

neardi

LKD3588 开发板
产品手册
V1.0

neardi

上海临滴科技有限公司
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上海临滴科技有限公司

网址：www.neardi.com

电话：+86 21 20952021

邮箱：sales@neardi.com

地址：上海市闵行区联航路 1505 弄 1 号 8 楼

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1 产品概述

1.1 产品描述

LKD3588 是基于瑞芯微 RK3588 芯片平台精心设计的一款多功能行业应用板，其由我司的 LCB3588 核心模块与底板组成。核心模块与底板采用 B2B 连接器的方式连接，并通过 4 颗 M2 的螺丝固定，稳定可靠。整板功能多样，接口丰富，尺寸小巧，轻薄平整，适用于结构空间受限的产品。

LKD3588 板载 3 路 Type-A USB3.0 HOST，1 路 Type-C USB 3.1 otg 以及 1 路 4pin PH2.0 插座 USB2.0 HOST 接口，可以外接多个 USB 摄像头；板载 2 个 mini-PCIE 接口，除了可以外接 4G 模块外还可以外接我司基于 RK1808 开发的 mini-PCIE 接口 NPU 计算卡，可扩展支持 9.0TOPS 算力的人工智能视觉计算板卡；LKD3588 还支持双频 WIFI6、BT5.0、双路 1000M 以太网、UART、I2C、RS232、RS485、CANBUS 等常用通讯模块接口，支持 3 路 HDMI 输出、1 路双通道 LVDS 输出、1 路 DP 接口输出等多种显示接口并支持多屏异显；另外还可支持多路 mipi-csi 摄像头接口输入以及 1 路 HDMI2.0 接口输入。

LKD3588 支持 Android、buildroot、Debian 和 Ubuntu 系统，具备高性能、高可靠性、高扩展性等优势，为用户开放系统源码。用户可基于此款产品二次开发和定制，我司为开发者和企业用户提供全方位的技术支持，使其高效的完成研究开发工作，大量缩短产品研发量产周期。

