

版本更新说明 杰理方案咨询 (QQ号:371116160 邮箱:sales@yunthinker.com)		
版本号	更新日期	更新描述:
V1.0	2025.01.07	初始版本

电源接口:

VPWR: 电源供电接口, 不超过5.5V;

IOVDD: 内部LDO输出, GPIO逻辑电压;

VSS: 数字地

模拟音频接口:

PB0: 模拟音频输出

PAI3: 麦克风模拟输入

APAP: D类扬声器驱动正输出

APAN: D类扬声器驱动负输出

特殊功能IO:

ADCx: 10bit ADC输入通道;

USBDM&DP: USB1.1信号

RESET: 默认长按复位

PA9: 耐5V IO, 驱动10mA, 串口升级

产品安全规范:

1.VPWR输入电压≤5.5V;

2.IOVDD的电容必须保证质量和容量, 电容耐压值应大于工作电压一倍以上;

3.锂电池必须带锂电, 如果电池不带锂电, 硬件设计需添加过流放电电路;

3.外漏接口和后焊物料: USB座, 电池等, 做好静电和浪涌保护措施,

整机ESD应符合最低标准, 接触4K, 空气48K.

设计注意事项:

1.VPWR输入电压≤5.5V;

2.IOVDD3.3V/100mA@0.3Vdnp输出状态, 电压档位可调, 软件无法关断(软开机方案注意避免漏电流);

3.GPIO的电压输入范围: VSS≤Vio≤IOVDD, 超出范围有损坏风险;

4.所有GPIO都支持三态输出和内置上下拉电阻配置, 可配置唤醒/中断功能;

5.PAI3的MIC_BIAS功能为麦克风供电输出, 可软件配置电压输出档位;

6.PA0默认长按复位, 长按复位时间最长可配置16s, 复位功能可屏蔽;

7.支持重映射的外设接口: I2C, UART0&1, PWM, IRDA, 可映射到任意IO;

8.集成FuSpeed USB接口, USBDM和DP可GPIO使用;

9.PB0的DAC输出内阻5K左右;

10.APAP: APAN直接驱动8Ω/4Ω@0.5W扬声器;

11.必要测试点: VPWR, USBDM, USBDP, VSS;

12.IO分配时, MIC和DAC等模拟信号必须远离PWM, CLK, DAT等数字翻转信号, 避免相邻干扰。

语音控制方案

U1

IOVDD 1 VSS 8 GND

VPWR/HPVDD 2 ADC12/MICBIAS/AINA0/PA13 7 MICIN MIC输入

APAP 3 ADC4/ADC2/PA2/USBDM 6 USBDM PA2

APAN/PA9(HVT)/Update 4 ADC6/ADC5/PA4/USBDM 5 USBDM PA4

AD248A

U2

IOVDD 1 VSS 8 GND

VPWR 2 ADC12/MICBIAS/AINA0/PA13 7 MICIN MIC输入

LED B 3 PA0(pu)/PB0/ADC0/ADC15/DAC/RESET 6 USBDM LED G

PA9 4 PA9(HVT)/Update 5 USBDM LED R

AD248B

Speaker

APAP 1

APAN 2

D10 TVS-5V

D11 TVS-5V

MCU直接驱动8Ω/4Ω扬声器

MIC

MICIN

RGB_LED

LED B 2 B 1

LED G 4 G 3

LED R 6 R 5

TP1 VPWR

TP2 USBDM

TP3 USBDM

TP4 GND

烧写调试

USB 小音箱方案

U3

IOVDD 1 VSS 8 GND

VPWR/HPVDD 2 ADC12/MICBIAS/AINA0/PA13 7 ADKEY 按键检测

APAP 3 ADC4/ADC2/PA2/USBDM 6 USBDM PA2

APAN/PA9(HVT)/Update 4 ADC6/ADC5/PA4/USBDM 5 USBDM PA4

AD248A

U4

IOVDD 1 VSS 8 GND

VPWR 2 ADC12/MICBIAS/AINA0/PA13 7 ADKEY 按键检测

PA0(pu)/PB0/ADC0/ADC15/DAC/RESET 6 USBDM PA2

PA9(HVT)/Update 5 USBDM PA4

AD248B

U5

IOVDD 1

MUTE 2

Bypass 3

IN+ 4

IN- 5

OUT+ 8

OUT- 7

GND 6

VDD 5

SPK+ 8

SPK- 7

DC5V

U6

1

2

SPK

U7

1

2

APAP

APAN

D12 TVS-5V

D13 TVS-5V

MCU直接驱动8Ω/4Ω扬声器

Audio PA

U8

TYPEC母(充电输入)

VBUS 1

SBU2 2

DN2 3

DP2 4

CC2 5

VBUS 6

GND 7

GND 8

GND 9

GND 10

GND 11

GND 12

GND 13

GND 14

GND 15

GND 16

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