REVISION HISTORY

Revision	Description	Date	Drawn	Checked
Ver 0.1	Initial Version	2020-04-21	FRM	
Ver 1.0	1.PAGE7 增加SPI-FLASH模块； 2.PAGE10 新增千兆网口模块； 3.PAGE11 新增加WIFI AP6256模块； 4.电源座更改成TPYE-C接口 5.8211F的批12PIN接至CPU的PI6，做复位用 6.新增加5V电源处的是TVS器件；			
Ver 1.1	7.type-c处电路DP1,DN1网络优化； 8.丢掉VCC-DRAM模块部分的7个电容	2020-07-28		
Ver 1.2	9.Wl-WAKE-AP,BT-WAKE-AP,AP-WAKE-BT,WL-REG-ON,BT-REG-ON 5个网络与UART1_TX1,UART1_RX,UART1_RTS, UART1_CTS 5个网络对调；	2020-08-24		
	10.增加RP15,接VCC-PG,WIFI-IO网络至1.8V；增加RP27，VCC3V3-EXT网络接ALDO2；	2020-08-26		
	11.BT-RST-N网络增加一个串阻R458;BLDO2电源并一个电容，增加一个电阻RP28与BLDO1短接； 修改26PIN座子的第8，10PIN的网络顺序			
Ver 1.3	12.usb2.0座子P2的封装修改，座子固定孔尺寸改小，工厂容易加工；	2020-09-28		

Schematics Index：

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P09: CARD-USB-LED-DEBUG-EXT26-HDMI
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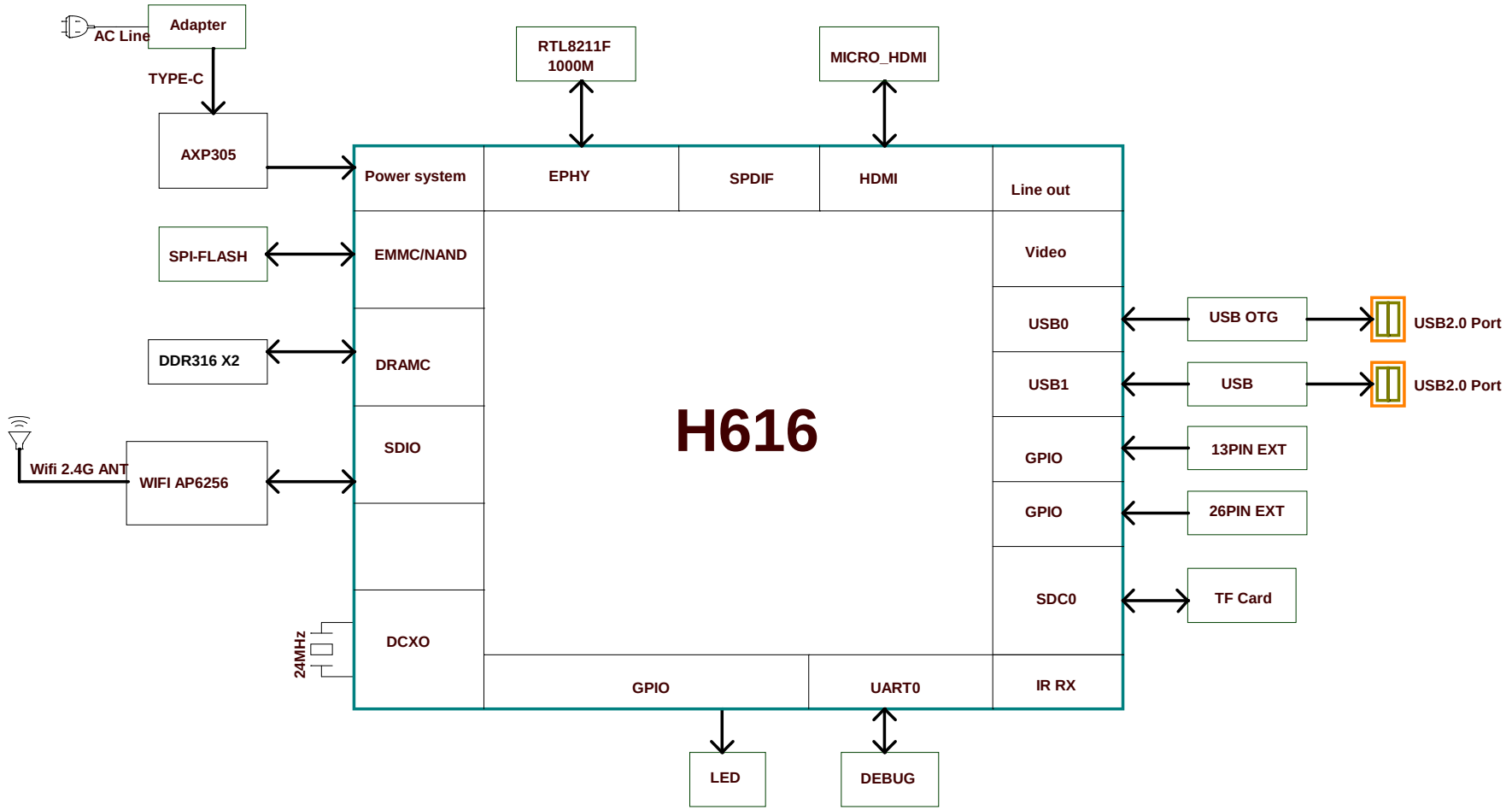
BLOCK