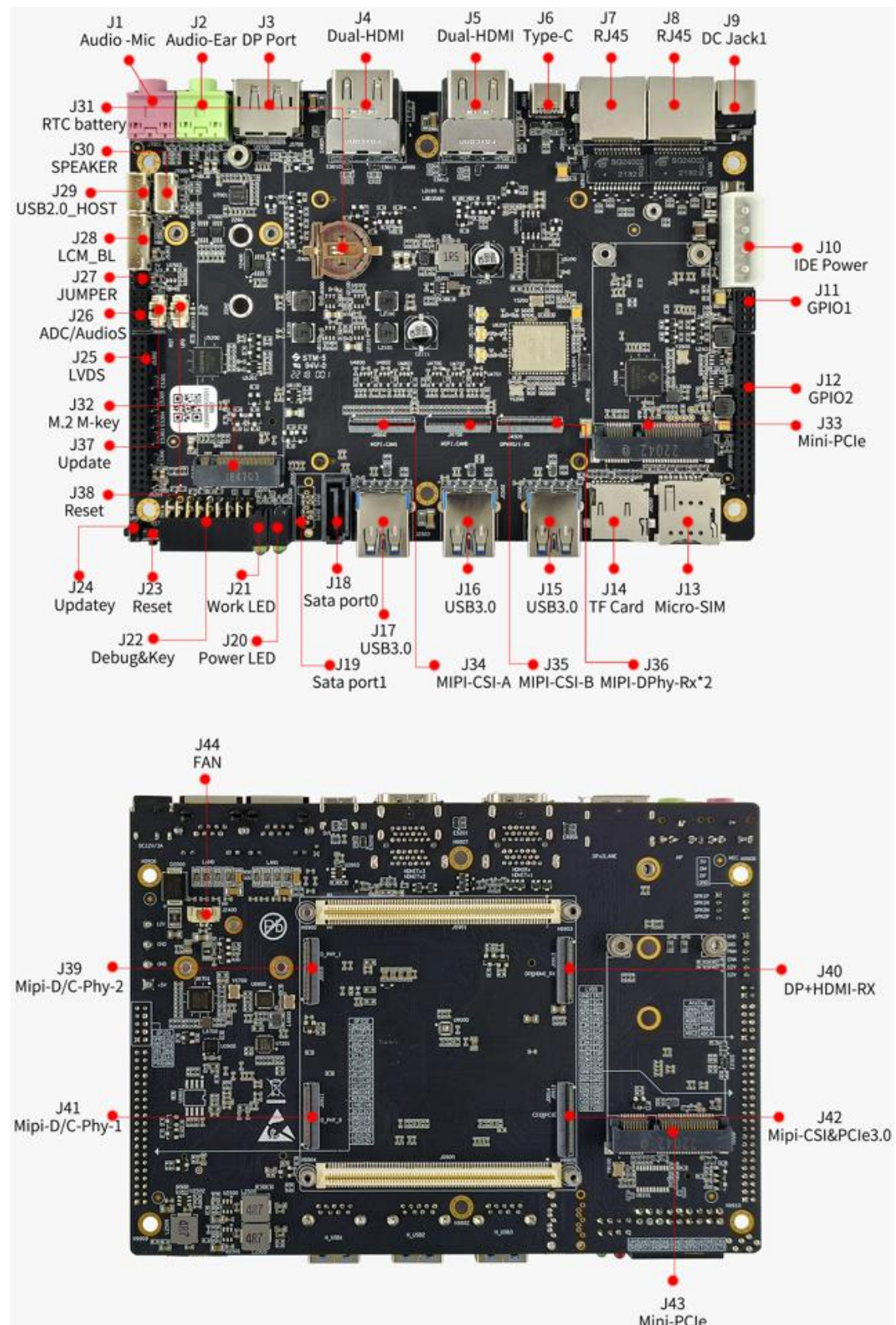


图 1-1

1.2 功能概要

- 供电方式：DC 12V/3A，支持过压，欠压，过流保护；
- 多路 USB 接口：3 路 Type-A USB3.0 HOST，1 路 Type-C USB 3.1 otg 带 DP 显示，1 路 4pin PH2.0 插座 USB2.0 HOST，板内 2 路 USB3.0 到 mini-PCIe 接口；
- 板载 2 个 mipi PCIe 接口，可以接 4G 模块，5G 模块及 RK1808 AI 计算卡；
- 多种显示屏接口：3 路 HDMI2.0 输出，1 路 DP 接口输出，1 路 type-C 带 DP1.4 显示接口输出，1 路双通道 LVDS 显示屏接口，可支持多屏异显；
- 多路网络通讯：双路千兆以太网、双频 WIFI6 和 BT5.0，支持外接 4G/5G 模块；
- 板载 M.2 M-KEY 接口，支持外接 NVMe 协议 2280 规格的 SSD；
- 支持外扩多种数据通讯接口：I2C, UART, RS232, RS485, CAN, GPIO, PWM；
- 支持 Android, Linux, Ubuntu 多种 OS；

