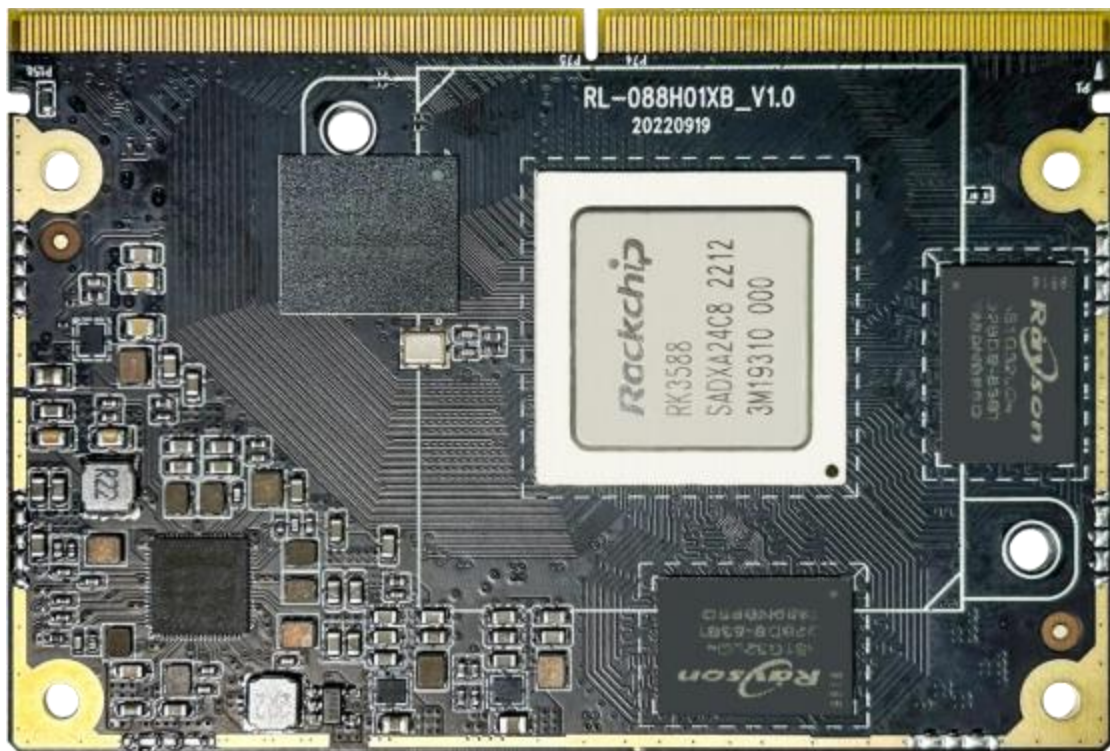


SZ-088H01XB ARM核心板

硬件技术规格手册



标准金手指SMARC_314接口

| 型号: | SZ-088H01XB | PCBA No: | SZ-088H01XB_V1.0 | |
|--------|-------------|----------|------------------|----|
| 编制: | | 审核: | | |
| 批准: | | 制作: | | |
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目 录

| 项目 | 标题 |
|----|----------|
| 一 | 产品功能概述 |
| 二 | 硬件显著特性 |
| 三 | 实物图及接口 |
| 四 | 接口定义详解图表 |
| 五 | 结构尺寸图 |

| | |
|---|------------|
| 六 | 运输、存储及使用条件 |
| 七 | PCBA 物理尺寸 |
| 八 | 温馨提示 |
| | |
| | |

一、 产品功能

功能概述:

RK3588 采用新一代旗舰八核 64 位 ARM 处理器, 8nm 先进制程, 最大可支持 32G_Byte 内存, ARM Mali-G610 MC4 GPU, 专用 2D 图形加速模块支持 4K/8K 视频解码, 拥有丰富的接口: 支持多路 SATA 硬盘接口, 多路网口, wifi6, 4G/5G 扩展接口, 多路摄像头输入, HDMI 输入和输出, 以及 EDP, MIPI 屏显示接口; 支持多种操作系统, 可应用于 ARM PC, 边缘计算, 网络云服务, 智能 AIOT, NVR 等领域。

全新特点:

RK3588 是全新一代 AIOT 芯片: 8 核 64 位 8nm 制程, 主频 2.4GHz, ARM Mali-G610 MC4 GPU, 内置 AI 加速 NPU 支持 6Tops 算力;

支持 8K 视频编解码, 8K@60fps H.265/VP9 视频解码, 8K@30fps H.265/H.264 视频编码, 支持同编同解最高 32 路 1080@P30 解码和 16 路 1080@P30 编码;

支持多通道视频输入和输出, 支持多屏异显: HDMI 2.1/eDP 1.3/MIPI DSI/DP 1.4/BT 1120 视频输出, HDMI IN/MIPI CSI 视频输入; 输入支持 4K, 输出支持 8K; 最多可以支持 7 屏异显;

支持多硬盘接入, 扩展海量存储: 支持原生 SATA3 接口 HDD 硬盘, 可支持 PCIE 3.0 扩展多个 SSD 固态存储盘; 轻松扩大至 TB 级海量存储;

支持强大的网络通讯功能: 芯片集成 PCIE 3.0 & 2.0/GMAC/SDIO 3.0/USB 3.0, 可以灵活扩展 2.5G/1G 以太网, WiFi 2.4/5G & WiFi 6/蓝牙, 5G/4G 无线网络;

支持丰富的扩展接口: 拥有 PCIE 3.0, PCIE 2.0, USB 3.0, USB 2.0, MIPI_DSI, MIPI_CSI, SDIO 3.0, SPI, I2S, I2C, UART, CAN, GPIO, ADC 等多个扩展接口;

支持多种操作系统: Android 12, Ubuntu 18.04/20.04, Buildroot, Debian 等;

