RK3576_AIOT_REF_SCH_V11 Modify_Notes_CN

版　本：	V1.1
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审　　核：	Reviewer
日　期：	2024-05-30

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更新记录

修订记录累积了每次文档更新的说明，最新版本的文档包含以前所有文档版本的更新内容。

版本	修改人	修改日期	修改说明	备注
V1.0	Wesley Huang	2024.03.22	First edition for RK3576	
V1.1	Wesley Huang	2024.05.30	具体修改记录请见下面内容。	

目录

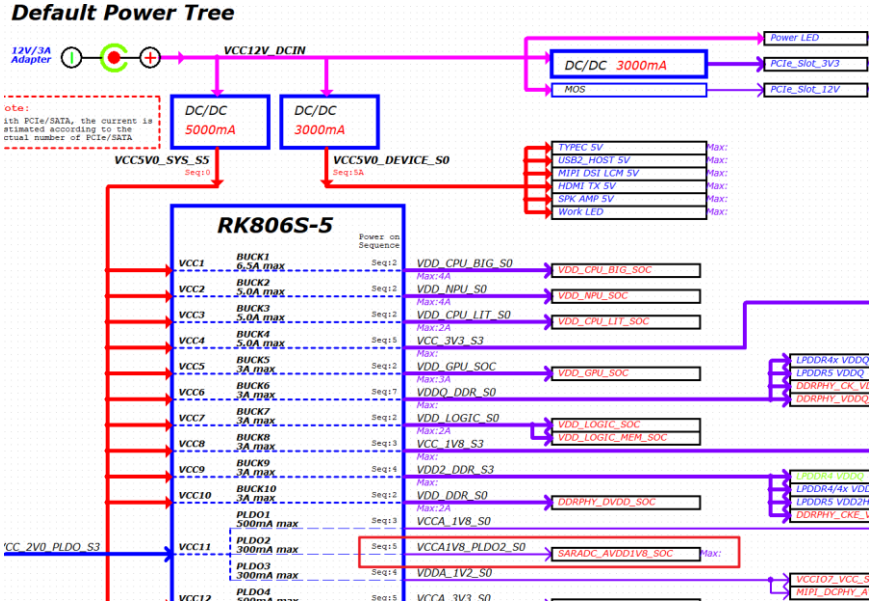
1 原理图版本说明

基于《RK3576_AIOT_REF_SCH_V10_20240322.DSN》版本上更新修改。
最新版本为《RK3576_AIOT_REF_SCH_V10_20240530.DSN》

