

RK3288 REF V1.3

01.Index
02.Change List
03.Block Diagram
04.Power Tree-RC5T620
05.Power Tree-ACT8846
06.Power Tree-RK818
10.RK3288 Power
11.RK3288 PMU Controler
12.RK3288 DDR Controler
13.RK3288 Flash Controler
14.RK3288 USB/HSIC Controler
15.RK3288 SARADC/Key Board
16.RK3288 DVP Interface
17.RK3288 Display Interface
18.RK3288 GPIO
20.USB Port
21.Power-RT5C620_1CELL
22.Power-ACT8846_2CELL (option)
23.Power-RK818_1CELL (option)
30.RAM-DDR3 4x16bit
32.RAM-DDR3 2x32bit (option)
33.RAM-LPDDR2(168P) (option)
34.RAM-LPDDR2(216P) (option)
35.RAM-LPDDR2(220P) (option)
36.RAM-LPDDR3(178P) (option)
40.Memory-eMMC
41.Memory-Nand FLASH (option)
42.Memory-tSD (option)
45.DVP power and Flash LED
46.Camera-MIPI CSI
47.Camera-CIF (option)
50.LCM-eDP Panel
51.LCM-MIPI Panel (option)
52.LCM-Dual MIPI Panel (option)
53.LCM-LVDS Panel (option)
60.WIFI/BT-AP6210
61.WIFI ac/BT-AP6335 (option)
62.WIFI/BT/GPS-AP6476 (option)
65.3G-UNA
66.3G-UNA LITE (option)
70.Audio Codec-ES8323
71.Audio Codec-ALC5631 (option)
72.Audio Codec-ALC5640 (option)
73.Audio Codec-ES8316 (option)
75.TP COF
76.TP COB-CT363 (option)
77.TP COB-FT5506 (option)
78.TP COB-GSL3680 (option)
80.Sensor/VIB
81.TF Card
82.HDMI Port
84.eFUSE (option)

I2C address(7bit):

1.I2C0 POWER:

ACT8846 0x5a
CW2013 0x62
HYM8563 0x51
RK818 0x1C
RT5C620 0x32
SYR827 0x40
SYR828 0x41

2.I2C1 Sensor:

CM3218 0x10,0x0c
LSM330TR G:0x6a A:0x1e
MMA8452Q 0X1d
MPU6500 0x34
LIS3DH 0X19
LSM303D 0X1d

3.I2C2 Audio Codec:

ALC5640 0x19
ALC5623 0x1a
ALC5631 0x1a
ES8323 0x10
ES8316 0x10

4.I2C3 Camera:

OV2659 0x30
OV8825 0x36

5.I2C4 Touch:

CT363 0x1b
FT5506
GSL3680 0x40



福州瑞芯微电子有限公司

Title: Index

File: RK3288_REF

REV:V1.3

Create Date: Monday, February 10, 2014

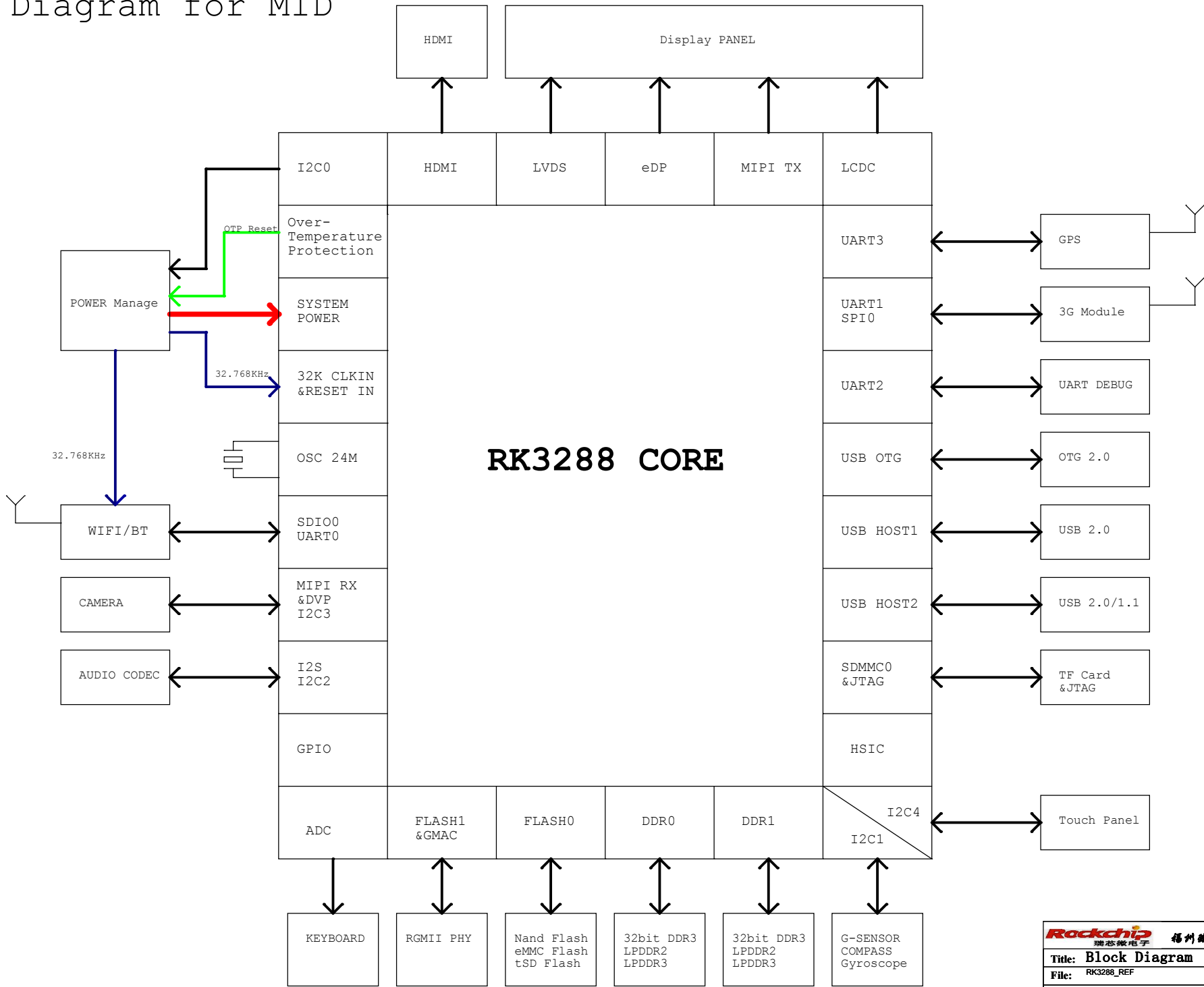
Page Num:1

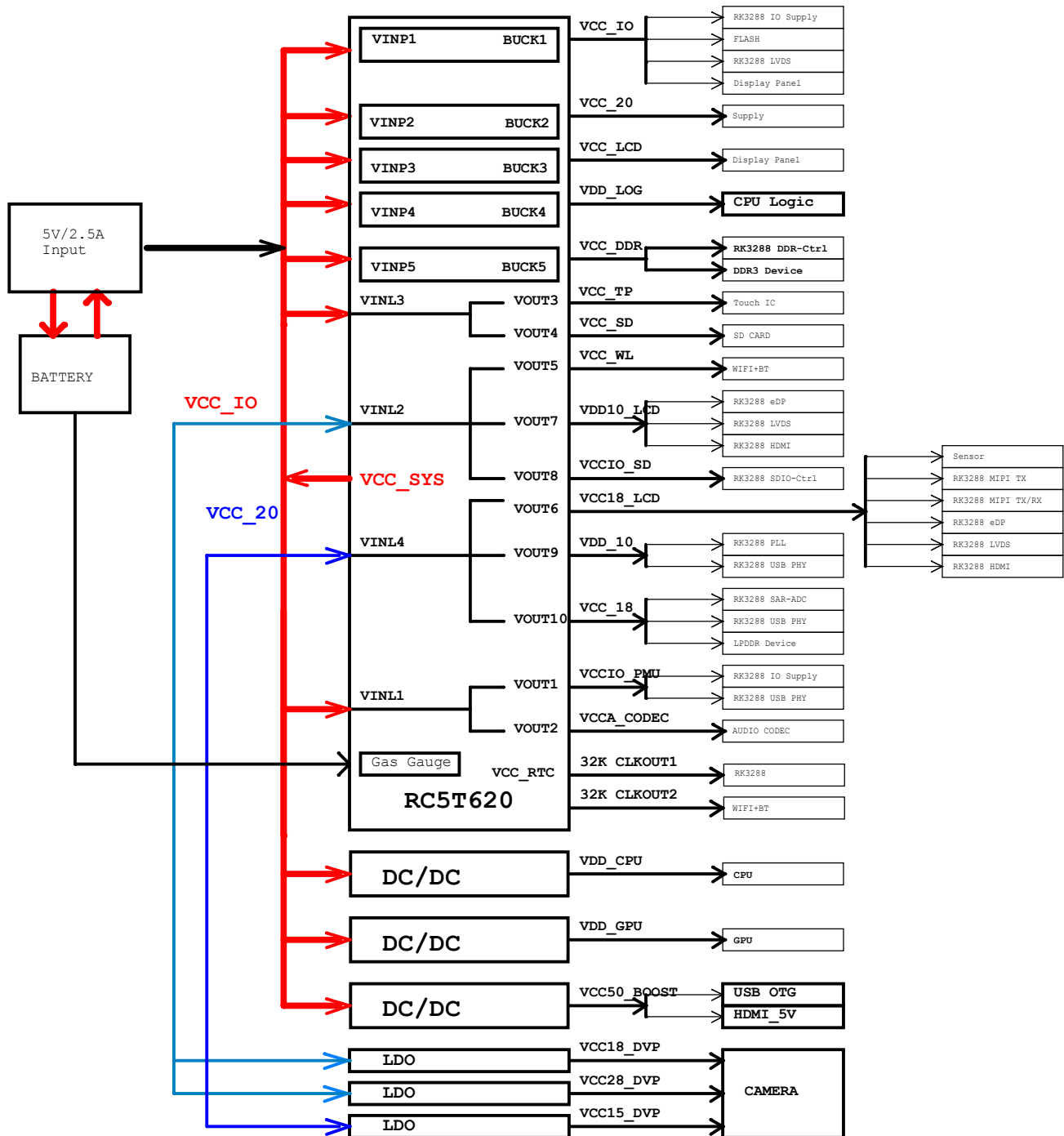
Modify Date: Thursday, December 11, 2014

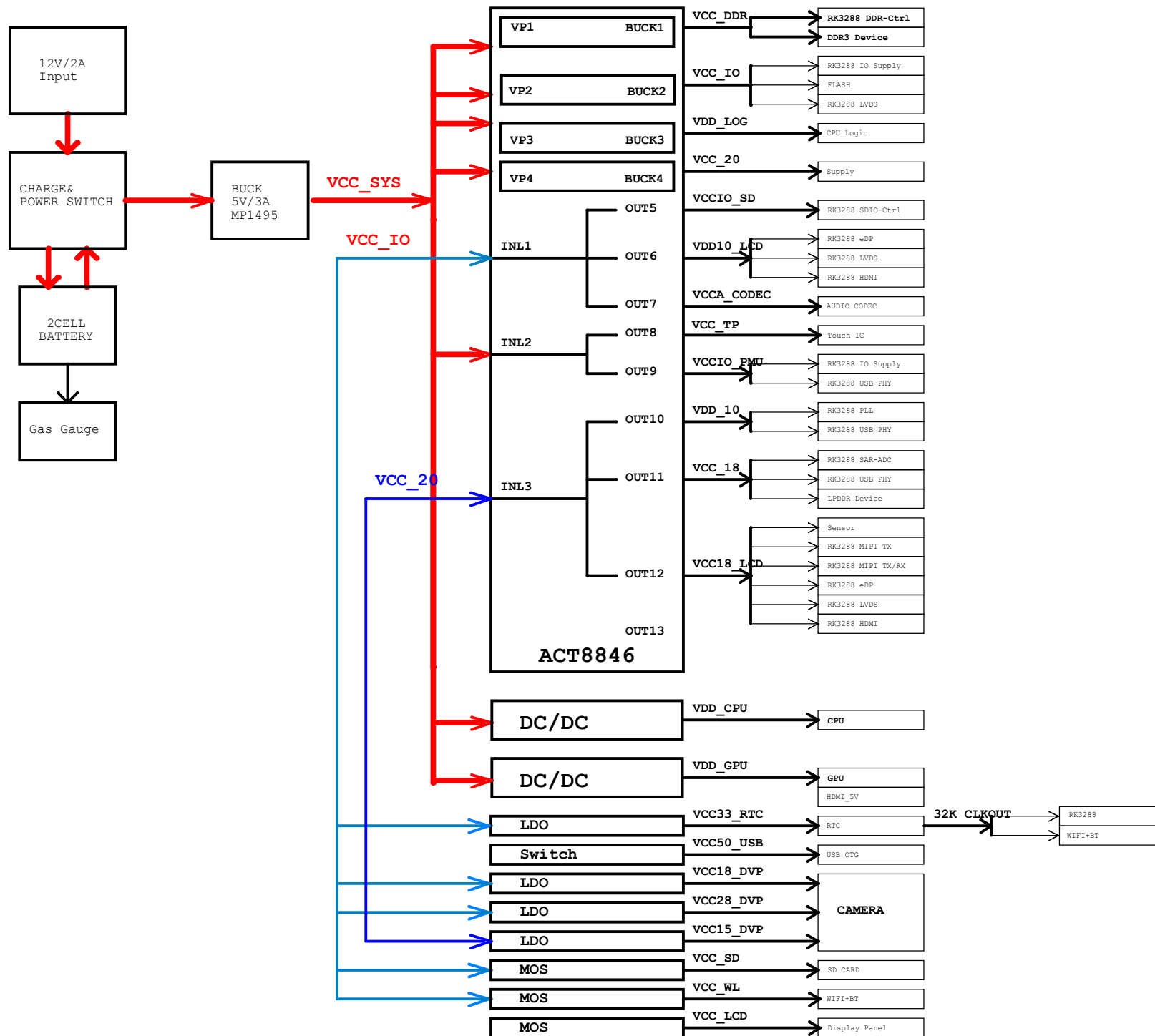
Page Total:52

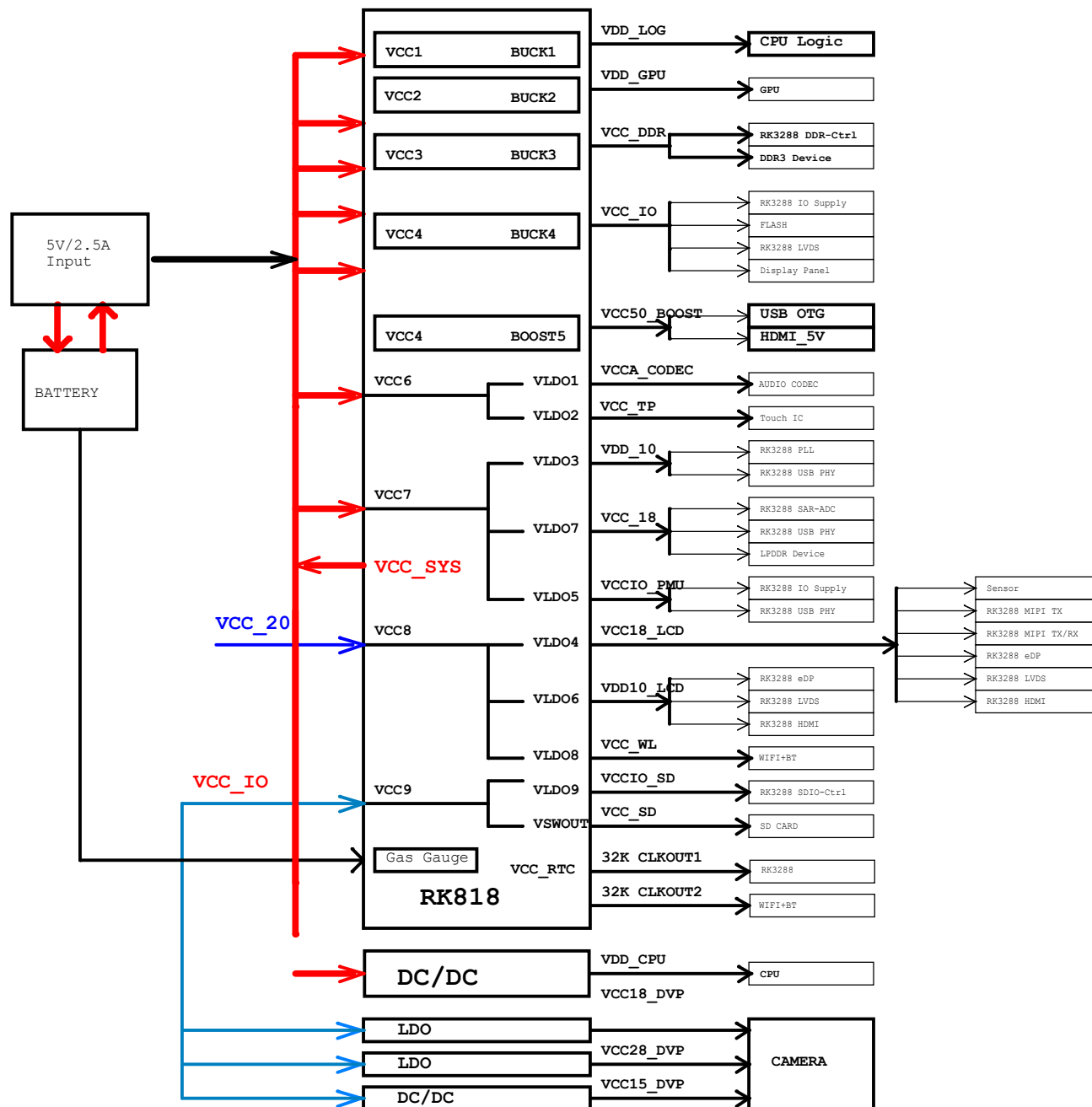
Version	Date	Author	Change Note	Approved
V1.0	20140429	LX	First edictor	
V1.1	20140625	LX	Please refer to document of 《RK3288发布原理图修改点 V11 20140625》	
V1.2	20140806	LX	Please refer to document of 《RK3288发布原理图修改点 V12 20140806》 Note:GPIO外部所接是开漏信号或者利用GPIO上下拉默认状态做特定功能的，有可能出现小概率的不确定状态，外部需要增加或预留上拉或下拉电阻以确定状态。	
V1.3	20141210	LX	Please refer to document of 《RK3288发布原理图修改点 V13 20141210》	

