RK3326 EVB User Guide

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Preface

Overview

This document mainly describes RK3326 EVB board basic functions and hardware characteristics, multi-function hardware configuration and software debug operation method, aiming to help developers to use RK3326 EVB more quickly and correctly, and familiar with RK3326 chip solution.

Product Version

The corresponding product version of the document is as below:

Product Name	Product Version
RK3326 EVB	RK_EVB_RK3326_LP3S178P132SD4_V11_20180301LX_Final RK_EVB_RK3326_LP3S178P132SD4_V12_20181024LX_Final

Applicable object

This document is mainly suitable for below engineers:

- Field application engineers
- Single board hardware development engineers
- Embedded software development engineers
- Test engineers

Revision History

The revision history accumulates instructions for each update of the document and the latest version contains updates of all previous versions.

Version	Author	Revision Date	Revision Description	Remark
V1.0	WHB/LX	2018.07.09	The initial version release	
V1.1	Linus.Lin	2019.06.24	Preliminary draft of English version	

Acronym

Acronym includes the abbreviations of commonly used phrases in this document.

DDR	Double Data Rate	双倍速率同步动态随机存储器
eMMC	Embedded Multi Media Card	内嵌式多媒体存储卡
I^2C	Inter-Integrated Circuit	内部整合电路(两线式串行通讯总线)
JTAG	Joint Test Action Group	联合测试行为组织定义的一种国际标准测试协议（IEEE 1149.1兼容）
LDO	Low Drop Out Linear Regulator	低压差线性稳压器
LVDS	Low-Voltage Differential Signaling	低电压差分信号
Micro-SD Card	Micro-SD Card(Trans-flash Card)	外置记忆卡
MIPI	Mobile Industry Processor Interface	移动产业处理器接口
PMIC	Power Management IC	电源管理芯片
PMU	Power Management Unit	电源管理单元
RK	Rockchip Electronics Co.,Ltd.	瑞芯微电子股份有限公司
SD Card	Secure Digital Memory Card	安全数码卡
SDIO	Secure Digital Input and Output	安全数字输入输出接口
SDMMC	Secure DigitalMulti Media Card	安全数字多媒体存储卡
USB	Universal Serial Bus	通用串行总线

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1.Overview

1.1 EVB Introduction

RK3326 EVB is the hardware development board integrated with reference design, chip debugging and testing, and chip verification for RK3326 multimedia processing chip (hereinafter referred to as RK3326 chip). It is used to demo RK3326 powerful multimedia interfaces and rich peripheral interfaces, and also provide RK3326 based hardware reference design for customers, so that customers can finish the product hardware development without modification or only simply modify the module circuit of the reference design. RK3326 EVB supports SDK development of RK3326 chip, application software development and running and so on. Considering the different usage environment and chip full function verification, the interfaces are complete and the design is relatively complex.

RK3326 EVB can be used as a basic developing system by connecting with PC via USB cable, or to implement more complete developing system or demo environment by connecting with below devices or components:

- Power supply
- MIPI Panel
- Micro-SD Card memory device
- Headphone or speaker box
- Camera module

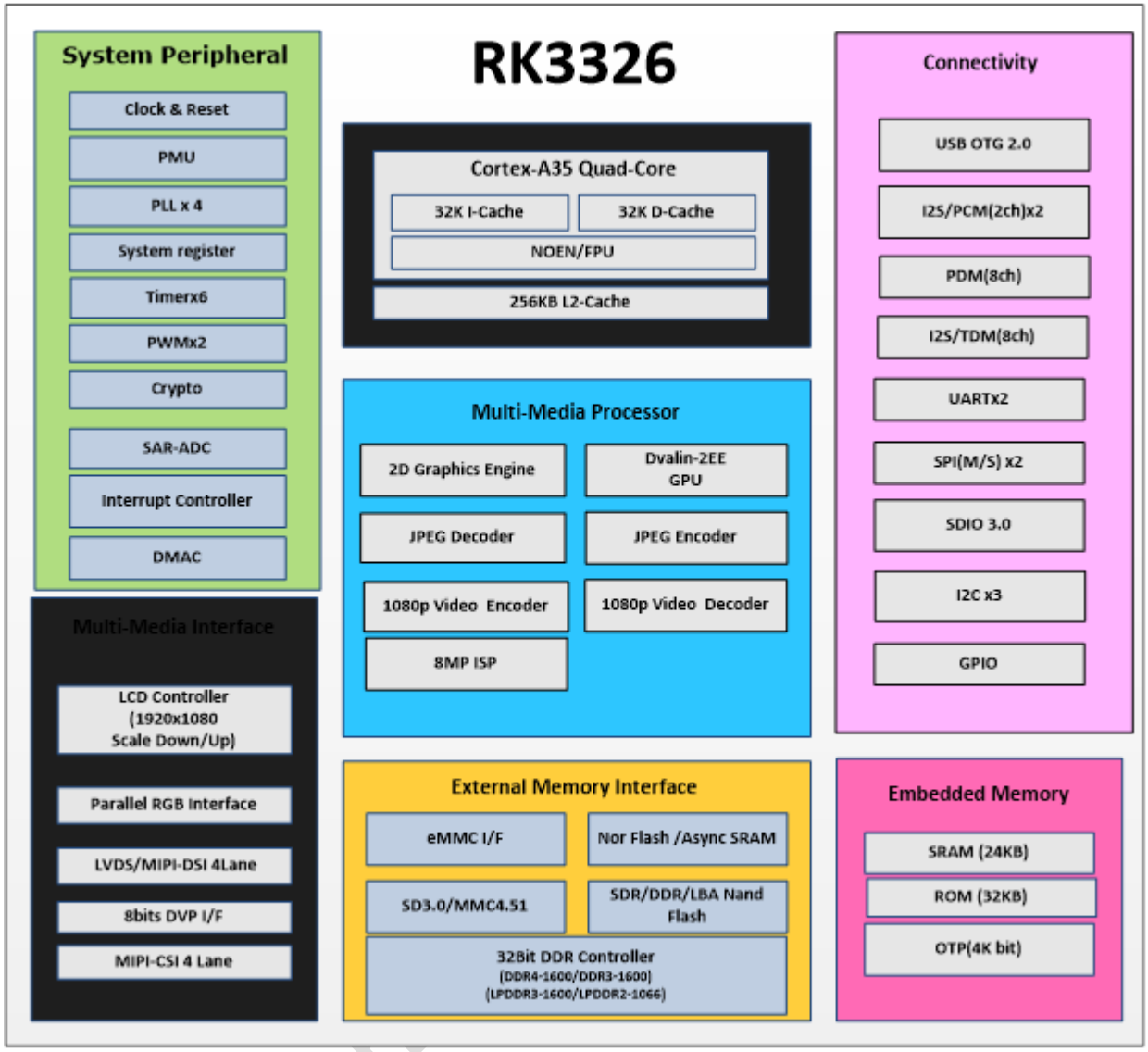

Figure 1-1 RK3326 Chip Architecture

1.2 EVB Block Diagram

The EVB block diagram lets developers to have an intuitive understanding of the architecture and principle of the whole system: the whole system is powered by power adapter or battery, and debugging through UART serial port or JTAG interface to verify each function module. The EVB has most interfaces, and is equipped with Camera, Wi-Fi/BT module, USB OTG, Micro-SD card, audio interface, video interface, and can meet the different applications requirements in most cases, which is benefit for the deep development of the chip solution and rapid productization.

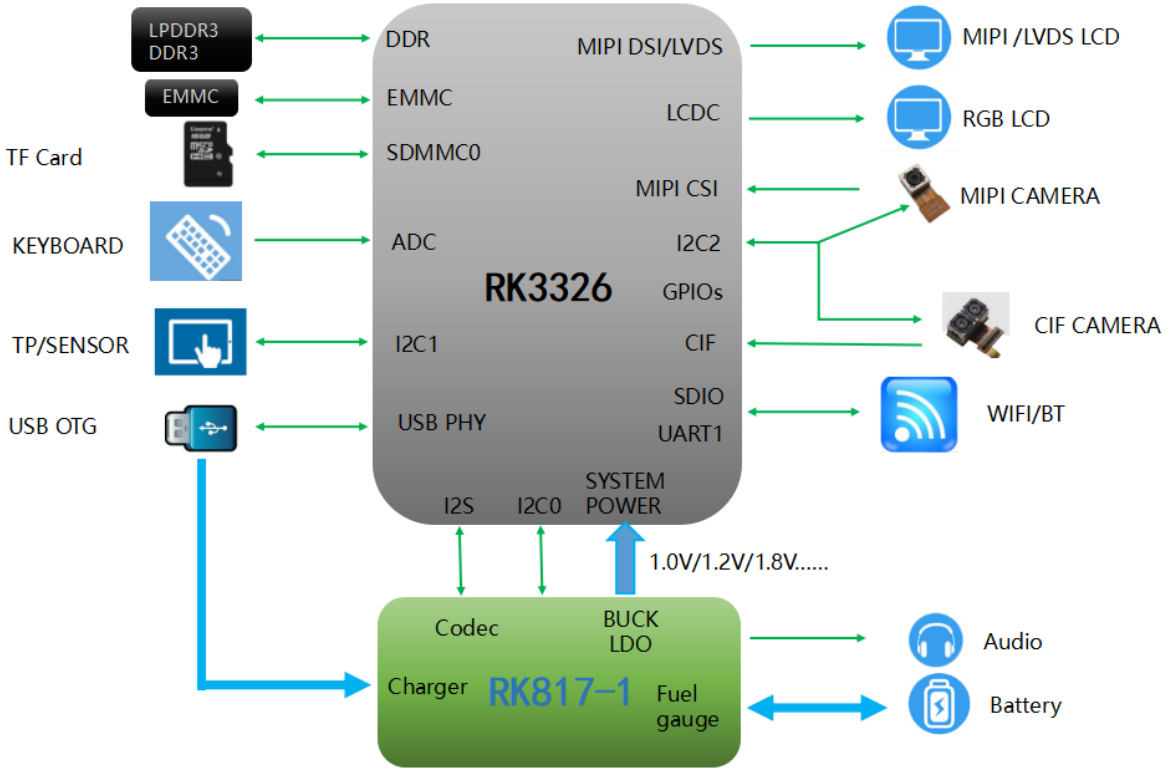

Figure 1-2 EVB Block Diagram

1.3 EVB Function Overview

RK3326 EVB includes the following features:

- RK817-1 charger and power management IC
- 32bit LPDDR3, total size 2GByte
- 8bit eMMC Flash, total size 16GByte
- Micro-SD Card: support external storage card
- USB Micro-B Port: used for image download and adb debug,support OTG
- USB Mini Port: used for EVB UART Debug
- System button:Power, Reset, Menu, Esc, VOL+, VOL-, Home and Maskrom
- SDIO Wi-Fi（AP6212）:support 802.11 b/g/n and BT4.1
- Audio out:support Headphone, speaker
- Audio in:support microphone recording
- Sensor:Accelerometer MMA7660FC、Compass AK8963C
- DVP Camera:IMX323,2M pixel
- MIPI Camera:OV5695,5M pixel
- Extended interface includes:JTAG、Wi-Fi expansion interface、RGB expansion interface、Raspberry Pi

Function module layout as below:

TOP Layer:

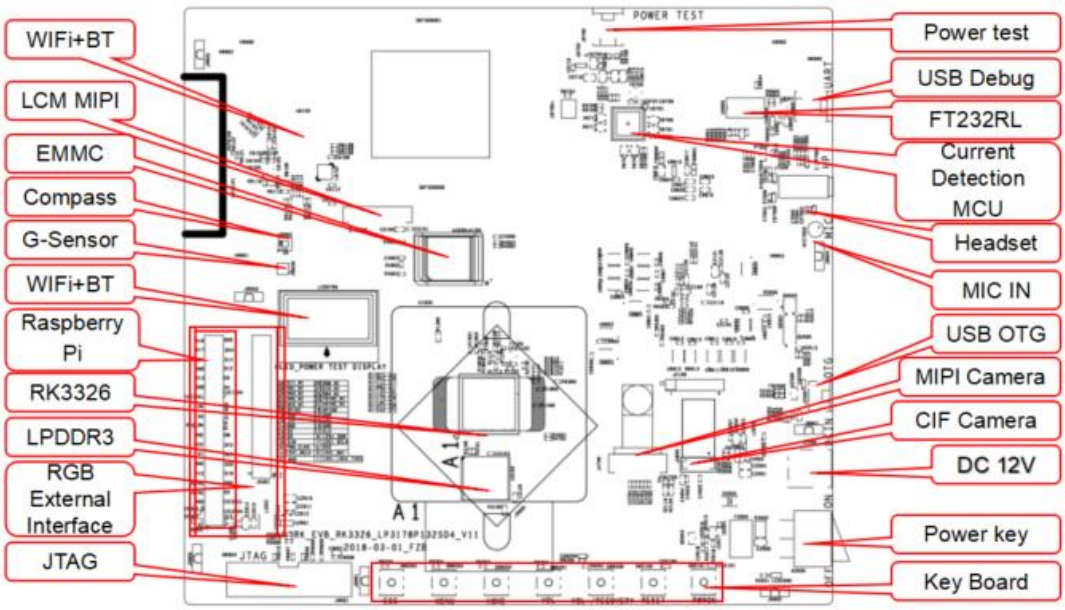

Figure 1-3 EVB Interfaces and Module Location of Top

Bottom Layer:

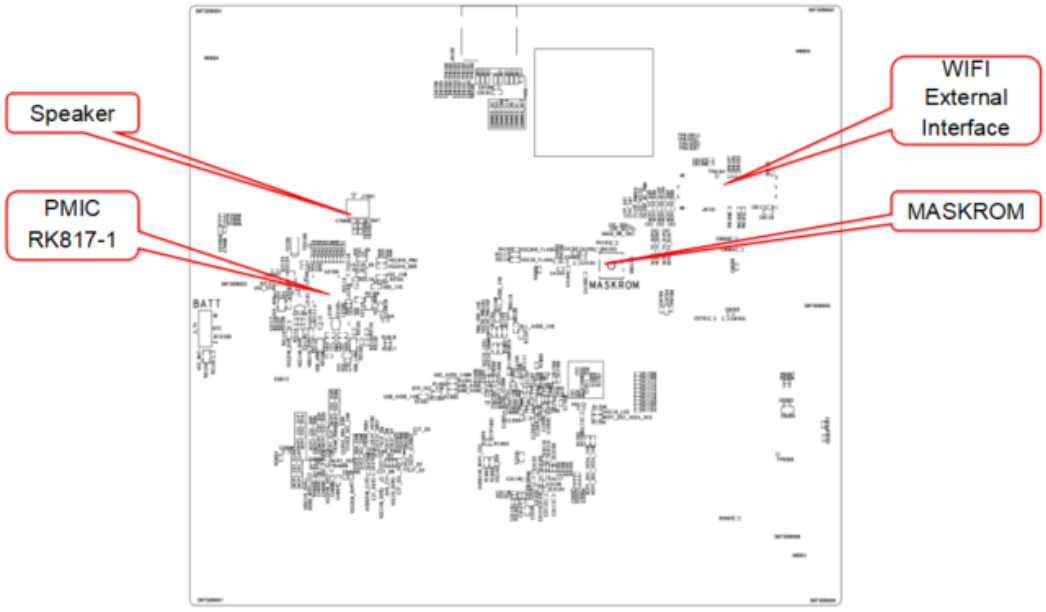

Figure 1-4 EVB Interfaces and Module Location of Bottom

1.4 EVB Function Default

The EVB that user gets already has the firmware inside. All the functions covered by default are listed below:

Table 1-1 EVB Function Table

Item.	Function Part	Requirement
1	PMIC RK817-1	1-cell battery normal charging and discharging, Output of each power supply is normal, accurate battery volume detection
2	DDR LPDDR3	Can recognize total size 2GByte
3	eMMC Flash	Can normally recognize 16GByte
4	USB Mini Port	Serial port input and output normally
5	USB Micro-B Port	Can recognize ADB device, can download images
6	Micro-SD Card	Normal recognition Micro-SD Card
7	Audio codec	Headphone and speakers function normal, and switching between them is normally
8	Accelerometer	MMA7660FC function normally
9	KEY Array	All the buttons function normally
10	Wi-Fi/BT	AP6212 module functions normally
11	MIPI/ DVP Camera	Camera works normally, MIPI camera input by default
16	MIPI Panel	Screen image displays normally
12	Standby and wake up	Can standby and wake up system normally

1.5 EVB Component

RK3326 EVB includes the following components:

- RK3326 EVB
- DC adapter: input 100V AC~240V AC,50Hz, output DC12V/2A
- Panel: 5.5 inch MIPI panel, 1280x720 resolution

The EVB has the following extension optional components:

