野火®

Dongguan EmbedFire Electronic Technology Co., Ltd

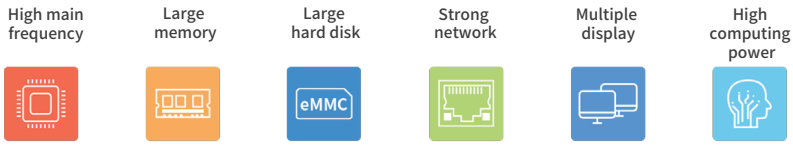
Product Manual

www.embedfire.com

LubanCat Series

LubanCat®

LubanCat is a high performance Single Board Computer launched by EmbedFire



Brand metaphor

- **In the name of Lu Ban**
  Encourage engineers to carry forward Lu Ban's innovative craftsmanship spirit and strive to be the modern-day Lu Ban.
- **In the shape of cat**
  May we stay curious like children and cats alike,keep exploring endlessly, and always hold a childlike heart.

Rockchip RK/RV series

Processor	Model
RockChip RK3566	LubanCat Zero N、LubanCat Zero W
RockChip RK3566	LubanCat1、LubanCat1N、LubanCat 1CB、LubanCat 1CF、LubanCat 1H
External RK3566 core board	LubanCat 1IOB、LubanCat 1IOF
RockChip RK3562	LubanCat 1HS CS、 LubanCat 1HS
RockChip RK3568	LubanCat2、LubanCat2N、LubanCat 2CF、LubanCat 2CB、LubanCat 2H
RockChip RK3568J	LubanCat 2CFI、LubanCat 2CBI
External RK3568/RK3568J core board	LubanCat 2IOF/LubanCat 2IOFI、LubanCat 2IOB/LubanCat 2IOBI
RockChip RK3576	LubanCat 3 、 LubanCat 3CB、LubanCat 3CF
External RK3576 core board	LubanCat 3IOB、LubanCat 3IOF
RockChip RK3588S/RK3588S2	LubanCat 4、LubanCat 4CB
External RK3588S2 core board	LubanCat 4IOB
RockChip RK3588	LubanCat 5、LubanCat 5CB

Processor	Model
External RK3588 core board	LubanCat 5IOB
RockChip RK3528A	LubanCat Q1
RockChip RV1106	LubanCat RV06 CS、LubanCat RV06

Allwinner/SOPHON series

Processor	Model
Allwinner H618	LubanCat A0、LubanCat A1、LubanCat A1CS、LubanCat A1CS+IO
SOPHON SG2000	LubanCat P1

HiSilicon series

Processor	Model
HiSilicon Hi3403	LubanCat Hi3403

Note: The corresponding relationship of product letters is C= core board; IO= baseboard; W= whole plate; F= card edge connector; B=BTB;S=postal stamp hole;I= Industrial grade.

Software ecology

Application/Software framework

PythonGPIO Glamor OpenBLAS *Streamer*

System support

Simulator

Gem5 Jupiter Jor1k FireSim

Compile/Debug

Application area


Smart gateway


NAS personal storage


Industrial gateway


Set up a home gigabit network


Entry-level notebook


TV box (Audio-visual entertainment player)


Karaoke


Unmanned Aerial Vehicle


Robot


Home Security Monitoring


Smart Home


Handheld device


Smart business display

Smart retail


Vehicle central control


Smart energy

Cooperative partner

WHEELTEC 轮趣科技

ROS Education Robot

B585 Balance Car

S100 Differential Service Robot

Ackerman Robot

R550 LBC Mak wheel version

R550 LBC four-wheel drive version

The above robots of Wheeltec all use the EmbedFire's LubanCat series products as the main control.

LubanCat Product Catalogue_Part1

Model name	Main chip	Storage+Memory	Ethernet	PCIE+M.2 interface	WiFi/Bluetooth	USB interface
LubanCat Zero N	RK3566 Quad-core A55,1.8GHz 1TOPS NPU	None eMMC Memory:LPDDR4(X) (Optional)	Gigabit network port*1	⊖	⊖	USB2.0 Host TypeC*1 USB2.0 OTG TypeC*1
LubanCat Zero W	RK3566 Quad-core A55,1.8GHz 1TOPS NPU	None eMMC Memory:LPDDR4(X) (Optional)	⊖	⊖	Onboard WiFi + Bluetooth	USB2.0 Host TypeC*1 USB2.0 OTG TypeC*1
LubanCat1	RK3566 Quad-core A55,1.8GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	Mini-PCIe*1	Connected via PCIE interface	USB2.0 Host TypeA*3 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*3
LubanCat1 N	RK3566 Quad-core A55,1.8GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*2	⊖	Onboard WiFi + Bluetooth	USB2.0 Host TypeA*1 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1
LubanCat 1CF LubanCat 1CB	RK3566 Quad-core A55,1.8GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat1IOF LubanCat1IOB	External RK3566 core board LubanCat 1CF LubanCat 1CB	⊖	Gigabit network port*1	Mini-PCIe*1	Onboard WiFi + Bluetooth	USB2.0 Host TypeA*3 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1
LubanCat1H	RK3566 Quad-core A55,1.8GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	Mini-PCIe*1	Onboard WiFi	USB2.0 Host *2 USB2.0 OTG TypeA*1 USB3.0 Host TypeA*1
LubanCat 1HS CS	RK3562/RK3562J Cortex A53 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat 1HS	RK3562/RK3562J Cortex A53 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	⊖	Onboard WiFi	USB2.0 HUB*4 USB3.0 OTG TypeA*1
LubanCat2	RK3568 Quad-core A55,2.0GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*2	Mini-PCIe*1; M.2 M KEY interface*1	Connected via PCIE interface	USB2.0 Host TypeA*1 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1
LubanCat2N	RK3568 Quad-core A55,2.0GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	2.5G port*2 Gigabit network port*2	Mini-PCIe*1	Connected via PCIE interface	USB2.0 Host TypeA*1 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1
LubanCat 2CF/2CFI LubanCat 2CB/2CBI	RK3568 Quad-core A55,2.0GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat 2IOF/2IOFI LubanCat 2IOB/2IOBI	External RK3568 core board LubanCat 2CF/2CFI LubanCat 2CB/2CBI	⊖	Gigabit network port*2	Mini-PCIe*1; M.2 M KEY interface*1	Connected via PCIE interface	USB2.0 Host TypeA*3 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1
LubanCat2H	RK3568 Quad-core A55,2.0GHz 1TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	Mini-PCIe*1; M.2 M KEY interface*1	Onboard WiFi	USB2.0 Host*6 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*2
LubanCat3	RK3576 Quad-core A72+ Quad-core A53 2.2GHz 6TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1 RGMII interface*1	Mini-PCIe*1	Connected via PCIE interface	USB2.0 Host TypeA*3 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1 USB3.0 OTG TypeC*1
LubanCat 3CB LubanCat 3CF	RK3576 Quad-core A72+ Quad-core A53 2.2GHz 6TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat 3IOB LubanCat 3IOF	External RK3576 core board LubanCat 3CB LubanCat 3CF	⊖	Gigabit network port*2	Mini-PCIe*1	Onboard WiFi + Bluetooth	USB2.0 Host TypeA*3 USB3.0 OTG TypeA*1 USB3.0 OTG TypeC*1

Single Board Computer

LubanCat series

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Model name	Main chip	Storage+Memory	Ethernet	PCIE+M.2 interface	WiFi/Bluetooth	USB interface
LubanCat 4	**RK3588S/RK3588S2** Guad-core A76+ Guad-core A55 2.4GHz 6TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	Mini-PCIe*1	Connected via PCIE interface	USB2.0 Host TypeA*3 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1 USB3.0 OTG TypeC*1
LubanCat 4CB	**RK3588S2** Guad-core A76+ Guad-core A55 2.4GHz 6TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat 4IOB	**External RK3588S2** core board LubanCat 4CB	⊖	Gigabit network port*1	Mini-PCIe*1	Onboard WiFi + Bluetooth	USB2.0 Host TypeA*2 USB3.0 Host TypeA*1 USB3.0 OTG TypeC*1
LubanCat 5	**RK3588** Guad-core A76+ Guad-core A55 2.4GHz 6TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	Mini-PCIe*1; M.2 M KEY interface*1; M.2 E KEY interface*1	Connected via PCIE interface	USB2.0 Host TypeA*2 USB3.0 Host TypeA*1 USB3.0 OTG TypeA*1 USB3.0 OTG TypeC*1
LubanCat 5CB	**RK3588** Guad-core A76+ Guad-core A55 2.4GHz 6TOPS NPU	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat 5IOB	External RK3588 core board LubanCat 5CB	⊖	Gigabit network port*2	Mini-PCIe*1; M.2 M KEY interface*1; M.2 E KEY interface*1	Connected via PCIE interface	USB2.0 Host TypeA*3 USB3.0 OTG TypeA*1 USB3.0 OTG TypeC*1
LubanCat Q1	**RK3528A** Guad-core A53 2.0GHz	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	⊖	Onboard WiFi (Optional)	USB2.0 Host TypeA*3 USB2.0 OTG TypeC*1 USB3.0 Host TypeA*1
LubanCat RV06 CS	**RV1106G2/G3** Cortex A7+MCU 0.5/1TOPS NPU	Storage:SPI NAND FLASH Built-in DDR3L	⊖	⊖	⊖	⊖
LubanCat RV06	**RV1106G2/G3** Cortex A7+MCU 0.5/1TOPS NPU	Storage:SPI NAND FLASH Built-in DDR3L	100M network port*1	Mini-PCIe*1	Onboard WiFi	USB2.0 Host TypeA*2 USB2.0 OTG TypeC*1
LubanCat A0	**Allwinner H618** Guad-core A53 1.5GHz	None eMMC Memory:LPDDR4(X) (Optional)	100M network port*1	⊖	Onboard WiFi (Optional)	USB2.0 Host TypeC*1 USB2.0 OTG TypeC*1
LubanCatA1	**Allwinner H618** Guad-core A53 1.5GHz	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	⊖	Onboard WiFi + Bluetooth (Optional)	USB2.0 TypeC*1 USB2.0 Host TypeA*3 USB2.0 OTG TypeA*1
LubanCat A1 CS	**Allwinner H618** Guad-core A53 1.5GHz	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	⊖	⊖	⊖	⊖
LubanCat A1 CS+IO	**Allwinner H618** Guad-core A53 1.5GHz	Storage:eMMC(Optional) Memory:LPDDR4(X) (Optional)	Gigabit network port*1	⊖	Onboard WiFi + Bluetooth	USB2.0 TypeC*1 USB2.0 Host TypeA*4
LubanCat P1	**SOPHON SG2000** Dual RISC-V C906 + A53 + 8051 1GHz	Storage:eMMC（8GB） Built-in 4Gb DDR3	100M network port*1	⊖	Onboard WiFi + Bluetooth	TypeC*1, USB2.0 Host TypeA*4
LubanCat Hi3403	**Hi3403V100** Guad-core A55 1.4GHz 10.4TOPS NPU	Storage:eMMC(64GB) Memory：LPDDR4X(8GB)	Gigabit network port*1	Mini-PCIe*1	Onboard WiFi	USB2.0 Host TypeA*3 USB3.0 DRD TypeA*1

LubanCat Product Catalogue_Part 2

Model name	Display interface	Camera interface	Audio	SATA interface	TF+SIM card slot	Others
LubanCat Zero N	HDMI*1 MIPI DSI*1	MIPI CSI*1	⊖	⊖	TF card slot*1	40-pin header
LubanCat Zero W	HDMI*1 MIPI DSI*1	MIPI CSI*1	⊖	⊖	TF card slot*1	40-pin header
LubanCat1	HDMI*1 MIPI DSI*1	MIPI CSI*2	Headphone + Microphone Interface * 1	⊖	TF card slot*1 SIM card slot*1	40-pin header RTC battery interface*1 Fan interface*1
LubanCat1 N	HDMI*1 MIPI DSI*1	MIPI CSI*1	Headphone + Microphone Interface * 1	⊖	TF card slot*1	40-Pin header Fan interface*1
LubanCat 1CF LubanCat 1CB	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat1IOF LubanCat1IOB	HDMI*1 MIPI DSI*1 eDP*1 LVDS*1	MIPI CSI*2	Audio output: 3.5mm Audio Jack (Green); Audio intput: 3.5mm Audio Jack (Red); MIC interface * 1; SPK interface * 1, connect 1W power speaker	⊖	TF card slot*1 SIM card slot*1	RTC battery interface*1 Fan interface*1 I2C*2,RS232*2, RS485*2
LubanCat1H	HDMI*1 MIPI DSI*1 eDP*1 LVDS*1	MIPI CSI*2	3.5mm Headphone + Microphone Interface * 1; MIC interface * 1; Mono speaker interface*1; Stereo speaker interface * 1	⊖	TF card slot*1 SIM card slot*1	RTC battery interface*1 Fan interface*1 RS232*4，RS485*2
LubanCat 1HS CS	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat 1HS	MIPI DSI/RGB*1 LVDS*1	MIPI CSI*4	3.5mm Headphone + Microphone Interface * 1; Microphone Interface*1; Mono speaker interface*1; Stereo speaker interface * 1	⊖	TF card slot*1	Infrared Remote Control interface*1 RTC battery interface*1 Fan interface*1 RS232*4， RS485*2, Serial port*1
LubanCat2	HDMI*1 MIPI DSI*2	MIPI CSI*2	3.5mm Headphone + Microphone Interface * 1; SPK interface * 1, connect 1W power speaker	SATA cable connector*1	TF card slot*1 SIM card slot*1	40-pin header RTC battery interface*1 Fan interface*1
LubanCat2N	HDMI*1 MIPI DSI*1	MIPI CSI*1	3.5mm Headphone + Microphone Interface * 1; SPK interface * 1, connect 1W power speaker	Standard SATA interface*1	TF card slot*1 SIM card slot*1	40-pin header RTC battery interface*1 Fan interface*1
LubanCat 2CF/2CFI LubanCat 2CB/2CBI	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat 2IOF/2IOFI LubanCat 2IOB/2IOBI	HDMI*1 MIPI DSI*2 eDP*1	MIPI CSI*2	Audio output: 3.5mm Audio Jack (Green); Audio intput: 3.5mm Audio Jack (Red); MIC interface * 1; SPK interface * 1, connect 1W power speaker	Standard SATA interface*1	TF card slot*1 SIM card slot*1	RTC battery interface*1 Fan interface*1 CAN*2,RS232*2, RS485*2
LubanCat2H	HDMI*1 MIPI DSI*1 eDP*1 LVDS*1	MIPI CSI*2	3.5mm Headphone + Microphone Interface * 1; Stereo speaker interface * 1	⊖	TF card slot*1 SIM card slot*1	RTC battery interface*1 Fan interface*1 I2C*2,RS232*2, RS485*2,Serial port*1， PWM*1
LubanCat3	HDMI*1 MIPI DSI*1 DP(USB)*1	MIPI CSI*5	3.5mm Headphone + Microphone Interface * 1; Capacitive microphone*1	⊖	TF+SIM card slot*1	40-pin header RTC battery interface*1 Fan interface*1
LubanCat 3CB LubanCat 3CF	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat 3IOB LubanCat 3IOF	MIPI DSI*1 HDMI*1	MIPI CSI*5	3.5mm Headphone + Microphone Interface * 1; Capacitive microphone*1; SPK interface * 2, connect 3W power speaker	⊖	TF card slot*1 SIM card slot*1	18-Pin header RTC battery interface*1 Fan interface*1 RS232*2， RS485*2, UART*2，CAN*2

Single Board Computer

LubanCat series

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Model name	Display interface	Camera interface	Audio	SATA interface	TF+SIM card slot	Others
LubanCat 4	HDMI*1 MIPI DSI*2 DP(USB)*1	MIPI CSI*3	3.5mm Headphone + Microphone Interface * 1; Capacitive microphone*1	⊖	TF+SIM card slot*1	40-Pin header RTC battery interface*1 Fan interface*1
LubanCat 4CB	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat 4IOB	MIPI DSI*2 HDMI*1	MIPI CSI*4	Audio output: 3.5mm Audio Jack (Green); Audio intput: 3.5mm Audio Jack (Red); Onboard MIC*1; SPK interface * 1, connect 3W power speaker	⊖	TF card slot*1 SIM card slot*1	RTC battery interface*1 Fan interface*1 CAN*2,RS232*2, RS485*2
LubanCat 5	HDMI*2 MIPI DSI*2 EDP*1 DP(USB)*1	MIPI CSI*6	3.5mm Headphone + Microphone Interface * 1; MIC interface * 1; SPK interface * 1, connect 3W power speaker	⊖	TF card slot*1 SIM card slot*1	40-Pin header RTC battery interface*1 Fan interface*1
LubanCat 5CB	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat 5IOB	HDMI*2 MIPI DSI*2 DP(USB)*1	MIPI CSI*6	3.5mm Headphone + Microphone Interface * 1; MIC interface * 1; SPK interface * 1, connect 3W power speaker	Standard SATA interface*1	TF card slot*1 SIM card slot*1	RTC battery interface*1 Fan interface*1 CAN*2, RS232*2 / RS485*2, Serial port*2
LubanCat Q1	HDMI*1	⊖	3.5mm Headphone Interface*1	⊖	TF card slot*1	30-Pin header
LubanCat RV06 CS	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat RV06	RGB screen interface*1	MIPI CSI*2	MIC interface * 2; SPK interface*1	⊖	TF card slot*1 SIM card slot*1	30-Pin header
LubanCat A0	⊖	⊖	⊖	⊖	TF card slot*1	40-Pin header 32Pin FPC interface
LubanCatA1	HDMI*1	⊖	3.5mm Headphone Interface*1	⊖	TF card slot*1	26-Pin header Fan interface*1
LubanCat A1 CS	⊖	⊖	⊖	⊖	⊖	⊖
LubanCat A1 CS+IO	HDMI*1	⊖	3.5mm Headphone Interface*1	⊖	TF card slot*1	26-Pin header Fan interface*1
LubanCat P1	MIPI DSI*1	MIPI CSI*2	3.5mm Headphone + Microphone Interface * 1; SPK interface*1	⊖	TF card slot*1	22-Pin header RTC battery interface
LubanCat Hi3403	MIPI DSI*1 HDMI*1	MIPI CSI*2	3.5mm Headphone + Microphone Interface * 1	⊖	TF card slot*1 SIM card slot*1	40-Pin header RTC battery interface*1 Fan interface*1

Single Board Computer

LubanCat series

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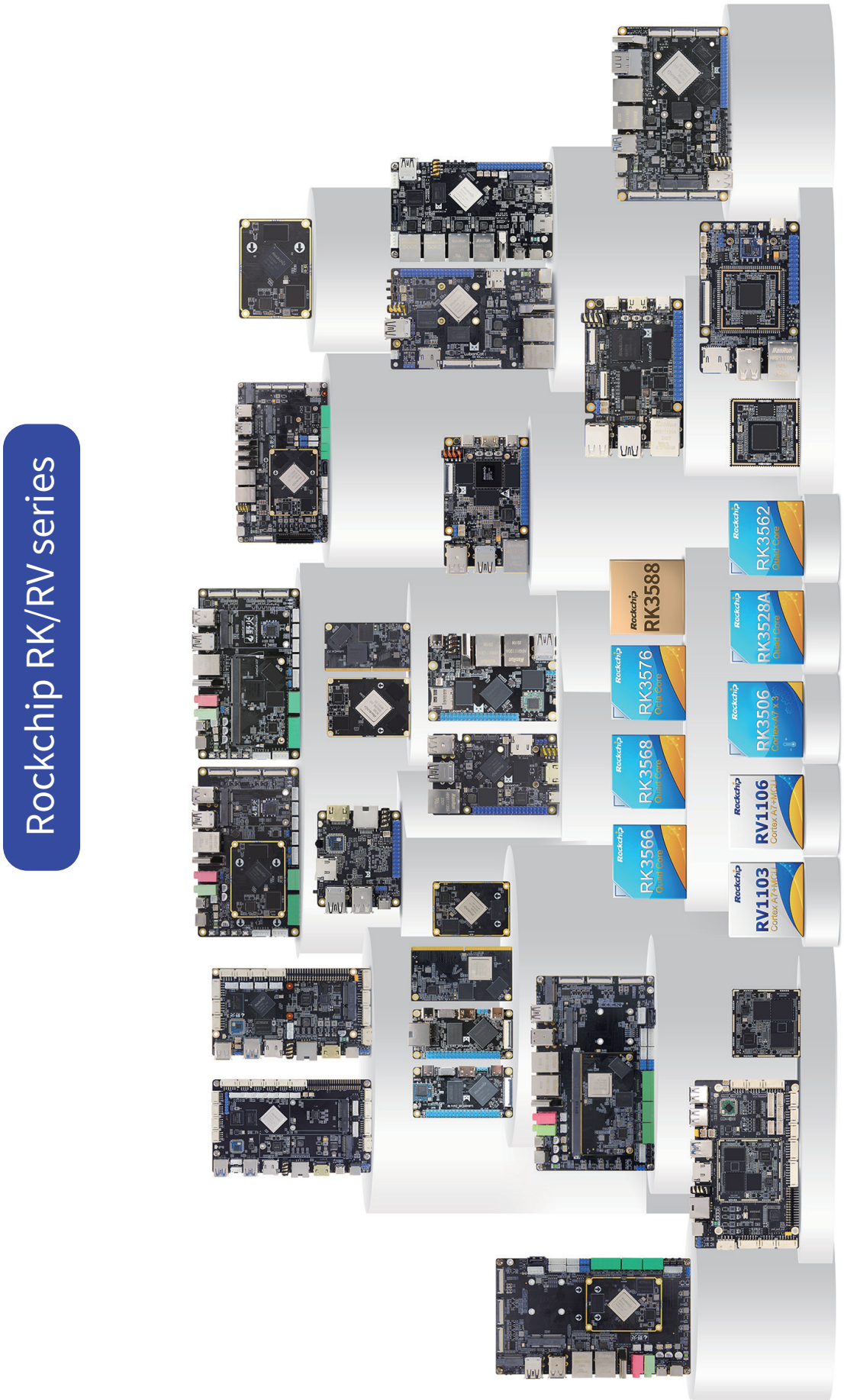

Single Board Computer

LubanCat series

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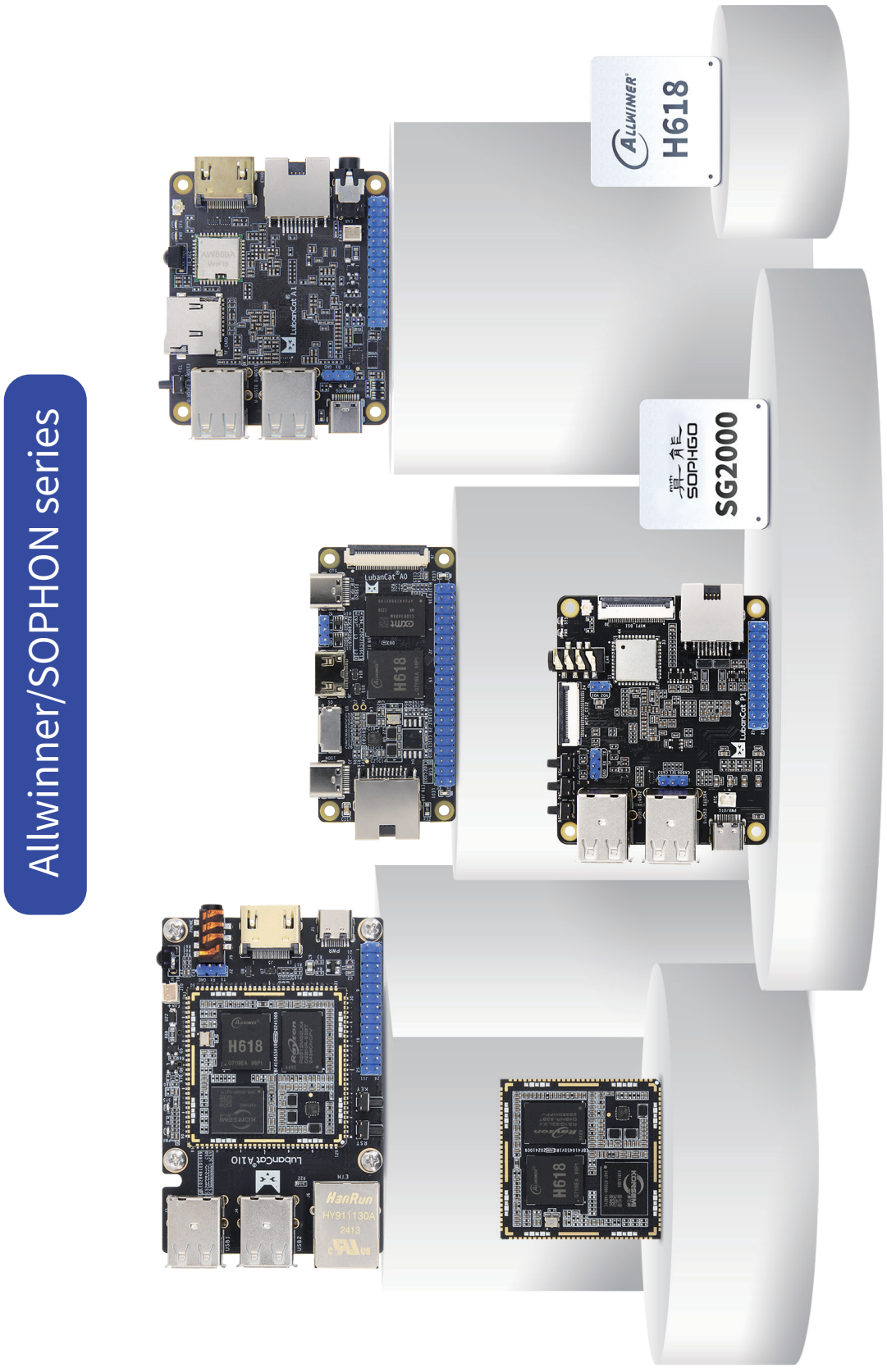