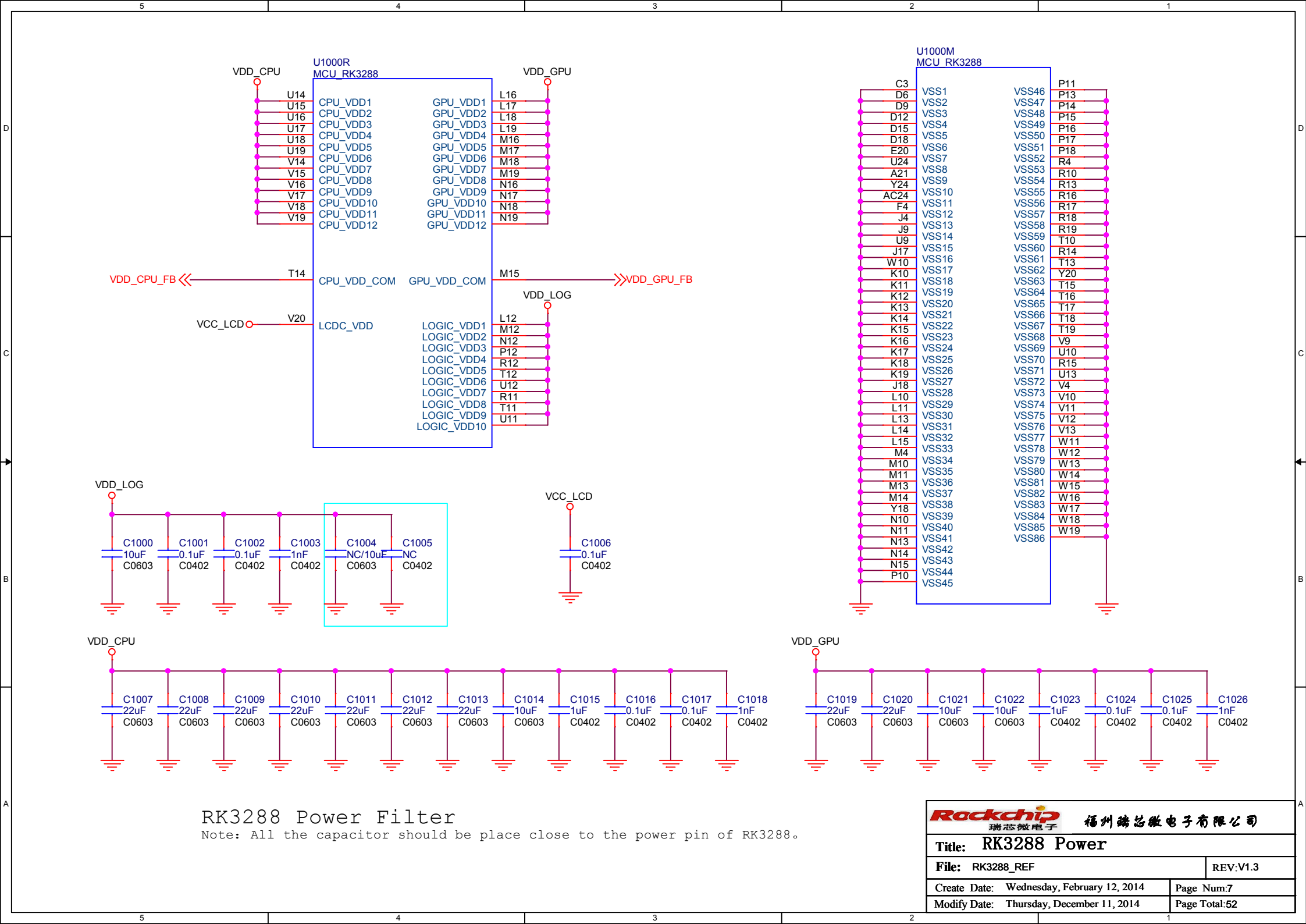
Block Diagram for MID

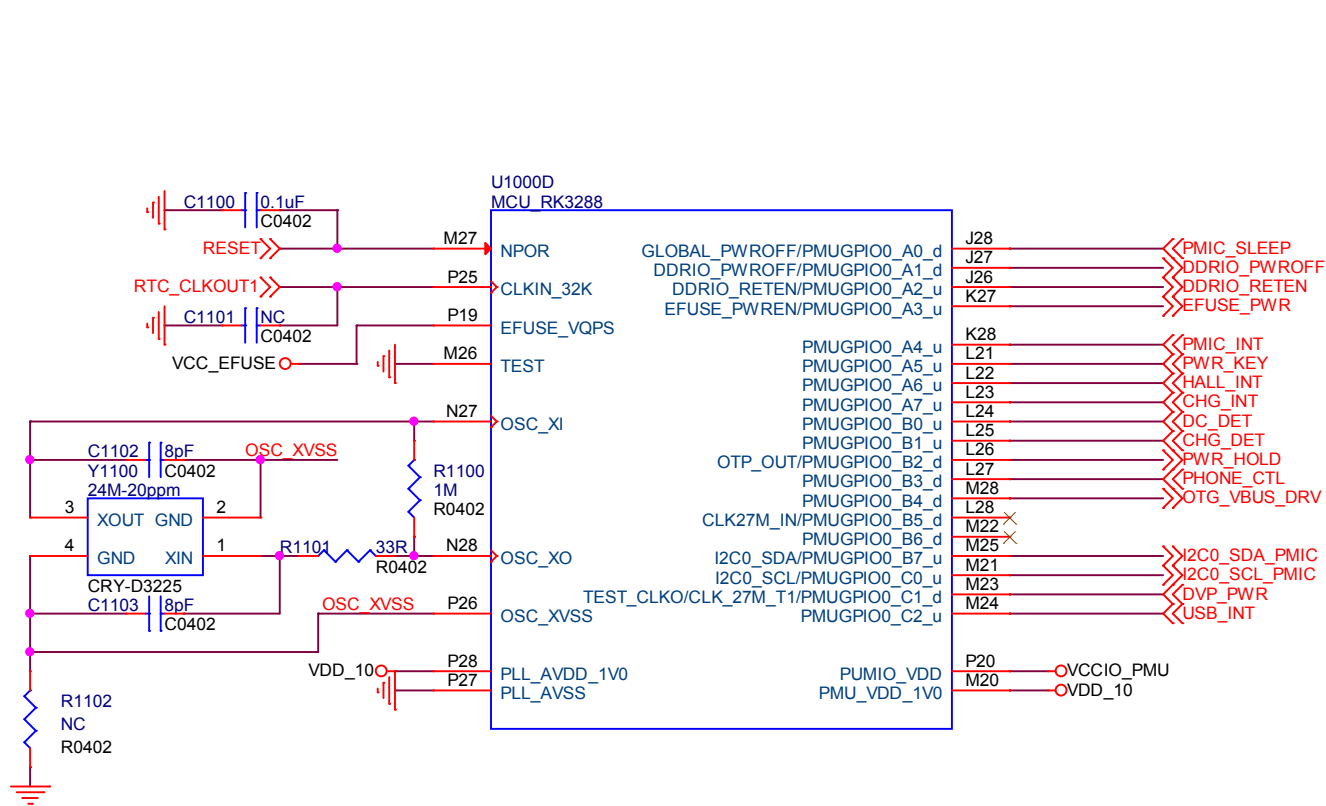




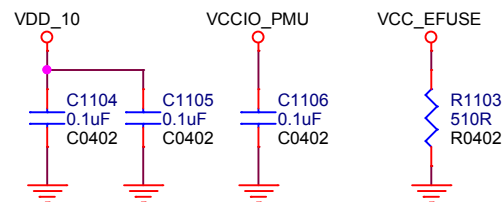








Note: All the capacitor should be place close to the power pin of RK3288.

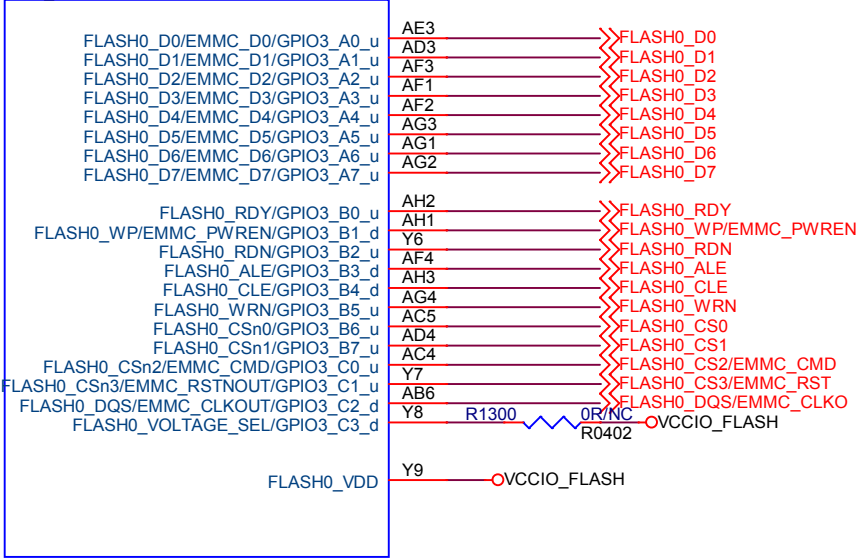


RK3288 P

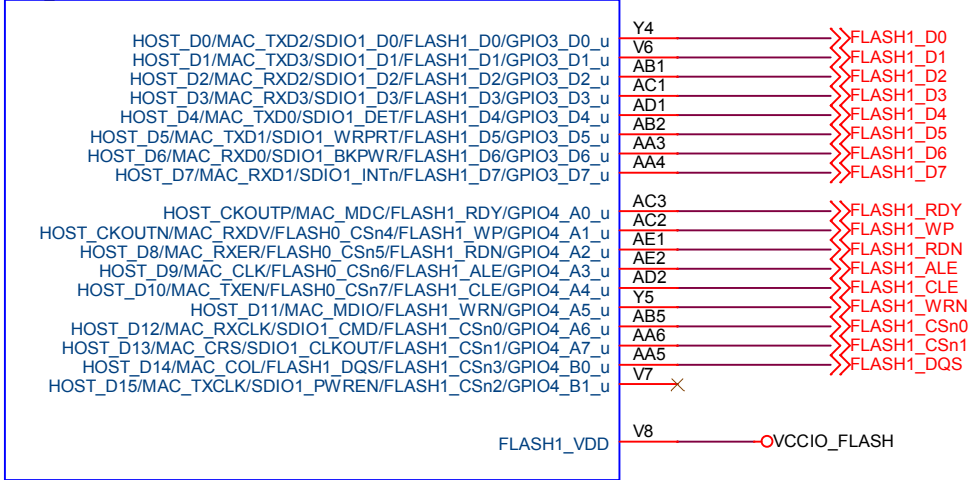
Note:VCC_FLASH (The supply may be 1.8V or3.0V,
and must be connected to RK3288 FLASH_VDD).

RK3288_Q

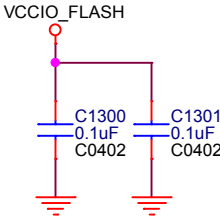
U1000P
MCU RK3288



U1000Q
MCU RK3288

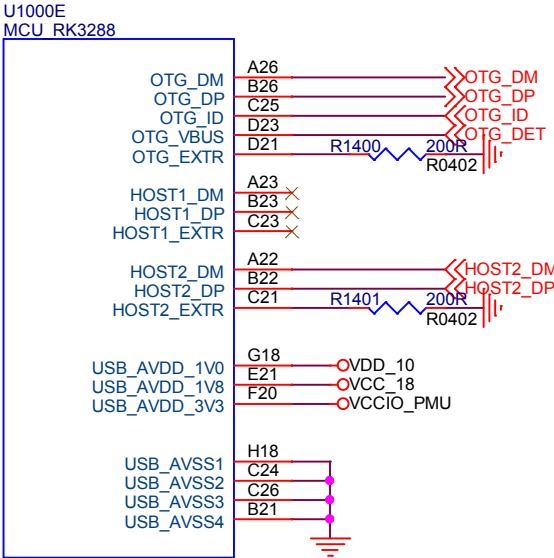


	VCCIO_FLASH=1.8V	VCCIO_FLASH=3.3V
FLASH0_VOLTAGE_SEL pin connect to	VCC_FLASH	Floating(Default)



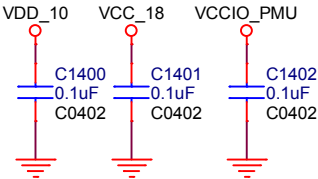
Note: All the capacitor should be place close to
the power pin of RK3288.

RK3288_E

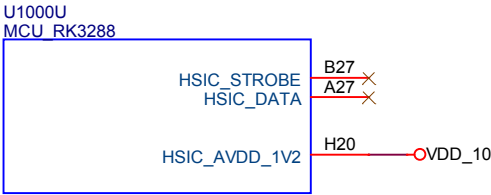


Note1: All the capacitor should be place close to the power pin of RK3288.

Note2: USB_HOST1 don't support USB1.1;

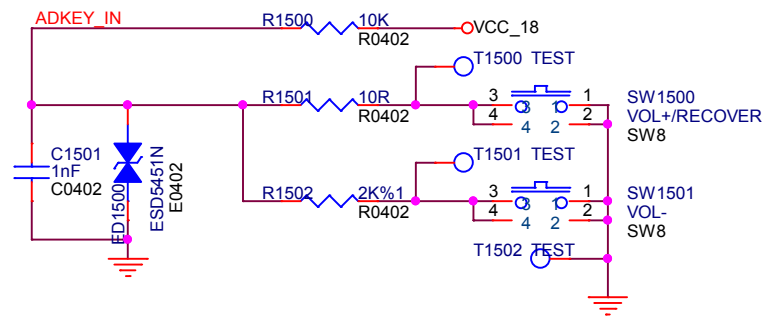
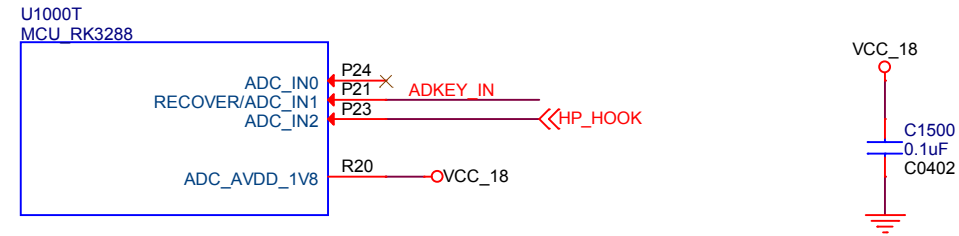


RK3288_U



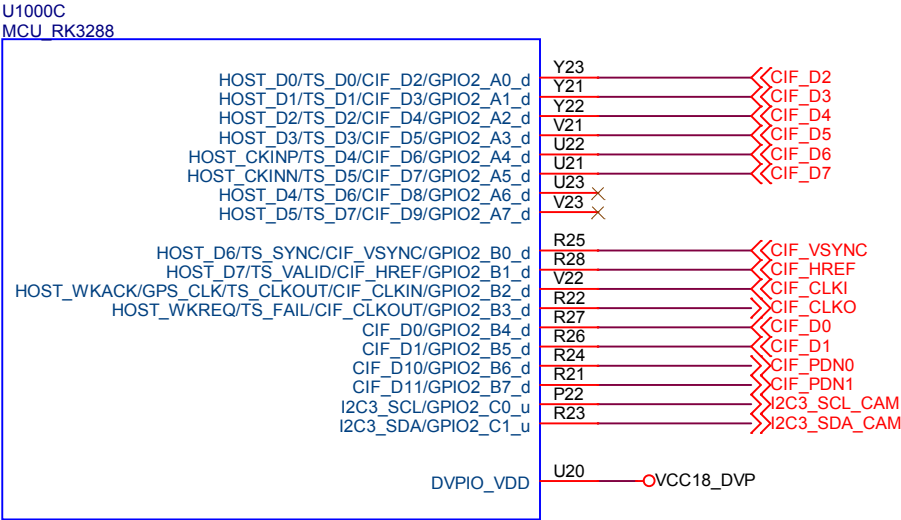
RK3288_T

Note: All the capacitor should be place close to the power pin of RK3288.

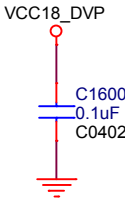


KEY BAORD

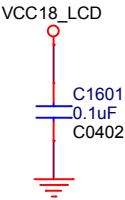
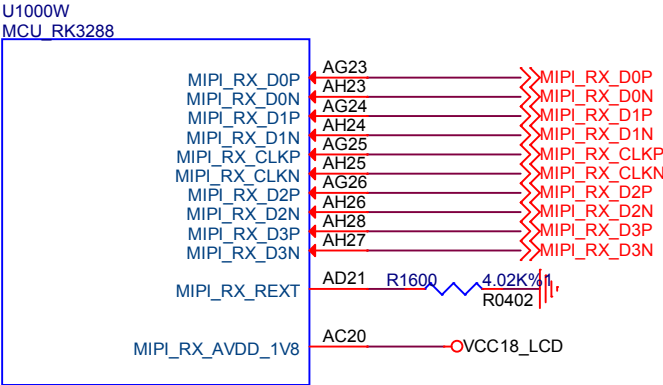
RK3288_C



Note: All the capacitor should be place close to the power pin of RK3288.

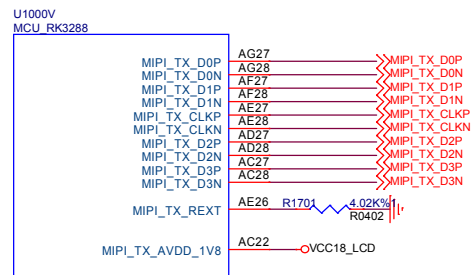


RK3288_W

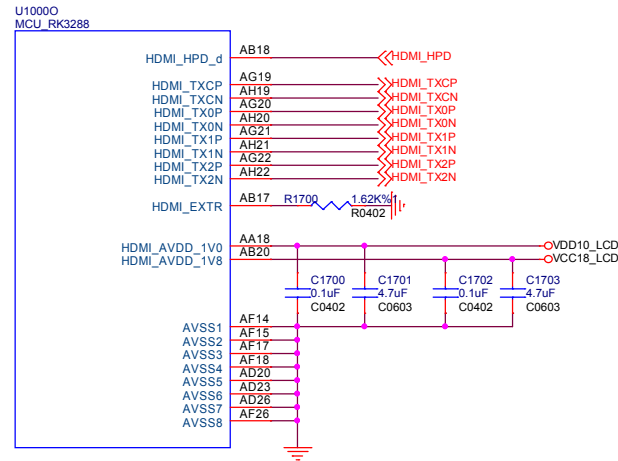


 瑞芯微电子		福州瑞芯微电子股份有限公司	
Title: RK3288 DVP Interface			
File: RK3288_REF			REV:V1.3
Create Date: Wednesday, February 12, 2014		Page Num:13	
Modify Date: Thursday, December 11, 2014		Page Total:52	

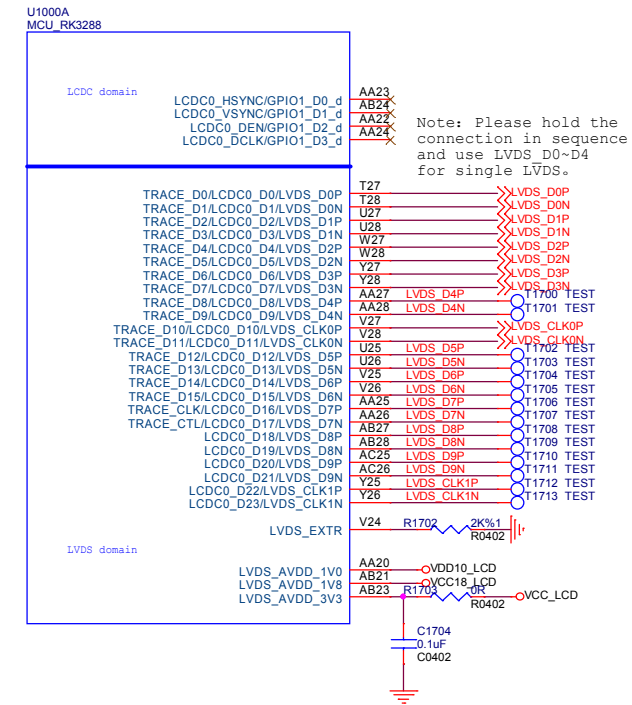
RK3288_V



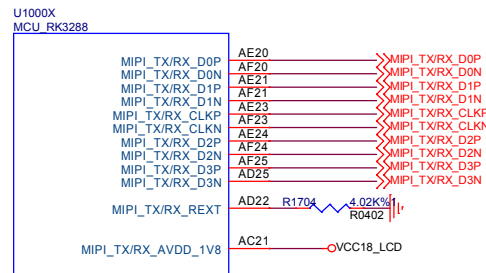
RK3288_O



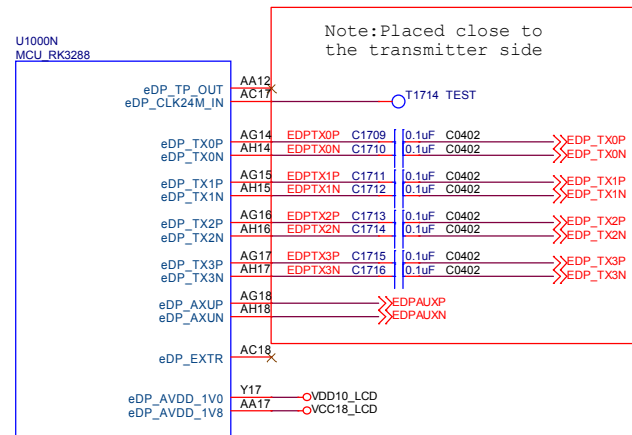
RK3288_A



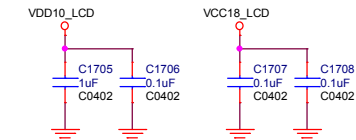
RK3288_X



RK3288_N

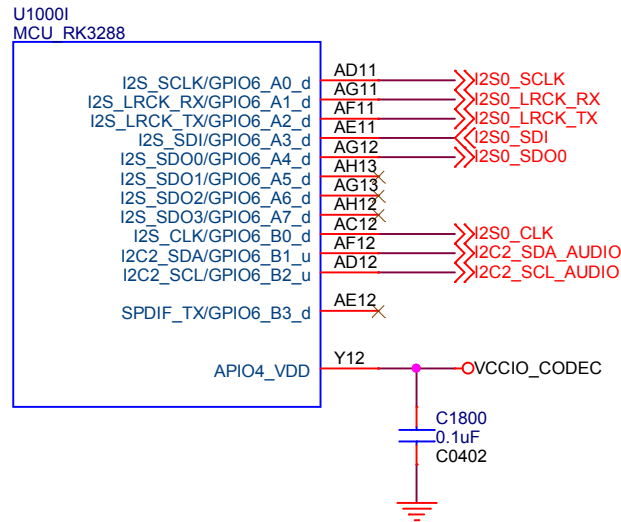
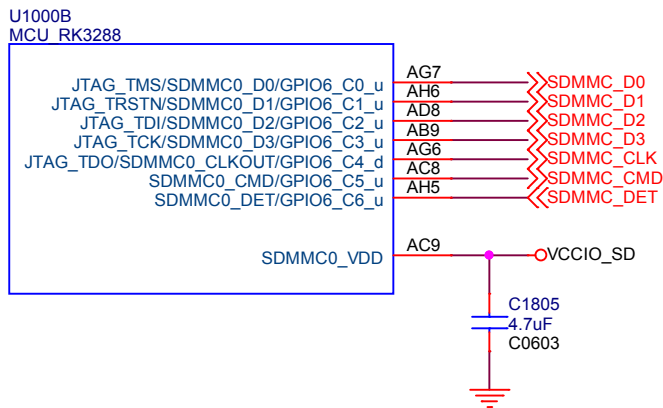
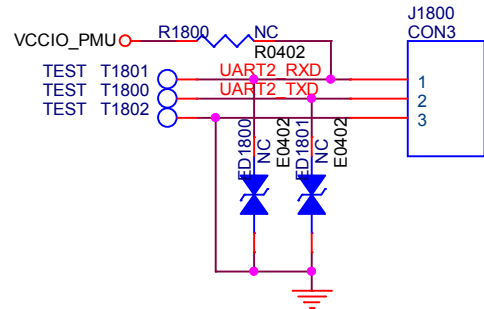
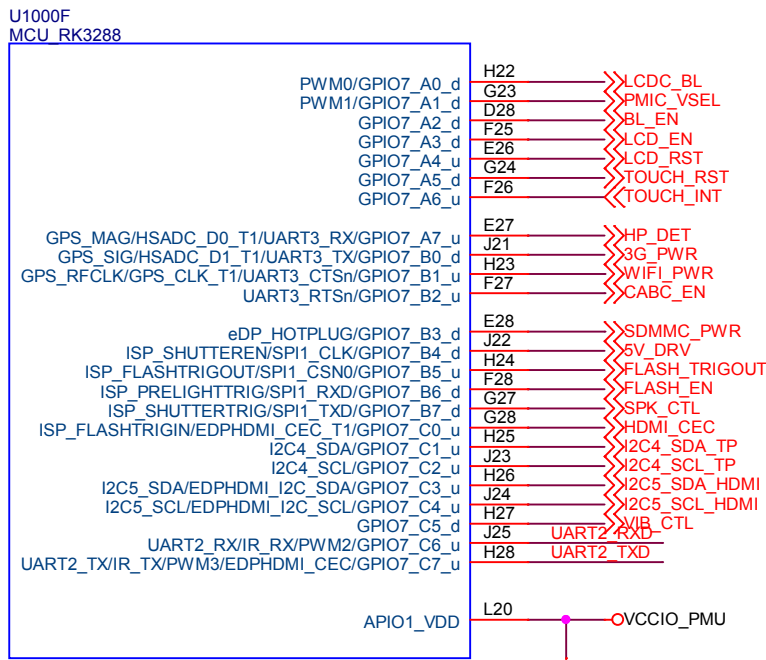


Note: All the capacitor should be place close to the power pin of RK3288.

