# Reference Schematics For RK3588

## RK3588\_AIOT\_REF\_SCH\_V11

### **Main Functions Introduction**

1) PMIC: 1xRK806-1+DiscretePower

2) RAM: 2xLPDDR4/4X\_32bit or 2xLPDDR5\_32bit

3) ROM: eMMC5.1(Default) or SPI Flash

4) Support: 1xSDMMC3.0 Card

5) Support: 1 x TYPEC3.0(With DP TX)+1 x USB3.0 HOST+ 1 x USB20 HOST or USB3.0/2.0 HUB

6) Support: 3 x SATA3.0 Connector (7pin) or SATA PM

7) Support: 1 x 4Lane PCIe3.0 Connector (Dual Mode)

8) Support: 2 x 4Lanes MIPI DPHY RX Camera
9) Support: 2 x 4Lanes MIPI D/CPHY RX Camera

10) Support: 1 x HDMI2.0 RX

11) Support: 2 x HDMI2.1 TX or 2 x eDP1.3 TX

12) Support: 2 x 4Lanes MIPI D/CHY-TX

13) Support: 1xVGA Connector(DP to VGA)

14) Support: 1x4Lanes DP Port

15) Support: a/b/g/n/ac/ax 2T2R WIFI 6/5(PCIE/SDIO) +BT5.0

16) Support: 1x 10/100/1000 RJ45 Port(RGMII) 17) Support: 1x 10/100/1000 RJ45 Port(PCIE)

18) Support: 4G Module 19) Support: PCIE M.2

20) Support: 1xHeadphone+2xSPK+1xAnalog MIC

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Project:	roject: RK3588_AIOT_SCH							
File:	File: 00.Cover Page							
Date:	Wednesday, February 23, 2022 Rev: V1.1							
Designed by:	RZF	Reviewed by:		Sheet:	0 of 99			

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#### Note

The power suffix S0 or S3 means:

S3: Keep power On during sleeping

S0:Power off during sleeping

## Generate Bill of Materials

#### Header:

Item\tPart\tDescription\tPCB Footprint\tReference\tQuantity\tOption

### Combined property string:

{Item}\t{Value}\t{Description}\t{PCB Footprint}\t{Reference}\t{Quantity}\t{Option}

## **Notes**

Component parameter description

1. DNP stands for component not mounted temporarily

2. If Value or option is DNP, which means the area is reserved without being mounted

Please use our recommended components to avoid too many changes. For more informations about the second source, please refer to our AVL.

**Description** 

Note

**Option** 

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Project:	RK3588_AIOT_SCH						
File:	01.Index and Notes						
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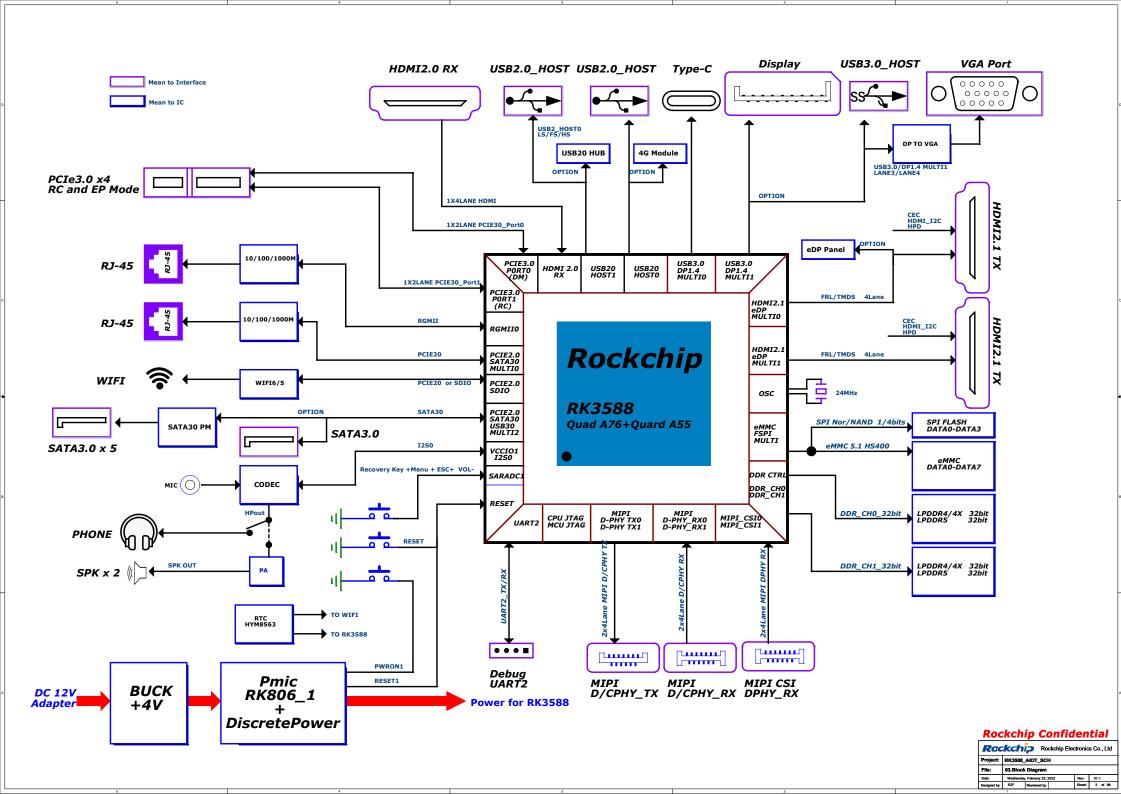
## Revision History

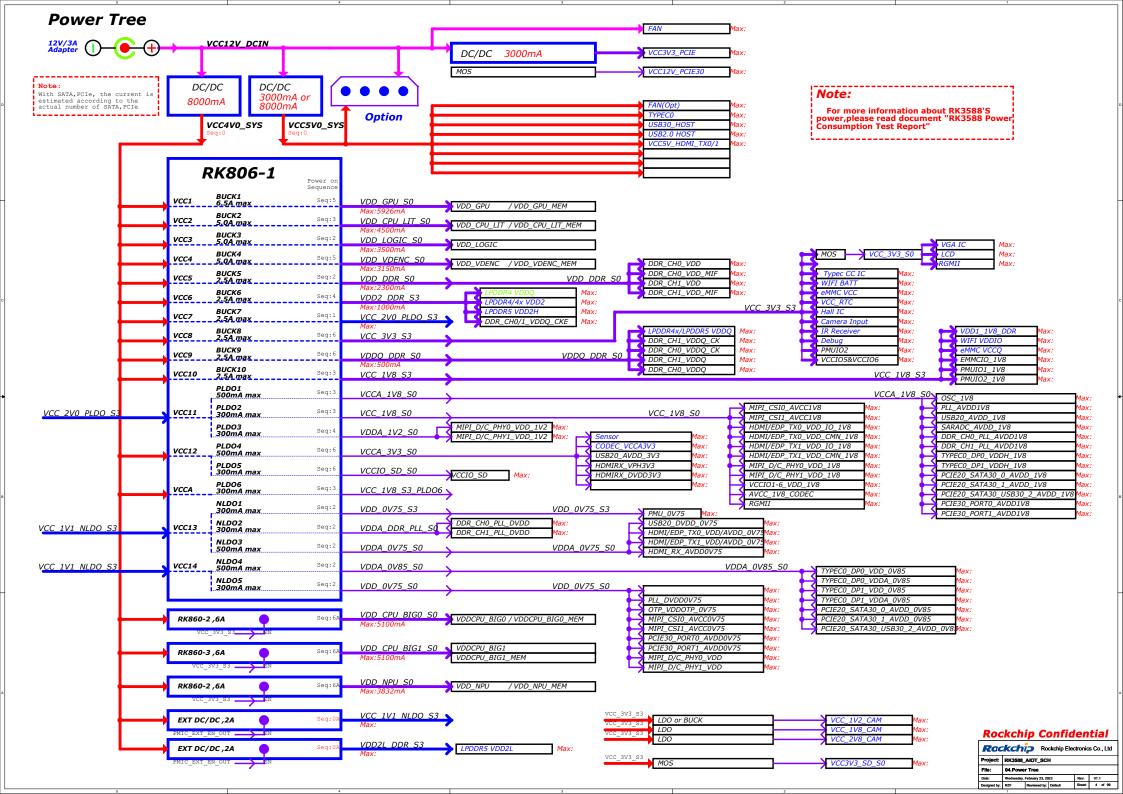
Version	Date	Ву	Change Dsecription	Approved
V1.0	2021-12-28	Felix.ruan	1:Revision preliminary version	Chenw
V1.1	2022-02-15	Felix.ruan	1. 更改C5808-C5810,C5816的电容两边网络一致的问题。 2.C5205-C5208的耐压值改成25V; C5304—C5307的耐压值改成25V; C5614—C5617的耐压值改成25V。 3.C1600,C1608的电容改成1UF/4V。 4.PCIEx1_0_PERSTn_M1_L网络改成PCIEx1_0_PERSTn_M2_L; PCIEx1_0_CLKREQn_M1_L网络改成PCIEx1_0_WAKEn_M1_L/GPIO1_B3网络改成PCIEx1_0_WAKEn_M2_L/GPIO1_B3。 5. 删除预留的电源。VCC_1V8_S3_PLDO6,"VCC1V8_PMU_DDR_S3"网络的电源直接接VCC_1V8_S3。 6."VGA_HPDIN_L"(Pin AK27)与"SDMMC_PWREN"(Pin T28)的IO分配互换。7.为了减少待机功耗,PMUIO2的供电电源改成1.8V。8.L2300,L2301,L2203,L2205,L2207,L2303的电感0.22uH(TDK)改为0.24uH(Sunlord,L2201的电感0.22uH(TDK)改为0.22uH(Sunlord),封装IND_404020。9.R2001电阻封装改0805。 10.C4900改为NC,R4911的47K改为2K,R4908的100K改为10K,R4909的100K改为10K。11.eARC的功能不支持,相关eARC的网络改成"HDMIO/1_TX_SBDP/N"	;

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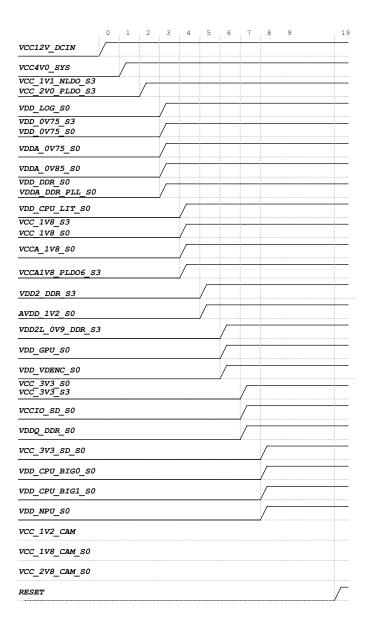
Rockchip Electronics Co., Ltd							
Project: RK3588_AIOT_SCH							
File: 02.Revision History							
Date:	Wednesday	, February 23, 2	Rev:	V1.1			
Designed by:	RZF	Reviewed by:		Sheet:	2 of 99		

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## **Power Sequence**



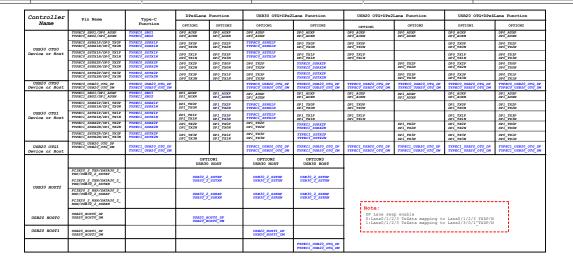
Power Supply	PMIC Channel	Supply Limit	Power Name	Time Slot	Default Voltage	Default ON/OFF	Sleep ON/OFF	Peak Current	Sleep Current
VCC4V0 SYS	RK806-1 BUCK1	6.5A	VDD_GPU_S0	Slot:5	0.75V	ON	OFF	TBD	TBD
	RK806-1 BUCK2	5A	VDD_CPU_LIT_S0	Slot:3	0.75V	ON	OFF	TBD	TBD
VCC4V0 SYS	RK806-1_BUCK3	5A	VDD_LOG_S0	Slot:2	0.75V	ON	OFF	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK4	3A	VDD_VDENC_S0	Slot:5	0.75V	ON	OFF	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK5	2.5A	VDD_DDR_S0	Slot:2	0.85V	ON	OFF	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK6	2.5A	VDD2_DDR_S3	Slot:4	ADJ FB=0.5V	ON	ON	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK7	2.5A	VCC_2V0_PLDO_S3	Slot:1	2.0V	ON	ON	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK8	2.5A	VCC_3V3_S3	Slot:6	3.3V	ON	ON	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK9	2.5A	VDDQ_DDR_S0	Slot:6	ADJ FB=0.5V	ON	OFF	TBD	TBD
VCC4V0_SYS	RK806-1_BUCK10	2.5A	VCC_1V8_S3	Slot:3	1.8V	ON	ON	TBD	TBD
	RK806-1_PLD01	0.5A	VCCA_1V8_S0	Slot:3	1.8V	ON	OFF	TBD	TBD
/CC_2V0_PLDO	RK806-1_PLDO2	0.3A	VCC_1V8_S0	Slot:3	1.8V	ON	OFF	TBD	TBD
	RK806-1_PLDO3	0.3A	VDDA_1V2_S0	Slot:4	1.2V	ON	OFF	TBD	TBD
	RK806-1_PLDO4	0.5A	VCCA_3V3_S0	Slot:6	3.3V	ON	OFF	TBD	TBD
	RK806-1_PLDO5	0.3A	VCCIO_SD_S0	Slot:6	3.3V	ON	OFF	TBD	TBD
	RK806-1_PLDO6	0.3A	VCCA1V8_PLDO6_S3	Slot:3	1.8V	ON	ON	TBD	TBD
	RK806-1_NLDO1	0.3A	VDD_0V75_S3	Slot:2	0.75V	ON	ON	TBD	TBD
CC 1V1 NLDO	RK806-1 NLDO2	0.3A	VDDA DDR PLL SO	Slot:2	0.85V	ON	OFF	TBD	TBD
	RK806-1_NLDO3	0.5A	VDDA_0V75_S0	Slot:2	0.75V	ON	OFF	TBD	TBD
	RK806-1 NLDO4	0.5A	VDDA_0V85_S0	Slot:2	0.85V	ON	OFF	TBD	TBD
CC_1V1_NLDC	RK806-1_NLDO5	0.3A	VDD_0V75_S0	Slot:2	0.75V	ON	OFF	TBD	TBD
VCC4V0 SYS	BUCK RK860-2	6A	VDD_CPU_BIGO_SO	Slot:6A	0.75V	ON	OFF	TBD	TBD
VCC4V0 SYS	BUCK RK860-3	6A	VDD_CPU_BIG1_S0	Slot:6A	0.75V		OFF	TBD	TBD
VCC4V0 SYS	BUCK RK860-2	6A	VDD NPU_S0	Slot:6A	0.75V	ON	OFF	TBD	TBD
	EXT BUCK	2A	VCC_1V1_NLDO_S3	Slot:1	1.1V	ON	ON	TBD	TBD
	EXT BUCK	2A	VDD2L OV9 DDR S3	Slot:5	0.9V	ON	ON	TBD	TBD
VCC4V0_SYS	EXT BUCK	2.5A	VCC_3V3_SD_S0	Slot:6A	3.3V	ON	OFF	TBD	TBD
VCC 3V3 S3	EXT_BUCK	2A	VCC_1V2_CAM_S0	OFF	1.2V	OFF	OFF	TBD	TBD
VCC 3V3 S3	LDO PT5108	0.5A	VCC_1V8_CAM_S0	OFF	1.8V	OFF	OFF	TBD	TBD
	LDO_PT5108	0.5A	VCC 2V8 CAM SO	OFF	2.8V	OFF	OFF	TBD	TBD

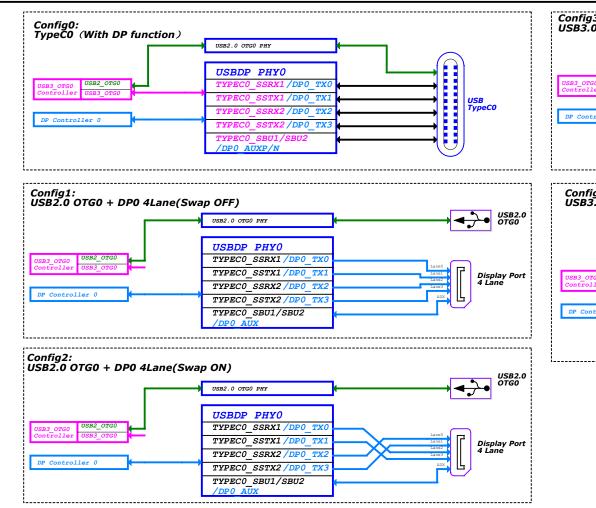
## IO Power Domain Map

IO Domain	Pin Num	Support IO Voltage	Supply Power Pin Name	Power Source	IO Operating Voltage
PMUIO1	Pin N28	1.8V Only	PMUIO1_1V8	VCC_1V8_53	1.8V
PMUIO2	Pin R27 Pin P28	1.8V or 3.3V	PMUIO2_1V8 PMUIO2	VCC_1V8_S3	1.8V
EMMCIO	Pin V26	1.8V Only	EMMCIO_1V8	VCC_1V8_S0	1.8V
VCCI01	Pin G20	1.8V Only	VCCIO1_1V8	VCC_1V8_S0	1.8V
VCCIO2	Pin AA7 Pin Y7	1.8V or 3.3V	VCCIO2_1V8 VCCIO2	VCC_1V8_S0 VCC_IO_SD	1.8V/3.3V
VCCI03	Pin Y26	1.8V Only	VCCIO3_1V8	VCC_1V8_S0	1.8V
VCCIO4	Pin H20 Pin H21	1.8V or 3.3V	VCCIO4_1V8 VCCIO4	VCC_1V8_S0 VCC_1V8_S0	1.8V
VCCI05	Pin W25 Pin W26	1.8V or 3.3V	VCCIO5_1V8 VCCIO5	VCC_1V8_S0 VCC_3V3_S0	3.3V
VCCIO6	Pin AC25 Pin AC26	1.8V or 3.3V	VCCIO6_1V8 VCCIO6	VCC_1V8_S0 VCC_3V3_S0	3.3V

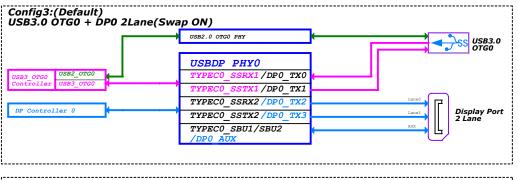
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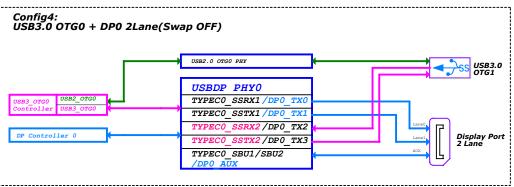
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Project:	RK3588_	RK3588_AIOT_SCH						
File:	05.System Power Sequence							
Date:	Wednesday, February 23, 2022 Rev: V1.1							
Designed by:	RZF	Reviewed by:	<checker></checker>	Sheet:	5 of 99			