Single Board Computer

LubanCat series

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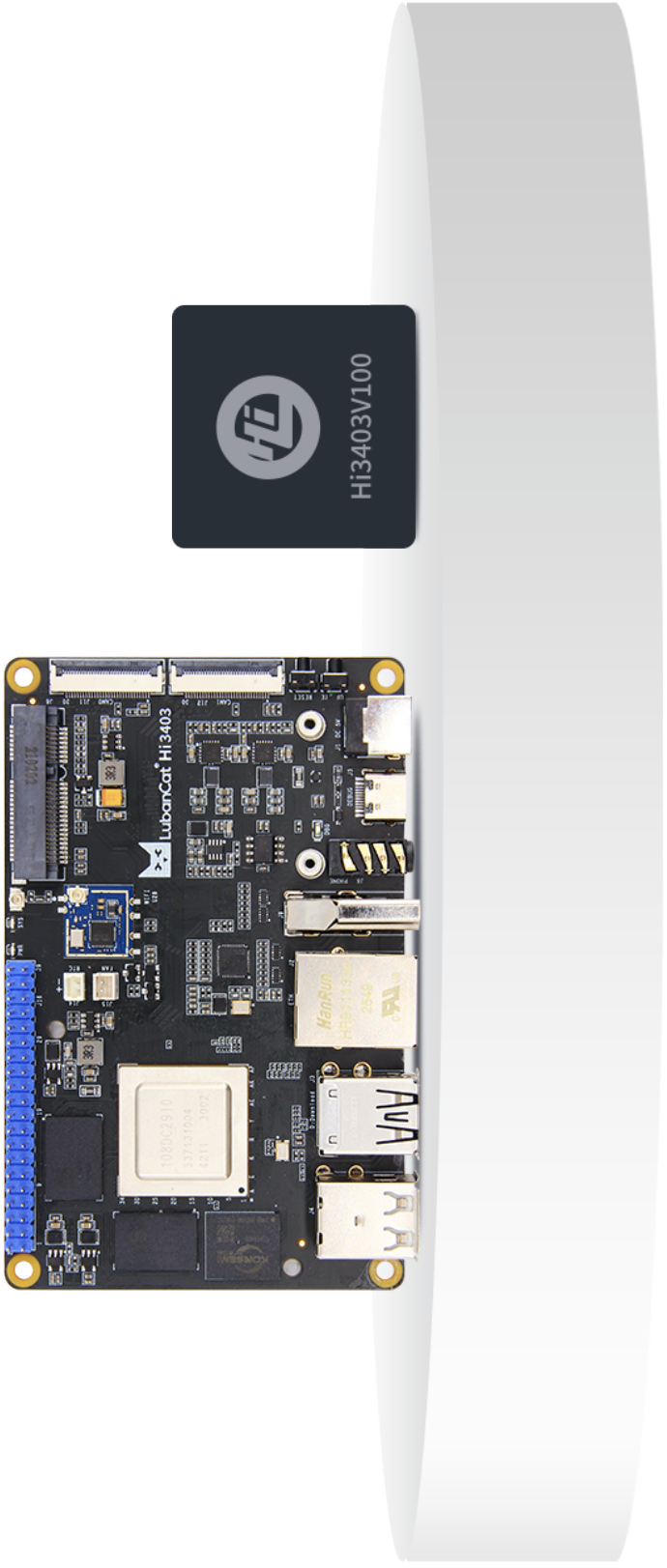
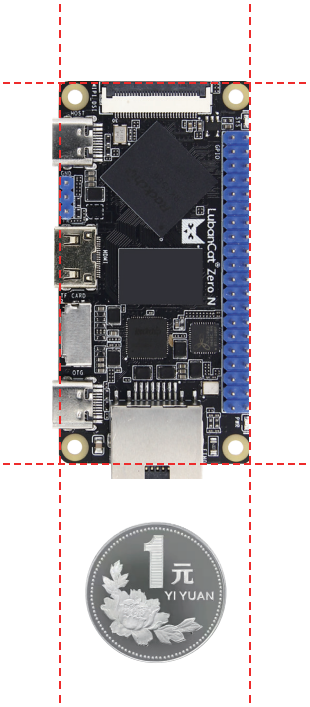
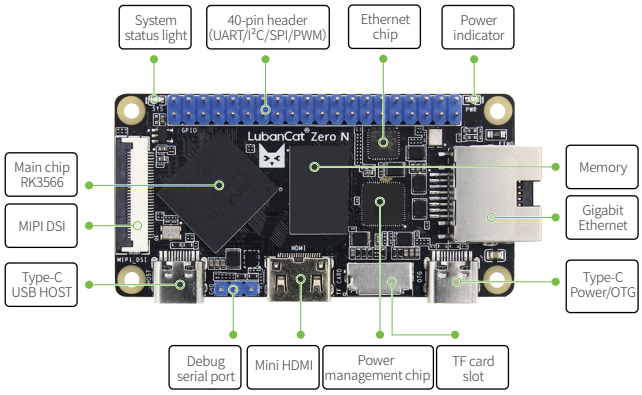
HiSilicon series

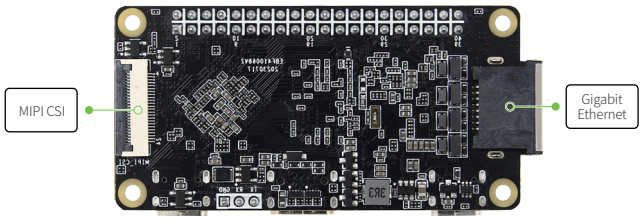


LubanCat Zero N



- Using Rockchip RK3566 as the main chip, 22nm process and 1.8GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power, LubanCat Zero N is used for light-weight AI applications;
- Support 1 channel 4K@60fps decoded video output and 1080P coding;
- Providing a variety of memory configuration options, the board is compact, measuring only 70mmX35mm, and low-power and high-performance, can easily run Linux or Android system;
- Rich peripheral interfaces, including Gigabit Ethernet, USB2.0 Type-C, Mini HDMI, MIPI screen interface and MIPI camera interface and so on, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Used as a mobile single board computer and embedded motherboard with office, education, programming development, embedded system development and other functions;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.





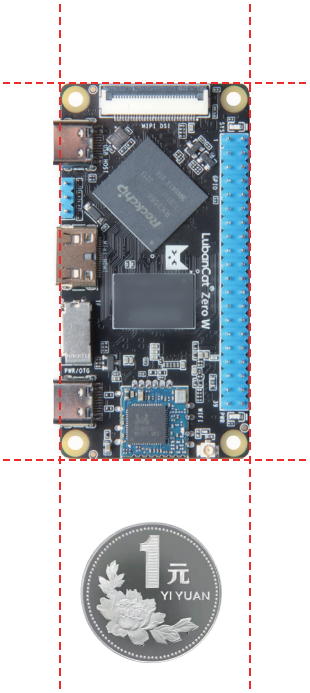
OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK

Main hardware parameter

Power interface	Type-C_5V@3A DC input
Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB, 1056MHz
Ethernet	10/100/1000M adaptive Ethernet port x1
HDMI	Mini-HDMI2.0 display interface x1, support only MIPI or HDMI display separately
MIPI-DSI	MIPI DSI x1, support plug in EmbedFire's MIPI screen, support only MIPI or HDMI display separately;Single MIPI mode supports up to 1920x1080@60fps,refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x1,support plug into EmbedFire's MIPI camera
USB2.0	Type-C interface x1 (OTG), shared with the power interface; Type-C interface x1 (HOST), unavailable for power supply
40Pin interface	Compatible with Raspberry Pi 40Pin headers, supporting PWM, GPIO, I2C, SPI, UART functions
Debug serial port	Default parameter 1500000-8-N-1
TF card slot	Support Micro SD(TF) card boot system, up to 512GB

LubanCat Zero W



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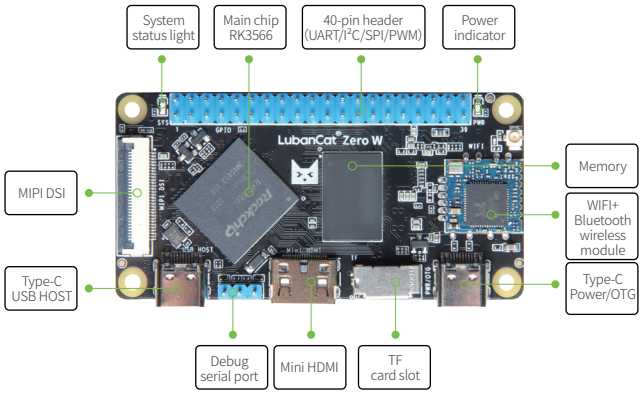
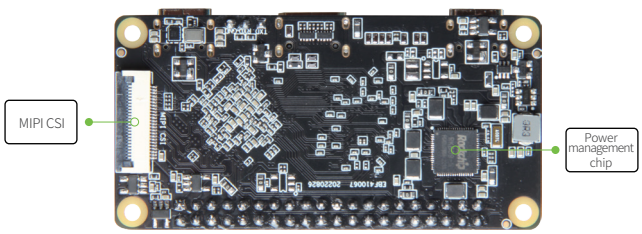
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.





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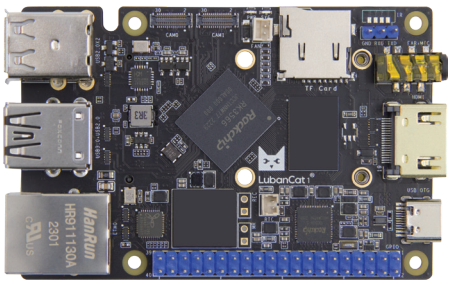
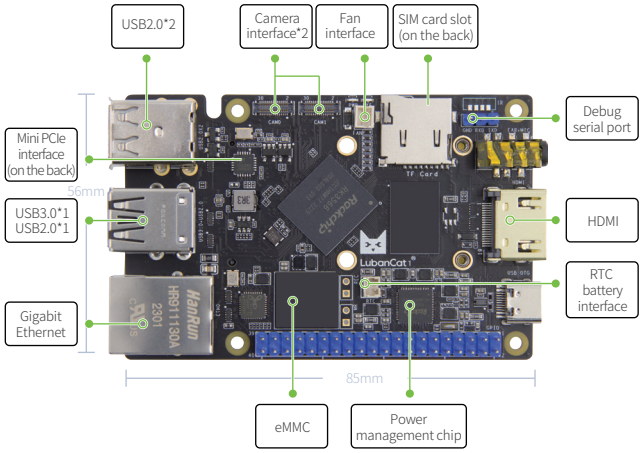
Main hardware parameter

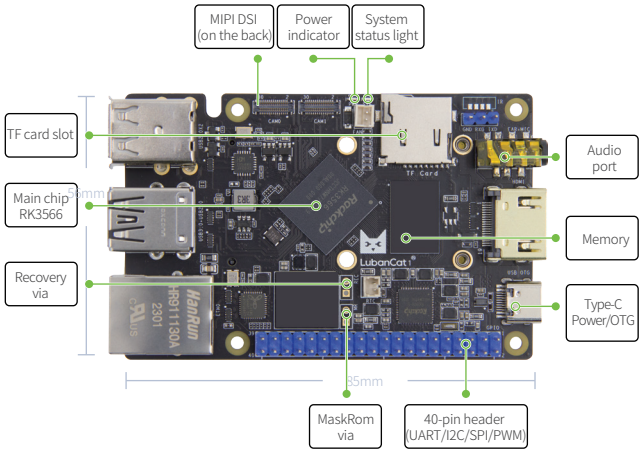
Power interface	Type-C_5V@3A DC input
Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Wireless network	802.11ac dual-band wireless network adapter, up to 433Mbps; Bluetooth supports BT4.2 protocol
HDMI	Mini-HDMI2.0 display interface x1, support only MIPI or HDMI display separately
MIPI-DSI	MIPI DSI x1, support plug in EmbedFire's MIPI screen, support only MIPI or HDMI display separately;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x1,support plug into EmbedFire's MIPI camera
USB2.0	Type-C interface x1 (OTG), shared with the power interface; Type-C interface x1 (HOST), unavailable for power supply
40Pin interface	Compatible with Raspberry Pi 40Pin headers, supporting PWM, GPIO, I2C, SPI, UART functions
Debug serial port	Default parameter 1500000-8-N-1
TF card slot	Support TF card boot system, up to 512GB

LubanCat 1



- Using Rockchip RK3566 as the main chip, 22nm process and 1.8GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power, LubanCat 1 is used for light-weight AI applications;
- Support 1 channel 4K@60fps decoded video output and 1080P coding;
- Rich peripheral interfaces, including Gigabit Ethernet, USB3.0, USB2.0, HDMI, Mini PCIe, MIPI screen interface and MIPI camera interface and so on, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Providing a variety of memory configuration options, measuring only 85mmX56mm, the board is low-power and high-performancet, can easily run Linux or Android system;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

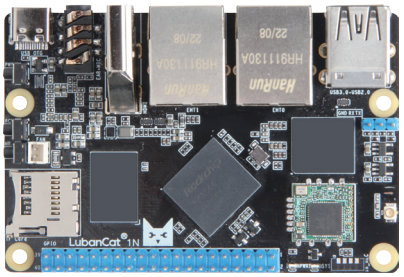




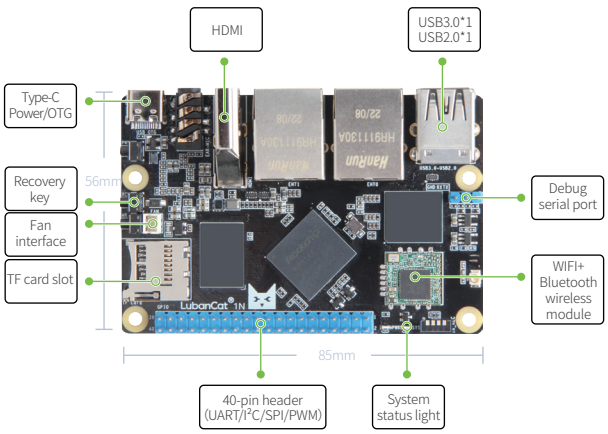
Main hardware parameter

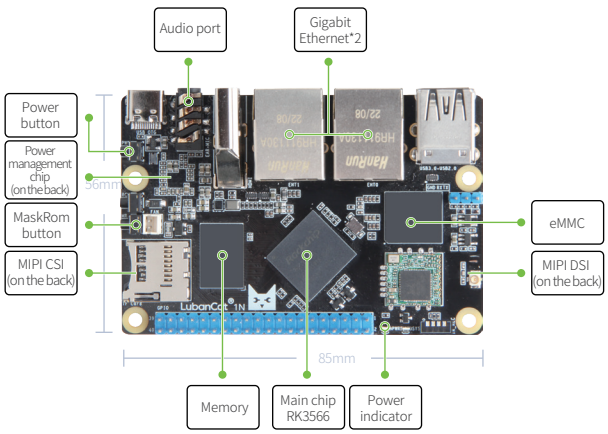
Power interface	Type-C_5V@3A DC input
Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB
Ethernet	10/100/1000M adaptive Ethernet port x1
HDMI	HDMI2.0 display interface x1, support only MIPI or HDMI display separately
MIPI-DSI	MIPI DSI x1, support plug in EmbedFire's MIPI screen, support only MIPI or HDMI display separately;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	2x15Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
USB2.0	Type-A interface x3 (HOST) Type-C interface x1 (OTG), firmware burning interface, shared with the power interface
USB3.0	Type-A interface x1 (HOST)
Mini-PCIe	Mini-PCIe x1, used with full-height or half-height WIFI network adapter, 4G module or other Mini-PCIe interface modules
SIM card slot	Interface for use with 4G module
40Pin interface	Compatible with Raspberry Pi 40Pin headers, supporting PWM, GPIO, I2C, SPI, UART functions
Debug serial port	Default parameter 1500000-8-N-1
TF card slot	Support TF card boot system, up to 512GB
Audio interface	Headphone output + microphone input 2 in 1 interface
Short jumper	MR(MaskRom), REC(Recovery)
RTC interface	Support RTC function
Fan interface	Support the installation of fans for heat dissipation

LubanCat 1N



- Using Rockchip RK3566 as the main chip, 22nm process and 1.8GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power, LubanCat 1N is used for light-weight AI applications;
- Support 1 channel 4K@60fps decoded video output and 1080P coding;
- Providing a variety of memory configuration options, measuring only 85mmX56mm, the board is low-power and high-performancet, can easily run Linux or Android system;
- Rich peripheral interfaces, including dual-band WiFi+BT4.2 wireless module, dual Gigabit Ethernet port, USB3.0, USB2.0, HDMI, Mini PCIe, MIPI screen interface and MIPI camera interface and so on, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

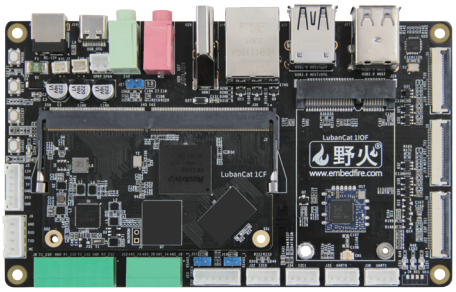




Main hardware parameter

Power interface	Type-C_5V@3A DC input
Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB
Wireless network	802.11ac dual-band wireless network adapter, up to 433Mbps; Bluetooth supports BT4.2 protocol
Ethernet	10/100/1000M adaptive Ethernet port x2
HDMI	HDMI2.0 display interface x1, support only MIPI or HDMI display separately
MIPI-DSI	MIPI DSI x1, support plug in EmbedFire's MIPI screen, support only MIPI or HDMI display separately;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x1,support plug into EmbedFire's MIPI camera
USB2.0	Type-A interface x1 (HOST) Type-C interface x1 (OTG), firmware burning interface, shared with the power interface
USB3.0	Type-A interface x1 (HOST)
40Pin interface	Compatible with Raspberry Pi 40Pin headers, supporting PWM, GPIO, I2C, SPI, UART functions
Debug serial port	Default parameter 1500000-8-N-1
TF card slot	Support TF card boot system, up to 512GB
Audio interface	Headphone output + microphone input 2 in 1 interface
Button	Power button; MaskRom button; Recovery button
Fan interface	Support the installation of fan for heat dissipation

LubanCat 1F



- Using Rockchip RK3566 as the main chip, 22nm process and 1.8GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power, LubanCat 1F is used for light-weight AI applications;
- Support a variety of screen interfaces,support 4K@60fps decoded video output and 1080P coding;
- The board provides commercial core board and base board with a variety of memory and storage configuration options, PCB measuring 137mmX82mm,which is low-power and high-performance, can easily run Linux or Android system;
- Rich peripheral interfaces, including dual-band WiFi+BT4.2 wireless module, Gigabit Ethernet port, HDMI, eDP, Mini PCIe, USB3.0/2.0, MIPI screen interface and two MIPI camera interface, audio socket, LVTTL serial /RS232 / RS485 interface and so on;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

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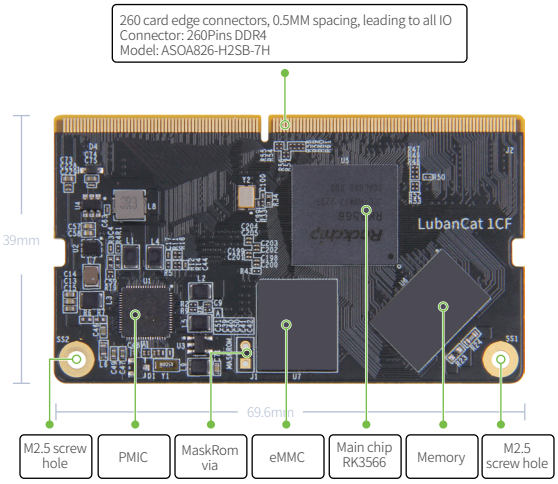


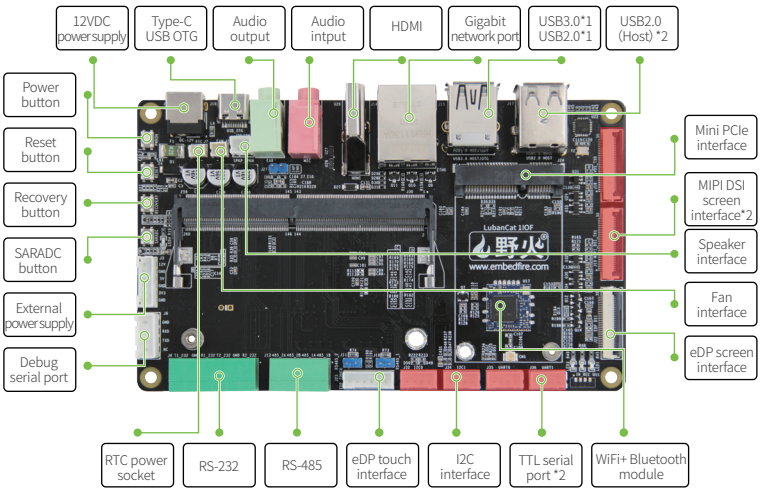
Main hardware parameter

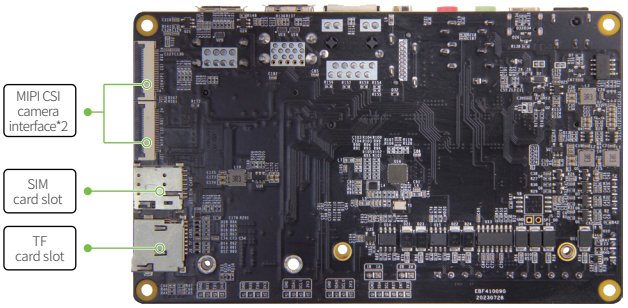
Connector	260Pins DDR4 connector, Model: ASOA826-H2SB-7H
Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
IO	260 card edge connector, 0.5MM spacing, leading to all IO
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB

Single Board Computer

LubanCat series

Embedded solution expert

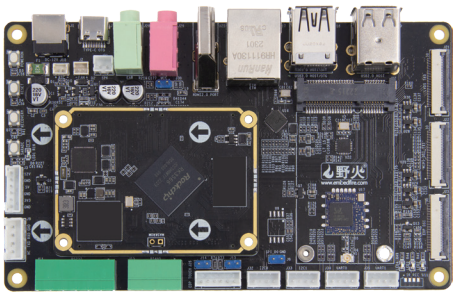




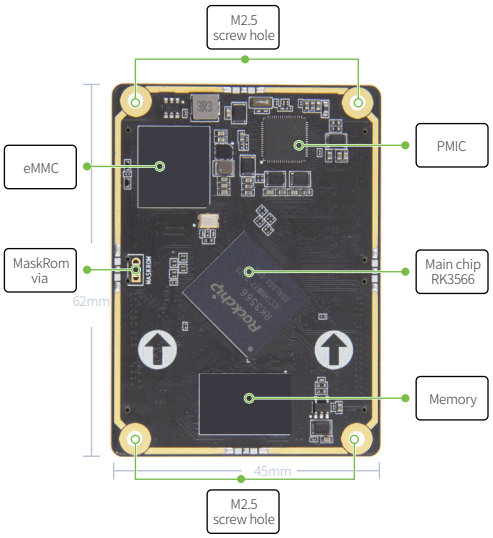
Main hardware parameter

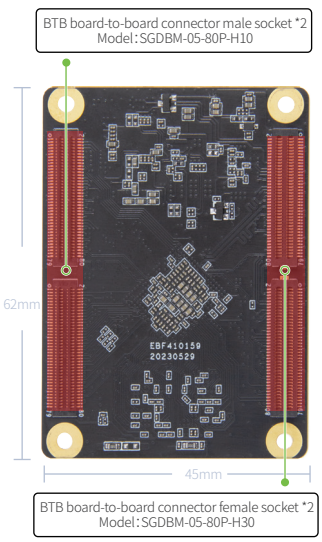
Connector	260Pins DDR4 connector, Model: ASOA826-H2SB-7H
Power interface	12V @ 1A (1A and above) DC input, DC interface
Ethernet	10/100/1000M adaptive Ethernet port
HDMI	HDMI2.0 display interface x1, the maximum resolution is 4096*2160@60fps
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
eDP	eDP1.3 Screen interface x1, eDP touch interface x1
USB2.0	Type-A interface x3 (HOST) Type-C interface x1 (OTG), firmware burning interface
USB3.0	Type-A interface x1 (HOST)
WiFi+ Bluetooth	Onboard WiFi Bluetooth module, Model :RTL8821CU
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WIFI network adapter, 4G module, or other Mini-PCIe interface modules
SIM card slot	The SIM card function requires 4G/5G module to be used
I2C	I2C x2
Serial port	Debug serial port x1 (UART2) ,Default parameter 1500000-8-N-1; LVTTL serial port x2 (UART7&UART9); RS232 x2 (UART3&UART4); RS485 x2 (UART1&UART6)
TF card slot	Support TF card boot system, up to 512GB
Audio interface	Audio output, 3.5mm audio socket x1 (green); Audio input, 3.5mm audio socket x1 (red); SPK speaker interface x1, can be connected to 1W power speaker
Button	Power button;MaskRom button; Recovery button;SARADC button
RTC	RTC power socket x1
Fan interface	Support 5V fan for heat dissipation

LubanCat 1B （Luban Cat 1. BTB）



- Using Rockchip RK3566 as the main chip, 22nm process and 1.8GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power, LubanCat 1B is used for light-weight AI applications;
- Support a variety of screen interfaces,support 4K@60fps decoded video output and 1080P coding;
- The board provides commercial core board and base board with a variety of memory and storage configuration options, PCB measuring 137mmX82mm,which is low-power and high-performance, can easily run Linux or Android system;
- Rich peripheral interfaces, including dual-band WiFi+BT4.2 wireless module, Gigabit Ethernet port, HDMI, eDP, Mini PCIe, USB3.0, USB2.0, MIPI screen interface and two MIPI camera interfaces, audio socket, LVTTL serial /RS232 / RS485 interface and so on;
- The board provides Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Provide a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.





