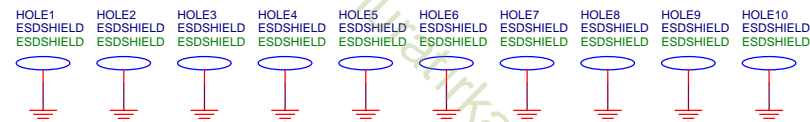


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## RK3328 BOX Ref



### Bill of Materials

#### Header:

Item\Part\Description\PCB Footprint\Reference\Quantity\Option

#### Combined property string:

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

#### Note:

Component parameter description

1. DNP stands for component not mounted temporarily

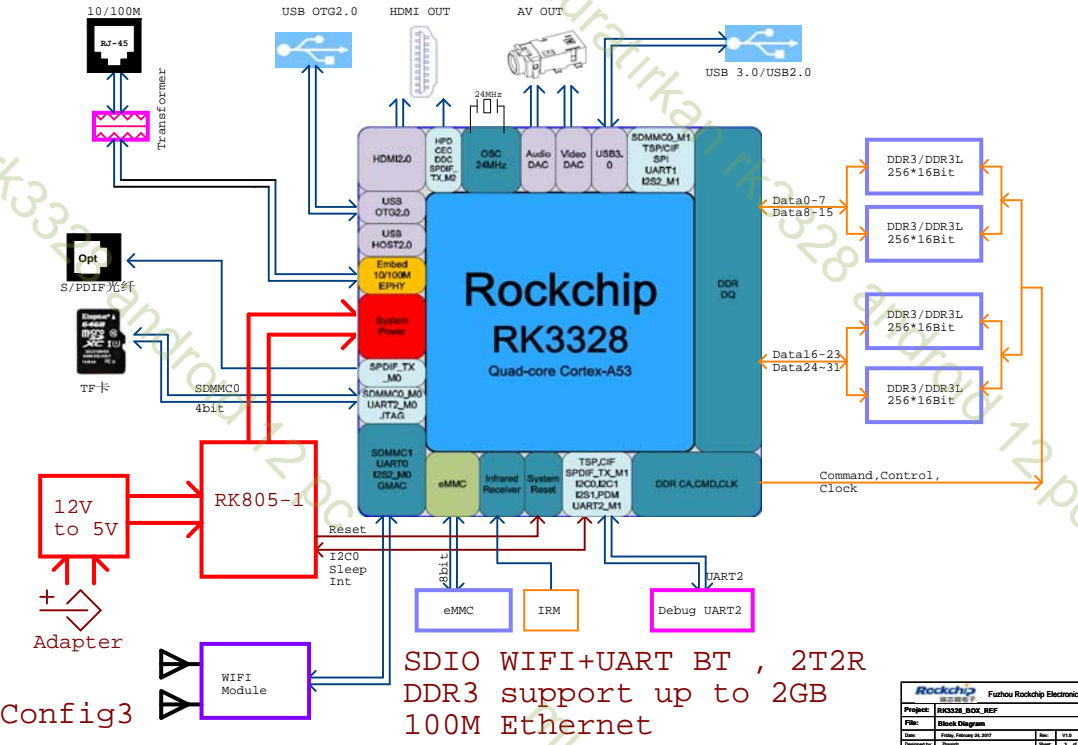
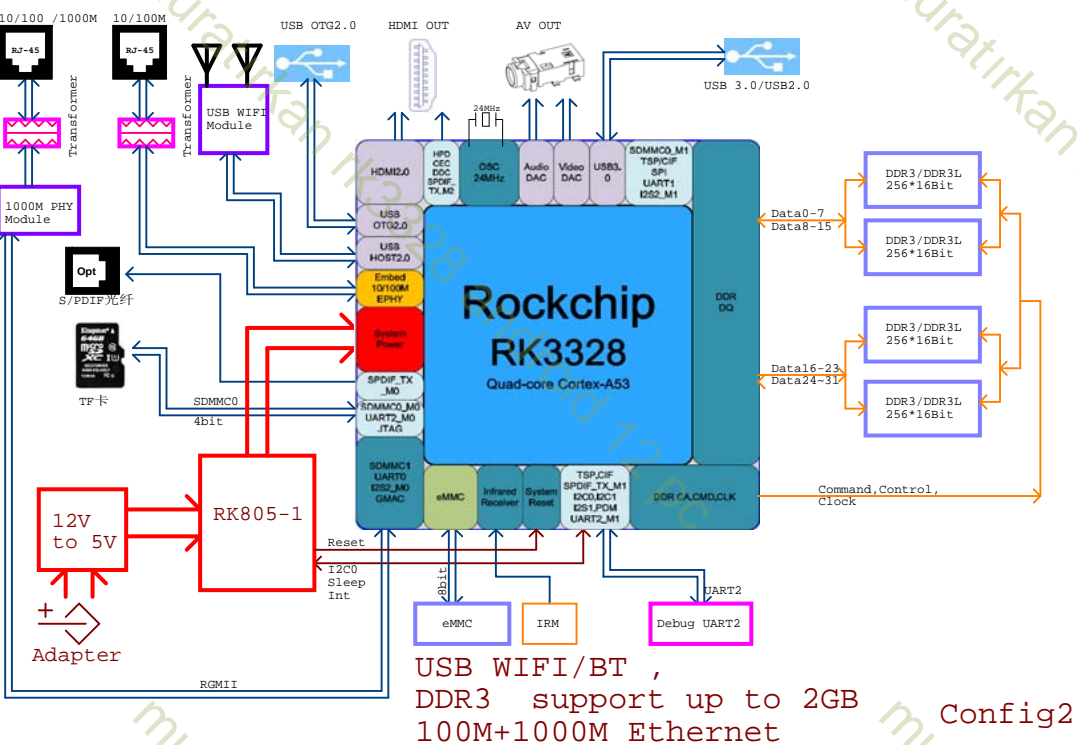
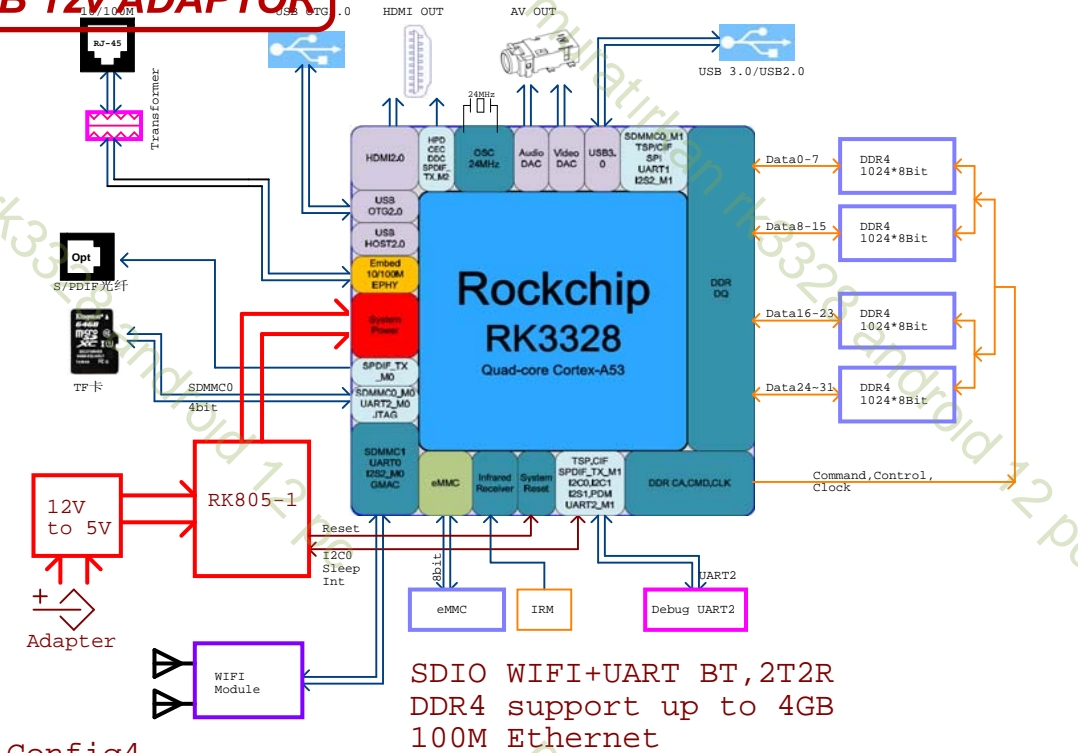
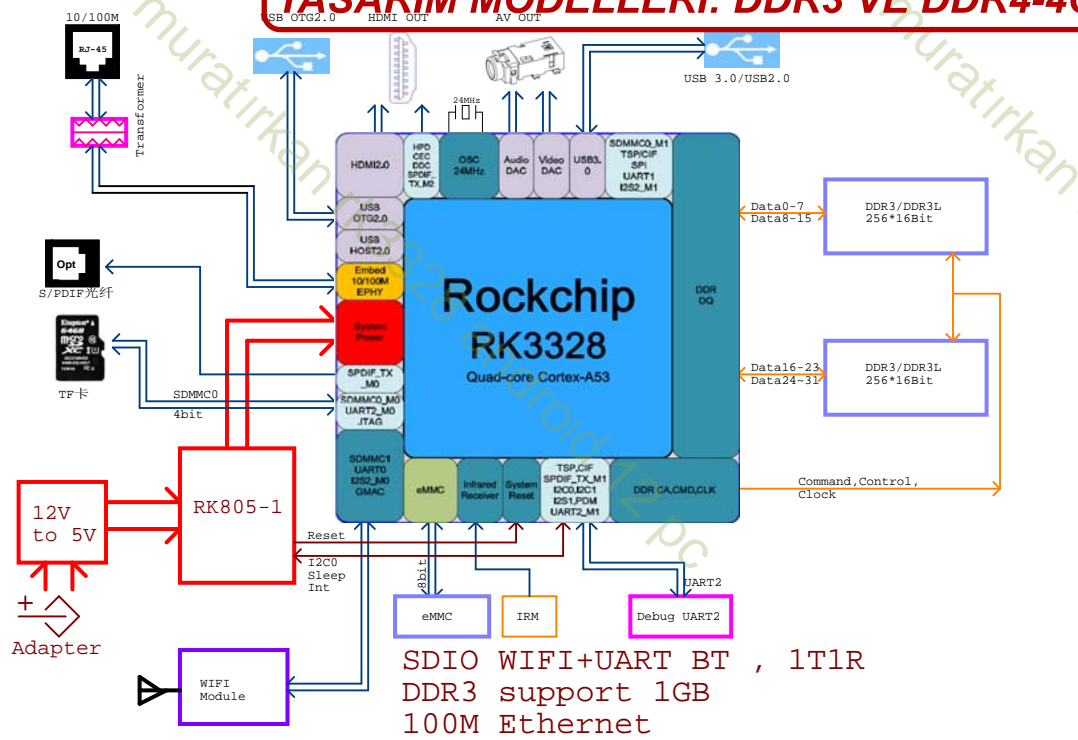
2. If Value or option is DNP, which means the area is reserved without being mounted

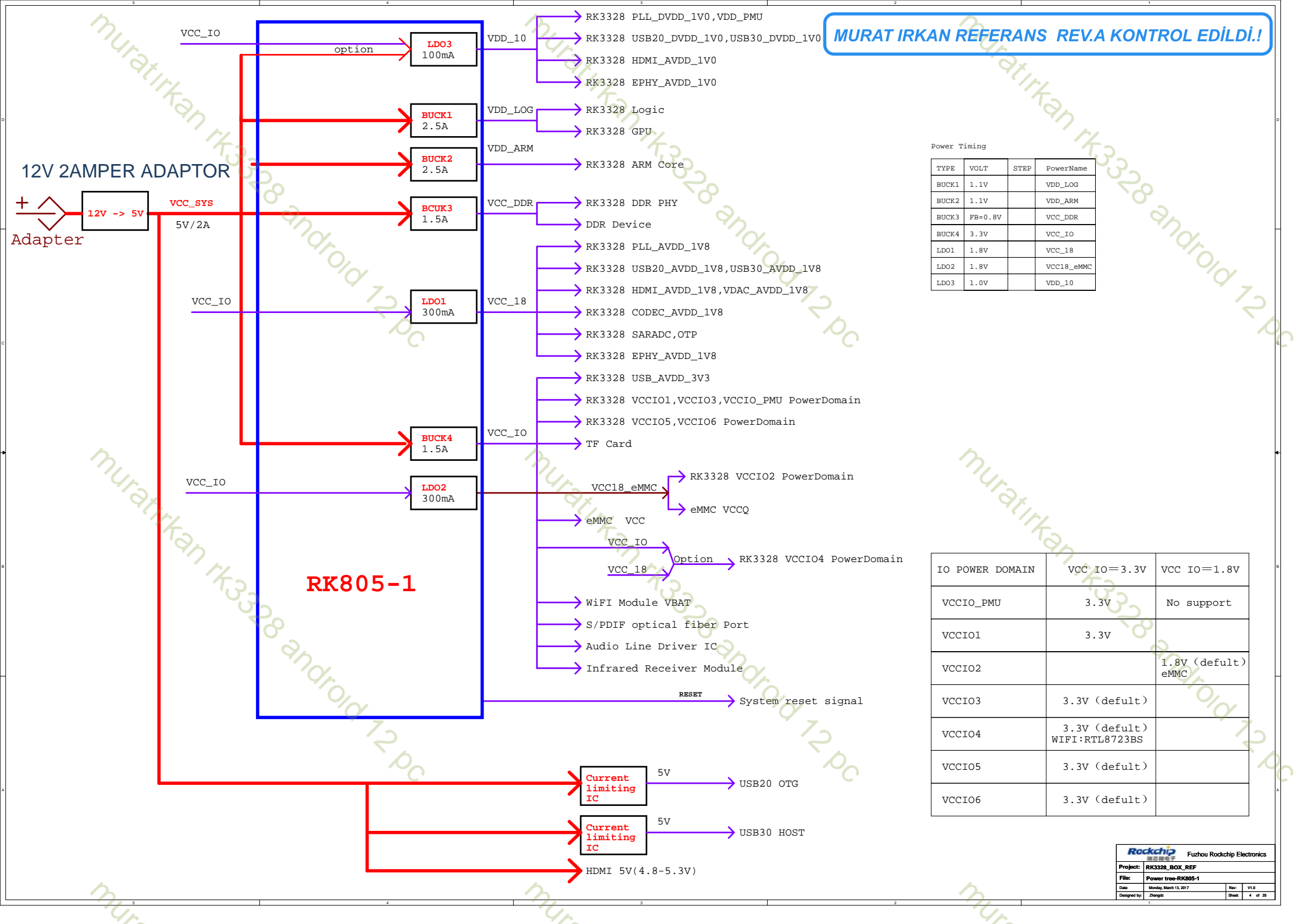
**Rockchip**  
瑞芯微电子 Fuzhou Rockchip Electronics