**USB Controller Configure Table** 



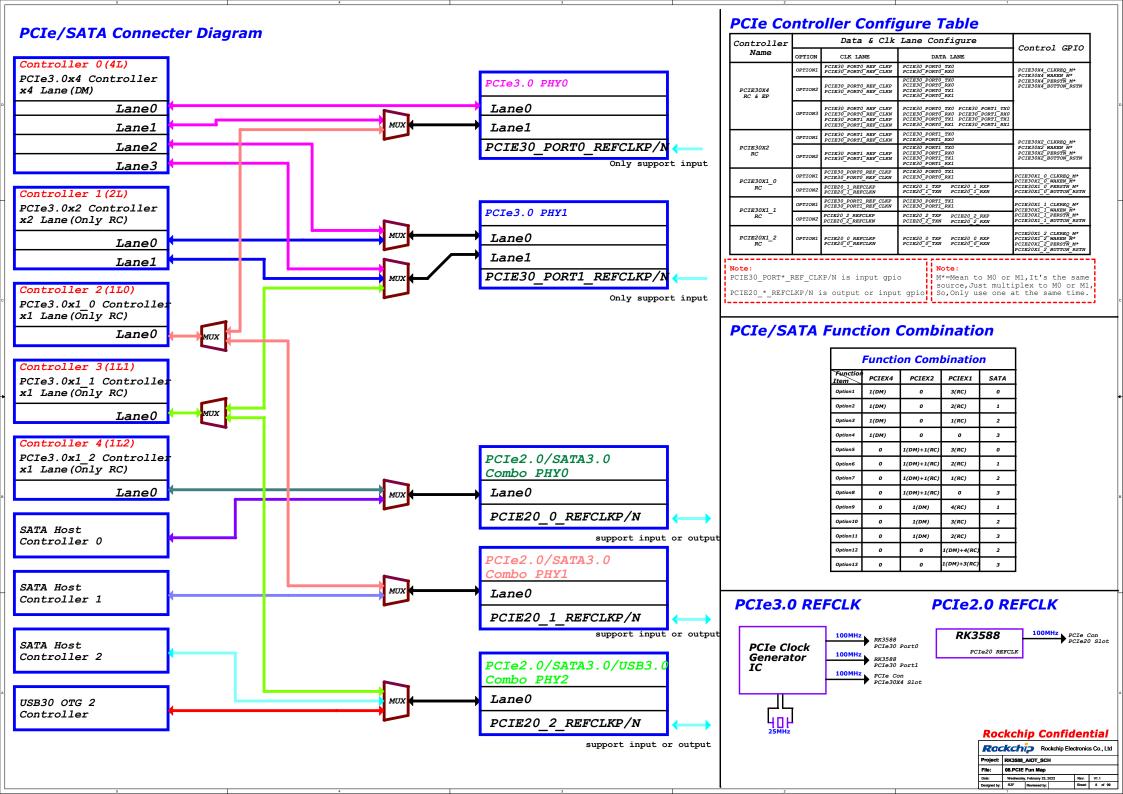


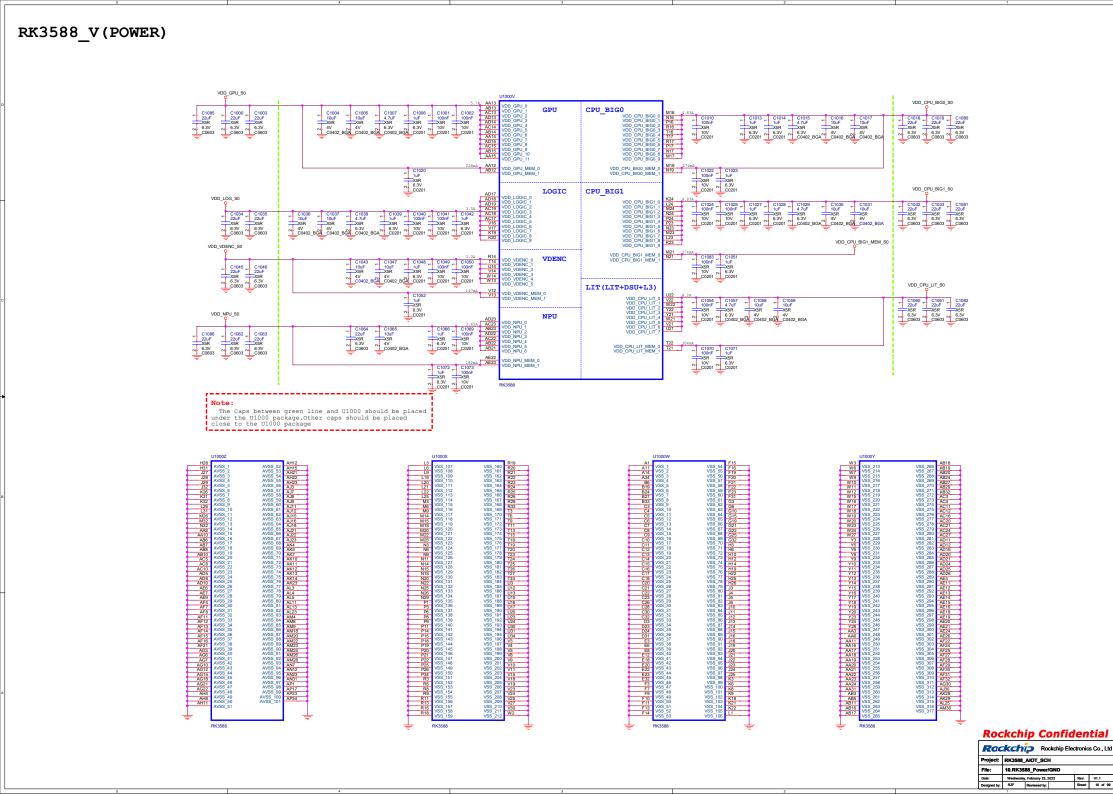
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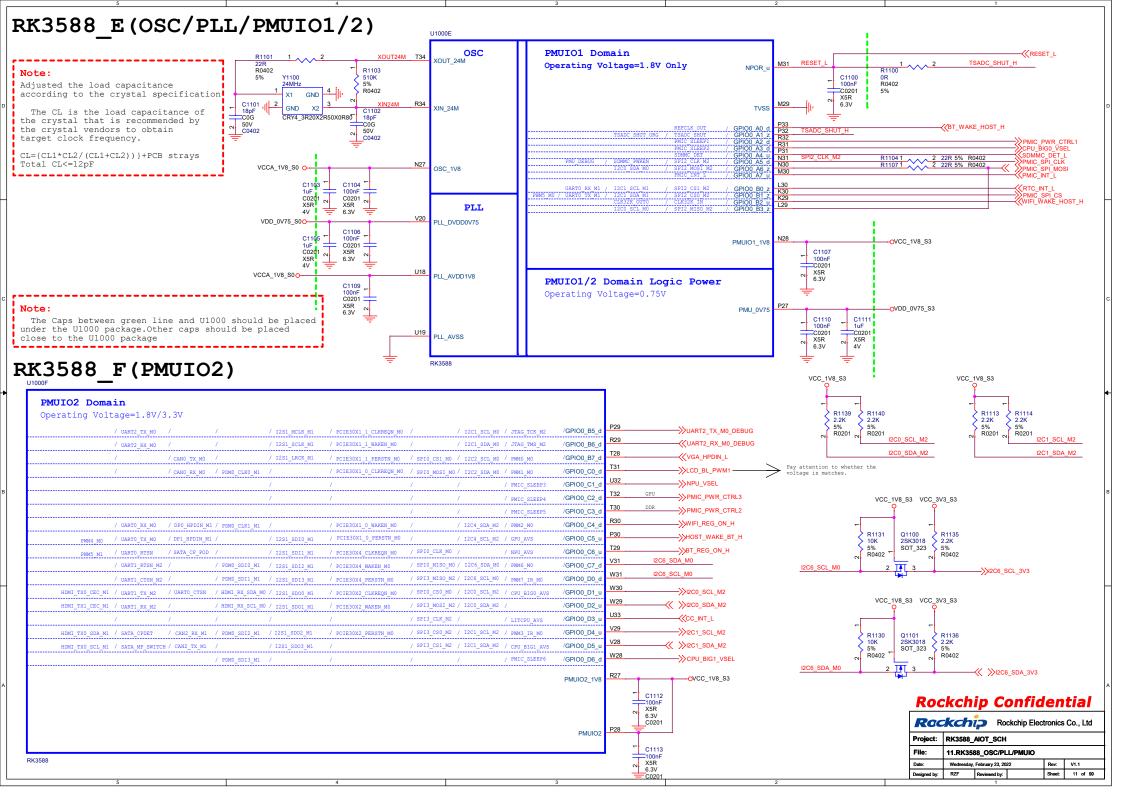
Rockchip Rockchip Electronics Co., Ltd

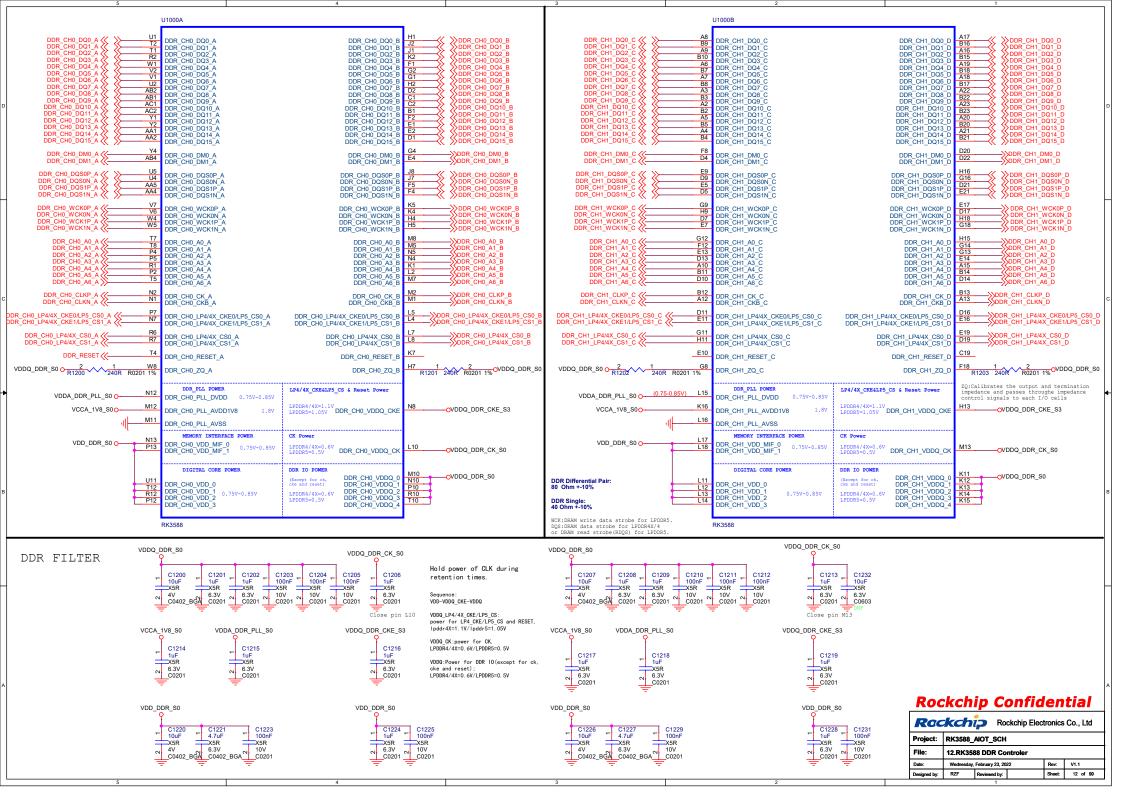
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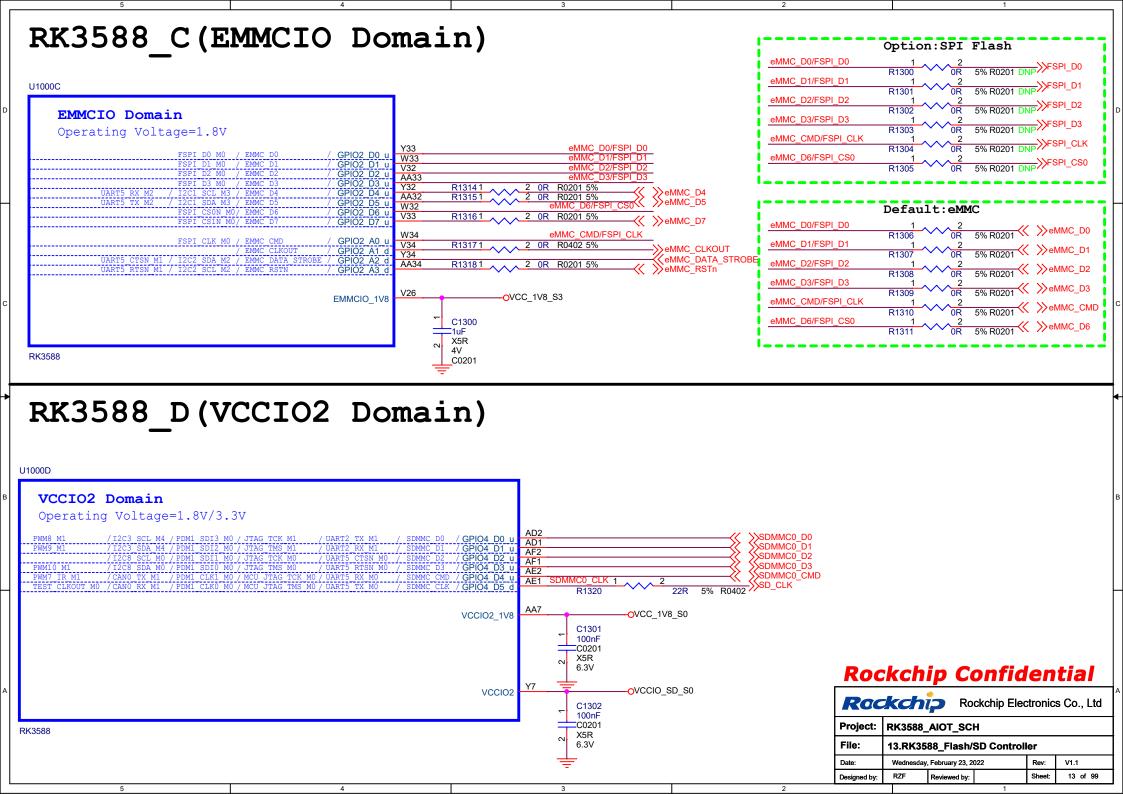
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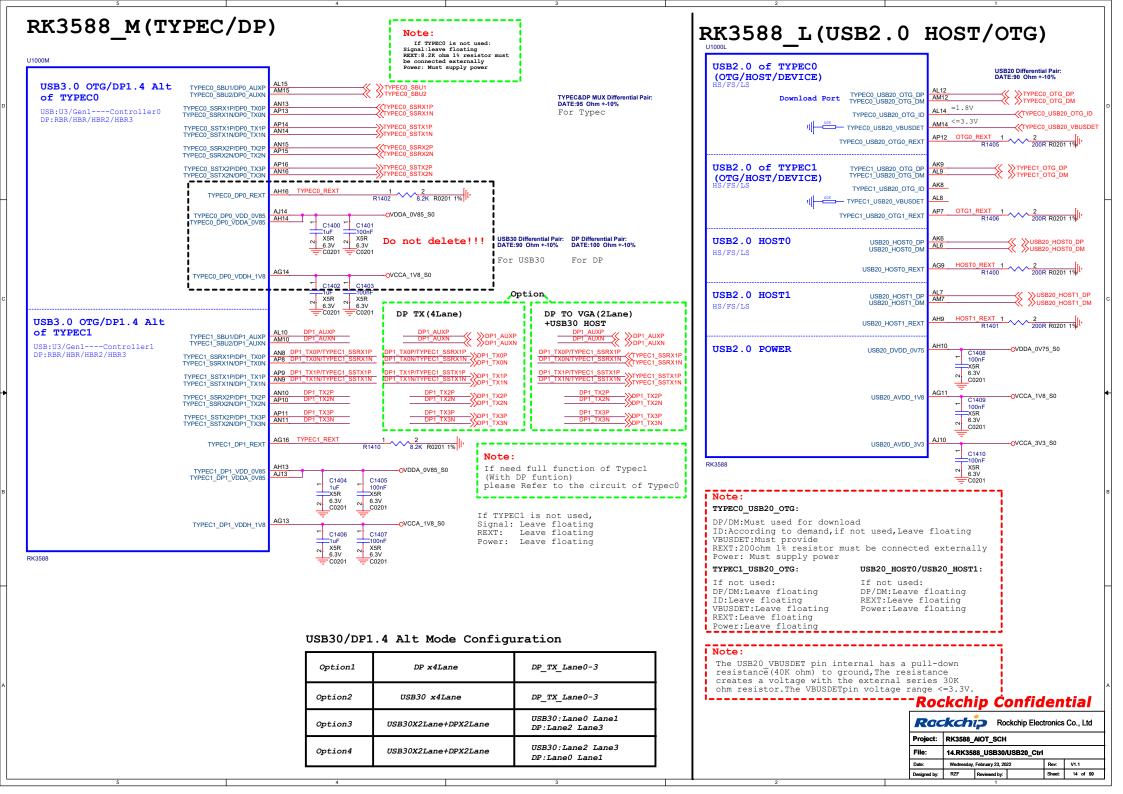


