BPI_F3_LP4XP200_32X1

Revision	Date	Change Description
V1.0	20231207	Initial version
V2.0	20240131	Update based on test results
V3.0	20240401	Update based on test results

GUANGDONG BIPAI KEJI CPA.LTD

Design Name: BPI-F3_LP4XP200_32X1

Size: A3 | Page Name: 01 REVISION HISTORY | Rev: <RevCode>

http://www.banana-pi.org

Date: Wednesday, May 08, 2024 | Sheet 1 of 28

INDEX/NOTES

	GUANGDONG BIPAI KEJI CPA.LTD
http://www.banana-pi.org	Design Name: BPI-F3_LP4XP200_32X1
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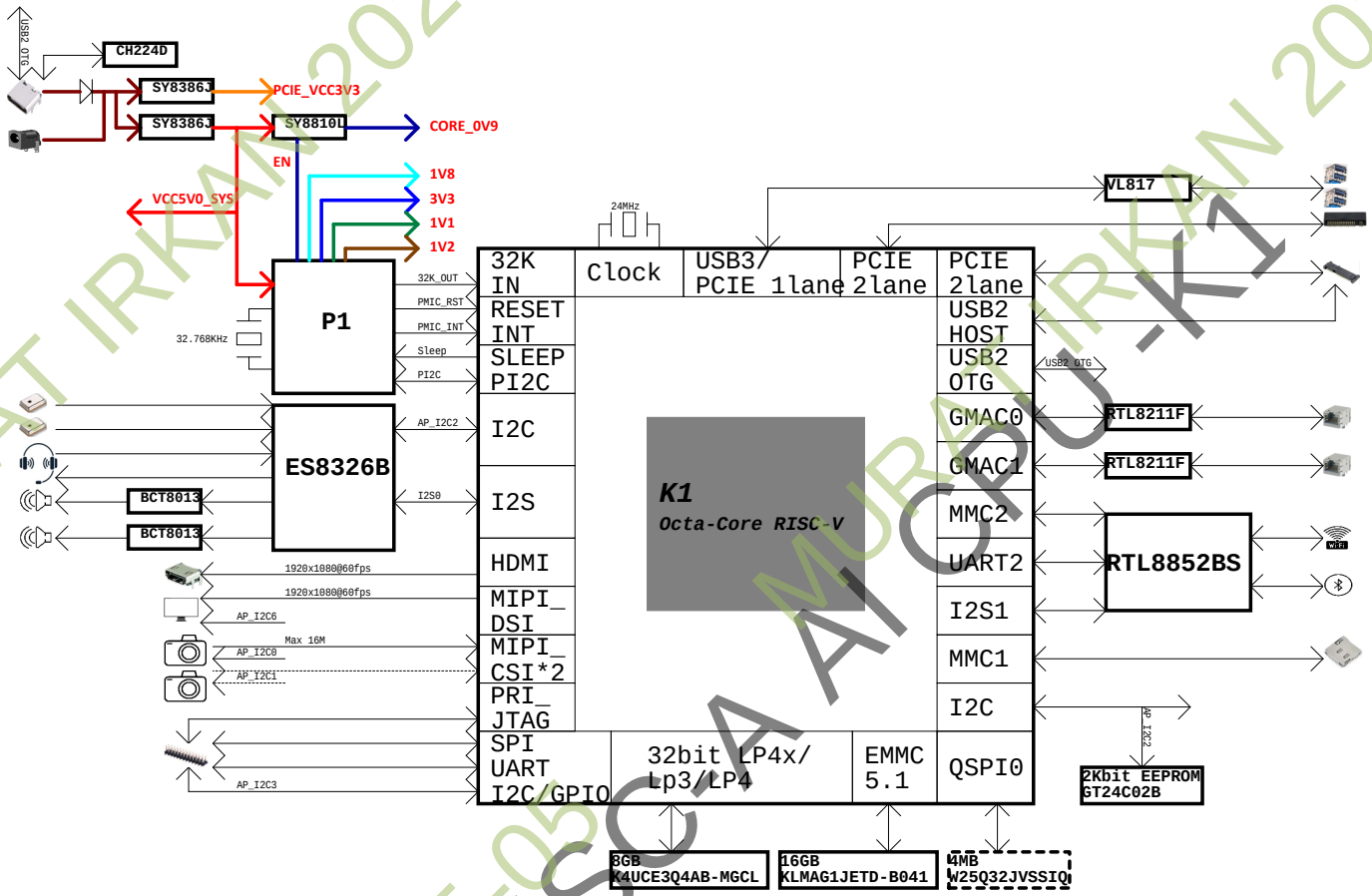
BLOCK

RISC-V 64-BIT K1 CPU : YAPAY ZEKA BİLGİSAYAR-K1



	GUANGDONG BIPAI KEJI CPA.LTD	
http://www.banana-pi.org	Design Name: BPI-F3_LP4XP200_32X1	
	Size: A3 / Page Name: 03 BLOCK DIAGRAM	Rev: <RevCode>
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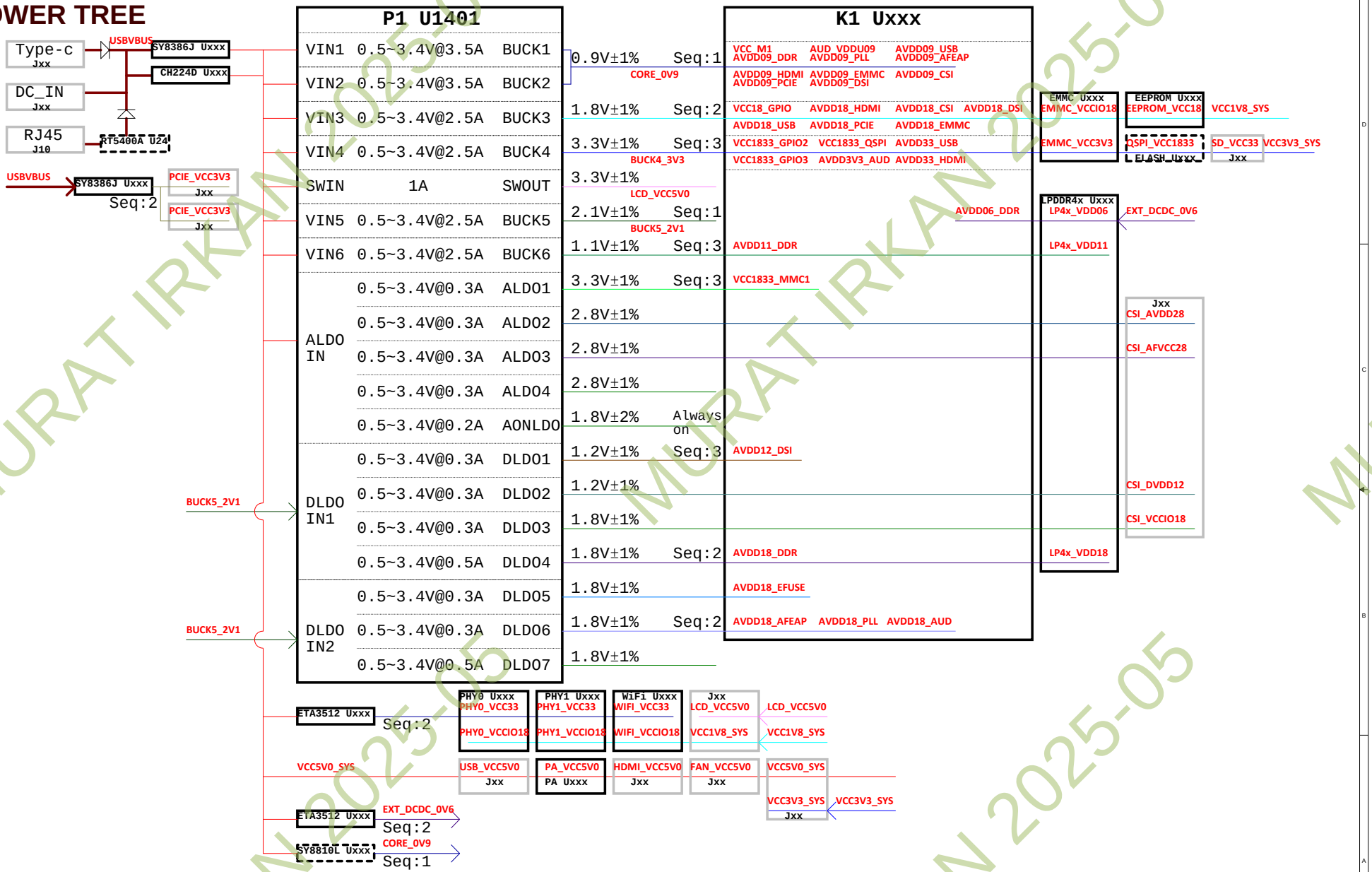
POWER TREE



GUANGDONG BIPAI KEJI CPA.LTD					
Design Name	BPI-F3_LP4XP200_32X1				
Size A3	Page Name 04 POWER TREE				Rev <RevCode>
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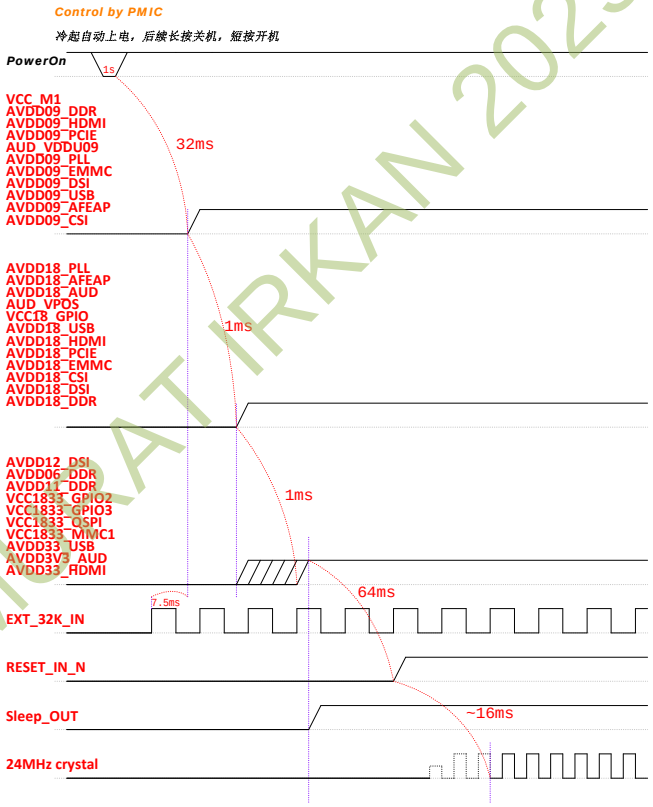
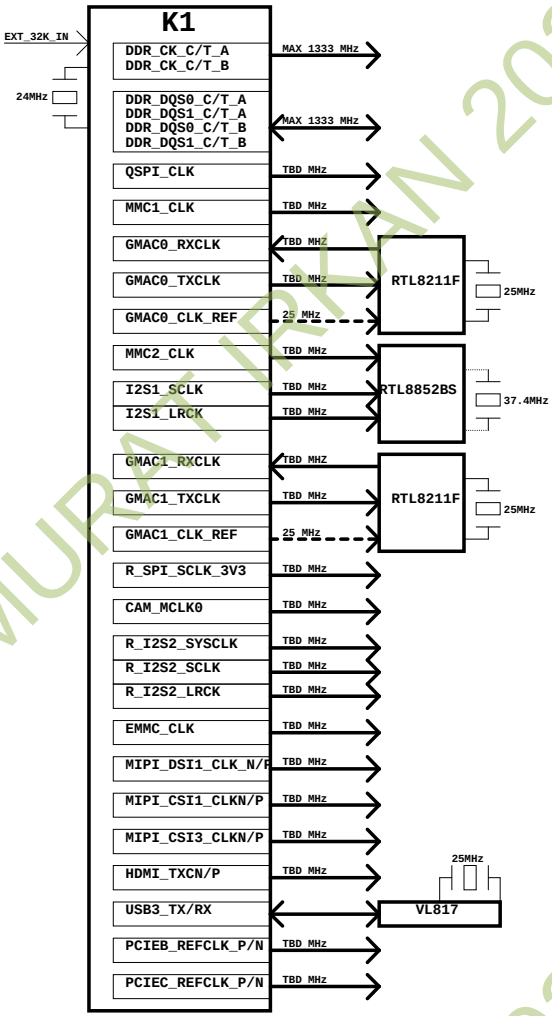
POWER SEQUENCE

