

SS-A133 主板产品规格书

SS-A133 Mainboard Specification

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修改记录 Changelog

1.0.0	2022-10-10	中英文合并版本。Chinese and English merged version.
1.0.1	2022-11-07	更改主板型号为 SS-A133
1.0.2	2022-11-24	更新蓝牙支持 4.2 版本

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
➤	J1 DC-5V 输入接口 DC-5V INPUT HEADER	8
➤	J3 MIPI 屏 FPC 接口 MIPI PANEL FPC CONNECTOR.....	8
➤	J4 防拆防爆开关 TAMPER-PROOF HEADER	9
➤	J5 RTC 电池座 RTC BATTERY HEADER	9
➤	J6 开关和复位接口 POWER SWITCH & RESET HEADER.....	9
➤	J7 LED 补光灯 RGB&PWM LED	10
➤	J8 按键和开关接口 KEYPAD AND SWITCH HEADER	10
➤	J9 USB OTG 接口 USB OTG HEADER	11
➤	J10 USB HOST 接口 USB HOST HEADER	11
➤	J11 数字硅麦接口 DIGITAL SILICON MICPHONE HEADER.....	11
➤	J13 10/100M 以太网接口 10/100M ETHERNET HEADER	12
➤	J14 内置串口 0 BUILT-IN SERIAL PORT 0	12
➤	J15 内置串口 2 BUILT-IN SERIAL PORT 2	12
➤	J16 I2C 总线接口 I2C BUS HEADER.....	13
➤	J17 TP FPC 接口 TP FPC HEADER	13
➤	J18 WiFi 天线座 WiFi ANTENNA IPEX.....	14
➤	J19 告警输入接口 WARNING INPUT HEADER.....	14
➤	J20 遥控-LED 接口 REMOTE CONTROL & LED HEADER.....	14
➤	J21 音频线路输出 AUDIO LINE OUTPUT	14
➤	J22 喇叭输出 SPEAKER OUTPUT	15
➤	SW1 烧录模式按键 RECOVERY MODE BUTTON.....	15
➤	SW2 硬件复位按键 HW RESET BUTTON	15
4	物理尺寸 PHYSICAL SIZE	16
5	注意事项 PRECAUTIONS	17
6	软件指南 SOFTWARE GUIDE	19

1 产品概述 Product Overview

SS-A133 主板基于全志 A133 高性能应用处理器平台, A133 主芯片集成四核 Cortex-A53@1.6GHz、PowerVR GE8300 高性能 GPU (支持 OpenGL ES3.2、Vulkan 1.1、OpenCL 1.2), 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, 支持 4Kx2K@30fps 超清视频解码。