1.3 产品框图

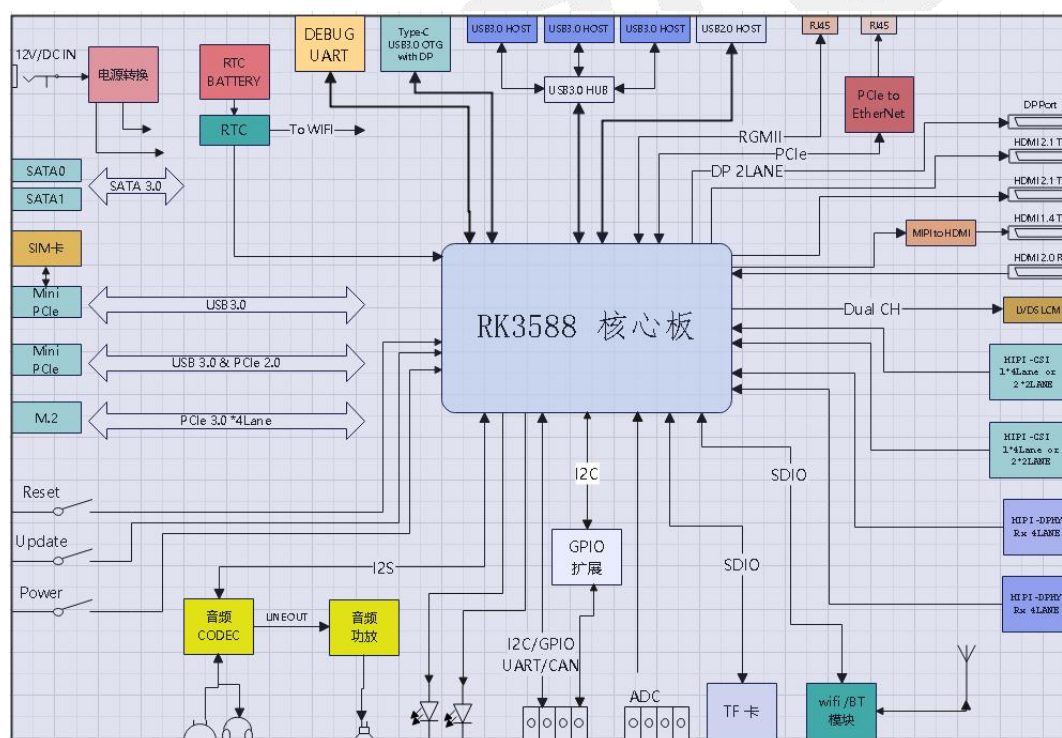


图 1-3

2 外观和尺寸

2.1 产品外观

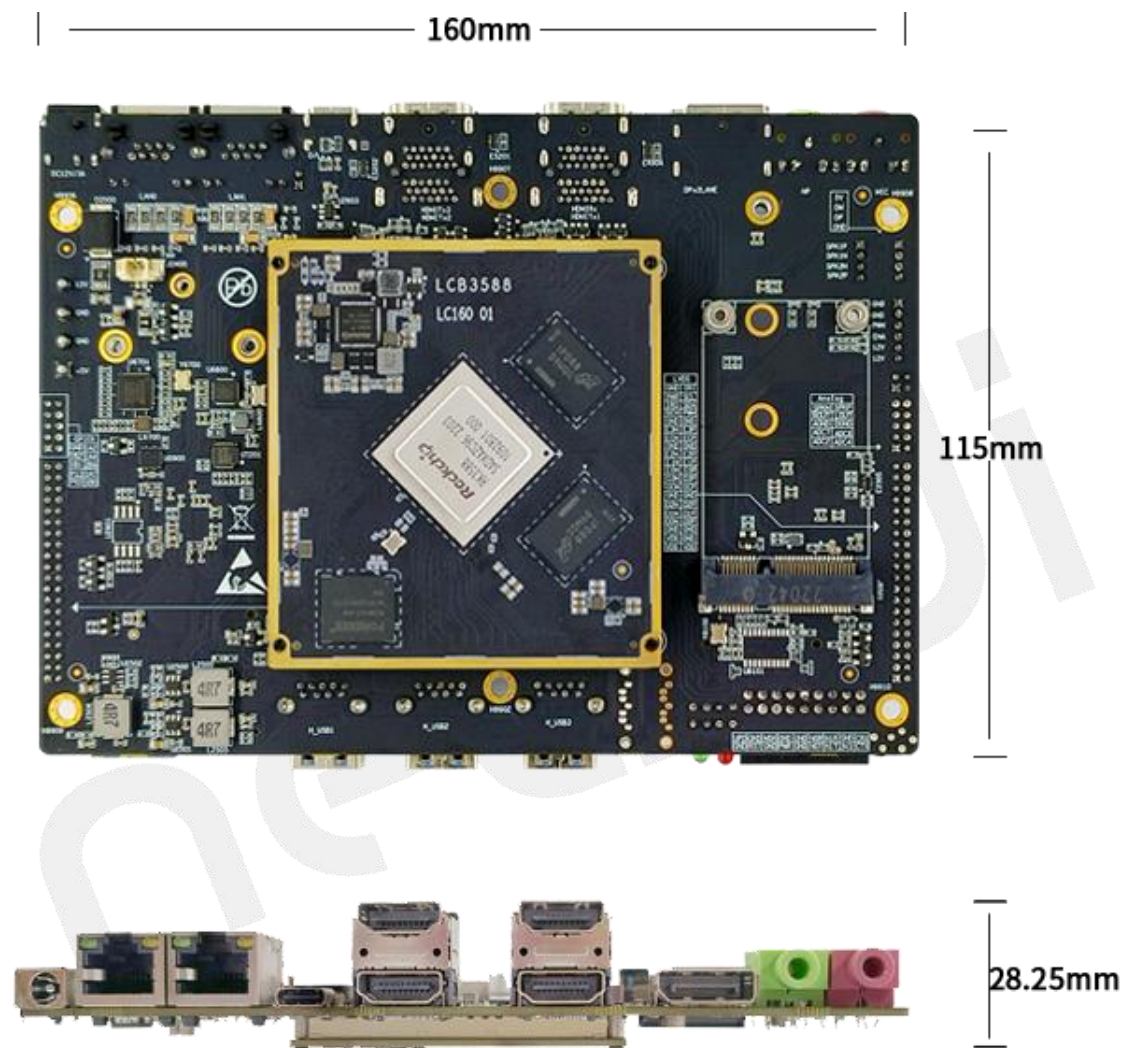


图 2-1

2.2 产品尺寸

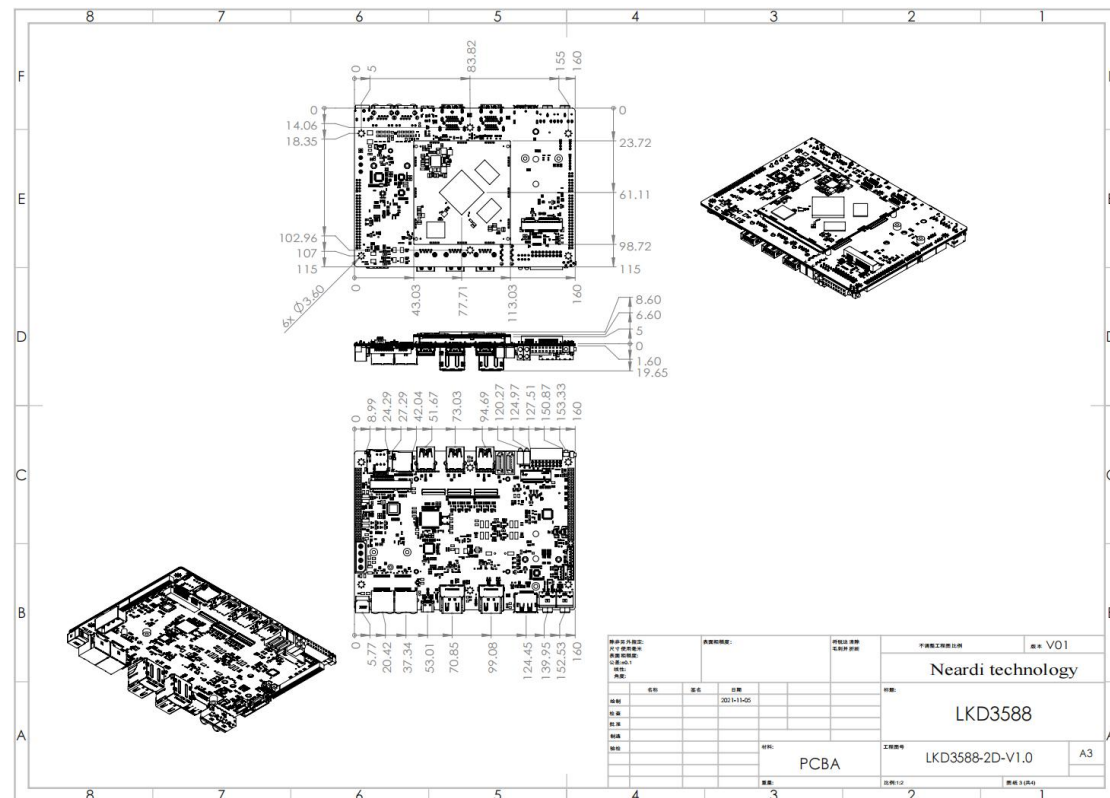


图 2-2

3 产品参数

表 3-1

Function	Description
CPU	RK3588, 8nm LP, 4×Cortex-A76+4×Cortex-A55, 2.4GHz
GPU	ARM Mali-G610 MP4 四核 GPU 支持 OpenGL ES3.2 / OpenCL 2.2 / Vulkan1.1, 450 GFLOPS
NPU	NPU 算力高达 6 TOPS, 支持 INT4/INT8/INT16 混合运算, 可实现基于 TensorFlow / MXNet / PyTorch / Caffe 等系列框架的网络模型转换
VPU	视频解码: 8K@60fps H.265/VP9/AVS2 8K@30fps H.264 AVC/MVC 4K@60fps AV1 1080P@60fps MPEG-2/-1/VC-1/VP8 视频编码: 8K@30fps 编码, 支持 H.265 / H.264 *最高可实现 32 路 1080P@30fps 解码 和 16 路 1080P@30fps 编码视频解码:
DDR	4GB/8GB/16GB 64bit LPDDR4/LPDDR4x
eMMC	eMMC 5.1, 8GB/16GB/32GB/64GB/128GB(Optional)
PMU	RK809-5