支持广泛的应用领域: 边缘计算, 网络云服务, 智能 AIOT, NVR, ARM_PC, 智慧大屏, 工业平板, 多摄像头设备, 智能汽车驾驶等领域。

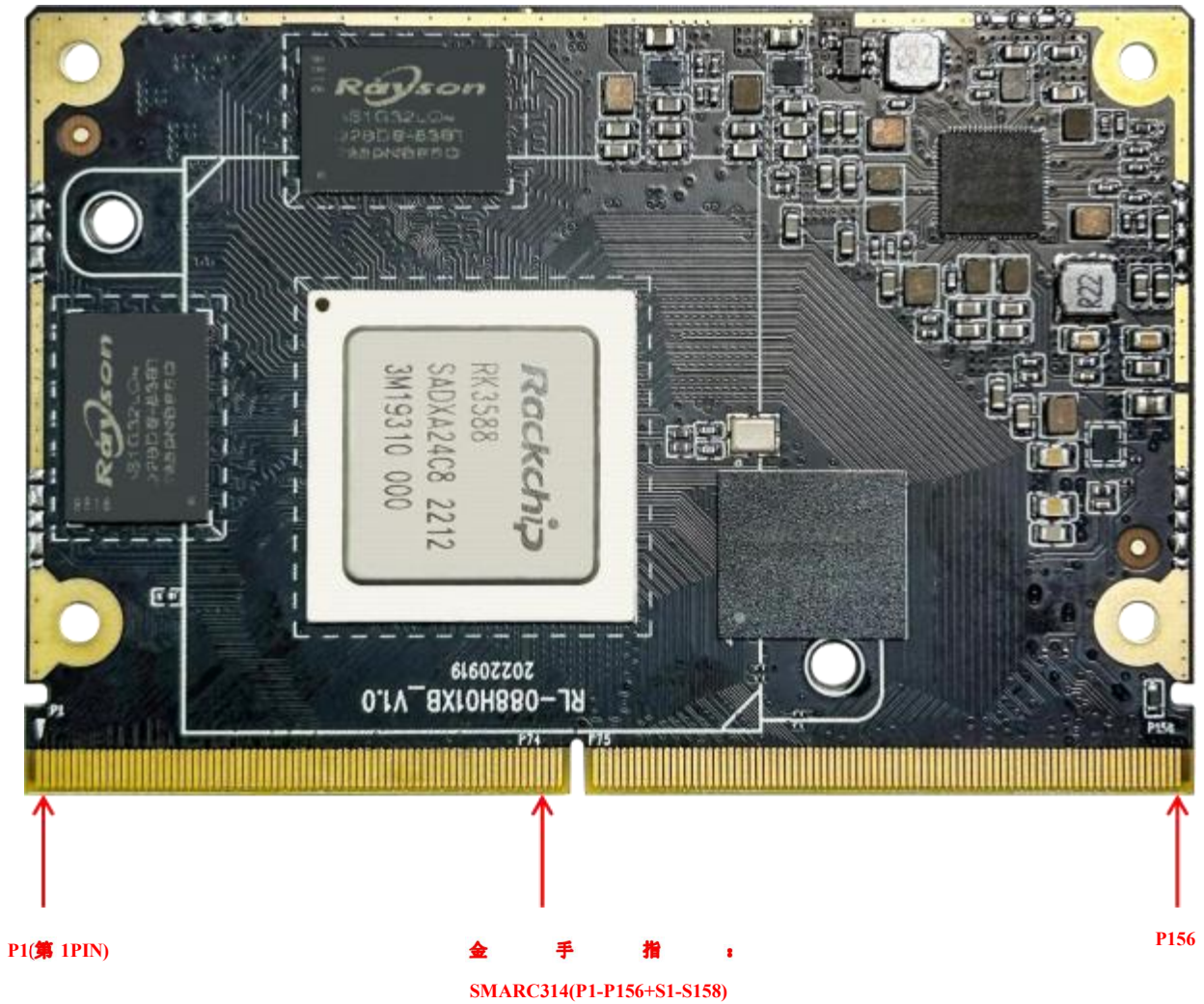
【本份 SPEC 上有可能没有完全反映 PCBA 所有最新的更改, 以实际产品为准】

