neardi

LKD3588 Development Board

Datasheet

V1.0

Shanghai Neardi Technology Co., Ltd.

www.neardi.com

Notes: All contengs only for explanatory and descriptive purposes. Please refer to the actual product. We strive to ensure consistency with the actual product. This document is provided for customers as a reference for product design and end application. It is better for you confirm the specifications and parameters carefully, provided in the document to ensure they meet the design or application requirements of the product. Whatsmore, it is strongly recommended that customers conduct detailed tests based on our actual products in the actual application scenario to ensure they meet the final usage requirements. Neardi Technology does not assume any responsibility for any damage suffered due to the use of the document, materials, and product functions.

Due to product version upgrades or other needs, our company may update the manual. If you need the latest version of the manual, please contact our company. We always adhere to the principle of customer first and provide customers with fast and efficient support services. If you have any needs, please feel free to contact our company at any time. Contact information is as follows:

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Version History

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

Contents

1.Product Introduction

The LKD3588 is an exquisitely designed multifunctional development and evaluation board based on the Rockchip RK3588 chip platform, consisting of our company's LCB3588 core module and baseboard. The core module is connected to the baseboard via a B2B connector and secured with four M2 screws, ensuring stability and reliability. The board is versatile, with a rich set of interfaces, compact size, and slim profile, suitable for products with limited structural space.

The LKD3588 features 3*Type-A USB 3.0 HOST ports, 1*Type-C USB 3.1 OTG, and 1*USB 2.0 HOST interface with a 4-pin PH2.0 connector, capable of connecting multiple USB cameras externally. It also has 2 mini-PCIe interfaces that, in addition to supporting 4G modules, can also connect to NPU computing cards based on the RK1808 mini-PCIe interface. The LKD3588 also supports dual-band WIFI 6, BT5.0, dual 1000M Ethernet, UART, I2C, RS232, RS485, CANBUS, and other common communication module interfaces. It supports 3*HDMI outputs, 1 *dual-channel LVDS output, 1*DP interface output, and various display interfaces, supporting multi-screen independent display. Additionally, it supports multiple MIPI-CSI camera interface inputs and 1* HDMI 2.0 interface input.

The LKD3588 supports Android, buildroot, Debian, and Ubuntu systems, offering advantages such as high performance, high reliability, and high scalability, and provides users with open system source code. Users can develop and customize based on this product, and our company provides comprehensive technical support for developers and enterprise users, enabling them to efficiently complete research and development work and significantly shorten the product development and mass production cycle.

2. Function Overview

High-Performance Processor

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

Rich Interfaces

3 HDMI 2.0 outputs, 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.

4 MIPI CSI interfaces, supporting up to 6 MIPI camera inputs.

2 Gigabit Ethernet ports, dual-band WIFI 6.

2 MIPI PCIe interfaces, expandable for 4G/5G modules, expandable for computational power cards.

1 M.2 M-Key interface, supporting external NVMe protocol 2280 form factor.

3 Type-A USB 3.0 HOSTs, 1 Type-C USB 3.1 OTG with DP display, 1 4-Pin PH2.0 socket USB 2.0 HOST.

Scalable NPU Computing Power

NPU computational power can be expanded up to 38 TOPS; capable of externally connecting 1 computational card with 26 TOPS of computational power and 2 computational cards with 3 TOPS each.

Demo programs are provided.

Operating System

Android

Linux （Buildroot / Debian / Ubuntu）

Kylin

Open Source Materials

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

Quick Start

Firmware Upgrade

Android Development

Linux Development

Kernel Drivers

DEMO

System Customization

Accessories

Frequently Asked Questions (FAQ)

Release Notes

Hardware Materials

Chip Datesheet

Product 2D/3D Drawings

Core Board Pin Definitions

Baseboard Reference Schematic

Baseboard Reference PCB

Key Bill of Materials (BOM)

Software Materials

Firmware Tools and Drivers

Android Source Code and Images

U-Boot and Kernel Source Code

Debian/Ubuntu/Buildroot System Files

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	DC12V - 3A (DC Jack 5.5*2.1mm / PH2.0 wafer connector)
USB	3*Type-A USB3.0 HOST
	1* Type-C USB3.1 OTG
	1*4Pin PH2.0 USB2.0 HOST
Display	2*Type-A HDMI 2.1 up to 8K@60fps or 4K@120fps
	1*Type-A HDMI 1.4 up to 1080P@60fps

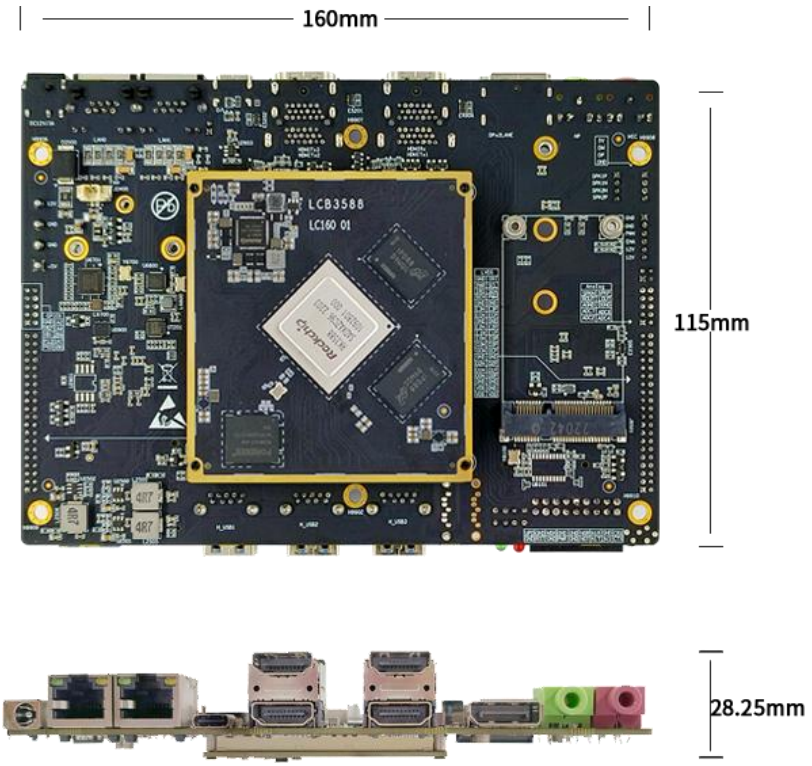
	Duel channel LVDS up to 1080P@60HZ
	1* DP1.4（8K@30fps，type-C multiplexing）
	1*DP1.2 2Lane Output
	1*HDMI-IN（4K@60fps），support HDCP 2.3
Audio	φ3.5mm earphone Jack with L/R audio out
	φ3.5mm micphone Jack with Mic in
	1*HDMI audio out
	2*2.7W/4Ω speaker out with L/R channel
Camera	2* MIPI CSI (4 Lane) or 4*MIPI CSI (2 Lane) + 2* MIPI CSI (4 Lane)
Mini-PCIe	mini PCIe for 2G/3G/4G/5G module
	RK1808 AI computing card
M.2	M.2 NGFF (M-KEY) PCIE V3.0 x4 with NVMe SSD supported
SD card	Compatible with SDIO 3.0 protocol, system boot up supported
SIM card	Micro sim slot for Mini-PCIe 4G LTE module
RJ-45	2*10/100/1000-Mbps data transfer rates
RTC	RTC power on and off supported
Serial port	3*Uart, 1*I2C
Keys	3* keys (power, reset, update)
Power output	12V, 5V, 3.3V,1.8V
Others	5*ADC,1*I2C,2*SATA