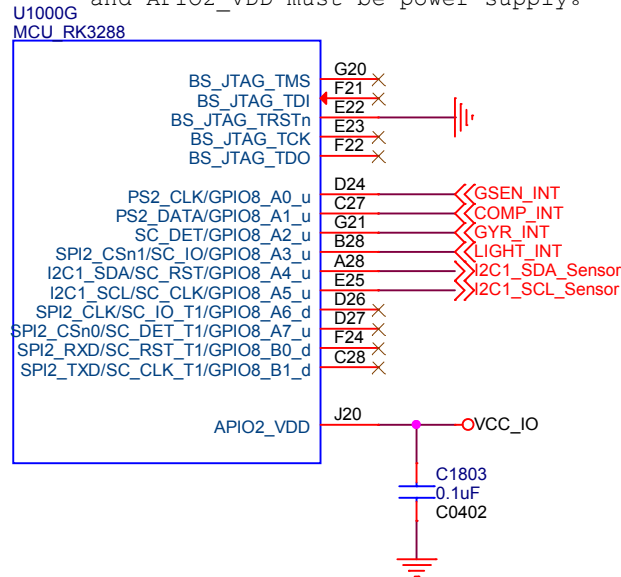


Correspondence between LCD0 DATA and RGB

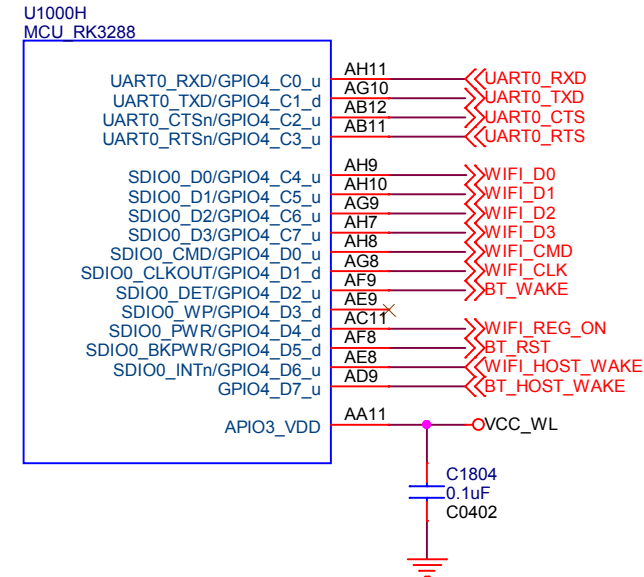
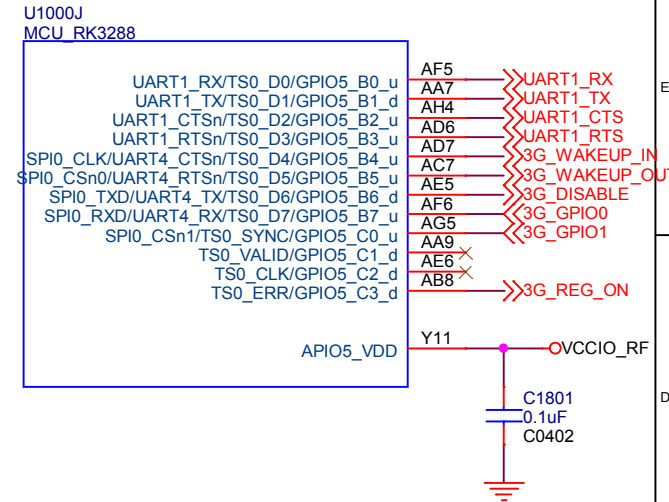
LDC0_D0	B0	LDC0_D8	G0	LDC0_D16	R0
LDC0_D1	B1	LDC0_D9	G1	LDC0_D17	R1
LDC0_D2	B2	LDC0_D10	G2	LDC0_D18	R2
LDC0_D3	B3	LDC0_D11	G3	LDC0_D19	R3
LDC0_D4	B4	LDC0_D12	G4	LDC0_D20	R4
LDC0_D5	B5	LDC0_D13	G5	LDC0_D21	R5
LDC0_D6	B6	LDC0_D14	G6	LDC0_D22	R6
LDC0_D7	B7	LDC0_D15	G7	LDC0_D23	R7



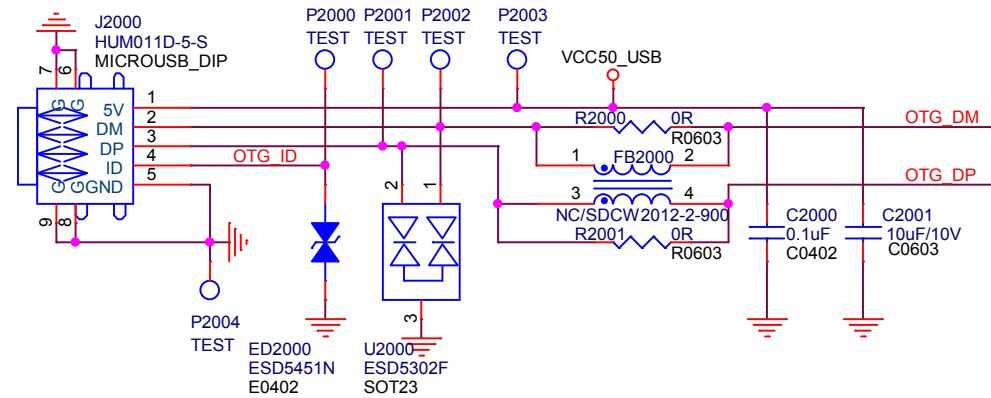
Note: BS_JTAG_TRSTn must be connected to VSS and APIO2_VDD must be power supply.



Note: All the capacitor should be place close to the power pin of RK3288.



OTG_DM
OTG_DP
OTG_ID
OTG_DET
USB_INT



VCC50_USB

R2002
10K
R0402

OTG_DET

R2004
15K
R0402

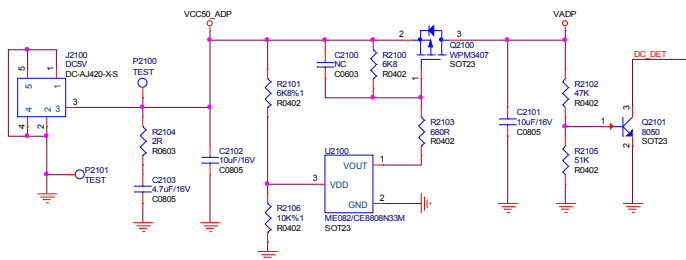
C2002
0.1uF
C0402

R0402

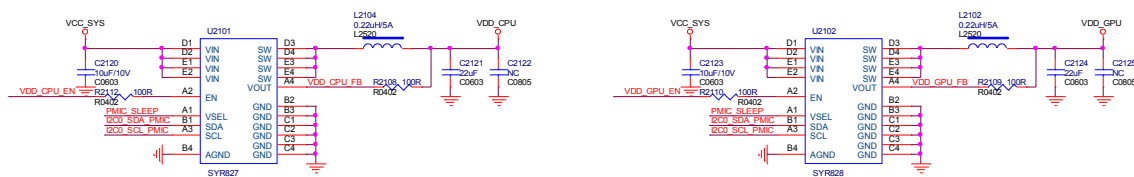
1K

USB_INT

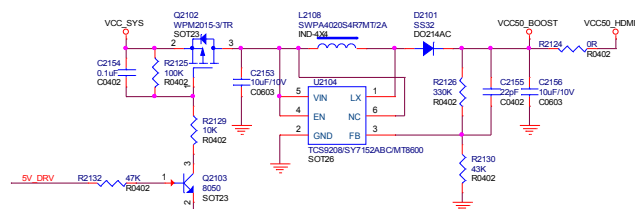
Note:
Please use a 5V DC.



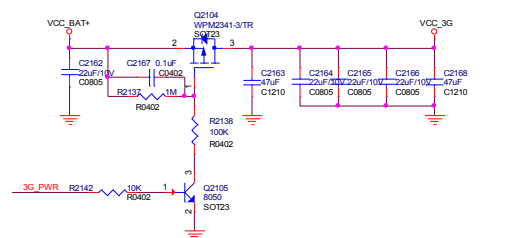
VDD CPU、 VDD GPU



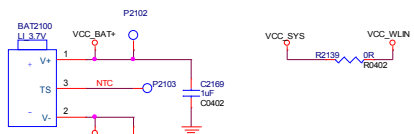
Boost



3G POWER



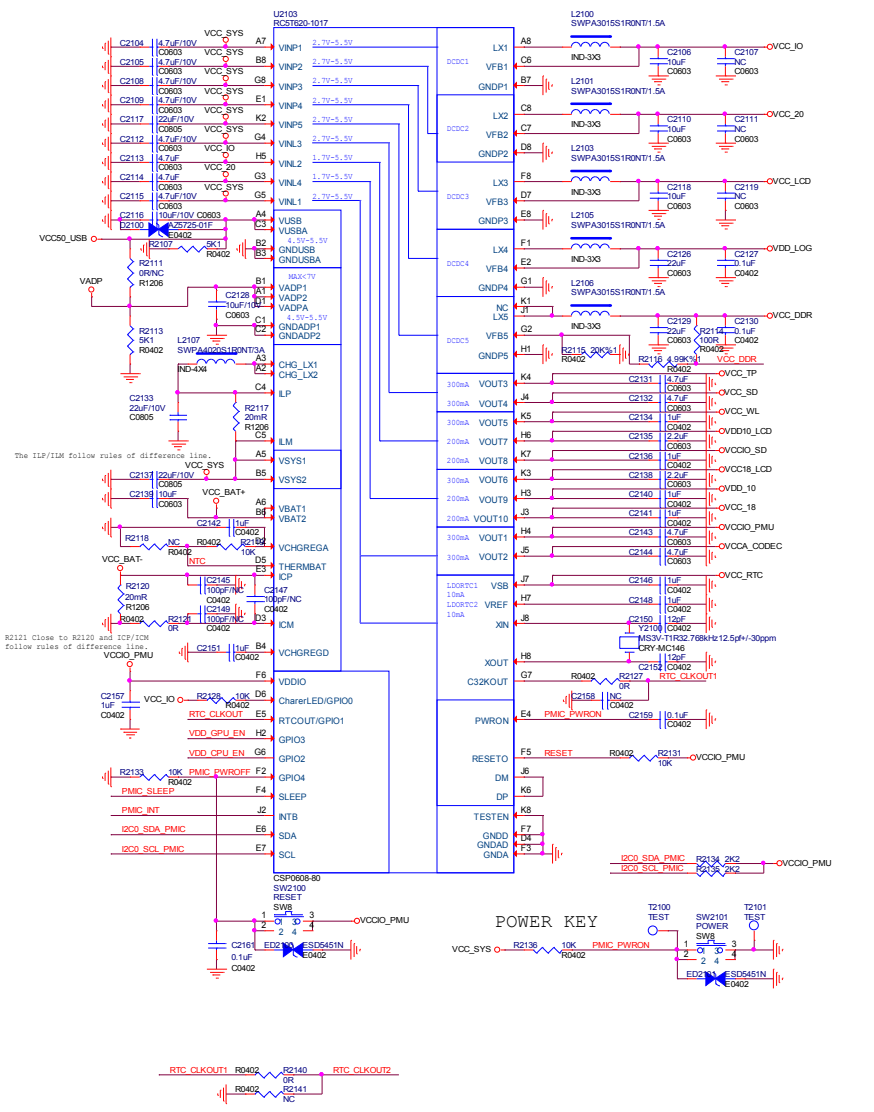
BATTERY



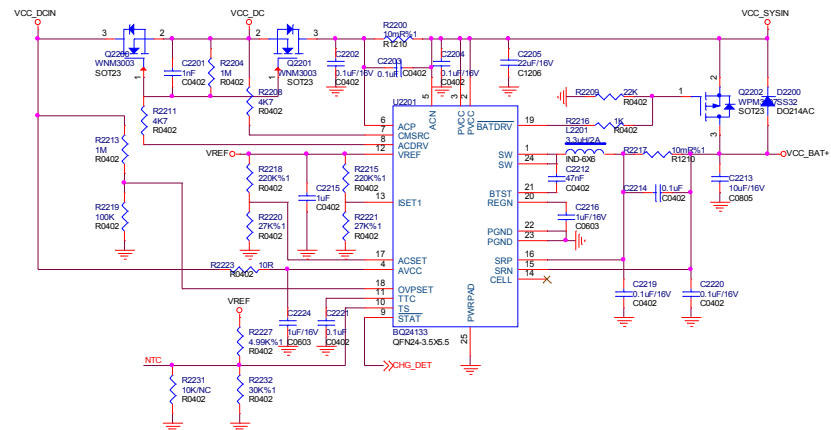
SYSTEM POWER

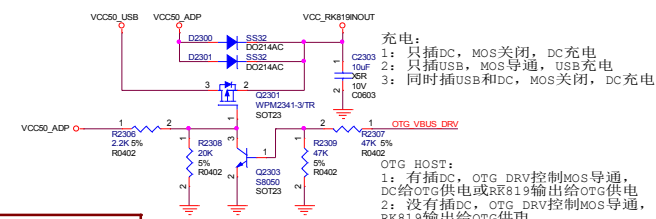
PowerName	FME Channel	FMEB (2MB)	OutPut
VOC 10	OC0C1	501E:8	1.3V
VOC 20	OC0C2	501E:0	1.0V
VOC10 SPD	OC0C3	501E:5	0.0V
VOC 10	OC0C4	501E:5	0.0V
VOC 50B	OC0C5	501E:4	1.2V
VOC 50A	BA0C0C1	501E:2	0.0V
VOC SPD	BA0C0C0	501E:3	0.0V
VOC 10	OC0C6	501E:5	0.0V
VOC 10	OC0C7	501E:5	0.0V
VOC10 ME	VO0C1	50F	1.0V
VOC10 SPD	VO0C2	50F	1.0V
VOC10 SPD	VO0C6	501E:0	1.0V
VOC10 SPD	VO0C7	501E:0	1.0V
VOC 10	VO0C9	501E:1	0.0V
VOC 18	VO0T10	501E:6	0.8V
VOC10 FMEB	VO0T1	501E:7	1.0V
VOC10 FMEB	VO0T2	50F	1.3V

DDR Type	OutPut voltage	R2115	R2116
DDR3	1.5V	20K	4.9K
DDR3L	1.35V	20K	2.4K
LPDDR2/3	1.25V	20K	1K



CHARGE and Power Path





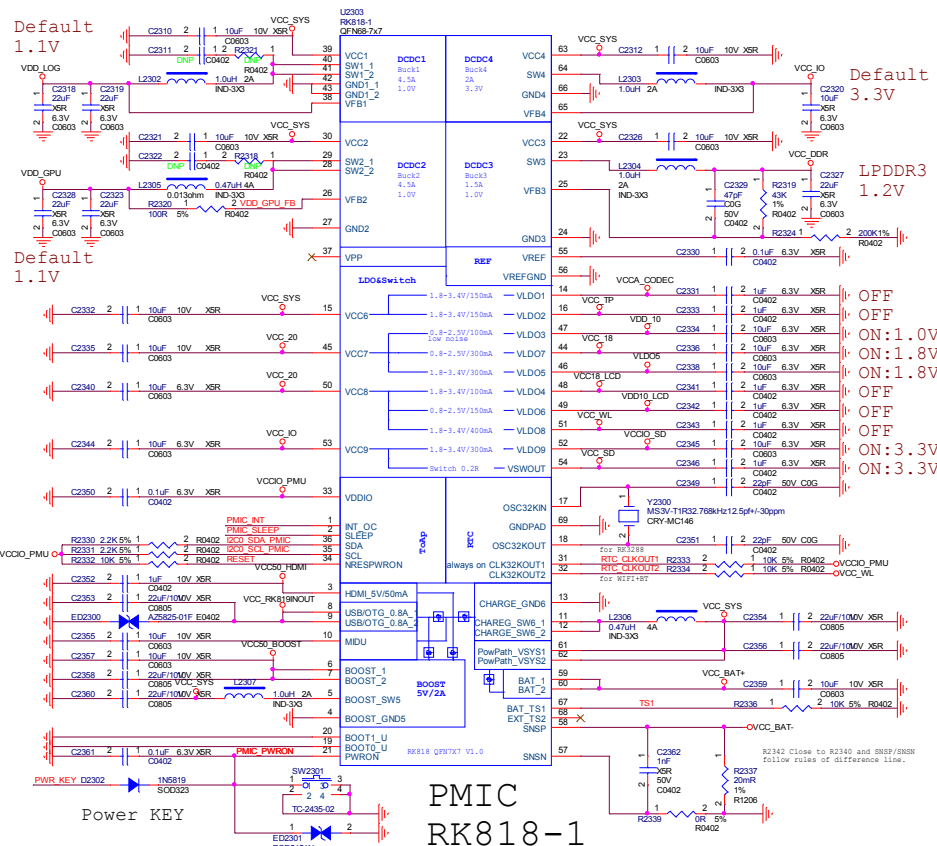
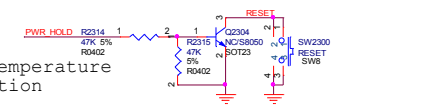
充电:

- 1: 只插DC, MOS关闭, DC充电
- 2: 只插USB, MOS导通, USB充电
- 3: 同时插USB和DC, MOS关闭, DC充电

OTG HOST:
1: 有插DC, OTG DRV控制MOS导通,
DC给OTG供电或RK819输出给OTG供电
2: 没有插DC, OTG DRV控制MOS导通,
RK819输出给OTG供电

Only the USB Port
VCC50 USB cnncted to the VCC RK819INOUT

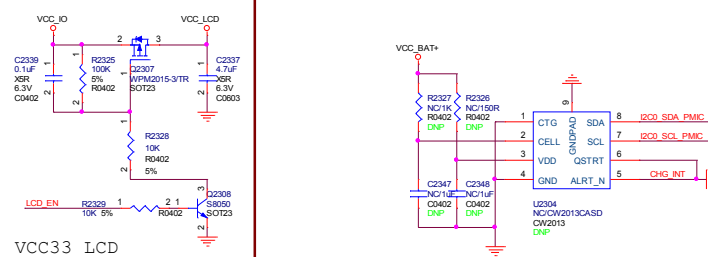
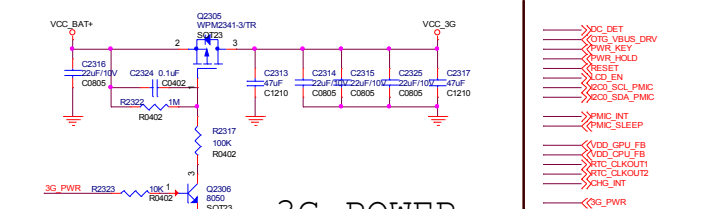
Over-temperature Protection



DDR Type	OutPut voltage	R2311	R2312
DDR3	1.5V	100K	200K
DDR3L	1.358V	43K	120K
LPDDR2/3	1.25V	49.9K	200K