二. 硬件特性

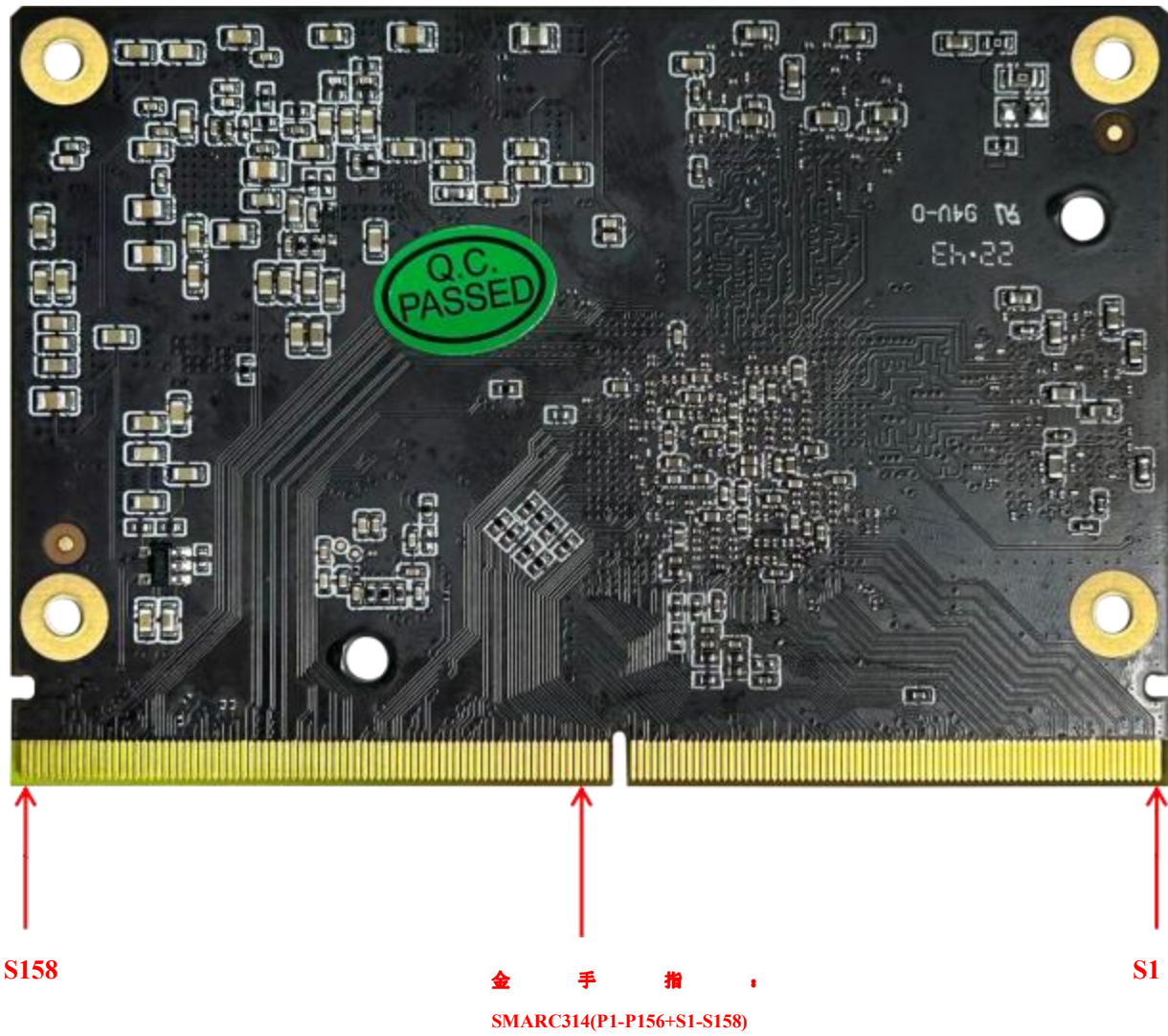
| | |
|--|---|
| SOC | RockChip RK3588 |
| CPU | ARM Cortex 8 核 64 位大小核架构 (4xA76+4xA55) 处理器, 8nm 工艺制程, 最高主频 2.4GHz |
| GPU | ARM Mali-G610 MC4 四核 GPU 支持 OpenGL ES3.2, OpenGL 2.2 and Vulkan 1.1; 内嵌高性能 2D 图像加速模块; 450 GFLOPS, 解码支持 H.264 decoder by 8K@60fps 和 H.265 decoder by 8K@60fps, 编码支持 H.264/H.265 encoder by 8K@30fps |
| NPU | 支持 6Tops 算力, 支持 INT4/INT8/INT16 混合运算 |
| ISP | 集成 48MP ISP with HDR&3DNR |
| 内存 RAM | 4G/8G/16G-Byte 64bit LPDDR4/4X, LPDDR5 最大支持 32G |
| 存储 ROM | 16G/32G/64G/128G 可选)最大 256G Byte EMMC |
| 编解码 | 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 |
| 视频输出 (EDP/DP/MIPI DSI/BT1120/HDMI) | 2*eDP 接口: 支持 eDP 1.3 (4K@60Hz) 2*DP 接口: 支持 eDP 1.4 (8K@30fps, 与 USB 3.0 复用) 1*BT1120 接口: (1080@60fps) 2*MIPI DSI 接口: (4K@60Hz) 1*HDMI2.0 接口: (4K@60fps) support for HDMI1.4 and HDMI2.0; 1*HDMI2.1 接口: (8K@60fps 或 4K@120fps) 支持双屏异显功能。 |
| 视频输入 (HDMI_IN/MIPI CSI/MIPI DC/DVP) | 1*HDMI-IN 接口: (4K@60fps), 支持 HDCP 2.3 1*MIPI CSI (4 Lane) 或者 2*MIPI CSI (2 Lane) 2*MIPI DC (4 通道 DPHY v2.0 或 3 通道 CPHY V1.1) 1*DVP 摄像头接口 (最高 150MHz 输入数据) |
| USB | 3*USB3.0 HOST super-speed, 支持最高 8.48Gbps bandwidth; 4*USB2.0 HOST High-speed, 最高 480Mbps 2*USB2.0 OTG |
| 音频 | 2*8 通道 I2S 2*2 通道 I2S 2*SPD IF 2*8 通道 PDM (支持多 MIC 阵列) 1*双通道数字音频编解码器 (16 位 DAC) 1*VAD |
| 以太网 | 集成 PCIe3.0/GMAC/USB3.0, 可扩展多路千兆(1G)或 2.5G 以太网 |
| WIFI 及蓝牙 | 支持 2.4+5GHz WiFi6, 支持 Wi-Fi 802.11b/g/n/ac 协议 |

| | |
|----------|--|
| | 支持蓝牙功能, V2.1+EDR/Bluetooth 3.0/3.0+HS/4.2/5.1BLE |
| 无线网络 | 4G LTE/5G(USB2.0 或 USB3.0 扩展) |
| PCI E | PCIe3.0 (2*2lanes, 1*4lanes, 4*1lanes) 3*PCI E2.0(1 lanes) |
| SATA | 3*SATA3.0 |
| 电源 | +4V (电压误差±5%) |
| IO 口 | 9*12C, 10*UART, 5* SPI, 7* ADC, 16*PWM 1*SDMMC, GPIO |
| 操作系统 | Android12, Ubuntu 18.04/20.04, Buildroot, Debian |
| 音频格式 | MP3, WMA, WAV, APE, FLAC, AAC, OGG, M4A, 3GPP 等 |
| 图片 | 支持 JPG, BMP, PNG 等各种图片格式浏览并支持旋转/幻灯片播放/图片放大功能 |
| 系统自带应用软件 | AFK 安装器, 电子邮件, 计算器, 浏览器, 录音机, 日历, 设置, 时钟, 视频播放器, 搜索, 通讯录, 下载, 相机, 音乐播放器, 资源管理等 |
| 语言 | 支持多国语言(中文, 英语等) |
| 输入法 | 标准 Android 键盘, 可选第三方输入法 |
| 系统管理 | 原生态 Android 系统, 开放 root 权限, 可以进行产品定制开发; 支持硬件或软件看门狗; 可支持 OTA 远程升级 |
| 其它参数 | |
| 尺寸 | 82mmx55mm |
| 接口类型 | SMARC (314 PIN, 0.5mm 间距) |
| PCB 规格 | 10 层板 沉金工艺 |
| 散热 | 散热片安装孔距 50.7mm |
| 功耗 | 待机功耗: 约 1.3W (12V/110mA) 典型功耗: 约 4.8W (12V/400mA) 最大功耗: 约 20W (12V/1700mA) |

