

1

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A

B

C

D

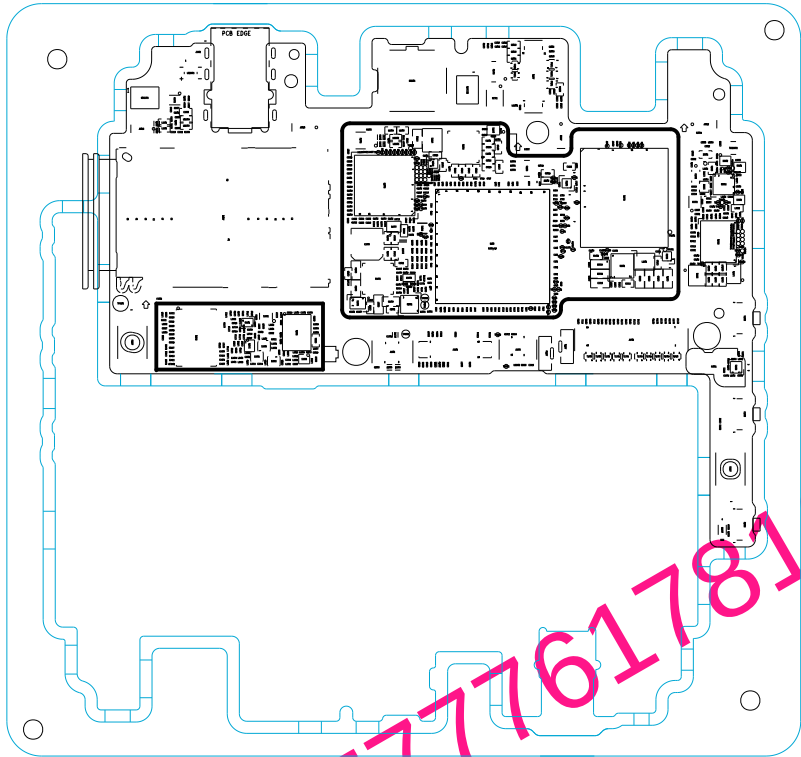
A

B

C

D

VERSIONS		
VER	DESIGNER	DATE
A	yuonjun	2015-12-22
B	zhuqing	2016-03-07
C		
D		
E		
F		



SH1EDTSONAL10M VER.B SILKSCREEN TOP
SPELL MODE:1x2

6

5

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3

2

1

A

B

C

D

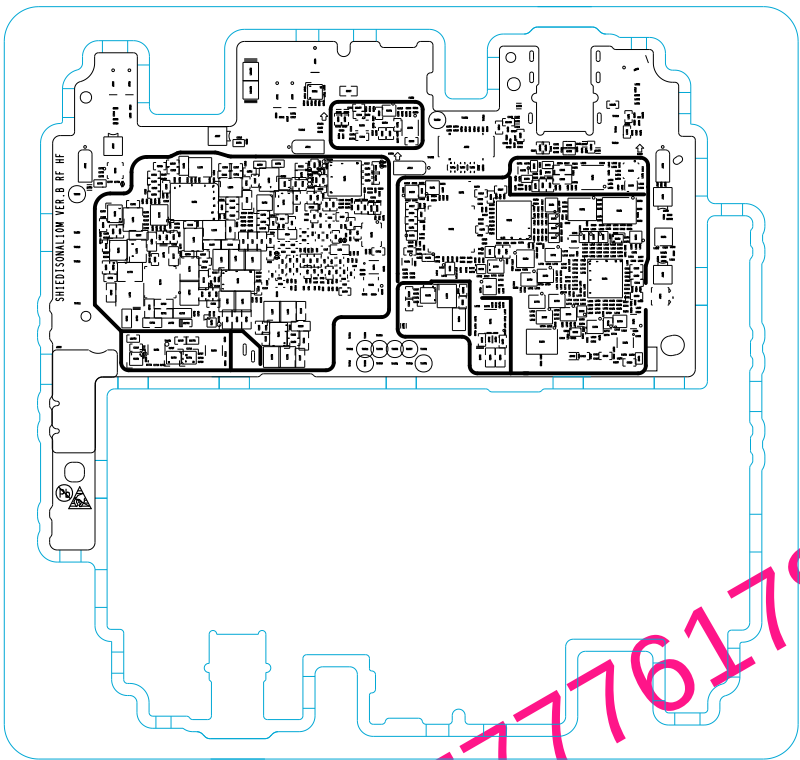
A

B

C

D

VERSIONS		
VER	DESIGNER	DATE
A	yuanjun	2015-12-22
B	zhuqing	2016-03-07
C		
D		
E		
F		



SH1EDISONAL10M VER.B SILKSCREEN BOTTOM
SPELL MODE:1x2

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6

5

4

3

2

1

Baseband Schematic

1. Contents
2. Block Diagramm
3. SOC PWR1
4. SOC PWR2
5. SOC PWR3
6. SOC HS Interface
7. SOC GPIO Interface
8. SOC RF Interface
9. SOC GND
10. PMU LDO
11. PMU BUCK & 8758 BUCK
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15. Battery & Fuel guage
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22. Codec HI6402
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24. Headphone
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MODEM Schematic

31. RF Interface
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36. Reserved
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38. RF Front End MMMBPA+Switch /Main
39. RF Front End MAIN ANT TUNNER
40. Reserved
41. Reserved
42. TCX0
43. Reserved for CDMA Modem
44. Reserved for CDMA Modem
45. Reserved for CDMA Modem
46. Reserved for CDMA Modem
47. Reserved for CDMA Modem
48. Reserved for CDMA Modem
49. RESERVED
50. RESERVED
51. Reserved
52. BT/WLAN/FM/NFC
53. BT/WLAN/FM/NFC
54. WIFI_RF_FrontEnd_2.4GHz
55. WIFI_RF_FrontEnd_5GHz
56. GPS
57. Reserved
58. RF Transceiver2
59. RFIC2_GSM PA+Switch+RX
60. RF PMU2

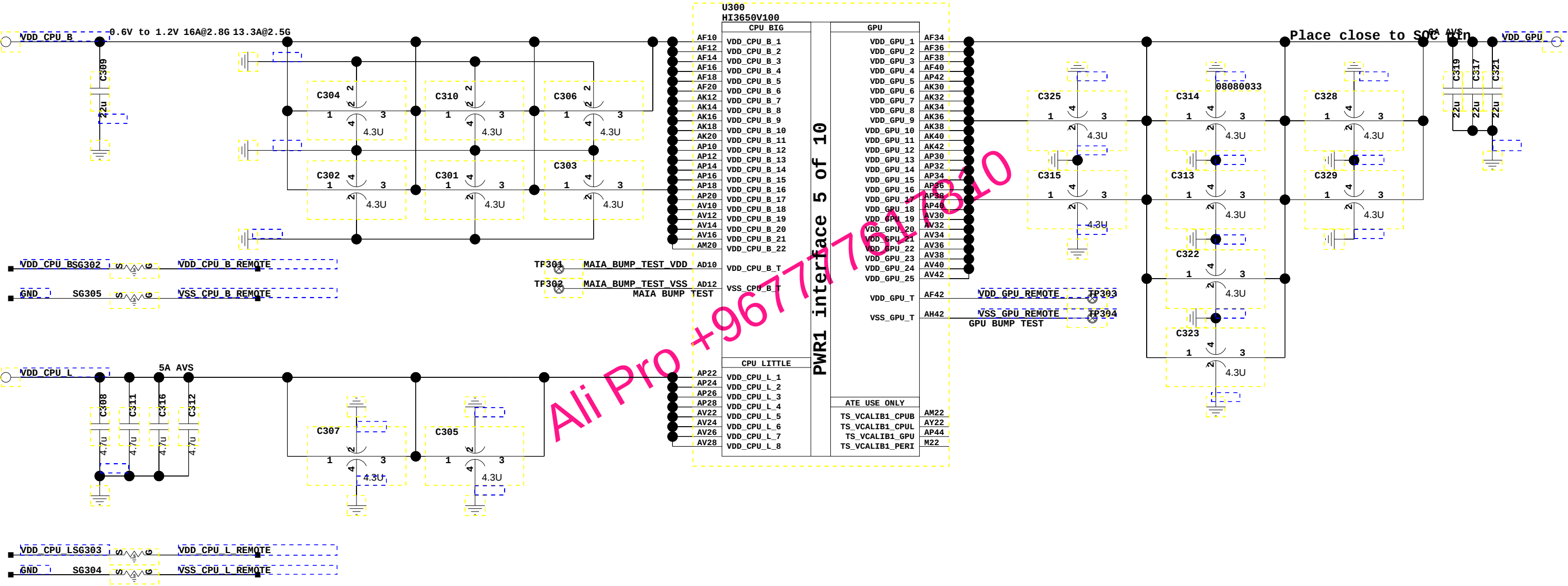
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2. Block Diagramm

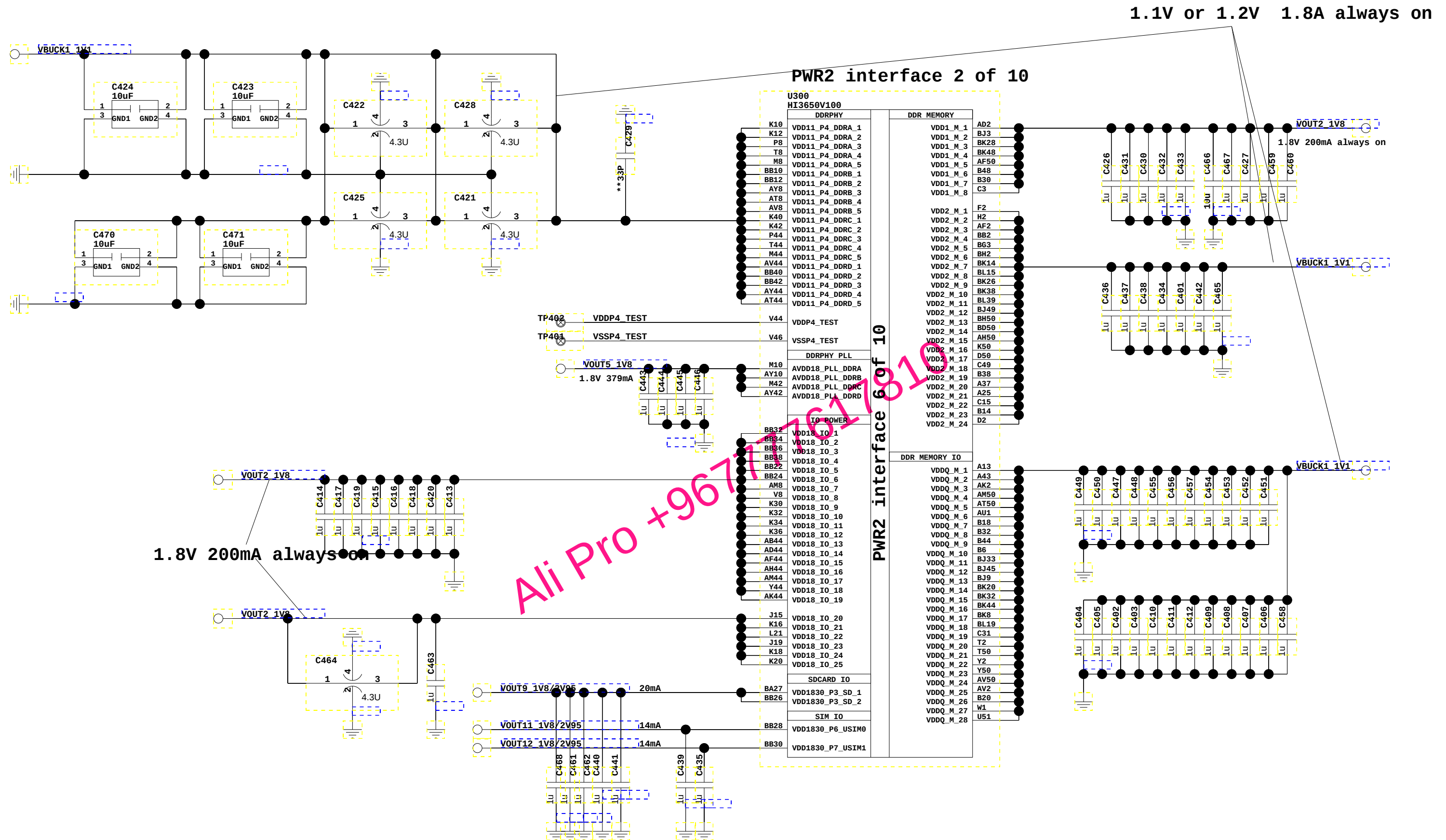


3. SOC PWR1

PWR1 interface 1 of 10

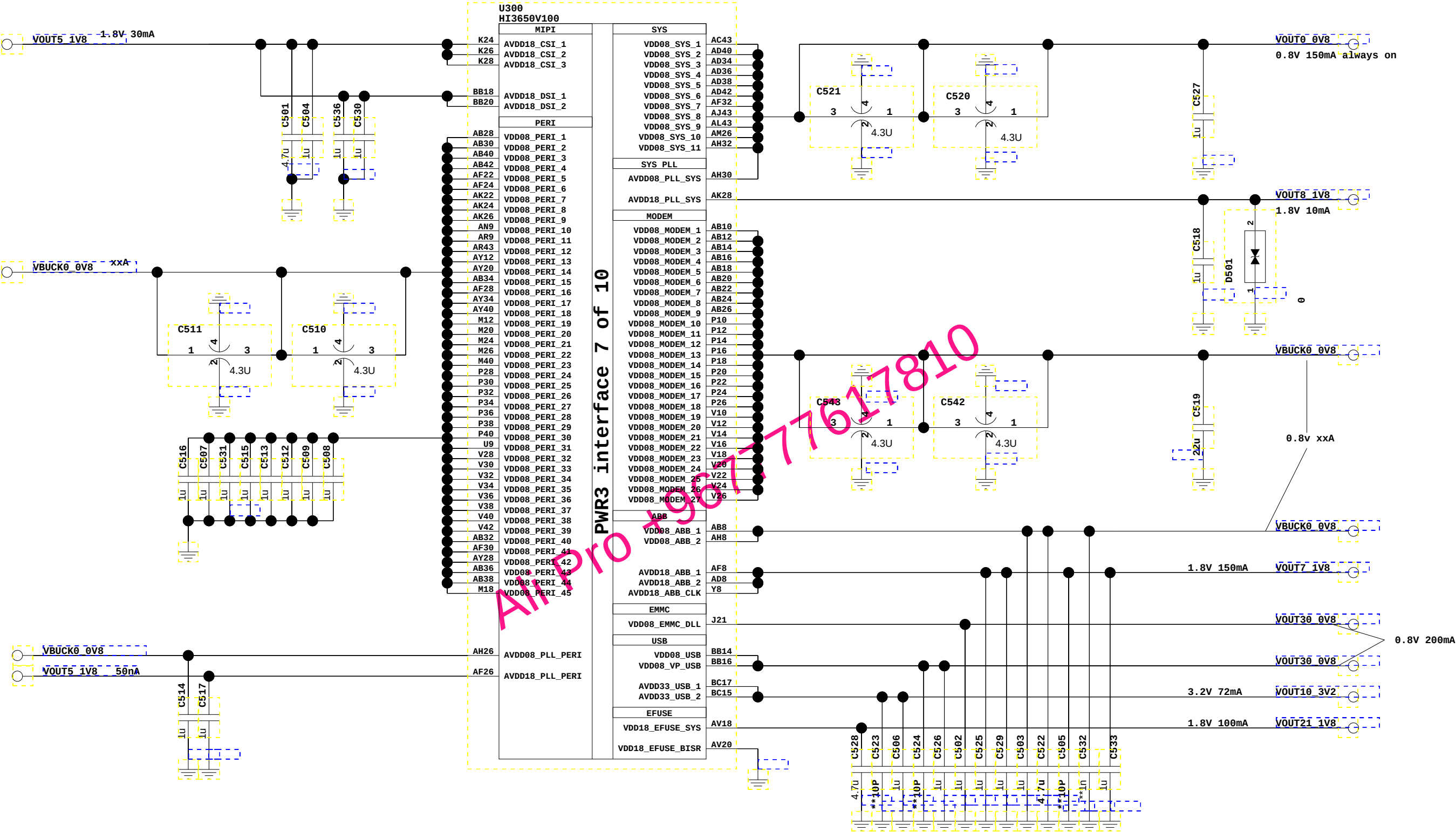


4. SOC PWR2

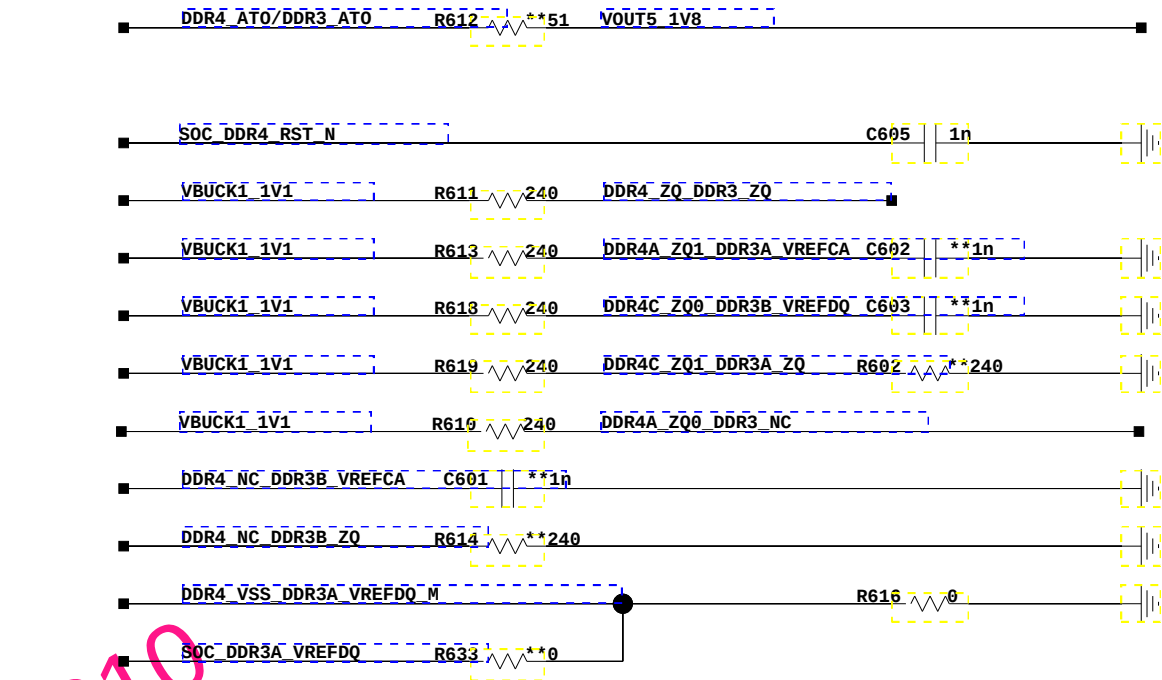
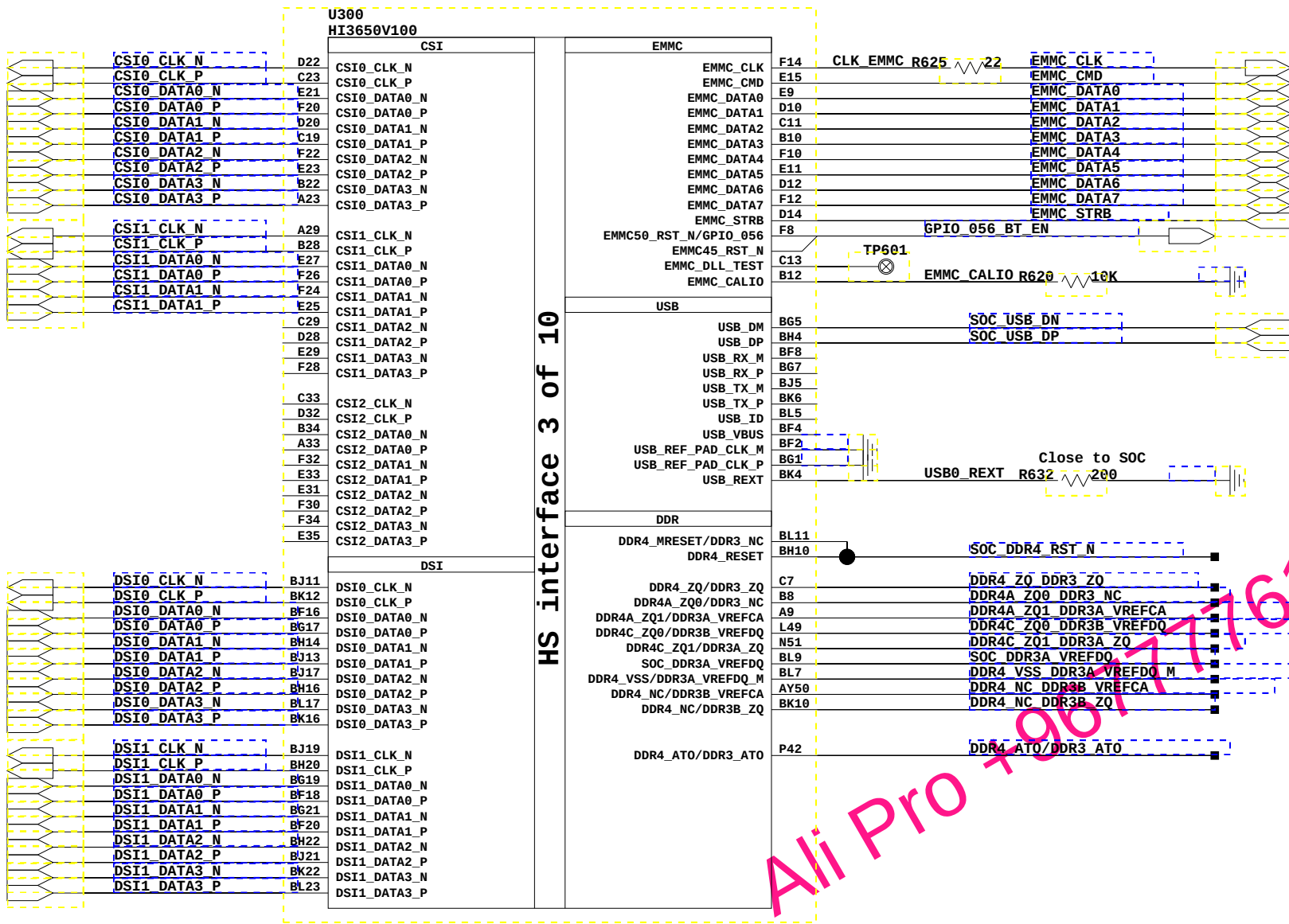


5. SOC PWR3

PWR3 interface 3 of 10



6. SOC HS

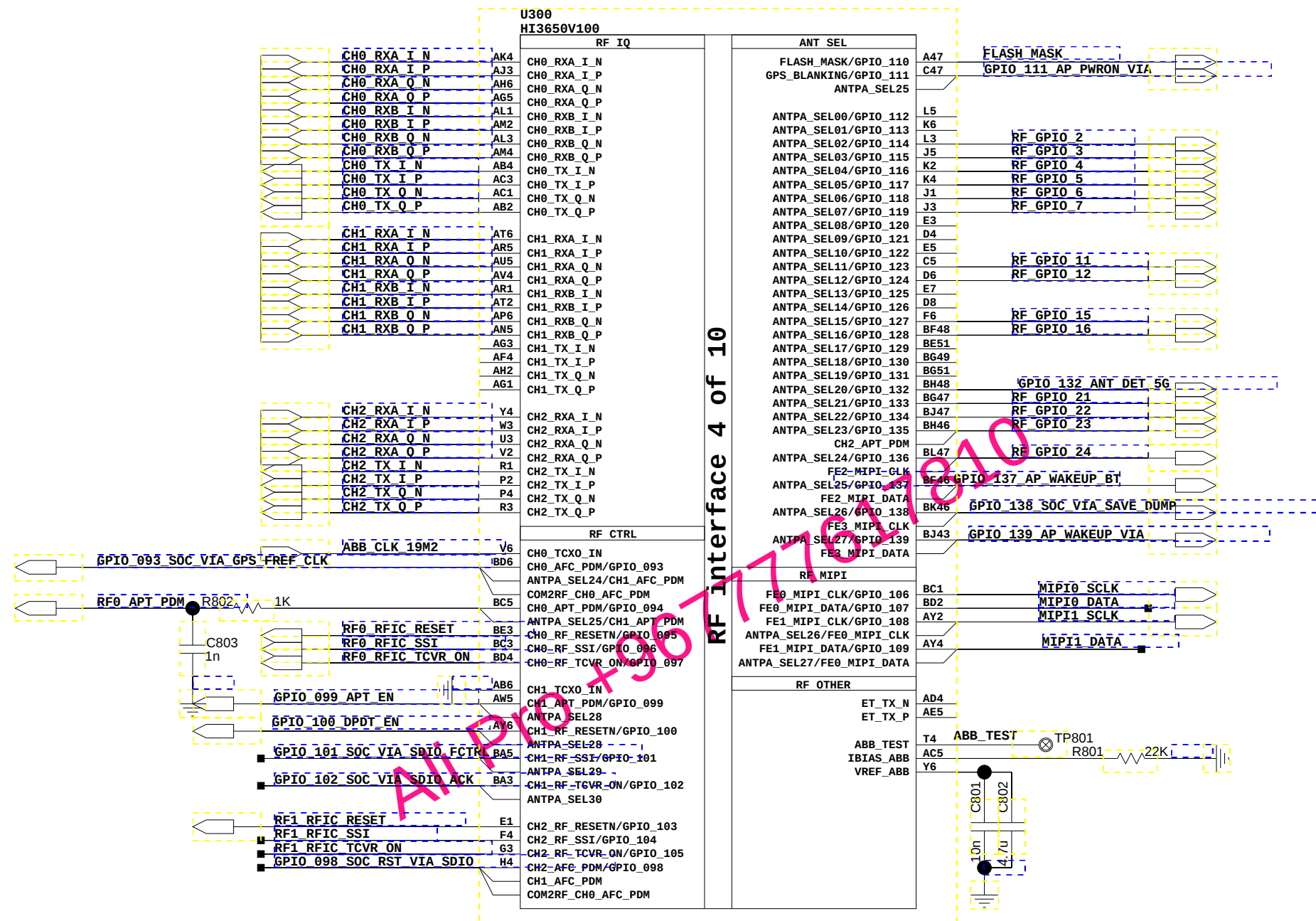


	LPDDR3	LPDDR4
DDR4_ZQ_DDR3_ZQ	WELD R611	WELD R611
DDR4A_ZQ0_DDR3_NC	R610 NC	WELD R610
DDR4A_ZQ1_DDR3A_VREFCA	WELD C602,R613 NC	WELD R613,C602 NC
DDR4C_ZQ0_DDR3B_VREFDQ	WELD C603,R618 NC	WELD R618,C603 NC
DDR4C_ZQ1_DDR3A_ZQ	WELD R602,R619 NC	WELD R619,R602 NC
DDR4_VSS_DDR3A_VREFDQ_M	R616 WELD 1nF	WELD R616
DDR4_NC_DDR3B_VREFCA	WELD C601	C601 NC
DDR4_NC_DDR3B_ZQ	WELD R614	R614 NC
SOC_DDR3A_VREFDQ	WELD R633	R633 NC
BUCK1_VOL_SEL	WELD R1212,R1219 NC	WELD R1219,R1212 NC
DDR4_ATO/DDR3_ATO	WELD R612(for test)	R612 NC
SOC_DDR4_RST_N		