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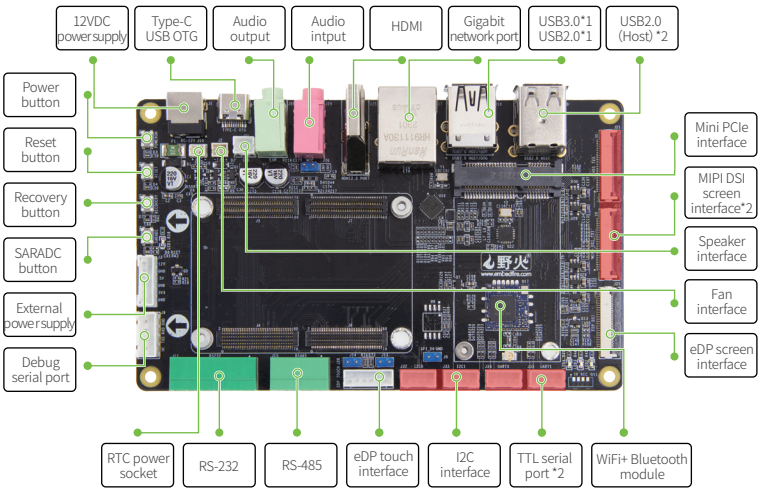
Main hardware parameter

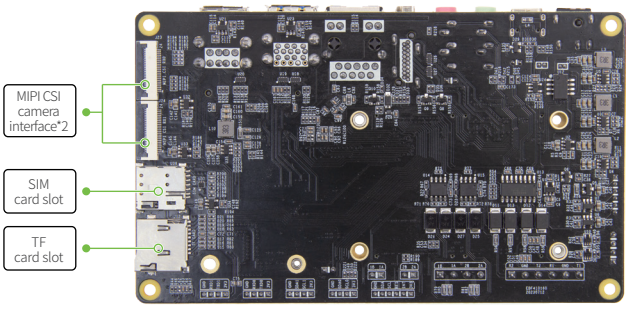
Connector	plug:SGDBM-05-80P-H10, receptacle: SGDBF-05-80P-H30
Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
IO	BTB leads to 320 pins,0.5mm spacing, leading to all IO
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB

Single Board Computer

LubanCat series

Embedded solution expert

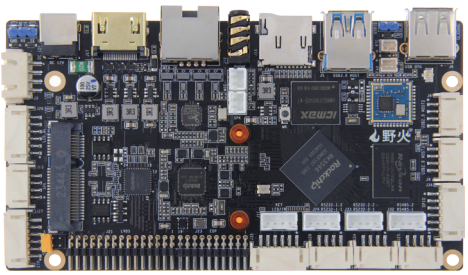




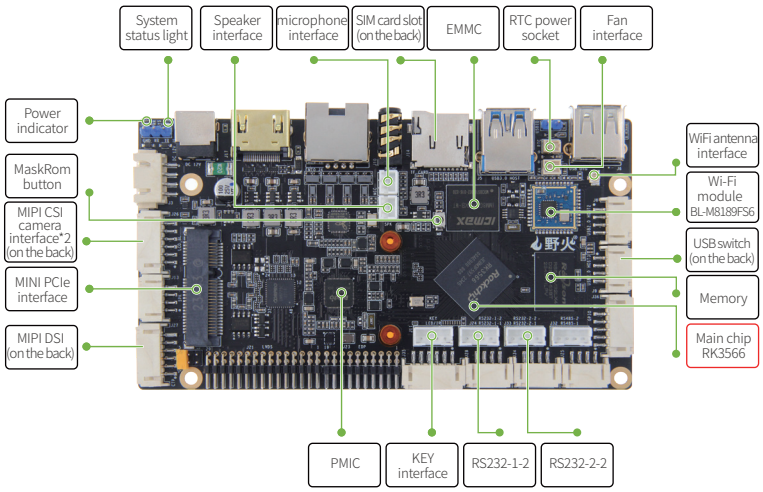
Main hardware parameter

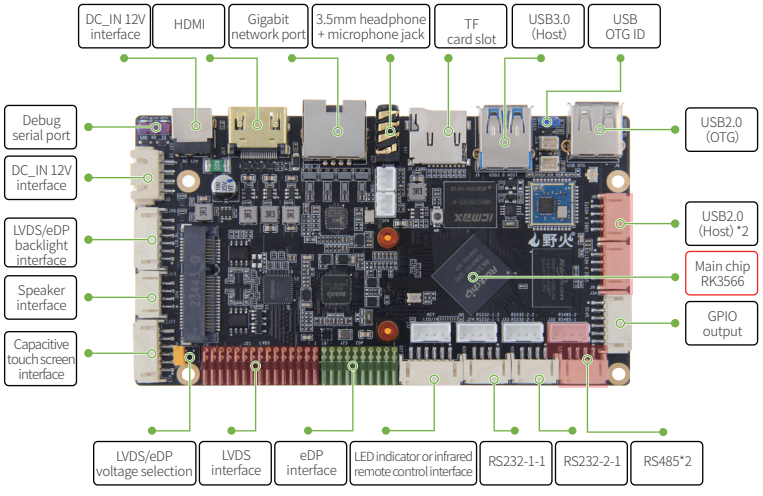
Connector	plug:SGDBM-05-80P-H10, receptacle: SGDBF-05-80P-H30
Power interface	12V@1A (1A and above) DC input, DC interface
Ethernet	10/100/1000M adaptive Ethernet port
HDMI	HDMI2.0 display interface x1, the maximum resolution is 4096*2160@60fps
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
eDP	eDP1.3 Screen interface x1, eDP touch interface x1
USB2.0	Type-A interface x3 (HOST) Type-C interface x1 (OTG), firmware burning interface
USB3.0	Type-A interface x1 (HOST)
WiFi+ Bluetooth	Onboard WiFi Bluetooth module, Model :RTL8821CU
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WIFI network adapter, 4G module, or other Mini-PCIe interface modules
SIM card slot	The SIM card function requires 4G/5G module to be used
I2C	I2C x2
Serial port	Debug serial port x1 (UART2) ,default parameter 1500000-8-N-1; LVTTL serial port x2 (UART7&UART9); RS232 x2 (UART3&UART4); RS485 x2 (UART1&UART6)
TF card slot	Support TF card boot system, up to 512GB
Audio interface	Audio output, 3.5mm audio socket x1 (green); Audio input, 3.5mm audio socket x1 (red); SPK speaker interface x1, can be connected to 1W power speaker
Button	Power button;MaskRom button; Recovery button;SARADC button
RTC	RTC power socket x1
Fan interface	Support 5V fan for heat dissipation

LubanCat 1H



- Using Rockchip RK3566 as the main chip, 22nm process and 1.8GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power, LubanCat 1H is used for light-weight AI applications;
- Support four type of screen interfaces,such as HDMI, LVDS, EDP and MIPI DSI interface , support 4K@60fps decoding video output and 1080P coding; Suitable for HD network player box, advertising machine and all-in-one machine and other equipment;
- Providing a variety of memory configuration options, measuring 126.5mmX70mm, the board is low-power and high-performance, can easily run Linux or Android system;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

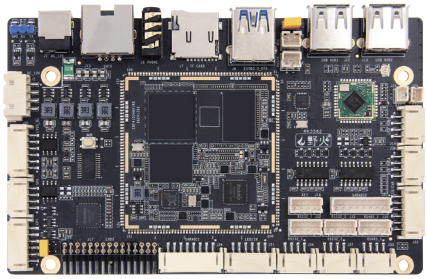




Main hardware parameter

Main chip	RK3566 (quad-core Cortex-A55, 1.8GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB
Power interface	12V@2A DC input
Ethernet	10/100/1000M adaptive Ethernet port
HDMI	HDMI2.0 screen interface x1
MIPI-DSI	MIPI DSI x1, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
eDP	2x10Pin eDP screen interface x1
LVDS	2x15Pin LVDS screen interface x1
LVDS/eDP	Touch screen interface x1; Backlight interface x1 Voltage selection interface x1
USB2.0	USB Host interface x2; USB OTG interface x1, the default mode is Device mode, you can select the mode by jumping cap
USB3.0	Type-A interface x1 (HOST)
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WIFI network adapter, 4G module, or other Mini-PCIe interface modules
WiFi	Onboard WiFi module, model: BL-M8189FS6
SIM card slot	The SIM card function requires 4G/5G module to be used
TF card slot	Support TF card boot system, up to 512GB
Serial port	Debug serial port x1 (UART2) ,Default parameter 1500000-8-N-1; RS232 x4 (UART4&UART5&UART7&UART9); RS485 x2 (UART0&UART3)
Audio interface	3.5mm headphone + microphone jack x1; Mono microphone interface x1; Mono 8Ω/1.3W speaker interface x1; Dual channel 8Ω/10W speaker interface x1
Button	MaskRom button; Key interface x1(reserved reset button, power button, Recovery button interface)
Fan interface	Support 5V fan for heat dissipation

LubanCat 1HS



- Built around the Rockchip RK3562/RK3562J main chip, manufactured with a 22nm process and running at 2.0GHz. The chip integrates a quad-core 64-bit Cortex-A53 processor, a Mali-G52 2EE GPU, and a dedicated NPU.
- Delivering 1 TOPS of AI computing power, the LubanCat 1HS is ideal for lightweight AI applications.
- It supports LVDS, MIPI DSI/RGB display interfaces, 4K@30fps H.265/VP9 decoding, and 1080p@60fps H.264 encoding, making it suitable for HD media players, digital signage, all-in-one terminals, and similar devices.
- The complete board uses a castellated core board plus base board design, offers multiple memory configuration options, and measures just 129.5mm × 79mm. A low-power, high-performance solution, it can smoothly run Linux or Android operating systems.
- It supports official system images including Android, Debian, and Ubuntu, enabling deployment in diverse application scenarios.
- A full SDK, driver package, design schematics, and other development resources are provided to support user operation and secondary development.

OPEN SOURCE CODE

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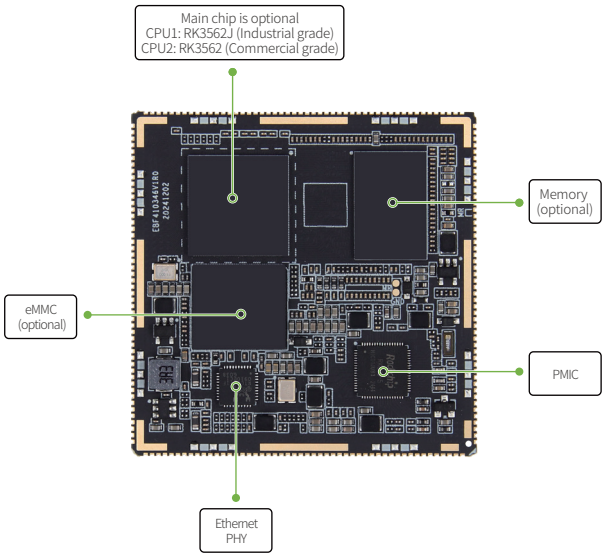


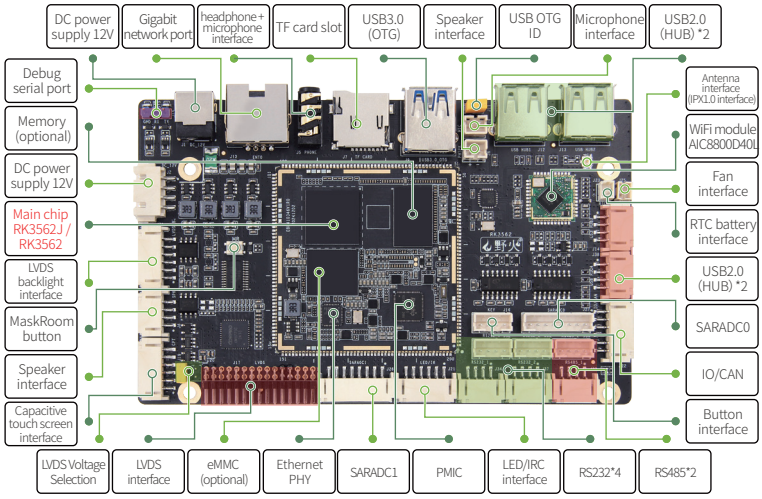
Main hardware parameter

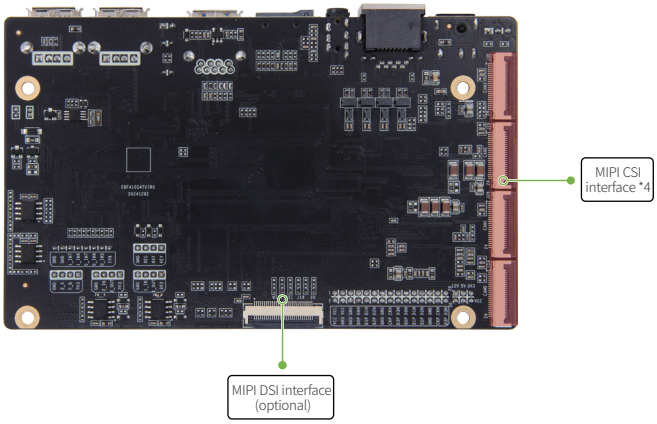
Main chip	Rockchip RK3562/RK3562J - CPU: Quad-core Cortex-A53 up to 2.0 GHz - GPU: Mali-G52 - NPU: 1 TOPS computing power
Memory	1/2/4/8GB LPDDR4/4X (customizable)
Storage	8/32/64/128GB eMMC (customizable)
Interface	Castellated edge design; all I/Os are fully broken out
PCB	8-layer PCB, black solder mask
Size	48.1 mm x 48.1 mm

Single Board Computer

LubanCat series

Embedded solution expert



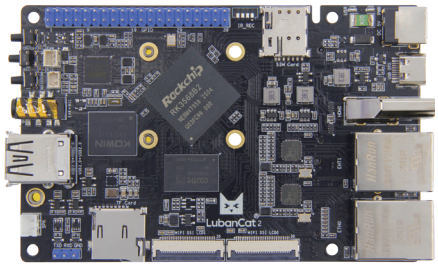


Main hardware parameter

Main chip	Rockchip RK3562/RK3562J - CPU: Quad-core Cortex-A53 up to 2.0 GHz - GPU: Mali-G52 - NPU: 1 TOPS computing power
Memory	1/2/4/8GB LPDDR4/4X (customizable)
Storage	8/32/64/128GB eMMC (customizable)
Power interface	12V@2A DC input
Ethernet	Gigabit Ethernet port x1, support 10/100/1000Mbps data transfer rates
LVDS	2x15Pin LVDS screen interface x1
MIPI-DSI	MIPI screen interface x1, MIPI DSI and LVDS are shared. LVDS is used by default. To use MIPI DSI, resistor configuration must be modified.
MIPI-CSI	24pin FPC camera interface x4, support plug into EmbedFire's MIPI cameras.
Capacitive touch screen	LVDS touch screen interface x1
LCD backlight	LVDS backlight interface x1
Screen power interface	LVDS voltage selection interface x1
USB2.0	USB HUB interface x4
USB3.0	USB OTG interface x1. It is set to Device mode by default and the mode can be selected by jumping hat.
WiFi	Onboard WiFi6 module, Model :AIC8800D40L
TF card holder	Support Micro SD(TF) card boot system, up to 512GB
ADC	ADC acquisition interface x2
Serial port	Debug serial port x1 (UART0) ,default :1500000-8-N-1;RS232 x4(UART2,UART3,UART4,UART7); RS485 x2 (UART8,UART9)
Audio interface	3.5mm Headphone output + microphone input 2 in 1 interface; Mono microphone jack x1; Mono 8Ω/1.3W speaker jack x1; Stereo 8Ω/10W speaker jack x1
Button	MaskRom button x1; KEY interface x1(reserved for Reset, Power , and Recovery)
IRC	Infrared remote control interface x1
RTC	RTC power socket x1
Fan interface	Support 5V fan for heat dissipation
IO interface	6pin headers with 2.54mm pitch, support GPIO and CAN
LED	System LED x1 ; Power LED x1

LubanCat 2

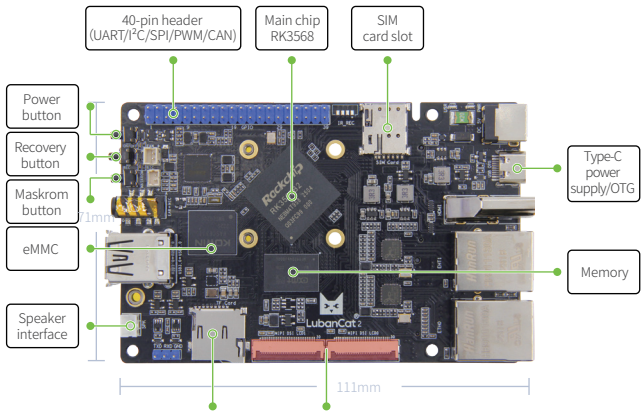
- Using Rockchip RK3568 as the main chip, 22nm process and 2.0GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power,LubanCat 2 is used for light-weight AI applications;
- Support dual screen display, support the highest simultaneous output of 4K@60fps +1080P@60fps image, support HDR, support 4K@60fps decoded video output and 1080P coding;

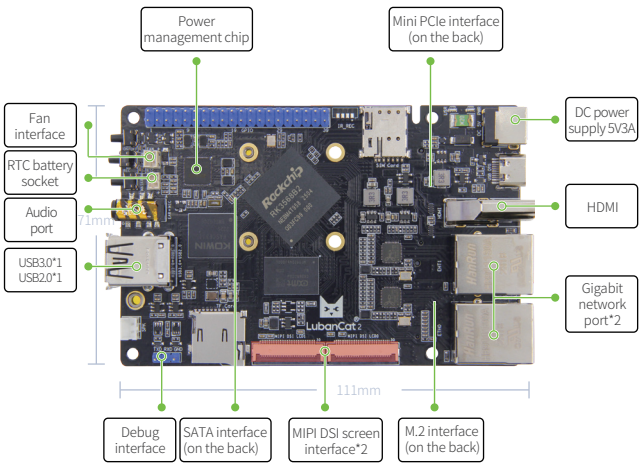


- Providing a variety of memory configuration options, measuring 111mmx71mm, the board is low-power and high-performance, can easily run Linux or Android system;
- A large number of common on-board peripherals, integrated dual Gigabit Ethernet port, HDMI, Mini PCIe, SATA, M.2, USB3.0, USB2.0, MIPI screen interface and MIPI camera interface and other peripherals, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK



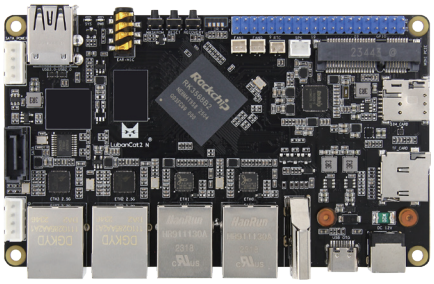


Main hardware parameter

Power interface	5V@3A DC input ,DC/Type-C interface
Main chip	RK3568/RK3568B2 (quad-core Cortex-A55, 2.0GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB
Ethernet	10/100/1000M adaptive Ethernet port x2
HDMI	HDMI2.0 screen interface,support dual-screen different display
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
USB2.0	Type-A interface x1 (HOST); Type-C interface x1 (OTG), firmware burning interface, shared with the power interface
USB3.0	Type-A interface x1 (HOST)
M.2 interface	M.Key model, PCIe 3.0x2Lanes, can plug 2280 NVME SSD
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WiFi network adapter, 4G module, or other Mini-PCIe interface modules
SATA interface	SATA wiring interface, it can be used with a conversion board and supports 5V SATA hard disks
SIM card slot	The SIM card function requires 4G/5G module to be used
40Pin interface	Compatible with Raspberry Pi 40Pin interface, supports PWM, GPIO, I2C, SPI, UART ,CAN functions
Debug serial port	Default parameter 1500000-8-N-1
TF card slot	Support TF card boot system, up to 512GB
Audio interface	Headphone output + microphone input 2 in 1 interface
SPK interface	Can be connected to 1W power speaker
Button	Power button, MaskRom button, Recovery button
RTC battery interface	Support RTC function
Fan interface	Support the installation of fan for heat dissipation

*There is no difference between RK3568 and RK3568B2 in essence, but RK3568 is encapsulated in an aluminum shell, which has better heat dissipation. The main chip package currently used please refer to the physical or pre-sales customer service.