三. 实物图及接口



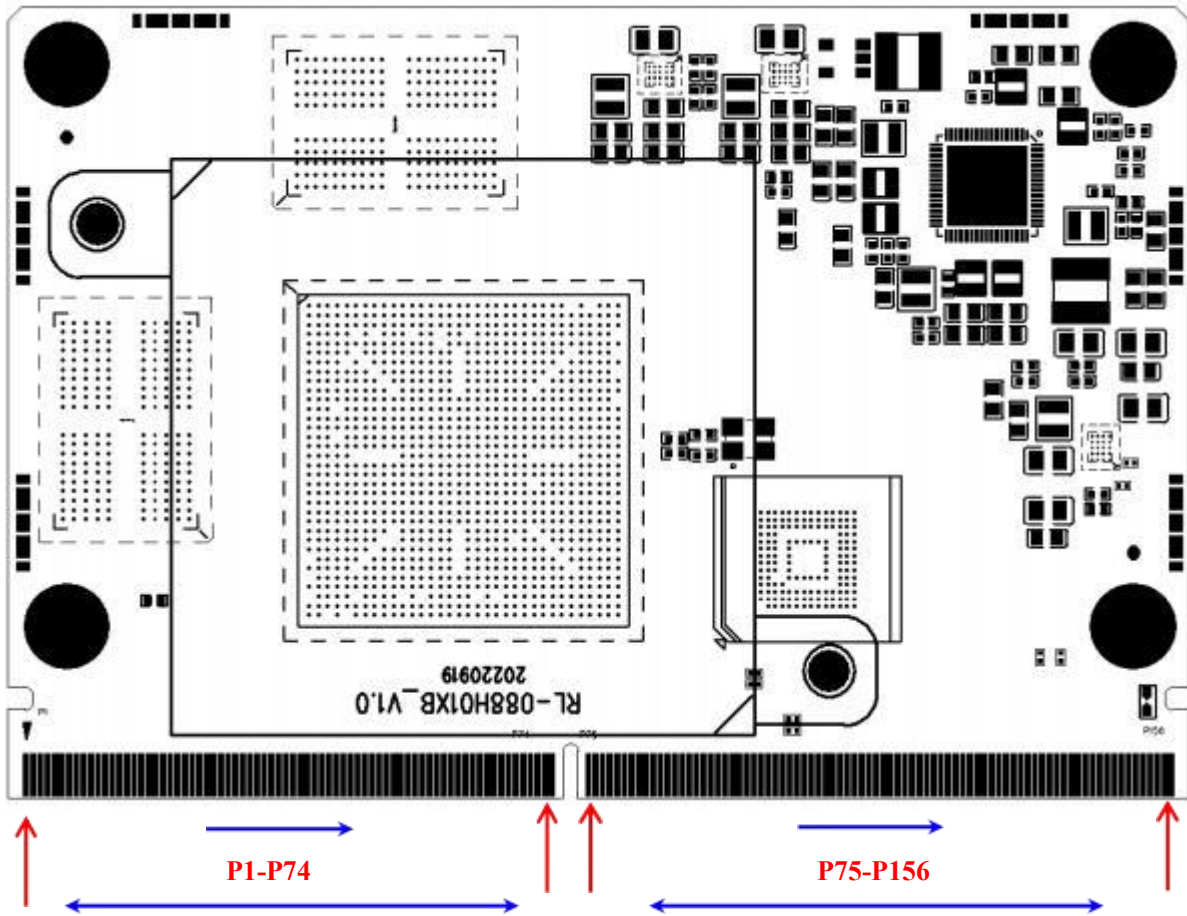
图一 (实物图正面)



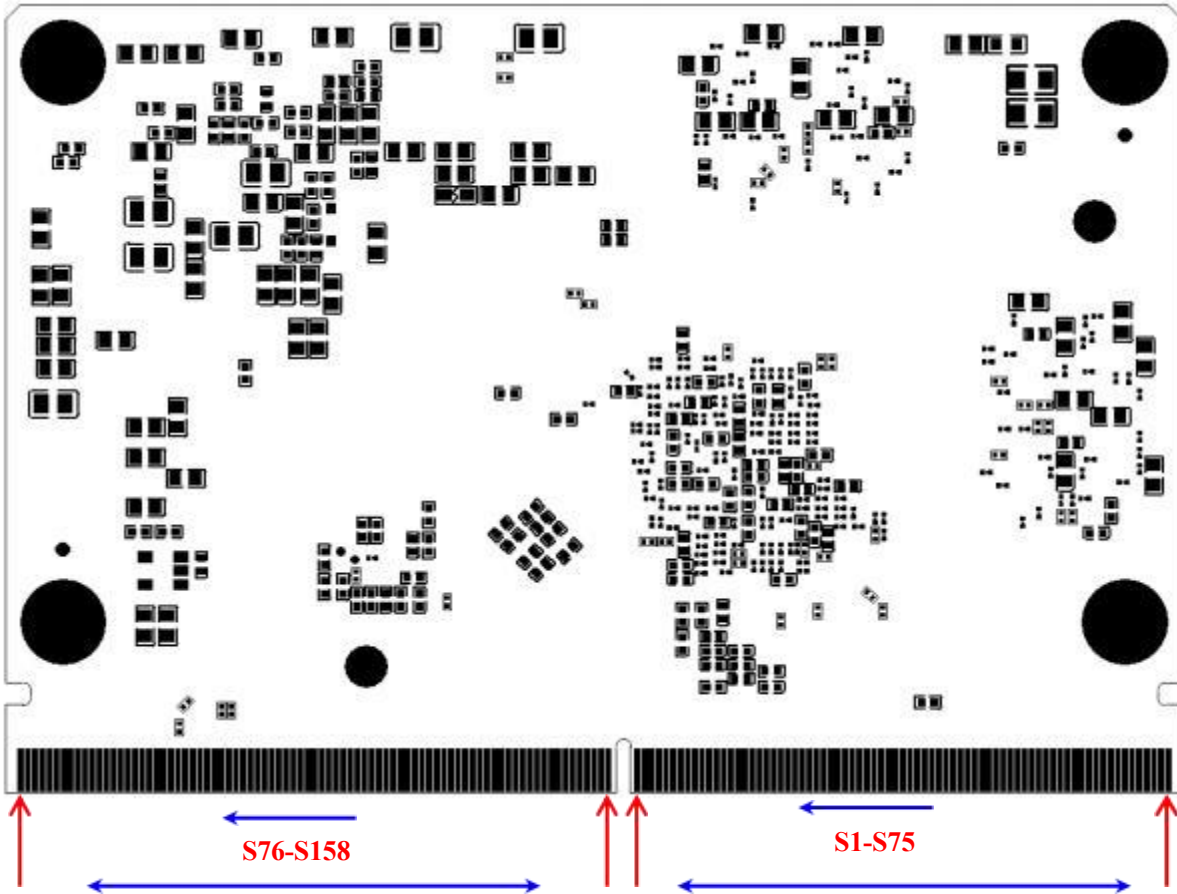
图二 (实物图底面)

