

neardi

# LPB3588 Embedded Computer Datasheet

## V1.0



Shanghai Neardi Technology Co., Ltd.

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## Version History

Version	Date	Description
V1.0	2022/8/23	Initial version

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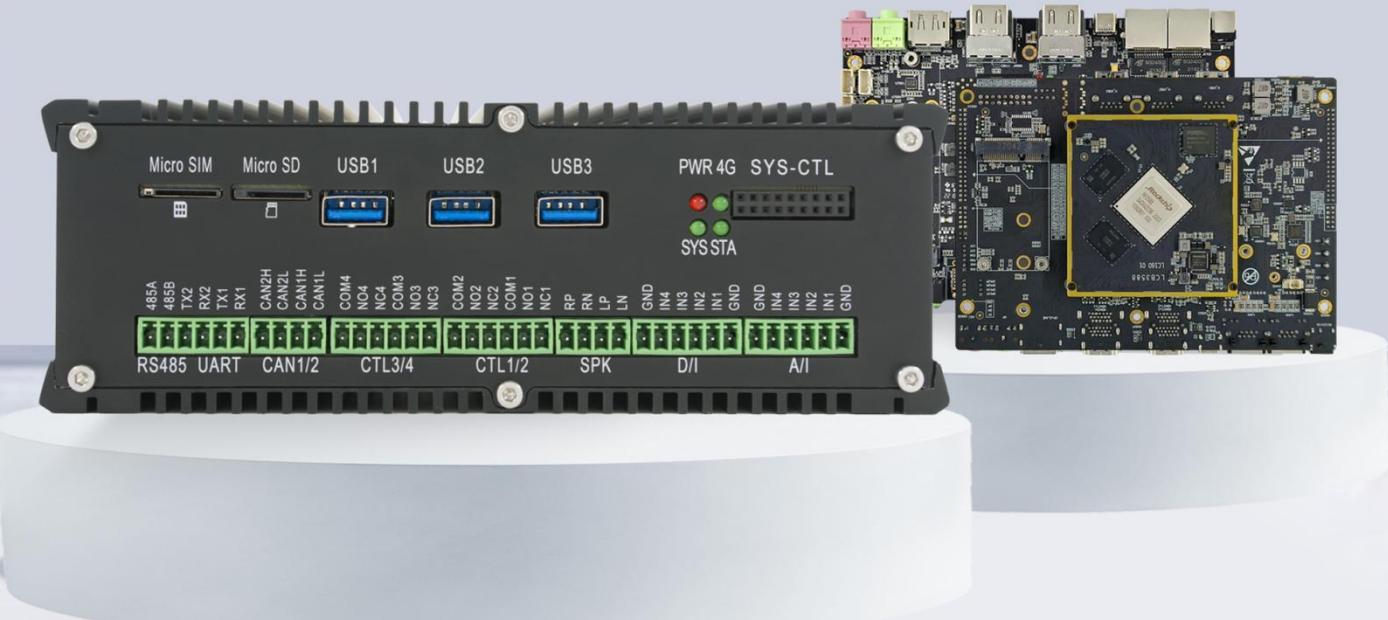
# 1. Product Introduction

The LPB3588 intelligent computer is a product meticulously designed based on the Rockchip RK3588 chip. The body is made of full aluminum material with a fanless design and an innovative internal structural combination, allowing key heat-generating components such as the CPU and PMU to efficiently conduct heat to the external aluminum casing, using the entire body casing as a heat dissipation material. This design not only enables the LPB3588 to perform excellently in more severe working environments but also allows it to be widely applied in various industrial scenarios.

The LPB3588 has a variety of interfaces, including 3 Type-A USB 3.0 HOSTs, and 1 full-function Type-C interface, suitable for connecting multiple USB cameras. It has 2 onboard mini-PCIe interfaces that can be expanded to connect 4G modules, 5G modules, and NPU computing cards with mini-PCIe interfaces based on RK1808. In addition, the LPB3588 supports dual-band WIFI 6, BT5.0, 2 Gigabit Ethernet, 2 CANBUS, 1 RS485, and 4 RS232 communication module interfaces. It provides 3 HDMI outputs, 1 DP output, 1 dual-channel LVDS interface and backlight control and touch screen interface, 1 HDMI input, supports audio input and output, can be connected to a 10W@8  $\Omega$  stereo sound box, has a built-in M.2 NVMe 2280 solid-state drive interface, and supports multi-screen independent display.

The LPB3588 intelligent computer supports 4-relay control, including 4 groups of normally open, normally closed, and COM ports; supports 4 switch inputs, each with optocoupler isolation, supporting active input (up to 36V) or passive input; supports 4 analog inputs, supporting 0~16V voltage detection or 4-20mA current detection, and can be connected to various sensors externally.

