Hi3515DMEB VER . A

The HI3515 Digital media evaluate board

Version History

30.12.2009 change the value of R192,R193,R194

30.12.2009 change the package of sata connector J23,J24

30.12.2009 change the package of SD Card connector J14

23.02.2010 change the values of SD Card pull-up resistor

23.02.2010 add pull-up resistors at uart RX/TX signals

23.02.2010 change the USB0\USB1 circuit

24.03.2010 change the value of R1008
bypass the FMS6143 and NCS2563
VGA HS/VS 3.3V/5.0V Compatibly

31.01.2010 change NCS2563 to TSH343
Delete C346/C347/C348 CAP

http://www.openipcam.com/files/ARM9/HiVision/20101224102422_hi3515dmeb_va_1.3.pdf

Provide by hisilicon

The type and specification of the components refer to the BOM

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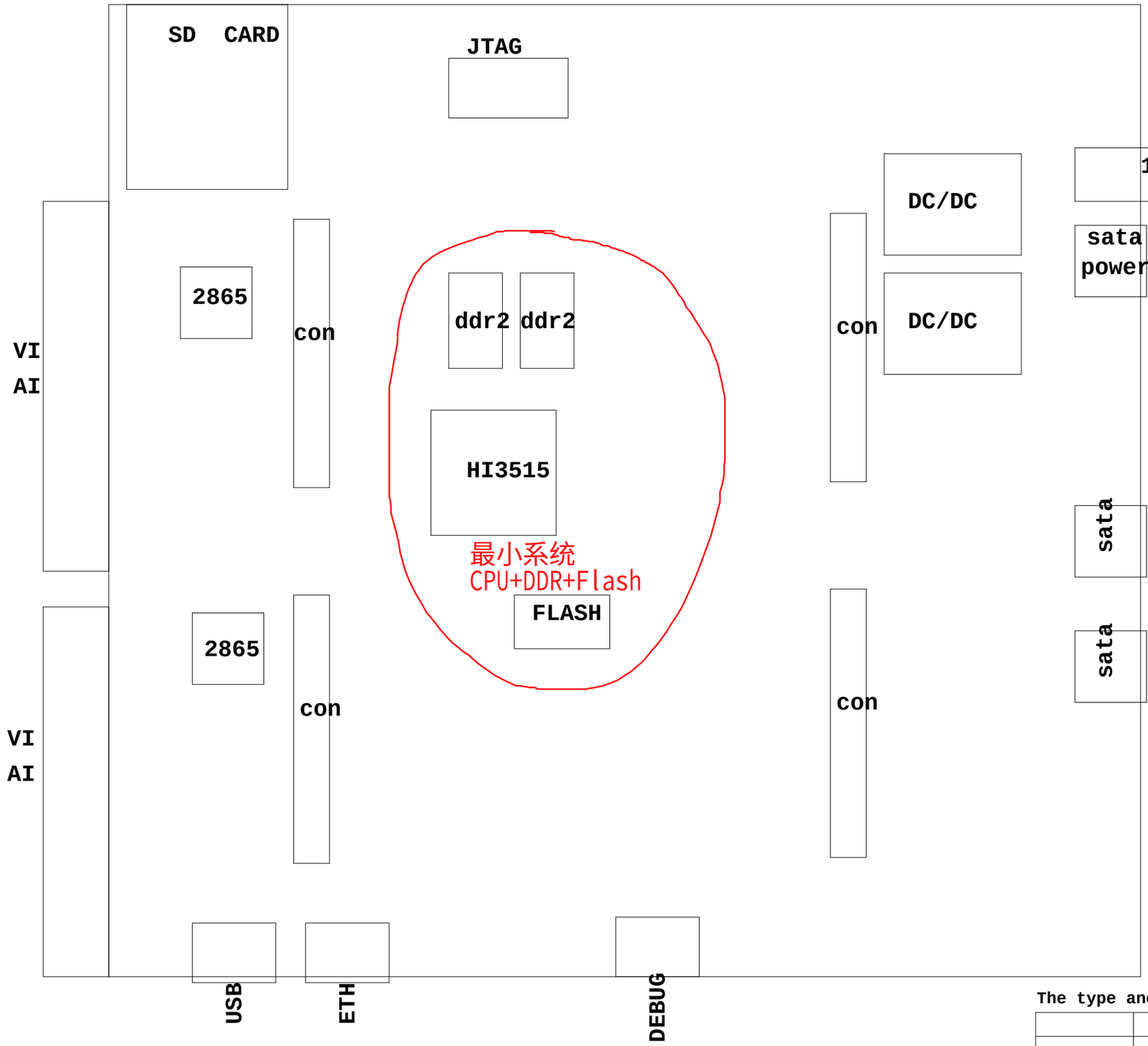
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
REVIEWED	LISI XXXXX				
		VER	PART_NUMBER	SHEET 1 OF 21	
		C	03030001	HUAWEI TECH CO.,LTD.	

Block Diagram



3P	LDO&DC/DC power for dmeb
4P	power for sata
5P	3511 POWER
6P	hi3515 DDR2
7P	DDR2 CHIP
8P	hi3515 EBI & NOR/NAND fla
9P	hi3515 VI&VO&SIO
10P	video input switch 1
11P	video input switch 2
12P	video output&SIO switch
13P	CVBS&VGA&YPbPr output
14P	video&audio jack
15P	tw2865 A
16P	tw2865 B
17P	HI3515 system & peripher
18P	sata & usb connector
19P	ETH RTL8201
20P	uart & sd card
21P	alarm & sys run & key

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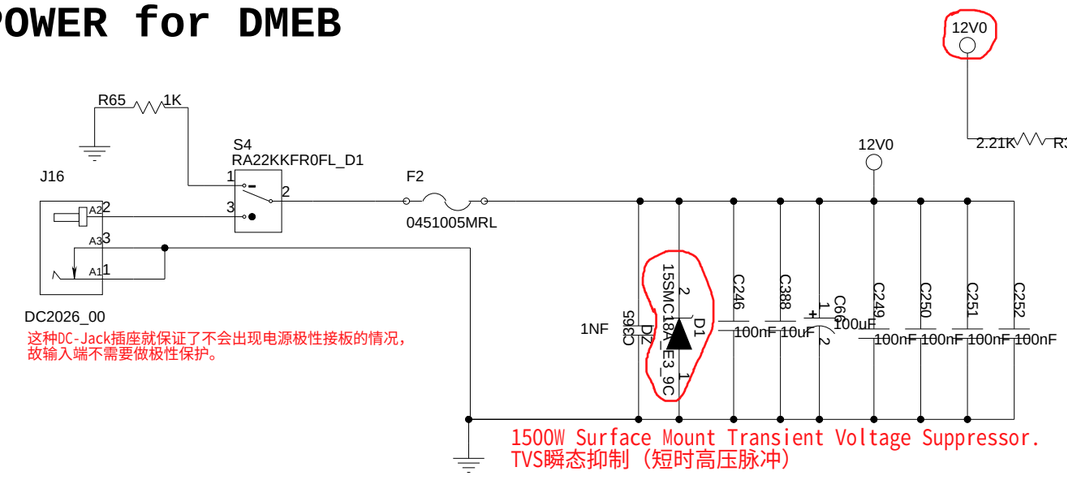
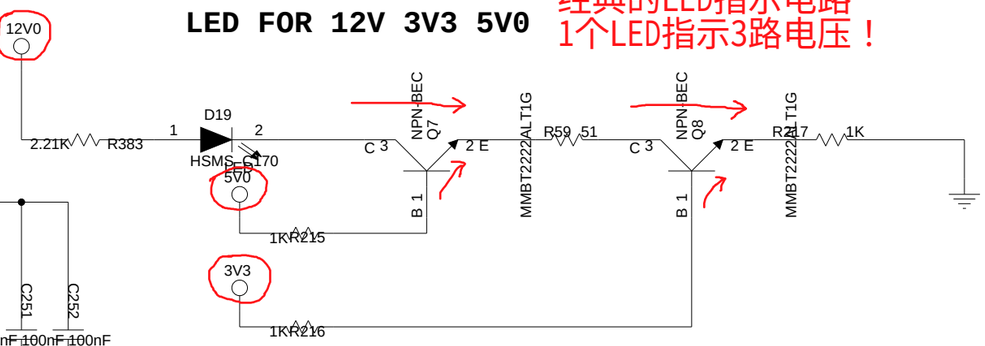
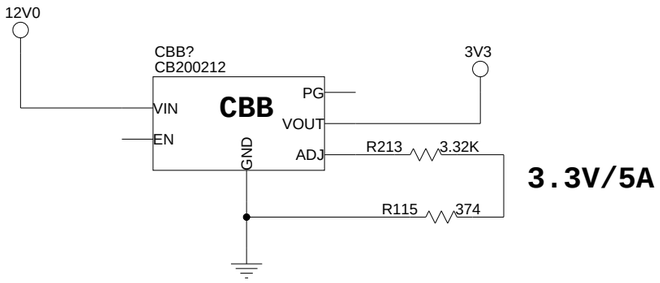
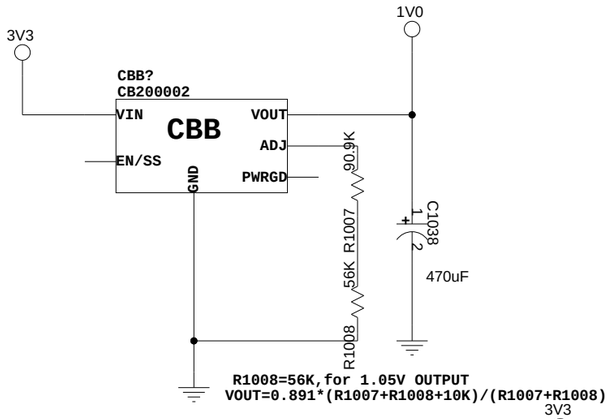
POWER for DMEB

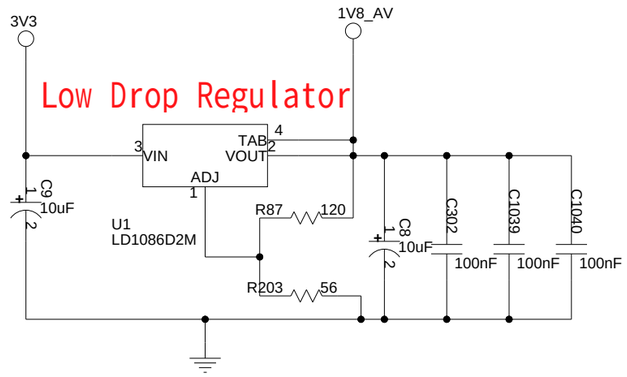


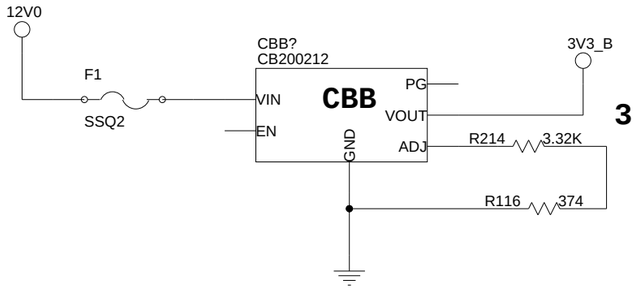




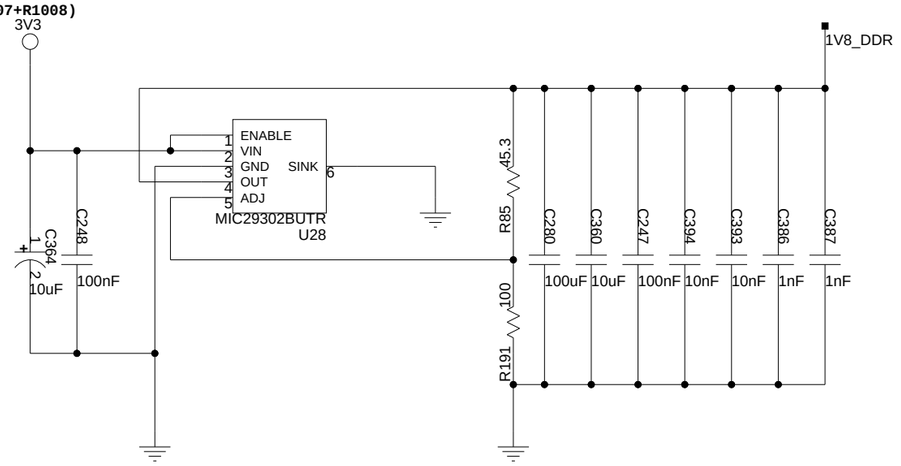
3.3V/5A

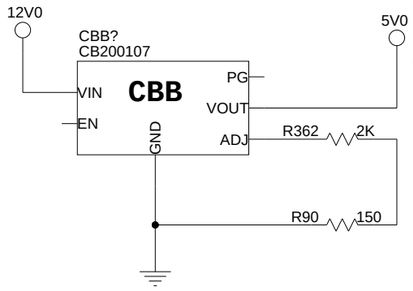






3.3V/5A for daughter board





5V/3A for usb

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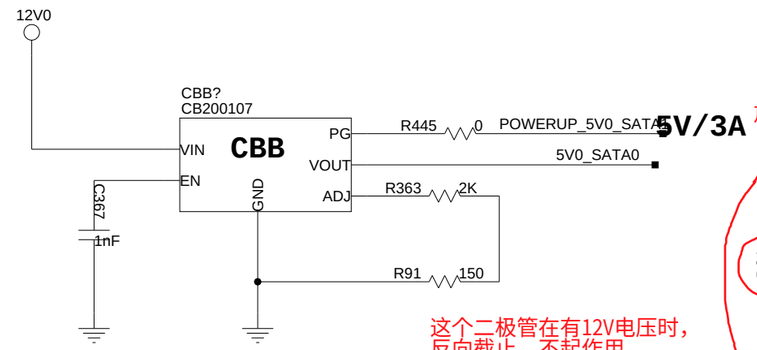
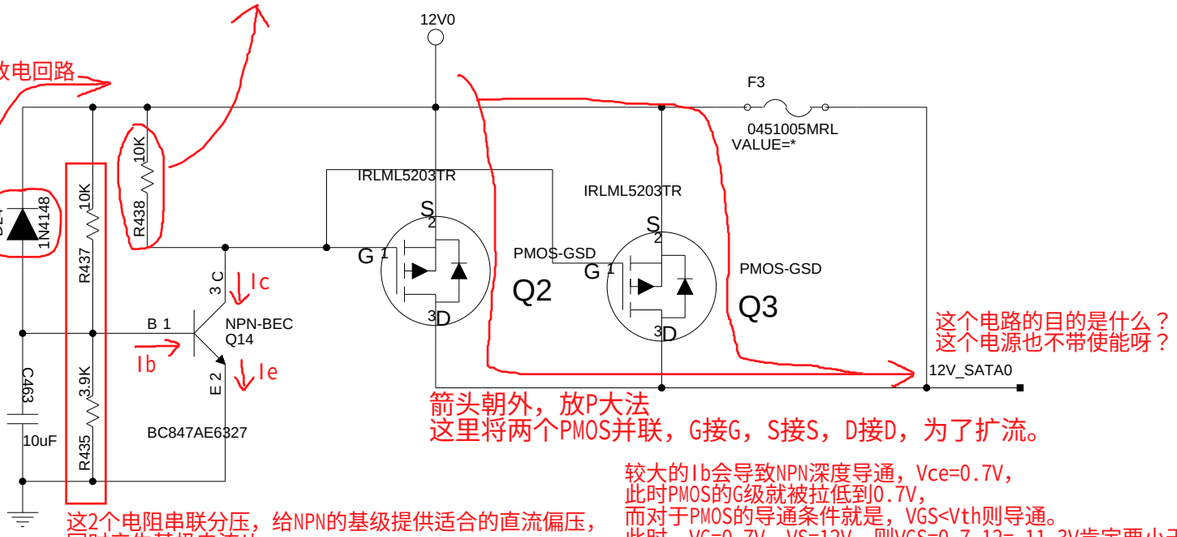
POWER for SATA



这个二极管在有12V电压时，
反向截止，不起作用，
当然12V断电时，
用于给10uF的电容提供放电回路，
通过负载放电。

放电回路

这个电阻在三极管NPN未导通时给PMOS的G级一个固定12V的电平。



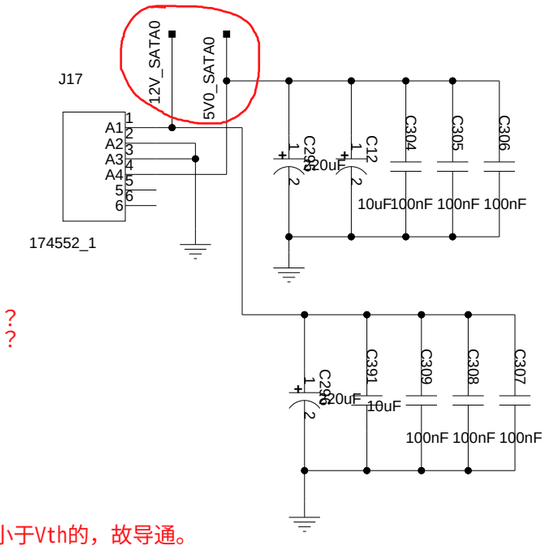
箭头朝外，放P大法
这里将两个PMOS并联，G接G，S接S，D接D，为了扩流。

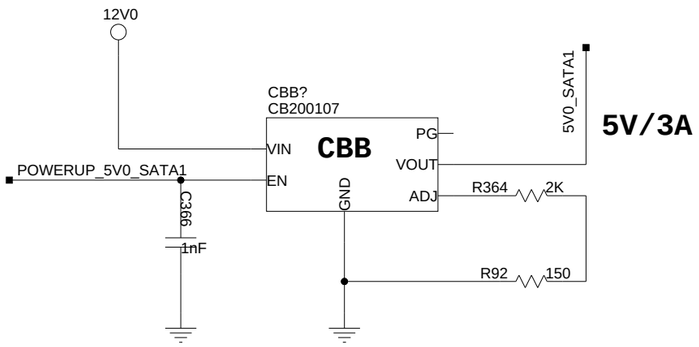
这个电路的目的是什么？
这个电源也不带使能呀？

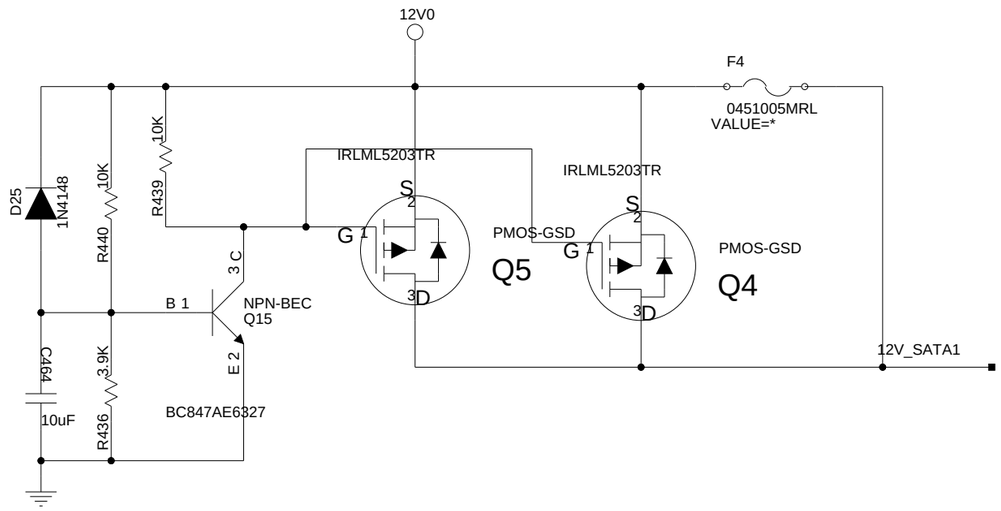
较大的Ib会导致NPN深度导通，Vce=0.7V，
此时PMOS的G级就被拉低到0.7V，
而对于PMOS的导通条件就是，VGS<Vth则导通。
此时，VG=0.7V，VS=12V，则VGS=0.7-12=-11.3V肯定要小于Vth的，故导通。
PMOS导通后，S-D间电阻很小，毫欧级别的电阻。

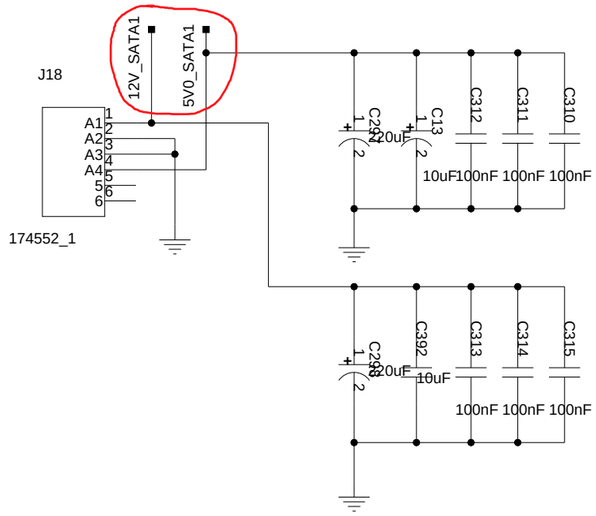
这2个电阻串联分压，给NPN的基级提供适合的直流偏压，
同时产生基极电流Ib.