四. 接口定义详解图表

A. 主板连接器丝印位置图示:



图三 (正面丝印图)



图四 (底面丝印图)

B. 引脚功能详细描叙:

| SMARC_314: (P1-P156), 未标注管脚为空 | | | |
|-------------------------------|------------|---|----|
| 序号 | RK3588 管脚名 | 管脚功能描述 | 备注 |
| P1 | AD1 | SDMMC_D1/PDM1_SDI2_M0/JTAG_TMS_M1/I2C3_SDA_M4/UART2_RX_M1/PWM9_M1/GPIO4_D1_u | |
| P2 | AD2 | SDMMC_D0/PDM1_SDI3_M0/JTAG_TCK_M1/I2C3_SCL_M4/UART2_TX_M1/PWM8_M1/GPIO4_D0_u | |
| P3 | AE1 | SDMMC_CLK/PDM1_CLK0_M0/TEST_CLKOUT_M0/MCU_JTAG_TMS_M0/CAN0_RX_M1/UART5_TX_M0/GPIO4_D5_d | |

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|-----|------|---|--|
| P4 | AE2 | SDMMC_CMD/PDM1_CLK1_M0/MCU_JTAG_TCK_M0/CAN0_TX_M1/UART5_RX_M0/PWM7_IR_M1/GPIO4_D4_u | |
| P5 | AF1 | SDMMC_D3/PDM1_SDI0_M0/JTAG_TMS_M0/I2C8_SDA_M0/UART5_RTSN_M0/PWM10_M1/GPIO4_D3_u | |
| P6 | AF2 | SDMMC_D2/PDM1_SDI1_M0/JTAG_TCK_M0/I2C8_SCL_M0/UART5_CTSN_M0/GPIO4_D2_u | |
| P7 | | GND | |
| P8 | AG1 | HDMI_TX0_SBDN/eDP_TX0_AUXN | |
| P9 | AG2 | HDMI_TX0_SBDP/eDP_TX0_AUXP | |
| P10 | AH2 | HDMI_TX0_D3N/eDP_TX0_D3N | |
| P11 | AH3 | HDMI_TX0_D3P/eDP_TX0_D3P | |
| P12 | AJ1 | HDMI_TX0_D0N/eDP_TX0_D0N | |
| P13 | AJ2 | HDMI_TX0_D0P/eDP_TX0_D0P | |
| P14 | AK2 | HDMI_TX0_D1N/eDP_TX0_D1N | |
| P15 | AK3 | HDMI_TX0_D1P/eDP_TX0_D1P | |
| P16 | AL1 | HDMI_TX0_D2N/eDP_TX0_D2N | |
| P17 | AL2 | HDMI_TX0_D2P/eDP_TX0_D2P | |
| P18 | | GND | |
| P19 | AP2 | HDMI_TX1_SBDN/eDP_TX1_AUXN | |
| P20 | AN2 | HDMI_TX1_SBDP/eDP_TX1_AUXP | |
| P21 | AN3 | HDMI_TX1_D3N/eDP_TX1_D3N | |
| P22 | AM3 | HDMI_TX1_D3P/eDP_TX1_D3P | |
| P23 | AP4 | HDMI_TX1_D0N/eDP_TX1_D0N | |
| P24 | AN4 | HDMI_TX1_D0P/eDP_TX1_D0P | |
| P25 | AN5 | HDMI_TX1_D1N/eDP_TX1_D1N | |
| P26 | AM5 | HDMI_TX1_D1P/eDP_TX1_D1P | |
| P27 | AP6 | HDMI_TX1_D2N/eDP_TX1_D2N | |
| P28 | AN6 | HDMI_TX1_D2P/eDP_TX1_D2P | |
| P29 | | GND | |
| P30 | AP8 | TYPEC1_SSRX1N/DP1_TX0N | |
| P31 | AN8 | TYPEC1_SSRX1P/DP1_TX0P | |
| P32 | AP9 | TYPEC1_SSTX1P/DP1_TX1P | |
| P33 | AN9 | TYPEC1_SSTX1N/DP1_TX1N | |
| P34 | AP10 | TYPEC1_SSRX2N/DP1_TX2N | |
| P35 | AN10 | TYPEC1_SSRX2P/DP1_TX2P | |
| P36 | AP11 | TYPEC1_SSTX2P/DP1_TX3P | |
| P37 | AN11 | TYPEC1_SSTX2N/DP1_TX3N | |
| P38 | | GND | |
| P39 | AP13 | TYPEC0_SSRX1N/DP0_TX0N | |
| P40 | AN13 | TYPEC0_SSRX1P/DP0_TX0P | |
| P41 | AP14 | TYPEC0_SSTX1P/DP0_TX1P | |
| P42 | AN14 | TYPEC0_SSTX1N/DP0_TX1N | |