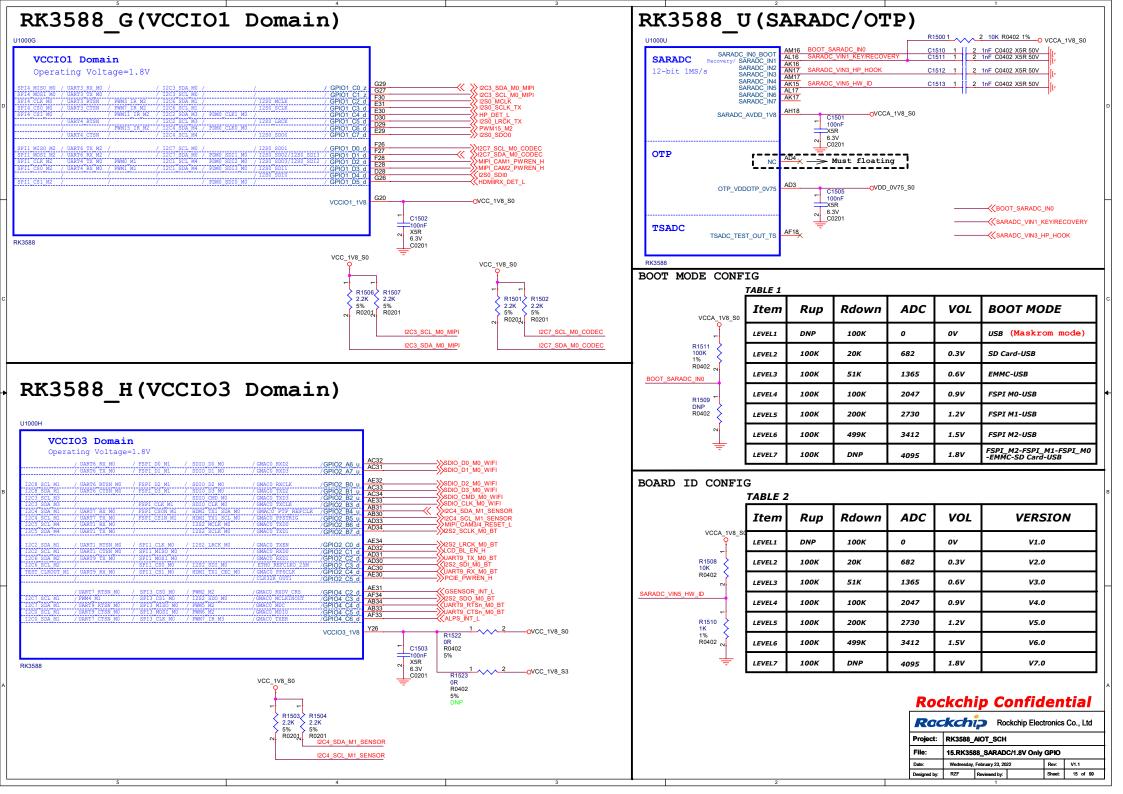


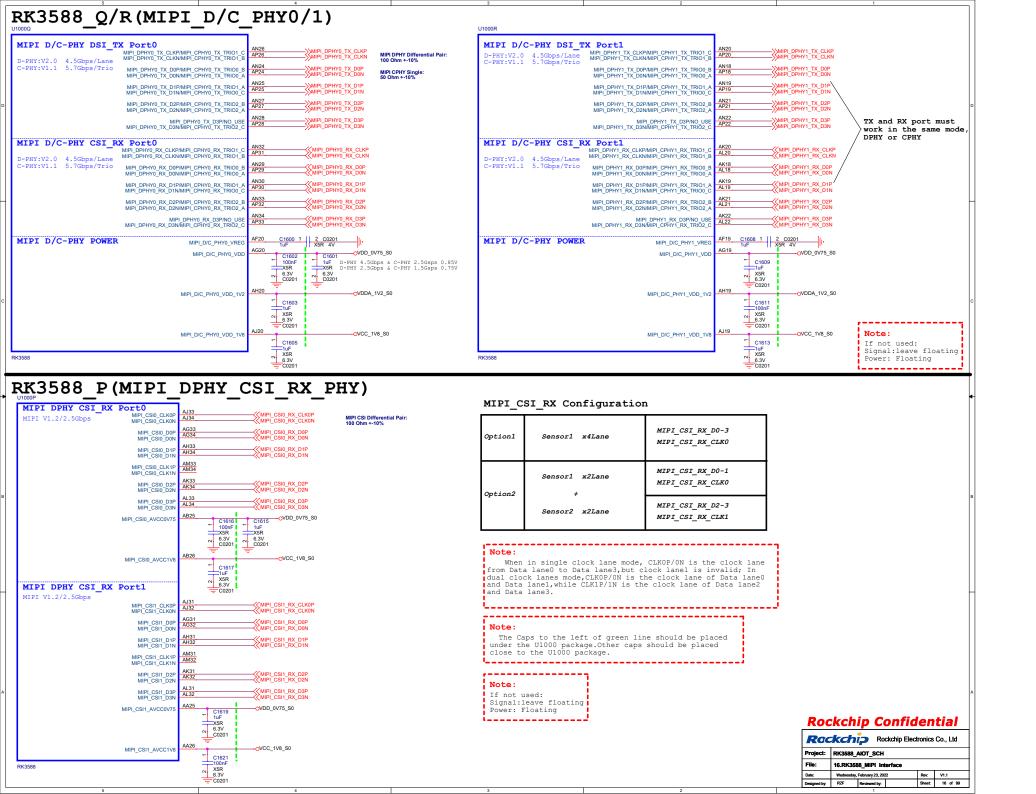


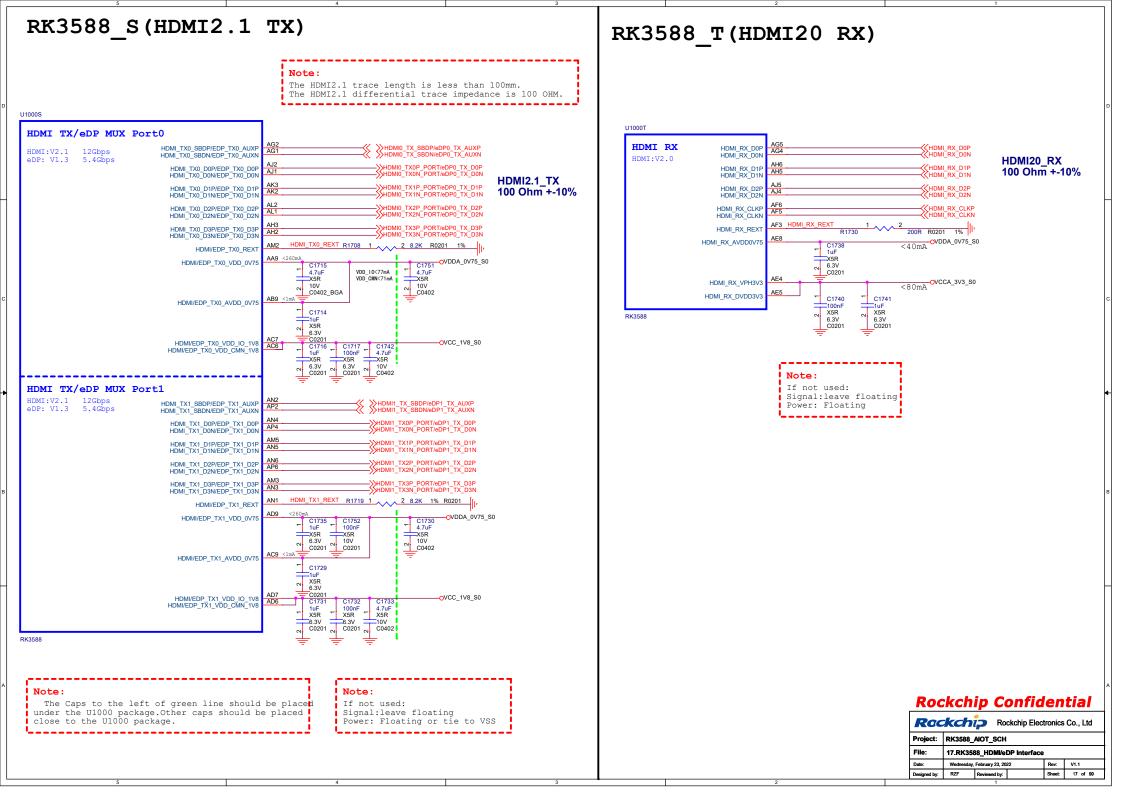


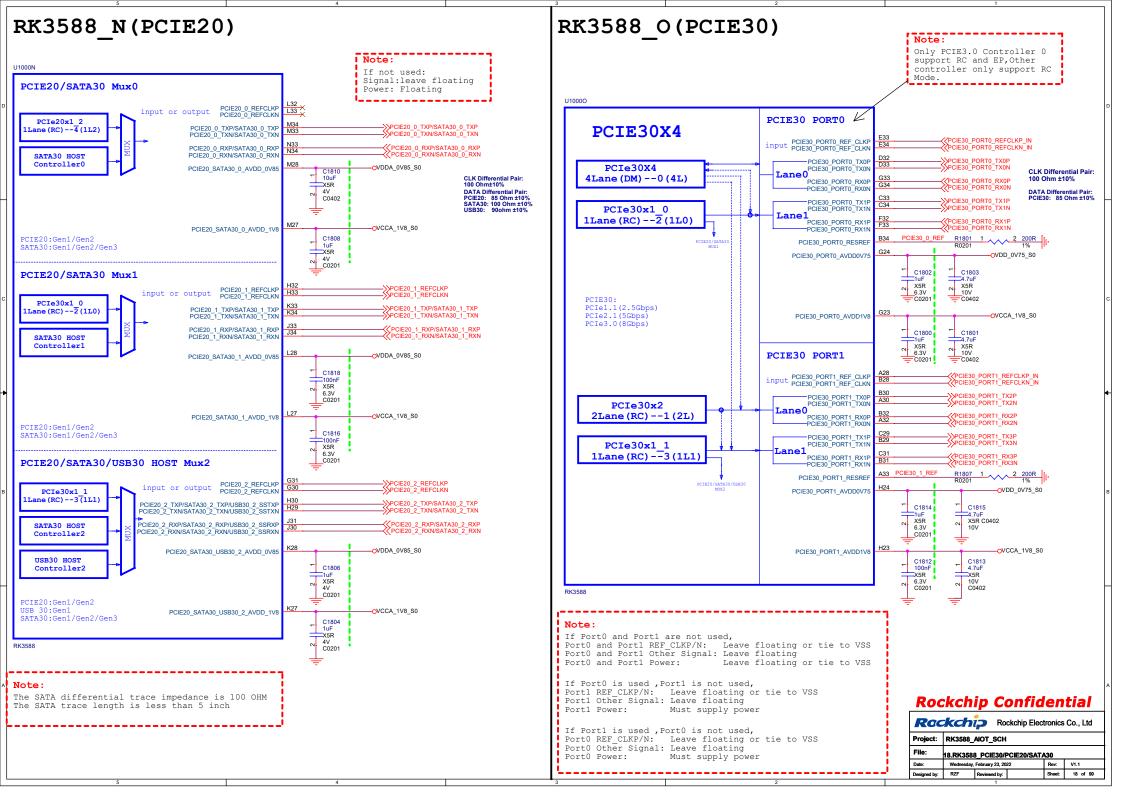




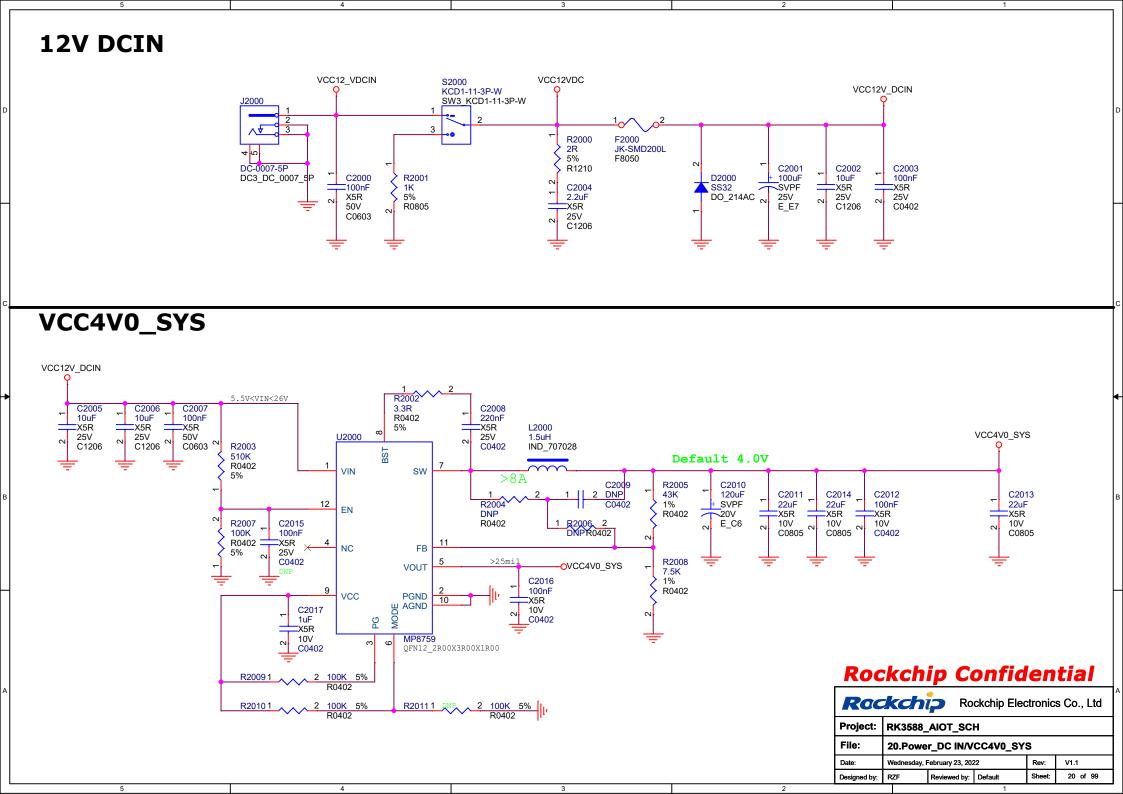


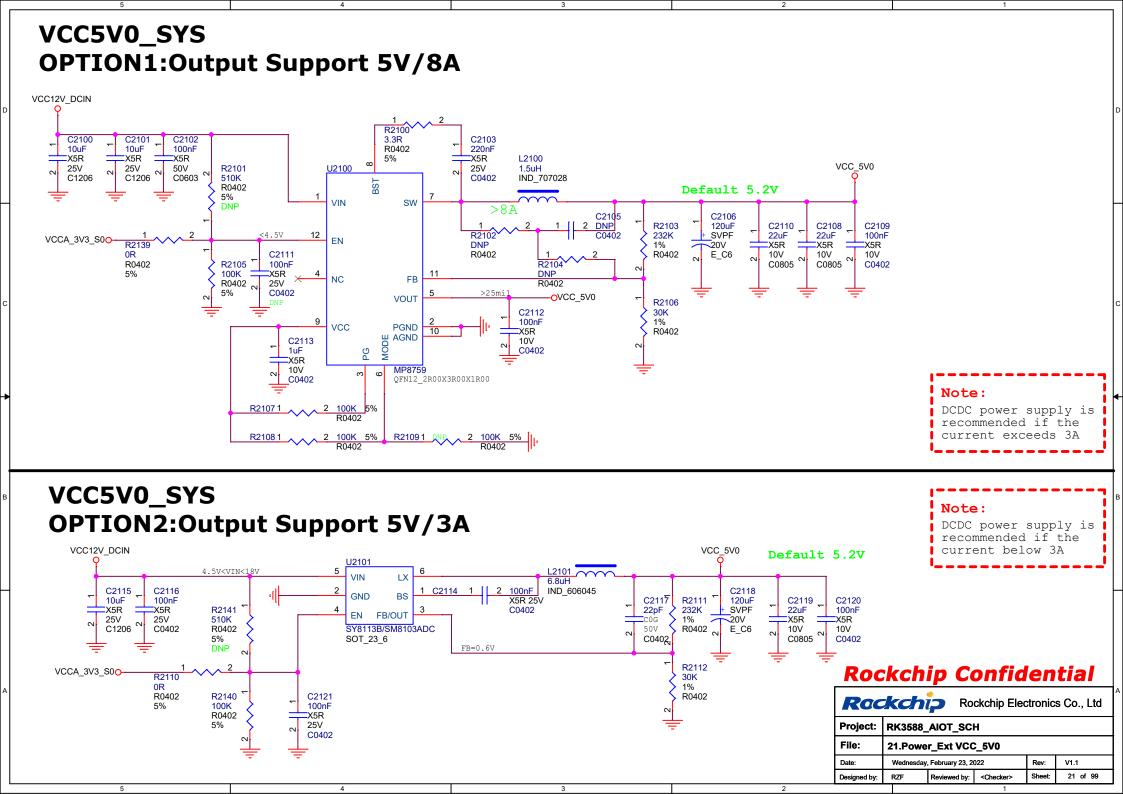


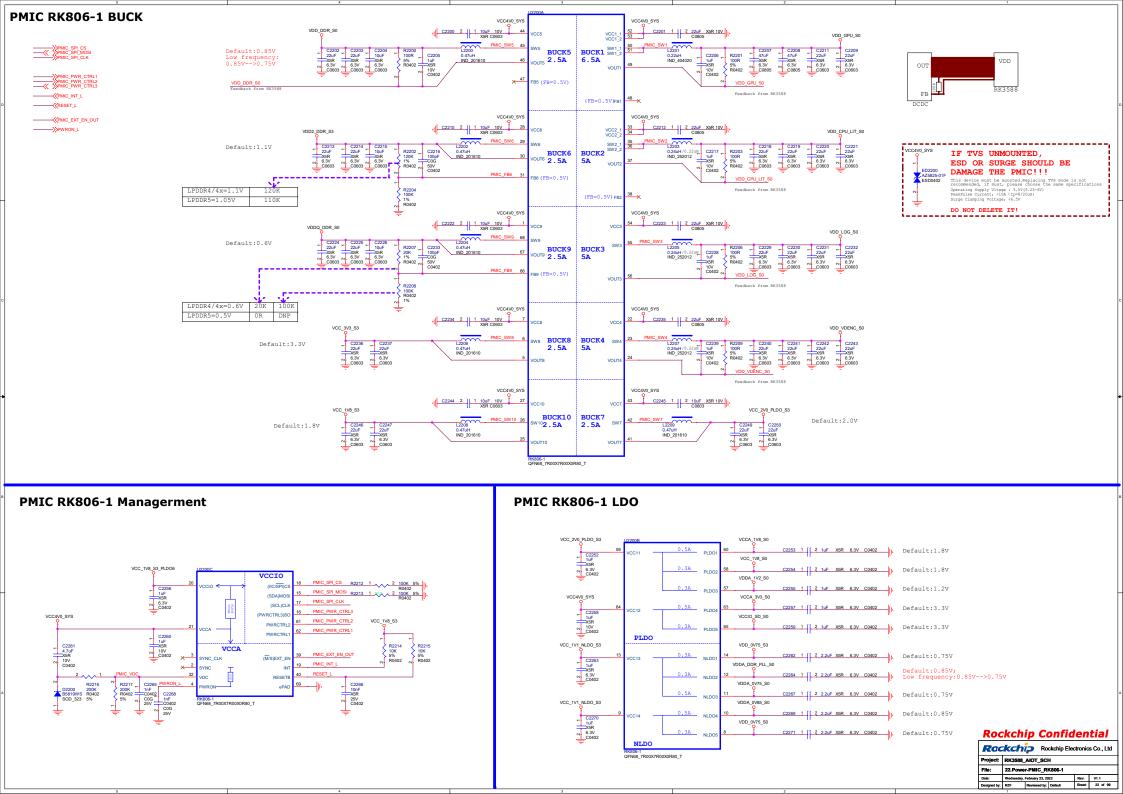


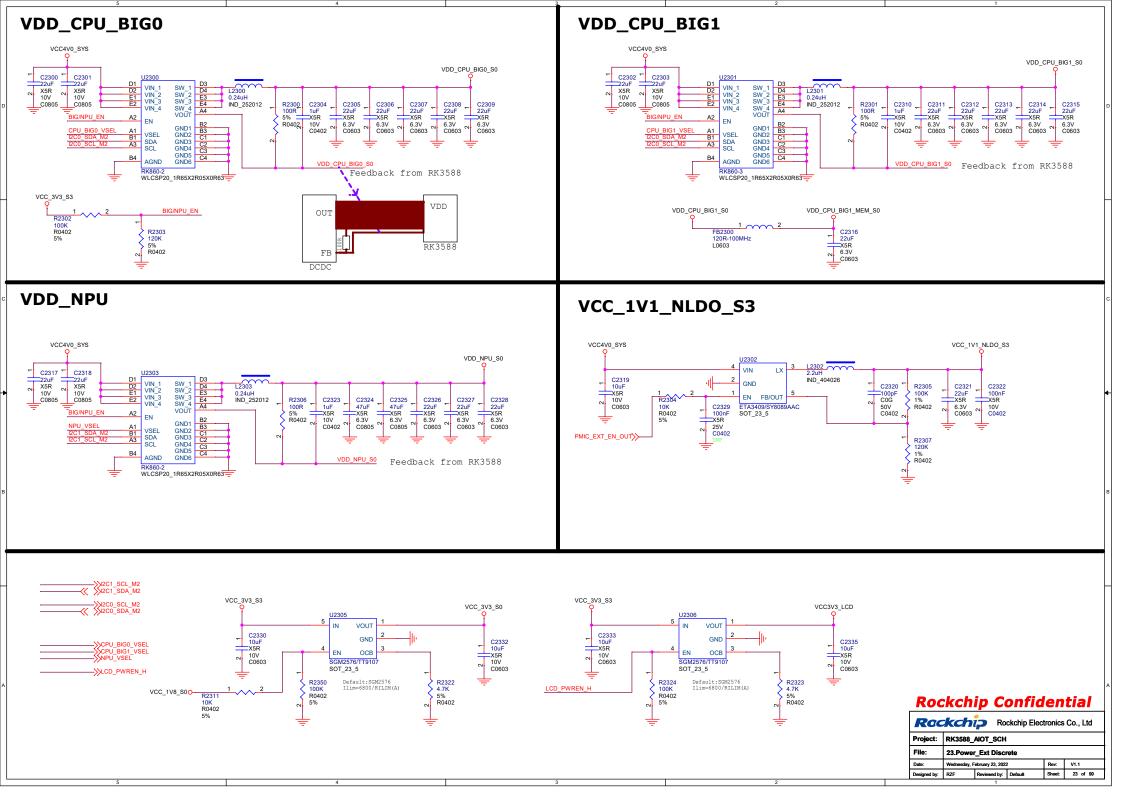


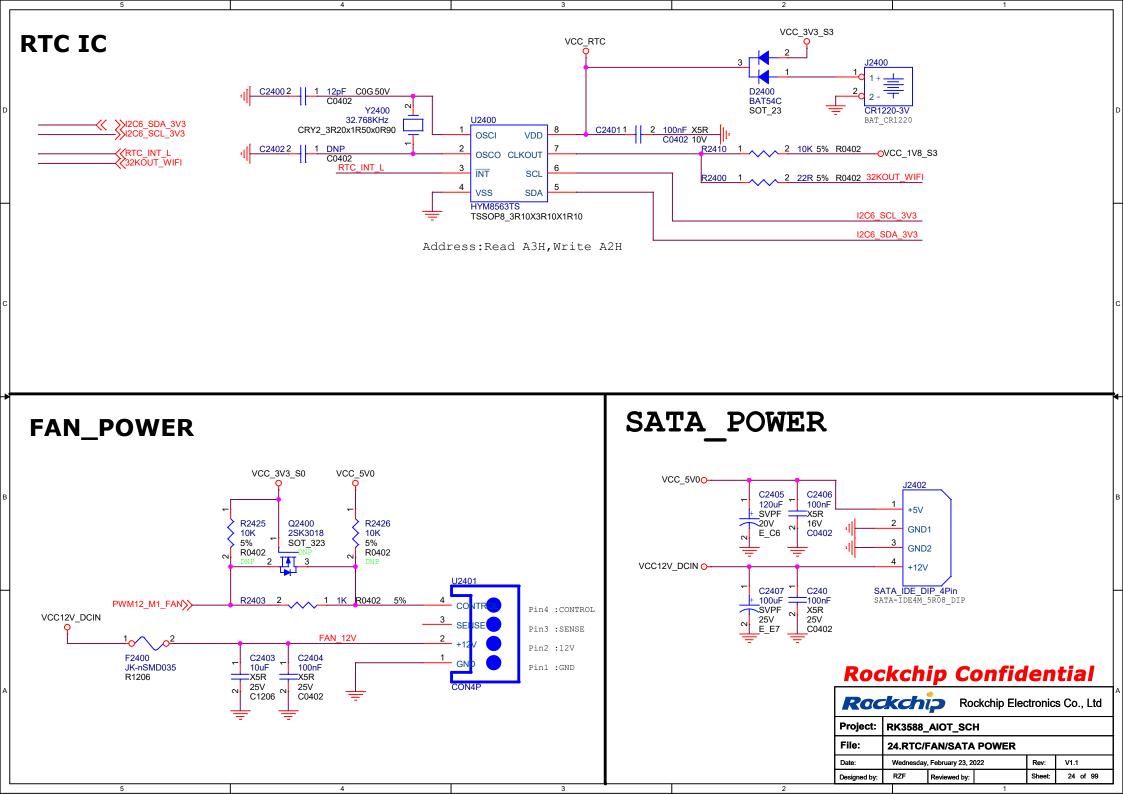


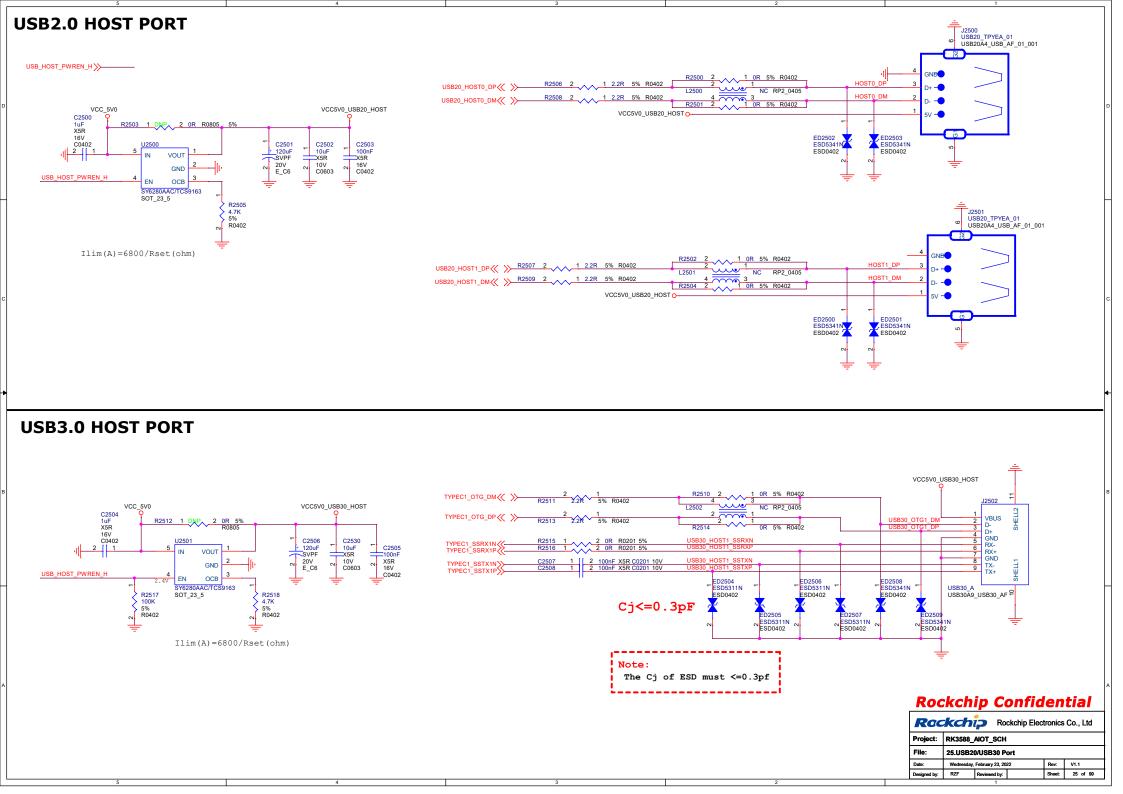


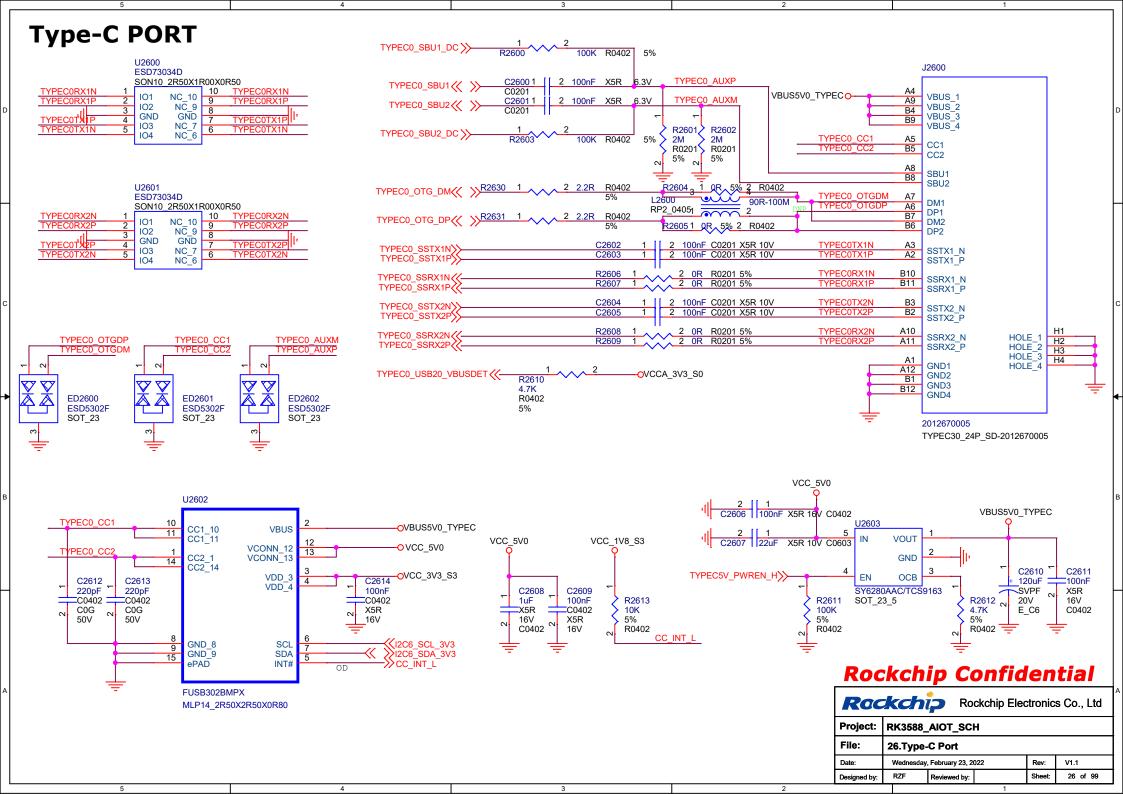


