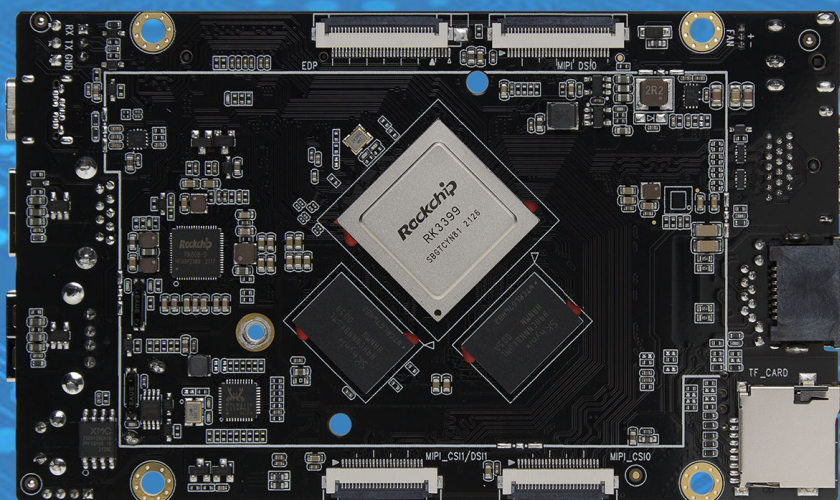


ROC-RK3399-PC Pro

Six-Core High-Performance Mainboard

V1.0



T-CHIP INTELLIGENCE TECHNOLOGY CO.,LTD.
www.t-firefly.com

Update history

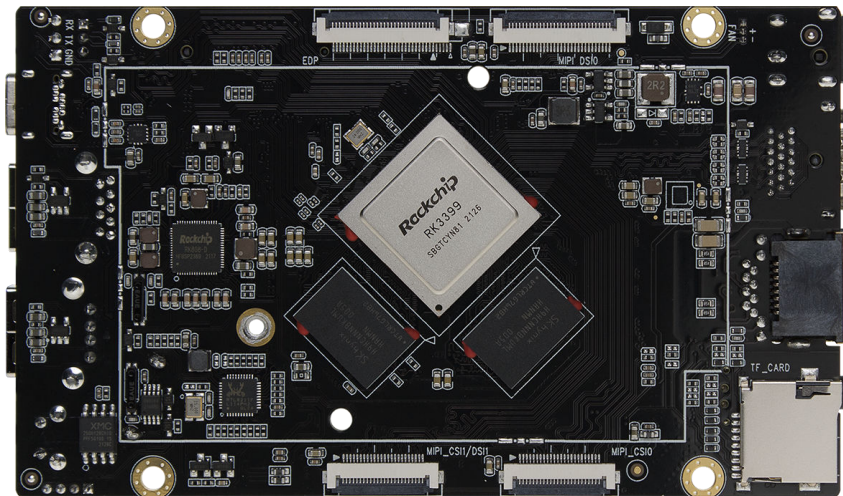
Version	Date	Details
V1.0	2021-12-27	Original version

Firefly

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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.Support 2242 PCIe2.1 NVMe SSD

The onboard M.2 PCIe2.1 interfaces can be connected with an M.2 NVMe SSD , owning the advantages of high-speed reading and writing and large capacity.

4.Strong Network Capability

Supports Gigabit Ethernet, 2.4GHz / 5GHz Wifi and Bluetooth5.0, as well as owns strong Network expansion capability.

5.Multiple Operating Systems

Supports multiple operating systems such as Android, Ubuntu, Station OS, Debian9, Linux+QT, etc.. 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.Rich Peripheral Interface

With rich interfaces, such as MIPI DSI/eDP screen interface, dual 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.