The LPB3588 supports multiple operating systems such as Android, buildroot, Debian, and Ubuntu, offering excellent high performance, high reliability, and high scalability. The system source code is open to users, providing open-source support for secondary development and customization. We are committed to providing developers and enterprise users with comprehensive technical services to assist users in efficiently completing research and development work and helping customers quickly bring products to market.



## 2. Function Overview



### High-Performance Processor

<b>CPU</b>	8nm advanced process technology with an 8-core 64-bit architecture (4A76 + 4A55), offering high performance with low power consumption.
<b>GPU</b>	ARM Mali-G610 MC4 GPU, featuring a dedicated 2D graphics acceleration module.
<b>NPU</b>	6TOPS computing power for AI-related tasks.
<b>VPU</b>	Capable of 8K video encoding and decoding, as well as 8K display output.
<b>DDR</b>	LPDDR4 memory, with options for 4GB, 8GB, or 16GB capacities.
<b>eMMC</b>	eMMC 5.1 storage, with options for 32GB, 64GB, or 128GB capacities.



### Rich Interfaces

9-36V wide voltage input
3 HDMI outputs, 1 HDMI input, 1 DP interface output, 1 Type-C with DP1.4 display interface output, 1 dual 8-bit LVDS output, supporting up to 6 screens with independent display.
2 Gigabit Ethernet ports, dual-band WIFI 6, expandable with 4G/5G modules
3 Type-A USB 3.0 HOSTs
2*Uart, 2*CAN BUS, 4*RS232, 1*RS485
4*Relays, 4*digital input, 4*analog input



## Scalable NPU Computing Power

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NPU computational power can be expanded up to 12 TOPS; capable of externally connecting two 3 TOPS computational power cards.

Demo programs are provided.

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## Operating System

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Android

Linux (Buildroot / Debian / Ubuntu)

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## Open Source Materials

WIKI Documentation <http://www.neardi.com/cms/en/wiki.html>

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Quick Start

Firmware Upgrade

Android Development

Linux Development

Kernel Drivers

DEMO

System Customization

Accessories

Frequently Asked Questions (FAQ)

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## Release Notes

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### Hardware Materials

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Product 2D/3D Drawings

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### Software Materials

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Firmware Tools and Drivers

Android Source Code and Images

U-Boot and Kernel Source Code

Debian/Ubuntu/Buildroot System Files

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### 3. Technical Specifications

#### Basic Parameters

SOC	RK3588 8nm; 8-core 64-bit processor architecture (4A76 + 4A55).
GPU	ARM Mali-G610 MC4; Supports OpenGL ES 1.1/2.0/3.1/3.2; Vulkan 1.1/1.2; OpenCL 1.1/1.23/2.0; High-performance 2D image acceleration module.
NPU	6TOPS computing power / 3-core architecture; Supports int4/int8/int16/FP16/BF16/TF32.
VPU	Supports H.265/H.264/AV1/VP9/AVS2 video decoding, up to 8K60FPS; Supports H.264/H.265 video encoding, up to 8K30FPS.
DDR	LPDDR4, with options for 4GB/8GB/16GB.
eMMC	eMMC 5.1, with options for 32GB/64GB/128GB.
PMU	RK806
OS	Android / Ubuntu / Buildroot / Debian

#### Hardware Specifications

Power	DC 9-36V
USB	3*Type-A USB3.0 HOST 1*Type-c USB3.1 OTG
	3*Type-A HDMI 2.0
Display out	1* DP1.2 1*Duel channel LVDS

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Display in	1* HDMI-IN
	1*φ3.5mm audio out,
Audio	1*φ3.5mm microphone
	2*Speaker output with 10W@8Ω
Net work	2*10/100/1000Mbps Ethernet
expandable	1*mini PCIe for AI cards (optional) ;
interface	M.2 NGFF ( M-KEY ) PCIE V2.1 x4 with NVMe SSD supported ;
	1*SATA3.0
Connectivity	2*Uart, 2*CAN BUS, 4*RS232, 1*RS485
Input/output	4*Relays, 4*digital input, 4*analog input