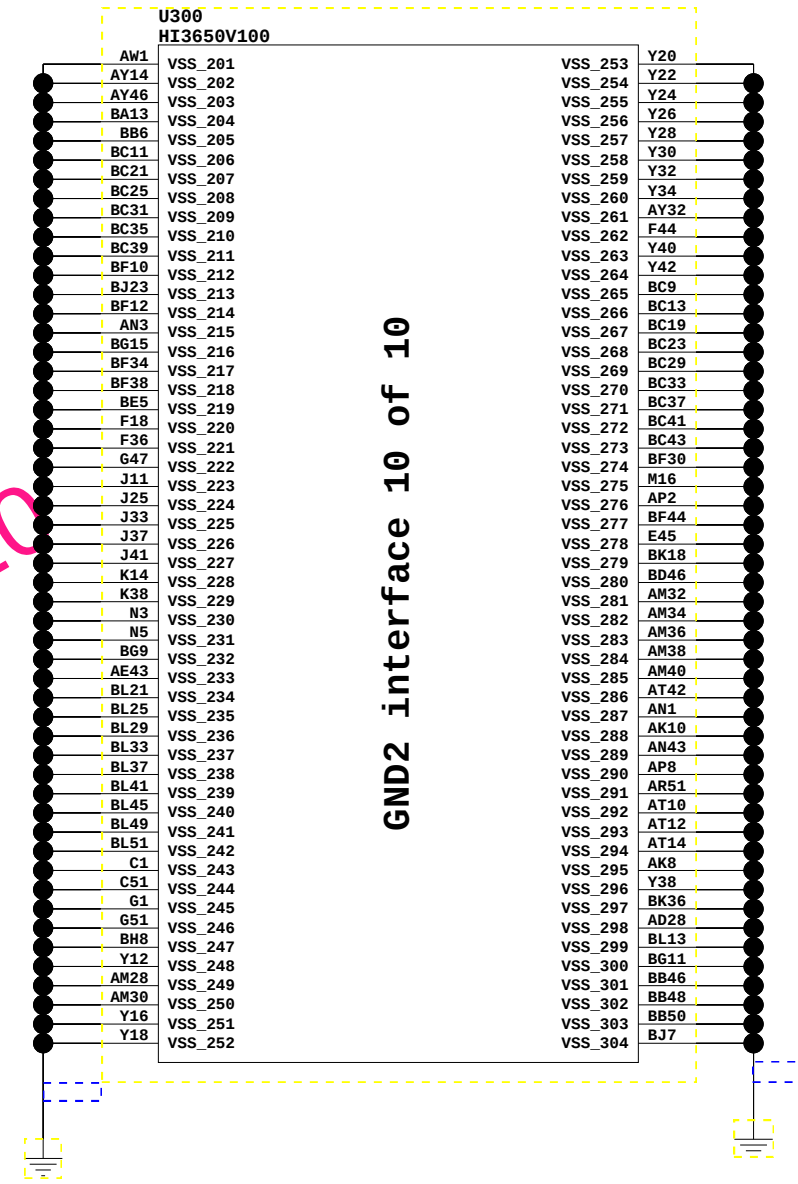
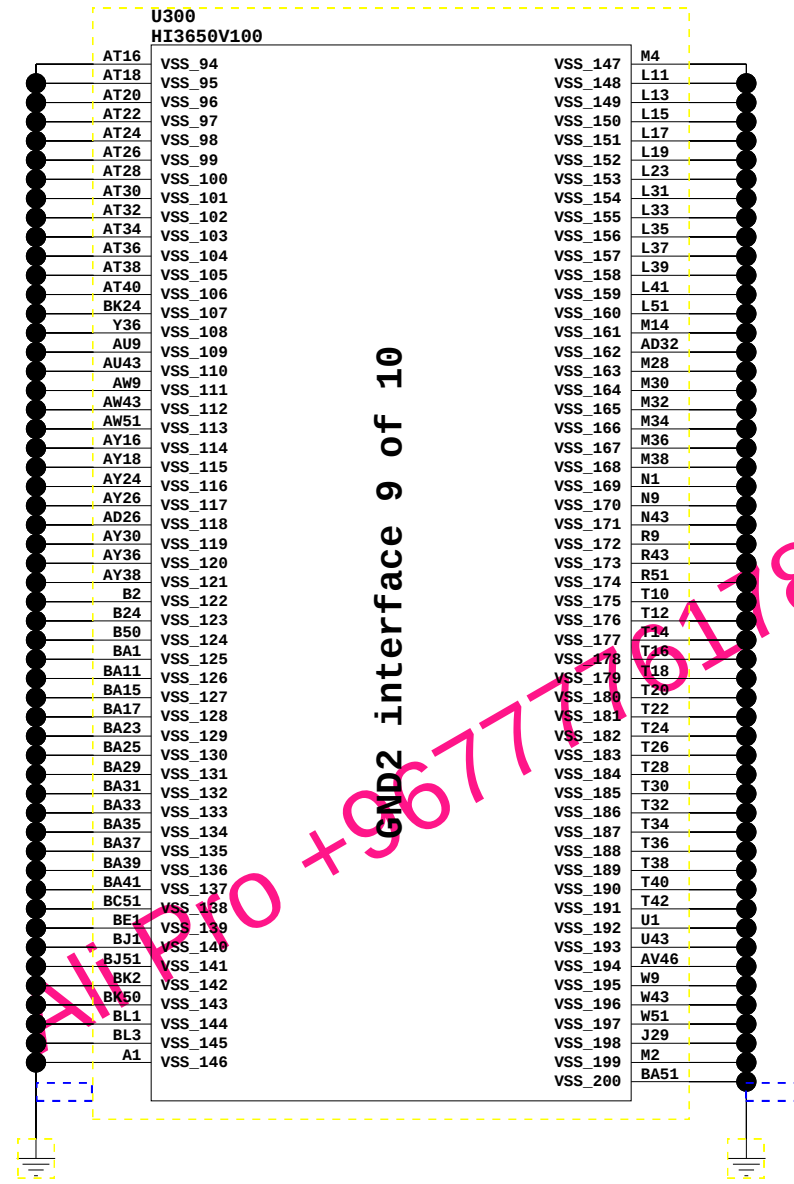
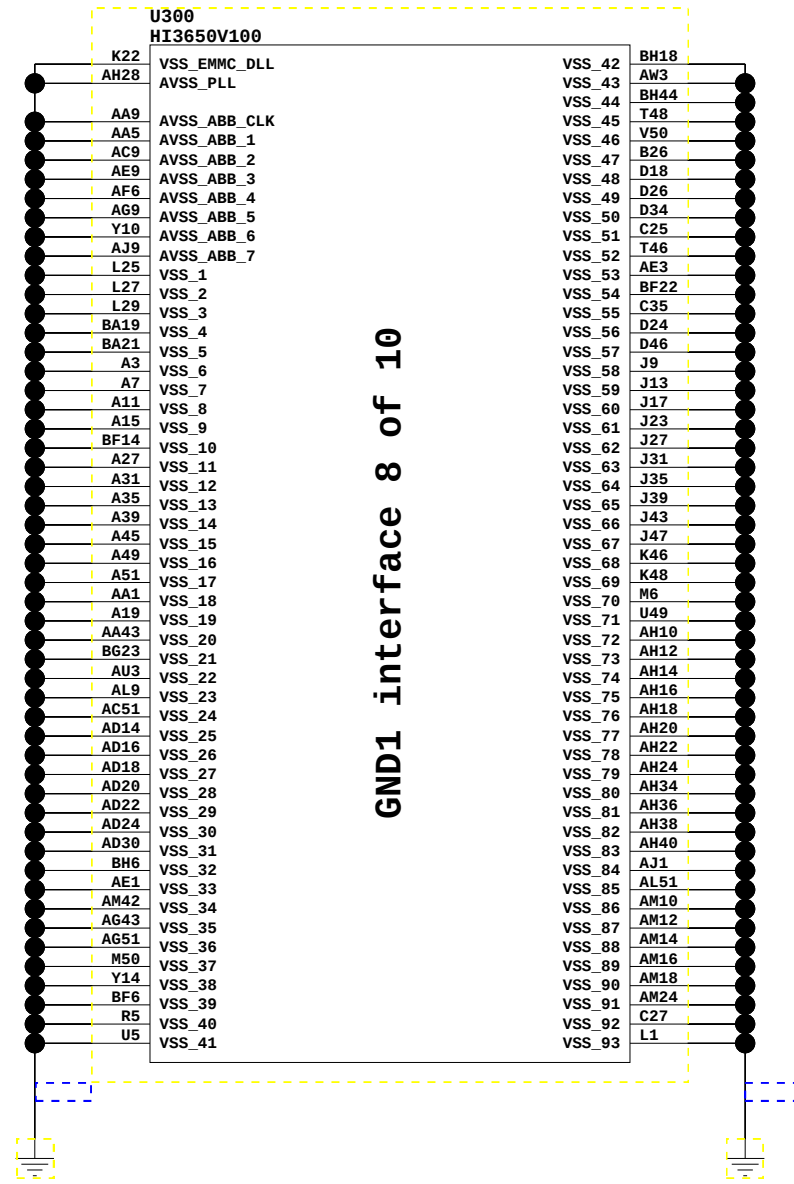
7. SOC GPIO



8. SOC RF

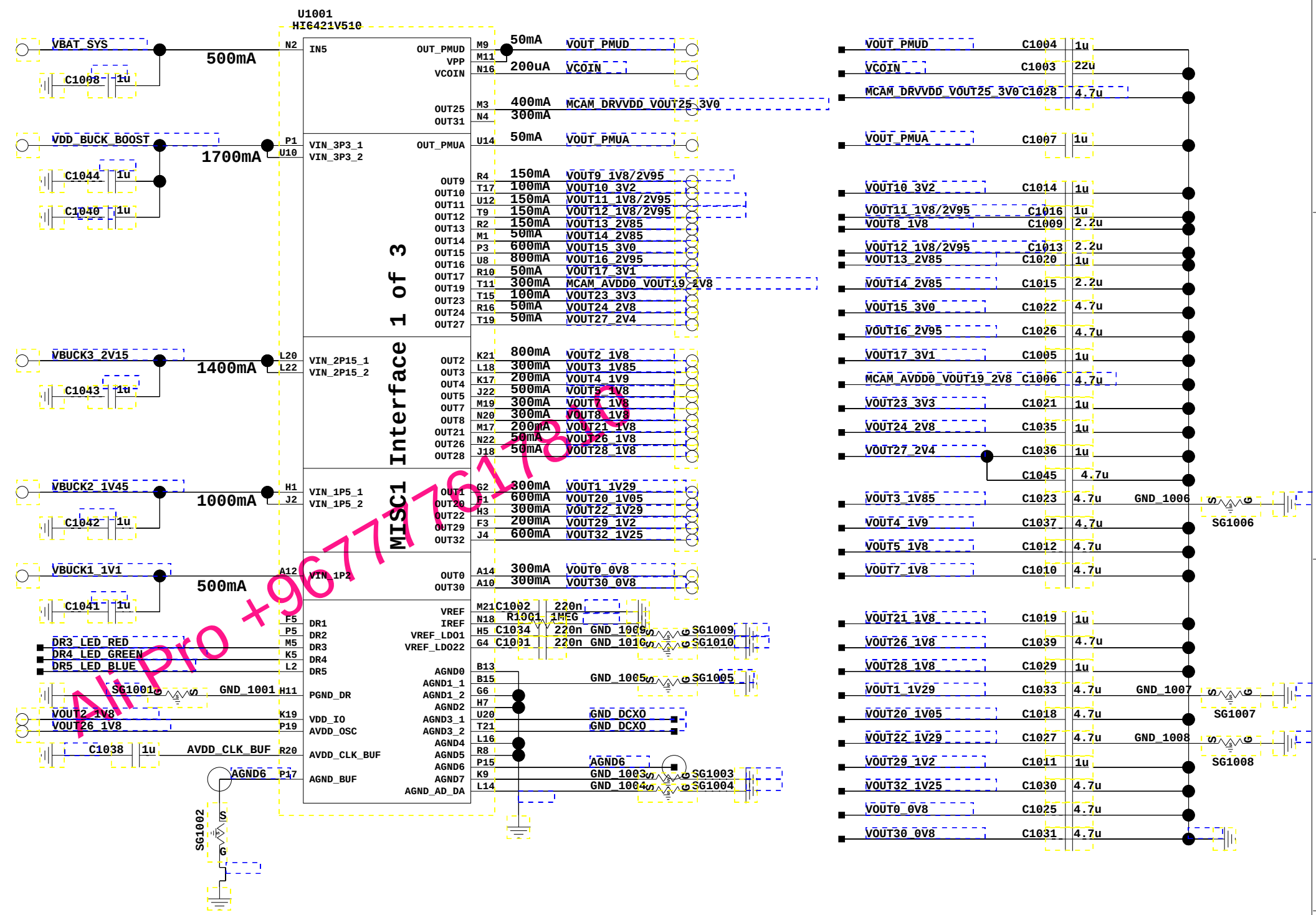


9. SOC GND & NC



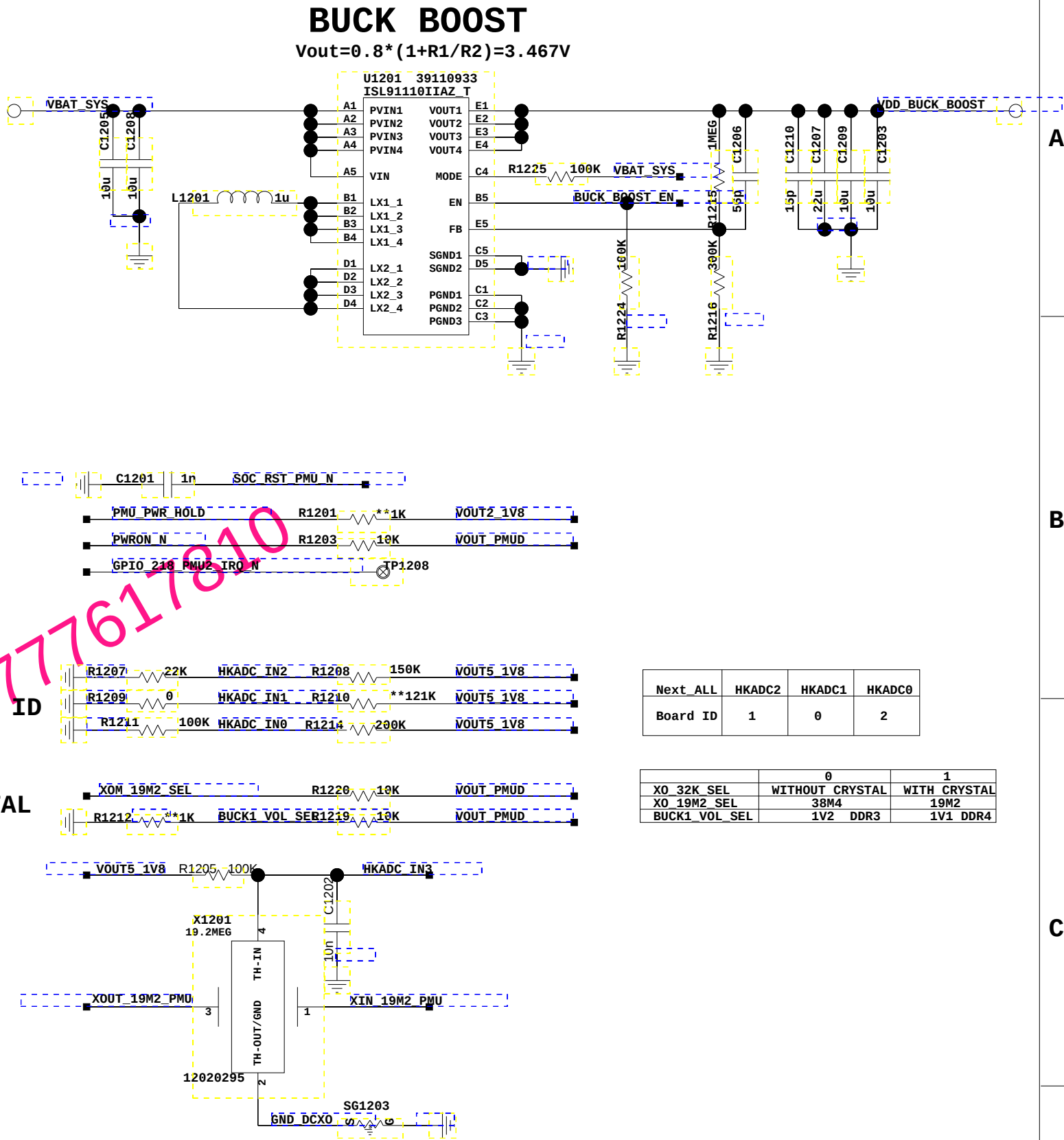
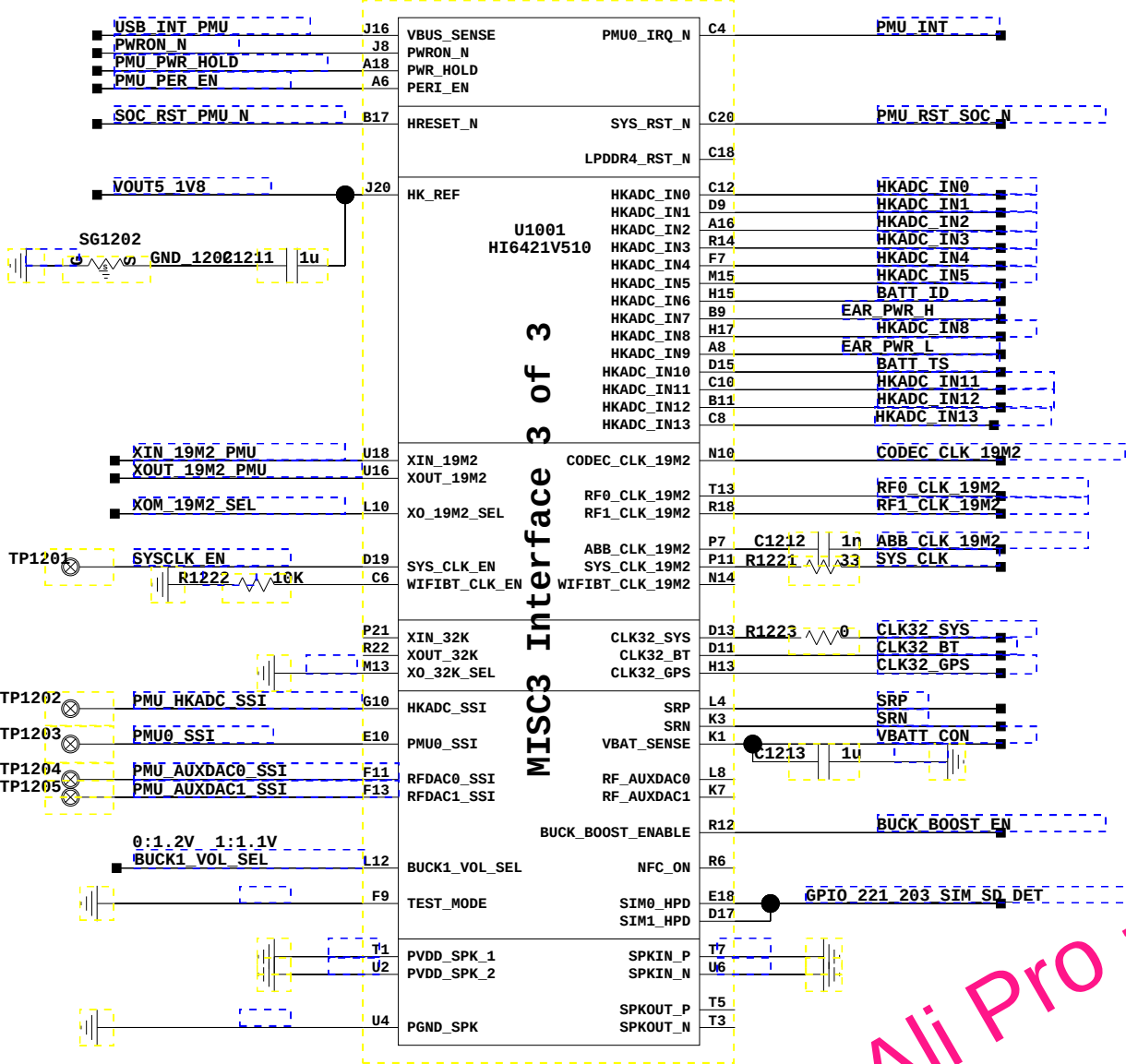
10. PMU LDO

Name	Voltage	Current	Function
LD00	0.8	300	SOC AO
LD01	1.29	300	RFIC0 AVDD1 1.29V
LD02	1.8	800	1V8 IO
LD03	1.85	300	RFIC0&1 AVDD2 1.85V
LD04	1.8	200	For LCD&TP 1.8V I/O
LD05	1.8	500	MIPI PHY&DDR PHY
LD07	1.8	300	ABB&PLL ANA_1V8
LD08	1.8	300	Hi6402 ANA_1V8
LD09	1.8/2.95	50	HI3650 SD IO
LD010	3.2	100	USB PHY 3.3V
LD011	1.8	150	SIM0
LD012	1.8	150	SIM1
LD013	2.85	150	SUB_CAM ANA_2V85
LD014	2.85	50	TCX01
LD015	3	600	eMMC Flash VDDM
LD016	2.95	800	SD
LD017	2.8	50	LCD &TP AVDD
LD019	2.8	300	Camera ANA_2V85
LD020	1.2	600	M_Camera Core
LD021	1.8	200	EFUSE_SYS
LD022	1.29	300	RFIC1 AVDD1 1.29V
LD023	3.3	100	PA BIAS
LD024	2.8	50	X Sensor AVDD_2V8
LD025	2.85	400	Camera OIS AVDD_2V85
LD026	1.8	50	19M2 XO
LD027	2.4	50	Hi6362 AVDD3
LD028	1.8	50	PA Star
LD029	1.2	200	Hi6402 1.2V
LD030	0.8	300	emmc phy 0.8V Core
LD031	2.8	300	Vibrator
LD032	1.2	600	S_Camera Core



11. PMU BUCK & 8758 BUCK

12. PMU MISC & BUCKBOOST



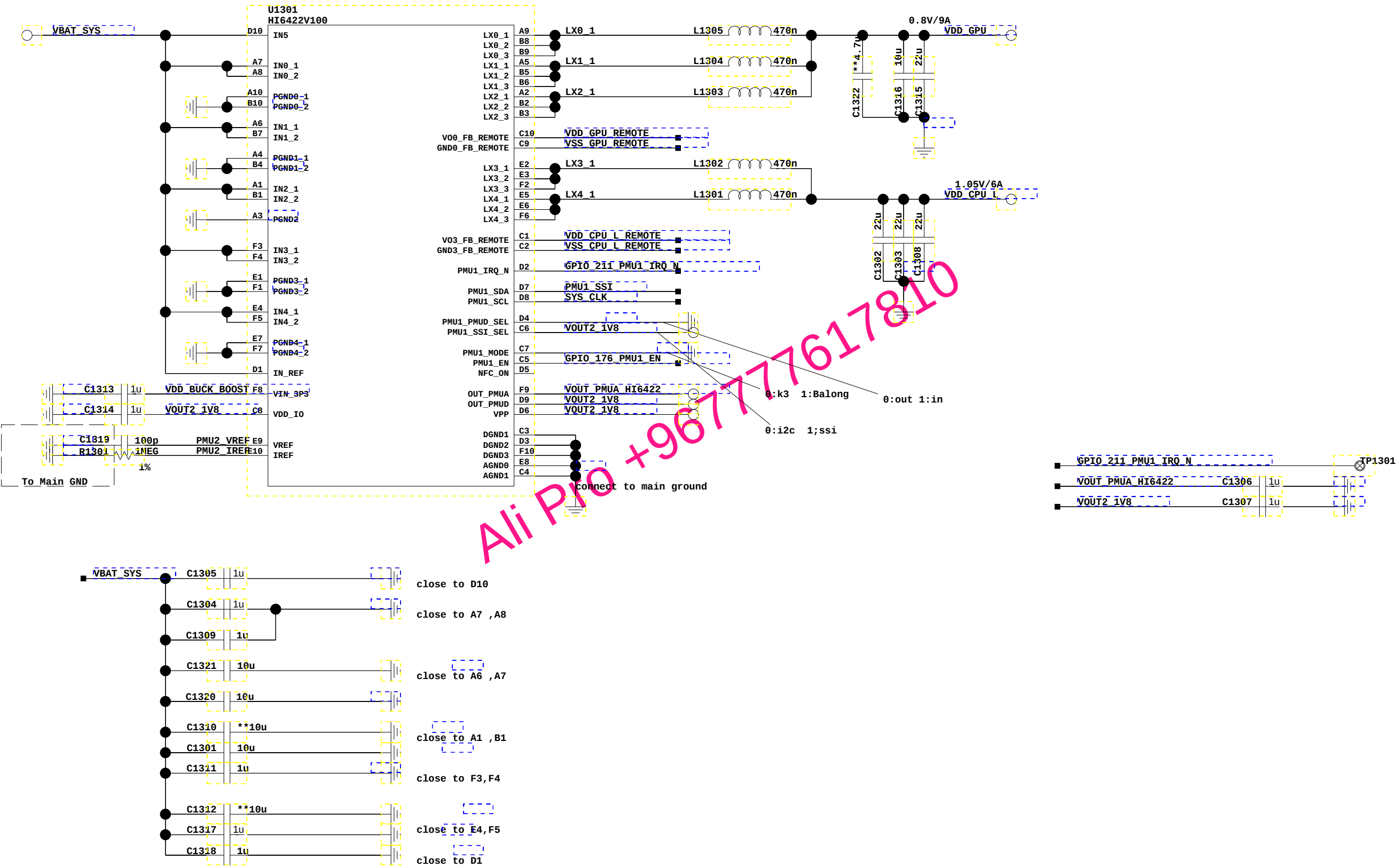
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Next_ALL	HKADC2	HKADC1	HKADC0
Board ID	1	0	2