- RGB expansion board: RGB 24bit, 1920x1080 resolution

2.EVB Hardware

2.1 Physical View

EVB physical picture

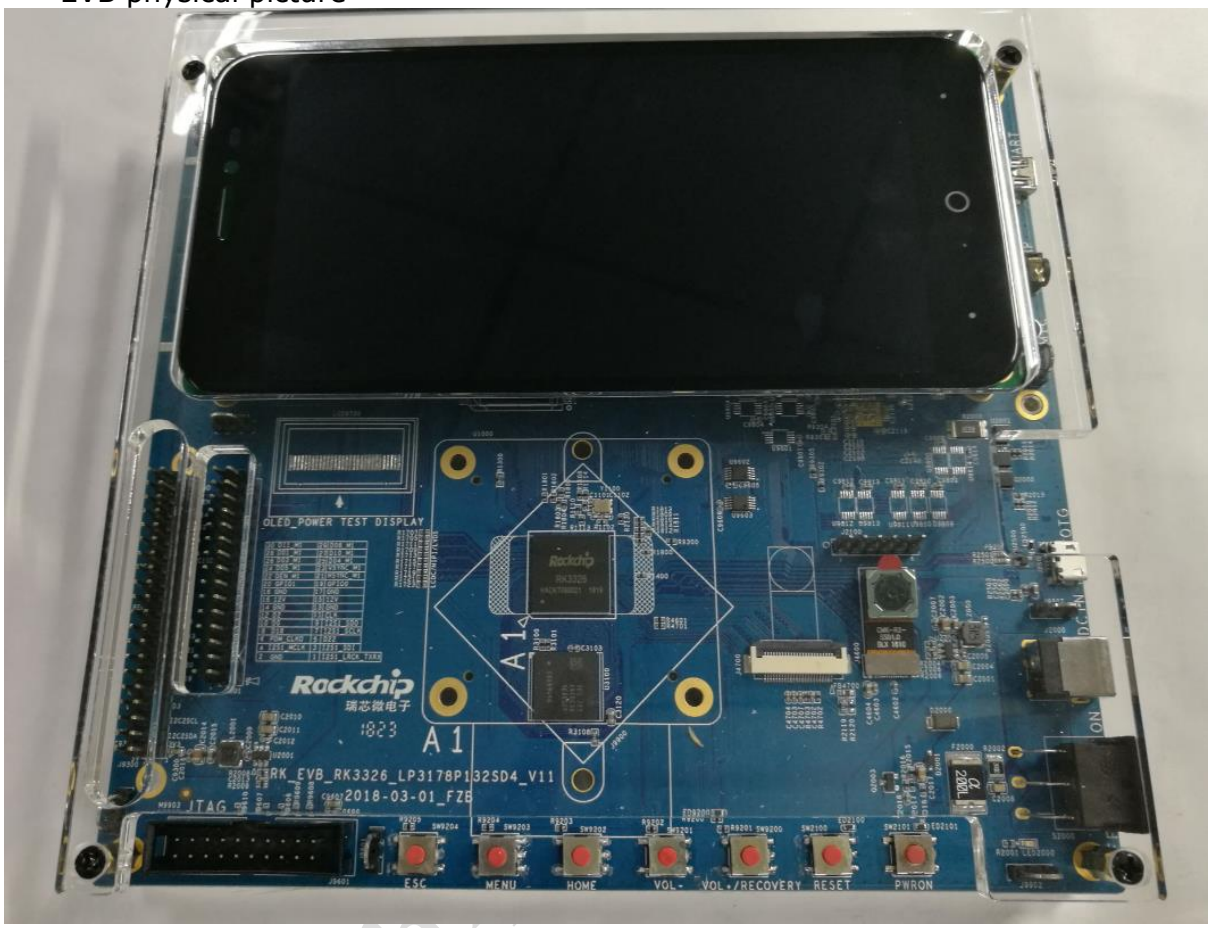

Figure 2-1 EVB Physical Front View

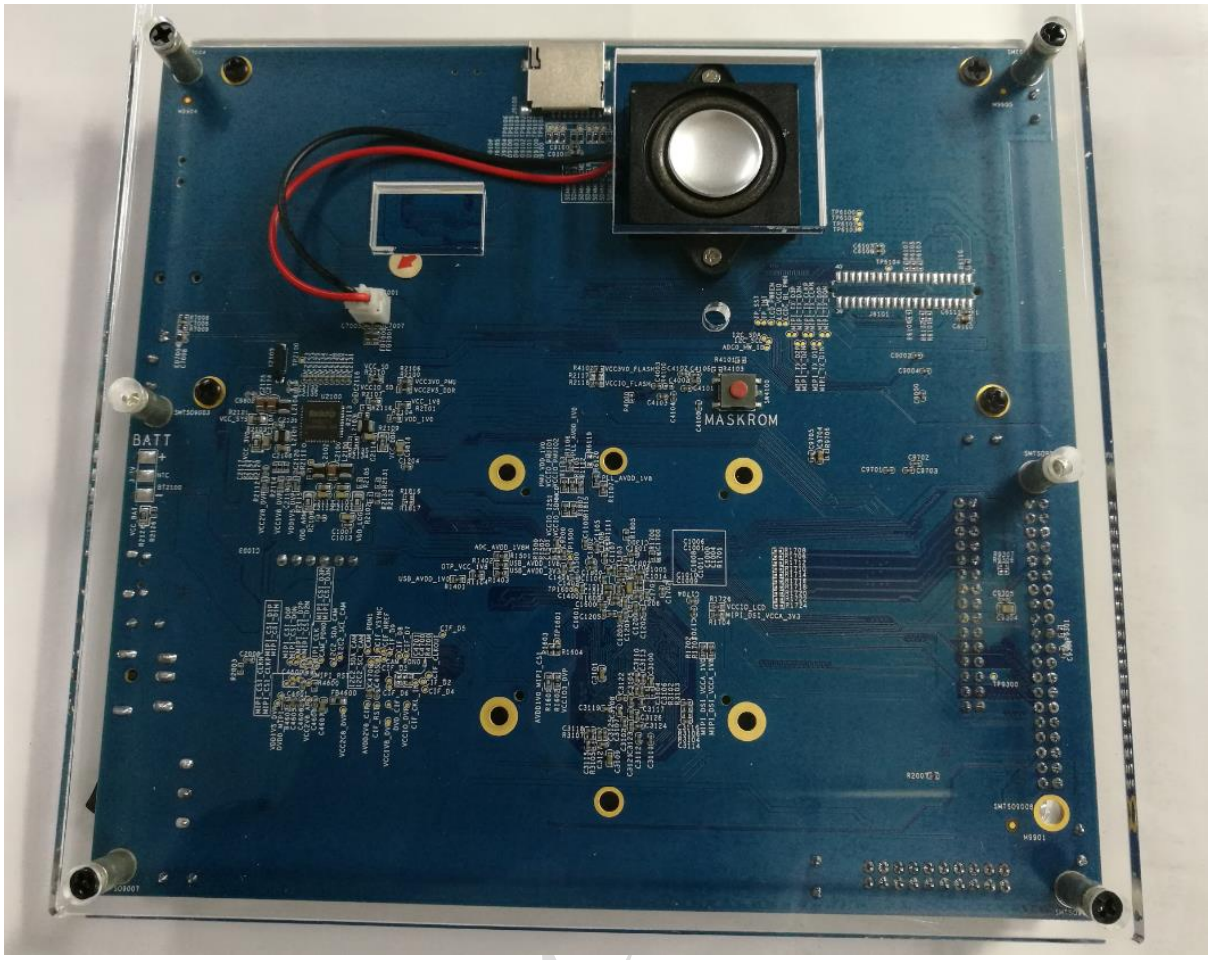

Figure 2-2 EVB Physical Back View

2.2 PCB View

The PCB picture of RK3326 EVB is shown as below:

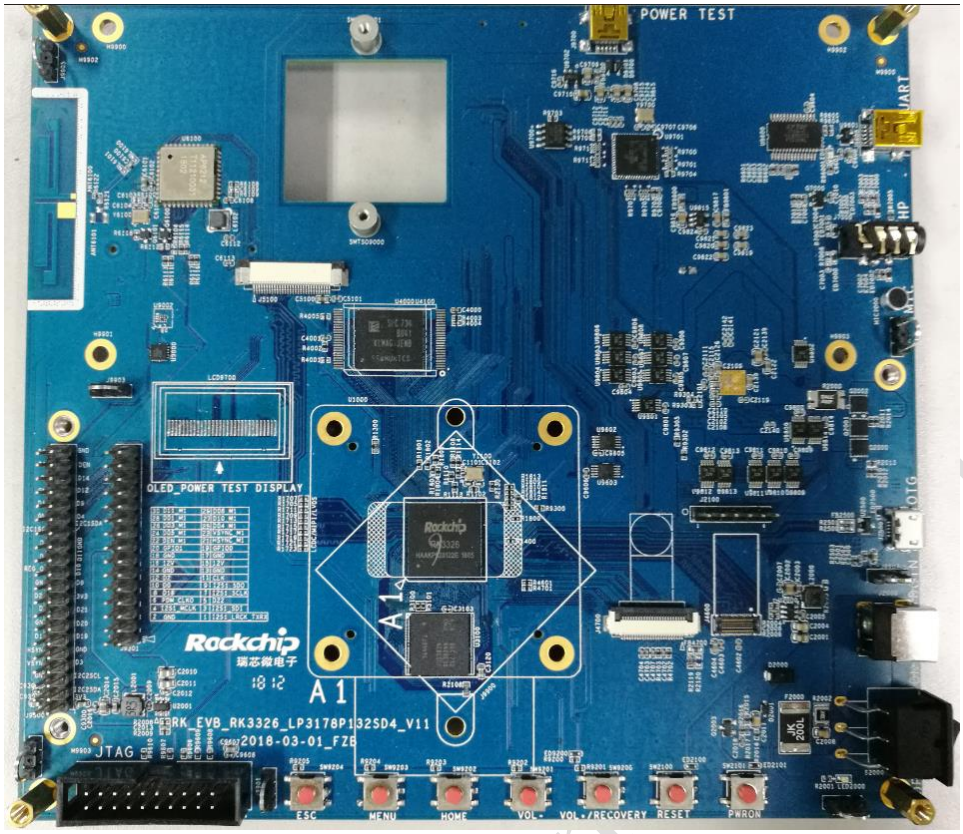

Figure 2-3 EVB PCB Front View

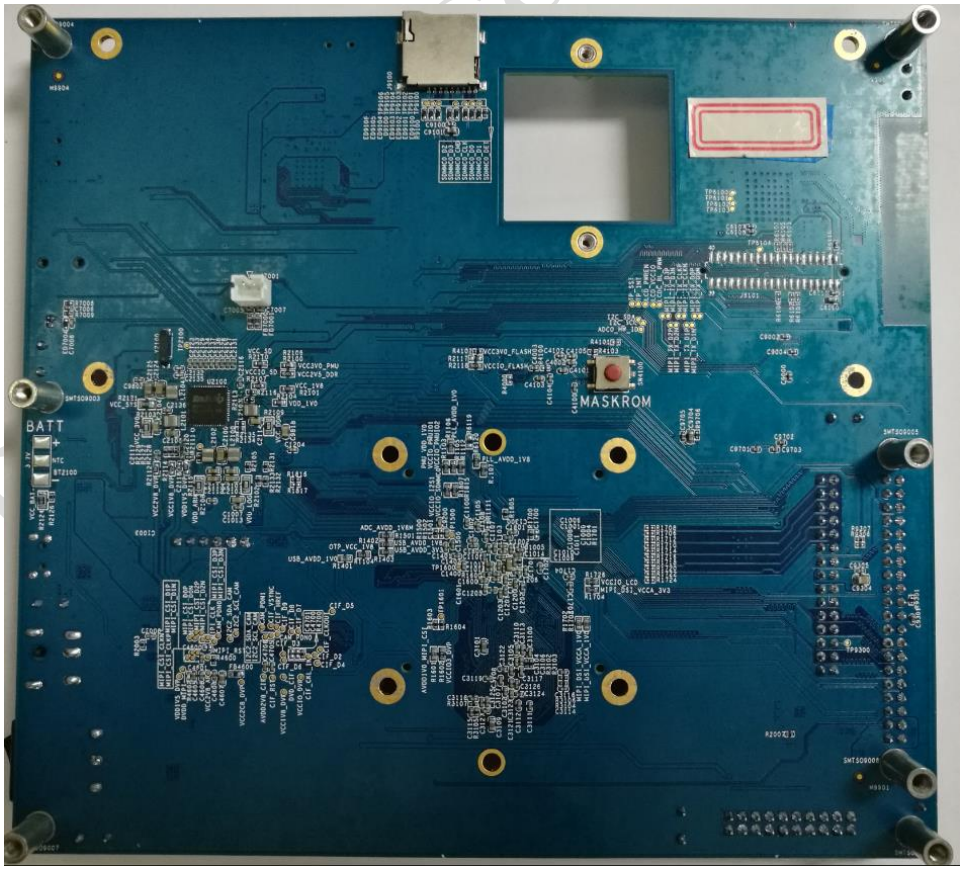

Figure 2-4 EVB PCB Back View

2.3 Power Block Diagram

RK3326 EVB uses PMIC of RK817-1. The power block diagram is as below:

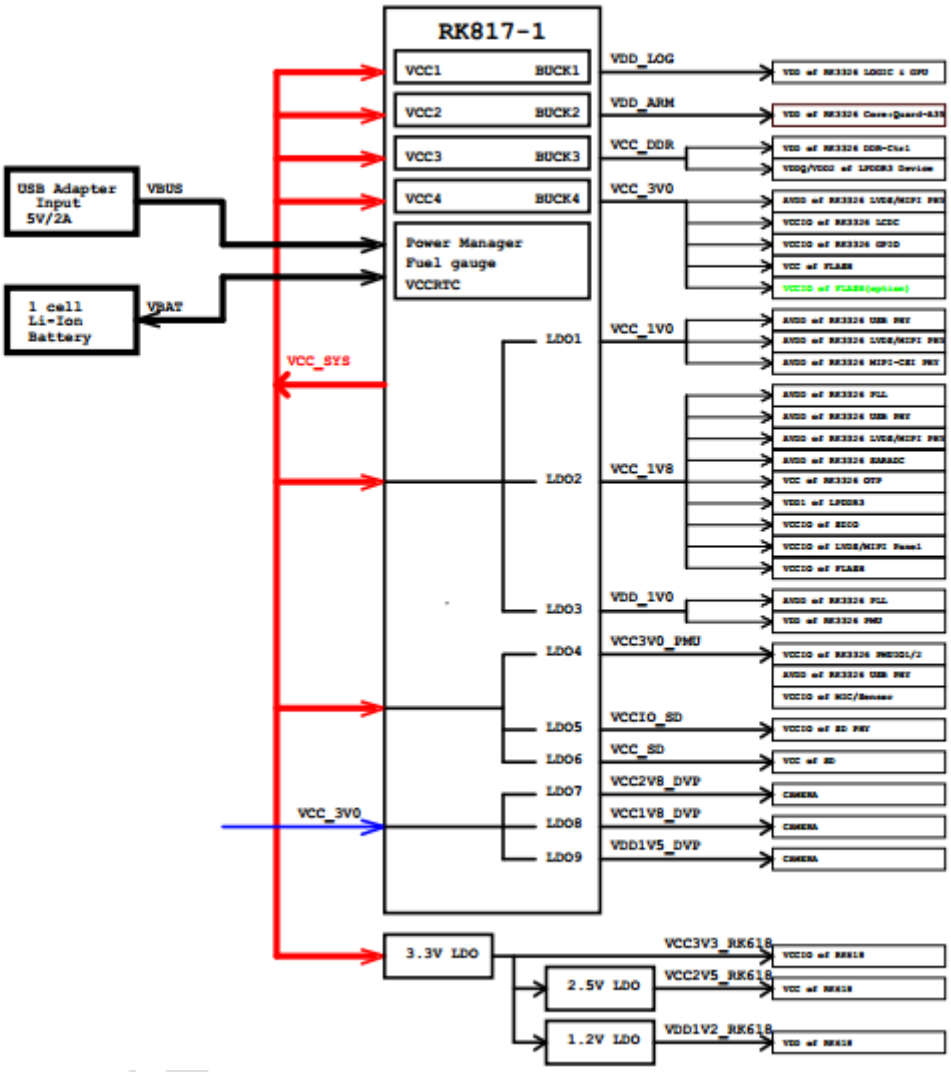

Figure 2-5 EVB Power Block Diagram

2.4 I²C Address

I2C address（7bit） configurations of RK3326 EVB are shown as below table:

Table 2-1 EVB I2C Address Table

	Device	Address
I²C0	RK817	0x20
	RK618	0x50
I²C1	MMA7660F	0x4c
	AK8963C	0x0d
	Raspberry Pi	

	Touch IC	
I²C2	OV5695	0x36
	IMX323	0x1a

Note: when using the extension board, need to ensure that the I²C address not conflict with the I²C address of the EVB.

2.5 Reference Design of The EVB

Please contact with RK FAE to get the reference design of RK3326 EVB. The latest version is as follows:

<RK_EVB_RK3326_LP3S178P132SD4_V12_20181024LX_Final.dsn>
<RK_EVB_RK3326_LP3S178P132SD4_12_20181024Lint_final.brd>

3.EVB Module Description

3.1 Power Input

The 12V power supply input by the DC adapter can be controlled ON/OFF by the boat switch. The power input was step-down to 3.8V by DC-DC BUCK SY8113B, it will provide input for PMIC, and then PMIC outputs multiple power supplies for EVB.