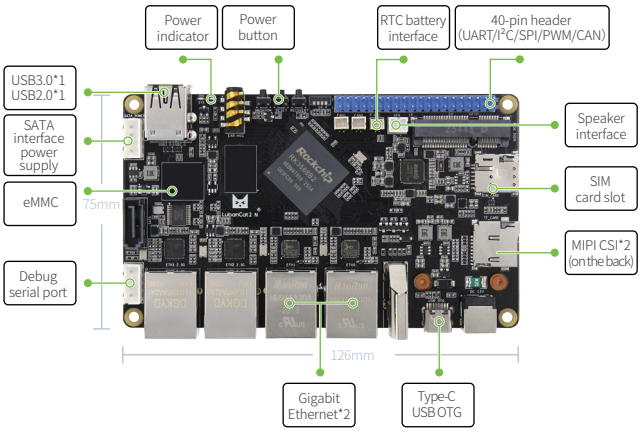
LubanCat 2N

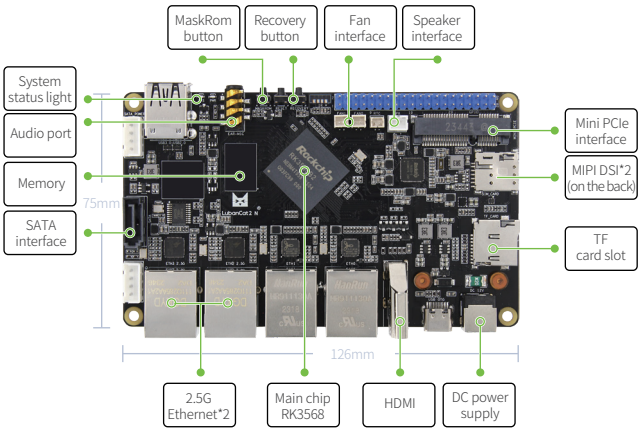


- Using Rockchip RK3568 as the main chip, 22nm process and 2.0GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power,LubanCat 2N is used for light-weight AI applications;
- Support dual screen display, support the highest simultaneous output of 4K@60fps +1080@60fps image, support HDR, support 4K@60fps decoded video output and 1080P coding;
- Providing a variety of memory configuration options, measuring 126 mmx75mm, the board is low-power and high-performance, can easily run Linux or Android system;
- A large number of common on-board peripherals, integrated dual gigabit Ethernet port, dual 2.5G Ethernet port, HDMI, Mini PCIe, SATA, USB3.0, USB2.0, MIPI screen interface and MIPI camera interface and other peripherals, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK



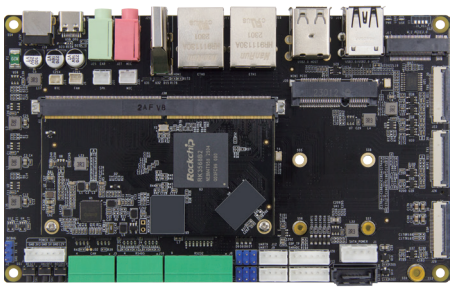


Main hardware parameter

Power interface	12V@2A DC input ,DC interface
Main chip	RK3568/RK3568B2 (quad-core Cortex-A55, 2.0GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB
Ethernet	10/100/1000M adaptive Ethernet port x2
HDMI	HDMI 2.0 screen interface x1, support dual-screen display with MIPI-DSI.
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
USB2.0	Type-A interface x1 (HOST); Type-C interface x1 (OTG), firmware burning interface
USB3.0	Type-A interface x1 (HOST)
PCIe interface	Mini-PCIe interface, can be used with a full-height or half-height WiFi network adapter, 4G module, or other Mini-PCIe interface modules
SATA interface	Standard SATA interface
Hard disk power	Supply interface supports 12V output
SIM card slot	The SIM card function requires 4G/5G module to be used
40Pin interface	Compatible with Raspberry Pi 40Pin headers, supporting PWM, GPIO, I2C, SPI, UART ,CAN functions
Debug serial port	Default parameter 1500000-8-N-1
TF card slot	Support TF card boot system, up to 512GB
Audio interface	Headphone output + microphone input 2 in 1 interface
SPK interface	Can be connected to 1W power speaker
Button	Power button, MaskRom button, Recovery button
RTC battery interface	Support RTC function
Fan interface	Support the installation of fan for heat dissipation

*There is no difference between RK3568 and RK3568B2 in essence, but RK3568 is encapsulated in an aluminum shell, which has better heat dissipation. The main chip package currently used please refer to the physical or pre-sales customer service.

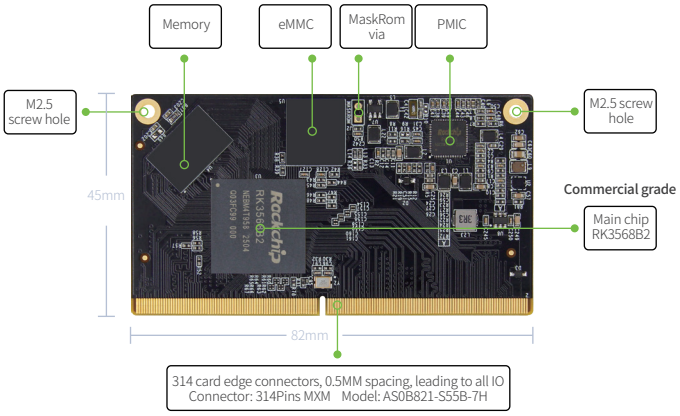
LubanCat 2F /LubanCat 2FI

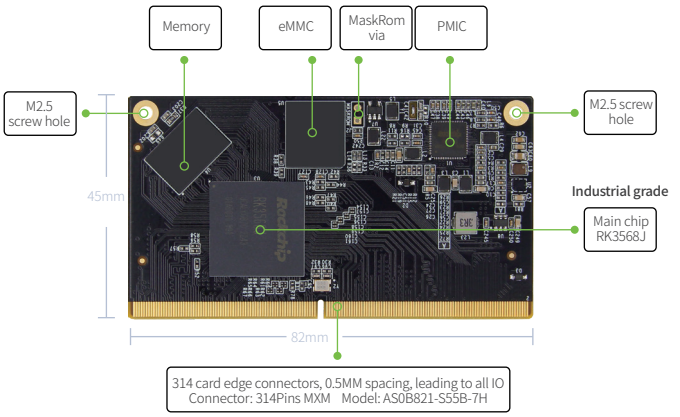


- Using Rockchip RK3568B2/RK3568J as the main chip, 22nm process and 2.0GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS/512MAC computing power, used for light-weight AI applications;
- Support dual screen display, support the highest simultaneous output of 4K@60fps +1080@60fps image, support HDR, support 4K@60fps decoded video output and 1080P coding;
- Providing commercial core board and base board with a variety of memory and storage configuration options, measuring 158mmx95mm, the board is low-power and high-performance, can easily run Linux or Android system;
- Rich peripheral interfaces, including dual Gigabit Ethernet port, M.2, HDMI, Mini PCIe, SATA, USB3.0, USB2.0, eDP, two MIPI screen interfaces, two MIPI camera interfaces, separate LVTTL serial port, RS232, RS485, CAN and so on;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK





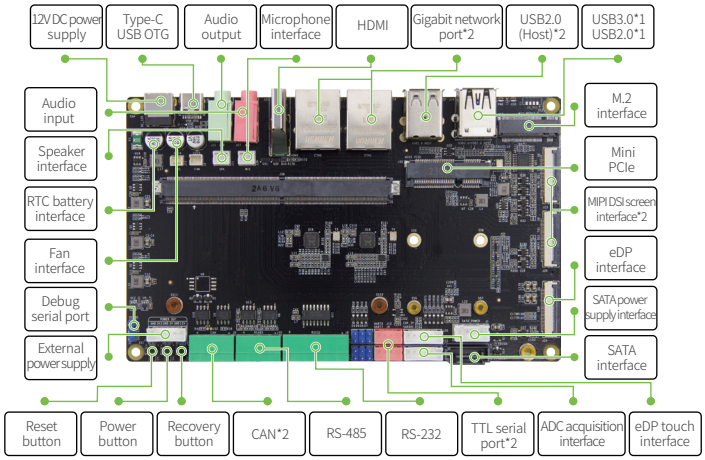
Main hardware parameter

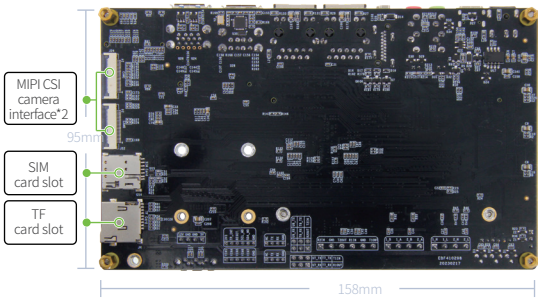
Connector	314Pins MXM connector, Model: AS0B821-S55B-7H
Main chip	RK3568B2/RK3568J (quad-core Cortex-A55,2GHz, Mali-G52)
IO	314 card edge connector, 0.5MM spacing,leading to all IO
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB

Single Board Computer

LubanCat series

Embedded solution expert

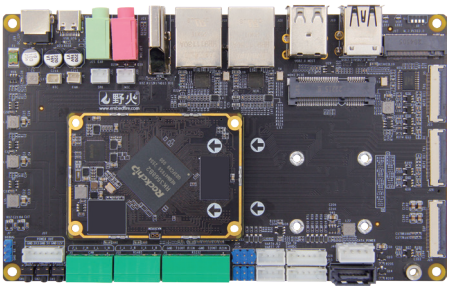




Main hardware parameter

Connector	314Pins MXM connector, Model: AS0B821-S55B-7H
Power interface	12V@1A(1A and above) DC input,DC interface
Ethernet	10/100/1000M adaptive Ethernet port x2
HDMI	HDMI 2.0 screen interface x1, support dual-screen separate display, with the highest resolution of 4096x2160@60fps
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
eDP	eDP1.3 Screen interface x1, eDP touch interface x1，support dual-screen different display
USB2.0	Type-A interface x3 (HOST)；Type-C interface x1 (OTG), firmware burning interface
USB3.0	Type-A interface x1 (HOST)
M.2 interface	M.Key model, PCIe 3.0x2Lanes, can plug 2280 NVME SSD
PCIe interface	Mini-PCIe interface，can be used with a full-height or half-height WIFI network adapter, 4G module, or other Mini-PCIe interface modules
SIM card slot	The SIM card function requires 4G/5G module to be used
SATA interface	Standard SATA interface x1; SATA power supply interface x1,support 12V output
CAN	CAN x2
ADC	ADC acquisition interface x1
Serial port	Debug serial port x1 (UART2) ,Default parameter: 1500000-8-N-1; LVTTL serial port x2 (UART7&UART9); RS232 x2 (UART7&UART9); RS485 x2 (UART3&UART4)
TF card slot	Support TF card boot system, up to 512GB
Audio socket	Audio output, 3.5mm audio socket x1 (green); Audio input, 3.5mm audiosocket x1 (red); MIC microphone interface*1; SPK speaker interface x1, can be connected to 1W power speaker
Button	Power button;Recovery button;Reset button
RTC	RTC power socket x1
Fan interface	Support 5V fan for heat dissipation

LubanCat 2B /LubanCat 2BI



- Rockchip RK3568B2/RK3568J is used as the main chip, 22nm process and 2.0GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS/512MAC computing power, used for light-weight AI applications;
- Support dual screen display, support the highest simultaneous output of 4K@60fps +1080@60fps image, support HDR, support 4K@60fps decoded video output and 1080P coding;
- Providing commercial core board and base board with a variety of memory and storage configuration options, measuring 158mmx95mm, the board is low-power and high-performance, can easily run Linux or Android system;
- Rich peripheral interfaces, including dual Gigabit Ethernet port, M.2, HDMI, Mini PCIe, SATA, USB3.0, USB2.0, eDP, two MIPI screen interfaces, two MIPI camera interfaces, separate LVTTL serial port, RS232, RS485, CAN and so on;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

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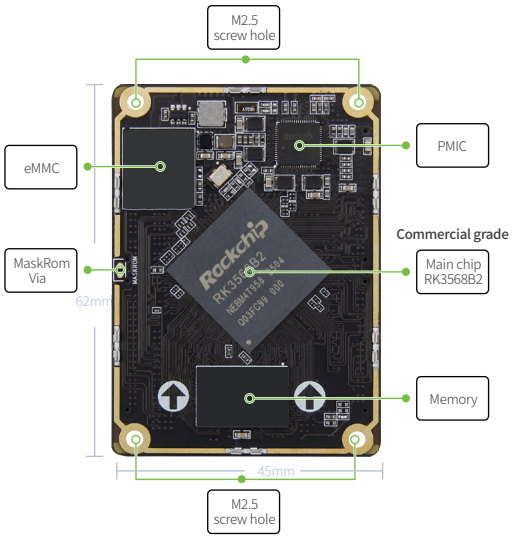
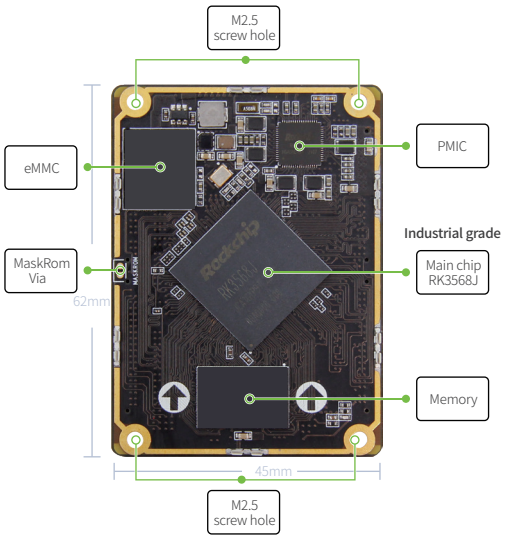




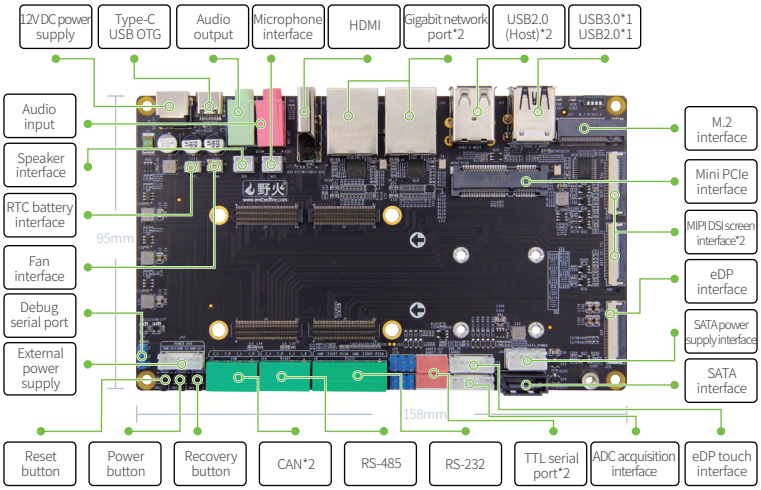
Main hardware parameter

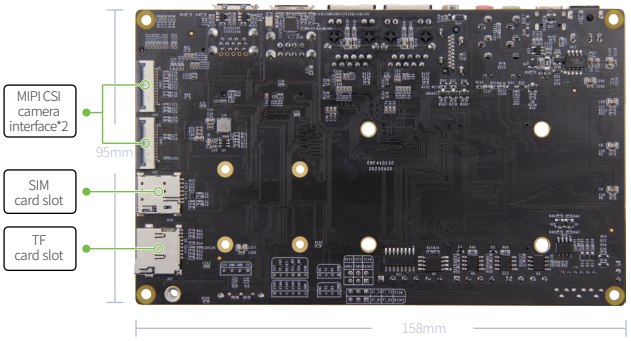
Connector	plug:SGDBM-05-80P-H10, receptacle: SGDBF-05-80P-H30
Main chip	RK3568B2/RK3568J (quad-core Cortex-A55, 2.0GHz, Mali-G52)
IO	BTB leads to 320 pins,0.5mm spacing, leading to all IO
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB

Single Board Computer

LubanCat series

Embedded solution expert

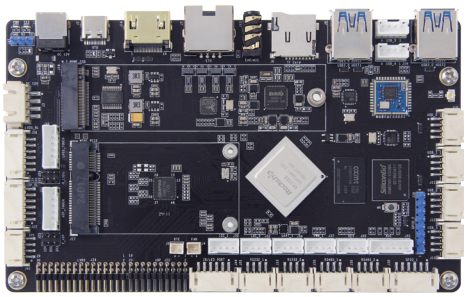




Main hardware parameter

Connector	plug:SGDBM-05-80P-H10, receptacle: SGDBF-05-80P-H30
Power interface	12V@1A(1A and above) DC input, DC interface
Ethernet	10/100/1000M adaptive Ethernet port x2
HDMI	HDMI 2.0 screen interface x1, support dual-screen separate display, with the highest resolution of 4096x2160@60fps
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
eDP	eDP1.3 Screen interface x1, eDP touch interface x1，support dual-screen different display
USB2.0	Type-A interface x3 (HOST); Type-C interface x1 (OTG), firmware burning interface
USB3.0	Type-A interface x1 (HOST)
M.2 interface	M.Key model, PCIe 3.0x2Lanes, can plug 2280 NVME SSD
PCIe interface	Mini-PCIe interface，can be used with a full-height or half-height WIFI network adapter, 4G module, or other Mini-PCIe interface modules
SIM card slot	The SIM card function requires 4G/5G module to be used
SATA interface	Standard SATA interface x1; SATA power supply interface x1,support 12V output
CAN	CAN x2
ADC	ADC acquisition interface x1
Serial port	Debug serial port x1 (UART2) ,Default parameter: 1500000-8-N-1; LVTTL serial port x2 (UART7&UART9); RS232 x2 (UART7&UART9); RS485 x2 (UART3&UART4)
TF card slot	Support TF card boot system, up to 512GB
Audio	Audio output, 3.5mm audio socket x1 (green); Audio input, 3.5mm audio socket x1 (red); MIC microphone interface*1; SPK speaker interface x1, can be connected to 1W power speaker
Button	Power button;Recovery button;Reset button
RTC	RTC power socket x1
Fan interface	Support 5V fan for heat dissipation

LubanCat 2H



- Rockchip RK3568 is used as the main chip, 22nm process and 2.0GHz main frequency, integrated quad-core 64-bit Cortex-A55 processor, Mali G52 2EE graphics processor and independent NPU;
- With 1TOPS computing power,LubanCat 2H is used for light-weight AI applications;
- Support dual screen display, support 4K@60fps decoding video output and 1080P coding; Suitable for HD network player box, advertising machine and all-in-one machine and other equipment;
- Providing a variety of memory and storage configuration options, measuring 150mmx90mm, the board is low-power and high-performance, can easily run Linux or Android system;
- Rich peripheral interfaces, including Gigabit Ethernet port, WIFI, Mini PCIe, M.2, USB3.0/2.0, HDMI/eDP/LVDS/MIPI screen interface and MIPI camera interface, IIC, 485, 232 key and other peripherals;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

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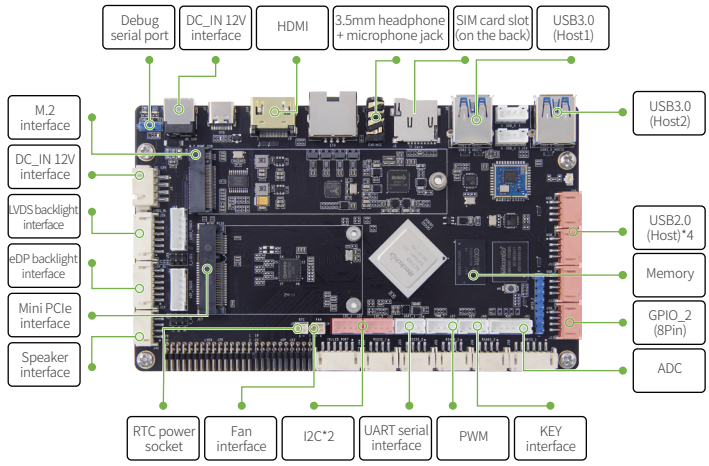
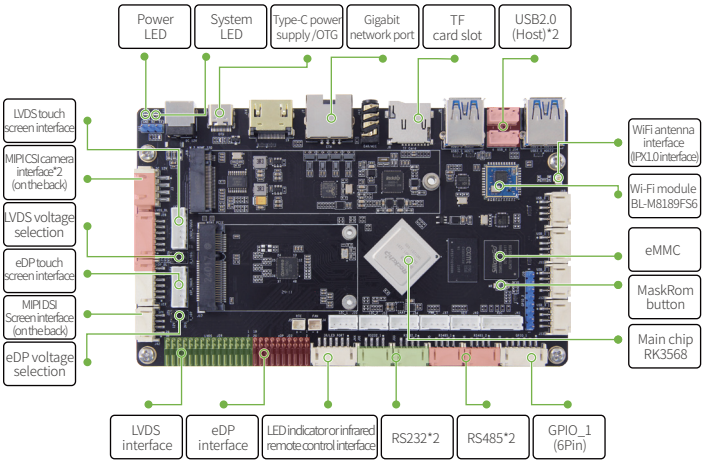
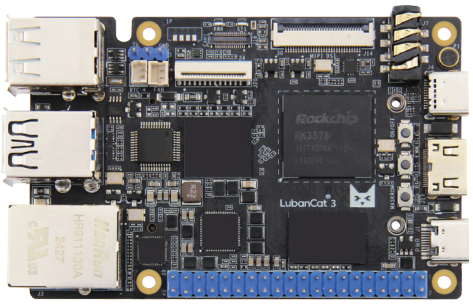




Main hardware parameter

Main chip	RK3568 (quad-core Cortex-A55,2.0GHz, Mali-G52)
Memory	LPDDR4/4x-1/2/4/8GB
Storage	eMMC-8/32/64/128GB
Power interface	12V@2A DC input
Ethernet	10/100/1000M adaptive Ethernet port
HDMI	HDMI2.0 screen interface
MIPI-DSI	MIPI DSI x1, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 1920x1080@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x2,support plug into EmbedFire's MIPI camera
eDP	2x10Pin eDP screen interface x1,the highest resolution is 2560x1600@60Hz
LVDS	2x15Pin LVDS screen interface x1,the highest resolution is 1920x1080@60Hz
Capacitive touch screen	LVDS touch screen interface x1; eDP touch screen interface x1
Screen power interface	LVDS voltage selection interface x1, eDP voltage selection interface x1
USB2.0	USB Host interface x6; USB OTG interface x1, the default mode is Device mode
USB3.0	Type-A interface x2 (HOST)
PCIe interface	Mini-PCIe interface, can be used with a full-height or half-height WIFI network adapter, 4G module, or other Mini-PCIe interface modules
M.2 interface	SSD M.Key type, PCIe3.0x2Lanes, can insert 2280 specification NVME SSD
WiFi	Onboard WiFi module, model: BL-M8189FS6
SIM card slot	The SIM card function requires a 4G module to be used
TF card slot	Support TF card boot system, up to 512GB
Serial port	Debug serial port x1 (UART2) ,default parameter 1500000-8-N-1; TTL Serial port x1 (UART5);RS232 x2 (UART6&UART7); RS485 x2 (UART8&UART9)
I2C	I2C interface x2
PWM	PWM interface x1
Audio interface	3.5mm headphone + microphone jack x1; Dual channel 8Ω/10W speaker interface x1
Infrared receiving	Infrared remote control interface x1
RTC	RTC power socket x1
Fan interface	Support the installation of fan for heat dissipation

LubanCat 3



- Built around the Rockchip RK3576 main chip, manufactured with a 8nm process and running at 2.2GHz. The chip integrates a quad-core 64-bit Cortex-A72 and quad-core 64-bit Cortex-A53 processor, a Mali-G52 MC3 GPU, and an independent triple-core architecture NPU;
- It is equipped with a computing power of up to 6 TOPS, used for various AI applications;
- Support 8K video decoding and 4K display output with extremely powerful image processing capabilities.It supports multiple camera inputs and multi-screen independent display, with a maximum simultaneous output configuration of 4K@120fps + 2K@60fps + 1080p@60fps;
- A variety of memory and storage configurations are optional, and the specific size can also be customized. The board size 85mmx56mm,which is the same as the LubanCat 1 and LubanCat 4.Delivering low power consumption and high performance, it can smoothly run Linux or Android operating systems;
- Rich on-board peripherals are integrated, including Gigabit Ethernet port, RGMII, USB2.0/3.0, Mini PCIe, Mini HDMI, MIPI CSI/DSI interface and other peripherals. 40Pin headers are reserved and compatible with the Raspberry Pi interface;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment.