Specifications

Basic

SOC	RK3399
CPU	Six-core ARM® 64-bit processor, 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	4K@60fps H.265/H.264/VP9 video decoding 1080P multi-format video decoding (WMV, MPEG-1/2/4, VP8) 1080P video coding, support H.264,VP8 format
RAM	2GB/4GB LPDDR4
Storage	eMMC: 16GB/32GB/64GB/128GB (onboard) SPI Flash: Onboard 16MB (16MB-512 MB optional)
Storage Expansion	Supports M.2 PCIe 2.1 NVMe SSD (2242) Supports TF card

Hardware

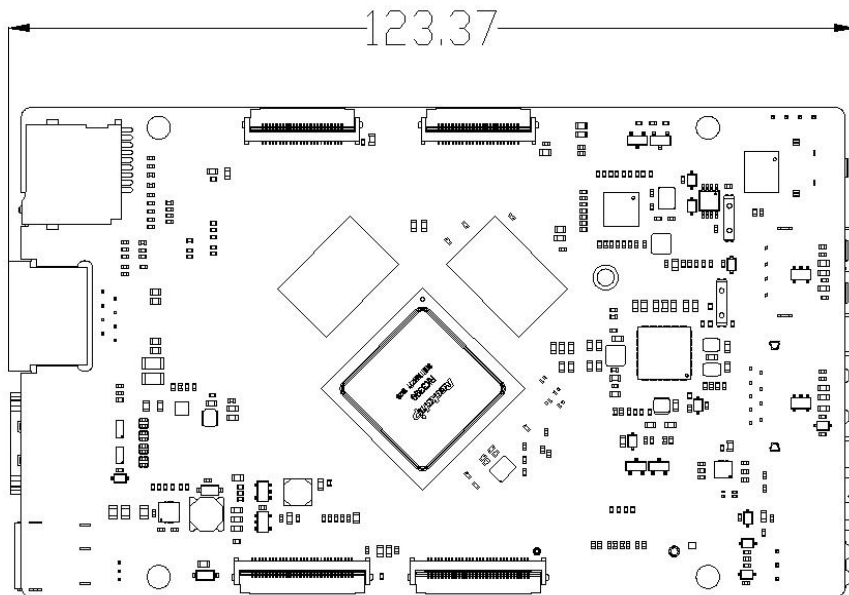
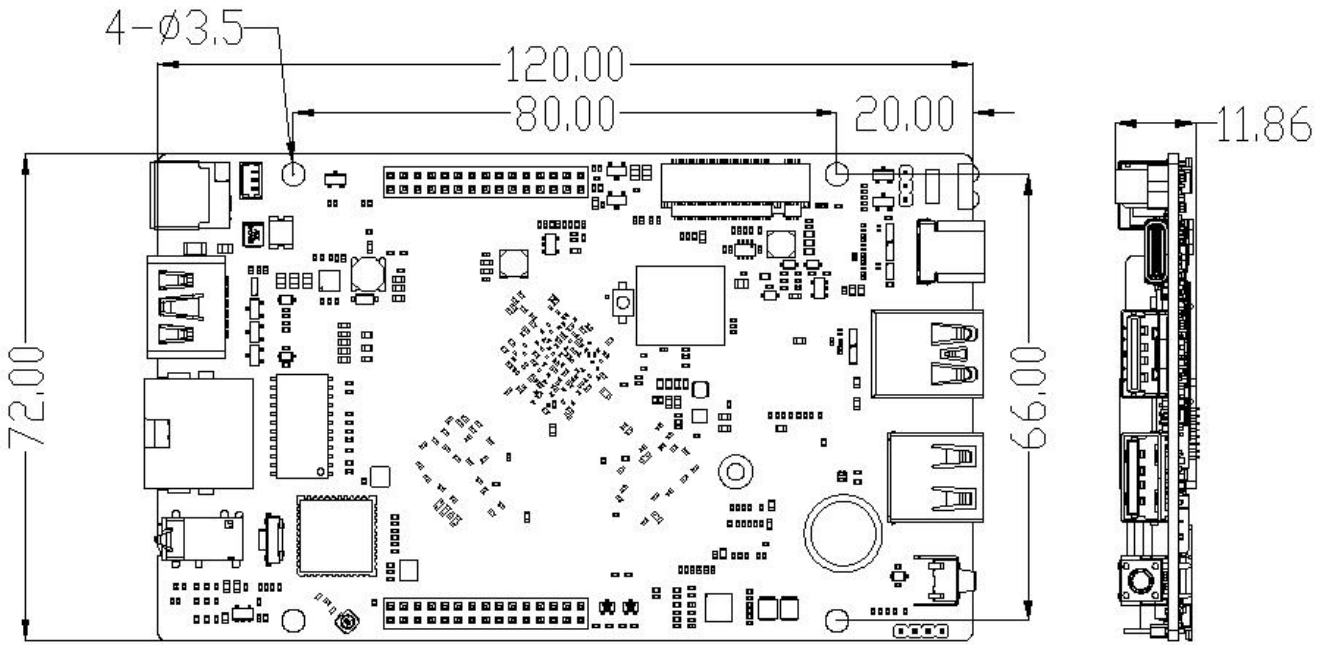
Ethernet	1×1000Mbps Ethernet (RJ45)
WiFi	2.4GHz / 5GHz dual-band WiFi, 802.11a/b/g/n/ac Bluetooth5.0(Support BLE)
Display	1 × HDMI 2.0, supports 4K resolution (up to 60Hz) 1 × DP1.2 (USB-C) , supports 4K resolution (up to 60Hz) 1 × eDP1.3, supports 2560×1600@60fps 2 × MIPI-DSI, Support 1080p@60fps output with single channel * Supports dual displays: 1×USB-C (2K output) + 1×HDMI (4K output)
Audio	1 × 3.5mm jack, supports MIC input 1 × HDMI audio output 1 × DP audio output (USB-C) 1 × Line-in (located in double row female header) 1 × Line-out (Located in double row female header)
Camera	2 × MIPI-CSI camera interface (8M ISP, up to single 13Mpixel / dual 8Mpixel)
USB	1 × USB3.0 (Max : 1000 mA) 1 × USB2.0 (Max : 500 mA) 1 × USB 2.0 (Located in double row female header) 1 × USB-C (USB3.0 / OTG / DP1.2)
PCIe	1 × PCIe2.1(2Lane), supports 2242 NVMe SSD
Key	1 × Power button 1 × Recovery key (at the end of the earphone jack)
IR	Supports infrared remote control
Power	DC12V-2A (5.5*2.1mm) supports 9-12V wide voltage input
Interface	female header 1: I2S、Line_in、Line_out、SPDIF、SPI、UART、I2C、GPIO female header 2: USB 2.0、I2C、ADC、GPIO

