

C3 主板产品规格书

C3 Mainboard Specification

| | |
|------------|------------|
| 版本 Version | 1.1 |
| 日期 Date | 2020-05-05 |

敬告：本档版权归内容原创公司所有，并保留一切权力。档内容如有修改更新，请联系提供方获取最新本，恕不另行通知。

Note: This document is copyrighted by the content original company and all rights reserved. If the contents of the document are updated, please contact the provider for the latest version without notice.

修改记录 Changelog

| | | |
|-------|------------|----------------------------|
| 1.0.0 | 2019-07-19 | 本文档第一个版本。 |
| 1.1.0 | 2020-02-12 | 修正规格清单表格中的文字错误和 J4/J18 定义。 |
| 1.1.1 | 2020-05-05 | 增加 m-PCIe 接口 USB 端口信号说明。 |

目录 Contents

| | | |
|----------|---|-----------|
| 1 | 产品概述 PRODUCT OVERVIEW | 4 |
| 2 | 规格清单 SPECIFICATION LIST | 6 |
| 3 | 接口定义 INTERFACE DEFINITION | 8 |
| 3.1 | J1 串口和 IO 接口 SERIAL AND IO HEADER | 8 |
| 3.2 | J2 DC-12V 插座 DC-12V JACK | 8 |
| 3.3 | J3 DC-12V 输入接口 DC-12V INPUT HEADER | 8 |
| 3.4 | J4 RTC 电池座 RTC BATTERY HEADER | 9 |
| 3.5 | J5 音频输入接口 AUDIO INPUT HEADER | 9 |
| 3.6 | J6 按键和 IO KEYPAD AND IO HEADER | 9 |
| 3.7 | J7 USB OTG 插座 USB OTG JACK | 10 |
| 3.8 | J8 M-PCIE 卡座 M-PCIE CARD SOCKET | 10 |
| 3.9 | J9 NANO-SIM 卡座 NANO-SIM SOCKET | 10 |
| 3.10 | J10 风扇供电 FAN SUPPLY | 10 |
| 3.11 | J11 RJ45 以太网口 RJ45 ETHERNET JACK | 10 |
| 3.12 | J12 USB 2.0 接口 USB 2.0 HOST HEADER | 10 |
| 3.13 | J14 USB 2.0 接口 USB 2.0 HOST HEADER | 11 |
| 3.14 | J15 三色 LED TRIPLE-COLOR LED | 11 |
| 3.15 | J16 双层 USB TYPE A 插座 DOUBLE USB TYPE A SOCKET | 11 |
| 3.16 | J17 音频线路输出 AUDIO LINE OUTPUT | 11 |
| 3.17 | J18 开关机插座 POWER SWITCH HEADER | 12 |
| 3.18 | J19 耳机插座 HEADPHONE JACK | 12 |
| 3.19 | J20 VGA 输出接口 VGA OUTPUT HEADER | 12 |
| 3.20 | J22 VGA 输出插座 VGA OUTPUT JACK | 12 |
| 3.21 | J28 TF 卡座 TF CARD JACK | 13 |
| 3.22 | J29 HDMI 输出插座 HDMI OUTPUT JACK | 13 |
| 3.23 | IR 红外遥控接收头 IR INFRA-RED REMOTE CONTROL RECEIVE HEADER | 13 |
| 3.24 | ANT WiFi 天线插座 WiFi ANTENNA JACK | 13 |
| 3.25 | SW1 烧录模式按键 RECOVERY MODE BUTTON | 13 |
| 4 | 物理尺寸 PHYSICAL SIZE | 14 |
| 5 | 注意事项 PRECAUTIONS | 15 |
| 6 | 软件指南 SOFTWARE GUIDE | 17 |

1 产品概述 Product Overview

C3 主板基于瑞芯微 RK3288 高性能四核应用处理器平台，RK3288 主芯片集成四核 Cortex-A17 和 Mali-T764 高性能四核 GPU，主频最高可达 1.6GHz，具备超强的计算性能、2D/3D 图形处理能力和全高清视频编解码能力，完美支持 4Kx2K@60fps 超清解码和 4Kx2K HDMI 超清输出。

