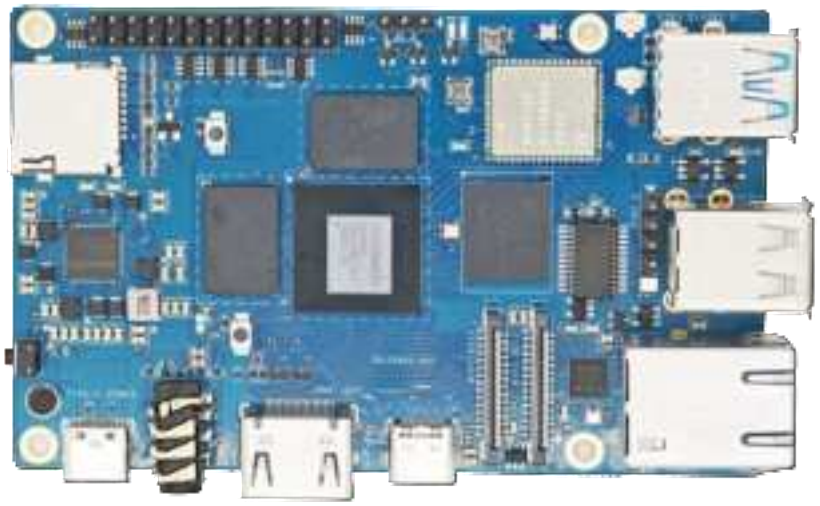
Type:YKR-IP5B-Pro



Contents

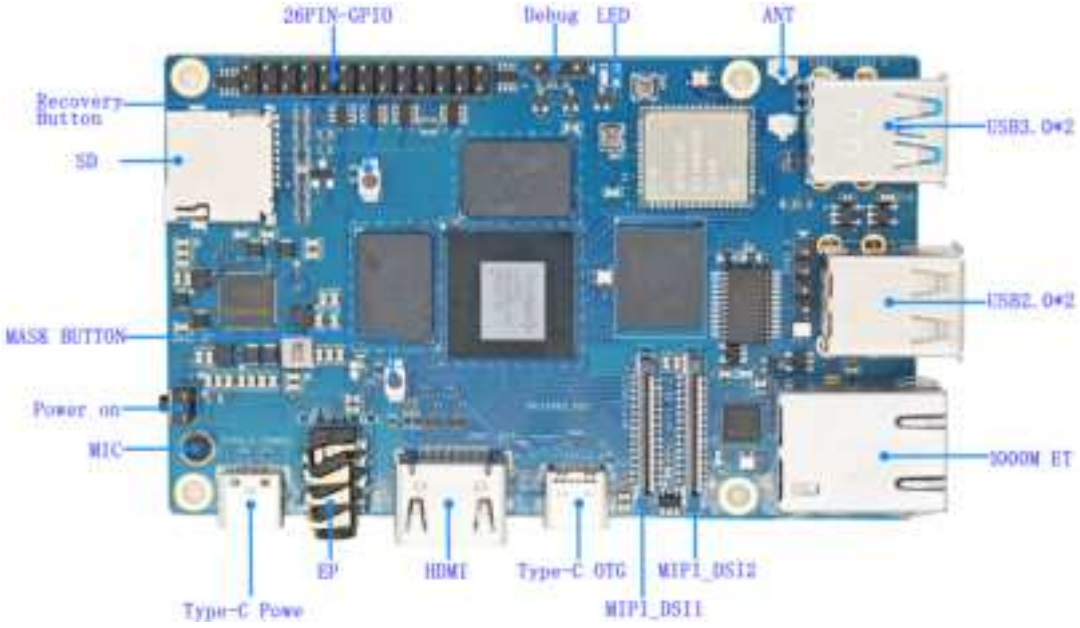
Chapter 1 Product Introduction

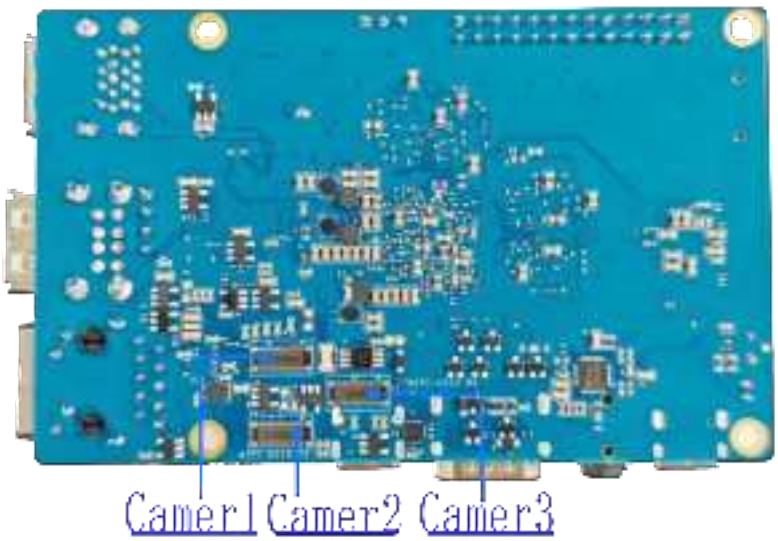
The YKR-IP5B-Pro motherboard features a 10-layer immersion gold (Immersion Gold) PCB and is equipped with the Rockchip RK3588S2 chip (quad-core A76 + quad-core A55 architecture, clocked at up to 2.4GHz). It also boasts a built-in independent NPU supporting 6TB of computing power. With its rich peripheral interfaces, it can be widely used in edge computing, self-service retail equipment, facial recognition gates, facial verification equipment, commercial robots, self-service checkouts, and other terminal products, helping users across multiple industries quickly upgrade their products and terminal application scenarios.

