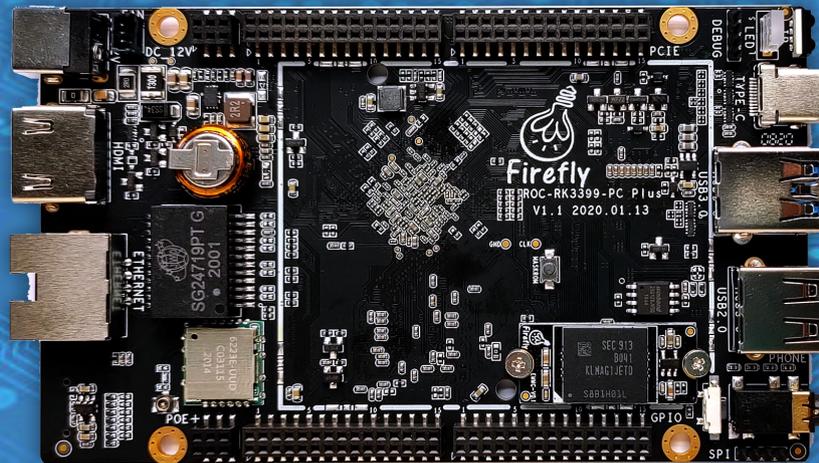


# T-CHIP TECHNOLOGY

## ROC-RK3399-PC Plus

### Six-Core 64-Bit High-Performance Main Board

#### V1.0



T-CHIP INTELLIGENCE TECHNOLOGY CO.,LTD.

[www.t-firefly.com](http://www.t-firefly.com)



### Update history

Version	Date	Details
V1.0	2020-6-24	Hardware version : V1.1

Firefly

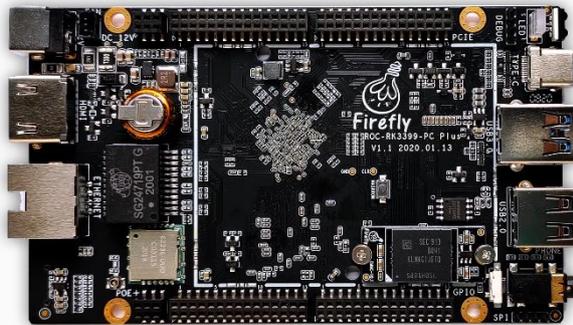


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## 1. Overview

Equipped with high-performance RK3399 processor and adopts multiple power supply modes. It supports WIFI or BT wireless connection and can be connected to the expansion board, making the performance stronger and superior. When combined with the all-aluminum alloy case, it becomes a pocket portable personal computer..



### 1.High-performance Core Processor

With"server-level" dual-core Cortex-A72+ quad-core Cortex-A53 architecture, the frequency is up to 1.8 GHz, and 4GB LPDDR4 dual-channel 64-bit RAM high-performance memory is configured to comprehensively improve the performance of mainboard.

### 2.Portable Personal Computer

With unique model design and the size is only 120 x 72 x 11.2mm. When combined with the all-aluminum alloy case, it becomes a pocket portable personal computer.

### 3.Expansion Board Combination

Expansion board onboard balanced charging circuit can charge the battery, and it can also be powered by POE+. The equipped M.2 M-Key and M.2 E-Key interface can be separately used to expand SSD and provide SDIO 3.0 and USB 2.0 signals. ROC-RK3399-PC Plus is combined with the expansion board, which can greatly improve its performance.

### 4.Strong Network Capability

Supports Gigabit Ethernet, 2.4GHz Wifi and Bluetooth4.2, as well as owns strong Network expansion capability.

### 5.Multiple Operating Systems

Supports xserver, wayland display framework and multiple operating systems such as Android, Ubuntu, Debian9 and Linux+QT. It has onboard SPI flash and supports boot with TF card, EMMC, SSD and USB flash disk, making it more convenient to start the system.

### 6.Multiple Power Supply Modes

The main board can be powered by DC 12V, POE+ (802.3 AT, output power: 30W) via the expansion board or dual-cell battery. With multiple power supply modes, it can cater to the demands of users in different scenarios, making it more flexible and convenient to use.