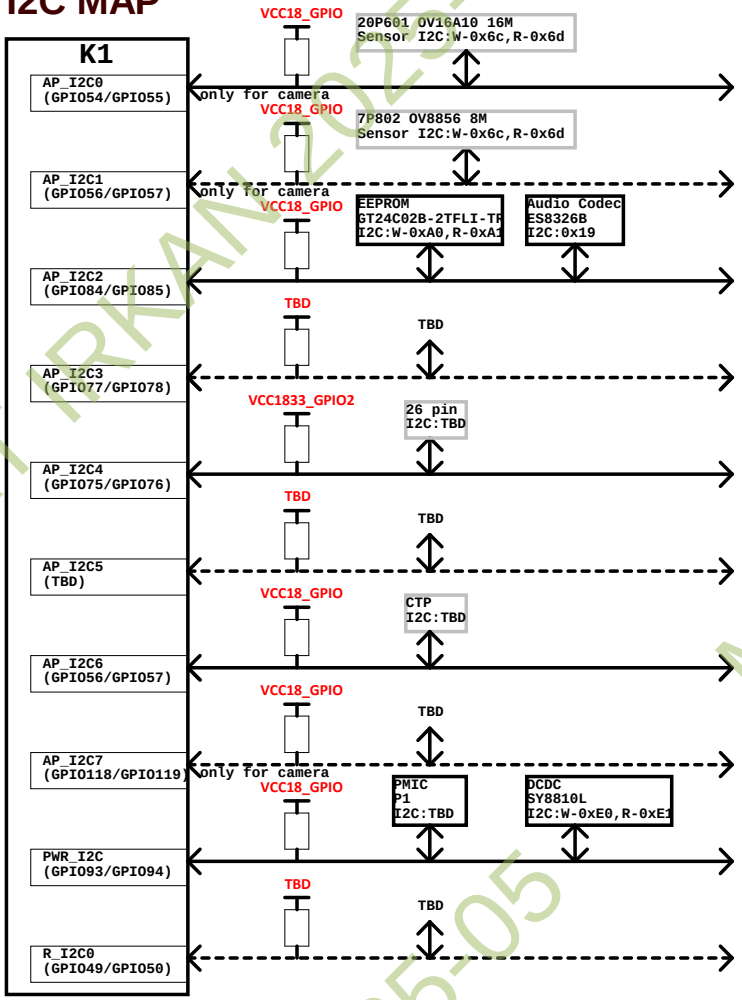


P1

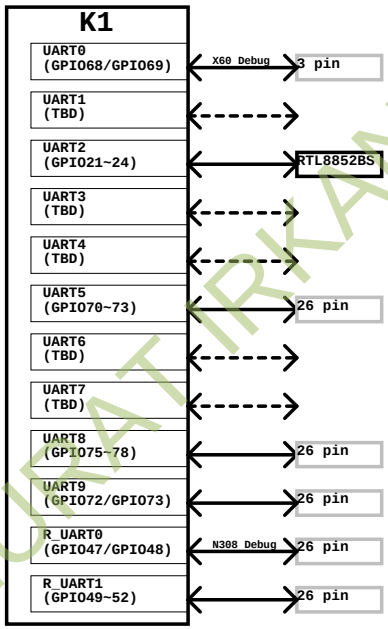
CLOCK MAP



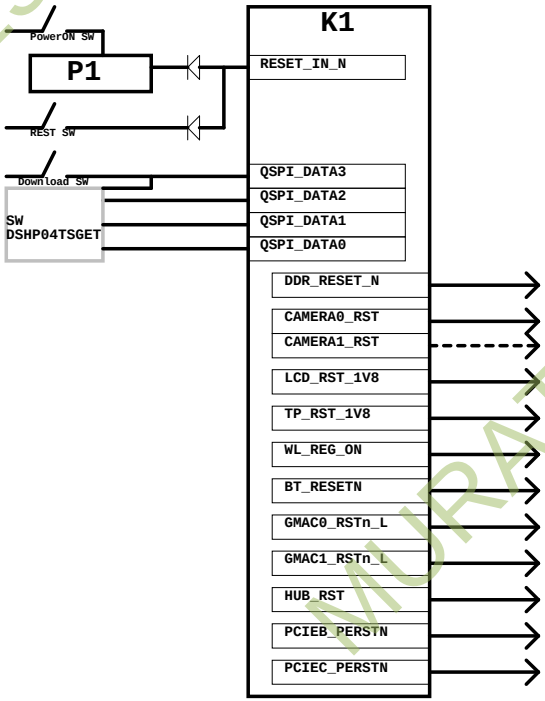
I2C MAP



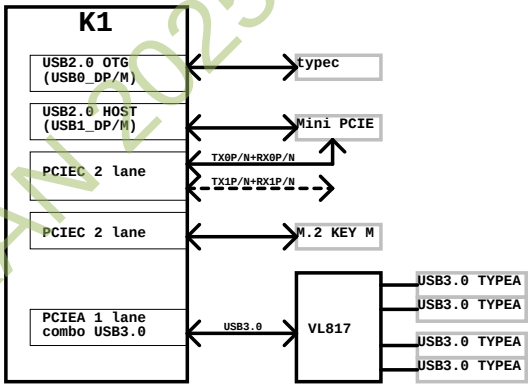
UART MAP



SW&RESET MAP



PCIE/USB MAP



GPIO ASSIGNMENT

PIN	Define	CFG	Function
GPIO0	GMAC0_RXDV	1	Ethernet -GMAC0
GPIO1	GMAC0_RXD0	1	
GPIO2	GMAC0_RXD1	1	
GPIO3	GMAC0_RXCLK	1	
GPIO4	GMAC0_RXD2	1	
GPIO5	GMAC0_RXD3	1	
GPIO6	GMAC0_TXD0	1	
GPIO7	GMAC0_TXD1	1	
GPIO8	GMAC0_TXCLK	1	
GPIO9	GMAC0_TXD2	1	
GPIO10	GMAC0_TXD3	1	
GPIO11	GMAC0_TXEN	1	
GPIO12	GMAC0_MDC	1	
GPIO13	GMAC0_MDIO	1	
GPIO14	GMAC0_INT_N	1	
GPIO15	MMC2_DATA3	1	WiFi/BT
GPIO16	MMC2_DATA2	1	
GPIO17	MMC2_DATA1	1	
GPIO18	MMC2_DATA0	1	
GPIO19	MMC2_CMD	1	
GPIO20	MMC2_CLK	1	
GPIO21	UART2_TXD	1	
GPIO22	UART2_RXD	1	
GPIO23	UART2_CTS_N	1	
GPIO24	UART2_RTS_N	1	
GPIO25	I2S1_SCLK	1	
GPIO26	I2S1_LRCK	1	
GPIO27	I2S1_TXD	1	
GPIO28	I2S1_RXD	1	
GPIO29	GMAC1_RXDV	1	Ethernet -GMAC1
GPIO30	GMAC1_RXD0	1	
GPIO31	GMAC1_RXD1	1	
GPIO32	GMAC1_RXCLK	1	
GPIO33	GMAC1_RXD2	1	
GPIO34	GMAC1_RXD3	1	
GPIO35	GMAC1_TXD0	1	
GPIO36	GMAC1_TXD1	1	
GPIO37	GMAC1_TXCLK	1	
GPIO38	GMAC1_TXD2	1	
GPIO39	GMAC1_TXD3	1	
GPIO40	GMAC1_TXEN	1	
GPIO41	GMAC1_MDC	1	
GPIO42	GMAC1_MDIO	1	
GPIO43	GMAC1_INT_N	1	
GPIO44	LCD_BL_PWM_1V8	4	LCD/CTP
GPIO45	GMAC0_CLK_REF	1	GMAC0
GPIO46	GMAC1_CLK_REF	1	GMAC1

PIN	Define	CFG	Function
GPIO110	GMAC0_RSTn_L	0	GMAC0
GPIO115	GMAC1_RSTn_L	0	GMAC1
GPIO116	WL_DIS_N	0	WiFi/BT
GPIO117	PCIEC_CLKREQN	4	PCIEC
GPIO118	I2S0_SCLK	3	Audio Codec
GPIO119	I2S0_LRCK	3	
GPIO120	I2S0_OUT	3	
GPIO121	I2S0_IN	3	
GPIO122	I2S0_SYSCLK	3	
GPIO123	HUB_PWREN	0	USB3_HUB
GPIO124	HUB_RST	0	
GPIO125	VBUS_ON0	1	USB2
GPIO126	CODEC_IRQ	0	Audio Codec
GPIO127	PA_SHUTDOWN	0	

PIN	Define	CFG	Function
GPIO53	CAM_MCLK0	1	CAMERA0
GPIO54	CAM_I2C0_SCL	1	
GPIO55	CAM_I2C0_SDA	1	
GPIO56	AP_I2C6_SCL	5	LCD/CTP
GPIO57	AP_I2C6_SDA	5	
GPIO58	TP_INT_1V8	0	
GPIO111	CAMERA0_RST	1	CAMERA0
GPIO112	PCIEC_WAKEN	3	PCIEC
GPIO113	CAMERA0_PDN	1	CAMERA0
GPIO114	TP_RST_1V8	0	LCD/CTP
GPIO63	BT_RESETN	0	WiFi/BT
GPIO64	AP_WAKE_BT	0	
GPIO65	BT_WAKE_AP	0	
GPIO66	WL_WAKE_AP	0	
GPIO67	WL_REG_ON	0	
GPIO68	UART0_TXD	2	X60 Debug
GPIO69	UART0_RXD	2	

PIN	Define	CFG	Function
GPIO59	PCIEB_PERSTN	4	PCIEB
GPIO60	PCIEB_WAKEN	4	
GPIO61	PCIEB_CLKREQN	4	
GPIO62	PCIEC_PERSTN	4	PCIEC
GPIO70	GPIO70	1	26 pin
GPIO71	GPIO71	1	
GPIO72	GPIO72	1	
GPIO73	GPIO73	1	
GPIO74	GPIO74	0	

红色字体GPIO表示默认、持续上拉，等效上拉电阻约60K。需要软件修改才能解除默认上拉状态

PIN	Define	CFG	Function
GPIO93	PI2C_SCL	0	PMIC
GPIO94	PI2C_SDA	0	
GPIO95	SLEEP_OUT	0	
GPIO96	GPIO96	1	LED
GPIO97	USB3_PWREN	1	USB3_HUB
GPIO81	LCD_RST_1V8	0	LCD/CTP
GPIO82	LCD_BL_EN_1V8	0	
GPIO83	LCD_PWR_EN_1V8	0	
GPIO84	AP_I2C2_SCL	4	EEPROM Audio
GPIO85	AP_I2C2_SDA	4	
GPIO86	HDMI_SCL	1	HDMI_OUT
GPIO87	HDMI_SDA	1	
GPIO88	HDMI_CEC	1	
GPIO89	HDMI_HPD	1	
GPIO90	GPIO90	0	26 pin
GPIO91	GPIO91	0	
GPIO92	GPIO92	0	

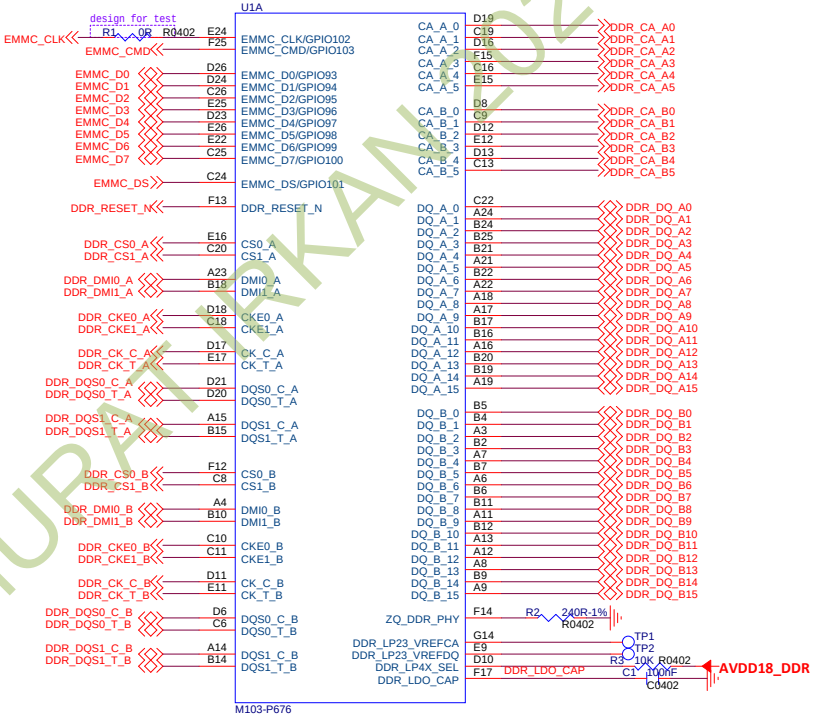
PIN	Define	CFG	Function
GPIO98	QSPI_DATA3	0	SPI FLASH
GPIO99	QSPI_DATA2	0	
GPIO100	QSPI_DATA1	0	
GPIO101	QSPI_DATA0	0	
GPIO102	QSPI_CLK	0	
GPIO103	QSPI_CS1	0	