	0	1
XO_32K_SEL	WITHOUT CRYSTAL	WITH CRYSTAL
XO_19M2_SEL	38M4	19M2
BUCK1_VOL_SEL	1V2 DDR3	1V1 DDR4

HKADC	Function	HKADC	Function
HKADC_IN0	Board ID	HKADC_IN7	EAR_PWR_H
HKADC_IN1	Board ID	HKADC_IN8	Power Detect
HKADC_IN2	Board ID	HKADC_IN9	EAR_PWR_L
HKADC_IN3	DCX0 Temp	HKADC_IN10	BATT Temp
HKADC_IN4	USB Temp Protection (Flash LED Temp compatible)	HKADC_IN11	MMBPA Temp
HKADC_IN5	Charge Current	HKADC_IN12	AP Temp
HKADC_IN6	BATT ID	HKADC_IN13	Invalid

13. HI6422



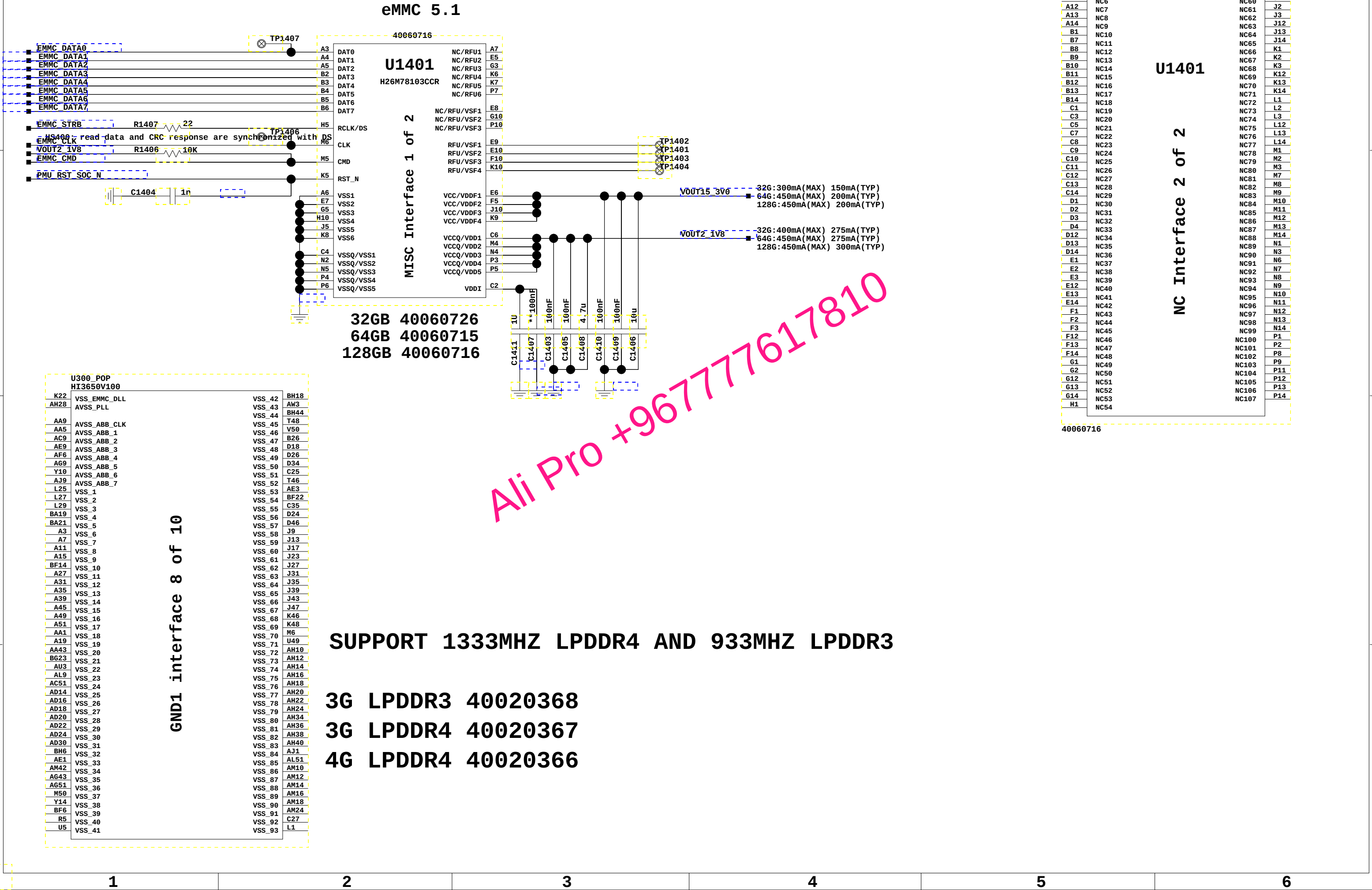
14. eMMC AND LpDDR3

A

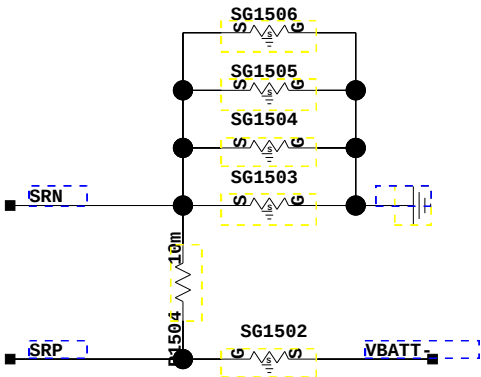
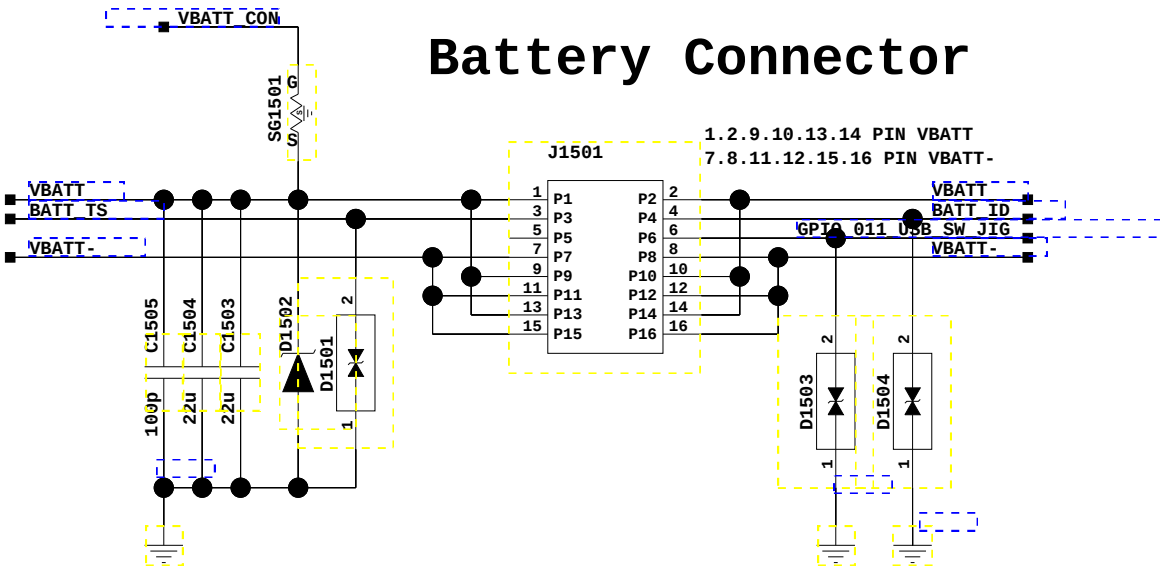
B

C

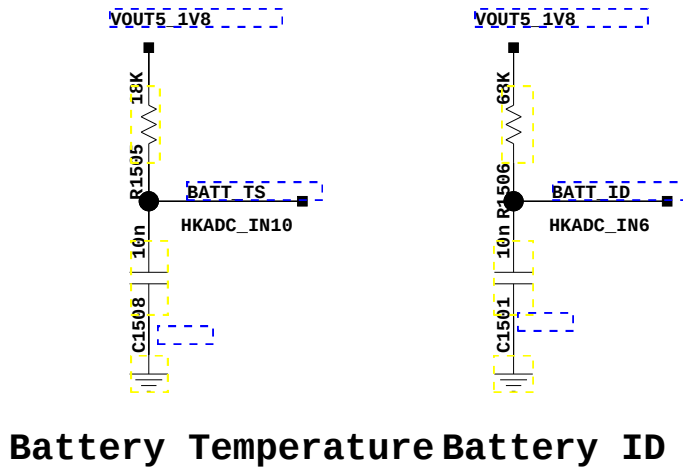
D



15. Battery & Fuel guage



CAD note:1.Trace for 6A
2.Differential trace



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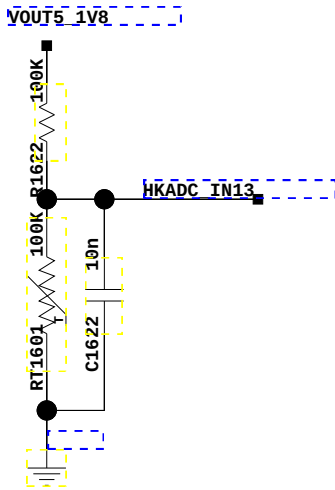
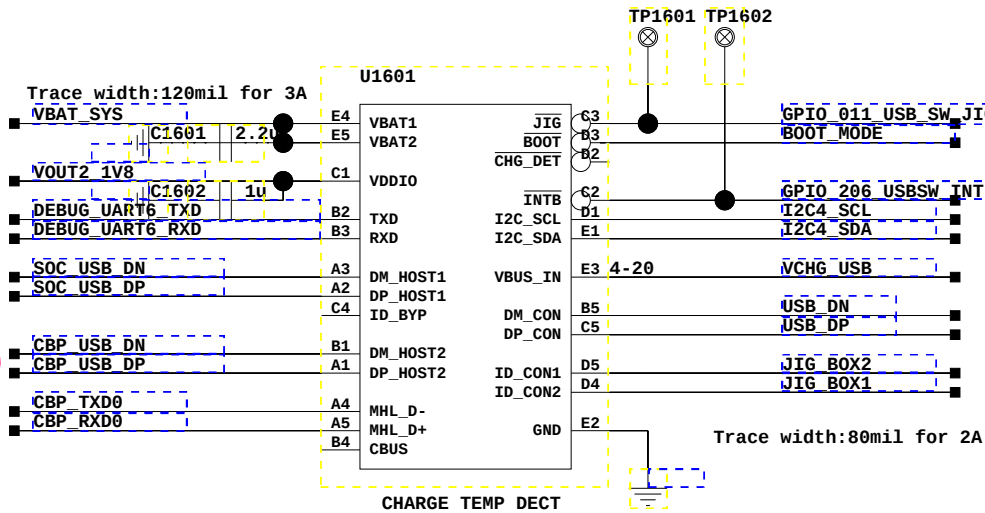
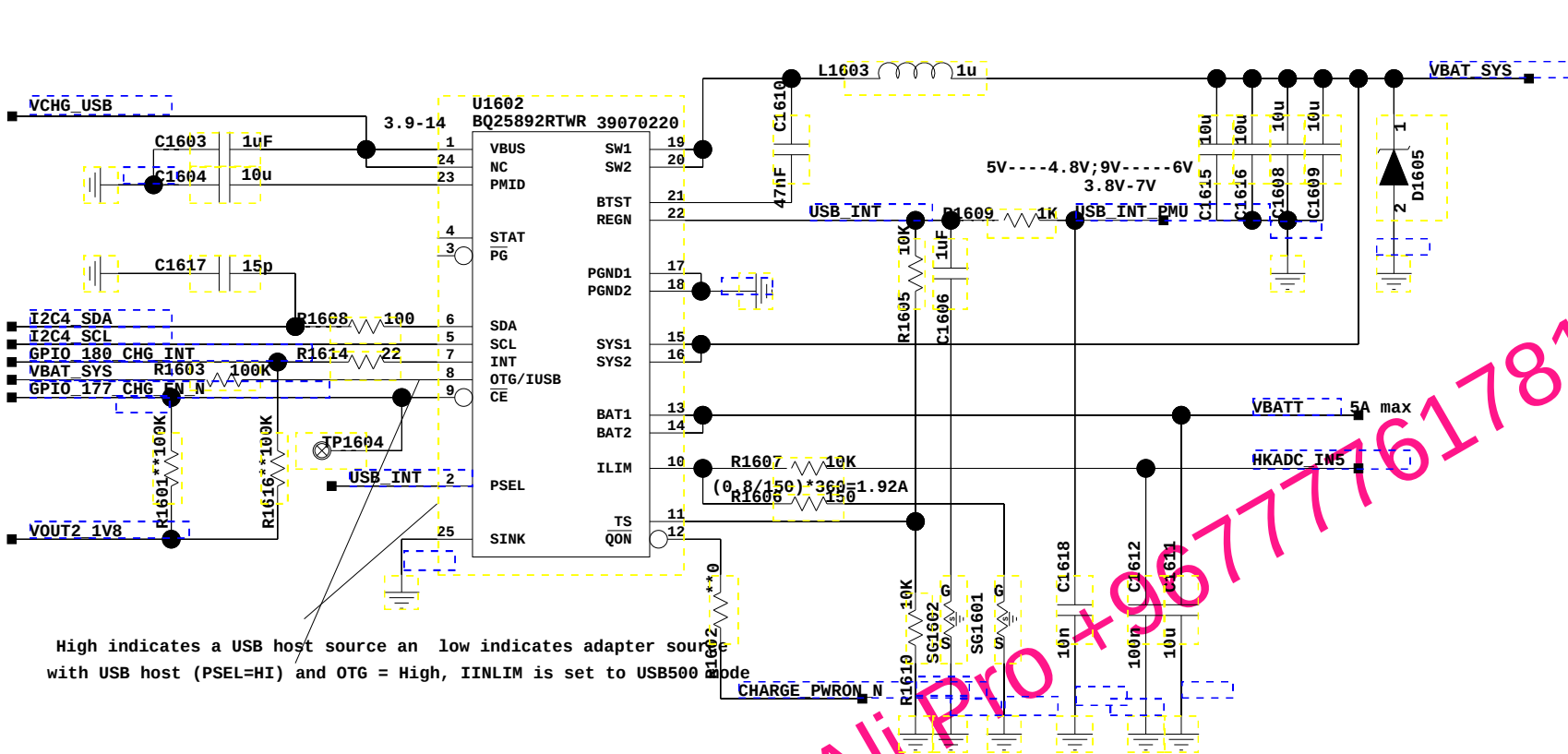
16. Charge Management

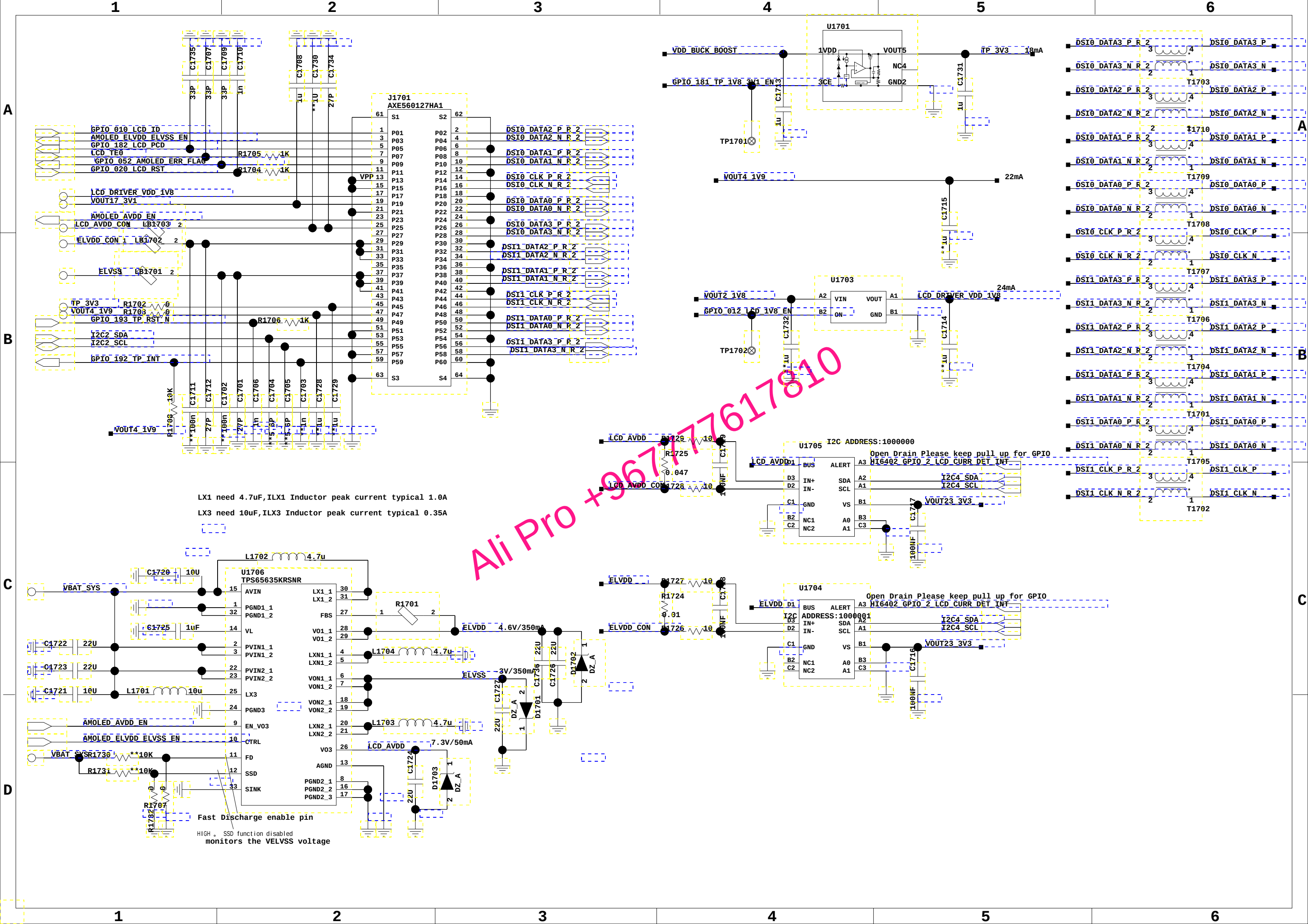
Charger IC

I2C address=1101011(0x6B)

USB/UART SWITCH

I2C address=0100101(0x25)





	1	2	3	4	5	6
A						
B						
C						
D						

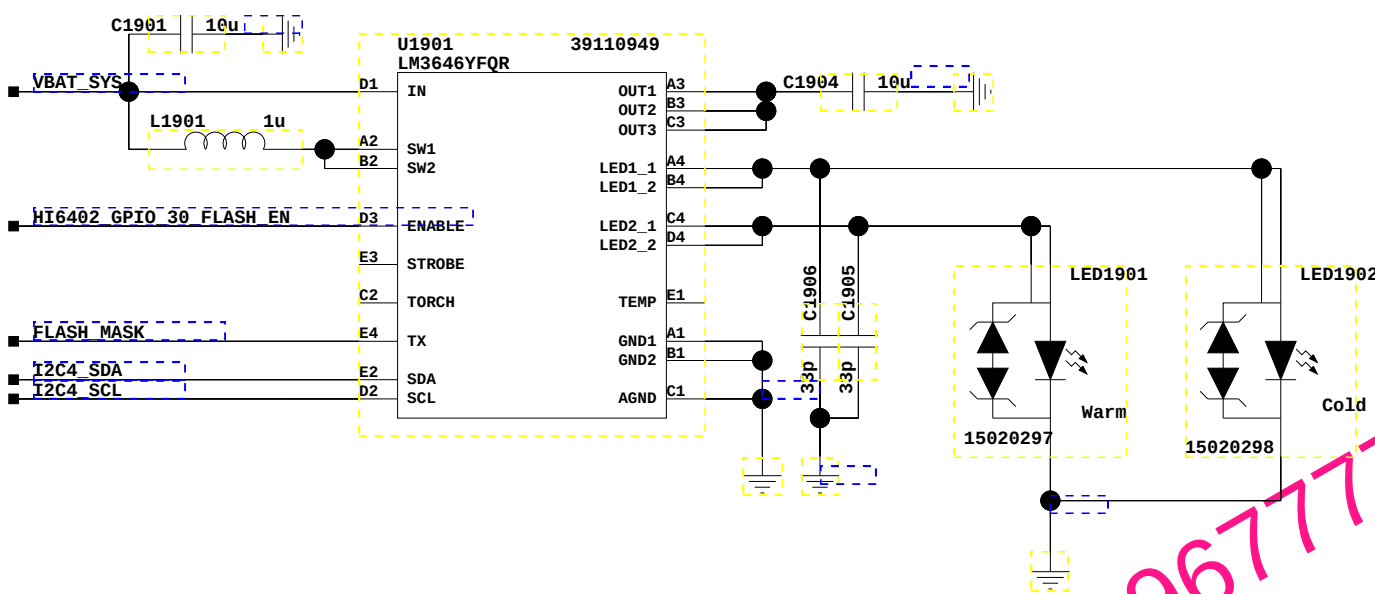
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19. Flash LED

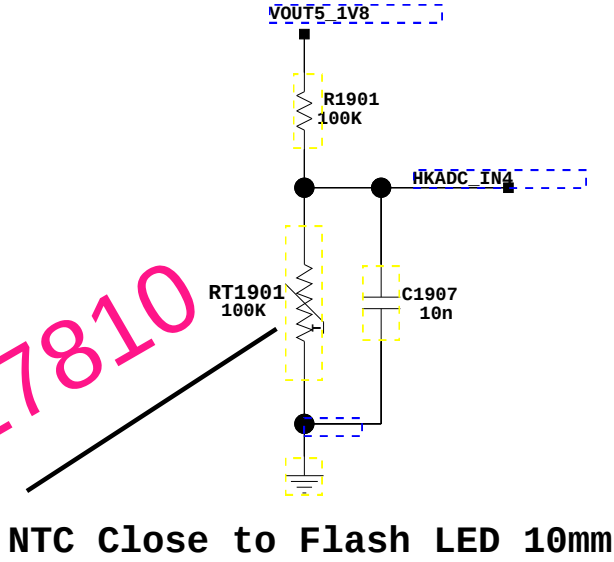
Flash LED

I2C address=1100111(0x67)

rear camera double flash led
software set the limit current 2.5A



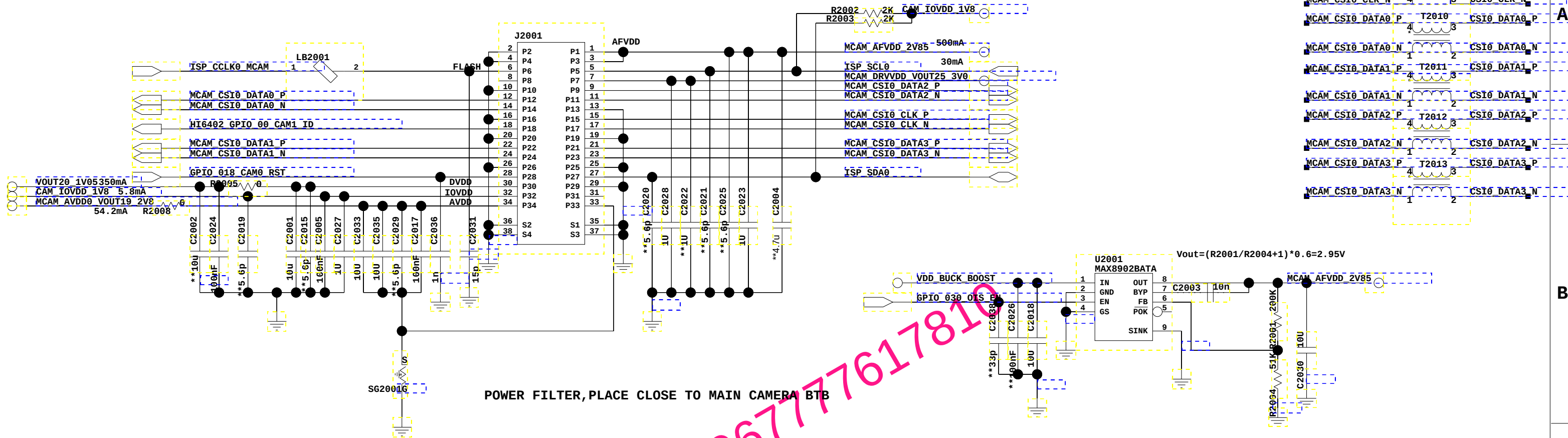
Flash LED Temp Detect



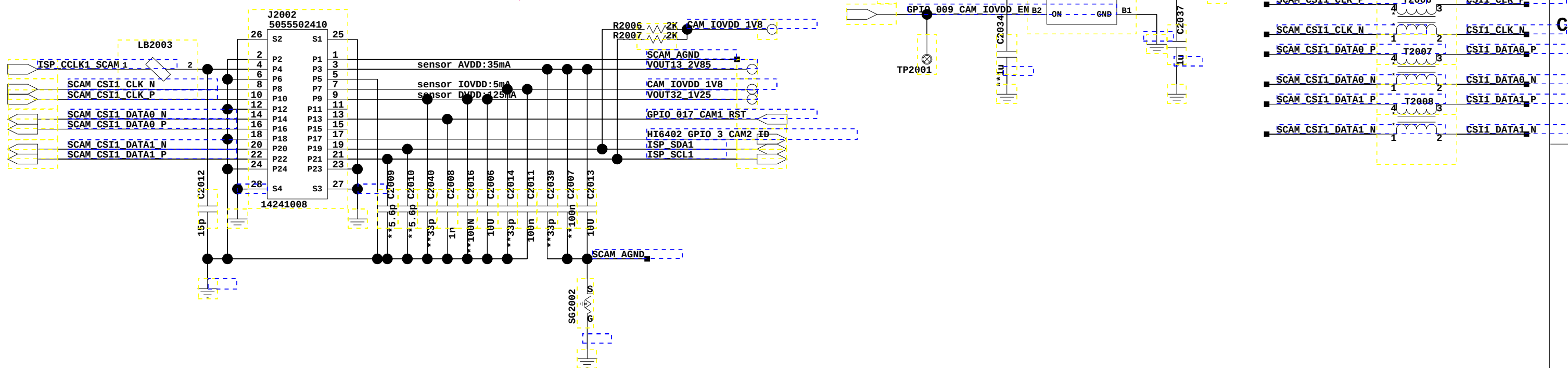
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20. Camera

MAIN CAM:23060175



SLAVE CAMERA 23060200
I2C address=0100000(0x20)