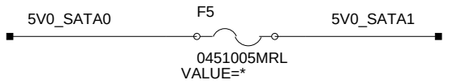
Ic=B*Ib,Ie=Ic+Ib











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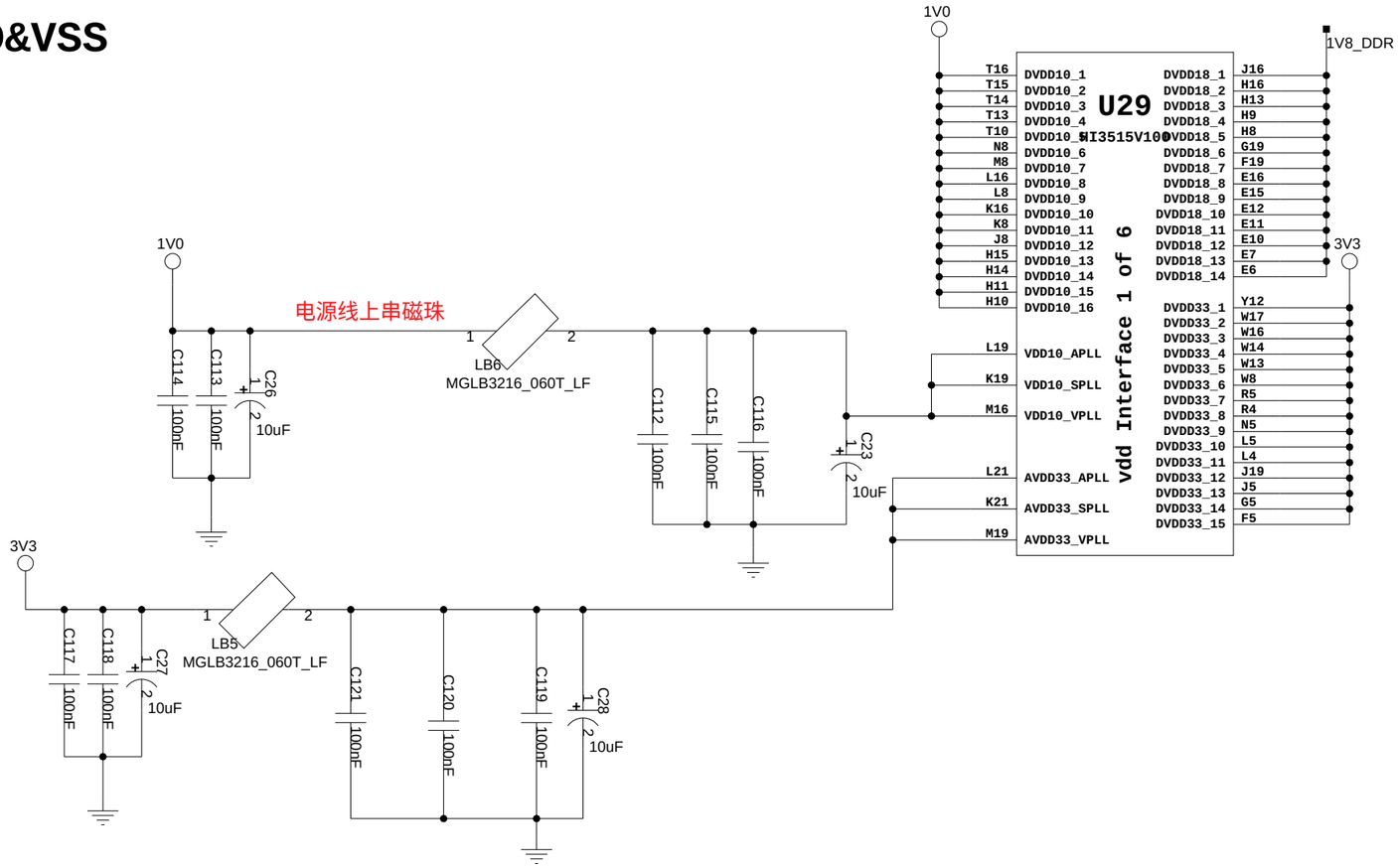
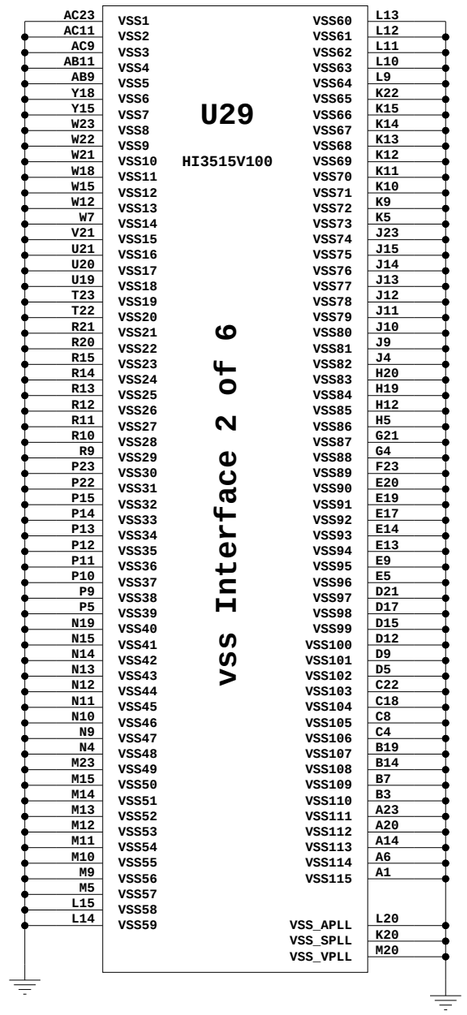
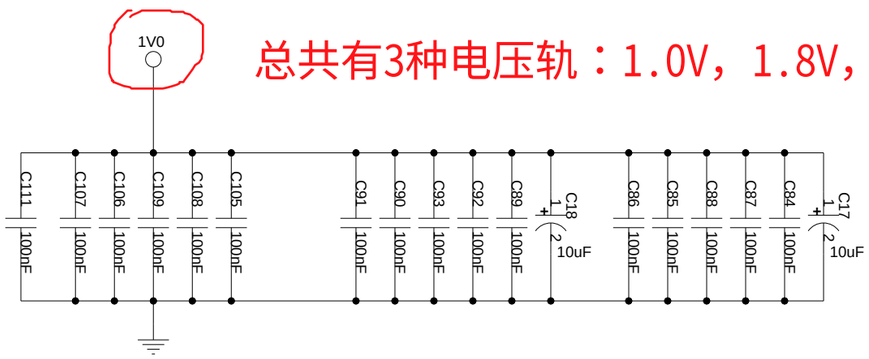
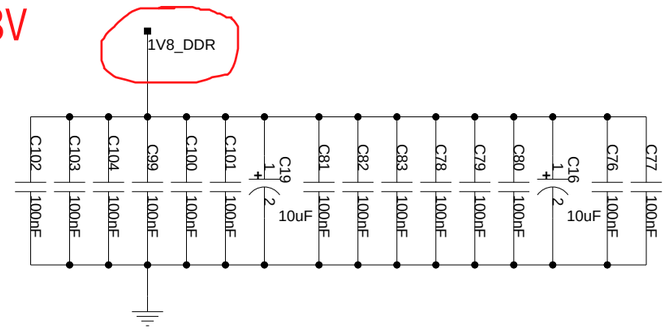
Hi3515 VDD&VSS

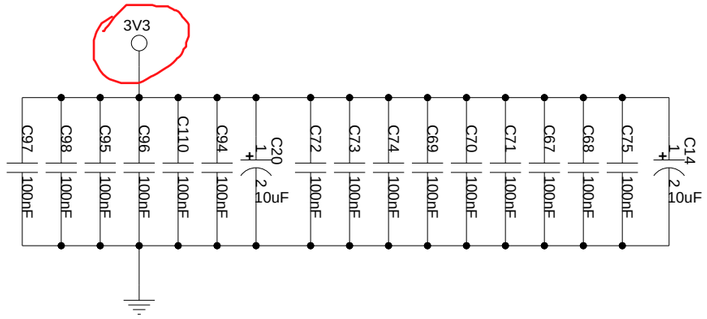






总共有3种电压轨：1.0V，1.8V，3.3V





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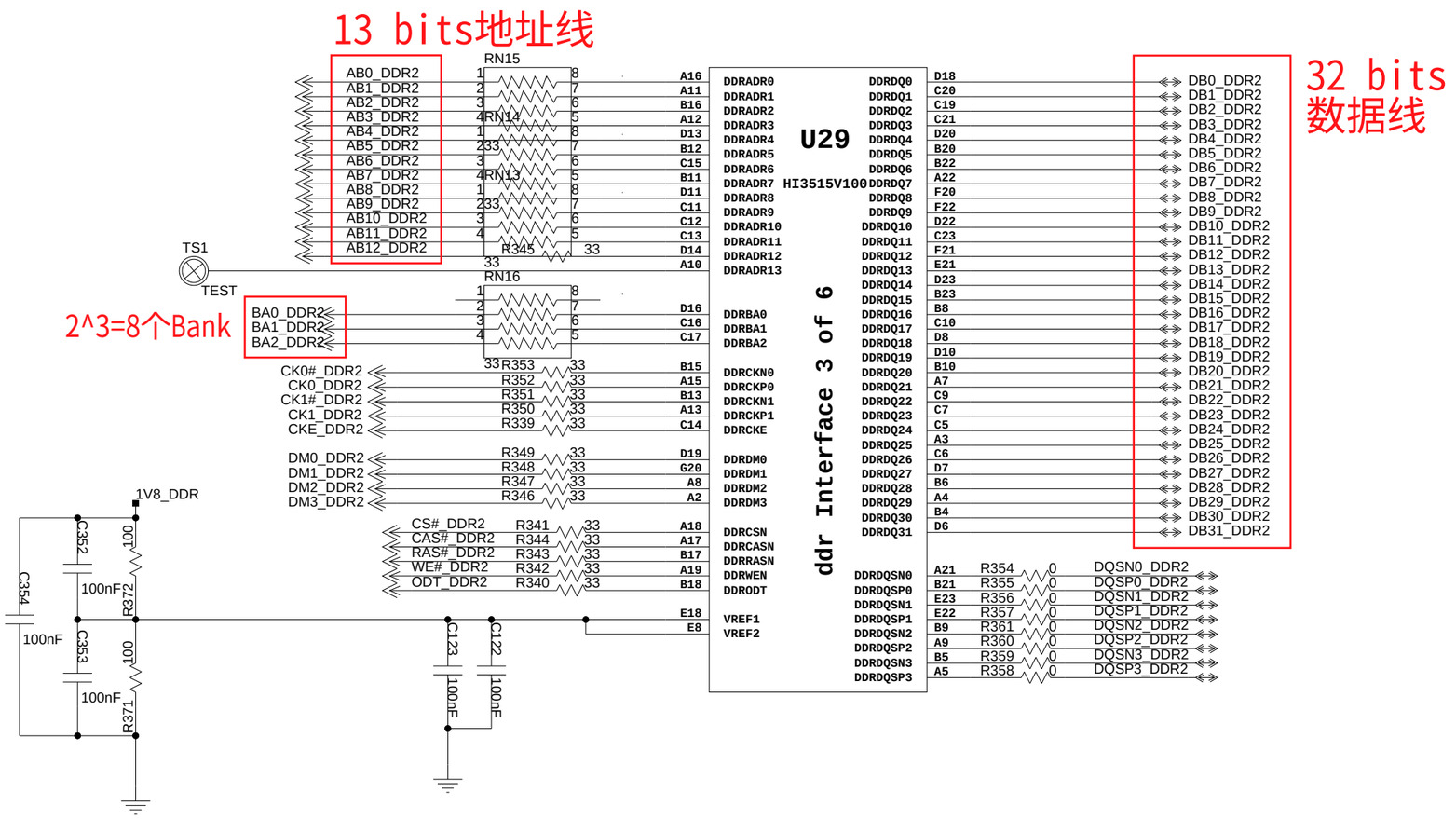
HI3515 DDR2



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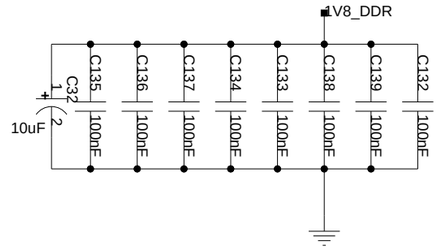
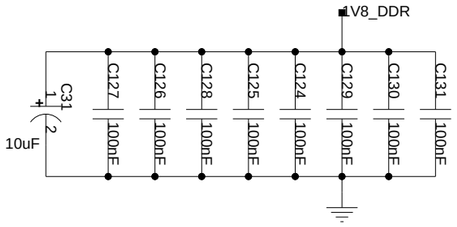
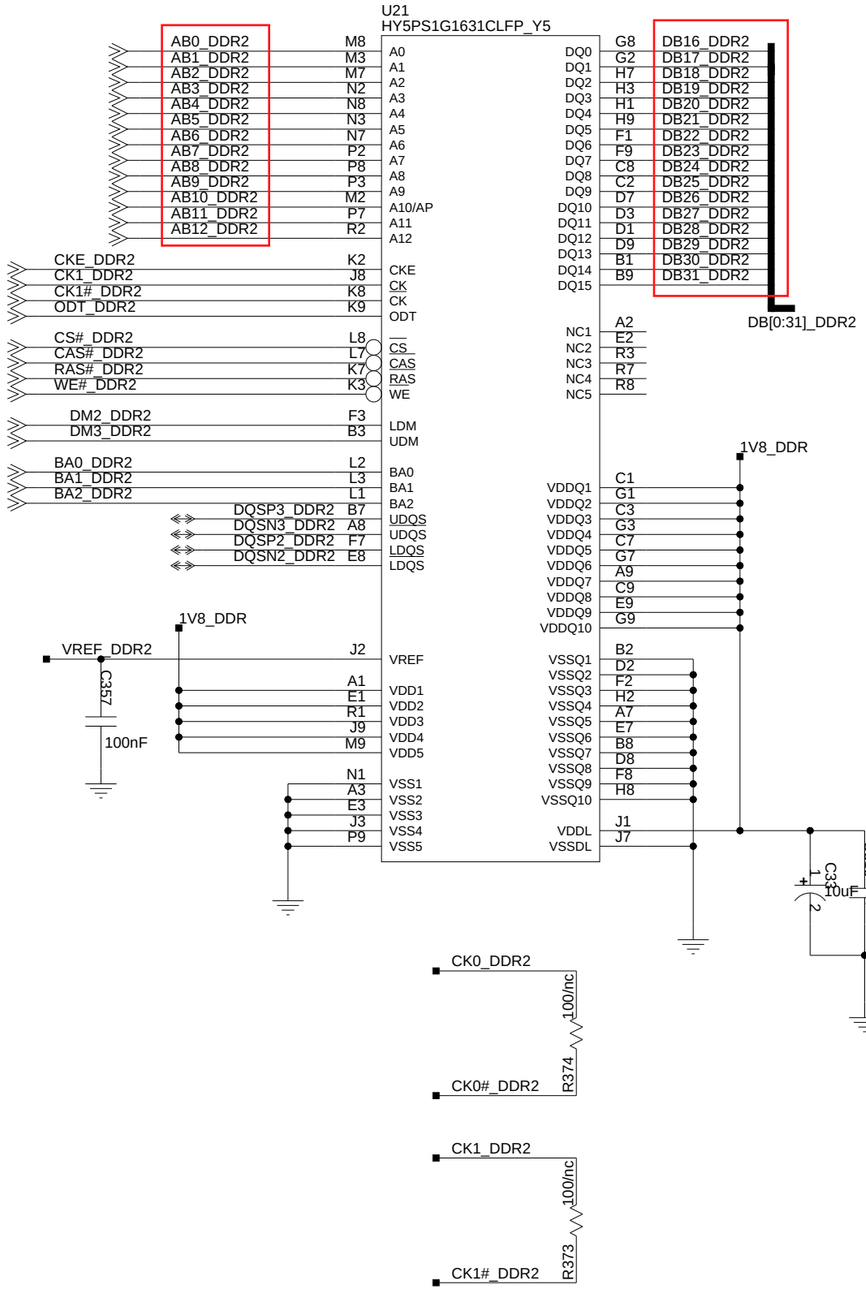
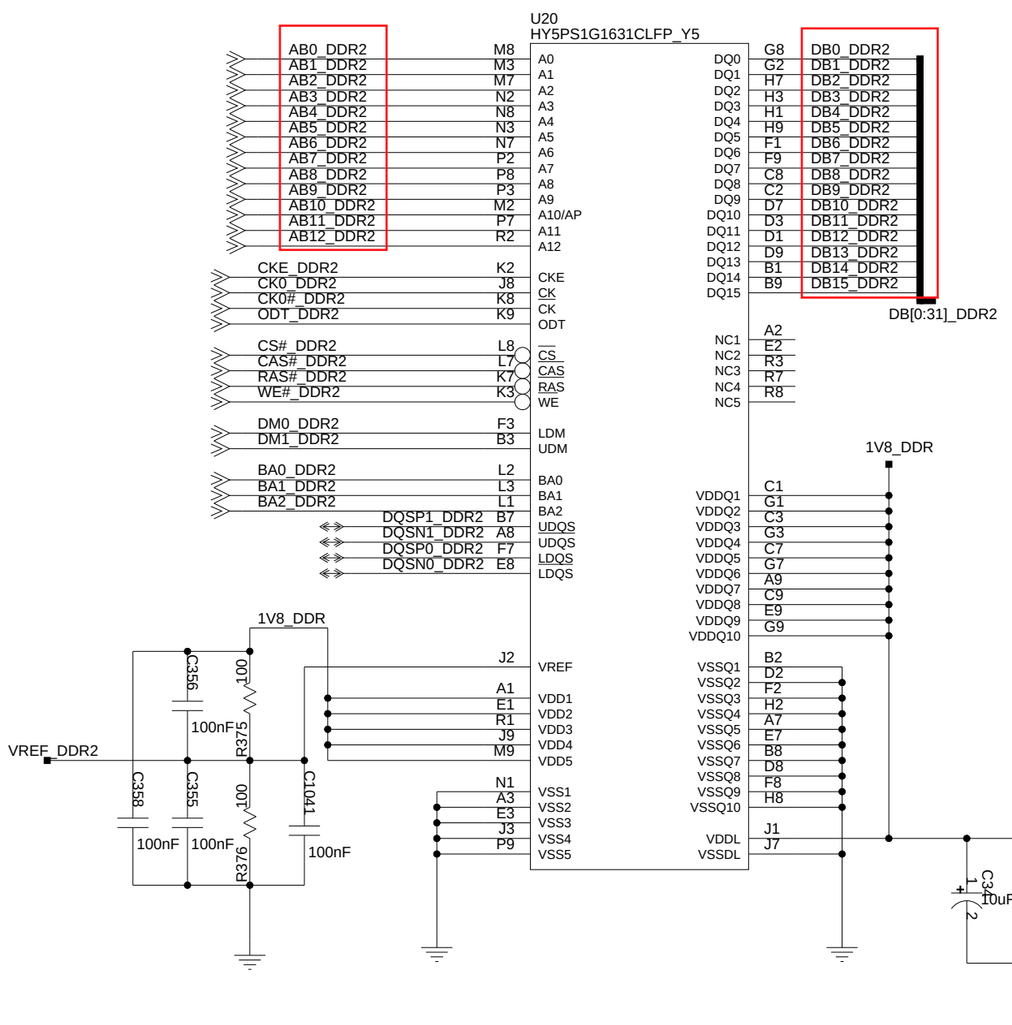
DDR2 Chip