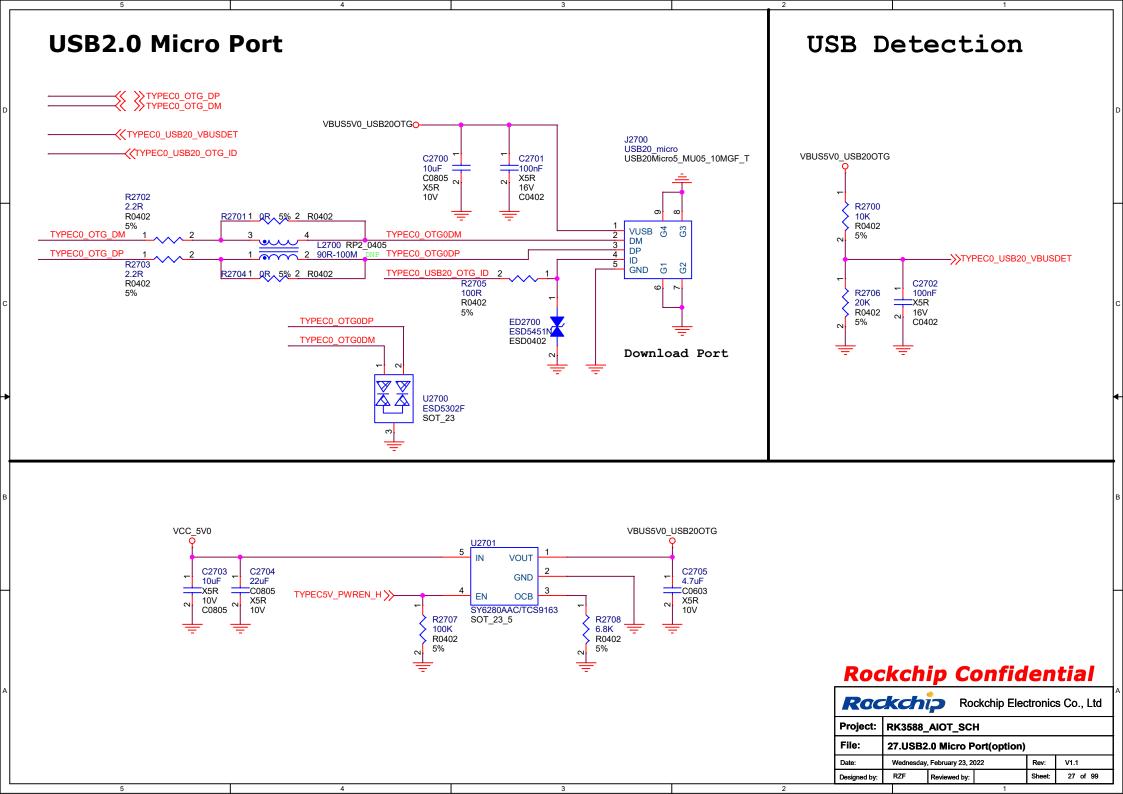


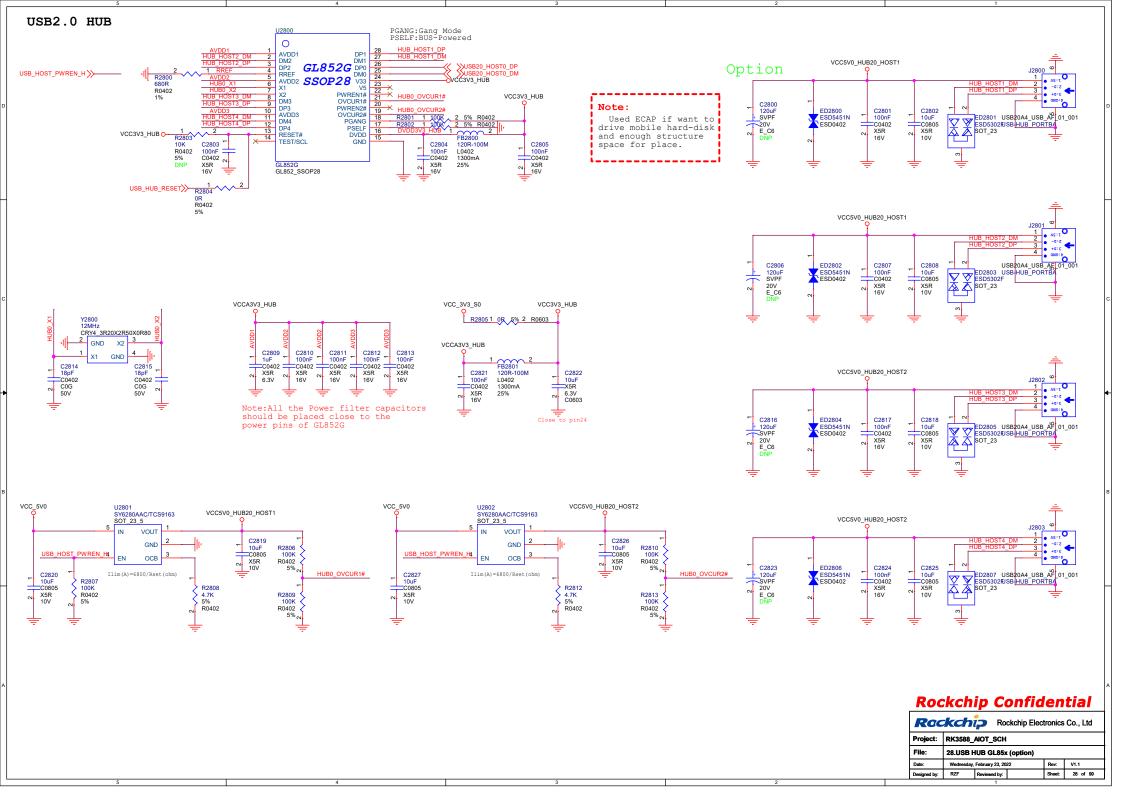


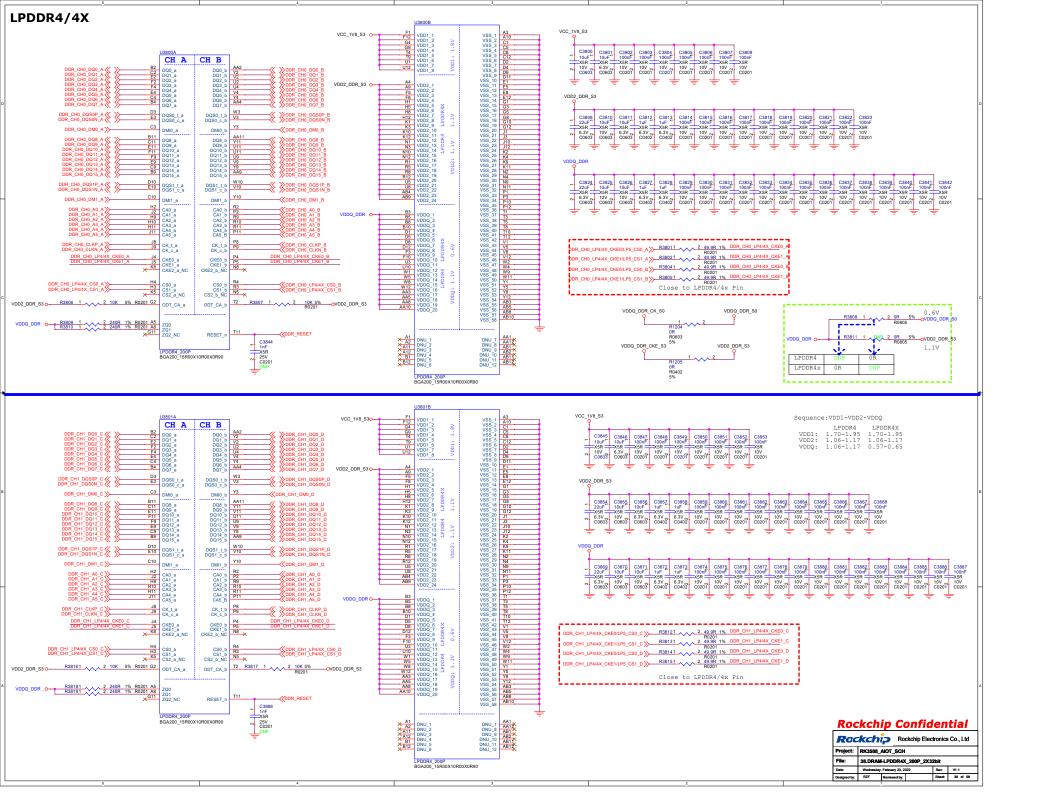


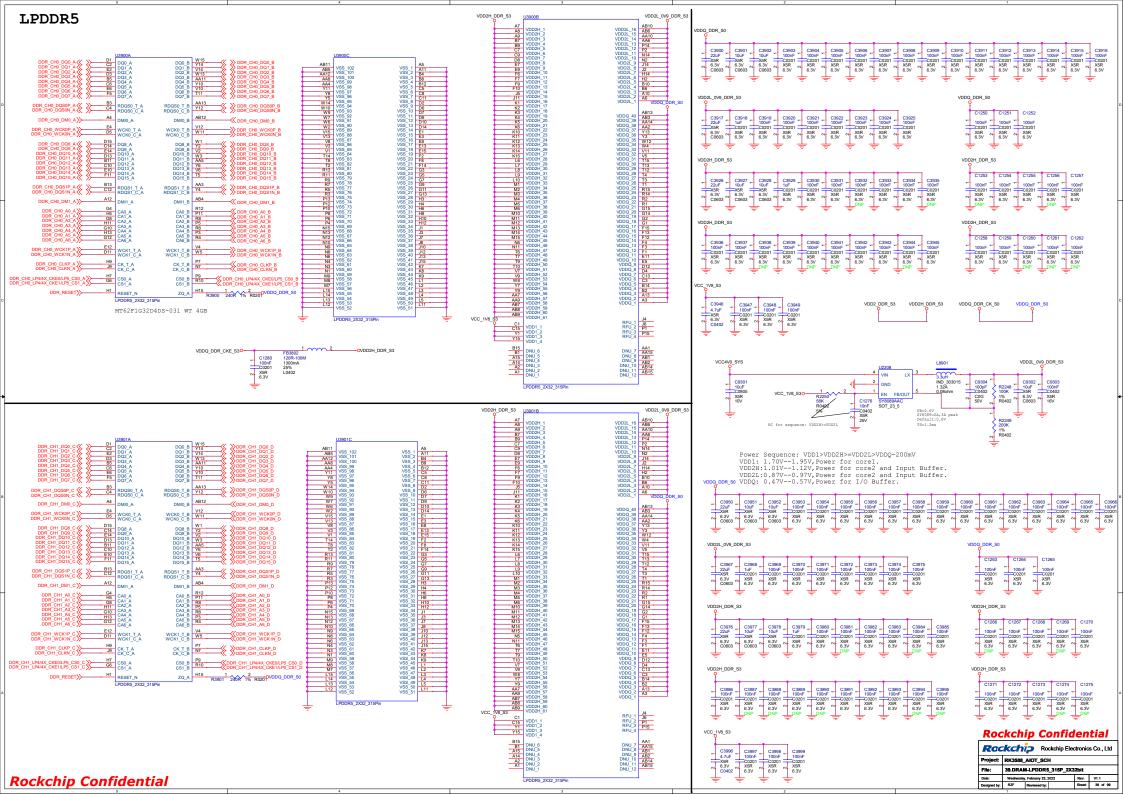


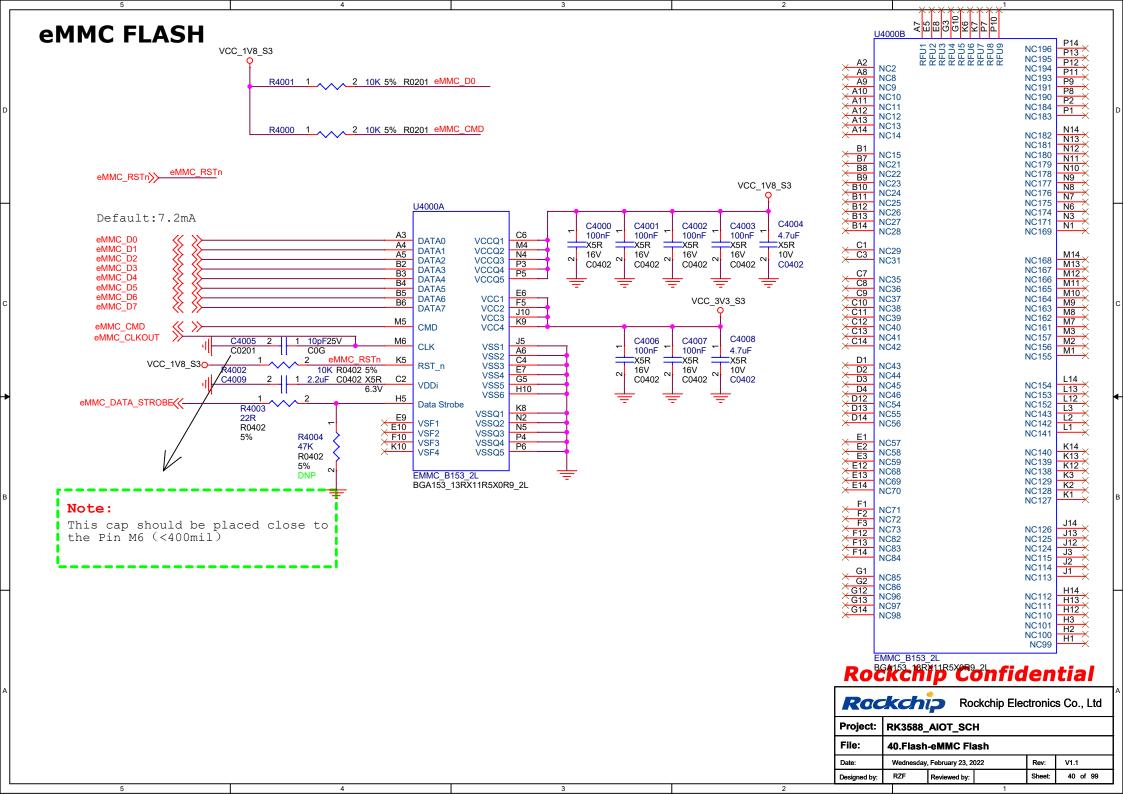


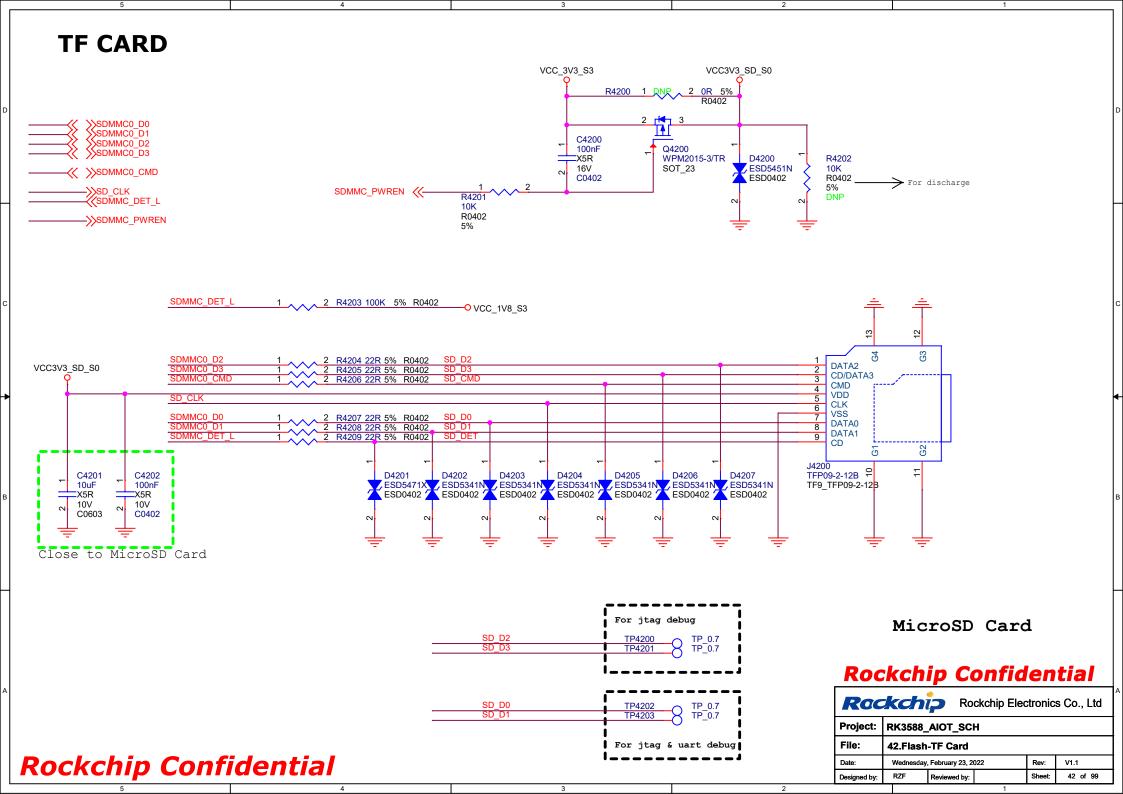


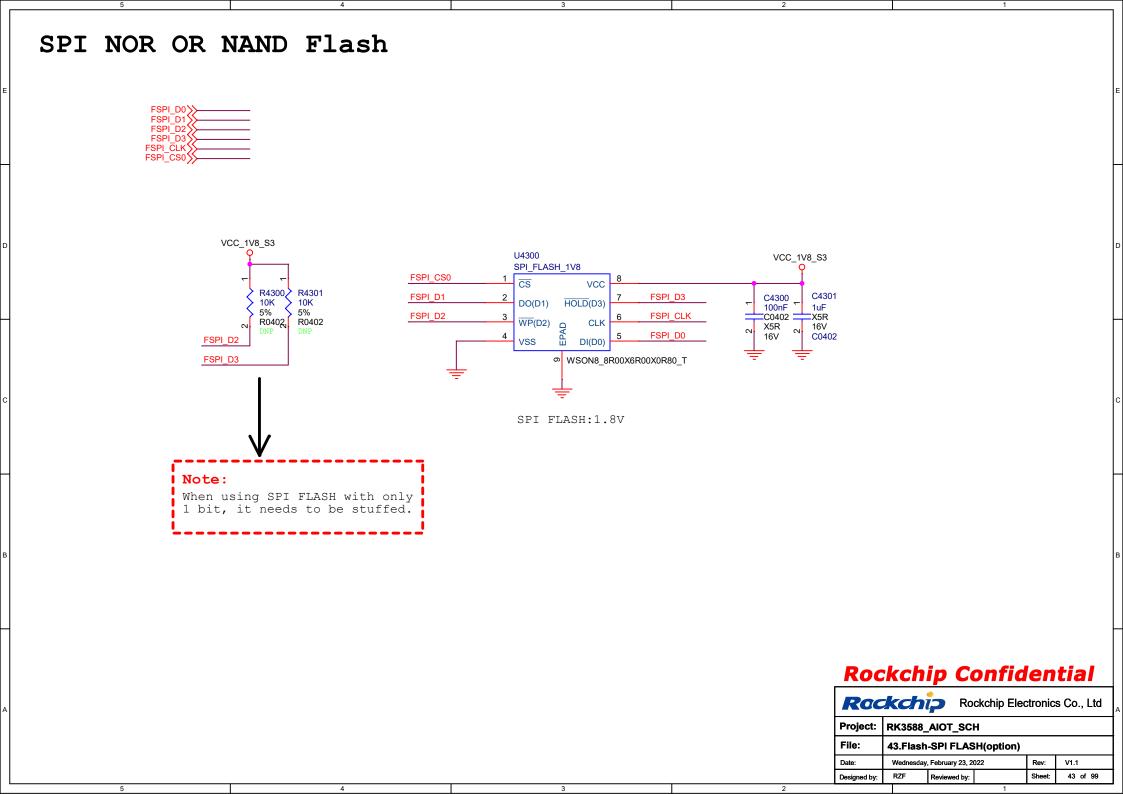


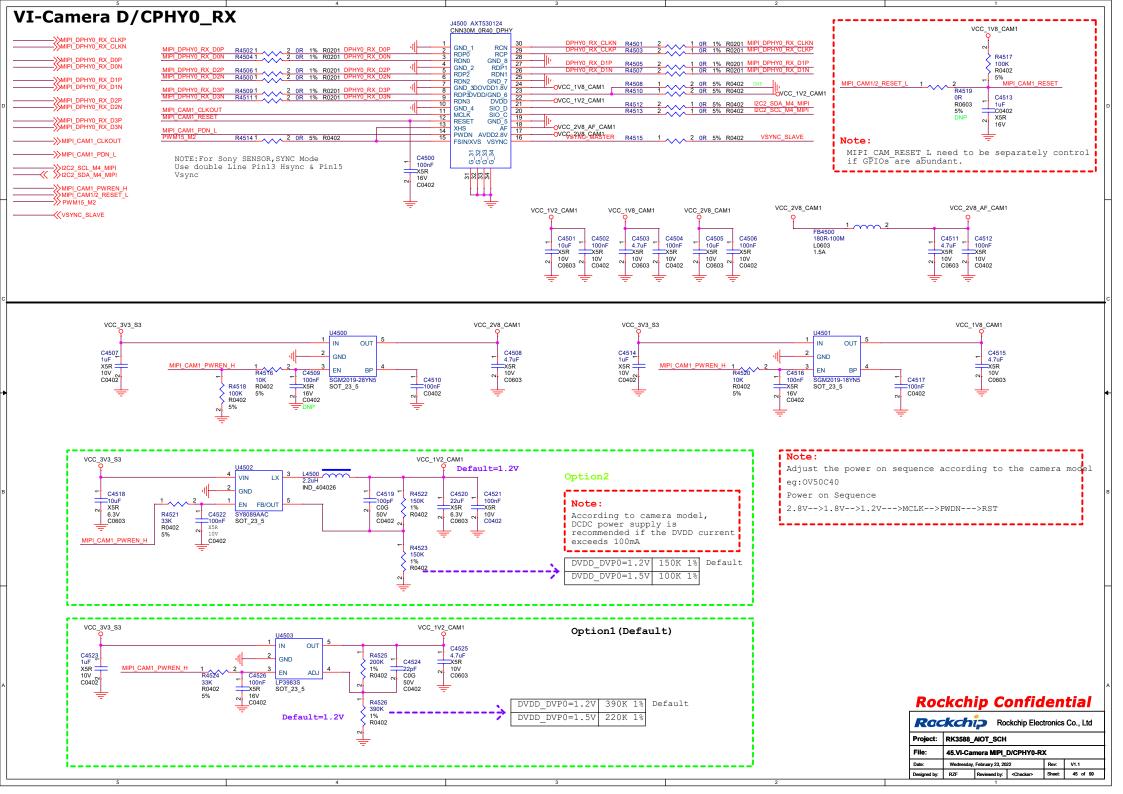


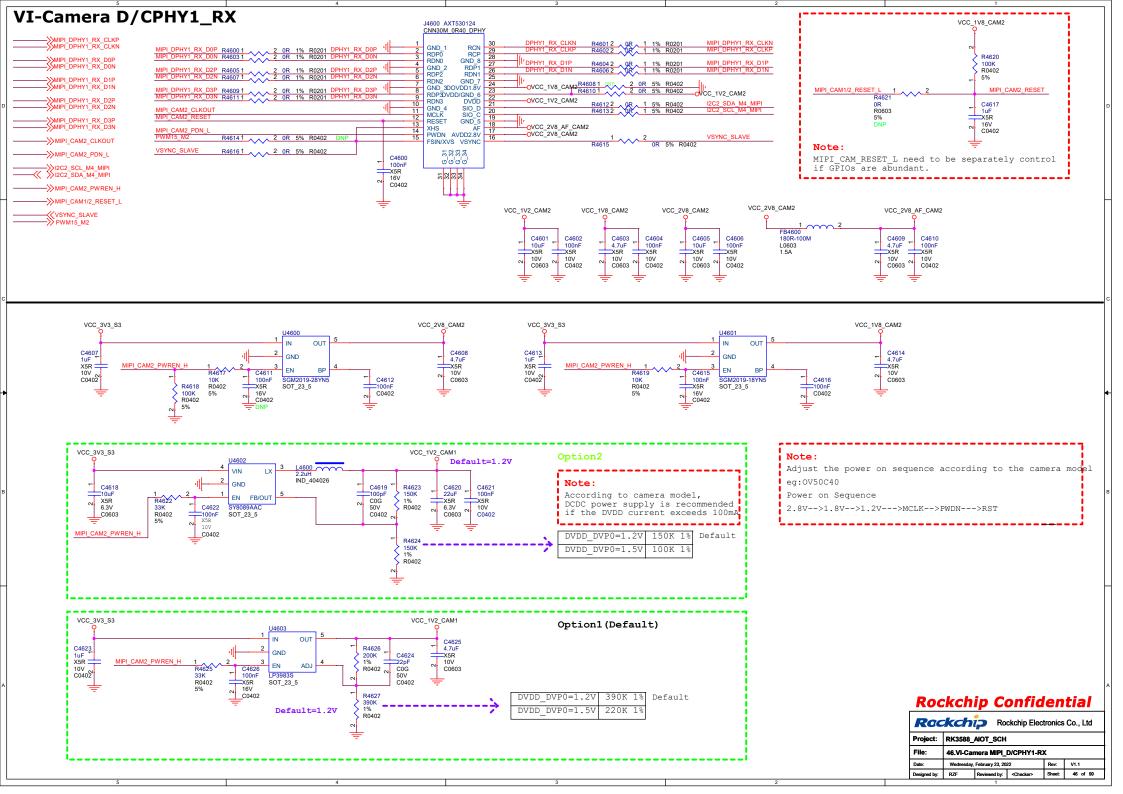


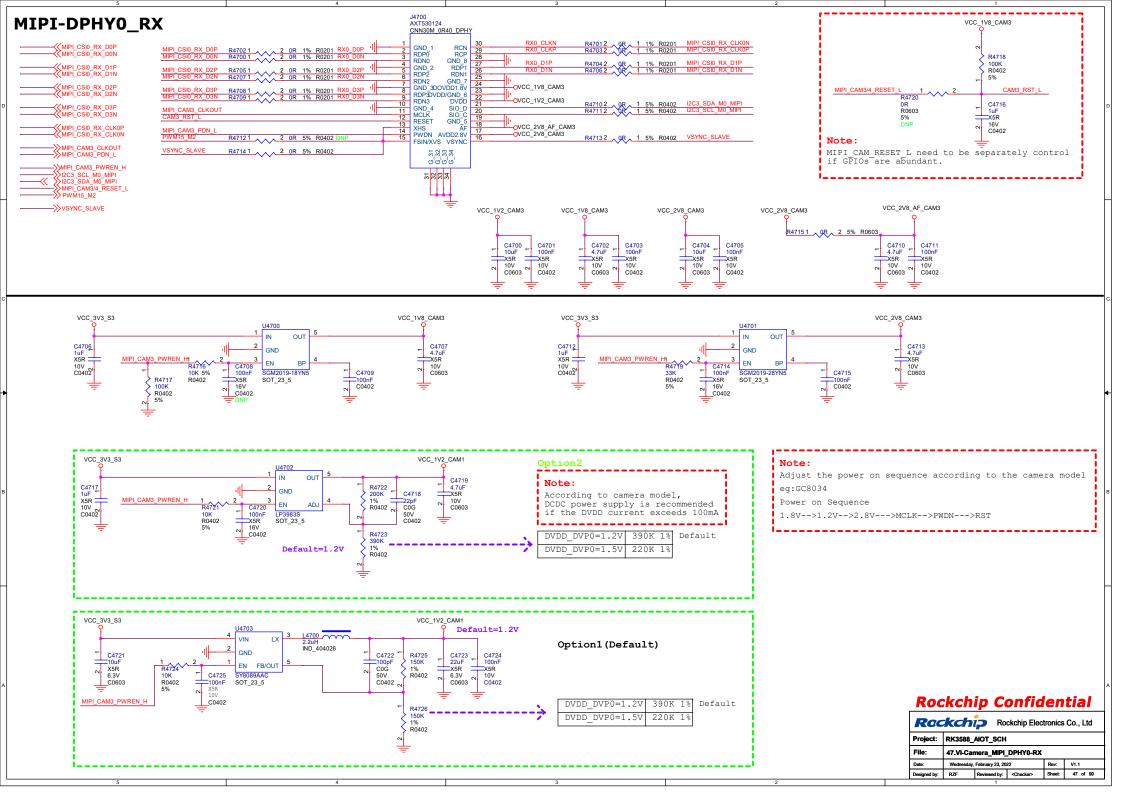


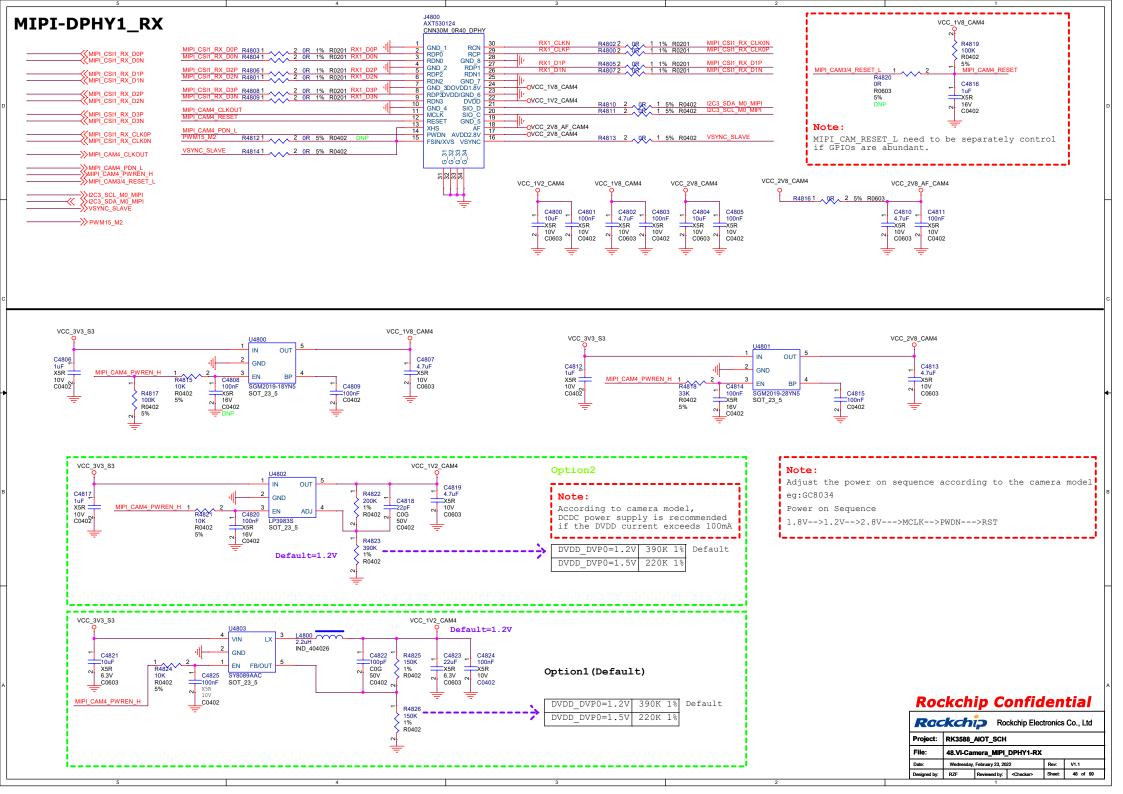