PIN	Define	CFG	Function
GPIO104	MMC1_DATA3	0	TF CARD
GPIO105	MMC1_DATA2	0	
GPIO106	MMC1_DATA1	0	
GPIO107	MMC1_DATA0	0	
GPIO108	MMC1_CMD	0	
GPIO109	MMC1_CLK	0	

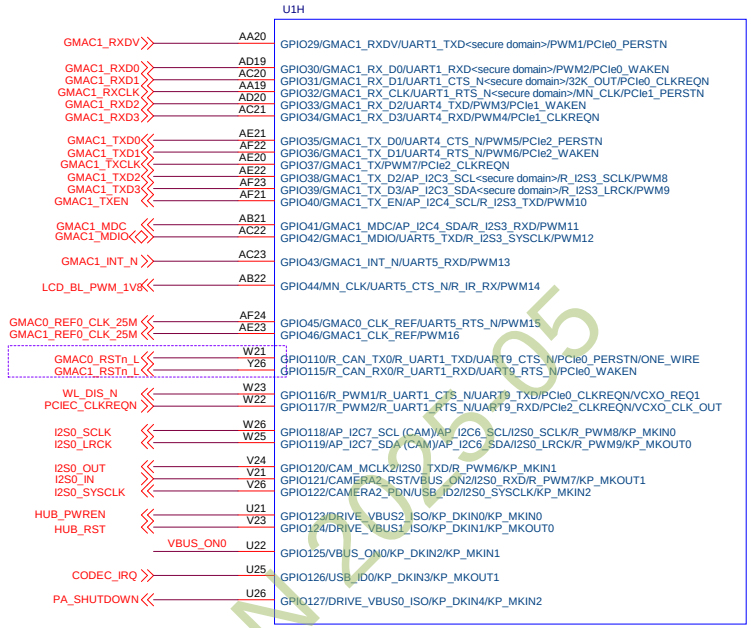
PIN	Define	CFG	Function
GPIO75	SPI3_SCLK_3V3	2	26 pin
GPIO76	SPI3_CS_3V3	2	
GPIO77	SPI3_MOSI_3V3	2	
GPIO78	SPI3_MISO_3V3	2	
GPIO79	FAN_PWM	2	FAN
GPIO80	SD_CD_3V3	1	TF CARD

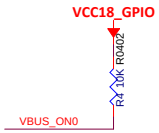
PIN	Define	CFG	Function
GPIO47	R_UART0_TXD_3V3	1	26 pin
GPIO48	R_UART0_RXD_3V3	1	
GPIO49	GPIO_49_3V3	0	
GPIO50	GPIO_50_3V3	0	
GPIO51	AP_I2C4_SCL_3V3	4	
GPIO52	AP_I2C4_SDA_3V3	4	