Xunlong Software Co.,Limited		
Design Name: ORANGE_PI-Zero_H616		
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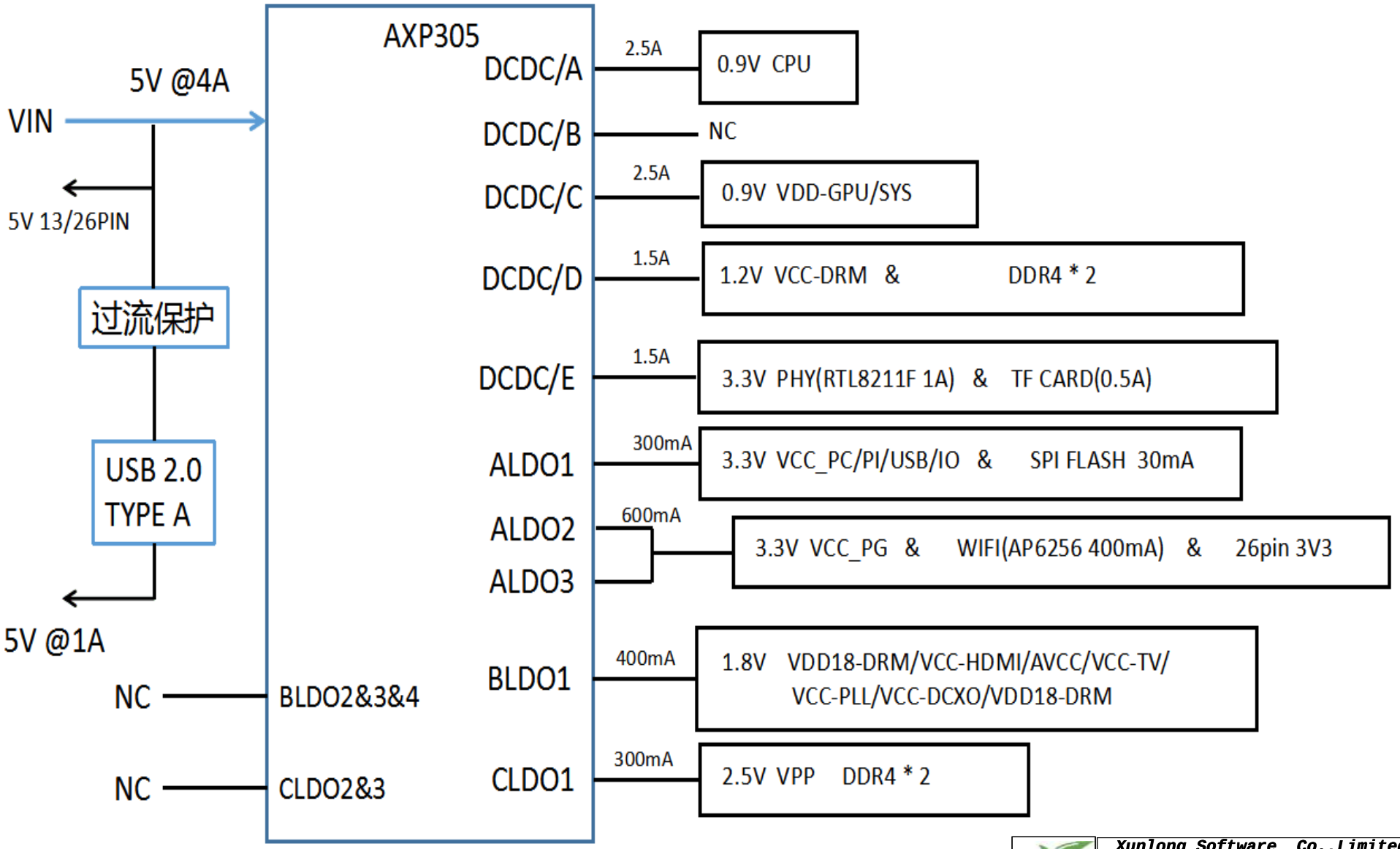
POWER TREE



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GPIO ASSIGNMENT

PIN	Define	CFG	Function
PC0	NAND_WE/SDC2_DS	2/3	
PC1	NAND_ALE/SDC2_RST	2/3	
PC2	NAND_CLE	2	
PC3	NAND_CE1	2	
PC4	NAND_CE0	2	
PC5	NAND_RE/SDC2_CLK	2/3	
PC6	NAND_RB0/SDC2_CMD	2/3	
PC7	NAND_RB1	2	NAND/eMMC
PC8	NAND_DQ7/SDC2_D3	2/3	
PC9	NAND_DQ6/SDC2_D4	2/3	
PC10	NAND_DQ5/SDC2_D0	2/3	
PC11	NAND_DQ4/SDC2_D5	2/3	
PC12	NAND_DQS	2	
PC13	NAND_DQ3/SDC2_D1	2/3	
PC14	NAND_DQ2/SDC2_D6	2/3	
PC15	NAND_DQ1/SDC2_D2	2/3	
PC16	NAND_DQ0/SDC2_D7	2/3	

PIN	Define	CFG	Function
PF0	SDC0_D1	2	
PF1	SDC0_D0	2	
PF2	SDC0_CLK/UART0_TX	2/3	
PF3	SDC0_CMD	2	CARD0
PF4	SDC0_D3/UART0_RX	2/3	
PF5	SDC0_D2	2	
PF6	SDC0-DET	2	

PIN	Define	CFG	Function
PG0	SDC1_CLK	2	
PG1	SDC1_CMD	2	
PG2	SDC1_D0	2	
PG3	SDC1_D1	2	
PG4	SDC1_D2	2	
PG5	SDC1_D3	2	
PG6	UART1_TX	2	
PG7	UART1_RX	2	
PG8	UART1_RTS	2	
PG9	UART1_CTS	2	
PG10	AP-CK32KO	3	WIFI+BT
PG11	PCM2_SYNC	2	
PG12	PCM2_CLK	2	
PG13	PCM2_DOUT	2	
PG14	PCM2_DIN	2	
PG15	WL-WAKE-AP	0	
PG16	BT-WAKE-AP	0	
PG17	AP-WAKE-BT	1	
PG18	WL-REG-ON	1	
PG19	BT-REG-ON	1	

PIN	Define	CFG	Function
PH0	CPUX-UTX	2	
PH1	CPUX-URX	2	
PH2	FD628-SCK	X	
PH3	FD628-SDA	X	
PH4	SPDIF-OUT	3	
PH5		1	
PH6	SYS-LED	1	
PH7		1	
PH8	USB0-DRVVBUS	1	
PH9	RECOVERY	0	
PH10	IR-RX	3	