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|-----|------|--|--|
| P43 | AP15 | TYPEC0_SSRX2N/DP0_TX2N | |
| P44 | AN15 | TYPEC0_SSRX2P/DP0_TX2P | |
| P45 | AP16 | TYPEC0_SSTX2P/DP0_TX3P | |
| P46 | AN16 | TYPEC0_SSTX2N/DP0_TX3N | |
| P47 | | GND | |
| P48 | AP18 | MIPI_DPHY1_TX_D0N/MIPI_CPHY1_TX_TRIO0_A | |
| P49 | AN18 | MIPI_DPHY1_TX_D0P/MIPI_CPHY1_TX_TRIO0_B | |
| P50 | AP19 | MIPI_DPHY1_TX_D1N/MIPI_CPHY1_TX_TRIO0_C | |
| P51 | AN19 | MIPI_DPHY1_TX_D1P/MIPI_CPHY1_TX_TRIO1_A | |
| P52 | AP20 | MIPI_DPHY1_TX_CLKN/MIPI_CPHY1_TX_TRIO1_B | |
| P53 | AN20 | MIPI_DPHY1_TX_CLKP/MIPI_CPHY1_TX_TRIO1_C | |
| P54 | AP21 | MIPI_DPHY1_TX_D2N/MIPI_CPHY1_TX_TRIO2_A | |
| P55 | AN21 | MIPI_DPHY1_TX_D2P/MIPI_CPHY1_TX_TRIO2_B | |
| P56 | AP22 | MIPI_DPHY1_TX_D3N/MIPI_CPHY1_TX_TRIO2_C | |
| P57 | AN22 | MIPI_DPHY1_TX_D3P/NO_USE | |
| P58 | | GND | |
| P59 | AP24 | MIPI_DPHY0_TX_D0N/MIPI_CPHY0_TX_TRIO0_A | |
| P60 | AN24 | MIPI_DPHY0_TX_D0P/MIPI_CPHY0_TX_TRIO0_B | |
| P61 | AP25 | MIPI_DPHY0_TX_D1N/MIPI_CPHY0_TX_TRIO0_C | |
| P62 | AN25 | MIPI_DPHY0_TX_D1P/MIPI_CPHY0_TX_TRIO1_A | |
| P63 | AP26 | MIPI_DPHY0_TX_CLKN/MIPI_CPHY0_TX_TRIO1_B | |
| P64 | AN26 | MIPI_DPHY0_TX_CLKP/MIPI_CPHY0_TX_TRIO1_C | |
| P65 | AP27 | MIPI_DPHY0_TX_D2N/MIPI_CPHY0_TX_TRIO2_A | |
| P66 | AN27 | MIPI_DPHY0_TX_D2P/MIPI_CPHY0_TX_TRIO2_B | |
| P67 | AP28 | MIPI_DPHY0_TX_D3N/MIPI_CPHY0_TX_TRIO2_C | |
| P68 | AN28 | MIPI_DPHY0_TX_D3P/NO_USE | |
| P69 | | GND | |
| P70 | AP29 | MIPI_DPHY0_RX_D0N/MIPI_CPHY0_RX_TRIO0_A | |
| P71 | AN29 | MIPI_DPHY0_RX_D0P/MIPI_CPHY0_RX_TRIO0_B | |
| P72 | AP30 | MIPI_DPHY0_RX_D1N/MIPI_CPHY0_RX_TRIO0_C | |
| P73 | AN30 | MIPI_DPHY0_RX_D1P/MIPI_CPHY0_RX_TRIO1_A | |
| P74 | | GND | |
| P75 | AP31 | MIPI_DPHY0_RX_CLKN/MIPI_CPHY0_RX_TRIO1_B | |
| P76 | AN32 | MIPI_DPHY0_RX_CLKP/MIPI_CPHY0_RX_TRIO1_C | |
| P77 | AP32 | MIPI_DPHY0_RX_D2N/MIPI_CPHY0_RX_TRIO2_A | |
| P78 | AN33 | MIPI_DPHY0_RX_CLKP/MIPI_CPHY0_RX_TRIO1_C | |
| P79 | AP33 | MIPI_DPHY0_RX_D3N/MIPI_CPHY0_RX_TRIO2_C | |
| P80 | AN34 | MIPI_DPHY0_RX_D3P/NO_USE | |
| P81 | | GND | |
| P82 | AM33 | MIPI_CSI0_CLK1P | |
| P83 | AM34 | MIPI_CSI0_CLK1N | |
| P84 | AL33 | MIPI_CSI0_D3P | |

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|------|------|--|--|
| P85 | AL34 | MIPI_CSI0_D3N | |
| P86 | AK33 | MIPI_CSI0_D2P | |
| P87 | AK34 | MIPI_CSI0_D2N | |
| P88 | AJ33 | MIPI_CSI0_CLK0P | |
| P89 | AJ34 | MIPI_CSI0_CLK0N | |
| P90 | AH33 | MIPI_CSI0_D1P | |
| P91 | AH34 | MIPI_CSI0_D1N | |
| P92 | AG33 | MIPI_CSI0_D0P | |
| P93 | AG34 | MIPI_CSI0_D0N | |
| P94 | | GND | |
| P95 | AF33 | GMAC0_TXER/I2C0_SDA_M1/UART7_CTSN_M0/PWM7_IR_M3/SPI3_CLK_M0/GPIO4_C6_d | |
| P96 | AF34 | GMAC0_MCLKINOUT/I2S2_SDO_M0/I2C7_SCL_M1/PWM4_M1/SPI3_CS1_M0/GPIO4_C3_d | |
| P97 | AE33 | GMAC0_TXCLK/SDIO_CLK_M0/FSPI_CLK_M1/I2C3_SDA_M3/GPIO2_B3_d | |
| P98 | AE34 | GMAC0_TXEN/I2S2_LRCK_M0/I2C2_SDA_M1/UART1_RTSN_M0/SPI1_CLK_M0/GPIO2_C0_d | |
| P99 | AD33 | GMAC0_TXD0/I2S2_MCLK_M0/I2C5_SCL_M4/UART1_RX_M0/GPIO2_B6_d | |
| P100 | AD34 | GMAC0_TXD1/I2S2_SCLK_M0/I2C5_SDA_M4/UART1_TX_M0/GPIO2_B7_d | |
| P101 | AC33 | GMAC0_TXD2/SDIO_D3_M0/FSPI_D3_M1/I2C8_SDA_M1/UART6_CTSN_M0/GPIO2_B1_u | |
| P102 | AC34 | GMAC0_TXD3/SDIO_CMD_M0/I2C3_SCL_M3/GPIO2_B2_u | |
| P103 | AB33 | GMAC0_MDIO/I2C0_SCL_M1/UART9_CTSN_M0/PWM6_M2/SPI3_MOSI_M0/GPIO4_C5_d | |
| P104 | AB34 | GMAC0_MDC/I2C7_SDA_M1/UART9_RTSN_M0/PWM5_M2/SPI3_MISO_M0/GPIO4_C4_d | |
| P105 | | GND | |
| P106 | N34 | PCIE20_0_RXN/SATA30_0_RXN | |
| P107 | N33 | PCIE20_0_RXP/SATA30_0_RXP | |
| P108 | M34 | PCIE20_0_TXP/SATA30_0_TXP | |
| P109 | M33 | PCIE20_0_TXN/SATA30_0_TXN | |
| P110 | L33 | PCIE20_0_REFCLKN | |
| P111 | L32 | PCIE20_0_REFCLKP | |
| P112 | | GND | |
| P113 | K34 | PCIE20_1_TXN/SATA30_1_TXN | |
| P114 | K33 | PCIE20_1_TXP/SATA30_1_TXP | |
| P115 | J34 | PCIE20_1_RXN/SATA30_1_RXN | |
| P116 | J33 | PCIE20_1_RXP/SATA30_1_RXP | |
| P117 | H33 | PCIE20_1_REFCLKN | |