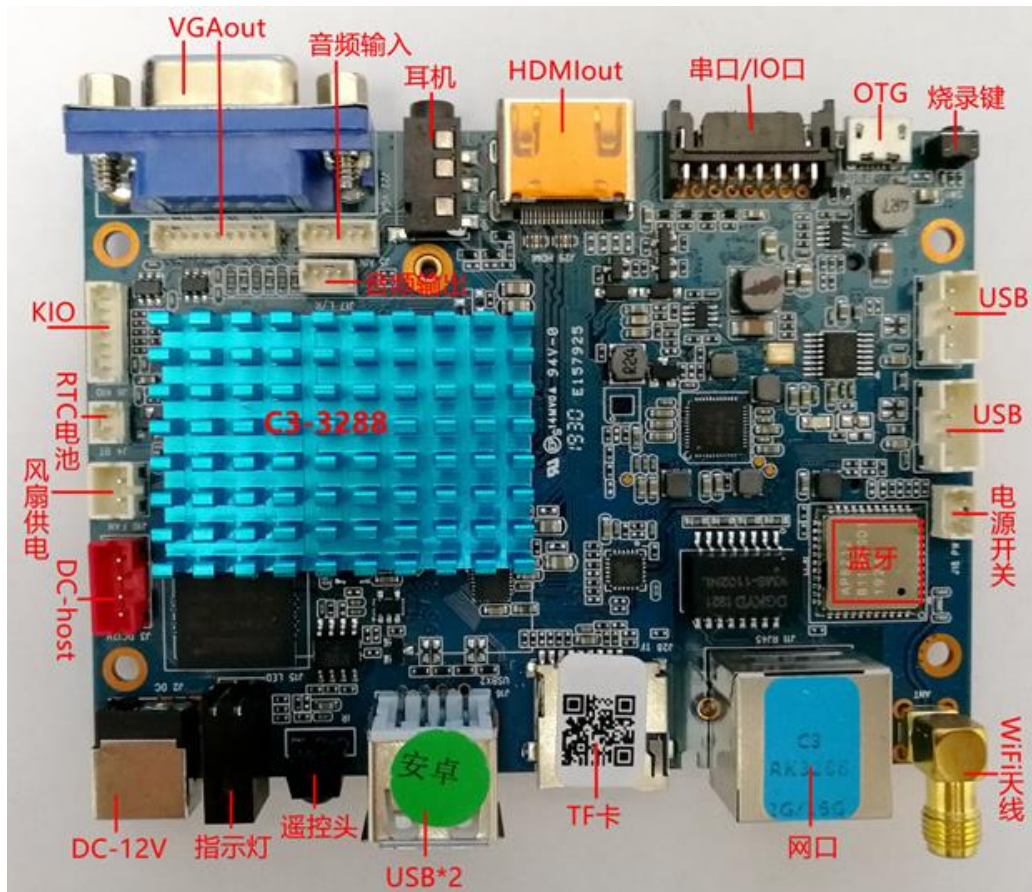
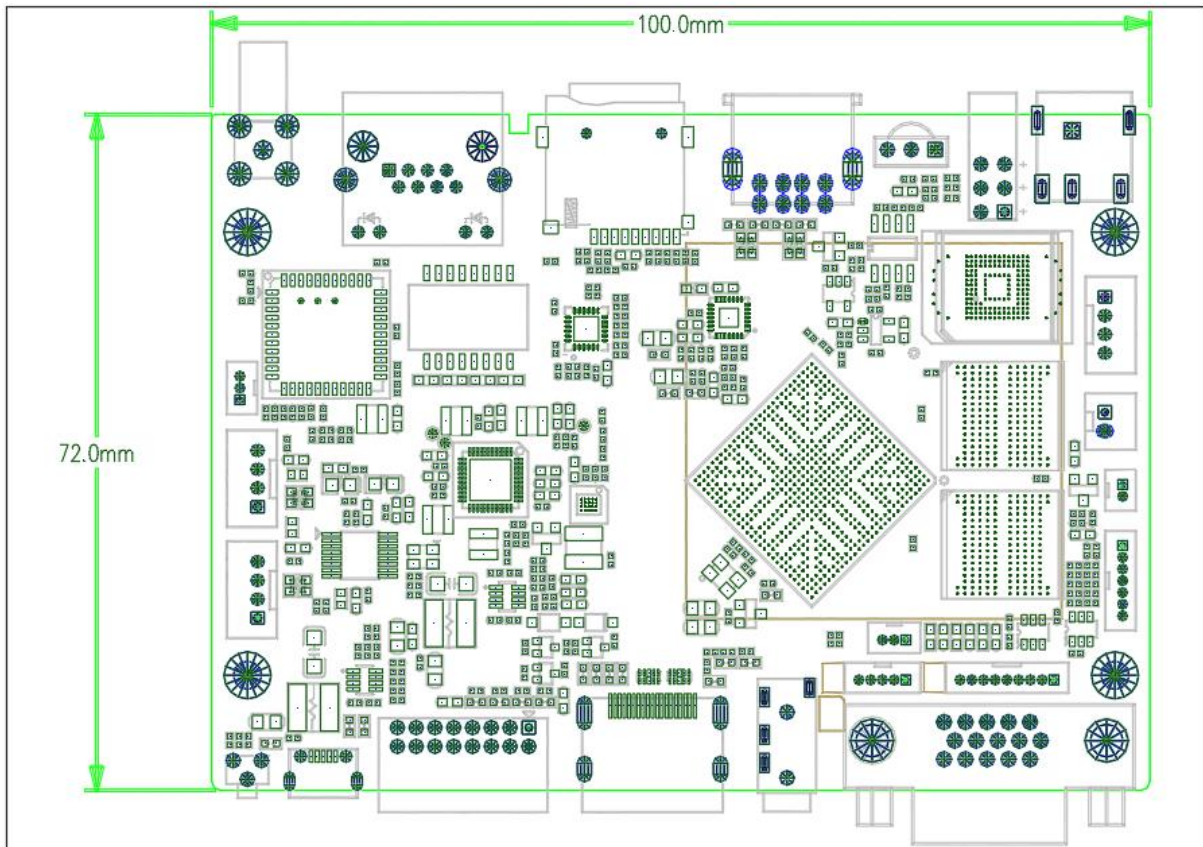
C3 mainboard is based on Rockchip RK3288 high-performance application processor platform. RK3288 SOC chip integrates Cortex-A17 quad-core and Mali-T764 quad-core GPU, clocked at up to 1.6GHz, with superior computing performance, 2D/3D graphics processing capabilities and Full HD video codec capabilities. It perfectly supports 4Kx2K@60fps decoding and 4Kx2K HDMI output.