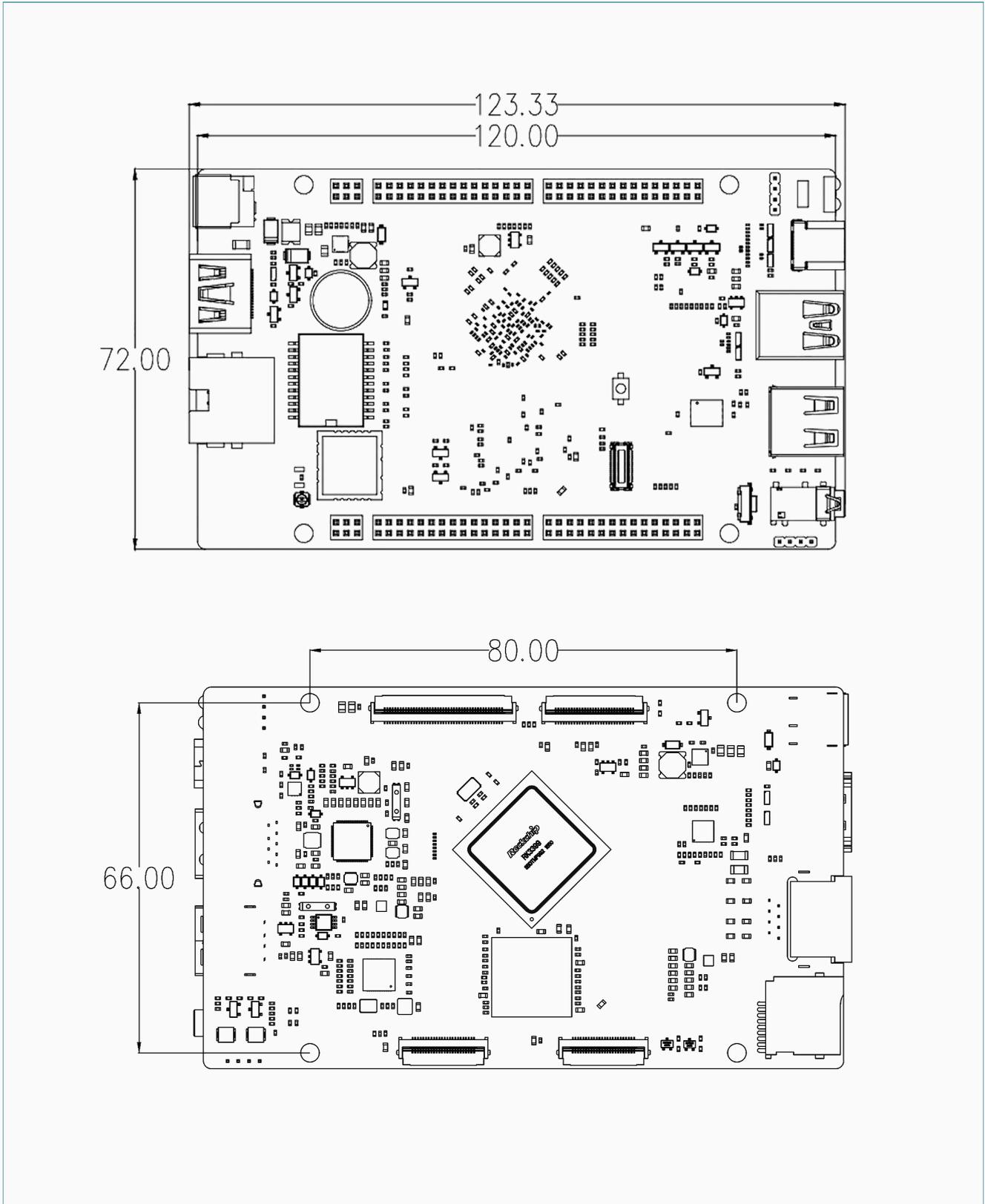
### 7.Rich Peripheral Interface

With rich interfaces, such as MIPI DSI/eDP screen interface, dual-channel MIPI CSI camera interface(built-in ISP), Type-C(USB3.0+DP1.2), USB 2.0, USB3.0, HDMI 2.0, Gigabit Ethernet (RJ45), PCIe, GPIO, etc.

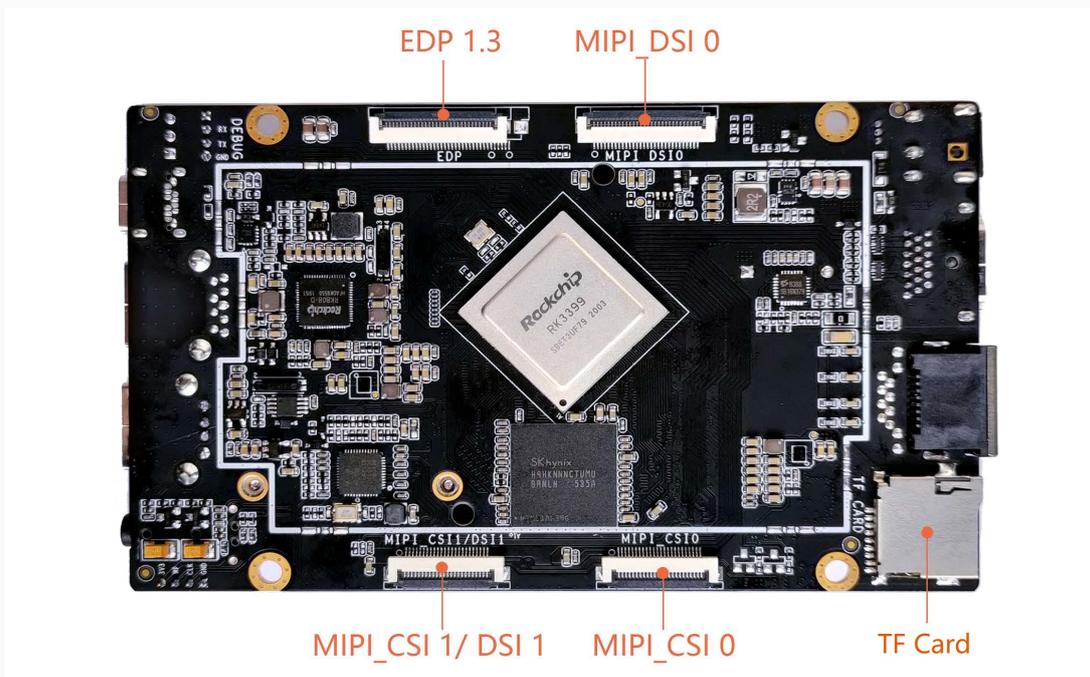
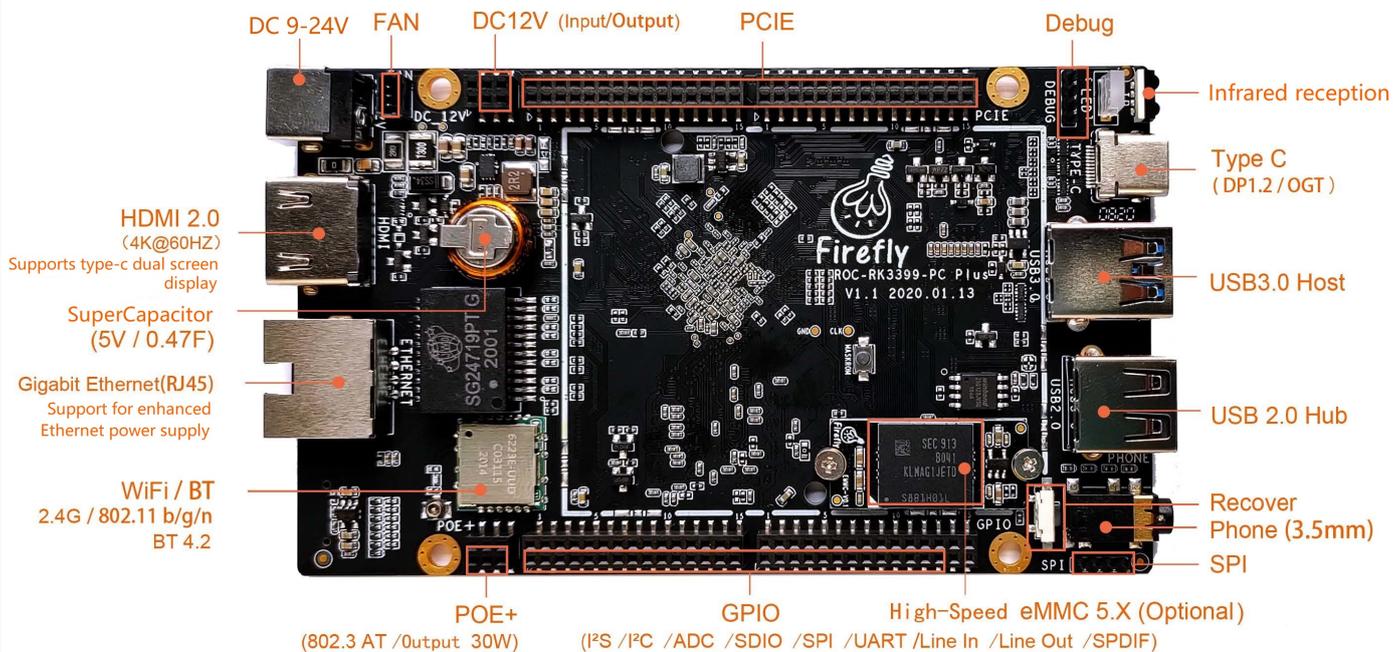
## 2. Product Specification