| | | | |
|------|-----|---|---|
| P118 | H32 | PCIE20_1_REFCLKP | |
| P119 | | GND | |
| P120 | G34 | PCIE30_PORT0_RX0N | |
| P121 | G33 | PCIE30_PORT0_RX0P | |
| P122 | F33 | PCIE30_PORT0_RX1N | |
| P123 | F32 | PCIE30_PORT0_RX1P | |
| P124 | E34 | PCIE30_PORT0_REF_CLKN | |
| P125 | E33 | PCIE30_PORT0_REF_CLKP | |
| P126 | D33 | PCIE30_PORT0_TX0N | |
| P127 | D32 | PCIE30_PORT0_TX0P | |
| P128 | C34 | PCIE30_PORT0_TX1N | |
| P129 | C33 | PCIE30_PORT0_TX1P | |
| P130 | | GND | |
| P131 | B32 | PCIE30_PORT1_RX0P | |
| P132 | A32 | PCIE30_PORT1_RX0N | |
| P133 | C31 | PCIE30_PORT1_RX1P | |
| P134 | B31 | PCIE30_PORT1_RX1N | |
| P135 | B30 | PCIE30_PORT1_TX0P | |
| P136 | A30 | PCIE30_PORT1_TX0N | |
| P137 | C29 | PCIE30_PORT1_TX1P | |
| P138 | B29 | PCIE30_PORT1_TX1N | |
| P139 | B28 | PCIE30_PORT1_REF_CLKN | |
| P140 | A28 | PCIE30_PORT1_REF_CLKP | |
| P141 | | GND | |
| P142 | C24 | HDMI_TX1_HPD_M0/SPI2_CLK_M0/GPIO1_A6_d | |
| P143 | B26 | HDMI_TX0_HPD_M0/SPI2_MOSI_M0/GPIO1_A5_d | |
| P144 | B25 | HDMI_TX1_SCL_M2/SPI2_MISO_M0/GPIO1_A4_d | |
| P145 | A27 | HDMI_TX1_SDA_M2/I2C4_SCL_M3/UART6_CTSN_M1/PWM1_M2/SPI4_CS0_M2/GPIO1_A3_d | |
| P146 | A26 | VOP_POST_EMPTY/I2C4_SDA_M3/UART6_RTSN_M1/PWM0_M2/SPI4_CLK_M2/GPIO1_A2_d | |
| P147 | A25 | PCIE30X1_1_WAKEN_M2/DP1_HPDIN_M2/SATA1_ACT_LED_M1/I2C2_SCL_M4/UART6_TX_M1/SPI4_MOSI_M2/GPIO1_A1_d | |
| P148 | A24 | PCIE30X1_1_CLKREQN_M2/DP0_HPDIN_M2/I2C2_SDA_M4/UART6_RX_M1/SPI4_MISO_M2/GPIO1_A0_d | |
| P149 | | VCC_1V8_S3 | 1.8V Output (Pin:P149/S15 1 Total Max:400mA) |
| P150 | | VCC_3V3_S3 | 3.3V Output (Pin:P150/S15 2 Total) |

| | | | Max:800mA) |
|--------------------------------------|------------|----------------------|------------|
| P151 | | GND | 核心板主供电 |
| P152 | | VCC4V0_SYS | |
| P153 | | VCC4V0_SYS | |
| P154 | | VCC4V0_SYS | |
| P155 | | VCC4V0_SYS | |
| P156 | | VCC4V0_SYS | |
| SMARC_314: (S1-S158), 未标注管脚为空 | | | |
| 序号 | RK3588 管脚名 | 管脚功能描述 | 备注 |
| S1 | | GND | |
| S2 | AF5 | HDMI_RX_CLKN | |
| S3 | AF6 | HDMI_RX_CLKP | |
| S4 | AG4 | HDMI_RX_D0N | |
| S5 | AG5 | HDMI_RX_D0P | |
| S6 | AH5 | HDMI_RX_D1N | |
| S7 | AH6 | HDMI_RX_D1P | |
| S8 | AJ4 | HDMI_RX_D2N | |
| S9 | AJ5 | HDMI_RX_D2P | |
| S10 | | GND | |
| S11 | AK6 | USB20_HOST0_DP | |
| S12 | AL6 | USB20_HOST0_DM | |
| S13 | AL7 | USB20_HOST1_DP | |
| S14 | AM7 | USB20_HOST1_DM | |
| S15 | AK9 | TYPEC1_USB20_OTG_DP | |
| S16 | AL9 | TYPEC1_USB20_OTG_DM | |
| S17 | AL10 | TYPEC1_SBU1/DP1_AUXP | |
| S18 | AM10 | TYPEC1_SBU2/DP1_AUXN | |
| S19 | AL12 | TYPEC0_USB20_OTG_DP | |
| S20 | AM12 | TYPEC0_USB20_OTG_DM | |
| S21 | AL14 | TYPEC0_USB20_OTG_ID | |
| S22 | AM14 | TYPEC0_USB20_VBUSDET | |
| S23 | | GND | |
| S24 | AL15 | TYPEC0_SBU1/DP0_AUXP | |
| S25 | AM15 | TYPEC0_SBU2/DP0_AUXN | |
| S26 | AM16 | SARADC_IN0_BOOT | |
| S27 | AL16 | SARADC_IN1 | |
| S28 | AK16 | SARADC_IN2 | |
| S29 | AN17 | SARADC_IN3 | |
| S30 | AM17 | SARADC_IN4 | |
| S31 | AK15 | SARADC_IN5 | |
| S32 | AL17 | SARADC_IN6 | |