此款主板专门针对**精简电脑**应用选材和设计，紧凑的尺寸和丰富的接口方便其集成到整机中，为最终的产品带来流畅的体验和超强的性能。

This mainboard is specially designed for **compact PC application** with strict material selection and design. The compact size and rich interface facilitate its integration into the complete machine, bringing a smooth experience and superior performance to the final product.

C3 主板实物照片接口示意图如下所示。

C3 mainboard actual interface diagram as shown below.



2 规格清单 Specification List

C3 的系统功能和接口特性如下表所示。C3's system functions and interface features are shown in the following table.

| 功能&接口 Function&Interface | 详细描述 Detailed Description |
|---|--|
| CPU | RK3288 Cortex-A17 四核, 最高主频 1.6GHz RK3288 Cortex-A17 quad-core, up to 1.6GHz |
| DDR | LPDDR-III 2GB (4GB 可选) LPDDR-III 2GB (4GB optional) |
| 存储·Storage | 默认标配 8GB EMMC NAND 芯片, 可扩展至最大 128GB The default comes with an 8GB EMMC NAND chip that can scale up to 128GB |
| VGA 输出 | 行业标准 DB-15 VGA 输出接口和 9 芯排针接口, 最高支持 1080P 输出 Industry-standard DB-15 and 9-pin header VGA output up to 1080P |
| HDMI 输出 HDMI Output | HDMI 2.0 标准显示接口, 最高支持 4K 输出 HDMI 2.0 standard display interface supports up to 4K output |
| 线路输出·Line Output | 支持标准左右声道线路输出 (排针接口) 和三段耳机接口 Support standard left and right channel line output (pin header) and 3-pole HP jack |
| MIC 输入 MIC Input | 单端 MIC 输入 (排针接口) Single-end MIC input (pin header) |
| USB 2.0 接口 USB 2.0 Interface | 2 个外置横插接口 (双层插座), 2 个内置排针, 1 个 OTG Micro-USB 插座 2 horizontal connectors (Dual Socket), 2 pin headers, 1 OTG Micro-USB |
| 串口 Serial Port | 4 路 TTL/RS-232 兼容 (2 路一组同时为 TTL 或 RS-232) 4 TTL/RS-232 compatible |
| 风扇接口 Fan Port | 5V 风扇供电接口 5V fan power supply port |
| TF 卡 Micro SD Card | 自弹式 TF 卡插座, 最高支持 128GB TF 卡 Self-elastic micro SD card socket, up to 128GB capacity |
| 摄像头 Camera | 支持 200 万像素以内 USB 摄像头 Support USB camera within 2 million pixels |
| WiFi | 内置高性能 SDIO 接口 WiFi 模块, 支持 IEEE 802.11 b/g/n Built-in high performance SDIO interface WiFi module, support IEEE 802.11 b/g/n |
| 蓝牙 Bluetooth | 内置高性能串口接口 BT 模块 (选配), 支持 V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.0 Built-in high performance serial interface BT module (optional) with support for V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.0 |
| 以太网口 Ethernet | 10/100M 自适应以太网 RJ45 网口 10/100M Adaptive Ethernet RJ45 connector |
| MiniPCI-E 4G | 行业标准 MiniPCI-E 4G 模块接口, 支持 Nano-SIM 卡插槽 Industry standard MiniPCI-E 4G module interface with Nano-SIM card socket |
| 红外遥控 | 标准红外遥控接收头和红外接收排针接口 |

| 功能&接口 Function&Interface | 详细描述 Detailed Description |
|---|--|
| Infrared RC | Standard infrared remote control receiver and infrared receiver pin header |
| GPIO 信号 GPIO Signals | 9 路 GPIO 信号, 可扩展 GPIO 按键和/或 3.3V 输入/输出 9-way GPIO signals for such as GPIO buttons and/or 3.3V digital input/output |
| 实时时钟 Real Time Clock | 超低功耗 RTC 电路 (带 CR1220 纽扣电池), 并可支持定时开关机 Ultra-low-power RTC circuit (CR1220 battery) with timer and alarm functionalities |
| 指示灯 LED Indicator | 待机/网络/运行三色指示灯 Three-color LED indicator for standby, network and running |
| 按键 Buttons | 烧录键 (RECOVERY) 和电源/复位排针排接口 Recovery mode button and power/reset pin header |
| 电源输入 DC Input | 支持 9~15V 宽电压直流电源输入 Supports 9~15V wide voltage DC power input |
| 环境要求 Ambient Requirement | 工作温度 0°~70°, 工作湿度 0%~95% (不结露) Working temperature 0°~70°, working humidity 0%~95% (non-condensing) |
| 物理尺寸 Physical Size | 长*宽*高 (100mm*72mm*17mm) Length*Width* Height (100mm*72mm*17mm) |
| 安卓系统 Android Version | 推荐 Android 5.1, 可选 Android 6.0 和 7.1 Recommended Android 5.1, Optional Android 6.0 and 7.1 |

3 接口定义 Interface definition

3.1 J1 串口和 IO 接口 Serial and IO Header

【J1】串口和 IO 接口（双排 2.0mm-方孔为 1 脚）。[J1] Serial and IO Header (DIP 2.0mm-Square pad is pin 1).

| Pin# | Definition | Pin# | Definition |
|------|------------|------|------------|
| 1 | IO1 | 2 | IO2 |
| 3 | IO3 | 4 | IO4 |
| 5 | 5V | 6 | 3V3 |
| 7 | GND | 8 | GND |
| 9 | RX2 | 10 | RX1 |
| 11 | TX2 | 12 | TX1 |
| 13 | RX4 | 14 | RX3 |
| 15 | TX4 | 16 | TX3 |

说明：IO1~IO4 的软件编号分别为 8、228、9、227。串口 1~4 默认为 RS-232 电平，U35 未焊接则串口 1/2 为 TTL 电平，U68 未焊接则串口 3/4 为 TTL 电平。

注意：串口 RX2/TX2 信号开机上电 2~3 秒内会有调试信息输出，上位机和此串口通信时必须具备上电容错能力。

3.2 J2 DC-12V 插座 DC-12V Jack

【J2】DC-12V 插座（内正外负，内径 2.0mm）。[J2] DC-12V Jack (Internal diameter 2.0mm).