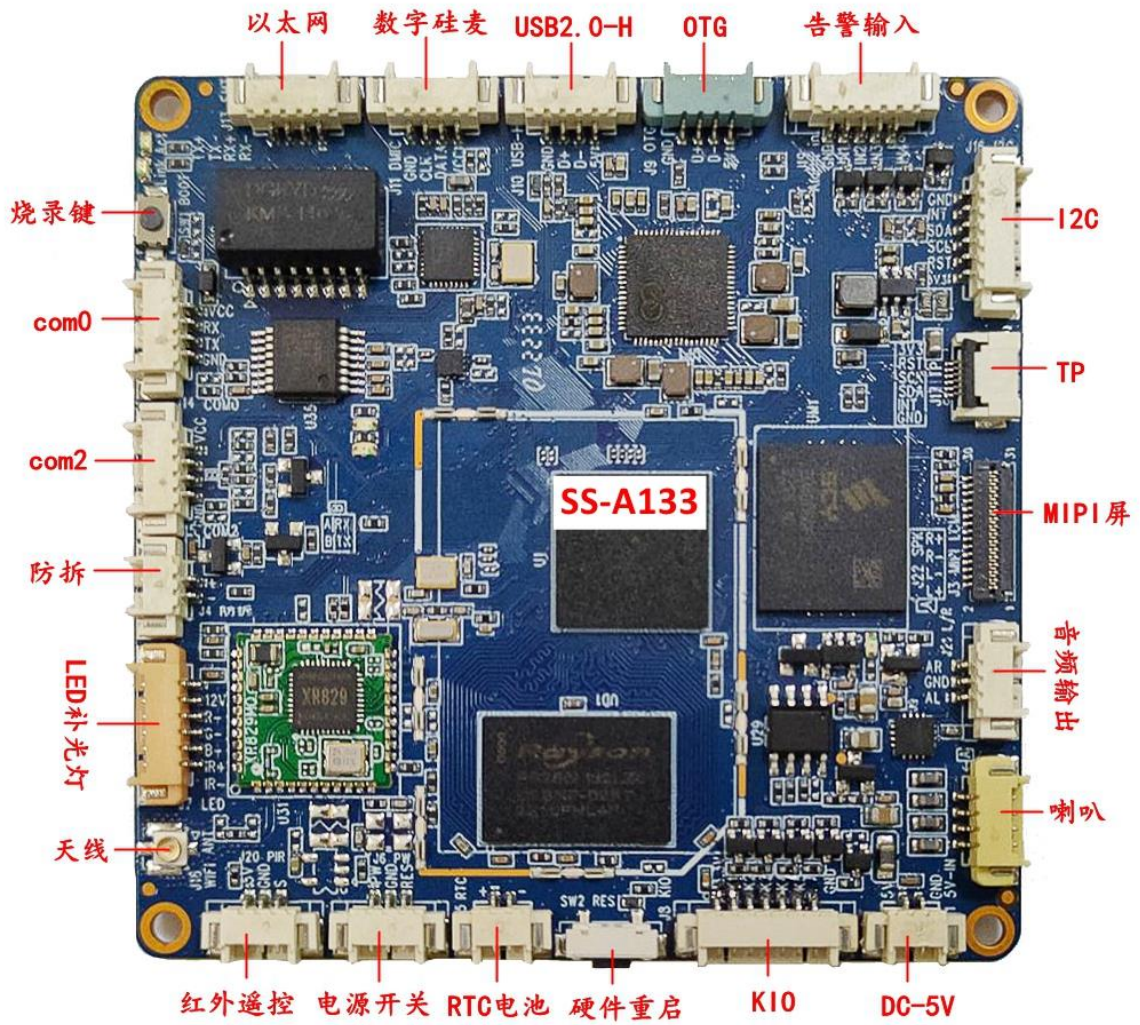
SS-A133 mainboard is based on Allwinner A133 high-performance application processor platform. A133 is a low power, high performance processor for computing, personal mobile internet devices and other smart device applications. It integrates quad-core Cortex-A53 clocked at up to 1.6GHz, with superior computing performance, 2D/3D graphics processing capabilities and Full HD video codec capabilities. It perfectly supports 4Kx2K@30fps video decoding.

此款主板专门针对**超薄**应用进行严格选材和设计, 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, 可应用于数字标牌、触摸互动、消费电子、娱乐系统等行业。

This mainboard is specially designed for **ultra-thin** applications 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. It can be applied to digital signage, touch interactive, consumer electronics, entertainment systems and other industries.

SS-A133 V1.0 主板实物照片接口示意图如下所示。

SS-A133 V1.0 mainboard actual interface diagram as shown below.