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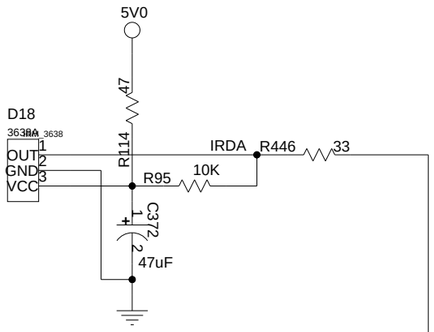
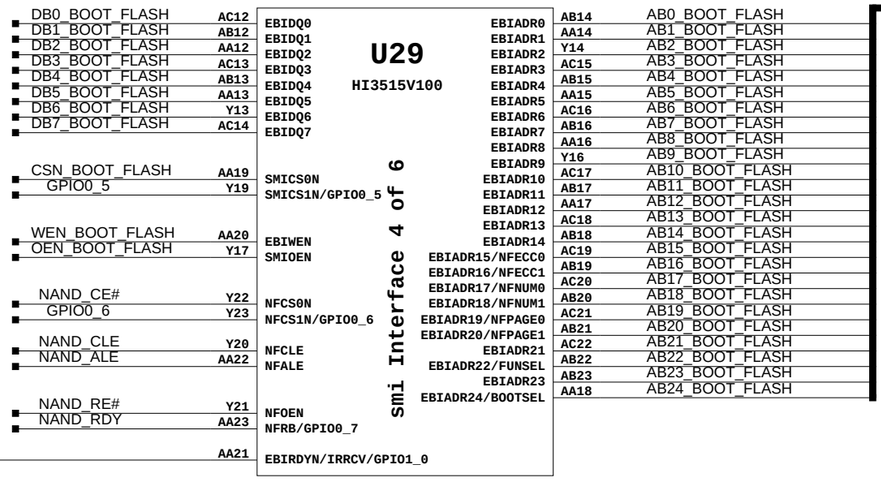
BOOT FLASH





AB[0:24]_BOOT_FLASH

AB0_BOOT_FLASH
AB1_BOOT_FLASH
AB2_BOOT_FLASH
AB3_BOOT_FLASH
AB4_BOOT_FLASH
AB5_BOOT_FLASH
AB6_BOOT_FLASH
AB7_BOOT_FLASH
AB8_BOOT_FLASH
AB9_BOOT_FLASH
AB10_BOOT_FLASH
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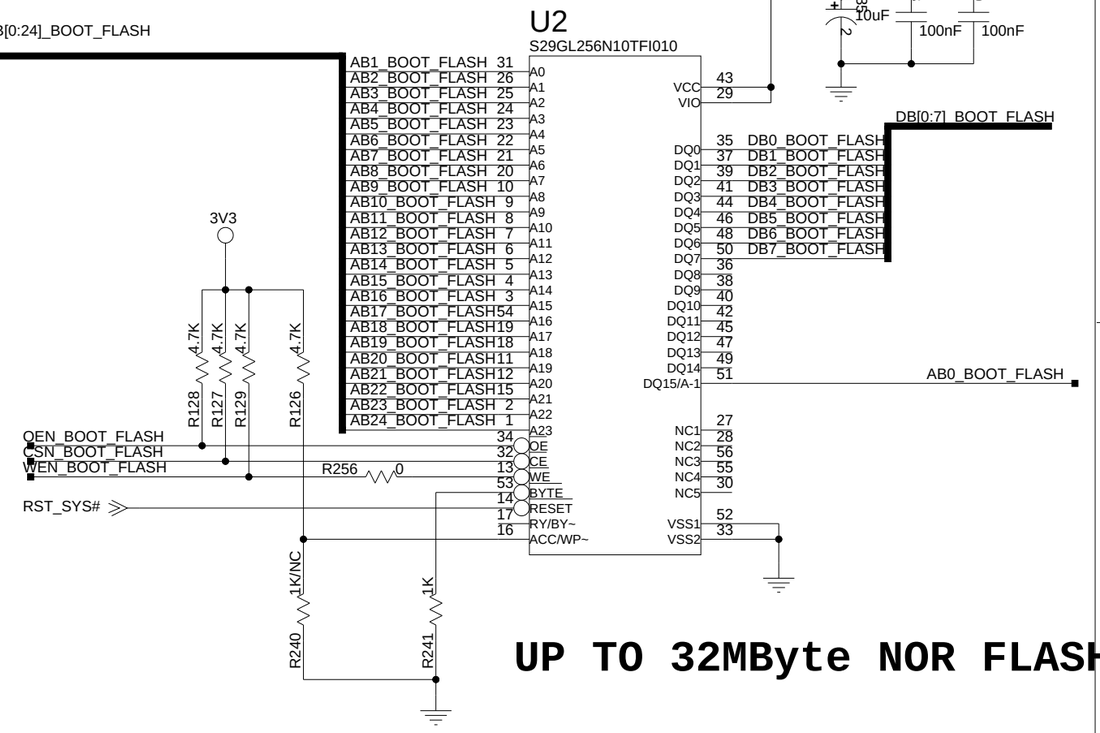
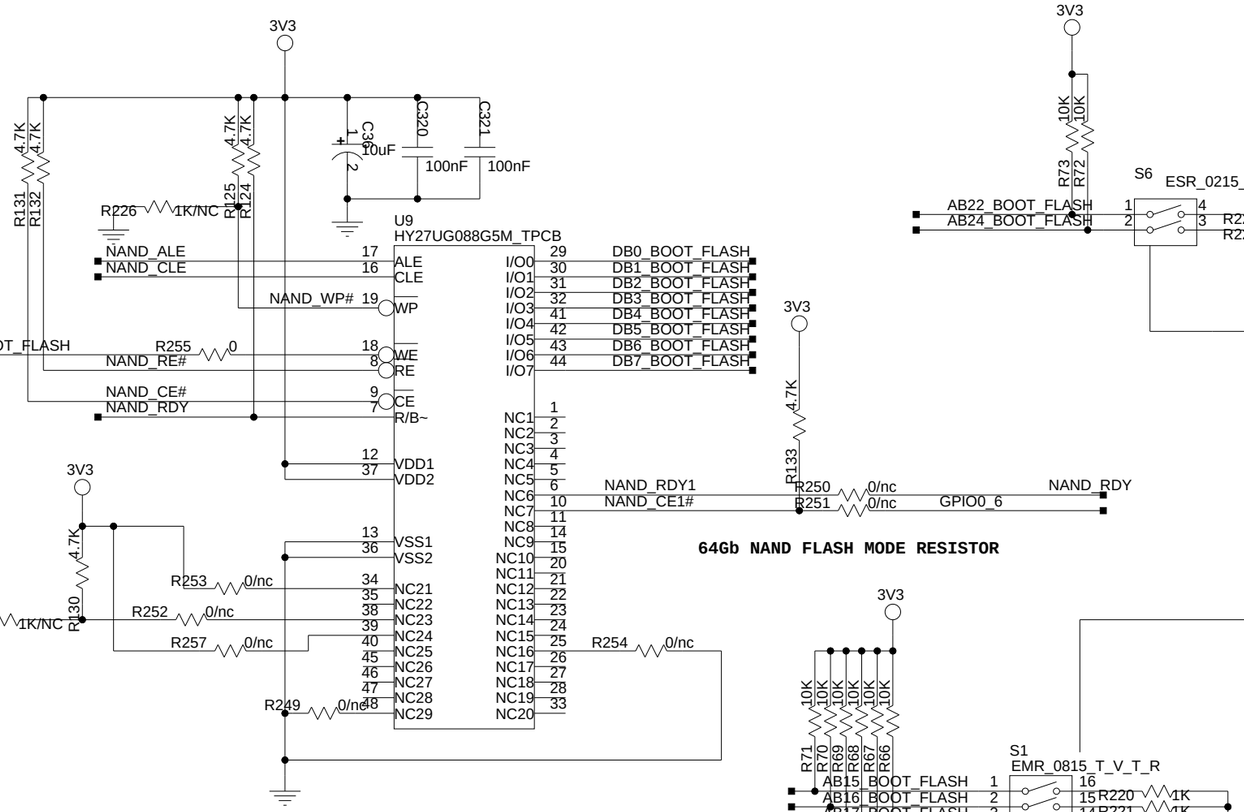
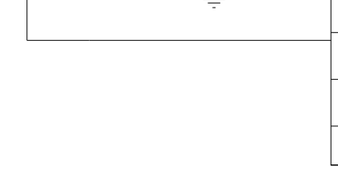
AB24_BOOT_FLASH



UP TO 32MByte NOR FLASH





64Gb NAND FLASH MODE RESISTOR

UP TO 8GByte NAND FLASH

P1	funsel
0	ARM9 JTAG
1	SATA PHY JTAG
P2	BOOTSEL0
0	NOR FLASH BOOT
1	NAND FLASH BOOT

P4	P3	NFNUM
0	0	3 address cycle
0	1	4 address cycle
1	0	5 address cycle
1	1	6 address cycle

P2	P1	NFECC
0	0	Disable
0	1	1 bit
1	0	4 bit
1	1	8 bit

P6	P5	NFPAGE
0	0	512byte
0	1	2KB
1	0	4KB
1	1	4KB

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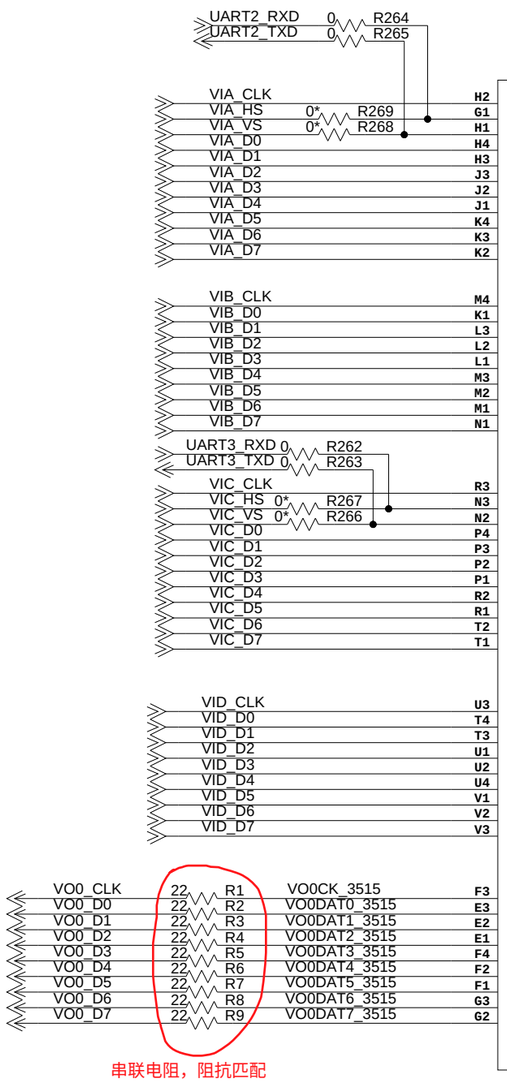
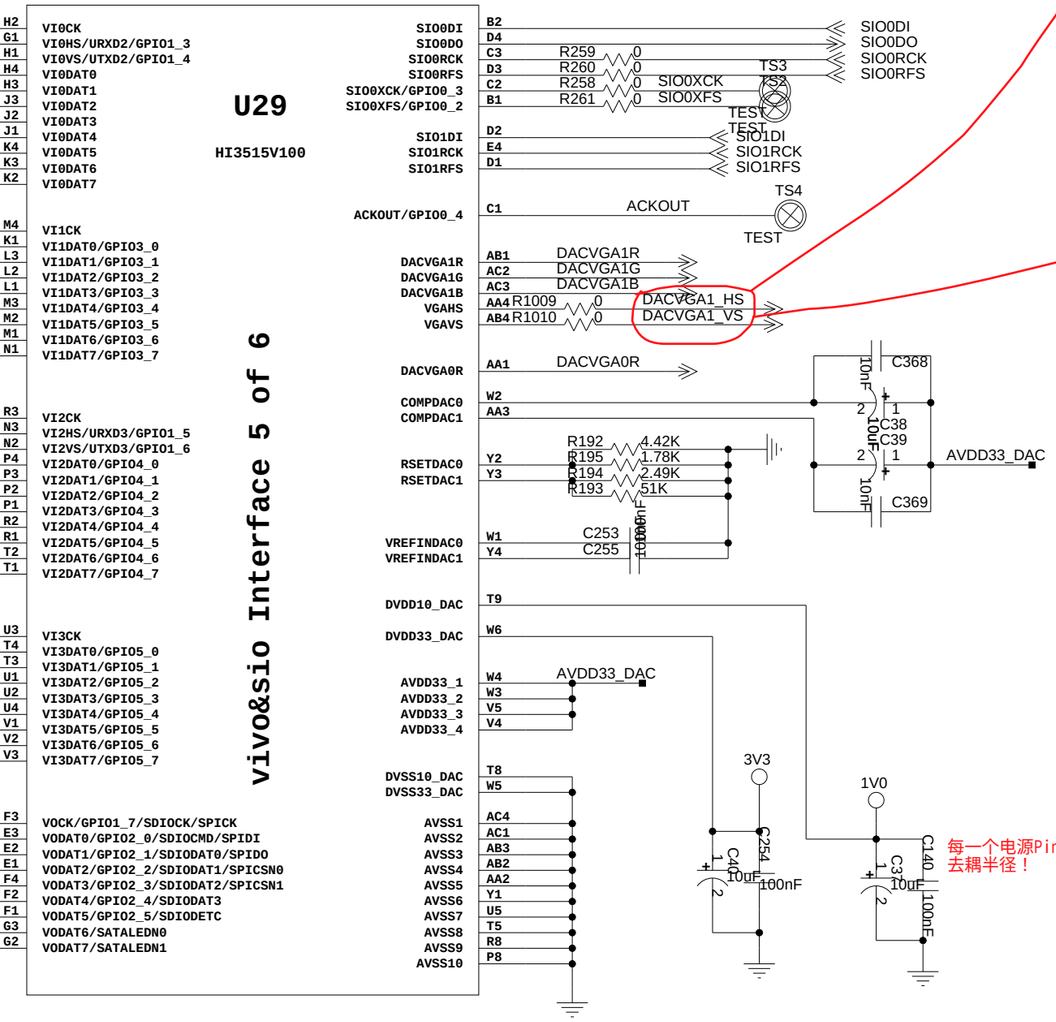
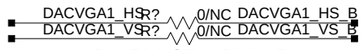
Hi3515 VIVO & SIO