PowerName	PMU Channel	TIMER (ms)	OutPut voltage
VCC LOG	DCDC1	500	1.0
VDD_GPU	DCDC4	500	1.2
VCC DDR	DCDC4	500	1.05
VCC IO	DCDC4	500	1.7
VDD ARM	BaDCDC1	500	1.1
VCCA CORN	VLD01	500	1.3
VCCA_FPU	VLD02	500	1.3
VCCA_VIO	VLD03	500	1.1
VCCA_I2C	VLD04	500	1.8
VCCIO_FMU	VLD05	500	1.6
VCCIO_I2C	VLD06	500	1.8
VCC IE	VLD07	500	1.5
VCC_ML	VLD08	500	1.8
VCCIO_SD	VLD09	500	1.3
VCCIO_USB	VLD10	500	1.8
SECT1	15A000000		

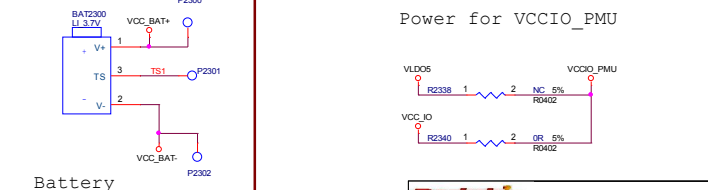
3G POWER



VCC33 LCD

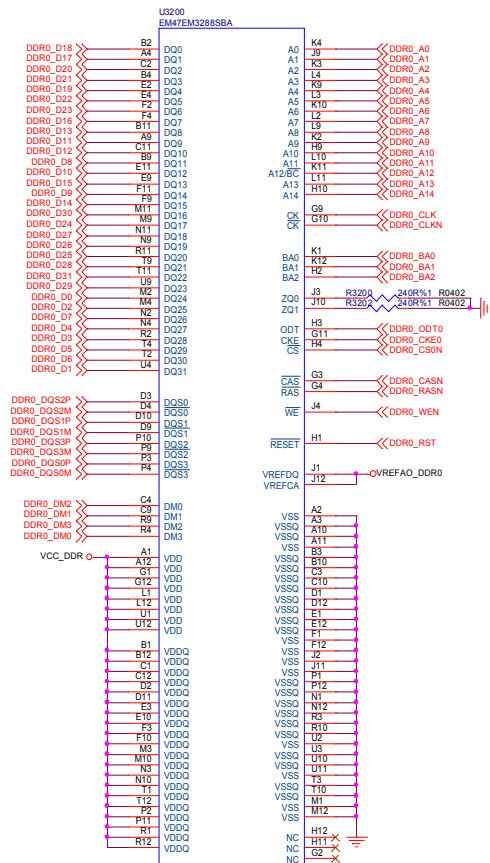
Power for WIFI+BT

Power for VCCIO PMU

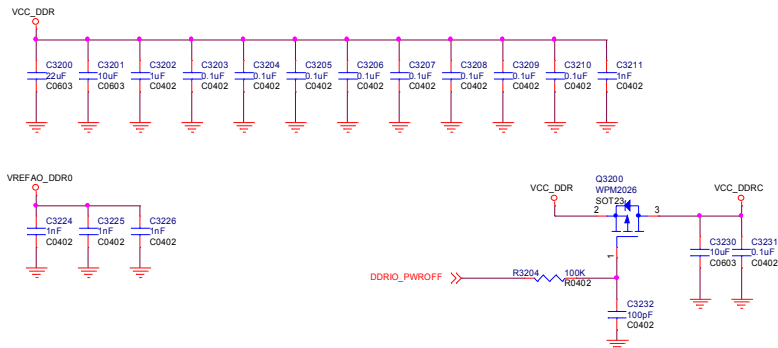


Battery

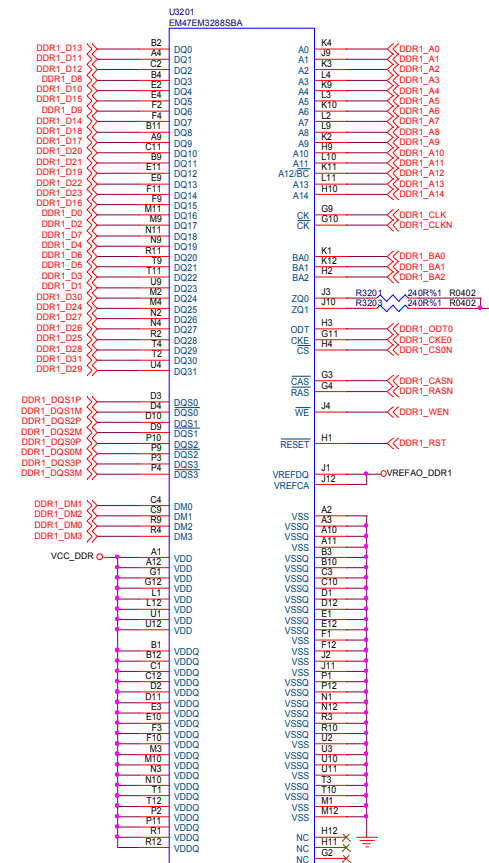
DDR3 Channel-0



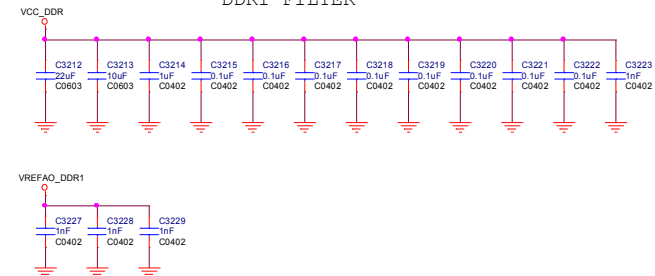
DDR0 FILTER



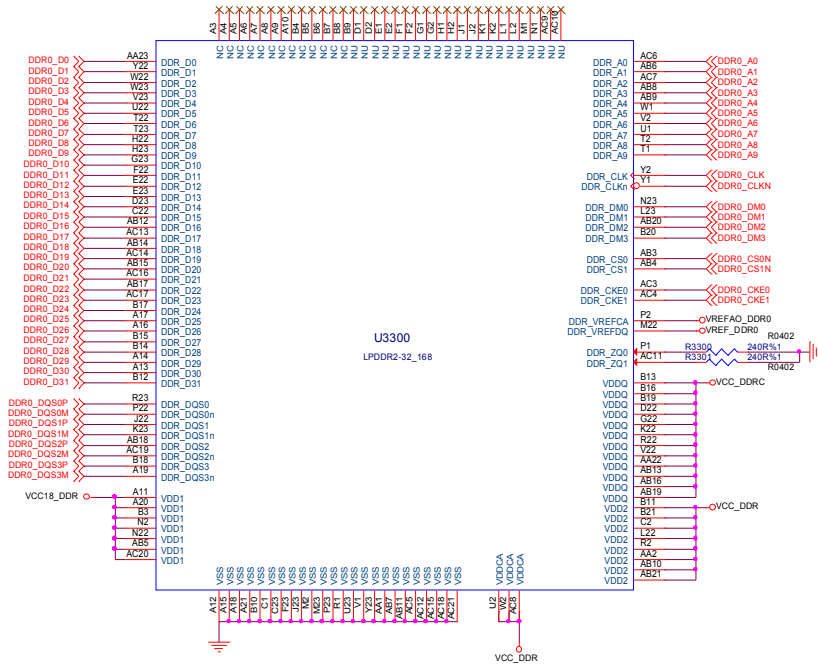
DDR3 Channel-1



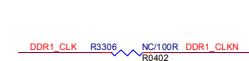
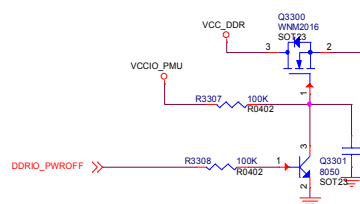
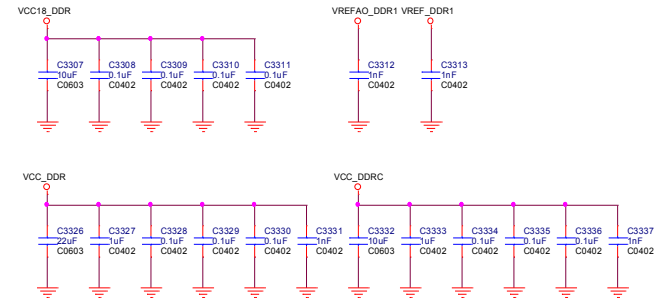
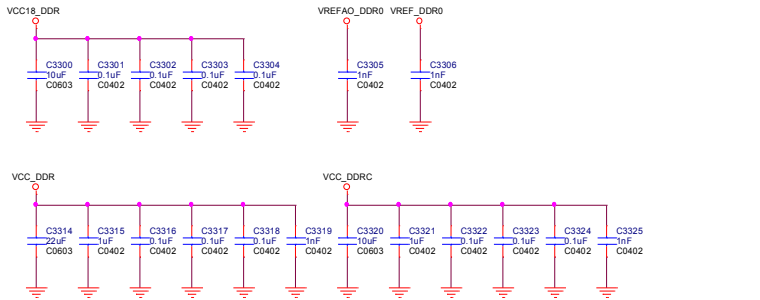
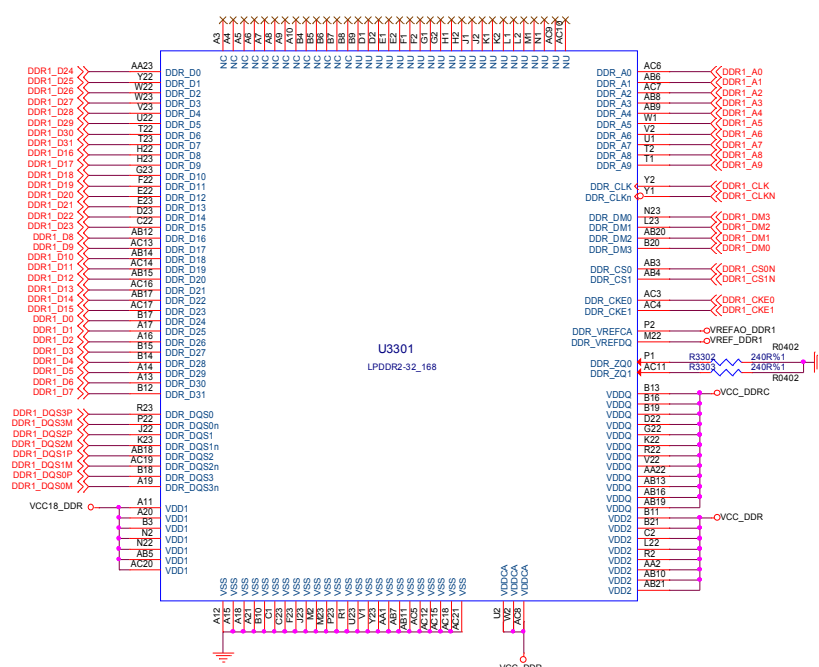
DDR1 FILTER

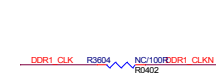
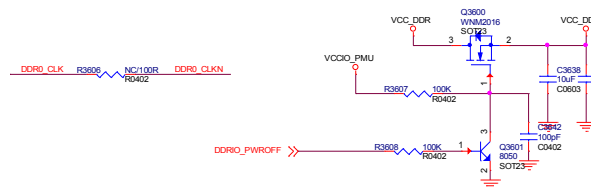
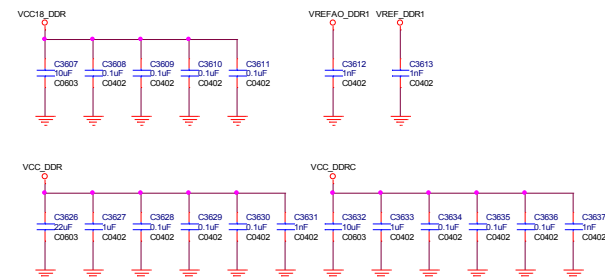
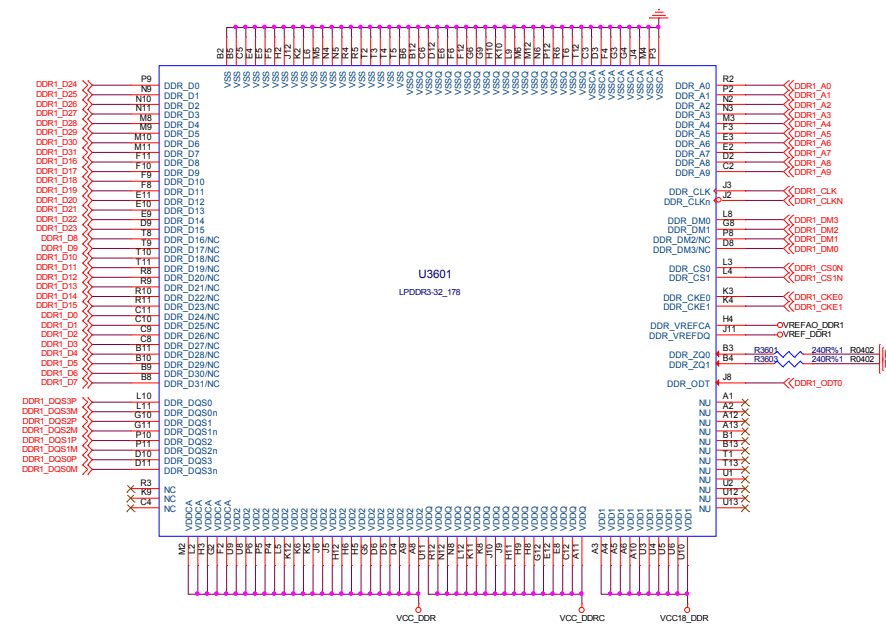
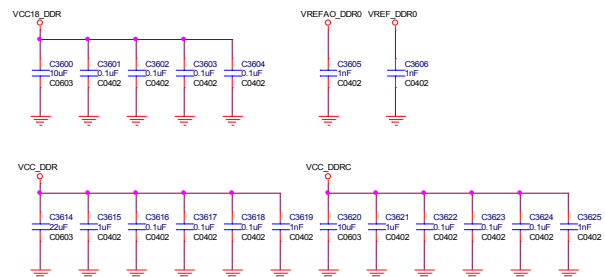
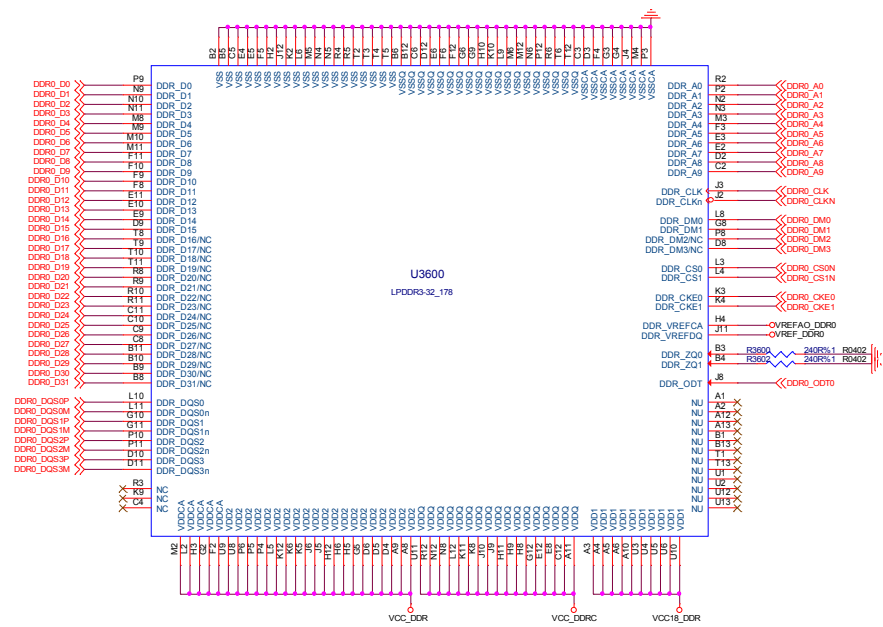


LPDDR2 Channel-0

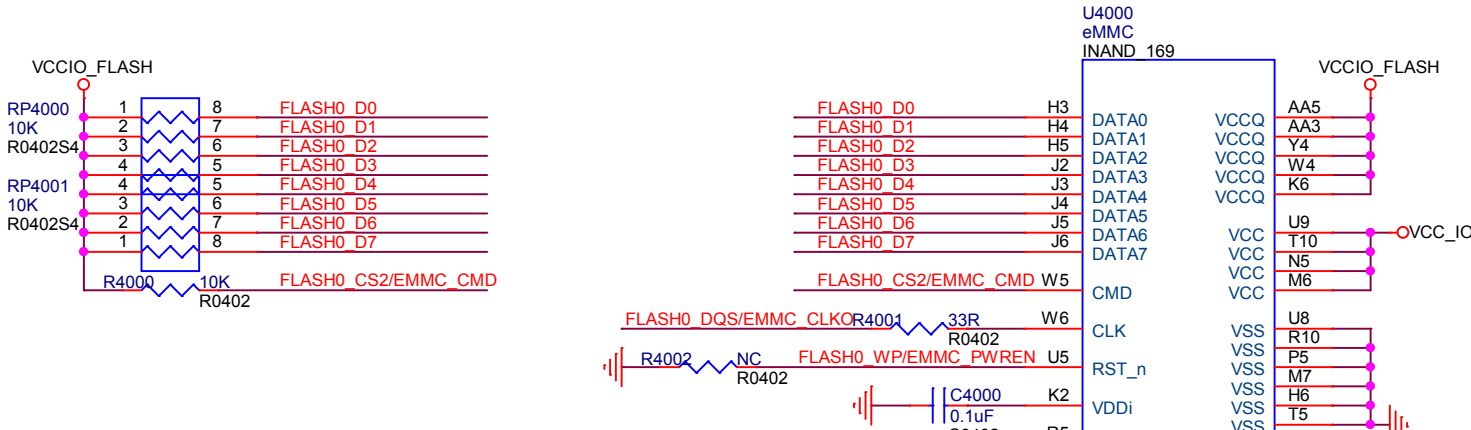


LPDDR2 Channel-1

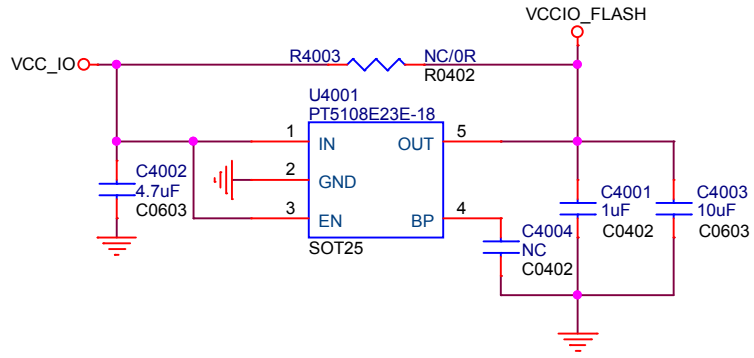




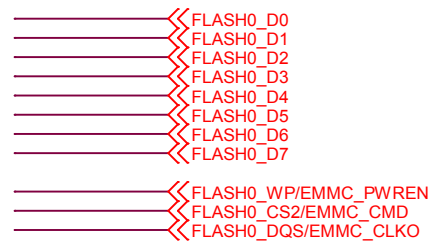
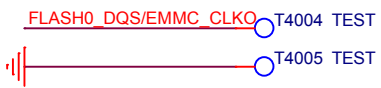
eMMC FLASH



Note:
U4001 must be use for Sandisk 5.0 TLC eMMC,
because it support only 1.8V VCCQ power supply.

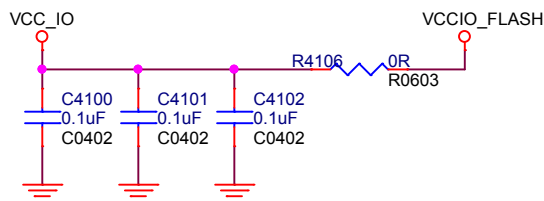
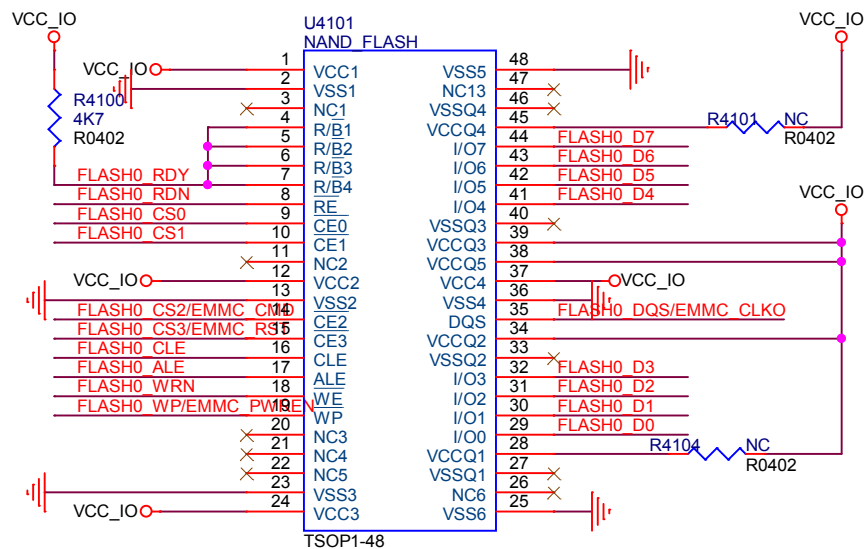


Note:
Reserve PAD for Update.