Other Parameters

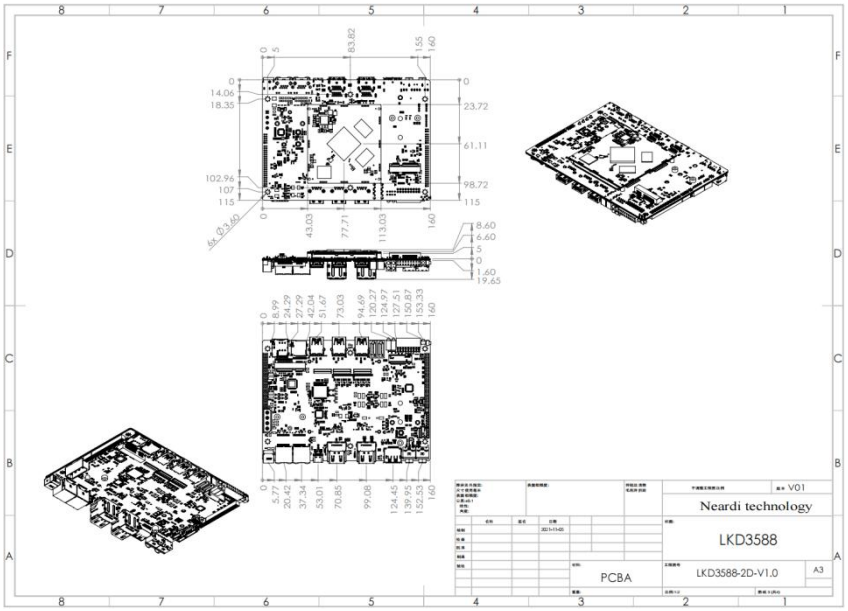
Dimensions	Length * Width * Height (mm) 160*115*28.25
Operating Temperature	-10 ~ 70℃
Weight	Approximately 200g (excluding peripherals)