2 最新V1.1版本原理图及PCB修改内容说明

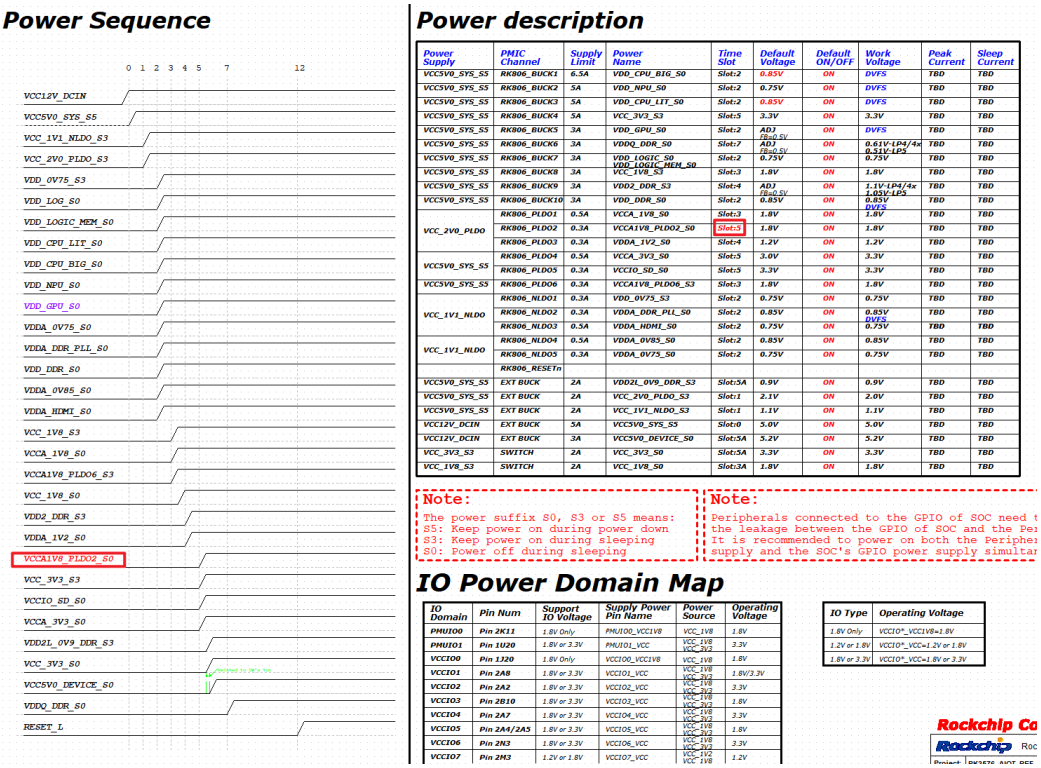
2.1 Page 5--04.Power Tree

根据 SOC 的时序要求，PMIC 的 PLDO2 时序修改为 5，用于给 SARADC_AVDD1V8 供电，请务必更新。



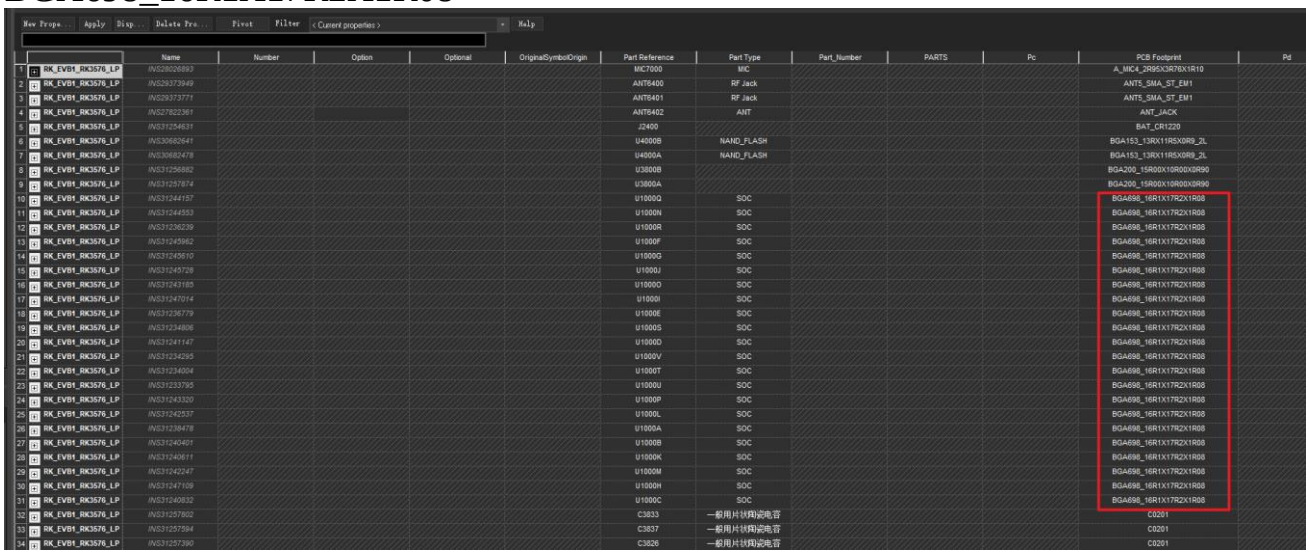
2.2 Page 6-- 05.Power Sequence and Map

根据 SOC 的时序要求，PMIC 的 PLDO2 时序修改为 5，请务必更新。



2.3 Page 10~Page 19

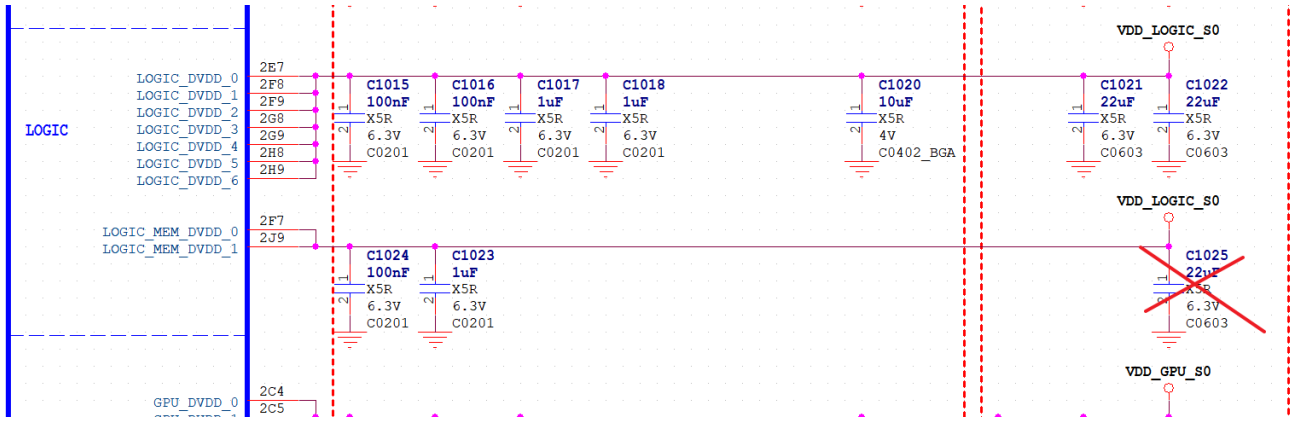
RK3576 量产芯片的厚度变薄 0.1mm，相应 PCB 封装名修改为 BGA698_16R1X17R2X1R08



	Name	Number	Option	Optional	OriginalSymbolOrigin	Part Reference	Part Type	Part_Number	PARTS	Pc	PCB Footprint	Pd
1	RK_EVB1_RK3576_LP					MIC7000	MIC				A_MIC4_2R9SX3R7BX1R10	
2	RK_EVB1_RK3576_LP					ANT6400	RF Jack				ANT5_SMA_ST_EM1	
3	RK_EVB1_RK3576_LP					ANT6401	RF Jack				ANT5_SMA_ST_EM1	
4	RK_EVB1_RK3576_LP					ANT6402	ANT				ANT_JACK	
5	RK_EVB1_RK3576_LP					J2400					BAT_CR1220	
6	RK_EVB1_RK3576_LP					U4000B	NAND_FLASH				BGA153_13RX11RSX0R9_2L	
7	RK_EVB1_RK3576_LP					U4000A	NAND_FLASH				BGA153_13RX11RSX0R9_2L	
8	RK_EVB1_RK3576_LP					U3800B					BGA200_15R00X10R00X0R90	
9	RK_EVB1_RK3576_LP					U3800A					BGA200_15R00X10R00X0R90	
10	RK_EVB1_RK3576_LP					U1000Q	SOC				BGA698_16R1X17R2X1R08	
11	RK_EVB1_RK3576_LP					U1000N	SOC				BGA698_16R1X17R2X1R08	
12	RK_EVB1_RK3576_LP					U1000R	SOC				BGA698_16R1X17R2X1R08	
13	RK_EVB1_RK3576_LP					U1000F	SOC				BGA698_16R1X17R2X1R08	
14	RK_EVB1_RK3576_LP					U1000G	SOC				BGA698_16R1X17R2X1R08	
15	RK_EVB1_RK3576_LP					U1000J	SOC				BGA698_16R1X17R2X1R08	
16	RK_EVB1_RK3576_LP					U1000O	SOC				BGA698_16R1X17R2X1R08	
17	RK_EVB1_RK3576_LP					U1000I	SOC				BGA698_16R1X17R2X1R08	
18	RK_EVB1_RK3576_LP					U1000E	SOC				BGA698_16R1X17R2X1R08	
19	RK_EVB1_RK3576_LP					U1000S	SOC				BGA698_16R1X17R2X1R08	
20	RK_EVB1_RK3576_LP					U1000D	SOC				BGA698_16R1X17R2X1R08	
21	RK_EVB1_RK3576_LP					U1000V	SOC				BGA698_16R1X17R2X1R08	
22	RK_EVB1_RK3576_LP					U1000T	SOC				BGA698_16R1X17R2X1R08	
23	RK_EVB1_RK3576_LP					U1000U	SOC				BGA698_16R1X17R2X1R08	
24	RK_EVB1_RK3576_LP					U1000P	SOC				BGA698_16R1X17R2X1R08	
25	RK_EVB1_RK3576_LP					U1000L	SOC				BGA698_16R1X17R2X1R08	
26	RK_EVB1_RK3576_LP					U1000A	SOC				BGA698_16R1X17R2X1R08	
27	RK_EVB1_RK3576_LP					U1000B	SOC				BGA698_16R1X17R2X1R08	
28	RK_EVB1_RK3576_LP					U1000K	SOC				BGA698_16R1X17R2X1R08	
29	RK_EVB1_RK3576_LP					U1000M	SOC				BGA698_16R1X17R2X1R08	
30	RK_EVB1_RK3576_LP					U1000H	SOC				BGA698_16R1X17R2X1R08	
31	RK_EVB1_RK3576_LP					U1000C	SOC				BGA698_16R1X17R2X1R08	
32	RK_EVB1_RK3576_LP					C3833	一般用片状陶瓷电容				C0201	
33	RK_EVB1_RK3576_LP					C3837	一般用片状陶瓷电容				C0201	
34	RK_EVB1_RK3576_LP					C3826	一般用片状陶瓷电容				C0201	