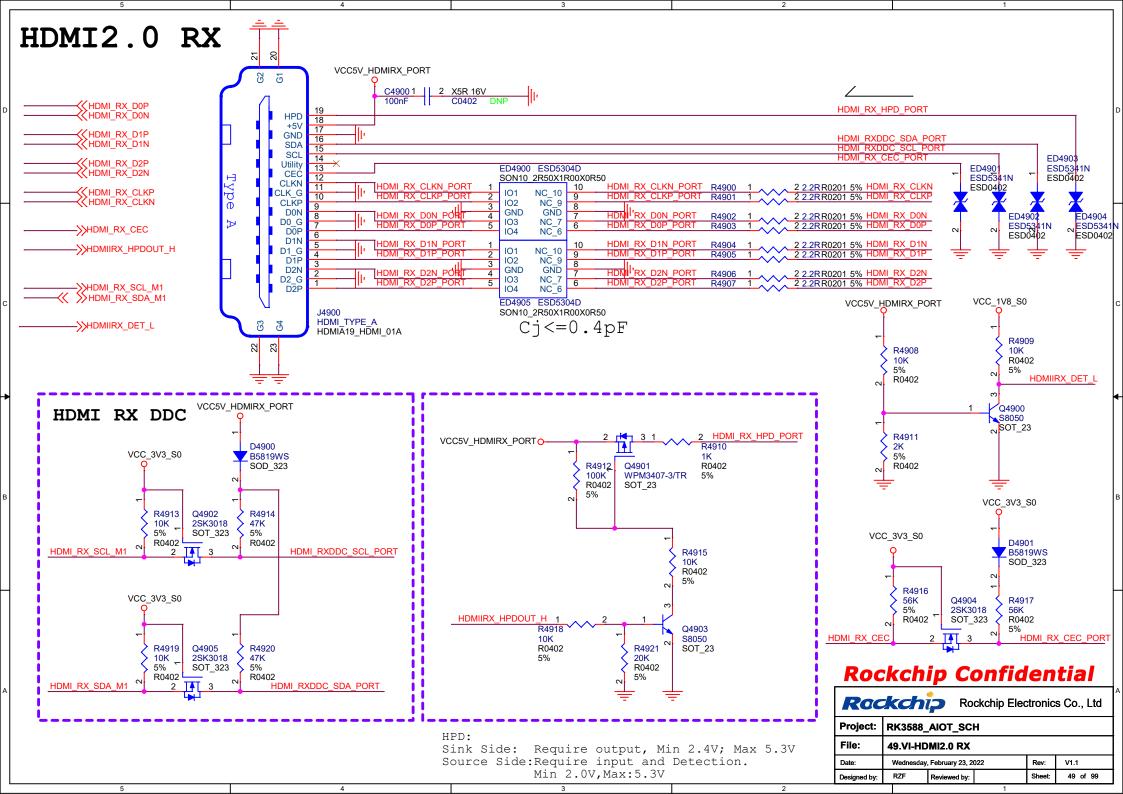


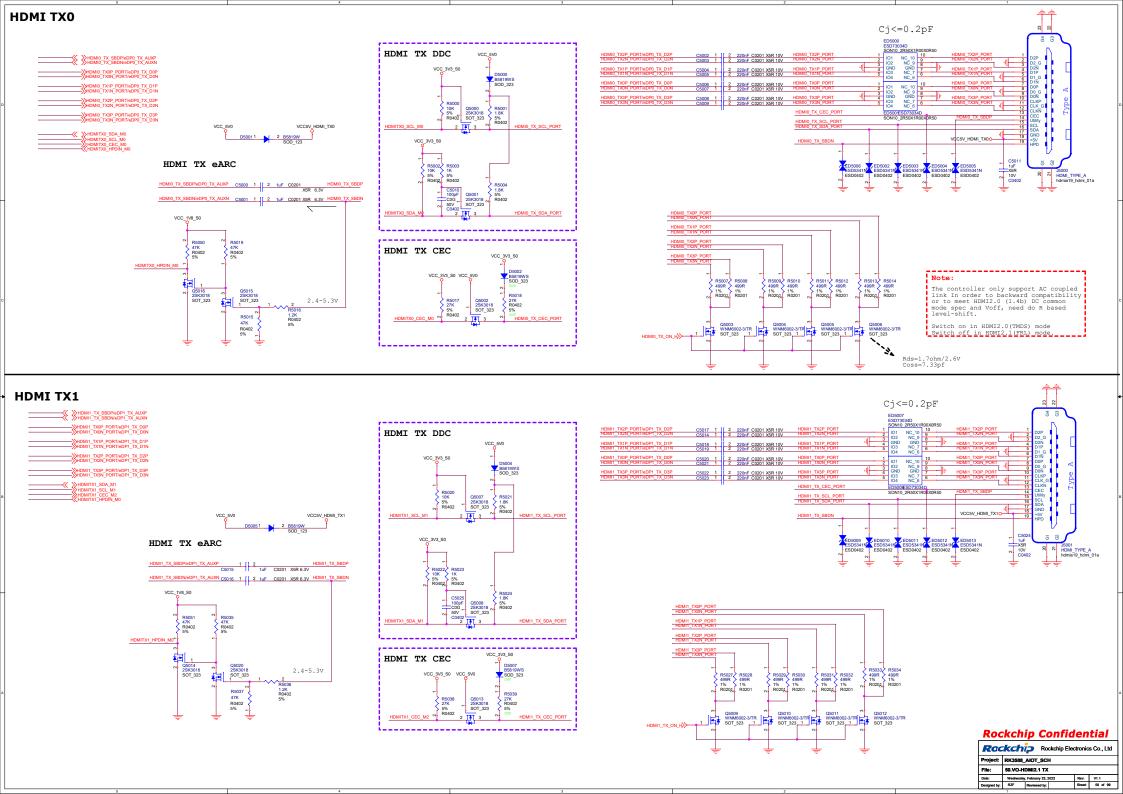


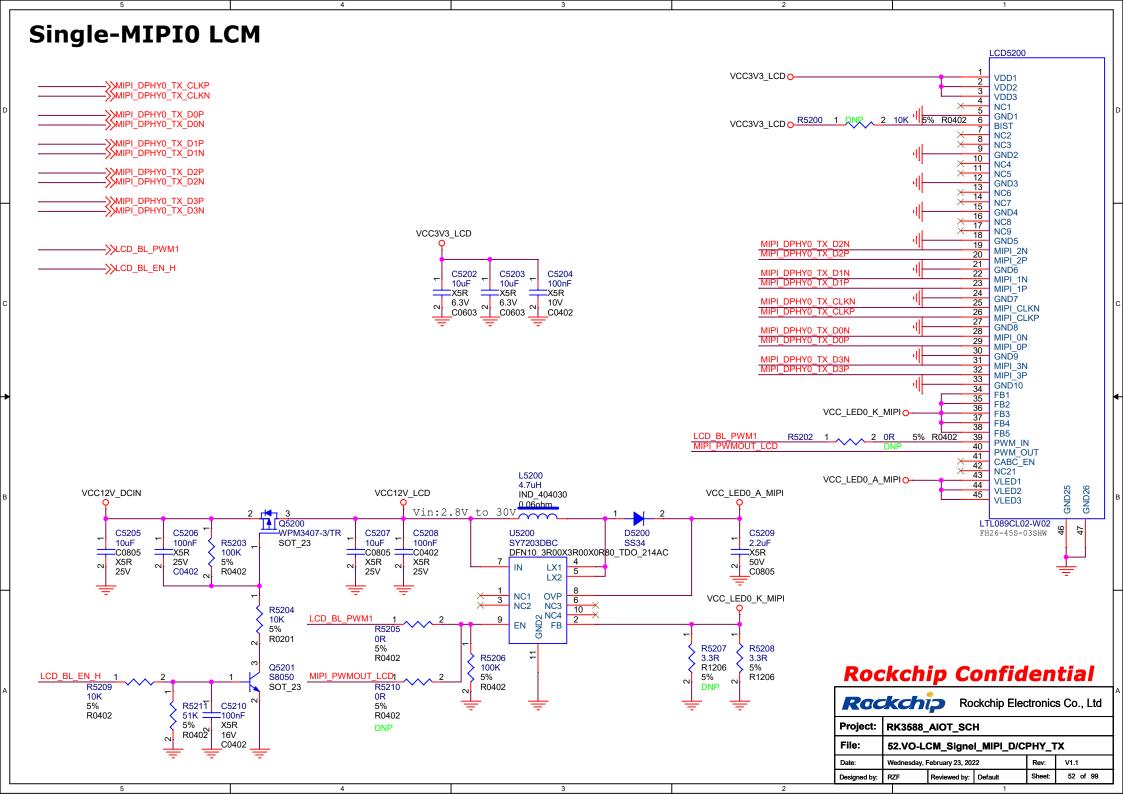


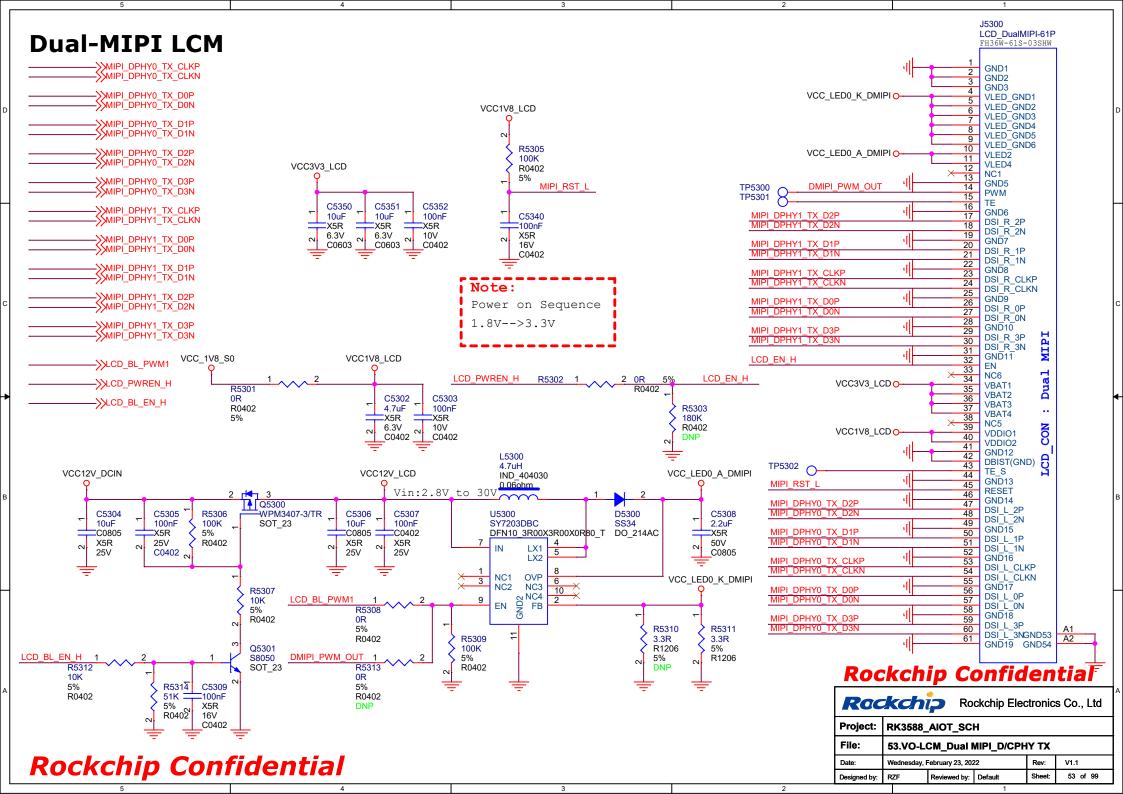


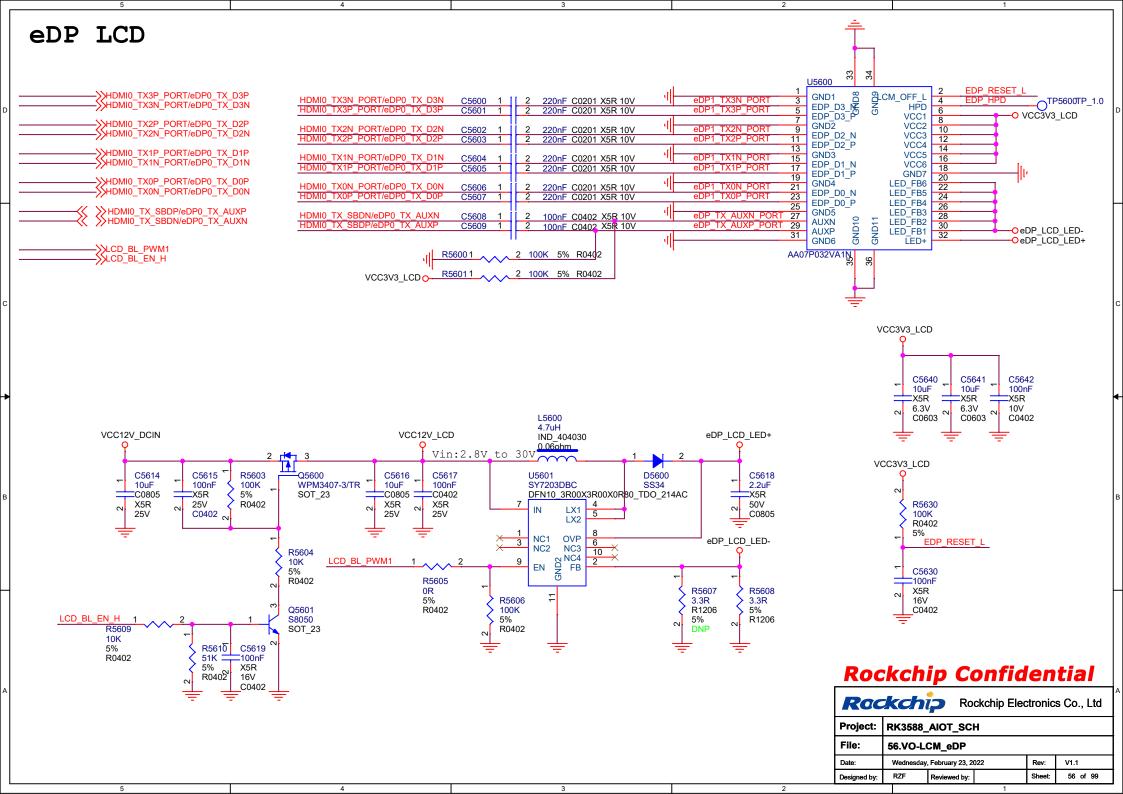


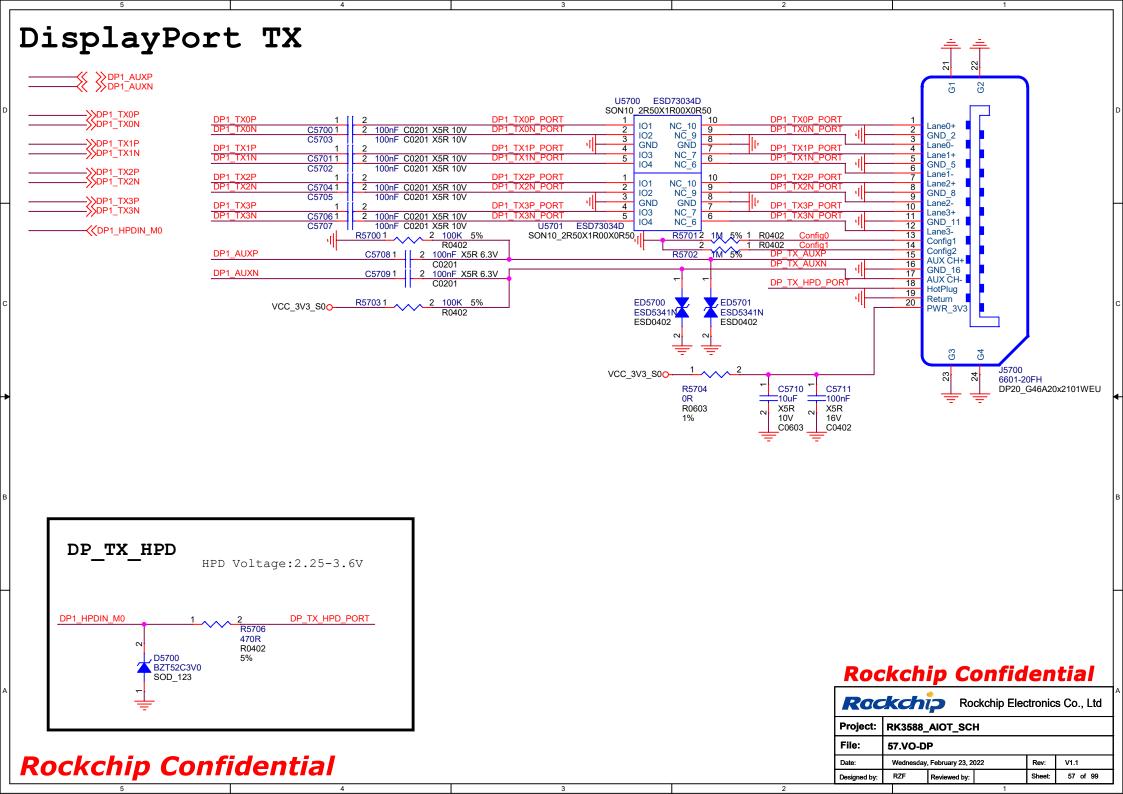


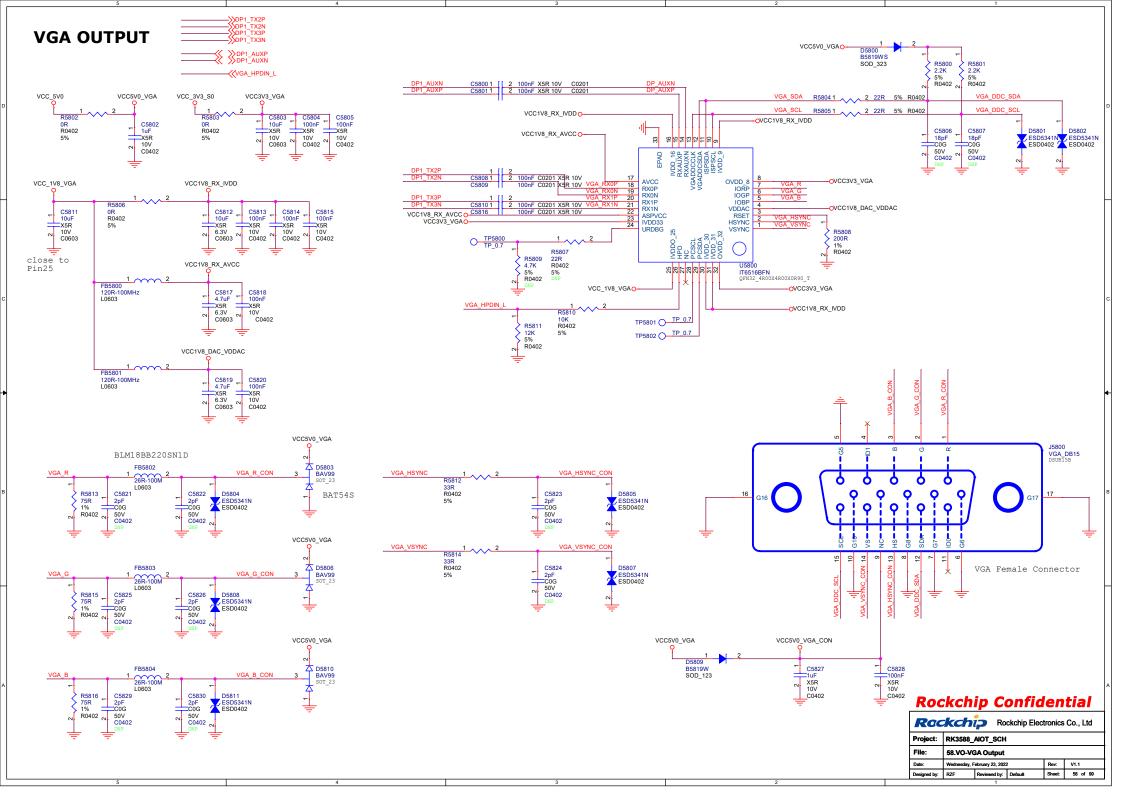


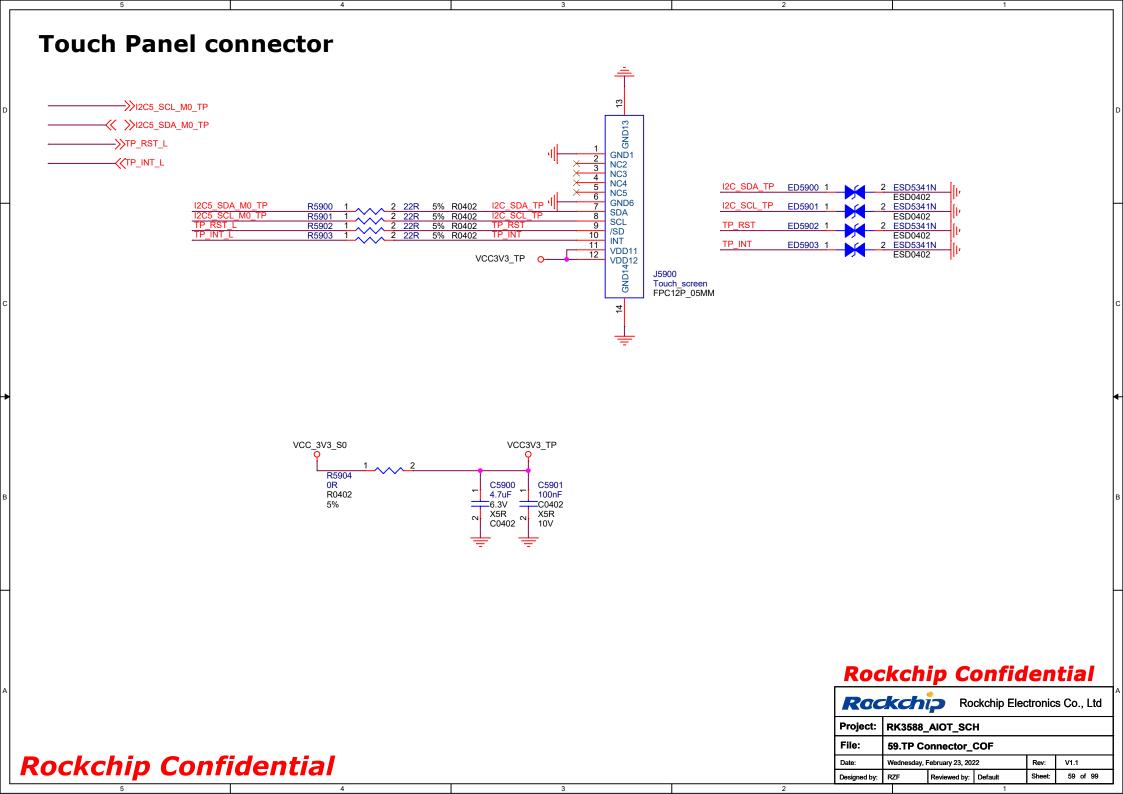


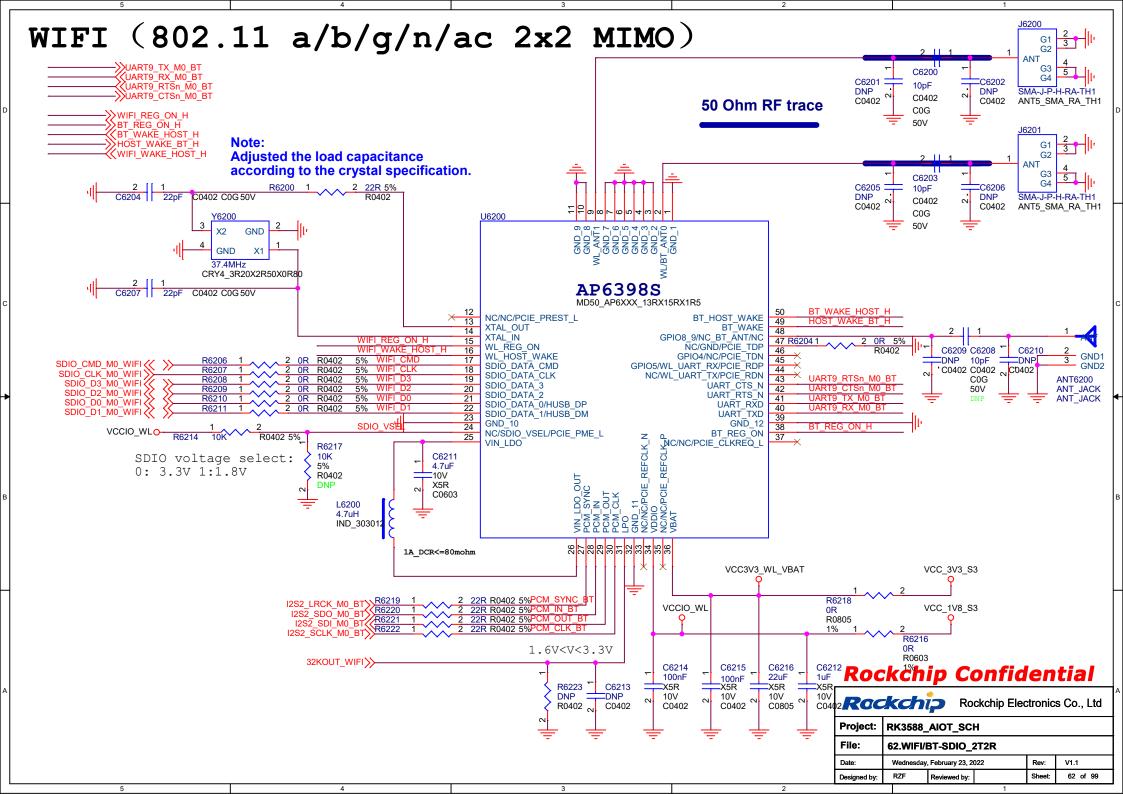


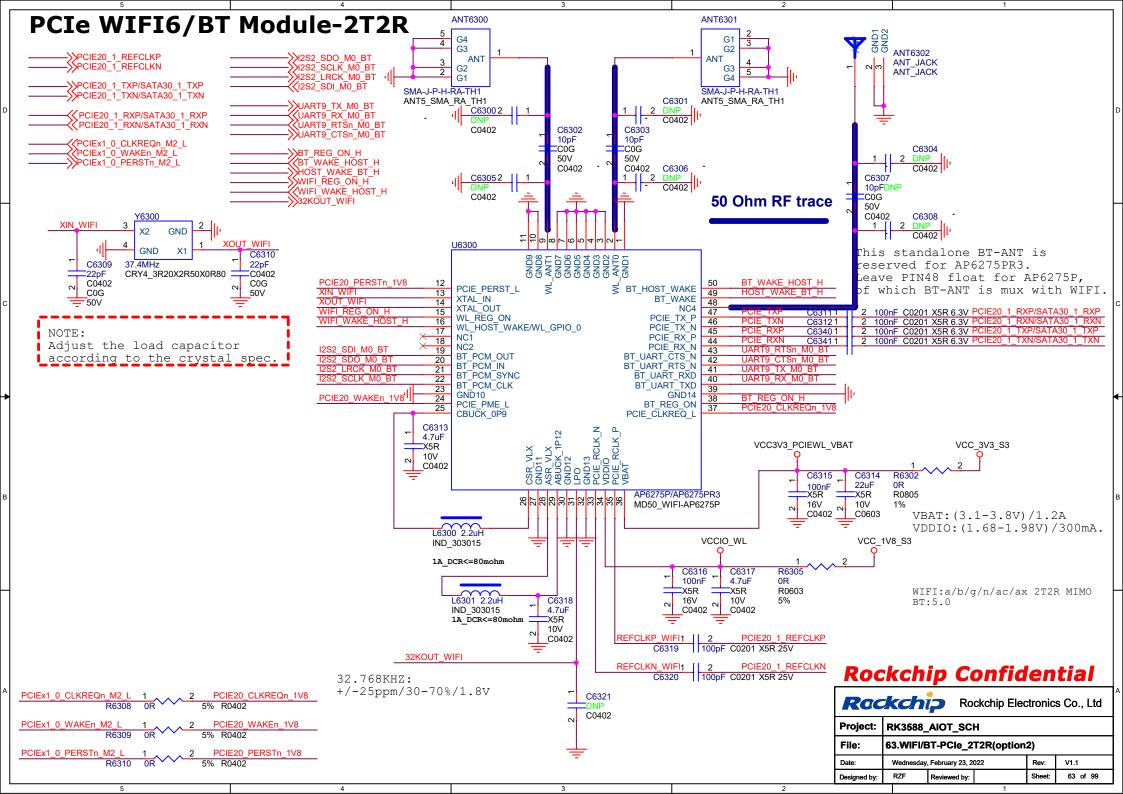


