

LKS3588 开发板
产品手册
V1.1



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版本历史

| 版本 | 日期 | 说明 |
|------|-----------|------|
| V1.0 | 2024/6/10 | 初始版本 |
| V1.1 | 2024/7/29 | 更新数据 |

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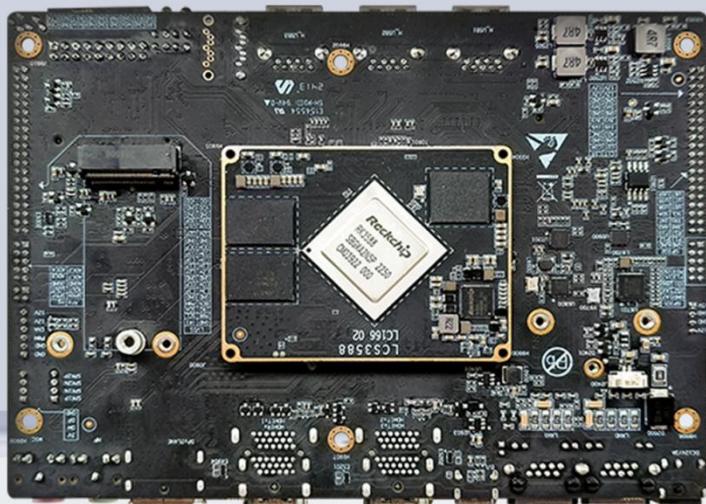
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1.产品介绍

LKS3588 是基于瑞芯微 RK3588 芯片平台精心设计的一款多功能开发评估板，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。

LKS3588 板载 3 路 Type-A USB3.0，1 路 Type-C USB 3.1 以及 1 路 4pin PH2.0 插口的 USB2.0 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 模块外还可以外接基于 RK1808 的 mini-PCIe 接口 NPU 计算卡；LKS3588 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。

LKS3588 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。



2. 功能概述



高性能处理器

| | |
|------|-------------------------------------|
| CPU | 8nm 先进制程, 8 核 64 位架构, 高性能, 低功耗 |
| GPU | ARM Mali-G610 MC4 GPU, 专用 2D 图形加速模块 |
| NPU | 6TOPS 算力 |
| VPU | 8K 视频编解码, 8K 显示输出 |
| DDR | LPDDR4,可选 4/8/16GB |
| eMMC | eMMC 5.1,可选 32/64/128GB |



接口丰富

-
- 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, 一路双 8 位 LVDS 输出, 多达 6 屏异显
 - 4 路 mipi-csi 接口, 最多 6 个 mipi 摄像头输入
 - 2 路千兆网口, 双频 WIFI6
 - 2 路 MIPI PCIE 接口, 可扩展 4/5G 模块, 可扩展算力卡
 - 1 路 M.2 M-Key 接口, 支持外接 NVMe 协议 2240 规格
 - 3 路 Type-A USB3.0, 1 路 Type-C USB3.1 带 DP 显示, 1 路 4Pin PH2.0 插座 USB2.
-



可扩展 NPU 算力

NPU 算力可扩展至 38TOPS; 可外接 1 块 26TOPS 算力卡, 2 块 3TOPS 算力卡

提供 Demo 程序



操作系统

Android

Linux (Buildroot / Debian / Ubuntu)

Kylin(麒麟)