Software

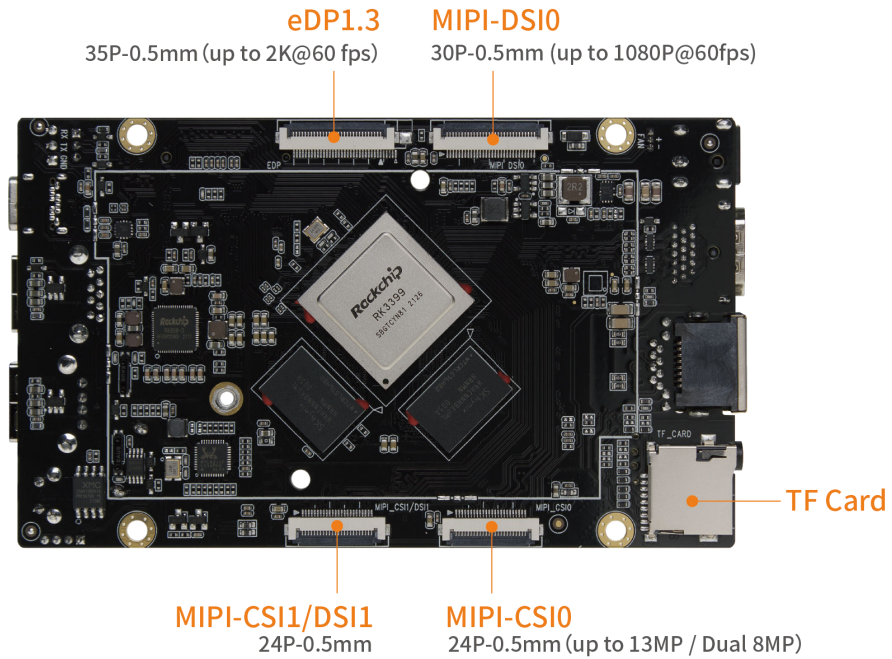
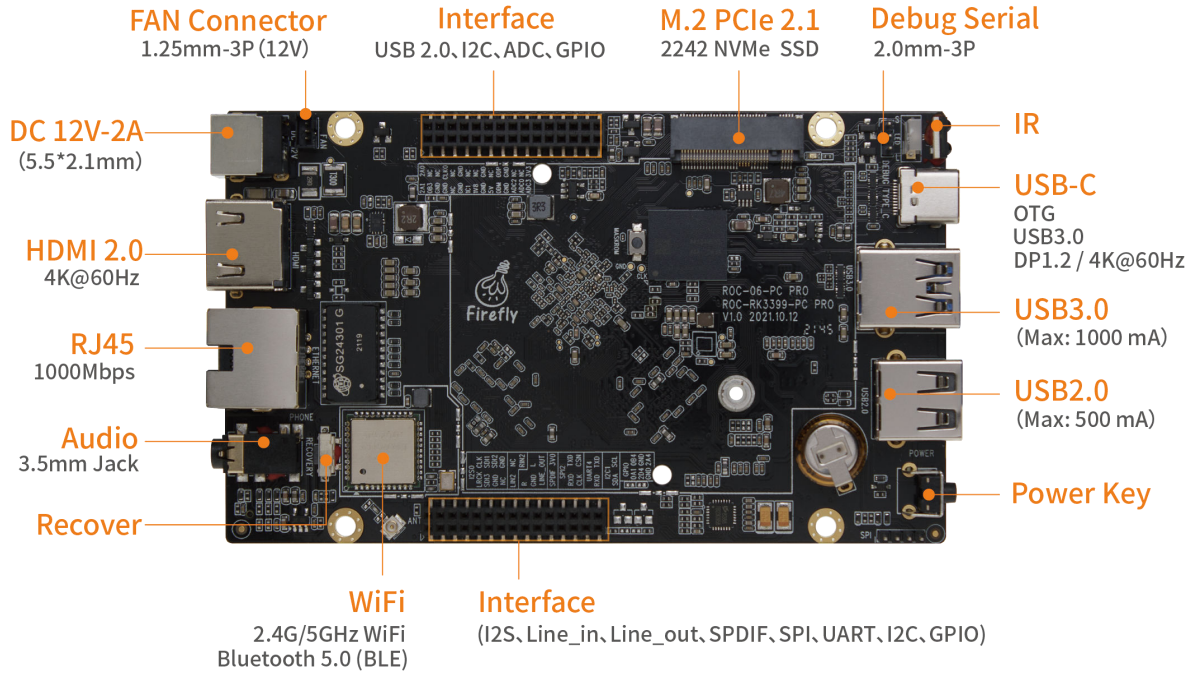
OS	Supports Android, Ubuntu, Station OS, Debian9, Linux+QT, etc. Supports TF card, EMMC, SSD, U disk boot
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General

Size	120 mm × 72 mm × 11.2 mm
Heat Dissipation	Heat sink installation hole pitch: 52mm, matched heat sink is recommended (Click to See)
Power Consumption	Idle: 0.12W Normal: 3.6W Max: 9.6W
Environment	Operating Temperature: -20°C-60°C, Storage Temperature: -20°C-70°C, Storage Humidity: 10%-80%