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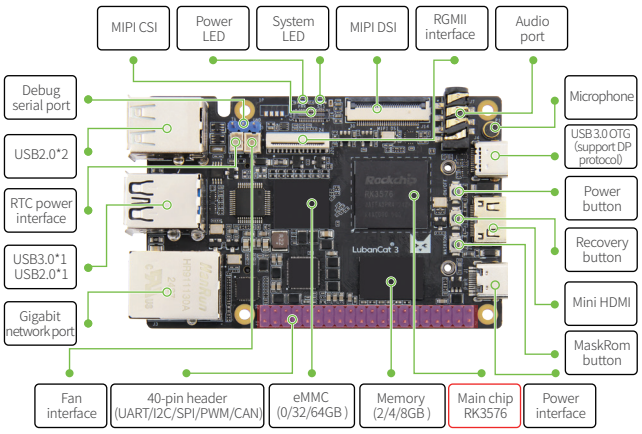
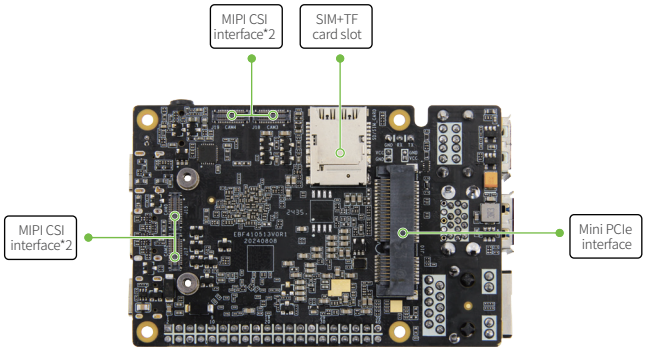
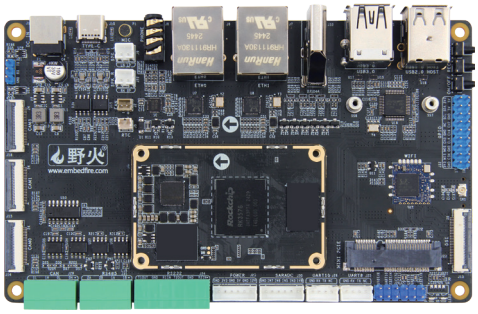




Main hardware parameter

Power interface	5V@4A DC input , Type-C interface (No data transfer capacity)
Main chip	RK3576 (quad-core Cortex-A72+quad-core Cortex-A53, Mali-G52 MC3, 6TOPS)
Memory	2/4/8GB,LPDDR4X(Other memory requirements can be customized)
Storage	0/32/64GB,eMMC(Other storage requirements can be customized)
Ethernet	Gigabit network port x1, support data transmission rates of 10/100/1000 Mbps; RGMII interface x1, support data transmission rates of 10/100/1000 Mbps and compatible with EmbedFire’ s RGMII Gigabit Ethernet module
HDMI	HDMI2.1 screen interface,support dual-screen different display
MIPI-DSI	MIPI screen interface x2,support multi-screen split display with other screens, a maximum resolution of 4K@120 fps.
MIPI-CSI	2x15Pin BTB camera interfaces x5 (front x1, back x4),compatible with EmbedFire's MIPI camera; Single MIPI mode supports up to 2560x1600@60fps. Refer to the specification document for additional parameter modes.
USB2.0	Type-A HOST interface x3
USB3.0	Type-A HOST interface x1; Type-C OTG interface x1, firmware burning interface, support DP protocol, multi-screen display with other screens
PCIe interface	The Mini-PCIe interface supports full-height or half-height WiFi network adapters, 4G/5G and other Mini-PCIe interface modules
SIM+TF card slot	SIM card and Micro SD (TF) card can be inserted at the same time, and TF card can be used to boot the system, up to 512GB, and the SIM card function needs to be used with 4G module
40Pin interface	Compatible with Raspberry Pi 40Pin headers, support PWM, GPIO, I2C, SPI, UART, CAN
Debug serial port	Default parameters :1500000-8-N-1
Audio interface	MIC IN x1,capacitance mic head; Headphone output + microphone input 2 in 1 interface x1
Button	Power button x1 , MaskRom button x1 , Recovery button x1
LED	System LED x1 , Power LED x1
RTC	RTC battery interface x1
Fan interface	Support the installation of 5V fan for heat dissipation

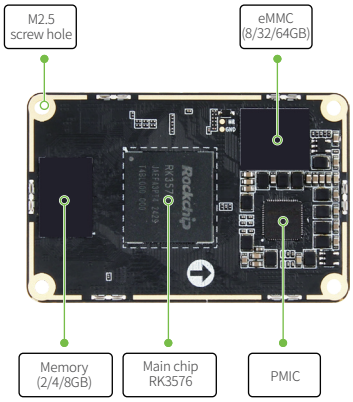
LubanCat 3.BTB

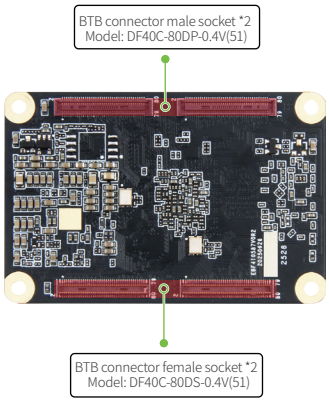


- Built around the Rockchip RK3576 main chip, manufactured with 8nm process and running at 2.2GHz. The chip integrates a quad-core 64-bit Cortex-A72 and quad-core 64-bit Cortex-A53 processor, a Mali-G52 MC3 GPU, and an independent triple-core architecture NPU;
- It is equipped with a computing power of up to 6 TOPS, used for various AI applications;
- Support 8K video decoding and 4K display output with extremely powerful image processing capabilities.It supports 5-channel camera inputs and multi-screen independent display, with a maximum simultaneous output configuration of 4K@120fps + 2K@60fps + 1080p@60fps;
- A variety of memory and storage configurations are optional, and the size is 150mmx90mm.Delivering low power consumption and high performance, it can smoothly run Linux or Android operating systems.
- Rich on-board peripherals are integrated, including Dual-Gigabit Ethernet port, dual-band WIFI+Bluetooth,USB2.0/3.0,Mini PCIe,HDMI,MIPI CSI/DSI interface,Audio interface,TF card slot ,as well as RS232, RS485 and CAN interfaces are broken out.
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK





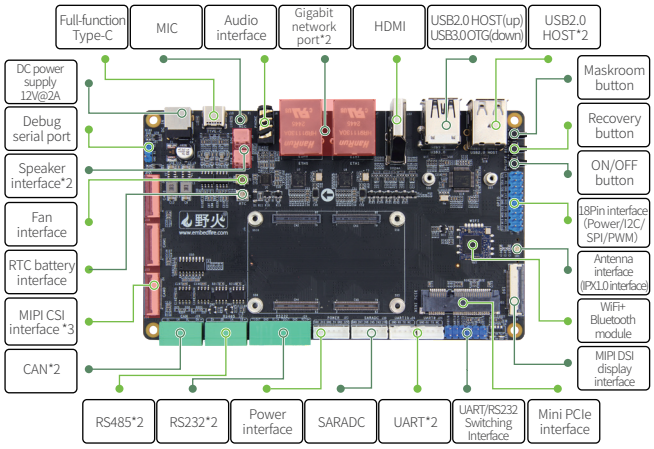
Main hardware parameter of the core board

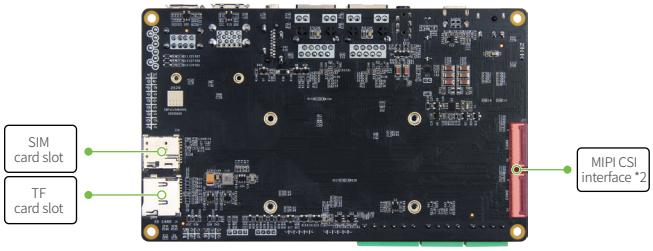
Connector	plug:DF40C-80DP-0.4V(51), receptacle: DF40C-80DS-0.4V(51)
Main chip	RK3576 (quad-core Cortex-A72+quad-core Cortex-A53, Mali-G52,6TOPS)
IO	BTB leads to 320 pins,0.5mm spacing
Memory	2/4/8GB,LPDDR4x (Other memory requirements can be customized)
Storage	8/32/64GB,eMMC (Other storage requirements can be customized)

Single Board Computer

LubanCat series

Embedded solution expert

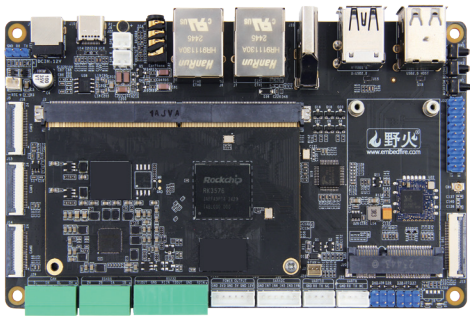




Main hardware parameter of the base board

Connector	plug:DF40C-80DP-0.4V(51), receptacle:DF40C-80DS-0.4V(51)
Power interface	12V@2A DC input; 3.3V/5V/12V Power interface x1
Ethernet	Gigabit network port x2, support data transmission rates of 10/100/1000 Mbps;
WiFi+ Bluetooth	Onboard support for 2.4G/5.8G dual-band WiFi5 + BLE4.2. Model: TL8821CUB
HDMI	HDMI2.1 screen interface,support multi-screen split display with other screens, with the highest resolution of 4K@120 Hz.
MIPI-DSI	MIPI screen interface x1,support plug into Embedfire's MIPI screen, multi-screen split display with other screens; Single MIPI mode supports 2560x1600@60Hz. Refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x5 (front x3, back x2),support plug into Embedfire's MIPI camera;
USB2.0	Type-A interface x3 (HOST)
USB3.0	Type-A interface x1 (OTG); Type-C interface x1 (OTG), firmware burning interface, support DP1.4 protocol
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WiFi network adapter, 4G/5G module, or other Mini-PCIe interface modules
TF card slot	Micro SD (TF) card slot x1, and TF card can be used to boot the system, up to 512GB
SIM card slot	SIM card slot x1, the SIM card function needs to be used with 4G or 5G module
ADC	ADC acquisition interface x1,the collection range is from 0 to 1.8 v.
CAN	CAN x2
Serial port	Debug serial port x1 (UART0) ,default parameter: 1500000-8-N-1; UART x2 (UART8&UART10) RS232 x2 (UART8&UART10); RS485 x2 (UART3&UART5)
IO interface	18Pin headers, support Power, I2C, SPI, PWM; UART/RS232 switching interface x1
Audio interface	Built-in MIC microphone x1; Headphone + microphone 2 in 1 interface; SPK interface x2,can be connected to 3W power speaker
Button	Power button x1 , MaskRom button x1 , Recovery button x1
LED	System LED x1 , Power LED x1
RTC	RTC battery interface x1
Fan interface	Support 5V fan for heat dissipation

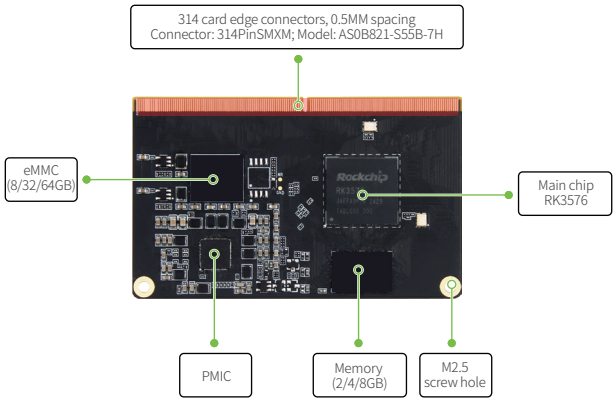
LubanCat 3F



- Built around the Rockchip RK3576 main chip, manufactured with 8nm process and running at 2.2GHz. The chip integrates a quad-core 64-bit Cortex-A72 and quad-core 64-bit Cortex-A53 processor, a Mali-G52 MC3 GPU, and an independent triple-core architecture NPU;
- It is equipped with a computing power of up to 6 TOPS, used for various AI applications;
- Support 8K video decoding and 4K display output with extremely powerful image processing capabilities.It supports 5-channel camera inputs and multi-screen independent display, with a maximum simultaneous output configuration of 4K@120fps + 2K@60fps + 1080p@60fps.;
- A variety of memory and storage configurations are optional, and the size is 150mm x 90mm.Delivering low power consumption and high performance, it can smoothly run Linux or Android operating systems.
- Rich on-board peripherals are integrated, including Dual-Gigabit Ethernet port, dual-band WIFI+Bluetooth, USB2.0/3.0, Mini PCIe, HDMI, MIPI CSI/DSI interface,Audio interface, TF card slot , as well as separate RS232, RS485 and CAN interfaces are broken out.
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK



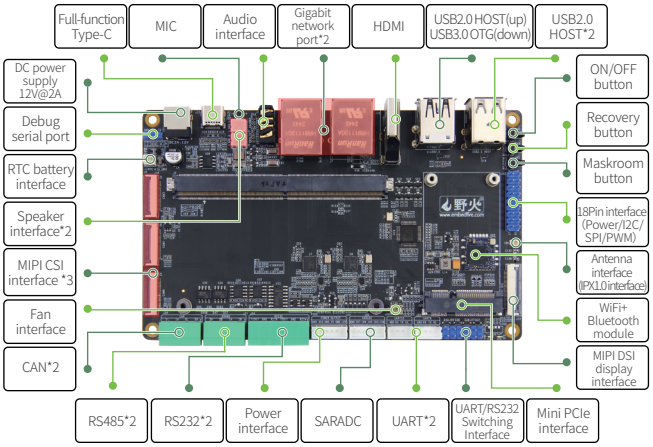
Main hardware parameter of the core board

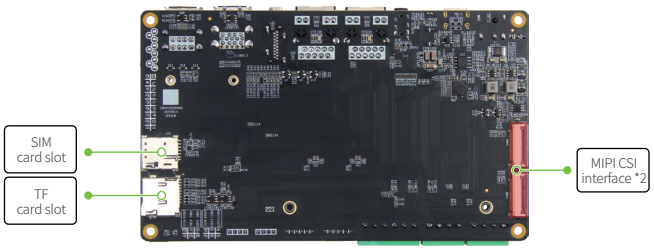
Connector	314Pins MXM connector, Model: AS0B821-S55B-7H
Main chip	RK3576 (quad-core Cortex-A72+quad-core Cortex-A53, Mali-G52,6TOPS)
IO	314 card edge connector, 0.5mm pitch
Memory	2/4/8GB,LPDDR4x (Other memory requirements can be customized)
Storage	8/32/64GB,eMMC (Other storage requirements can be customized)

Single Board Computer

LubanCat series

Embedded solution expert

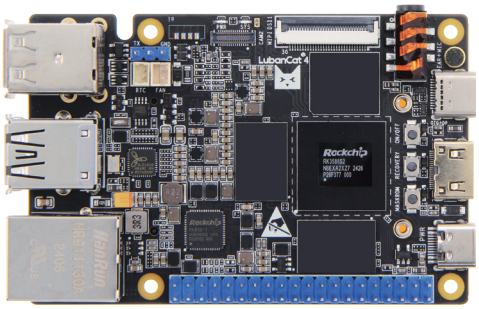




Main hardware parameter of the base board

Connector	314Pins MXM connector, Model: AS0B821-S55B-7H
Power interface	12V@2A DC input; 3.3V/5V/12V Power interface x1
Ethernet	Gigabit network port x2, supporting data transmission rates of 10/100/1000 Mbps;
WiFi+ Bluetooth	Onboard support for 2.4G/5.8G dual-band WiFi5 + BLE4.2, Model: TL8821CUB
HDMI	HDMI2.1 screen interface x1,support multi-screen split display with other screens, with the highest resolution of 4K@120 Hz.
MIPI-DSI	MIPI screen interface x1,support plug into Embedfire's MIPI screen, multi-screen split display with other screens; Single MIPI mode supports 2560x1600@60Hz. Refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x5 (front x3, back x2),support plug into Embedfire's MIPI camera;
USB2.0	Type-A interface x3 (HOST)
USB3.0	Type-A interface x1 (OTG); Type-C interface x1 (OTG), firmware burning interface, support DP1.4 protocol
PCIe interface	The Mini-PCIe interface can be used with full-height or half-height WiFi network adapter, 4G/5G module, or other Mini-PCIe interface modules
TF card slot	Micro SD (TF) card slot x1, and TF card can be used to boot the system, up to 512GB
SIM card slot	SIM card slot x1, the function needs to be used with 4G/5G module
ADC	ADC acquisition interface x1,the collection range is from 0V to 1.8V
CAN	CAN x2
Serial port	Debug serial port x1 (UART0) ,Default parameter:1500000-8-N-1; UART x2 (UART8&UART10) RS232 x2 (UART8&UART10); RS485 x2 (UART3&UART5)
IO interface	18Pin interface, support Power, I2C, SPI, PWM;UART/RS232 Switching Interface x1
Audio interface	Built-in MIC microphone x1; Headphone + microphone 2 in 1 interface; SPK interface x2,can be connected to 3W power speaker
Button	Power button x1 , MaskRom button x1 , Recovery button x1
LED	System LED x1 , Power LED x1
RTC	RTC battery interface x1
Fan interface	Support 5V fan for heat dissipation

LubanCat 4



- Using Rockchip RK3588S2 as the main chip, 8nm process technology, 8-core 64-bit core architecture, integrated quad-core 64-bit Cortex-A76(2.4GHz) and quad-core 64-bit Cortex-A55(1.8GHz) processor, Mali-G610 MC4 graphics processor and standalone three-core architecture NPU;
- With 6TOPS computing power, used for various AI applications;
- Support multi-screen display, support the highest simultaneous output 8K@60 fps +4K@60 fps +2K@60 fps (three screens display) or 4K@60 fps +4K@60 fps +4K@60 fps +2K@60 fps (four screens display);
- Support 8K@60 fps H.265/H.264/AV1/VP9/AVS2 video decoding and 8K@30 fps H.264/H.265 video encoding;
- A variety of memory and storage configurations are optional, and the specific size can also be customized. The board size is 85mmx56mm,which is the same as the LubanCat 1 and LubanCat 3.Delivering low power consumption and high performance, it can smoothly run Linux or Android operating systems;
- A large number of common on-board peripherals, integrated Gigabit Ethernet port, USB3.0, USB2.0, Mini PCIe, Mini HDMI, MIPI screen interface and MIPI camera interface and other peripherals, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

OPEN SOURCE CODE

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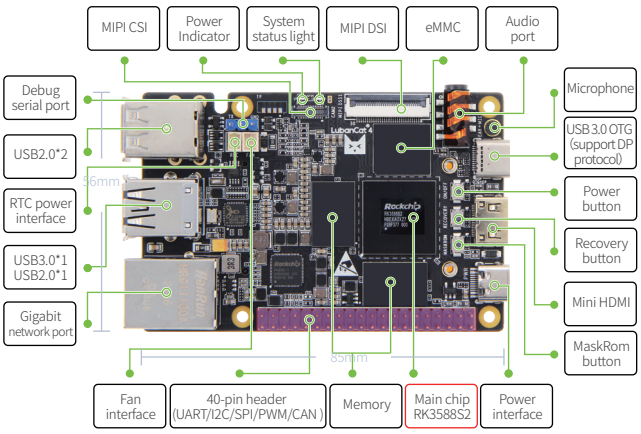
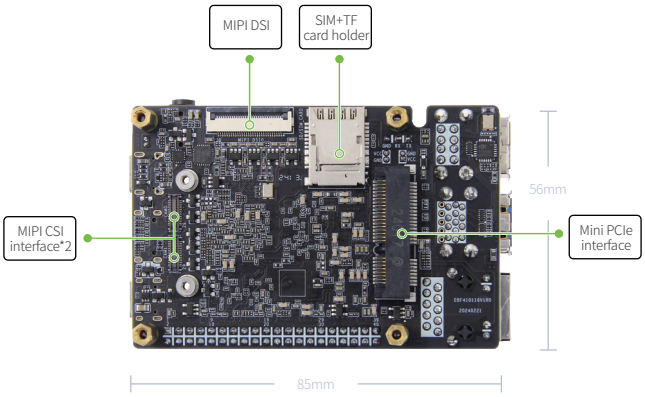
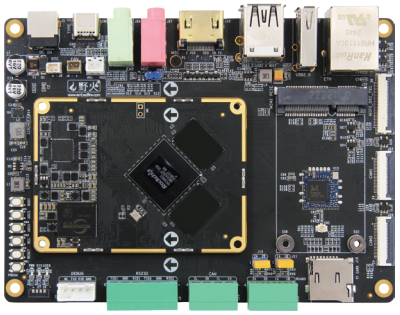




Main hardware parameter

Power interface	5V@4A DC input , Type-C interface (No data transfer capacity)
Main chip	RK3588S2 (quad-core Cortex-A76+quad-core Cortex-A55, Mali-G610, 6TOPS) Note: RK3588S2 is an upgraded version of RK3588S
Memory	LPDDR4x-4/8/16GB(Other memory requirements can be customized)
Storage	eMMC-0/32/64/128GB(Other storage requirements can be customized)
Ethernet	10/100/1000M adaptive Ethernet port
HDMI	Mini-HDMI 2.1 display interface, support multi-screen split display with other screens
MIPI-DSI	MIPI DSI x2, support plug in EmbedFire's MIPI screen;Single MIPI mode supports up to 3840x2160@60fps, refer to the specification document for additional parameter modes.
MIPI-CSI	2x15Pin BTB camera interface x3 (front x1, back x2), support plug into EmbedFire's MIPI camera
USB2.0	Type-A interface x3 (HOST)
USB3.0	Type-A interface x1 (HOST); Type-C interface x1 (OTG), firmware burning interface, support DP protocol, can be different from other screen multi-screen
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WiFi network adapter, 4G module, or other Mini-PCIe interface modules
SIM+TF card slot	SIM card and Micro SD (TF) card can be inserted at the same time, and TF card can be used to boot the system, up to 512GB, and the SIM card function needs to be used with 4G module
40Pin interface	Compatible with Raspberry Pi 40Pin headers, supporting PWM, GPIO, I2C, SPI, UART, CAN functions
Debug serial port	Default parameter 1500000-8-N-1
Audio interface	Capacitance mic head; Headphone output + microphone input 2 in 1 interface
Button	Power button, MaskRom button, Recovery button
RTC battery interface	Support RTC function
Fan interface	Support the installation of 5V fan for heat dissipation

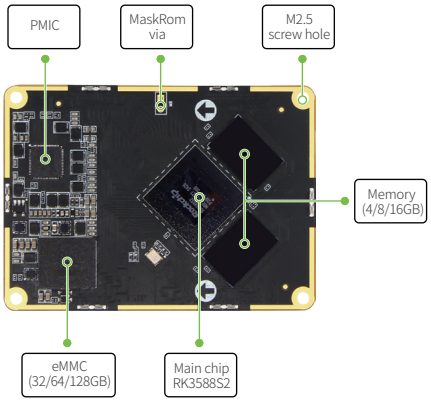
LubanCat 4.BTB

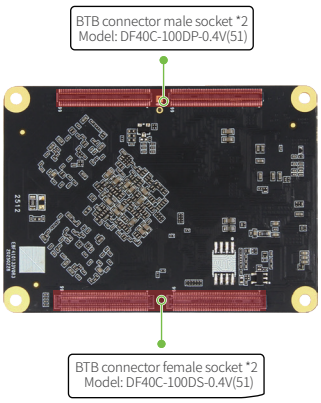


- Using Rockchip RK3588S2 as the main chip, 8nm process technology, 8-core 64-bit core architecture, integrated quad-core 64-bit Cortex-A76(2.4GHz) and quad-core 64-bit Cortex-A55(1.8GHz) processor, Mali-G610 MC4 graphics processor ;
- It is equipped with an independent NPU with a computing power of up to 6 TOPS, used for various AI applications;
- Support multi-screen display, support the highest simultaneous output 8K@60fps+4K@60fps+2K@60fps (three screens display) or 4K@60fps+4K@60fps +4K@60fps+2K@60fps(four screens display);support 8K@60fps H.265/H.264/AV1/VP9/AVS2 video decoding and 8K@30fps H.264/H.265 video encoding;
- A variety of memory and storage configurations are optional, and the board size is 133mm x 96mm.It is low-power and high-performance, can smoothly run Linux or Android systems.
- Rich on-board peripherals are integrated, including Gigabit Ethernet port, USB3.0, USB2.0, Mini PCIe, Mini HDMI, MIPI screen interface and MIPI camera interface and Audio interface, TF card slot, ect.40Pin headers are reserved and compatible with the Raspberry Pi interface;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment;