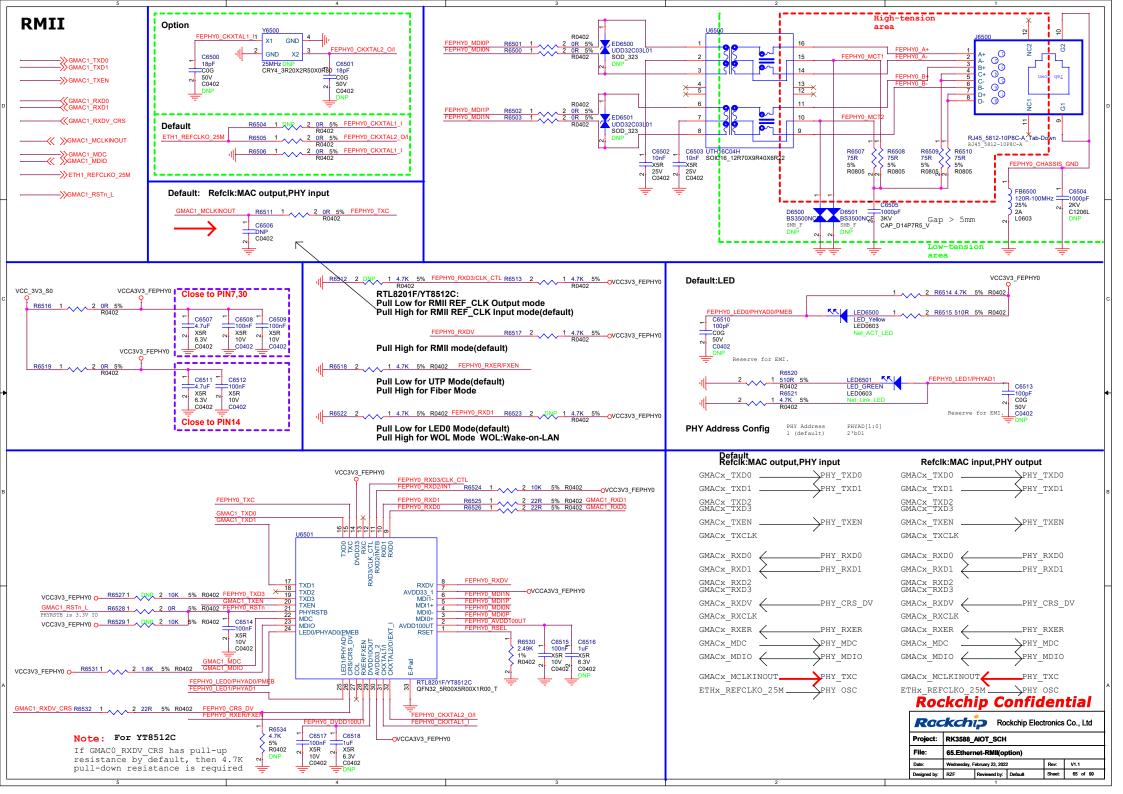


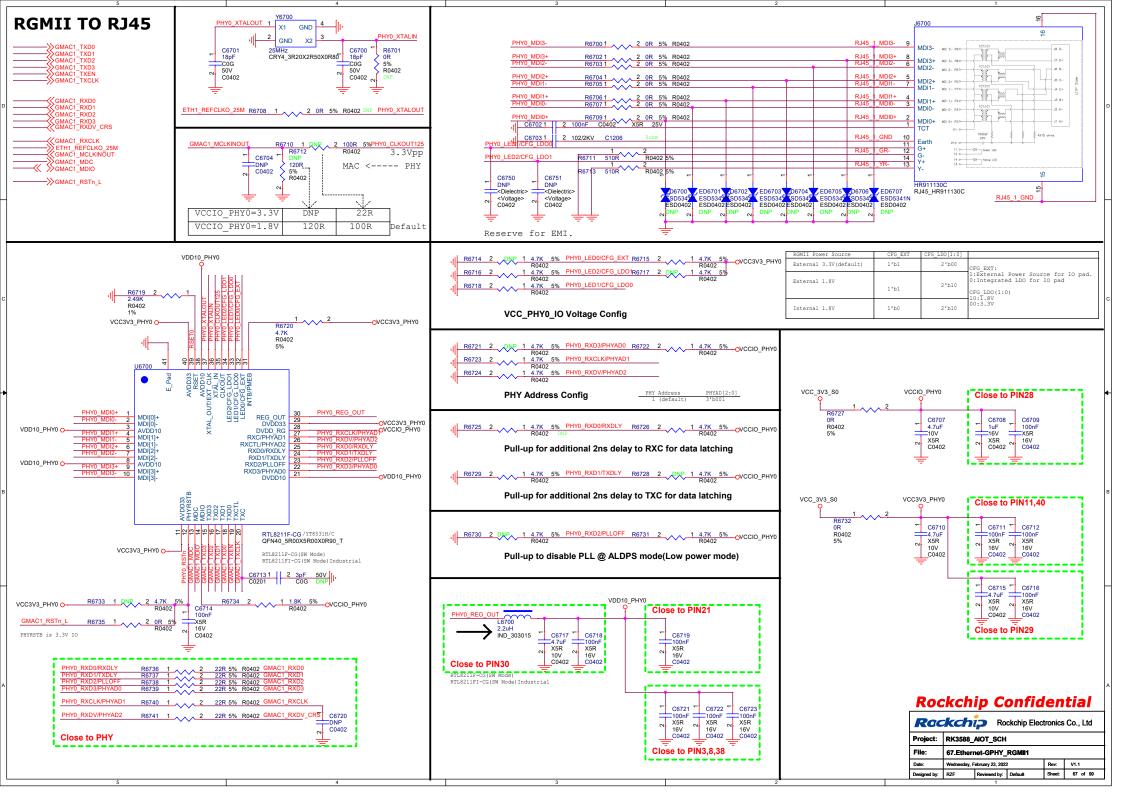


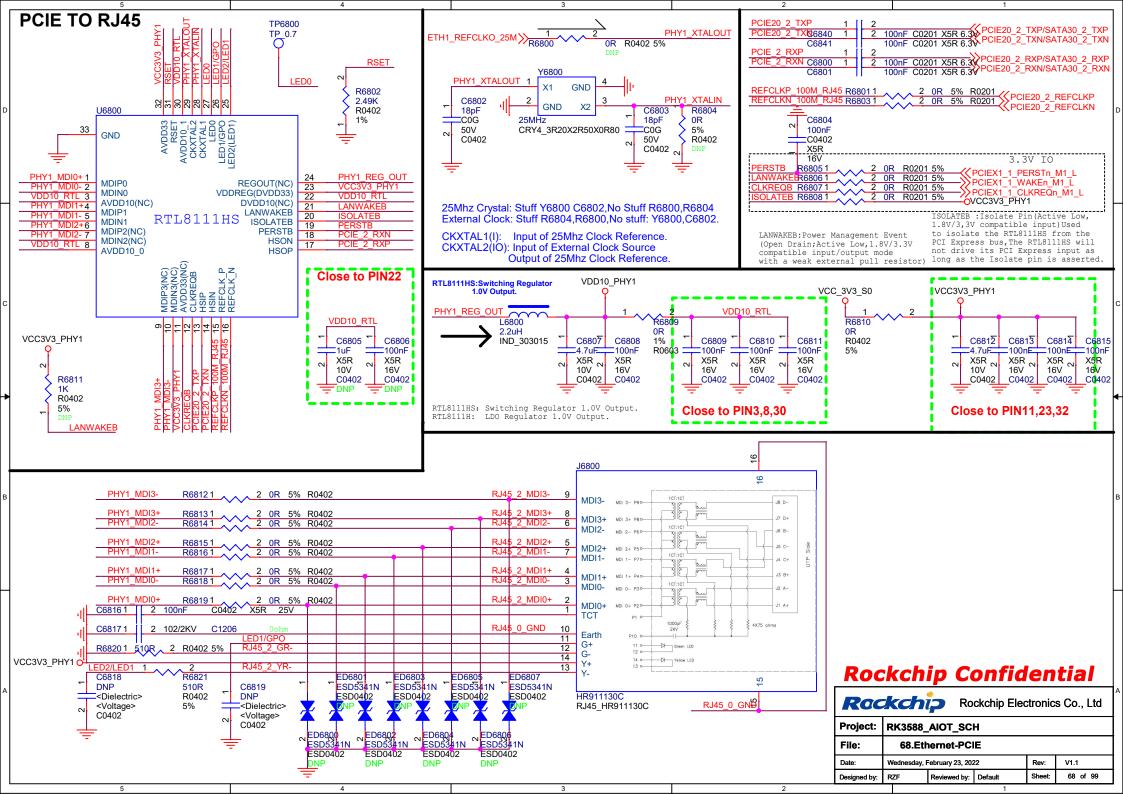


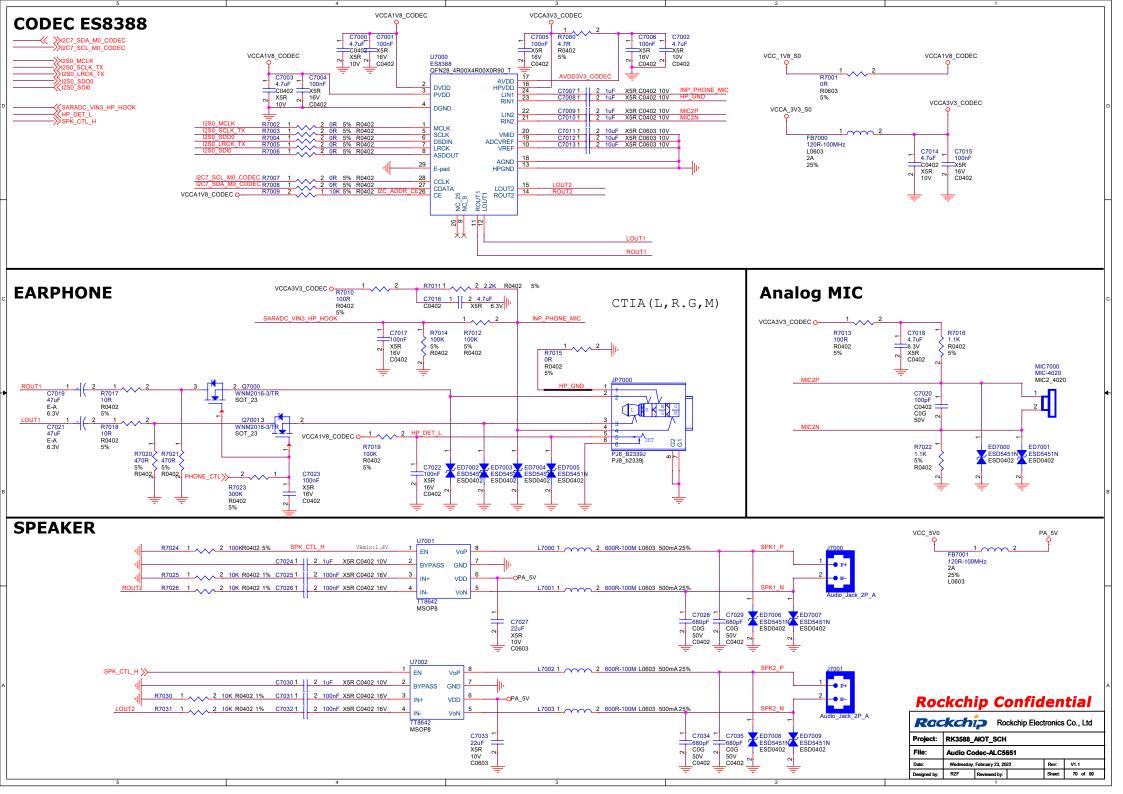


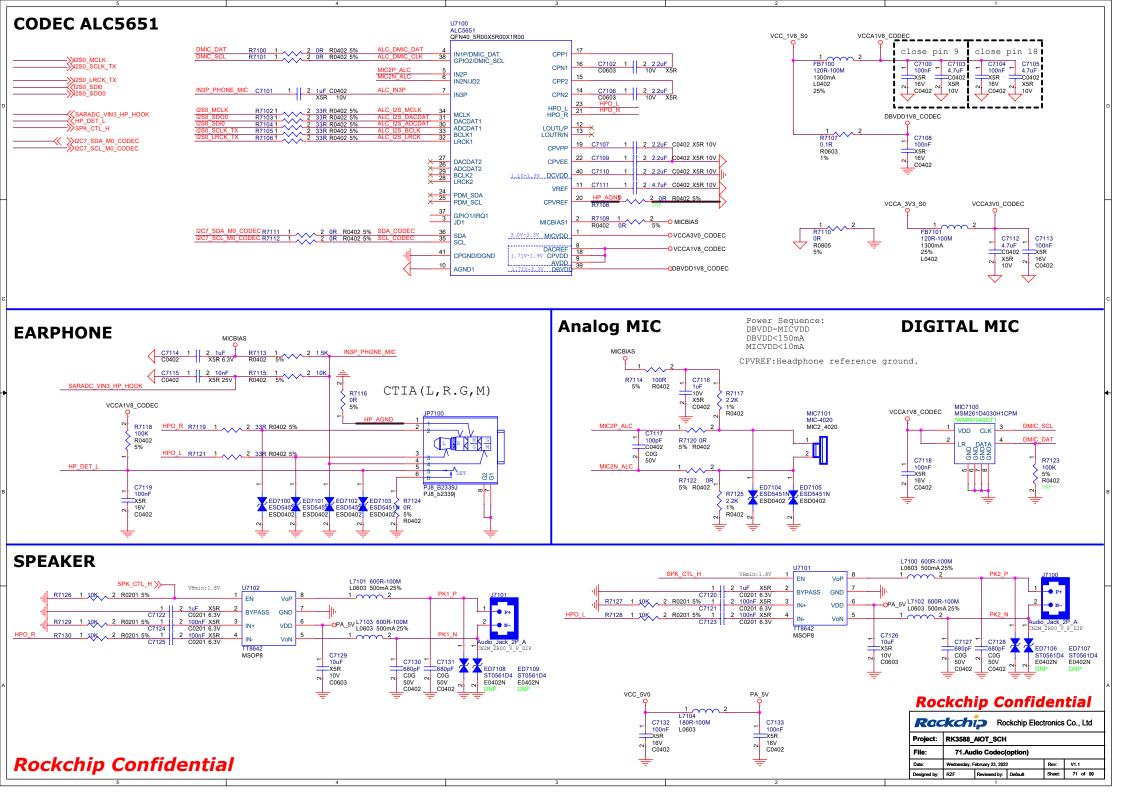


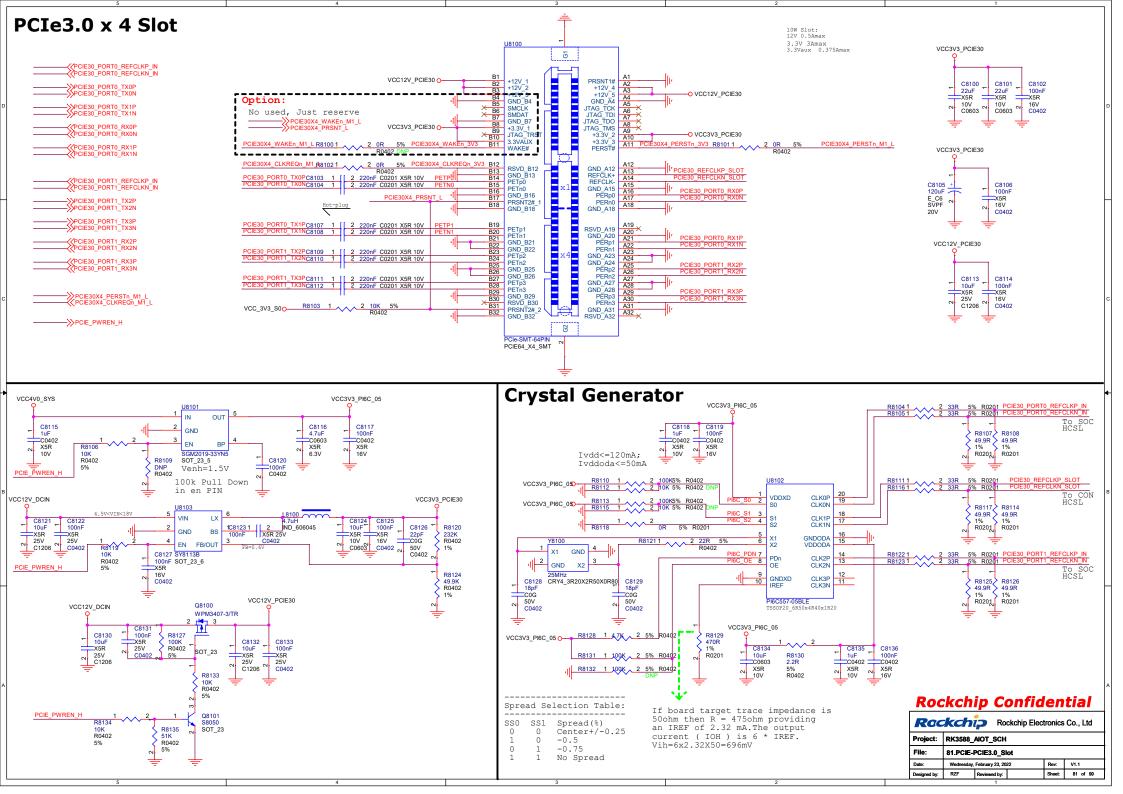


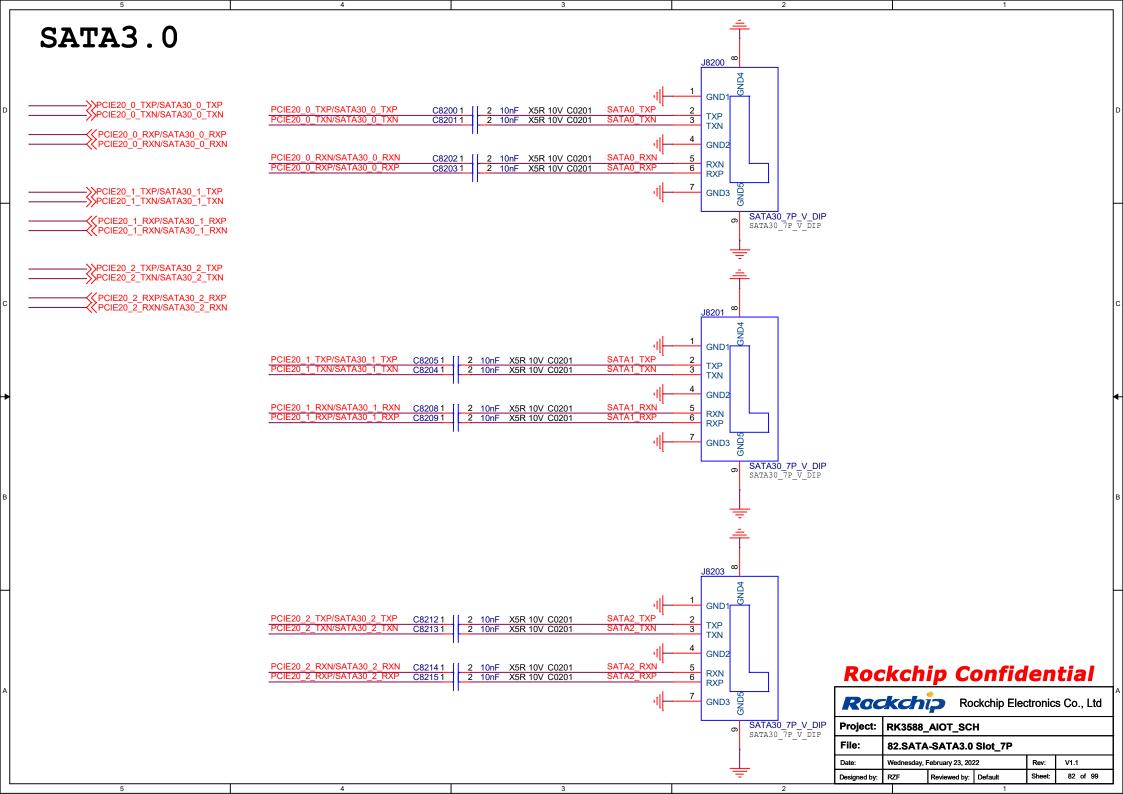


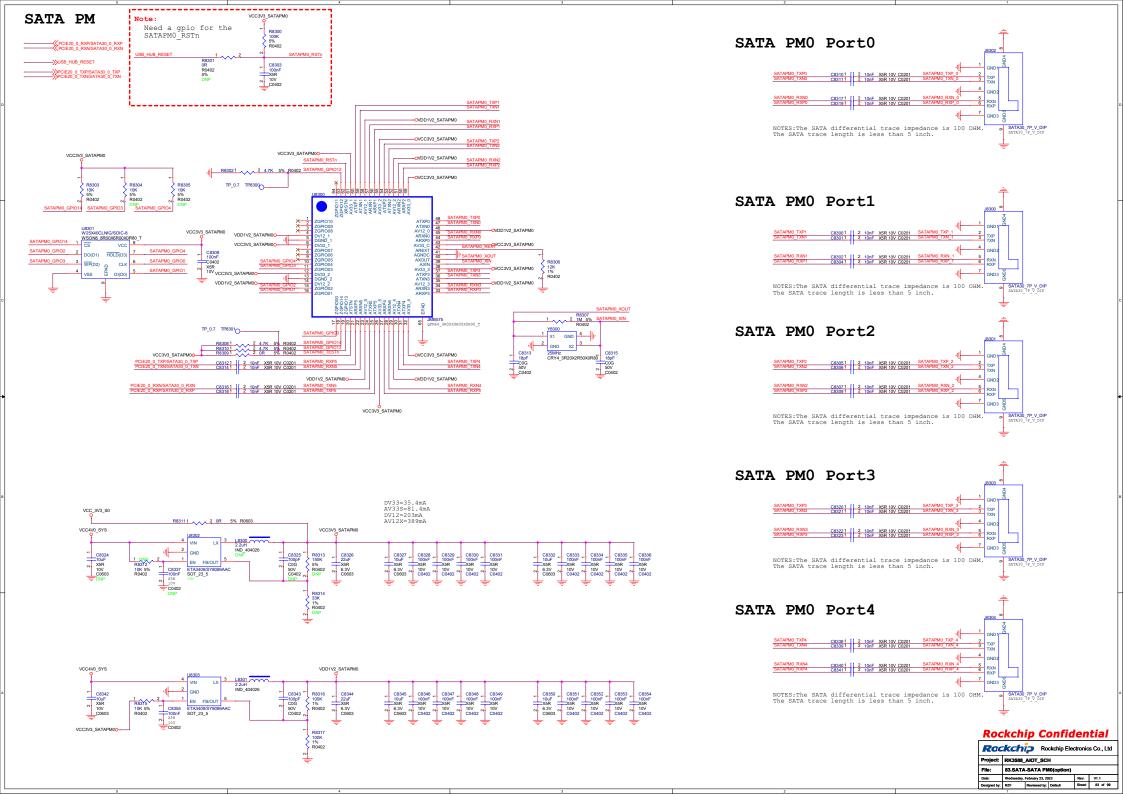


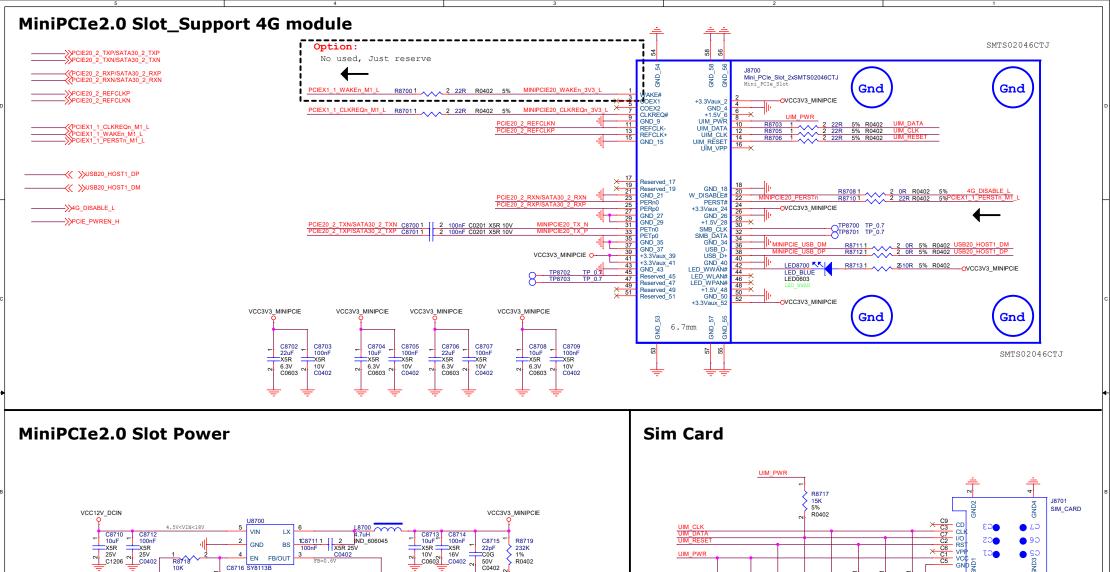


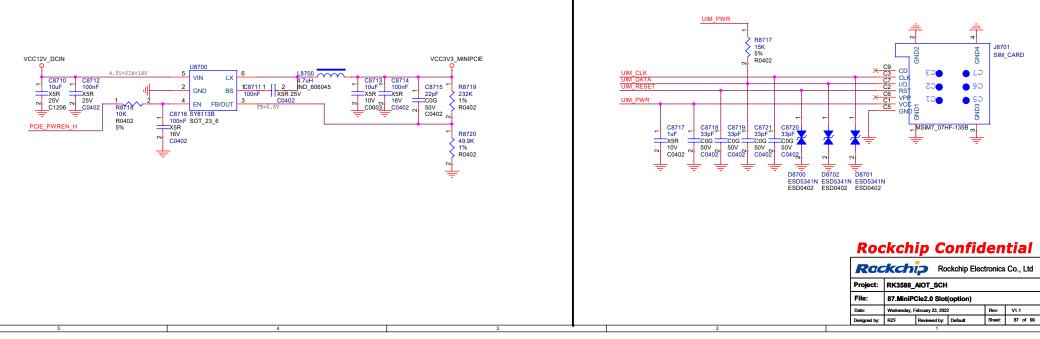


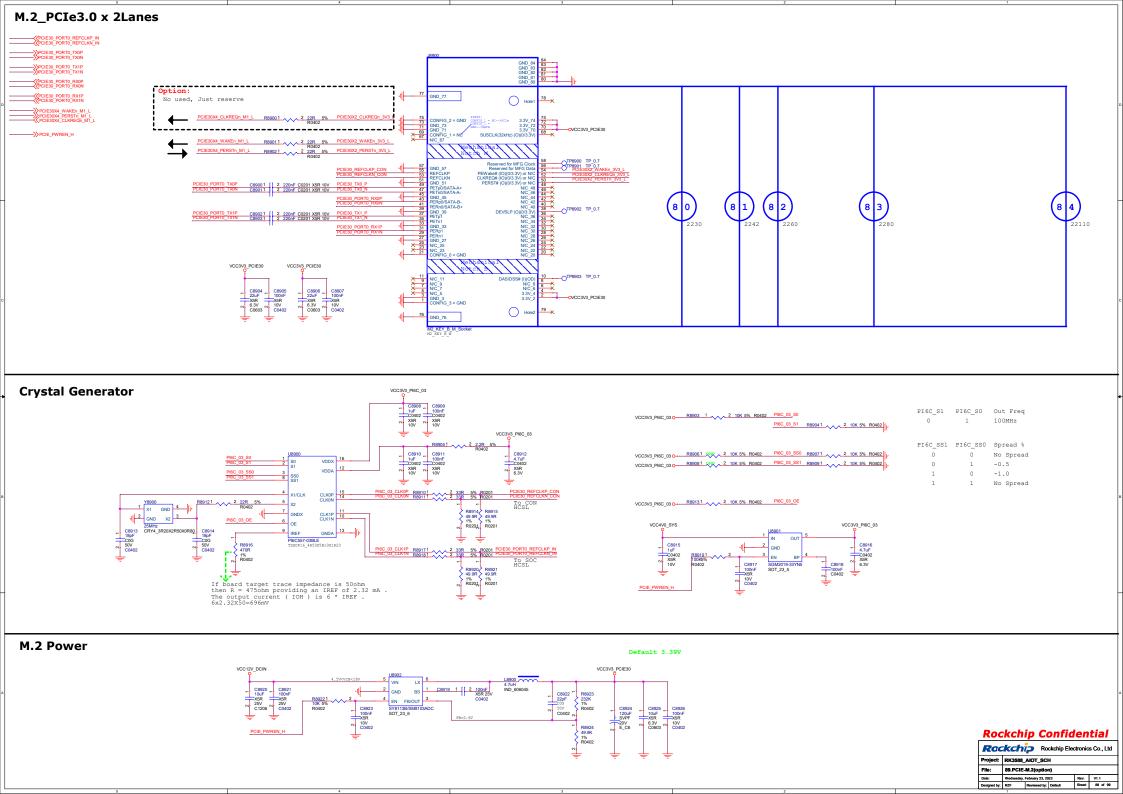