开源资料

WIKI 资料 <http://www.neardi.com/cms/index/wiki.html>

快速入门

升级固件

Android 开发

Linux 开发

内核驱动

DEMO

系统定制

配件

常见问题

发布说明

硬件资料

芯片 Datasheet

核心板引脚定义

底板参考原理图

底板参考 PCB

关键物料清单

产品 2/3D 图

软件资料

烧写工具及驱动

Android 源码及镜像

uboot 及内核源码

Debian/Ubuntu/Buildroot 的系统文件

3.规格参数

基本参数

| | |
|------|--|
| SOC | RK3588 8nm; 8核64位架构处理器 (4*A76+4*A55) |
| GPU | ARM Mali-G610 MC4; OpenGL ES 1.1/2.0/3.1/3.2; Vulkan 1.1/1.2 OpenCL 1.1/1.23/2.0; 高性能2D图像加速模块 |
| NPU | 6TOPS算力 / 3核架构; 支持int4/int8/int16/FP16/BF16/TF32 |
| VPU | 支持H.265/H.264/AV1/VP9/AVS2视频解码, 最高支持8K60FPS 支持H.264/H.265视频编码, 最高支持8K30FPS |
| DDR | LPDDR4, 可选4GB/8GB/16GB |
| eMMC | eMMC 5.1, 可选32GB/64GB/128GB |
| PMU | RK806 |
| 系统 | Android / Ubuntu / Buildroot / Debian |

硬件参数

| | |
|---------|--|
| Power | DC12V - 3A (DC Jack 5.5*2.1mm / PH2.0 wafer connector) |
| USB | 3*Type-A USB3.0 1* Type-C USB3.1 1*4Pin PH2.0 USB2.0 |
| 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 |
| | 1*HDMI audio out |
| | 2*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 | 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 |

其他参数

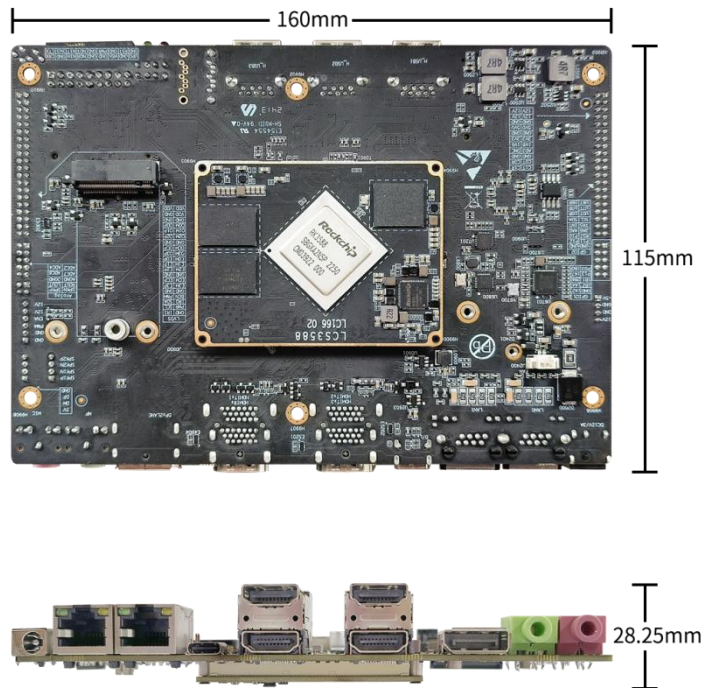
尺寸 L*W*H(mm) 160*115*28.25

温度 工作温度 -10 - 70°C

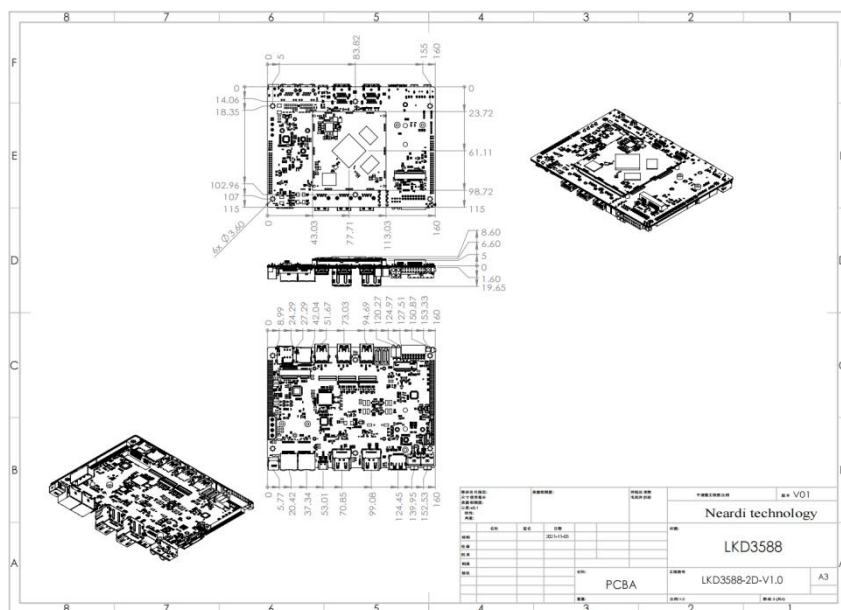
重量 约 171.3g (不含外设)