2 规格清单 Specification List

SS-A133 的系统功能和接口特性如下表所示。SS-A133'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	A133 Cortex-A53 四核，最高主频 1.6GHz A133 Cortex-A53 quad-core, up to 1.6GHz
DDR	LPDDR4 1GB (2GB 4GB 可选) LPDDR4 1GB (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
MIPI-DSI	31-Pin FPC MIPI-DSI 显示接口，最高支持 1920x1200 输出 31-Pin FPC MIPI-DSI display port supporting up to 1920x1200
功放输出 Amplifier output	8 欧·2W 双路音频功放输出 8 Ohm 2W Dual Audio Amplifier Output
MIC 输入 MIC Input	数字硅麦 DMIC 输入 (排针接口) Digital SiliconMIC DMIC input (pin header)
USB 2.0 接口 USB 2.0 Interface	1 个 4P 排针标准 USB 2.0，1 个 4P 排针 USB 2.0 OTG 1 USB 2.0 4P pin headers, 1 USB 2.0 OTG 4P pin header
串口 Serial Port	1 个 TTL/RS-232 兼容内置，1 个 TTL/RS-232/RS-485 兼容内置 1 TTL/RS-232 compatible pin header, 1 TTL/RS-232/RS-485 compatible pin header
LED 接口 LED Port	3 个 LED 灯开关驱动接口 (可接 3 种颜色 LED 灯) 3 LED switch and driver port for 3 color LEDs
补光灯接口 PWM LED Port	1 个可调光 LED 补光灯接口 (LED+/-+PWM 可调光) 1 PWM LED driver port (LED+/-)
防拆防爆 Security Port	1 路防拆控制接口 1 Tamper-proof port
USB 摄像头 USB Camera	支持 200 万像素以内双目 USB 摄像头 Support dual USB cameras 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，支持 V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.2 Built-in high performance serial interface BT module (optional) with support for V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.2
以太网口 Ethernet	1 路 10/100M 自适应以太网排针 (不带 RJ45 插座) 1 port 10/100M Adaptive Ethernet pin header (no RJ45 socket)
I2C 总线 I2C Bus	I2C 排针和 FPC 接口，可扩展 I2C 电容屏等 I2C pin header and FPC for I2C capacitive screen and etc
实时时钟	超低功耗 RTC 电路 (带 CR1220 纽扣电池)，并可支持定时开关机

功能&接口 Function&Interface	详细描述 Detailed Description
Real Time Clock	Ultra-low-power RTC circuit (CR1220 battery) with timer and alarm functionalities
指示灯 LED Indicator	贴片系统运行指示灯 One LED for system running
按键 Buttons	两个扩展 (PW 和复位)、两个侧按按键 (烧录、复位) Two extended button (PW and Reset) and two side button (UBOOT and Reset)
电源输入 DC Input	支持 5V 直流电源输入 Supports 5V DC power input
环境要求 Ambient Requirement	工作温度-20°~70°，工作湿度 0%~95% (不结露) Working temperature -20°~70°，working humidity 0%~95% (non-condensing)
物理尺寸 Physical Size	长*宽*高 (70mm*70mm*7mm)，PCB 正面高度 5 mm Length*Width*Height (70mm*70mm*7mm), PCB top side height 5mm
安卓系统 Android Version	推荐安卓 10，可选 Linux (待发布) Recommended Android 10，Linux optional (Not Ready)

3 接口定义 Interface definition

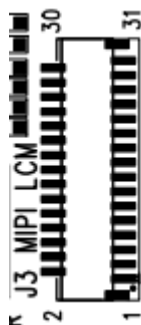
➤ J1 DC-5V 输入接口 DC-5V Input Header

【J1】DC-5V 输入接口 (单排 1.25mm-三角为 1 脚)。 [J1] DC-5V Input Header (SIP 1.25mm- Triangle pad is pin 1).

Pin#	Definition	Note
1	5V	直流电源输入5V DC Power Input 5V
2	GND	电源地 Power Ground

➤ J3 MIPI 屏 FPC 接口 MIPI Panel FPC Connector

【J3】MIPI 屏 FPC 接口 (FPC-0.3mm 31-Pin 下接触)。 [J3] MIPI Panel FPC Connector (FPC-0.3mm 31-Pin Top/Bottom Contact).



Pin#	Definition	Note
1	LED+	LED 阳极 LED Anode
2	LED+	LED 阳极 LED Anode
3	LED+	LED 阳极 LED Anode
4	NC	未连接 Not Connected
5	LED-	LED 阴极 LED Cathode
6	LED-	LED 阴极 LED Cathode
7	LED-	LED 阴极 LED Cathode
8	LED-	LED 阴极 LED Cathode
9	GND	数字地 Digital Ground
10	GND	数字地 Digital Ground
11	MIPI_D2P	+MIPI 差分数据输出 +MIPI differential lane2
12	MIPI_D2N	-MIPI 差分数据输出 -MIPI differential lane2
13	GND	数字地 Digital Ground
14	MIPI_D1P	+MIPI 差分数据输出 +MIPI differential lane1

