REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

DC座子 12V输入

主力供电

12V端子 常开

调试方便，不能作为主力供电使用

注意选的电容要耐高压

预留9V电源 潜在外设需要

VOUT=0.6*(1+R0202/R0203)=9v

9V端子 可控

LCD偏置/背光/数字电源+音频PA

VOUT=0.6*(1+R0202/R0203)=5v

Air1603/4G/WiFi/153D/...

板载485及外设供电 5V

VOUT=0.6*(1+R0202/R0203)=5v

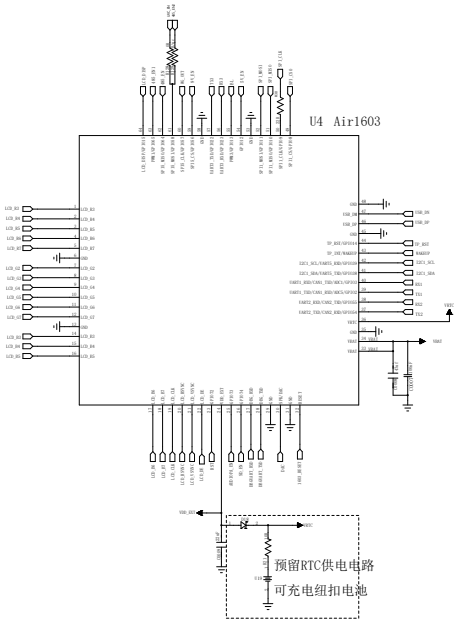
5V端子 常开

UVC供电 5.5V

VOUT=0.6*(1+R0202/R0203)=5.5v

DRAWN: ZhuPingjun	DATE: 20260528	COMPANY: 上海合宙	
CHECKED: Laolu	DATE: 20260528	TITLE: Air8603	
QUALITY CONTROL: Laolu	DATE: 20260528	CODE:	SIZE: A0 / DRAWING NO: / REV:
RELEASED: Laolu	DATE: 20260528	SCALE:	SHEET: 1 OF 12

Air1603 大屏智能主控

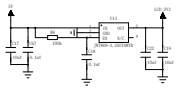


螺丝孔

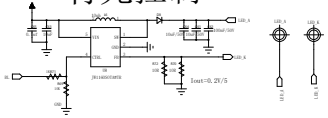
COMPANY: 上海合宙			
TITLE: Air8603			
DRAWN: ZhuPingjun	DATE: 20260928		
CHECKED: Laolu	DATE: 20260928		
QUALITY CONTROL: Laolu	DATE: 20260928		
RELEASED: Laolu	DATE: 20260928		
CODE:	SIZE: A0	DRAWING NO:	REV:
SCALE:		SHEET: 2 OF 12	

REVISION RECORD			
LTR	ECO NO.	APPROVED:	DATE:

数字电源3.3V



背光控制

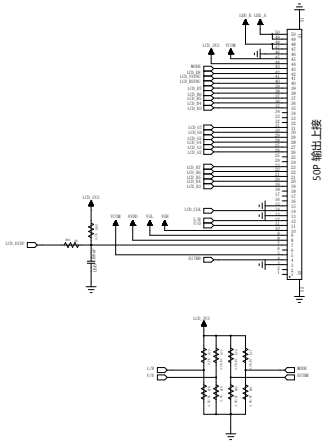


Air1603全系仅支持RGB565

当前已适配最高分辨率1200*600，理论可支持到1280*800

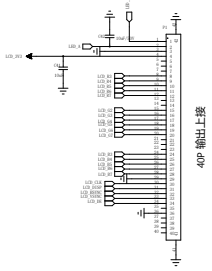
50PIN LCD

常用于7寸 9寸 10.1寸等大尺寸LCD



40PIN LCD

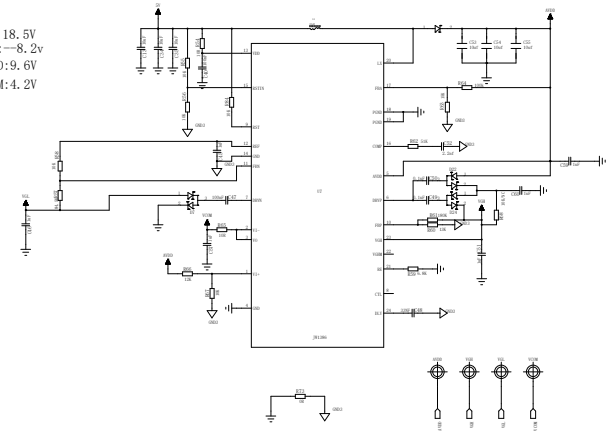
常用于5寸 7寸 9寸等小尺寸LCD



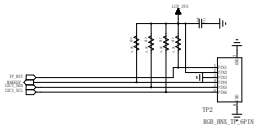
偏置电源

本示例仅在50PIN LCD类型时使用,7寸 9寸 10.1寸等大尺寸LCD常用

VGH:18.5V
VGL:—8.2v
AVDD:9.6V
VCOM:4.2V



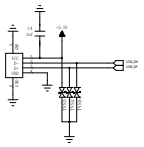
电容触摸



DRAWN: ZhuPingJun	DATE: 20260928	COMPANY: 上海合宙	
CHECKED: Laolu	DATE: 20260928	TITLE: Air8603	
APPLICATE CONTROL: Laolu	DATE: 20260928	CODE:	SIZE: A0 / DRAWING NO: / REV:
REVIEWED: Laolu	DATE: 20260928	SCALE:	SHEET: 3 OF 12

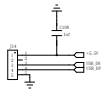
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

Type-A USB母头



USB端子连接器

与USB母头做兼容设计



UART串口端子

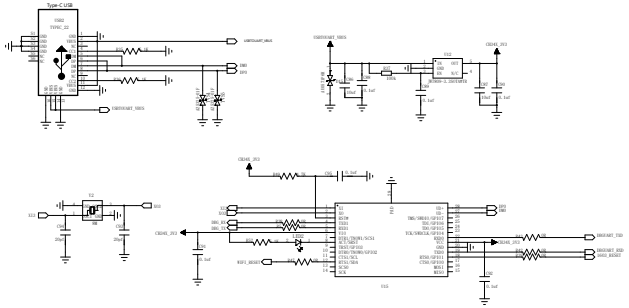
人脸识别摄像头需搭配一路UART通信

人脸识别摄像头:AirCamera_1034

DRAWN: ZhuPingJun	DATE: 20260928	COMPANY: 上海合宙	
CHECKED: Laolu	DATE: 20260928	TITLE: Air8603	
QUALITY CONTROL: Laolu	DATE: 20260928	CODE: / SIZE: A0 DRAWING NO: / REV: /	
APPROVED: Laolu	DATE: 20260928	SCALE: / SHEET: 4 OF 12	

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

USB to UART 下载电路



DRAWN:	ZhuPingJun	DATE:	202605928
CHECKED:	Laolu	DATE:	202605928
QUALITY CONTROL:	Laolu	DATE:	202605928
RELEASED:	Laolu	DATE:	202605928

COMPANY: 上海合宙

TITLE: Air8603

CODE: | SIZE: A0 | DRAWING NO: | REV:

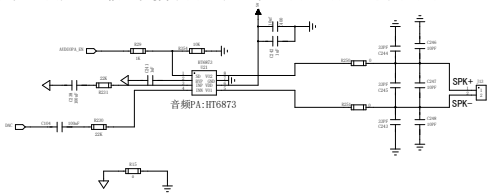
SCALE: | SHEET: 5 OF 12

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

音频PA电路

4Ω喇叭/5V供电/THD=10% 下最高输出功率3.5W

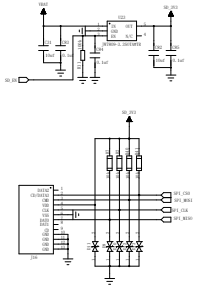
Air1603仅支持音频DAC输出，播放音乐或TTS；录音/通话/SIP等功能仅在Air1604系列支持



DRAWN: ZhuPingJun	DATE: 20260928	COMPANY: 上海合宙	
CHECKED: Laolu	DATE: 20260928	TITLE: Air8603	
QUALITY CONTROL: Laolu	DATE: 20260928	CODE:	SIZE: A0 / DRAWING NO: / REV:
REVIEWED: Laolu	DATE: 20260928	SCALE:	SHEET: 6 OF 12