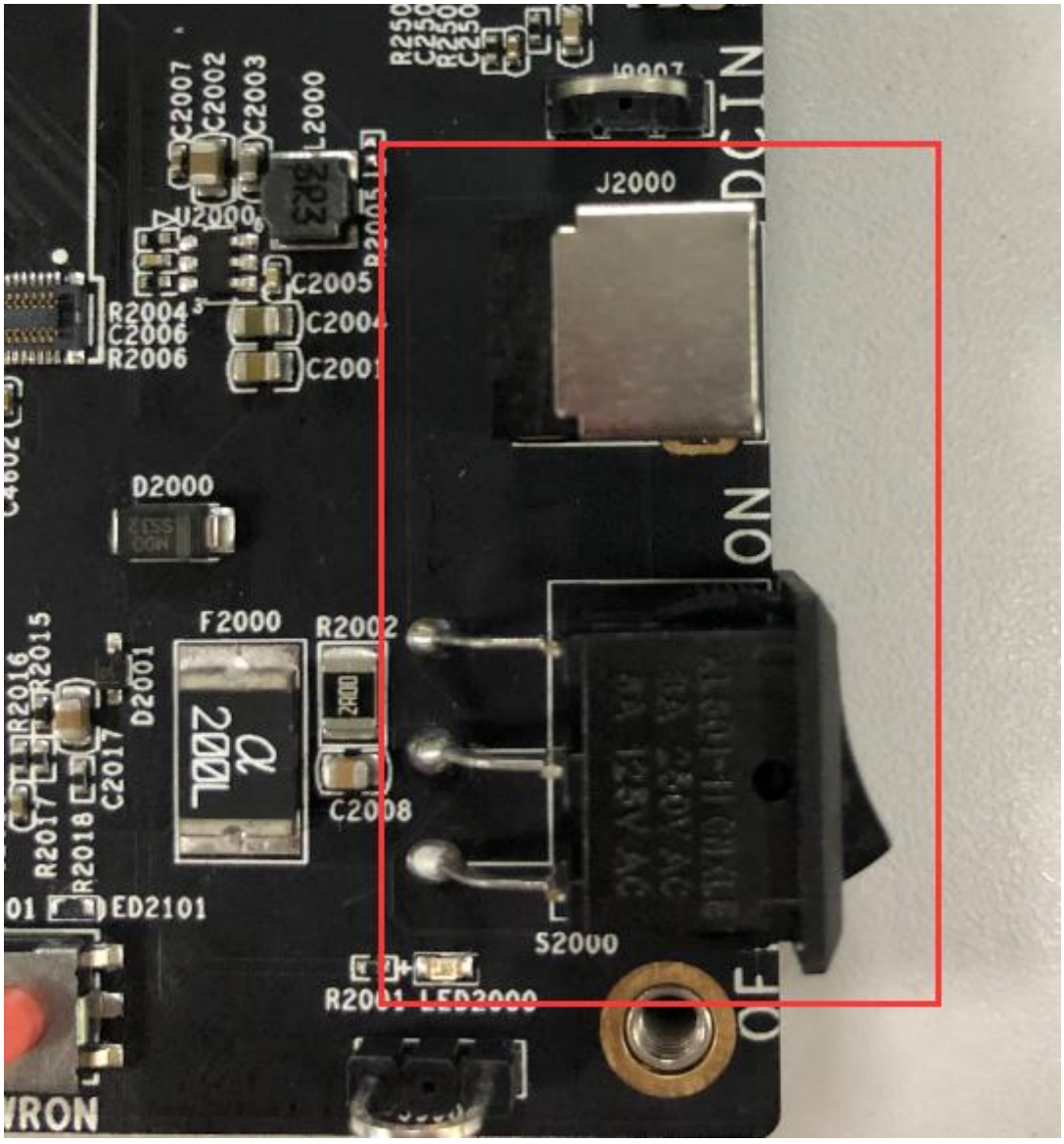

Figure 3-1 EVB Power Input

3.2 Memory

3.2.1 Flash

1. The default storage on the EVB is 16GByte eMMC FLASH, and the Nand Flash is reserved.

2. There is Update button back of the Flash, which is marked as “MASKROM” on

the main board, in order to upgrade images of the EVB conveniently. Connect USB, press and hold the button, EVB power on or reset, and then the system will enter MaskRom mode for image download.

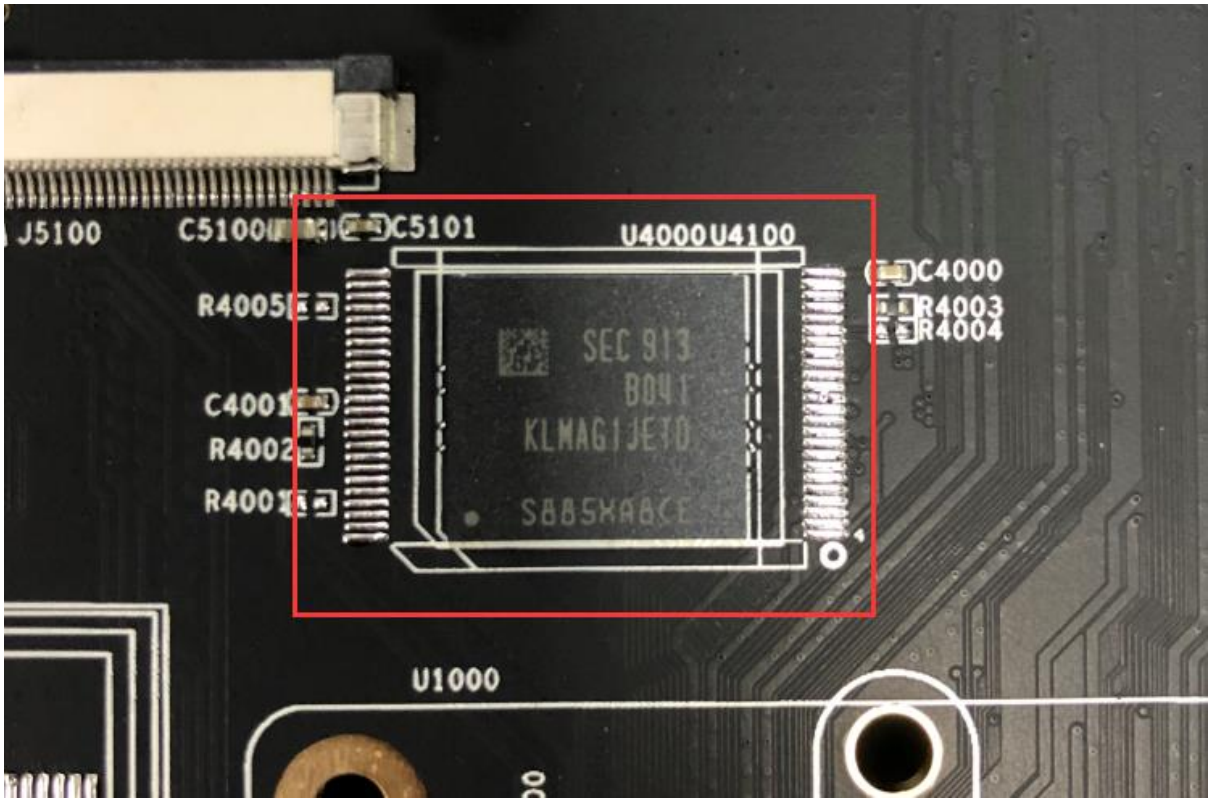

Figure 3-2 EVB Flash Memory

Figure 3-3 EVB Maskrom Button

3.2.2 DDR

The DDR controller of RK3326 supports 32bit DDR, EVB use LPDDR3, and total size is 2GByte.

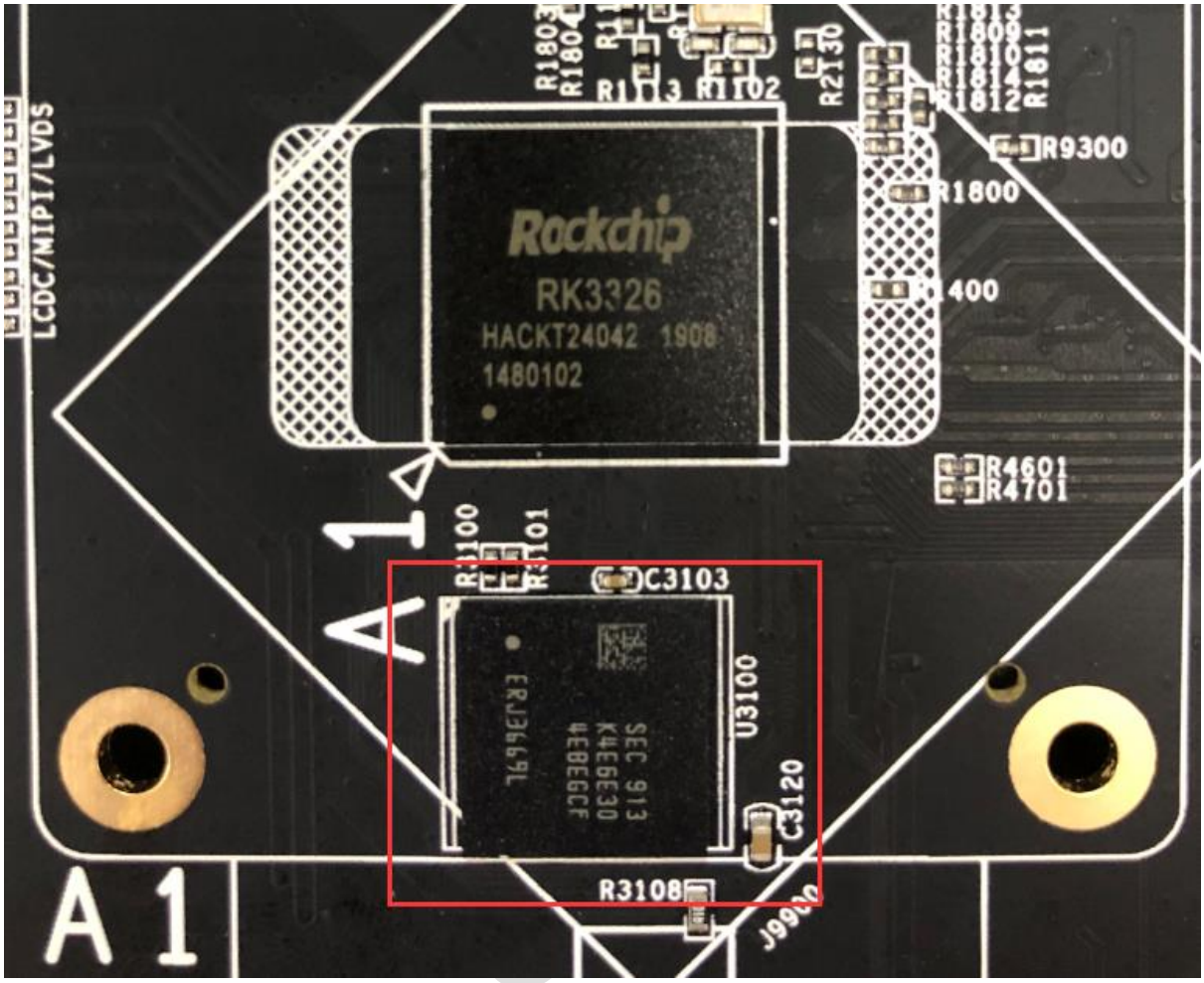

Figure 3-4 EVB LPDDR3

3.3 Button Array

1. The EVB provides button array, uses RK3326 ADC_IN2 as detection input, and supports 10bit resolution.

2. ADC power supply is provided by VCC_1V8, and the corresponding key value can be calculated according to the resistance parameter in Figure 3-6.

3. The EVB defines several commonly used function buttons: VOL+/VOL-/MENU/ESC/HOME.

4. Connect USB, press and hold VOL+/Recovery then power on (or reset), enter into Rockusb(Recovery) mode for image download.

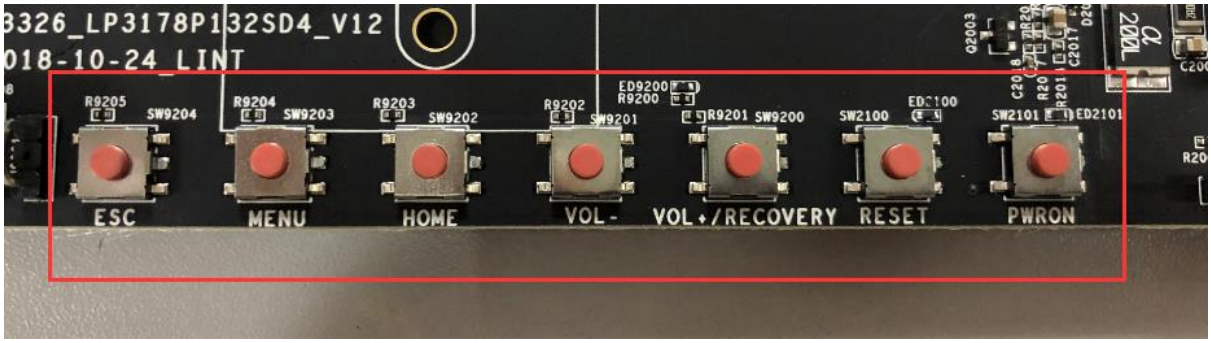

Figure 3-5 EVB Button Array

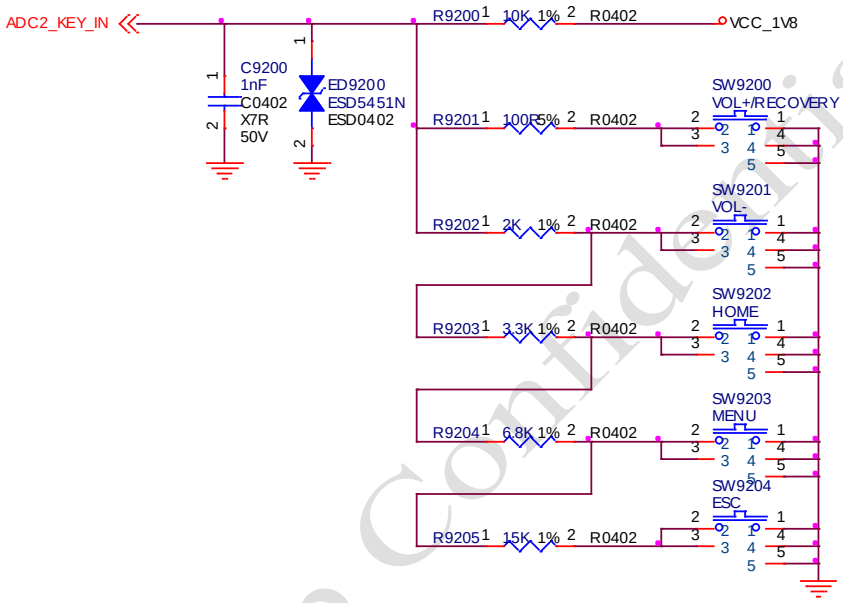

Figure 3-6 EVB Button Design

3.4 Accelerometer

The accelerometer used on the EVB is three-axis sensor MMA7660FC. It as shown below:

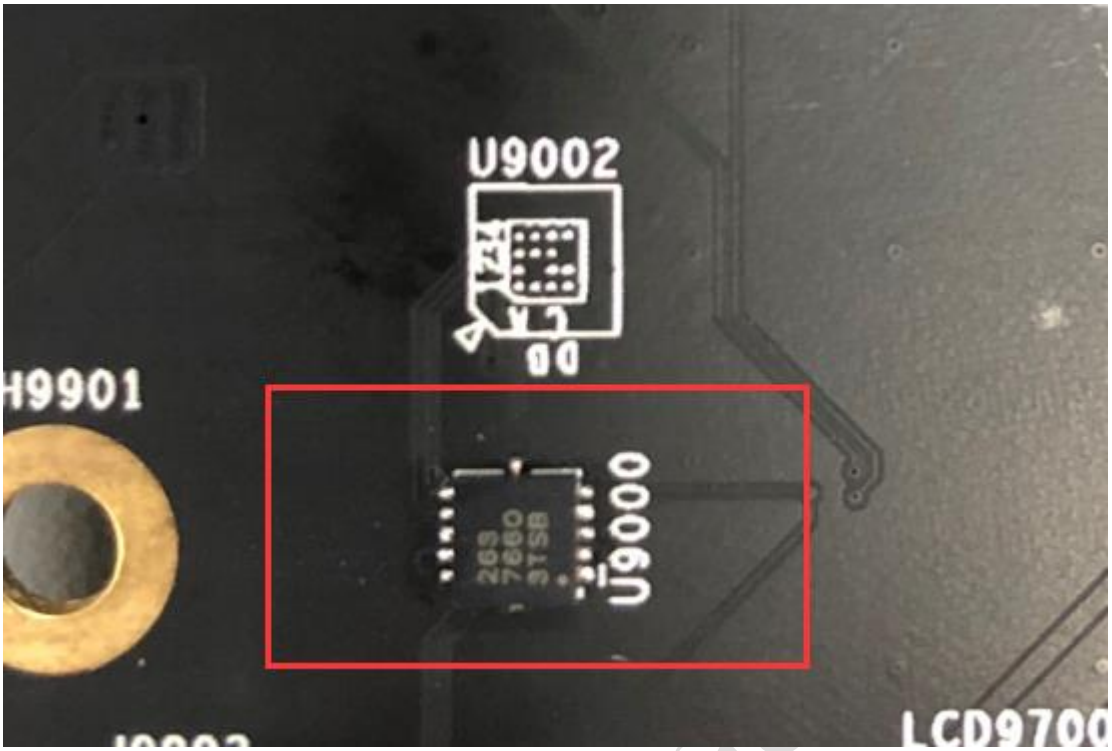

Figure 3-7 EVB Accelerometer Sensor

3.5 Compass

The electronic compass used on the EVB is AK8963C, which is communicating with SoC via I^2C. It is not pasted default, if you use it, please paste it yourself. It is shown as below.