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK





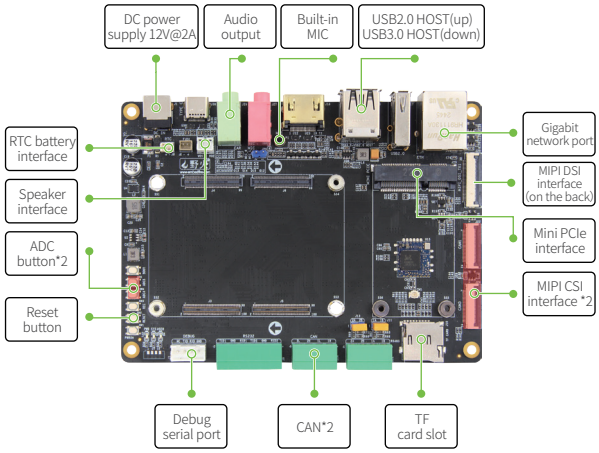
Main hardware parameter of the core board

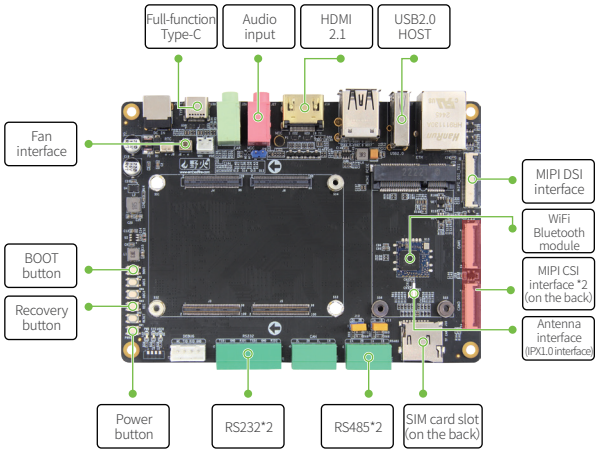
Connector	plug:DF40C-100DP-0.4V(51), receptacle: DF40C-100DS-0.4V(51)
Main chip	RK3588S2 (quad-core Cortex-A76+quad-core Cortex-A55, Mali-G610,6TOPS)
IO	BTB leads to 400 pins,0.5mm pitch
Memory	4/8/16GB,LPDDR4x
Storage	32/64/128GB,eMMC

Single Board Computer

LubanCat series

Embedded solution expert

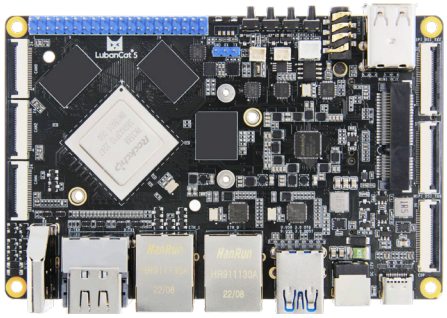




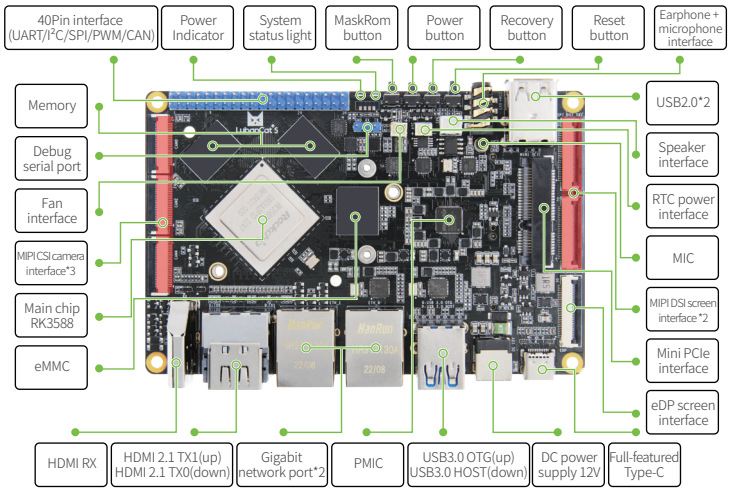
Main hardware parameter of the base board

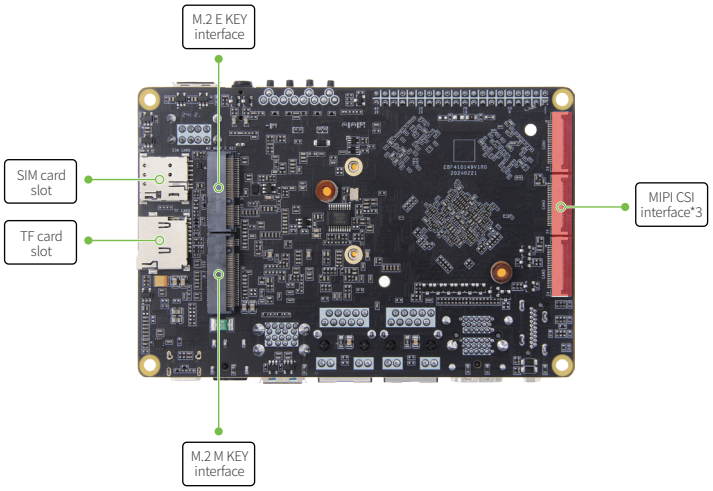
Connector	plug:DF40C-100DP-0.4V(51), receptacle: DF40C-100DS-0.4V(51)
Power interface	12V@2A DC input
Ethernet	Gigabit Ethernet port x1, support data transmission rates of 10/100/1000 Mbps;
WiFi+ Bluetooth	Onboard support for 2.4G/5.8G dual-band WiFi5 + BLE4.2. Model: TL8821CUB
HDMI	HDMI2.1 screen interface x1,support multi-screen split display with other screens, with the highest resolution of 7680x4320@60 fps.
MIPI-DSI	MIPI screen interface x2,support plug into EmbedFire's MIPI screen, multi-screen split display with other screens; Single MIPI mode supports 3840x2160@60fps. Refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x4 (front x2, back x2),support plug into EmbedFire's MIPI camera;
USB2.0	Type-A interface x2 (HOST)
USB3.0	Type-A interface x1 (HOST); Type-C interface x1 (OTG), used for firmware burning, support DP1.4 protocol
PCIe interface	The Mini-PCIe interface can be used with a full-height or half-height WiFi network adapter, 4G/5G module, or other Mini-PCIe interface modules
TF card slot	Micro SD (TF) card slot x1, and TF card can be used to boot the system, up to 512GB
SIM card slot	SIM card slot x1, the function needs to be used with 4G or 5G module
CAN	CAN x2
Serial port	Debug serial port x1 (UART2) ,default parameter:1500000-8-N-1; RS232 x2 (UART0&UART9); RS485 x2 (UART4&UART7)
Audio interface	Audio output, 3.5mm audio socket x1 (green); Audio input, 3.5mm audio socket x1 (red); SPK interface x1, can be connected to 3W power speaker; Built-in MIC x1
Button	Power button x1 , Reset button x1 , Recovery button x1, ADC button x1 , Boot button x1
LED	System LED x1 , Power LED x1, User LED x1
RTC	RTC battery interface x1
Fan interface	Support 5V fan for heat dissipation

LubanCat 5



- Rockchip RK3588 is used as the main chip, 8nm process technology, 8-core 64-bit core architecture, integrated quad-core 64-bit Cortex-A76(2.4GHz) and quad-core 64-bit Cortex-A55(1.8GHz) processor, Mali-G610 MC4 graphics processor and independent three-core architecture NPU;
- With 6TOPS computing power, used for various AI applications;
- Support multi-screen display, support the highest simultaneous output 8K@60 fps +4K@60 fps +2K@60 fps(three screens display) or 4K@60 fps +4K@60 fps+4K@60 fps +2K@60 fps (four screens display);
- Support 8K@60 fps H.265/H.264/AV1/VP9/AVS2 video decoding and 8K@30 fps H.264/H.265 video encoding;
- A variety of memory and storage configurations are optional, measuring 125mm*80mm, the board is low-power and high-performance, can easily run Linux or Android systems.
- A large number of common on-board peripherals, integrated dual gigabit Ethernet port, USB3.0, USB2.0, Mini PCIe, HDMI, MIPI CSI, MIPI DSI, M.2 interface, audio interface, TF card and other peripheral equipment, compared with Luban Cat 4, the interface is more abundant, reserved 40Pin headers unused, compatible with Raspberry PI interface;
- Providing Android , Debian, Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

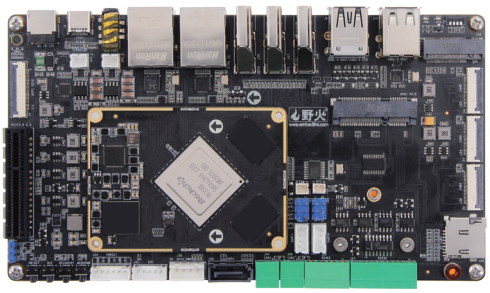




Main hardware parameter

Power interface	12V@2A DC input , DC interface
Main chip	RK3588 (quad-core Cortex-A76+quad-core Cortex-A55, Mali-G610, 6TOPS)
Memory	LPDDR4x-4/8/16GB(Other memory requirements can be customized)
Storage	eMMC-0/32/64/128GB(Other storage requirements can be customized)
Ethernet	Gigabit network port x2, support 10/100/1000Mbps data transfer rate
HDMI	HDMI 2.0 input x1, up to 3840x2160@60Hz; HDMI 2.1 output x2, support multi-screen different display with other screens, the highest resolution is 7680x4320@60Hz
eDP	eDP screen interface x1,support multi-screen different display, the highest resolution is 3840x2160@60Hz
MIPI-DSI	MIPI screen interface x2,support plug into Embedfire's MIPI screen,support multi-screen different display,the highest resolution in single MIPI mode is 3840x2160@60Hz
MIPI-CSI	24Pin FPC MIPI camera interface x6 (front x3, back x3),support plug into Embedfire's MIPI camera
USB2.0	Type-A interface x1 (HOST);Type-A interface x1(OTG)
USB3.0	Type-A interface x1 (HOST); Type-A interface x1(OTG) Type-C interface x1 (OTG), firmware burning interface, support DP1.4 protocol
PCIe interface	Mini-PCIe interface, can be used with a full-height or half-height WiFi network adapter, 4G module, or other Mini-PCIe interface modules
M.2 interface	M.2 E KEY interface x1, wireless network adapter module supporting M.2 E-Key; M. 2 M KEY interface x1, support M.2M-key PCIe3.0*4Lanes 2280 hard disk specification
SIM card	SIM card slot x1, SIM card function needs to be used with 4G module;
TF card	Micro SD (TF) card slot x1, support TF card boot the system, up to 512GB
40Pin interface	Compatible with Raspberry Pi 40Pin interface, supports PWM, GPIO, I2C, SPI, UART ,CAN functions
Audio interface	Onboard Mic IN x1; SPK interface x1,can be connected to 3W power speaker; Headphone output + microphone input 2 in 1 interface
Fan interface	Support the installation of 5V or 12V fan for heat dissipation

LubanCat 5.BTB



- Rockchip RK3588 is used as the main chip, 8nm process technology, 8-core 64-bit core architecture, integrated quad-core 64-bit Cortex-A76(2.4GHz) and quad-core 64-bit Cortex-A55(1.8GHz) processor, Mali-G610 MC4 graphics processor and independent three-core architecture NPU;
- With 6TOPS computing power, used for various AI applications;
- Support 6-channel camera input, support multi-screen display, support the highest simultaneous output 8K@60fps +4K@60fps +2K@60fps (three screens display) or 4K@60fps +4K@60fps +4K@60fps +2K@60fps (four screens display);
- Support 8K@60fps H.265/H.264/AV1/VP9/AVS2 video decoding and 8K@30fps H.264/H.265 video encoding;
- The board card adopts a core board and base plate design, and a variety of memory and storage configurations are optional,measuring 173mmx96mm,it is low-power and high-performance, can smoothly run Linux or Android systems.
- Rich on-board peripherals are integrated, including Dual-Gigabit Ethernet port, USB3.0/2.0, Mini PCIe, HDMI, MIPI CSI/DSI, M.2 interface, audio interface, TF card,as well as LVTTL serial, RS232, RS485,CAN and ADC acquisition interfaces are provided;
- Providing Android, Debian, Ubuntu operating system image, can be applied to a variety of different application environment.

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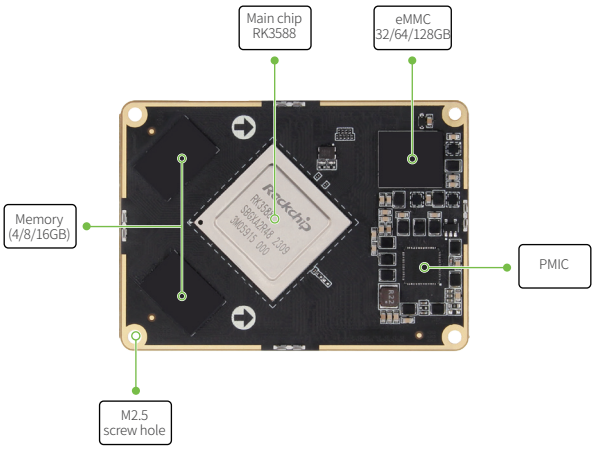

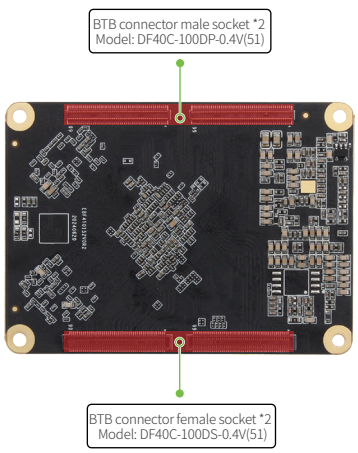

Main hardware parameter of the core board

Connector	plug:DF40C-100DP-0.4V(51), receptacle:DF40C-100DS-0.4V(51)
Main chip	RK3588 (quad-core Cortex-A76+quad-core Cortex-A55, Mali-G610,6TOPS)
IO	BTB leads to 400 pins,0.5mm pitch
Memory	4/8/16GB,LPDDR4x
Storage	32/64/128GB,eMMC
Size	52mm x 72mm

Single Board Computer

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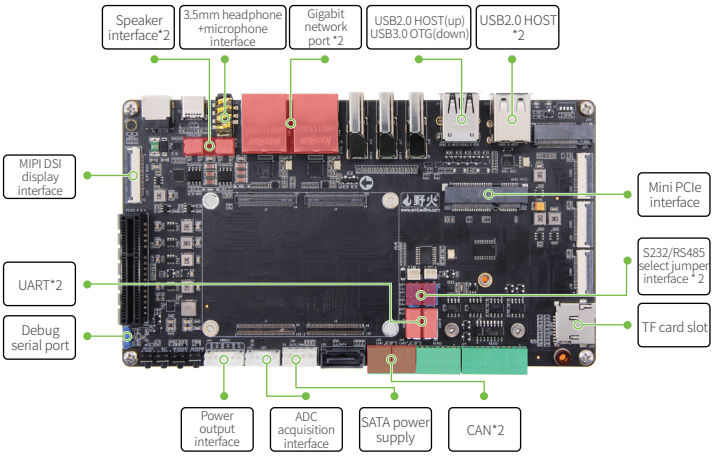
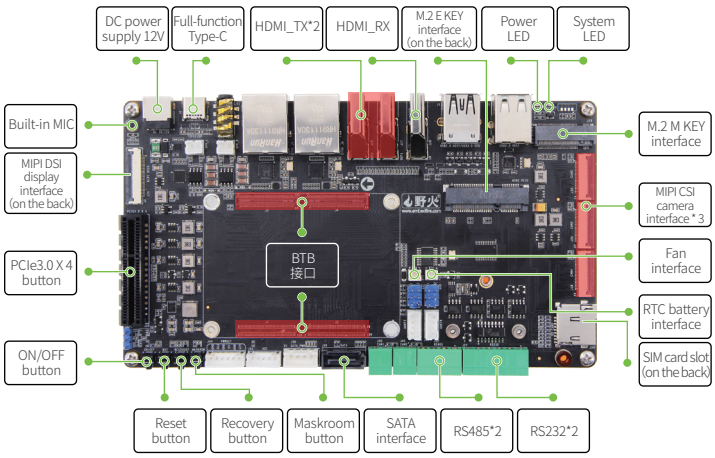
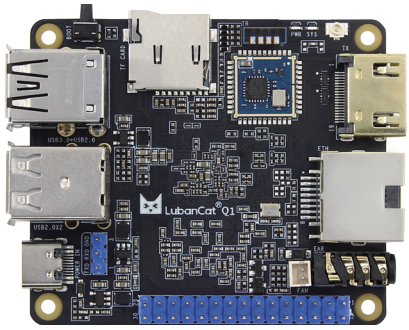




Main hardware parameter of the base board

Connector	plug:DF40C-100DP-0.4V(51), receptacle: DF40C-100DS-0.4V(51)
Power interface	12V@2A DC input ; Power output interface x1
Ethernet	Gigabit Ethernet port x2, support data transmission rates of 10/100/1000 Mbps;
HDMI	HDMI2.0 input interface x1,with the highest resolution of 3840x2160@60fps. HDMI2.1 output interface x2,support multi-screen split display with other screens, with the highest resolution of 7680x4320@60fps.
MIPI-DSI	MIPI screen interface x2,support plug into EmbedFire's MIPI screen, multi-screen split display with other screens; Single MIPI mode supports 3840x2160@60fps. Refer to the specification document for additional parameter modes.
MIPI-CSI	24Pin FPC camera interface x6 (front x3, back x3),support plug into EmbedFire's MIPI camera;
USB2.0	Type-A interface x3 (HOST)
USB3.0	Type-A interface x1 (OTG);Type-C interface x1 (OTG), used for firmware burning, support DP1.4 protocol
PCIe interface	Mini-PCIe x1,the Mini-PCIe interface can be used with a full-height or half-height WiFi network adapter, 4G/5G module, or other Mini-PCIe interface modules; PCIe x4 slot x1, PCIe 3.0 x 2Lanes, support connection of PCIe devices
M.2 interface	M.2 E KEY interface x1, wireless network adapter module supporting M.2 E-Key; M. 2 M KEY interface x1, support M.2M-key PCIe3.0 x2Lanes 2280 hard disk specification
TF card slot	Micro SD (TF) card slot x1, and TF card can be used to boot the system, up to 512GB
SIM card slot	SIM card slot x1, the SIM card function needs to be used with 4G or 5G module
SATA interface	Standard SATA interface x1; SATA power interface x1, supporting 12V output
CAN	CAN x2
ADC	ADC acquisition interface x1
Serial port	Debug serial port x1 (UART2) ,Default parameter: 1500000-8-N-1;UART x2 (UART7&UART9); RS232 x2 (UART4&UART7);RS485 x2 (UART4&UART7);RS232/RS485 selection of jumper interface x2
Audio interface	Built-in MIC x1; SPK interface x2, can be connected to 3W power speaker; Headphone + microphone 2 in 1 interface x1
Button	ON/OFF button x1 , MaskRom button x1 , Recovery button x1, Reset button x1
LED	System LED x1 ; Power LED x1
RTC	RTC battery interface x1
Fan interface	Support 5V or 12V fan for heat dissipation

LubanCat Q1



- Using Rockchip RK3528A as the main chip, 2.0GHz main frequency, integrated quad-core 64-bit Cortex-A53 processor and ARM Mali-450 graphics processor ;
- Rich peripheral interfaces, integrated 2.4G WiFi wireless module, USB HOST, HDMI 2.0, Gigabit Ethernet, TF card and other peripherals, reserved 30Pin headers unused, supporting GPIO, SPI, UART, PWM functions, compatible with Raspberry PI interface;
- Support 4K@60fps H.265/H.264/AVC decoded video output and 1080P @60 fps H.265/H.264 coding;
- Providing a variety of memory configuration options, the board is compact, measuring only 56mmx65mm. It is low-power and high-performance, can easily run Linux or Android system;
- Providing Android, Debian and Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' usage and secondary development.

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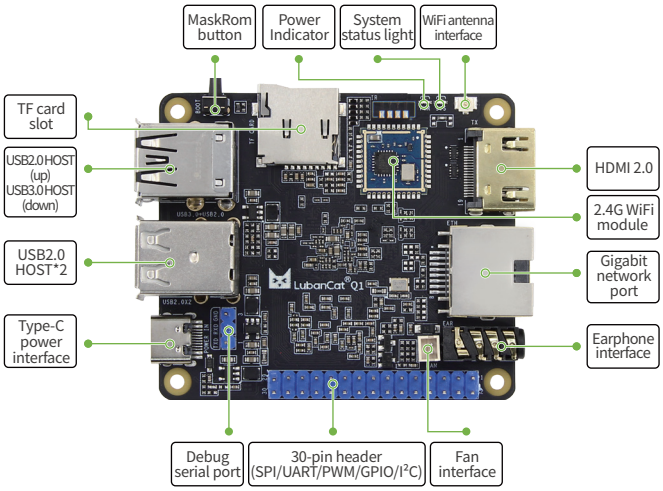
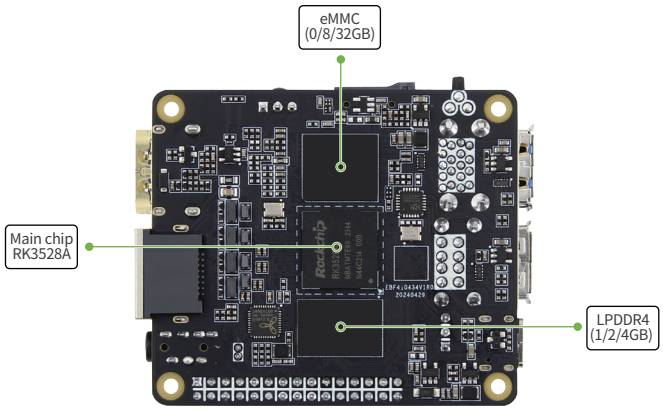


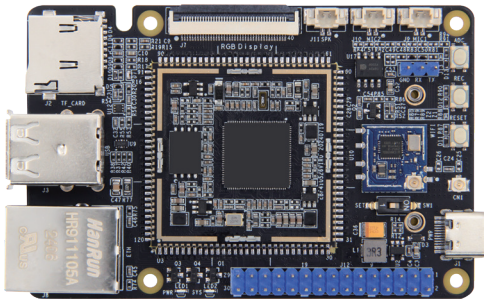


Main hardware parameter

CPU	Main chip: RK3528A, quad-core Cortex-A53
GPU	ARM Mali-450
Memory	LPDDR4-1/2/4/8GB
Storage	eMMC-0/8/32GB,support eMMC boot system
Power interface	Type-C_5V@3A DC input
Ethernet	10/100/1000M adaptive Ethernet port
USB2.0	Type-A interface x3 (HOST)
USB3.0	Type-A interface x1 (HOST)
HDMI	HDMI2.0 Display interface x1,the highest resolution is 4096×2160@60fps
WIFI	Onboard support 2.4G WiFi, Model: BL-RTL8189FS
TF card slot	SD3.0 interface,support TF card boot system, up to 512GB
IO interface	30Pin headers, 2.54mm pitch, supporting GPIO, SPI, UART, PWM, I²C functions
Debug serial port	Default parameter 1500000-8-N-1
Audio socket	Headphone jack x1, only support audio output
Button	MaskRom button x1
Fan interface	Support the installation of 5V fan for heat dissipation

LubanCat RV06

- Using Rockchip RV1106 as the main chip, integrating Cortex A7 + MCU and embedding DDR3L. The RV1106G2 with 128MB or RV1106G3 with 256MB can be selected;
- It has an independent NPU with a computing power of up to 0.5T/1TOPS@int8. When paired with a camera, it can perform real-time YOLO video recognition, image recognition, and other functions;
- It is equipped with a low-latency video encoding module, supporting up to 5M@30fps H264 and H265 video encoding, 4M@60fps JPEG and MJPEG encoding, and multiple bitrate control methods.