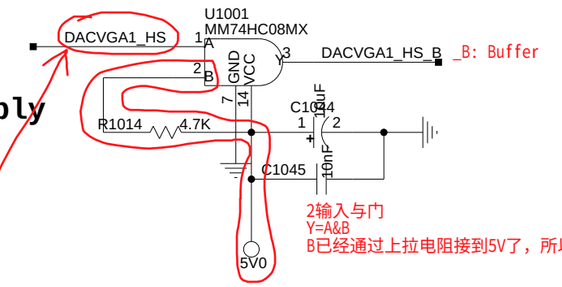


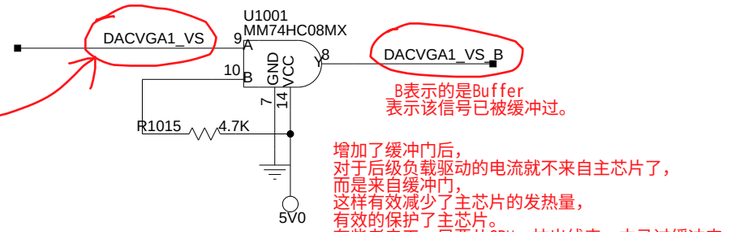
缓冲门的跳线，用于bypass缓冲门

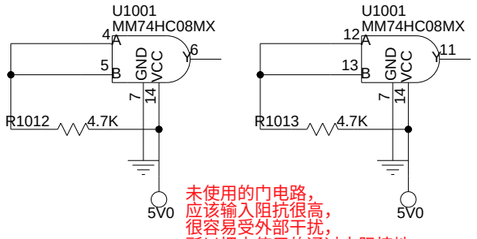


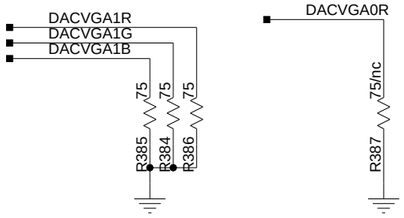
3.3V/5.0V Compatibly

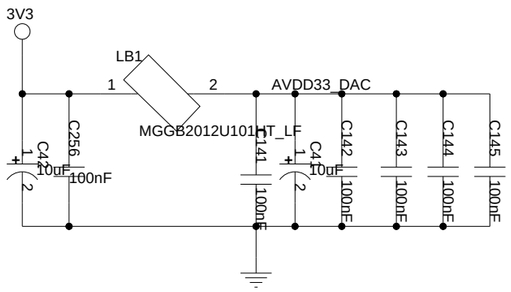
Quad 2-Input AND Gate











The type and specification of the components refer to the BOM

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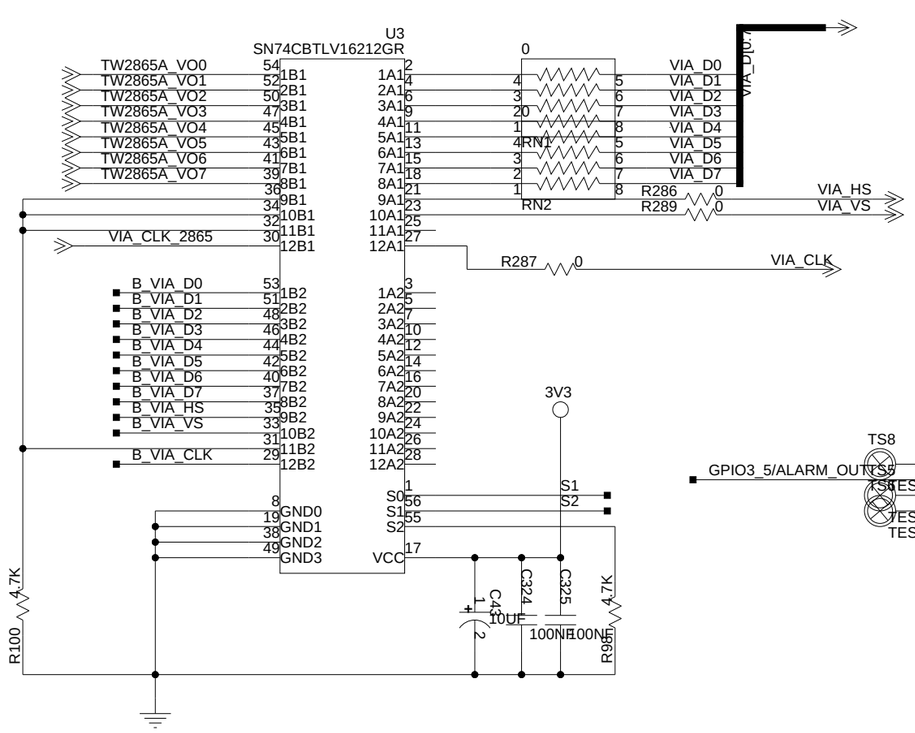
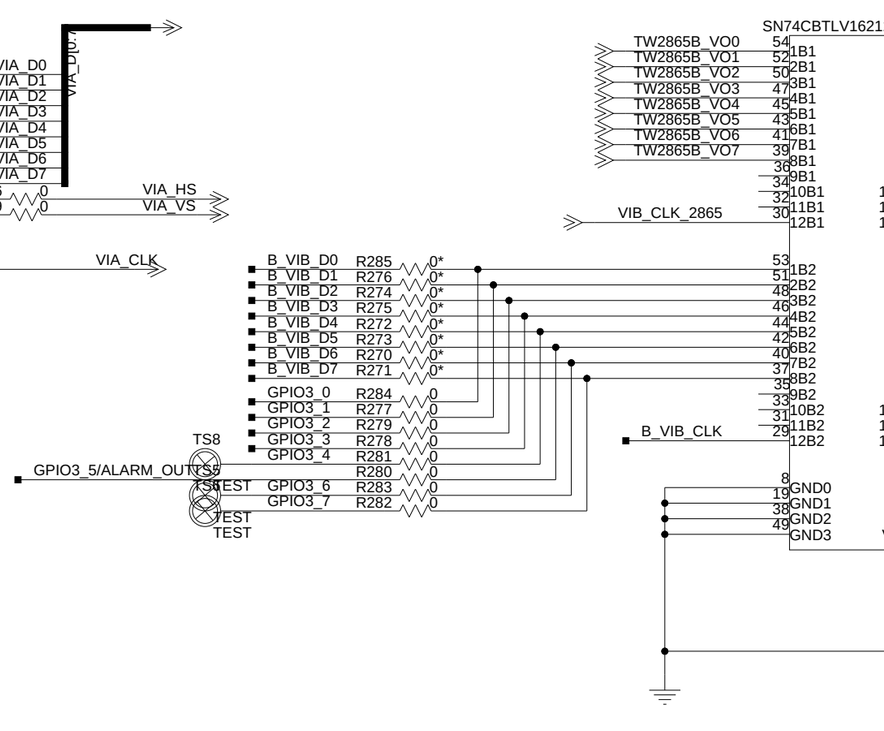
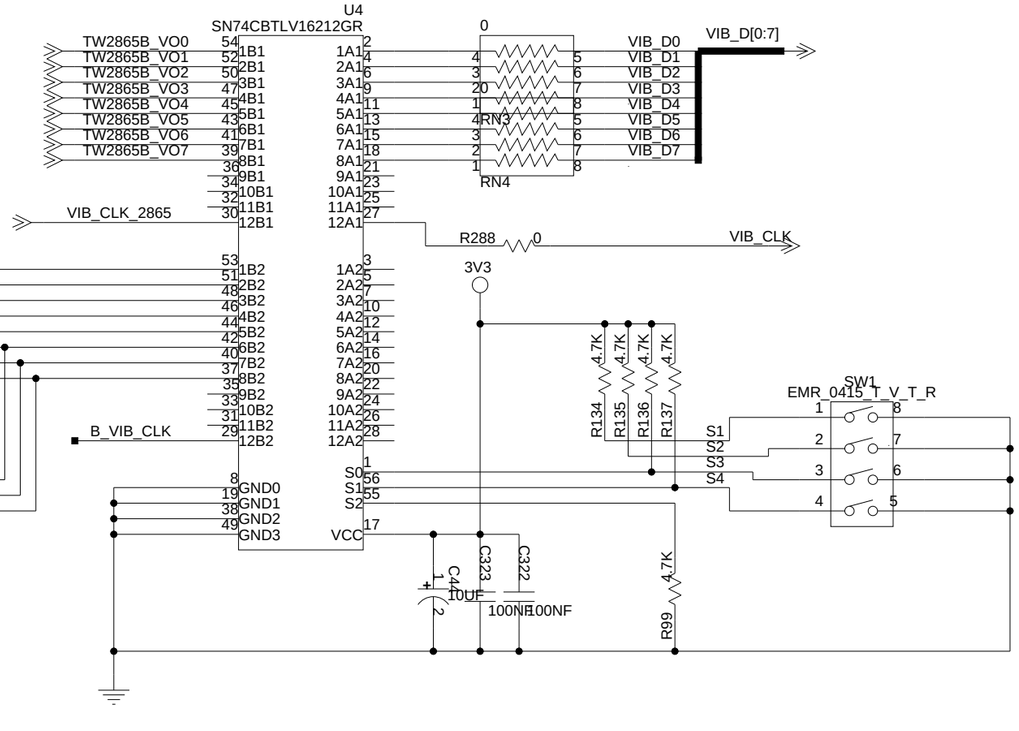
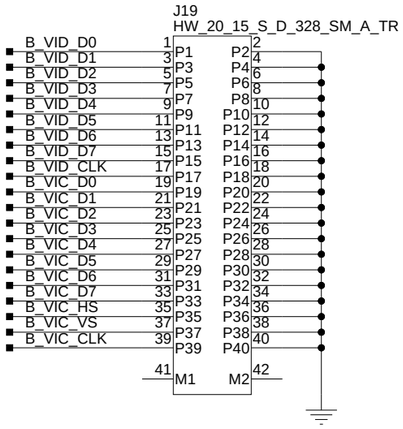
				ECA NO	DATE
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
REVIEWED	LISI XXXXX	VER	PART_NUMBER	SHEET 9 OF 21	
		C	03030001	HUAWEI TECH CO.,LTD.	

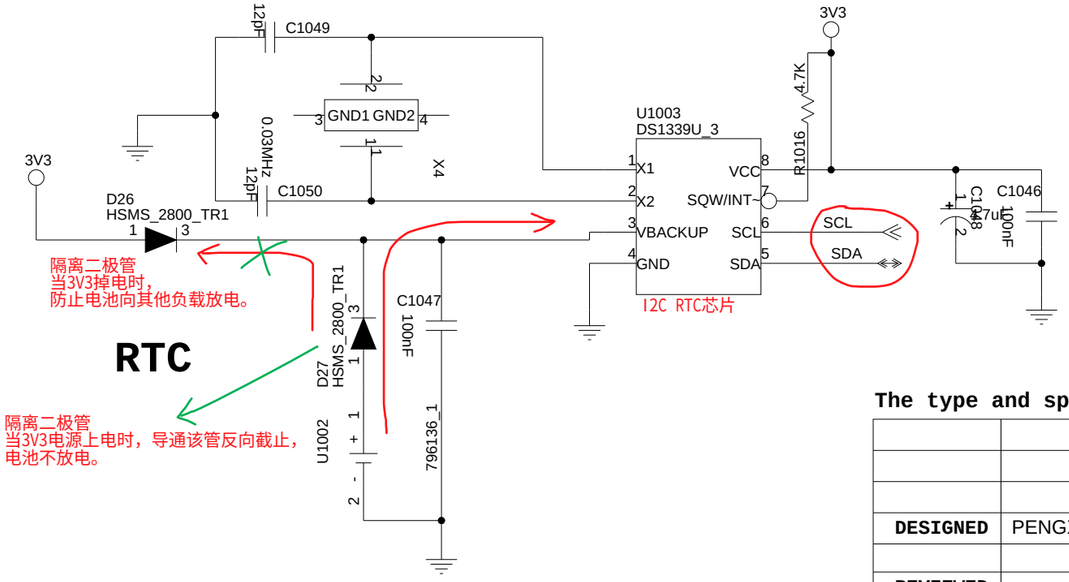
VIDEO INPUT SWITCH 1











P 2/4	P 1/3	CHANNEL SELECT
1	0	A1=B2 Daughter board
0	1	A1=B1 2865

普通二极管在电流流过时，会产生约0.7-1.7伏特的电压降，
不过肖特基二极管的电压降只有0.15-0.45伏特，因此可以提升系统的效率。
肖特基二极管正向导通压降比普通二极管低，所以低功耗。
肖特基二极管反向恢复时间比普通二极管短，所以工作频率更高。

The type and specification of the components refer to the BOM

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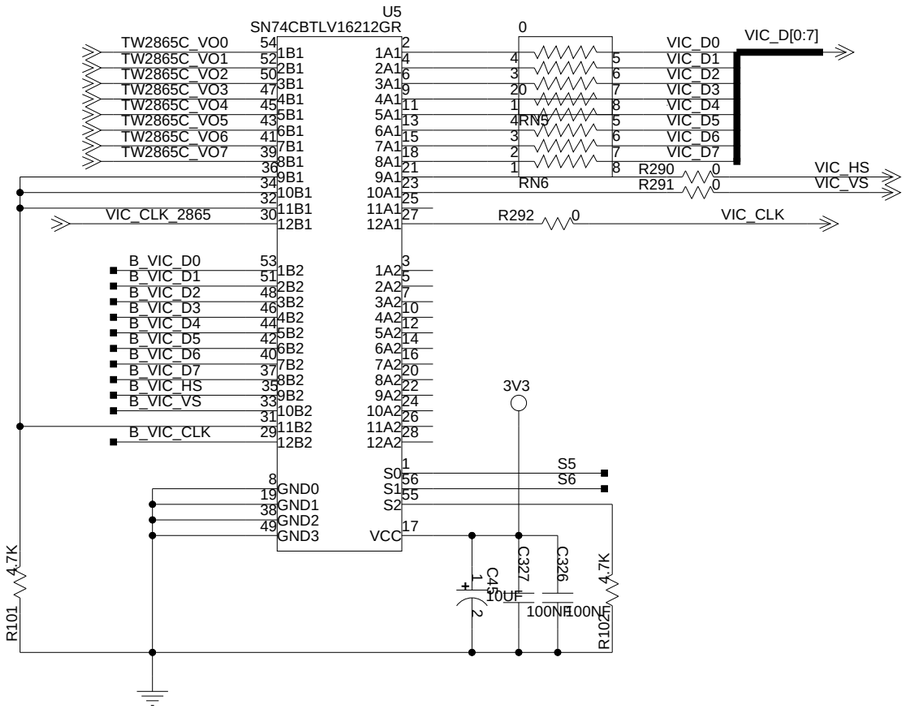
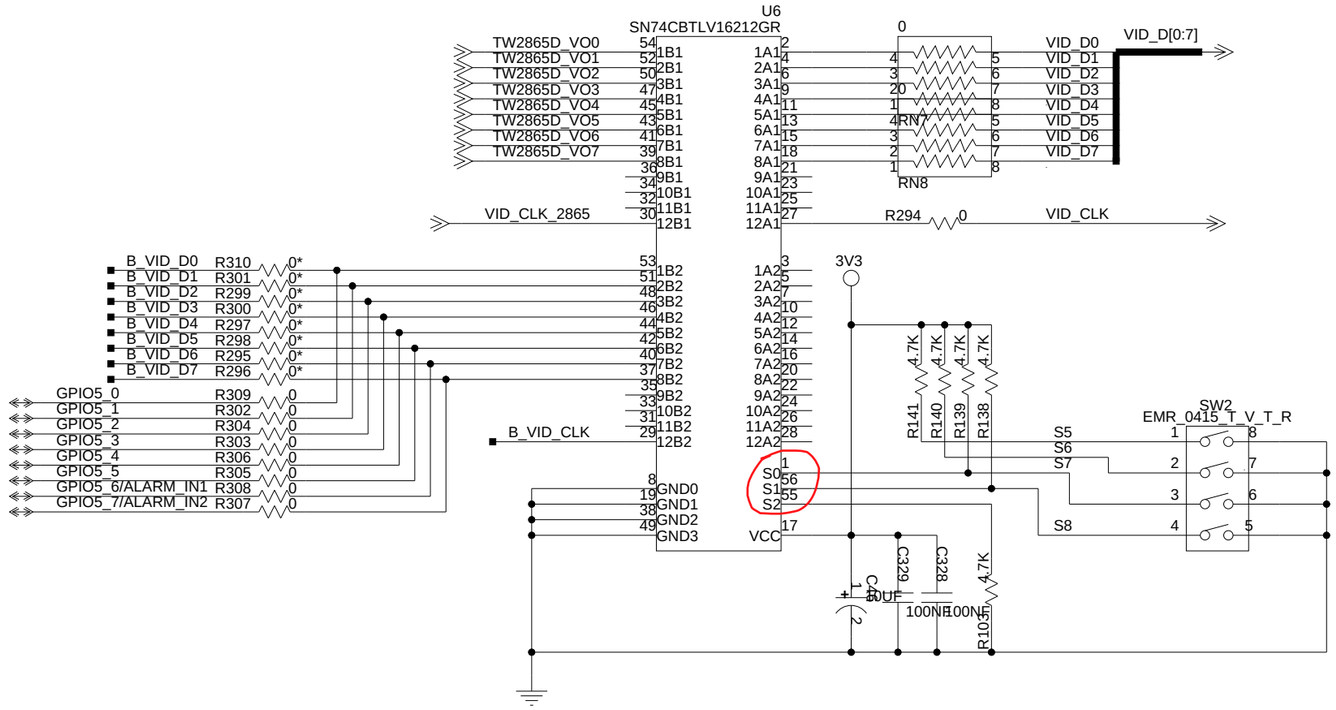
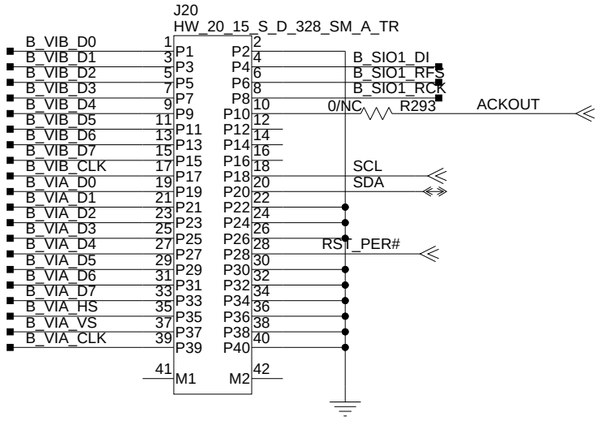
VIDEO INPUT SWITCH 2







P 2/4	P 1/3	CHANNEL SELECT
1	0	A1=B2 Daughter board
0	1	A1=B1 2865

The type and specification of the components refer to the BOM

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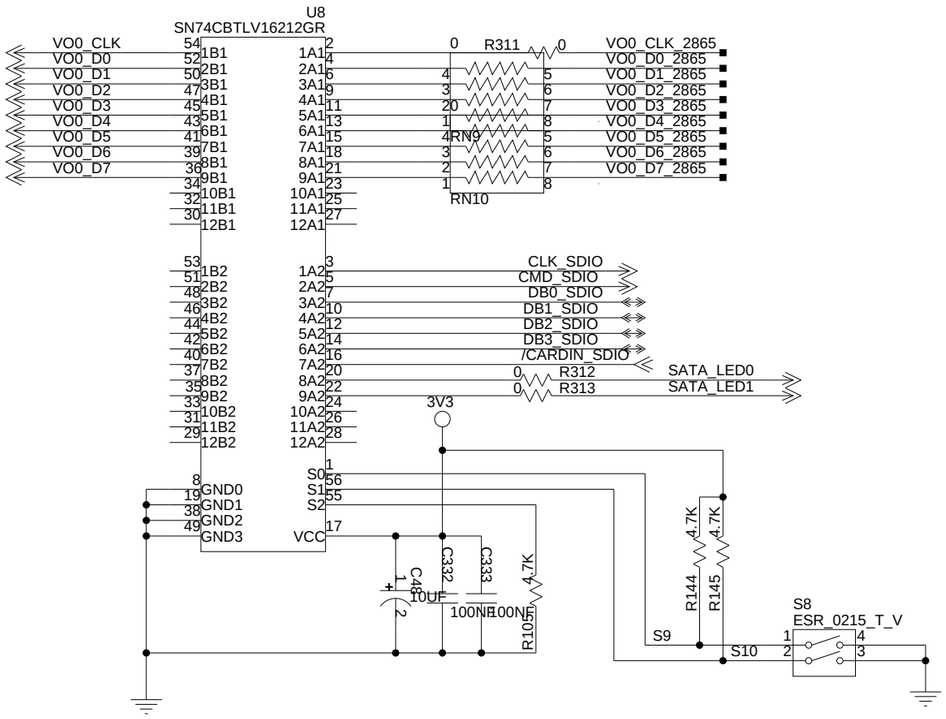
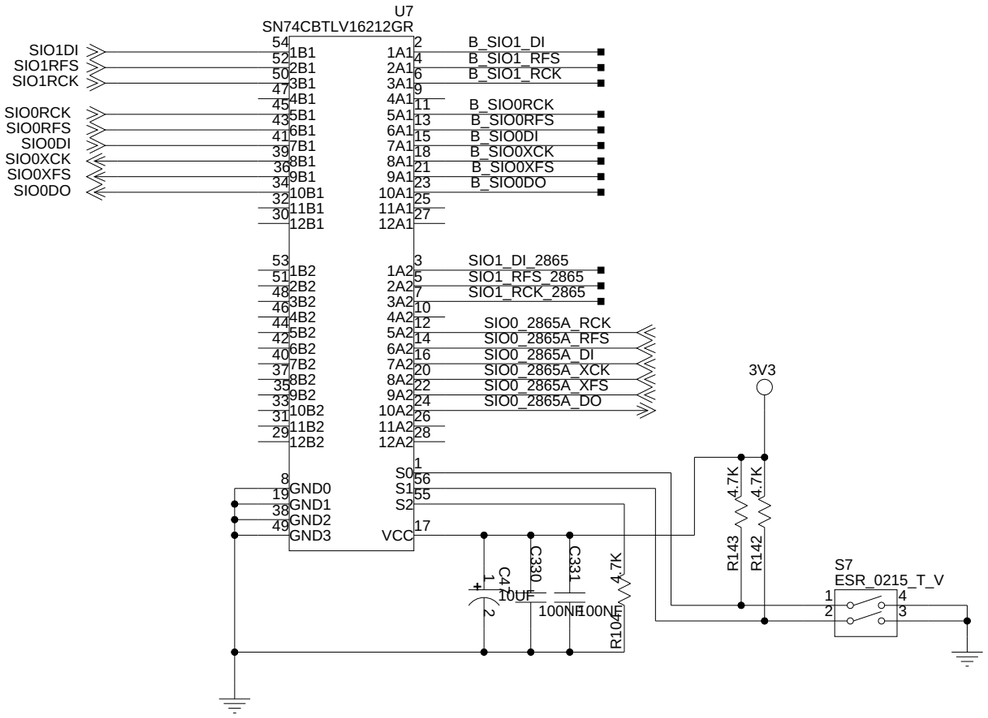
				ECA NO	DATE
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
REVIEWED	B				
		VER	PART_NUMBER	SHEET 11 OF 21	
		C	03030001	HUAWEI TECH CO.,LTD.	