15	MIPI_D1N	-MIPI 差分数据输出 -MIPI differential lane1
16	GND	数字地 Digital Ground
17	MIPI_CKP	+MIPI 差分时钟输出 +MIPI differential clock output
18	MIPI_CKN	-MIPI 差分时钟输出 -MIPI differential clock output
19	GND	数字地 Digital Ground
20	MIPI_D0P	+MIPI 差分数据输出 +MIPI differential lane0
21	MIPI_D0N	-MIPI 差分数据输出 -MIPI differential lane0
22	GND	数字地 Digital Ground
23	MIPI_D3P	+MIPI 差分数据输出 +MIPI differential lane3
24	MIPI_D3N	-MIPI 差分数据输出 -MIPI differential lane3
25	GND	数字地 Digital Ground
26	VDD-1V8	供电输出1.8V Power Supply 1.8V (默认不连接)
27	RESET	复位信号 (1.8V 电平) Reset Signal in 1.8V
28	GND	数字地 Digital Ground
29	VDD-1V8	供电输出1.8V Power Supply 1.8V
30	VDD-3V3	供电输出3.3V Power Supply 3.3V
31	VDD-3V3	供电输出3.3V Power Supply 3.3V

➤ J4 防拆防爆开关 Tamper-proof Header

【J4】防拆防爆开关 (单排 1.25mm-三角为 1 脚)。 [J4] Tamper-proof header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	控制1	控制5V 输出1 [软件 GPIO 编号205] On-board 12V Power Output 1
2	GND	数字地 Digital Ground

➤ J5 RTC 电池座 RTC Battery Header

【J5】RTC 电池座 (单排 1.25mm-三角为 1 脚)。 [J5] RTC Battery Header (SIP 1.25mm-Triangle pad is pin 1).

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

➤ J6 开关和复位接口 Power Switch & Reset Header

【J6】开关和复位接口 (单排 1.25mm-三角为 1 脚)。 [J6] Power switch & reset Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	PW	一键开关机/开关屏信号 Power on/off and screen on/off signal
2	GND	数字地 Digital Ground
3	RES	硬件复位信号 Hardware reset signal

➤ J7 LED 补光灯 RGB&PWM LED

【J7】LED 补光灯 (单排 1.25mm-三角为 1 脚)。 [J7] RGB&PWM LEDs (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	12V	板载12V 输出 [软件 GPIO 编号 363] On-board 12V Power Output
2	R-	LED1控制开关 [软件 GPIO 编号 202] LED1 Switch
3	G-	LED2控制开关 [软件 GPIO 编号 203] LED2 Switch
4	B-	LED3控制开关 [软件 GPIO 编号 204] LED3 Switch
5	IR+	PWM 可调光 LED+ PWM adjustable LED+
6	IR-	PWM 可调光 LED- PWM adjustable LED-

说明：将 LED 灯板正极接电源 12V、负极接 R-/G-/B-的某个针脚，可通过 GPIO 编号进行控制开关（高电平导通则点亮 LED 灯）。此接口如果 12V 供电每个 LED 信号最大可提供约 200mA 的电流。IR+/IR-为 5V 升压 LED 电流驱动接口，默认驱动电流 160mA（可更换限流电阻 R150 和 R151 阻值调节电流大小）。

➤ J8 按键和开关接口 Keypad and Switch Header

【J8】KIO 按键接口 (单排 1.25mm-三角为 1 脚)。 [J8] KIO Keypad Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	3V3	3.3V 供电输出 Power output supply 3.3V
2	K1	按键1 (GPIO 编号66) K1 (Regular GPIO #66)
3	K2	按键2 (GPIO 编号67) K2 (Regular GPIO #67)
4	K3	按键3 (GPIO 编号68) K3 (Regular GPIO #68)
5	K4	按键4 (GPIO 编号71) K4 (Regular GPIO #71)
6	K5	按键5 (GPIO 编号76) K5 (Regular GPIO #76)
7	GND	数字地 Digital Ground

注意：所有 KIO 信号均可以通过单独的软件版本调整为按键使用，比如 K1 音量+/K2 音量-/K3 待机/K4 退出/K5 主屏。Note: All KIO signals can be adjusted to keypad via a separated software version, such as K1 Volume+/K2 Volume-/K3 Standby/K4 Exit/K5 Home.

➤ J9 USB OTG 接口 USB OTG Header

【J9】USB OTG 接口（单排 1.25mm-三角为 1 脚）。[J9] USB OTG Header (SIP 1.25mm-Triangle pad is pin 1).