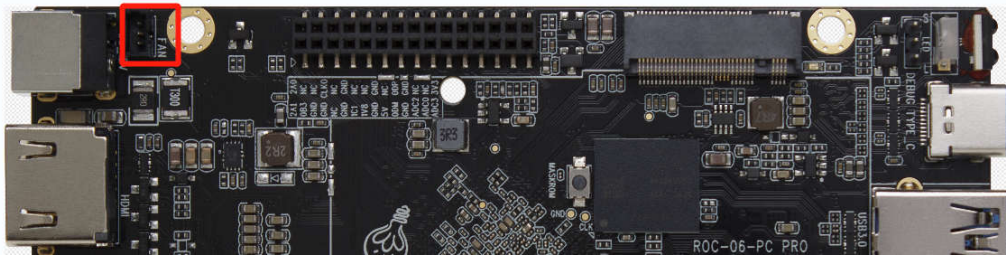


Interface describe



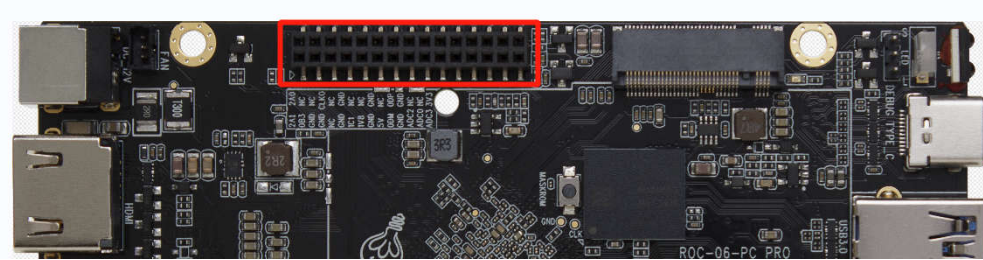
Interface definition

1、(J10) FAN 3 PIN 1.25mm pitch interface



NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	NC		3	FAN-	12
2	FAN+	12			

2、(J12)Double-row30 PIN 2.0mm pitch interface



NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	GPIO2_A1/VOP_D1/CIF_D1/I2C2_SC L_u	3.0	2	GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA_u	3.0
3	GPIO0_B3_D	1.8	4	NC	
5	GND		6	NC	3.0
7	GND		8	RTC_CLK_OUT/GPIO0_A0/TE ST_CLKOUT0/CLK32K_IN_u	1.8
9	NC		10	NC	
11	GND		12	GND	
13	GPIO1_C1/SPI3_CLK_d	3.0	14	NC	
15	1.8V POWER OUT	1.8	16	NC	
17	GND		18	GND	
19	5.0V POWER OUT	5.0	20	NC	
21	HOST0_DM	3.0	22	HOST0_DP	3.0
23	GND		24	GND	
25	ADC_IN2	1.8	26	NC	
27	ADC_IN0	1.8	28	NC	
29	ADC_IN3	1.8	30	3.3V POWER OUT	3.3

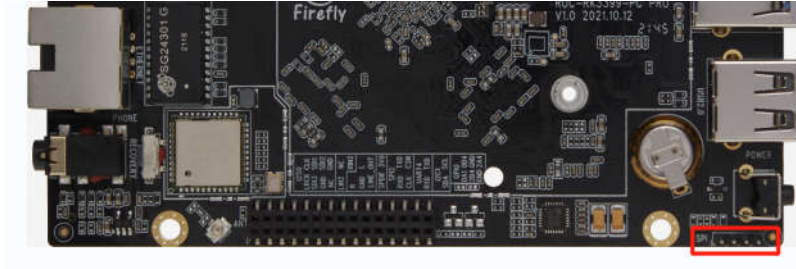
3、(J9) DEBUG 3 PIN 2.0mm pitch interface



NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	UART2_RXD	3.3	3	GND	
2	UART2_TXD	3.3			