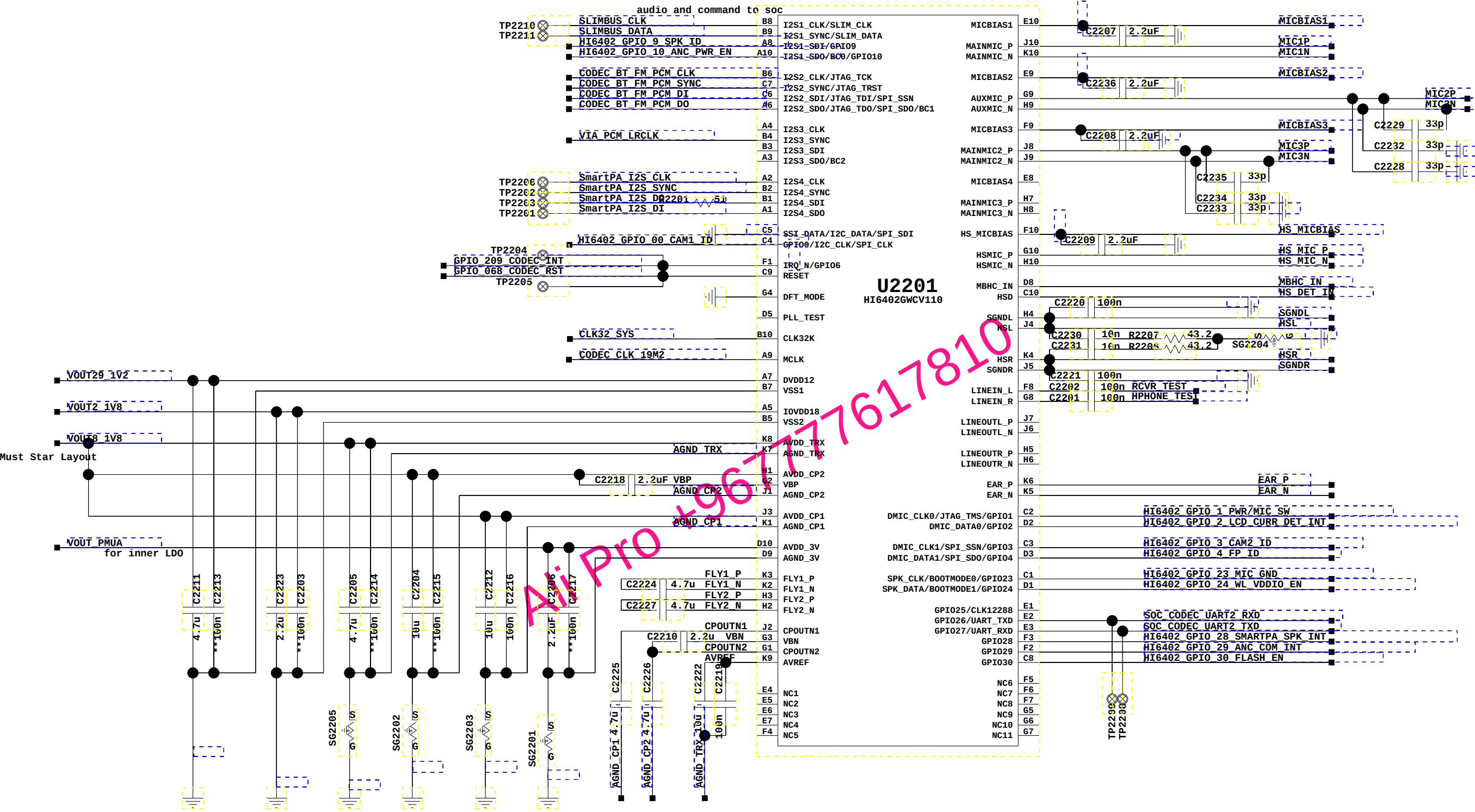


	1	2	3	4	5	6
A						
B						
C						
D						

21. ISP

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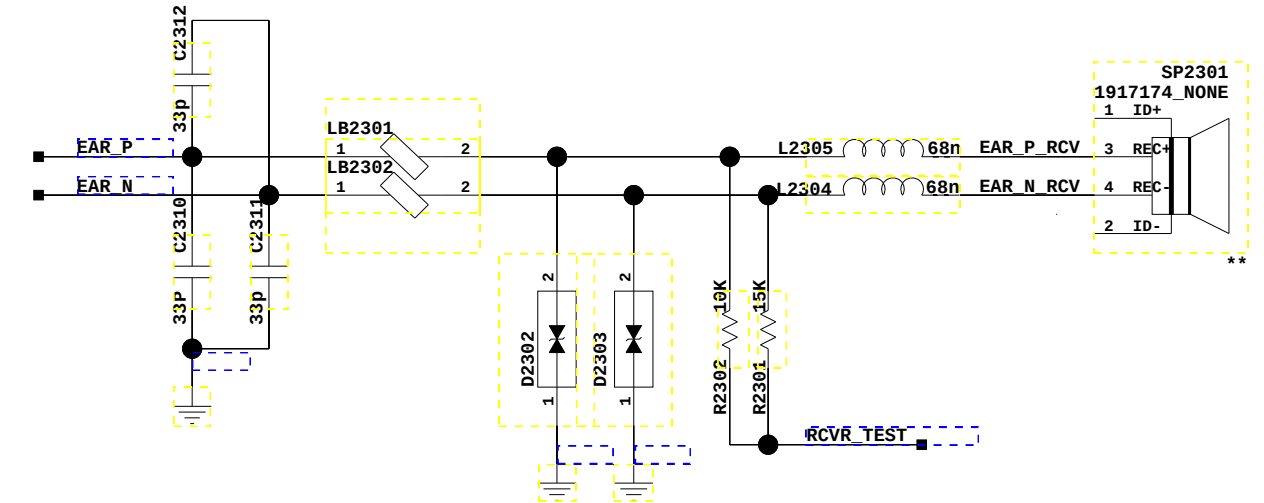
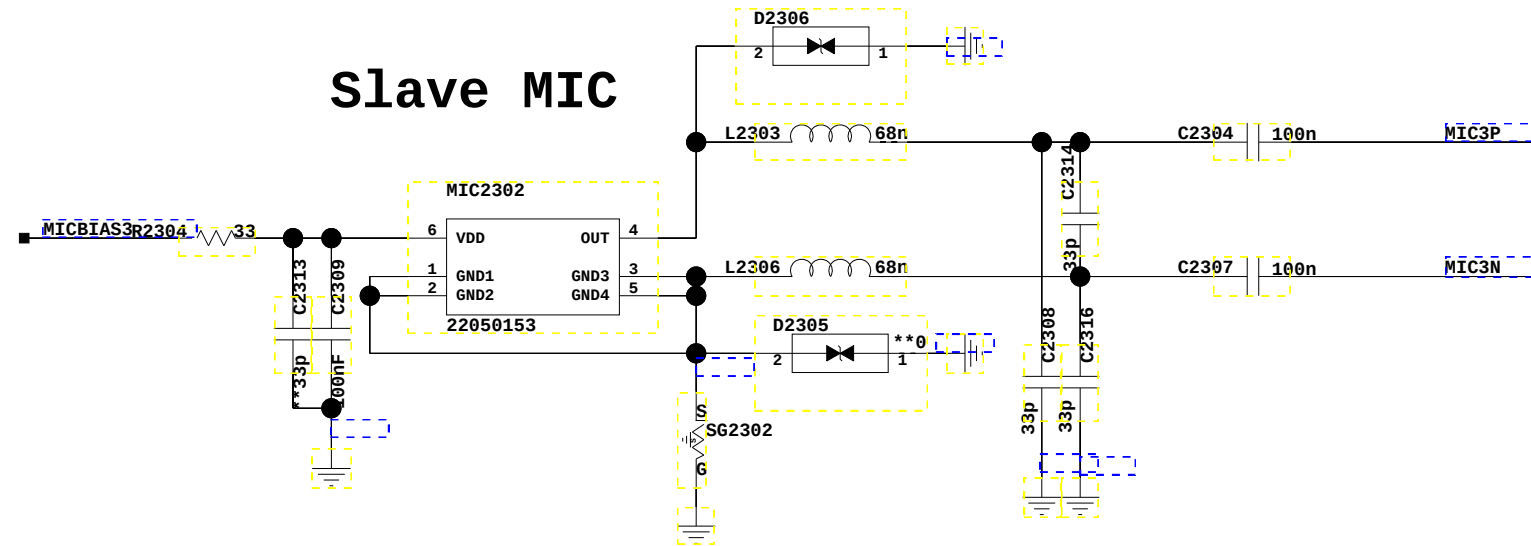
22. CODEC HI6402



BootMode0	BootMode1	Function(BootROM Start)
1	1	SPI Start
1	0	SSI Start
0	1	I2C Start
0	0	SLIMBUS Start

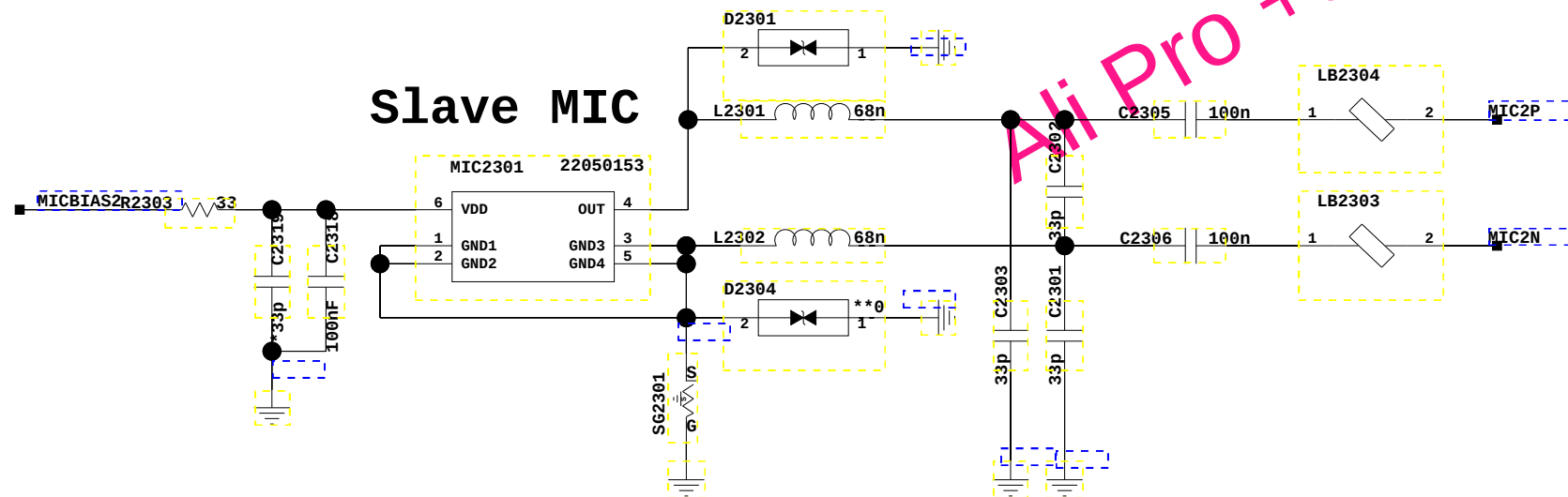
23. MIC/RCV/SPK/VIB

Slave MIC



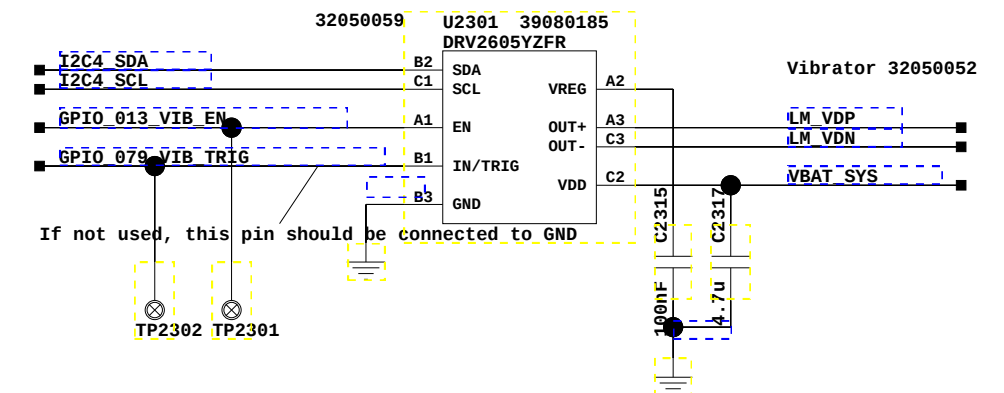
CAD note: MIC need differential trace

Slave MIC



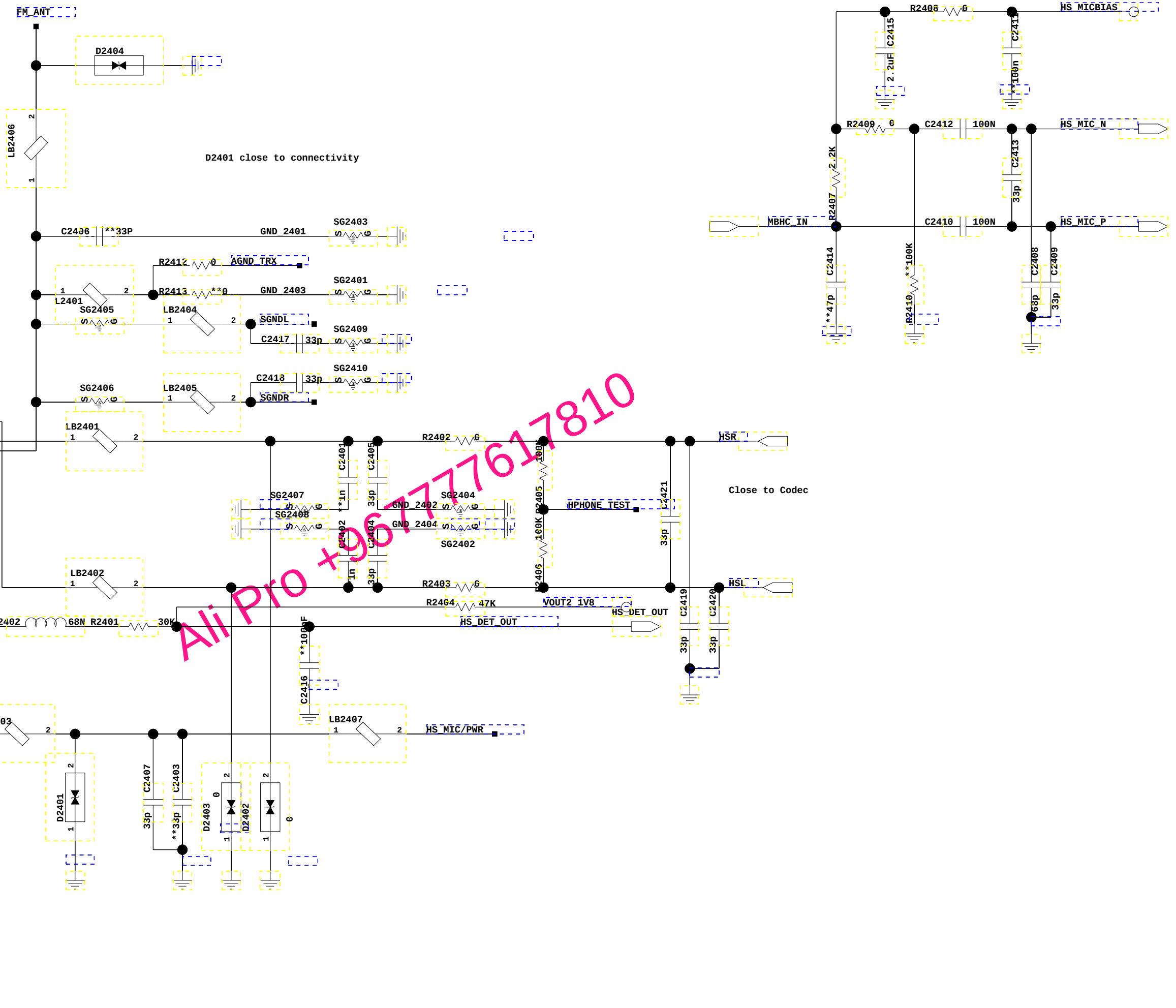
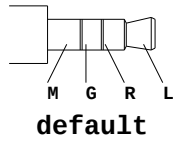
Linear Vibrator Driver

I2C address=1011010(0X5A)

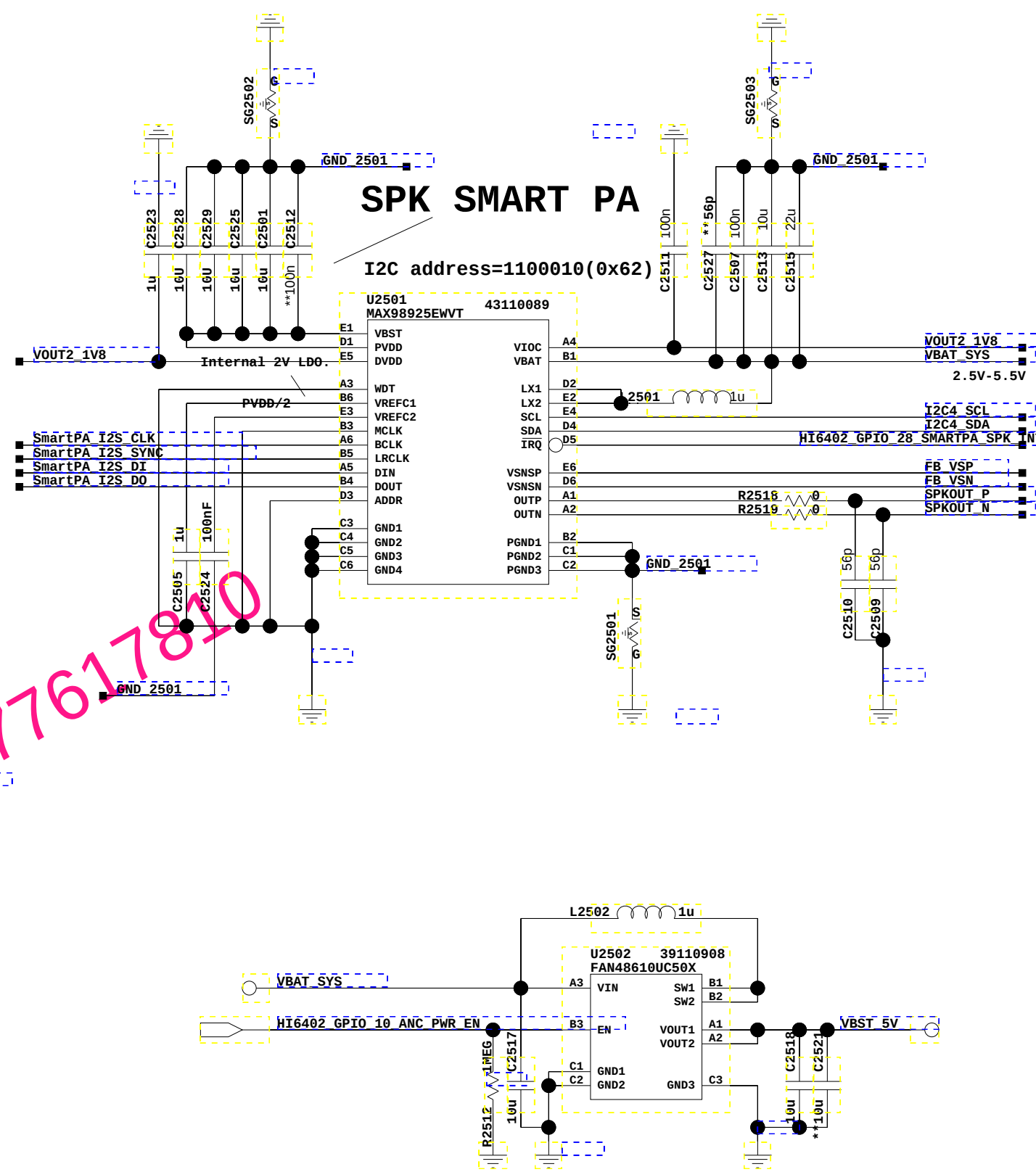
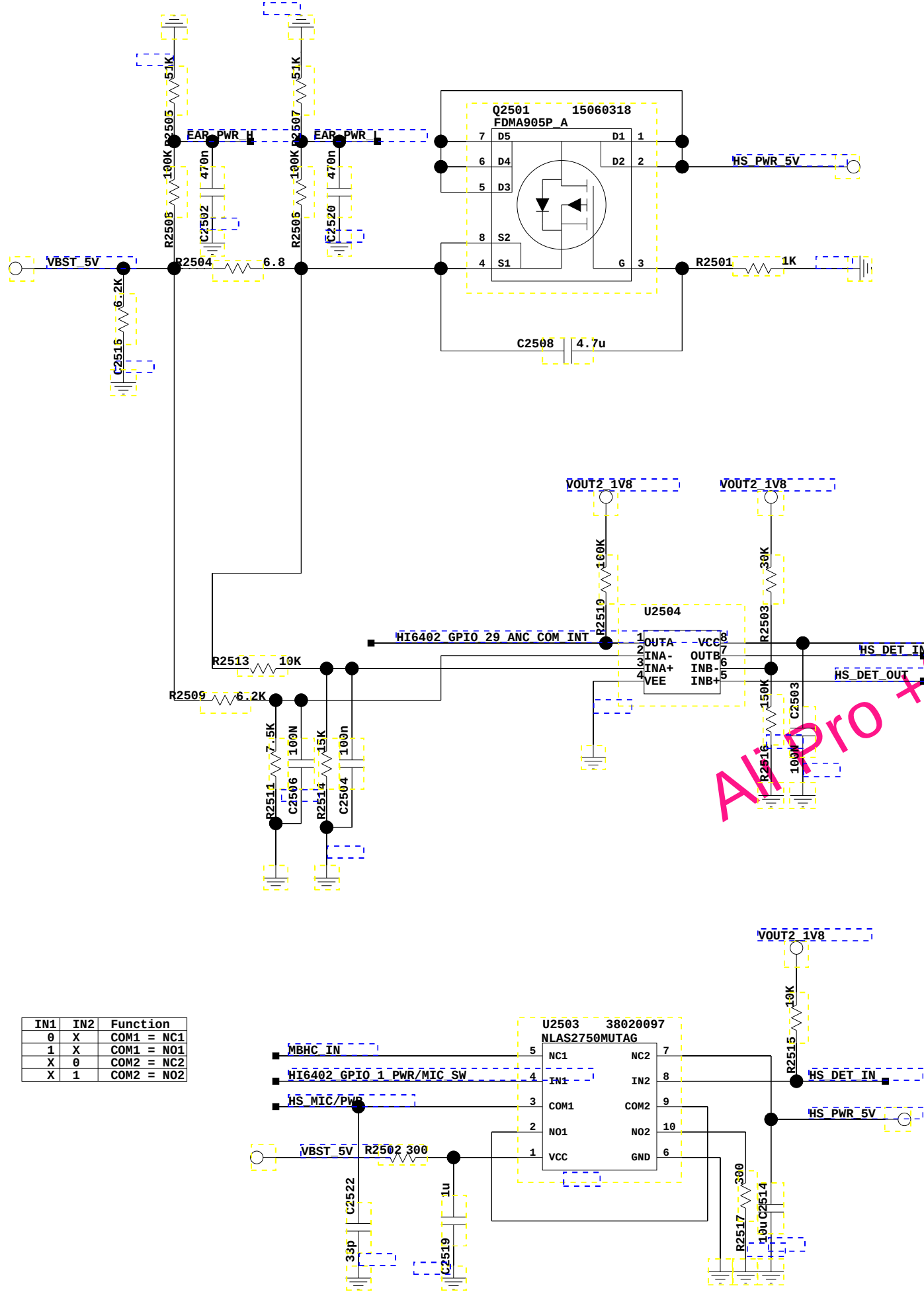


CAD note: MIC need differential trace

24. Headphone



25. Audio

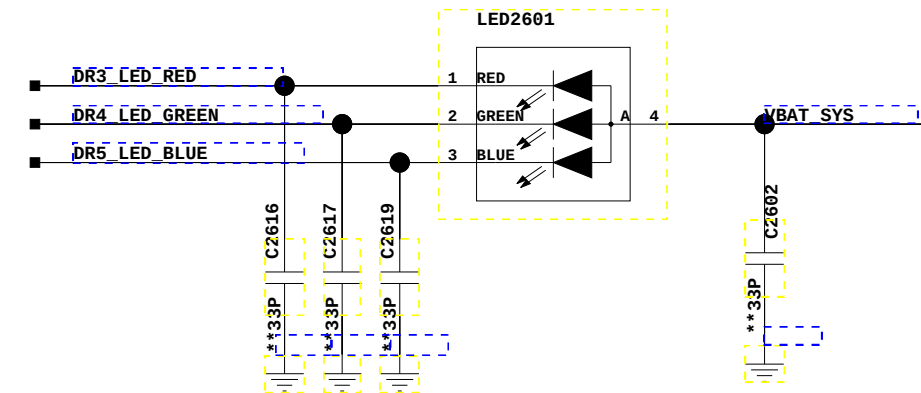
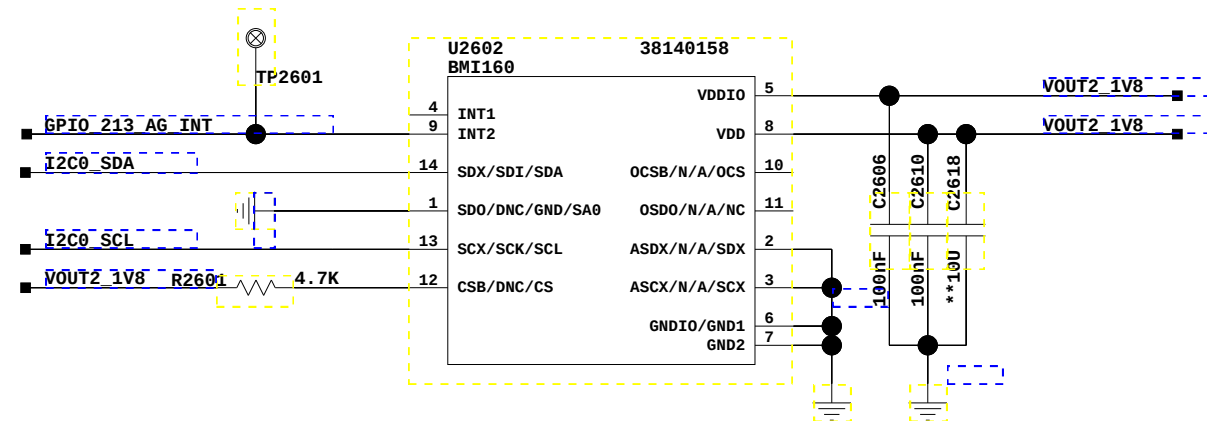