3.3 J3 DC-12V 输入接口 DC-12V Input Header

【J3】DC-12V 输入接口（单排 2.0mm-方孔为 1 脚）。[J3] DC-12V Input Header (SIP 2.0mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|---------------------------------------|
| 1 | 12V | 直流电源输入 (9~15V) DC Power Input (9~15V) |
| 2 | 12V | 直流电源输入 (9~15V) DC Power Input (9~15V) |
| 3 | GND | 电源地 Power Ground |
| 4 | GND | 电源地 Power Ground |

3.4 J4 RTC 电池座 RTC Battery Header

【J4】RTC 电池座 (单排-1.25mm 方孔为 1 脚)。[J4] RTC Battery Header (SIP-1.25mm Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|------------------------------------|
| 1 | BAT- | 3V 纽扣电池负极 3V Coin Battery Negative |
| 2 | BAT+ | 3V 纽扣电池正极 3V Coin Battery Positive |

3.5 J5 音频输入接口 Audio Input Header

【J5】音频输入接口 (单排 1.25mm-方孔为 1 脚)。[J5] Audio input header (SIP 1.25mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|---------------------------------|
| 1 | GND | 音频地 Audio Ground |
| 2 | MIC | 单声道麦克风输入 Mono microphone input |
| 3 | Line-in L | 立体声线路输入左声道 Stereo Line-in Left |
| 4 | GND | 数字地 Digital Ground |
| 5 | Line-in R | 立体声线路输入右声道 Stereo Line-in Right |

3.6 J6 按键和 IO Keypad and IO Header

【J6】按键和开关接口 (单排 1.25mm-方孔为 1 脚)。[J6] Keypad and Switch header (SIP 1.25mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|---------------------------|
| 1 | 3V3 | 3.3V 供电 3.3V Supply |
| 2 | K1 | 按键/IO [软件编号226] Keypad/IO |
| 3 | K2 | 按键/IO [软件编号256] Keypad/IO |
| 4 | K3 | 按键/IO [软件编号257] Keypad/IO |
| 5 | K4 | 按键/IO [软件编号258] Keypad/IO |
| 6 | K5 | 按键/IO [软件编号259] Keypad/IO |
| 7 | GND | 数字地 Digital Ground |

说明: 注意所有 KIO 信号均可以通过单独的软件版本调整为常规 GPIO 使用 (电平为 3.3V); 默认情况下 K1 音量+/K2 音量-/K3 待机/K4 退出/K5 HOME。Note: All KIO signals can be adjusted to regular GPIO via a separated software version (level is 3.3V); by default K1 Volume+/K2 Volume-/K3 Standby/K4 Exit/K5 Home.

3.7 J7 USB OTG 插座 USB OTG Jack

【J7】标准 Micro-USB 插座,此接口仅用于进行系统烧录和 ADB 调试。 [J7] Standard Micro-USB ADB Header, this port should only be used as system burn or ADB connection.

3.8 J8 m-PCIE 卡座 m-PCIE Card Socket

【J8】移动通信模块 m-PCIE 卡座, 接到 CPU 内独立的 USB 端口。 [J8] Mobile 4G Module m-PCIE Card Socket. It is connected directly to internal USB port.

3.9 J9 Nano-SIM 卡座 Nano-SIM Socket

【J9】Nano-SIM 卡座。 [J9] Nano-SIM Socket.

3.10 J10 风扇供电 Fan Supply

【J10】风扇供电接口 (单排 2.0mm-方孔为 1 脚)。 [J10] Keypad and Switch header (SIP 2.0mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|-----------------------|
| 1 | GND | 数字地 Digital Ground |
| 2 | 5V | 5V 供电 5V Power Supply |

3.11 J11 RJ45 以太网口 RJ45 Ethernet Jack

【J11】RJ45 以太网口。 [J11] RJ45 Ethernet Jack.