4. Appearance and Dimensions

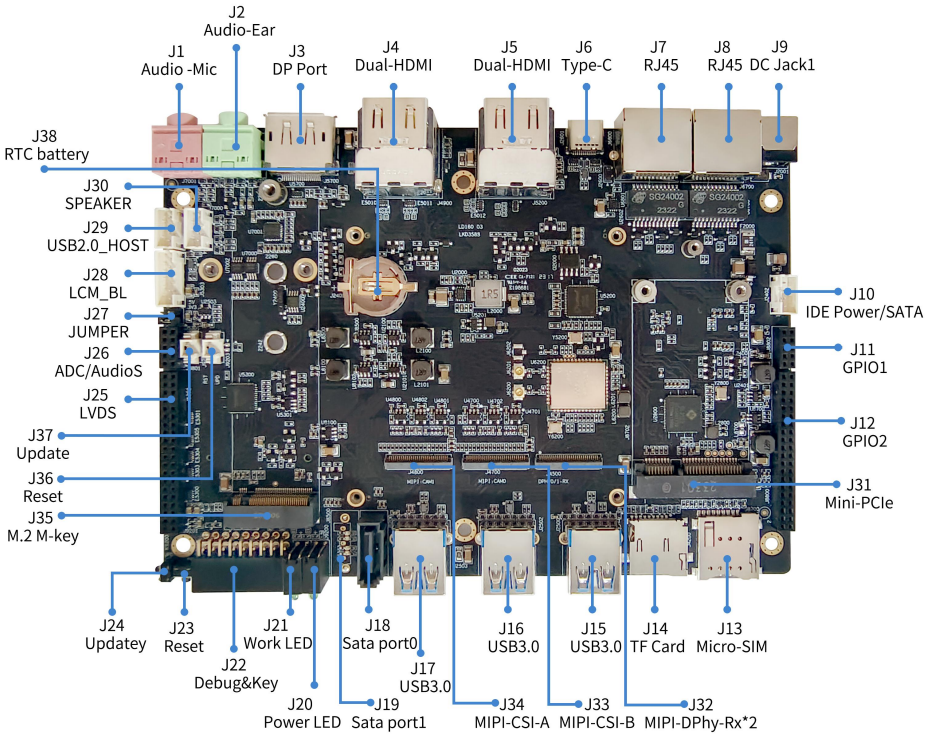
4.1 Appearance

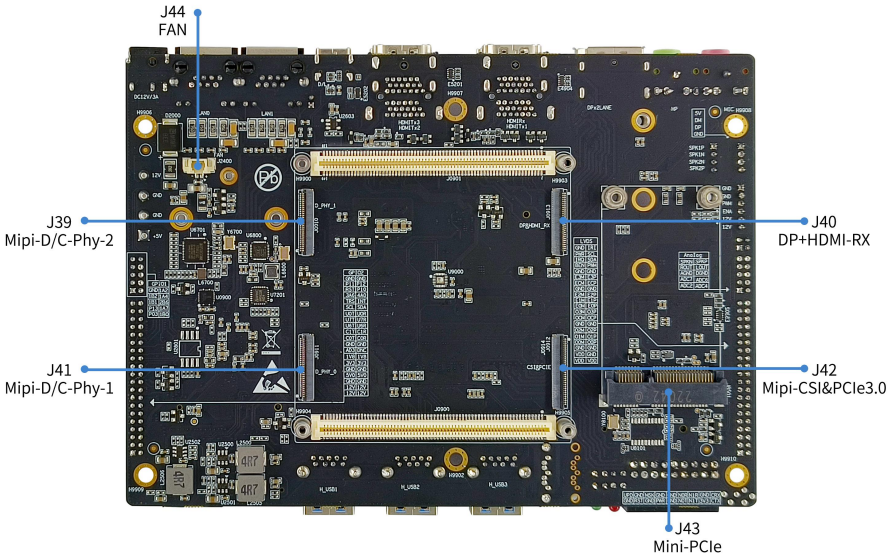


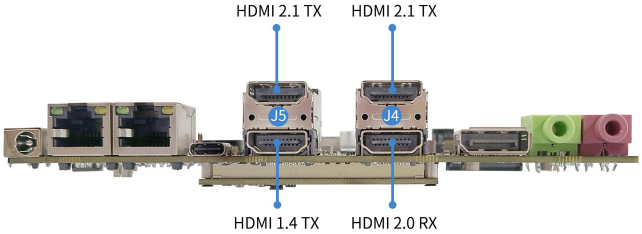
4.2 Dimensions



5.Interface Definition







Part reference	Part Name	Part Specifications	Part Description
J1	Audio Jack-Mic	φ3.5mm 3-L Jack	Micphone In
J2	Audio Jack-Ear	φ3.5mm 3-L Jack	L/R audio out
J3	DP Port	DisplayPort Socket	DP 2-Lane
J4	Dual-HDMI	Type-A HDMI 2in1	HDMI2.0 Rx + HDMI2.1 Tx
J5	Dual-HDMI	Type-A HDMI 2in1	HDMI1.4 Tx + HDMI2.1 Tx
J6	Type-C	Type-C Socket	Type-C with USB3.0 or Display port
J7	RJ45	Gigabit Ethernet	10/100/1000-Mbps data transfer rates
J8	RJ45	Gigabit Ethernet	10/100/1000-Mbps data transfer rates
J9	DC Jack1	DC 5.5*2.1mm	Main power supply, DC12V – 3A
J10	IDE Power	5.08mm pitch 4pin	Power for IDE/SATA Harddisk
J11	GPIO1	PH2.0mm 2x5pin header	GPIO for external usage
J12	GPIO2	PH2.0mm 2x20pin header	GPIO and Power for external usage
J13	Micro-SIM	Push-Push Micro SIM Socket	For Micro SIM Card (1.8/3.3V)
J14	TF Card	Push-Push TF socket	TF Card
J15	USB3.0	Type-A USB3.0 HOST	USB3.0 HOST
J16	USB3.0	Type-A USB3.0 HOST	USB3.0 HOST
J17	USB3.0	Type-A USB3.0 HOST	USB3.0 HOST
J18	Sata port0	7-pin SATA Port	SATA 3.0 Port
J19	Sata port1	7-pin SATA Port	SATA 3.0 Port
J20	Power LED	Red and Green LEDs	Power status indicate
J21	Work LED	Green led *2	Work status and 3G/4G Module Status Indicator
J22	Debug&Key	PH2.54mm 2x9pin Receptacle	Debug and Key and 3.3V out
J23	Reset	push-button	Key for system reset
J24	Update	push-button	Key for system recovery or other function
J25	LVDS	PH2.0mm 2x20pin header	Dual channel 24bit LVDS output
J26	ADC/Audio	PH2.0mm 2x5pin header	ADC In and Audio Out
J27	JUMPER	PH2.0mm 2x2pin header	Voltage Select for LVDS Panel Power
J28	LCM_BL	PH2.0mm 6pin wafer	LCM backlight control
J29	USB2.0_HOST	PH2.0mm 4pin wafer	USB2.0 host for external devices

J30	SPEAKER	PH2.0mm 4pin wafer	Dual channel audio Output for Speaker
J31	Mini-PCIe	Mini-PCIe 52pin socket	For 2G/3G/4G LTE module used
J32	MIPI-DPhy-Rx*2	30pin 0.5mm pitch FPC connector	Dual MIPI 4Lane Rx
J33	MIPI-CSI-B	30pin 0.5mm pitch FPC connector	MIPI-CSI 4lane or 2*2Lane for external cameras
J34	MIPI-CSI-A	30pin 0.5mm pitch FPC connector	MIPI-CSI 4lane or 2*2Lane for external cameras
J35	M.2 M-key	Standard M.2 M-key connector	M.2 NGFF (M-KEY) with PCIE V3.0*4Lane
J36	Reset	PH2.0mm 2pin wafer	Connector for external Reset key
J37	Update	PH2.0mm 2pin wafer	Connector for external update key
J38	RTC battery	CR1220 Socket	RTC battery power input 3.0V
J39	Mipi-D/C-Phy-2	30pin 0.5mm pitch FPC connector	Signals come from CoreBoard
J40	DP+HDMI-RX	30pin 0.5mm pitch FPC connector	Signals come from CoreBoard
J41	Mipi-D/C-Phy-1	30pin 0.5mm pitch FPC connector	Signals come from CoreBoard
J42	Mipi-CSI&PCIe3.0	30pin 0.5mm pitch FPC connector	Signals come from CoreBoard
J43	Mini-PCIe	Mini-PCIe 52pin socket	For External NPU module
J44	FAN	PH2.0mm 2pin wafer	12V Output for FAN Power

6. Pin Definition

Audio Jack-Mic (J1)