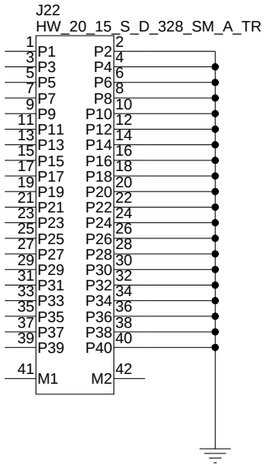
VIDEO OUTPUT SWITCH

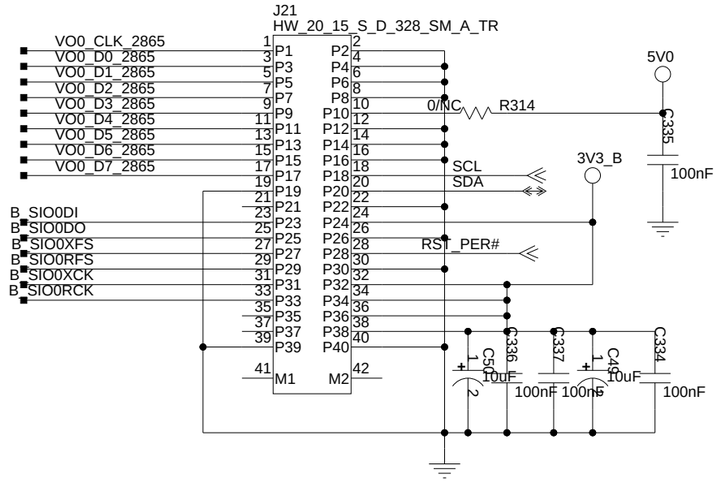




P 1	P 2	VO CHANNEL SELECT
1	1	A2=B1 SDIO&SPI&SATA_LED
1	0	A1=B1 VO

P 1	P 2	VO CHANNEL SELECT
1	1	A2=B1 sio for tw2865
1	0	A1=B1 SIO for daughter board





The type and specification of the components refer to the BOM

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REVIEWED	B				
		VER	PART_NUMBER	SHEET 12 OF 21	
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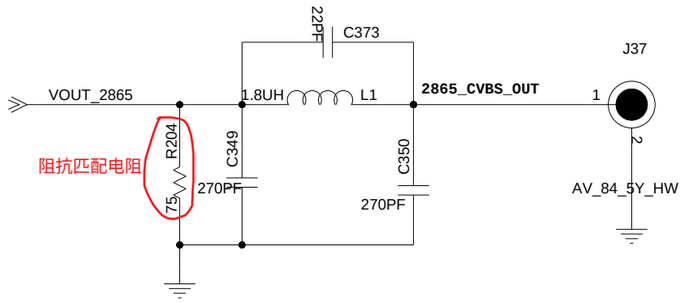
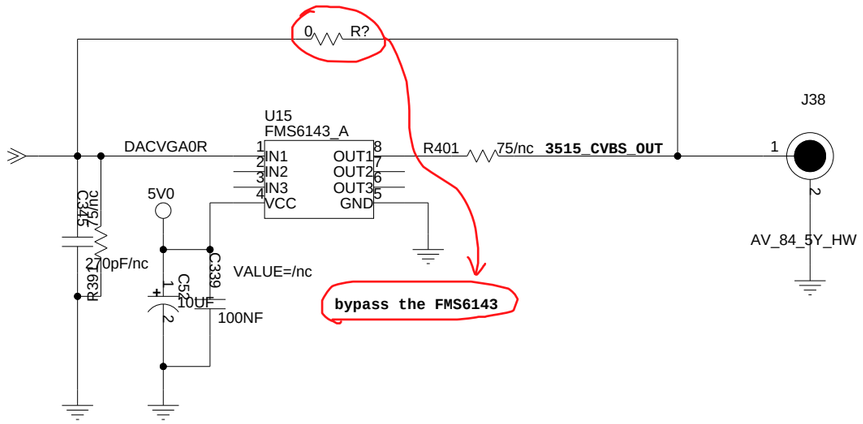
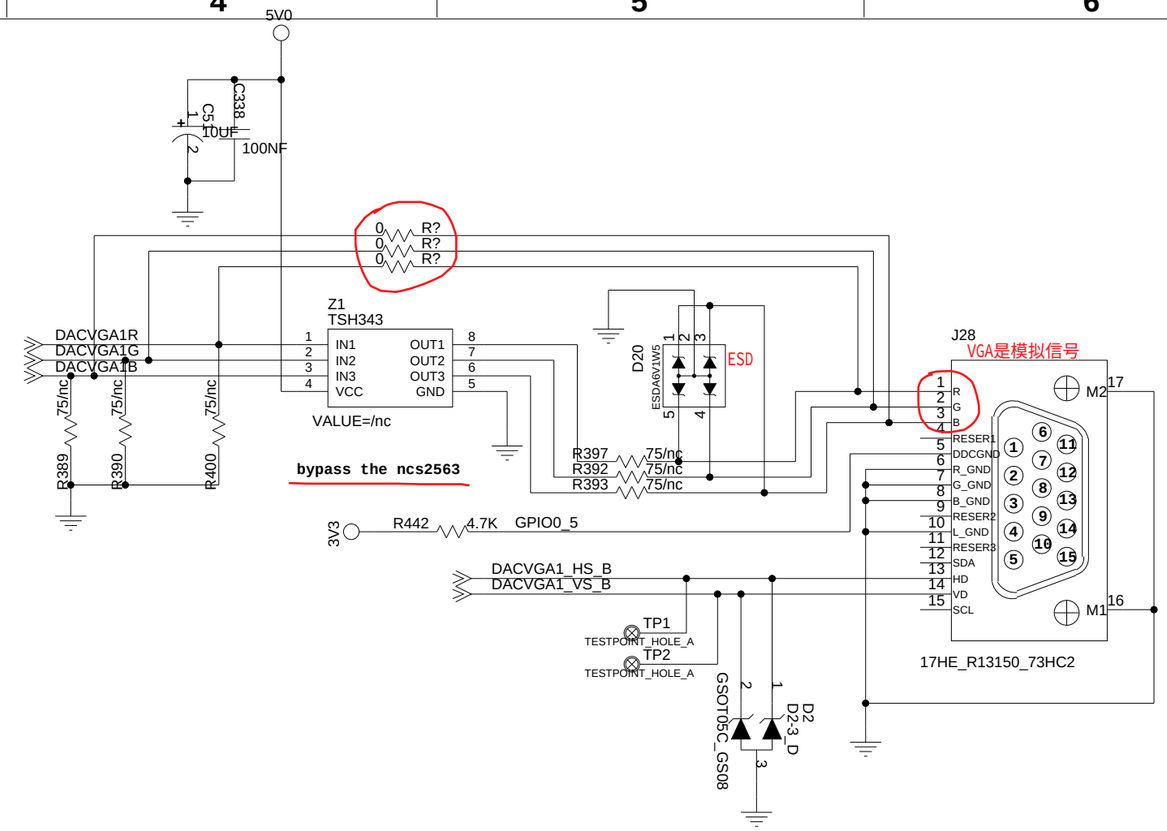
VGA & CVBS OUT







The type and specification of the components refer to the BOM

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DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
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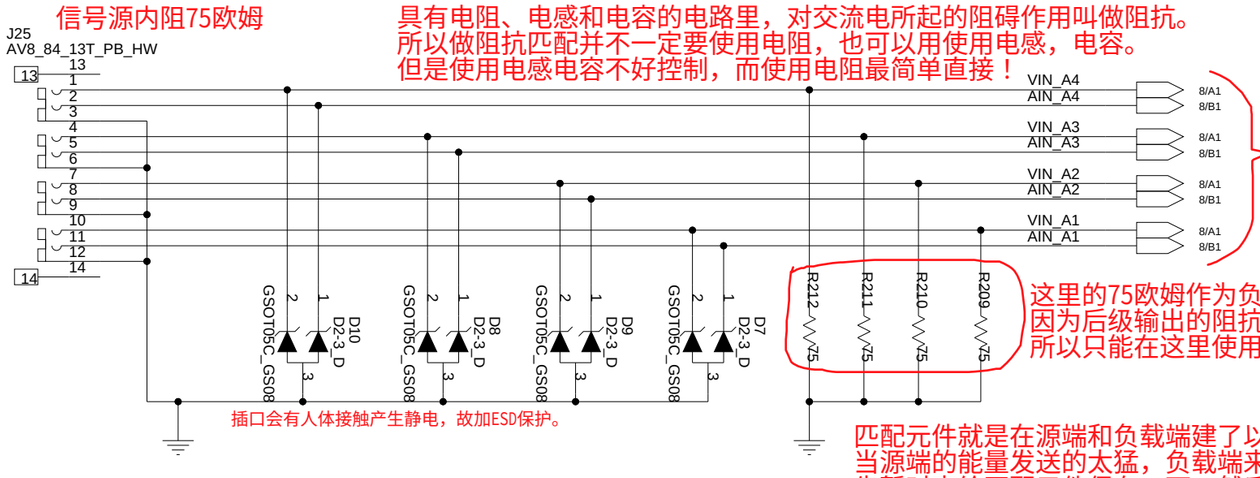
		C	03030001	**HUAWEI TECH CO.,LTD.**	

VIDEO JACK for 2865

信号源内阻75欧姆

具有电阻、电感和电容的电路里，对交流电所起的阻碍作用叫做阻抗。
所以做阻抗匹配并不一定要使用电阻，也可以用使用电感，电容。
但是使用电感电容不好控制，而使用电阻最简单直接！



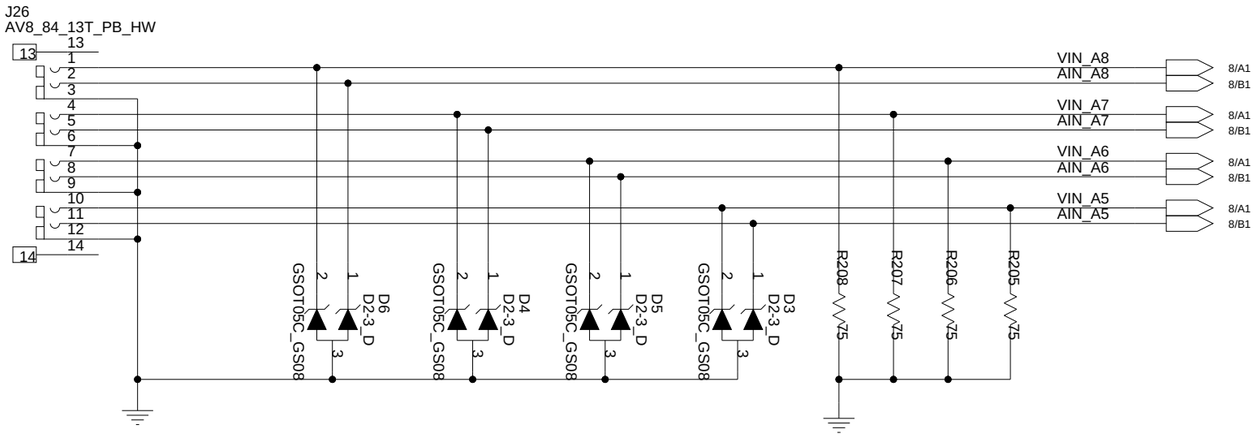
输入阻抗很大，跟源端不匹配！

这里的75欧姆作为负载端阻抗匹配。
因为后级输出的阻抗很大，匹配不了。
所以只能在这里使用电阻做匹配！

插口会有人体接触产生静电，故加ESD保护。

匹配元件就是在源端和负载端建了以个缓冲区，
当源端的能量发送的太猛，负载端来不及接收时，
先暂时交给匹配元件保存一下，然后再转交给负载端。

阻抗匹配的一般性原理
就是想通过增增加电抗元件，从而让源端和负载满足某种条件，例如共轭匹配条件。
匹配的过程中你可以从源端开始加元件，也可以从负载端开始，
不嫌麻烦的话，两边同时加，这都没有本质区别。



为什么不用电阻来匹配？

答： 电阻是消耗能量的，不能提高信噪比，所以这是最后的一招，不到万不得已不能用。

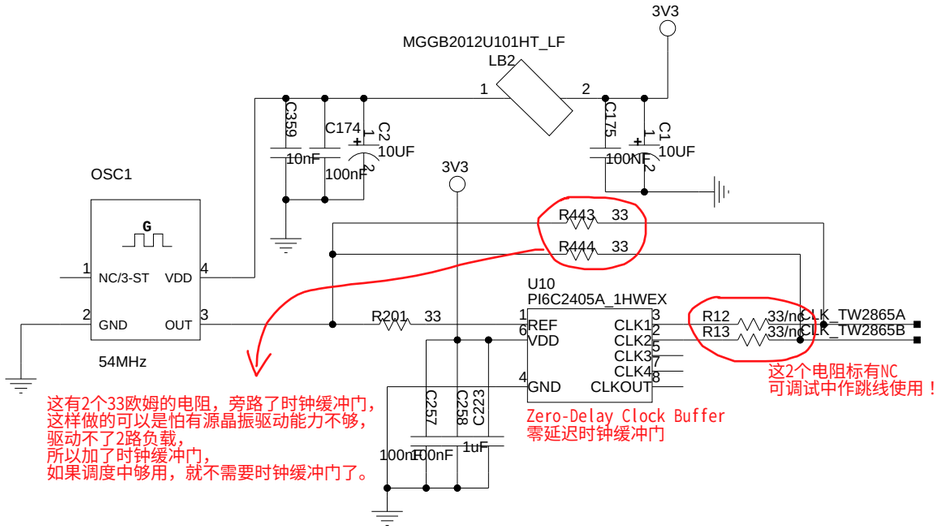
阻抗匹配常用元件

电感，电容：好像没啥需要介绍的。如果把电感比作女人的性感，那电容就好比男人的包容，yeah，好和谐的比方。

传输线： 本来我写了些介绍，但我又给删除了，毕竟能用传输线做匹配说明你已经很专业了，此文也入不了你的法眼。

变压器：这玩意儿真的很少用的，因为价钱死贵死贵的。

TW2865 CLOCK



这有2个33欧姆的电阻，旁路了时钟缓冲门，
这样做的可以是怕有源晶振驱动能力不够，
驱动不了2路负载，
所以加了时钟缓冲门，
如果调度中够用，就不需要时钟缓冲门了。

Zero-Delay Clock Buffer
零延迟时钟缓冲门

这2个电阻标有NC
可调试中作跳线使用！

The type and specification of the components refer to the BOM

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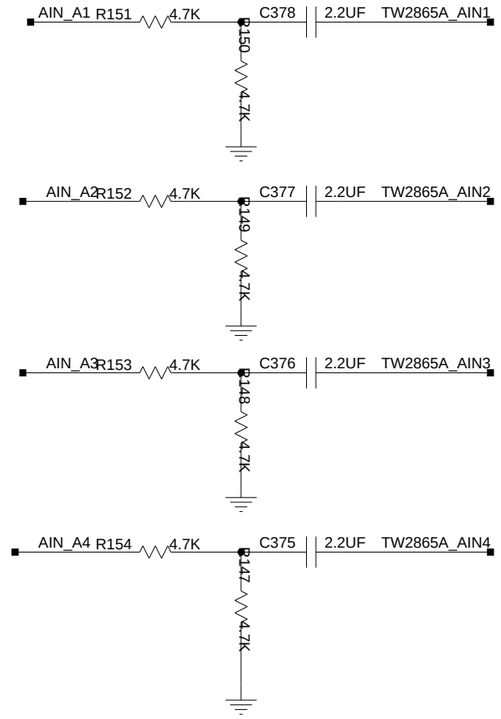
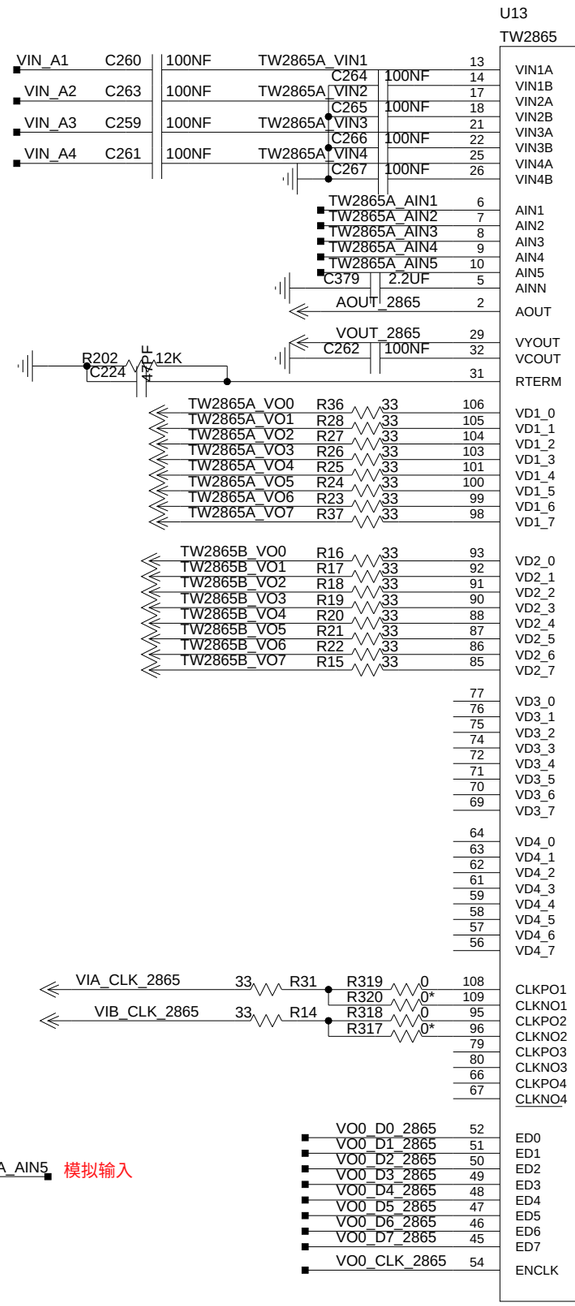
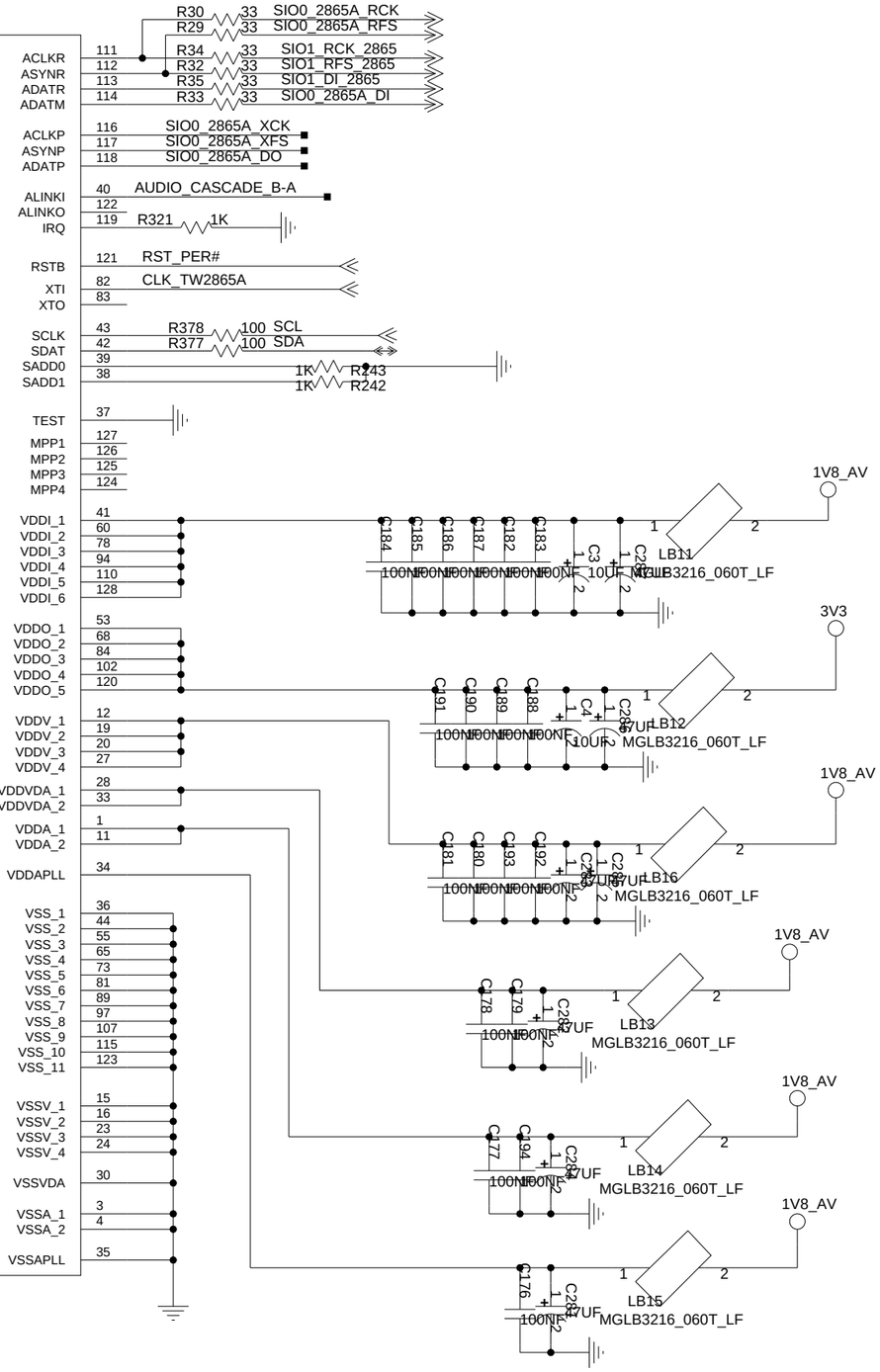
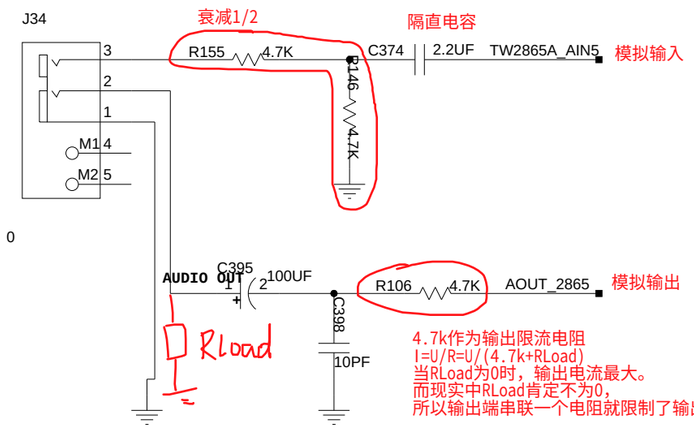
		VER	PART_NUMBER	SHEET 14 OF 21	
		C	03030001	HUAWEI TECH CO.,LTD.	