Project:	RK3328_BOX_REF		
File:	Index		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	1 of 29

Version	Date	Author	Change Note	Approved
v1.0	20170224	ZDZ	First edictor	

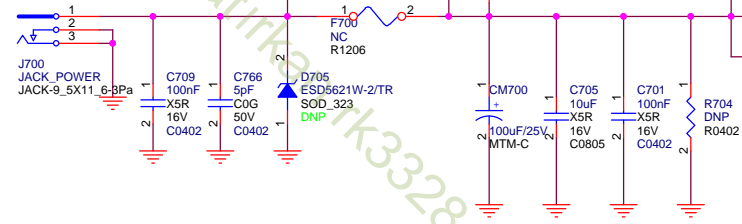
# TASARIM MODELLERİ: DDR3 VE DDR4-4GB 12V ADAPTOR



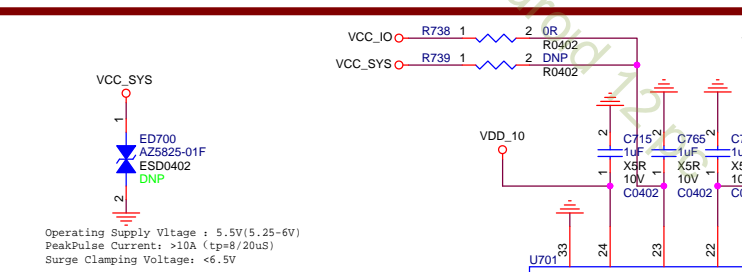


# PC GÜÇ ANAHTAR/ON/OFF

## ADAPTOR JACK



## DC12V



Operating Supply Voltage : 5.5V(5.25-6V)  
PeakPulse Current: >10A (tp=8/20uS)  
Surge Clamping Voltage: <6.5V

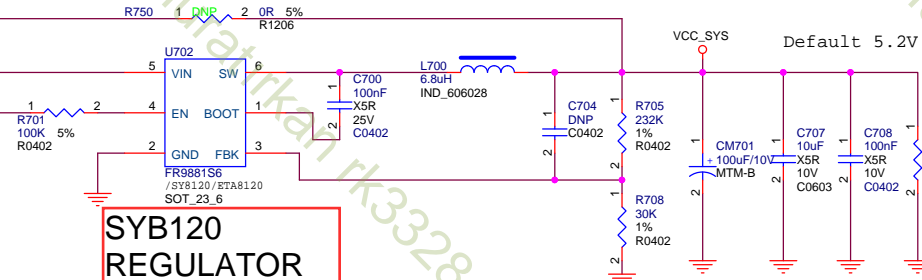
## VCC\_DDR

Default:DDR3=1.5V

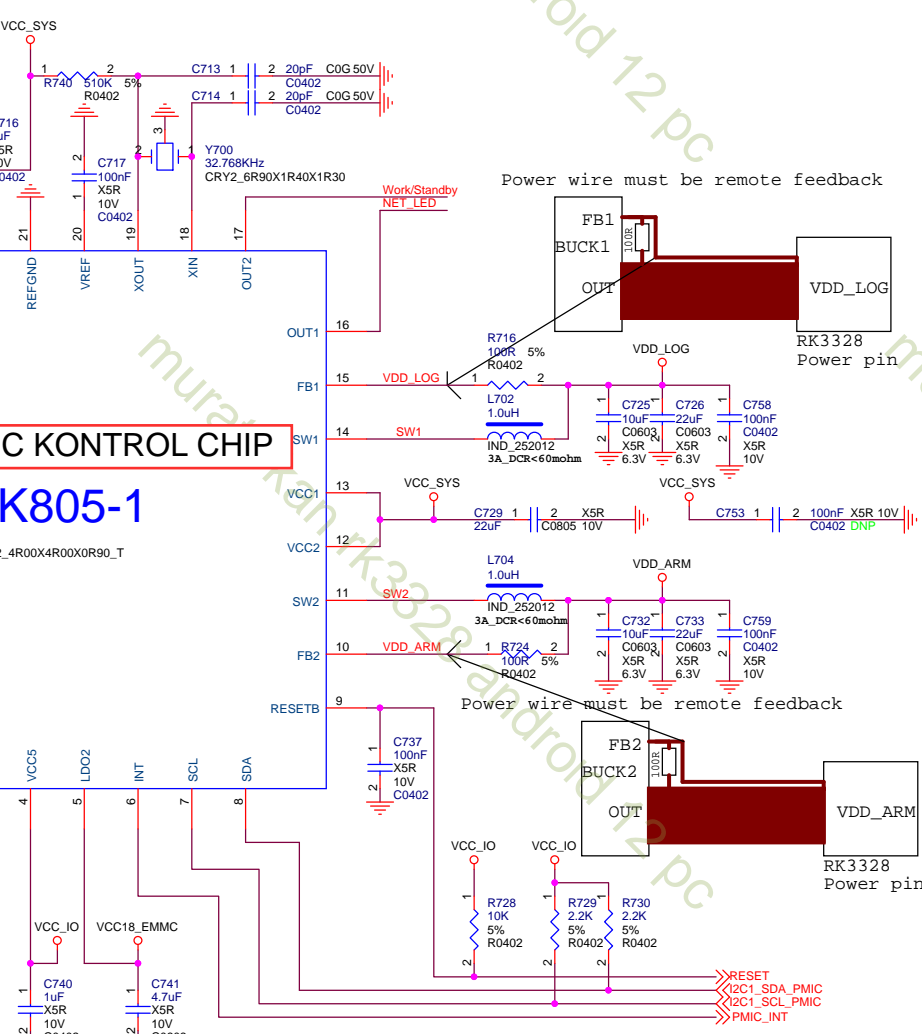
	DDR3	DDR3L	DDR4
VCC_DDR	1.527V	1.353V	1.2V
R725	100K 1%	47K 1%	51K 1%
R726	110K 1%	68K 1%	100K 1%

DDR3 VE DDR VOLTAJ DEGERLER

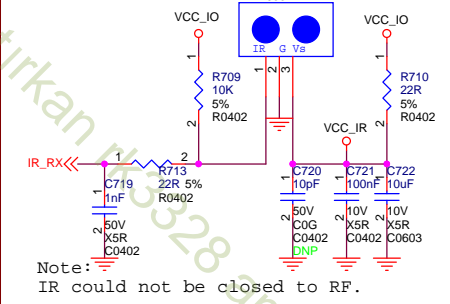
## SYB120 REGULATOR 5.2VOLT CIKIS



## VCC\_SYS

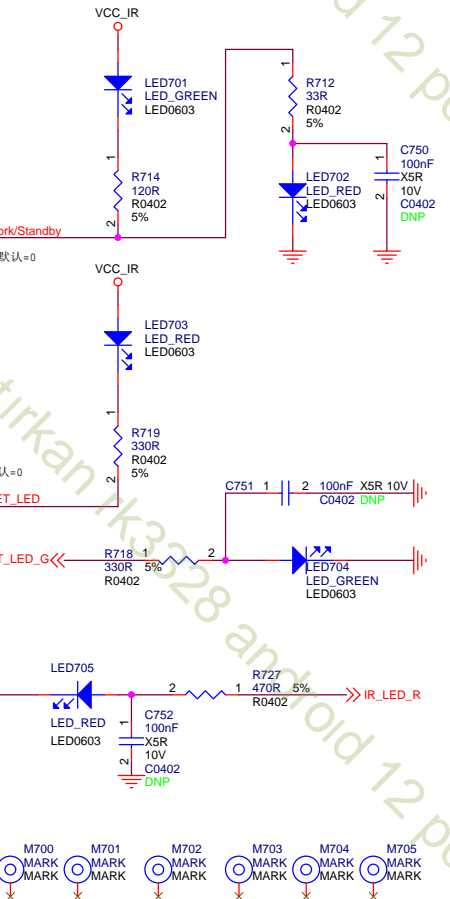


## IR Receiver



Note: IR could not be closed to RF.

## LED DISPLAY



Rockchip 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	System Power-PMIC RK805-1		
Date:	Tuesday, March 07, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet	5 of 29

RK3328 ARM CPU GUC VE GRAFİK  
KART GÜC BAĞLANTILARI VE SASE

ARM CPU RK3328 SASE VE GÜÇ KONTROL-1  
06/07/2024 11:04 AM

MURAT IRKAN 2023/11

ARM

VDD\_CORE  
VDD\_CORE  
VDD\_CORE  
VDD\_CORE  
VDD\_CORE  
VDD\_CORE  
VDD\_CORE

P13  
P14  
R13  
R14  
T13  
T14  
T15

Note:Place close to CPU power pin .

GPU/Logic

VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC  
VDD\_LOGIC

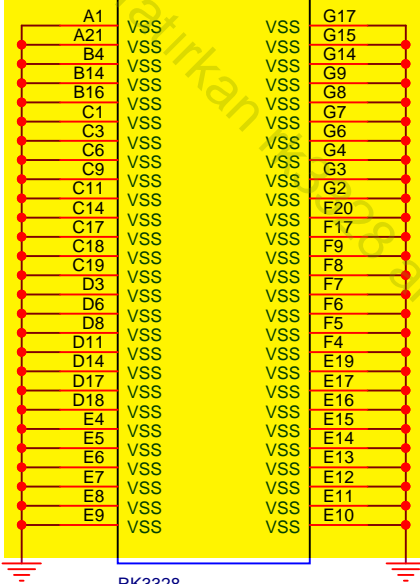
N9  
N10  
N11  
P9  
P10  
P11  
R9  
R10  
R11

Note:Place close to CPU power pin .