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	Mic in	-	Vp-p < 0.8V
3	NC	-	-
4	NC	-	-
5	Mic in	-	Vp-p < 0.8V

Audio Jack-Earphone (J2)

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	EarPhone right out	-	0.5V RMS @32Ohm Load
3	NC	-	Not Connected
4	Detect	-	Low-Plug Out; High-Plug In
5	EarPhone right out	-	0.5V RMS @32Ohm Load

DP Port – 2Lane data (J3)

Pin number	Pin name	Voltage level	Notice
1	Lane0+	-	Data0 plus
2	GND	GND	-
3	Lane0-	-	Data0 minus
4	GND	GND	-
5	Lane1+	-	Data1 plus
6	GND	GND	-
7	Lane1-	-	Data1 minus
8	GND	GND	-
9	NC	-	Not Connected
10	NC	-	Not Connected
11	GND	GND	-
12	NC	-	Not Connected
13	Config0	-	Pull Down by 1M resistor
14	Config1	-	Pull Down by 1M resistor
15	AUXP	-	AUX plus
16	GND	GND	-
17	AUXN	-	AUX minus
18	HPD	-	Hot Plug Detect(GPIO3_D5_d)
19	GND	GND	-
20	3V3	3.3V	3.3V Output

Dual-HDMI (J4)

Pin number	Pin name	Voltage level	Notice
U1	D2P	-	HDMI2.1 Output 0

U2	D2_GND	GND	-
U3	D2N	-	HDMI2.1 Output 0
U4	D1P	-	HDMI2.1 Output 0
U5	D1_GND	GND	-
U6	D1N	-	HDMI2.1 Output 0
U7	D0P	-	HDMI2.1 Output 0
U8	D0_GND	GND	-
U9	D0N	-	HDMI2.1 Output 0
U10	CLKP	-	HDMI2.1 Output 0
U11	CLK_GND	GND	-
U12	CLKN	-	HDMI2.1 Output 0
U13	NC	-	Not Connected
U14	AUXP	-	AUXP for eARC
U15	SCL	5V	I2C-SCL for HDMI2.1 Tx0(GPIO4_B7_u)
U16	SDA	5V	I2C-SDA for HDMI2.1Tx0(GPIO4_C0_u)
U17	GND	GND	-
U18	+5V	+5V	-
U19	AUXN	-	AUXN for eARC
D1	D2P	-	HDMI 2.0 Rx
D2	D2_GND	-	-
D3	D2N	-	HDMI 2.0 Rx
D4	D1P	-	HDMI 2.0 Rx
D5	D1_GND	-	-
D6	D1N	-	HDMI 2.0 Rx
D7	D0P	-	HDMI 2.0 Rx
D8	D0_GND	-	-
D9	D0N	-	HDMI 2.0 Rx
D10	CLKP	-	HDMI 2.0 Rx
D11	CLK_GND	-	-
D12	CLKN	-	HDMI 2.0 Rx
D13	NC	-	-
D14	NC	-	-
D15	SCL	5V	I2C-SCL for HDMI 2.0 Rx(GPIO3_D2_d)
D16	SDA	5V	I2C-SCL for HDMI 2.0 Rx(GPIO3_D5_d)
D17	GND	-	-
D18	+5V	-	-
D19	HPD	-	HPD for HDMI 2.0 Rx(GPIO3_D4_d)

Dual-HDMI（J5）

Pin number	Pin name	Voltage level	Notice
U1	D2P	-	HDMI2.1 Output 1
U2	D2_GND	GND	-

U3	D2N	-	HDMI2.1 Output 1
U4	D1P	-	HDMI2.1 Output 1
U5	D1_GND	GND	-
U6	D1N	-	HDMI2.1 Output 1
U7	D0P	-	HDMI2.1 Output 1
U8	D0_GND	GND	-
U9	D0N	-	HDMI2.1 Output 1
U10	CLKP	-	HDMI2.1 Output 1
U11	CLK_GND	GND	-
U12	CLKN	-	HDMI2.1 Output 1
U13	NC	-	Not Connected
U14	AUXP	-	AUXP for eARC
U15	SCL	5V	I2C-SCL for HDMI2.1 Tx0(GPIO3_C6_u)
U16	SDA	5V	I2C-SDA for HDMI2.1Tx0(GPIO3_C5_u)
U17	GND	GND	-
U18	+5V	+5V	-
U19	AUXN	-	AUXN for eARC
D1	D2P	-	HDMI 2.0 Rx
D2	D2_GND	-	-
D3	D2N	-	HDMI 1.4 Tx
D4	D1P	-	HDMI 1.4 Tx
D5	D1_GND	-	-
D6	D1N	-	HDMI 1.4 Tx
D7	D0P	-	HDMI 1.4 Tx
D8	D0_GND	-	-
D9	D0N	-	HDMI 1.4 Tx
D10	CLKP	-	HDMI 1.4 Tx
D11	CLK_GND	-	-
D12	CLKN	-	HDMI 1.4 Tx
D13	NC	-	-
D14	NC	-	-
D15	NC	5V	Pulled Up by 4.7K Resistor
D16	NC	5V	Pulled Up by 4.7K Resistor
D17	GND	-	-
D18	+5V	-	-
D19	HPD	-	Hot Plug Detect for HDMI 1.4 Tx

Type-C（J6）

Pin number	Pin name	Voltage level	Notice
A1	GND	GND	-
A2	TYPEC0TX1P	-	-
A3	TYPEC0TX1N	-	-

A4	VBUS5V0_TYPEC	+5V	-
A5	TYPEC0_CC1	-	-
A6	TYPEC0_OTGDP	-	-
A7	TYPEC0_OTGDM	-	-
A8	TYPEC0_AUXP	-	-
A9	VBUS5V0_TYPEC	+5V	-
A10	TYPEC0RX2N	-	-
A11	TYPEC0RX2P	-	-
A12	GND	GND	-
B1	GND	GND	-
B2	TYPEC0TX2P	-	-
B3	TYPEC0TX2N	-	-
B4	VBUS5V0_TYPEC	+5V	-
B5	TYPEC0_CC2	-	-
B6	TYPEC0_OTGDP	-	-
B7	TYPEC0_OTGDM	-	-
B8	TYPEC0_AUXM	-	-
B9	VBUS5V0_TYPEC	+5V	-
B10	TYPEC0RX1N	-	-
B11	TYPEC0RX1P	-	-
B12	GND	GND	-