4. 外观和尺寸

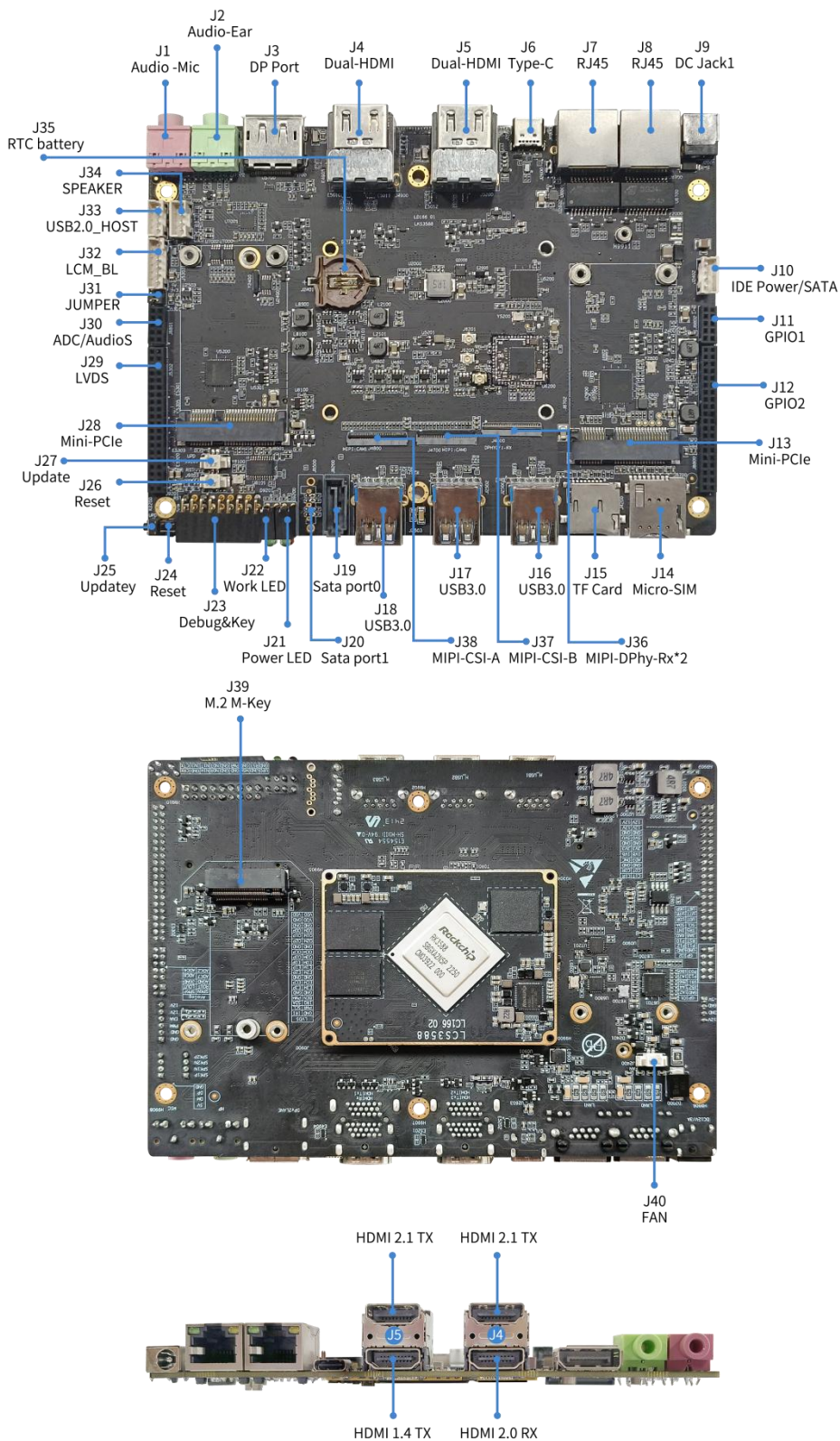
4.1 外观



4.2 尺寸



5.接口定义



| 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 / Debug |
| 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/SATA | 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 | Mini-PCIe | Mini-PCIe 52pin socket | For 2G/3G/4G LTE module used |
| J14 | Micro-SIM | Push-Push Micro SIM Socket | For Micro SIM Card (1.8/3.3V) |
| J15 | TF Card | Push-Push TF socket | TF Card |
| J16 | USB3.0 | Type-A USB3.0 | USB3.0 |
| J17 | USB3.0 | Type-A USB3.0 | USB3.0 |
| J18 | USB3.0 | Type-A USB3.0 | USB3.0 |
| J19 | Sata port0 | 7-pin SATA Port | SATA 3.0 Port |
| J20 | Sata port1 | 7-pin SATA Port | SATA 3.0 Port |
| J21 | Power LED | Red and Green LEDs | Power status indicate |
| J22 | Work LED | Green led *2 | Work status and 3G/4G Module Status Indicator |
| J23 | Debug&Key | PH2.54mm 2x9pin Receptacle | Debug and Key and 3.3V out |
| J24 | Reset | push-button | Key for system reset |
| J25 | Update | push-button | Key for system recovery or other function |
| J26 | Reset | PH2.0mm 2pin wafer | Connector for external Reset key |
| J27 | Update | PH2.0mm 2pin wafer | Connector for external update key |
| J28 | M.2 M-key | Standard M.2 M-key connector | M.2 NGFF (M-KEY) with PCIE V3.0*4Lane |
| J29 | LVDS | PH2.0mm 2x20pin header | Dual channel 24bit LVDS output |
| J30 | ADC/Audio | PH2.0mm 2x5pin header | ADC In and Audio Out |
| J31 | JUMPER | PH2.0mm 2x2pin header | Voltage Select for LVDS Panel Power |
| J32 | LCM_BL | PH2.0mm 6pin wafer | LCM backlight control |