TW2865A









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The type and specification of the components refer to the BOM

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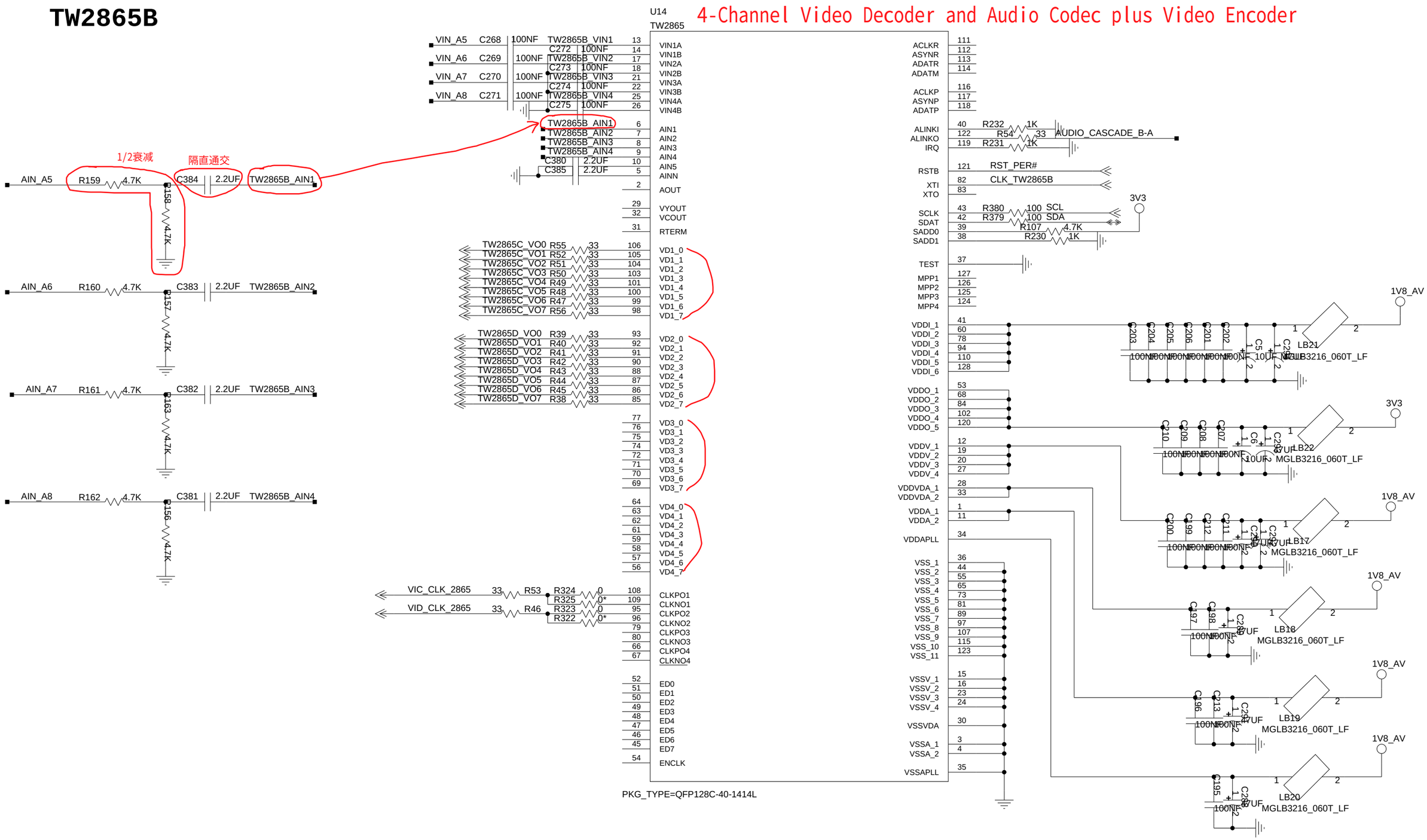
TW2865B

4-Channel Video Decoder and Audio Codec plus Video Encoder



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The type and specification of the components refer to the BOM

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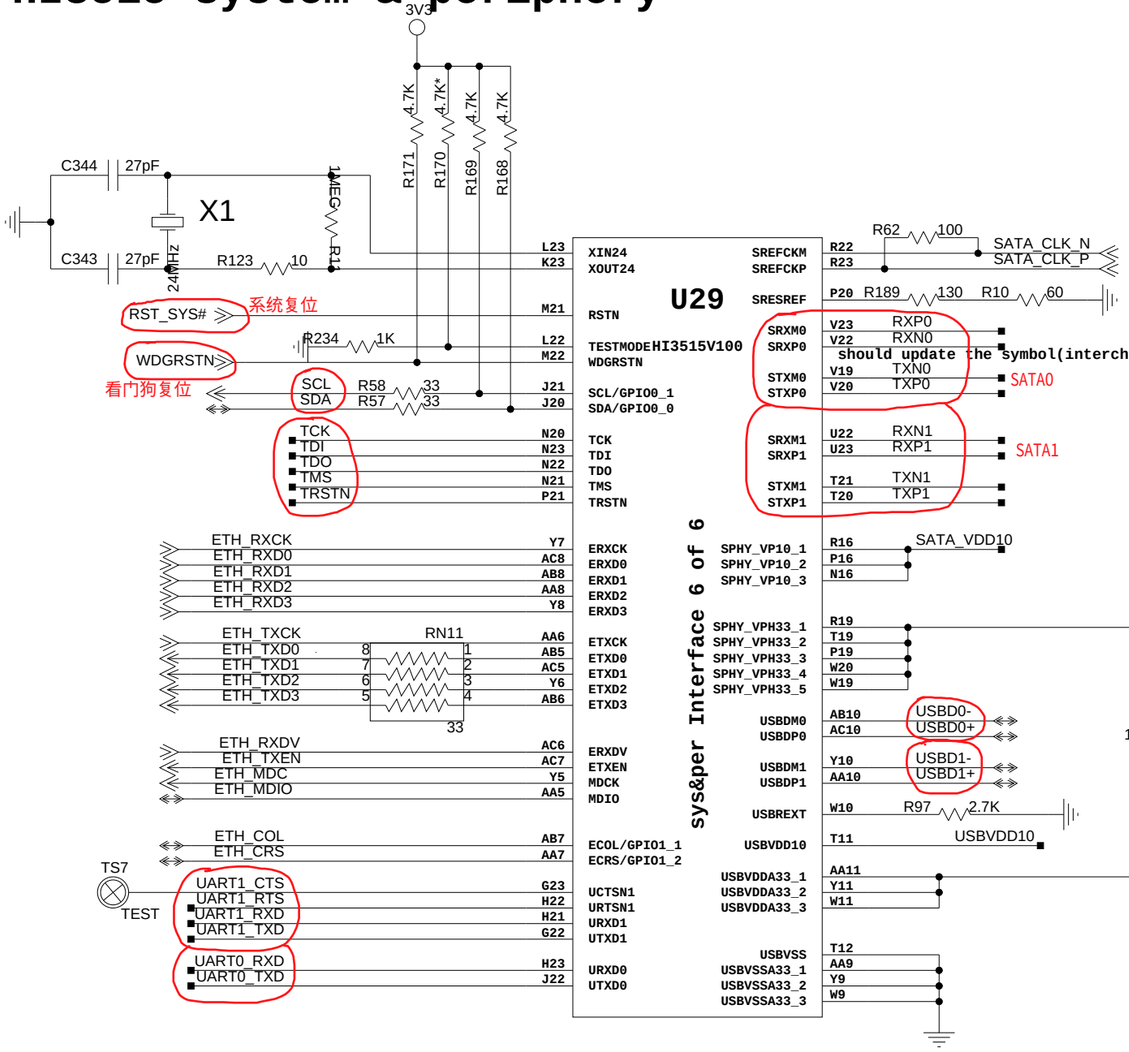
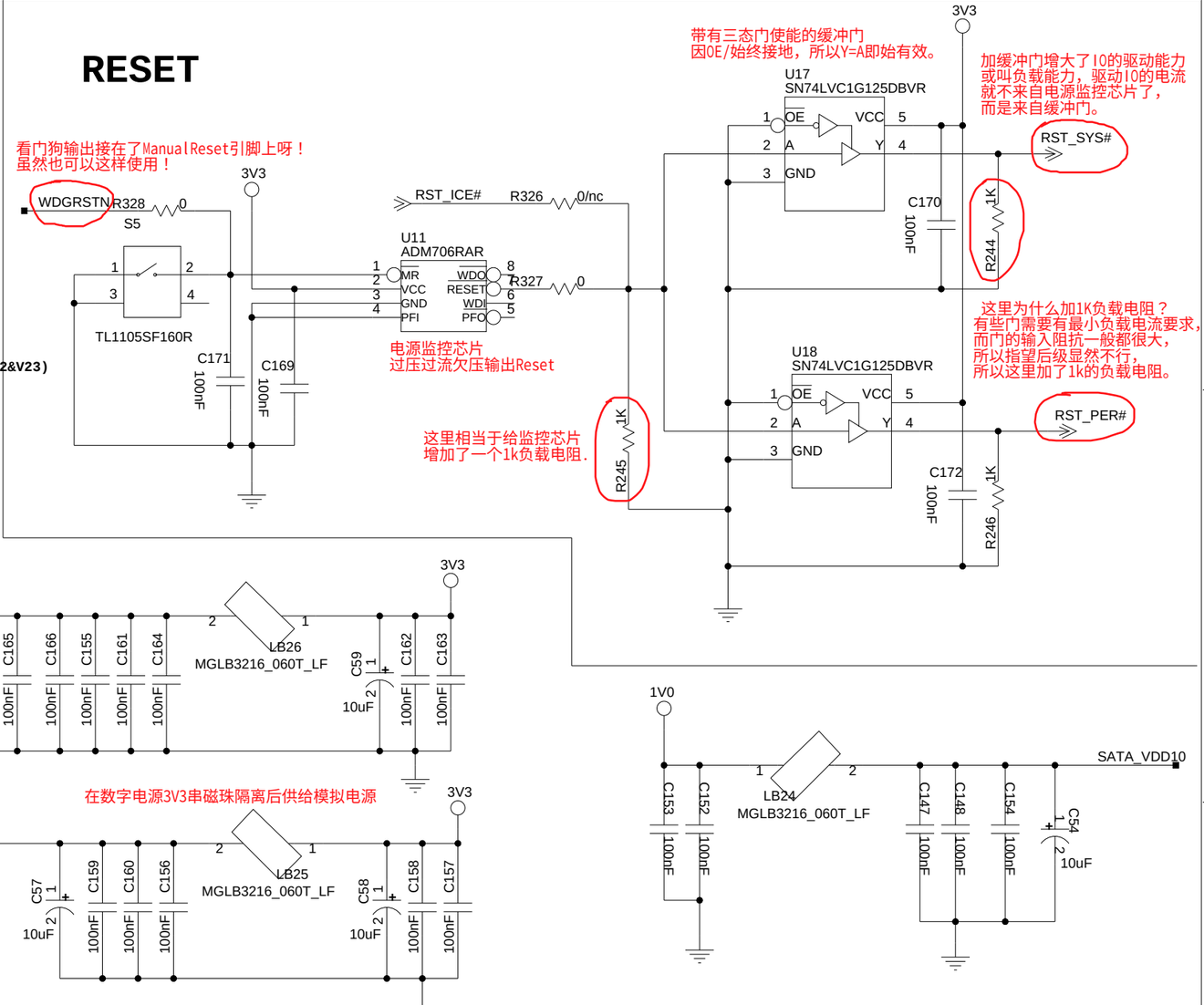
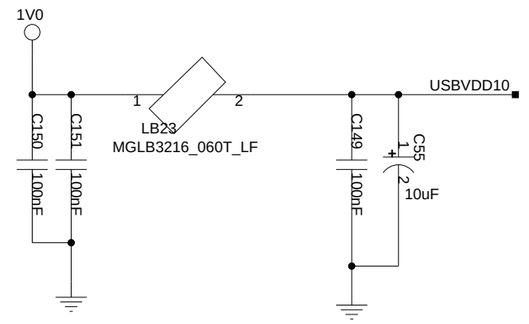
		VER	**PART_NUMBER**	**SHEET** 16 **OF** 21	
		C	03030001	**HUAWEI TECH CO.,LTD.**	

HI3515 system & periphery

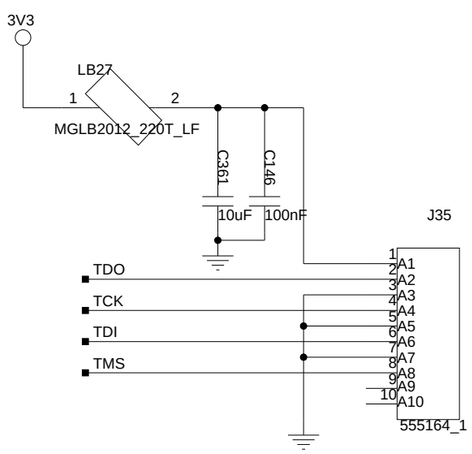


RESET

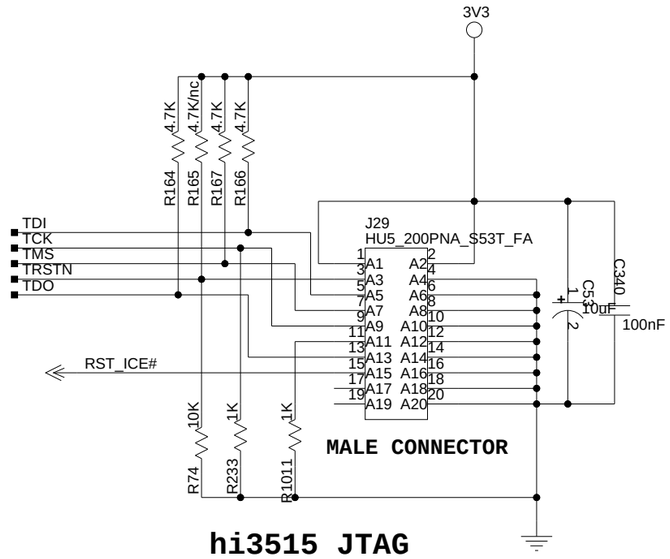




JTAG



RJ45 for SATA JTAG



hi3515 JTAG

The type and specification of the components refer to the BOM

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REVIEWED	LISI XXXXX				
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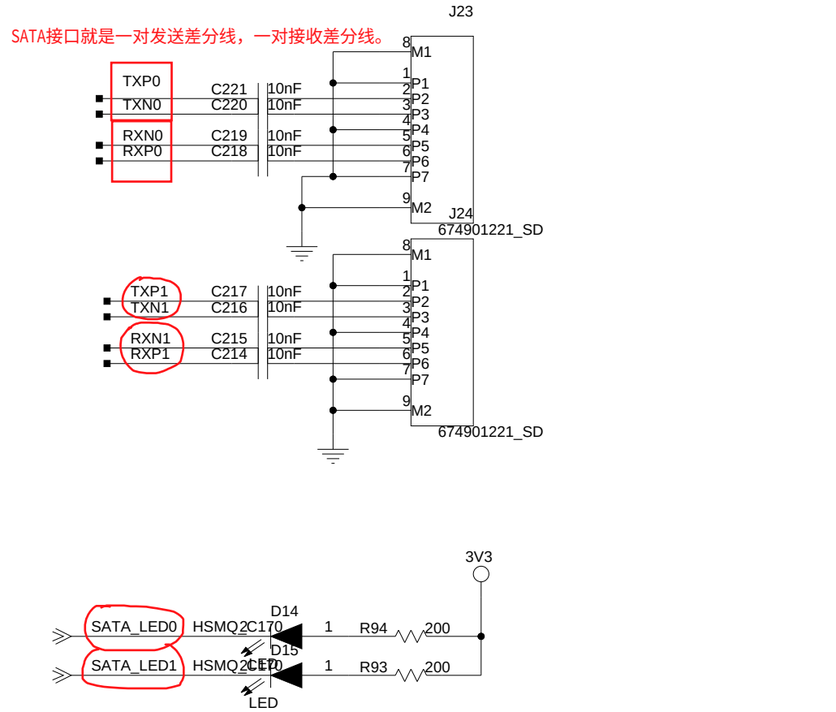
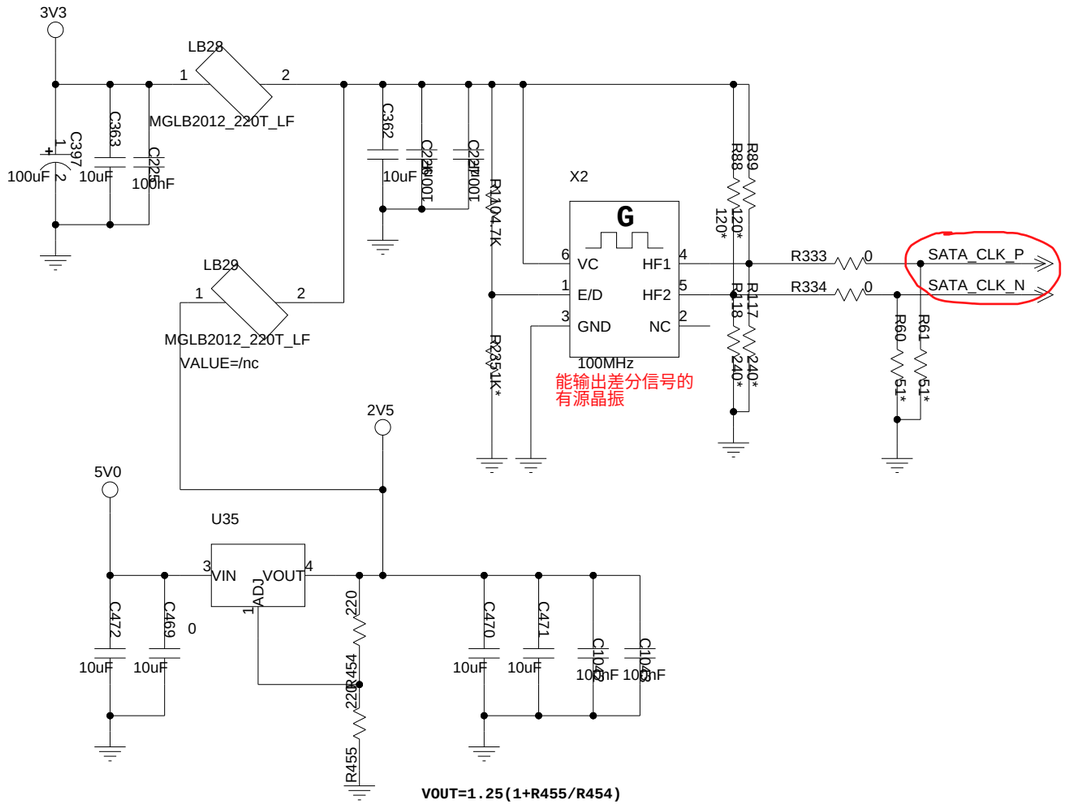
		C	03030001	HUAWEI TECH CO.,LTD.	