RJ45 (J7)

Pin number	Pin name	Voltage level	Notice
1	DA+	-	-
2	DA-	-	-
3	DB+	-	-
4	DC+	-	-
5	DC-	-	-
6	DB-	-	-
7	DD+	-	-
8	DD-	-	-

RJ45 (J8)

Pin number	Pin name	Voltage level	Notice
1	DA+	-	-
2	DA-	-	-
3	DB+	-	-
4	DC+	-	-
5	DC-	-	-
6	DB-	-	-
7	DD+	-	-
8	DD-	-	-

DC Jack1 (J9)

Pin number	Pin name	Voltage level	Notice

1	DC-IN	12V	DC 12V/3A Input
2	GND	GND	-
3	GND	GND	-
4	EARTH	-	Connected to GND by 1M Resistor//1nF Capacitor
5	EARTH	-	
6	NC	NC	Not Connected

IDE Power (J10)

Pin number	Pin name	Voltage level	Notice
1	+5V	GND	-
2	GND	GND	-
3	GND	+5V	+5V/2.5A Output
4	+12V	+12V	+12V Output

GPIO1 (J11)

Pin number	Pin name	Voltage level	Notice
1	EXTIO_P0_3	3.3V	Extended IO from AW9523
2	MIPI_CAM4_PDN_L	1.8V	GPIO1_B0_u
3	EXTIO_P1_3	3.3V	Extended IO from AW9523
4	MIPI_CAM3_PDN_L	1.8V	GPIO1_A7_u
5	MIPI_CAM4_PWREN_H	1.8V	GPIO0_B1_d
6	MIPI_CAM3/4_RESET_L	1.8V	GPIO2_B6_d
7	MIPI_CAM3_PWREN_H	1.8V	GPIO1_B2_d
8	MIPI_CAM2_PDN_L	1.8V	GPIO1_A4_d
9	GND	GND	-
10	MIPI_CAM1_PDN_L	1.8V	GPIO1_A2_d

GPIO2 (J12)

Pin number	Pin name	Voltage level	Notice
1	VCC12V_DCIN	12V	+12V Input/Output
2	VCC12V_DCIN	12V	
3	VCC12V_DCIN	12V	
4	VCC12V_DCIN	12V	
5	GND	GND	-
6	GND	GND	-
7	VCC_5V0	5V	+5V Output (2A)
8	VCC_5V0	5V	
9	GND	GND	-
10	GND	GND	-
11	VCC3V3_EXT	3.3V	+3.3V Output (2A)
12	VCC3V3_EXT	3.3V	
13	VCC1V8_EXT	1.8V	+1.8V Output (0.2A)
14	VCC1V8_EXT	1.8V	
15	SARADC_VIN3_HP_HOOK	0~1.8V	ADC input
16	NC	-	Not Connected

17	GND	GND	-
18	GND	GND	-
19	CAN0_TX_3V3	3.3V	CAN0-Tx-M0/GPIO0_B7_d
20	CAN0_RX_3V3	3.3V	CAN0-Rx-M0/GPIO0_C0_d
21	CAN1_TX_M1	3.3V	CAN1-TX-M1/GPIO4_B3_u
22	CAN1_RX_M1	3.3V	CAN1_RX_M1/GPIO4_B2_u
23	UART6_TX_M2_3V3	3.3V	GPIO1_D0_d
24	UART6_RX_M2_3V3	3.3V	GPIO1_D1_d
25	UART7_TX_M0_3V3	3.3V	GPIO2_B5_u
26	UART7_RX_M0_3V3	3.3V	GPIO2_B4_u
27	UART0_TX_M2_3V3	3.3V	GPIO4_A3_d
28	UART0_RX_M2_3V3	3.3V	GPIO4_A4_d
29	I2C6_SCL_M0_3V3	3.3V	GPIO0_D0_d
30	I2C6_SDA_M0_3V3	3.3V	GPIO0_C7_d
31	TP_RST_L_3V3	3.3V	GPIO3_C1_d
32	TP_INT_L_3V3	3.3V	GPIO3_C0_d(In:3.3V/Out:1.8V)
33	GPIO3A6D_1V8	1.8V	GPIO3_A6_d
34	SPK_CTRL_H_3V3	3.3V	GPIO4_A0_d
35	MIPI_CAM1/2_RESET_L	1.8V	GPIO1_A3_d
36	EXTIO_P1_0	3.3V	Extended IO from AW9523
37	EXTIO_P1_1	3.3V	Extended IO from AW9523
38	EXTIO_P1_2	3.3V	Extended IO from AW9523
39	GND	GND	-
40	GND	GND	-

Micro-SIM (J13)

Pin number	Pin name	Voltage level	Notice
1	CD	SIM_VCC	SimCard insert detect - Low:SIM card pluged in; High: SIM card pulled out.
2	NC	-	-
3	NC	-	-
4	SIM-IO	SIM_VCC	Data of SIM Card
5	SIM-Clock	SIM_VCC	Clock of SIM Card
6	NC	-	-
7	SIM-Reset	SIM_VCC	Reset of SIM Card
8	GND	-	-
9	SIM-VCC	-	1.8V/3.3V Auto Switched

TF Card (J14)

Pin number	Pin name	Voltage level	Notice
1	Data2	VCCIO_SD	GPIO4_D2_u
2	Data3	VCCIO_SD	GPIO4_D3_u
3	CMD	VCCIO_SD	GPIO4_D4_u
4	VDD	VCCIO_SD	-

5	CLK	VCCIO_SD	GPIO4_D5_d
6	GND	GND	-
7	Data0	VCCIO_SD	GPIO4_D0_u
8	Data1	VCCIO_SD	GPIO4_D1_u
9	Card-Detect	1.8V	GPIO0_A4-u