X: Network port lights need to be configured

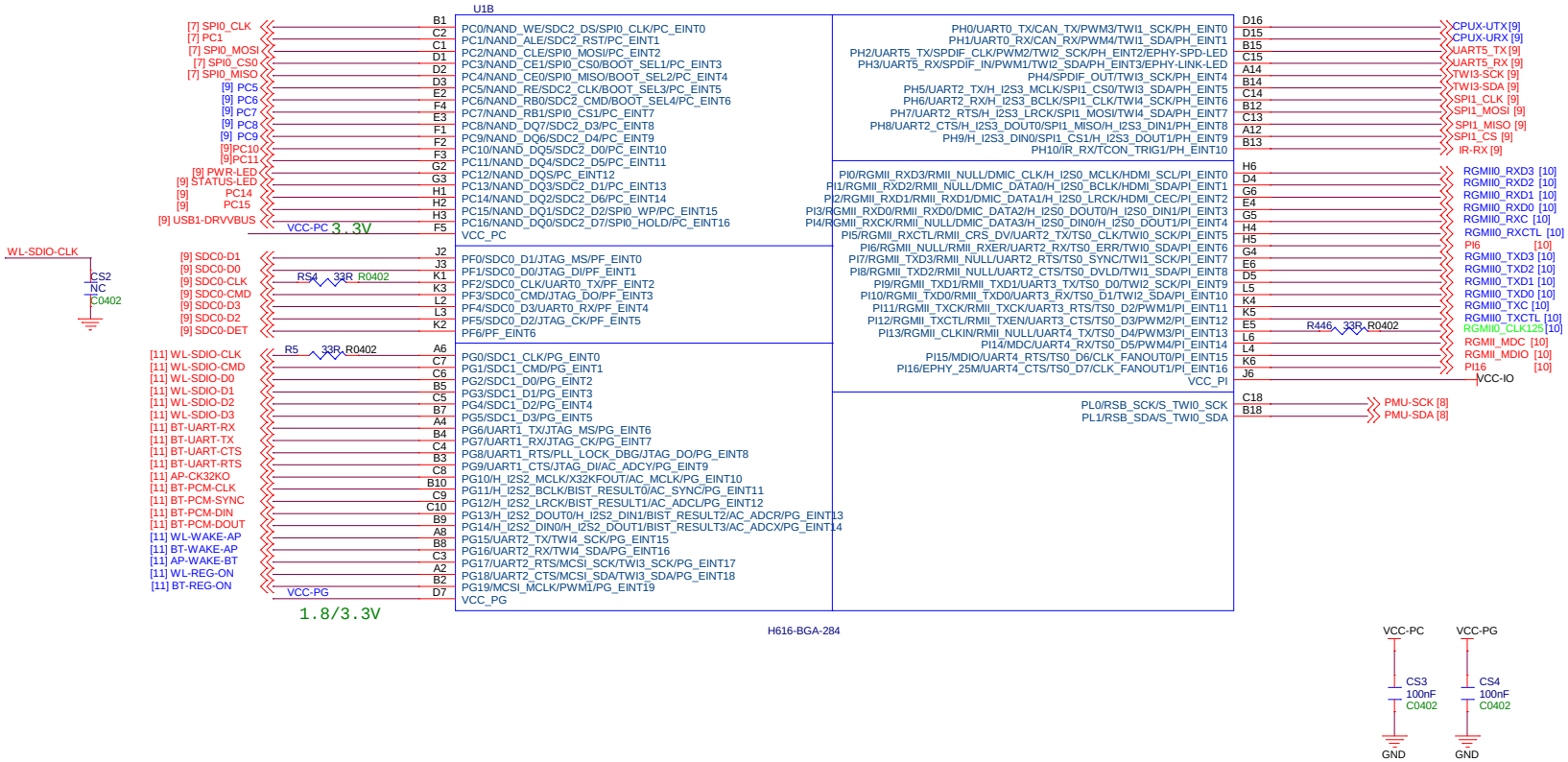
PIN	Define	CFG	Function
PI0			
PI1			
PI2			
PI3			
PI4			
PI5			
PI6			
PI7			
PI8			
PI9			
PI10			
PI11			
PI12			
PI13			
PI14			
PI15			
PI16			

PIN	Define	CFG	Function
PL0	PMU-SCK	2	
PL1	PMU-SDA	2	

GPIO use guide:

1.Note that the voltage of SOC GPIO must matches the external IO voltage.

2.The pull up voltage of the GPIO is selected to correspond to the power field voltage of GPIO.