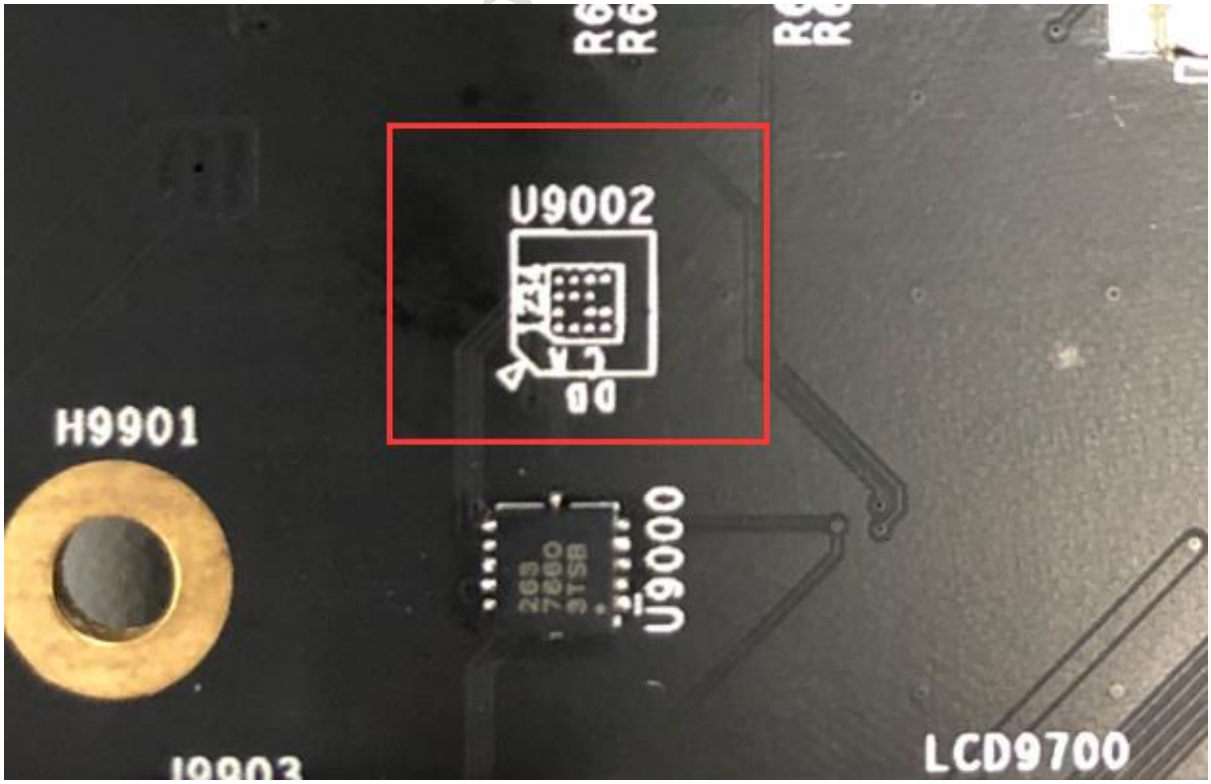

Figure 3-8 EVB Compass Sensor

3.6 Audio Input and Output

The EVB audio uses the embedded Codec of RK817-1. It has the following features:

- Embedded Charge Pump, support stereo Headphone output without capacitive coupling.
- Embedded Class-D amplifier, can drive 1.3W/8ohm speaker output, and have over-current protection
- Microphone supports single-end/differential input mode.

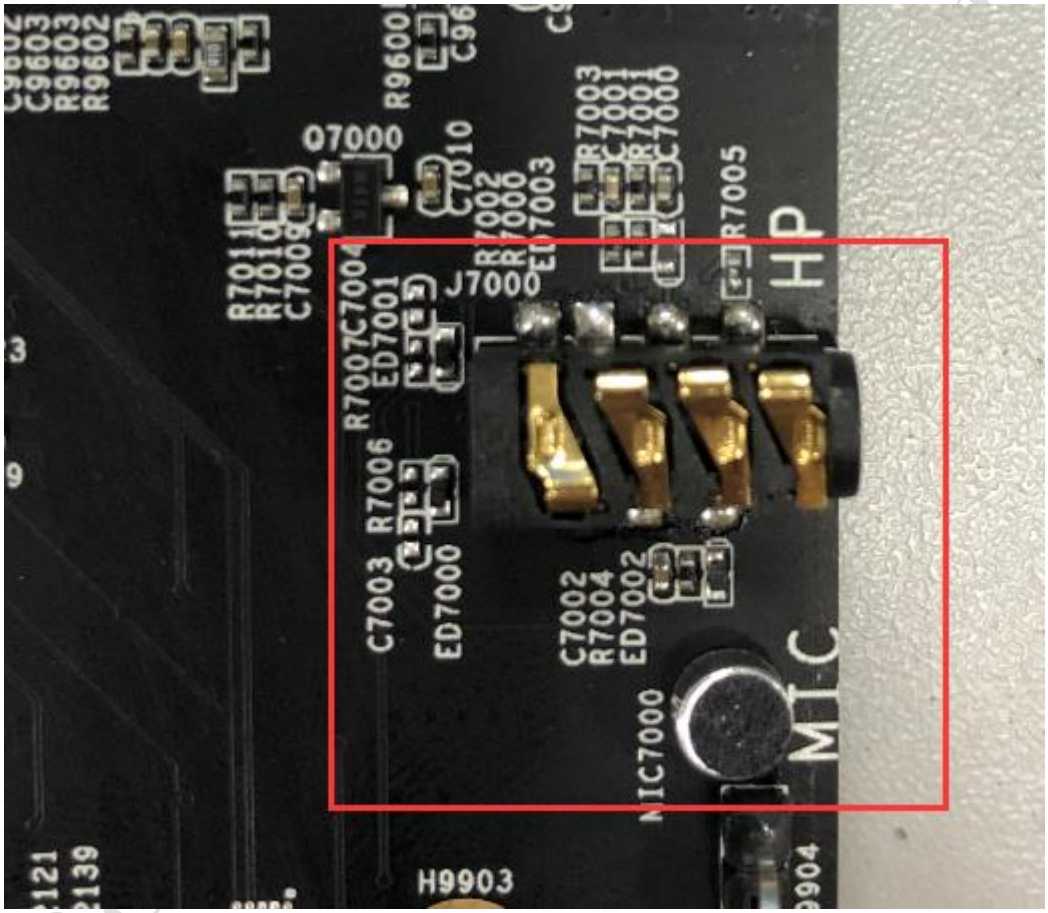

Figure 3-9 EVB Audio Input and Output

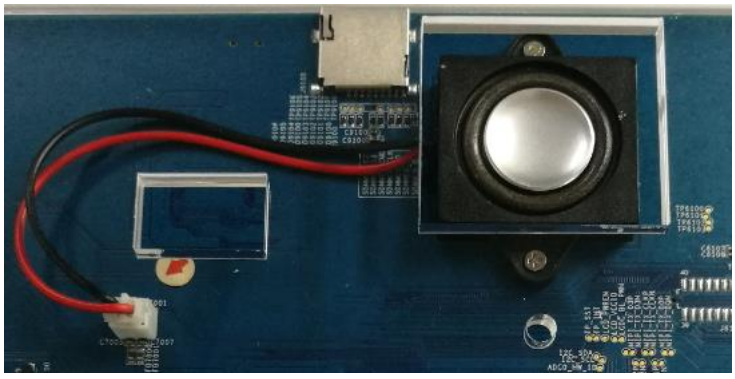

Figure 3-10 EVB Speaker Output

3.7 USB Micro-B Port

The EVB USB Micro-B connector, as shown below, supports USB OTG and is compatible with USB 2.0/1.1 specification. By detecting the input of VBUS and USB ID signals, it can be configured as USB HOST or USB DEVICE. In image download mode, J2500 is used as firmware download input.

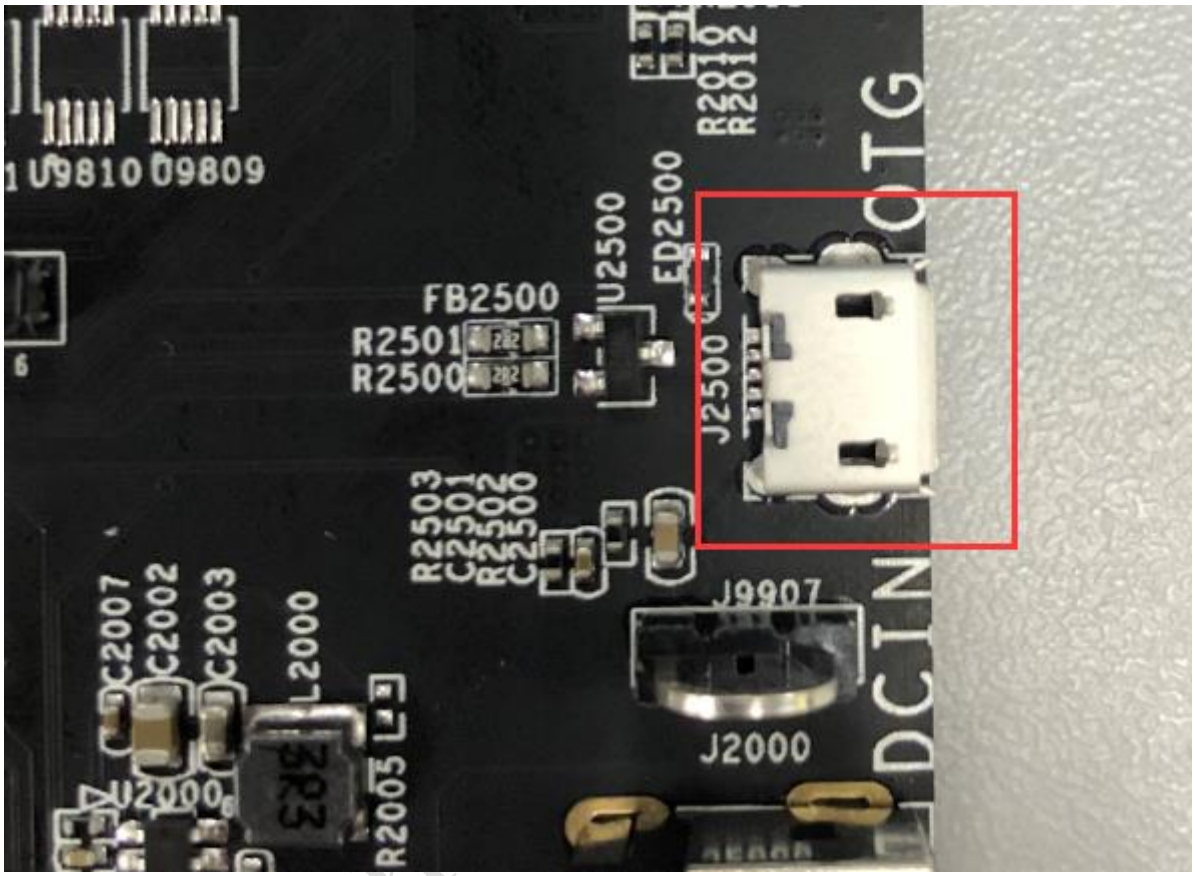

Figure 3-11 EVB USB Micro-B Port

3.8 Micro-SD Connector

The EVB has Micro-SD card interface as shown below. It can supports SDMMC 2.0/3.0, and the data bus width is 4bits.

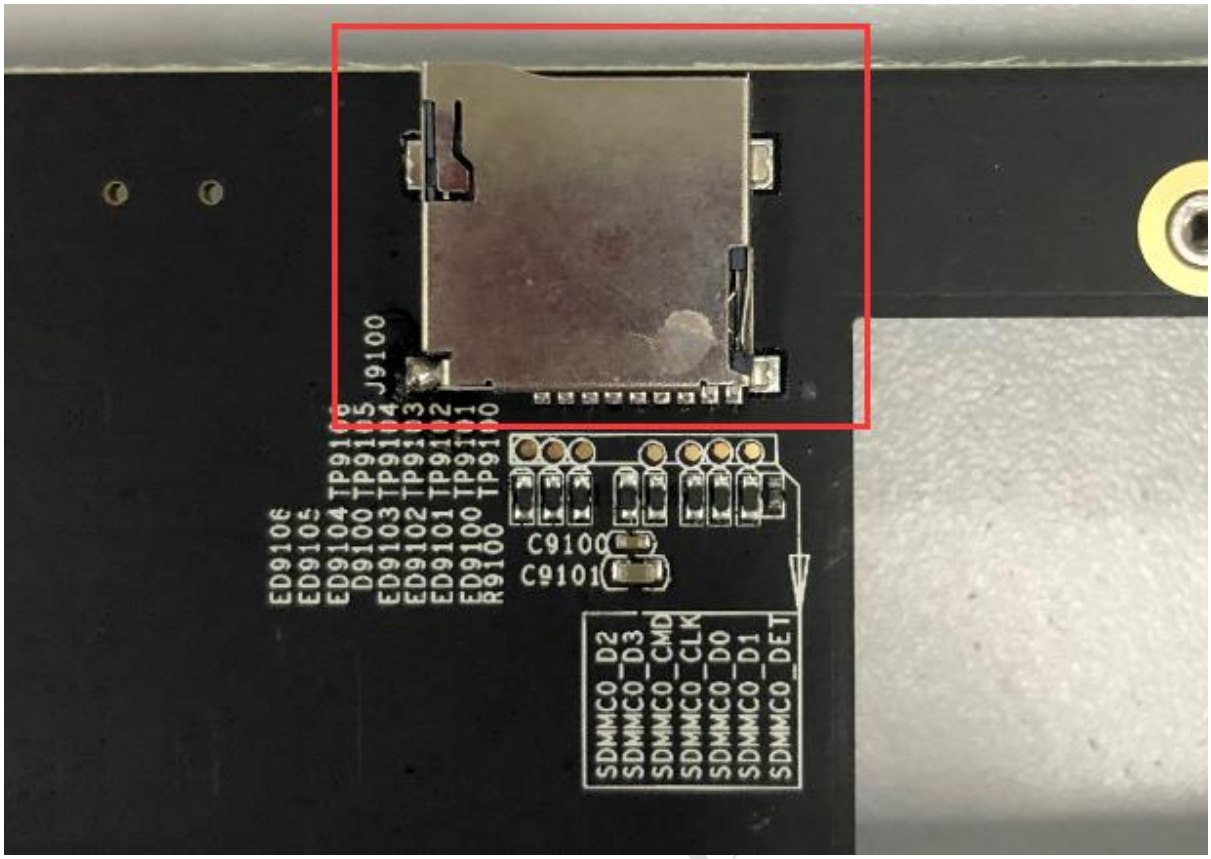

Figure 3-12 EVB Micro-SD Connector

3.9 Camera Connector

The EVB supports MIPI-CSI and DVP camera modules. The connector is shown as Figure 3-13. When using camera, please pay attention to voltage matching, otherwise it will cause camera work abnormally or fail to work. DVP Camera IO power supply defaults to 1.8V, as shown in Figure 3-14. To use 2.8V, you need to paste R2119 and do not paste R2120.

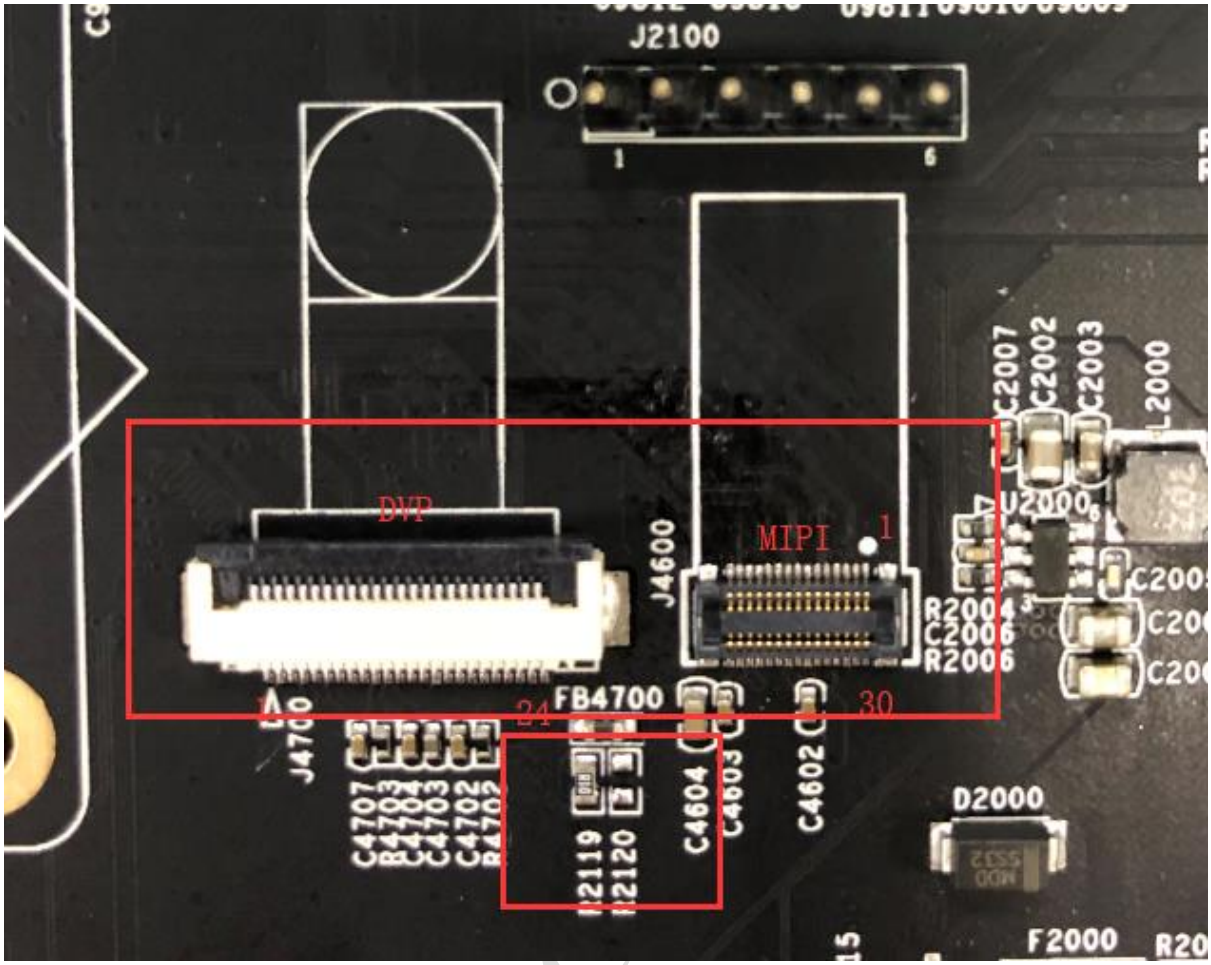

Figure 3-13 EVB Camera Connector

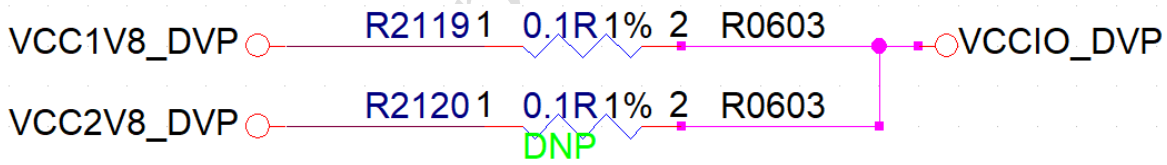

Figure 3-14 EVB Camera Power Selection

Table 3-1 EVB MIPI Camera Net Name and SoC Pin Name

Pin No.	Pin Net Name	SoC Pin Name
1	GND	GND
2	MIPI_CSI_D0P	MIPI_CSI_D0P
3	MIPI_CSI_DON	MIPI_CSI_DON
4	GND	GND
5	MIPI_CSI_D2P	MIPI_CSI_D2P
6	MIPI_CSI_D2N	MIPI_CSI_D2N
7	GND	GND
8	MIPI_CSI_D3P	MIPI_CSI_D3P
9	MIPI_CSI_D3N	MIPI_CSI_D3N
10	GND	GND
11	MIPI_MCLK	CIF_CLKO_M0/GPIO2_B3_d
12	MIPI_RST	N/A
13	GND	GND
14	CAM_PDN0	UART2_RX_M1/GPIO2_B6_d