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

说明：此接口用于系统烧录和 ADB 调试用；通过软件切换则可以作为普通 USB 口使用。

➤ J10 USB Host 接口 USB Host Header

【J10】USB 2.0 Host 直通接口（单排 1.25mm-三角为 1 脚）。[J10] USB 2.0 Host Direct Header (SIP 1.25mm-Triangle pad is pin 1).

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

➤ J11 数字硅麦接口 Digital Silicon Micphone Header

【J11】数字硅麦 DMIC 接口（单排 1.25mm-三角为 1 脚）。[J11] Digital Silicon Micphone Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	VCC	电源输出（仅3.3V） Power output (3.3V only)
2	DATA	PDM 数据输入 PDM data input
3	CLK	PDM 时钟输出 PDM clock output
4	GND	数字地 Digital Ground

➤ J13 10/100M 以太网接口 10/100M Ethernet Header

【J13】10/100M 以太网排针接口（单排 1.25mm-三角为 1 脚）。[J13] 10/100M Ethernet Header (SIP 1.25mm- Triangle pad is pin 1).

Pin#	Definition	Note
1	RX-	RX- Receive Data- 接收数据-
2	RX+	RX+ Receive Data+ 接收数据+
3	TX-	TX- Tranceive Data- 发送数据
4	TX+	TX+ Tranceive Data+ 发送数据+

➤ J14 内置串口 0 Built-in Serial Port 0

【J14】内置串口 0（单排 1.25mm-三角为 1 脚），默认为 TTL 3.3V 且可配置为 RS-232 电平（焊接 U35 则为 RS-232 电平）。**对应的软件编程设备节点为 ttyS0。** [J14] Built-in Serial Port 0 (SIP 1.25mm- Triangle pad is pin 1). The output level is TTL 3.3V by default and it could be setup to RS-232 if required (RS-232 if U35 mounted). **The related software device node name is ttyS0.**

Pin#	Definition	Note
1	VCC	电源输出（默认5V，可选3.3V） Power output (Default 5V, 3.3V option)
2	RX	数据接收（TTL 3.3V 或 RS-232电平） Data receive (TTL 3.3V or RS-232 level)
3	TX	数据发送（TTL 3.3V 或 RS-232电平） Data transmit (TTL 3.3V or RS-232 level)
4	GND	数字地 Digital Ground

注意：内置串口 0 为系统调试信息输出口，如果作为数据串口使用，则请联系供应商获取定制版本软件；在上电的前 5 秒此串口会输出启动信息（上位机或下位机需要处理数据容错）。Note: If you need to use the built-in serial port 0 as a data serial port, please contact the supplier to obtain the customized software; this serial port will output the startup information in the first 5 seconds of power on (the upper or lower machine should handle this kind of data fault tolerance).

➤ J15 内置串口 2 Built-in Serial Port 2

【J15】内置串口 2（单排 1.25mm-三角为 1 脚），默认为 TTL 3.3V 电平且可配置为 RS-232 或 RS-485 电平（焊接 U35 则为 RS-232 电平，焊接 U67 则为 RS-485 电平）；**对应的软件编程设备节点为 ttyS2。** [J15] Built-in Serial Port 2 (SIP 1.25mm- Triangle pad is pin 1). The output level is TTL 3.3V by default and it could be setup to RS-232 if required (RS-232 if U35 mounted, RS-485 if U67 mounted). **The related software device node name is ttyS2.**

Pin#	Definition	Note
1	VCC	电源输出 (默认5V, 可选3.3V) Power output (Default 5V, 3.3V option)
2	RX	数据接收 (TTL 或 RS-232或 RS-485电平) Data receive (TTL or 232/485)
3	TX	数据发送 (TTL 或 RS-232或 RS-485电平) Data transmit (TTL or 232/485)
4	GND	数字地 Digital Ground