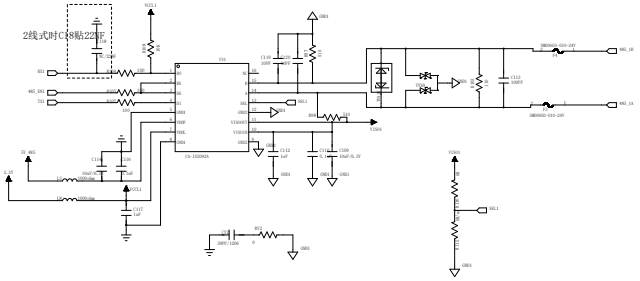
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

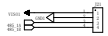
SPI接口SD卡



REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

隔离式485收发器1



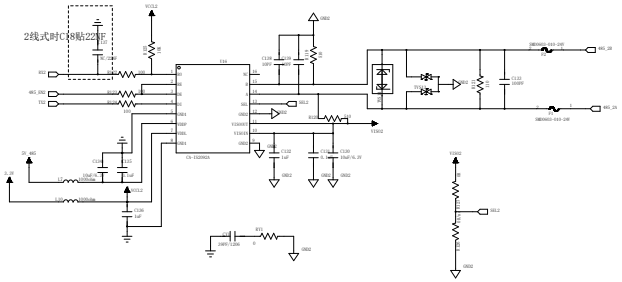


VISO1电流输出能力较弱

请结合IS2092规格书说明谨慎用于小电流外设

隔离式485收发器2

本路485与人脸识别UVC摄像头二选一，不可同时使用

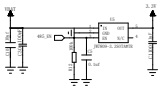


VISO2电流输出能力较弱

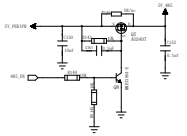
请结合IS2092规格书说明谨慎用于小电流外设

三路485数字电源

三路收发器共用(两路隔离+一路非隔离)

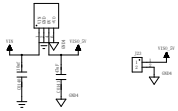


隔离485逻辑电源



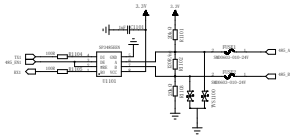
隔离电源输出

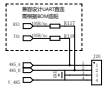
大电流隔离电源，预留设计，根据BOM选贴



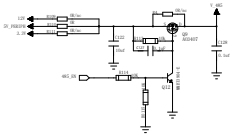
非隔离485收发器

与隔离式485收发器1二选一，不可同时使用





外设电源供电控制



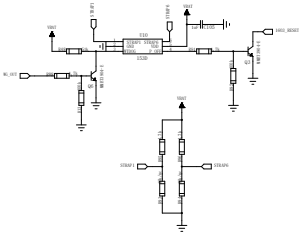
LuatOS已支持Modbus协议

详见扩展库exmodbus中的介绍

DRAWN: ZhaPingJun	DATE: 20260928	COMPANY: 上海合宙	
CHECKED: Laolu	DATE: 20260928	TITLE: Air8603	
QUALITY CONTROL: Laolu	DATE: 20260928	CODE:	SIZE: A0 / DRAWING NO: / REV:
APPROVED: Laolu	DATE: 20260928	SCALE:	SHEET: 8 OF 12

REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

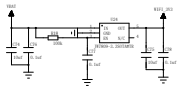
Air153D看门狗



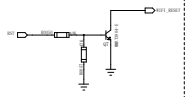
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

4G与WiFi不可同时使用
根据BOM选贴WiFi或4G

WiFi供电3.3V



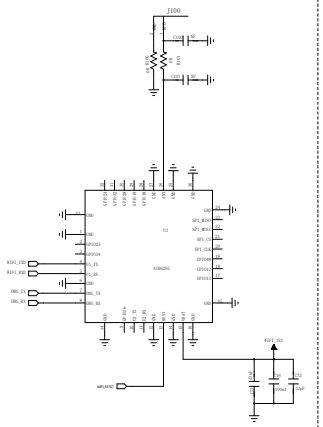
WiFi重启控制



WiFi模组Air6205

Air6205支持板载天线

Air6205A支持IPEX外接天线



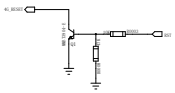
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