eMMC+DDR

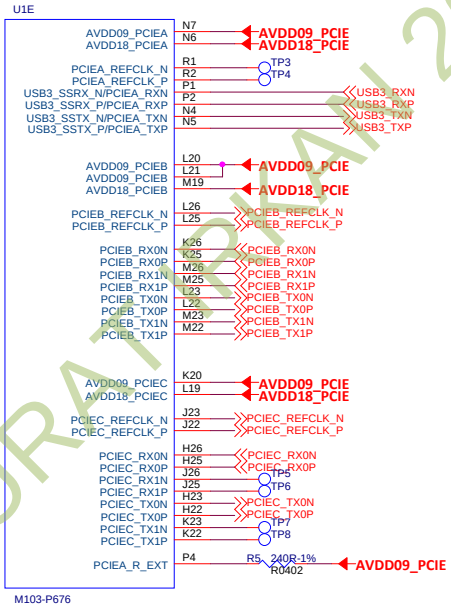


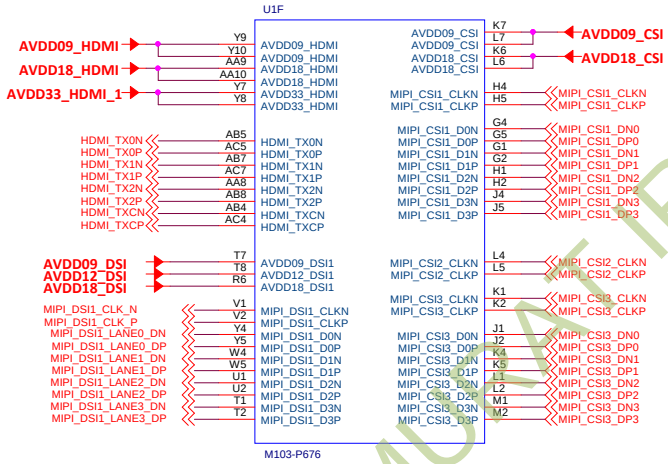
GPIO

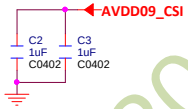


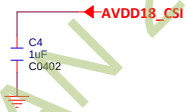


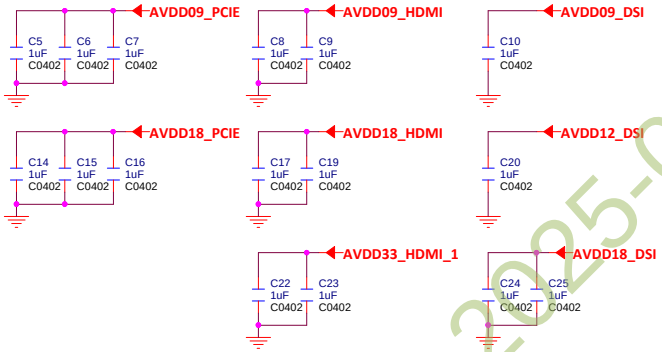
Perphery

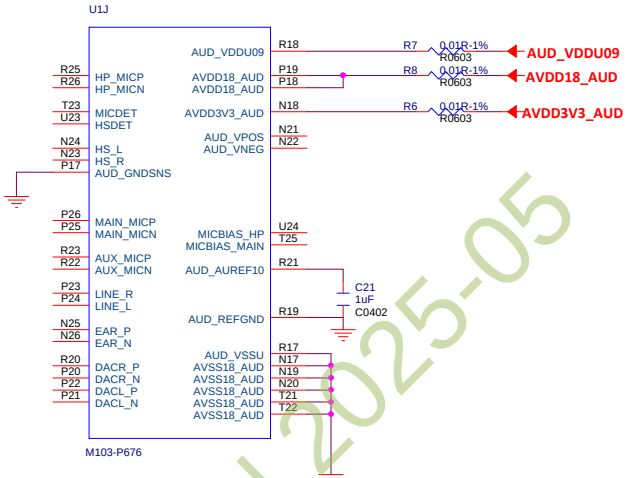




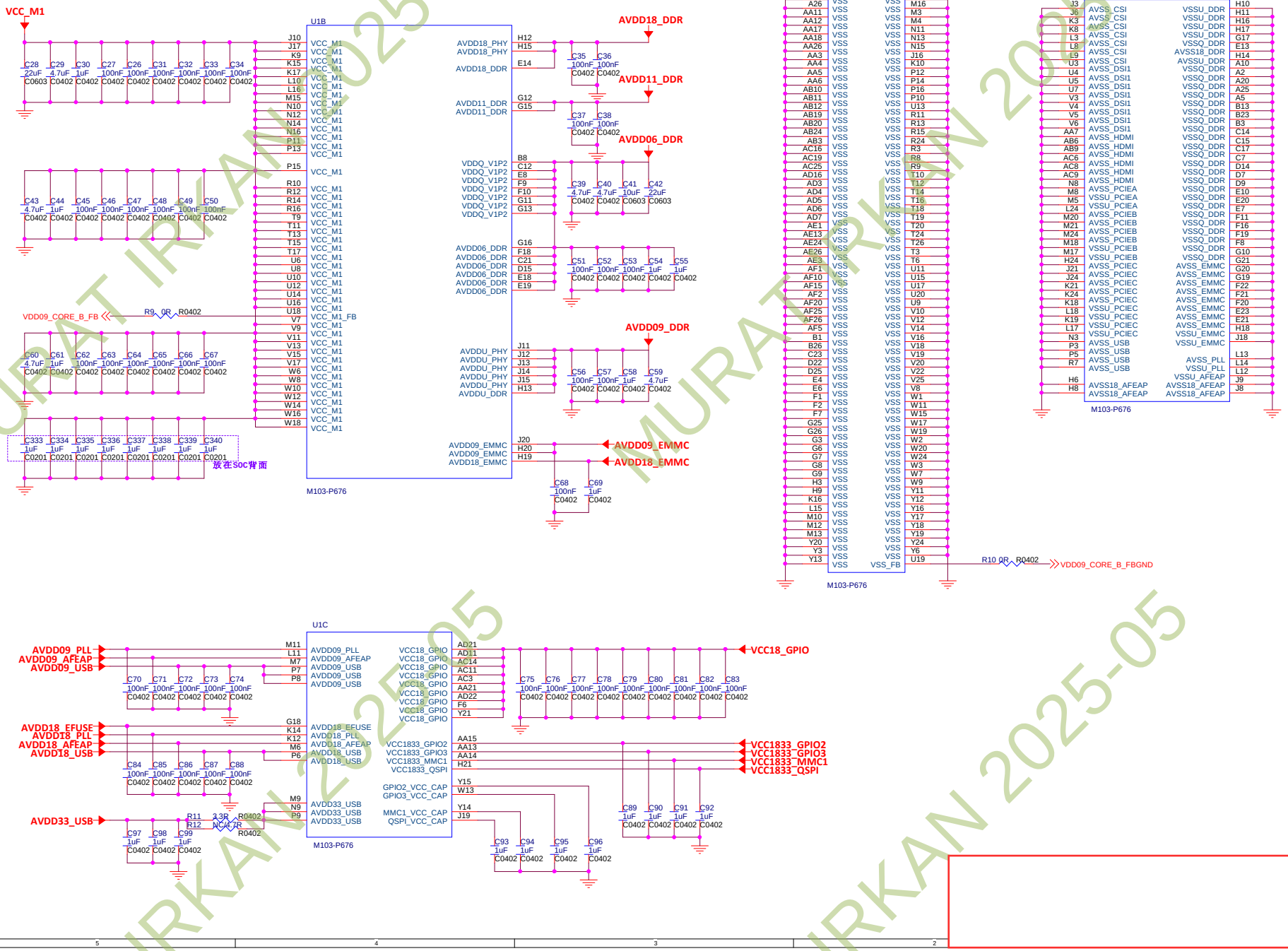




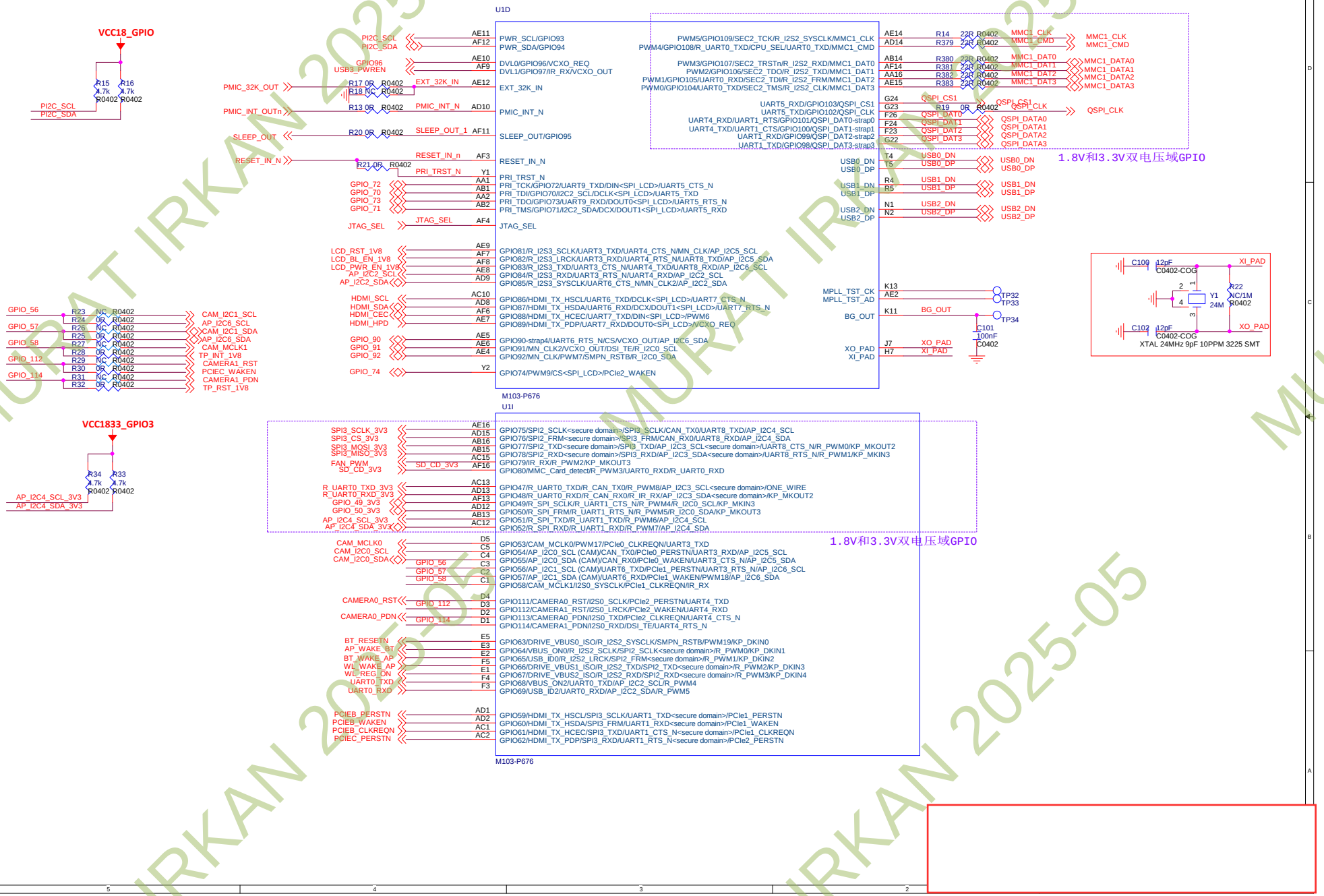




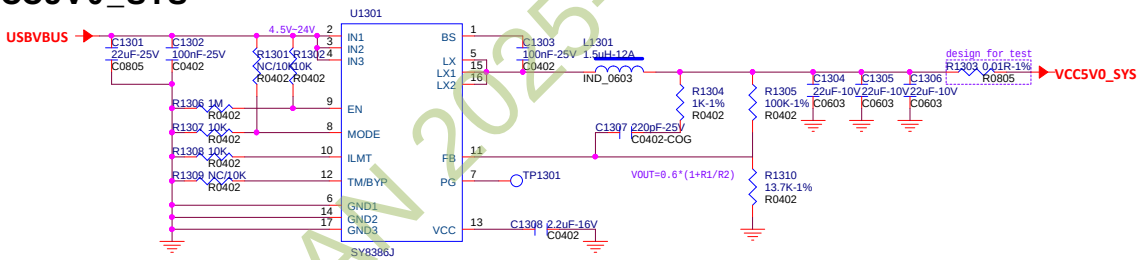
CPU-PWR



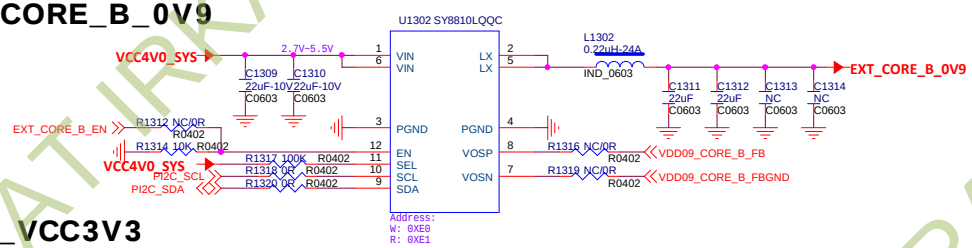
SYS-GPIO



VCC5V0_SYS



EXT_CORE_B_0V9



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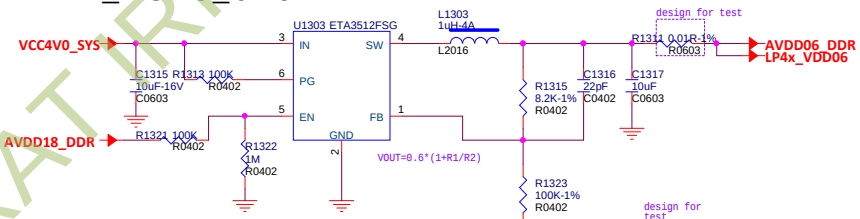

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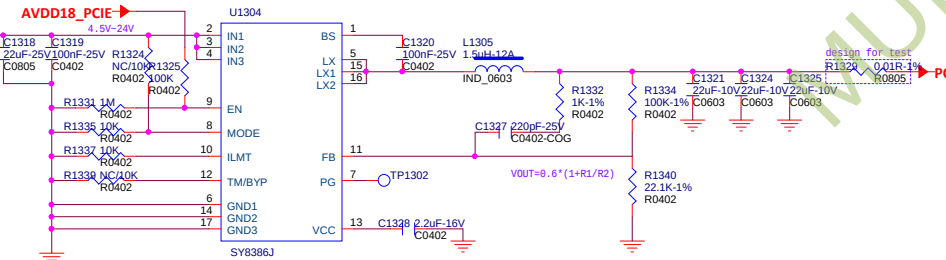
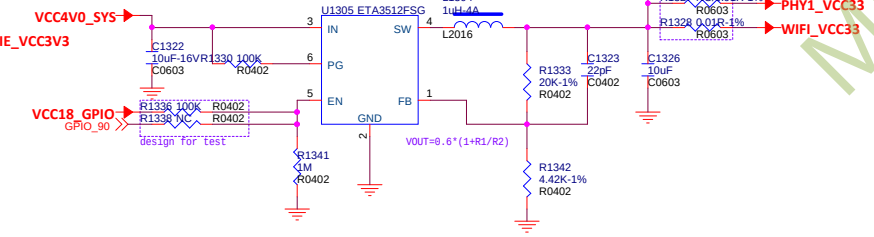
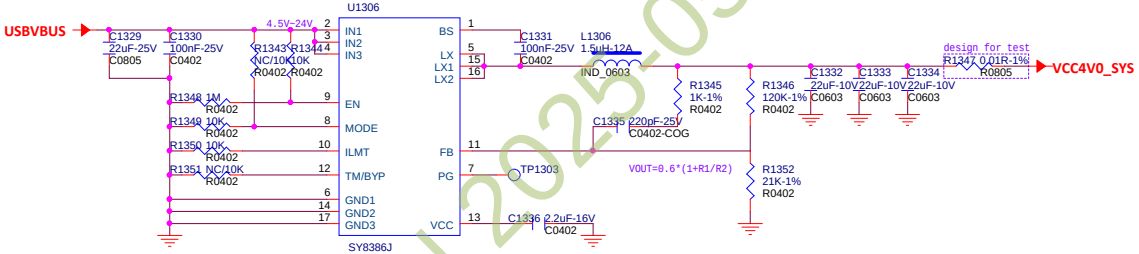