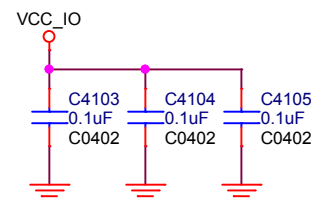
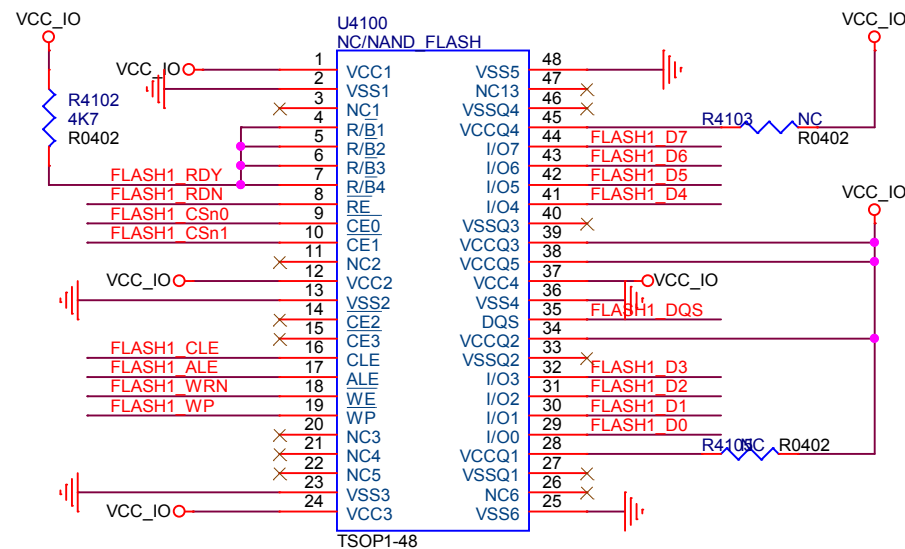
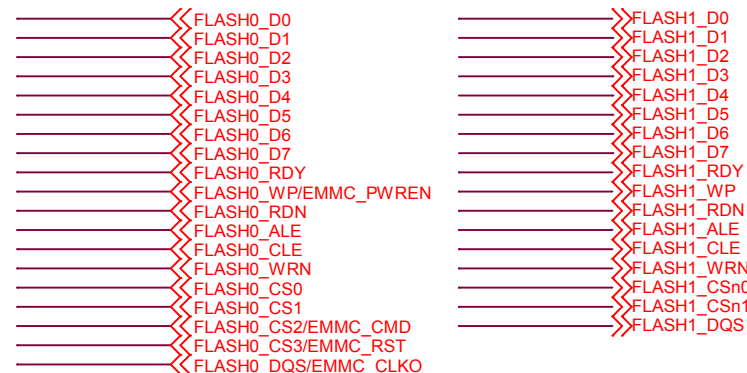


NAND FLASH

note: if use toshiba and sandisk Flash at DDR mode,
VCCQ1 and VCCQ4 must be connected to VCC_IO.

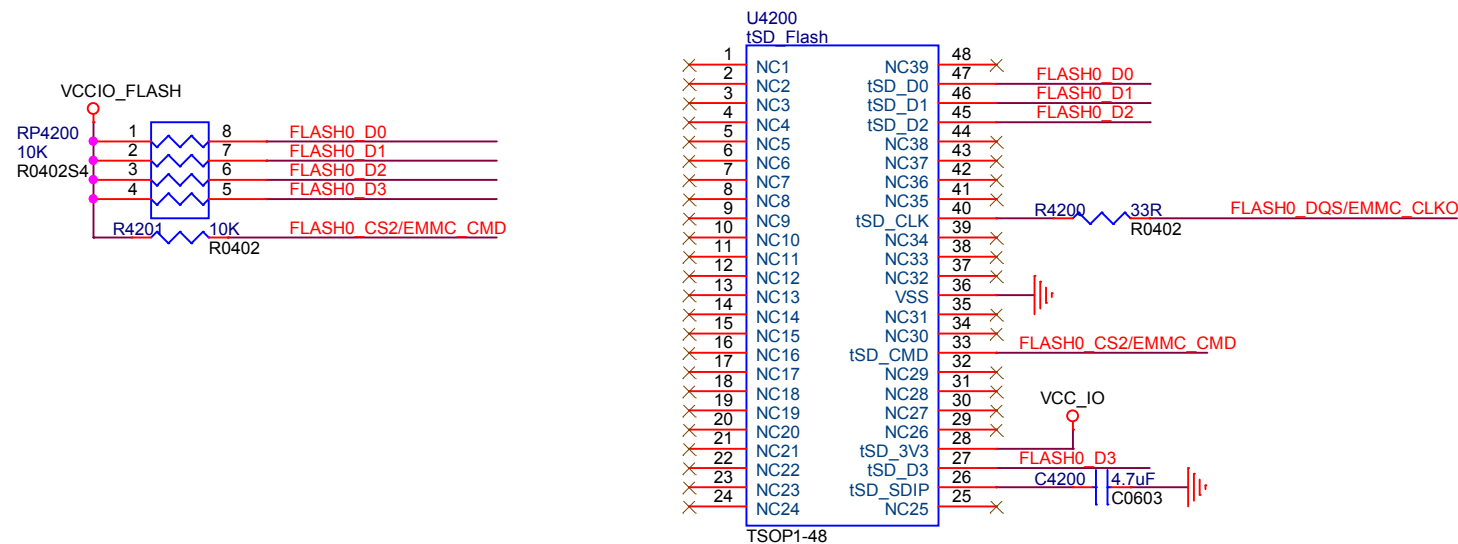


Note:
Reserve PAD for Update.

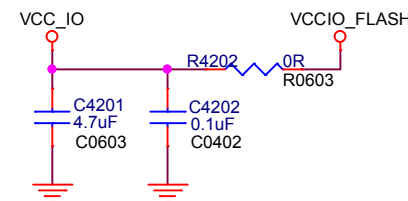
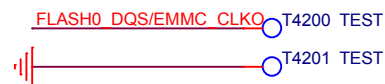


tSD FLASH

FLASH0_D0
FLASH0_D1
FLASH0_D2
FLASH0_D3
FLASH0_DQS/EMMC_CLKO
FLASH0_CS2/EMMC_CMD

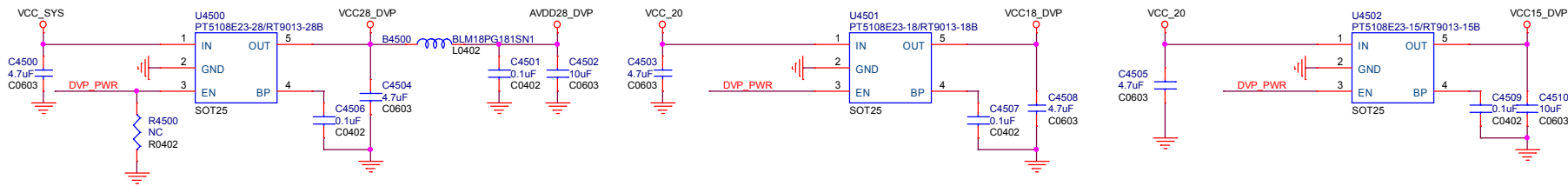


Note:
Reserve PAD for Update.



DVP Power

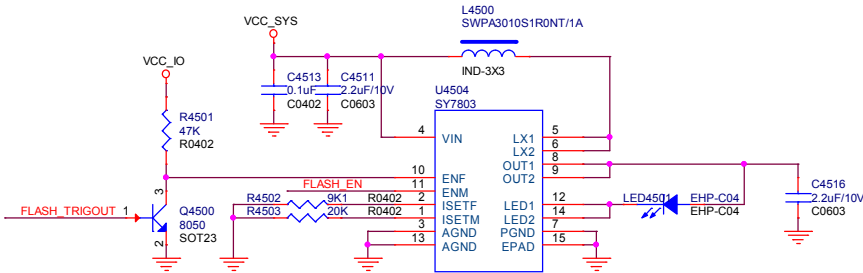
FLASH_TRIGOUT
FLASH_EN
DVP_PWR



FLASH LED Drive

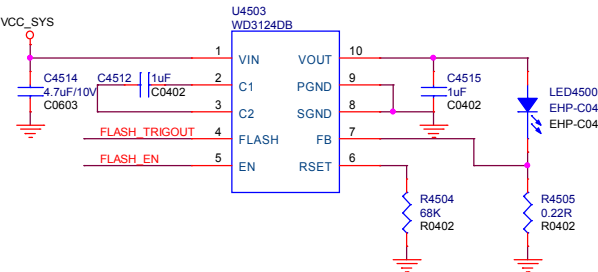
OPTION1

note: Drive up to total 1.5A or 0.75A per channel.



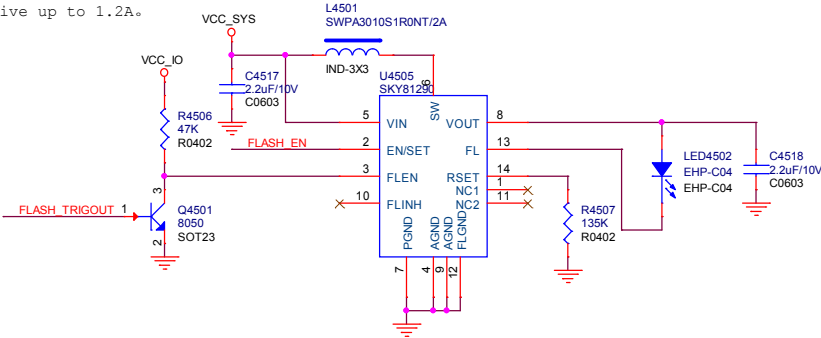
OPTION2

note: Drive up to 1A.

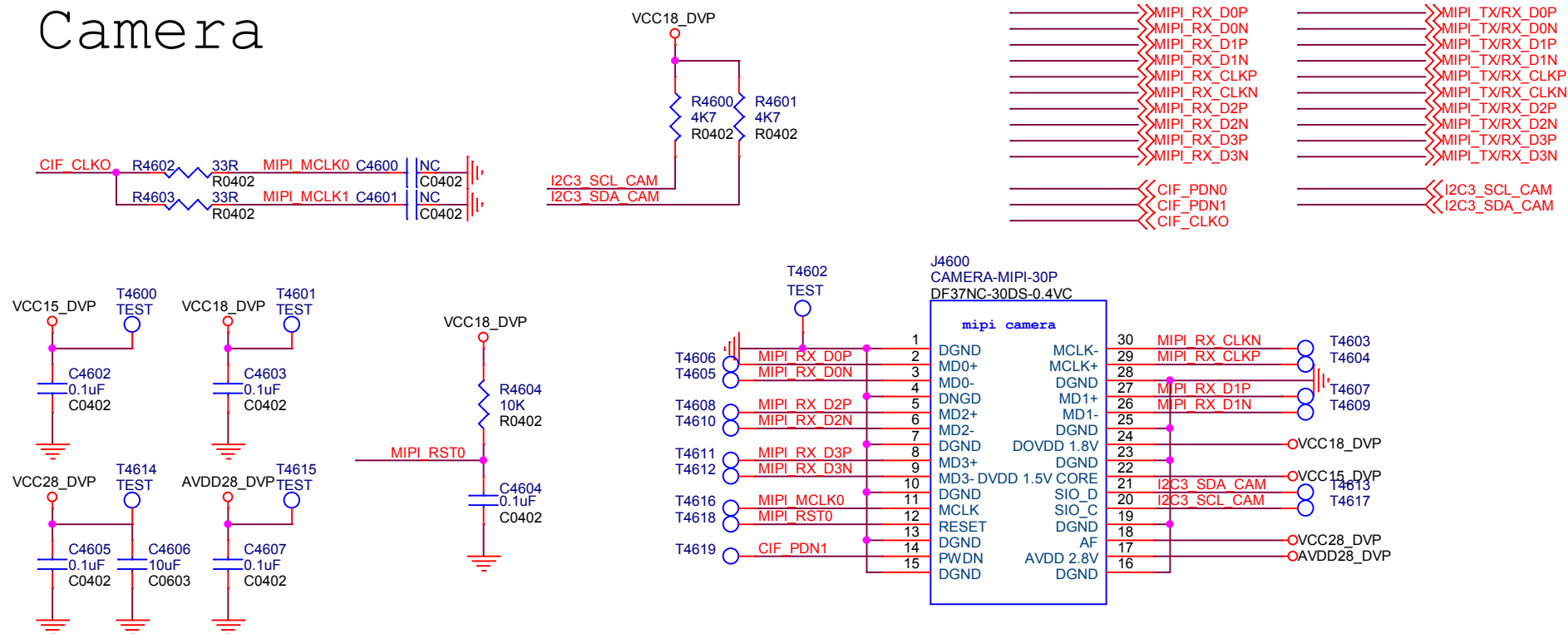


OPTION3

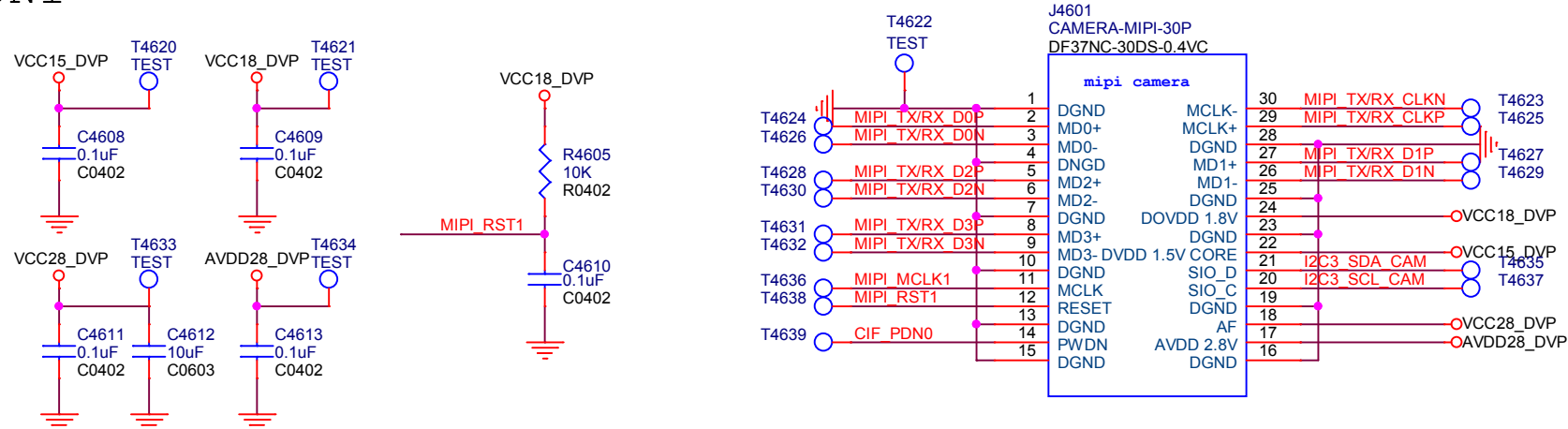
note: Drive up to 1.2A.



MIPI Camera



OPTION1



CIF Camera

VCC18_DVP

I2C3_SCL_CAM

I2C3_SDA_CAM

CIF_CLKI

CIF_CLKO

C4700

NC

C0402

R4702

33R

R0402

CIF_CLKIN

CIF_CLKOUT

C4701

8pF

C0402

VCC18_DVP

R4704

10K

R0402

CIF_RST

C4705

0.1uF

C0402

VCC28_DVP

C4702

4.7uF

C0603

VCC18_DVP

C4703

4.7uF

C0603

CIF_DVDD

C4704

1uF

C0402

T4700

T4702

T4703

T4704

T4701

T4705

T4706

T4707

T4708

T4709

T4710

T4711

T4712

T4713

T4714

T4715

T4716

T4717

T4718

T4719

J4700

OV2659

OV9650FSL

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

GND

GND

CIF_PDN1

I2C3_SDA_CAM

I2C3_SCL_CAM

CIF_RST

CIF_VSYNC

CIF_PDN0

CIF_HREF

CIF_D7

CIF_CLKOUT

CIF_D6

CIF_D5

CIF_CLKIN

CIF_D4

CIF_D0

CIF_D3

CIF_D1

CIF_D2

PWDN1

AGND

SIO_D

AVDD

SIO_C

RESET

VSYNC

PWDN0

HREF

DVDD

DOVDD

Y9

XCLK1

Y8

DGND

Y7

PCLK

Y6

Y2

Y5

Y3

Y4

Y1

Y0

CIF_D0

CIF_D1

CIF_D2

CIF_D3

CIF_D4

CIF_D5

CIF_D6

CIF_D7

CIF_HREF

CIF_VSYNC

CIF_CLKI

CIF_CLKO

CIF_PDN1

I2C3_SCL_CAM

I2C3_SDA_CAM

Rockchip

瑞芯微电子

福州瑞芯微电子有限公司

Title: Camera-CIF (option)

File: RK3288_REF

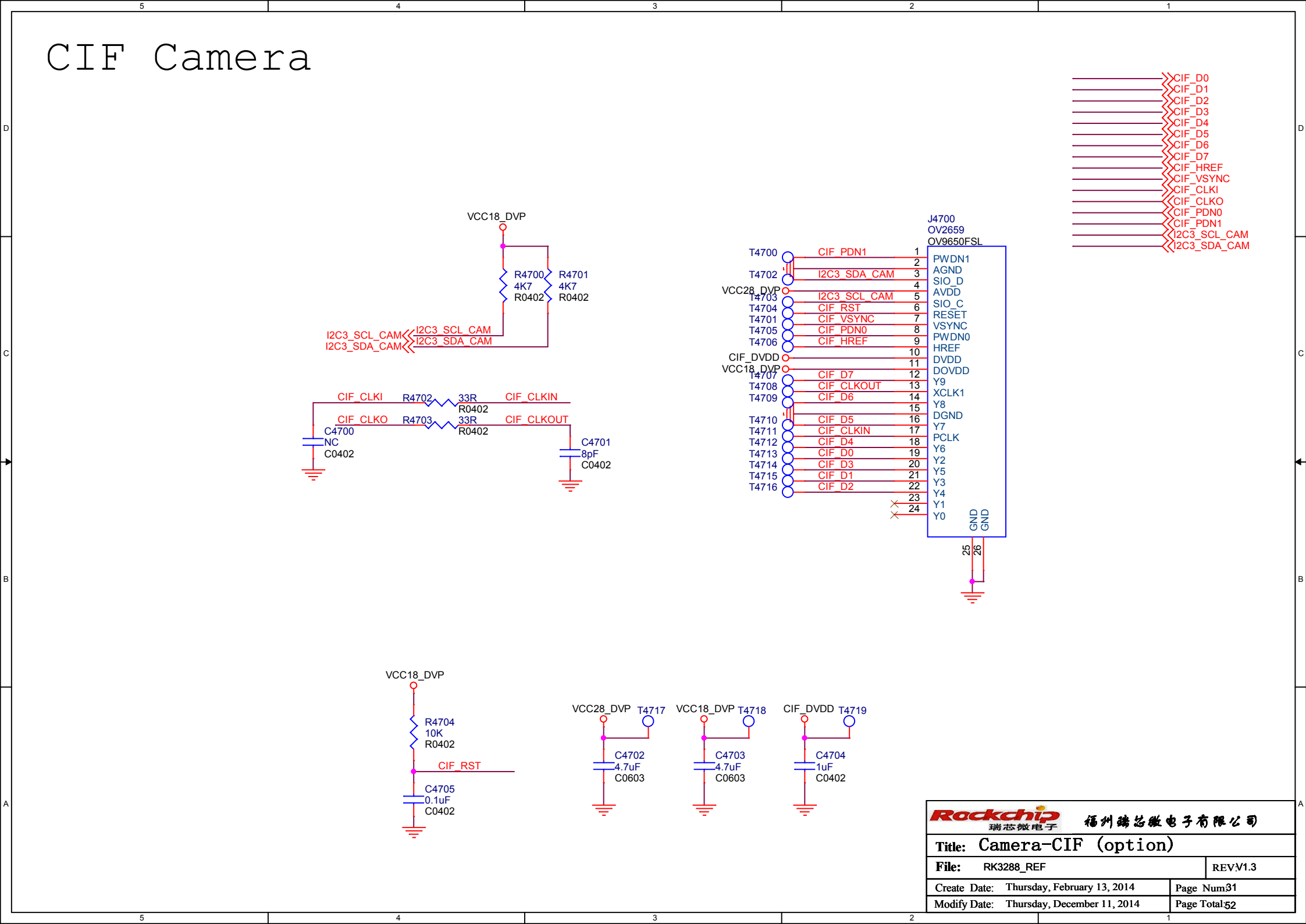
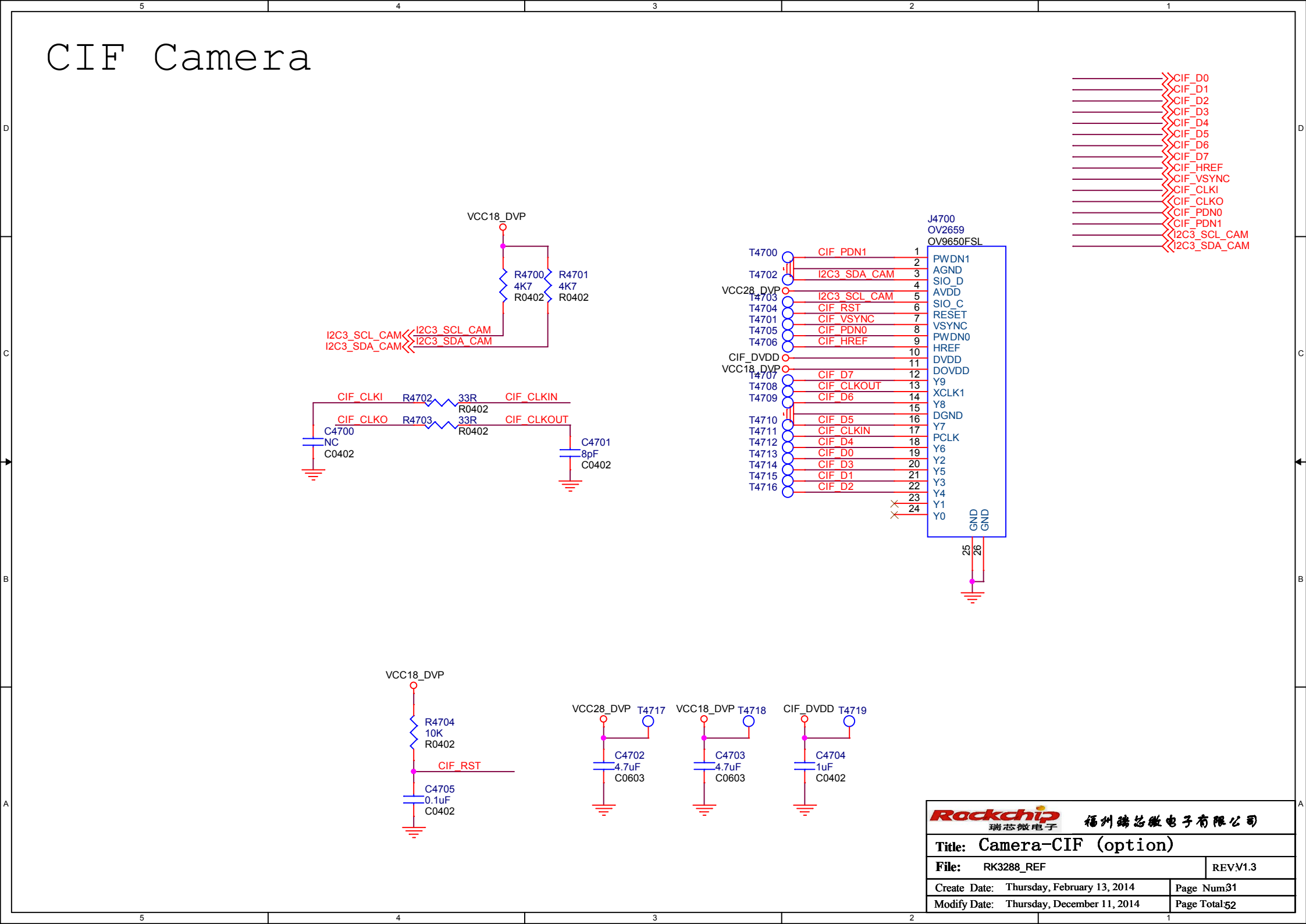
REV.V1.3