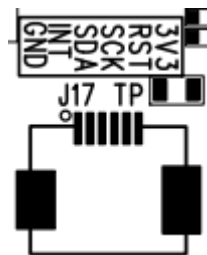
➤ J16 I2C 总线接口 I2C Bus Header

【J16】I2C 总线接口 (单排 1.25mm-三角为 1 脚)。 [J16] I2C Bus Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	3V3	3.3V 供电输出 Power output supply 3.3V
2	RST	复位输出 (3.3V 电平) Mainboard reset output (3.3V level)
3	SCL	I2C 总线时钟信号 I2C Bus clock signal
4	SDA	I2C 总线数据信号 I2C Bus data
5	INT	中断输入 (3.3V 电平) Interrupt input (3.3V level)
6	GND	数字地 Digital Ground

➤ J17 TP FPC 接口 TP FPC Header

【J17】I2C 总线接口 (FPC-0.5mm 前插后翻盖上下接触-三角为 1 脚)。 [J17] I2C Bus Header (FPC-0.5mm Bottom Contact Triangle Pin-1).



Pin#	Definition	Note
1	GND	数字地 Digital Ground
2	INT	中断输入 (3.3V 电平) Interrupt input (3.3V level)
3	SDA	I2C 总线数据信号 I2C Bus data
4	SCK	I2C 总线时钟信号 I2C Bus clock signal
5	RST	复位输出 (3.3V 电平) Mainboard reset output (3.3V level)
6	3V3	3.3V 供电输出 Power output supply 3.3V

➤ J18 WiFi 天线座 WiFi Antenna IPEX

【J18】标准 IPEX 3dBi 天线座 (Φ2.0mm)。 [J18] Standard IPEX 3dBi antenna connector (Φ2.0mm).

➤ J19 告警输入接口 Warning Input Header

【J19】告警输入接口 (单排 1.25 mm-三角为 1 脚)。 [J19] Warning Input Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	IN4	按键4 (GPIO 编号109) IN4 (Regular GPIO #109)
2	IN3	按键3 (GPIO 编号106) IN3 (Regular GPIO #106)
3	IN2	按键2 (GPIO 编号107) IN2 (Regular GPIO #107)
4	IN1	按键1 (GPIO 编号108) IN1 (Regular GPIO #108)
5	GND	数字地 Digital Ground

注意：板卡丝印有误，正确丝印：1 管脚为 GND，5 管脚为 IN4。

➤ J20 遥控-LED 接口 Remote Control & LED Header

【J20】遥控-LED 接口(单排 1.25 mm-三角为 1 脚)。 [J20] Remote Control & LED Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	5V	5V Standby 供电输出 Power output supply 5V standby
2	GND	数字地 Digital Ground
3	S	5V 电平红外遥控输入信号 5V level Irda remote control input singal

➤ J21 音频线路输出 Audio Line Output

【J21】音频线路输出 (单排 1.25mm-三角为 1 脚)。 [J21] Audio Line Output (SIP 1.25mm- Triangle 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

➤ J22 喇叭输出 Speaker Output

【J22】喇叭输出接口（单排 1.25mm-三角为 1 脚）。[J22] Speaker Output Header (SIP 1.25mm-Triangle pad is pin 1).

Pin#	Definition	Note
1	L+	左喇叭正极 Left Speaker Positive
2	L-	左喇叭负极 Left Speaker Negative
3	R-	右喇叭负极 Right Speaker Negative
4	R+	右喇叭正极 Right Speaker Positive

说明：喇叭输出功率为 8 欧•2W。

➤ SW1 烧录模式按键 Recovery Mode Button

【SW1】侧按烧录模式轻触按键，先按住且保持然后上电约 3 秒后松开则进入烧录模式。[SW1] Side-Press recovery mode button. First press and then hold for about 3-second while power on will enter the recovery mode.

➤ SW2 硬件复位按键 HW Reset Button

【SW2】侧按硬件复位轻触按键，按一下硬件重启。[SW2] Side-Press hardware reset button. Press once to reset the board.

4 物理尺寸 Physical Size

PCB 大小为 70mm*70mm , 固定孔内径 2.6mm , 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 70mm*70mm and the fixing hole diameter is 2.6mm. 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

SS-A133 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 SS-A133 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：-20°~70°。The working temperature of this product: -20°~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

SS-A133 主板内部串口和扩展串口软件端口号如下(可以用 SerialDemo.apk 或者其他串口工具进行通信测试):

端口 Port	软件设备节点 Software Device Node
J14	/dev/ttyS0
J15	/dev/ttyS2