| J33 | USB2.0 | PH2.0mm 4pin wafer | USB2.0 for external devices |
| J34 | SPEAKER | PH2.0mm 4pin wafer | Dual channel audio Output for Speaker |
| J35 | RTC battery | CR1220 Socket | RTC battery power input 3.0V |
| J36 | MIPI-DPhy-Rx*2 | 30pin 0.5mm pitch FPC connector | Dual MIPI 4Lane Rx |
| J37 | MIPI-CSI-B | 30pin 0.5mm pitch FPC | MIPI-CSI 4lane or 2*2Lane for external |

| | | connector | cameras |
|------------|----------------|---------------------------------|--|
| J38 | MIPI-CSI-A | 30pin 0.5mm pitch FPC connector | MIPI-CSI 4lane or 2*2Lane for external cameras |
| J39 | Mipi-D/C-Phy-2 | 30pin 0.5mm pitch FPC connector | Signals come from CoreBoard |
| J40 | FAN | PH2.0mm 2pin wafer | 12V Output for FAN Power |

6. 引脚定义

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 @320hm Load |
| 3 | NC | - | Not Connected |
| 4 | Detect | - | Low-Plug Out; High-Plug In |
| 5 | EarPhone right out | - | 0.5V RMS @320hm 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 |
| 5 | EARTH | - | Resistor//1nF Capacitor |
| 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 | - |
| Mini-PCIe (J13) | | | |
| 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 |

Micro-SIM (J14)

| | | | |
|-------------------|-----------------|----------------------|---|
| 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 |

TF Card (J15)

| | | | |
|-------------------|-----------------|----------------------|---------------|
| 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 (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 (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+ |