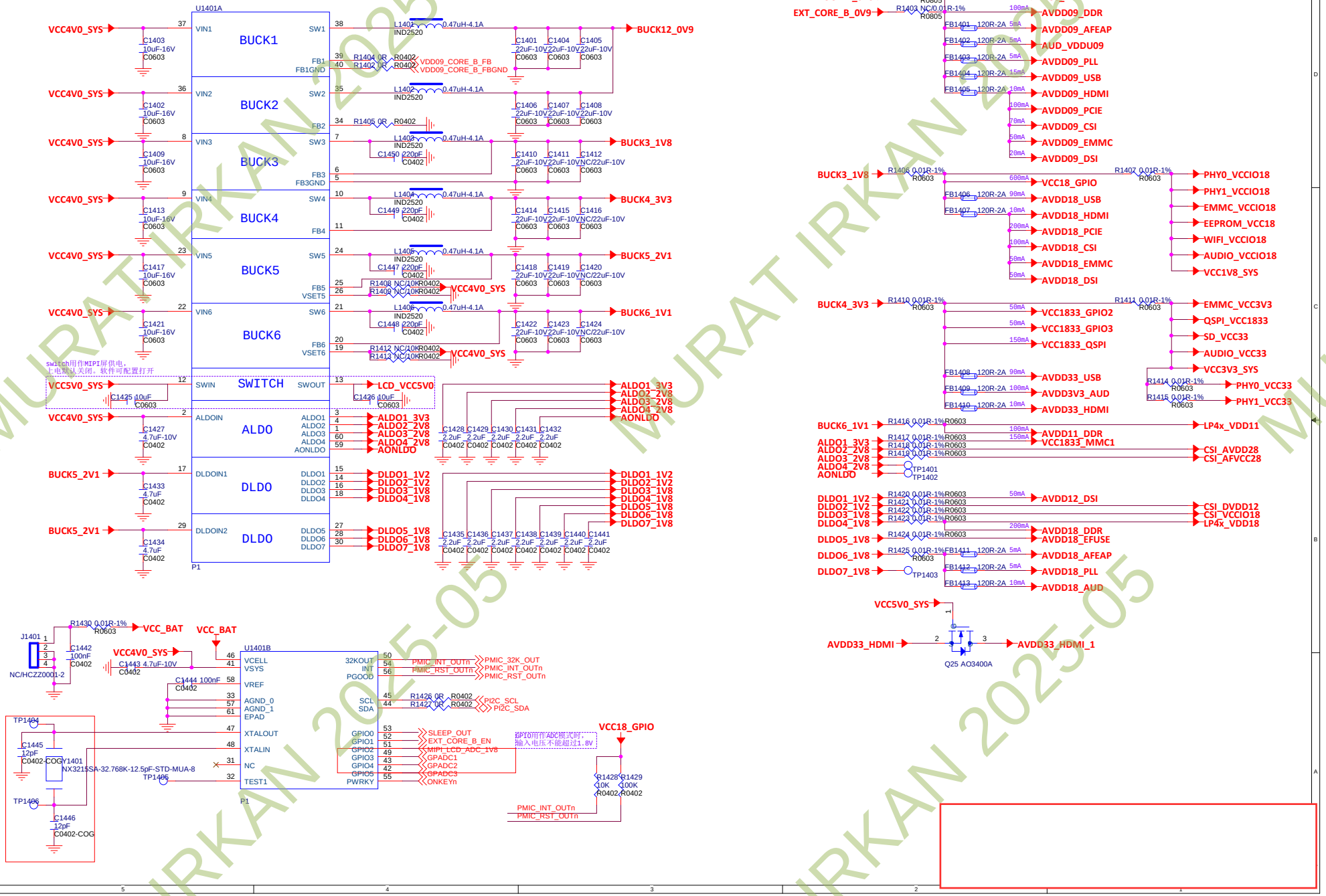
WIFI_PHY0_PHY1_3V3



VCC4V0_SYS

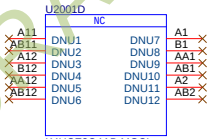


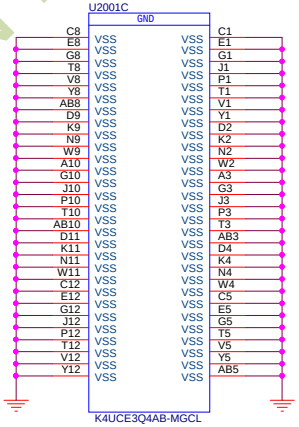
P1

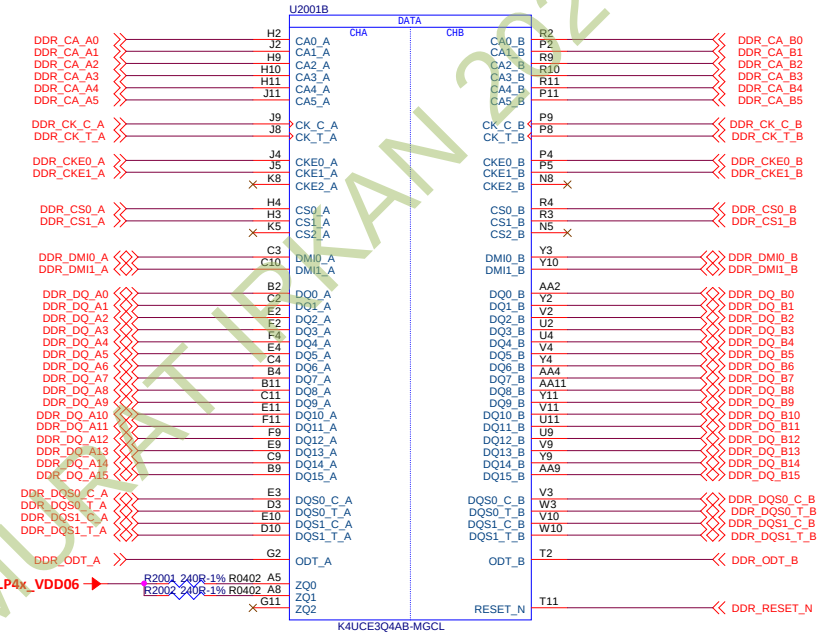


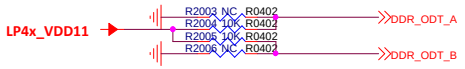
LPDDR4X

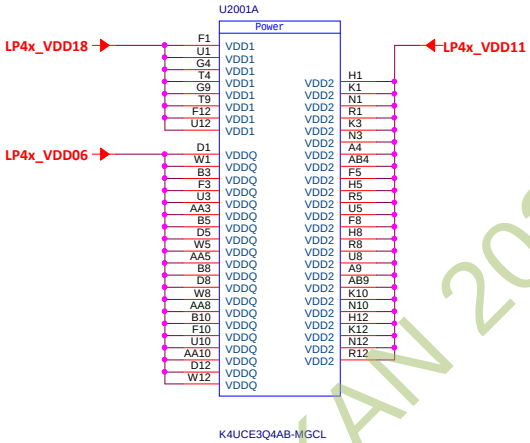
NOTE:CKE2/CS2/ZQ2 NC IN SUMSUNG

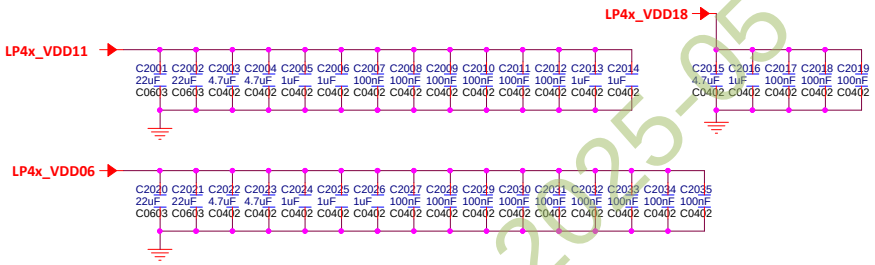




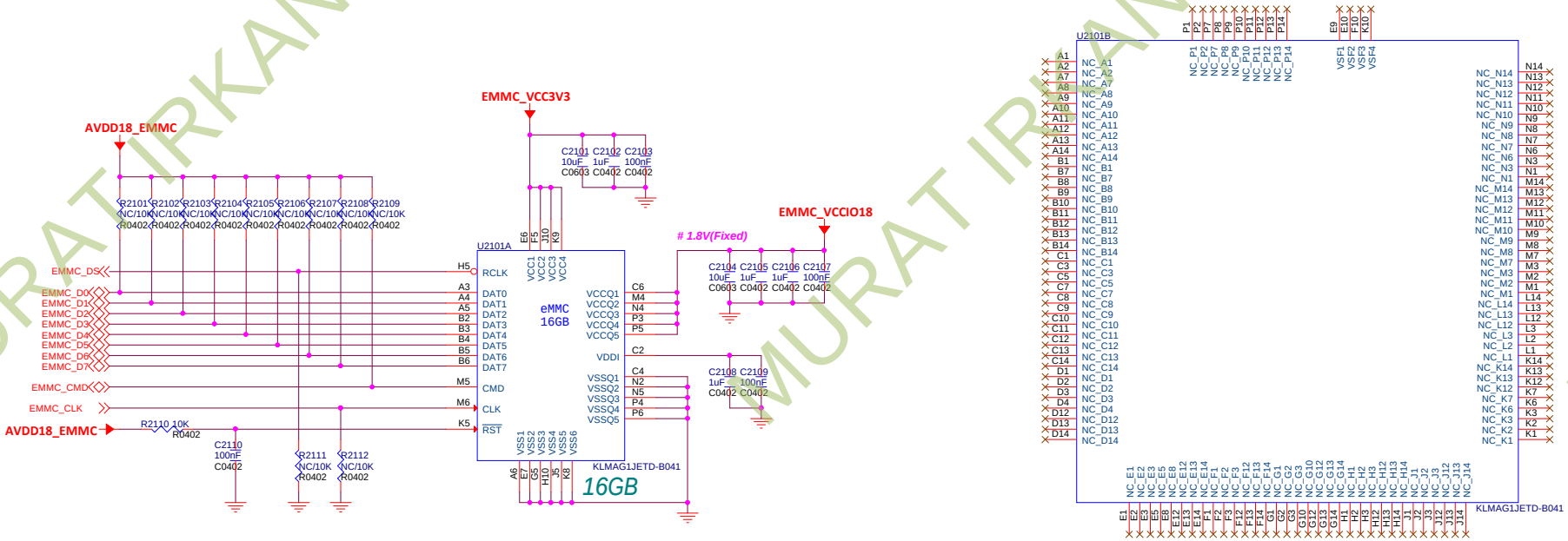








EMMC


AVDD18_EMMC
EMMC_VCC3V3
EMMC_VCCIO18
1.8V(Fixed)
U2101A
eMMC
16GB
KLMAG1JETD-B041
16GB
EMMC_DS
EMMC_D0
EMMC_D1
EMMC_D2
EMMC_D3
EMMC_D4
EMMC_D5
EMMC_D6
EMMC_D7
EMMC_CMD
EMMC_CLK
RCLK
DAT0
DAT1
DAT2
DAT3
DAT4
DAT5
DAT6
DAT7
CMD
CLK
RST
VCC1
VCC2
VCC3
VCC4
VCCQ1
VCCQ2
VCCQ3
VCCQ4
VCCQ5
VDDI
VSSQ1
VSSQ2
VSSQ3
VSSQ4
VSSQ5
VSS1
VSS2
VSS3
VSS4
VSS5
VSS6
C2101 C2102 C2103
10uF 1uF 100nF
C0603 C0402 C0402
C2104 C2105 C2106 C2107
10uF 1uF 1uF 100nF
C0603 C0402 C0402 C0402
C2108 C2109
1uF 100nF
C0402 C0402
C2110
100nF
C0402
R2110 10K
R0402
R2111
NC/10K
R0402
R2112
NC/10K
R0402
R2101 R2102 R2103 R2104 R2105 R2106 R2107 R2108 R2109
NC/10K NC/10K NC/10K NC/10K NC/10K NC/10K NC/10K NC/10K NC/10K
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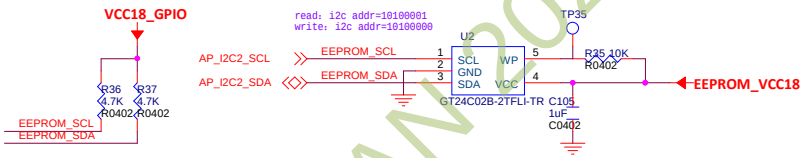
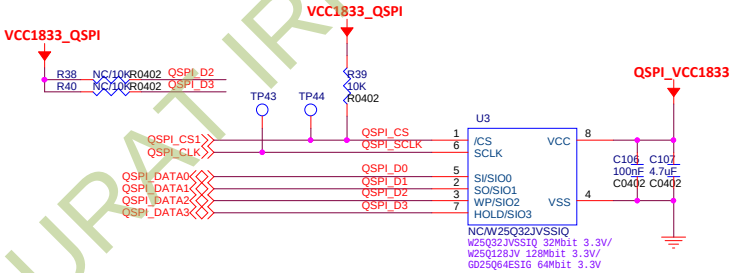
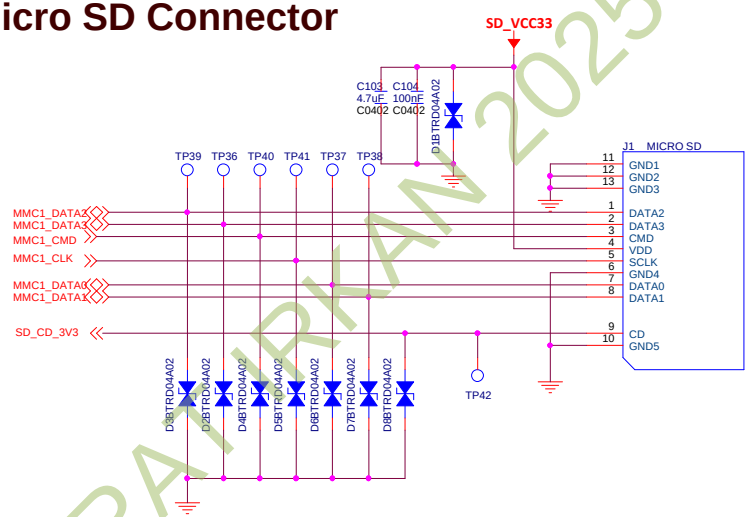
EEPROM



