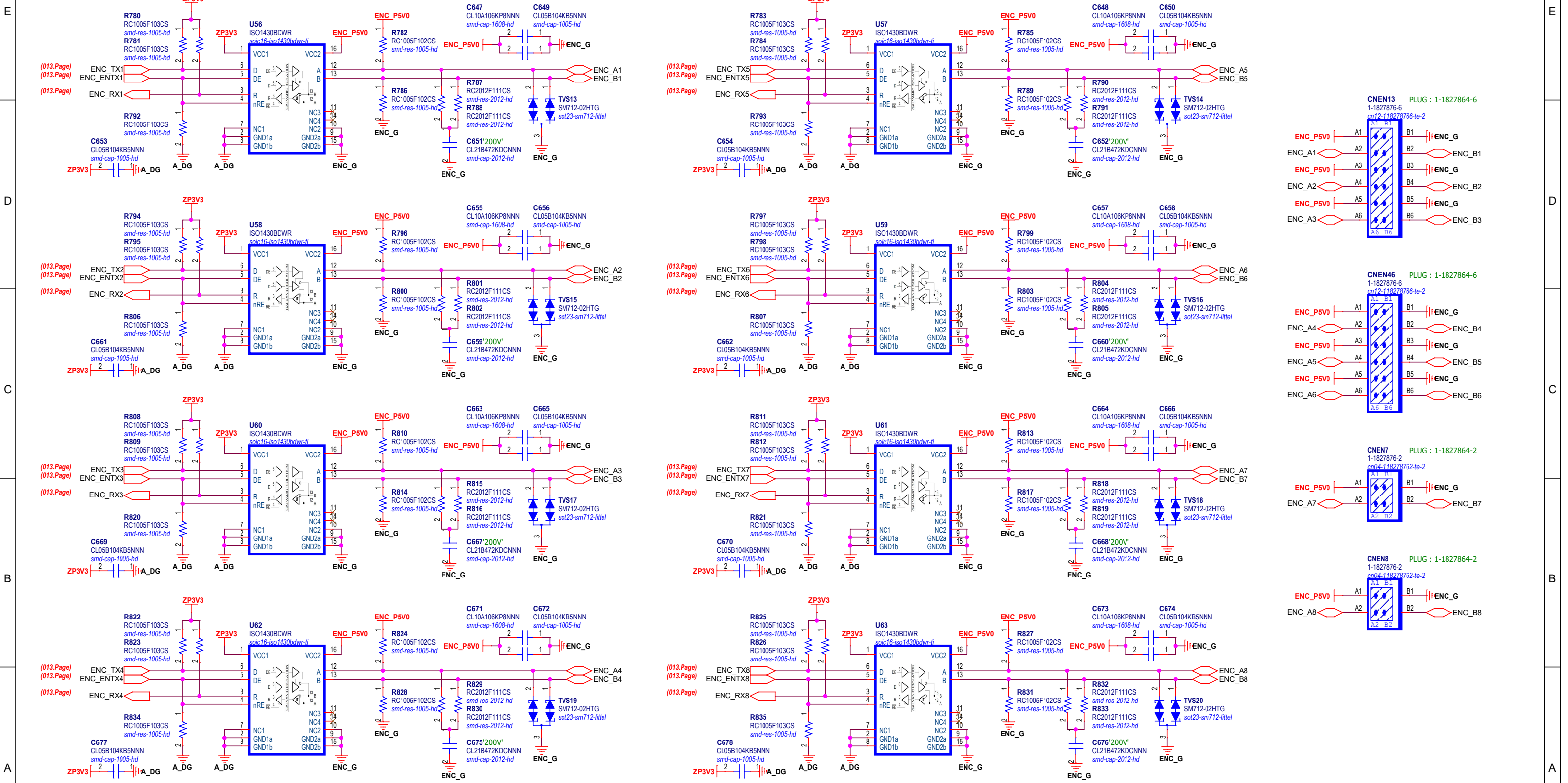
[Design Note]
1. BUFFER Logic
1) H(:Input A) -> L(:Output Y)
2) L(:Input A) -> Hi-Z(:Output Y)



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	Dsmd by: LYOO.H.S	Title: 21. I/F PWM BUF	
	Drwn by: LYOO.H.S	Doc: <Doc>	
		Sheet: 21 of 24	Rev: V03 Size: Custom
		Date: Friday, August 11, 2023	



[Design Note]
: RS485's I/F is TAMAGAWA Encoder.