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### Other Parameters

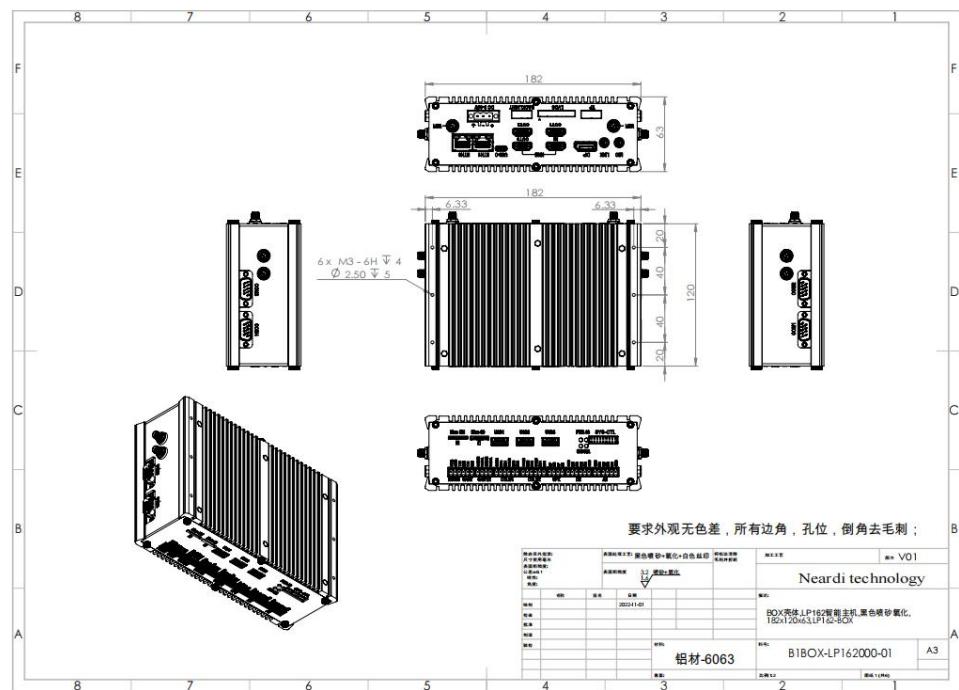
Dimensions	L*W*H(mm) 182*120*63
Operating	-10 ~ 70°C
Temperature	
Weight	Approximately 1132g (excluding peripherals)

## 4. Appearance and Dimensions

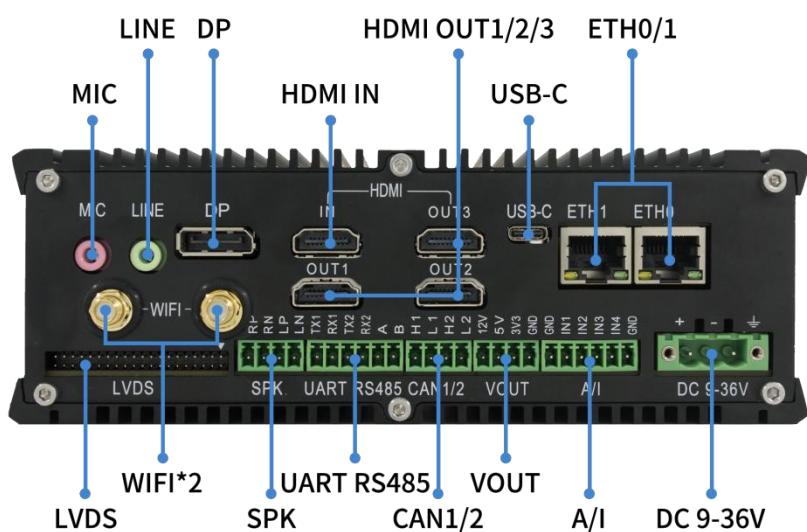
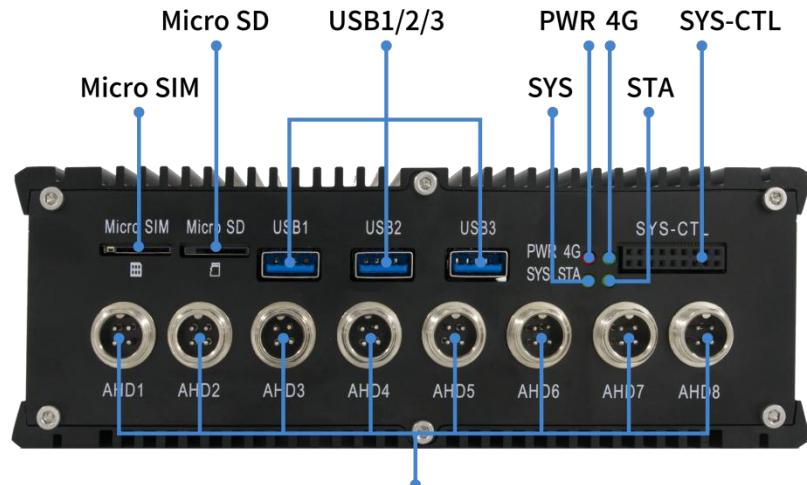
### 4.1 Appearance