Chapter 2 Appearance and Dimensions

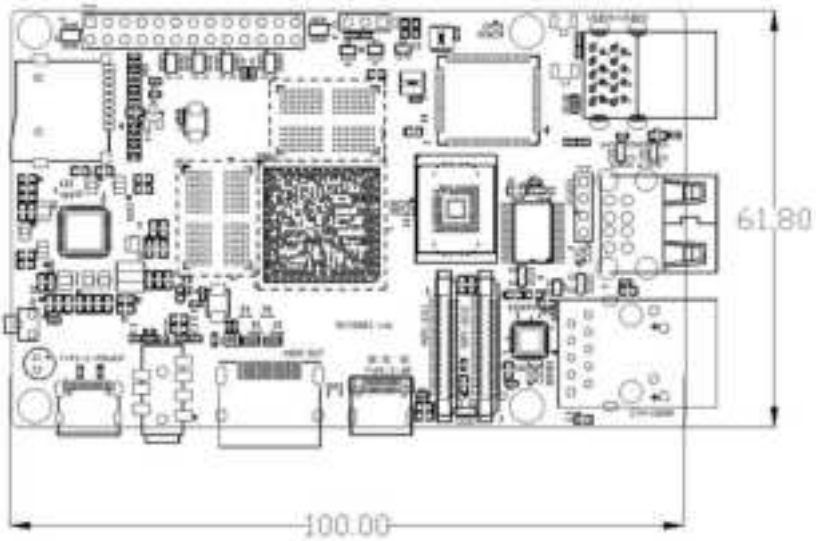
Photo Statement: The pictures shown in this specification are selected from a batch of complete boards produced by our company. Due to continuous product maintenance and different configurations selected by customers, the actual shipment may not be consistent with the pictures in this specification.

2.1 Board appearance





2.2 Board Dimensions



Chapter 3 Product Specifications

Detailed parameters	
SOC	Rockchip RK3588S2
CPU	8-core 64-bit RAM architecture, 4 Cortex-A76 clocked at 2.4GHz, 4 Cortex-A55 clocked at 1.8GHz
GPU	Integrated Mali-G610 MP4 quad-core GPU, supporting OpenGLES 1.1, 2.0, 3.2, Vulkan 1.2, and OpenCL 2.2
NPU	Built-in NPU, supports INT4/INT8/INT16/FP16 mixed operations, and has a computing power of 6TOPS
VPU	• Supports 8K@60fps H.264, H.265, and VP9 video decoding, and 8K@30fps H.264 and H.265 video encoding. • Supports HDR. A new generation of hardware-based ISP with a maximum resolution of 48 megapixels and support for Dualpipe ISP (48M-16M).
PMU	• Supports HDMI 2.0/HDMI 2.1/MIPI interfaces, enabling multi-screen display.
Memory	RK806-1 supports dynamic frequency modulation.
Storage	Supports LPDDR4/LPDDR4X, standard configuration: 8GB (customizable: 4GB/8GB/16GB/32GB).
USB	• Onboard EMMC 5.0, standard configuration: 32GB (customizable: 16GB/64GB/128GB/256GB).
Video Output	• Onboard microSD card slot, supports up to 256GB of expansion.
Camera	• Three USB 2.0 host ports: two standard USB-A ports and one 2.54 x 4-pin header.
Audio	• Two USB 3.0 host ports: standard USB-A ports.
Network	10/100/1000Mbps Ethernet. 2.4G+5.8GWi
GPIO	One 2.54mm²*13mm double-row 26-pin GPIO header
Debug Serial Port	3.3V debug serial port, 1500000bps baud rate
Indicator Lights	Two GPIO-controlled LEDs (SYS & LED1)
Buttons	RESET, RECOVERY, and MASK buttons
Power Port	DC 5V/4A, USB-C port
System Support	Android, Ubuntu, Debian, etc.
Dimensions	100mm×62 mm
Weight	17g
Operating Temperature	-20℃ to 80℃