Net work	2x 10/100/1000Mbps Ethernet Wi-Fi 2.4GHz/5GHz, 802.11a/b/g/n/ac/ax BT V5.0 with BLE supported 2G/3G/4G/5G LTE module supported (optional)
Storage	MicroSD (TF) Card Compatible with SDIO3.0 M.2 nvme pcie3.0 SSD
OS	Android / Ubuntu / Buildroot
PCB size	L* W (mm): 160 * 115*28.25
Screw size	φ3.6mm
Hardware Interface	
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, 与 type-C 复用) 1× DP1.2 2Lane Output

	1 × HDMI-IN (4K@60fps), 支持 HDCP 2.3
Audio	φ3.5mm earphone Jack with L/R audio out φ3.5mm microphone Jack with Mic in 1x HDMI audio out 2x 2.7W/4Ω speaker out with L/R channel
Camera	2× MIPI CSI (4 Lane) 或者 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	2x 10/100/1000-Mbps data transfer rates
RTC	RTC power on and off supported
Serial port	3x Uart, 1xI2C
Keys	3x keys (power, reset, update)
Power output	12V, 5V, 3.3V, 1.8V
Others	5x ADC, 1x I2C(CTP supported), 2*SATA

4 接口定义

4.1 接口编号

表 4-1

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	RTC battery	CR1220 Socket	RTC battery power input 3.0V
J32	M.2 M-key	Standard M.2 M-key connector	M.2 NGFF (M-KEY) with PCIE V3.0*4Lane
J33	Mini-PCie	Mini-PCie 52pin socket	For 2G/3G/4G LTE module used
J34	MIPI-CSI-A	30pin 0.5mm pitch FPC connector	MIPI-CSI 4lane or 2*2Lane for external cameras

J35	MIPI-CSI-B	30pin 0.5mm pitch FPC connector	MIPI-CSI 4lane or 2*2Lane for external cameras
J36	MIPI-DPhy-Rx*2	30pin 0.5mm pitch FPC connector	Dual MIPI 4Lane Rx
J37	Update	PH2.0mm 2pin wafer	Connector for external update key
J38	Reset	PH2.0mm 2pin wafer	Connector for external Reset key
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