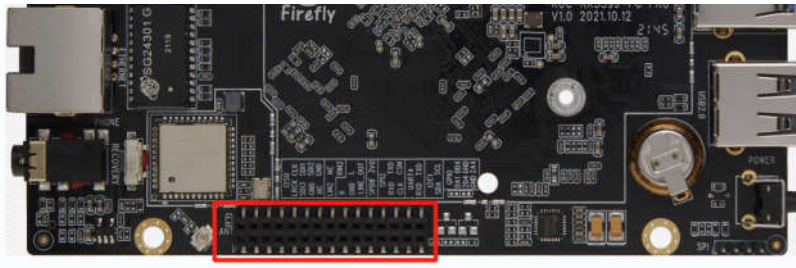
Interface definition

4、(J16) SPI 4 PIN 2.0 pitch interface



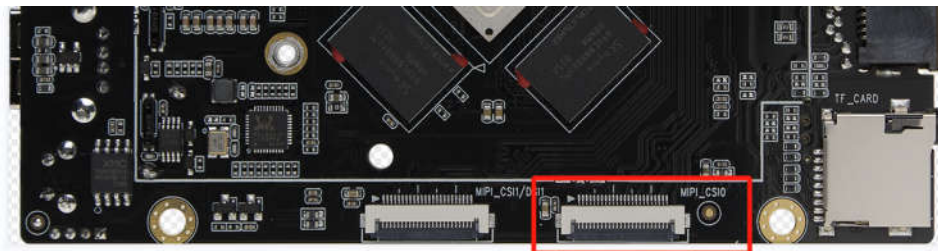
NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	GND		3	FLASH_WP (default L)	
2	SPI1_CLK	3.3	4	VCC3V3_SYS	3.3

5、(J20) GPIO Double-row30 PIN 2.0mm pitch interface



NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	GPIO3_D2/I2S0_LRCK_TX_d	1.8	2	GPIO4_A0/I2S_CLK_d	1.8
3	GPIO3_D6/I2S0_SDI3SDO1_d	1.8	4	GPIO3_D4/I2S0_SDI1SDO3_d	1.8
5	GND		6	GPIO3_D5/I2S0_SDI2SDO2_d	1.8
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_u/GPIO3_C0/MAC_COL/ UART3_CTSn	3.3	16	3.0V POWER OUT	3.0
17	SPI2_RXD/ GPIO2_B1/CIF_HREF/I2C6_SDA_u	3.3	18	SPI2_TXD/ GPIO2_B2 /CIF_CLKIN/I2C6_SCL_u	3.3
19	SPI2_CLK/ GPIO2_B3 /VOP_DEN/CIF_CLKOUTA_u	3.3	20	SPI2_CSN0/ GPIO2_B4_u	3.3
21	SPI1_RXD/UART4_RXD/ GPIO1_A7 _u	3.0	22	SPI1_TXD/UART4_TXD/ GPIO1_B0_u	3.0
23	GPIO4_A1/I2C1_SDA_u	1.8	24	GPIO4_A2/I2C1_SCL_u	1.8
25	GPIO0_A1/DDRIO_PWROFF/TCPD_C CDB_EN_u	1.8	26	GPIO0_B4/TCPD_VBUS_BDIS_ d	1.8
27	GPIO2_D4/SDIO0_BKPWR_d	1.8	28	GND	
29	GND		30	GPIO2_A4/VOP_D4/CIF_D4_d	3.0