15	GND	GND
16	GND	GND
17	VCC2V8_DVP	N/A
18	VCC2V8_AF	N/A
19	GND	GND
20	I2C2_SCL_CAM	I2C2_SCL/GPIO2_B7_u
21	I2C2_SDA_CAM	I2C2_SDA/GPIO2_C0_u
22	DVDD_MIPI	N/A
23	GND	GND
24	VCC1V8_DVP	N/A
25	GND	GND
26	MIPI_CSI_D1N	MIPI_CSI_D1N
27	MIPI_CSI_D1P	MIPI_CSI_D1P
28	GND	GND
29	MIPI_CSI_CLKP	MIPI_CSI_CLKP
30	MIPI_CSI_CLKN	MIPI_CSI_CLKN
31	GND	GND
32	GND	GND
33	GND	GND
34	GND	GND

Table 3-2 EVB DVP Camera Net Name and SoC Pin Name

Pin No.	Pin Net Name	SoC Pin Name
1	CAM_PDN1	GPIO2_B5_d
2	GND	GND
3	I2C2_SDA_CAM	I2C2_SDA/GPIO2_C0_u
4	AVDD2V8_CIF	N/A
5	I2C2_SCL_CAM	I2C2_SCL/GPIO2_B7_u
6	CIF_RST	N/A
7	CIF_VSYNC	CIF_VSYNC_M0/GPIO2_B0_d
8	CAM_PDN0	UART2_RX_M1/GPIO2_B6_d
9	CIF_HREF	CIF_HREF_M0/GPIO2_B1_d
10	DVDD_CIF	N/A
11	VCCIO_DVP	VCCIO3
12	CIF_D9	CIF_D9_M0/GPIO2_A7_d
13	CIF_CLKOUT	CIF_CLKO_M0/GPIO2_B3_d
14	CIF_D8	CIF_D8_M0/GPIO2_A6_d
15	GND	GND
16	CIF_D7	CIF_D7_M0/GPIO2_A5_d
17	CIF_CLK_IN	CIF_CLKI_M0/GPIO2_B2_d
18	CIF_D6	CIF_D6_M0/GPIO2_A4_d
19	CIF_D2	CIF_D2_M0/GPIO2_A0_d
20	CIF_D5	CIF_D5_M0/GPIO2_A3_d
21	CIF_D3	CIF_D3_M0/GPIO2_A1_d
22	CIF_D4	CIF_D4_M0/GPIO2_A2_d
23	NC	N/A
24	NC	N/A
25	GND	GND
26	GND	GND

3.10 Wi-Fi/BT Molude

The Wi-Fi/BT module of the EVB is AP6212 module as shown in Figure 3-15. It has the following features:

- Support Wi-Fi (802.11 b/g/n), BT4.1, FM functions
- BT data is transmitted through UART
- BT voice is transmitted through PCM
- Wi-Fi data supports 4bits SDIO 3.0
-

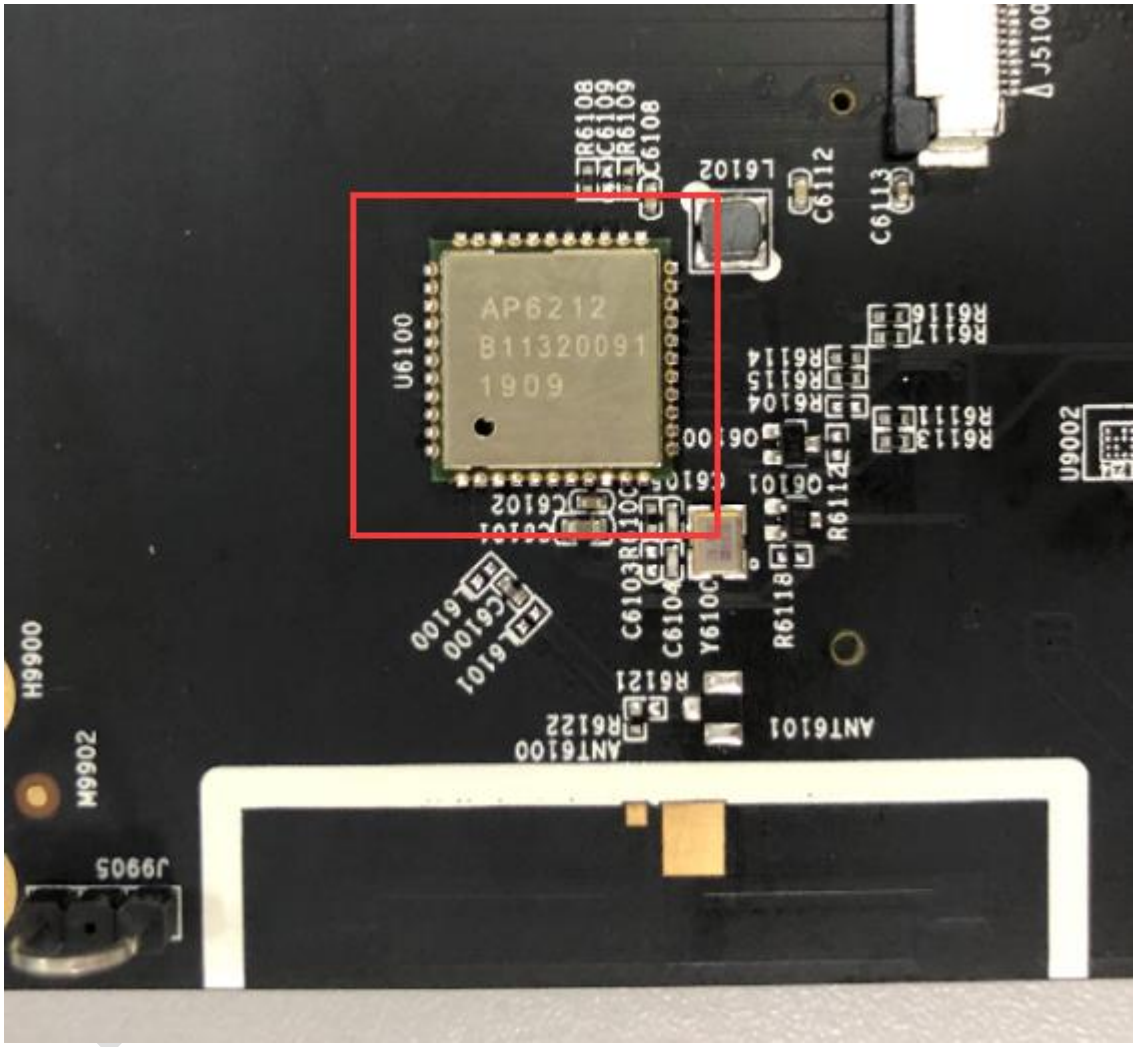

Figure 3-15 EVB Wi-Fi/BT Module

The Wi-Fi/BT expansion connector is reserved on the development board, as shown in Figure 3-16. If it needs to be used, the AP6212 module on the EVB needs to be removed.

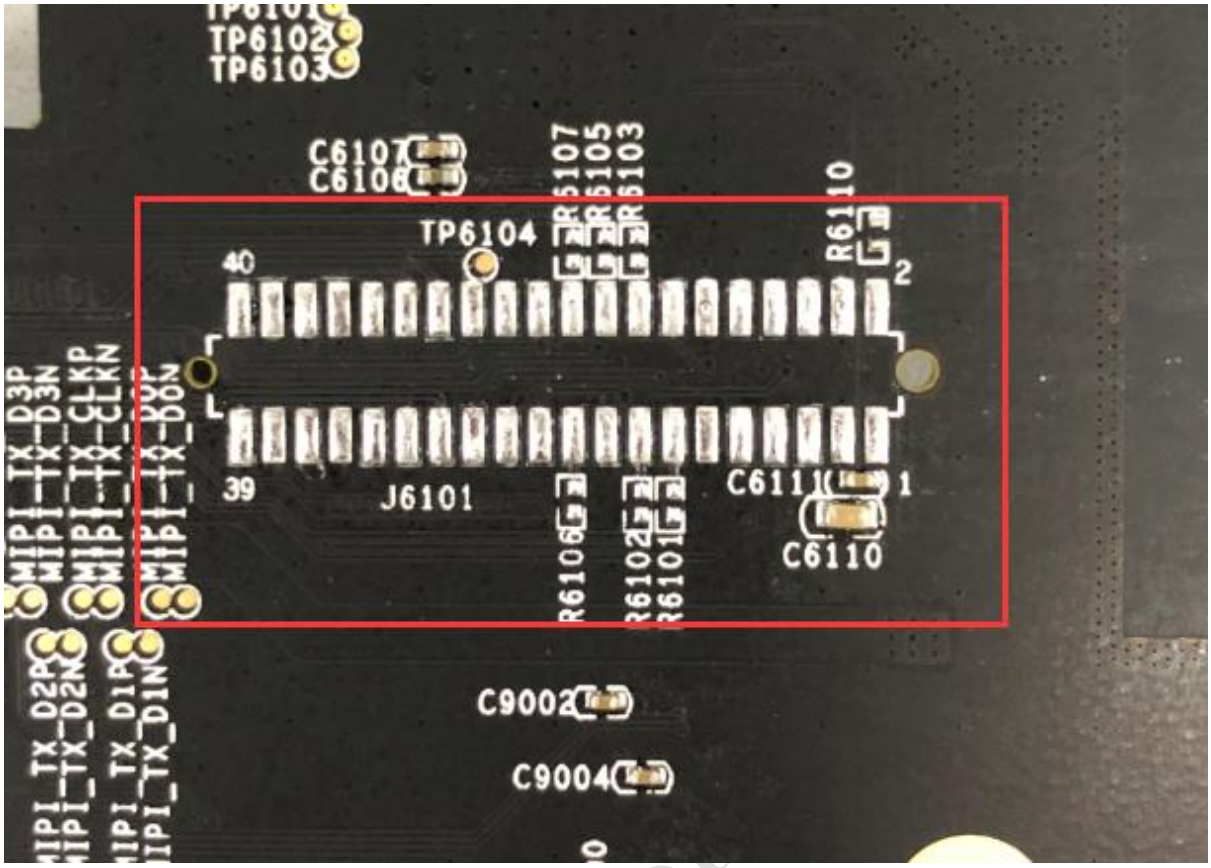

Figure 3-16 EVB Wi-Fi/BT Expansion Connector

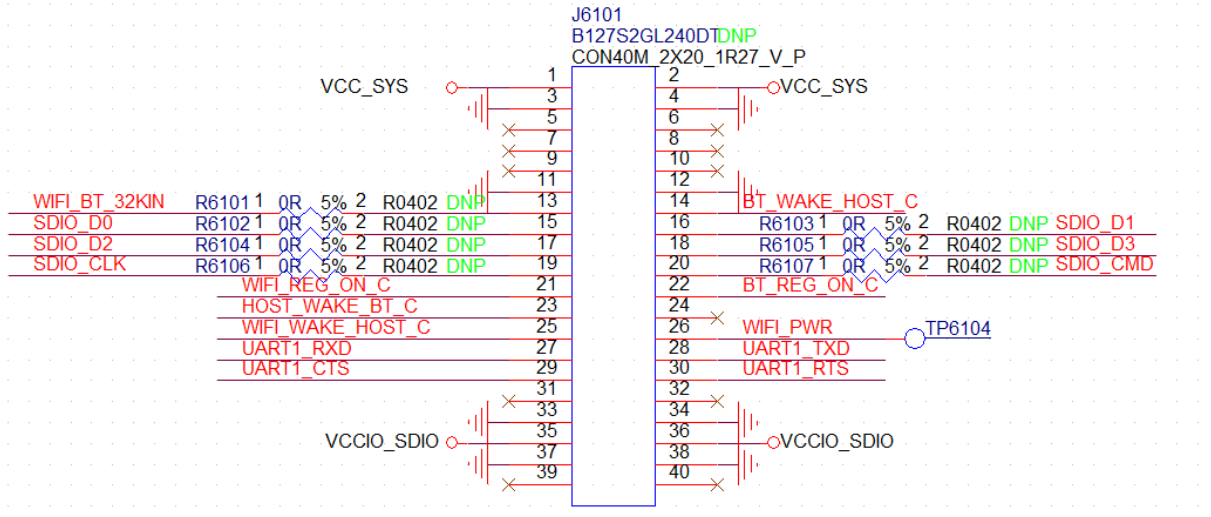

Figure 3-17 EVB Wi-Fi/BT Expansion Connector Pin Net Name

Table 3-3 EVB Wi-Fi/BT Expansion Connector Net Name and SoC Pin Name

Pin No.	Pin Net Name	SOC Pin Name
1	VCC_SYS	N/A
2	VCC_SYS	N/A
3	GND	GND
4	GND	GND
5	NC	N/A
6	NC	N/A

7	NC	N/A
8	NC	N/A
9	NC	N/A
10	NC	N/A
11	GND	GND
12	GND	GND
13	WIFI_BT_32KIN	CLKIO_32K/GPIO0_C4_z
14	BT_WAKE_HOST_C	GPIO0_B3_d
15	SDIO_D0	SDIO_D0/GPIO1_C6_u
16	SDIO_D1	SDIO_D1/GPIO1_C7_u
17	SDIO_D2	SDIO_D2/GPIO1_D0_u
18	SDIO_D3	SDIO_D3/GPIO1_D1_u
19	SDIO_CLK	SDIO_CLK/GPIO1_C5_u
20	SDIO_CMD	SDIO_CMD/GPIO1_C4_u
21	WIFI_REG_ON_C	GPIO0_A2_d
22	BT_REG_ON_C	GPIO0_C1_d
23	HOST_WAKE_BT_C	GPIO0_A1_d
24	NC	N/A
25	WIFI_WAKE_HOST_C	GPIO0_B2_d
26	Wi-Fi_PWR	N/A
27	UART1_RXD	UART1_RXD/GPIO1_C0_u
28	UART1_TXD	UART1_TXD/GPIO1_C1_u
29	UART1_CTS	UART1_CTS/GPIO1_C2_u
30	UART1_RTS	UART1_RTS/GPIO1_C3_u
31	NC	N/A
32	NC	N/A
33	GND	GND
34	GND	GND
35	VCCIO_SDIO	VCCIO1
36	VCCIO_SDIO	VCCIO1
37	GND	GND
38	GND	GND
39	NC	N/A
40	NC	N/A

3.11 LCM MIPI

The MIPI screen is used for EVB display default. As shown in the figure below, the selected resistor is pasted 0ohm by default to connect the MIPI signal:

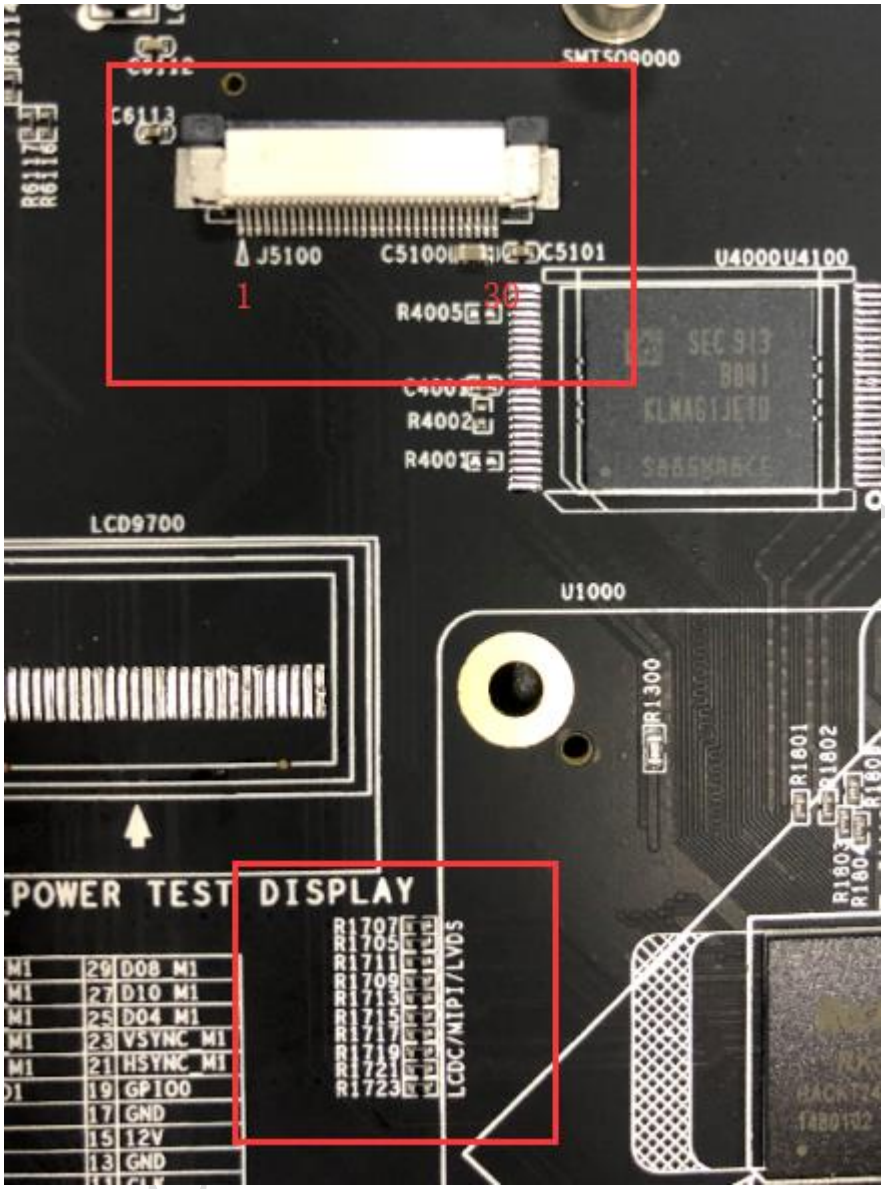

Figure 3-18 EVB MIPI LCM Connector

Table 3-4 EVB MIPI LCM Connector Net Name and SoC Pin Name

Pin No.	Pin Net Name	SOC Pin Name
1	GND	GND
2	LCM_LVDS/MIPI_TX_D0N	LVDS/MIPI_TX_D0N/LCDC_D11_M1
3	LCM_LVDS/MIPI_TX_D0P	LVDS/MIPI_TX_D0P/LCDC_D8_M1
4	GND	GND
5	LCM_LVDS/MIPI_TX_D1N	LVDS/MIPI_TX_D1N/LCDC_D1_M1
6	LCM_LVDS/MIPI_TX_D1P	LVDS/MIPI_TX_D1P/LCDC_D10_M1
7	GND	GND
8	LCM_LVDS/MIPI_TX_CLKN	LVDS/MIPI_TX_CLKN/LCDC_D4_M1
9	LCM_LVDS/MIPI_TX_CLKP	LVDS/MIPI_TX_CLKP/LCDC_D3_M1
10	GND	GND
11	LCM_LVDS/MIPI_TX_D2N	LVDS/MIPI_TX_D2N/LCDC_VSYNC_M1
12	LCM_LVDS/MIPI_TX_D2P	LVDS/MIPI_TX_D2P/LCDC_D5_M1
13	GND	GND
14	LCM_LVDS/MIPI_TX_D3N	LVDS/MIPI_TX_D3N/LCDC_HSYNC_M1

15	LCM_LVDS/MIPI_TX_D3P	LVDS/MIPI_TX_D3P/LCDC_DEN_M1
16	GND	GND
17	LCDC_BL_PWM	PWM1/GPIO0_C0_d
18	NC	N/A
19	LCD_VCCIO	N/A
20	NC	N/A
21	ADC0_HW_ID	ADC_IN0
22	LCD_PWREM	TEST_CLK1/GPIO0_B5_u
23	I2C1_SCL	I2C1_SCL/GPIO0_C2_d
24	I2C1_SDA	I2C1_SDA/GPIO0_C3_d
25	TP_INT	GPIO0_A5_u
26	TP_RST	GPIO0_B4_u
27	GND	GND
28	VCC_SYS	N/A
29	VCC_SYS	N/A
30	VCC_SYS	N/A
31	GND	GND
32	GND	GND

3.12 RGB Expansion Connector

RGB expansion connector (J9300, J9301) are reserved on the EVB. As shown in the following figure, if you need to choose the RGB expansion connector, you need to replace the selected resistors (0R) of Figure 3-19 with the selected resistors position of Figure 3-20.

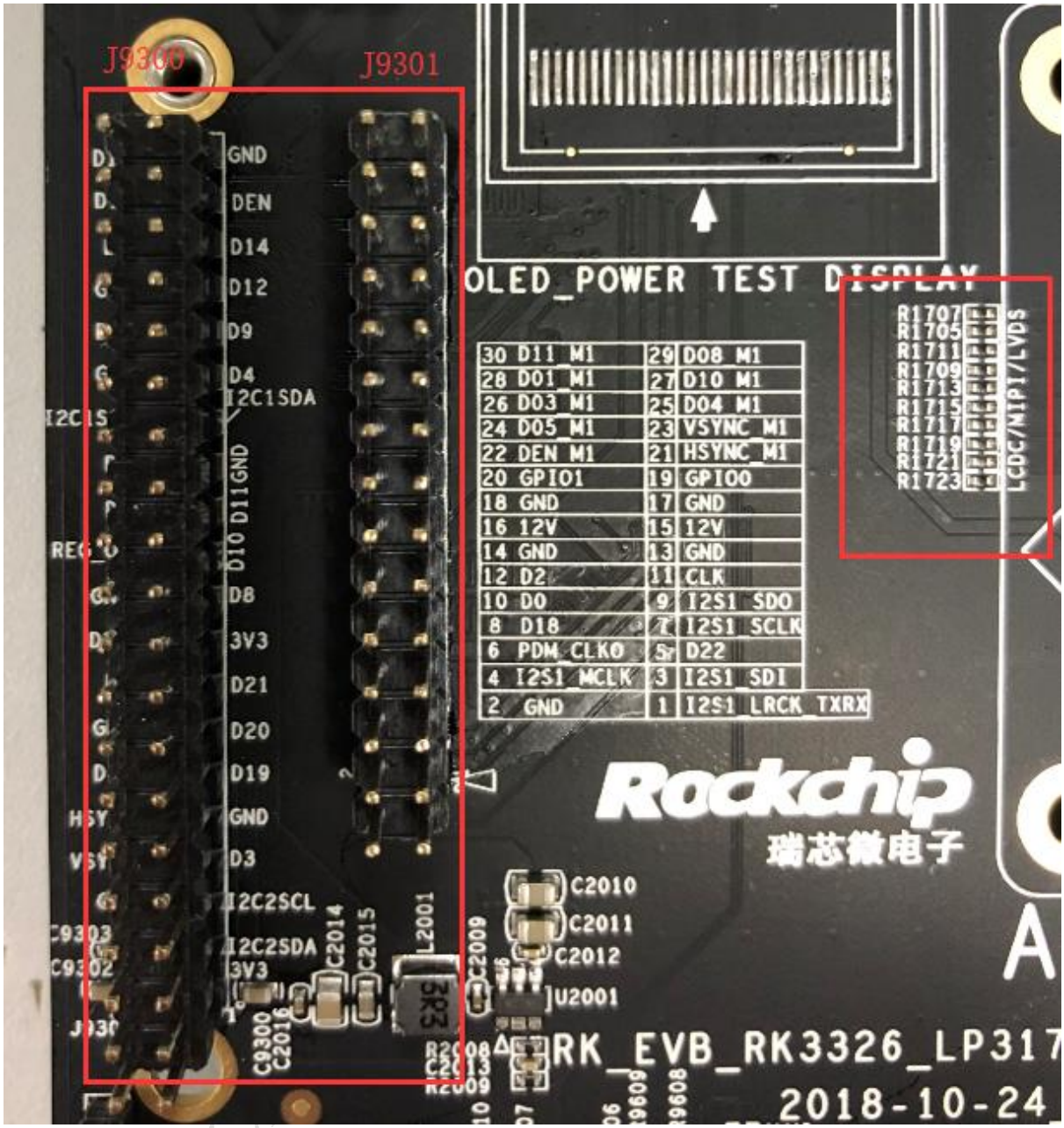

Figure 3-19 EVB RGB Expansion Connector

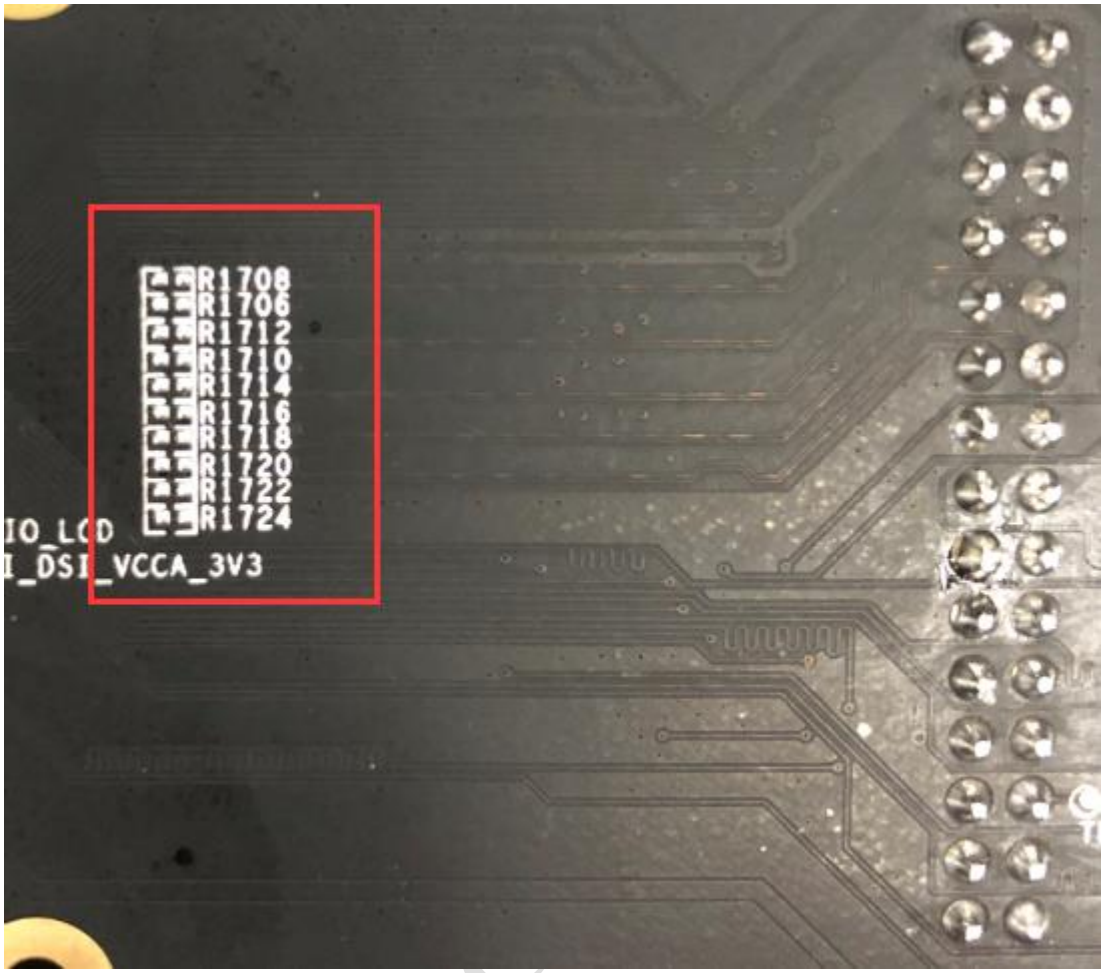

Figure 3-20 EVB RGB Expansion Connector Selection

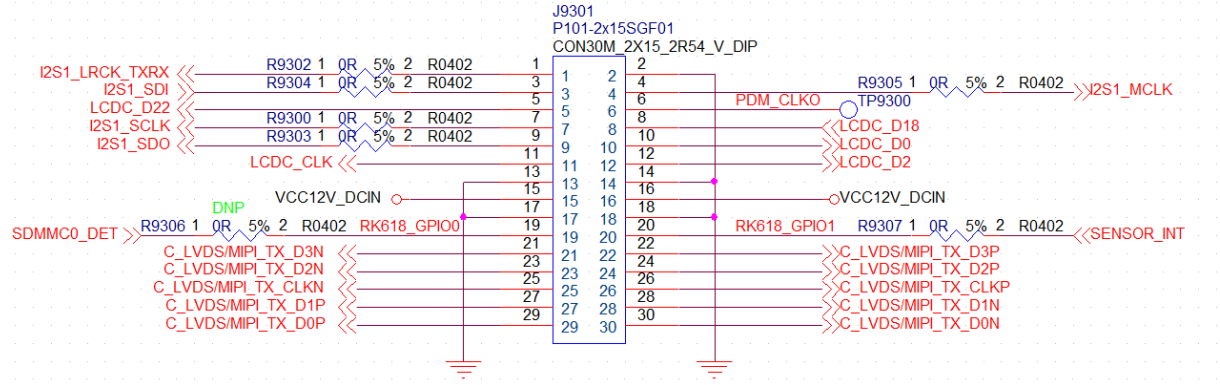

Figure 3-21 EVB RGB Expansion Connector Pin Net Name

Table 3-5 EVB RGB Expansion Connector Net Name and SoC Pin Name

Pin No.	Pin Net Name	SOC Pin Name
1	I2S1_LRCK_TXRX	I2S1_LRCK_TXRX/GPIO2_C1_d
2	GND	GND
3	I2S1_SDI	PDM_SDIO_M1/I2S1_SDI/GPIO2_C5_d
4	I2S1_MCLK	I2S1_MCLK/GPIO2_C3_d
5	LCDC_D22	ISP_FLASH_TRIGOUT/PDM_SDI3/CIF_HREF_M1/LCDC_D22/GPIO3_D2_d
6	PDM_CLKO	N/A

7	I2S1_SCLK	I2S1_SCLK/GPIO2_C2_d
8	LCDC_D18	PDM_CLK0_M0/LCDC_D18/GPIO3_C6_d
9	I2S1_SDO	I2S1_SDO/GPIO2_C4_d
10	LCDC_D0	LCDC_D0/GPIO3_A4_d
11	LCDC_CLK	LCDC_CLK/GPIO3_A0_d
12	LCDC_D2	LCDC_D2/GPIO3_A6_d
13	GND	GND
14	GND	GND
15	VCC12V_DCIN	N/A
16	VCC12V_DCIN	N/A
17	GND	GND
18	GND	GND
19	SDMMC0_DET	SDMMC0_DETN/GPIO0_A3_u
20	SENSOR_INT	OTG_DRV/PWM0/GPIO0_B7_d
21	C_LVDS/MIPI_TX_D3N	LVDS/MIPI_TX_D3N/LCDC_HSYNC_M1
22	C_LVDS/MIPI_TX_D3P	LVDS/MIPI_TX_D3P/LCDC_DEN_M1
23	C_LVDS/MIPI_TX_D2N	LVDS/MIPI_TX_D2N/LCDC_VSYNC_M1
24	C_LVDS/MIPI_TX_D2P	LVDS/MIPI_TX_D2P/LCDC_D5_M1
25	C_LVDS/MIPI_TX_CLKN	LVDS/MIPI_TX_CLKN/LCDC_D4_M1
26	C_LVDS/MIPI_TX_CLKP	LVDS/MIPI_TX_CLKP/LCDC_D3_M1
27	C_LVDS/MIPI_TX_D1P	LVDS/MIPI_TX_D1P/LCDC_D10_M1
28	C_LVDS/MIPI_TX_D1N	LVDS/MIPI_TX_D1N/LCDC_D1_M1
29	C_LVDS/MIPI_TX_D0P	LVDS/MIPI_TX_D0P/LCDC_D8_M1
30	C_LVDS/MIPI_TX_D0N	LVDS/MIPI_TX_D0N/LCDC_D11_M1

3.13 Raspberry Pi Connector

The EVB has reserved the interface connector of the second generation B version of raspberry pie, as shown in the following figure.

