

DF-A133 主板产品规格书

DF-A133 Mainboard Specification

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修改记录 Changelog

1.0.0	2022-09-15	中英文合并版本。Chinese and English merged version.
1.0.1	2022-09-16	更新 v2 背面注释图，默认 USB2.0 不焊接。
1.0.2	2022-09-27	更新板卡注释的注释图
1.0.3	2022-11-08	增加喇叭功率说明
1.0.4	2022-11-24	更新蓝牙支持 4.2 版本，修正多处文字笔误

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1 产品概述 Product Overview

DF-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。

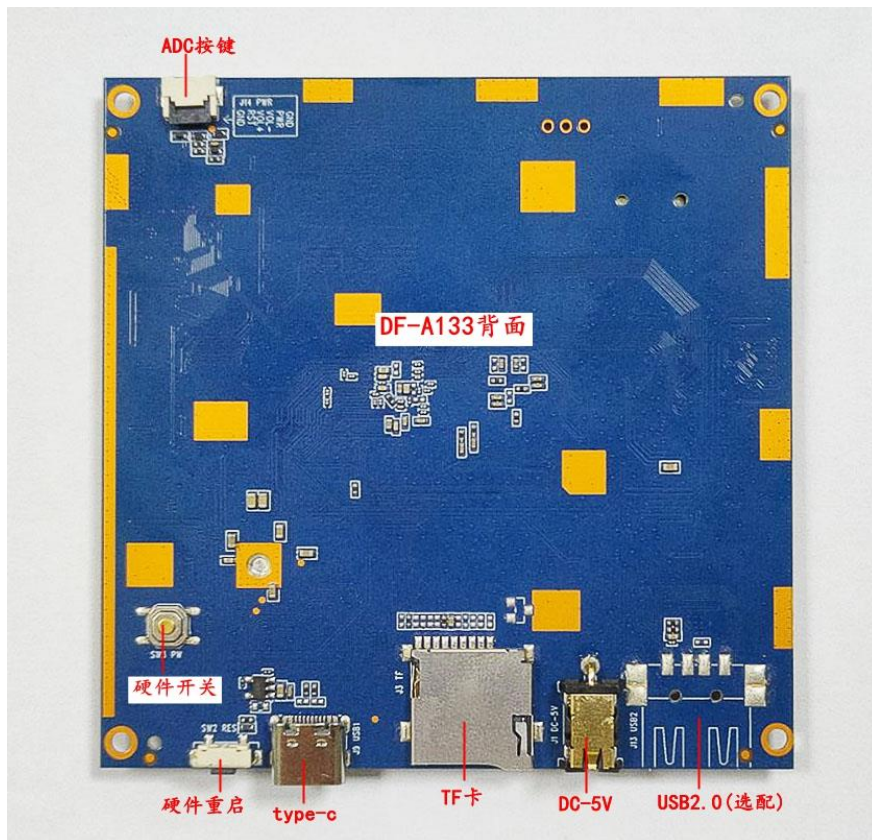
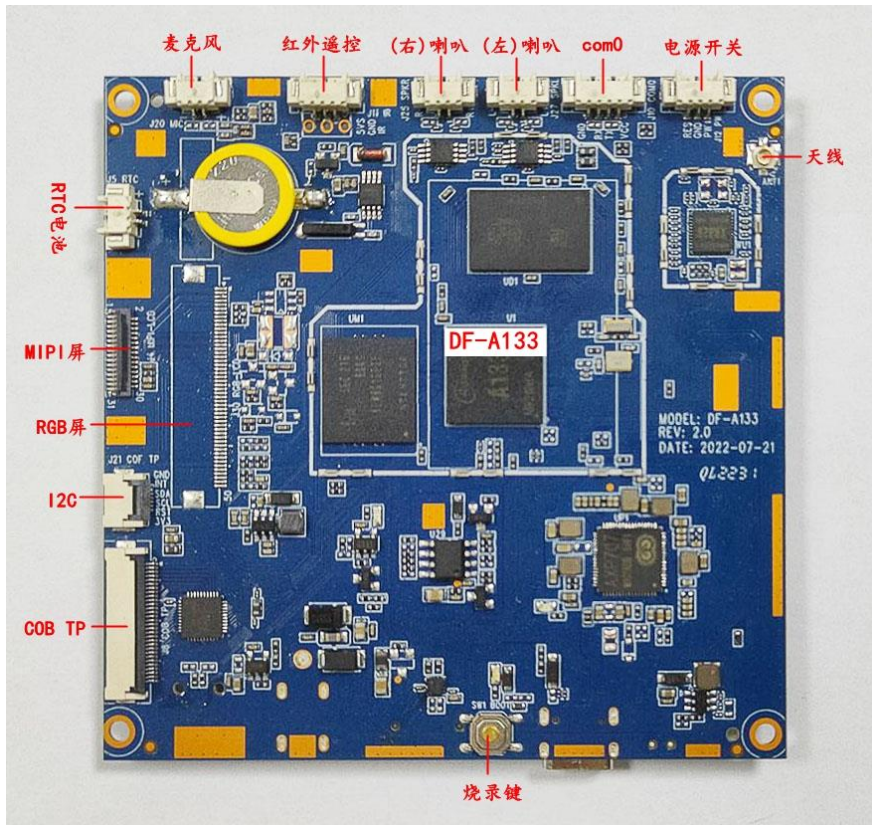
DF-A133 mainboard is based on Allwinner A133 high-performance application processor platform. A133 is a low power, high performance processor for computing, personal mobile internet devices and other smart device applications. It integrates quad-core Cortex-A53 clocked at up to 1.6GHz, with superior 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.