Create Date: Thursday, February 13, 2014

Page Num:31

Modify Date: Thursday, December 11, 2014

Page Total:52



CIF Camera

VCC18_DVP

I2C3_SCL_CAM

I2C3_SDA_CAM

CIF_CLKI

CIF_CLKO

C4700

NC

C0402

CIF_CLKIN

CIF_CLKOUT

C4701

8pF

C0402

VCC18_DVP

R4704

10K

R0402

CIF_RST

C4705

0.1uF

C0402

VCC28_DVP

T4717

C4702

4.7uF

C0603

VCC18_DVP

T4718

C4703

4.7uF

C0603

CIF_DVDD

T4719

C4704

1uF

C0402

J4700

OV2659

OV9650FSL

1 PWDN1

2 AGND

3 SIO_D

4 AVDD

5 SIO_C

6 RESET

7 VSYNC

8 PWDN0

9 HREF

10 DVDD

11 DOVDD

12 Y9

13 XCLK1

14 Y8

15 DGND

16 Y7

17 PCLK

18 Y6

19 Y2

20 Y5

21 Y3

22 Y4

23 Y1

24 Y0

25 GND

26 GND

CIF_PDN1

I2C3_SDA_CAM

I2C3_SCL_CAM

CIF_RST

CIF_VSYNC

CIF_PDN0

CIF_HREF

CIF_D7

CIF_CLKOUT

CIF_D6

CIF_D5

CIF_CLKIN

CIF_D4

CIF_D0

CIF_D3

CIF_D1

CIF_D2

Rockchip

瑞芯微电子

福州瑞芯微电子有限公司

Title: Camera-CIF (option)

File: RK3288_REF

REV:V1.3

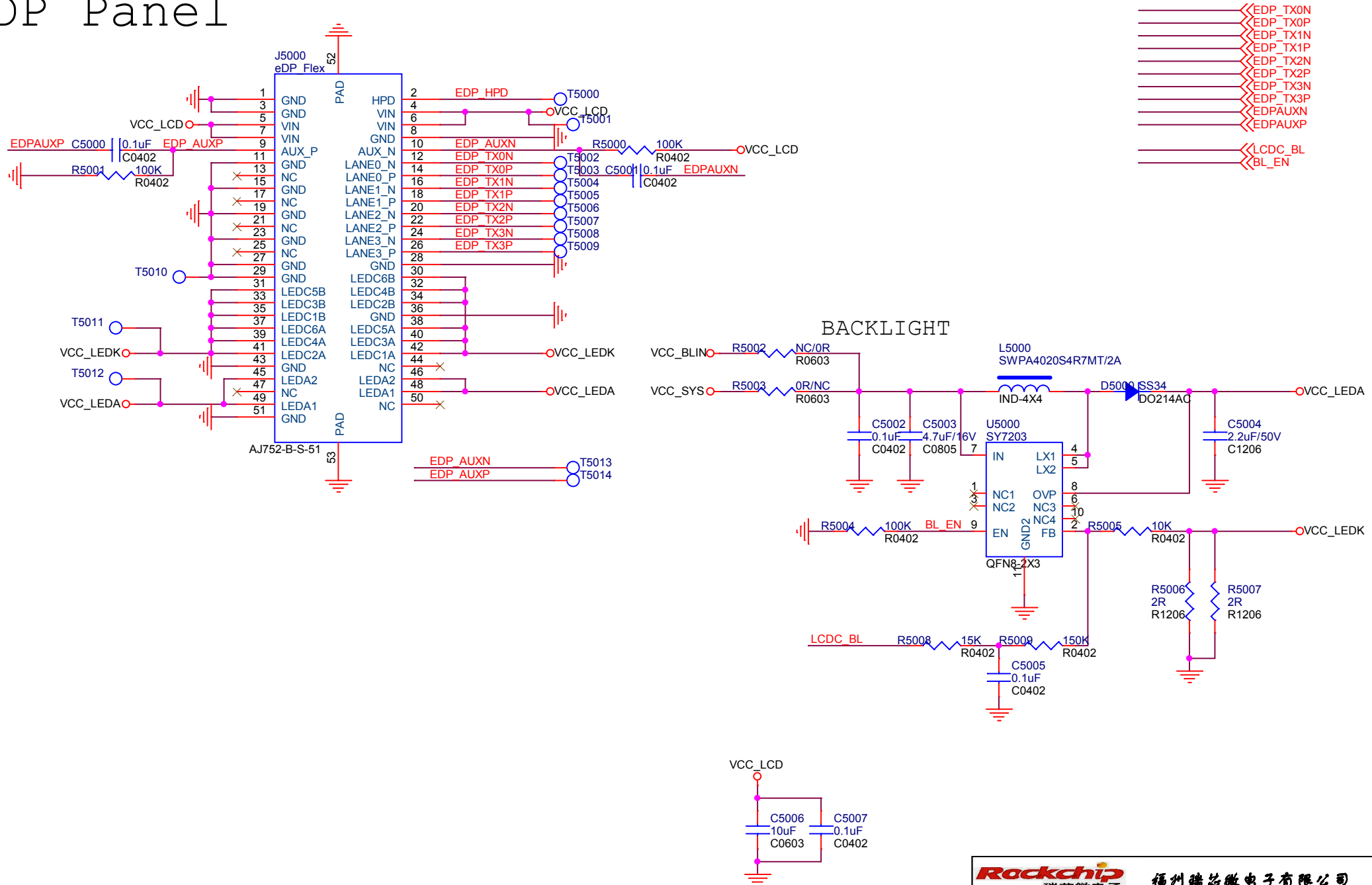
Create Date: Thursday, February 13, 2014

Page Num:31

Modify Date: Thursday, December 11, 2014

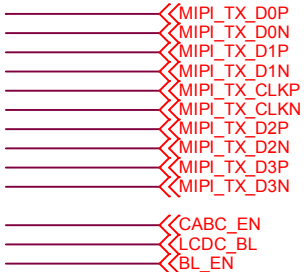
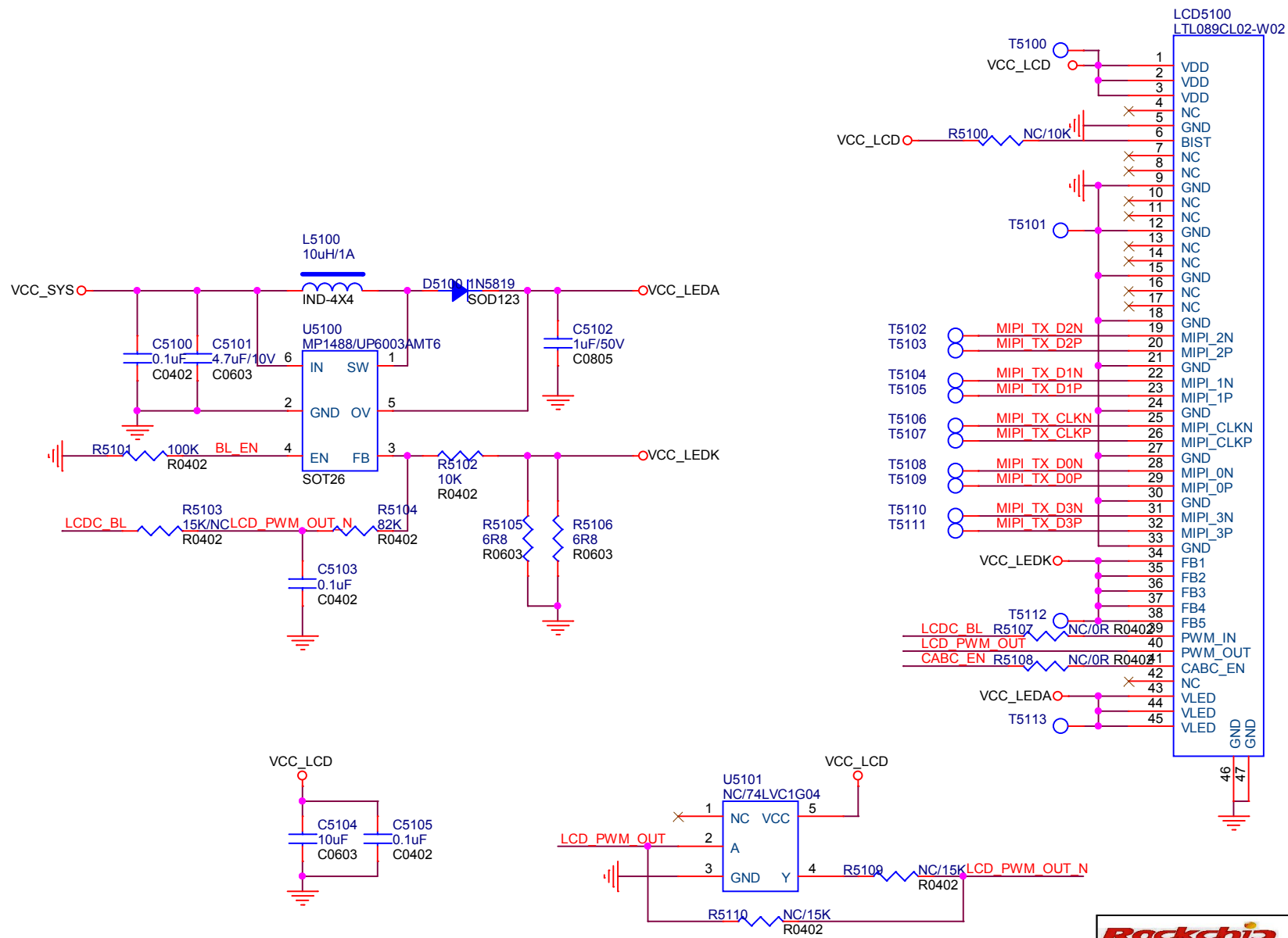
Page Total:52

eDP Panel

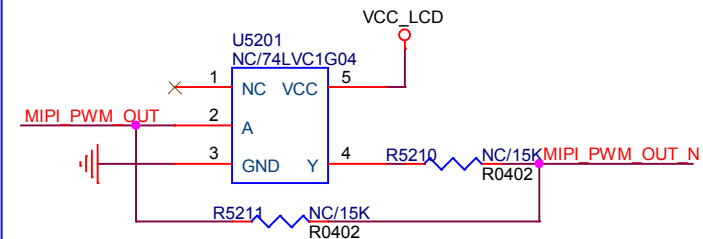
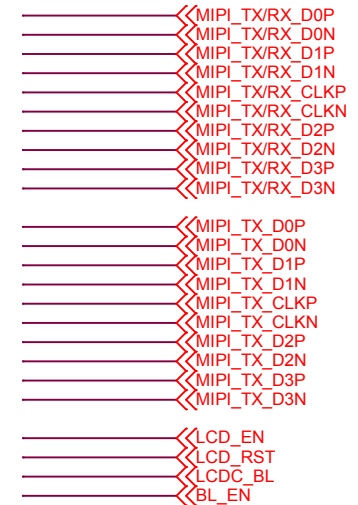
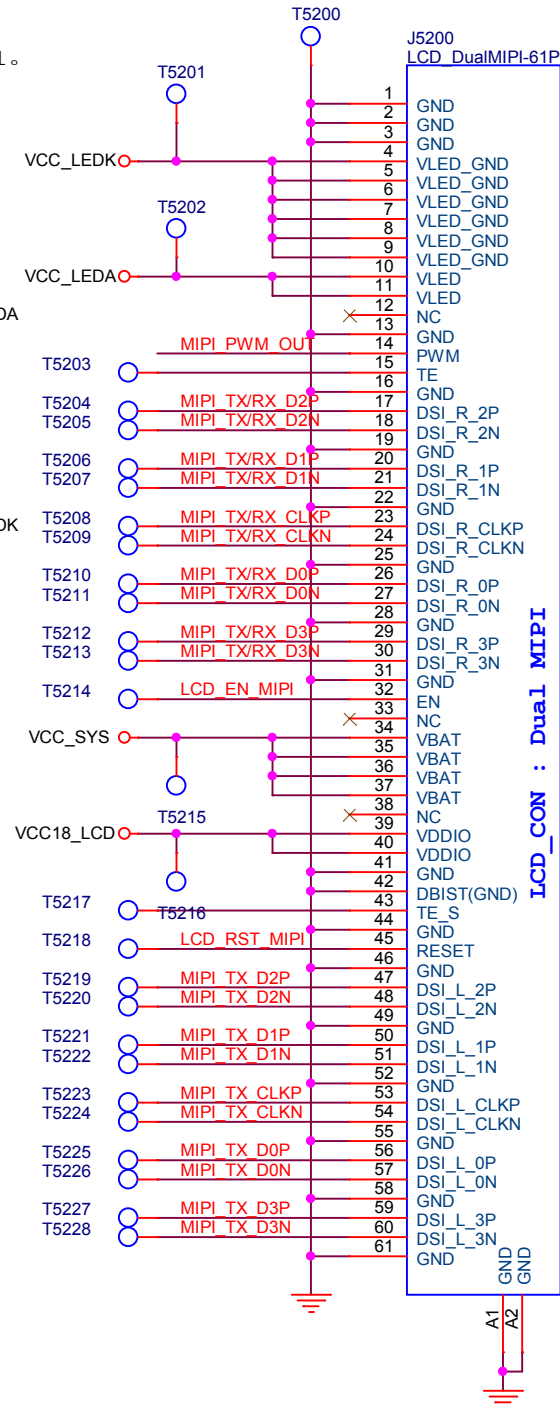
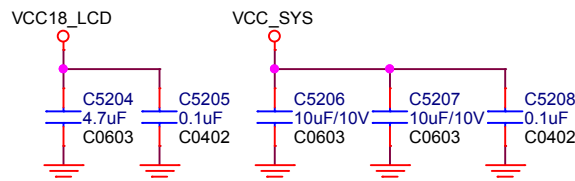
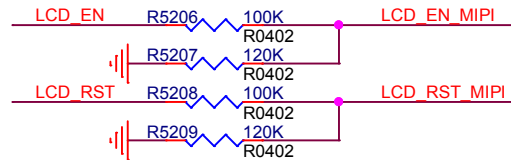
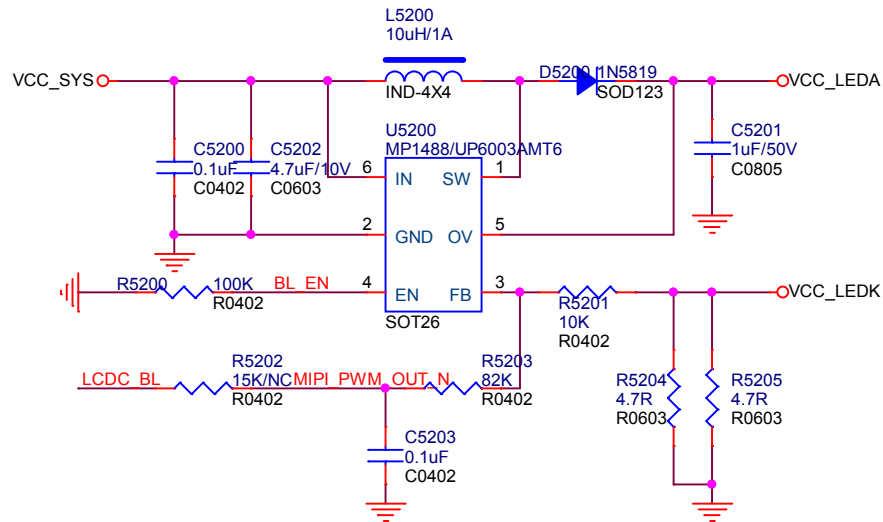


MIPI Panel

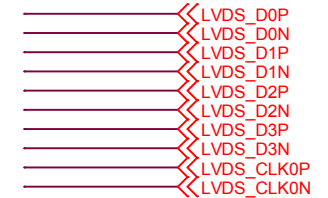
Note: Single MIPI LCM must be connected to MIPI_TX controller.



note: MIPI_TX for Left channel, and MIPI_TX/RX for right channel.