Specification	
SoC	RK3399, Six-core 64-bit ( dual-core A72+ quad-core A53)processor, frequency up to 1.8GHz
CPU	Six-core ARM® 64-bit processor, frequency up to 1.8GHz Based on big.LITTLE core architecture, dual-core Cortex-A72(big core)+ quad-core Cortex-A53(little core)
GPU	Mali-T860 MP4 quad-core GPU, support OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11
VPU	Support 4K VP9 and 4K 10bits H265/H264 video decoding, up to 60fps 1080P multi-format video decoding (WMV, MPEG-1/2/4, VP8) 1080P video coding, support H.264, VP8 format Video post processor: de-interlacing, de-noising, edge/detail/color optimization
RAM	4GB LPDDR4 dual-channel 64-bit RAM
Storage	Onboard SPI Flash(16MB) Optional high-speed eMMC(16GB/32GB/128GB) Support MicroSD(TF card), USB flash disk expansion Support expansion board M.2 M-Key to expand SSD
Hardware Features	
Ethernet	10/100/1000Mbps Gigabit Ethernet (RJ45 interface)
WiFi	WiFi 2.4GHz 802.11b/g/n, Bluetooth 4.2(support BLE)
Display	HDMI2.0 support 4K 60Hz display, support HDCP 1.4/2.2 DP1.2 (DisplayPort 1.2 support up to 4K 60Hz) Support eDP 1.3 Support MIPI-DSI(dual-channel) Support Type-C + HDMI dual display, support 4K + 2K output
Audio	1 x Phone( 3.5mm), 1 x HDMI, 1 x DP Support LINE_IN and LINE_OUT
Camera	2x MIPI-CSI (Built-in dual ISP, Maximum support single 13Mpixel or dual 8Mpixel)
USB	1 x USB 2.0, 1 x USB3.0, 1 x Type-C (USB3.0 / DP1.2 / OTG)
Key	1 x Recover(Located at the end of the 3.5mm audio port)
IR	Support infrared remote control
Power	DC 9-24V 2A(5.5*2.1mm) Support POE+ (802.3 AT, output power 30W)
OS/Software	
OS	Support Android, Ubuntu, PhoenixOS Support Firefly Geek Entertainment System--Station OS, Desktop and Media mode, seamless switching between study, entertainment, and work
Appearance	
Size	120 mm × 72 mm × 11.2 mm

### 3. PCB Size

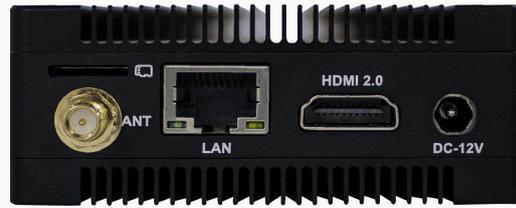


### 4. Interface description



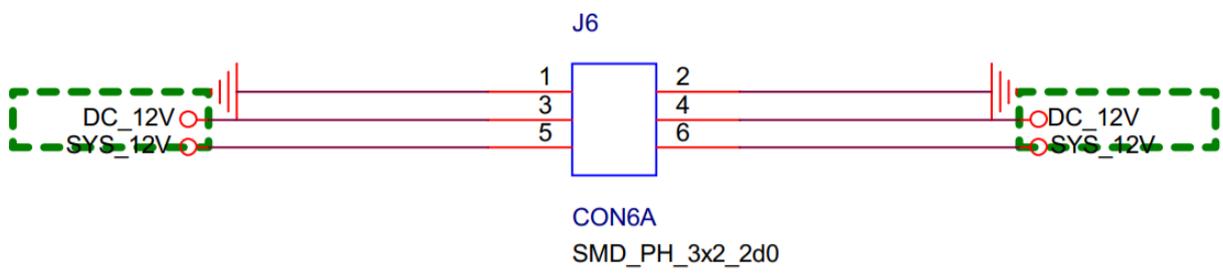
## 5. Geek Mini PC

Small and portable, it is equipped with a metal case and can be used immediately when powered on. It possesses Firefly Geek Entertainment System -- Station OS on which the Desktop and Media modes can be switched randomly to finish daily office work or play games for fun. It can be easily updated to various systems like Android, Ubuntu and Phoenix OS, satisfying geeks' needs of operating multiple systems freely.