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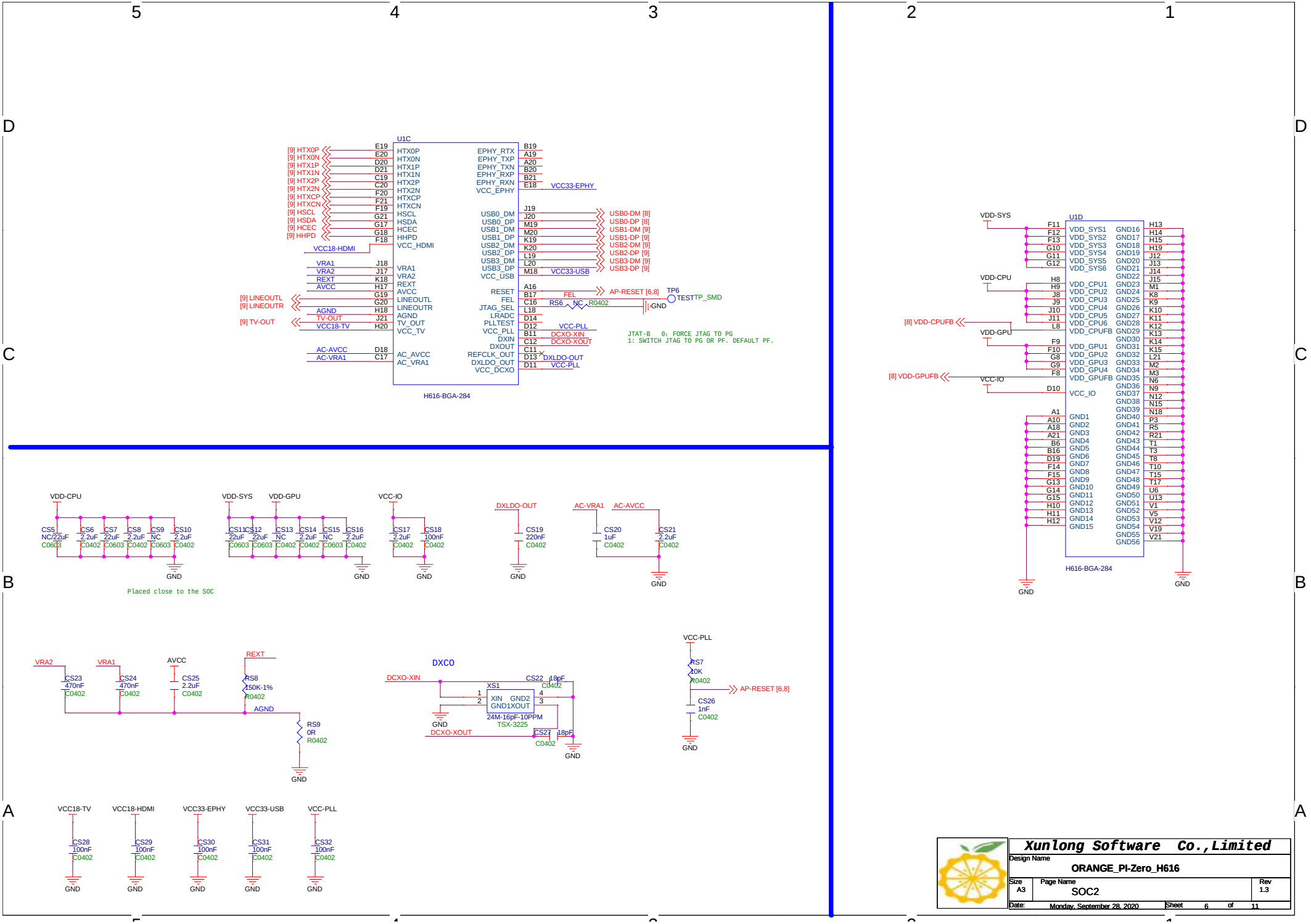
U1C
H616-BGA-284
JTAT-B 0: FORCE JTAG TO PG
1: SWITCH JTAG TO PG OR PF. DEFAULT PF.
U1D
H616-BGA-284
Placed close to the SOC
Xunlong Software Co.,Limited
Design Name
ORANGE_PI-Zero_H616
Size
A3
Page Name
SOC2
Rev
1.3
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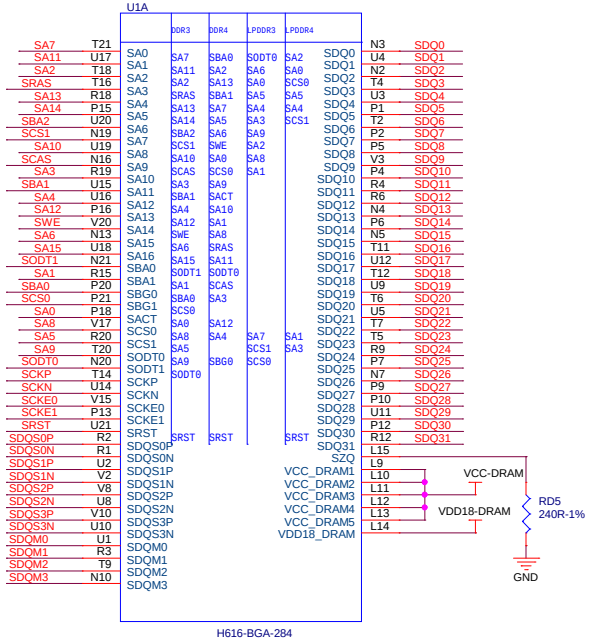
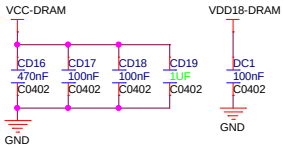
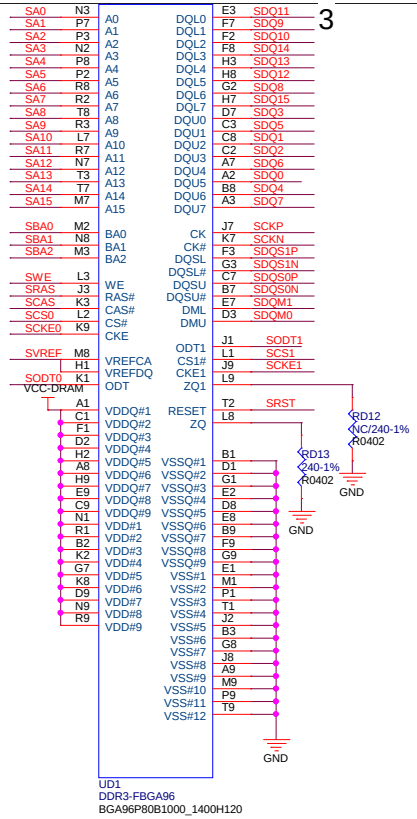
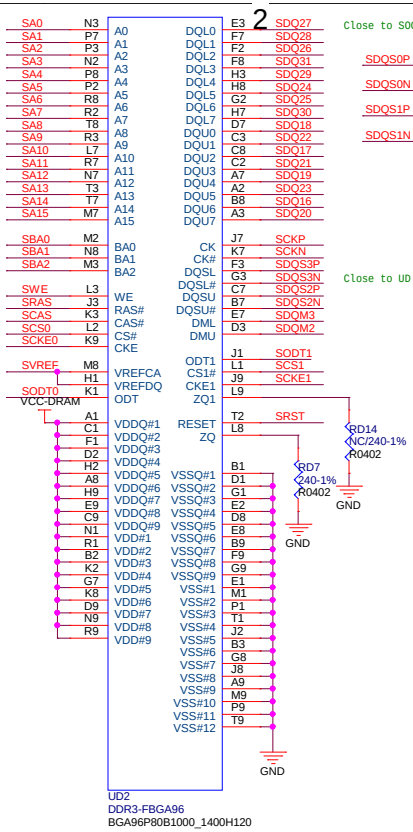
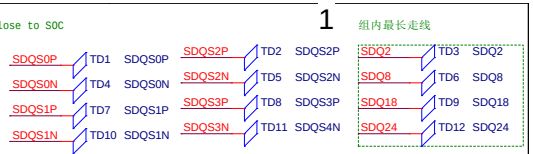
DDR3