3.12 J12 USB 2.0 接口 USB 2.0 Host Header

【J12】USB 2.0 接口 (单排 2.0mm-方孔为 1 脚)。 [J12] USB 2.0 Host Header (SIP 2.0mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|----------------------------------|
| 1 | GND | 数字地 Digital Ground |
| 2 | DP | USB 差分数据+ USB Differential Data+ |
| 3 | DM | USB 差分数据- USB Differential Data- |

| | | |
|---|----|-----------------------|
| 4 | 5V | 5V 输出 Power output 5V |
|---|----|-----------------------|

3.13 J14 USB 2.0 接口 USB 2.0 Host Header

【J14】USB 2.0 接口 (单排 2.0mm-方孔为 1 脚)。[J14] USB 2.0 Host Header (SIP 2.0mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|----------------------------------|
| 1 | GND | 数字地 Digital Ground |
| 2 | DP | USB 差分数据+ USB Differential Data+ |
| 3 | DM | USB 差分数据- USB Differential Data- |
| 4 | 5V | 5V 输出 Power output 5V |

3.14 J15 三色 LED Triple-Color LED

【J15】三色 LED 定义: 上-黄色 (WiFi 状态)、中-绿色 (系统/遥控指示)、下-红色 (待机亮、开机灭)。[J15] Triple-Color LED: Top-Yellow (WiFi Status) , Middle-Green (System/IR Status), Bottom-Red (Standby Status).

注意: WiFi 状态灯对应 GPIO 编号 234, 如果软件需要自定义控制此灯, 则可定制内核开放出来。

3.15 J16 双层 USB Type A 插座 Double USB Type A Socket

【J16】双层标准 USB 2.0 Type A 插座。[J16] Double USB Type A Socket.

3.16 J17 音频线路输出 Audio Line Output

【J17】音频线路输出 (单排 1.25mm-方孔为 1 脚)。[J17] Audio Line Output (SIP 1.25mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|--------------------------------------|
| 1 | AL | 立体声输出左声道 Stereo output left channel |
| 2 | GND | 音频地 Audio Ground |
| 3 | AR | 立体声输出右声道 Stereo output right channel |

3.17 J18 开关机插座 Power Switch Header

【J18】开关机插座（单排-1.25mm 方孔为 1 脚）。[J18] Power Switch Header (SIP-1.25mm Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|---------------------------|
| 1 | RST | 复位信号 Reset Signal |
| 2 | GND | 数字地 Digital Ground |
| 3 | PW+ | 开关机信号 Power Switch Signal |

说明：PW+键可实现一键开关屏/长按关机，结合特定的单片机版本可实现长按开机。

3.18 J19 耳机插座 Headphone Jack

【J19】标准三段 3.5mm 耳机插座。[J19] Standard 3-pole headphone jack.

3.19 J20 VGA 输出接口 VGA Output Header

【J20】VGA 输出接口（单排 1.25mm-方孔为 1 脚）。[J20] VGA Output Header (SIP 1.25mm-Square pad is pin 1).

| Pin# | Definition | Note |
|------|------------|---------------------|
| 1 | GND | 信号地 Signal Ground |
| 2 | VS | 场同步 Vertical Sync |
| 3 | HS | 行同步 Horizontal Sync |
| 4 | GND | 信号地 Signal Ground |
| 5 | Red | 红色信号 Red Signal |
| 6 | GND | 信号地 Signal Ground |
| 7 | Green | 绿色信号 Green Signal |
| 8 | GND | 信号地 Signal Ground |
| 9 | Blue | 蓝色信号 Blue Signal |

3.20 J22 VGA 输出插座 VGA Output Jack

【J22】标准 DB-15 VGA 输出插座。[J22] Standard VGA Output Jack.

3.21 J28 TF 卡座 TF Card Jack

【J28】TF 卡座。 [J28] TF Card Jack.

3.22 J29 HDMI 输出插座 HDMI Output Jack

【J29】标准 HDMI 输出插座。 [J29] Standard HDMI Output Jack.