2.4 Page 11-- 10.RK3576-Power/GND

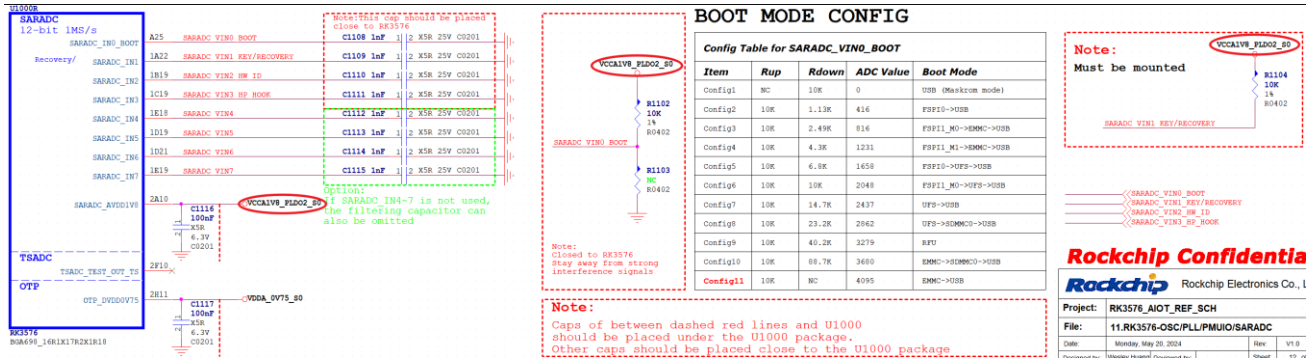
删除 C1025



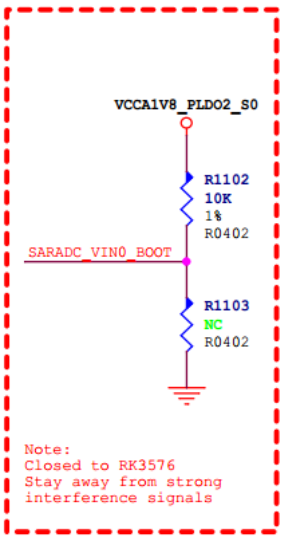
2.5 Page 12--11.RK3576-OSC/PLL/PMUIO/SARADC

(1) SARADC/OTP 修改

根据 SOC 的时序要求，SARADC/OTP 的供电时序需要改为 5，因此 SARADC/OTP 的供电引脚 SARADC_AVDD1V8 改用 RK806S-5 的 PLDO2 电源 VCCA1V8_PLDO2_S0(时序改为 5)来单独供电，SARADC 的相关上拉电源需要同步更新到 VCCA1V8_PLDO2_S0