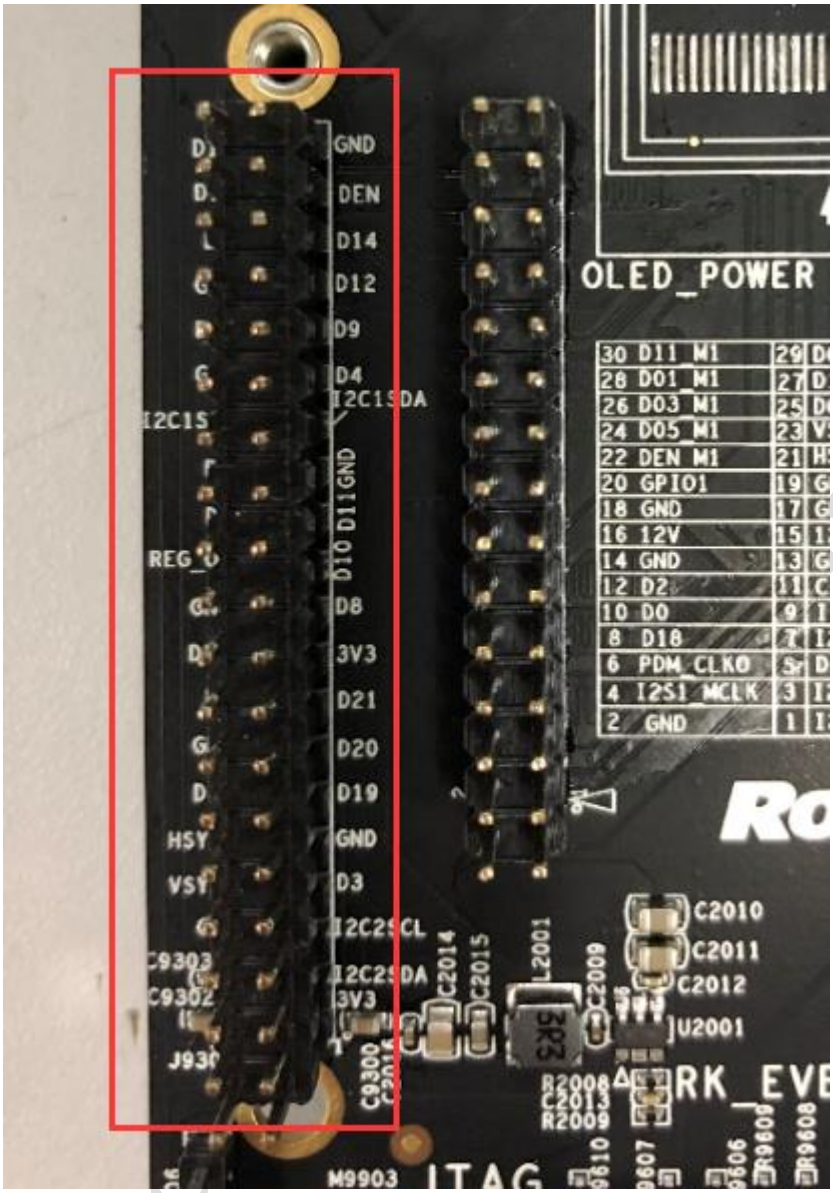

Figure 3-22 EVB Raspberry Pi Expansion Connector

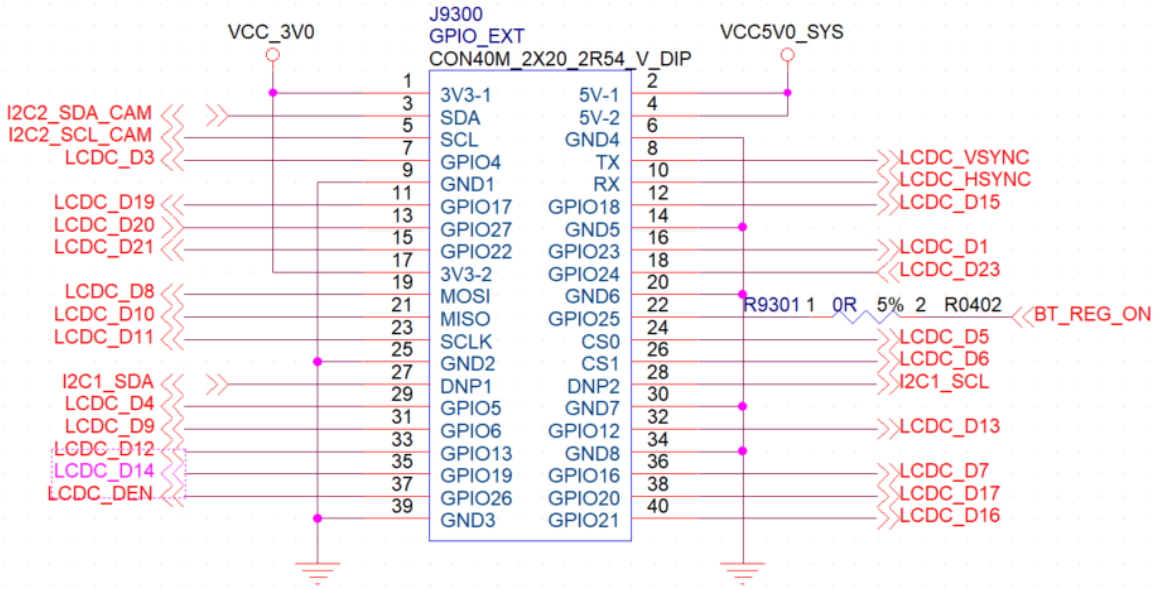

Figure 3-23 EVB Raspberry Pi Expansion Connector Pin Net Name

Table 3-6 EVB Raspberry Pi Expansion Connector Net Name and SoC Pin Name

Pin No.	Pin Net Name	SOC Pin Name
1	VCC_3V0	VCCIO4
2	VCC5V0_SYS	N/A
3	I2C2_SDA_CAM	I2C2_SDA/GPIO2_C0_u
4	VCC5V0_SYS	N/A
5	I2C2_SCL_CAM	I2C2_SCL/GPIO2_B7_u
6	GND	GND
7	LCDC_D3	I2S2_2CH_SDO/CIF_D4_M1/LCDC_D3_M0/GPIO3_A7_d
8	LCDC_VSYNC	I2S2_2CH_SCLK/LCDC_VSYNC_M0/GPIO3_A2_d
9	GND	GND
10	LCDC_HSYNC	I2S2_2CH_MCLK/LCDC_HSYNC_M0/GPIO3_A1_d
11	LCDC_D19	PDM_CLK1/LCDC_D19/GPIO3_C7_d
12	LCDC_D15	TDM_SCLK/I2S0_8CH_SCLKTX/LCDC_D15/GPIO3_C3_d
13	LCDC_D20	PDM_SDI1/CIF_CLKOUT_M1/LCDC_D20/GPIO3_D0_d
14	GND	GND
15	LCDC_D21	ISP_PRELIGHT_TRIG/PDM_SDI2/CIF_VSYNC_M1/LCDC_D21/GPIO3_D1_d
16	LCDC_D1	I2S2_2CH_SDI/CIF_D3_M1/LCDC_D1_M0/GPIO3_A5_d
17	VCC_3V0	VCCIO4
18	LCDC_D23	ISP_FLASH_TRIGIN/PDM_SDI0_M0/CIF_CLKIN_M1/LCDC_D23/GPIO3_D3_d
19	LCDC_D8	SPI1_MOSI/I2S0_8CH_SCLKRX/CIF_D7_M1/LCDC_D8_M0/GPIO3_B4_d
20	GND	GND
21	LCDC_D10	SPI1_MISO/I2S0_8CH_SDO3/CIF_D8_M1/LCDC_D10_M0/GPIO3_B6_d

22	BT_REG_ON	GPIO0_C1_d
23	LCDC_D11	SPI1_CLK/I2S0_8CH_SDO2/CIF_D9_M1/LCDC_D11_M0/GPIO3_B7_d
24	LCDC_D5	SPI1_CSN0/I2S0_8CH_SDI2/CIF_D6_M1/LCDC_D5_M0/GPIO3_B1_d
25	GND	GND
26	LCDC_D6	SPI1_CSN1/LCDC_D6/GPIO3_B2_d
27	I2C1_SDA	I2C1_SDA/GPIO0_C3_d
28	I2C1_SCL	I2C1_SCL/GPIO0_C2_d
29	LCDC_D4	I2S0_8CH_SDI3/CIF_D5_M1/LCDC_D4_M0/GPIO3_B0_d
30	GND	GND
31	LCDC_D9	I2S0_8CH_LRCKRX/LCDC_D9/GPIO3_B5_d
32	LCDC_D13	I2S0_8CH_MCLK/LCDC_D13/GPIO3_C1_d
33	LCDC_D12	I2S0_8CH_SDO1/LCDC_D12/GPIO3_C0_d
34	GND	GND
35	LCDC_D14	TDM_FSYNC/LCDC_D14/I2S0_8CH_LRCKTX/GPIO3_C2_d
36	LCDC_D7	I2S0_8CH_SDI1/LCDC_D7/GPIO3_B3_d
37	LCDC_DEN	I2S2_2CH_LRCK/CIF_D2_M1/LCDC_DEN_M0/GPIO3_A3_d
38	LCDC_D17	TDM_SDI/I2S0_8CH_SDI0/LCDC_D17/GPIO3_C5_d
39	GND	GND
40	LCDC_D16	TDM_SDO/I2S0_8CH_SDO0/LCDC_D16/GPIO3_C4_d

3.14 UART Debug Connector

The EVB provides serial port for debugging. FT232RL highly integrated FT232-USB interface conversion chip is used as following.

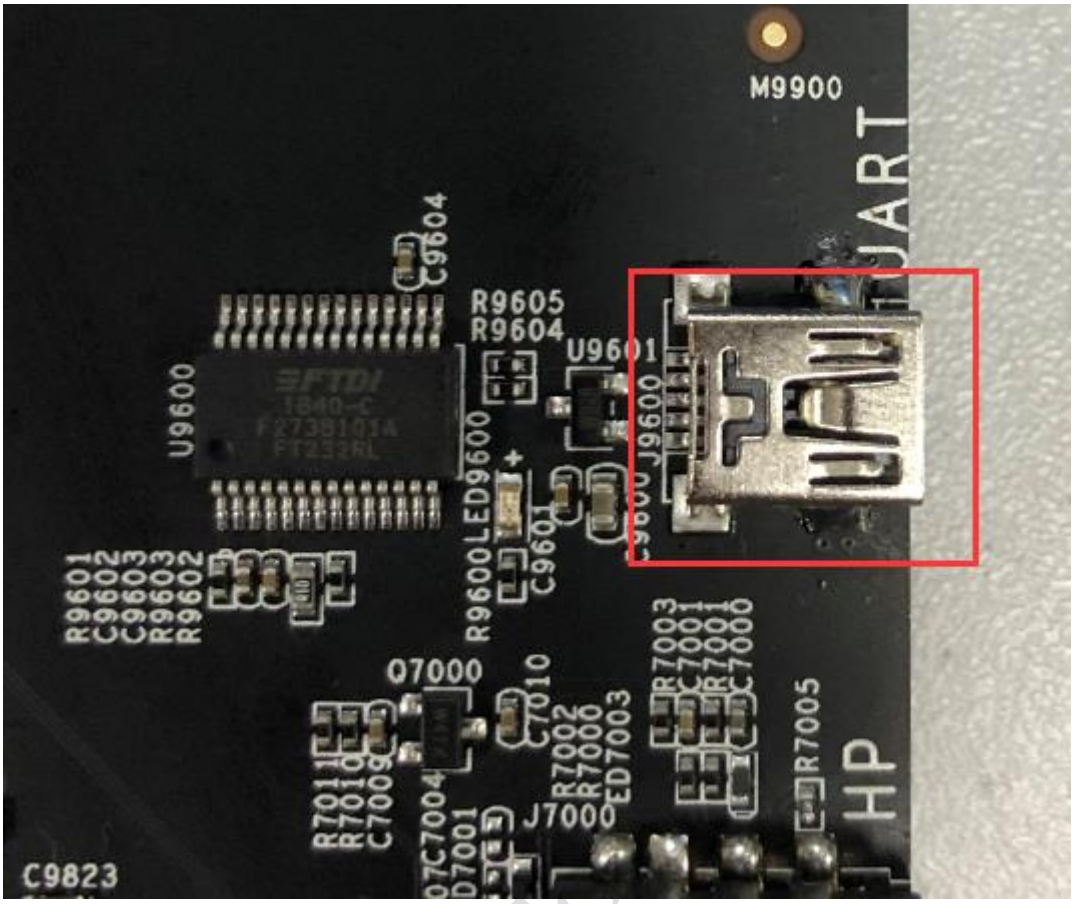

Figure 3-24 EVB USB Mini Port（UART Debug）

3.15 JTAG Debug Connector

The EVB uses standard 20pin JTAG debug connector as shown below, which is convenient for customers to do the debugging and development through it.

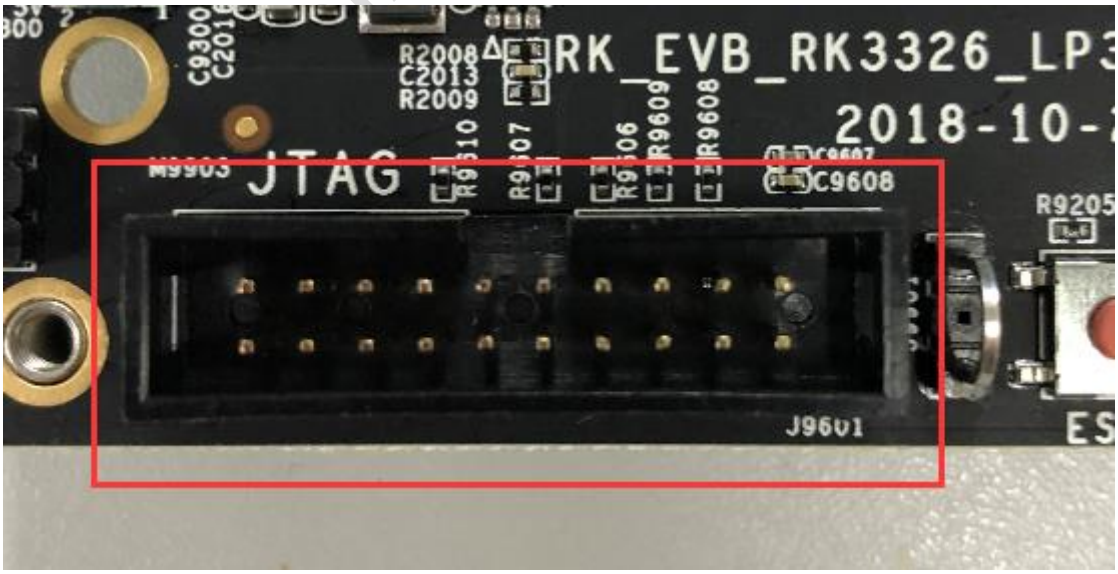

Figure 3-25 EVB JTAG Debug Connector

4.EVB Usage

4.1 EVB Power On/Off and Standby

EVB power on and power off method is described as below:

4.1.1 Power On

- If use DC 12V for power supply, turn on the power switch, short press power button over 0.5s, and then EVB will power on.
- If use 1-cell Li-battery for power supply, short press power button over 0.5s, and then EVB will power on.

4.1.2 Power Off

Long press Power button for over 2s, and click power off on the display panel.

4.1.3 Abnormal Power Off

- If use 1-cell Li-battery for power supply, in abnormal case, long press Power button for over 8s can force to power off, or press Reset button to reset EVB.
- If use DC 12V for power supply, in abnormal case, except the above method, turn off the power switch also can power off the power of the EVB.

4.1.4 Standby

In desk or application case, press Power button, the system will enter standby mode. If not connecting with USB, without any operation, the system will enter into deep sleep after a while.

4.2 USB Driver Installation

EVB needs to install USB driver before image download, driver upgrading and ADB debug. The driver tool path is:

- Open "DriverInstall.exe" in the directory of SDK\RKTools\windows\Release_DriverAssitant, click "driver install", and then waiting for it prompts "install driver successfully". If there is old driver installed, please click "driver uninstall", and re-install the driver.
- The driver only supports Windows currently.

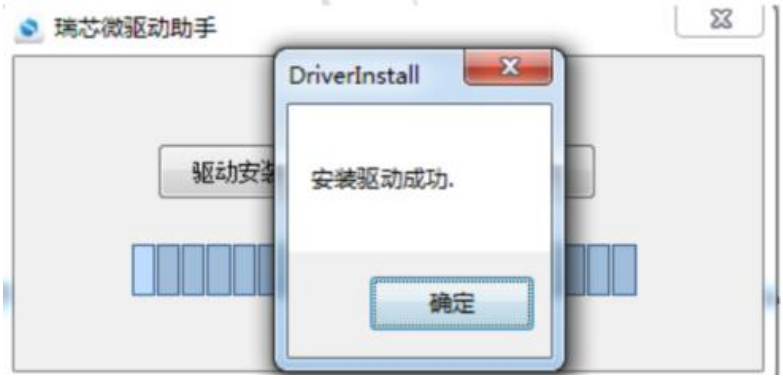

Figure 4-1 Driver Install Successfully

4.3 EVB image download

RK3326 EVB has two kinds of image download methods.

4.3.1 Maskrom download mode

The basic principle is to short connect FLASH_D0 with GND before the system is power on, to make Flash fail to load, and then enter into Maskrom state. It is applicable for the case when download the wrong bootloader image so that the system cannot be power on normally.

The detailed steps are as below:

- Connect USB to PC, press and hold the Maskrom button of the EVB.
- Supply 12V for EVB, and turn on the switch. If it is already power on, please press the reset button.
- Wait for a while, the development tool will display “find a Maskrom device”. Need to note that in Maskrom mode the corresponding miniLoader should be selected for upgrading.
- Select the corresponding image files.
- Click execute to enter the upgrading state, there is the progress bar in the right box of the tool to display the download and verification status.