## Sensor Ambient Light+Proximity Sensor ✓ GSENSOR\_INT\_L ✓ ALPS\_INT\_L VCC\_1V8\_S0 O C9000 100nF X5R >> I2C4\_SDA\_M1\_SENSOR 16V > 12C4\_SCL\_M1\_SENSOR C0402 I2C4\_SDA\_M1\_SENSOR VDD I2C4\_SCL\_M1\_SENSOR ALPS\_INT\_L SCL GND NC OTP9000 TP\_0.7 R9004 VCC 3V3 S0 O-LEDA LDR DNP 15R STK3311-A R0402 R0402 C9001 1uF VCC\_1V8\_S0 X5R 6.3V C0402 Gyroscope+G-sensor VCC\_1V8\_S0 VCC\_1V8\_S0 I2C4\_SCL\_M1\_SENSOR I2C4 SDA M1 SENSOR R9005 U9000 compatible with DNP ICM-20600 ICM-40607 R0402 SDA SCL REGOUT AD0 R9006 100nF LGA14-2R5X3<sup>FSYNC</sup> NC0 X5R 10K 5% 10V NC2 INT2 R0402 C9003 100nF GSENSOR\_INT\_L 4 AVDDIO GND0 VDD RESV X5R 10V 7 bit Address: C0402 $A\overline{d}dr = H -->0x69$ VCC\_1V8\_S00-Addr = L -->0x68C9002 100nF X5R 10V C0402 **Rockchip Confidential** Rackchip Rockchip Electronics Co., Ltd Project: RK3588\_AIOT\_SCH File: 90.SENSOR

Wednesday, February 23, 2022

Designed by:

Rev:

V1.1 90 of 99