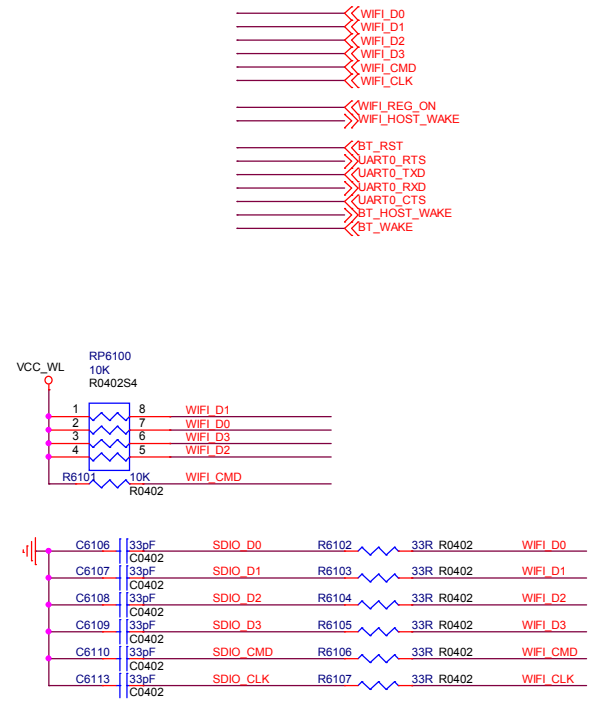
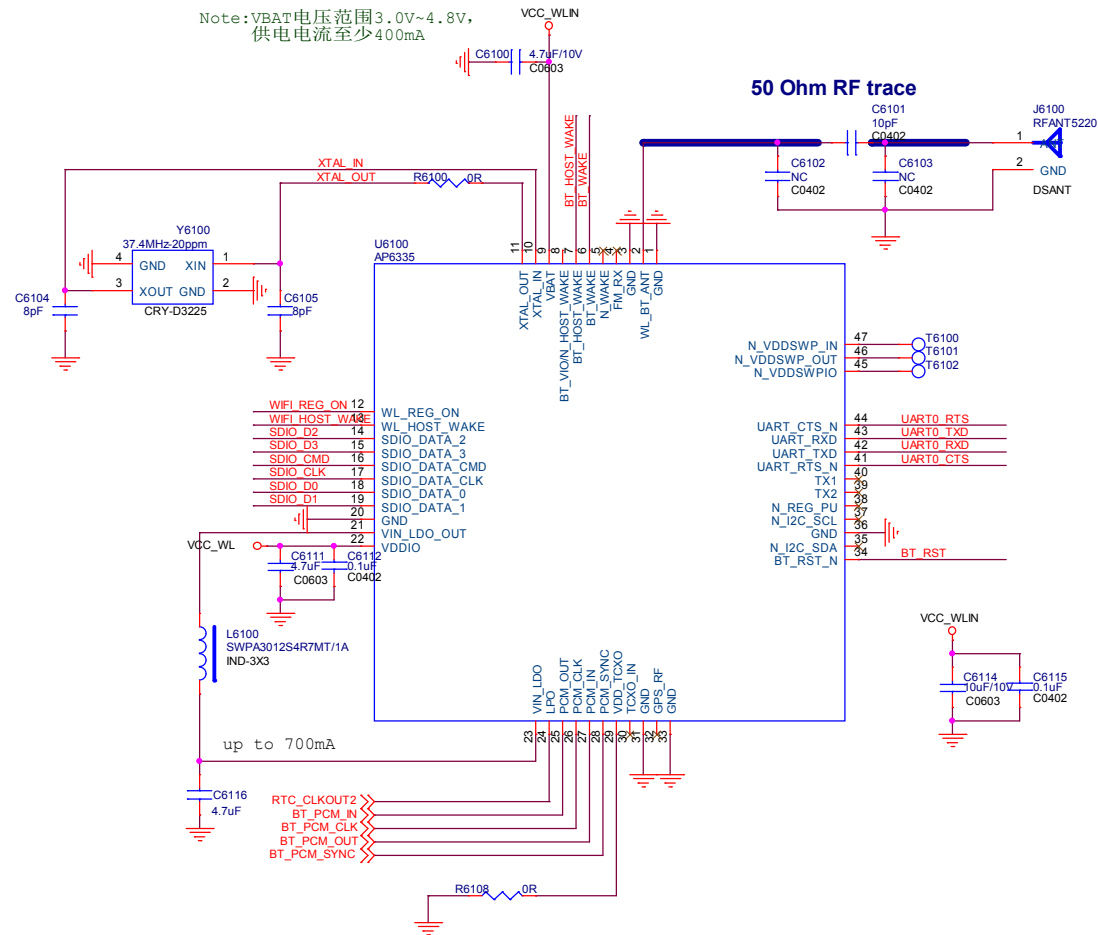


1



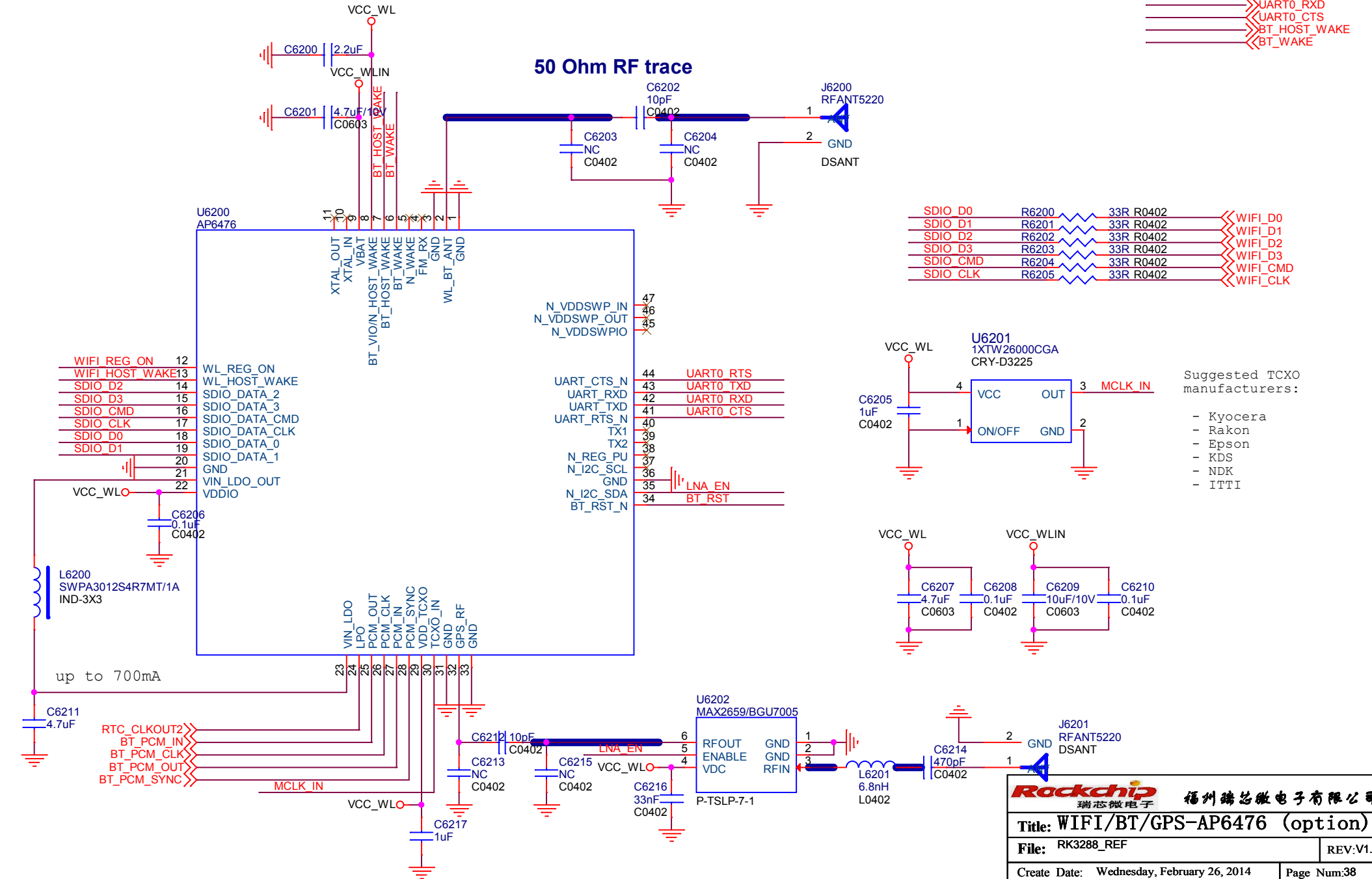
Page Total: 52

WIFI/WIFI ac/BT MODULE

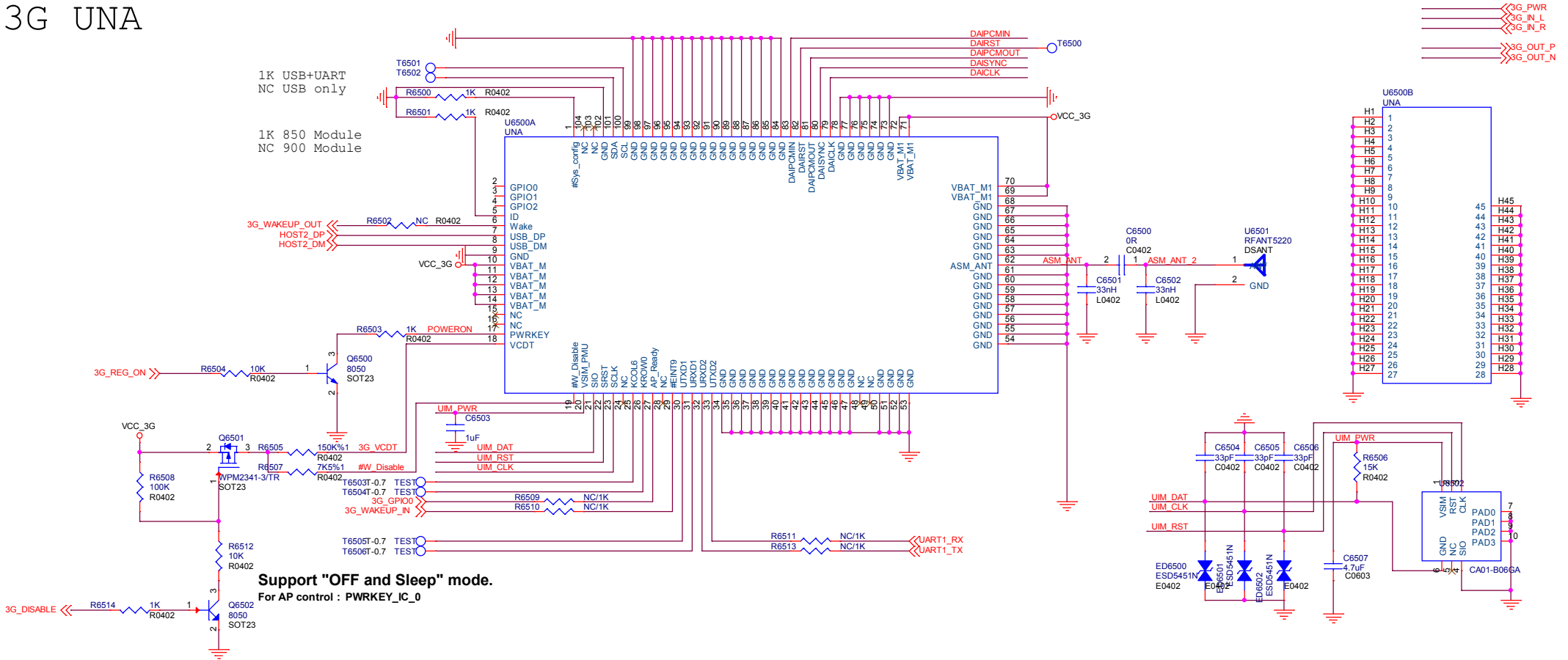


WIFI/BT MODULE

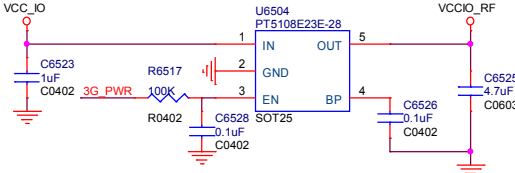
Note: VBAT电压范围3.0V~4.8V,
供电电流至少400mA



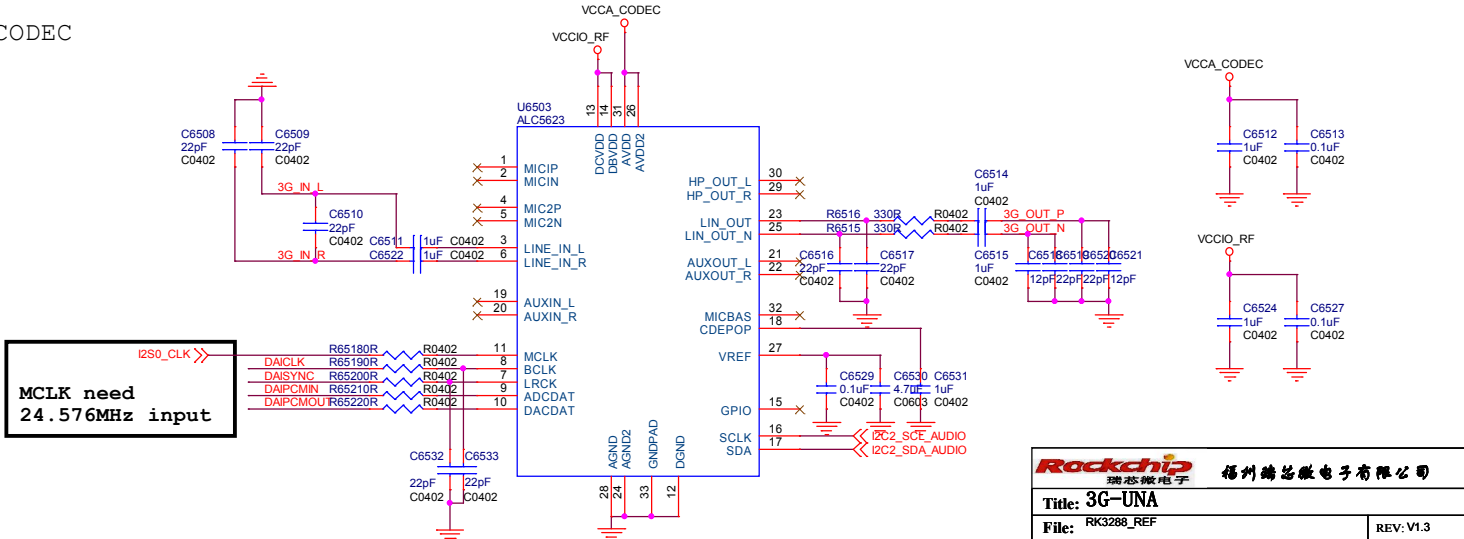
3G UNA



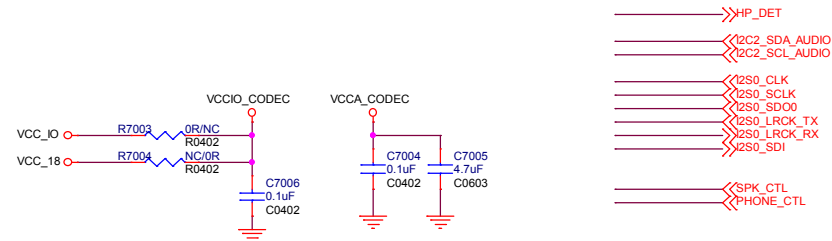
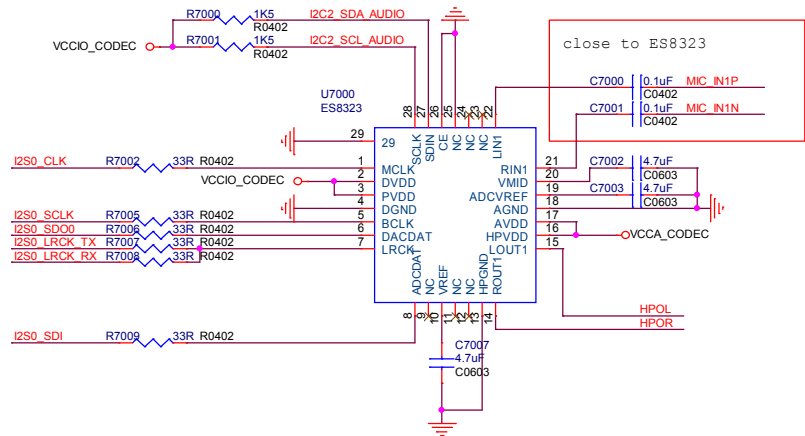
POWER



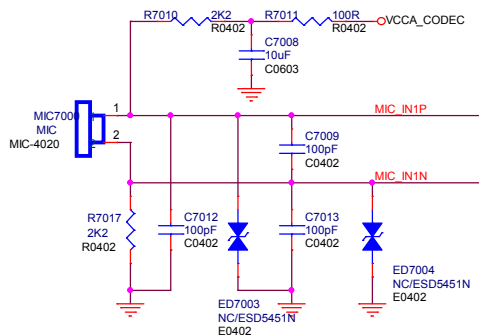
CODEC



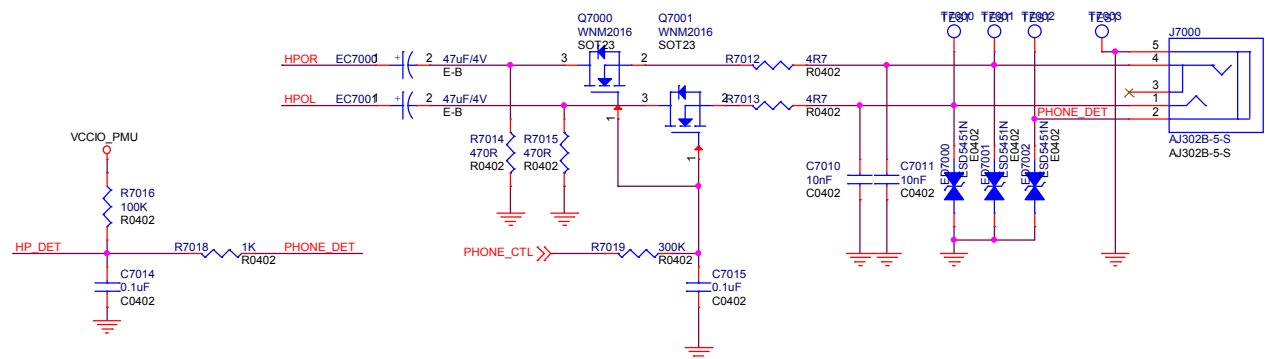
CODEC



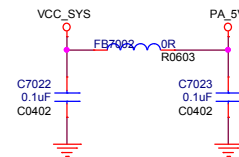
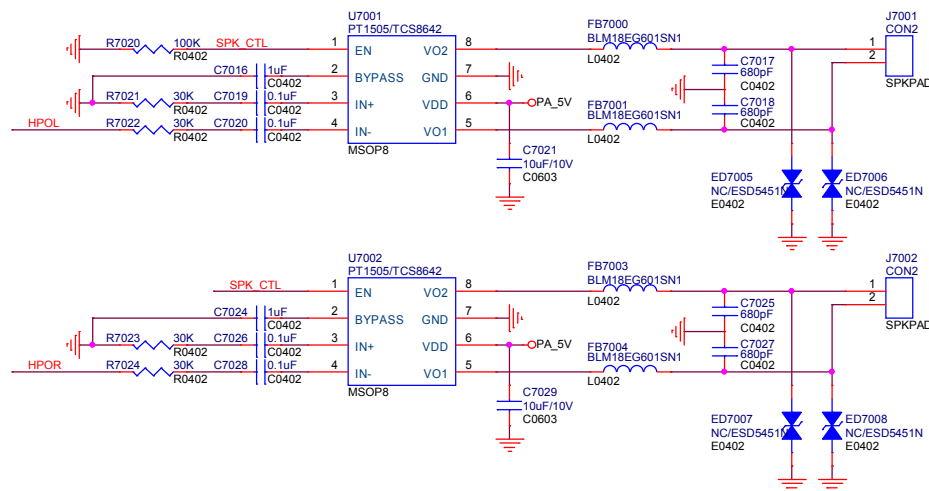
MIC