IN1	IN2	Function
0	X	COM1 = NC1
1	X	COM1 = NO1
X	0	COM2 = NC2
X	1	COM2 = NO2

26. X-Sensor

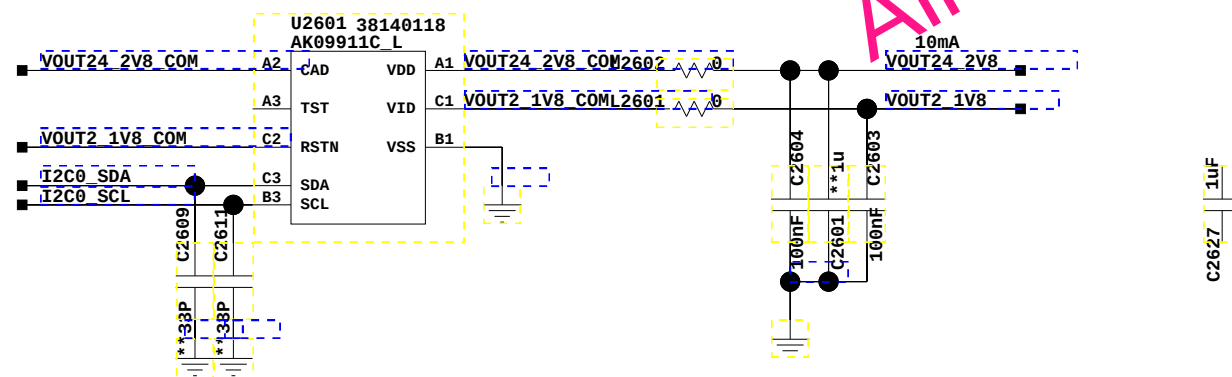
Accelerometer and Gyroscope 6-AXIS SENSOR

SDO=1 ADDRESS=0X6B(ST)/0X69(BOSCH)
SDO=0 ADDRESS=0X6A(ST)/0X68(BOSCH)

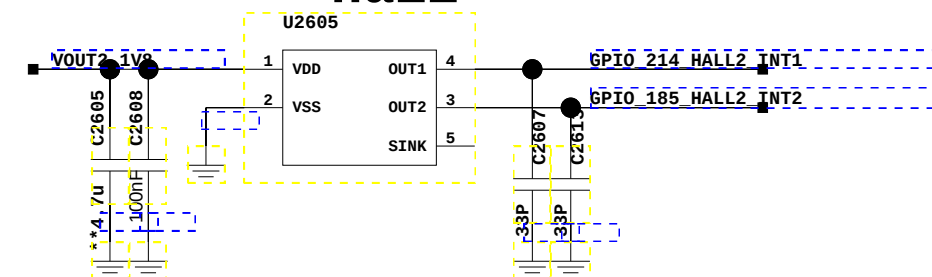


Compass

I2C Address=0001101(0x0D)

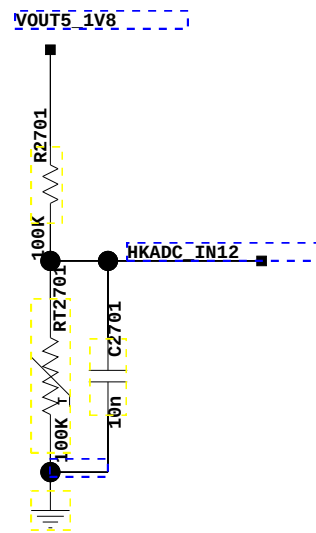


Hall

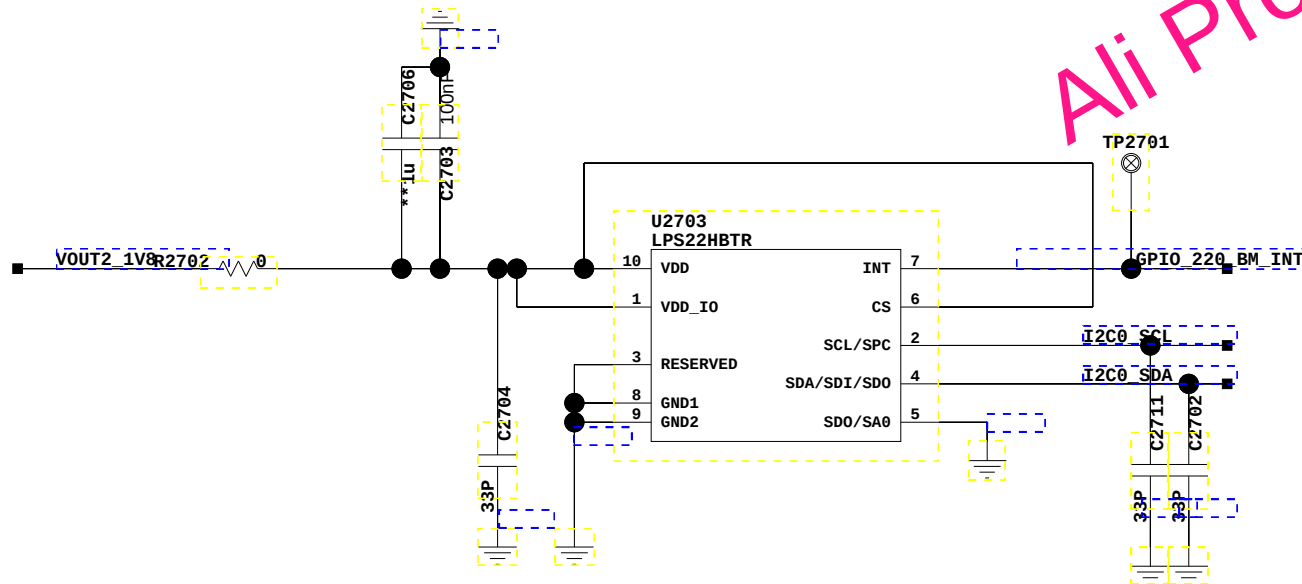


27. X-Sensor

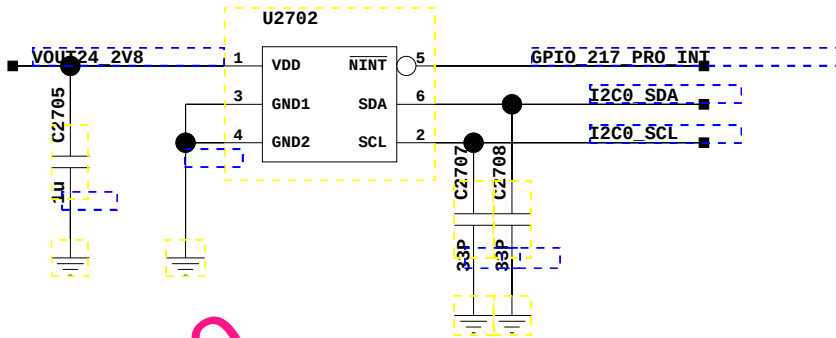
Hot Area TMP sensor



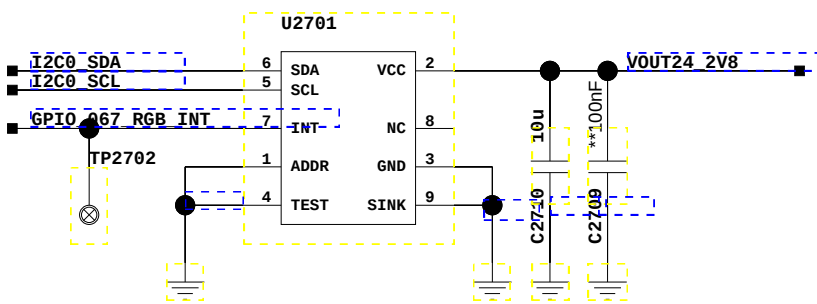
AP & Chrg IC TEMP



Proximity
PRO I2C Address=(0x1E)

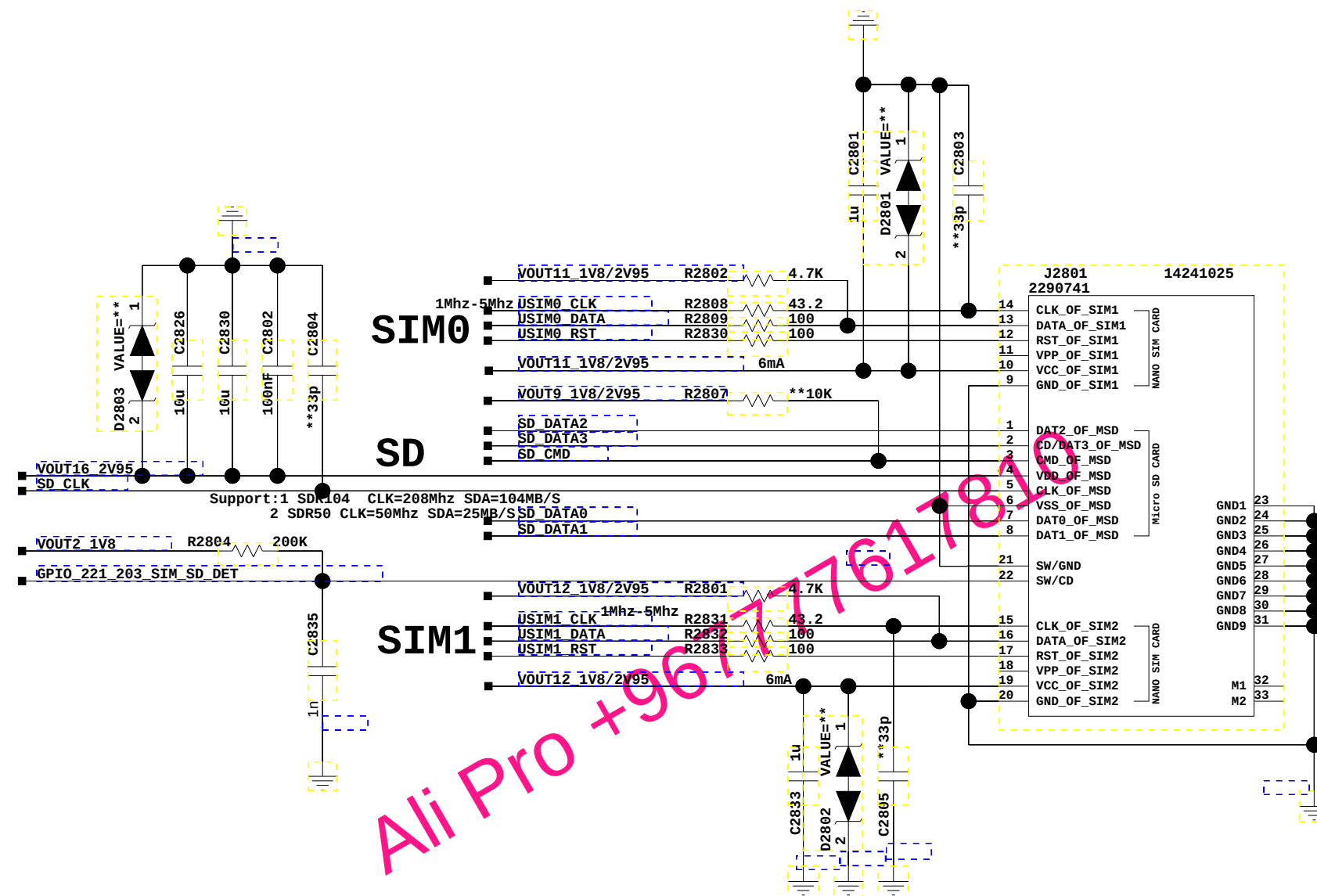


Ambient Light
RGB I2C Address=(0x38)



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28.SIM/uSD Card

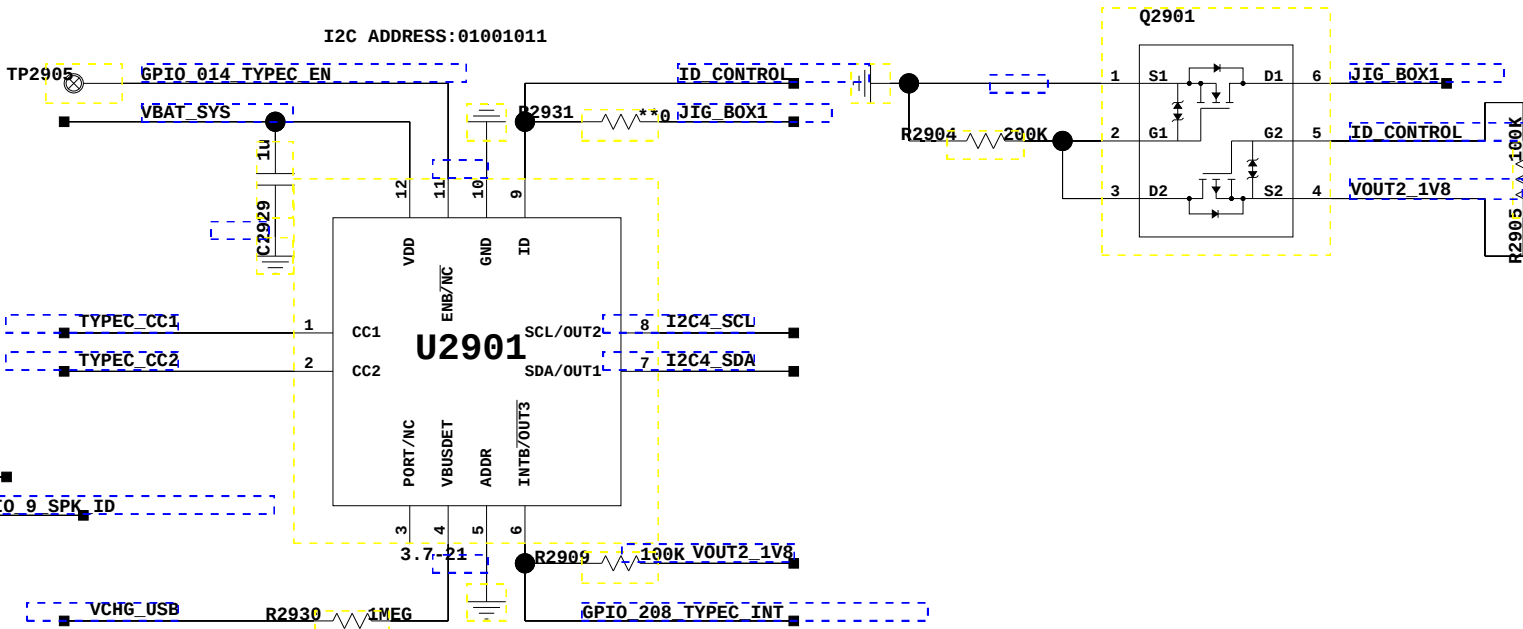
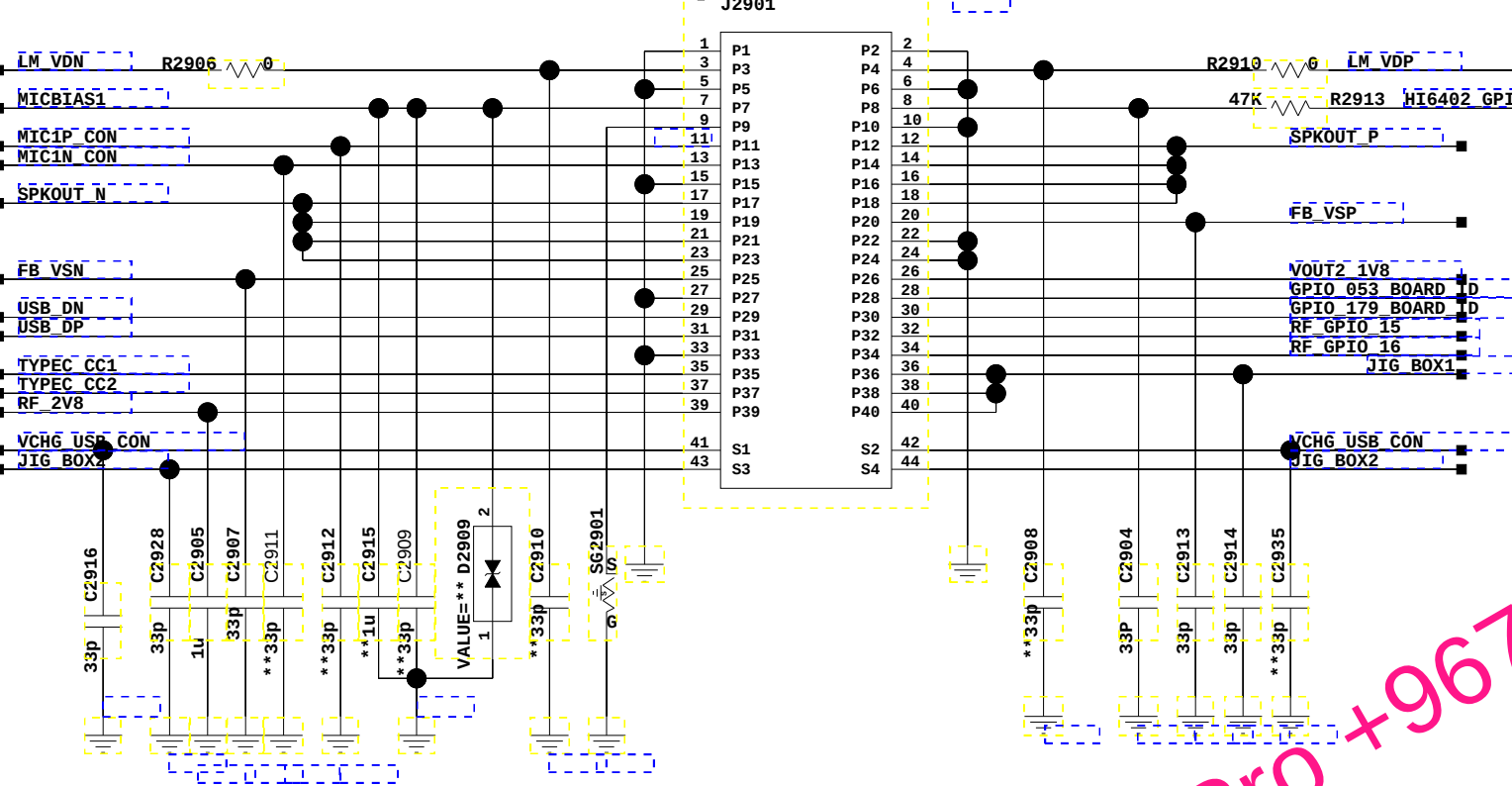


SIM1_VCC		
HI6402_GPIO_3	SVDD_1V8	VOUT12_1V8/2V95
H		○
L	○	

29.FPC Interface

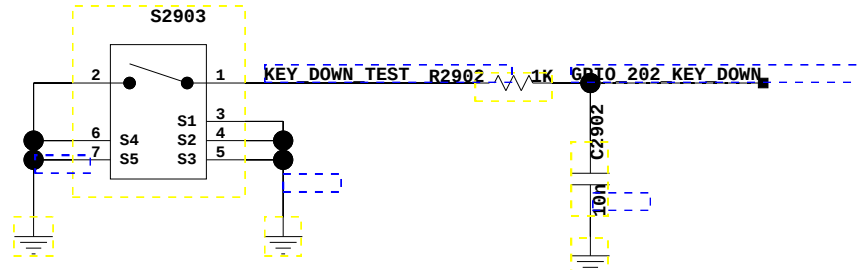
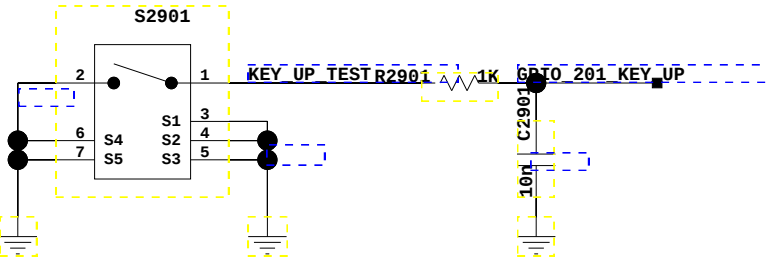
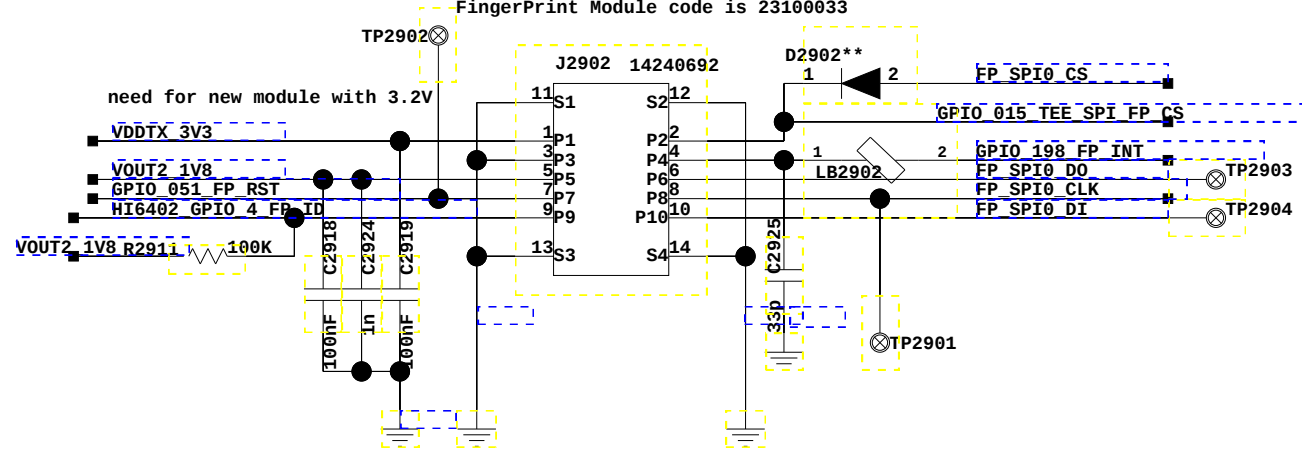
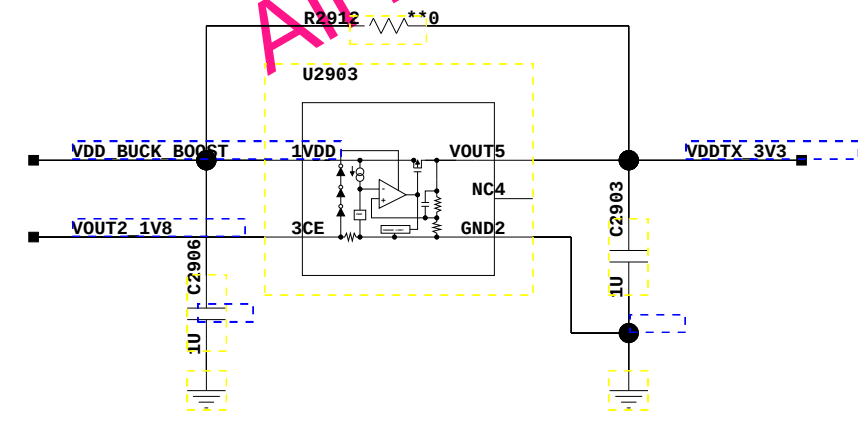
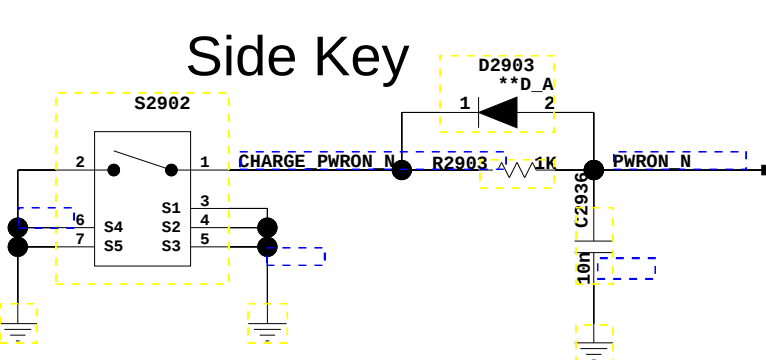
FeMale=14241010