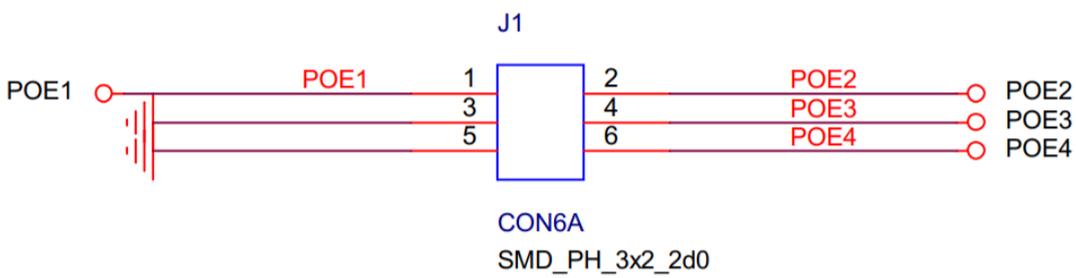
## 6. Interface definition

### 6.1 Dual row 6PIN 2.0 pitch interface(J6\_DC\_12V)



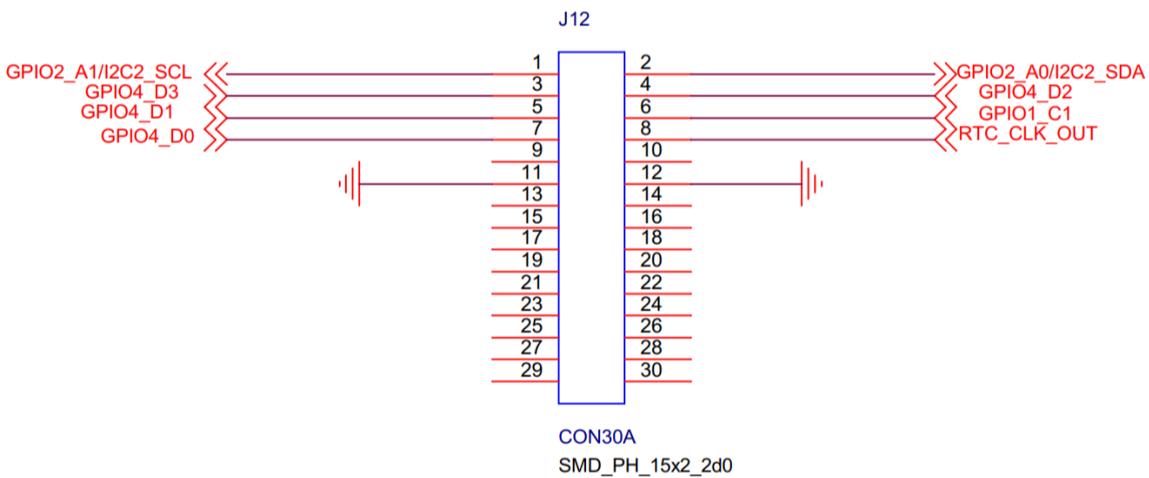
NO.	Definition	Power
1	GND	
2	GND	
3	DC_12V	12V_IN1
4	DC_12V	12V_IN1
5	SYS_12V	12V_IN2
6	SYS_12V	12V_IN2

### 6.2 Dual row 6PIN 2.0 pitch interface (J1\_POE+)



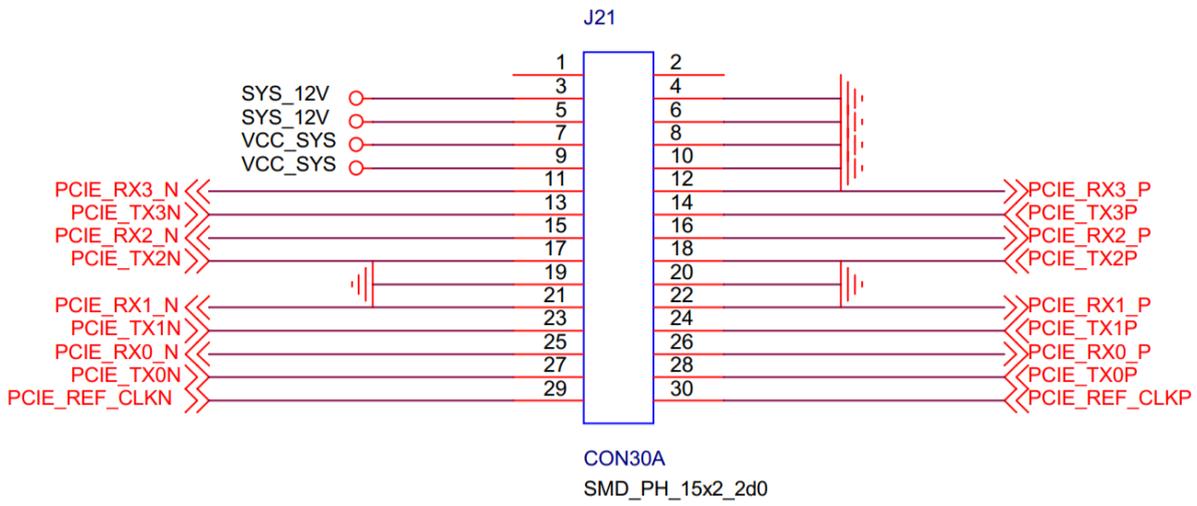
NO.	Definition	Power
1	POE1	48V
2	POE2	48V
3	GND	
5	GND	
4	POE3	48V
6	POE4	48V