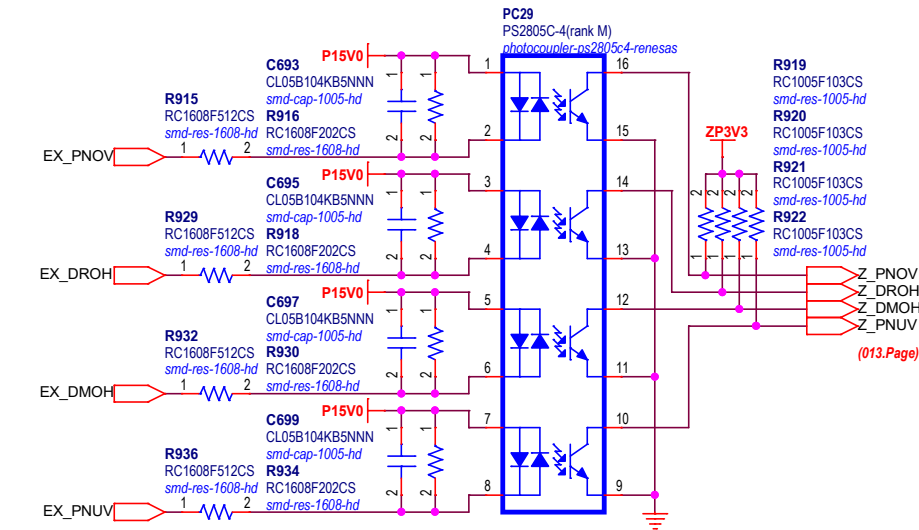
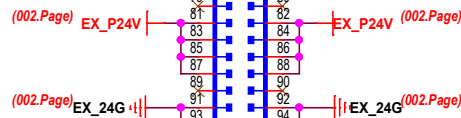
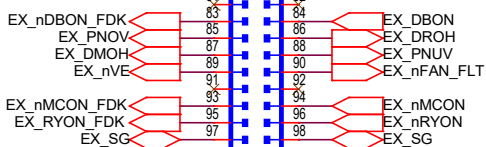


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	Check by: LYOO.H.S	BD642A_V03
	Drwn by: LYOO.H.S	Title: 22_I/F ENCODER
		Doc: <Doc>
현대로보텍스	Sheet: 22 of 24	Rev: V03
	Date: Friday, August 11, 2023	Size: Custom