(2) SARADC_VIN0_BOOT 配置的电阻阻值等比例缩小，以增强抗干扰能力

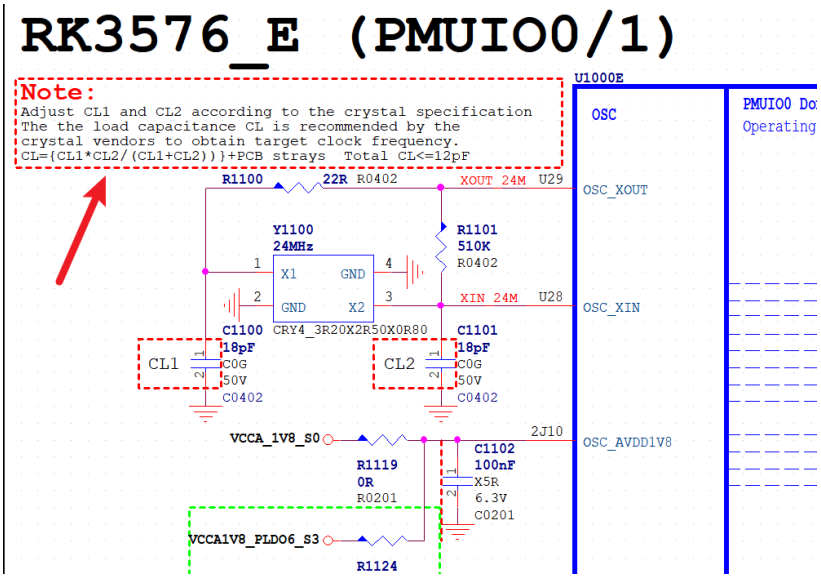


BOOT MODE CONFIG

Config Table for SARADC_VIN0_BOOT

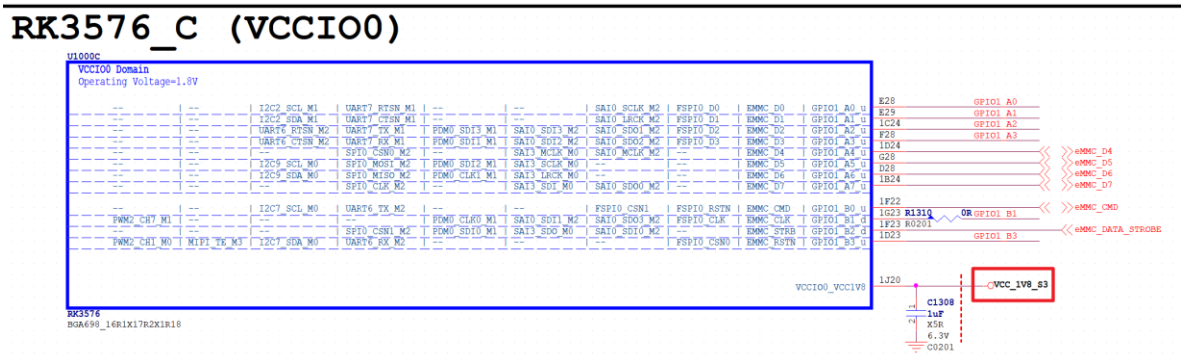
Item	Rup	Rdown	ADC Value	Boot Mode
Config1	NC	10K	0	USB (Maskrom mode)
Config2	10K	1.13K	416	FSPI0->USB
Config3	10K	2.49K	816	FSPI1_M0->EMMC->USB
Config4	10K	4.3K	1231	FSPI1_M1->EMMC->USB
Config5	10K	6.8K	1658	FSPI0->UFS->USB
Config6	10K	10K	2048	FSPI1_M0->UFS->USB
Config7	10K	14.7K	2437	UFS->USB
Config8	10K	23.2K	2862	UFS->SDMMC0->USB
Config9	10K	40.2K	3279	RFU
Config10	10K	88.7K	3680	EMMC->SDMMC0->USB
Config11	10K	NC	4095	EMMC->USB

(3) 增加系统OSC的负载电容要求文字说明：



2.6 Page 14--13.RK3576-eMMC/UFS/SD

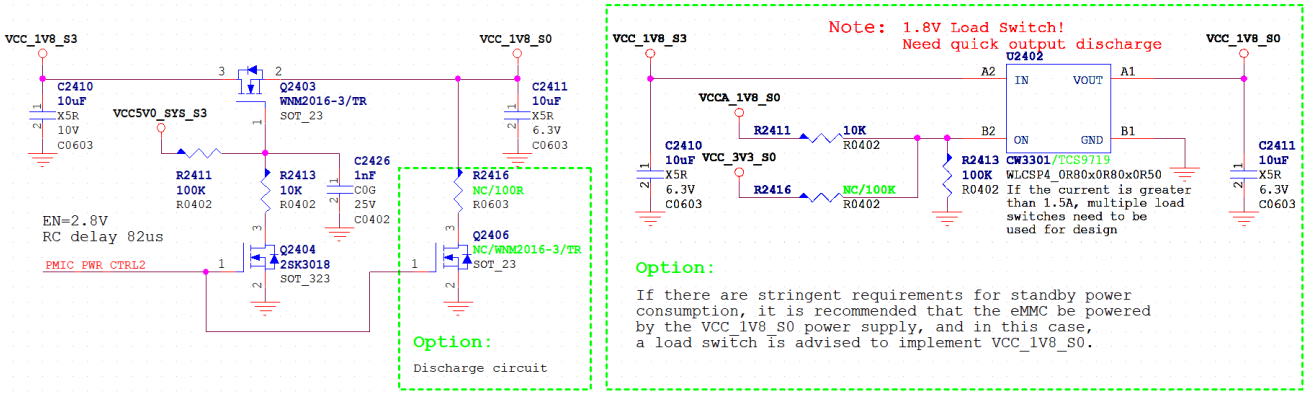
针对待机功耗要求不高的项目，可以将EMMC的VCCIO0电源域供电改为待机常供电VCC_1V8_S3，也就是EMMC待机常供电，此时系统的VCC_1V8_S0供电可不需要采用带放电电阻的load switch(详见2.7 Page 23--24.Power-Ext Discrete/RTC IC)。如果待机功耗要求较高，比如带电池的产品—平板和电子书等，建议EMMC待机时下电来减少功耗，此时需要采用带放电电阻的load switch。



2.7 Page 23--24.Power-Ext Discrete/RTC IC

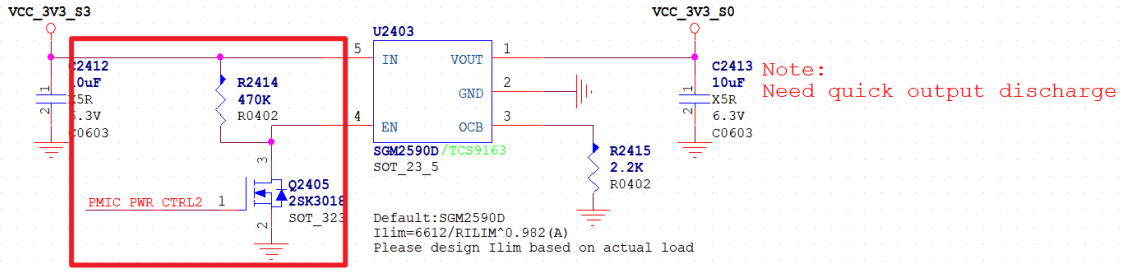
1.8V的带放电电阻的load switch成本较高。
针对待机功耗要求不高时，EMMC待机时可不下电，此时对系统的VCC_1V8_S0供电要求不高，VCC_1V8_S0供电修改为采用MOS管的方案，如下图左侧图所示，其中放电电路为option电路。
如果待机功耗要求较高，比如带电池的产品—平板和电子书等，建议EMMC待机时下电来减少功耗，此时需要采用带放电电阻的load switch，如下图右侧的绿色虚框方案。