40 pin BTB

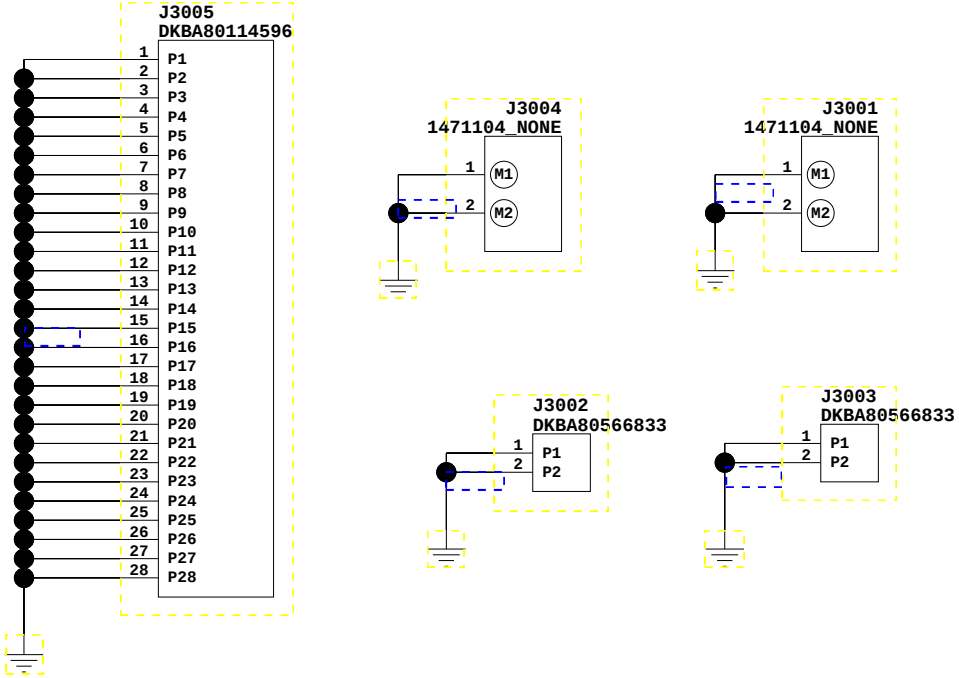
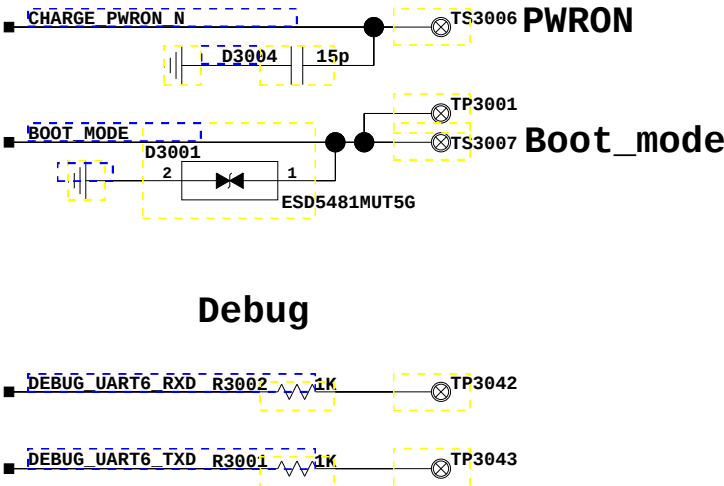
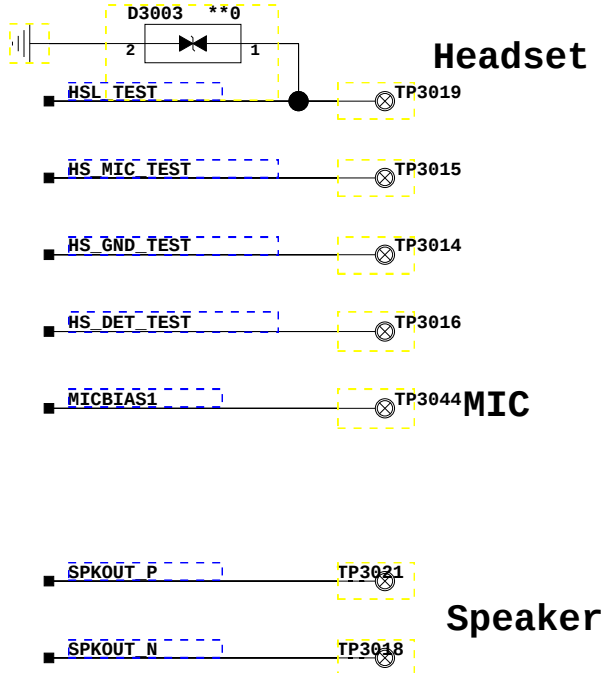
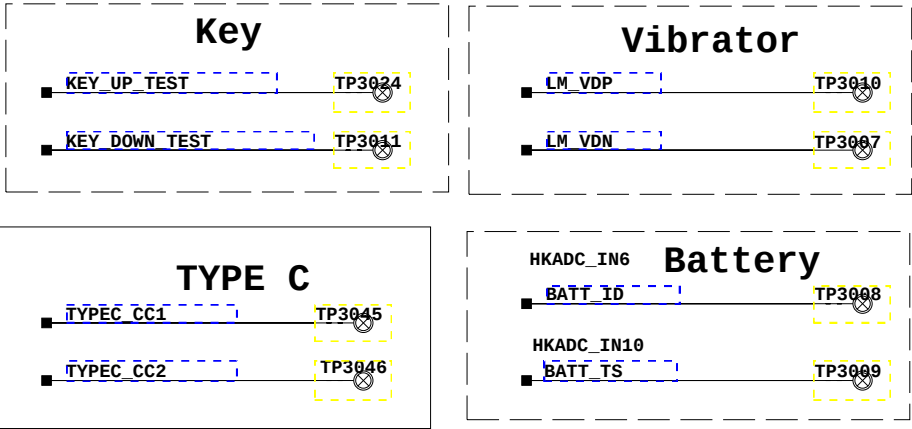
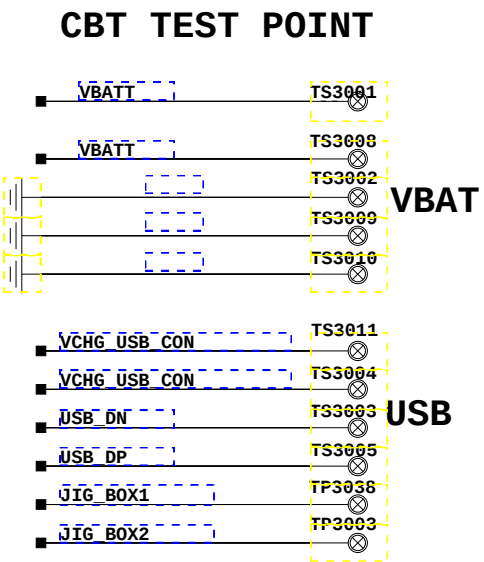


$$VIN_OLV0=1.2*(1+R2907/R2908)=13.2V$$

To Charger
FingerPrint BTB



30. Test Points/Shields



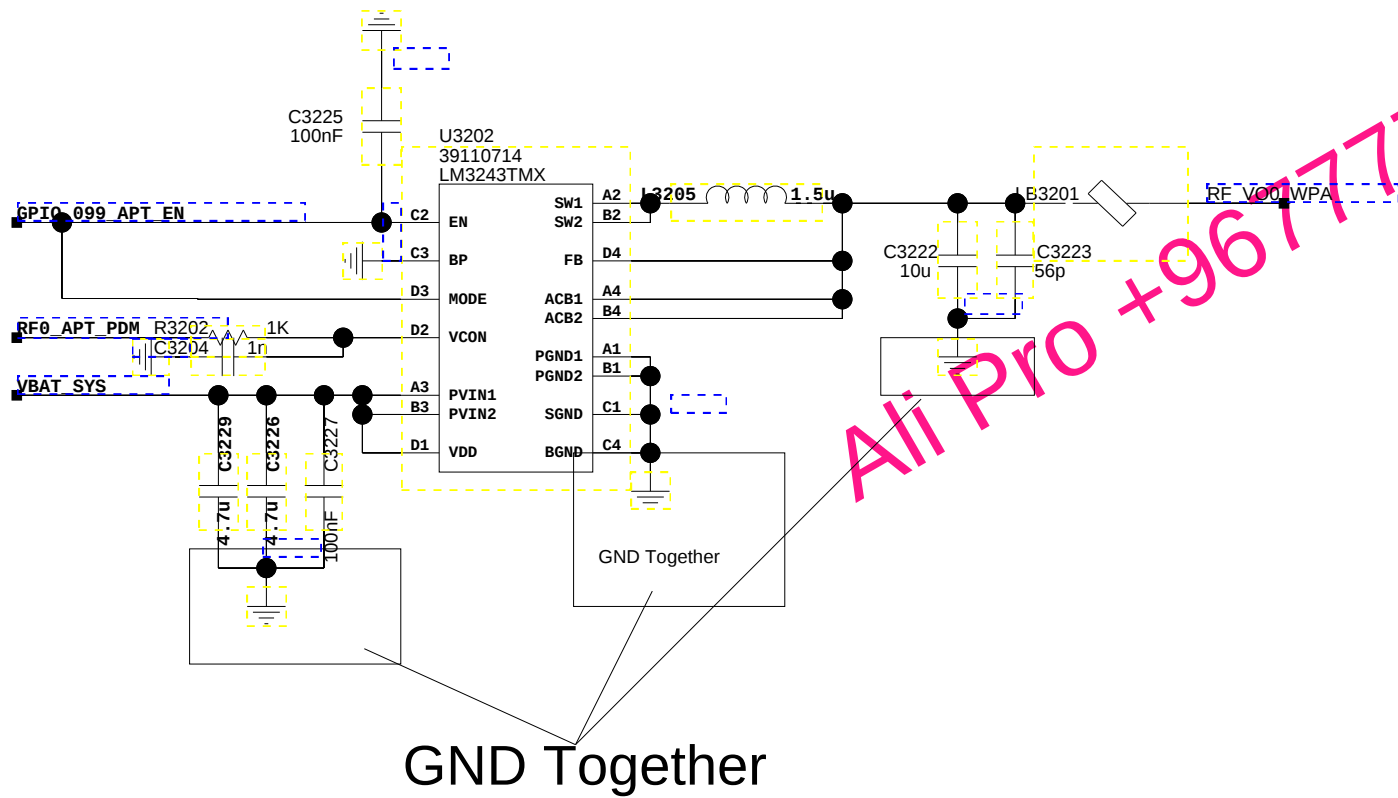
shield

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31.RF Interface

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32.APT Power



Main SIM

RFIC0

- LDO1=1.29V
- LDO2=1.8V
- LDO3=1.85V
- LDO27=2.4V

Switch

- VCC 2.8V=LDO14
- VIO 1.8V=LDO28

PA

- VCC1 =LDO23
- VCC2 =APT

Secondary SIM

RFIC1

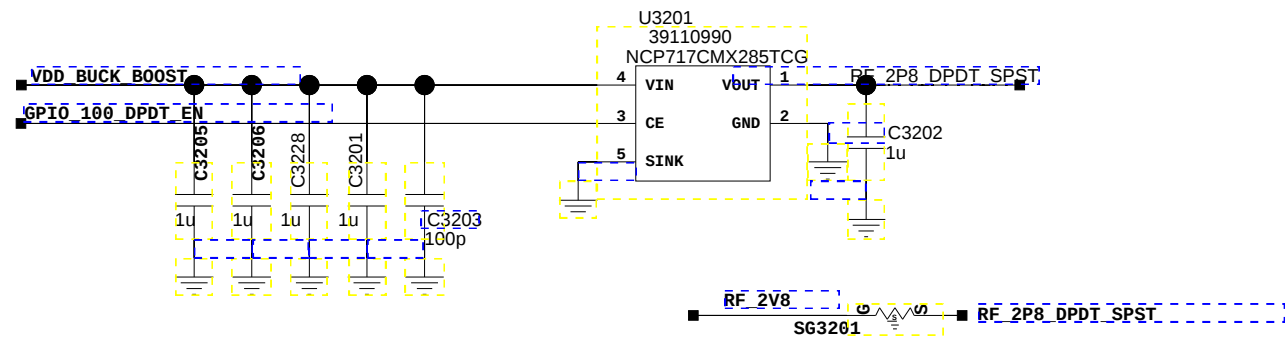
- LDO22=1.29V
- LDO2=1.8V
- LDO3=1.85V
- LDO27=2.4V

Switch

- VCC 2.8V=LDO14
- VIO 1.8V=LDO28

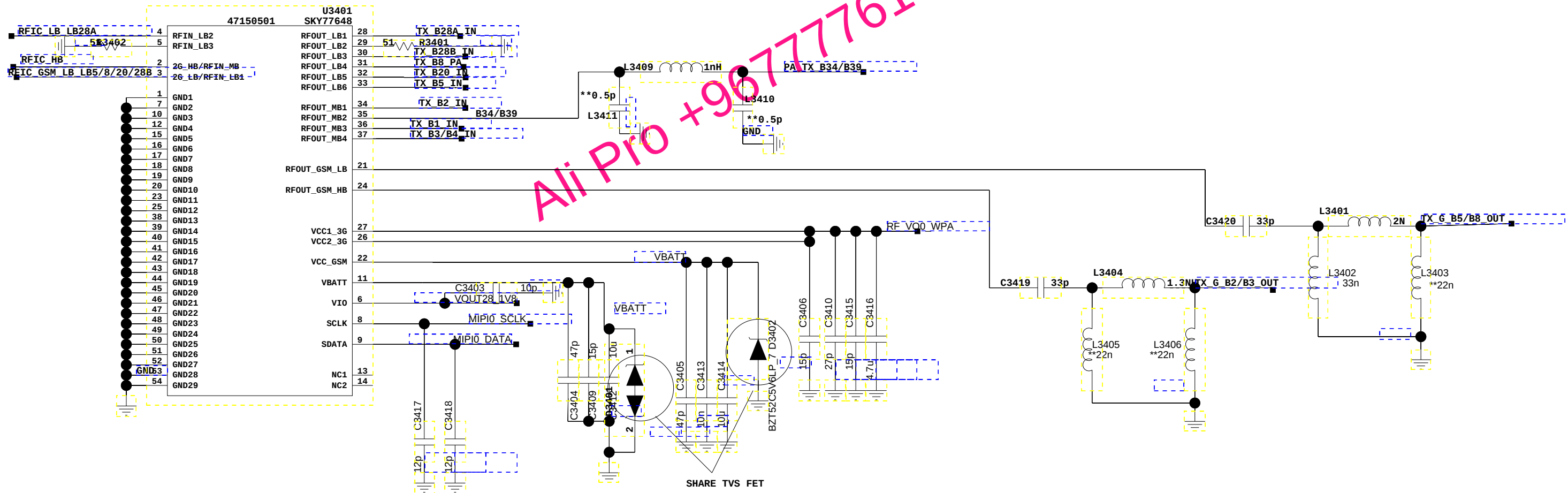
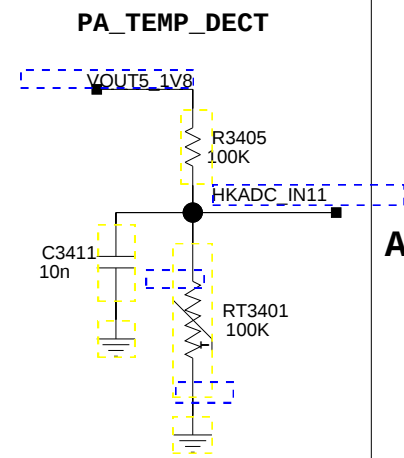
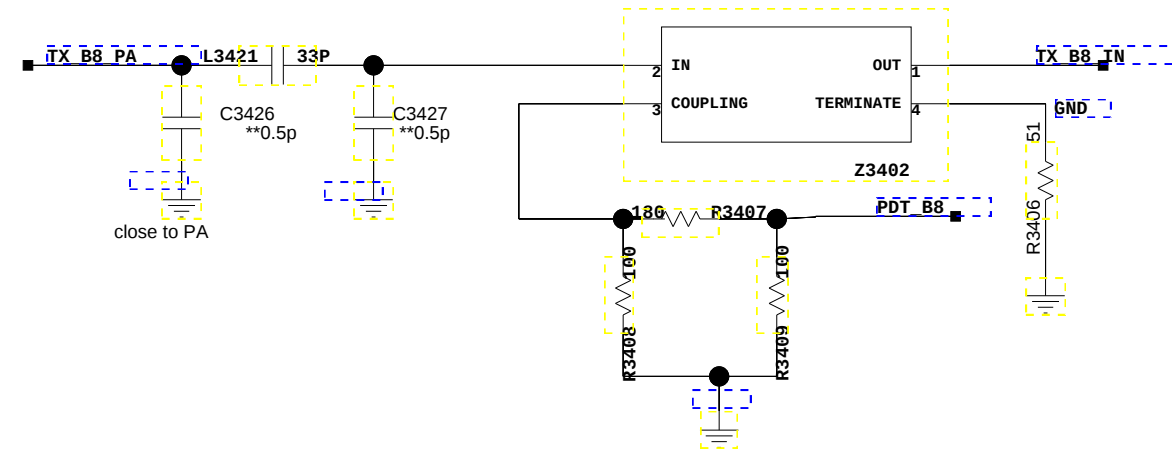
2G PA

- Vbatt=VBattery
- VCC =VBattery
- LDO23=PA Bias



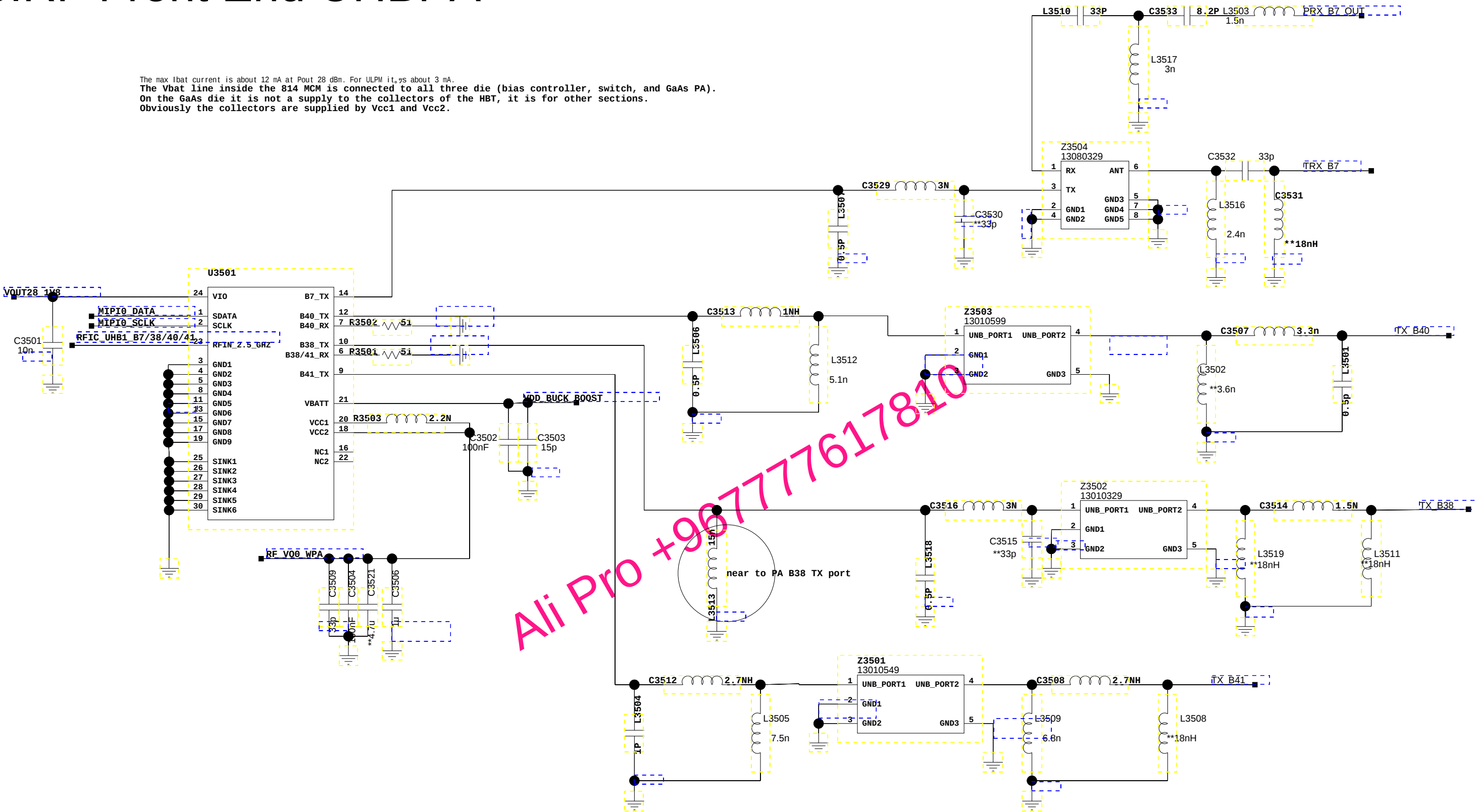
33.RF Transceiver_0

34.RF Front End MMMBPA

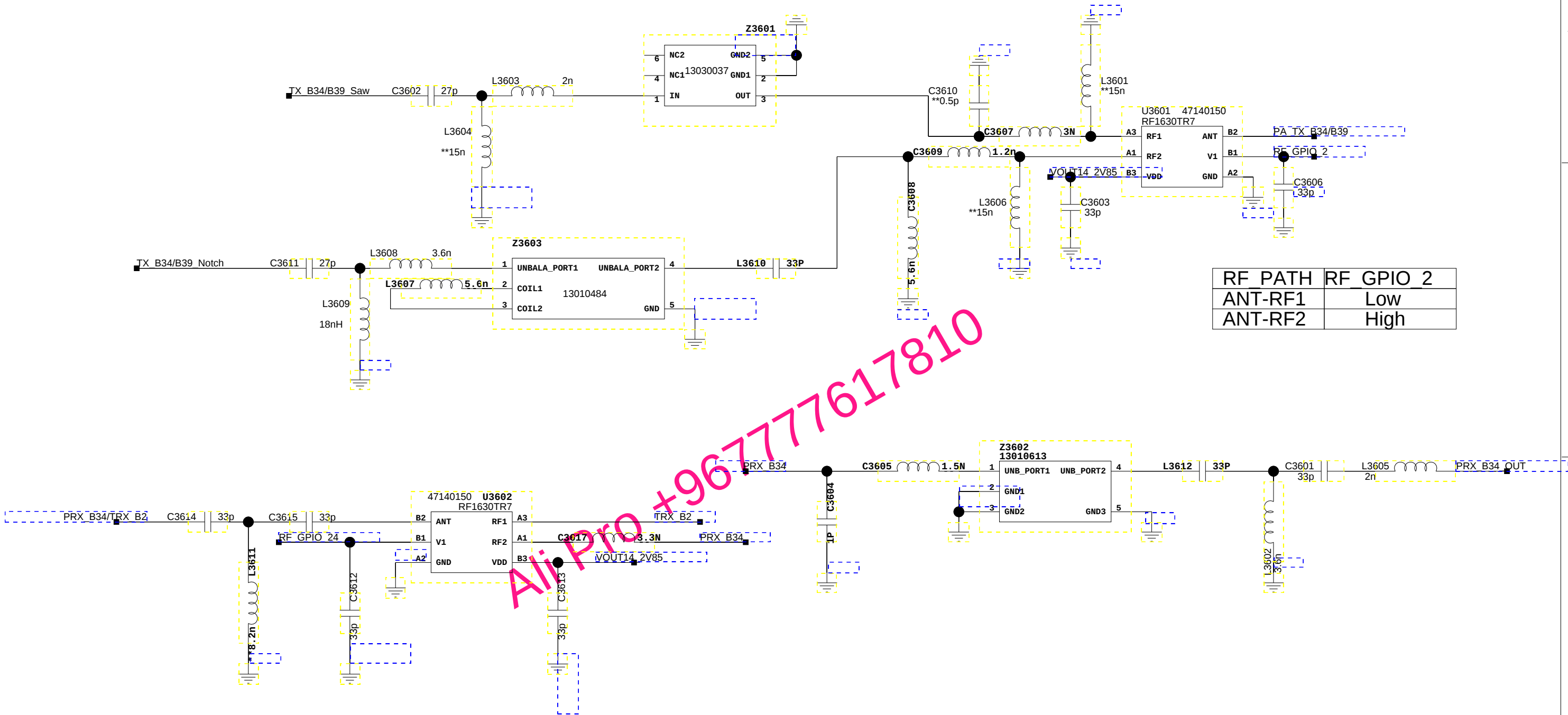


35.RF Front End UHBPA

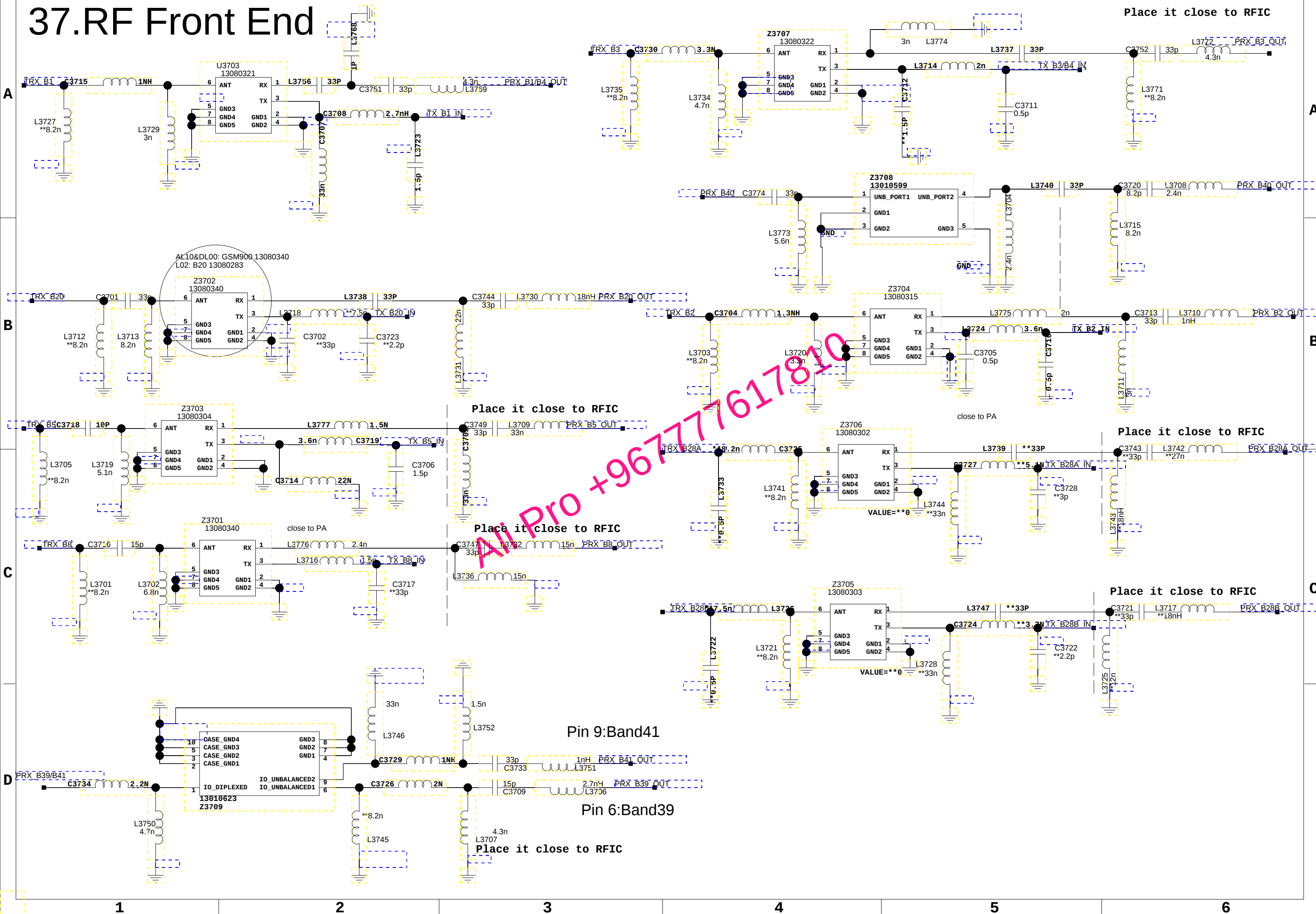
The max Ibat current is about 12 mA at Pout 28 dBm. For ULPM it,ys about 3 mA.
The Vbat line inside the 814 MCM is connected to all three die (bias controller, switch, and GaAs PA).
On the GaAs die it is not a supply to the collectors of the HBT, it is for other sections.
Obviously the collectors are supplied by Vcc1 and Vcc2.