DF-A133 V2.0 主板实物照片接口示意图如下所示。

DF-A133 V2.0 mainboard actual interface diagram as shown below.



2 规格清单 Specification List

DF-A133 的系统功能和接口特性如下表所示。DF-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
MPI-DSI 输出 MIPI-DSI Output	31 针行业标准 FPC MIPI 屏接口，可扩展 MIPI 显示输出 31-Pin common MIPI DSI interface for extended MIPI panel sub-board
LCD RGB	50 针行业标准 FPC LCD RGB 接口，支持 1024x768 以内常规 LCD 屏 50-pin common FPC LCD RGB supporting normal panel up to 1024x768
MIC 输入 MIC Input	差分 MIC 输入（排针接口） Differential MIC input (pin header)
USB 接口 USB Interface	1 个外置横插 USB 2.0 接口，1 个 USB 3.0 Type-C 接口 1 horizontal USB 2.0 connectors ,1 USB 3.0 Type-C connector
串口 Serial Port	1 个 TTL 内置串口 1 TTL serial 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
功放输出 Amplifier output	8 欧·1W 双路音频功放输出 8 Ohm 1W Dual Audio Amplifier Output
WiFi	内置高性能 SDIO 接口 WiFi 模块，支持 IEEE 802.11 b/g/n/ac，默认配置单频 2.4GHz Built-in high performance SDIO interface WiFi module, support IEEE 802.11 b/g/n/ac
蓝牙 Bluetooth	内置高性能串口 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
红外遥控 Infrared RC	标准红外遥控接收头和红外接收排针接口 Standard infrared remote control receiver and infrared receiver pin header
I2C 总线 I2C Bus	FPC 接口，可扩展 I2C 电容屏等 FPC for I2C capacitive screen and etc
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	绿色工作指示灯

功能&接口 Function&Interface	详细描述 Detailed Description
LED Indicator	Green LED indicator for running
按键 Buttons	两个扩展 (PW 和复位)、两个侧按按键 (烧录、复位和 PW) Two extended button (PW and Reset) and two side button (UBOOT ,Reset and PW)
电源输入 DC Input	支持 5V 宽电压直流电源输入 Supports 5V wide voltage 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 (85mm*85mm*9mm) ， PCB 正面高度 5.5mm Length*Width*Height (85mm*85mm*9mm), PCB top side height 5.5mm
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 插座 DC-5V Socket

【J1】DC-5V 电源插座，内正外负，内芯直径 1.35mm，外圈孔径 3.5mm。 [J1] DC-5V power socket, positive outer and negative inner, inner pin diameter 1.35mm, outer ring diameter 3.5mm.

➤ J3 TF 卡插座 TF Card Socket

【J3】标准 TF 卡插座。 [J3] Standard TF Card Socket.