RK3328

BGA395\_14R00X14R00X1R24

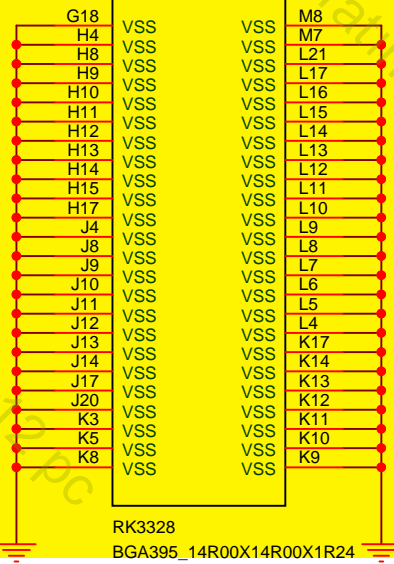
U800O



RK3328

BGA395\_14R00X14R00X1R24

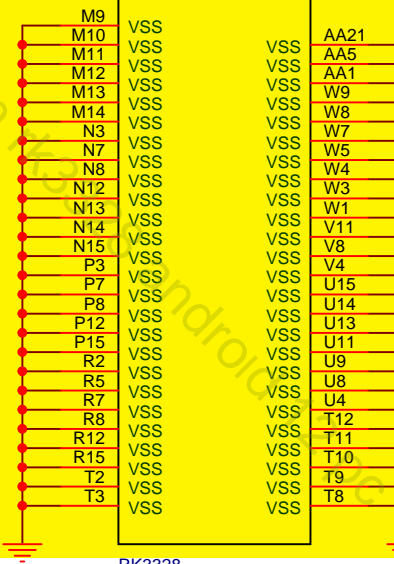
U800P



RK3328

BGA395\_14R00X14R00X1R24

U800Q

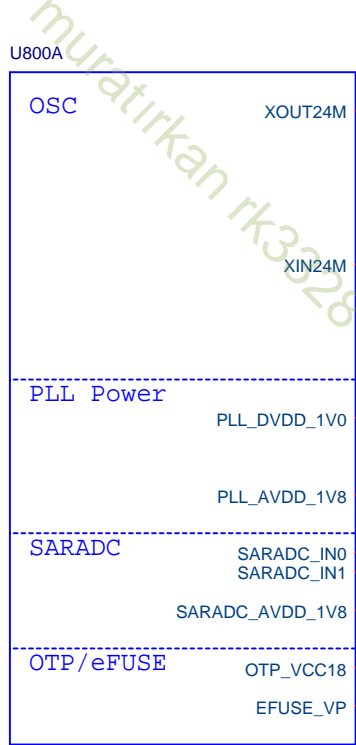


RK3328

BGA395\_14R00X14R00X1R24

MURAT IRKAN RK3328 ROCKCHIP  
PC S STEM





KR STAL: 24MHz

VDDPLL/USB30\_1V0

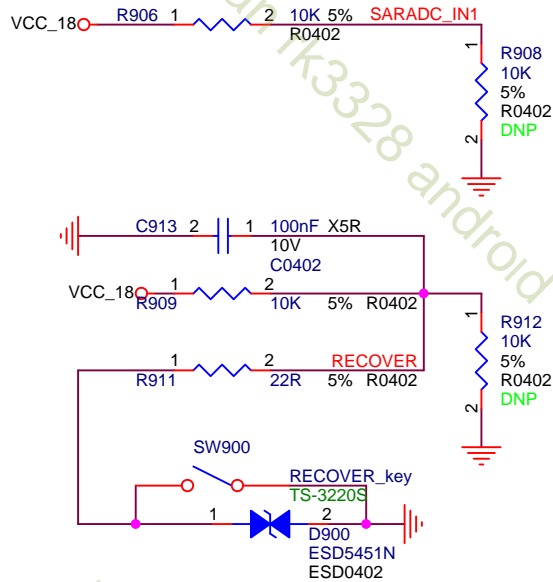
VDD\_10

VDDPLL/USB30\_1V8

VCC\_18

RK3328

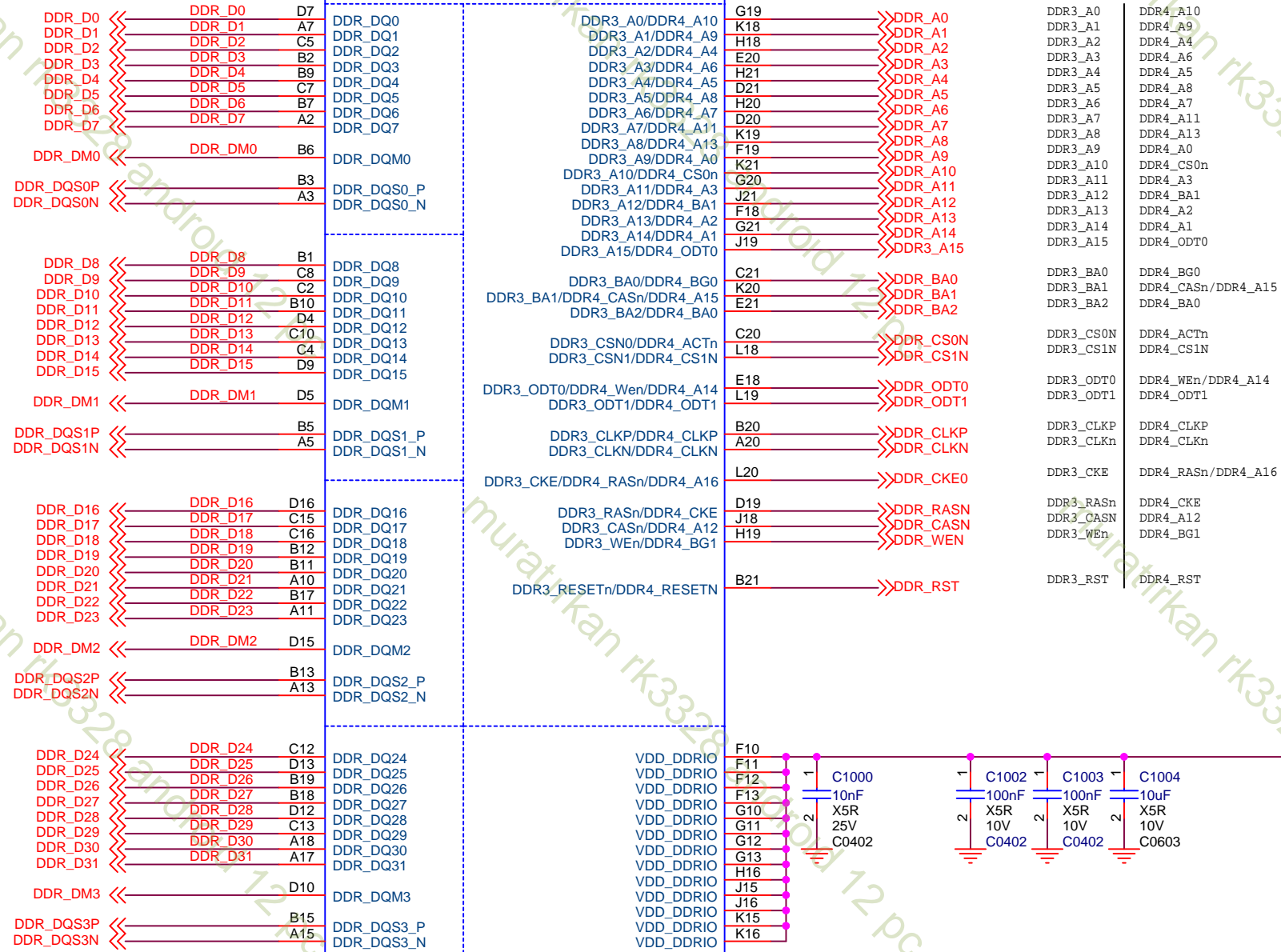
BGA395\_14R00X14R00X1R24




SARADC_IN0 BOM Ver...	SARADC_IN1 PCB Ver...	Pull up	Pull down	
Recover		DNP	10K	
BOM1		110K	10K	
BOM2		100K	20K	
BOM3		100K	33K	
BOM4		36K	18K	
BOM5		51K	36K	
BOM6		51K	51K	
BOM7		36K	51K	
BOM8		18K	36K	
BOM9		33K	100K	
BOM10		20K	100K	
BOM11		10K	110K	
BOM12		10K	DNP	

KR STAL S GORTA V.S

# DDR3 VE DDR4 BELLEKLER :KONTROL-1

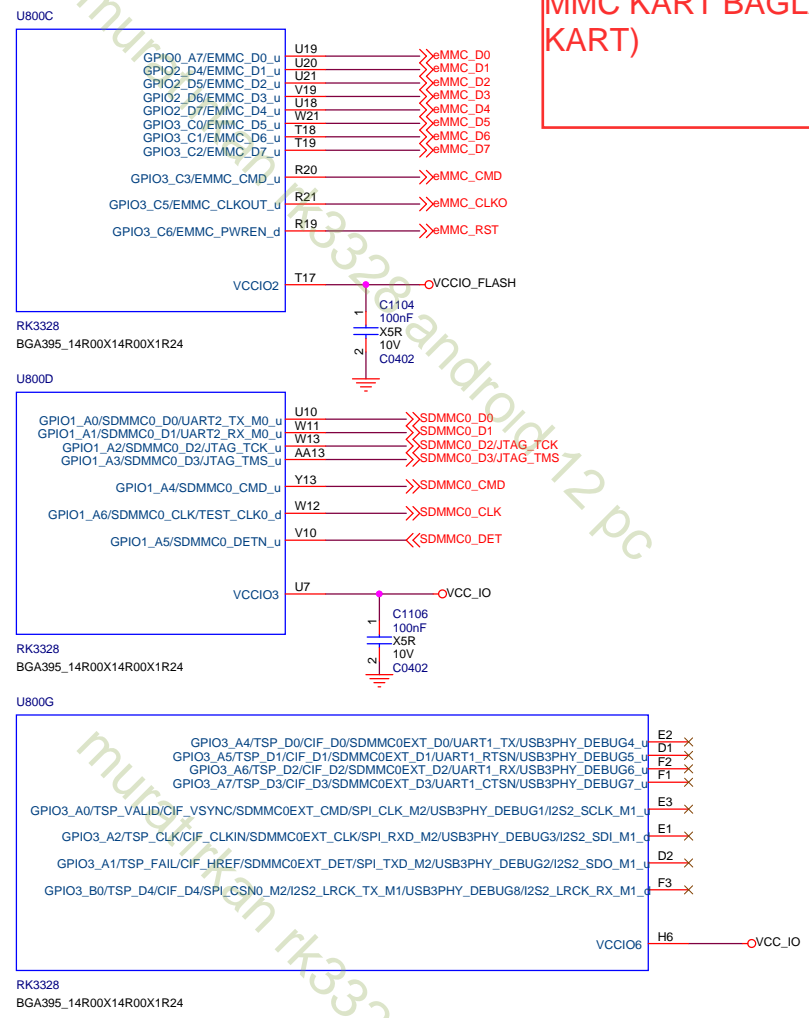


RK3328  
BGA395\_14R00X14R00X1R24

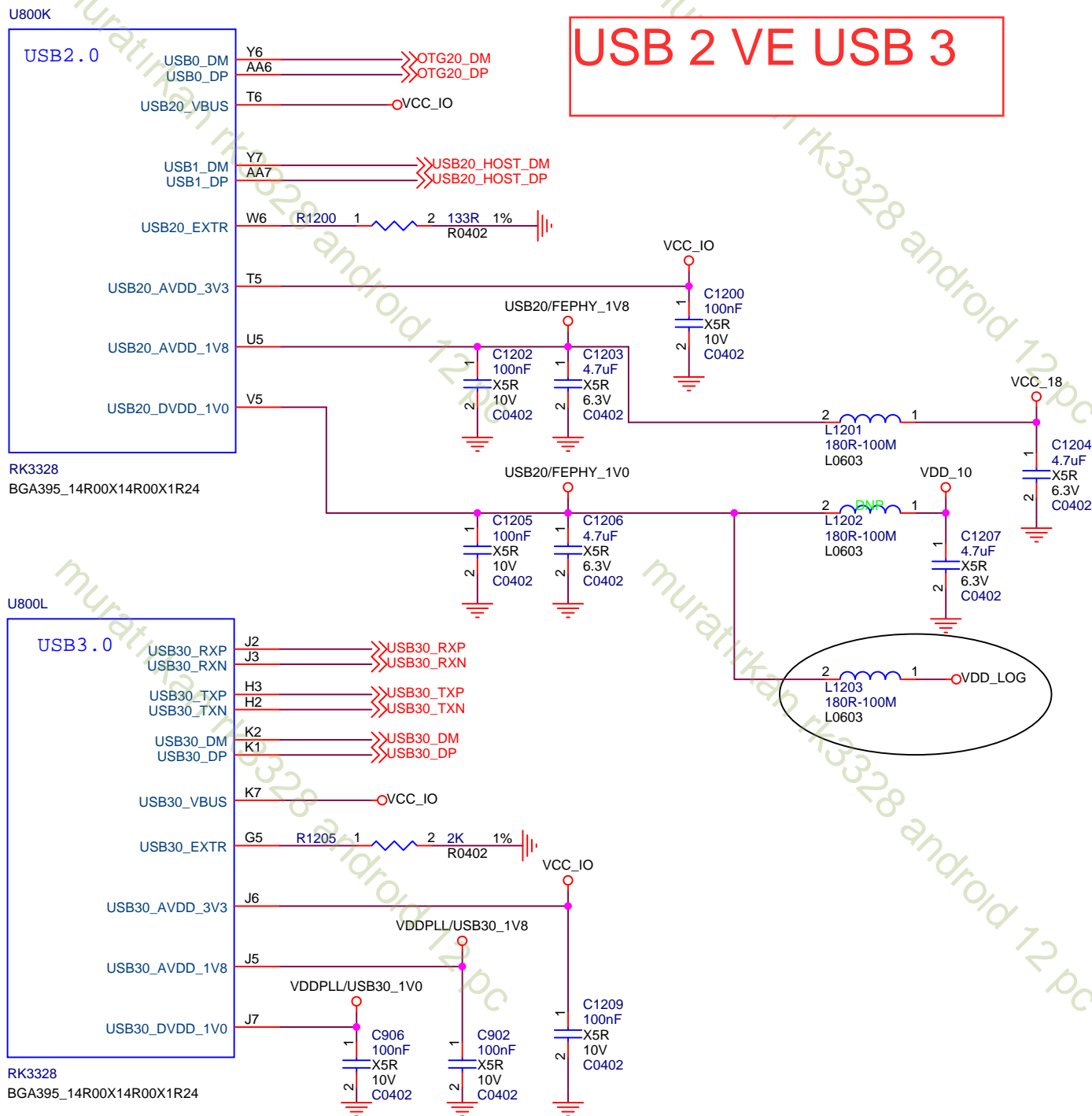
 <b>Fuzhou Rockchip Electronics</b>	
<b>Project:</b>	RK3328_BOX_REF
<b>File:</b>	RK3328 DDR Controller
<b>Date:</b>	Friday, February 24, 2017
<b>Designed by:</b>	Zhangdz
<b>Rev:</b>	V1.0
<b>Sheet:</b>	8 of 29