### 6.3 Dual row 30PIN 2.0 pitch interface (J12\_PCIE)



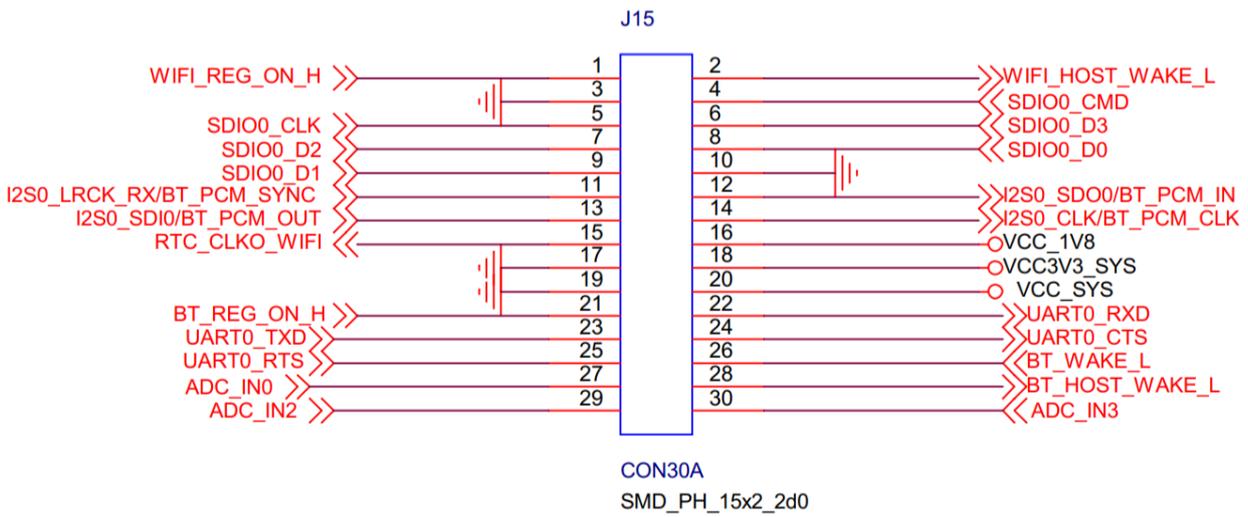
NO.	Definition	Power
1	GPIO2_A1/I2C2_SCL	3.0V
2	GPIO2_A0/I2C2_SDA	3.0V
3	GPIO4_D3	3.0V
4	GPIO4_D2	3.0V
5	GPIO4_D1	3.0V
6	GPIO1_C1	3.0V
7	GPIO4_D0	3.0V
8	RTC_CLK_OUT	1.8V
9	NC	
10	NC	
11	GND	
12	GND	
13	NC	
14	NC	
15	NC	
16	NC	
17	NC	
18	NC	
19	NC	
20	NC	
21	NC	
22	NC	
23	NC	
24	NC	
25	NC	
26	NC	
27	NC	
28	NC	
29	NC	
30	NC	

6.4 Dual row 30PIN 2.0 pitch interface (J21\_PCIE)



NO.	Definition	Power
1	NC	
2	NC	
3	SYS_12V	12V
4	GND	
5	SYS_12V	12V
6	GND	
7	VCC_SYS	5.0V
8	GND	
9	VCC_SYS	5.0V
10	GND	
11	PCIE_RX3_N	1.8V
12	PCIE_RX3_P	1.8V
13	PCIE_TX3N	1.8V
14	PCIE_TX3P	1.8V
15	PCIE_RX2_N	1.8V
16	PCIE_RX2_P	1.8V
17	PCIE_TX2N	1.8V
18	PCIE_TX2P	1.8V
19	GND	
20	GND	
21	PCIE_RX1_N	1.8V
22	PCIE_RX1_P	1.8V
23	PCIE_TX1N	1.8V
24	PCIE_TX1P	1.8V
25	PCIE_RX0_N	1.8V
26	PCIE_RX0_P	1.8V
27	PCIE_TX0N	1.8V
28	PCIE_TX0P	1.8V
29	PCIE_REF_CLKN	1.8V
30	PCIE_REF_CLKP	1.8V

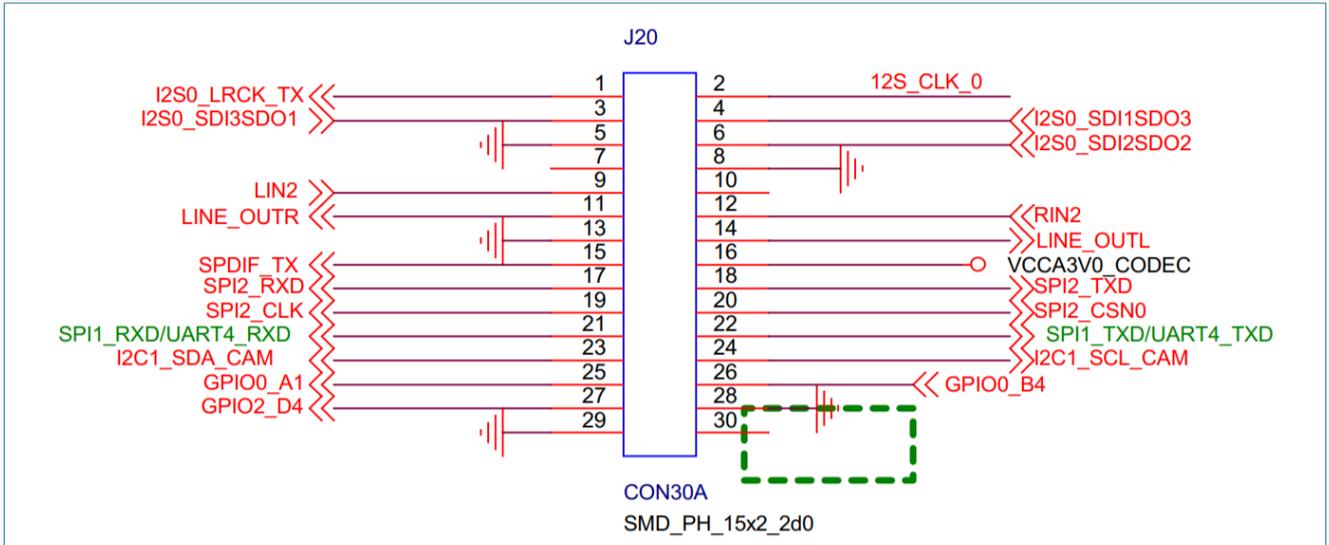
6.5 Dual row 30PIN 2.0 pitch interface (J15\_GPIO)



NO.	Definition	Power
1	WIFI_REG_ON_H	1.8V
2	WIFI_HOST_WAKE_L	1.8V
3	GND	
4	SDIO0_CMD	1.8V
5	SDIO0_CLK	1.8V
6	SDIO0_D3	1.8V
7	SDIO0_D2	1.8V
8	SDIO0_D0	1.8V
9	SDIO0_D1	1.8V
10	GND	
11	I2S0_LRCK_RX/BT_PCM_SYNC	1.8V
12	I2S0_SDO0/BT_PCM_IN	1.8V
13	I2S0_SDIO/BT_PCM_OUT	1.8V
14	I2S0_CLK/BT_PCM_CLK	1.8V
15	RTC_CLKO_WIFI	1.8V
16	VCC_1V8	1.8V
17	GND	
18	VCC3V3_SYS	3.3V
19	GND	