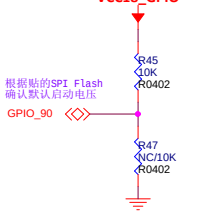
SPI FLASH



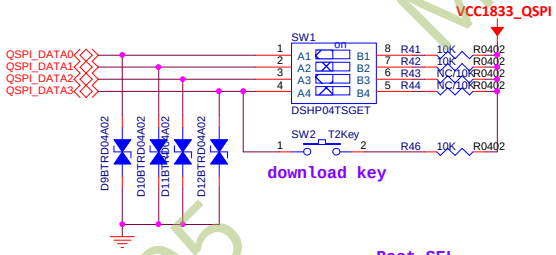
Micro SD Connector



Flash Boot voltage sel



GPIO 90	Function
0	1V8
1	3V3



boot download sel

QSPI_DATA3	Function
0	启动
1	下载

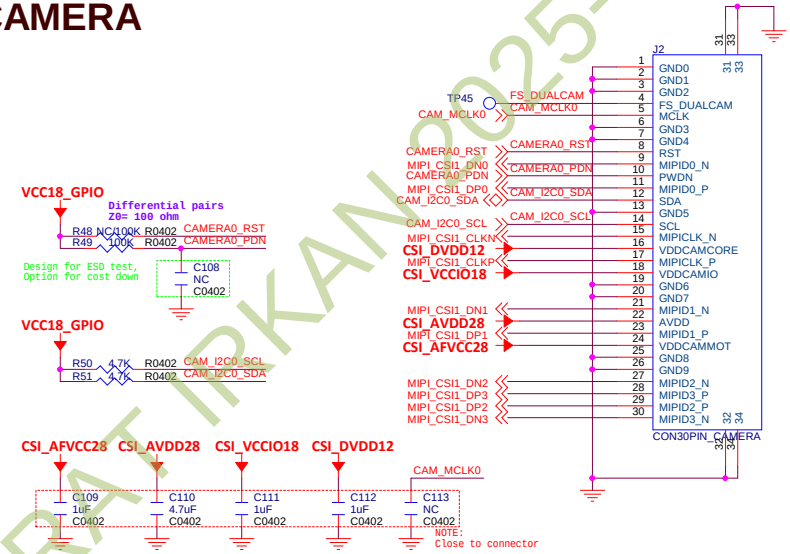
download sel

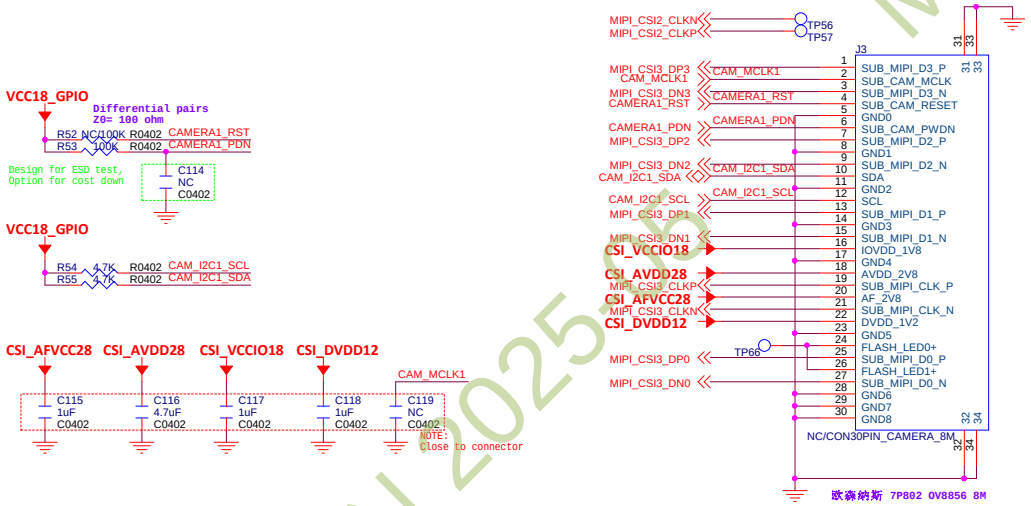
QSPI_DATA2	Function
0	USB
1	UART

Boot SEL

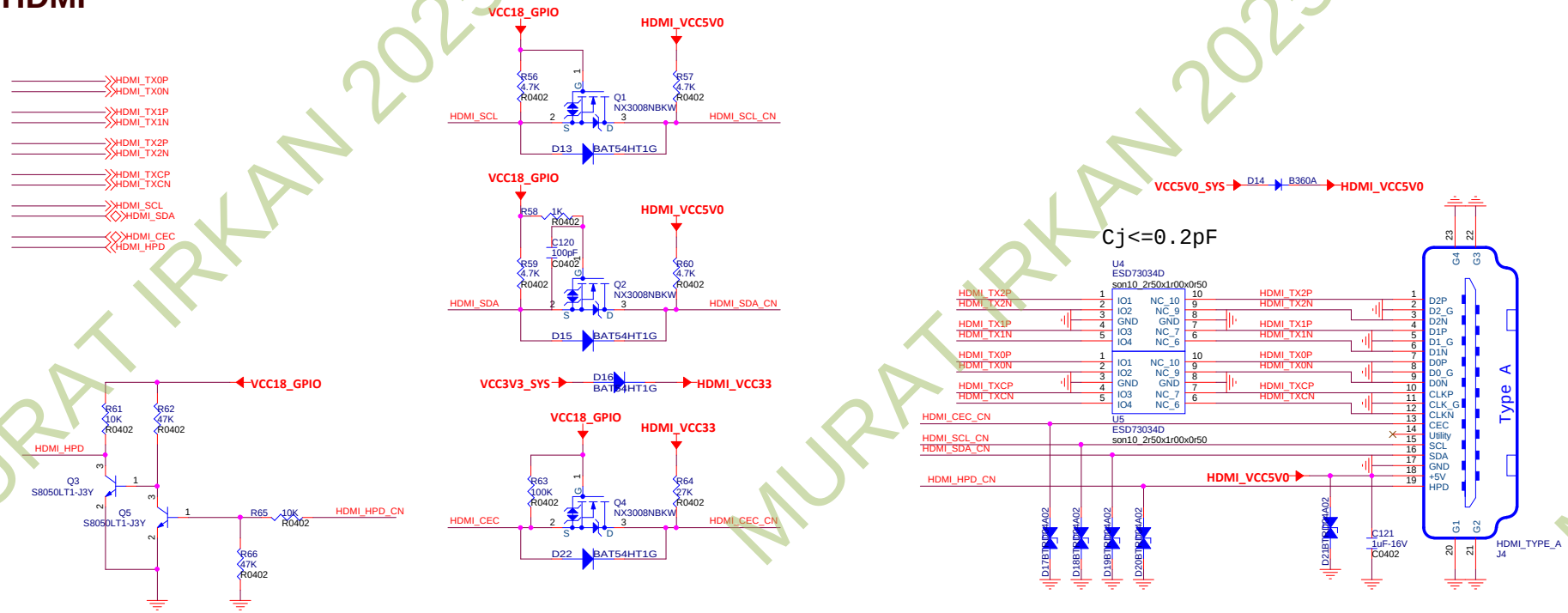
QSPI_DATA1	QSPI_DATA0	Function
0	0	TF Card -> EMMC
0	1	TF Card -> SPI NOR
1	0	TF Card -> SPI NAND
1	1	TF Card -> SD