USB3.0 Host (J15)

Pin number	Pin name	Voltage level	Notice
1	VBUS	+5V	5V/1A Output
2	D-	GND	USB 1.1/2.0 DP
3	D+	-	USB 1.1/2.0 DM
4	GND	GND	-
5	RX-	-	USB3.0 SSRX-
6	RX+	-	USB3.0 SSR+
7	GND	GND	-
8	TX-	-	USB3.0 SSTX-
9	TX+	-	USB3.0 SSTX+

USB3.0 Host (J16)

Pin number	Pin name	Voltage level	Notice
1	VBUS	+5V	5V/1A Output
2	D-	GND	USB 1.1/2.0 DP
3	D+	-	USB 1.1/2.0 DM
4	GND	GND	-
5	RX-	-	USB3.0 SSRX-
6	RX+	-	USB3.0 SSR+
7	GND	GND	-
8	TX-	-	USB3.0 SSTX-
9	TX+	-	USB3.0 SSTX+

USB3.0 Host (J17)

Pin number	Pin name	Voltage level	Notice
1	VBUS	+5V	5V/1A Output
2	D-	GND	USB 1.1/2.0 DP
3	D+	-	USB 1.1/2.0 DM
4	GND	GND	-
5	RX-	-	USB3.0 SSRX-
6	RX+	-	USB3.0 SSR+
7	GND	GND	-
8	TX-	-	USB3.0 SSTX-
9	TX+	-	USB3.0 SSTX+

Sata port0 (J18)

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	TXP	-	Transmit differential signal for Sata 3.0
3	TXN	-	

4	GND	GND	-
5	RXN	-	Receive differential signal for Sata 3.0
6	RXP	-	
7	GND	GND	-

Sata port1 (J19)

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	TXP	-	Transmit differential signal for Sata 3.0
3	TXN	-	
4	GND	GND	-
5	RXN	-	Receive differential signal for Sata 3.0
6	RXP	-	
7	GND	GND	-

Note: If this socket is used, the PCIe2.0 function in "J41" can not be used.

Power LED (J20)

Pin number	Pin name	Voltage level	Notice
1	LED1+	-	Red LED for Power OK
2	LED1-	-	-
3	LED2+	-	Green LED for system status
4	LED2-	-	-

Work LED (J21)

Pin number	Pin name	Voltage level	Notice
1	LED1+	-	Green LED for 3G/4G Modue
2	LED1-	-	-
3	LED2+	-	Green LED for system status
4	LED2-	-	-

Debug&Key (J22)

Pin number	Pin name	Voltage level	Notice
1	CPU_DBG_TX	3.3V	1.5M bps Datarate/GPIO0_B5_d
2	CPU_DBG_RX	3.3V	1.5M bps Datarate/GPIO0_B6_d
3	VCC3V3_EXT	3.3V	3.3V/1A Output
4	GND	GND	-
5	NPU1_TX	3.3V	UART From PCIe Slot(J41)
6	NPU1_RX	3.3V	UART From PCIe Slot(J41)
7	NPU2_TX	3.3V	UART From PCIe Slot(J33)
8	NPU2_RX	3.3V	UART From PCIe Slot(J33)
9	GND	GND	-
10	GND	GND	-
11	PWR_KEY	+3.3V	Pulled up internally by 30K Ohm resistor
12	GND	GND	-

13	GND	-	-
14	BOOT_SARADC_IN0_IO	-	Pulled up internally. Pull Low to make system enter USB download mode
15	RST_KEY	-	Pulled up internally. Pull Low to reboot the entire system.
16	GND	GND	-
17	GND	GND	-
18	UPDATE_KEY	-	Key for system recovery or other function

Reset Key (J23)

Pin number	Pin name	Voltage level	Notice
1	RESETn	-	Push to Reset the system

Update (J24)

Pin number	Pin name	Voltage level	Notice
1	SARADC_VIN1	0~1.8V	Key for system recovery or other function

LVDS (J25)

Pin number	Pin name	Voltage level	Notice
1	VCC_LVDS	3.3V/5V optional by J27	-
2	VCC_LVDS		-
3	VCC_LVDS		-
4	GND	GND	-
5	GND	GND	-
6	GND	GND	-
7	RXO0M	-	-
8	RXO0P	-	-
9	RXO1M	-	-
10	RXO1P	-	-
11	RXO2M	-	-
12	RXO2P	-	-
13	GND	GND	-
14	GND	GND	-
15	RXOCM	-	-
16	RXOCP	-	-
17	RXO3M	-	-
18	RXO3P	-	-
19	RXE0M	-	-
20	RXE0P	-	-
21	RXE1M	-	-
22	RXE1P	-	-
23	RXE2M	-	-
24	RXE2P	-	-
25	GND	GND	-

26	GND	GND	-
27	RXECM	-	-
28	RXECP	-	-
29	RXE3M	-	-
30	RXE3P	-	-
31	GND	-	-
32	GND	-	-
33	LVDS_BL_EN	1.8V	GPIO2_C1_d
34	LVDS_BL_PWM0	1.8V	GPIO4_C6_d
35	LVDS_IRQ	3.3V	Connected to GM8775
36	I2C_SDA_LVDS	1.8V	I2C2_SDA_M4/GPIO1_A0_d
37	LVDS_PWR_EN	1.8V	GPIO1_D6_u
38	I2C_SCL_LVDS	1.8V	I2C2_SCL_M4/GPIO1_A1_d
39	GND	-	-
40	NC	-	Not Connected

ADC/Audio (J26)

Pin number	Pin name	Voltage level	Notice
1	SARADC_VIN2	0～1.8V	ADC Input Channel 5
2	SARADC_VIN4	0～1.8V	ADC Input Channel 4
3	SARADC_VIN7	0～1.8V	ADC Input Channel 7
4	SARADC_VIN6	0～1.8V	ADC Input Channel 6
5	HP_GND	Analog GND	-
6	GND	GND	-
7	HPR_OUT	Analog	HeadPhone Right Channel Output
8	HPL_OUT	Analog	HeadPhone Left Channel Output
9	SPKN_OUT	Analog	Speaker Output N（3W @4 Ohm Load）
10	SPKP_OUT	Analog	Speaker Output P（3W @4 Ohm Load）