➤ J4 MIPI LCD 屏接口 MIPI LCD Panel FPC

【J4】MIPI 屏 LCD FPC 接口 (FPC-0.3mm 31-Pin 上/下接触)。 [J4] MIPI Panel LCD 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, 需加焊 R9232 0R)
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

➤ 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 纽扣电池负极 3V Coin Battery Negative
2	BAT+	3V 纽扣电池正极 3V Coin Battery Positive

➤ J8 COB TP 接口 COB TP Header

【J8】COB TP 接口 (前插后翻盖上下接触 0.5mm FPC 接口)。 [J8] COB TP Header (Front Insert Back Flip Top&Bottom Contact 0.5mm FPC Connector,).

Pin#	Definition	Note
1	GND	数字地 Digital Ground
2	YI_0	传感器感应线 Sensor sensing line
3	YI_1	传感器感应线 Sensor sensing line
4	YI_2	传感器感应线 Sensor sensing line
5	YI_3	传感器感应线 Sensor sensing line
6	YI_4	传感器感应线 Sensor sensing line
7	YI_5	传感器感应线 Sensor sensing line
8	YI_6	传感器感应线 Sensor sensing line
9	YI_7	传感器感应线 Sensor sensing line
10	YI_8	传感器感应线 Sensor sensing line
11	YI_9	传感器感应线 Sensor sensing line
12	GND	数字地 Digital Ground
13	GND	数字地 Digital Ground
14	XI_15	传感器驱动线 Sensor driving line
15	XI_14	传感器驱动线 Sensor driving line
16	XI_13	传感器驱动线 Sensor driving line

17	XI_12	传感器驱动线 Sensor driving line
18	XI_11	传感器驱动线 Sensor driving line
19	XI_10	传感器驱动线 Sensor driving line
20	XI_9	传感器驱动线 Sensor driving line
21	XI_8	传感器驱动线 Sensor driving line
22	XI_7	传感器驱动线 Sensor driving line
23	XI_6	传感器驱动线 Sensor driving line
24	XI_5	传感器驱动线 Sensor driving line
25	XI_4	传感器驱动线 Sensor driving line
26	XI_3	传感器驱动线 Sensor driving line
27	XI_2	传感器驱动线 Sensor driving line
28	XI_1	传感器驱动线 Sensor driving line
29	XI_0	传感器驱动线 Sensor driving line
30	GND	数字地 Digital Ground

➤ J9 Type-c 插座 Type-c Socket

【J9】Type-c 横插标准 Type C 插座 (标准插座)。 [J9] Type-c Horizontal Type C Jack (Standard jack).

注意 :此接口接到内部 USB1 信号 ,上电瞬间默认为固件烧录口 ,可连接 PC 电脑进行软件烧录。

➤ J10 数据串口 0 Data Serial Port 0

【J10】内置串口 0 (单排 1.25mm-三角为 1 脚) ,默认为 TTL 3.3V 电平 ; **对应的软件编程设备节点为 ttyS0。** [J10] Built-in Serial Port 0 (SIP 1.25mm- Triangle pad is pin 1). The output level is TTL 3.3V by default. **The related software device node name is ttyS0.**

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

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).

➤ J11 遥控-LED 接口 Remote Control & LED Header

【J11】遥控-LED 接口(单排 1.25 mm-三角为 1 脚)。[J11] Remote Control & LED Header (SIP 1.25mm-Triangle pad is pin 1).

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

➤ J12 开关和复位接口 Power Switch & Reset Header

【J12】开关和复位接口(单排 1.25mm-三角为 1 脚)。[J12] 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

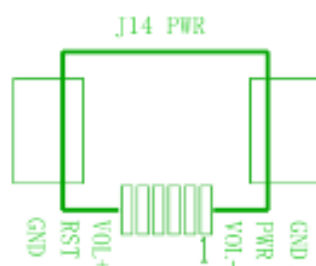
➤ J13 USB 2.0 插座 USB 2.0 Type A

【J13】USB 2.0 横插标准 Type A 插座(标准插座)。[J13] USB 2.0 Host Horizontal Type A Jack (Standard jack).

注意：USB 插座默认不焊接，可选焊接！

➤ J14 ADC 按键接口 ADC Keypad Header

【J14】ADC 按键接口(前插后翻盖上下接触 0.5mm FPC 接口, 1 脚定义如图)。[J14] ADC Keypad Header (Front Insert Back Flip Top&Bottom Contact 0.5mm FPC Connector, Pin-1 position is marked text 1).