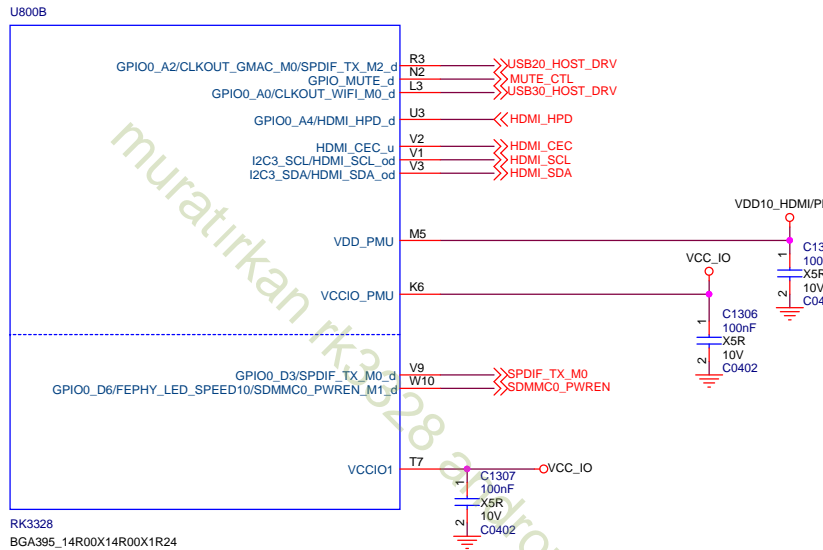
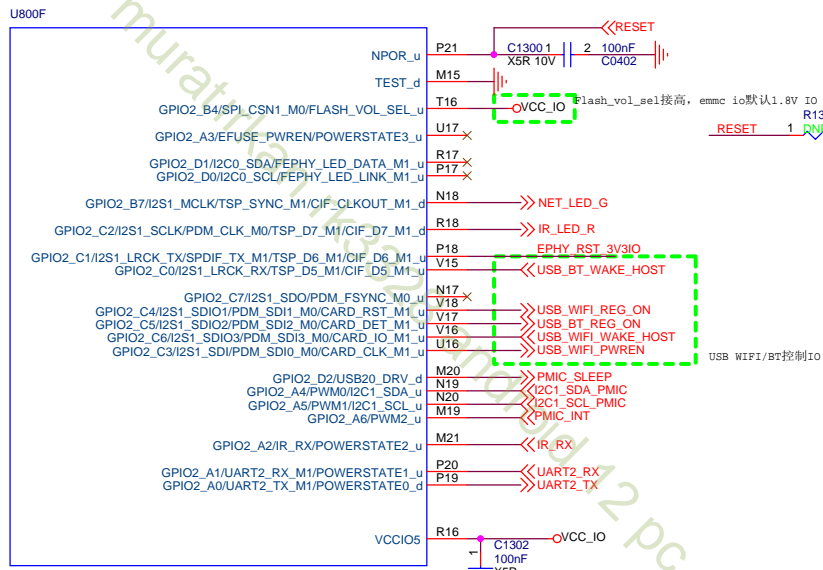
MMC KART BAGLANTISI (MULT MEDYA KART)



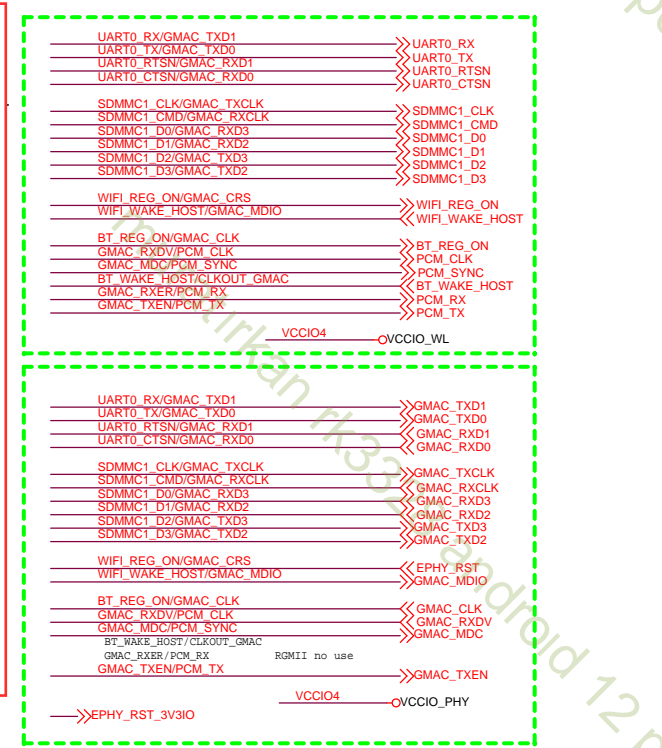
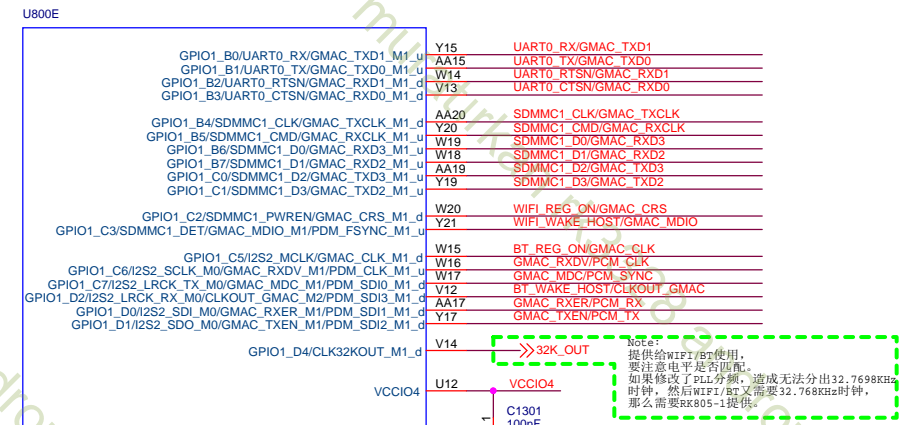
# USB 2 VE USB 3



 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	RK3328 USB2 PHY/USB3 PHY		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	10 of 29

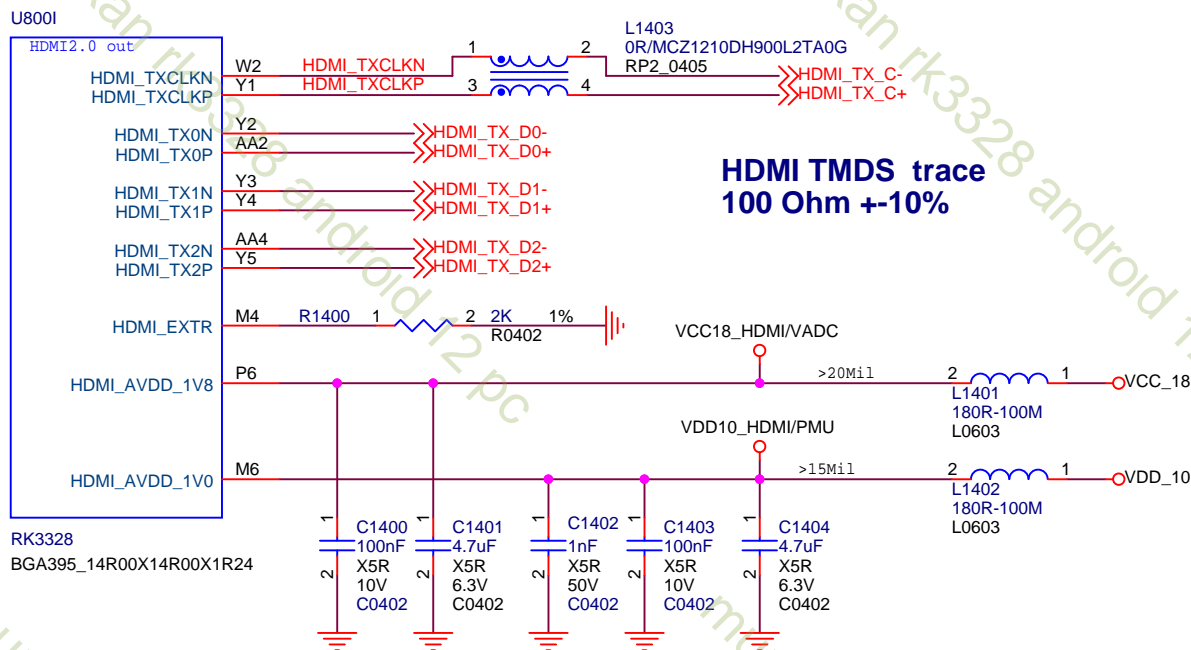


# USB BLUETOOTH VE WI\*FI



Note:  
SDIO1+UART0和GMAC的IO是复用的。  
二选一

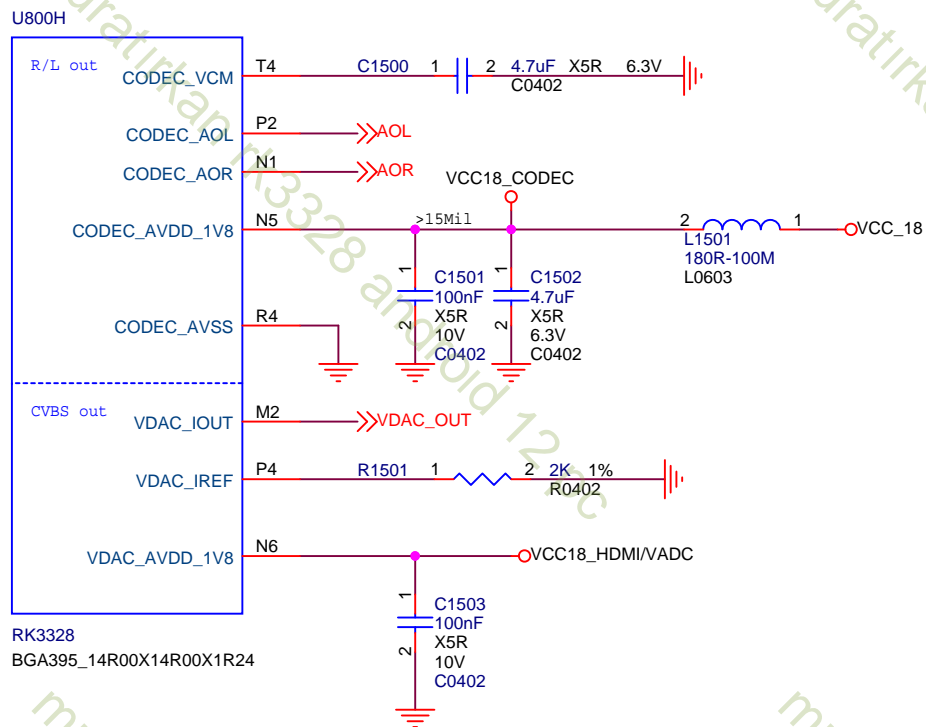
# RK3328 HDMI 4K VIDEO CIKIS




瑞芯微电子

Fuzhou Rockchip Electronics

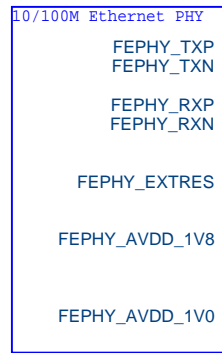
Project:	RK3328_BOX_REF		
File:	RK3328 HDMI PHY		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	12 of 29



 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	RK3328 AV Interface		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	13 of 29

# 10/100 NETWORK

U800J



RK3328  
BGA395\_14R00X14R00X1R24

Y9  
AA9

TD+  
TD-

Y8  
AA8

RD+  
RD-

V7 R1600 1 2 6.49K 1% R0402

USB20/FEPHY\_1V8

1  
C1600  
100nF  
X5R  
10V  
C0402

U6

V6

USB20/FEPHY\_1V0

1  
C1602  
100nF  
X5R  
10V  
C0402

Embed FEPHY

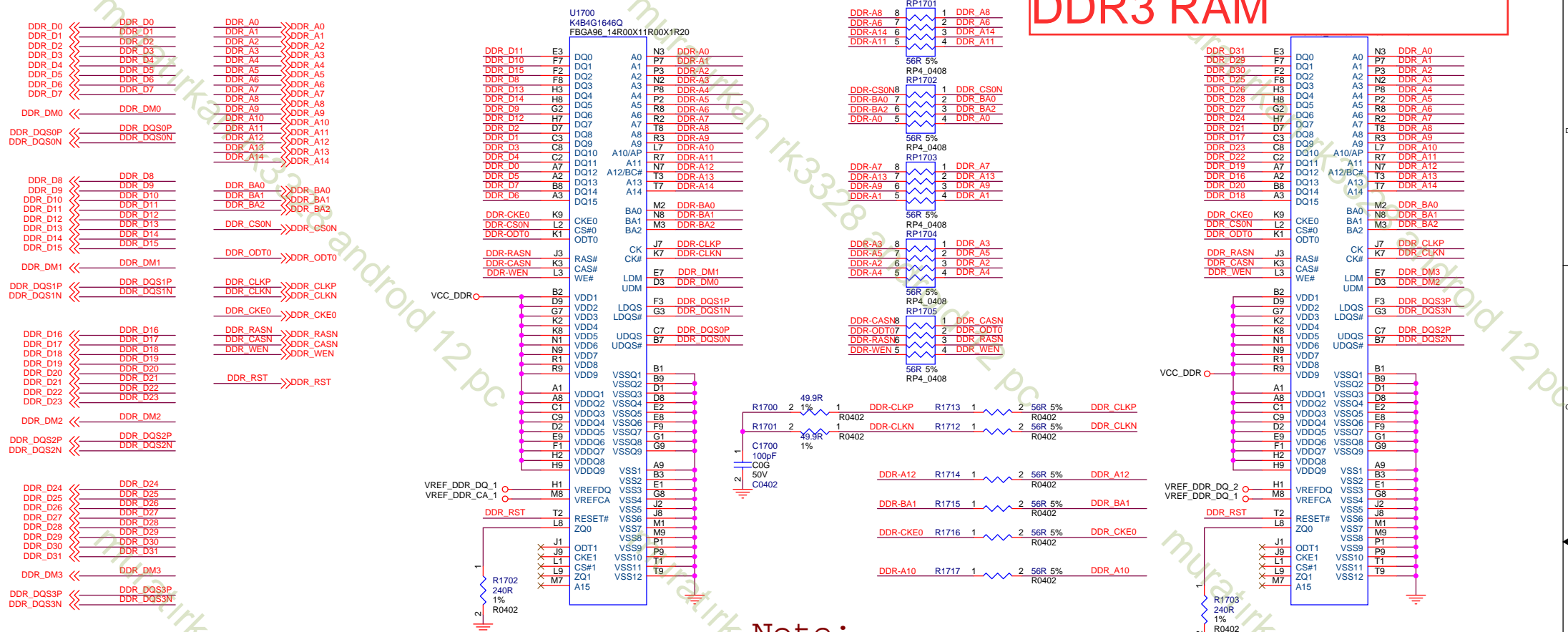


Fuzhou Rockchip Electronics

Project:	RK3328_BOX_REF		
File:	RK3328 FEPHY		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	14 of 29