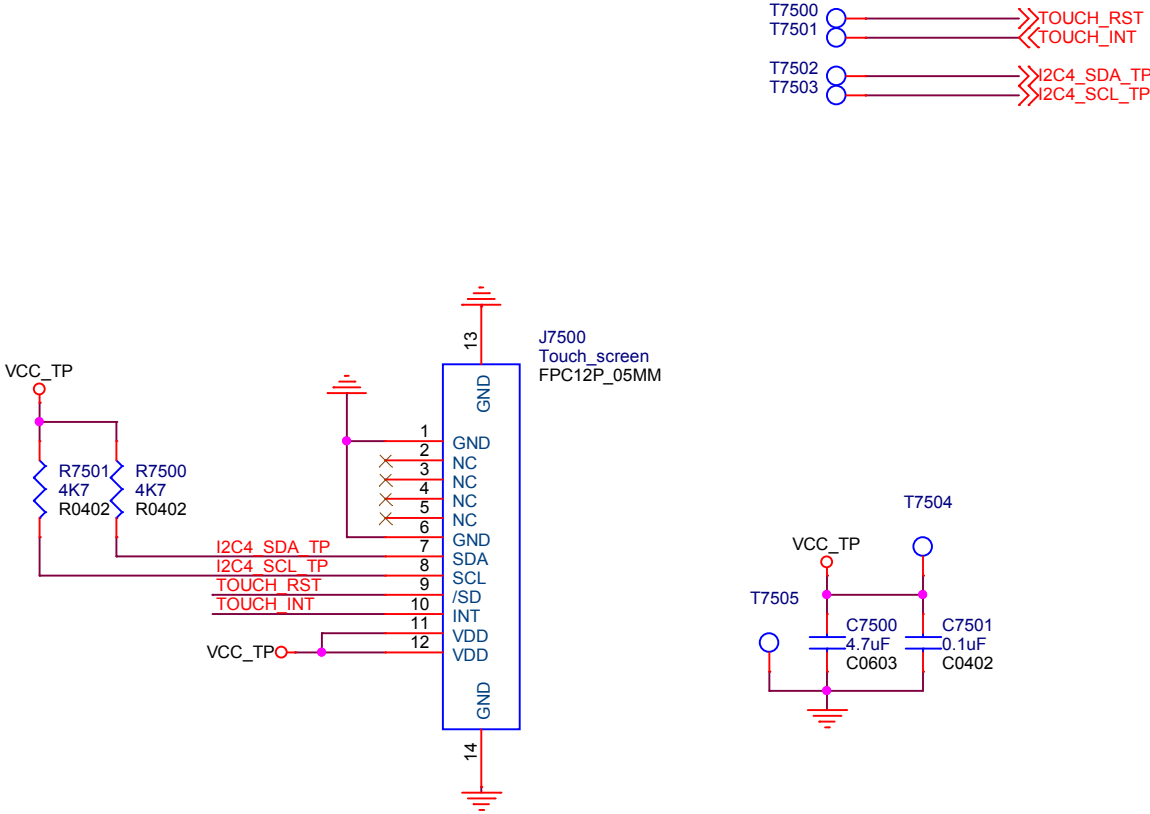
EARPHONE



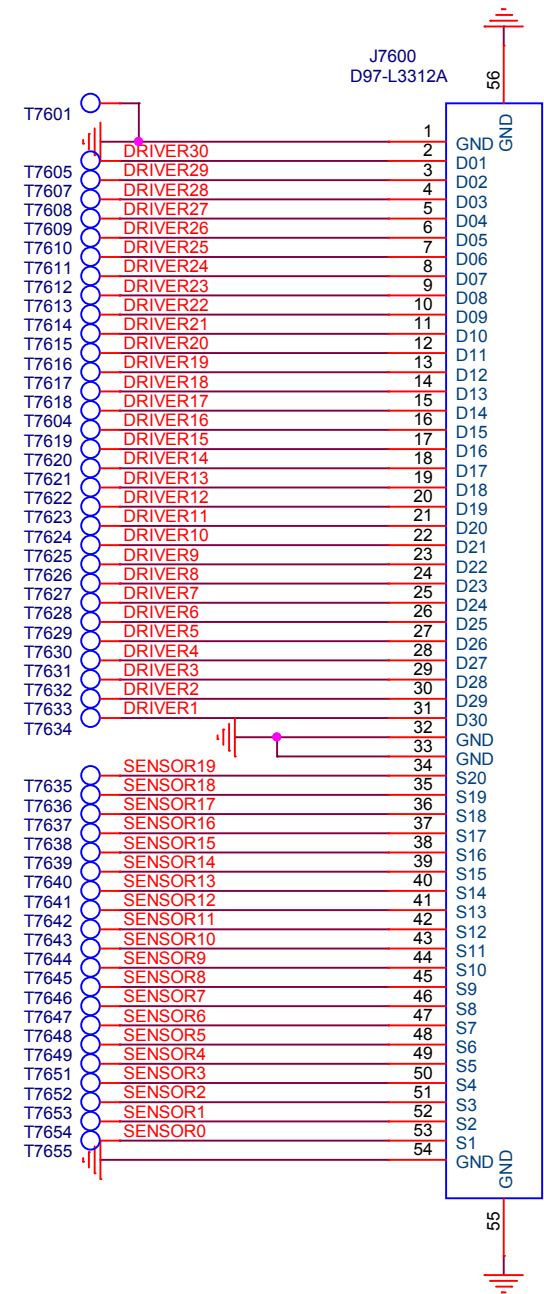
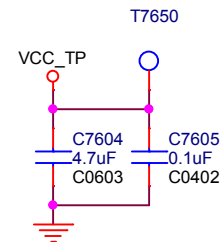
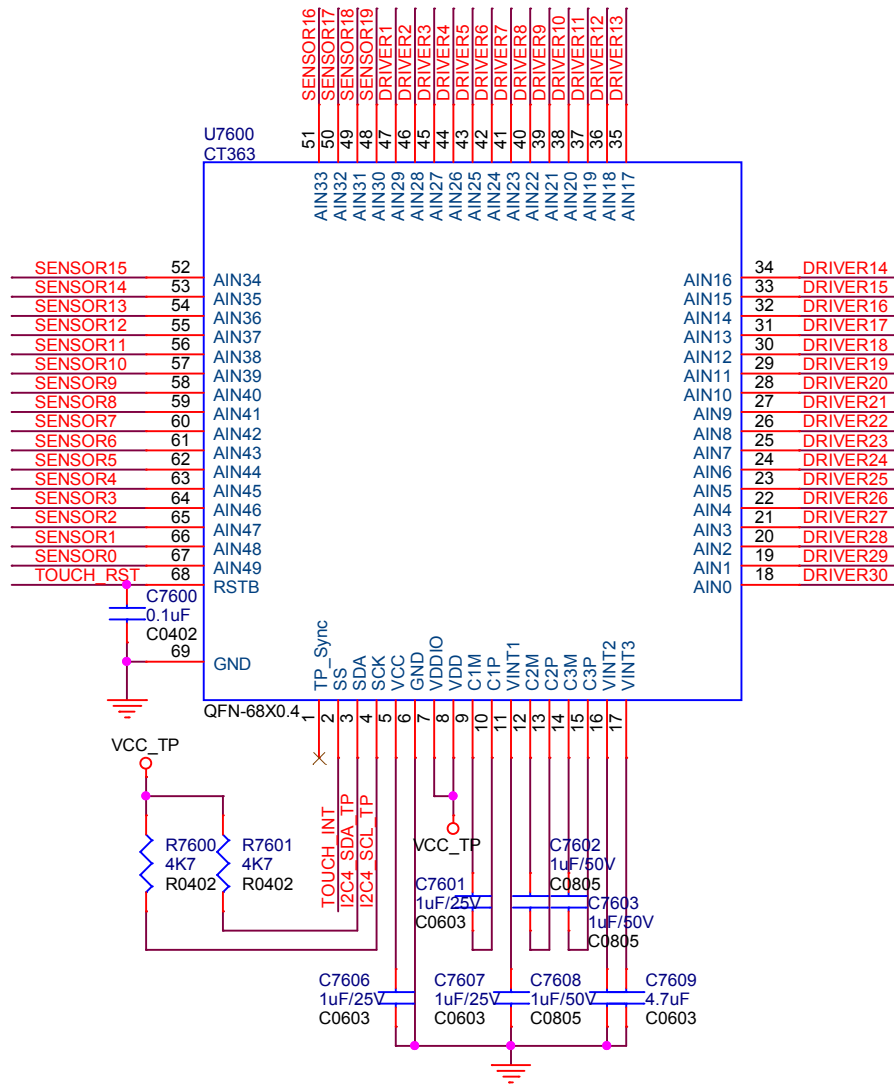
SPEAKER



Touch Panel connector

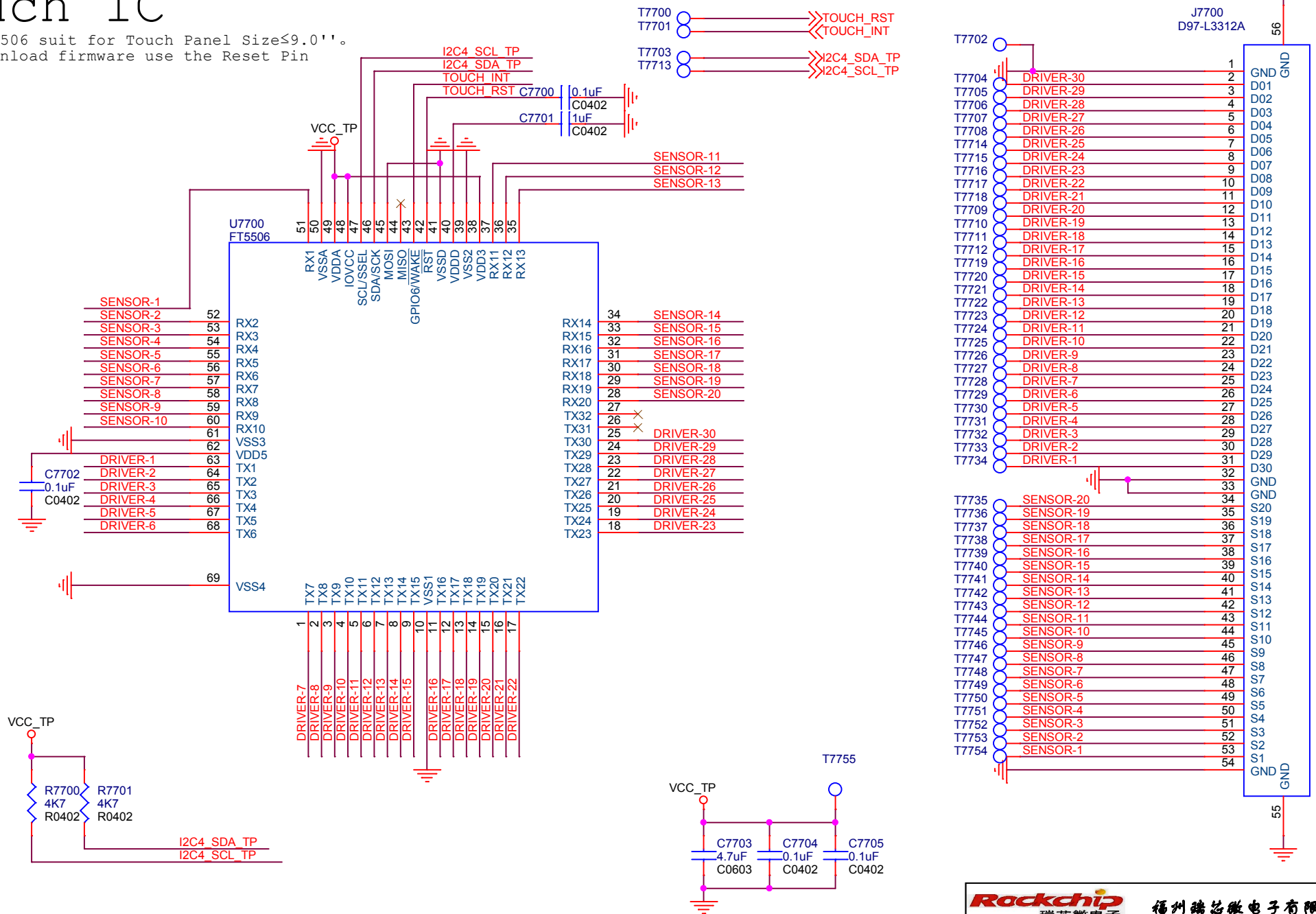


note: CT363 suit for Touch Panel Size≤10.1''.

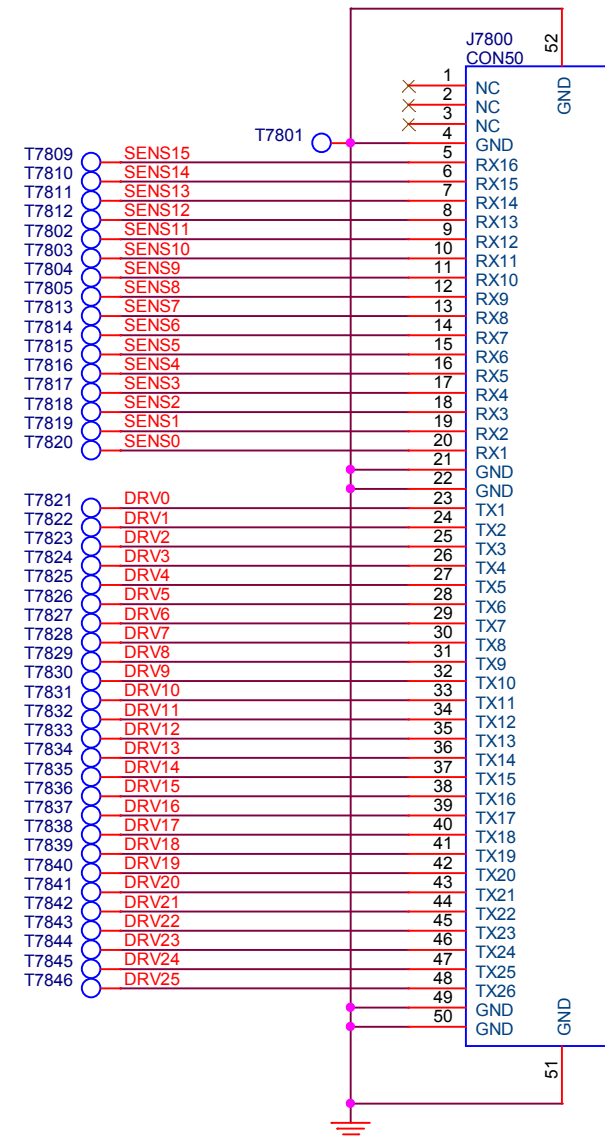
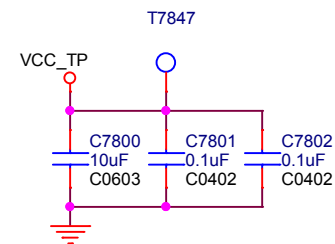


Touch IC

note: FT5506 suit for Touch Panel Size≤9.0''.
Download firmware use the Reset Pin



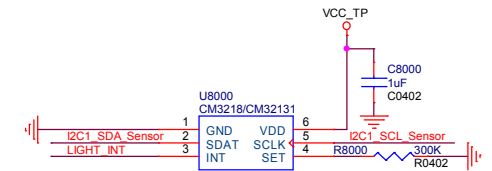
note: GSL3680B suit for Touch Panel Size≤10.1''.



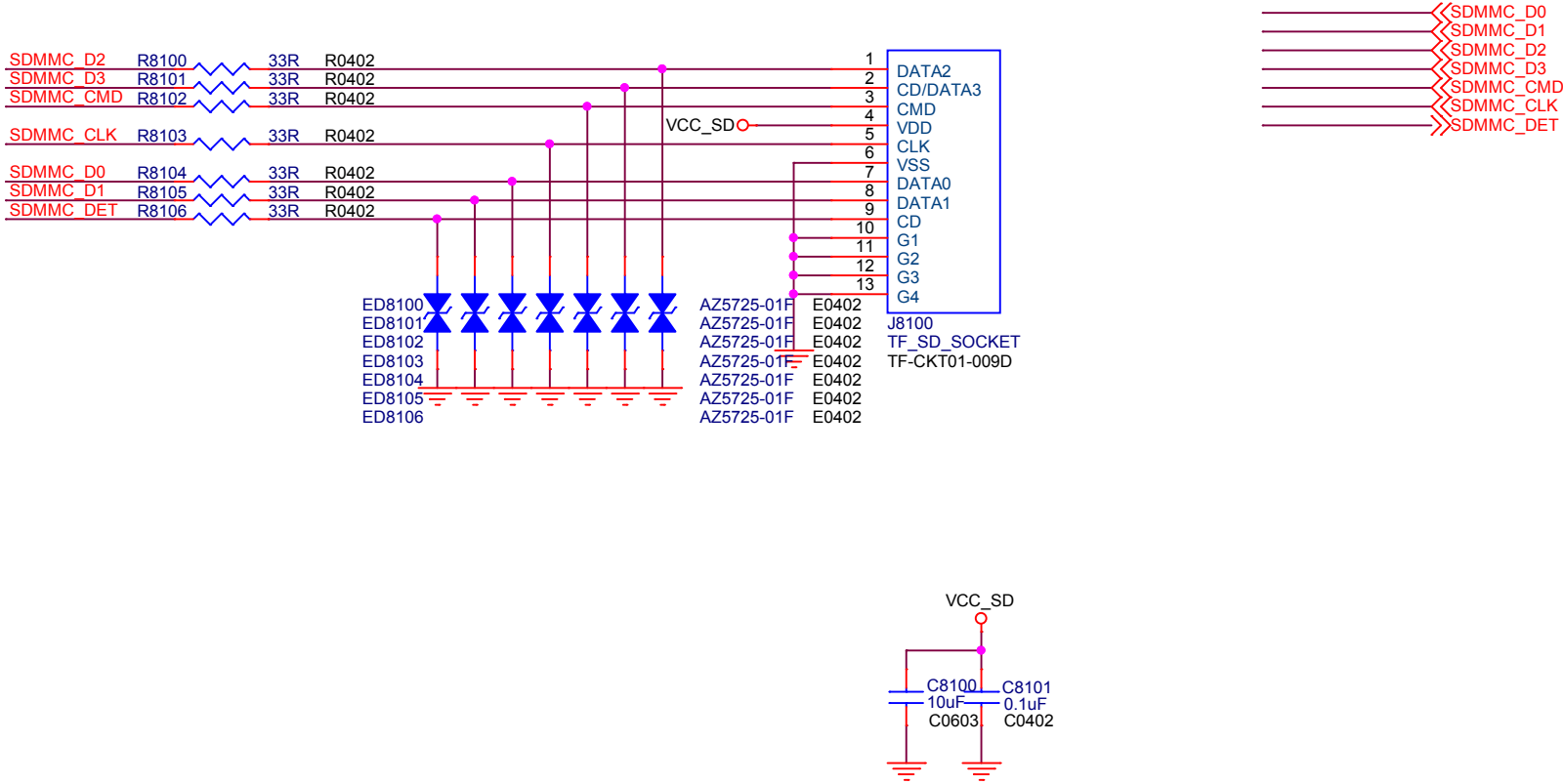
LSM303D with 3D Gsensor and E-compass

[illegible]

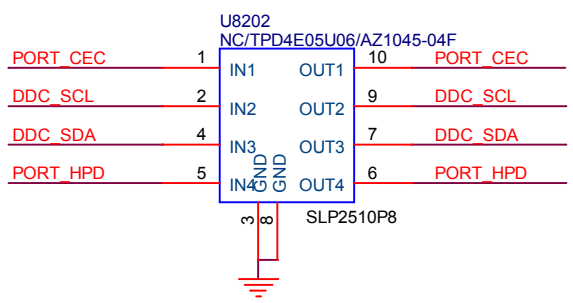
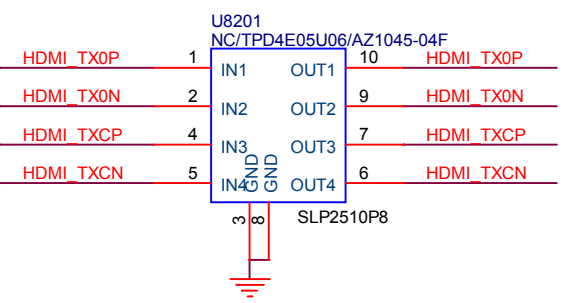
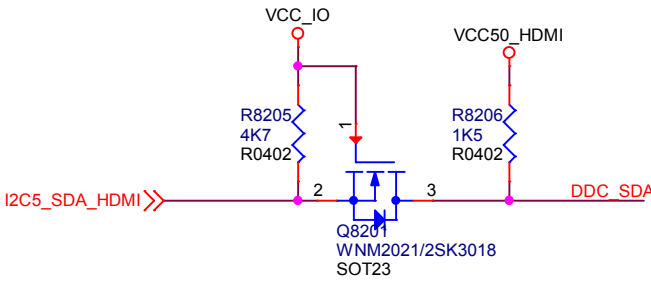
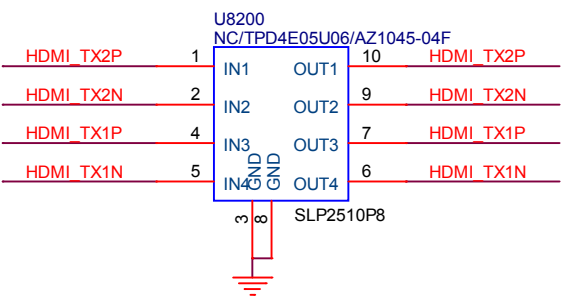
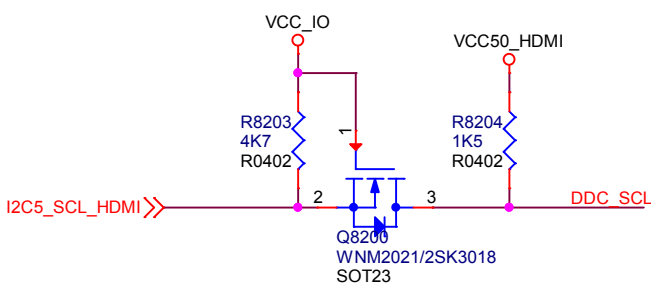
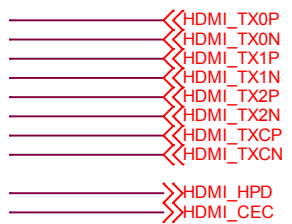
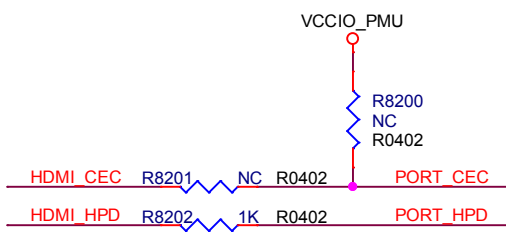
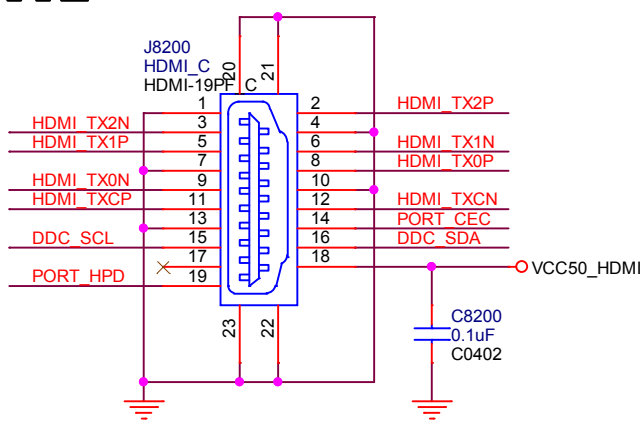
Note:
The first pin of AK8963C must be
place on the lower left corner of
PCB.

[illegible]

TF CARD



HDMI



EFUSE Power

Note:Place the Component if need to write eFUSE

EFUSE_PWR