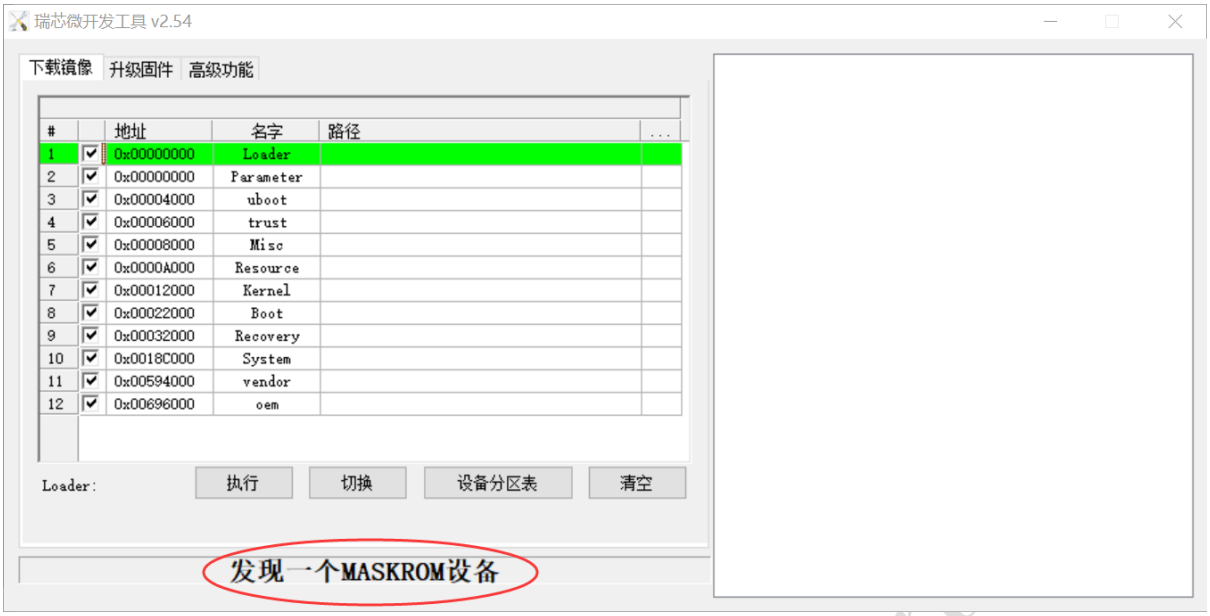

Figure 4-2 Maskrom Download Mode

4.3.2 Loader Download Mode

The basic principle is to ensure ADC2_KEY_IN is low level before the system is power on or reset, and the system will enter into recovery state after power on or reset. It is applicable for updating some part or whole of the image in normal.

The detailed steps are as below:

- Connect USB to PC, press and hold the Vol+/RECOVER button of the EVB.
- Supply 12V for EVB, and turn on the switch. If it is already power on, please press the reset button.
- Wait for a while, the development tool will display “find a Loader device”. Need to note that in Loader mode there is no need to download the whole image, you can select the image file to be updated.
- Select the corresponding image file.
- Click execute to enter the upgrading state, there is the progress bar in the right box of the tool to display the download and verification status.

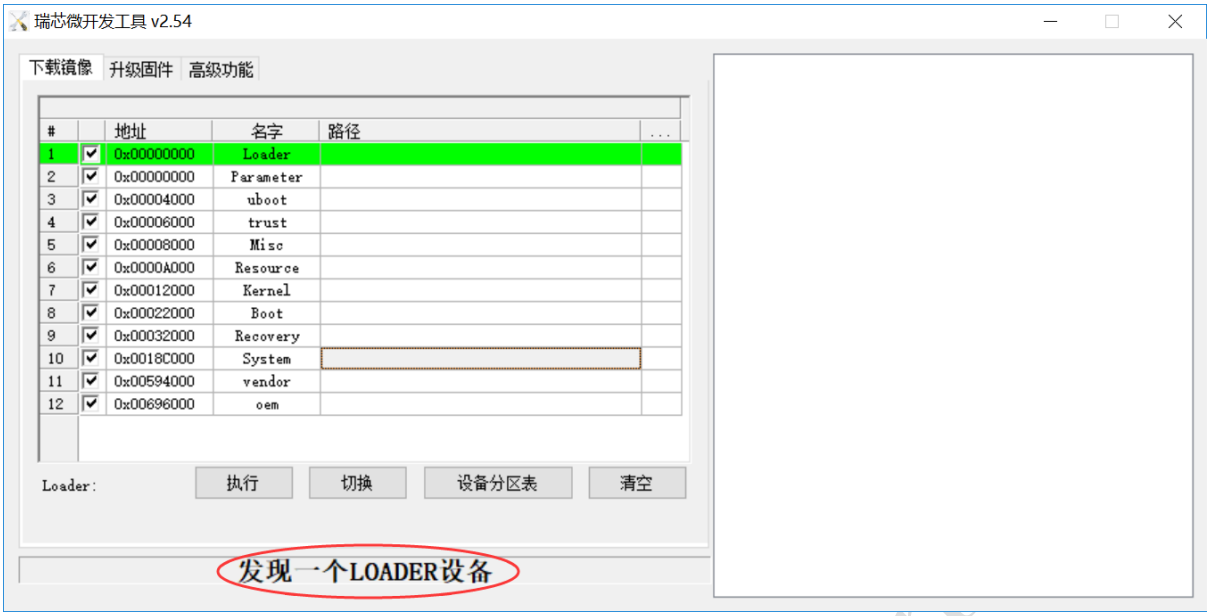

Figure 4-3 Loader Download Mode

4.4 Serial Port Debug

4.4.1 Connect Serial Port

Connect USB Debug port of EVB to PC, and obtain current comm port number in the device manager of PC.

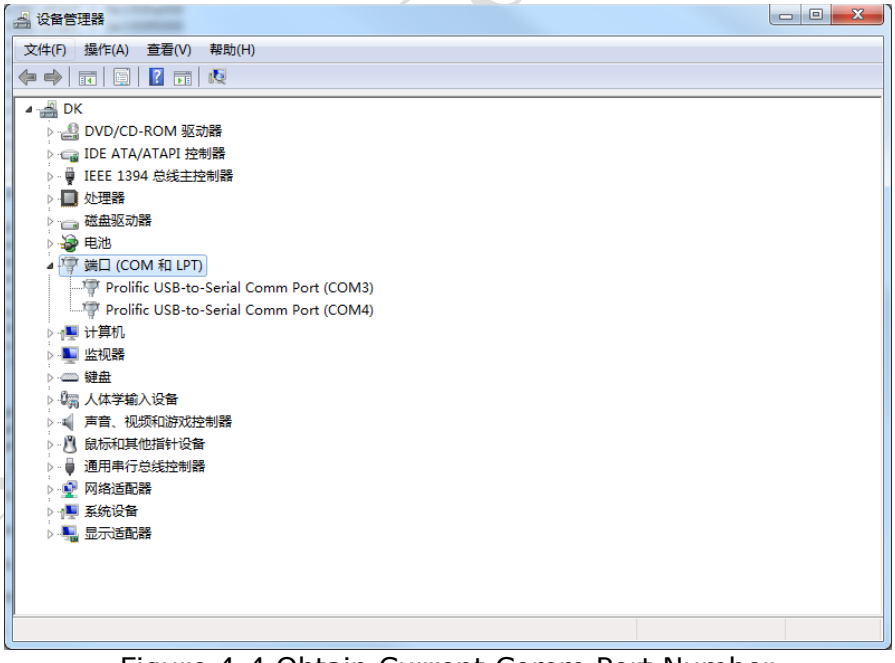

Figure 4-4 Obtain Current Comm Port Number

Open serial port tool “SecureCRT”, click “quick connection” button.

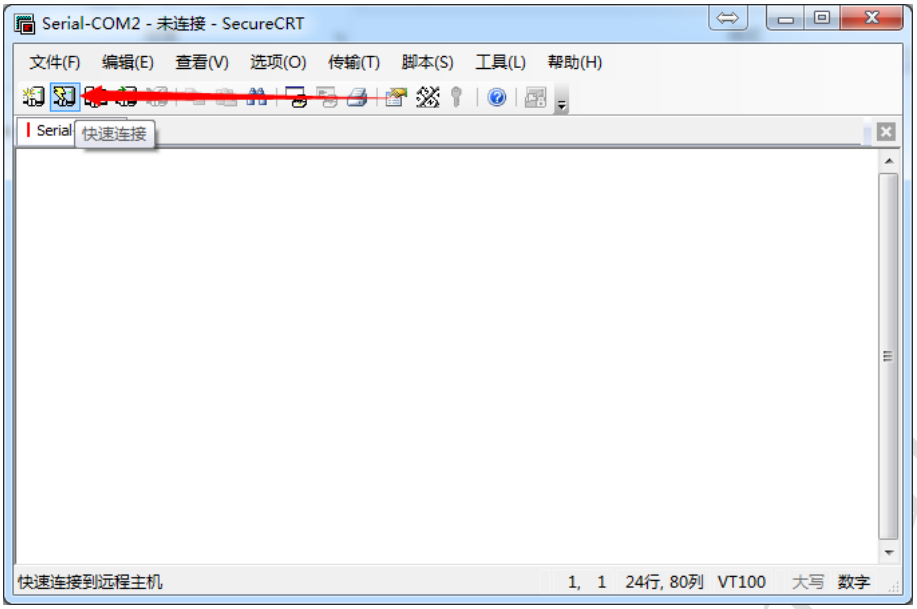

Figure 4-5 SecureCRT Windows

Configure the serial port, the port selects the port number connected with the EVB, baud rate selects 1.5M, flow control RTS/CTS doesn't need to select.

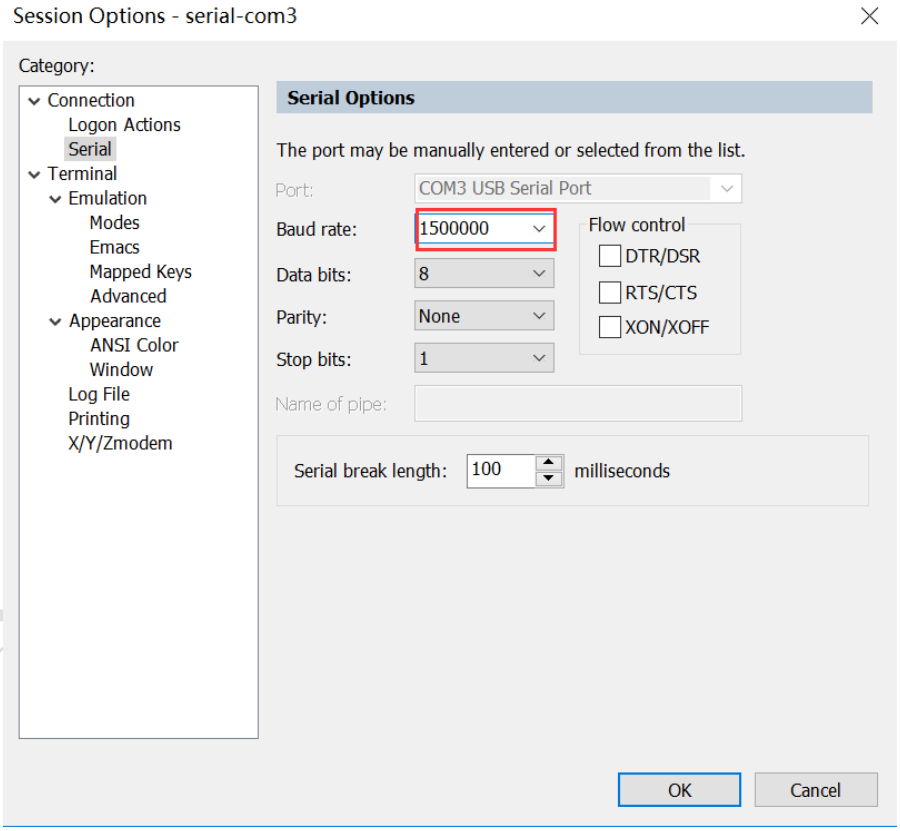

Figure 4-6 Configure Serial Port Information

Click connection, and then it will connect the device normally. Configure session option to make debugging convenient, click "Session Option" of the tool bar, it can save more log information if Scrollback buffer is set with bigger value.

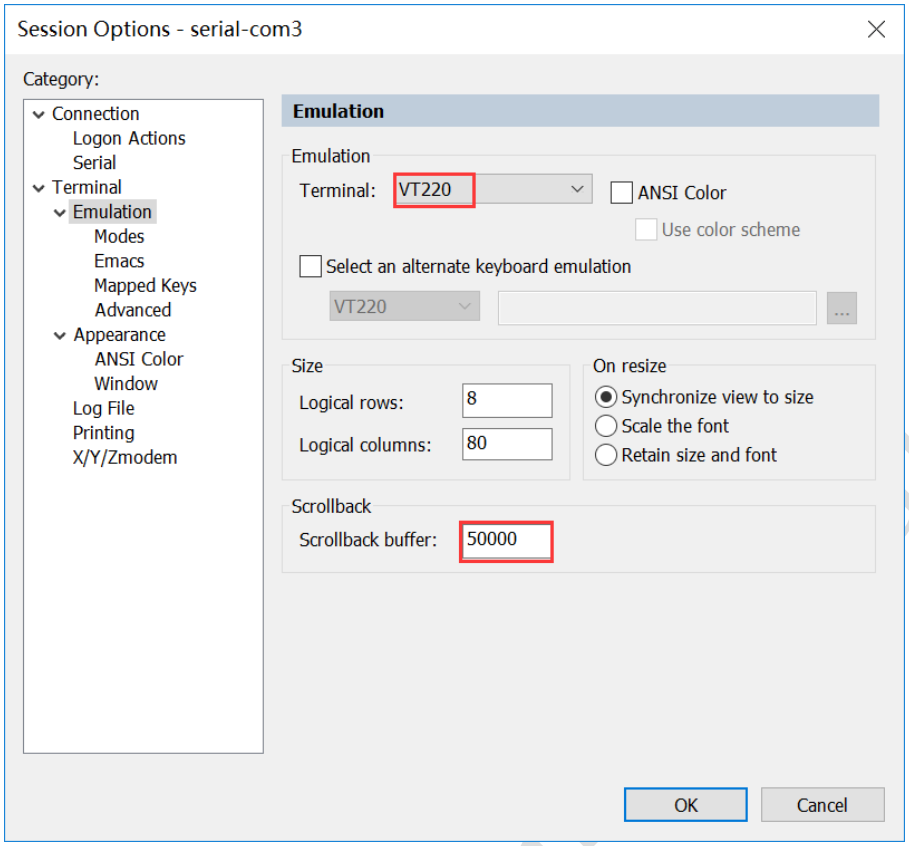

Figure 4-7 Configure Serial Port Tool Option

4.4.2 ADB Debug

The ADB connection steps are as below:

- Make sure the driver is installed successfully, and PC connects with USB port of the development board.
- The EVB is power on, enter the system setting option, select "developer options", and select "USB debugging".
- In PC side, click "start---run", input "cmd", enter the directory of adb.exe tool, input "adb devices", it means the connection is normal if can inquire the connected device.
- Input "adb shell", and enter ADB debug mode.

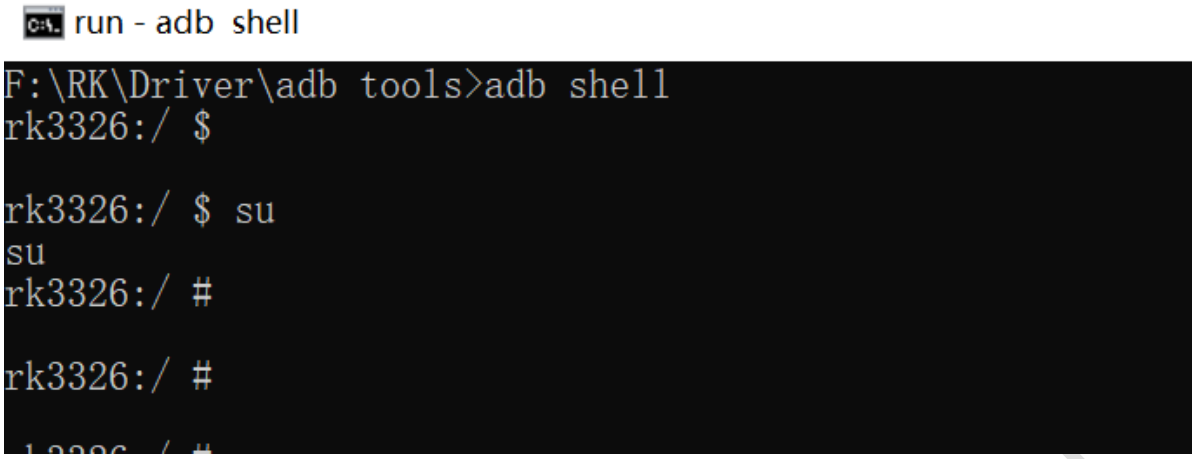

Figure 4-8 ADB Connects Normally

5.Notice

RK3326 EVB is suitable for lab or engineering development environment. Please read below notices before operation:

- Under no circumstance can the panel interface of the EVB and the expansion board be hot-plugged.
- Before unpacking and installing the EVB board, please take the necessary anti-static measures to avoid the damage to the hardware of the EVB board caused by ESD.
- Please hold the edge of the EVB board, and do not touch the exposed metal part of the EVB board, so as to avoid the electrostatic damage to the components of the EVB board.
- Please place RK3326 EVB board on the dry surface to keep them away from heat source, electromagnetic interference source and radiation source, electromagnetic radiation sensitive equipment (such as medical equipment) and so on.