- The module uses a stamp-hole designed core board plus a baseboard, and provides two optional memory configurations. Measuring only 56 mm × 85 mm, it features low power consumption and high performance, and can run Linux system smoothly.
- A large number of common on-board peripherals, including a single-frequency WiFi6 wireless module, USB2.0 OTG, 100M Ethernet, TF card slot, MIPI camera, MIC, SPK, etc. It has 30pin headers unused, supporting GPIO, SPI, I2C, UART, and PWM;
- Providing buildroot and Ubuntu operating system image, can be applied to a variety of different application environment.

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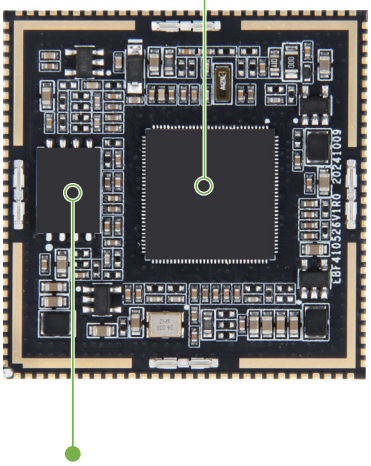
Main chip is optional
CPU1：RV1106G2 (128MB DDR3L)
CPU2：RV1106G3 (256MB DDR3L)



SPI NAND FLASH (256MB)

Main hardware parameter of core board

CPU	Main chip:RV1106,Cortex A7+MCU
Memory	Embedded DDR3L, optional RV1106G2: 128M / RV1106G3: 256M
Storage	256MB SPI NAND FLASH
AI computing power	RV1106G2:0.5TOPS@int8,RV1106G3:1TOPS@int8
Interface	All I/Os are fully expanded, excluding SPI NAND FLASH. These include: 84 GPIOs, 1xNPOR reset pin and 3xUSB dedicated pins.
PCB	4-layer PCB, gold-plated design
Size	35 mm x 35 mm

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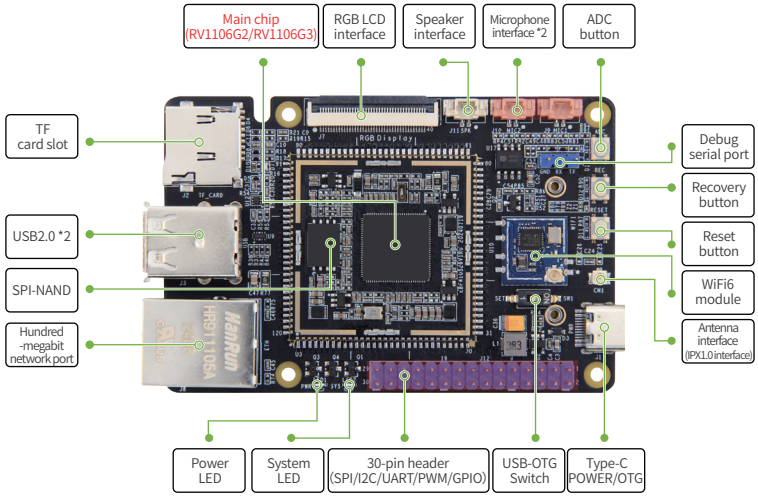
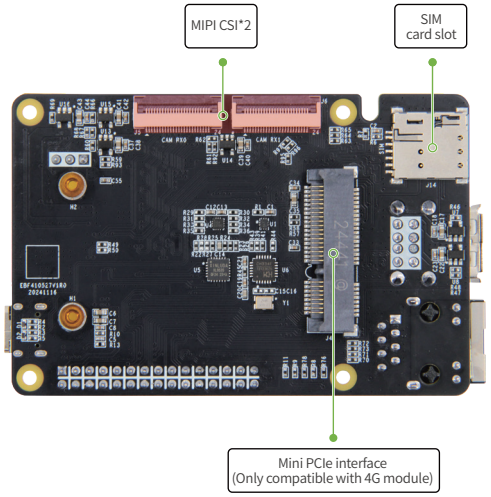
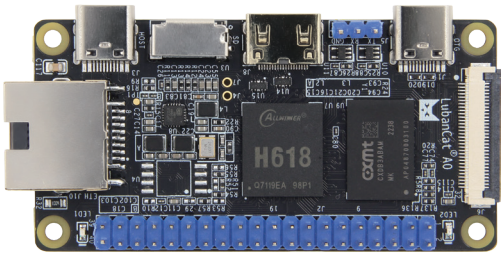




Main hardware parameters of the entire board

CPU	Main chip:RV1106,Coertex A7+MCU
Memory	Embedded DDR3L, optional RV1106G2: 128M / RV1106G3: 256M
Storage	256MB SPI NAND FLASH
AI computing power	RV1106G2:0.5TOPS@int8,RV1106G3:1TOPS@int8
Display	40pin FPC interface with 0.5mm pitch, 18-bit RGB interface timing. It can be directly connected to the 4.3/5/7inch RGB interface capacitive screens provided by EmbedFire through FPC cable.
Camera	Two 2-lane MIPI CSI inputs, the single-channel can support a maximum input of 5M@30fps, and the dual-channel can support a maximum input of 1080P@30fps simultaneously.
Power interface	5V@1A DC input, Type-C interface, it can also be used to burn mirror image
Ethernet	100Mbps network port x1, supporting data transmission rates of 10/100Mbps
PCIe interface	Mini-PCIe interface x1, capable of connecting to PCIe network cards that use USB protocol for communication
SIM card	SIM card slot x1, the SIM card function needs to be used with 4G or 5G module
TF card slot	SD2.0 interface,support TF card boot system, up to 512GB
USB2.0	USB-HOST Type-A interface x2;
USB-OTG Switch	The value is Host when Type-A is used,or Device when Type-C is used
WiFi	Onboard support 2.4G WiFi6, model: AIC8800DL
IO interface	30Pin headers with 2.54mm pitch, support GPIO, SPI, I2C,UART, PWM
Debug Serial Port	Default parameter: 115200-8-N-1
Audio	Microphone interface x2, dual-channel MIC input; Speaker interface x1, single-channel SPK output (left channel)
Button	Reset button x1; Recovery button x1; ADC button x1
LED	System LED x1 ; Power LED x1
Size	56mm x 85mm

LubanCat A0



- Allwinner H618 is used as the main chip, 1.5GHz main frequency,integrated quad-core 64-bit Cortex-A53 processor and Mali G31 MP2 graphics processor ;
- Integrate Single-frequency WiFi6 wireless module (optional), USB2.0 HOST/OTG, Mini HDMI, Gigabit Ethernet, TF card , reserved 40Pin headers unused and 32Pin FPC interface , supporting GPIO,SPI, UART, PWM ;
- Support 4K@60fps H.265/H.264/AVC video decoding and 1080P@60fps H.265/H.264 video encoding;
- Providing a variety of memory configuration options, the board is compact, measuring only 69.6mmx35mm.It is low-power and high-performance, can smoothly run Linux or Android TV systems;
- Providing Android TV, Debian and Ubuntu operating system image, can be applied to a variety of different application environment;
- A full SDK, driver package, design schematics, and other development resources are provided to support user operation and secondary development.

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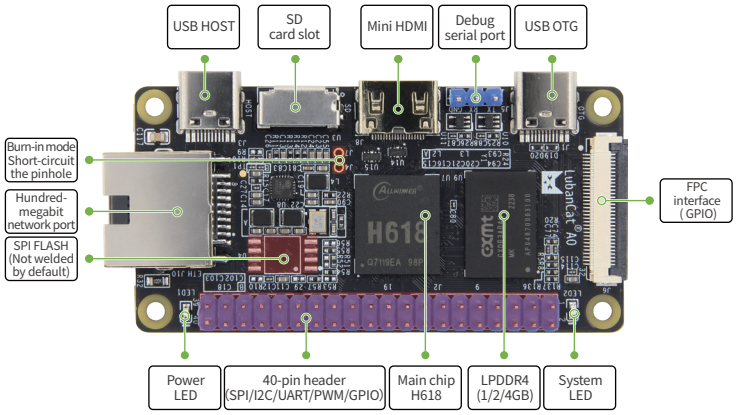
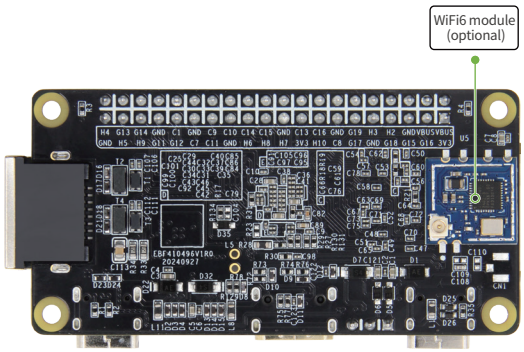




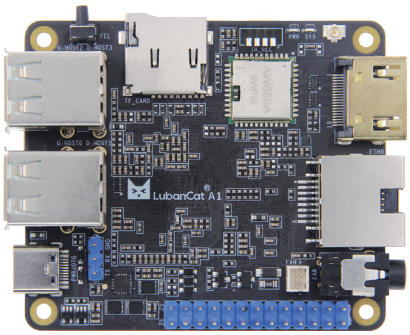
Main hardware parameter

CPU	Main chip: Allwinner H618, quad-core 64-bit Cortex-A53
GPU	Mali G31 MP2
Memory	LPDDR4,1/2/4GB
SPI FLASH	Reserved Flash chip interface (default not soldered)
Power interface	5V@3A DC input,Type-C interface,it can also be used to burn mirror image
Ethernet	10/100M adaptive Ethernet port
USB2.0	USB-HOST Type-C interface x1;USB-OTG Type-C interface x1
HDMI	Mini HDMI display interface x1,it supports 4096×2160 @60fps on Android TV
WIFI	Onboard support 2.4G WiFi6 module , model: AIC8800
SD card slot	SDIO3.0 interface,support SD card boot system
FPC interface	32pin FPC interface, with 0.5mm pitch, and GPIO is exposed.
40Pin interface	Compatible with Raspberry Pi 40-pin header, with 2.54mm pitch, supporting GPIO, I2C, SPI, UART and PWM.
Debug serial port	Default parameter:115200-8-N-1
LED	System LED x1 ; Power LED x1
Size	69.6mm x 35mm

Single Board Computer
LubanCat series

Embedded solution expert

LubanCat A1



- Allwinner H618 is used as the main chip, 1.5GHz main frequency, integrated quad-core 64-bit Cortex-A53 processor and Mali G31 MP2 graphics processor ;
- Rich peripheral interfaces, Integrated dual-band WiFi6+BT5.0 wireless module, USB2.0 HOST/OTG, HDMI 2.0, Gigabit Ethernet, TF card and other peripherals, reserved 26Pin headers unused, supporting GPIO, SPI, UART, PWM functions, compatible with Raspberry PI interface;
- Support 4K@60 fps H.265/H.264/AVC decoded video output and 1080P@60 fps H.265/H.264 coding;
- Providing a variety of memory configuration options, the board is compact, measuring only 56mmx65mm. It is low-power and high-performance, can easily run Linux or Android system;
- Providing Android, Debian and Ubuntu operating system image, can be applied to a variety of different application environment;
- Providing a complete SDK driver development kit, design schematic and other resources, facilitating users' utilization and secondary development.

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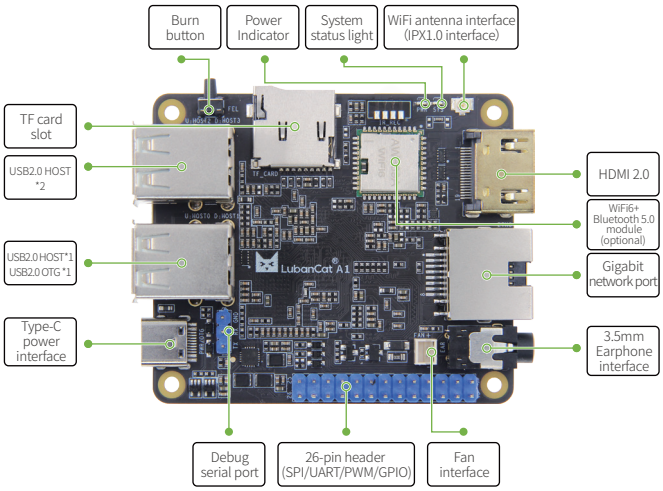
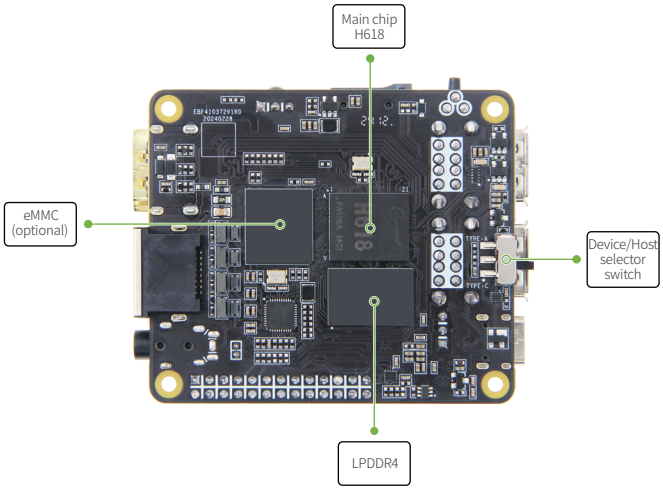
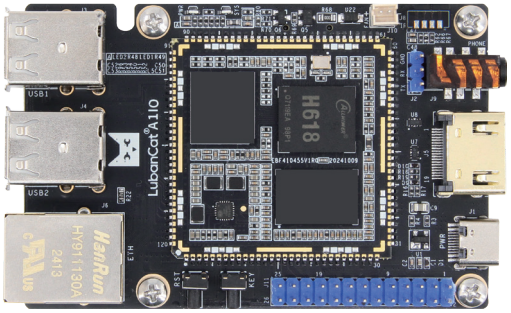




Main hardware parameter

CPU	Main chip: H618, quad-core Cortex-A53
GPU	Mali G31 MP2
Memory	LPDDR4-1/2/4GB
Storage	eMMC,8/32GB,support eMMC boot system;the non-EMMC version requires SD card to boot
Power interface	Type-C_5V@3A DC input,it can also be used to burn mirror image
Ethernet	10/100/1000M adaptive Ethernet port
USB2.0	USB-HOST Type-A interface x3; USB-OTG x1(Type-A and Type-C share, can be switched by switching)
USB-OTG selection switch	The value is Host when Type-A is used,or Device when Type-C is used
HDMI	HDMI2.0 Display interface x1,it supports 1920×1080@60fps on Linux and 4096×2160@60fps on Android
WIFI+bluetooth	Onboard support 2.4G / 5.8G dual-band WiFi6 + BLE5.0, model: AW869A
TF card slot	SD3.0 interface,support TF card boot system, up to 512GB
IO interface	26Pin headers, 2.54mm pitch, supporting GPIO, SPI, UART, PWM functions
Debug serial port	Default parameter 115200-8-N-1
Audio interface	3.5 mm Headphone jack x1
Button	Burn button x1
Fan interface	Support the installation of 5V fan for heat dissipation

LubanCat A1CS+IO



- Allwinner H618 is used as the main chip, 1.5GHz main frequency, integrated quad-core 64-bit Cortex-A53 processor and Mali G31 MP2 graphics processor ;
- Support 4K@60fps H.265/H.264/AVC decoded video output and 1080P@60fps H.265/H.264 coding;
- The board adopts core board + base board design. The core board has a stamp-hole interface, with a size of 40mm x 40mm. It is compact, featuring 6 layers of PCB. Besides DDR, EMMC bus and LRADC, all I/Os are externally broken out;
- The entire board measures 56mmx85mm.It integrates dual-band WiFi6+BT5.0 module, USB2.0 host, HDMI 2.0, Gigabit Ethernet, TF card slot ,and other peripherals. 26-pin header is reserved, which supports GPIO, SPI, I2C, UART, and PWM;
- Providing Android TV, Debian and Ubuntu operating system image, can be applied to a variety of different application environment;
- A full SDK, driver package, design schematics, and other development resources are provided to support user operation and secondary development.

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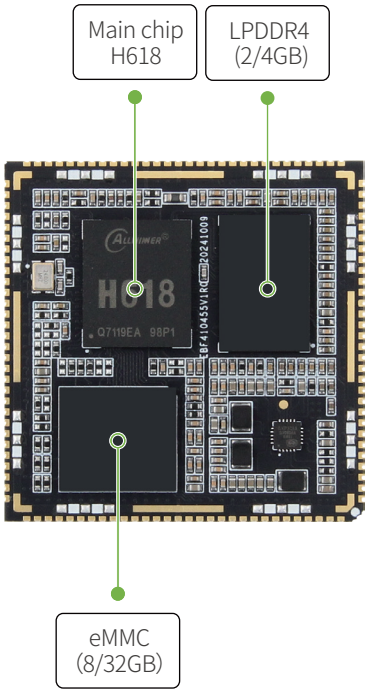

Main hardware parameter of core board

Main chip	Allwinner H618
CPU	Quad-core 64-bit Cortex-A53
GPU	ARM Mali-G31
Memory	2/4GB LPDDR4
Storage	8/32GB eMMC,support eMMC boot system
Interface	All I/Os are fully expanded, excluding DDR, eMMC bus, and LRADC. These include: 88 GPIOs, 8xdedicated USB ports, 1xAP RESET pin, 1xBluetooth enable pin, 1xWi-Fi enable pin, and 1xFEL button.
PCB	6-layer PCB, gold-plated design
Size	40 mm x 40 mm

Single Board Computer

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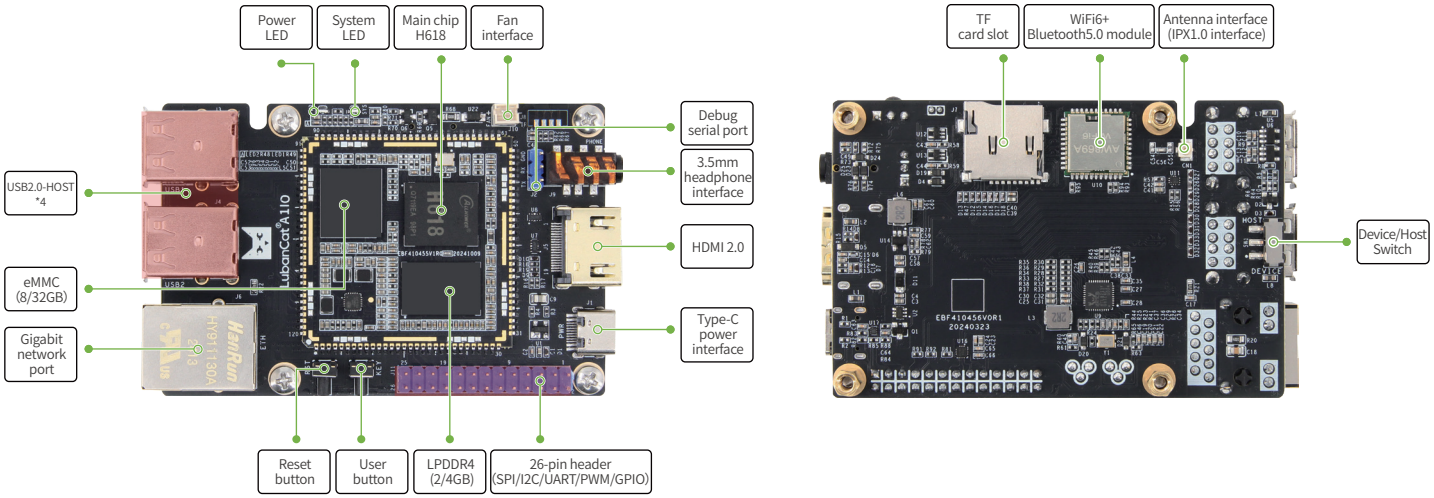
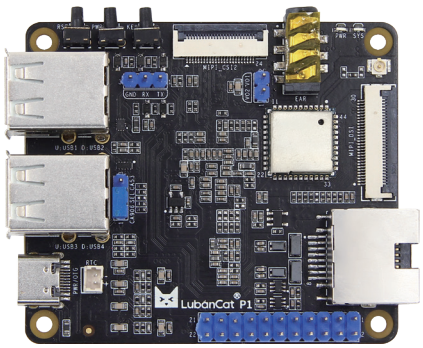


Main hardware parameters of the entire board

CPU	Main chip: H618,Quad-core 64-bit Cortex-A53
GPU	Mali G31MP2
Memory	LPDDR4, 2/4GB
Storage	eMMC,8/32GB,support eMMC boot system
Power interface	5V@1A DC input, Type-C interface, used to burn mirror image
Ethernet	10/100/1000M adaptive Ethernet port
USB2.0	USB-HOST Type-A interface x4;
USB-OTG Switch	The value is Host when Type-A is used,or Device when Type-C is used
HDMI	HDMI2.0 display interface x1,it supports 1920×1080@60fps on Linux and 4096×2160@60fps on Android TV
WiFi + Bluetooth	Onboard support 2.4G / 5.8G dual-band WiFi6 + BLE5.0, model: AW869A
TF card slot	SD3.0 interface,support TF card boot system, up to 512GB
IO interface	26Pin headers with 2.54mm pitch, supporting GPIO, SPI, I2C,UART, PWM
Debug Serial Port	Default parameter: 115200-8-N-1
Audio	3.5mm Microphone interface x1
Button	Reset button x1; User button x1
LED	System LED x1 ; Power LED x1
Fan interface	Support 5V fan for heat dissipation

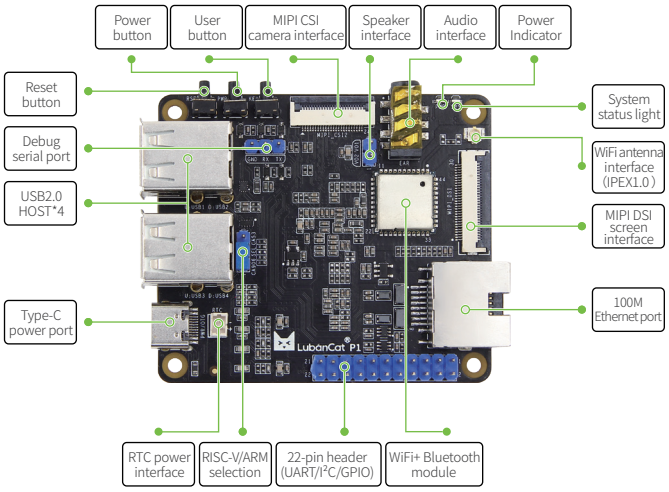
LubanCat P1

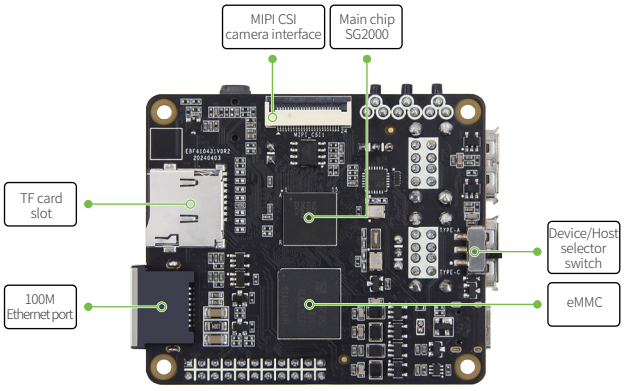


- SOPHON SG2000 is used as the main chip, 1GHz main frequency, 64-bit processor, dual RISC-V C906+A53+8051, support ARM switching;
- Rich peripheral interfaces, Integrated dual frequency WiFi5 + BLE4.2, USB 2.0, dual MIPI CSI, MIPI DSI, Ethernet, TF card and other peripherals,reserved 22Pin headers unused , supporting GPIO, I2C, UART functions;
- Support H.265/H.264 video decoding with maximum resolution of 2880x1620 (5M) , support binocular camera, 360° fisheye, wide dynamic, image Angle rotation and other professional image processing;
- The board is compact, measuring only 56mm*65mm, and low-power and high-performance, can easily run Linux or Ubuntu system;
- Fully open-sourced, offering official tutorials, a comprehensive SDK driver development kit, design schematics and other resources, facilitating users' utilization and secondary development.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK

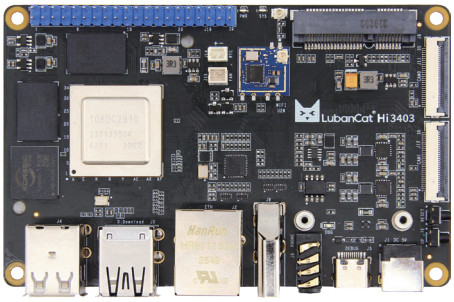




Main hardware parameter

CPU	Main chip: SG2000 Large core: 1GHz RISC-V C906 / ARM A53 (skip cap switch) Small core: 700MHz RISC-V C906 Low power core: 25 ~ 300M 8051
NPU	0.5 TOPS INT8, support BF16
Memory	Built-in 4Gbit (512 MByte) DDR3
Storage	eMMC,8/32GB,support eMMC boot system; the non-eMMC version requires SD card to boot
Power interface	Type-C_5V@3A DC input
USB2.0	Type-A interface x4 (HOST); Type-C interface x1,can be used for firmware burning
Ethernet	10/100M adaptive Ethernet port
MIPI-DSI	30Pin MIPI screen interface x1,support plug into Embedfire's MIPI screen, the highest resolution in single MIPI mode is 2880*1620@30Hz
MIPI-CSI	24Pin camera interface x2 (front x1, back x1),support plug into Embedfire's MIPI camera
WIFI+bluetooth	Onboard support 2.4G/5.8G dual-band WiFi5 + BLE4.2, model: M8821CS1
TF card slot	SDIO interface, up to 512GB
Option	RISC-V/ARM selection interface x1, switching through cap hopping; Device/Host toggle x1
IO interface	22Pin headers, 2.54mm pitch, supporting GPIO, I2C,UART functions
Debug serial port	Default parameter 1500000-8-N-1
Audio interface	Headphone output + microphone input 2 in 1 interface x1; Speaker interface x1
Button	Power button x1; Reset button x1; User presses x1
RTC	RTC power socket x1

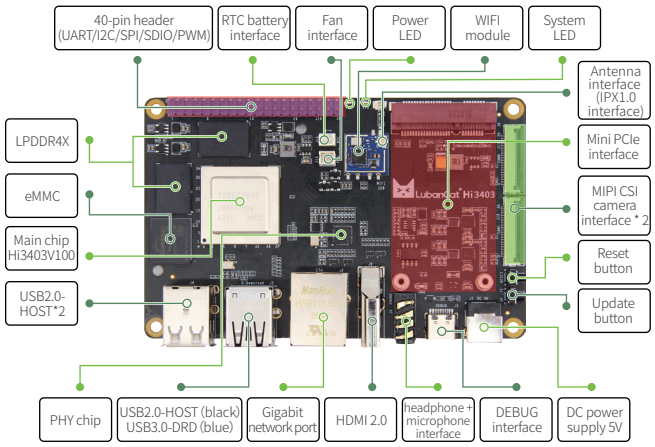
LubanCat Hi3403

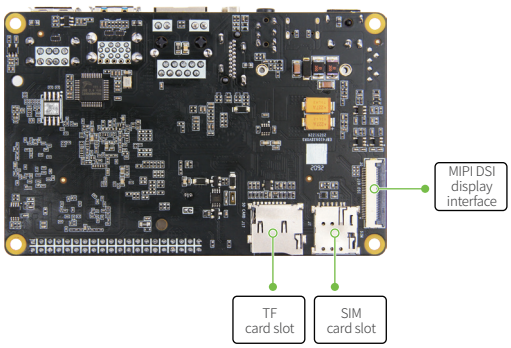


- Using the Hi3403V100 chip from Hisilicon as the main chip, the main frequency can reach 1.4GHz. It integrates a quad-core Cortex-A55 processor and has an independent dual-core NPU, with computing power reaching 10.4TOPS@INT8;
- Support dual-screen split display, dual-MIPI camera input, 4K60 ISP image processing capability, 3F WDR, multi-level noise reduction, six-axis stabilization, hardware stitching and other image enhancement and processing algorithms;
- With the board size of 111mm x 71mm, it is equipped with gigabit network ports, WiFi6, USB 2.0/3.0, Mini PCIe, HDMI, MIPI DSI/CSI interfaces and other peripheral devices;
- The official supports the mainstream Buildroot and Ubuntu operating system images, which are applicable to various different application environments. It also receives support from the HiSpark open-source community of Hisilicon, and can be adapted by third parties for the OpenEuler and OpenHarmony operating systems;
- Provide a complete SDK driver development package, design schematics and other resources to facilitate user usage and further development.

OPEN SOURCE CODE

OPEN SOURCE TEXTBOOK

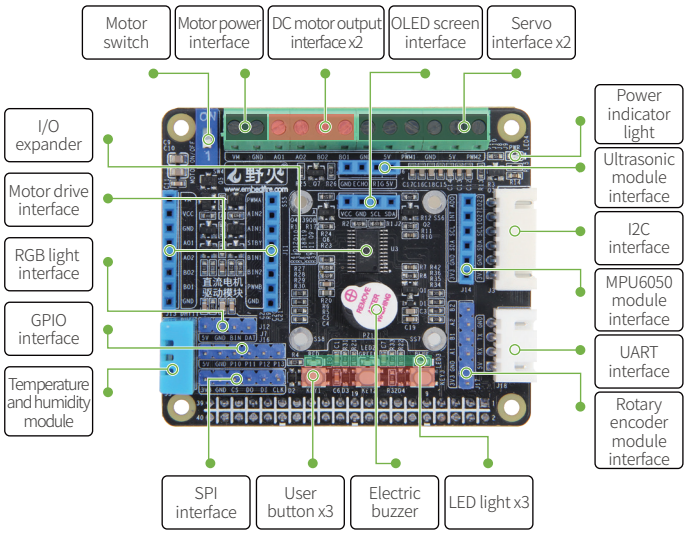


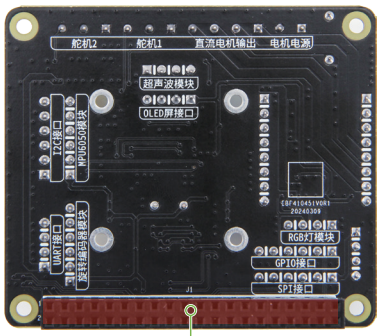


Main hardware parameter

Power interface	5V@3A DC input ,DC interface
Main chip	Hisilicon Hi3403V100(quad-core Cortex-A55, 1.4GHz, 10.4TOPS@INT8)
Memory	8GB LPDDR4X
Storage	64GB eMMC
Ethernet	10/100/1000M adaptive Ethernet port x1
WiFi	Onboard 2.4GHz single-band WiFi6 USB module, Model: AIC8800D40L
HDMI	HDMI2.0 output x1,support dual-screen different display with MIPI-DSI,with a maximum resolution of 4K@60fps
MIPI-DSI	MIPI screen interface x1,support plug into EmbedFire's MIPI screen, support dual-screen different display with HDMI2.0, the maximum resolution in single MIPI mode is 1920*1080@60fps
MIPI-CSI	30-pin FPC camera interface x2
USB2.0	Type-A interface x3 (HOST);
USB3.0	Type-A interface x1 (DRD)
PCIe interface	The Mini-PCIe interface x1, can be used with a full-height or half-height WiFi network adapter, 4G/5G module, or other Mini-PCIe interface modules
TF card slot	Micro SD(TF) card slot x1, up to 512GB
SIM card slot	SIM card slot x1, the SIM card function requires a 4G/5G module to be used
40Pin interface	40-pin header interface, support PWM, SDIO, I2C, SPI, UART
Debug serial port	Type-C interface, Default parameter:115200-8-N-1
Audio	Headphone output + microphone input 2 in 1 interface
Button	Update button x1 ; Reset button x1
LED	Power LED x1; System LED x1
RTC	RTC battery interface x1
Fan interface	Support the installation of 5V fan for heat dissipation

LubanCat multi-function expansion board





SUPPORT LUBANCAT SERIES

COMPATIBLE WITH RASPBERRY PI INTERFACE

SENSOR + MOTOR

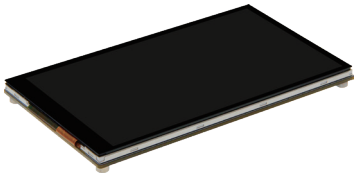
Main hardware parameter:

Multi-function expansion board	Introduction
Power supply	Power supply through 5v of LubanCat 40-pin header
40Pin female header connector	Support connect to 40-pin header of LubanCat series board directly
IO extension	XL9535 chip is used to expand 16 IO, support input and output
User LED	x3
User button	x3
Temperature and humidity sensor	Onboard DHT11, support plug into temperature and humidity
Ultrasonic wave interface	x1, support plug into the Embedfire's ultrasonic module
OLED interface	x1, support plug into OLED screen of the I2C
MPU6050 interface	x1, support plug into Embedfire's MPU6050 module
Electric buzzer	Onboard the active buzzer
Servo interface interface	x2, controlled by the PWM
Motor drive interface	support plug into Embedfire's motor drive module
Motor interface	Two motor interfaces, support 5v and 12v output switching, support control motor speed steering
Rotary encoder interface	x1, can be connected to Embedfire's rotary encoder, support key and A, B phase reading
I2C interface	x1, support plug into I2C module
SPI interface	x1, support plug into SPI module
Serial port	x1, support serial communication
RGB LED interface	x1, support plug into Embedfire's RGB lamp module
IO interface	x4, support input and output
Size	65mm*56mm

Compatibility situation of expansion board

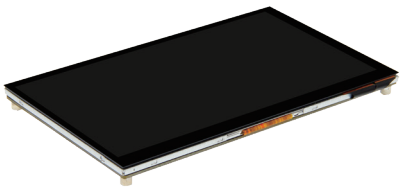
Product model number	Master control	Whether the function extension board is supported
LubanCat 0N	RK3566	Fully support
LubanCat 0W	RK3566	Fully support
LubanCat 1	RK3566	Fully support
LubanCat 2N	RK3568	Fully support
LubanCat 3	RK3576	Fully support
LubanCat 4	RK3588S	Fully support
LubanCat 1N	RK3566	Fully support, when using, attention should be paid to avoid the short circuit caused by the bottom structure of the expansion plate touching the LubanCat
LubanCat 2	RK3568	Fully support, when using, attention should be paid to avoid the short circuit caused by the bottom structure of the expansion plate touching the LubanCat
LubanCat 5	RK3588	Partially compatible, because the middle part of 40-pin header is divided into extended IO, PWM and other functions on the extension board are not supported
LubanCat Q1	RK3528A	Small part compatible, 30-pin header function is not complete, can not fully drive the expansion board peripheral, recommend to use dupont line directly connected to the sensor
LubanCat RV06	RV1106	Small part compatible, 30-pin header function is not complete, can not fully drive the expansion board peripheral, recommend to use dupont line directly connected to the sensor
LubanCat P1	SG2000	Incompatible, 22-pin header, IO level of 1.8V does not match the expansion board
LubanCat Hi3403	Hi3403V100	Incompatible, 40-pin header, IO level of 1.8V does not match the expansion board
LubanCat 1HS	RK3562	No, no 40-pin header
LubanCat 1H/2H	RK3566/3568	No, no 40-pin header
LubanCat 1 IO baseplate (Gold finger and BTB)	RK3566	No, no 40-pin header
LubanCat 2 IO baseplate (Gold finger and BTB)	RK3568	No, no 40-pin header
LubanCat 3 IO baseplate (Gold finger and BTB)	RK3576	No, 18-pin header function is not complete
LubanCat 5 IO baseplate (BTB)	RK3588	No, no 40-pin header
LubanCat 4 IO baseplate (BTB)	RK3588S2	No, no 40-pin header
LubanCat A0	H618	No, 40-pin header function is not complete
LubanCat A1	H618	No, 26-pin header function is not complete
LubanCat A1 IO	H618	No, 26-pin header function is not complete

LubanCat supporting module



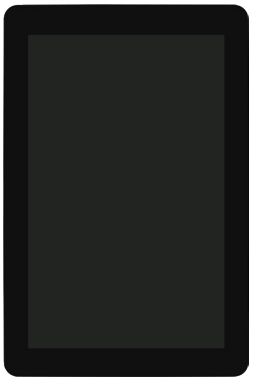
5.5 inch MIPI interface capacitive touch screen

- 5.5-inch IPS capacitive touch screen, resolution: 1920x1080, 4 Lanes MIPI DSI interface;
- The driver chip is HX8399-C , and the capacitive touch chip is GT911;
- RGB888 pixel format, brightness is 240cd/m^2;
- Supply voltage is 5V and 3.3V, and supply voltage must be simultaneous;
- Operating temperature is -20°C to 70°C;
- The FPC interface on the back of the screen is 30 Pin with 0.5mm pitch.



7 inch MIPI interface capacitive touch screen

- 7 inch IPS capacitive screen, resolution: 1024x600,4 Lanes MIPI DSI interface;
- The driver chip is EK79007, and the capacitive touch chip is GT911;
- RGB888 pixel format, brightness is 300cd/m^2;
- Supply voltage is 5V and 3.3V, and supply voltage must be simultaneous;
- Operating temperature is -20°C to 70°C;
- The FPC interface on the back of the screen is 30 Pin with 0.5mm pitch.



10.1 inch MIPI interface capacitive touch screen

- 10.1 inch IPS capacitive screen, resolution: 800x1280,4 Lanes MIPI DSI interface;
- The driver chip is JD9365DA-H3, and the capacitive touch chip is GT911;
- RGB888 pixel format, brightness is 320cd/m^2;
- Supply voltage is 5V and 3.3V, and supply voltage must be simultaneous;
- Operating temperature is 0°C to 50°C;
- The FPC interface on the back of the screen is 30 Pin with 0.5mm pitch.

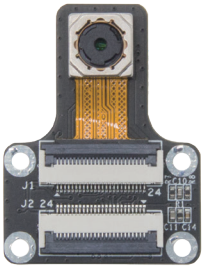
10.1 inch LVDS display screen

- 10.1 inch a-Si TFT capacitive screen, resolution: 1280x800;
- 6+2 bit color depth, 16.7M color display;
- The brightness is 400cd/m², and the backlight brightness can be adjusted by software.
- Supply voltage is 3.3V;
- Operating temperature is -20°C to 70°C;
- The LVDS interface behind the screen is 40pin , single channel.

10.1 inch eDP display screen

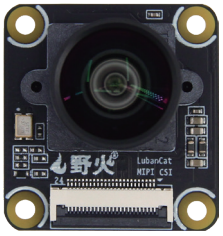
- 10.1 inch a-Si TFT capacitive screen, resolution: 1280x800;
- Display 16.7M color ;
- The brightness is 300cd/m², and the backlight brightness can be adjusted by software.
- Supply voltage is 3.3V;
- Operating temperature is -20°C to 70°C;
- The eDP interface on the back of the screen is 30 Pin with 0.5mm pitch.

OV8858 camera module



- 800W pixel color camera, resolution: 3264x2448, support continuous autofocus;
- Onboard 24M active crystal oscillator, using OV8858 sensor, lens: 1/4, focal length: 3.5mm, aperture: F2.4, field of view angle: 68°, distortion <1%;
- 2 Lanes MIPI CSI interface, supporting 10-bit RGB RAW output;
- Operating temperature is -30°C to 85°C;
- Supply voltage is 5V;
- Two interfaces, one is 24Pin FPC interface with 0.5mm pitch on the front and the other is 2x15Pin BTB interface with 0.4mm pitch on the back.

IMX415 camera module



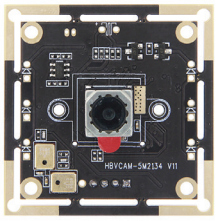
- 800W pixel color camera, resolution: 3264x2192, continuous autofocus is not supported ;
- Onboard 37.125M active crystal oscillator, using IMX415-AAQR-C sensor, lens: 1/2.8, focal length: 2.02mm, aperture: F2.5, field of view angle: 119.8°, distortion <7.1%;
- 4 Lanes MIPI CSI interface, supporting 10-bit/12-bit RGB RAW output;
- Operating temperature is -30°C to 85°C, Supply voltage is 5V;
- 24Pin FPC interface with 0.5mm pitch on the front.

OV9726 camera module

- 100W pixel USB camera, resolution: 1280x720, fixed focus;
- Support OTG, USB free drive, plug and play;
- Using OV9726 CMOS sensor, focal length:1.68mm, aperture:F2.0, field of view angle :63°, distortion <1.0%;
- USB2.0 interface, support YUY2/MJPEG format output;
- Multiple attribute is adjustable, fit WinXP/Win7/Win8/Win10/MAC/OSX/Linux/Android system;
- Operating temperature is -20°C to 70°C, 5V power supply;
- 4-pin header socket, 0.8mm pitch.

OV2720 camera module

- 200W pixel USB camera, resolution: 1920x1080, fixed focus;
- Support OTG, USB free drive, plug and play;
- Using OV2720 CMOS sensor, focal length:2.8mm, aperture:F2.8, field of view angle :73°, distortion <1.0%;
- USB2.0 interface, support YUY2/MJPEG format output;
- Multiple attribute is adjustable, fit WinXP/Win7/Win8/Win10/MAC/OSX/Linux/Android system;
- Operating temperature is -20°C to 70°C, 5V power supply;
- 4-pin header socket, 1.0mm pitch.



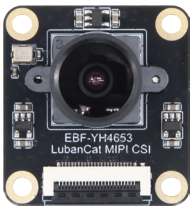
OV5693 camera module

- 500W pixel USB camera,built-in microphone,resolution: 2592x1944,support continuous autofocus;
- Support OTG, USB free drive, plug and play;
- Using OV5693 CMOS sensor, focal length:2.8mm, aperture:F2.2, field of view angle :76°, distortion <1.0%;
- USB2.0 interface, support YUY2/MJPEG format output;
- Multiple attribute is adjustable, fit WinXP/Win7/Win8/Win10/MAC/OSX/Linux/Android system;
- Operating temperature is -20°C to 70°C, 5V power supply;
- 4-pin header socket , 2.0mm pitch.

EBF-YH08A8 Camera Module

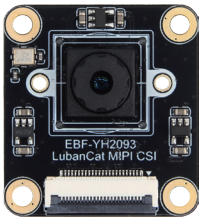
- 800W pixel camera, resolution:3264x2448, continuous autofocus is not supported ;
- Onboard 24M active crystal oscillator, using GC08A8 sensor, lens:1/4, focal length: 3.0mm, aperture: F2.2, field of view angle:138°, distortion < 2%;
- Supports 2/4 Lanes MIPI CSI interface, 10-bit RAW data output, with a maximum frame rate of up to 30 fps;
- Operating temperature is -20 °C to 70 °C, 5V power supply ;
- 24Pin FPC interface on the front, with 0.5mm pitch;
- Module dimensions:31 mm(L) × 29 mm (W)× 23 mm(H).

EBF-YH4653 Camera Module



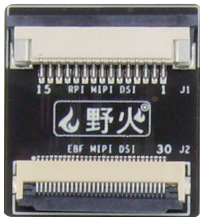
- 400W pixel camera, resolution:2560x1440, continuous autofocus is not supported ;
- Onboard 24M active crystal oscillator, using GC4653 sensor, lens:1/2.9, focal length: 3.2mm, aperture: F2.0, field of view angle:146°, distortion < 2%;
- Supports 2 Lanes MIPI CSI interface, 12/10-bit RAW data output, with a maximum frame rate of up to 30 fps;
- Operating temperature is -20 °C to 70 °C, 5V power supply ;
- 24Pin FPC interface on the front, with 0.5mm pitch;
- Module dimensions:31 mm(L) × 29 mm (W)× 23 mm(H).

GC20A3T Camera Module



- 200W pixel camera, resolution:1920x1080, continuous autofocus is not supported ;
- Onboard 24M active crystal oscillator, using GC20A3T sensor, lens:1/2.9, focal length: 3.96mm, aperture: F1.8, field of view angle:71°, distortion < 2%;
- The module PCB is compatible with GC2093/GC2053/GC20A3T and can use the GC2053 driver;
- Supports 2 Lanes MIPI CSI interface, 8/10-bit RAW data output, with a maximum frame rate of up to 30 fps;
- Operating temperature is -20 °C to 70 °C, 5V power supply ;
- 24Pin FPC interface on the front, with 0.5mm pitch;
- Module dimensions:31 mm(L) × 29 mm (W)× 7.2 mm(H).

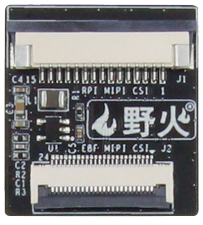
Raspberry PI screen to LubanCat adapter board



The adapter board cannot transfer the LubanCat module to the Raspberry PI board for use

- The Raspberry PI MIPI interface screen can be connected to the LubanCat series card computer for use;
- The appearance size is 23mmx25mm.

Raspberry PI camera to LubanCat adapter board



The adapter board cannot transfer the LubanCat module to the Raspberry PI board for use

- The Raspberry PI MIPI interface camera can be connected to the LubanCat series card computer for use;
- The appearance size is 23mmx25mm.

Intel 7265AC wireless network adapter

- Support 802.11ac wireless protocol;
- The speed of 2.4G band is 300Mbps, and it supports 2.4G AP mode;
- 5G band speed is 867Mbps;
- Support Bluetooth 4.2;
- The size is 30mmx26.8mmx3.2mm;
- Half height screw bit, Mini PCIe interface.

Realtek RTL8188CE wireless network adapter

- Support 802.11b/g/n wireless protocol;
- The speed of 2.4G band is 150Mbps, and it supports 2.4G AP mode;
- The size is 30mmx26.8mmx3.2mm;
- Half height screw bit, Mini PCIe interface.

Realtek RTL8188EE wireless network adapter

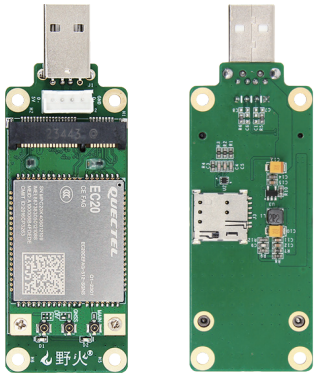
- Support 802.11b/g/n wireless protocol;
- The speed of 2.4G band is 150Mbps, and it supports 2.4G AP mode;
- The size is 30mmx26.8mmx3.2mm;
- Half height screw bit, Mini PCIe interface.

Realtek RTL8822CE wireless network adapter

- Support 802.11 b/g/n/ac wireless protocol;
- The speed of 2.4G band is 300Mbps, and it supports 2.4G AP mode;
- The speed of 5G band is 867Mbps, and it supports 5G AP mode;
- Support Bluetooth 5;
- The size is 30mmx26.8mmx3.2mm;
- Half height screw bit, Mini PCIe interface.

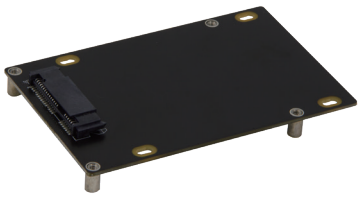
Realtek RTL8852BE wireless network adapter

- Support 802.11 b/g/n/ac/ax wireless protocol;
- The speed of 2.4G band is 574Mbps, and it supports 2.4G AP mode;
- The speed of 5G band is 1200Mbps, and it supports 5G AP mode;
- Support Bluetooth 5.2+WiFi6;
- The size is 30mmx22mmx2.15mm;
- M.2A+E Key interface, support M.2 to Mini PCIe adapter board.



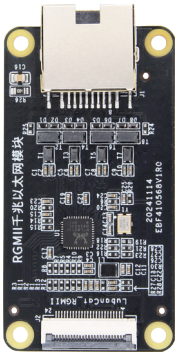
EC20 4G module

- Select EC20CEFAG, full netcom, support 2/3/4G network, with GPS function;
- Single antenna, need to plug into the IPS antenna;
- The use of GPS function requires GPS antenna, antenna needs to receive outdoor signals;
- Support to insert mini-SIM card;
- The communication protocol with the processor is USB.



SATA hard disk adapter board

- The 12Pin SATA interface with 0.5mm pitch on LubanCat 2 is transferred to the 7Pin+15Pin general SATA interface;
- Suitable for 2.5-inch HDD/SSD;
- LubanCat 2 special expansion module.



RGMII Gigabit Ethernet module

- PHY chip: RTL8211F-CG;
- Use discrete small network transformers and plated-out RJ45 network port;
- Support data transmission rates of 10/100/1000Mbps;
- The size is 30mm x 57mm;
- RGMII interface, a dedicated module for LubanCat 3.

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FLAGSHIP STORE

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