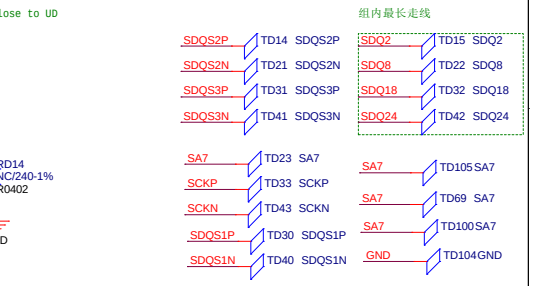

U1A
H616-BGA-284
VCC-DRAM
VDD18-DRAM
RD5
240R-1%
GND

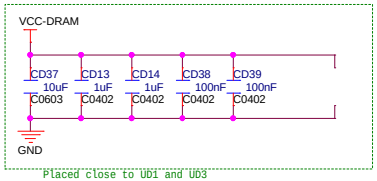

VCC-DRAM
VDD18-DRAM
CD16 470nF C0402
CD17 100nF C0402
CD18 100nF C0402
CD19 1UF C0402
DC1 100nF C0402
GND

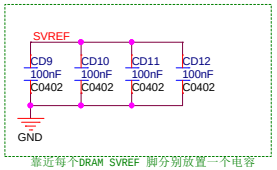

UD1
DDR3-FBGA96
BGA96P80B1000_1400H120
VCC-DRAM
RD12 NC/240-1% R0402
RD13 240-1% R0402
GND

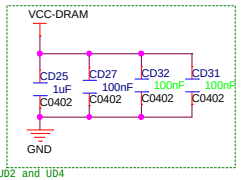

UD2
DDR3-FBGA96
BGA96P80B1000_1400H120
VCC-DRAM
RD14 NC/240-1% R0402
RD7 240-1% R0402
GND

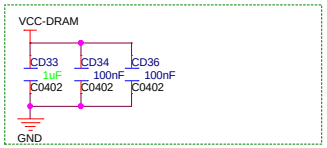

Close to SOC
SDQS0P TD1 SDQS0P
SDQS0N TD4 SDQS0N
SDQS1P TD7 SDQS1P
SDQS1N TD10 SDQS1N
SDQS2P TD2 SDQS2P
SDQS2N TD5 SDQS2N
SDQS3P TD8 SDQS3P
SDQS3N TD11 SDQS4N
组内最长走线
SDQ2 TD3 SDQ2
SDQ8 TD6 SDQ8
SDQ18 TD9 SDQ18
SDQ24 TD12 SDQ24

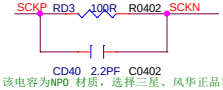

Close to UD
SDQS2P TD14 SDQS2P
SDQS2N TD21 SDQS2N
SDQS3P TD31 SDQS3P
SDQS3N TD41 SDQS3N
组内最长走线
SDQ2 TD15 SDQ2
SDQ8 TD22 SDQ8
SDQ18 TD32 SDQ18
SDQ24 TD42 SDQ24
SA7 TD23 SA7
SCKP TD33 SCKP
SCKN TD43 SCKN
SDQS1P TD30 SDQS1P
SDQS1N TD40 SDQS1N
SA7 TD105 SA7
SA7 TD69 SA7
SA7 TD100 SA7
GND TD104 GND

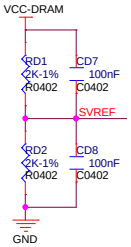

VCC-DRAM
CD37 10uF C0603
CD13 1uF C0402
CD14 1uF C0402
CD38 100nF C0402
CD39 100nF C0402
GND
Placed close to UD1 and UD3

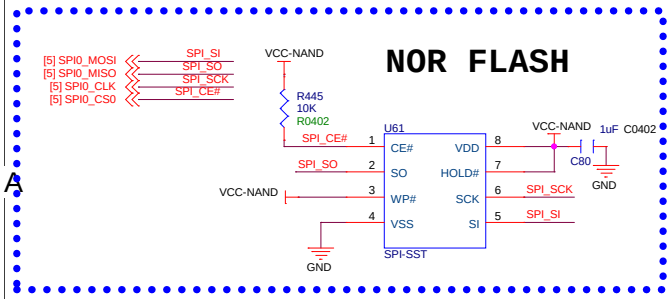

SVREF
CD9 100nF C0402
CD10 100nF C0402
CD11 100nF C0402
CD12 100nF C0402
GND
靠近每个DRAM SVREF 脚分别放置一个电容

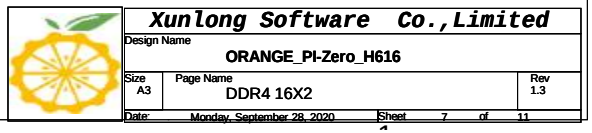

VCC-DRAM
CD25 1uF C0402
CD27 100nF C0402
CD32 100nF C0402
CD31 100nF C0402
GND
Placed close to UD2 and UD4