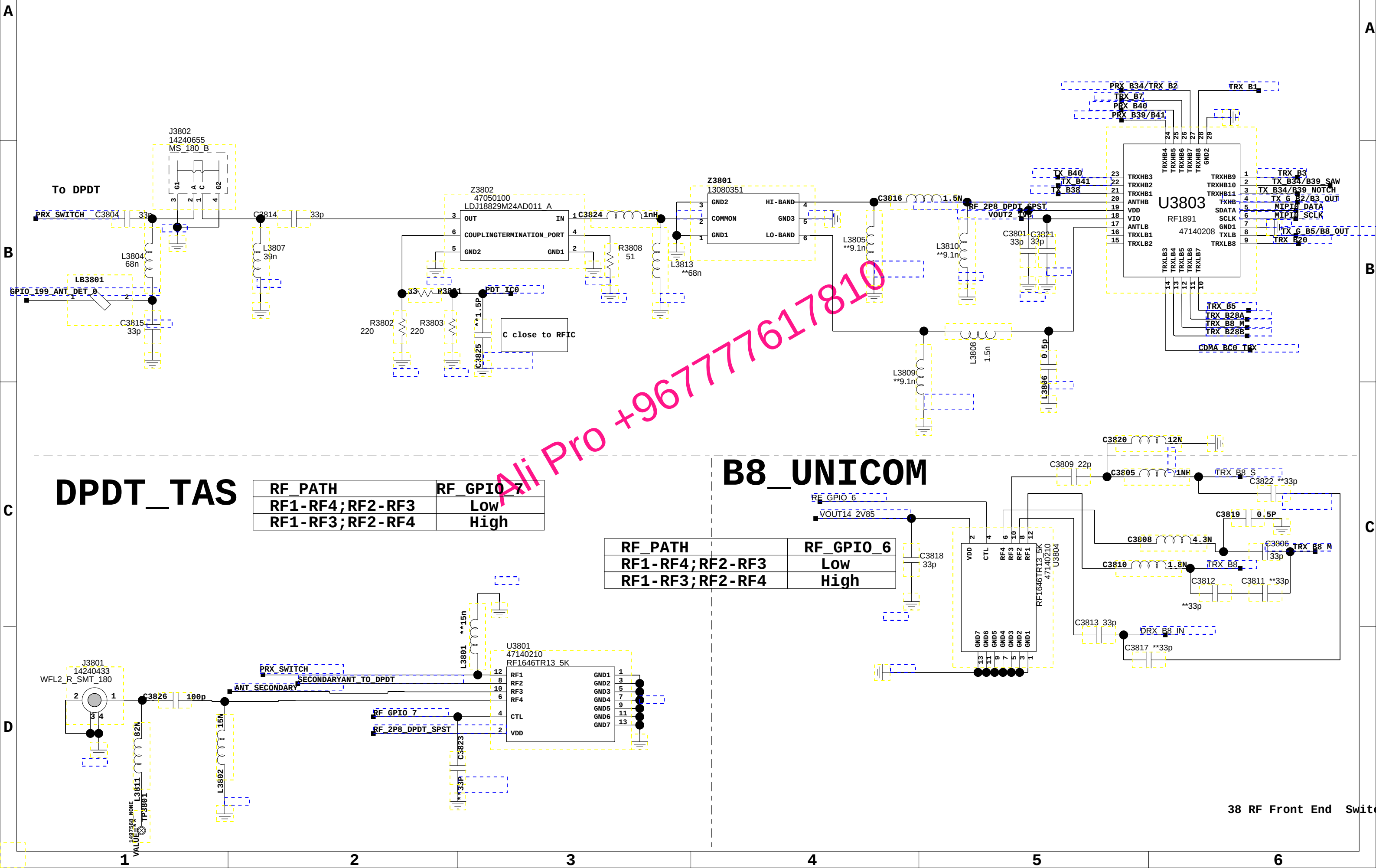
36.RF Front End



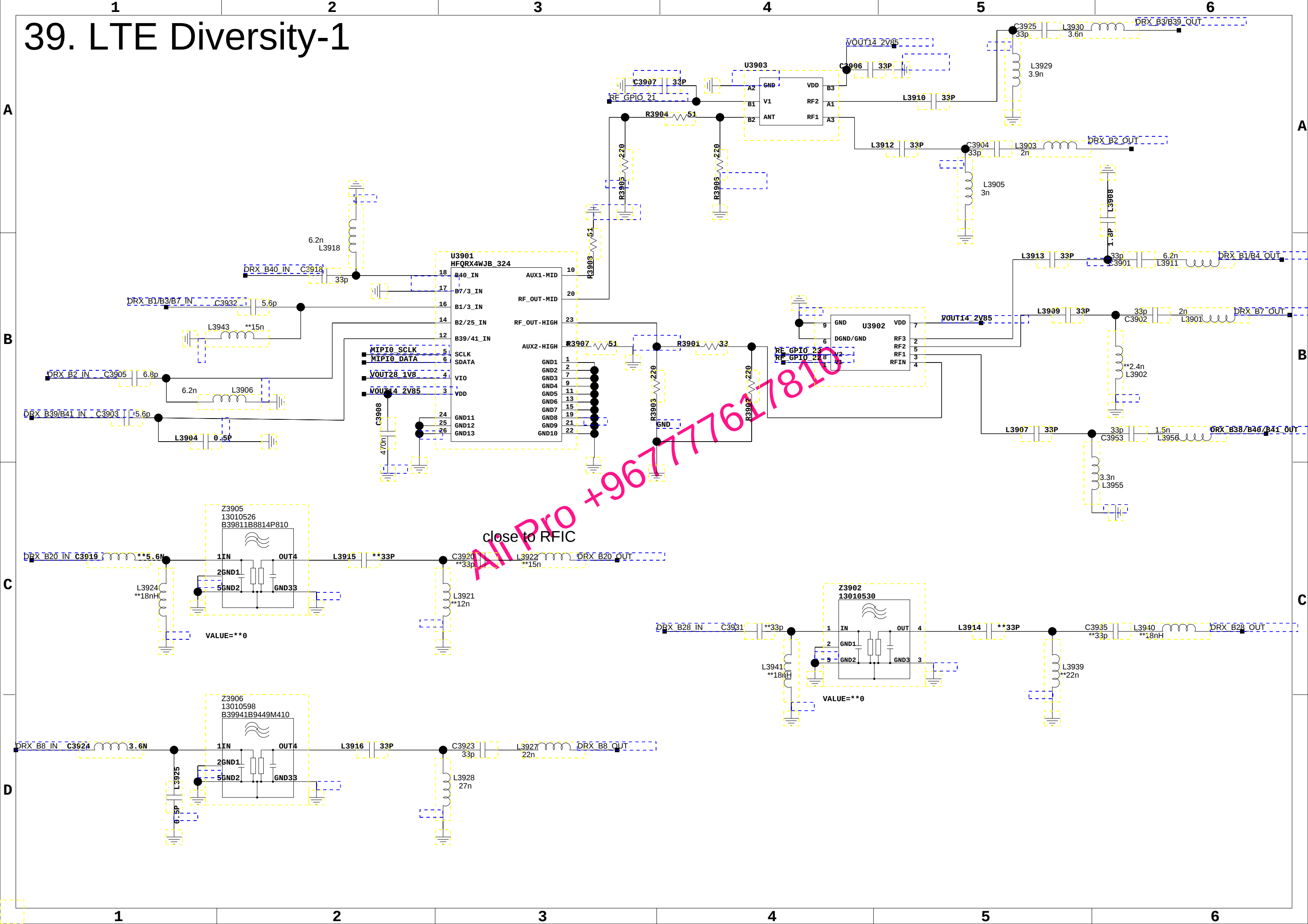
37.RF Front End



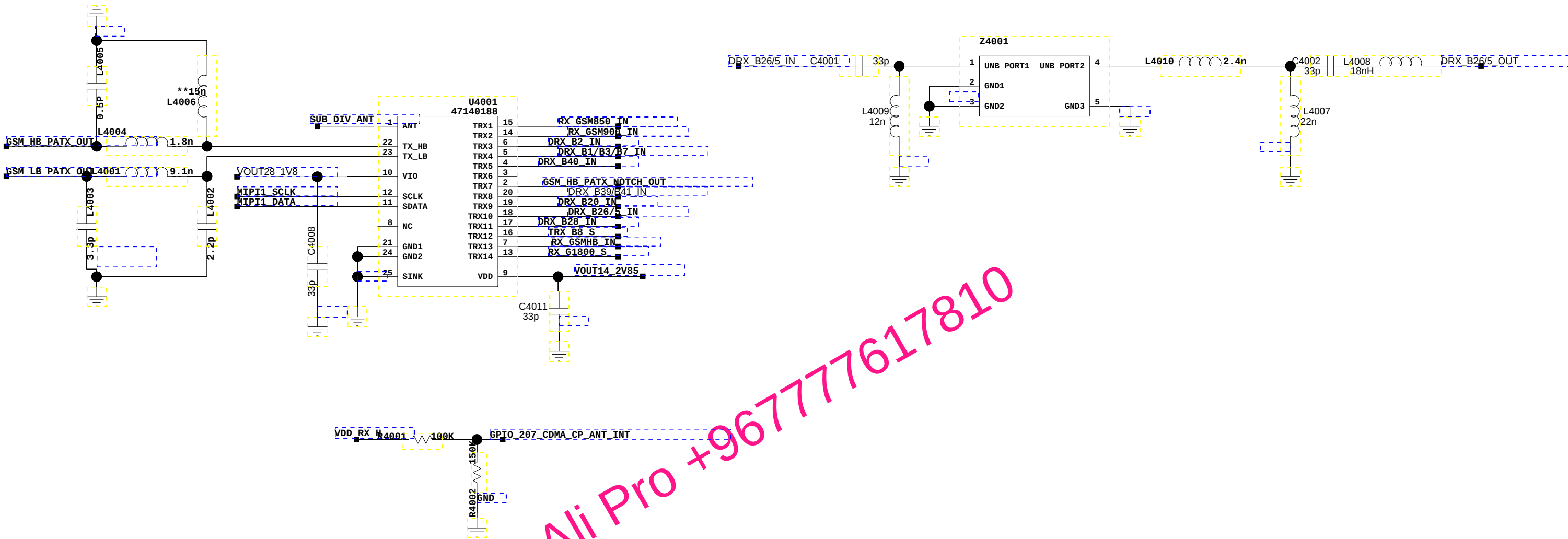
38. RF Front End Switch /Main ANT



39. LTE Diversity-1



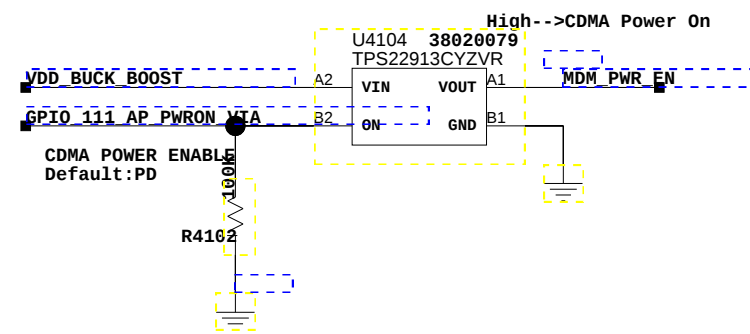
40. LTE Diversity-2



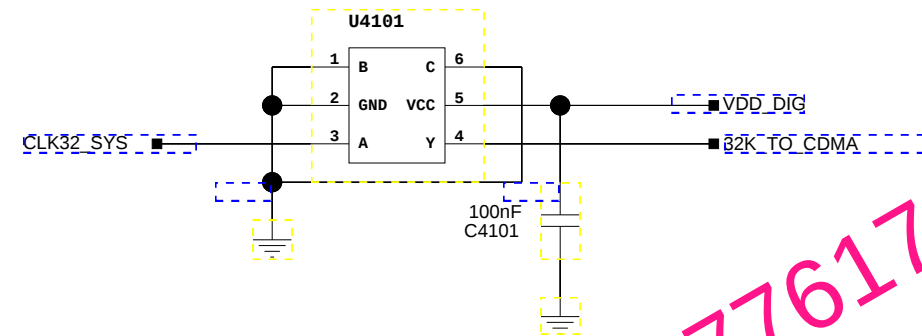
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41.CDMA Modem_VIA

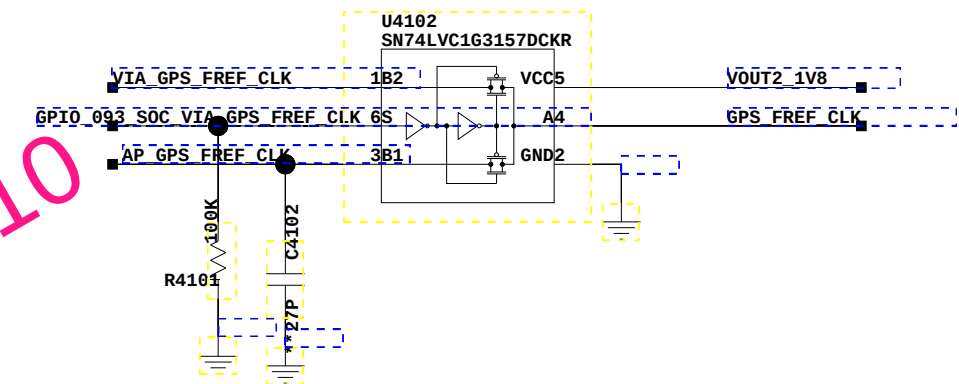
CDMA POWER ENABLE



CDMA 32k CLK buffer

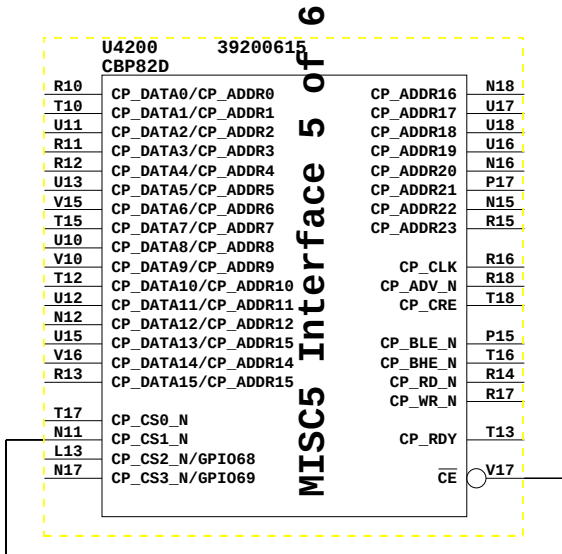


GPS FREF CLK switch

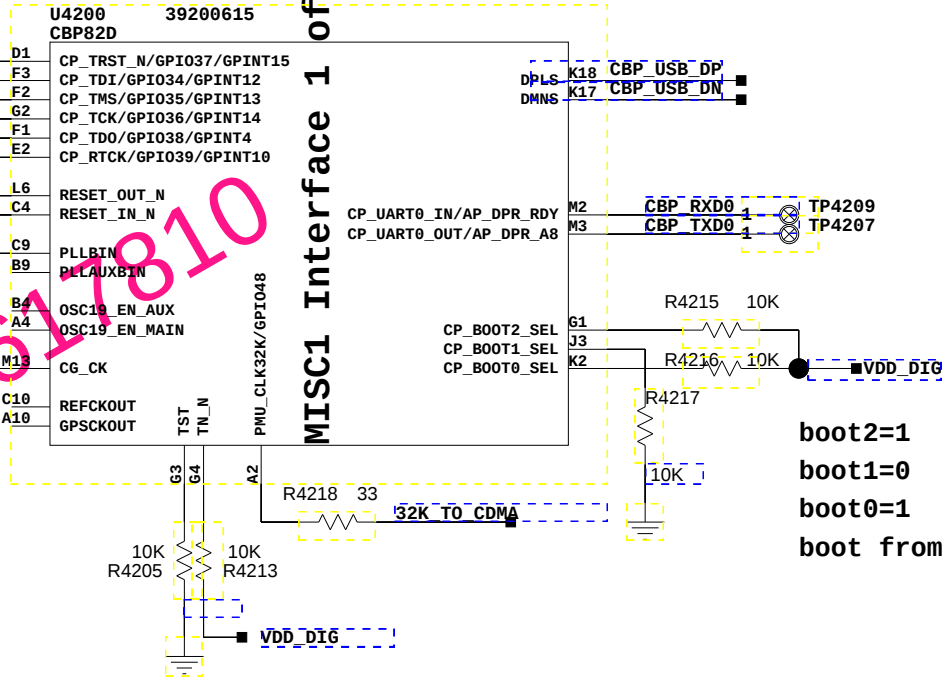
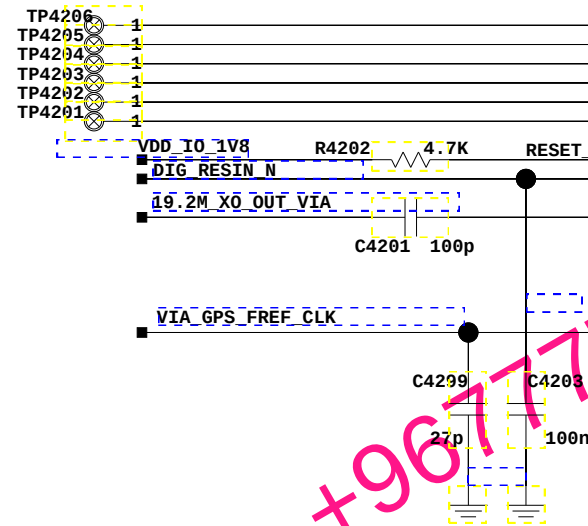


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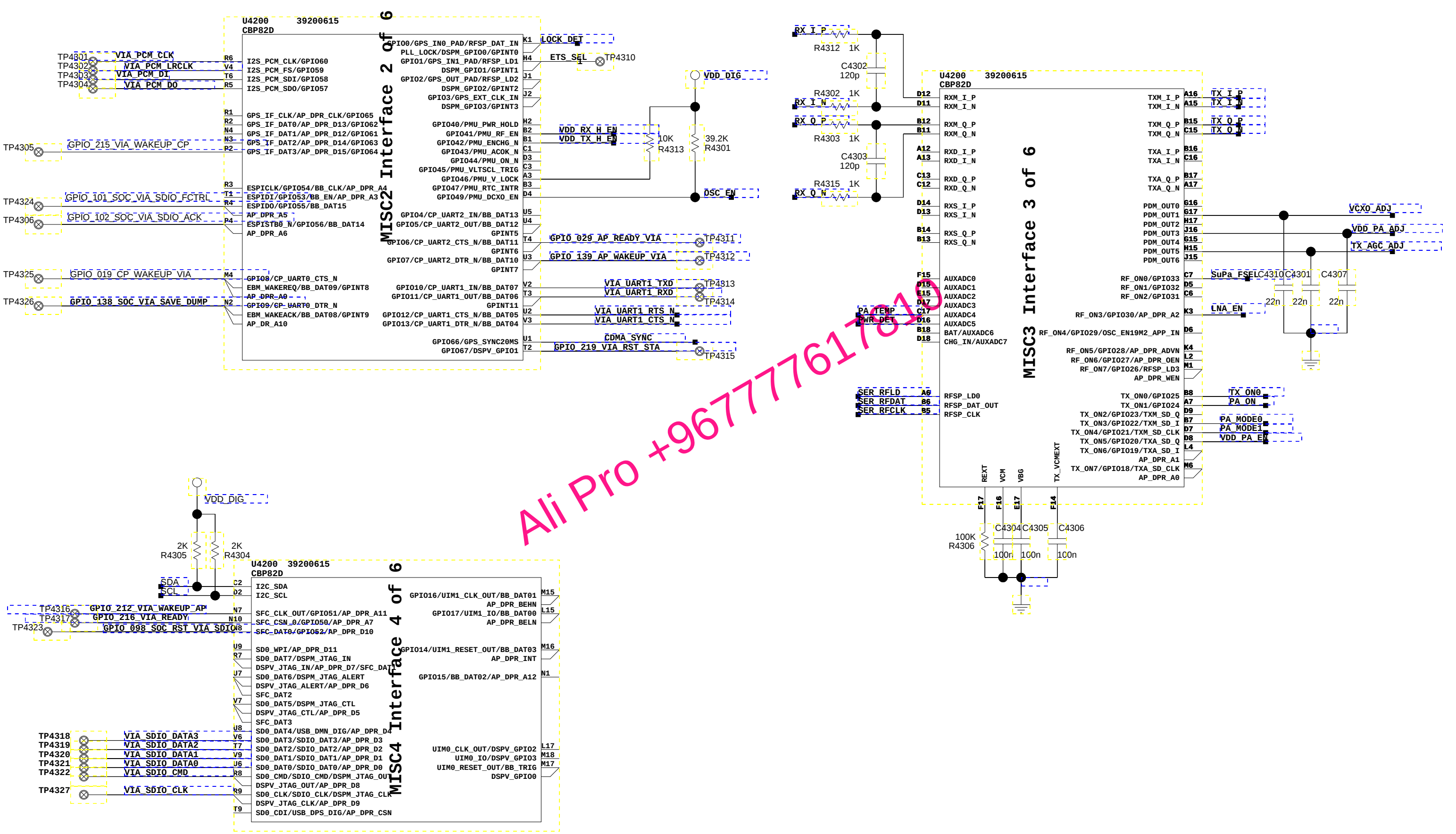
42.CDMA Modem_VIA