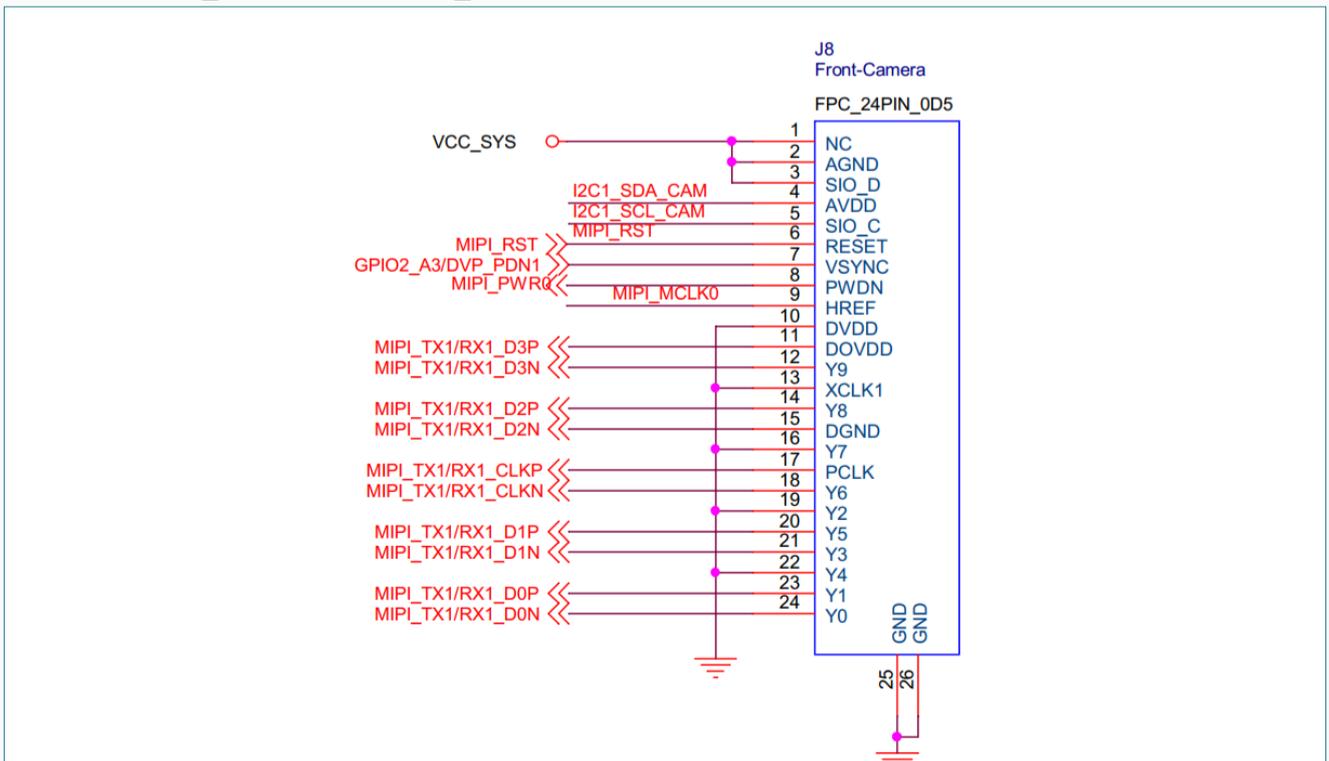
20	VCC_SYS	5.0V
21	BT_REG_ON_H	1.8V
22	UART0_RXD	1.8V
23	UART0_TXD	1.8V
24	UART0_CTS	1.8V
25	UART0_RTS	1.8V
26	BT_WAKE_L	1.8V
27	ADC_IN0	1.8V
28	BT_HOST_WAKE_L	1.8V
29	ADC_IN2	1.8V
30	ADC_IN3	1.8V

6.6 Dual row 30PIN 2.0 pitch interface (J20\_GPIO)



NO.	Definition	Power
1	I2S0_LRCK_TX	1.8V
2	12S_CLK_0	1.8V
3	I2S0_SDI3SDO1	1.8V
4	I2S0_SDI1SDO3	1.8V
5	GND	
6	I2S0_SDI2SDO2	1.8V
7	NC	
8	GND	
9	LIN2(series capacitor 0.1uF)	
10	NC	
11	LINE_OUTR	
12	RIN2(series capacitor 0.1uF)	
13	GND	
14	LINE_OUTL	
15	SPDIF_TX	3.3V
16	VCCA3V0_CODEC	3.0V
17	SPI2_RXD	3.0V
18	SPI2_TXD	3.0V
19	SPI2_CLK	3.0V
20	SPI2_CSN0	3.0V
21	SPI1_RXD/UART4_RXD	3.0V
22	SPI1_TXD/UART4_TXD	3.0V
23	I2C1_SDA_CAM	1.8V
24	I2C1_SCL_CAM	1.8V
25	GPIO0_A1	1.8V
26	GPIO0_B4	1.8V
27	GPIO2_D4	1.8V
28	GND	
29	GND	
30	NC	