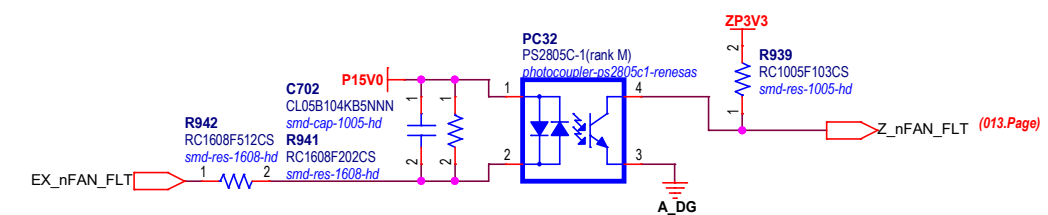
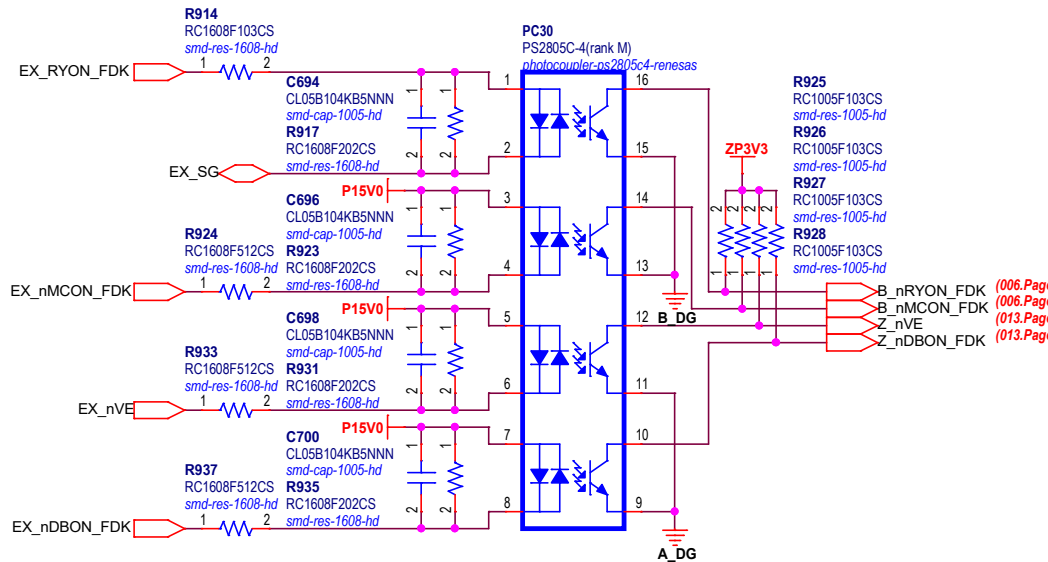
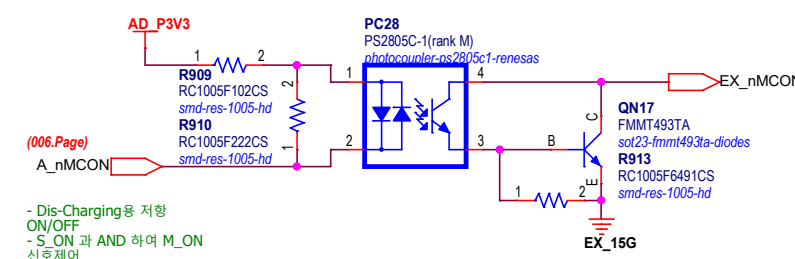
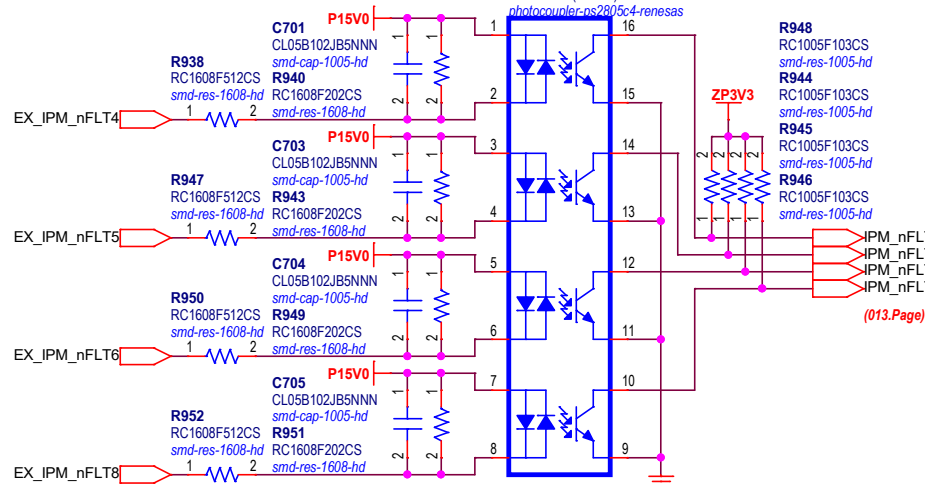



PCB Connector
 Plug Connector : MECF-50-01-L-DV-WT
 Pitch : 1.27mm, 3.5A(2pins), 280VAC

Total Pins
 : $98 * 2 = 196$ pins



PNOV : DC-LINK Over-Voltage Detection
 PNUV : DC-LINK Under-Voltage Detection
 DROH : 저항 온도 센서
 DMOH : 신호 전원(: 15V) 공급이 잘 되었나
 정도??



[NOTE]	Appd by: CHUNG.T.H.	Project Description:	
	Check by: LYOO.H.S	BD642A V03	
	Dsmd by: LYOO.H.S	Title: 24. I/F EX. CONNECTOR	
	Drwn by: LYOO.H.S	Doc: <Doc>	
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