Pin#	Definition	Note
1	GND	数字地 Digital Ground
2	PWR	开关机 Switch
3	VOL-	音量减 Volume Down
4	VOL+	音量加 Volume Up
5	RST	硬件重启 Hardware Reboot
6	GND	数字地 Digital Ground

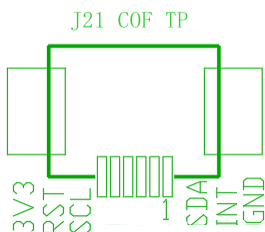
➤ J20 麦克风接口 Mic Input Header

【J20】麦克风接口 (单排 1.25mm-三角为 1 脚)。 [J20] Audio input header (SIP 1.25mm- Triangle 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

➤ J21 I2C FPC 接口 I2C FPC Header

【J21】I2C FPC 接口 (前插后翻盖上下接触 0.5mm FPC 接口 , 1 脚定义如图)。 [J21] I2C Bus Header (Front Insert Back Flip Top&Bottom Contact 0.5mm FPC Connector, Pin-1 position is marked text 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	SCL	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

➤ J25 喇叭右接口 Speaker Header

【J25】喇叭右接口 (单排 1.25mm-三角为 1 脚)。 [J25] Speaker Header (SIP 1.25mm- Triangle pad is pin 1).

Pin#	Definition	Note
1	R+	喇叭右声道+ Speaker right channel +
2	R-	喇叭右声道- Speaker right channel -

说明：喇叭输出功率为 8 欧·1 瓦。

➤ J27 喇叭左接口 Speaker Header

【J27】喇叭左接口（单排 1.25mm-三角为 1 脚）。[J27] Speaker Header (SIP 1.25mm- Triangle pad is pin 1).

Pin#	Definition	Note
1	L+	喇叭左声道+ Speaker right channel +
2	L-	喇叭左声道- Speaker right channel -

说明：喇叭输出功率为 8 欧·1 瓦。

➤ J30 RGB LCD 屏接口 RGB LCD Panel FPC

【J30】RGB LCD 屏接口（FPC-0.5mm 50-Pin **上/下接触**）。[J30] RGB LCD panel FPC connector (FPC-0.5mm 50-Pin Top/Bottom Contact).

Pin#	Definition	Note
1~4	VLED+	Power for LED backlight (Anode)
5	GND	Power ground
6	VCOM	Common voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select (Hight for DE mode by default)
9	DE	Data Input Enable
10	VS	Vertical Sync Input
11	HS	Horizontal Sync Input
12~17	B7~B2	Blue data(MSB) B7~B2
18~19	GND	Power ground
20~25	G7~G2	Green data(MSB) G7~G2
26~27	GND	Power ground
28~33	R7~R2	Red data(MSB) R7~R2
34~35	GND	Power ground
36	GND	Power ground
37	DCLK	Pixel clock
38	GND	Power ground
39	L/R	Left/Right selection (High for Left to Right by default)

40	U/D	Up/Down selection (Low for Up to Down by default)
41	VGH	Gate ON Voltage
42	VGL	Gate OFF Voltage
43	AVDD	Power for Analog Circuit
44	RESET	Global reset pin
45	NC	No connection
46	VCOM	Common Voltage
47	DITHB	Dithering function (High for Disable internal dithering function)
48	GND	Power ground
49	NC	No connection
50	NC	No connection

➤ ANT WiFi 天线座 WiFi Antenna IPEX

标准 IPEX 天线座 (Φ2.0mm)。Standard IPEX antenna connector (Φ2.0mm).

➤ 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.

➤ SW2 硬件重启按键 Hardware Reset Button

【SW2】硬件重启小按键,每按 1 次,系统重启 1 遍。[SW2] Hardware reset button, every time you press it, the system restarts once.

➤ SW3 硬件开关按键 Hardware Switch Button

【SW3】硬件开关小按键 按 1 次系统关机,再按 1 次系统开机。[SW3] Hardware switch button, press 1 time to shut down the system, press 1 time to start the system.

4 物理尺寸 Physical Size

PCB 大小为 85.0mm*85.0mm , 固定孔直径 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 85.0mm*85.0mm 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 Assembly Precautions

DF-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 DF-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

DF-A133 主板仅支持 LVDS/MIPI/RGB 屏单屏输出，不支持双屏异显组合。

DF-A133 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
J10	/dev/ttyS0