CAMERA

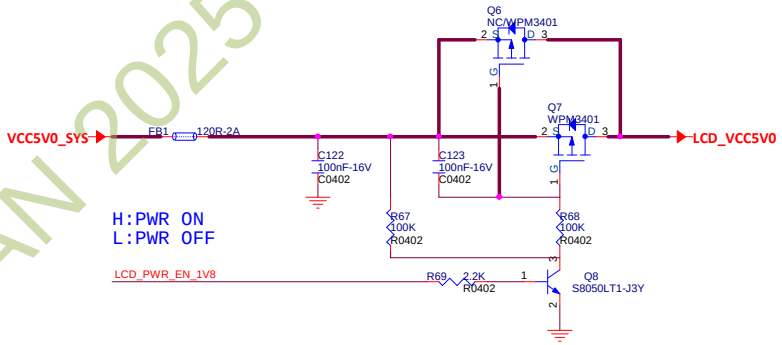


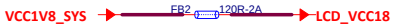


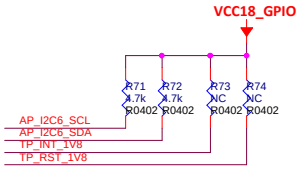
HDMI

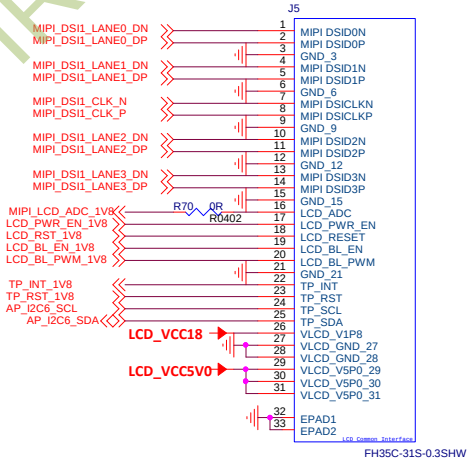


MIPI-DSI

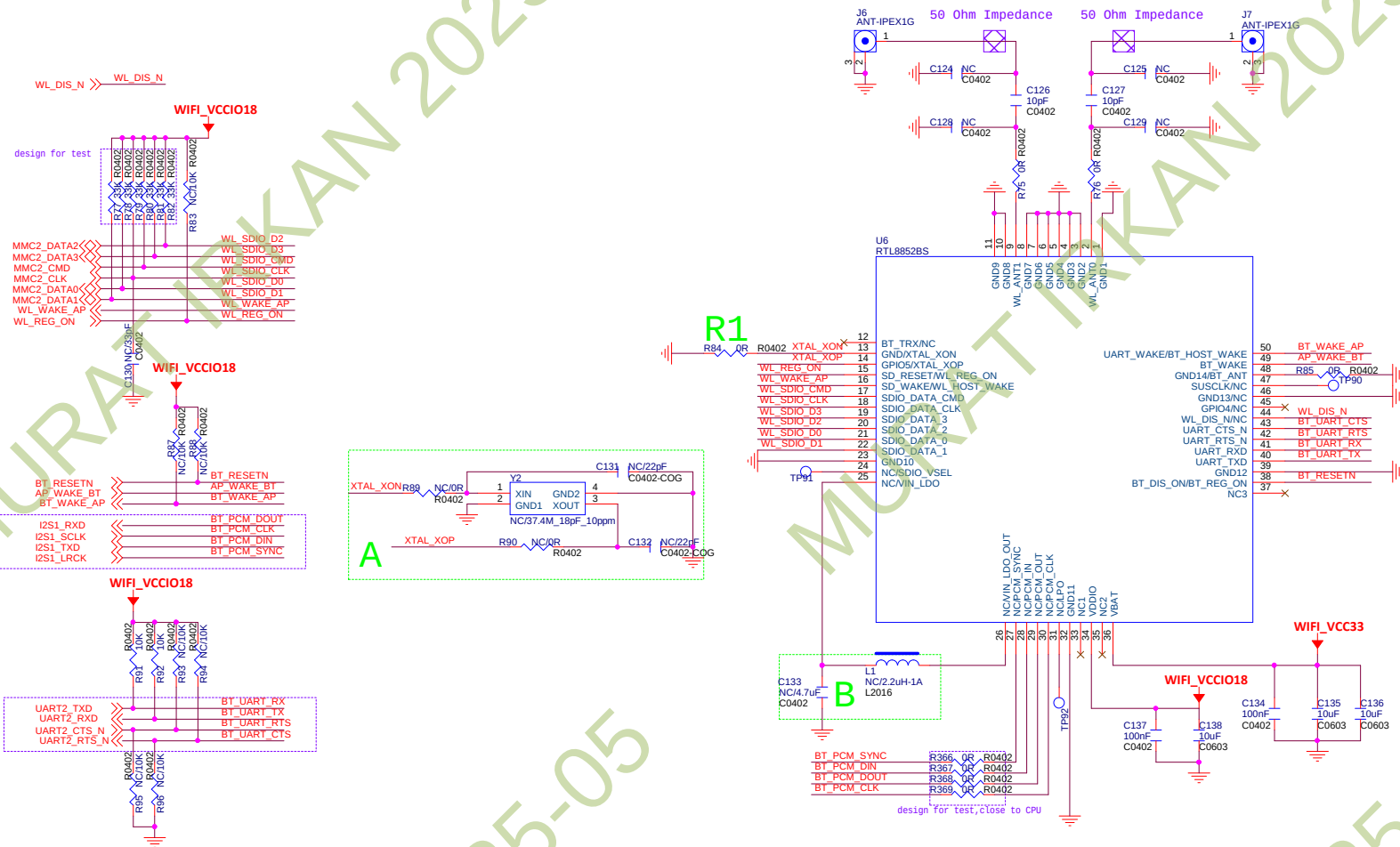




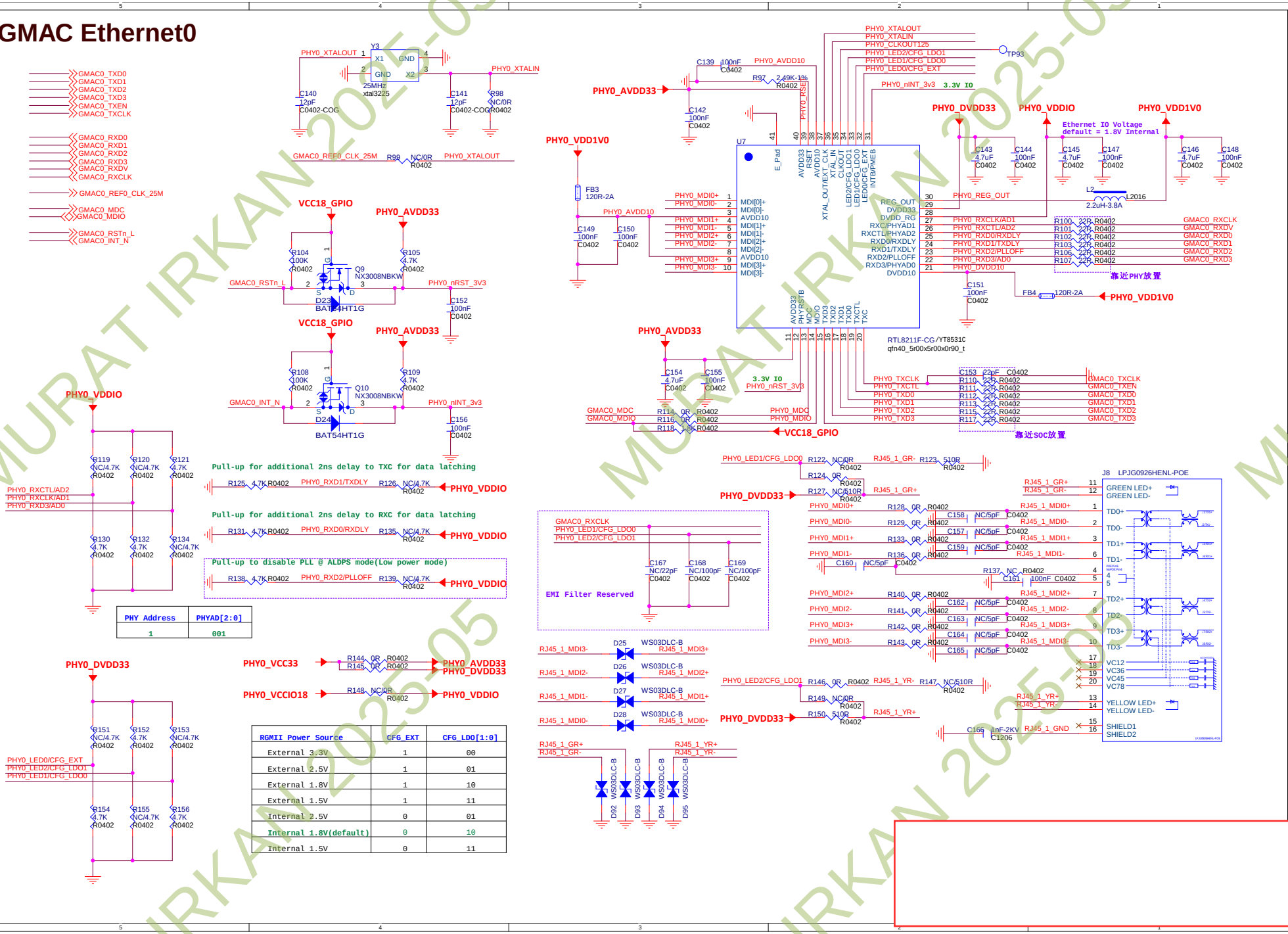




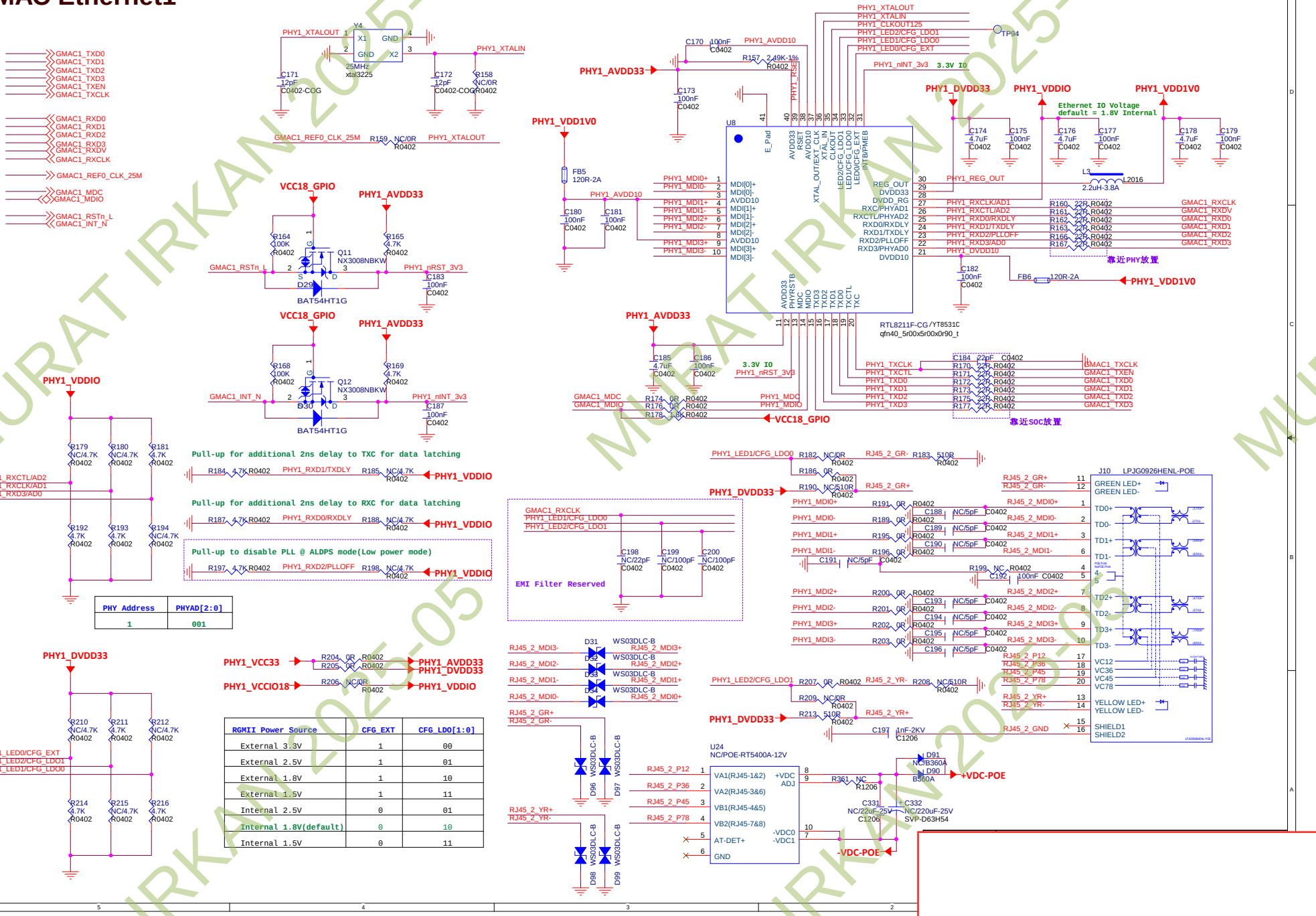
RTL8852BS

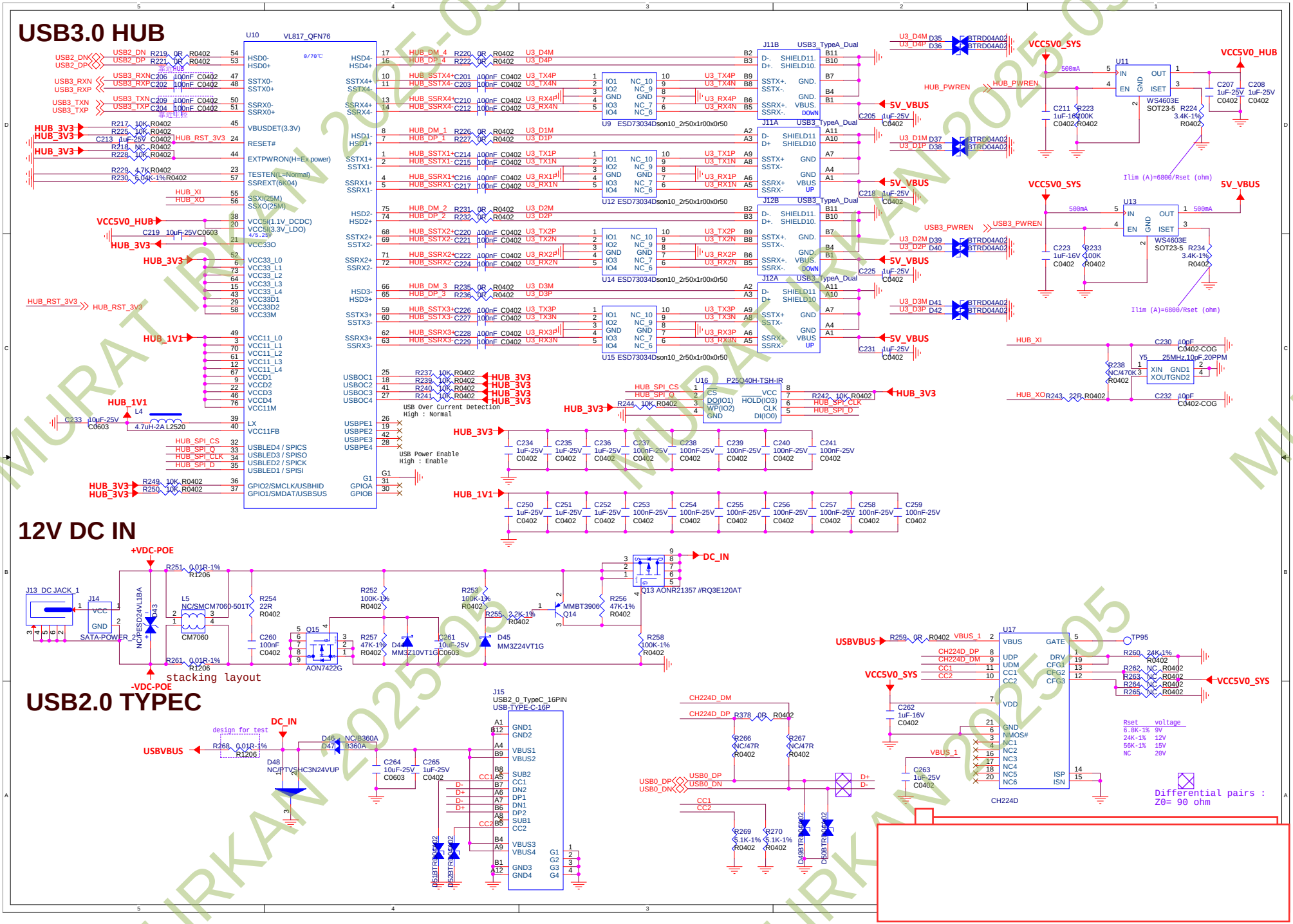

WL_DIS_N
WIFI_VCCIO18
design for test
MMC2_DATA2
MMC2_DATA3
MMC2_CMD
MMC2_CLK
MMC2_DATA0
MMC2_DATA1
WL_WAKE_AP
WL_REG_ON
WL_SDIO_D2
WL_SDIO_D3
WL_SDIO_CMD
WL_SDIO_CLK
WL_SDIO_D0
WL_SDIO_D1
WL_WAKE_AP
WL_REG_ON
BT_RESETN
AP_WAKE_BT
BT_WAKE_AP
I2S1_RXD
I2S1_SCLK
I2S1_TXD
I2S1_LRCK
BT_PCM_DOUT
BT_PCM_CLK
BT_PCM_DIN
BT_PCM_SYNC
UART2_TXD
UART2_RXD
UART2_CTS_N
UART2_RTS_N
BT_UART_RX
BT_UART_TX
BT_UART_RTS
BT_UART_CTS
A
B
R1
XTAL_XON
XTAL_XOP
NC/37.4M_18pF_10ppm
50 Ohm Impedance
50 Ohm Impedance
J6
ANT-IPEX1G
J7
ANT-IPEX1G
U6
RTL8852BS
BT_TRX/NC
GND/XTAL_XON
GPIO5/XTAL_XOP
SD_RESET/WL_REG_ON
SD_WAKE/WL_HOST_WAKE
SDIO_DATA_CMD
SDIO_DATA_CLK
SDIO_DATA_3
SDIO_DATA_2
SDIO_DATA_0
SDIO_DATA_1
GND10
NC/SDIO_VSEL
NC/VIN_LDO
UART_WAKE/BT_HOST_WAKE
BT_WAKE
GND14/BT_ANT
SUSCLK/NC
GND13/NC
GPIO4/NC
WL_DIS_N/NC
UART_CTS_N
UART_RTS_N
UART_RXD
UART_TXD
GND12
BT_DIS_ON/BT_REG_ON
NC3
NC/VIN_LDO_OUT
NC/PCM_SYNC
NC/PCM_IN
NC/PCM_OUT
NC/PCM_CLK
NC/LPO
GND11
NC1
VDDIO
NC2
VBAT
L1
NC/2.2uH-1A
L2016
WIFI_VCC33
WIFI_VCCIO18
design for test,close to CPU