4.2 pin 脚定义

4.2.1 Audio Jack-Mic (J1)

表 4-2-1

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

4.2.2 Audio Jack-Earphone (J2)

表 4-2-2

Pin number	Pin name	Voltage level	Notice
1	GND	GND	-
2	EarPhone right out	-	0.5V RMS @320hm Load
3	NC	-	Not Connected
4	Detect	-	Low-Plug Out; High-Plug In
5	EarPhone right out	-	0.5V RMS @320hm Load

4.2.3 DP Port - 2Lane data (J3)

表 4-2-3

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

4.2.4 Dual-HDMI (J4)

表 4-2-4

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)

4.2.5 Dual-HDMI (J5)

表 4-2-5

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

4.2.6 Type-C (J6)

表 4-2-6

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	-

4.2.7 RJ45 (J7)

表 4-2-7

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

4.2.8 RJ45 (J8)

表 4-2-8

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

4.2.9 DC Jack1 (J9)

表 4-2-9

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

4.2.10 IDE Power (J10)

表 4-2-10

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

4.2.11 GPIO1 (J11)

表 4-2-11

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

4.2.12 GPIO2 (J12)

表 4-2-12

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	-

4.2.13 Micro-SIM (J13)

表 4-2-13

Pin number	Pin name	Voltage level	Notice
1	CD	SIM_VCC	SimCard insert detect - Low:SIM card plugged 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

4.2.14 TF Card (J14)

表 4-2-14

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

4.2.15 USB3.0 Host (J15)

表 4-2-15

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+

4.2.16 USB3.0 Host (J16)

表 4-2-16

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+

4.2.17 USB3.0 Host (J17)

表 4-2-17

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+

4.2.18 Sata port0 (J18)

表 4-2-18

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	-

4.2.19 Sata port1 (J19)

表 4-2-19

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.

4.2.20 Power LED (J20)

表 4-2-20

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-	-	-

4.2.21 Work LED (J21)

表 4-2-21

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-	-	-

4.2.22 Debug&Key (J22)

表 4-2-22

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

4.2.23 Reset Key (J23)

表 4-2-23

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

4.2.24 Update (J24)

表 4-2-24

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

4.2.25 LVDS (J25)

表 4-2-25

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

4.2.26 ADC/Audio (J26)

表 4-2-26

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)

4.2.27 JUMPER (J27)

表 4-2-27

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

4.2.28 LCM_BL (J28)

表 4-2-28

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

4.2.29 USB2.0_HOST (J29)

表 4-2-29

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

4.2.30 SPEAKER (J30)

表 4-2-30

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+		

4.2.31 RTC Battery (J31)

表 4-2-31

CR1220 lithium battery Socket 3V

4.2.32 M.2 M-key (J32)

表 4-2-32

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

4.2.33 Mini-PCIE (J33)

表 4-2-33

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

4.2.34 MIPI-CSI-B (J34)

表 4-2-34

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.

4.2.35 MIPI-CSI-A (J35)

表 4-2-35

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.

4.2.36 MIPI-DPhy-Rx*2 (J36)

表 4-2-36

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	-	-

4.2.37 Update for external key (J37)

表 4-2-37

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

4.2.38 Reset for external key(J38)

表 4-2-38

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

4.2.39 Mipi-D/C-Phy-2

表 4-2-39

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

4.2.40 DP+HDMI-RX

表 4-2-40

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

4.2.41 Mipi-CSI&PCIe3.0 (J41)

表 4-2-41

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

4.2.42 Mipi-CSI&PCIe3.0 (J42)

表 4-2-4

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

4.2.43 Mini-PCIe for AI Card(J43)

表 4-2-43

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

4.2.44 Fan Power(J44)

表 4-2-44

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

5 应用场景

5.1 应用示例



智能零售



研发评估



功能验证



计算机视觉



商显设备

图 5-1

6 支持与服务

6.1 技术支持

- 为客户提供开发相关的技术咨询；
- 为签约客户提供相关设计资料的检查工作；

6.2 售后服务

- 按照国家规定提供产品售后服务；
- 为客户提供个性化定制服务，如有任何需求，请联系我司；