JUMPER (J27)

1	1,2 shorted	+3.3V	LVDS Panel Power(J22): +3.3V
2	3,4 shorted	+5V	LVDS Panel Power(J22): +5V

LCM_BL (J28)

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	GND	GND	-
3	BL_ADJ	1.8V	GPIO4_C6_d
4	BL_EN	1.8V	GPIO2_C1_d
5	VCC12V_BL	12V	12V Output for BackLight
6	VCC12V_BL	12V	12V Output for BackLight

USB2.0_HOST (J29)

Pin number	Pin name	Voltage level	Notice

1	+5V	+5V	5V/1A Output
2	D-	-	-
3	D+	-	-
4	GND	GND	-

SPEAKER (J30)

Pin number	Pin name	Voltage level	Notice
1	SPK_OUT_R+	-	3W ClassD audio Output
2	SPK_OUT_R-	-	
3	SPK_OUT_L-	-	3W ClassD audio Output
4	SPK_OUT_L+	-	

Mini-PCIe (J31)

Pin number	Pin name	Voltage level	Notice
2,24,39,41,52	VCC3V6_4G	+3.6V	Power Supply for 4G module
4,9,15,18,21,26,27,29,34,35,37,40,43,50	GND	GND	-
8	SIM_VCC	1.8/3.3V	Depending on the Module
10	4G_SIM_SIO	SIM_VCC	-
12	4G_SIM_CLK	SIM_VCC	-
14	4G_SIM_RST	SIM_VCC	-
22	4G_RESET	OC	GPIO2_D0_d Active High
36	4G_USB_DM	-	-
38	4G_USB_DP	-	-
42	4G_LED	Current Sink	-
17	4G_USB_SSRXN	-	-
19	4G_USB_SSRXP	-	-
31	HOST_WAKEUP_4G	OC	GPIO2_D1_d Active High
49	4G_USB_SSTXN	-	-
51	4G_USB_SSTXP	-	-
All the other pins	NC	-	Not Connected

MIPI-DPhy-Rx*2 (J32)

Pin number	Pin name	Voltage level	Notice
3,6,9,12,15,18,21,24,27,30	GND	GND	-
1	MIPI_DPHY0_RX_CLKP	-	-
2	MIPI_DPHY0_RX_CLKN	-	-
4	MIPI_DPHY0_RX_D0P	-	-
5	MIPI_DPHY0_RX_D0N	-	-
7	MIPI_DPHY0_RX_D1P	-	-
8	MIPI_DPHY0_RX_D1N	-	-
10	MIPI_DPHY0_RX_D2P	-	-
11	MIPI_DPHY0_RX_D2N	-	-
13	MIPI_DPHY0_RX_D3P	-	-

14	MIPI_DPHY0_RX_D3N	-	-
16	MIPI_DPHY1_RX_CLKP	-	-
17	MIPI_DPHY1_RX_CLKN	-	-
19	MIPI_DPHY1_RX_D0P	-	-
20	MIPI_DPHY1_RX_D0N	-	-
22	MIPI_DPHY1_RX_D1P	-	-
23	MIPI_DPHY1_RX_D1N	-	-
25	MIPI_DPHY1_RX_D2P	-	-
26	MIPI_DPHY1_RX_D2N	-	-
28	MIPI_DPHY1_RX_D3P	-	-
29	MIPI_DPHY1_RX_D3N	-	-

MIPI-CSI-B (J33)

Pin number	Pin name	Voltage level	Notice
1,4,7,10,13,16,19	GND	GND	-
2	MIPI_CAM2_RX_D0P	-	-
3	MIPI_CAM2_RX_D0N	-	-
5	MIPI_CAM2_RX_D1P	-	-
6	MIPI_CAM2_RX_D1N	-	-
8	MIPI_CAM2_RX_CLK0N	-	-
9	MIPI_CAM2_RX_CLK0P	-	-
11	MIPI_CAM2_RX_D2P	-	-
12	MIPI_CAM2_RX_D2N	-	-
14	MIPI_CAM2_RX_D3P	-	-
15	MIPI_CAM2_RX_D3N	-	-
17	MIPI_CAM2_RX_CLK1P	-	-
18	MIPI_CAM2_RX_CLK1N	-	-
20	MIPI_CAM2_CLK	1.8V	GPIO1_B7-u
21	CAMB_RST1	1.8V	GPIO2_B6-d
22	CAMB_PDN1_L	1.8V	GPIO1_A7-u
23	CAMB_RST2	1.8V	GPIO2_B6-d
24	CAMB_PDN2_L	1.8V	GPIO1_B0-u
25	I2C_SCL_CAM2	1.8V	I2C2_SCL_M4/GPIO1_A1-d
26	I2C_SDA_CAM2	1.8V	I2C2_SDA_M4/GPIO1_A0-d
27	VCC1V8_DOVDD_DVP0	1.8V	1.8V Output (300mA)
28	VDD1V2_DVDD_DVP0	1.2V	1.2V Output (300mA)
29	VCC2V8_DVP0	2.8V	2.8V Output (300mA)
30	VCC2V8_AVDD_DVP0	2.8V	2.8V Output (300mA)

Note: This MIPI can be used as a 4-Lane or 2*2Lane input.