VCC_1V8_S0



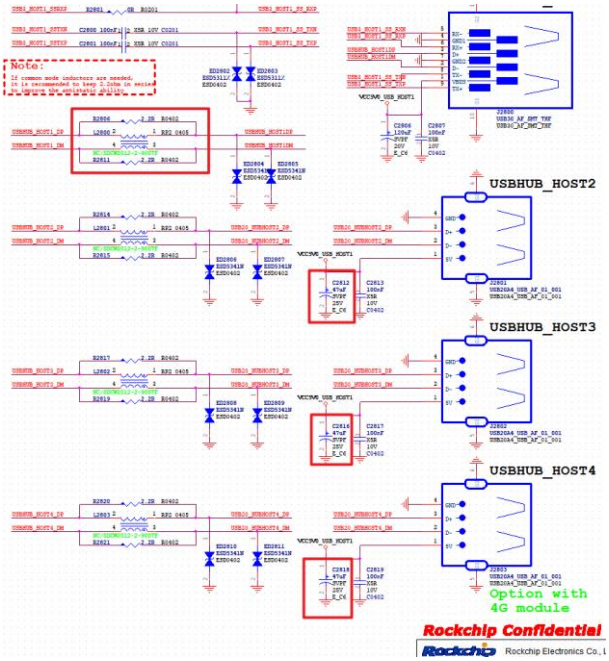
VCC_3V3_S0的使能改用PMIC_PWR_CTRL2和NMOS管来控制，以保证VCC_3V3_S0待机时和VCCA_1V8_S0的压差不大于2V(以满足USB的下电要求)

VCC_3V3_S0



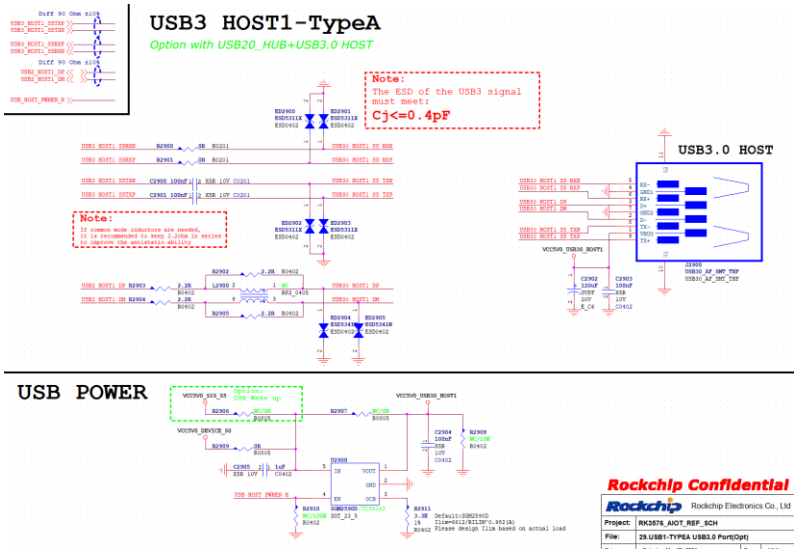
2.8 Page 27-- 28.USB1-USB20_HUB+USB3.0 HOST

由于HUB出来的4个USB公用一路5V供电，为避免总电容太大，上电瞬间把电源拉下来，将USB20接口的供电电源电容从120uF改为47uF。



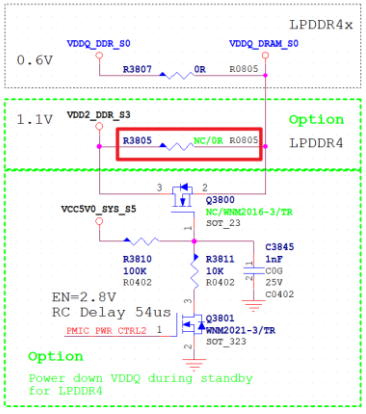
2.9 Page 28-- 29.USB1-TYPEA USB3.0 Port(Opt) (新增)

增加USB1原生USB30 TYPEA 电路，方便客户拷贝。



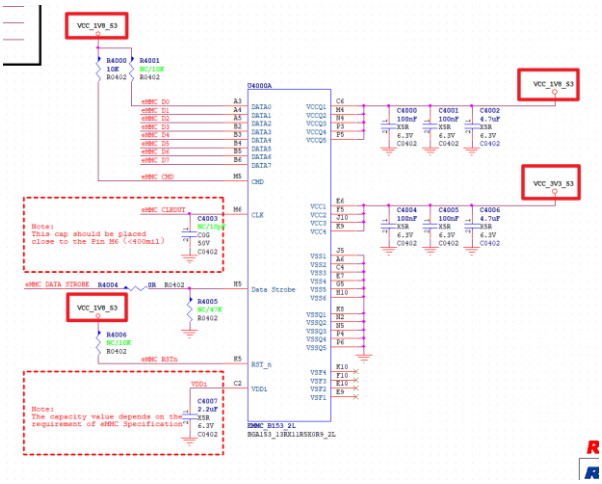
2.10 Page 29--38.DRAM-LPDDR4X_1X32bit_200P