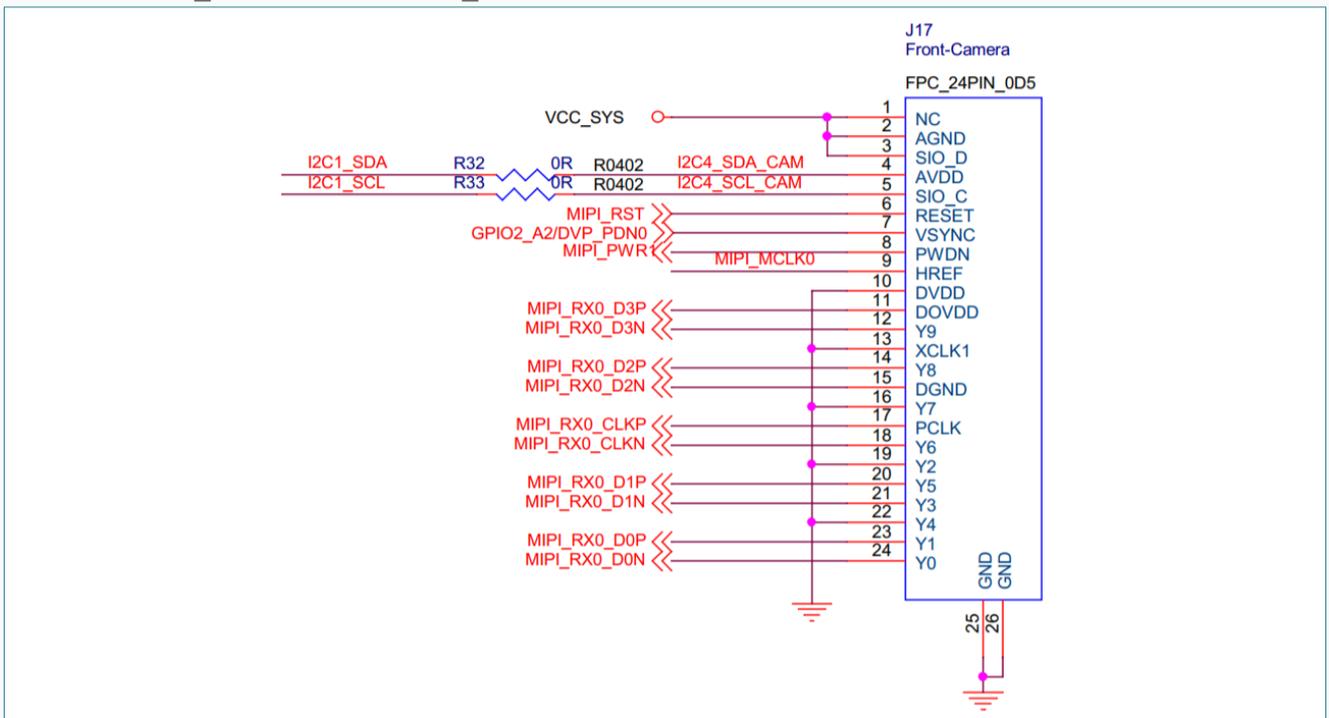
6.7 .24PIN MIPI\_CSI0 interface (J8\_MIPI CAMERA 0)



NO.	Definition	Power
1	VCC_SYS	5.0V
2	VCC_SYS	5.0V
3	VCC_SYS	5.0V
4	I2C1_SDA_CAM	1.8V

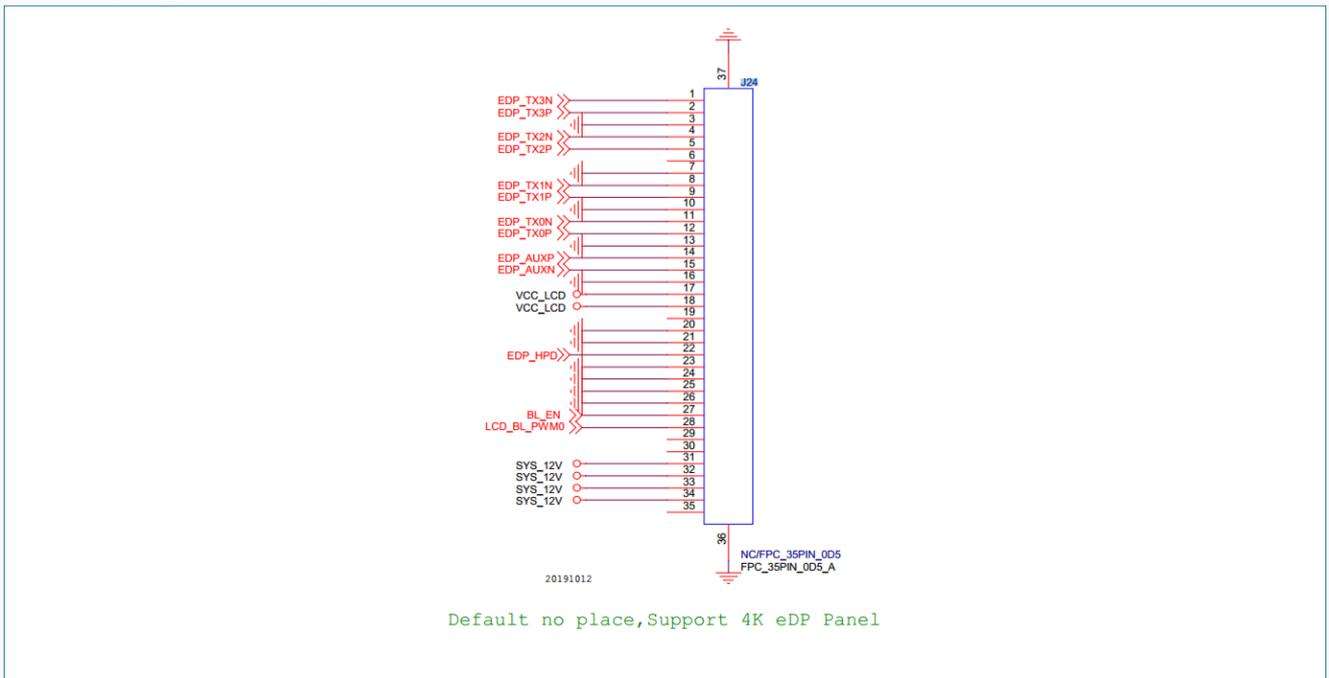
5	I2C1_SCL_CAM	1.8V
6	MIPI_RST	1.8V
7	GPIO2_A3/DVP_PDN1	1.8V
8	MIPI_PWR0	1.8V
9	MIPI_MCLK0	1.8V
10	GND	
11	MIPI_TX1/RX1_D3P	1.8V
12	MIPI_TX1/RX1_D3N	1.8V
13	GND	
14	MIPI_TX1/RX1_D2P	1.8V
15	MIPI_TX1/RX1_D2N	1.8V
16	GND	
17	MIPI_TX1/RX1_CLKP	1.8V
18	MIPI_TX1/RX1_CLKN	1.8V
19	GND	
20	MIPI_TX1/RX1_D1P	1.8V
21	MIPI_TX1/RX1_D1N	1.8V
22	GND	
23	MIPI_TX1/RX1_D0P	1.8V
24	MIPI_TX1/RX1_D0N	1.8V

6.8 24PIN MIPI\_CSI1 interface (J17\_MIPI CAMERA 1)