3.23 IR 红外遥控接收头 IR Infra-Red Remote Control Receive Header

【IR】标准 IR 红外遥控接收头。 [IR] Standard Infra-Red Remote Control Receive Header.

3.24 ANT WiFi 天线插座 WiFi Antenna Jack

【ANT】标准 SMA 天线插座（公座）。 [ANT] Standard SMA Antenna Jack (Male).

3.25 SW1 烧录模式按键 Recovery Mode Button

【SW1】直插烧录小按键, 先按住且保持然后上电约 3 秒后松开则进入烧录模式。 [SW1] On-board recovery mode button. First press and then hold for about 3-second while power on will enter the recovery mode.

4 物理尺寸 Physical Size

PCB 大小为 100mm*72mm, 固定孔直径 3.0mm, 相应的物理尺寸参数如下图所示。如需详细尺寸信息请咨询厂家索取 DXF 档文件。

The PCB size is 100mm*72mm and the fixing hole diameter is 3.0mm. The corresponding physical size parameters are shown in the figure below. For detailed size information, please consult the manufacturer for DXF file.

5 注意事项 Precautions

C3 主板组装和使用时请注意以下关键事项： Please note the following key points when using the C3 mainboard:

1. 本产品相对湿度：10%~90%，无凝露。Relative humidity of this product: 10% to 90%, no condensation.
2. 本产品工作温度：0°~70°。The working temperature of this product: 0°~70°.
3. 本产品存储温度：-40°~70°。This storage temperature of this product: -40 ° ~ 70 °.
4. 整机装配和运输过程中需做防静电处理。Anti-static treatment is required during assembly and transportation of this product.
5. 本板接口连接线缆不可过长，否则可能会影响信号质量。The board interface connection cable must not be too long. Otherwise, the signal quality may be affected.
6. 整机装配时严禁使板子受到扭曲或重压而变形。Never allow the board to be distorted or heavily stressed during assembly.
7. 严禁裸板与其他外设之间发生短路。Do not short circuit between mainboard and other peripherals.
8. 外接 LVDS 或 eDP 液晶屏时，注意驱屏电压和电流是否符合要求，且注意屏线插座 1 脚方向。When connecting to external LVDS or eDP LCD screen, pay attention to whether the screen voltage and current meet the requirements, and pay attention to the screen connector pin-1 direction.
9. 外接 LVDS 或 eDP 液晶屏时，注意背光电压和电流是否符合要求。**液晶屏背光功率在 20w 以上则建议使用单独的电源板进行背光供电。**When connecting to external LVDS or eDP LCD screen, pay attention to whether the backlight voltage and current meet the requirements.
10. 外接接口（USB、GPIO、串口、I2C、SPI、HDMI 等）外接设备时，注意外设的 IO 电平和电流是否符合要求。**使用主板插件件上的电源管脚给外设供电时，常规电源脚电流严禁超过 100mA、USB 电源脚电流严禁超过 500mA。**串口连接外设时还需要电平匹配（3.3V TTL 电平、RS-232 电平和 RS-485 电平）。When connecting to peripherals using USB, GPIO, Serial, I2C, SPI, HDMI, etc., pay attention to whether the IO voltage level and current of the peripheral meet the requirements. When using the power pin on these connectors to

supply power to the external circuit, the regular power pin must not exceed 100mA, and the USB power pin must not exceed 500mA.

11. 主板输入电源请务必接入电源输入接口或插座, 并根据总外设评估整板电流是否符合要求; **严禁为了方便操作从背光插座接口直接给主板供电**。Please connect the power to the power input socket or connector, and evaluate whether the current of the whole board meets the requirements according to the total peripherals. It is strictly forbidden to directly supply power from the backlight connector.
12. 通信模块部分距离金属壳体至少 5 毫米, 避免信号受到干扰。The communication module should be mounted at least 5mm away from the metal housing to avoid signal interference.

6 软件指南 Software Guide

C3 主板内部串口和扩展串口软件端口号如下：

| 端口 Port | 软件设备节点 Software Device Node |
|----------|-----------------------------|
| J1-10/12 | /dev/ttyS1 |
| J1-9/11 | /dev/ttyS2 |
| J1-14/16 | /dev/ttyS3 |
| J1-13/15 | /dev/ttyS4 |