VIA MODEM JTAG

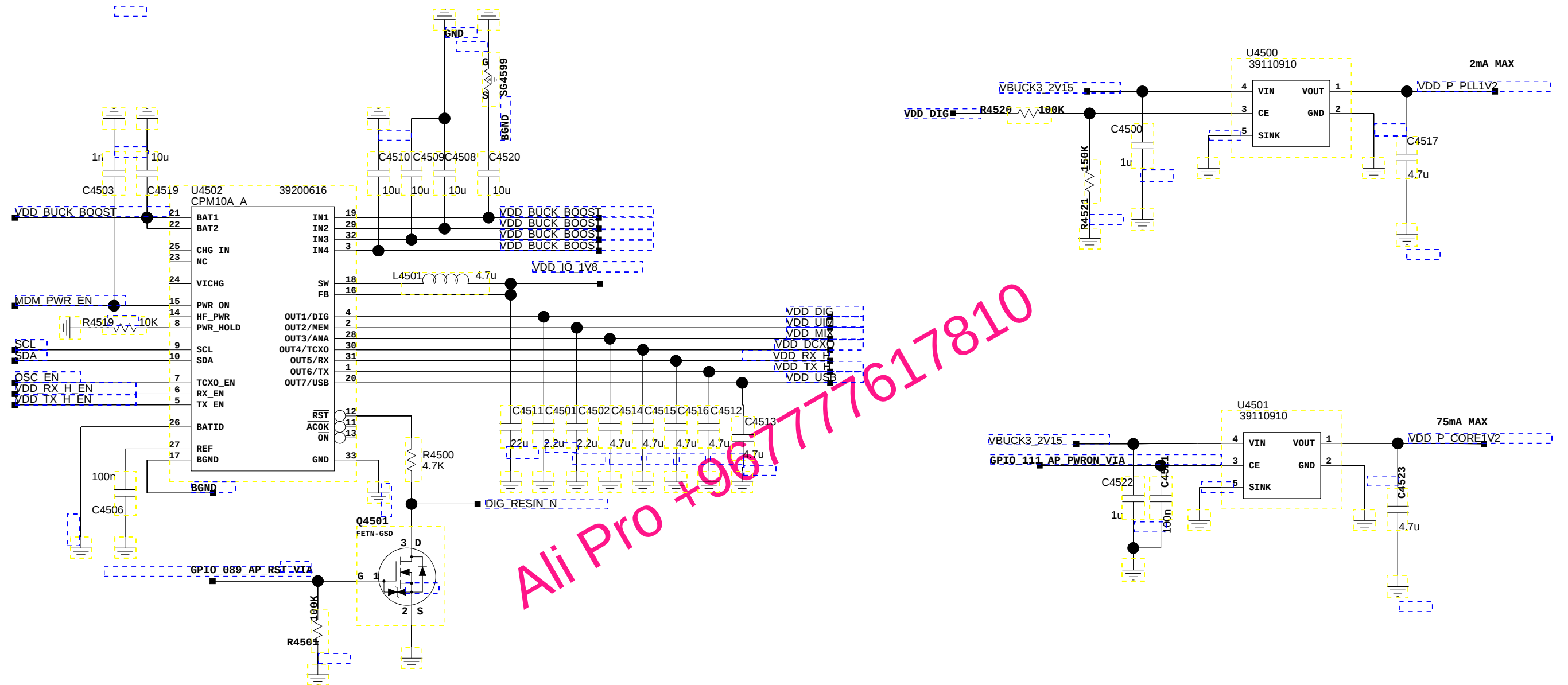


43.CDMA Modem_VIA



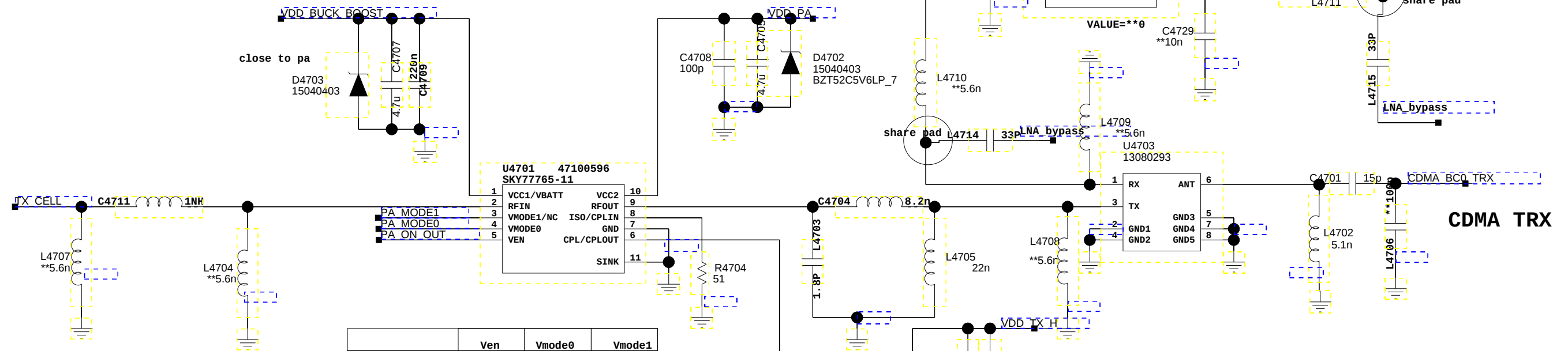
44.CDMA Modem_VIA PWR-1

45.CDMA Modem_VIA PWR-2



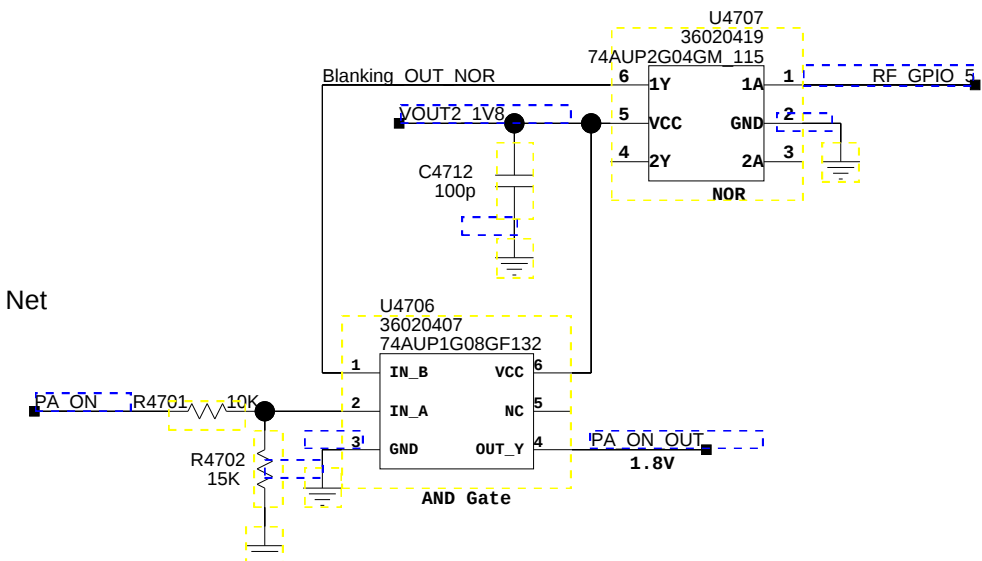
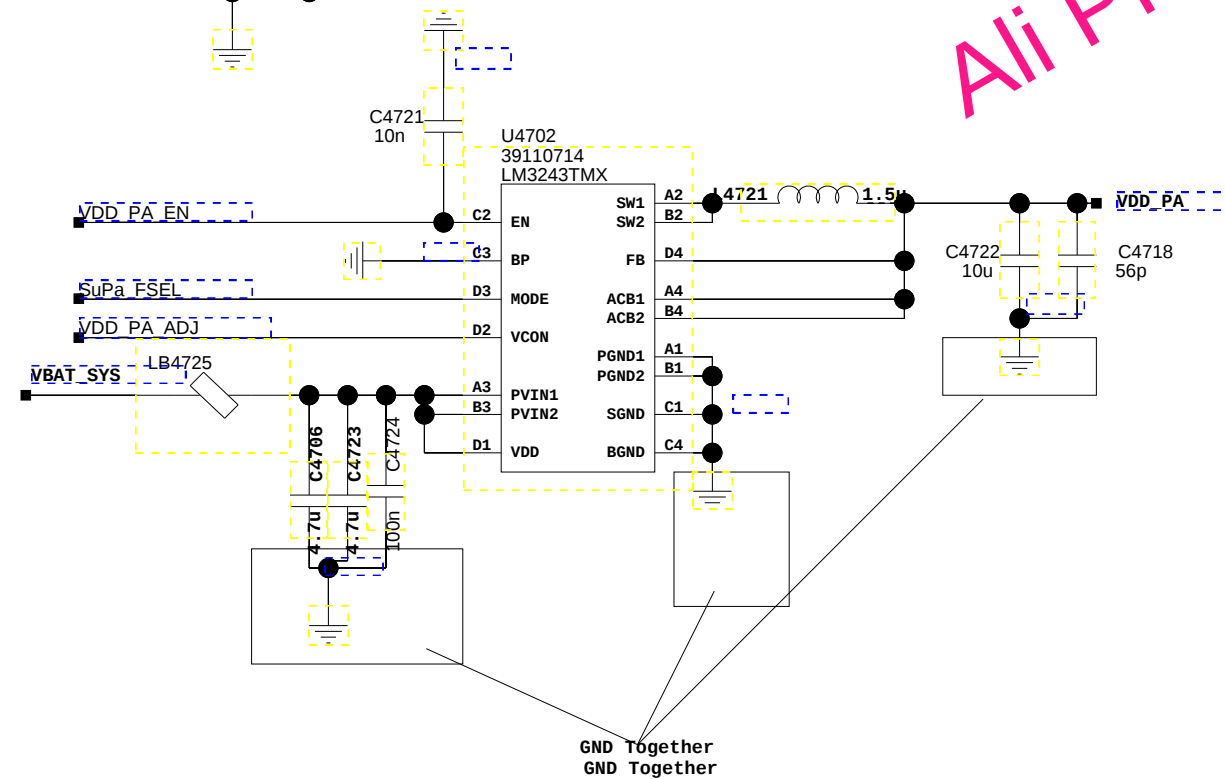
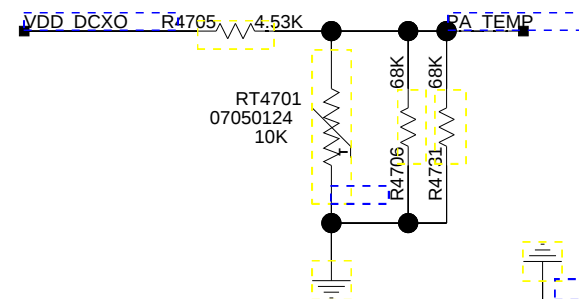
46.CDMA RFIC

47.CDMA TX/PA



	Ven	Vmode0	Vmode1
	PA_ON0	PA_Range	
Shut Down Mode	0	0	0
Low Power State	1	1	1
MID Power State	1	1	0
High Power State	1	0	0

RT4701 must close to CDMA PA PA Thermal Detector Circuits



1

2

3

4

5

6

48. Reserved

A

A

B

B

C

C

D

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1

2

3

4

5

6

49. Reserved

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1

2

3

4

5

6

50.LTE

A

A

B

B

C

C

D

1

2

3

4

5

6

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	1	2	3	4	5	6
A						
B						
C						
D						

51 Reserved

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52 Reserved

A

B

C

D

A

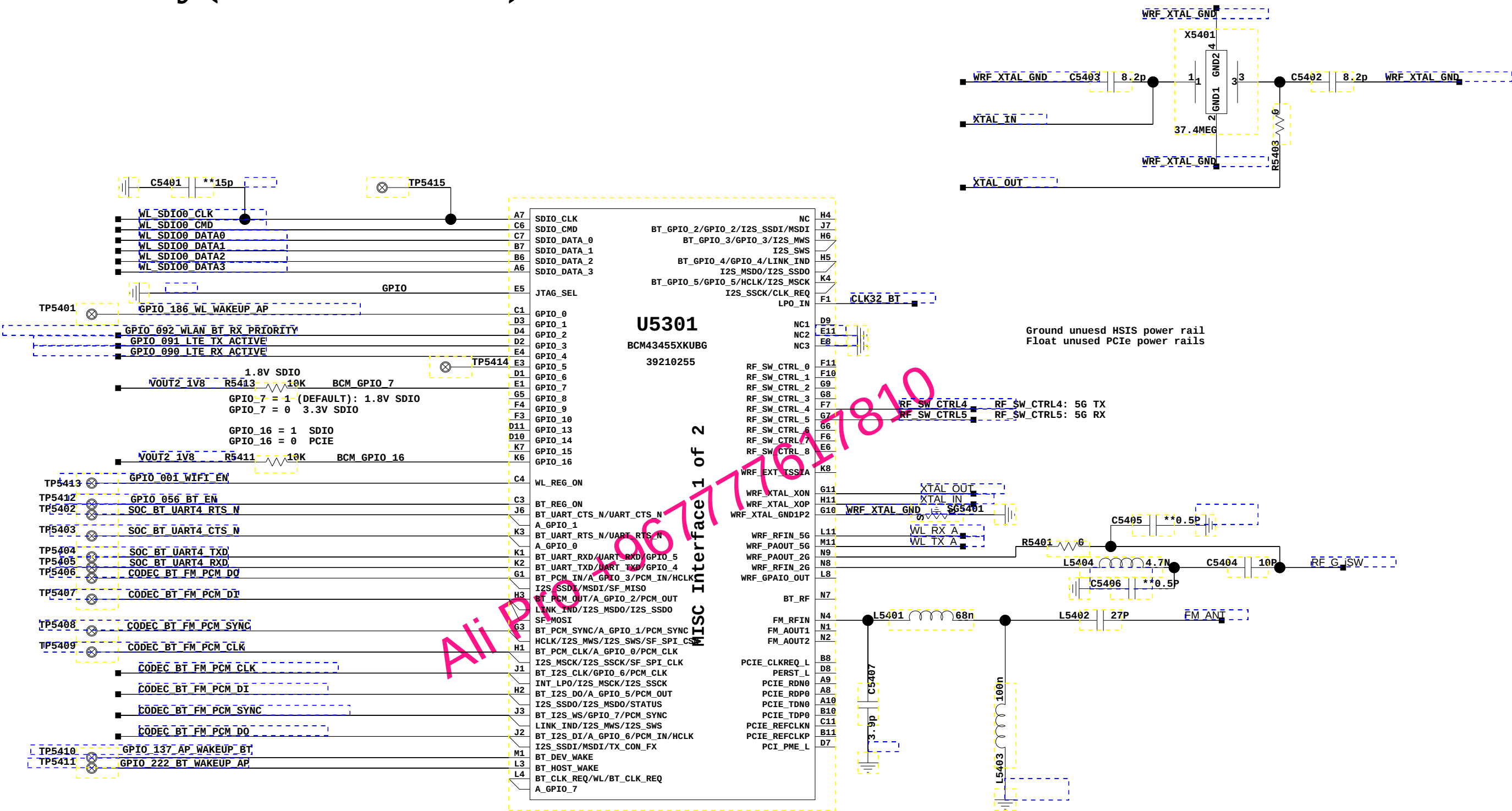
B

C

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53.wifi BCM43455-BB

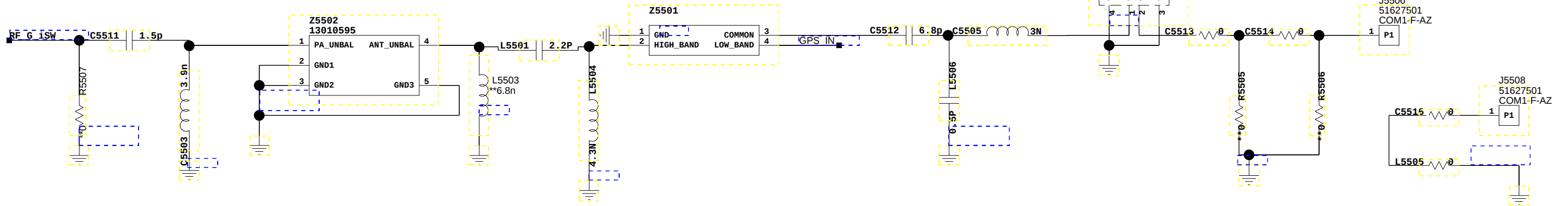
54.Connectivity(BT/WiFi/FM)-Power



55. wifi RF Front END

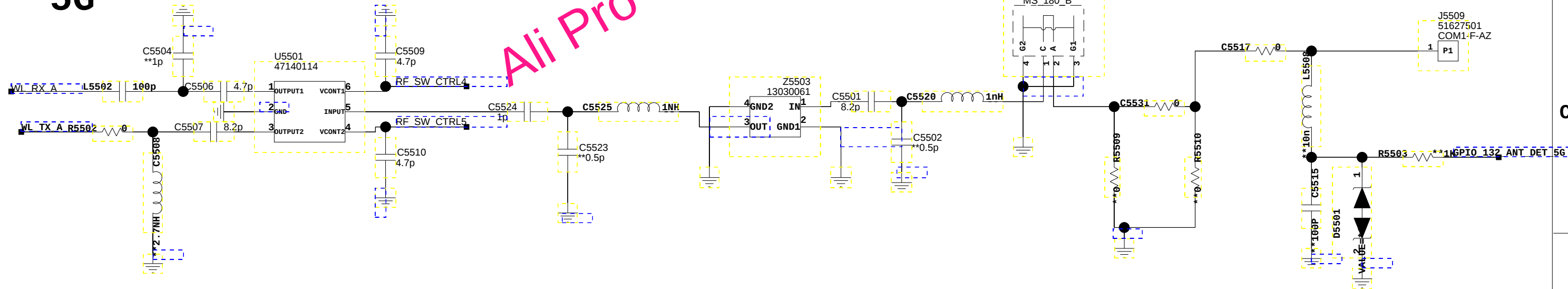
2.4G

2.4G wifi/GPS Spring



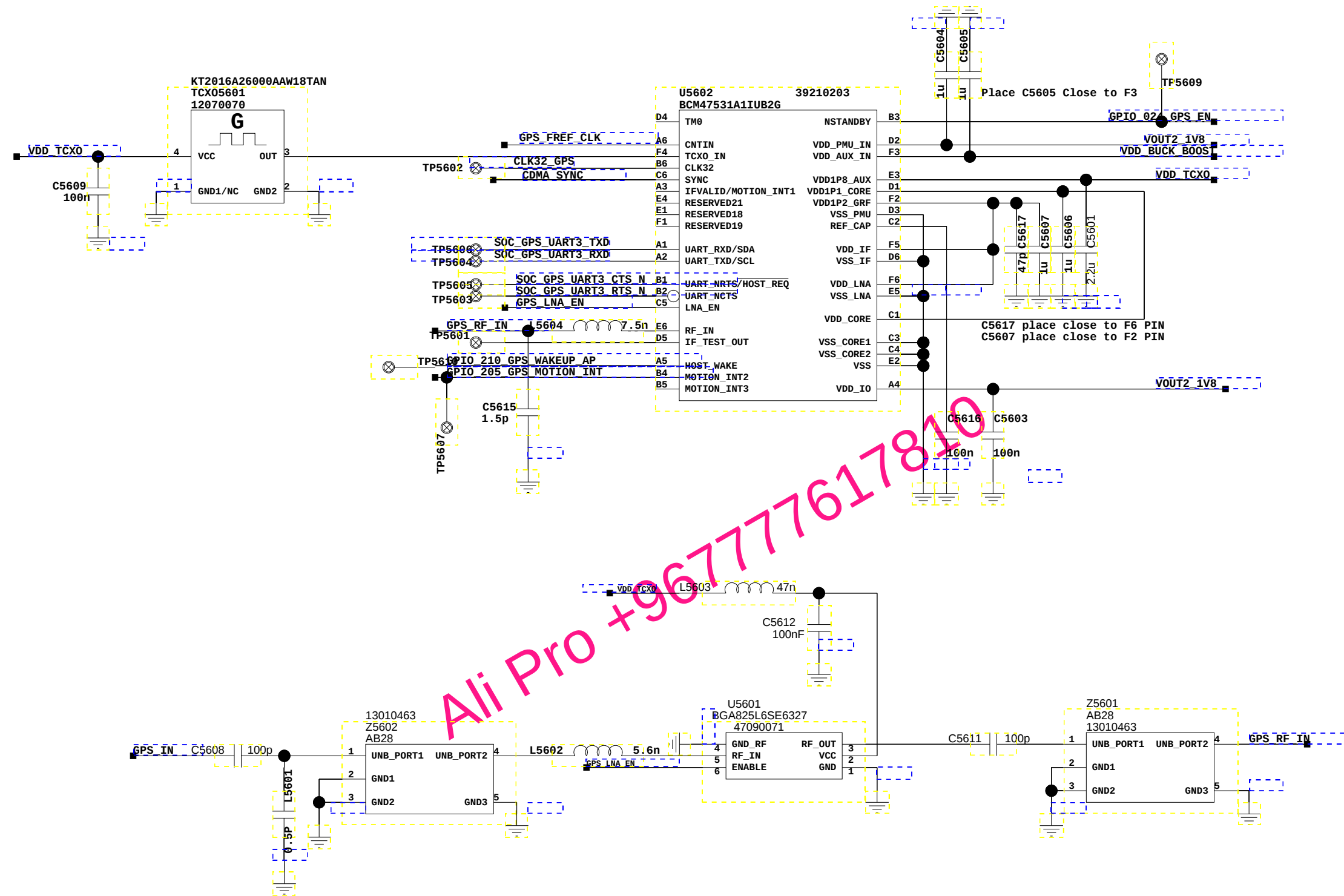
5G

5G wifi



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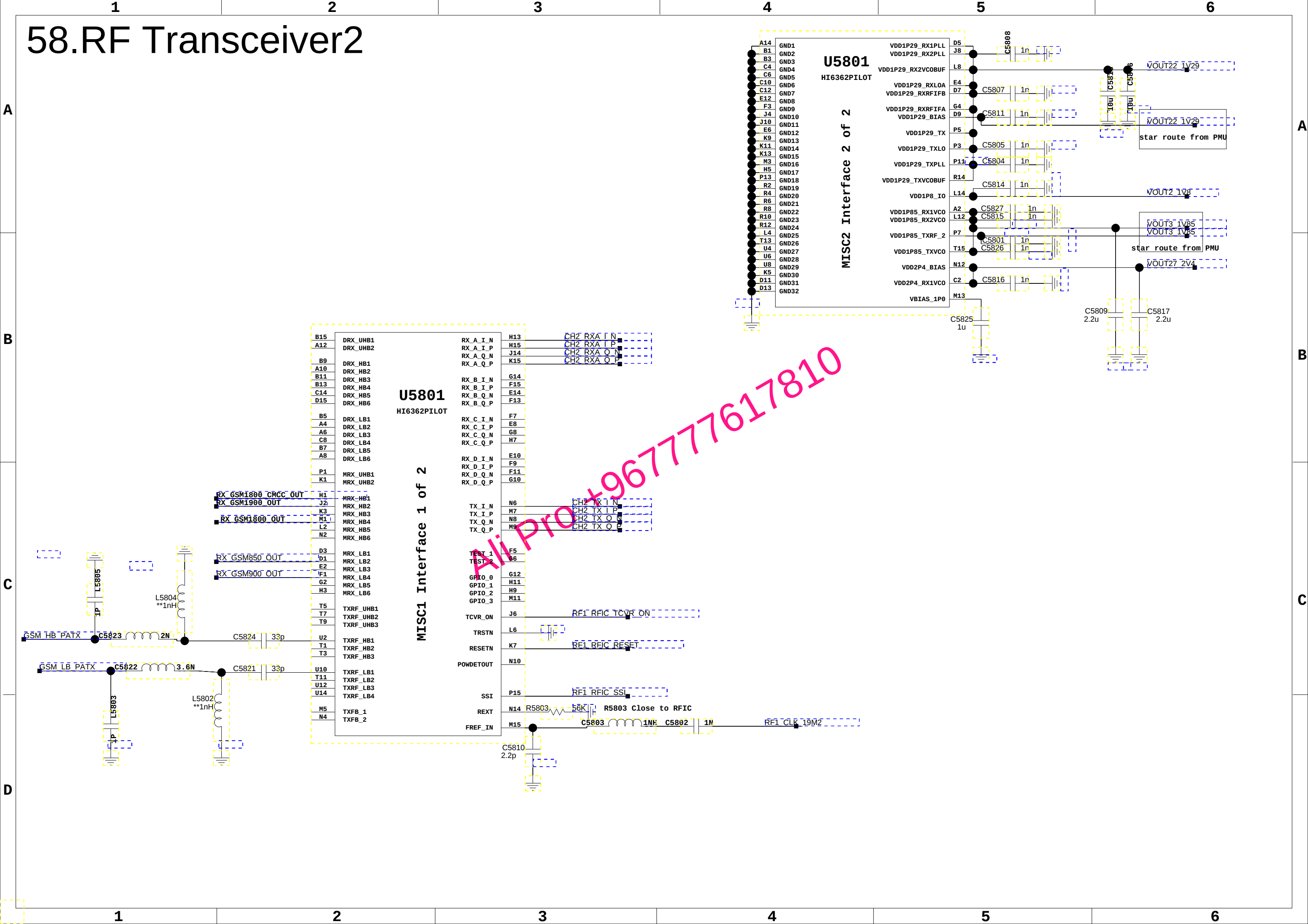
56. GPS



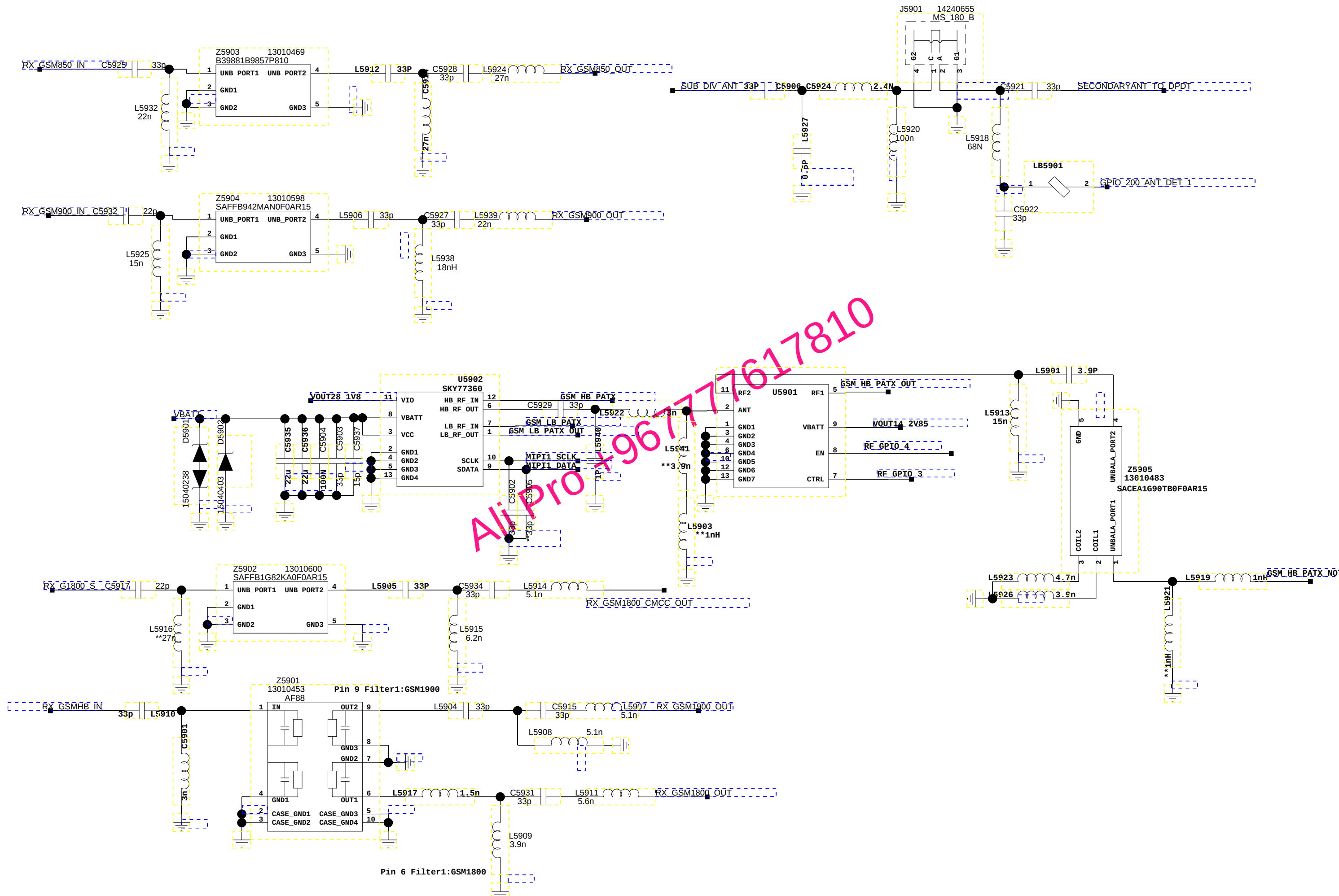
57. NFC

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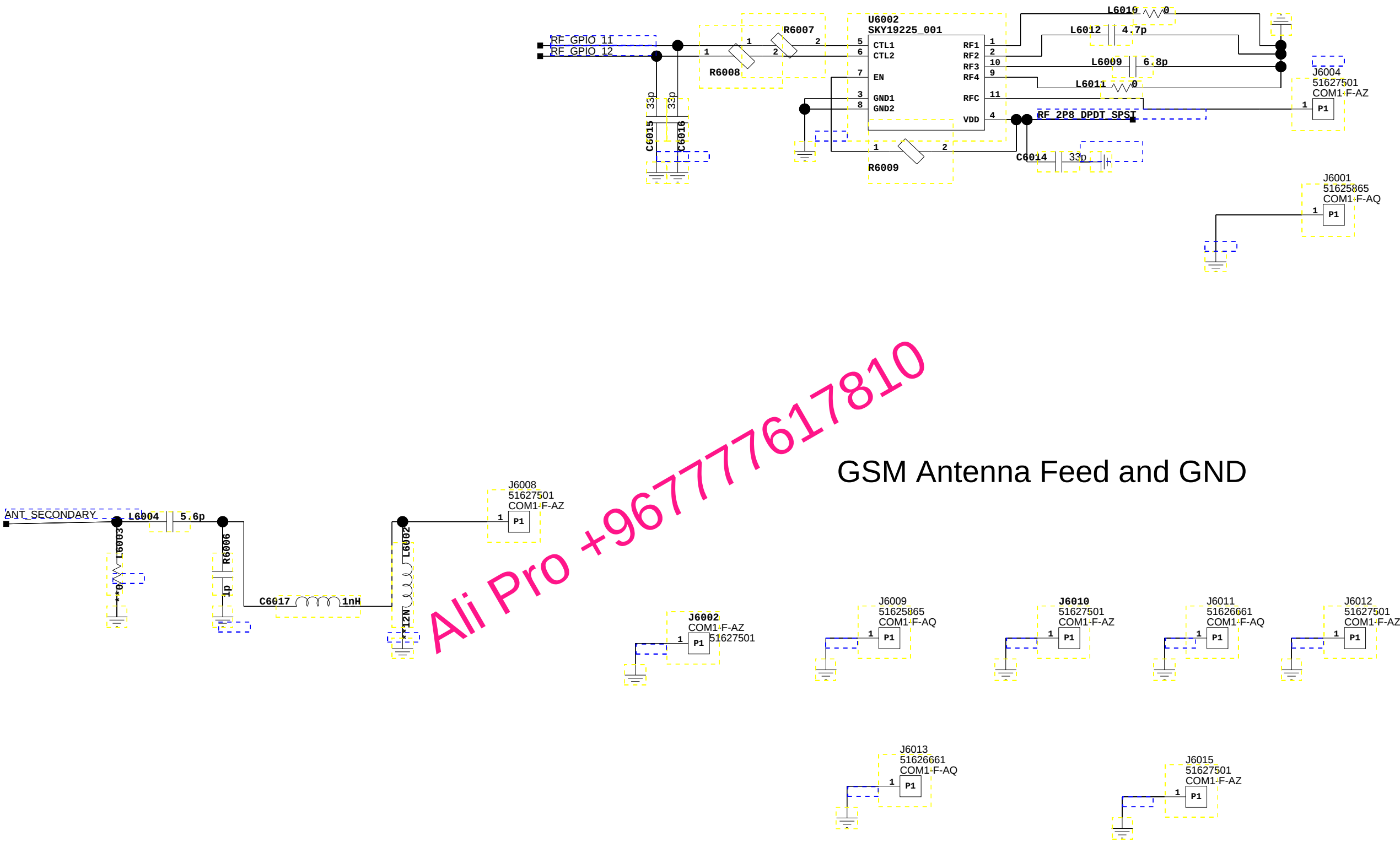
58.RF Transceiver2



59.RFIC2_GSM PA+Switch



60.Antanna Tunner



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GSM Antenna Feed and GND