VCC-DRAM
CD33 1uF C0402
CD34 100nF C0402
CD36 100nF C0402
GND


SCKP RD3 100R R0402 SCKN
CD40 2.2PF C0402
该电容为NPO 材质，选择三星、风华正品料


VCC-DRAM
RD1 2K-1% R0402
CD7 100nF C0402
SVREF
RD2 2K-1% R0402
CD8 100nF C0402
GND


NOR FLASH
[5] SPI0_MOSI
[5] SPI0_MISO
[5] SPI0_CLK
[5] SPI0_CS0
SPI_SI
SPI_SO
SPI_SCK
SPI_CE#
VCC-NAND
R445 10K R0402
U61
CE# VDD
SO HOLD#
WP# SCK
VSS SI
SPI-SST
VCC-NAND 1uF C0402
C80
GND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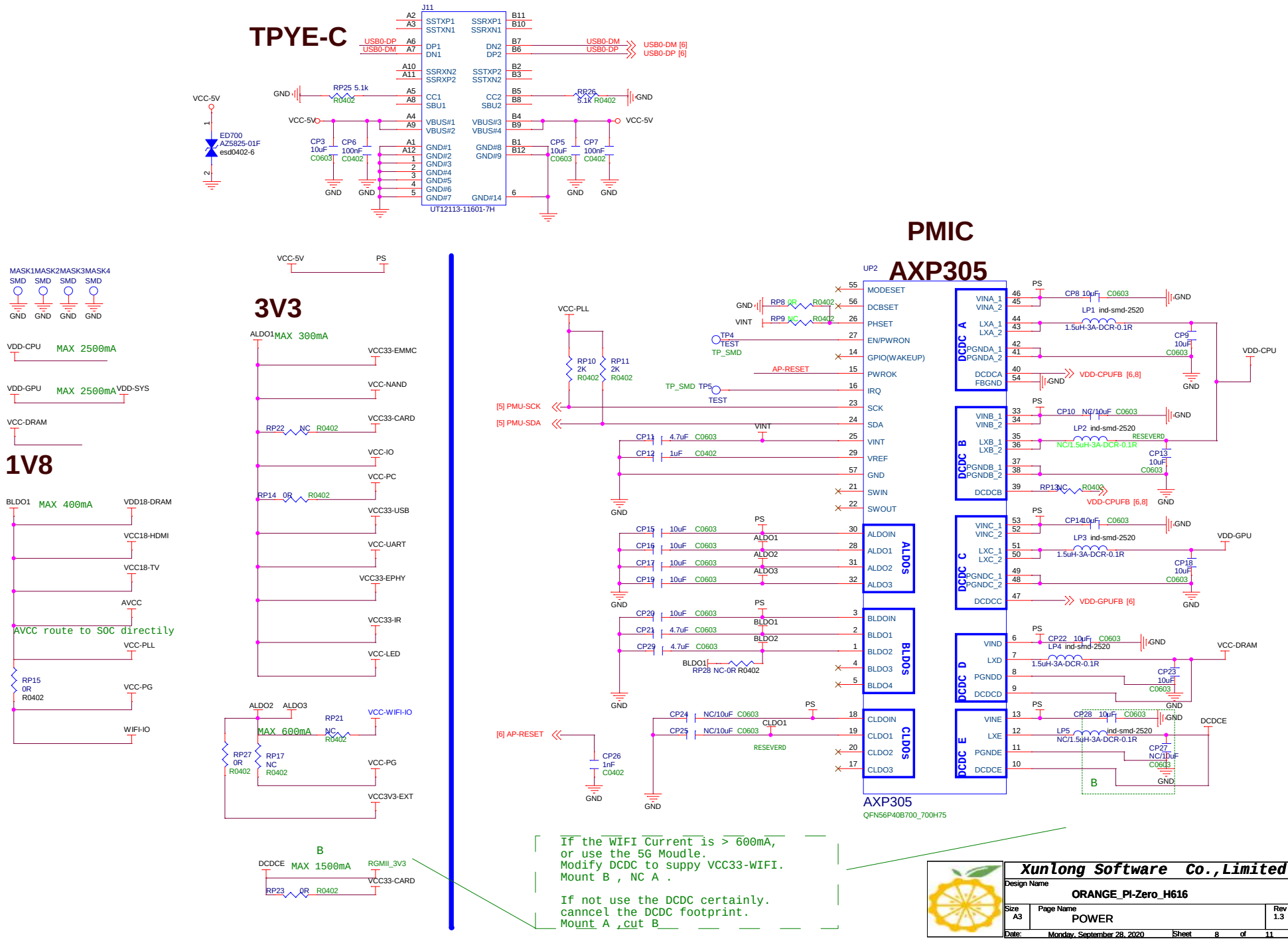
TPYE-C
J11
SSTXP1
SSTXN1
SSRXP1
SSRXN1
DP1
DN1
DN2
DP2
SSRXN2
SSRXP2
SSTXP2
SSTXN2
CC1
SBU1
CC2
SBU2
VBUS#1
VBUS#2
VBUS#3
VBUS#4
GND#1
GND#2
GND#3
GND#4
GND#5
GND#6
GND#7
GND#8
GND#9
GND#14
USB0-DP
USB0-DM
USB0-DM [6]
USB0-DP [6]
RP25 5.1k R0402
RP26 5.1K R0402
VCC-5V
GND
ED700
AZ5825-01F
esd0402-6
CP3 10uF C0603
CP6 100nF C0402
CP5 10uF C0603
CP7 100nF C0402
UT12113-11601-7H
PMIC
AXP305
UP2
MODESET
DCBSET
PHSET
EN/PWRON
GPIO(WAKEUP)
PWROK
IRQ
SCK
SDA
VINT
VREF
GND
SWIN
SWOUT
ALDOIN
ALDO1
ALDO2
ALDO3
BLDOIN
BLDO1
BLDO2
BLDO3
BLDO4
CLDOIN
CLDO1
CLDO2
CLDO3
ALDOS
BLDOS
CLDOS
RP8 0R R0402
RP9 NC R0402
TP4 TEST TP_SMD
TP5 TEST
AP-RESET
[5] PMU-SCK
[5] PMU-SDA
[6] AP-RESET
RP10 2K R0402
RP11 2K R0402
CP11 4.7uF C0603
CP12 1uF C0402
CP15 10uF C0603
CP16 10uF C0603
CP17 10uF C0603
CP19 10uF C0603
CP20 10uF C0603
CP21 4.7uF C0603
CP29 4.7uF C0603
RP28 NC-0R R0402
CP24 NC/10uF C0603
CP25 NC/10uF C0603
RESEVERD
CP26 1nF C0402
DCDC A
DCDC B
DCDC C
DCDC D
DCDC E
VINA_1
VINA_2
LXA_1
LXA_2
PGNDA_1
PGNDA_2
DCDCA
FBGND
VINB_1
VINB_2
LXB_1
LXB_2
PGNDB_1
PGNDB_2
DCDCB
VINC_1
VINC_2
LXC_1
LXC_2
PGNDC_1
PGNDC_2
DCDCC
VIND
LXD
PGNDD
DCDCD
VINE
LXE
PGNDE
DCDCE
CP8 10uF C0603
LP1 ind-smd-2520
1.5uH-3A-DCR-0.1R
CP9 10uF C0603
VDD-CPUFB [6,8]
CP10 NC/10uF C0603
LP2 ind-smd-2520
NC/1.5uH-3A-DCR-0.1R
RESEVERD
CP13 10uF C0603
RP13 NC R0402
CP14 10uF C0603
LP3 ind-smd-2520
CP18 10uF C0603
VDD-GPUFB [6]
CP22 10uF C0603
LP4 ind-smd-2520
CP23 10uF C0603
CP28 10uF C0603
LP5 ind-smd-2520
NC/1.5uH-3A-DCR-0.1R
CP27 NC/10uF C0603
B
AXP305
QFN56P40B700_700H75
VDD-CPU
VDD-GPU
VCC-DRAM
DCDCE
MASK1 MASK2 MASK3 MASK4
SMD
VDD-CPU MAX 2500mA
VDD-GPU MAX 2500mA
VDD-SYS
VCC-DRAM
1V8
BLDO1 MAX 400mA
VDD18-DRAM
VCC18-HDMI
VCC18-TV
AVCC
AVCC route to SOC directily
VCC-PLL
RP15 0R R0402
VCC-PG
WIFI-IO
3V3
ALDO1 MAX 300mA
VCC33-EMMC
VCC-NAND
VCC33-CARD
RP22 NC R0402
VCC-IO
VCC-PC
RP14 0R R0402
VCC33-USB
VCC-UART
VCC33-EPHY
VCC33-IR
VCC-LED
ALDO2
ALDO3
MAX 600mA
RP21 NC R0402
VCC-WIFI-IO
RP27 0R R0402
RP17 NC R0402
VCC-PG
VCC3V3-EXT
DCDCE MAX 1500mA
RGMII_3V3
VCC33-CARD
RP23 0R R0402
PS
If the WIFI Current is > 600mA,
or use the 5G Moudle.
Modify DCDC to suppy VCC33-WIFI.
Mount B , NC A .
If not use the DCDC certainly.
canncel the DCDC footprint.
Mount A ,cut B
Xunlong Software Co.,Limited
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HDMI