6、(J17) MIPI CAMERA 0 24 PIN 0.5mm pitch

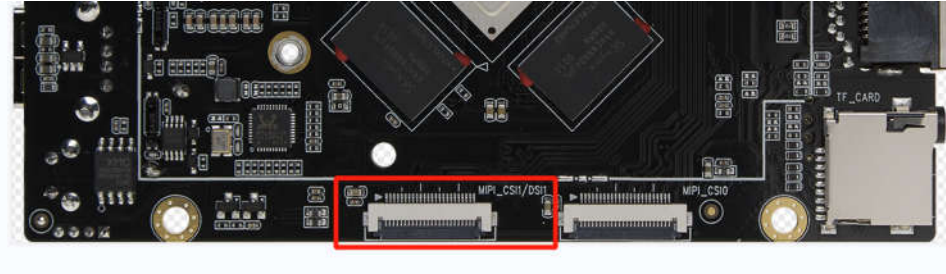


NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	VCC_SYS	5.0	2	VCC_SYS	5.0
3	VCC_SYS	5.0	4	I2C1_SDA	1.8
5	I2C1_SCL	1.8	6	MIPI_RST	1.8
7	GPIO2_A2/DVP_PDN0	1.8	8	MIPI_PWR1	1.8
9	MIPI_MCLK0	1.8	10	GND	

Interface definition

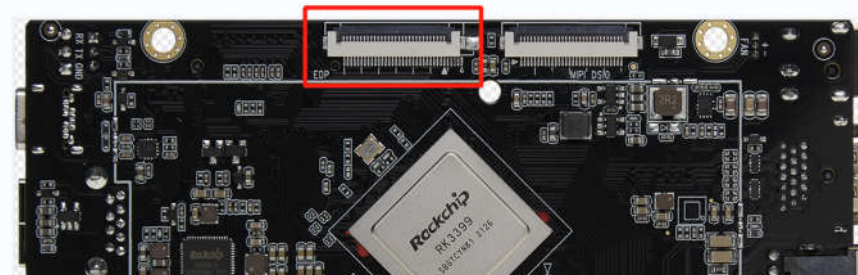
11	MIPI_RX0_D3P	1.8	12	MIPI_RX0_D3N	1.8
13	GND		14	MIPI_RX0_D2P	1.8
15	MIPI_RX0_D2N	1.8	16	GND	
17	MIPI_RX0_CLKP	1.8	18	MIPI_RX0_CLKN	1.8
19	GND		20	MIPI_RX0_D1P	1.8
21	MIPI_RX0_D1N	1.8	22	GND	
23	MIPI_RX0_D0P	1.8	24	MIPI_RX0_D0N	1.8

7、(J8) MIPI CAMERA 1 24 PIN 0.5mm pitch



NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	VCC_SYS	5.0	2	VCC_SYS	5.0
3	VCC_SYS	5.0	4	I2C1_SDA_CAM	1.8
5	I2C1_SCL_CAM	1.8	6	MIPI_RST	1.8
7	GPIO2_A3/DVP_PDN1	1.8	8	MIPI_PWR0	1.8
9	MIPI_MCLK0	1.8	10	GND	
11	MIPI_TX1/RX1_D3P	1.8	12	MIPI_TX1/RX1_D3N	1.8
13	GND		14	MIPI_TX1/RX1_D2P	1.8
15	MIPI_TX1/RX1_D2N	1.8	16	GND	
17	MIPI_TX1/RX1_CLKP	1.8	18	MIPI_TX1/RX1_CLKN	1.8
19	GND		20	MIPI_TX1/RX1_D1P	1.8
21	MIPI_TX1/RX1_D1N	1.8	22	GND	
23	MIPI_TX1/RX1_D0P	1.8	24	MIPI_TX1/RX1_D0N	1.8