GMAC Ethernet0

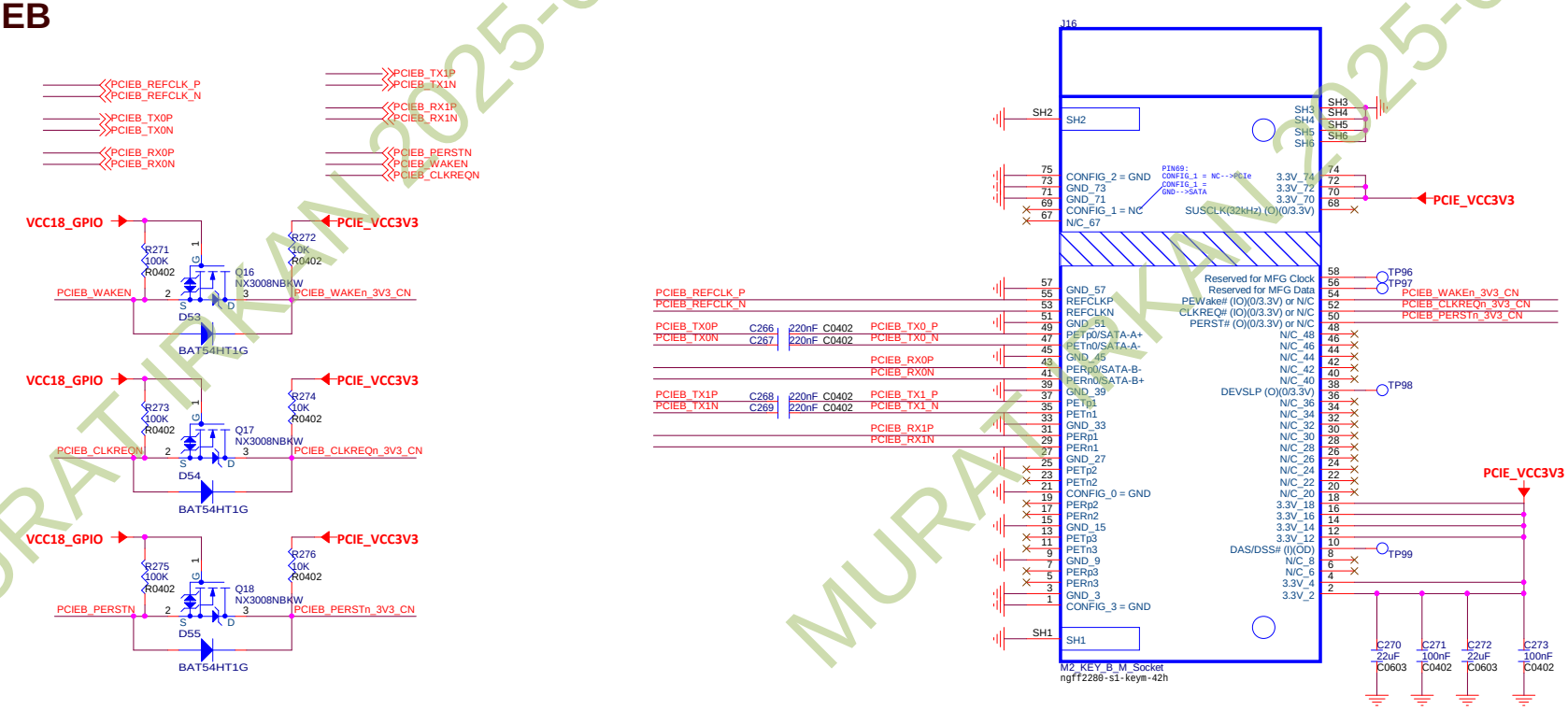


GMAC Ethernet1

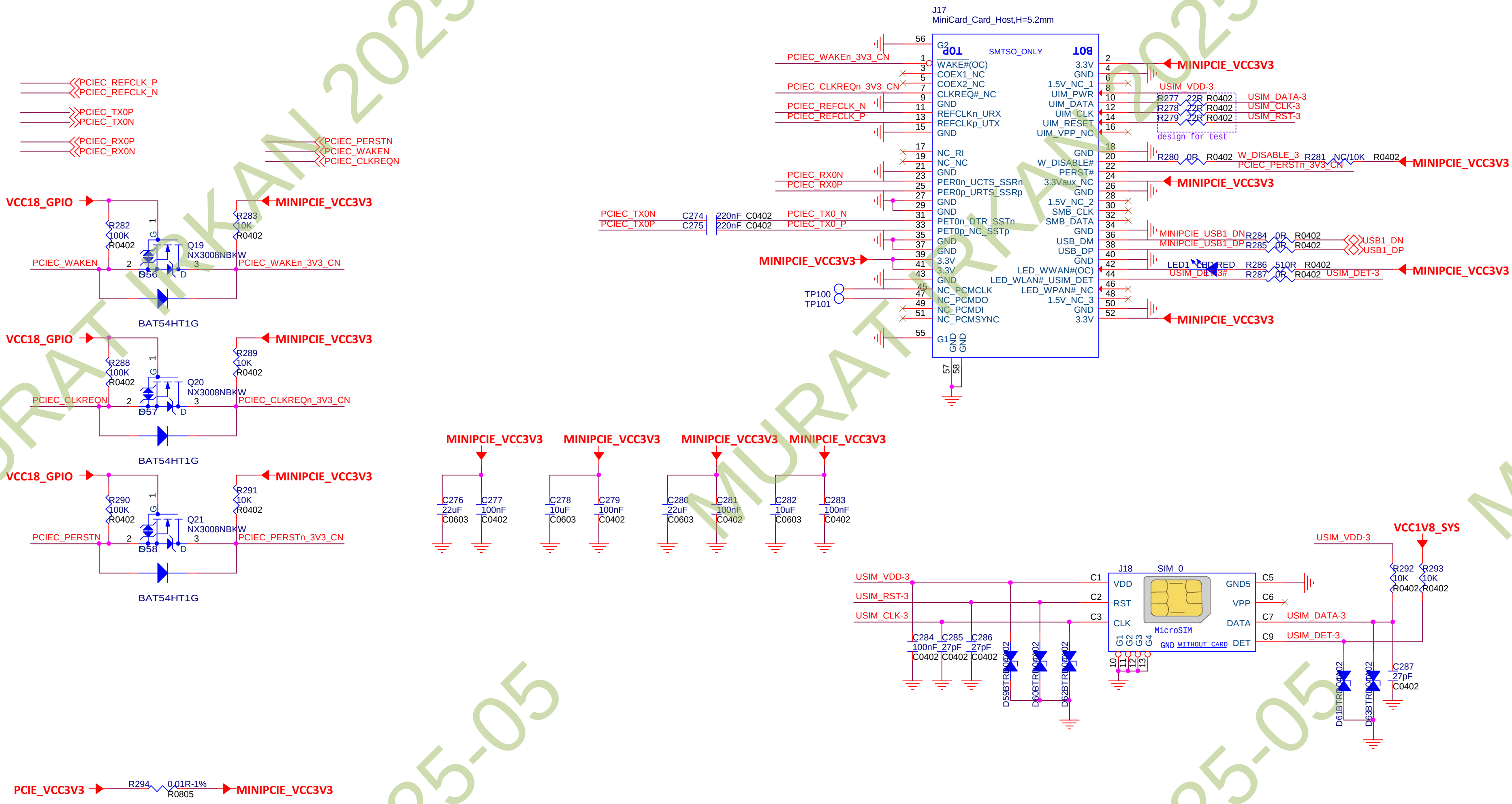



USB3.0 HUB
U10
VL817_QFN76
12V DC IN
+VDC-POE
-VDC-POE
stacking layout
DC_IN
USB2.0 TYPEC
J15
USB2_0_TypeC_16PIN
USB-TYPE-C-16P
U11
U12
U13
U14
U15
U16
U17
CH224D
VCC5V0_SYS
VCC5V0_HUB
5V_VBUS
HUB_3V3
HUB_1V1
USBVBUS
Differential pairs :
Z0= 90 ohm

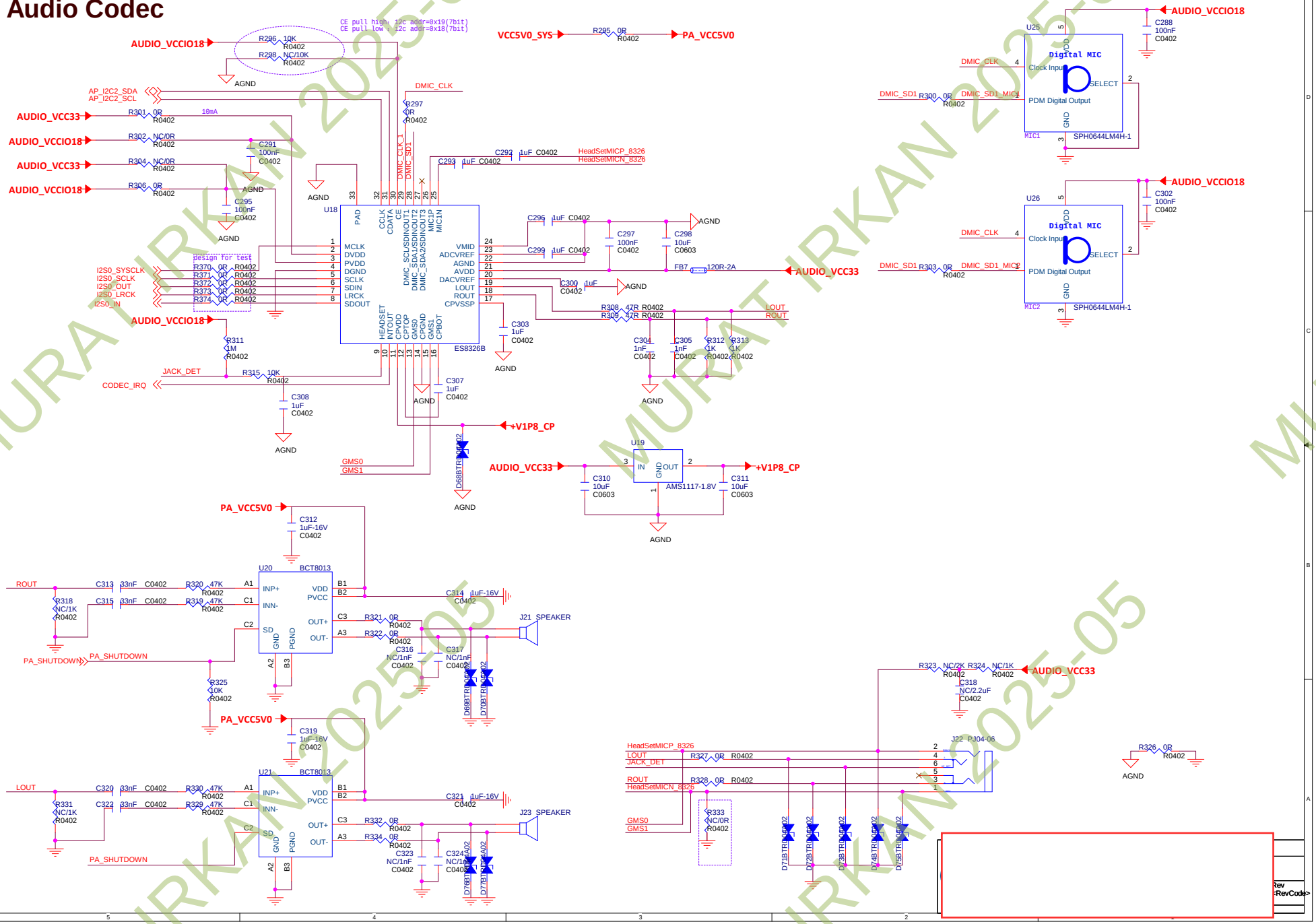
PCIEB

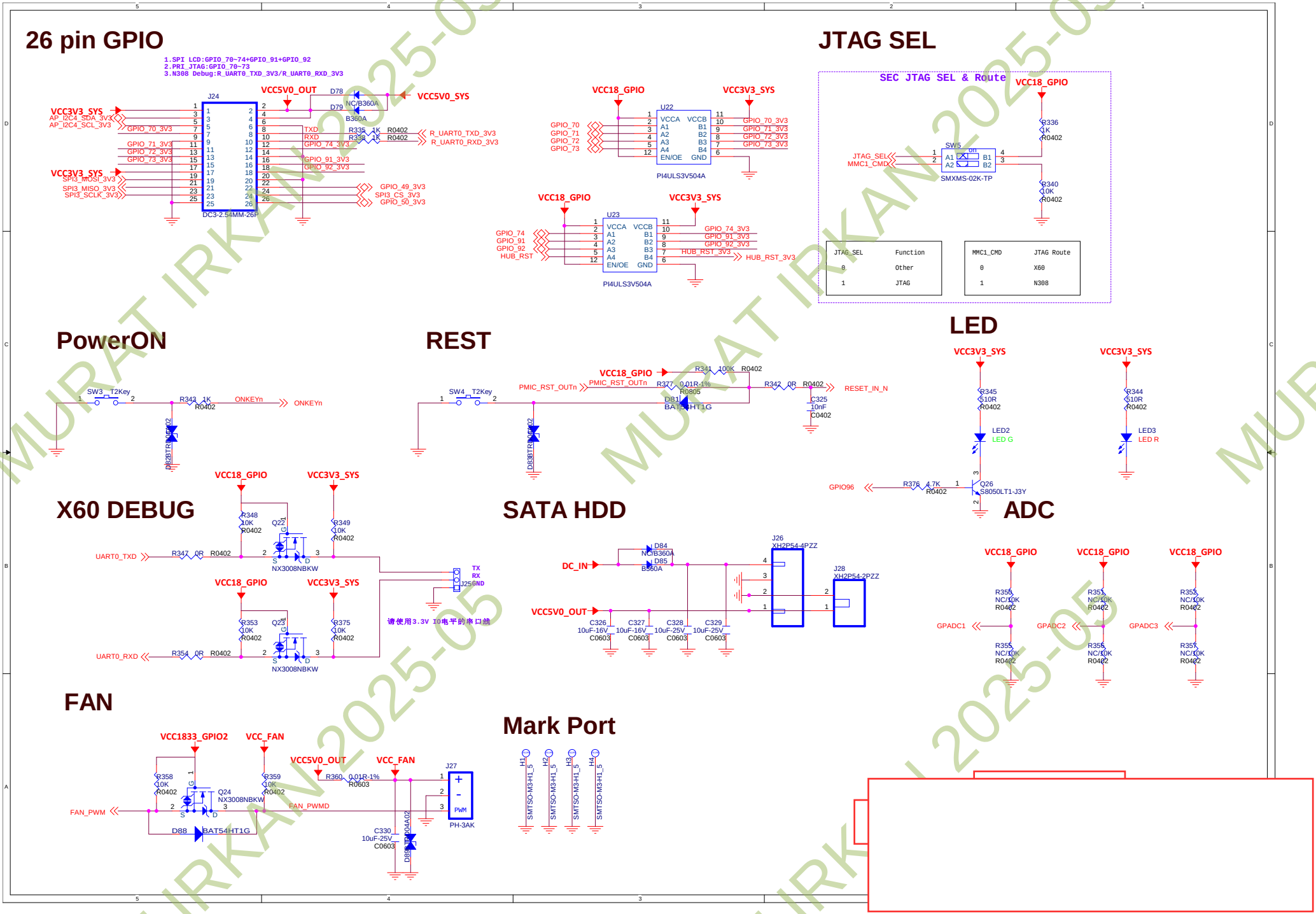


PCIEC



Audio Codec




26 pin GPIO
1.SPI LCD:GPIO_70~74+GPIO_91+GPIO_92
2.PRI_JTAG:GPIO_70~73
3.N308 Debug:R_UART0_TXD_3V3/R_UART0_RXD_3V3
J24
DC3-2.54MM-26P
VCC5V0_OUT
VCC5V0_SYS
VCC3V3_SYS
JTAG SEL
SEC JTAG SEL & Route
VCC18_GPIO
SMXMS-02K-TP
JTAG_SEL
MMC1_CMD
Function
Other
JTAG
JTAG Route
X60
N308
PI4ULS3V504A
PowerON
REST
LED
SW3_T2Key
SW4_T2Key
ONKEYn
PMIC_RST_OUTn
RESET_IN_N
LED2
LED G
LED3
LED R
X60 DEBUG
SATA HDD
ADC
NX3008NBKW
UART0_TXD
UART0_RXD
DC_IN
VCC5V0_OUT
GPADC1
GPADC2
GPADC3
FAN
Mark Port
VCC1833_GPIO2
VCC_FAN
FAN_PWM
FAN_PWMD
PH-3AK
SMTSO-M3-H1_5