LPDDR4颗粒的VDDQ_DRAM_S0供电增加VDD2_DDR_S3直通电阻方案，针对待机功耗要求不高时，可以选用VDD2_DDR_S3供电，减少器件数量。



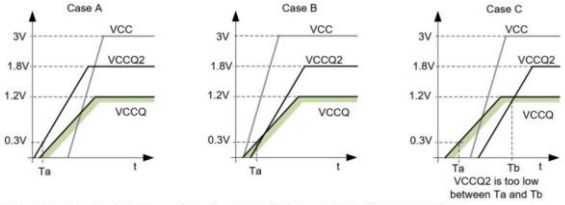
2.11 Page 31--40.Flash-eMMC

针对待机功耗要求不高的项目，可以将EMMC的颗粒供电改为待机常供电VCC_1V8_S3，也就是EMMC待机常供电，此时系统的VCC_1V8_S0供电可不需要采用带放电电阻的load switch(详见2.7 Page 23--24.Power-Ext Discrete/RTC IC)。如果待机功耗要求较高，比如带电池的产品—平板和电子书等，建议EMMC待机时下电来减少功耗，此时需要采用带放电电阻的load switch。



2.12 Page 32--41.Flash-UFS

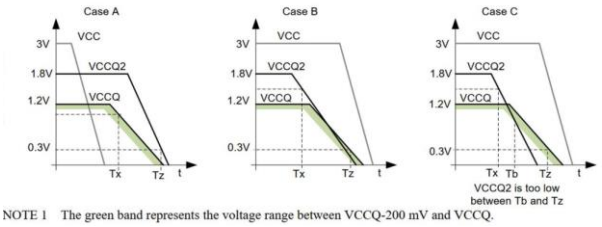
UFS 的时序要求如下：



NOTE 1 The green band represents the voltage range between VCCQ-200 mV and VCCQ.

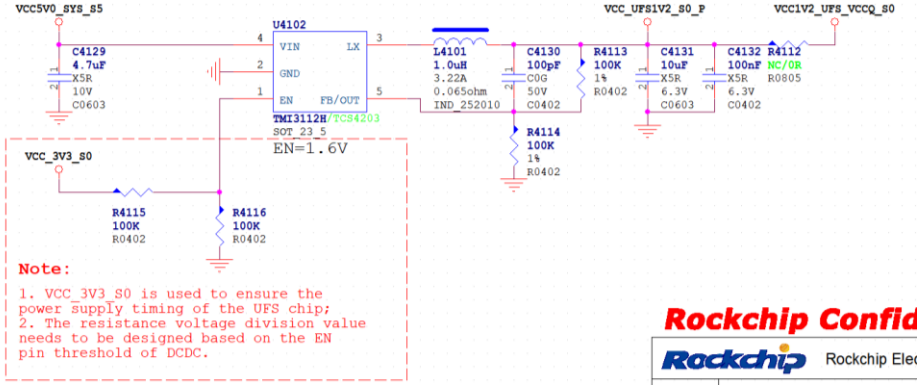
Figure 7.6 — Power up ramps

Figure 7.7 shows three power down ramp examples: case A and case B meet the requirement, while case C violates it in the time interval from Tb to Tz.



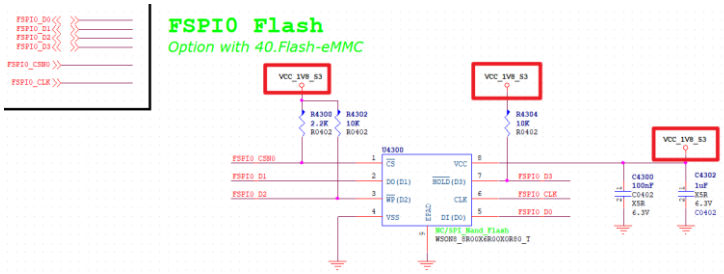
NOTE 1 The green band represents the voltage range between VCCQ-200 mV and VCCQ.

调整 UFS 的 VCC1V2_UFS_VCCQ_S0 供电的使能电路，改为用 VCC_3V3_S0 分压后来使能，该电路可以使 UFS 的时序得到满足。



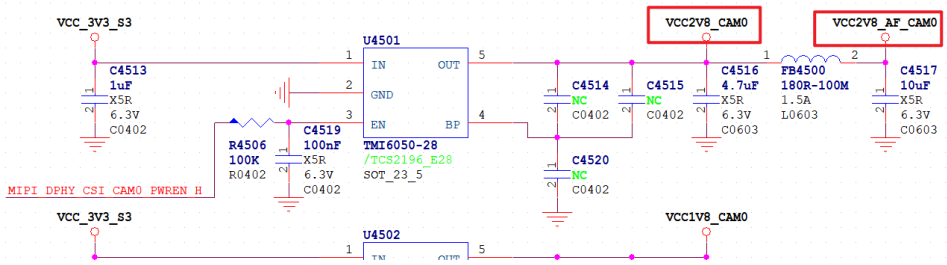
2.13 Page 34--43.Flash-SPI Flash(opt)

由于VCCIO0电源域的供电改为S3供电，FSPI0的颗粒供电也跟着改为S3电源



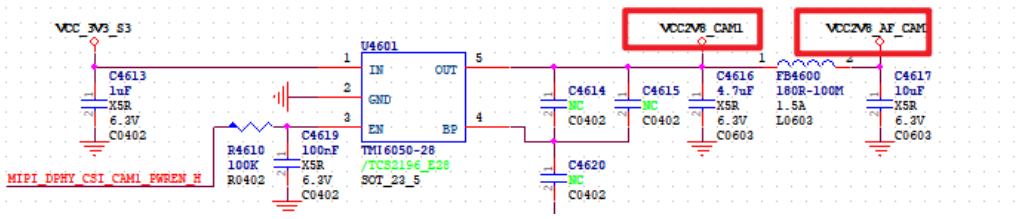
2.14 Page 35--45.VI-CAM MIPI DPHY CSI0 RX