USB3.0 (J18)

| 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 SSRX+ |
| 7 | GND | GND | - |

| | | | |
|---|-----|---|--------------|
| 8 | TX- | - | USB3.0 SSTX- |
| 9 | TX+ | - | USB3.0 SSTX+ |

Sata port0 (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 | - |

Sata port1 (J20)

| 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 (J21)

| 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 (J22)

| 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 (J23)

| 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 (J24)

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

Update (J25)

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

Reset for external key(J26)

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

Update for external key (J27)

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

| 2 | GND | GND | - |
|--|------------------------|---------------|-------------------------|
| M.2 M-key (J28) | | | |
| 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 |

LVDS (J29)

| Pin number | Pin name | Voltage level | Notice |
|------------|----------|---------------|--------|
| 1 | VCC_LVDS | 3.3V/5V | - |
| 2 | VCC_LVDS | optional | - |
| 3 | VCC_LVDS | by J27 | - |
| 4 | GND | GND | - |
| 5 | GND | GND | - |
| 6 | GND | GND | - |
| 7 | RX00M | - | - |

| | | | |
|----|--------------|------|------------------------|
| 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 (J30)

| 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 (J31)

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

LCM_BL (J32)

| 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 (J33)

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

SPEAKER (J34)

| 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+ | - | |

RTC Battery (J35)

CR1220 lithium battery Socket 3V

MIPI-DPhy-Rx*2 (J36)

| 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 (J37)

| 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 (J38)

| 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.

Mini-PCIe for AI Card(J39)

| 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(J40)

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

7.应用场景



人工智能



机器视觉



工业控制



能源电力



智慧平板



虚拟现实 VR



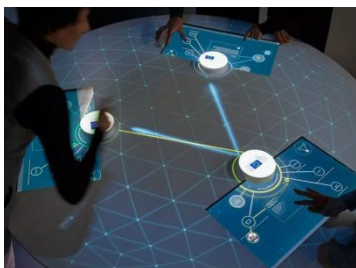
智慧物流



新零售



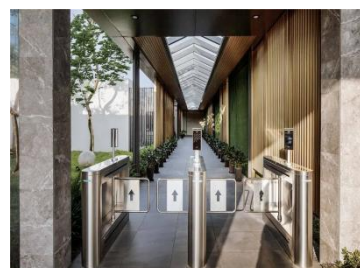
智慧商显



物体识别



车载终端



安防监控

8. 订购型号

| 产品型号 | 状态 | CPU 型号 | DDR 容量 | eMMC 容量 | 工作温度 |
|------------|--------|--------|--------|---------|--------------|
| LD16643200 | ACTIVE | RK3588 | 4GB | 32GB | -10°C - 70°C |
| LD16686400 | ACTIVE | RK3588 | 8GB | 64GB | -10°C - 70°C |
| LD1669A800 | ACTIVE | RK3588 | 16GB | 128GB | -10°C - 70°C |

*非标定制请邮件咨询 sales@neardi.com

9.关于临滴

上海临滴科技有限公司成立于 2014 年，国家级高新技术企业，瑞芯微战略合作伙伴，黑芝麻智能授权代理商。专注于企业级开源硬件平台的研发和生产，为客户提供核心模块、行业板、开发板、触控平板和工控主机等产品。公司坚持技术创新和专业服务的核心理念，以临滴科技的技术优势和行业经验，帮助合作伙伴实现产品快速量产。



公众号



淘宝店铺



B 站

Rockchip-产品线

核心模块



LCB3588/J



LCB3568/J



LCB3566



LCB3399Pro



LCB3399

开发板/行业板



LKD3588/J



LKD3568/J



LKD3566



LKD3399Pro



LKD3399

嵌入式智能计算机



LPB3588



LPM3588



LPC3588



LPB3568



LPB3399Pro

BST 黑芝麻-产品线



SOM-A-A1000



SOM-π-A1000



SOM-B-A1000



SOM-A1000 开发者套件

车载终端-产品线



LPA3588



LPA3568



LPA3399Pro



LPS3399Pro

WIFI 模块-产品线



FD7352S



FD7352P



FD7352M



FD7155U



FD7256S