Differential pairs
Z0= 100 ohm

UH1 AZ1345-04F
UH2 AZ1345-04F
SLP2510P8-ESD

JH1
HDMI_19plug type C
MICRO_HDMI_D_TYPE_23PIN_2

HOT_PLUG_DET
UTILITY_NC
D2P
G2
D2N
D1P
G1
D1N
D0P
G0
D0N
CLKP
G-CLK
CLKN
CEC
DDC/CEC_GND
SCL
SDA
5V
SHIELD1
SHIELD2
SHIELD3
SHIELD4

HTX2P
HTX2N
HTX0P
HTX0N
HTX1P
HTX1N
HTXCP
HTXCN
HDMI-CEC
HDMI-SCL
HDMI-SDA
HHPD
HDMI-5V

RH5 510R R0402
RH8 104 R0402
ESD5451X
DH2
DH3
DH4
DH5
DH6

VCC-5V
HCEC
RH6 100R R0402
D35 IN5819SL SOD123
D36 IN5819SL SOD123
HDMI-CEC
RH7 27K/1% R0402 VCC-IO
HSDA
RH10 R0402 100R
RH4 R0402 1.8K
HDMI-SDA
HSCL
RH11 R0402 100R
RH2 R0402 1.8K
HDMI-SCL

[5] SDC0-D1
[5] SDC0-D0
[5] SDC0-CLK
[5] SDC0-CMD
[5] SDC0-D3
[5] SDC0-D2
[5] SDC0-DET
[5] IR-RX
[6] LINEOUTL
[6] LINEOUTR
[6] TV-OUT
[6] HTX0P
[6] HTX0N
[6] HTX1P
[6] HTX1N
[6] HTX2P
[6] HTX2N
[6] HTXCP
[6] HTXCN
[6] HSCL
[6] HSDA
[6] HHPD
[6] HCEC

T CARD

VCC33-CARD
RC7 1R R0603
CC1 10uF C0603
RC4 10K R0402
RC2 10K R0402
SDC0-D2
SDC0-D3
SDC0-CMD
SDC0-CLK
SDC0-D0
SDC0-D1
SDC0-DET
RC5 R0402 1K
RC6 NC/1M R0402
DC2
DC3
DC4
DC5
DC6
DC7
DATA2
CD/DATA3
CMD
VDD
CLK
VSS
DATA0
DATA1
CD
J22
TF_SD_SOCKET
MICROSD-9P-A

13 PIN CONNECTOR

CON5
DIP13-254
DIP13-254

USB2-DM
USB2-DP
USB3-DM
USB3-DP
LINEOUTR
LINEOUTL
TV-OUT
PC1
PI16
PI6
IR-RX

26 PIN CONNECTOR

VCC3V3-EXT
VCC-5V

3.3V1
SDA
SCL
IO-GCLK
GND1
IO-0
IO-2
IO-3
3.3V2
SPI-MOSI
SPI-MISO
SPI-CLK
GND2
5.0V1
5.0V2
GND3
TXD5
RXD5
IO-1
GND4
IO-4
IO-5
GND5
IO-6
SPI-CE0
SPI-CE1

CON4
DIP26-254
DIP26-254

[5,9] TWI3-SDA
[5,9] TWI3-SCK
[5] PC9
[5] PC6
[5] PC5
[5] PC8
[5] SPI1_MOSI
[5] SPI1_MISO
[5] SPI1_CLK
UART5_TX [5]
UART5_RX [5]
PC11 [5]
PC15 [9]
PC14 [9]
PC7 [5]
SPI1_CS [5]
PC10 [5]

R151 2K R0402
R152 2K R0402
R455 2K R0402
R456 2K R0402
[5,9] PC15
[5,9] PC14

[6] USB1-DM
[6] USB1-DP
[6] USB2-DM
[6] USB2-DP
[6] USB3-DM
[6] USB3-DP
[6] USB1-DRVVBUS
[10] PC1
[10] PI6
[10] PI16

DEBUG

CPUX-UTX [5]
CPUX-UTX
R9 0R R0402
VCC-UART
R10 10K R0402
CPUX-URX [5]
CPUX-URX
Q1 BSN20 sot-23
J3 SIP1x3 SIP1x3

LED

[5] PWR-LED
[5] STATUS-LED
R131 2K R0402 LED1
R132 2K R0402 LED2
D7 LED-R LED0805
D8 LED-G LED0805

USB

Differential pairs
Z0= 90 ohm

VCC-5V
USB-VBUS
UU1
IN
OUT
EN
GND
ISET
SY6280 SOT23-5
USB1-DRVVBUS
RU2 100K R0402
RU3 6K8-1% R0402
CU2 100nF C0402
CU3 10uF C0603
USB1-DM
USB1-DP
P1
VBUS
D-
D+
GND
Shield1
Shield2
Shield3
USB_A_1-T
usb_a_1-t-11
DU1
DU2
ESD9B5VL-2/TR
esd0402-6