VCC2V8_CAM0 调整到磁珠前，VCC2V8_AF_CAM0 调整到磁珠后



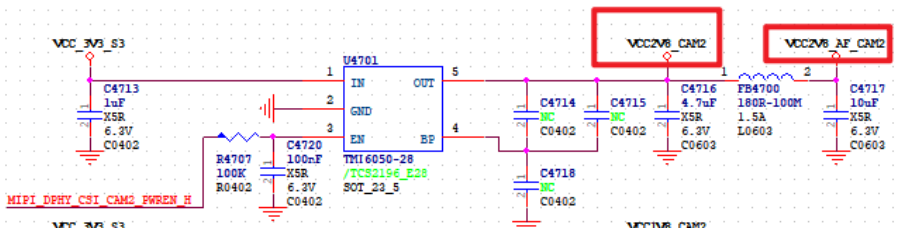
2.15 Page 36--46.VI-CAM MIPI DPHY CSI1/2 RX

VCC2V8_CAM1 调整到磁珠前，VCC2V8_AF_CAM1 调整到磁珠后



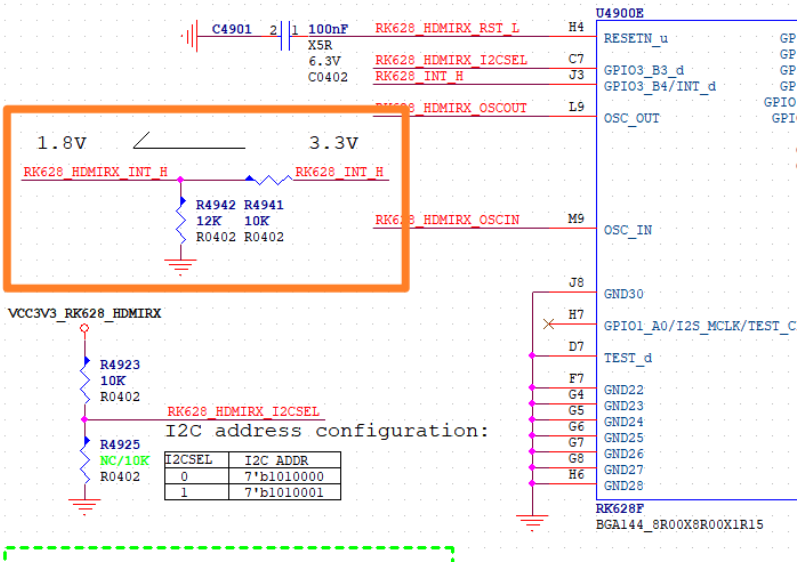
2.16 Page 37--47.VI-CAM MIPI DPHY CSI3/4 RX