MIPI-CSI-A (J34)

Pin number	Pin name	Voltage level	Notice
1,4,7,10,13,16,19	GND	GND	-
2	MIPI_CAM1_RX_D0P	-	-

3	MIPI_CAM1_RX_D0N	-	-
5	MIPI_CAM1_RX_D1P	-	-
6	MIPI_CAM1_RX_D1N	-	-
8	MIPI_CAM1_RX_CLK0N	-	-
9	MIPI_CAM1_RX_CLK0P	-	-
11	MIPI_CAM1_RX_D2P	-	-
12	MIPI_CAM1_RX_D2N	-	-
14	MIPI_CAM1_RX_D3P	-	-
15	MIPI_CAM1_RX_D3N	-	-
17	MIPI_CAM1_RX_CLK1P	-	-
18	MIPI_CAM1_RX_CLK1N	-	-
20	MIPI_CAM1_CLK	1.8V	GPIO1_B6-u
21	CAMA_RST1	1.8V	GPIO1_A3-d
22	CAMA_PDN1_L	1.8V	GPIO1_A2-d
23	CAMA_RST2	1.8V	GPIO1_A3-d
24	CAMA_PDN2_L	1.8V	GPIO1_A4-d
25	I2C_SCL_CAM1	1.8V	I2C3_SCL_M0/GPIO1_C1-z
26	I2C_SDA_CAM1	1.8V	I2C3_SDA_M0/GPIO1_C0-z
27	VCC1V8_DOVDD_DVP0	1.8V	1.8V Output (300mA)
28	VDD1V2_DVDD_DVP0	1.2V	1.2V Output (300mA)
29	VCC2V8_DVP0	2.8V	2.8V Output (300mA)
30	VCC2V8_AVDD_DVP0	2.8V	2.8V Output (300mA)
Note: This MIPI can be used as a 4-Lane or 2*2Lane input.			

M.2 M-key (J35)

Pin number	Pin name	Voltage level	Notice
1,3,9,15,21,27,33,39,45,51,57,63,65,67	GND	GND	-
2,4,12,14,16,18,62,64,66	VCC3V3	+3.3V	+3.3V Power Output
5	PCIE30_RX3N	-	-
7	PCIE30_RX3P	-	-
11	PCIE30_TX3_N	-	-
13	PCIE30_TX3_P	-	-
17	PCIE30_RX2N	-	-
19	PCIE30_RX2P	-	-
23	PCIE_TX2_N	-	-
25	PCIE_TX2_P	-	-
29	PCIE30_RX1N	-	-
31	PCIE30_RX1P	-	-
35	PCIE30_TX1N	-	-
37	PCIE30_TX1P	-	-
41	PCIE30_RX0N	-	-

43	PCIE30_RX0P	-	-
47	PCIE30_TX0N	-	-
49	PCIE30_TX0P	-	-
53	PCIE30_REFCLKN	-	-
55	PCIE30_REFCLKN	-	-
50	PCIE30X2_PERSTn_3V3_L	3.3V	GPIO4_B6_d
52	PCIE30X2_CLKREQn_3V3_L	3.3V	GPIO4_B4_u
54	PCIE30X2_WAKEn_3V3_L	3.3V	GPIO4_B5_d
60	PCIE_CLK_32K	3.0V	32K Clock from RTC Chip
All the other pins	NC	-	Not Connected

Reset for external key(J36)

Pin number	Pin name	Voltage level	Notice
1	RESETn	-	Push to Reset the system
2	GND	GND	-

Update for external key (J37)

Pin number	Pin name	Voltage level	Notice
1	SARADC_VIN1	0~1.8V	Key for system recovery or other function
2	GND	GND	-

RTC Battery (J38)

CR1220 lithium battery Socket 3V

Mipi-D/C-Phy-2 (J39)

This connector is used by core board, can NOT be used by customer! See 3588 Coreboard manual for more details.

DP+HDMI-RX (J40)

This connector is used by core board, can NOT be used by customer! See 3588 Coreboard manual for more details.

4.2.41Mipi-CSI&PCIe3.0 (J41)

This connector is used by core board, can NOT be used by customer! See 3588 Coreboard manual for more details.

Mipi-CSI&PCIe3.0 (J42)

This connector is used by core board, can NOT be used by customer! See 3588 Coreboard manual for more details.

Mini-PCIe for AI Card(J43)

Pin number	Pin name	Voltage level	Notice
2,24,39,41,52	VCC3V6_4G	+3.6V	Power Supply for 4G module
4,9,15,18,21,26,27,29,34,35,37,40,43,50	GND	GND	-
22	4G_RESET	OC	GPIO2_D0_d Active High
36	4G_USB_DM	-	-

38	4G_USB_DP	-	-
42	4G_LED	Current Sink	-
17	4G_USB_SSRXN	-	-
19	4G_USB_SSRXP	-	-
31	HOST_WAKEUP_4G	OC	GPIO2_D1_d Active High
49	4G_USB_SSTXN	-	-
51	4G_USB_SSTXP	-	-
All the other pins	NC	-	Not Connected

Fan Power(J44)

Pin number	Pin name	Voltage level	Notice
1	Fan Power out	+12V	+12V out for fan power
2	GND	GND	-

7.Application Scenarios

AI

Machine Vision

Industrial Control

Energy and Power

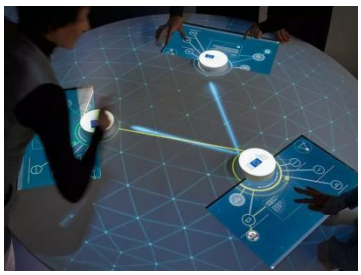
Smart Tablet

VR

Smart Logistics

New

Smart Commercial



Object Recognition

Vehicle terminal

Security Surveillance

8.Ordering Model

Product Model	Status	CPU	DDR	eMMC	Operating Temperature
LZ16243200	ACTIVE	RK3588	4GB	32GB	-10℃ - 70℃
LZ16286400	ACTIVE	RK3588	8GB	64GB	-10℃ - 70℃
LZ1629A800	ACTIVE	RK3588	16GB	128GB	-10℃ - 70℃

*For customized non-standard orders, please contact us via email at sales@neardi.com.

9.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

Rockchip

System On Module


LCB3588/J


LCB3568/J


LCB3566


LCB3399Pro


LCB3399

Development Board


LKD3588/J


LKD3568/J


LKD3566


LKD3399Pro


LKD3399

Embedded Computer


LPB3588


LPM3588


LPC3588


LPB3568


LPB3399Pro

Black Sesame Technologies


SOM-A-A1000


SOM-π-A1000


SOM-B-A1000


SOM-A1000 开发者套件

Vehicle Terminal


LPA3588


LPA3568


LPA3399Pro


LPS3399Pro

WIFI Module

FD7352S

FD7352P

FD7352M

FD7155U

FD7256S