特别提醒！

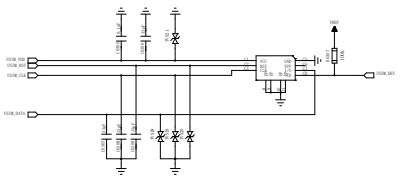
4G与WiFi不可同时使用

根据BOM选贴WiFi或4G

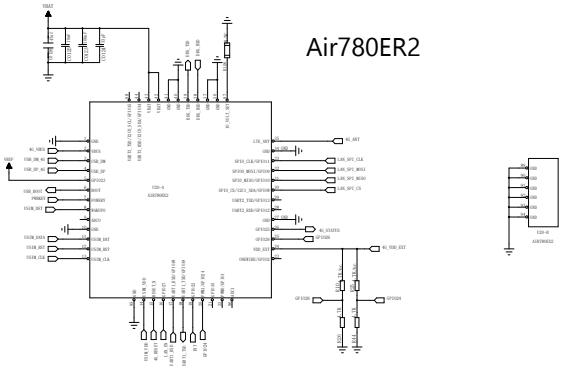
4G重启控制



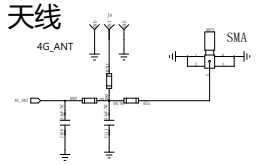
SIM卡座



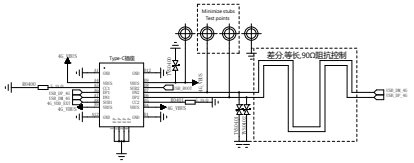
Air780ER2



天线

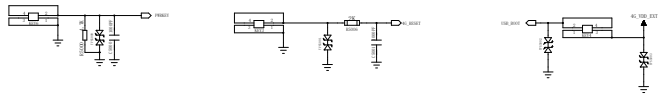


USB



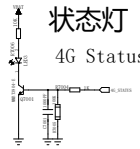
1.USB走线需要严格按照差分线控制，做到平行和等长；
2.USB走线的阻抗需要控制到差分90欧姆；
3.需要尽可能的减少USB走线的stubs，减少信号反射；USB信号的测试点最好直接放在走线上以减少stub
4.在靠近USB连接器或者测试点的地方添加TVS保护管，由于USB的速率较高，需保证选用的TVS保护管的寄生电容小于1pF
5.VBUS作为USB插入检测，必须连接USB电源或者外接电源，否则USB无法被检测到，VBUS的检测电压要大于3.3V

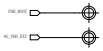
按键开机　RESET_N 复位　USB下载使能



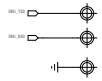
状态灯

4G Status

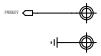




USB_BOOT 在开机过程中拉高可以进入USB下载模式
建议预留测试点



DGB_UART，也常备称作为UART0，用作底层日志的抓取
波特率921600bps，不可更改
不可作为通用UART使用



开机键测试点，设计批量升级夹具时会用到

VBAT供电测试点，设计批量升级夹具时会用到

COMPANY:	上海合宙		
TITLE:	Air8603		
DRAWN: ZhuPingJun	DATE: 20260928	CODE:	SIZE: A0 / DRAWING NO: / REV:
CHECKED: Laolu	DATE: 20260928		
APPLITT CONTROL: Laolu	DATE: 20260928		
RELEASED: Laolu	DATE: 20260928	SHEET 13 OF 12	

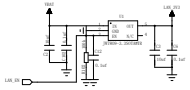
REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

以太网CH390H挂载在4G模组Air780ER2下

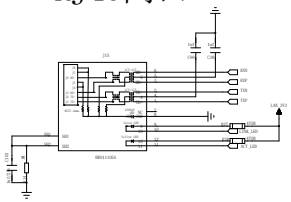
主控Air1603没有参与管理和调度

可用于为以太网接口的IPC外设提供通信通道

CH390H供电 3.3V

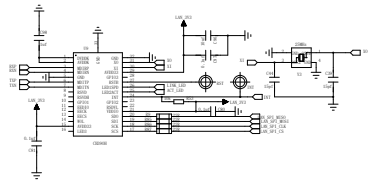


RJ45网口



以太网

SPI接口CH390H



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TITLE:	Air8603		
DRAWN: ZhuPingJun	DATE: 20260928	CODE:	SIZE: A0
CHECKED: Laolu	DATE: 20260928	DRAWING NO:	REV:
QUALITY CONTROL: Laolu	DATE: 20260928		
APPROVED: Laolu	DATE: 20260928	SCALE:	SHEET: 12OF 12