VCC2V8_CAM2 调整到磁珠前，VCC2V8_AF_CAM2 调整到磁珠后

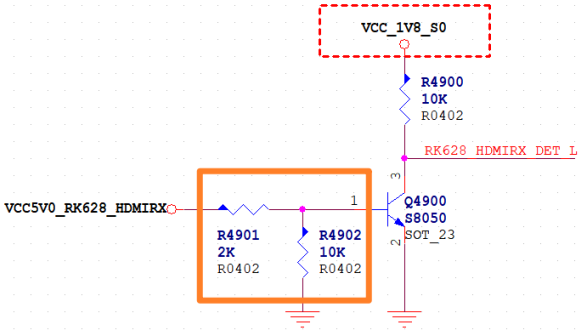


2.17 Page 38-- 49.VI-HDMI20 RX to MIPI RX(Opt)

RK628F 的 RK628_INT_H 信号是 3.3V 电平，且是高电平有效，RK3576 由于参考图中选择的 GPIO 是 1.8V 的，需要加电阻分压



分压电阻改小，加快放电速度



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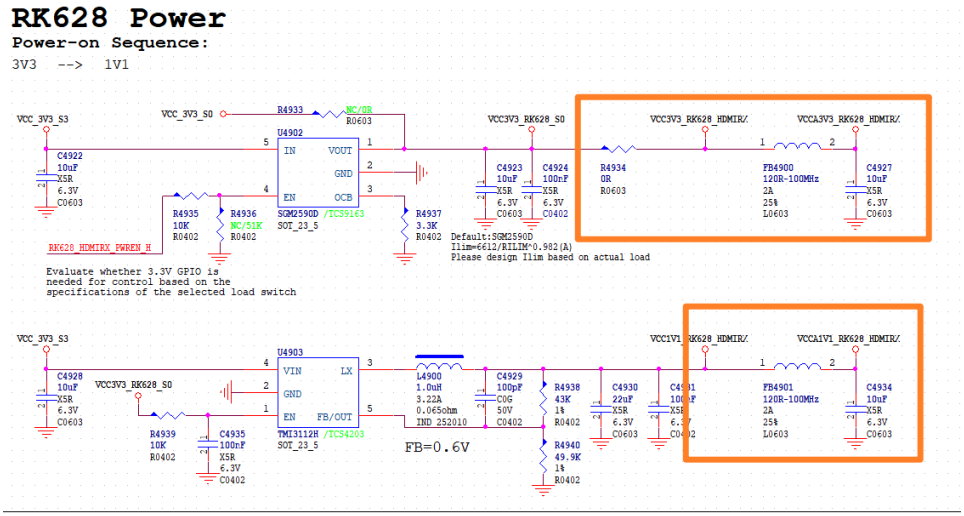
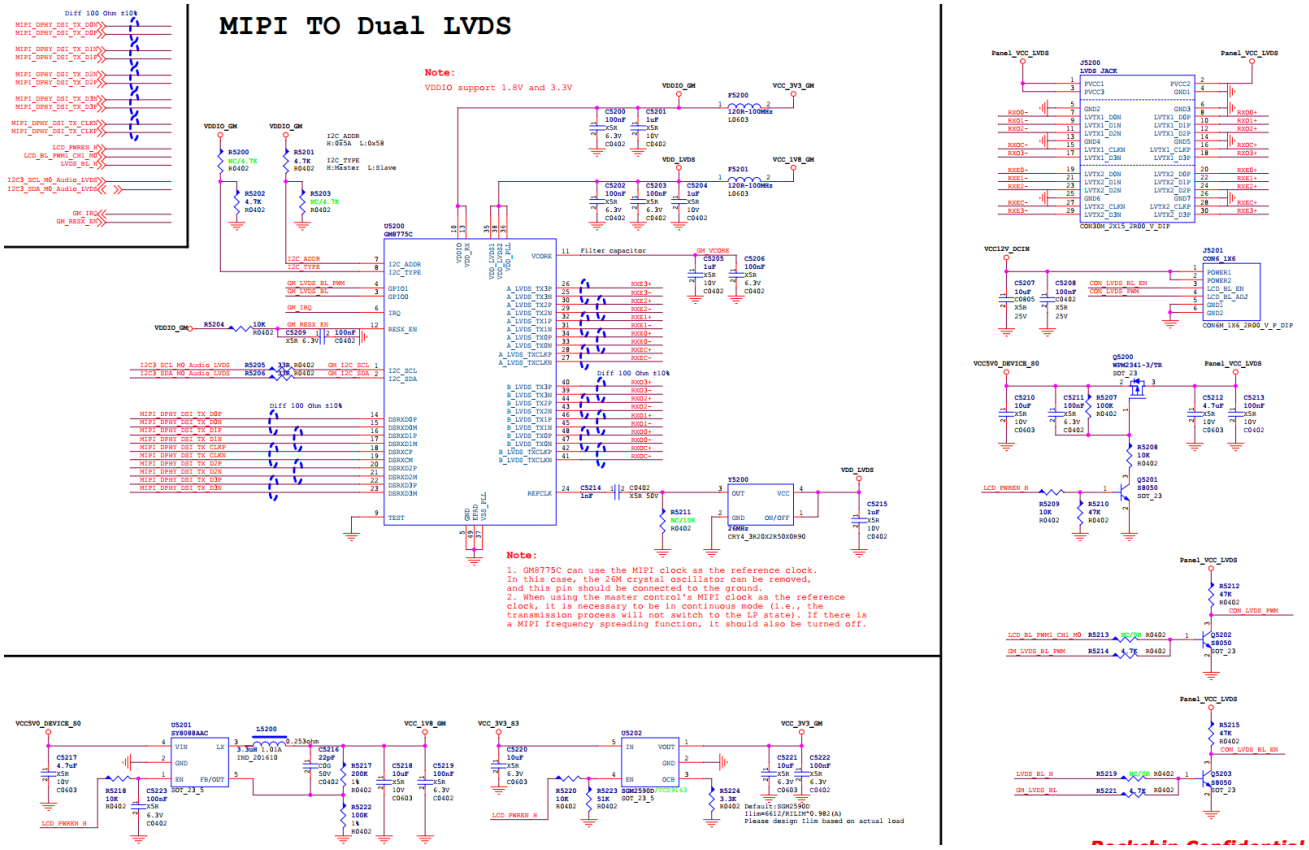


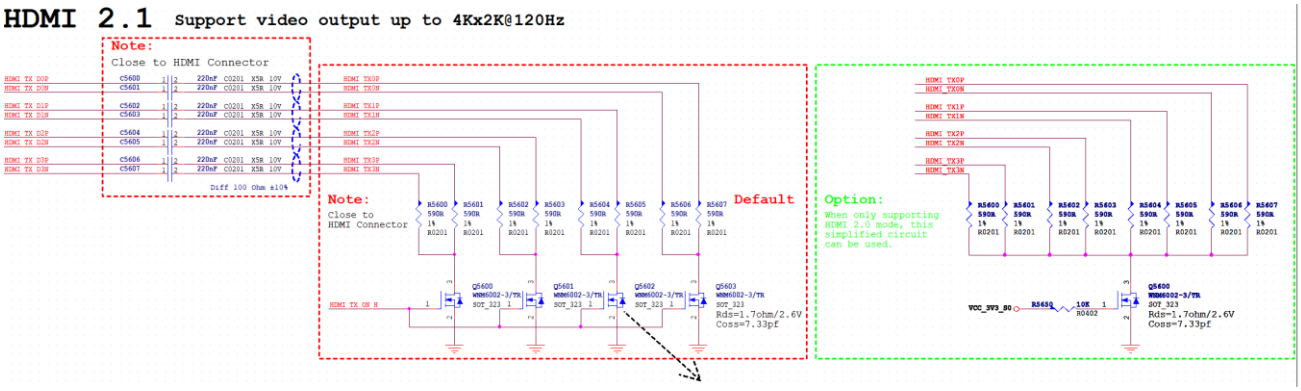
2.18 Page 40--52.VO-MIPI to LVDS_GM8775C(新增)

新增 MIPI 转双 LVDS 电路



2.19 Page 43--56.VO-HDMI TX

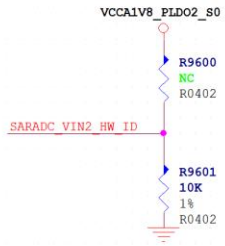
增加仅支持HDMI2.0时的MOS管简化方案，如下图绿色虚框所示。



2.20 Page 63-- 96.HW_ID

SARADC上拉电源改为VCCA1V8_PLDO2_S0。
将HW_ID的电阻配置等比例降低阻值，提高抗干扰能力。

HW_ID



Config Table for SARADC_VIN2_HW_ID				
Item	**Rup**	**Rdown**	**ADC Value**	**VERSION**
HW_ID1	NC	10K	0	HW_ID0
HW_ID2	10K	1.13K	416	RESERVE
HW_ID3	10K	2.49K	816	RESERVE
HW_ID4	10K	4.3K	1231	RESERVE
HW_ID5	10K	6.8K	1658	RESERVE
HW_ID6	10K	10K	2048	RESERVE
HW_ID7	10K	14.7K	2437	RESERVE
HW_ID8	10K	23.2K	2862	RESERVE
HW_ID9	10K	40.2K	3279	RESERVE
HW_ID10	10K	88.7K	3680	RESERVE
HW_ID11	10K	NC	4095	RESERVE