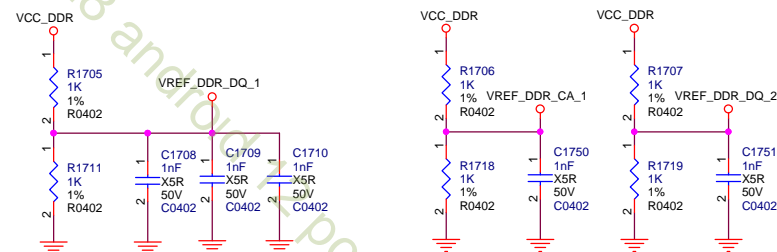
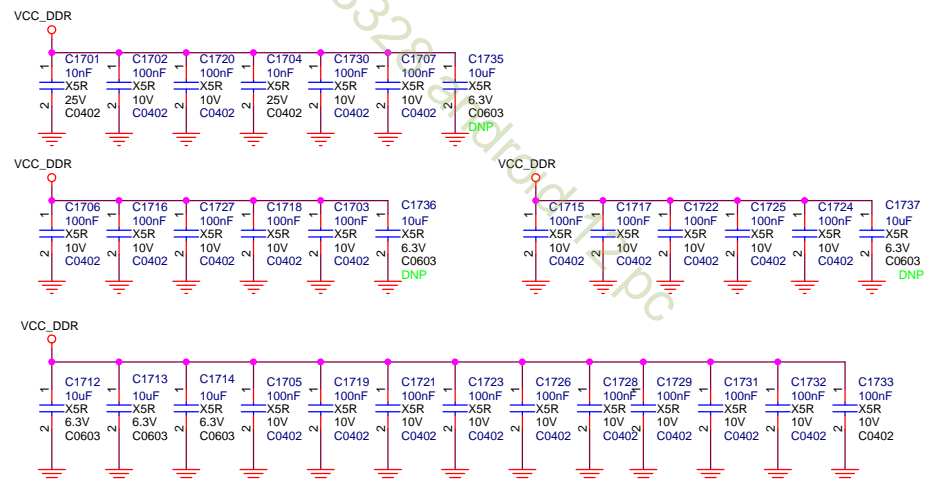