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Design Name: ORANGE_PI-Zero_H616		
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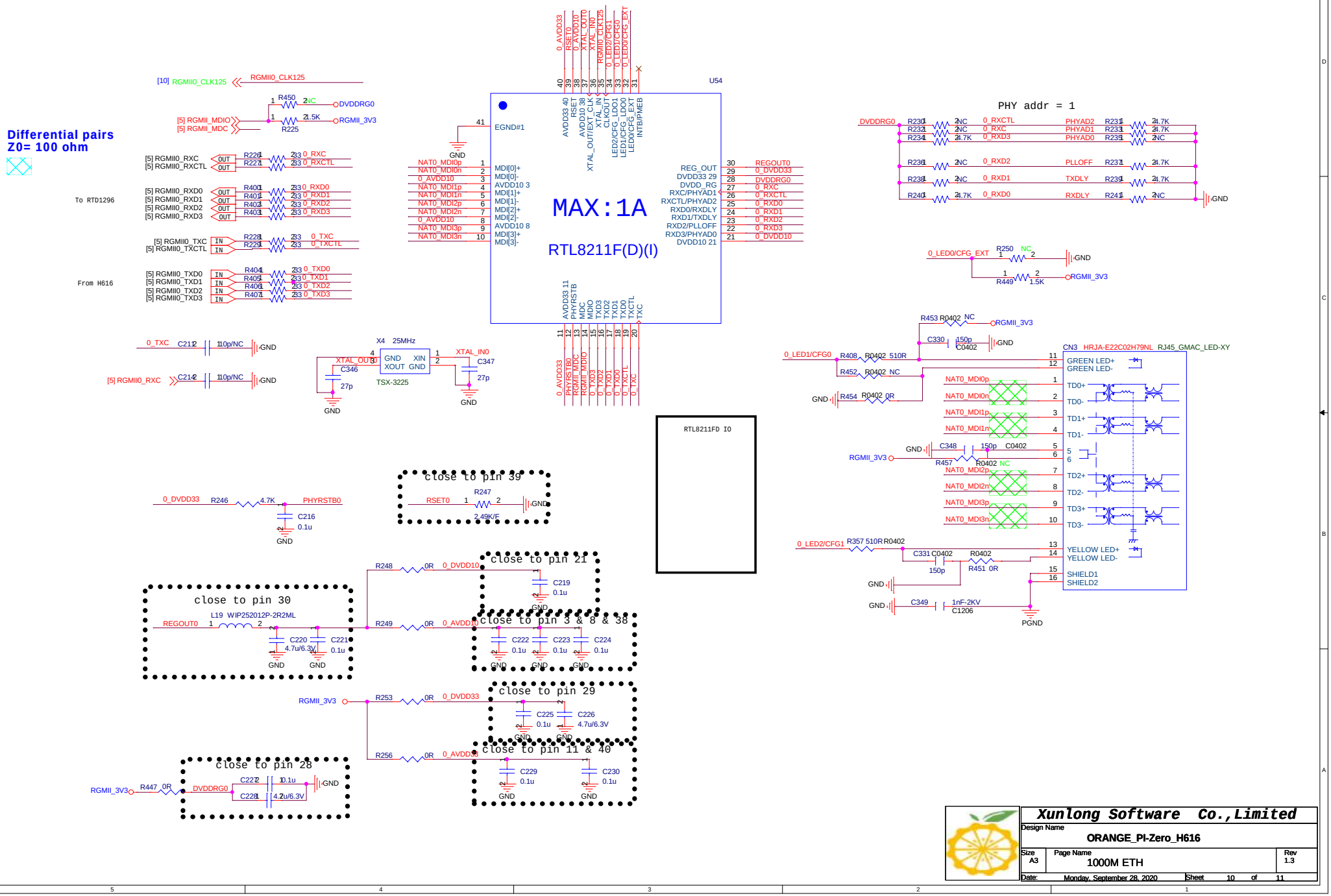
1000M ETH



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Design Name	ORANGE_PI-Zero_H616
Size A3	Page Name 1000M ETH
Rev 1.3	
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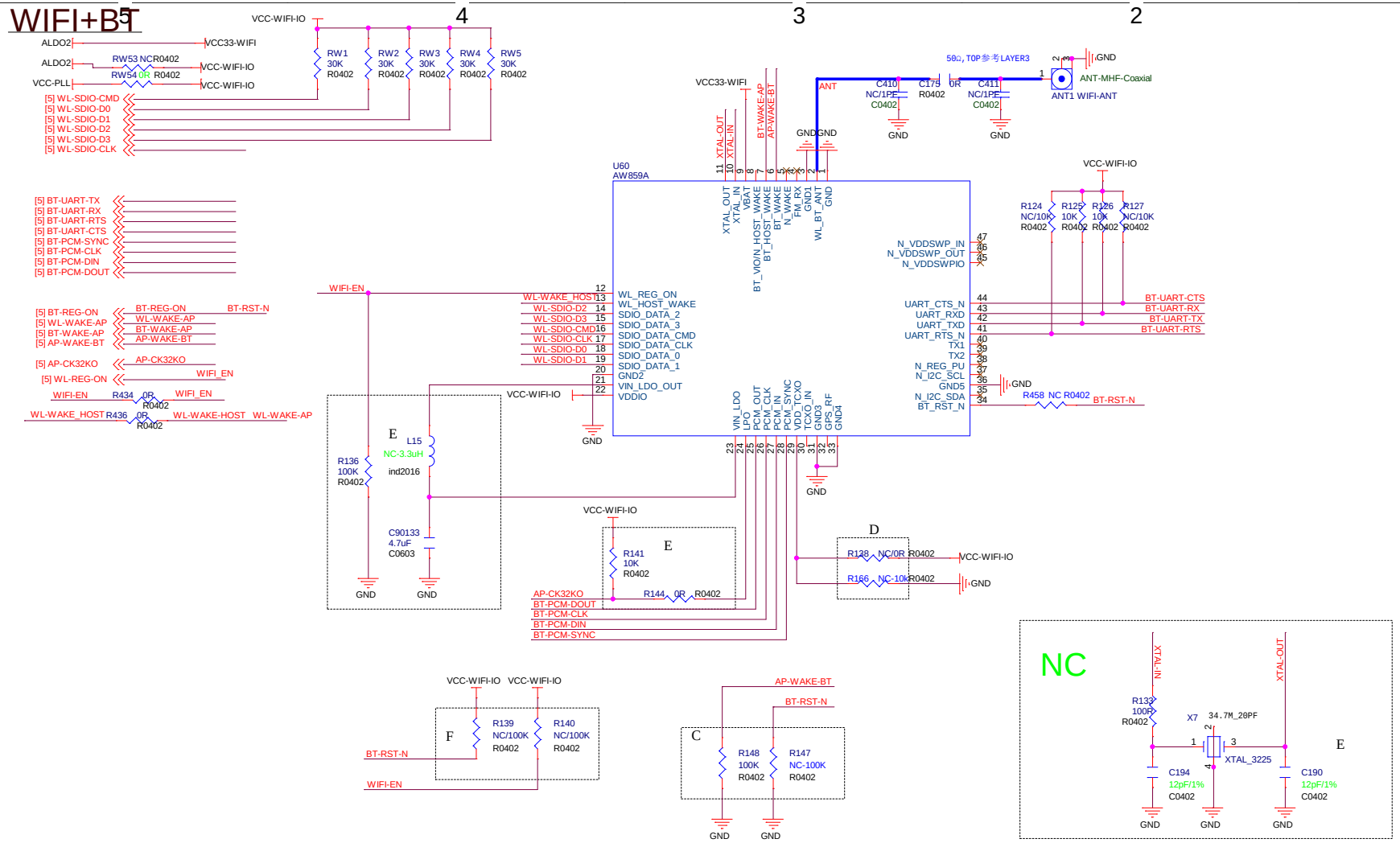

RW51 RW45 RW46 RW50 RW52 RW53

不带蓝牙遥控	IO为1.8V	NC	NC	NC	0R	NC	0R
	IO为3.3V	NC	NC	NC	0R	0R	NC
带蓝牙遥控	IO为1.8V	0R	NC	NC	NC	NC	NC
	IO为3.3V	0R	0R	0R	NC	NC	NC

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Design Name	ORANGE_Pi-Zero_H616	
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