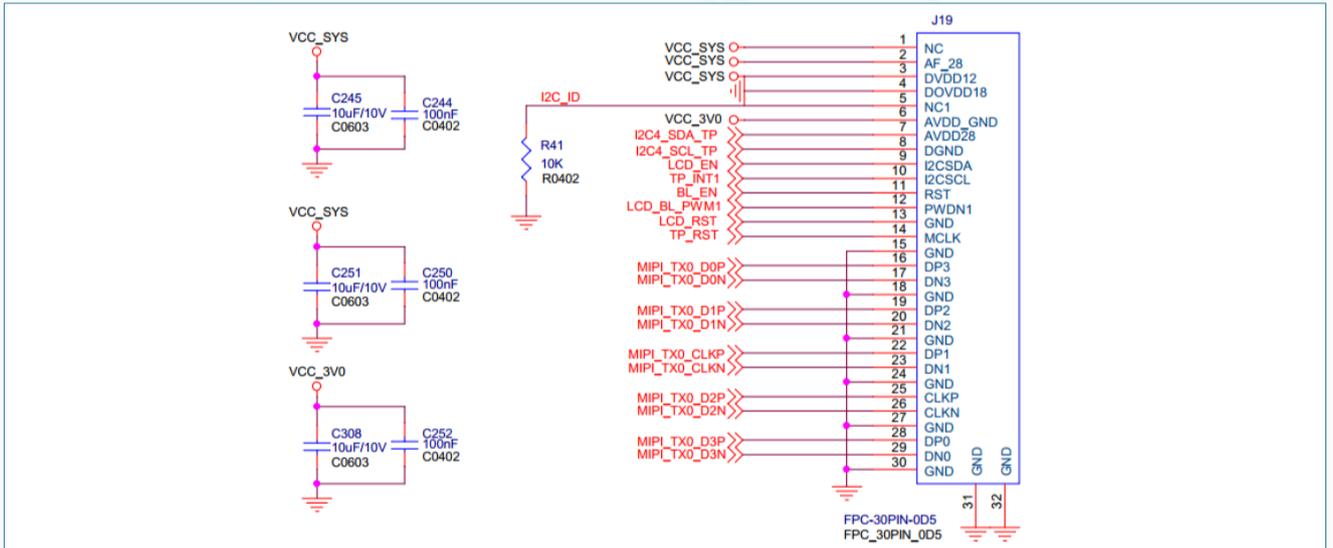
NO.	Definition	Power
1	VCC_SYS	5.0V
2	VCC_SYS	5.0V
3	VCC_SYS	5.0V
4	I2C4_SDA_CAM	1.8V
5	I2C4_SCL_CAM	1.8V
6	MIPI_RST	1.8V
7	GPIO2_A2/DVP_PDN0	1.8V
8	MIPI_PWR1	1.8V
9	MIPI_MCLK0	1.8V
10	GND	
11	MIPI_RX0_D3P	1.8V
12	MIPI_RX0_D3N	1.8V
13	GND	
14	MIPI_RX0_D2P	1.8V
15	MIPI_RX0_D2N	1.8V
16	GND	
17	MIPI_RX0_CLKP	1.8V
18	MIPI_RX0_CLKN	1.8V
19	GND	
20	MIPI_RX0_D1P	1.8V
21	MIPI_RX0_D1N	1.8V
22	GND	
23	MIPI_RX0_D0P	1.8V
24	MIPI_RX0_D0N	1.8V

6.9 EDP(J24\_EDP Display Interface)



NO.	Definition	Power
1	EDP_TX3N	1.8V
2	EDP_TX3P	1.8V
3	GND	
4	EDP_TX2N	1.8V
5	EDP_TX2P	1.8V
6	NC	
7	GND	
8	EDP_TX1N	1.8V
9	EDP_TX1P	1.8V
10	GND	
11	EDP_TX0N	1.8V
12	EDP_TX0P	1.8V
13	GND	
14	EDP_AUXP	1.8V
15	EDP_AUXN	1.8V
16	GND	
17	VCC_LCD	3.3V
18	VCC_LCD	3.3V
19	NC	
20	GND	
21	GND	
22	EDP_HPD	3.0V
23	GND	
24	GND	
25	GND	
26	GND	
27	BL_EN	3.0V
28	LCD_BL_PWM0	3.0V
29	NC	
30	NC	
31	SYS_12V	12V
32	SYS_12V	12V
33	SYS_12V	12V
34	SYS_12V	12V
35	NC	

6.10 MIPI DSI0(J19\_MIPIDisplay Interface)



NO.	Definition	Power
1	VCC_SYS	5.0V
2	VCC_SYS	5.0V
3	VCC_SYS	5.0V
4	GND	
5	I2C_ID(input,10K pull-down)	
6	VCC_3V0	3.0V
7	I2C4_SDA_TP	3.0V
8	I2C4_SCL_TP	3.0V
9	LCD_EN	3.0V
10	TP_INT1	3.0V
11	BL_EN	3.0V
12	LCD_BL_PWM1	3.0V
13	LCD_RST	3.0V
14	TP_RST	3.0V
15	GND	
16	MIPI_TX0_D0P	1.8V
17	MIPI_TX0_D0N	1.8V
18	GND	
19	MIPI_TX0_D1P	1.8V
20	MIPI_TX0_D1N	1.8V
21	GND	
22	MIPI_TX0_CLKP	1.8V
23	MIPI_TX0_CLKN	1.8V
24	GND	
25	MIPI_TX0_D2P	1.8V
26	MIPI_TX0_D2N	1.8V
27	GND	
28	MIPI_TX0_D3P	1.8V
29	MIPI_TX0_D3N	1.8V
30	GND	

## About us

### Company introduction

T-Chip Intelligent Technology Co., Ltd. was founded in 2005. It is a national high-tech enterprise. We focus on the research and development, design, production and sales of open source intelligent hardware, internet of things and digital audio products, and provide the overall solution for intelligent hardware products meanwhile.

The open-source brand "firefly" has an open-source community and online shopping mall on the Internet. At present, it has more than 200000 users and more than 5000 enterprise users, accelerating the R & D process for many technology entrepreneurs and start-ups, and providing professional technical services.

### T-CHIP INTELLIGENCE TECHNOLOGY CO.,LTD.

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