## DDR3 RAM

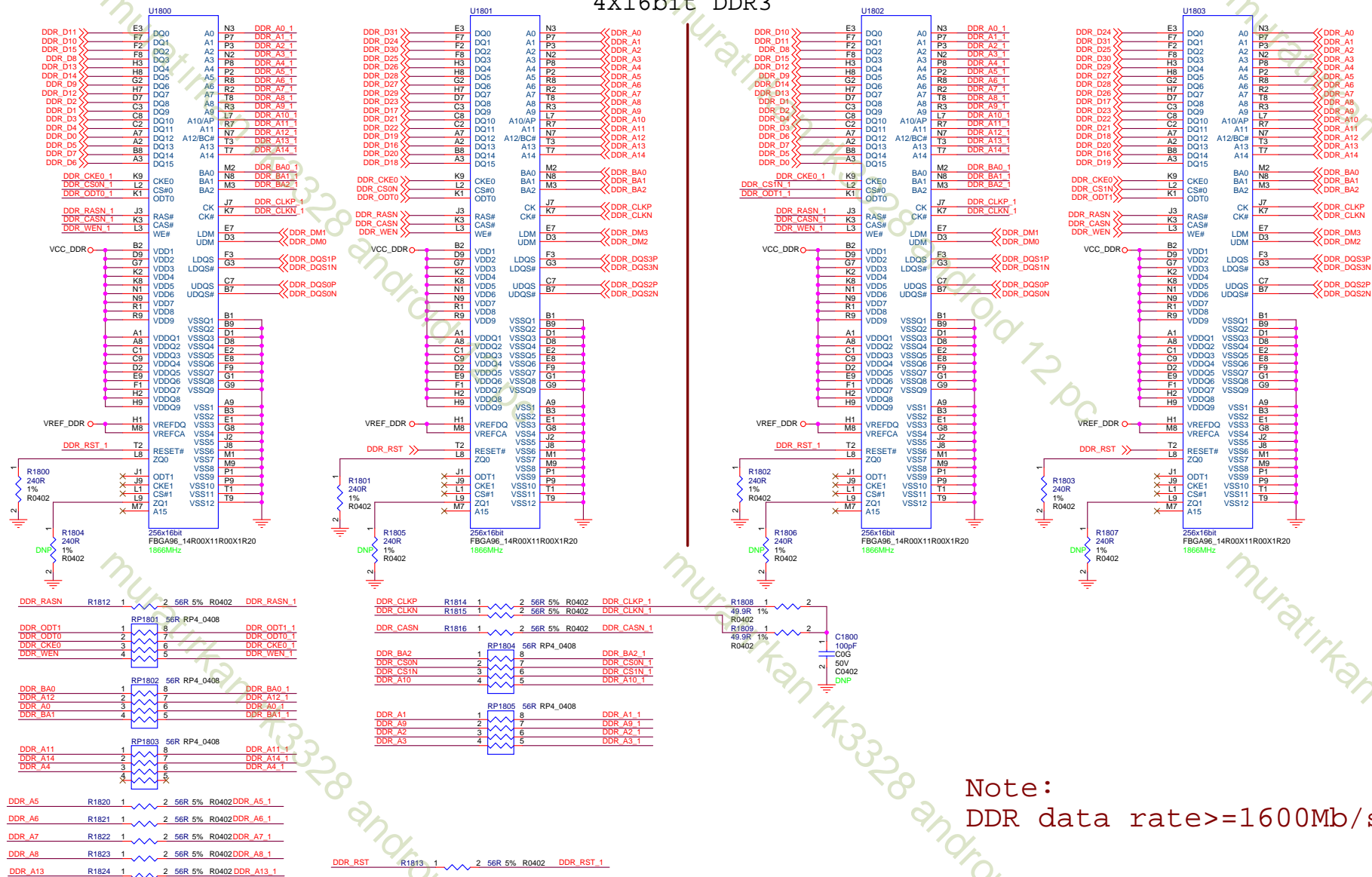


Note:  $\text{DDR data rate} \geq 1600\text{Mb/s}$

2X16bit DDR3

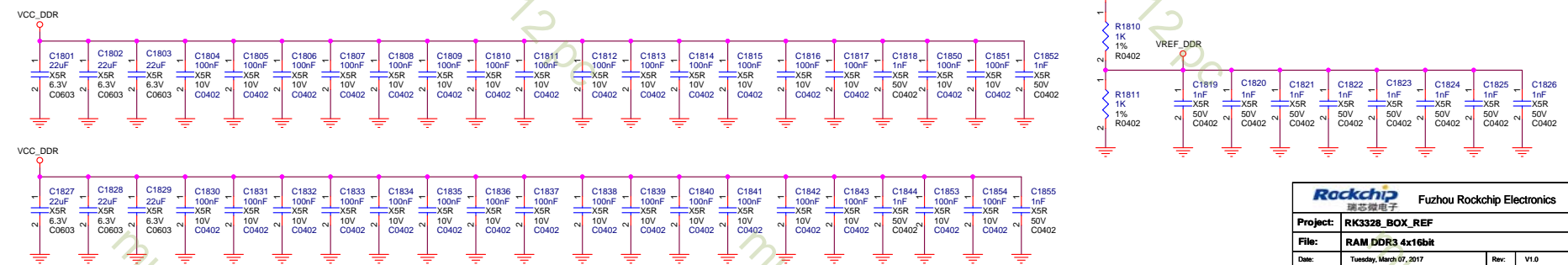


# 4x16bit DDR3

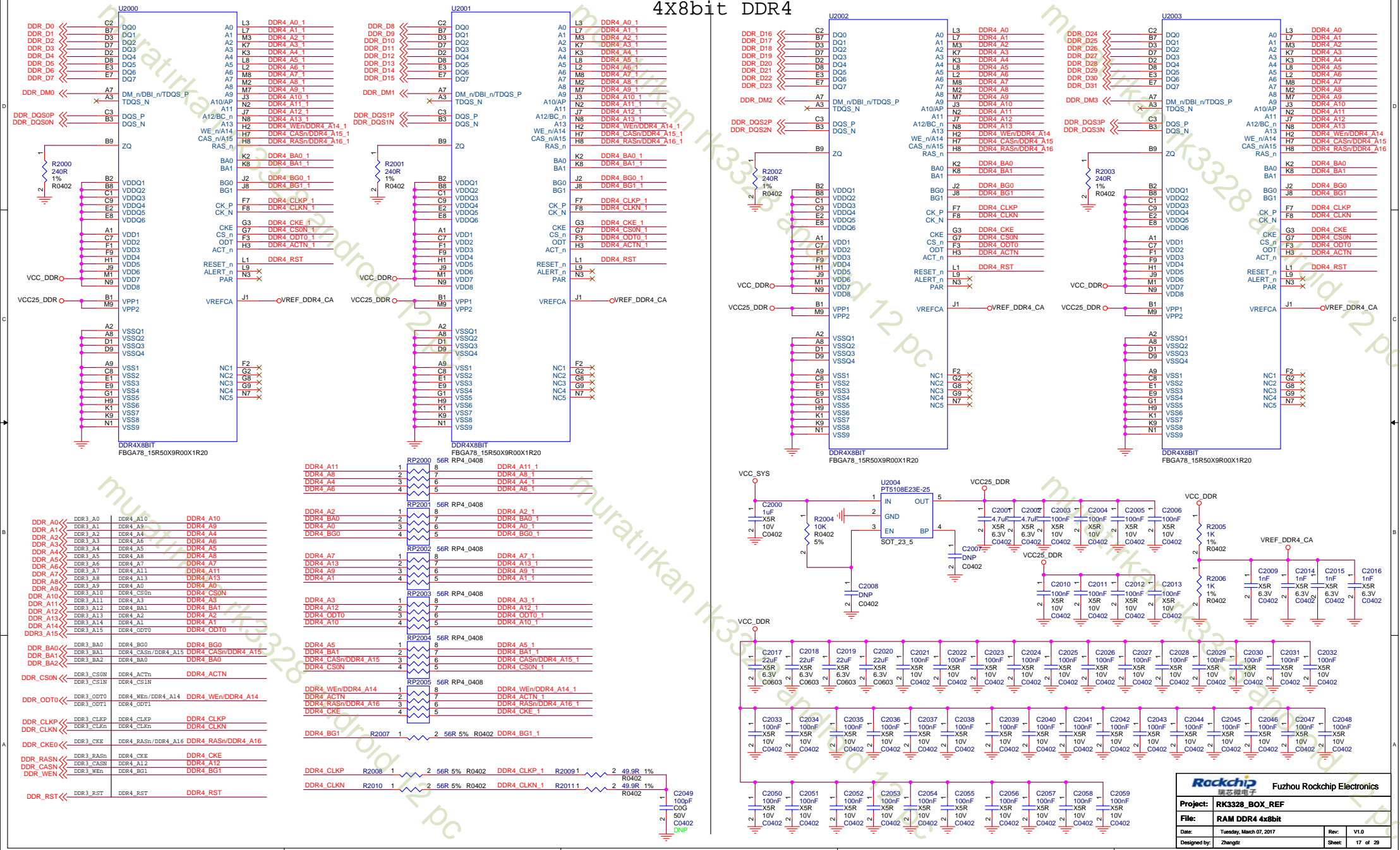


Note:  
DDR data rate ≥ 1600Mb/s

## DDR3 FILTER

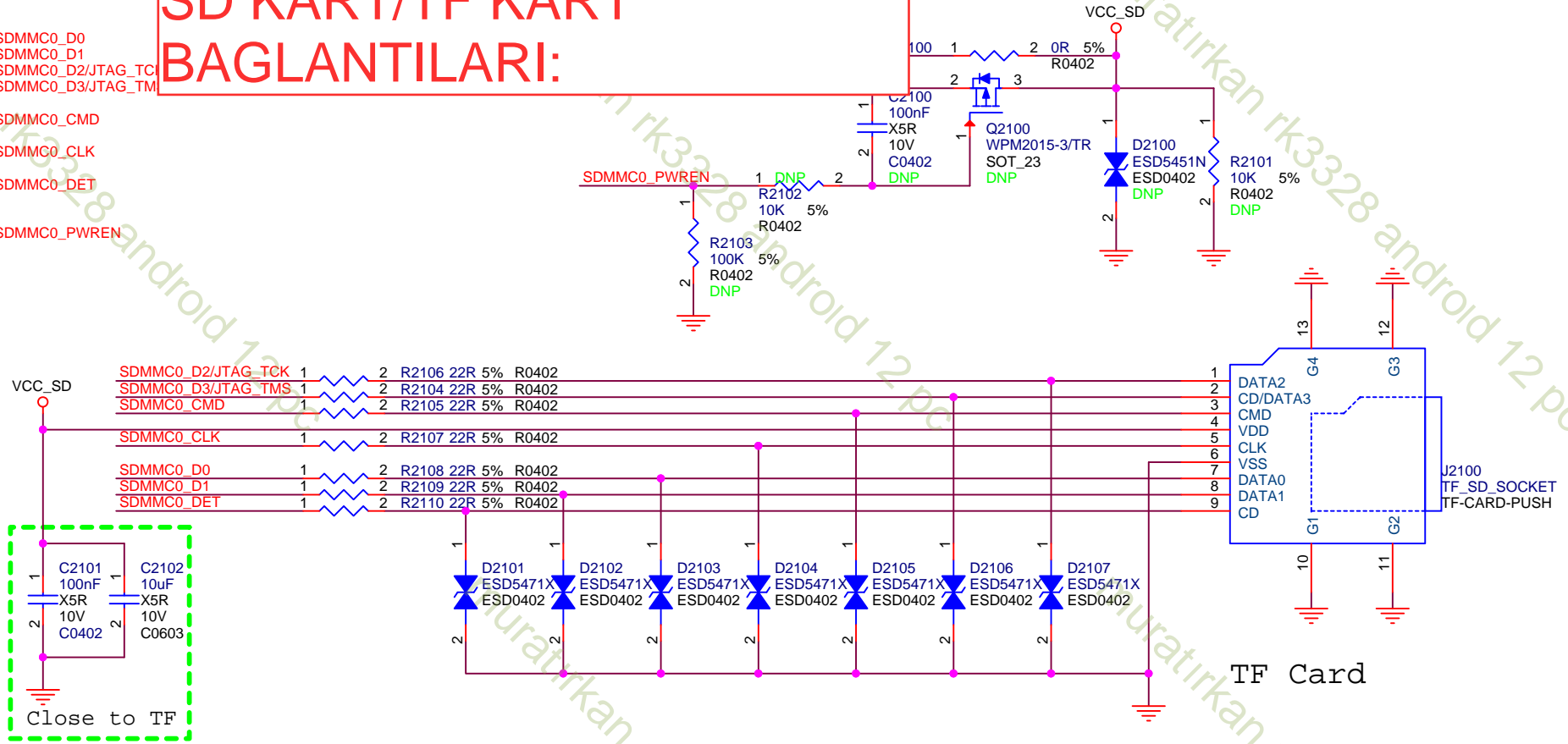


## 4x8bit DDR4



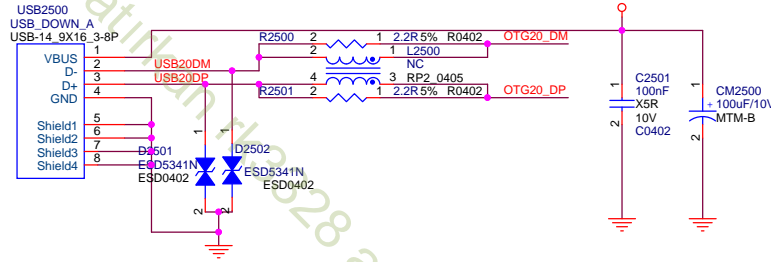
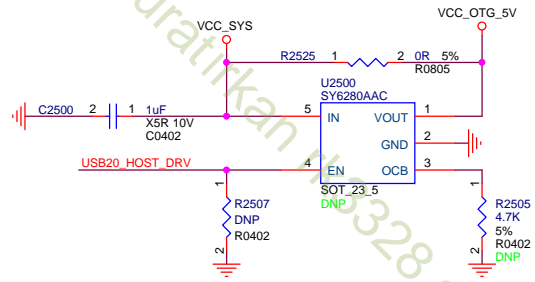
# SD KART/TF KART BAGLANTILARI:

>>SDMMC0\_D0  
 >>SDMMC0\_D1  
 >>SDMMC0\_D2/JTAG\_TCK  
 >>SDMMC0\_D3/JTAG\_TMS  
 >>SDMMC0\_CMD  
 >>SDMMC0\_CLK  
 <<SDMMC0\_DET  
 >>SDMMC0\_PWREN



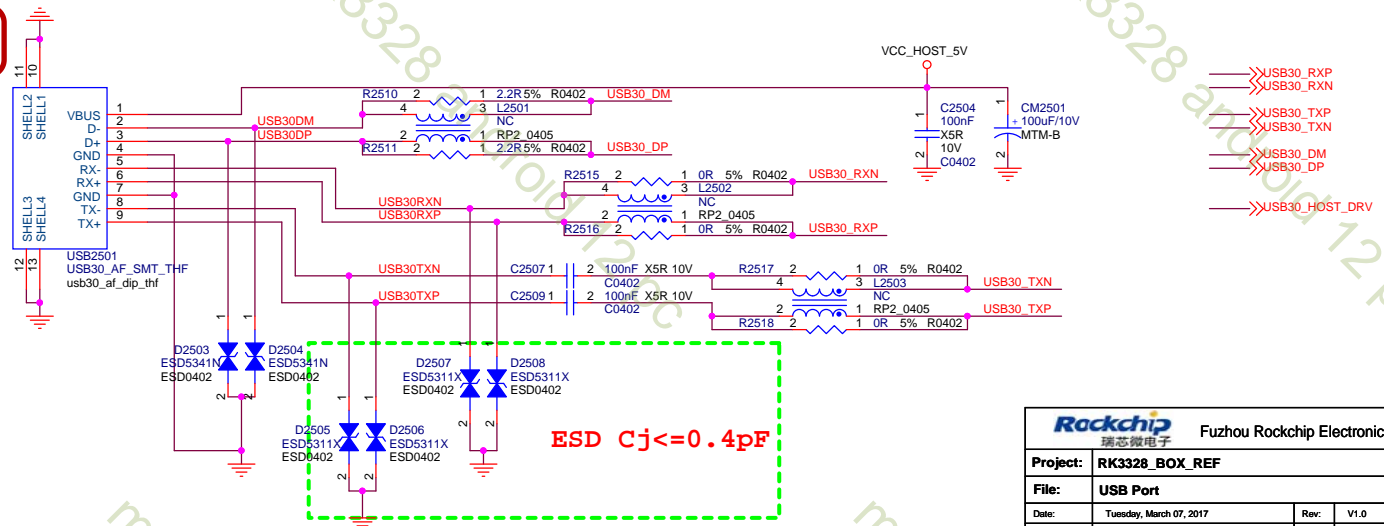
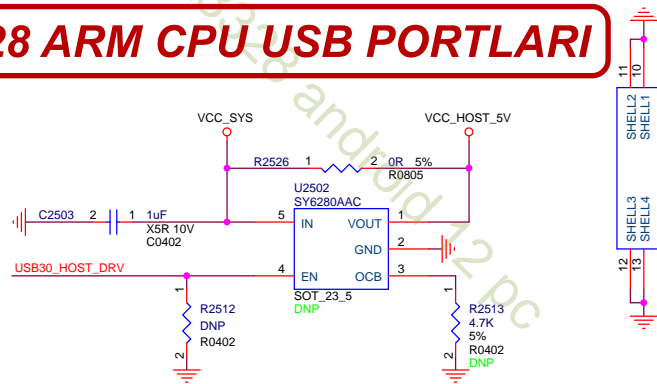
 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	TF/SD Card		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	18 of 29





>>>OTG20\_DM  
 >>>OTG20\_DP  
 >>>USB20\_HOST\_DRV

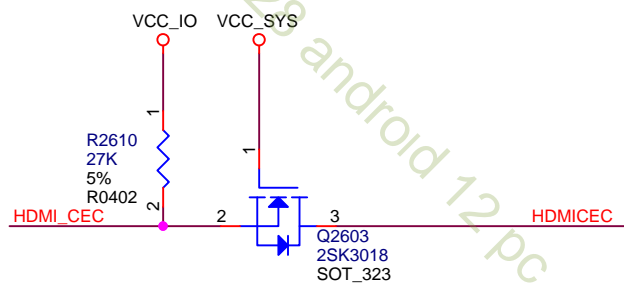
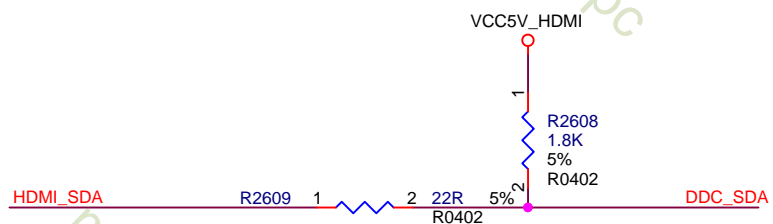
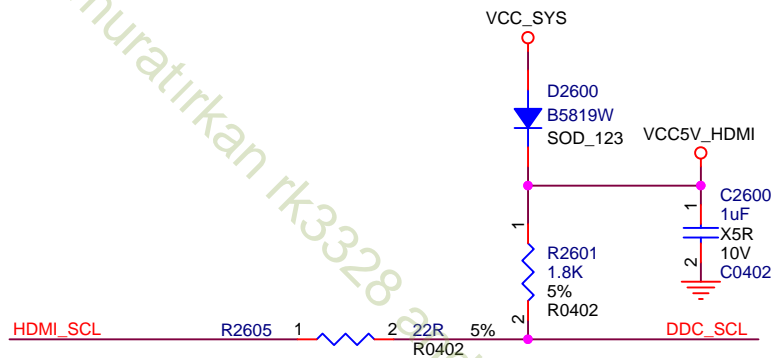
## RK3328 ARM CPU USB PORTLARI



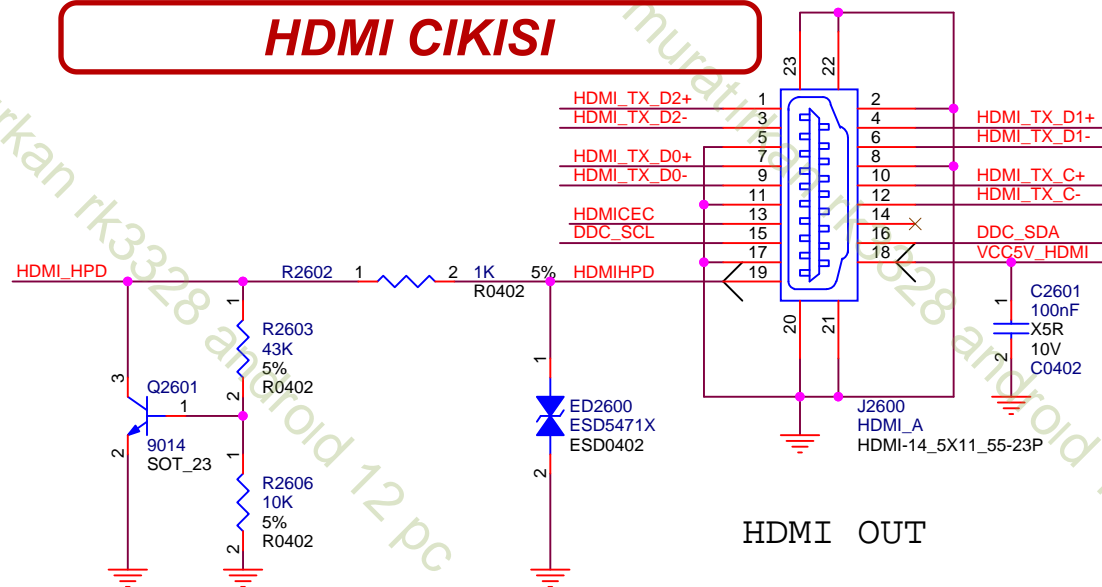
>>>USB30\_RXN  
 >>>USB30\_TXP  
 >>>USB30\_TXN  
 >>>USB30\_DM  
 >>>USB30\_DP  
 >>>USB30\_HOST\_DRV

 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	USB Port		
Date:	Tuesday, March 07, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	20 of 29

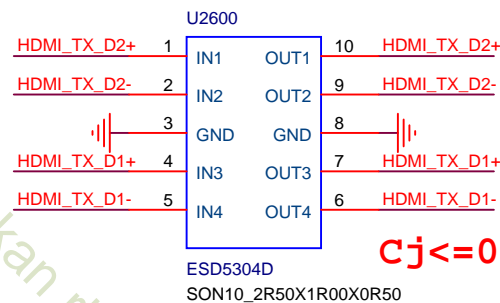




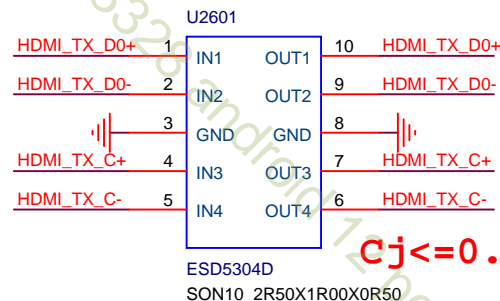
## HDMI CIKISI



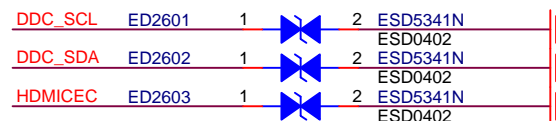
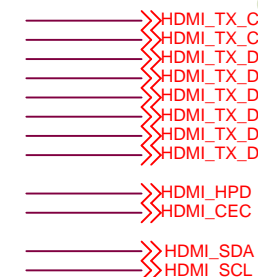
HDMI OUT