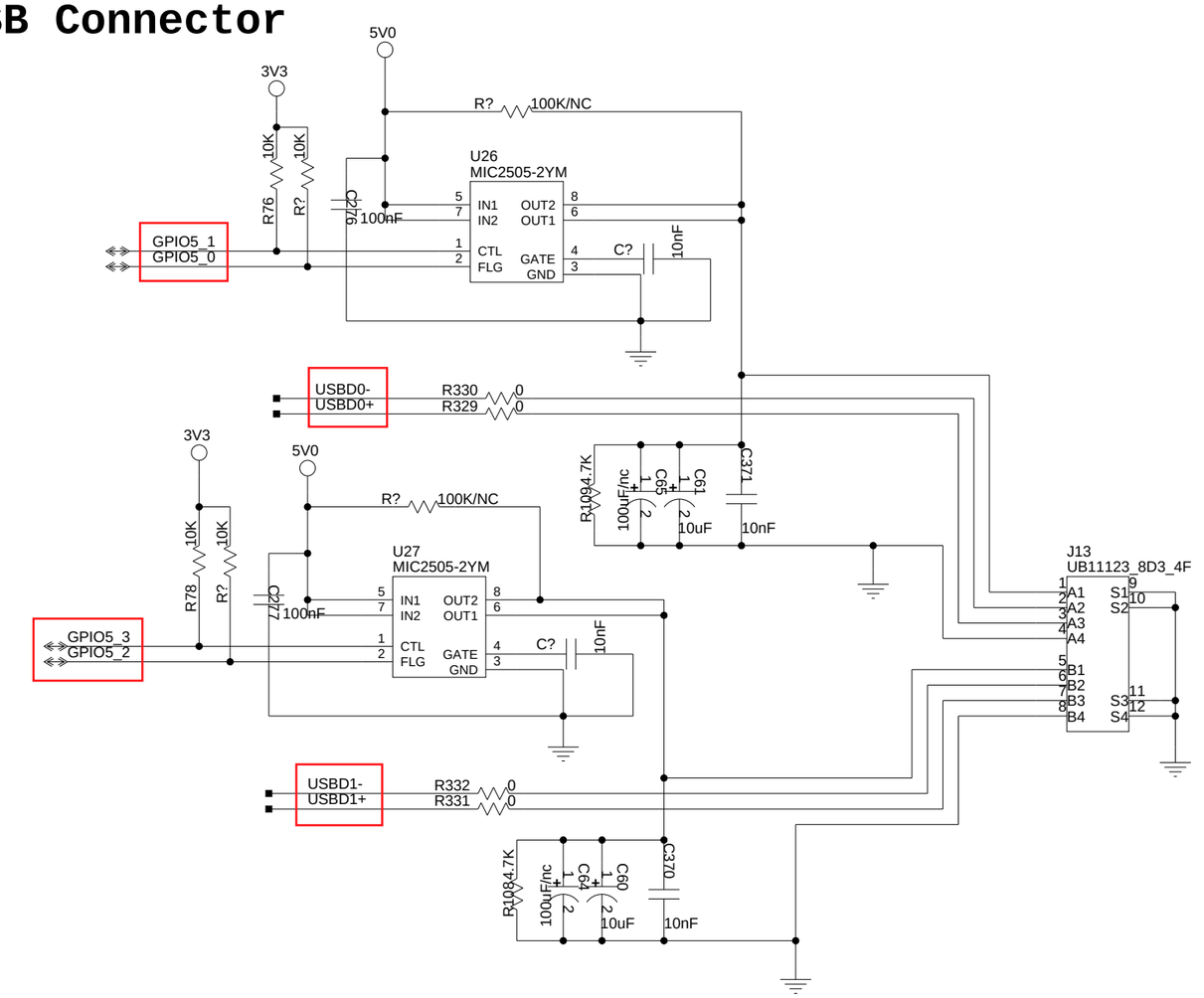
SATA Connector



SATA LVDS CLOCK



USB Connector



Take care of the VBUS drive capability to meet requirement for USB devices

The type and specification of the components refer to the BOM

				NA	
				ECA NO	**DATE**
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
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		VER	**PART_NUMBER**	**SHEET** 18 **OF** 21	
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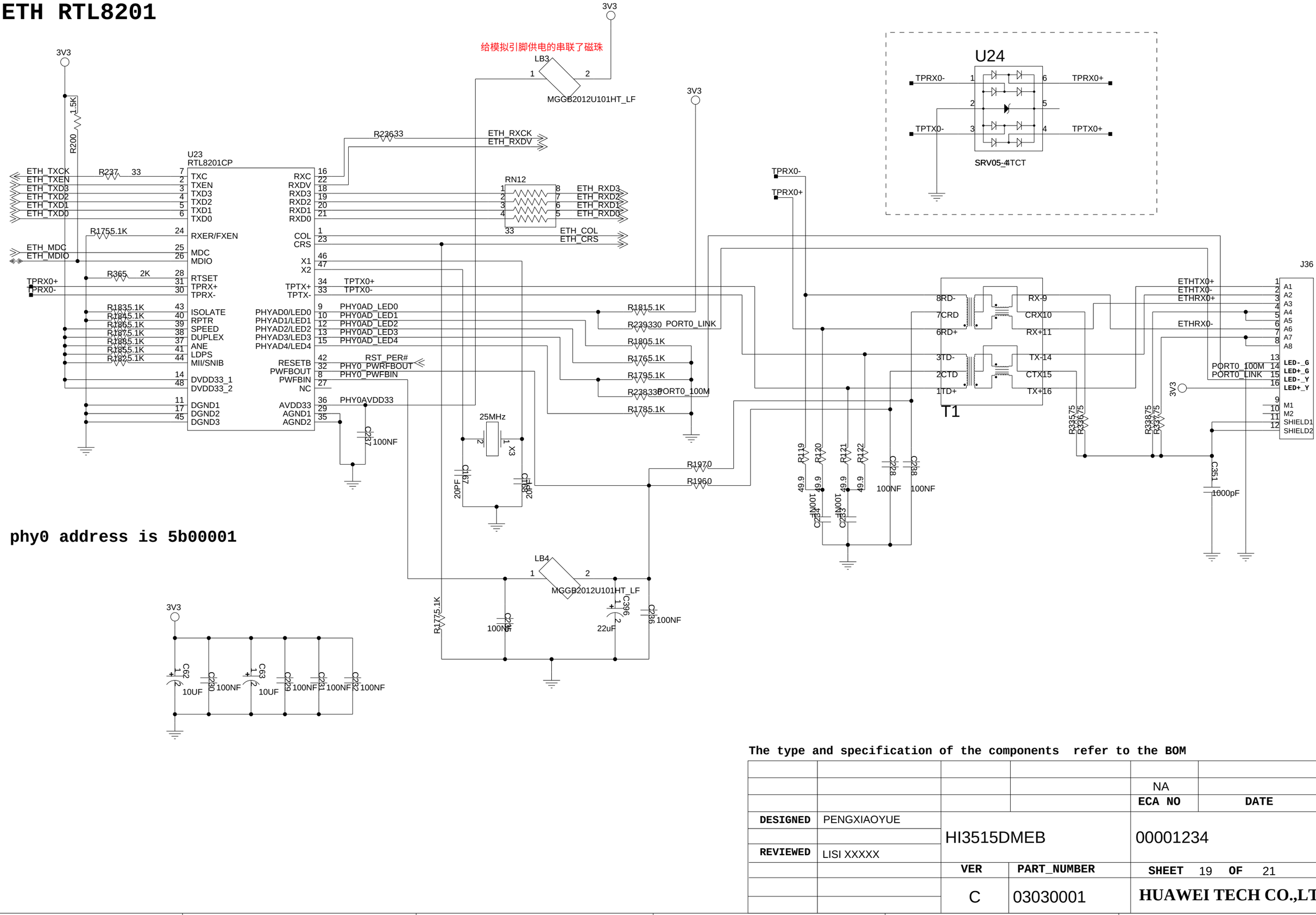
ETH RTL8201



phy0 address is 5b00001

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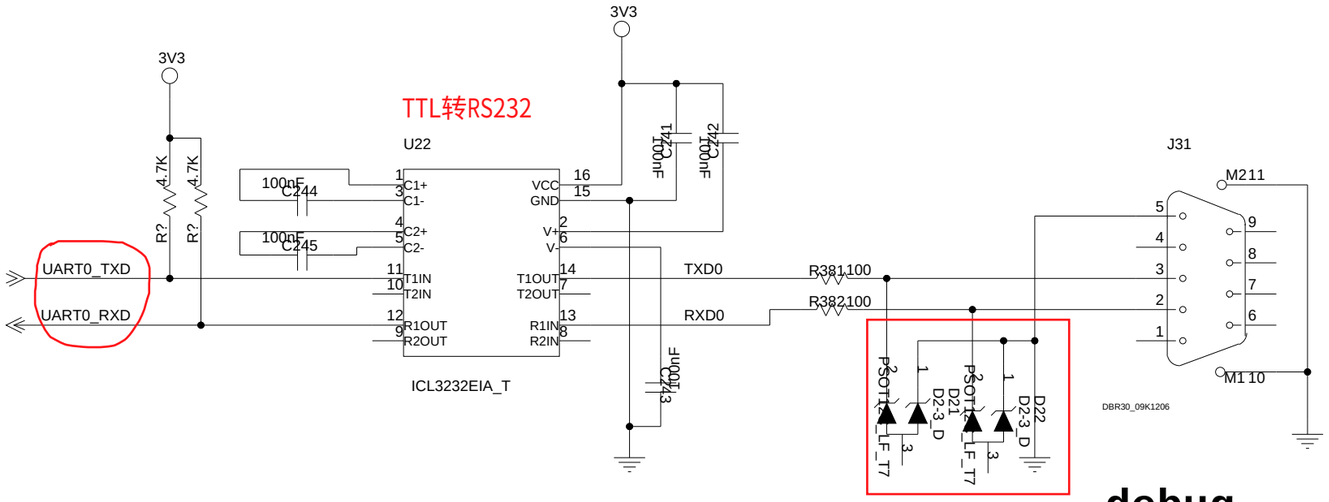
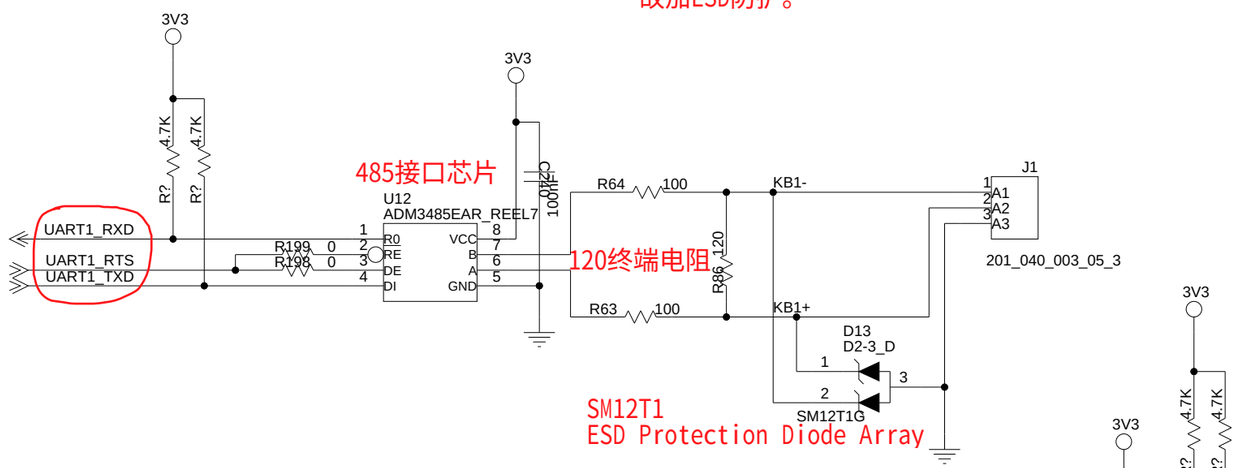
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
REVIEWED	LISI XXXXX				
		VER	**PART_NUMBER**	**SHEET** 19 **OF** 21	
		C	03030001	**HUAWEI TECH CO.,LTD.**	

UART 0,1,2,3

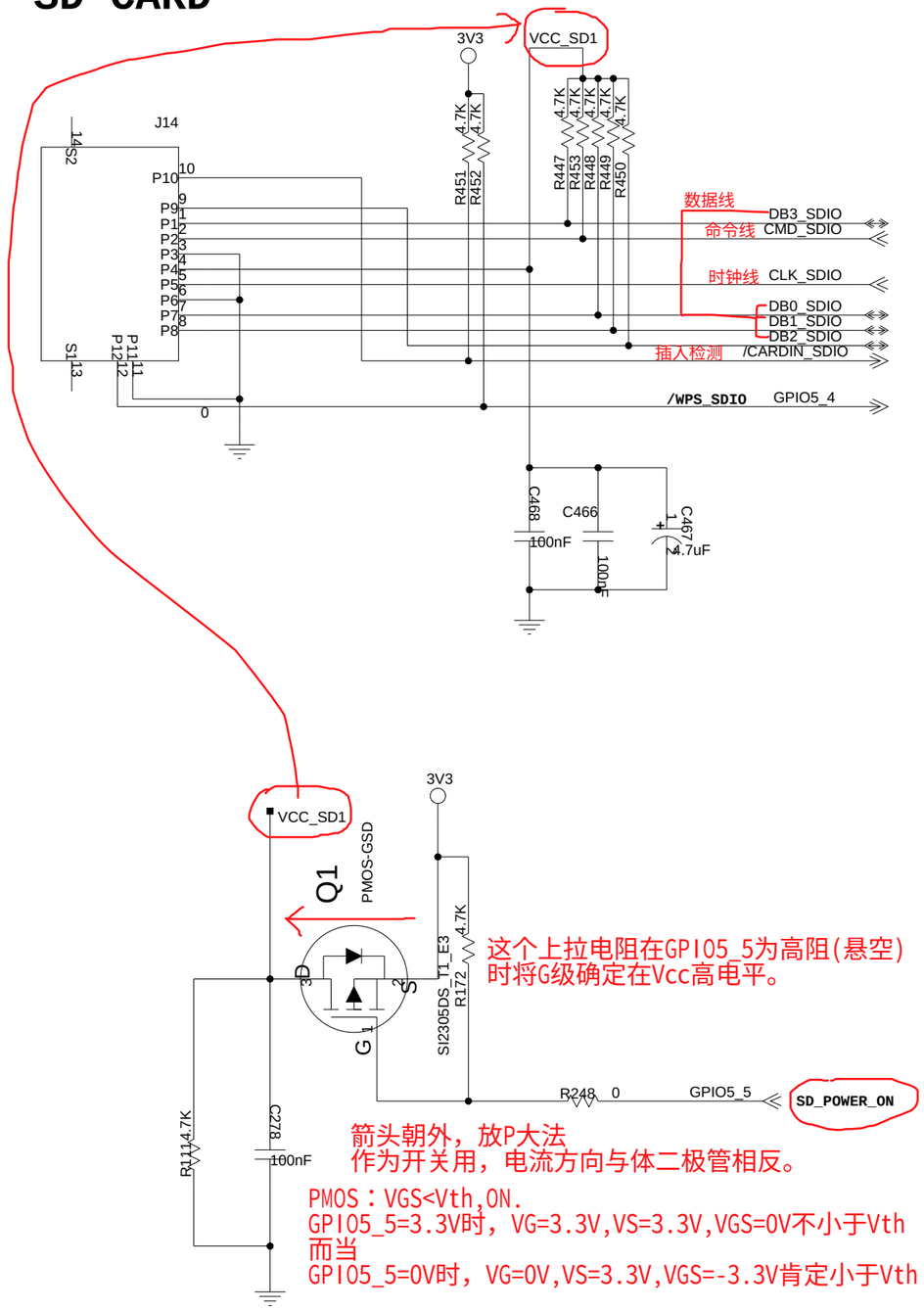


DB9插头，人体接触可能会有静电，故加ESD防护。

debug



SD CARD

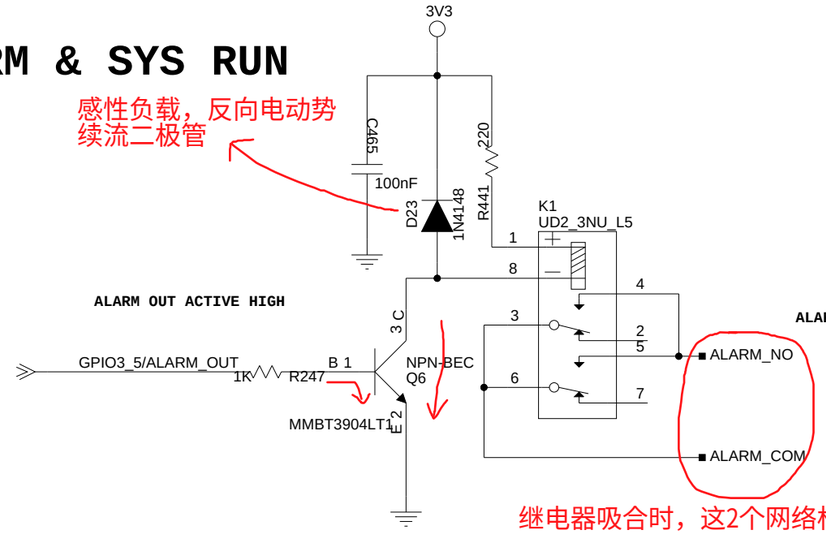


The type and specification of the components refer to the BOM

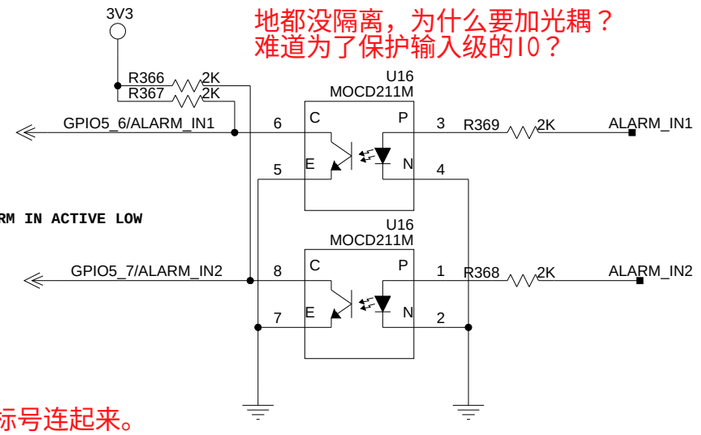
				NA	
				ECA NO	DATE
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
REVIEWED	LISI XXXXX				
		VER	PART_NUMBER	SHEET 20 OF 21	
		C	03030001	HUAWEI TECH CO.,LTD.	