Chapter 4 Interface Specifications

Debug UART (3-Pin 2.54mm pin header) debug serial port is 3.3V level, 1500000bps

PIN	definition
1	GND
2	UART2DBG_RX
3	UART2DBG_TX

26-Pin GPIO (2*13-PIN 2.54mm Double row pin header)

Serial number	definition	Serial number	definition
1	3.3V	2	5V
3	SDA	4	5V
5	SCL	6	GND
7	IO_GCLK	8	TXD0
9	GND	10	RXD0
11	IO_0	12	IO_1
13	IO_2	14	GND
15	IO_3	16	IO_4
17	3.3V	18	IO_5
19	SPI_MOSI	20	GND
21	SPI_MISO	22	IO_6
23	SPI_CLK	24	SPI_CE0
25	GND	26	SPI_CE1

MIPI screen interface (0.5mm, 30-PIN FPC connector)

Serial number	definition	Serial number	definition
1	GND	2	MIPI_DPHY0_T/D0N
3	MIPI_DPHY0_T/D0P	4	GND
5	MIPI_DPHY0_T/D1N	6	MIPI_DPHY0_T/D1P
7	GND	8	MIPI_DPHY0_T/CLKN
9	MIPI_DPHY0_T/CLKP	10	GND
11	MIPI_DPHY0_T/D2N	12	MIPI_DPHY0_T/D2P
13	GND	14	MIPI_DPHY0_T/D3N
15	MIPI_DPHY0_T/D3P	16	GND
17	LCD MIPI BL PWM2 M0	18	MIPI TE0
19	VCC_3.3V_MIPI	20	LCD MIPI RESET 0
21	SARADC VIN2 LCD ID	22	LCD MIPI PWREN H
23	I2C7 SCL M0	24	I2C7 SDA M0
25	TP INT L	26	TP RST L
27	GND	28	VCC5V_SYS
29	VCC5V_SYS/VCC_5V	30	VCC5V_SYS

MIPI camera interface (using OK-21F030-04 to connect the machine)

+

Serial number	definition	Serial number	definition
1	MIPI_CAM_CLKDUT	2	MIPI_CAM_RST
3	NC	4	I2C7_SDA_M0
5	I2C7_SDA_M0	6	NC
7	NC	8	NC
9	GND	10	AF_VDD_3.3V
11	VCC_2.8V_CAM	12	GND
13	VCC_1.1V_CAM	14	VCC_1.8V_CAM
15	GND	16	MIPI CSIO RX CLKON
17	MIPI CSIO RX CLKOP	18	GND
19	MIPI CSIO RX DON	20	MIPI CSIO RX DOP
21	GND	22	MIPI CSIO RX DIN
23	MIPI CSIO RX DIP	24	GND
25	MIPI CSIO RX D2N	26	MIPI CSIO RX D2P
27	GND	28	MIPI CSIO RX D3N
29	MIPI CSIO RX D3P	30	GND

Chapter 5 Electrical Characteristics

project	Minimum	typical	maximum
Voltage	4.5	5V	5.5V
Ripple	--	150mV	--
Current	0.9A	0.8A	0.7A
Relative Humidity	30%	--	80%
Operating Temperature	0℃	--	40℃
Storage Temperature	0℃	--	70℃

Chapter 6 Precautions for Assembly and Use

Please pay special attention to the following:

1: After removing the motherboard from the box, ensure there are no pins or other short circuits caused by shipping before powering on.

2: Electronic products are very sensitive to static electricity. Before handling the motherboard, please wear an anti-static wrist strap or anti-static gloves to dissipate static electricity on your body.

3: Always plug and unplug components when the power is off. Before connecting the power connector to the motherboard, ensure the power is off to avoid sudden electrical shocks that could damage sensitive components.

4: When connecting peripherals via cables, ensure that the pin assignments of the peripherals match the motherboard connectors to avoid short circuits and burns due to incorrect wiring sequences.

5: When securing the motherboard with screws, be careful to prevent deformation of the board, which could cause an open circuit on the PCB or components to fall out.

6: When connecting a monitor with selectable voltage (LVDS, eDP, etc.), ensure that the voltage selected by the jumper is consistent with the monitor's specifications.

7: When connecting peripherals such as SATA/USB/extension ports, pay attention to current limits. 9: When connecting serial and CAN ports, ensure that the serial port voltage levels match. Avoid connecting a UART to RS232 or RS485 voltage levels.

10: For RS232, ensure RX-TX interconnection. For RS485/CAN interfaces, ensure A-A/B-B and H-H/L-L.

11: When selecting a power supply, ensure that the voltage and current meet the power requirements of the motherboard and peripherals.

12: When designing the entire product, consider motherboard heat dissipation and height restrictions.

13: When not in use, store the motherboard on an anti-static mat or in a sealed anti-static bag.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

-This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.