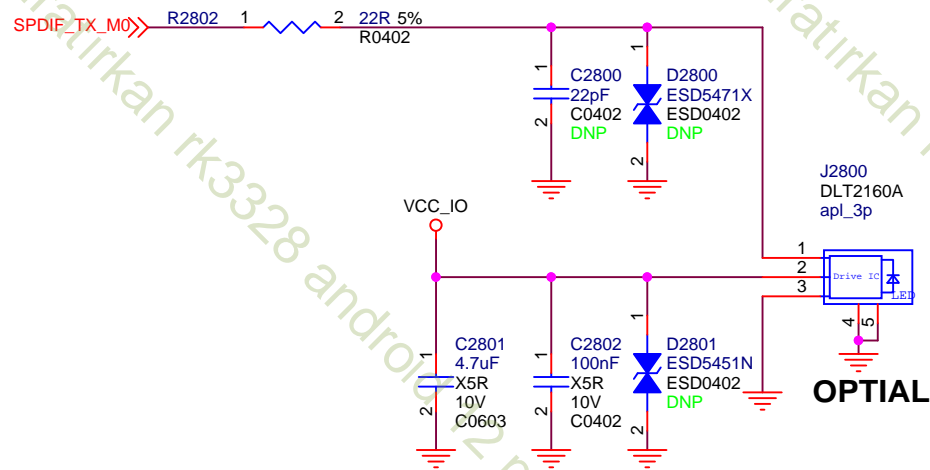
$C_j \leq 0.4 \text{ pF}$



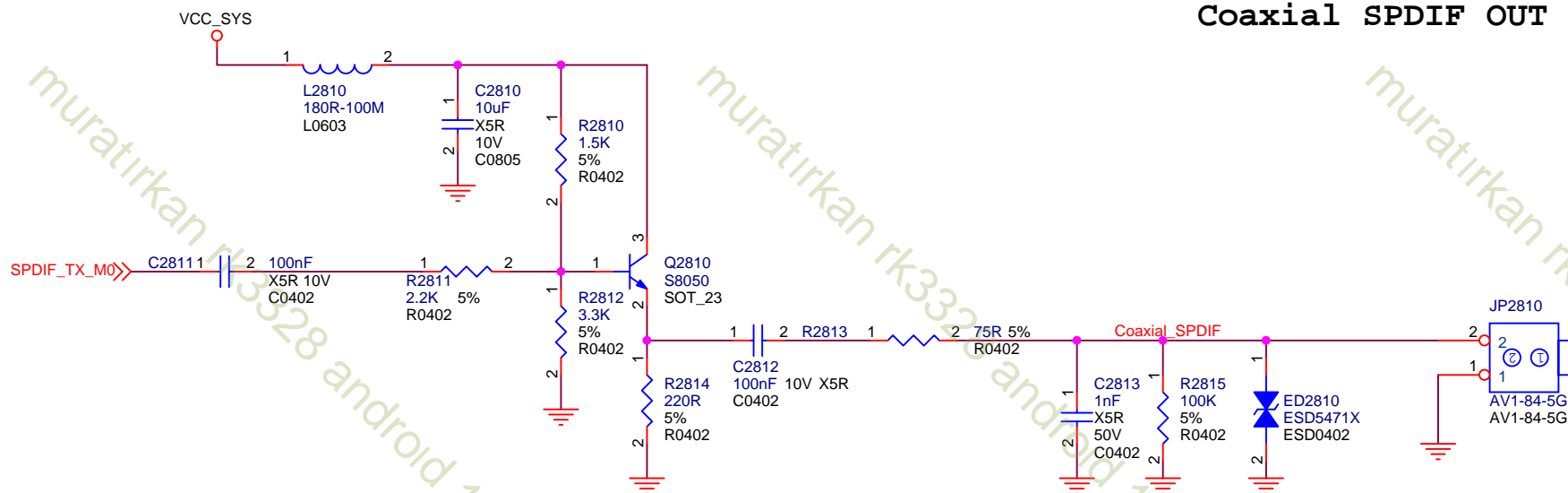
$C_j \leq 0.4 \text{ pF}$




 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	HDMI OUT Port		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	21 of 29



Optical SPDIF OUT



Coaxial SPDIF OUT

 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	S/PDIF Port		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	22 of 29

VDAC\_OUT

VCC\_IO

D2900  
BAT54S  
SOT\_23

CVBS\_OUT

CVBS\_OUT

ROUT  
LOUT

J2900

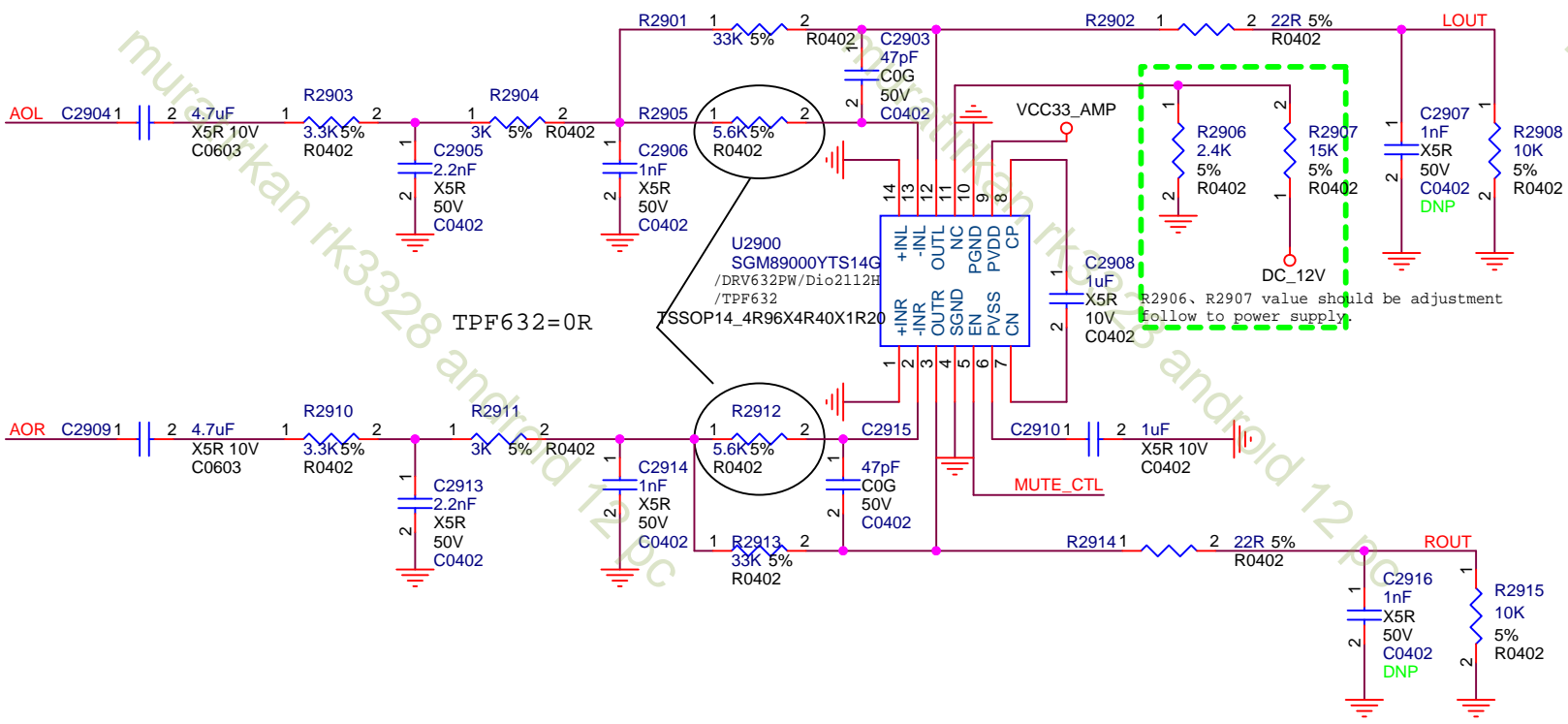
SMT-PJ  
PJ-320D-5-SMTa

D2901  
DNP  
ESD5451N  
ESD0402

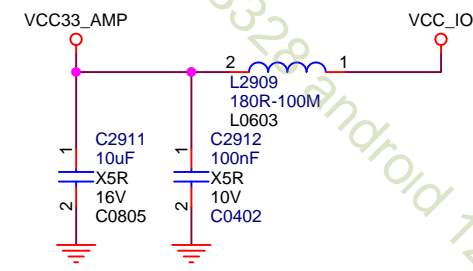
D2902  
DNP  
ESD5451N  
ESD0402

D2903  
DNP  
ESD5451N  
ESD0402


AV OUT

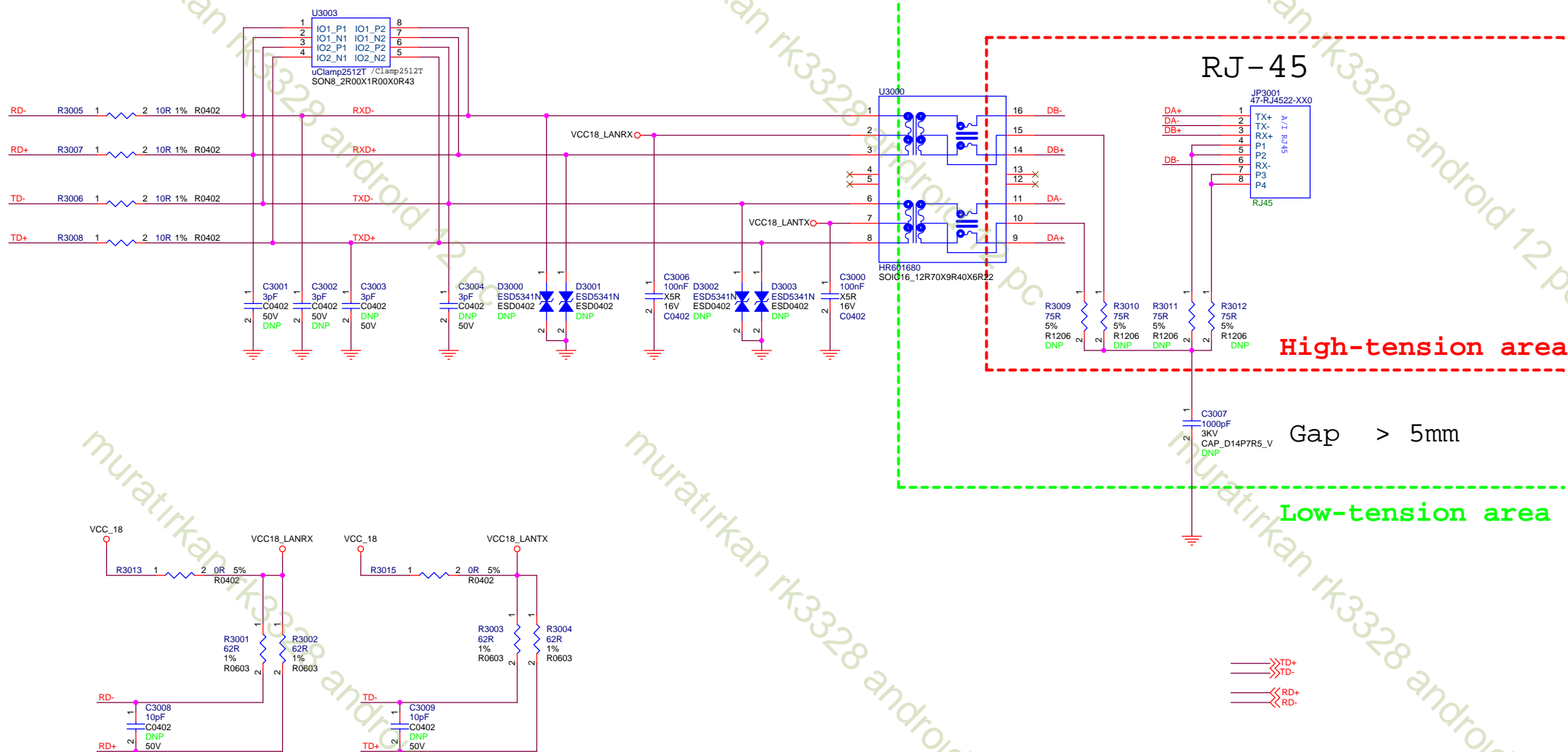


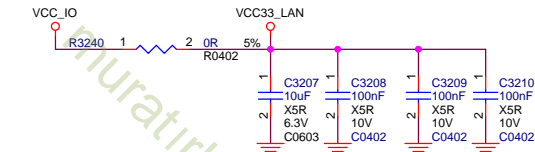
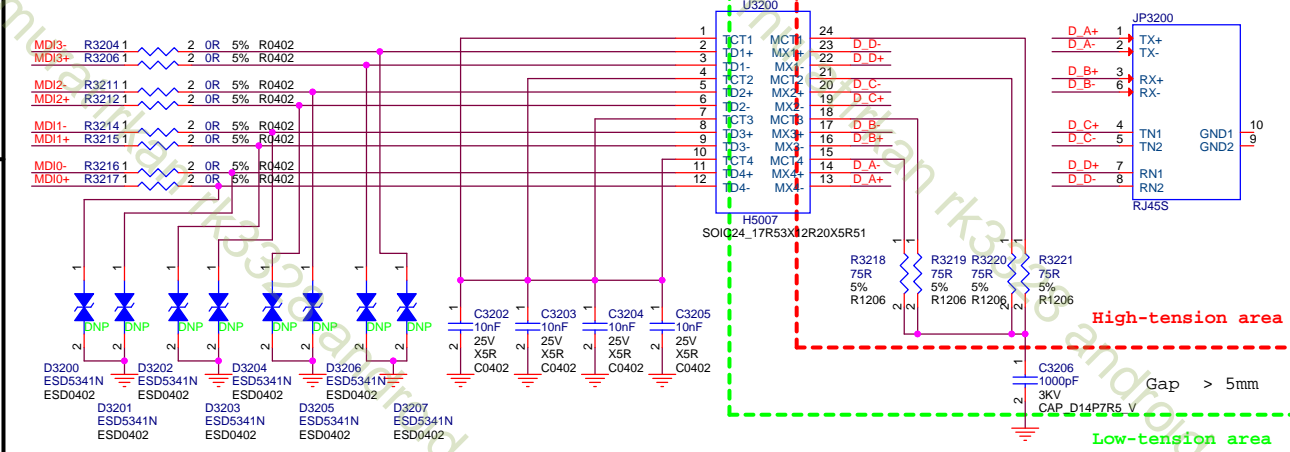
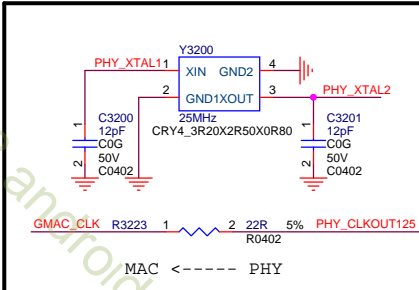
VDAC\_OUT  
AOL  
AOR  
MUTE\_CTL