8、(J24) EDP_Display_Interface 35 PIN 0.5mm pitch

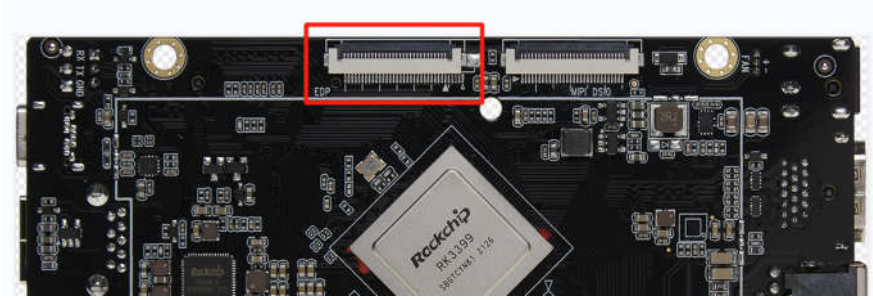


NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	EDP_TX3N	1.8	19	NC	
2	EDP_TX3P	1.8	20	GND	
3	GND		21	GND	
4	EDP_TX2N	1.8	22	EDP_HPD	3.0
5	EDP_TX2P	1.8	23	GND	
6	NC		24	GND	
7	GND		25	GND	
8	EDP_TX1N	1.8	26	GND	
9	EDP_TX1P	1.8	27	BL_EN	3.0
10	GND		28	LCD_BL_PWM0	3.0
11	EDP_TX0N	1.8	29	NC	
12	EDP_TX0P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

Interface definition

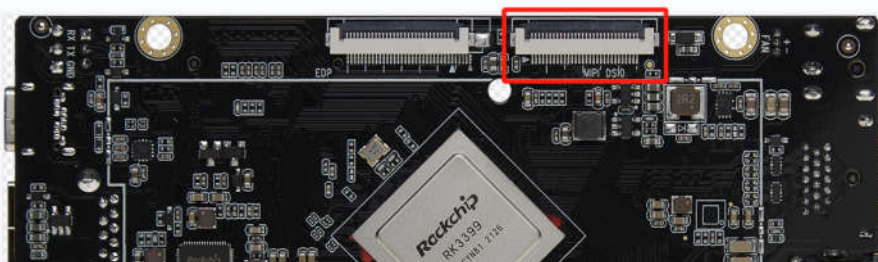
16	GND		34	SYS_12V	12
17	VCC_LCD	3.3	35	NC	
18	VCC_LCD	3.3			

9、(J23) EDP_Display_Interface 30 PIN 0.5mm pitch



NO.	Definition	Voltage/V	NO.	Definition	Voltage/V
1	NC		16	GND	
2	GND		17	EDP_HPDP	3.0
3	EDP_TX1N	1.8	18	GND	
4	EDP_TX1P	1.8	19	GND	
5	GND		20	GND	
6	EDP_TX0N	1.8	21	GND	
7	EDP_TX0P	1.8	22	BL_EN	3.0
8	GND		23	LCD_BL_PWM0	3.0
9	EDP_AUXP	1.8	24	NC	
10	EDP_AUXN	1.8	25	NC	
11	GND		26	SYS_12V	12
12	VCC_LCD	3.3	27	SYS_12V	12
13	VCC_LCD	3.3	28	SYS_12V	12
14	NC		29	SYS_12V	12
15	GND		30		

10、(J19) MIPI_Display_Interface 30 PIN 0.5mm pitch



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

About us

T-Chip Intelligent Technology (Zhongshan) Co., Ltd. , established in 2005, has more than ten years of technological product research and development capabilities, and has nearly 100 patents and software copyrights. As a national high-tech enterprise, we focus on the research and development, production and sales of open source smart hardware, Internet of Things, and digital audio products, while also provide overall solutions with smart hardware products.

T-Chip is an IDH (Independent Design House) officially authorized by Rockchip in Fuzhou, and also a strategic partner of Rockchip, with a close cooperative relationship for more than 10 years.

Firefly is a brand established by T-Chip, with open source community and online store. Firefly products include core boards, mainboards, embedded computers, cluster servers, development kits and other products. Currently, we have more than 100,000 users, including more than 10,000 enterprise users such as Arm, Google, Baidu, Tencent and Alibaba.

Firefly team has more than 70 R&D members, with excellent research and development capabilities of schematic design, PCB layout, board mass production, embedded development, system development, application development and so on. We accelerate the research and development process for many technology entrepreneurs and start-ups, and provide professional technical services.

Make technology simpler, Make life smarter - is the idea of Firefly team. We hope that through Firefly's open source products and technical services, the research and development of various technological products will become efficient and simple, and intelligent technology can be integrated into life.

Firefly is committed to providing enterprise customers with long-term stable and reliable industrial products and services, and continuously creating value for customers.

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