### 4.2 Dimensions



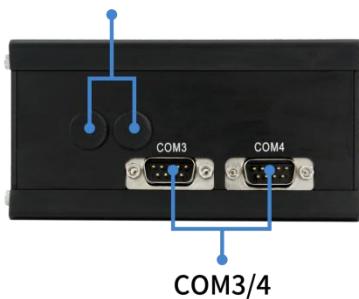
## 5. Interface Definition



Reserved Antenna Interface\*2



Reserved Antenna Interface\*2



Part Name	Part Specifications	Part Notes
MIC	φ3.5mm 3-L Jack	Micphone In
LINE	φ3.5mm 3-L Jack	L/R audio out
DP	VGA output	DP Output up to 1920*1080@60HZ
HDMI IN	Type-A HDMI 2.0	HDMI 2.0 input up to 4K@30HZ(系统版本不同规格不同)
HDMI OUT1	Type-A HDMI 2.1	HDMI 2.0 output up to 4K@60HZ(系统版本不同规格不同)
HDMI OUT2	Type-A HDMI 2.1	HDMI 2.0 output up to 4K@60HZ(系统版本不同规格不同)
HDMI OUT3	Type-A HDMI 2.0	HDMI 2.0 output up to 4K@30HZ(系统版本不同规格不同)
USB-C	Type-C USB3.1 otg	Full function type-C USB3.1 with DP output
EHT 1	Gigabit Ethernet	10/100/1000-Mbps data transfer rates
ETH 0	Gigabit Ethernet	10/100/1000-Mbps data transfer rates
WIFI*2	SMA connector	2.4G/5.8G frequency
TP	PH2.0mm 6pin wafer	I2C signal with RST and EN
LVDS	PH2.0mm 2x15pin header	Dual channel 24bit LVDS output
BACKLIGHT	PH2.0mm 2x20pin header	LCD backlight control
DC 9-36V	KF2EDGRM-5.08-3P	Can used with DC-12V simultaneously

Micro-SD	Push-Push TF socket	TF Card
USB1	Type-A USB3.0 host	The first USB3.0 host for external devices
USB2	Type-A USB3.0 host	The second USB3.0 host for external devices

USB3	Type-A USB3.0 host	The third USB3.0 host for external devices
PWR/SYS	Red and Green LEDs	Power status indicate
SYS-CTL	System control or debug	2.54MMpitch,2*9PIN,A2541HWR-2x9P
RS485 UART	KF2EDGR-3.5-6P	RS485 signal, UART 3.3V TTL signal
CAN1/2	KF2EDGR-3.5-4P	CAN bus signal
CTL1/2	KF2EDGR-3.5-6P	Relays control
CTL3/4	KF2EDGR-3.5-6P	Relays control
SPK	KF2EDGR-3.5-4P	L/R output with 10W@8Ω
D/I	KF2EDGR-3.5-6P	Photocoupler isolation, up to 36V, active or passive
A/I	KF2EDGR-3.5-6P	0-16V voltage detect or 4-20mA current detect
COM1	DB-9 male connector	RS232 signal
COM2	DB-9 male connector	RS232 signal
COM3	DB-9 male connector	RS232 signal
COM4	DB-9 male connector	RS232 signal

## 6. Application Scenarios



AI



Machine Vision



Industrial Control



Energy and Power



Smart Tablet



VR



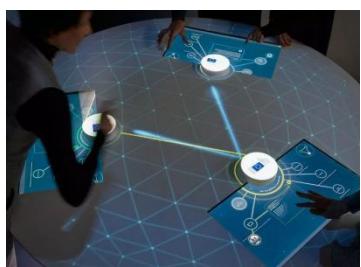
Smart Logistics



New



Smart Commercial



Object Recognition



Vehicle terminal



Security Surveillance

## 7.Ordering Model

Product Model	Status	CPU	DDR	eMMC	Operating Temperature
LP16243200	ACTIVE	RK3588	4GB	32GB	-10°C - 70°C
LP16286400	ACTIVE	RK3588	8GB	64GB	-10°C - 70°C
LP1629A800	ACTIVE	RK3588	16GB	128GB	-10°C - 70°C

\*For customized non-standard orders, please contact us via email at [sales@neardi.com](mailto:sales@neardi.com).

## 8. About Neardi

Shanghai Neardi Technology Co., Ltd., established in 2014, is a national-level high-tech enterprise, a strategic partner of Rockchip, and an authorized agent for Black Sesame Technologies. We focus on the research and development and production of enterprise-level open-source hardware platforms, offering customers core modules, industry-specific boards, development boards, touch panels, and industrial control hosts. Adhering to the core philosophy of technological innovation and professional service, leveraging Neardi Technology's technical strengths and industry experience, we assist our partners in achieving rapid mass production of their products.

### Company Advantages

Software Design / Custom OS / Product ODM / Bulk Delivery

### Products

#### FCC Warning

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

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

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

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### Radiation Exposure Statement

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