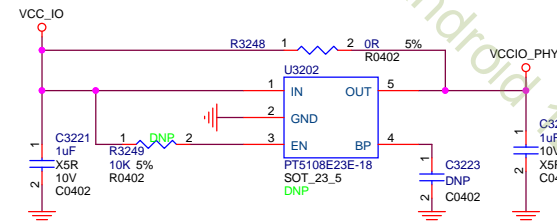
2-Vrms Audio Line Driver

 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	AV OUT Port		
Date:	Tuesday, March 07, 2017	Rev:	V1.0
Designed by:	Zhangdz	Sheet:	23 of 29

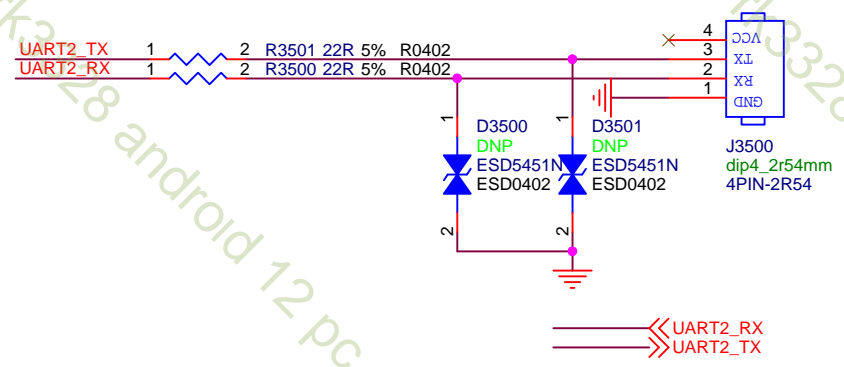





**Pull down for 2.5V RGMII(RTL8211D/8211E)**  
**Pull up for 3.3V RGMII (RTL8211D/8211E)**  
**Pull up1.5 /1.8V RGMII (RTL8211E-VL only)**

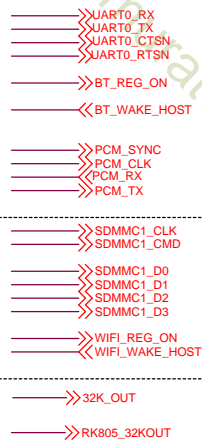


# Debug UART2

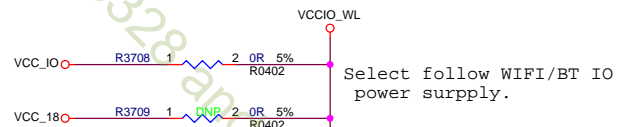
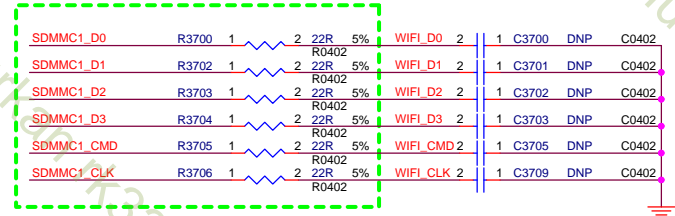


 瑞芯微电子		Fuzhou Rockchip Electronics	
Project:	RK3328_BOX_REF		
File:	Debug UART2/JTAG		
Date:	Friday, February 24, 2017	Rev:	V1.0
Designed by:	<designer>	Sheet:	26 of 29

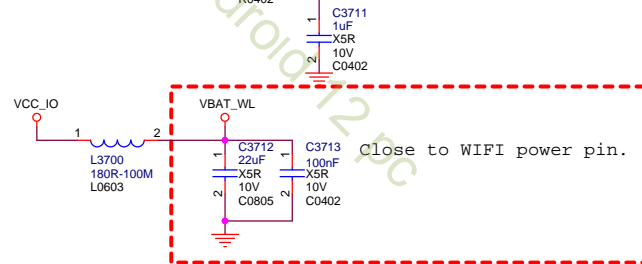




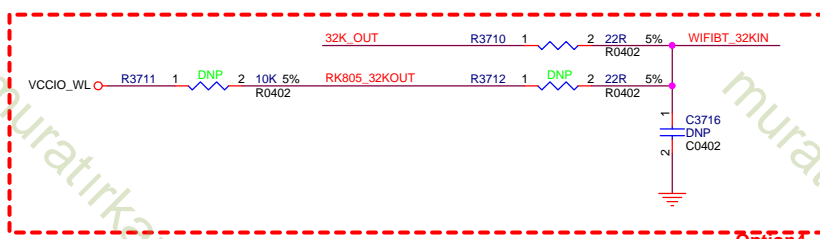
请靠近CPU放置。



Select follow WIFI/BT IO power surppl.

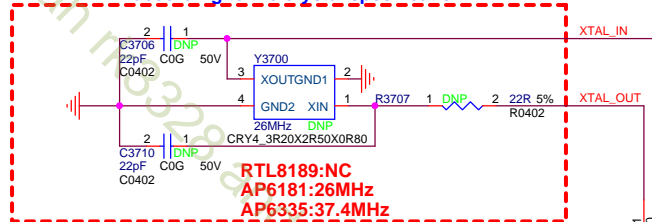


Close to WIFI power pin.



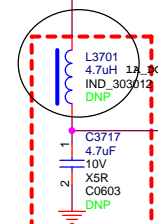
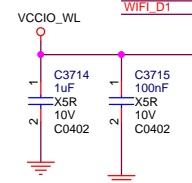
Option4

Note:  
Adjusted the load capacitance  
according to the crystal specification.

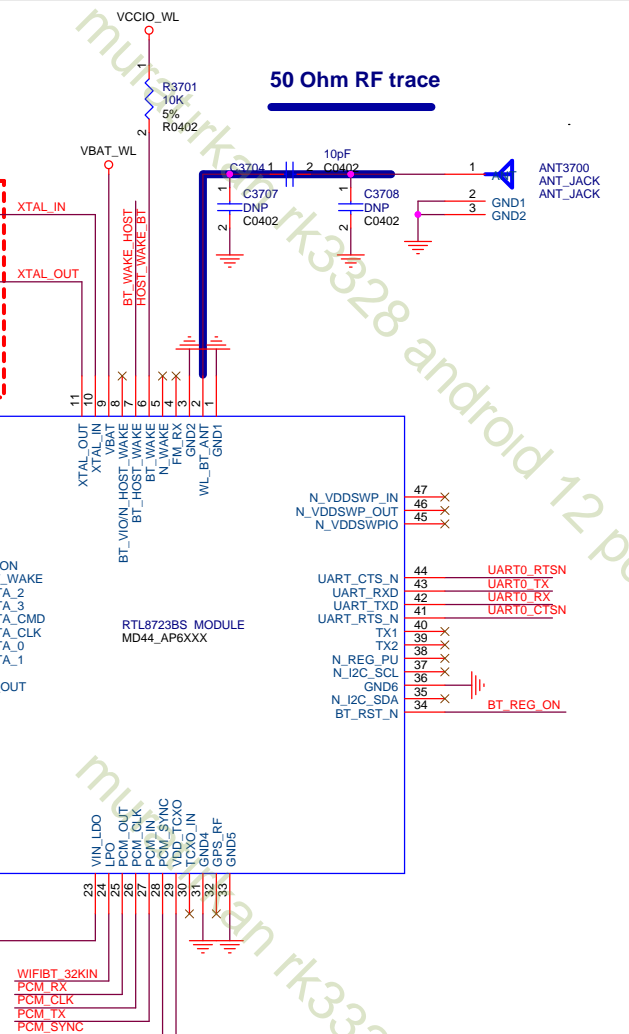


Option1

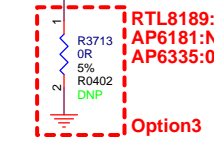
- WIFI REG\_ON
- WIFI WAKE\_HOST
- WIFI D2
- WIFI D3
- WIFI\_CMD
- WIFI\_CLK
- WIFI D0
- WIFI D1



Option2



50 Ohm RF trace



Option3

1X1 WIFI  
AP6181/AP6212/AP6330/AP6335/RTL8189FTV  
RTL8723BS/XZ3538/XZ3660

OPTION	WIFI				BT	Crystals	VDDIO
	a	b/g/n	ac	5GHz			
AP6181	No	Yes	No	No	No	26MHz	1.71-3.6V
AP6212	No	Yes	No	No	Yes	26MHz	1.71-3.6V
XZ3538	No	Yes	No	No	Yes	26MHz	1.71-3.6V
AP6330	Yes	Yes	No	Yes	Yes	26MHz	1.2-2.9V
XZ3660	Yes	Yes	No	Yes	Yes	26MHz	1.2-2.9V
AP6335	Yes	Yes	Yes	Yes	Yes	37.4MHz	1.71-3.63V
RTL8189FTV MODULE	No	Yes	No	No	No	40MHz On the module	3.3V
RTL8723BS	No	Yes	No	No	Yes		1.71-3.63V

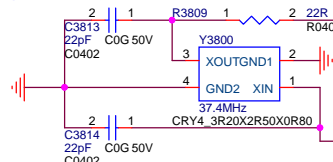
OPTION	1	2	3	4	5
AP6181	Yes	Yes	No	Yes	
AP6212	Yes	Yes	No	Yes	
AP6330	Yes	Yes	No	Yes	
AP6335	Yes	Yes	Yes	Yes	
RTL8189FTV MODULE	No	No	No	No	
RTL8723BS	No	No	No	Yes	

请靠近CPU放置。

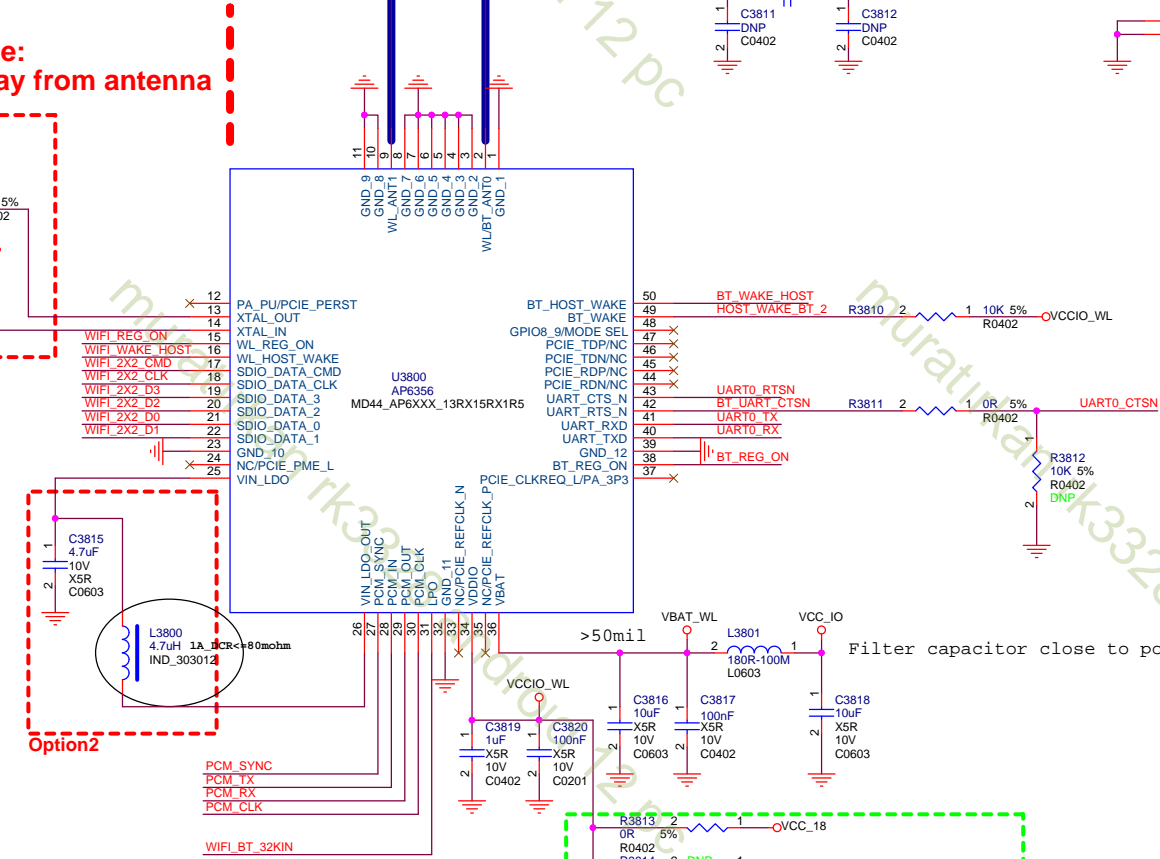


**Layout Note:**  
Crystal away from antenna

**Note:**  
Adjusted the load capacitance  
according to the crystal specification.



**Option1**



Filter capacitor close to power pin.

```
Select follow WIFI/BT IO power surpply.
```

2T2R

C3814 ||  
Z2pF C0G 50V  
C0402

Option1

OPTION	WIFI				BT	Crystals	VDDIO
	a	b/g/n	ac	5GHz			
AP6356S	Yes	Yes	Yes	Yes	Yes	37.4MHz	1.7-3.6V
QCA6174	Yes	Yes	Yes	Yes	Yes		1.7-3.6V
RTL8822	Yes	Yes	Yes	Yes	Yes		1.7-3.6V
RTL8192	No	Yes	No	No	No		1.7-3.6V

OPTION	1	2	3		
AP6356S	Paste	Paste			
QCA6174	<b>DNP</b>	<b>DNP</b>			
RTL8822	<b>DNP</b>	<b>DNP</b>			
RTL8192	<b>DNP</b>	<b>DNP</b>			