ALARM & SYS RUN

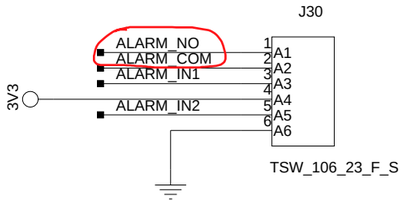
感性负载，反向电动势
续流二极管



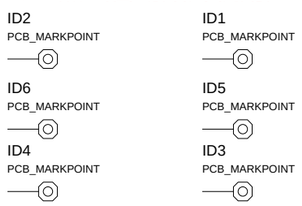
地都没隔离，为什么要加光耦？
难道为了保护输入级的IO？



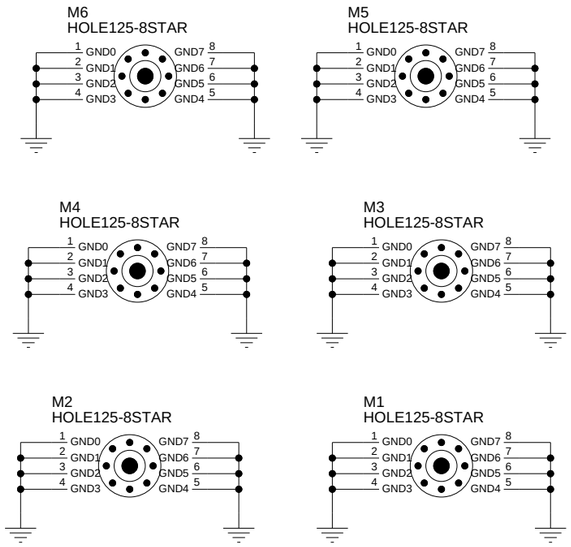
继电器吸合时，这2个网络标号连起来。



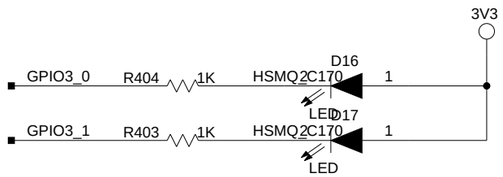
Mark点（自动贴片机用）



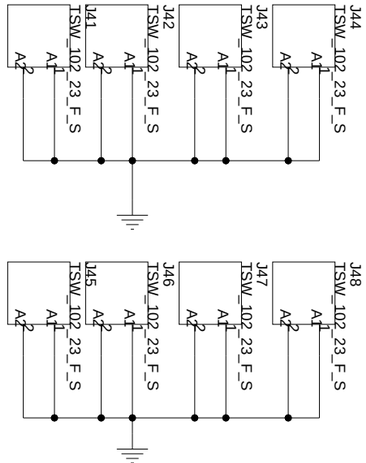
机械定位孔
防止拧螺丝起皮，加了一圈小孔。



KEYS INPUT

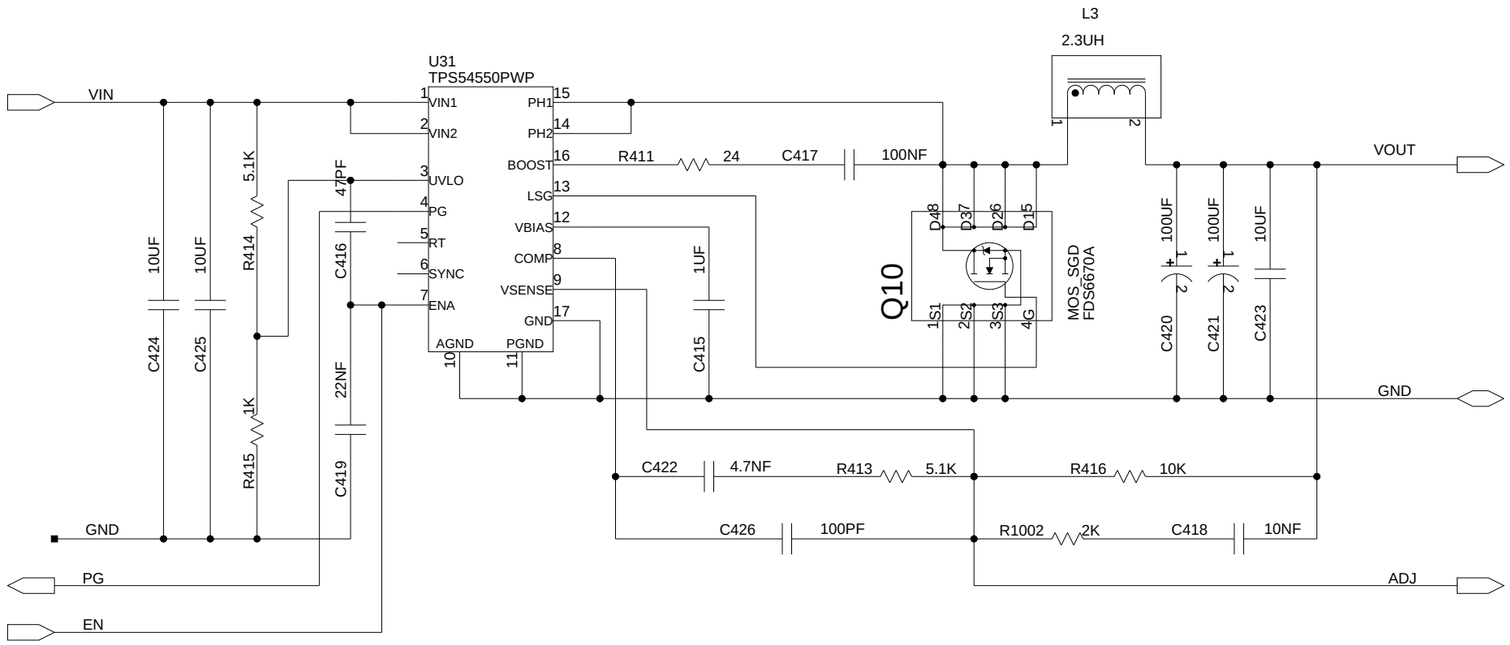


SYS RUN LED



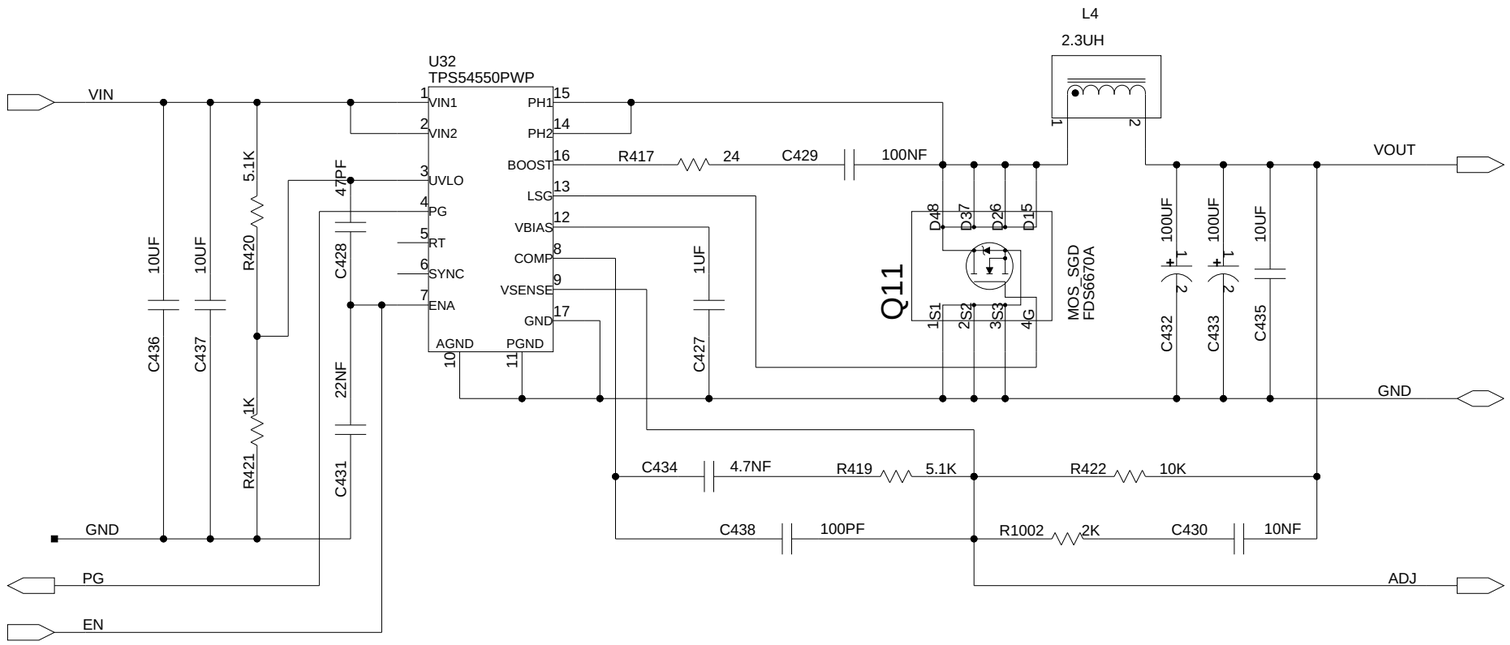
The type and specification of the components refer to the BOM

				NA	
				ECA NO	DATE
DESIGNED	PENGXIAOYUE	HI3515DMEB		00001234	
REVIEWED	LISI XXXXX				
		VER	PART_NUMBER	SHEET 21 OF 21	
		C	03030001	HUAWEI TECH CO.,LTD.	



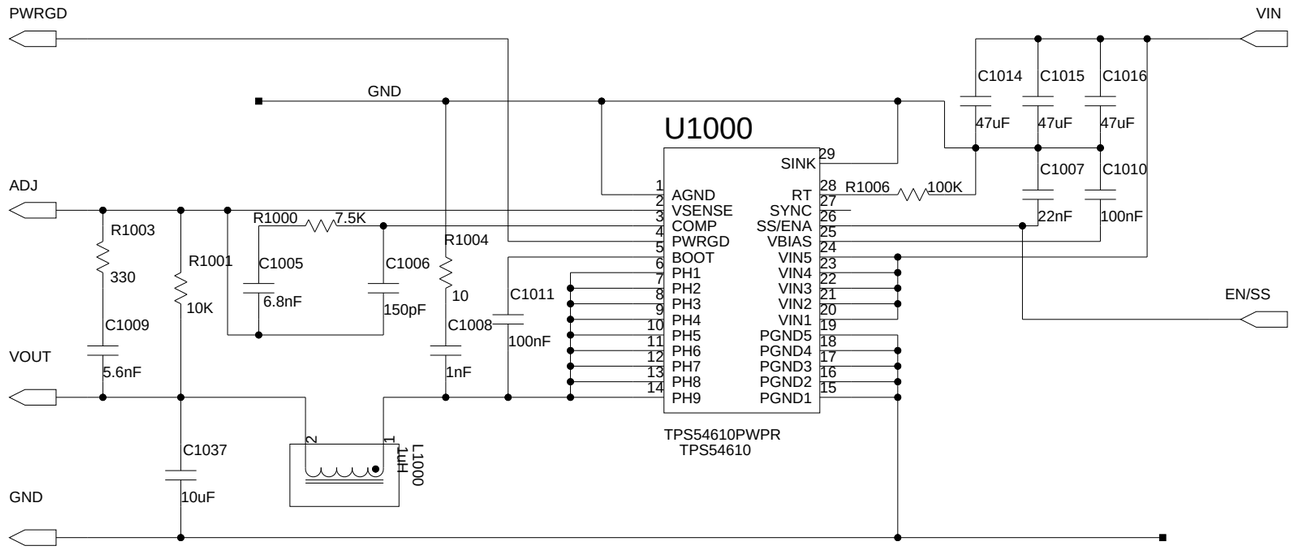
The type and specification of the components refer to the BOM

				NA	
				ECA NO	**DATE**
DESIGNED	LINSONGZHI 60019739	CB200212		00001234	
REVIEWED	DINGJIE 26211				
		VER	**PART_NUMBER**	**SHEET** 1 **OF** 1	
		A	03030001	**HUAWEI TECH CO.,LTD.**	



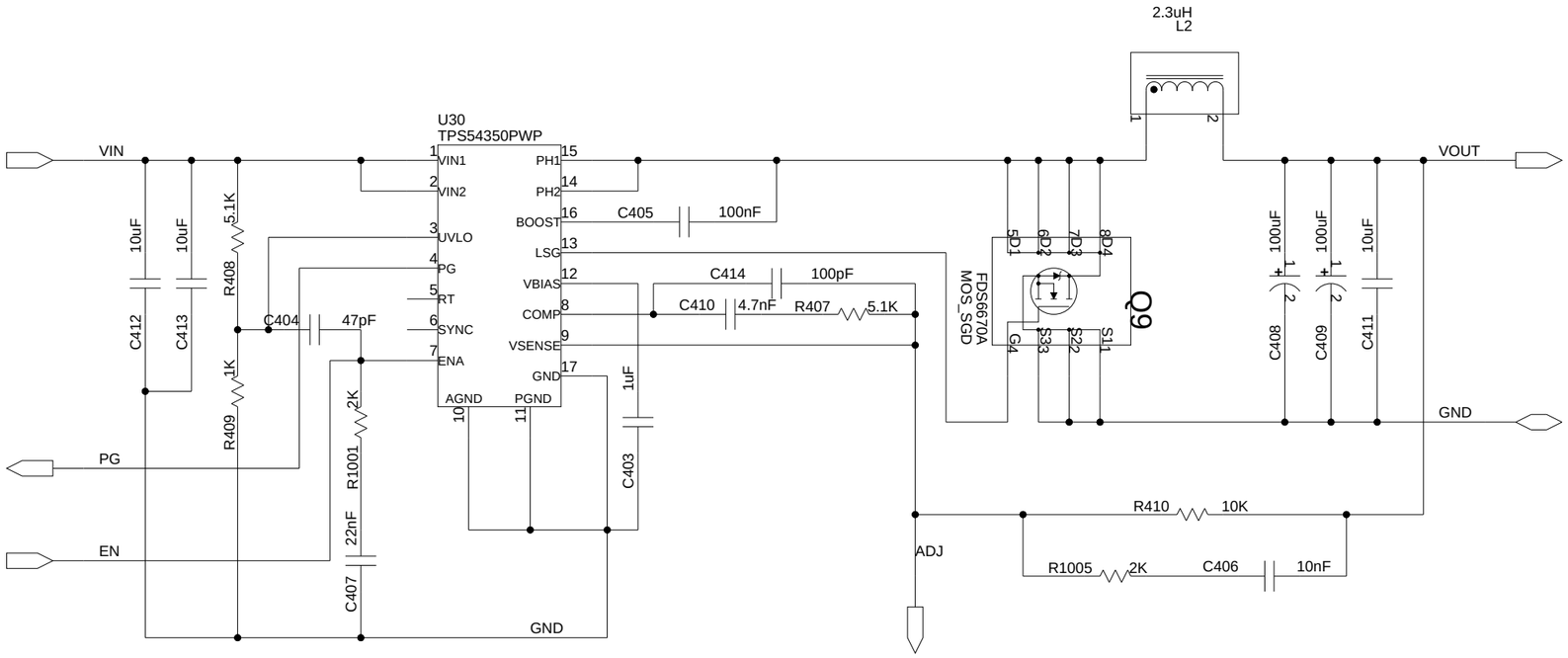
The type and specification of the components refer to the BOM

				NA	
				ECA NO	**DATE**
DESIGNED	LINSONGZHI 60019739	CB200212		00001234	
REVIEWED	DINGJIE 26211				
		VER	**PART_NUMBER**	**SHEET** 1 **OF** 1	
		A	03030001	**HUAWEI TECH CO.,LTD.**	



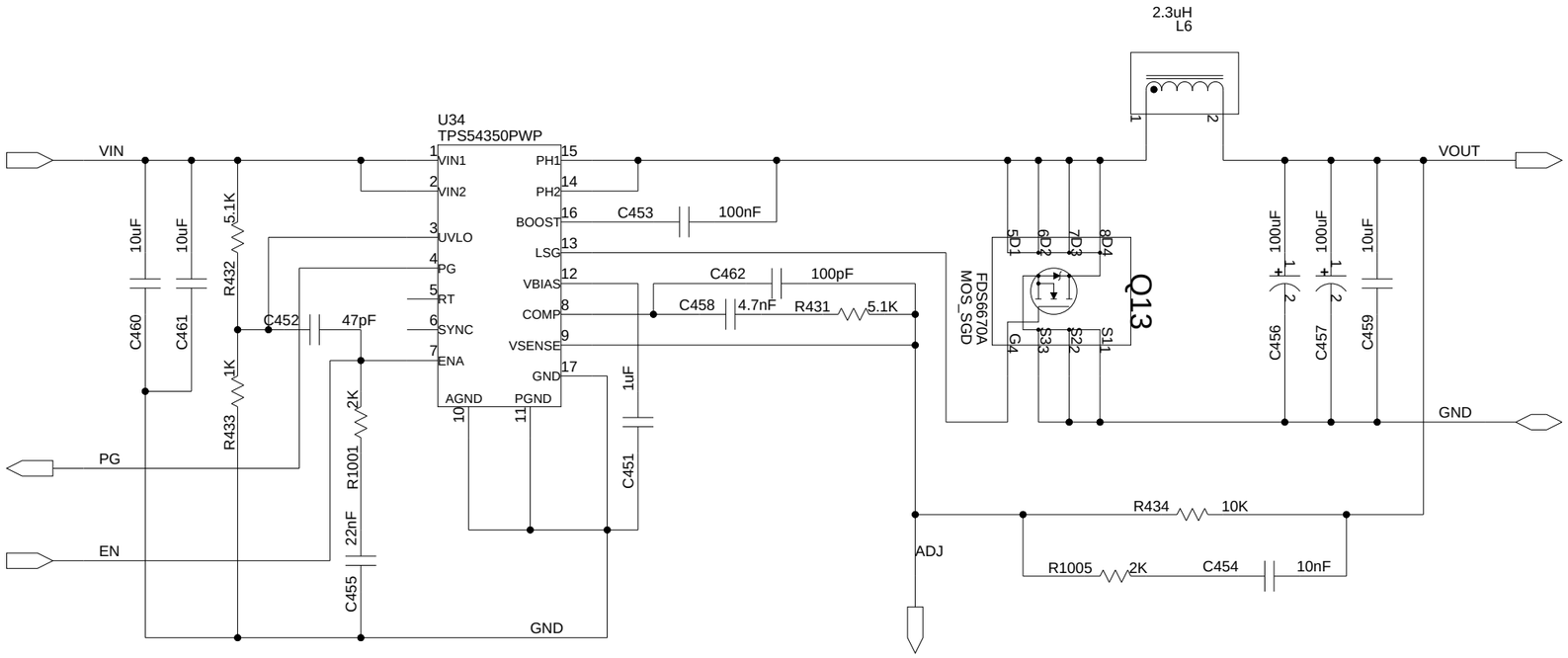
The type and specification of the components refer to the BOM

				NA	2006-11-01
				ECA NO	DATE
DESIGNED	LIUXUJUN51176	TPS54610		00000000	
REVIEWED	DINGJIE				
		VER	PART_NUMBER	SHEET 1 OF 1	
		A	03030001	HUAWEI TECH CO.,LTD.	



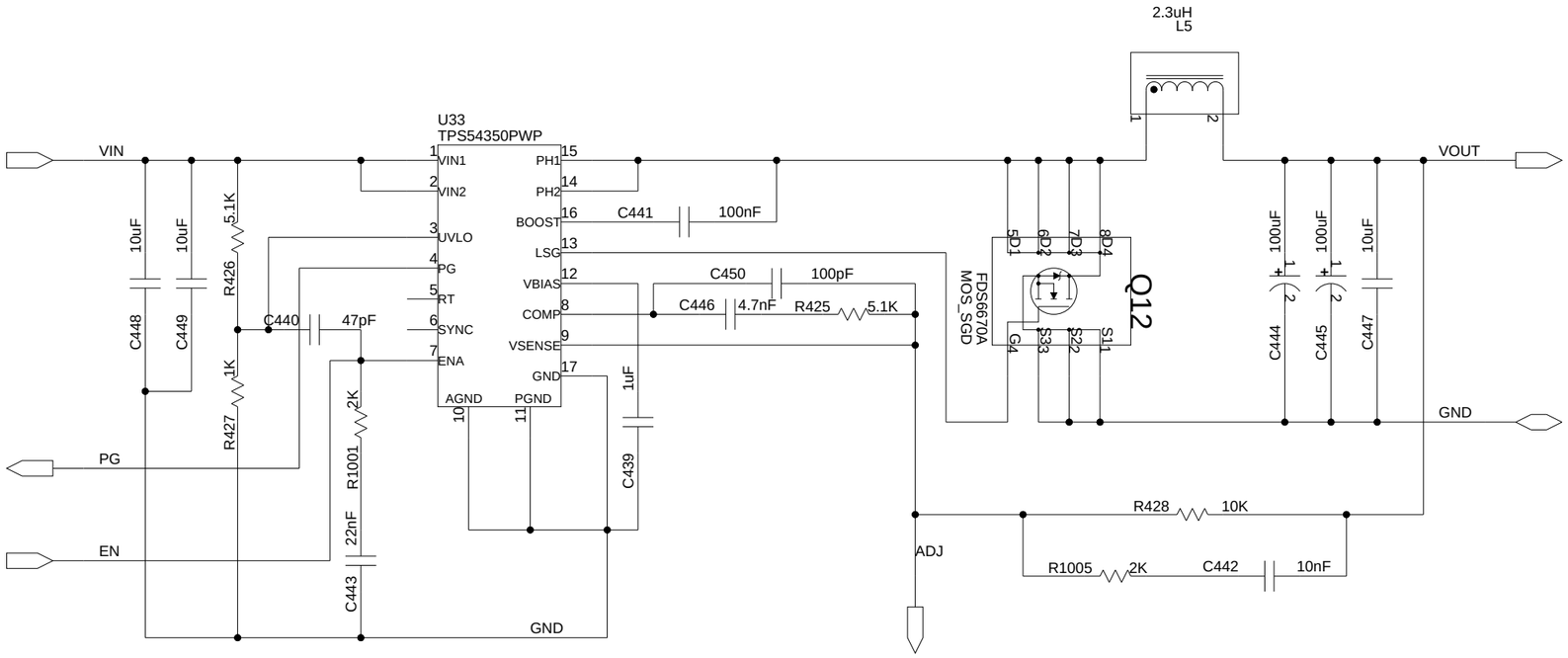
The type and specification of the components refer to the BOM

				NA	2006-10-28
				ECA NO	DATE
DESIGNED	LINSONGZHI 60019739	TPS5435012S3V3		00001234	
REVIEWED	DINGJIE 26211				
		VER	PART_NUMBER	SHEET 01 OF 1	
		A	03030001	HUAWEI TECH CO.,LTD.	



The type and specification of the components refer to the BOM

				NA	2006-10-28
				ECA NO	DATE
DESIGNED	LINSONGZHI 60019739	TPS5435012S3V3		00001234	
REVIEWED	DINGJIE 26211				
		VER	PART_NUMBER	SHEET 01 OF 1	
		A	03030001	HUAWEI TECH CO.,LTD.	



The type and specification of the components refer to the BOM

				NA	2006-10-28
				ECA NO	DATE
DESIGNED	LINSONGZHI 60019739	TPS5435012S3V3		00001234	
REVIEWED	DINGJIE 26211				
		VER	PART_NUMBER	SHEET 01 OF 1	
		A	03030001	HUAWEI TECH CO.,LTD.	