| | | | |
|-----|------|--|--|
| S33 | AK17 | SARADC_IN7 | |
| S34 | | GND | |
| S35 | AG23 | CIF_D13/PCIE20X1_2_PERSTN_M0/HDMI_RX_CEC_M1/UART4_TX_M1/PWM9_M2/SPI0_MISO_M3/GPIO3_D1_d | |
| S36 | AG25 | CIF_D14/PCIE30X2_CLKREQN_M2/HDMI_RX_SCL_M1/I2C7_SCL_M2/UART9_RTSN_M2/SPI0_MOSI_M3/GPIO3_D2_d | |
| S37 | AG24 | CIF_D15/PCIE30X2_WAKEN_M2/HDMI_RX_SDA_M1/I2C7_SDA_M2/UART9_CTSN_M2/PWM10_M2/SPI0_CLK_M3/GPIO3_D3_d | |
| S38 | AJ24 | CIF_D11/PCIE20X1_2_CLKREQN_M0/HDMI_TX0_SCL_M2/I2C5_SCL_M0/SPI3_MOSI_M3/GPIO3_C7_u | |
| S39 | AH24 | CIF_D12/PCIE20X1_2_WAKEN_M0/HDMI_TX0_SDA_M2/I2C5_SDA_M0/UART4_RX_M1/PWM8_M2/SPI3_CLK_M3/GPIO3_D0_u | |
| S40 | AH26 | CIF_D8/FSPI_CS0N_M2/PCIE30X4_CLKREQN_M2/HDMI_TX1_CEC_M2/CAN2_RX_M0/UART5_TX_M1/SPI3_CS0_M3/GPIO3_C4_u | |
| S41 | AH25 | CIF_D9/FSPI_CS1N_M2/PCIE30X4_WAKEN_M2/HDMI_TX1_SDA_M1/CAN2_TX_M0/UART5_RX_M1/SPI3_CS1_M3/GPIO3_C5_u | |
| S42 | AG26 | CIF_D10/PCIE30X4_PERSTN_M2/HDMI_TX1_SCL_M1/SPI3_MISO_M3/GPIO3_C6_u | |
| S43 | AM25 | CIF_VSYNC/BT1120_D9/I2S1_SDO2_M0/PCIE20X1_2_BUTTON_RSTN/I2C7_SDA_M3/UART8_CTSN_M0/PWM15_IR_M1/CAN1_TX_M1/GPIO4_B3_u | |
| S44 | AJ26 | BT1120_D11/PCIE30X4_WAKEN_M1/HDMI_RX_CEC_M0/SATA1_ACT_LED_M0/UART9_RX_M1/PWM12_M1/SPI3_MISO_M1/GPIO4_B5_d | |
| S45 | AL24 | MIPI_CAMERA0_CLK_M0/SPDIF1_TX_M1/I2S1_SDO0_M0/PCIE30X1_0_BUTTON_RSTN/SATA2_ACT_LED_M0/I2C6_SCL_M3/UART8_RX_M0/SPI0_CS1_M1/GPIO4_B1_u | |
| S46 | AK25 | CIF_HREF/BT1120_D8/I2S1_SDO1_M0/PCIE30X1_1_BUTTON_RSTN/I2C7_SCL_M3/UART8_RTSN_M0/PWM14_M1/SPI0_CS0_M1/CAN1_RX_M1/GPIO4_B2_u | |
| S47 | AK24 | BT1120_D15/SPDIF1_TX_M2/PCIE20X1_2_PERSTN_M1/HDMI_TX0_CEC_M0/I2C8_SDA_M3/PWM6_M1/SPI3_CS1_M1/GPIO4_C1_d | |
| S48 | AJ25 | BT1120_D14/PCIE20X1_2_WAKEN_M1/HDMI_TX0_SDA_M0/I2C8_SCL_M3/SPI3_CS0_M1/GPIO4_C0_u | |
| S49 | AJ28 | BT1120_D13/PCIE20X1_2_CLKREQN_M1/HDMI_TX0_ | |

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| | | SCL_M0/I2C5_SDA_M1/SPI3_CLK_M1/GPIO4_B7_u | |
| S50 | AL26 | CIF_CLKOUT/BT1120_D10/I2S1_SDO3_M0/PCIE30X4_CLKREQN_M1/DP0_HPDIN_M0/SPDIF0_TX_M1/UART9_TX_M1/PWM11_IR_M1/GPIO4_B4_u | |
| S51 | AJ27 | BT1120_D12/PCIE30X4_PERSTN_M1/HDMI_RX_HPDIN_M0/SATA0_ACT_LED_M0/I2C5_SCL_M1/PWM13_M1/SPI3_MOSI_M1/GPIO4_B6_d | |
| S52 | AK27 | CIF_D5/BT1120_D5/I2S1_SDI0_M0/PCIE30X1_0_PERSTN_M1/I2C3_SDA_M2/UART3_TX_M2/SPI2_MOSI_M1/GPIO4_A5_d | |
| S53 | AL27 | CIF_D6/BT1120_D6/I2S1_SDI1_M0/PCIE30X2_CLKREQN_M1/I2C5_SCL_M2/UART3_RX_M2/SPI2_CLK_M1/GPIO4_A6_d | |
| S54 | AM27 | CIF_D7/BT1120_D7/I2S1_SDI2_M0/PCIE30X2_WAKEN_M1/I2C5_SDA_M2/SPI2_CS0_M1/GPIO4_A7_d | |
| S55 | AK26 | CIF_CLKIN/BT1120_CLKOUT/I2S1_SDI3_M0/PCIE30X2_PERSTN_M1/I2C6_SDA_M3/UART8_TX_M0/SPI2_CS1_M1/GPIO4_B0_d | |
| S56 | AL28 | CIF_D4/BT1120_D4/PCIE30X1_0_WAKEN_M1/I2C3_SCL_M2/UART0_RX_M2/SPI2_MISO_M1/GPIO4_A4_d | |
| S57 | AL29 | CIF_D3/BT1120_D3/PCIE30X1_0_CLKREQN_M1/UART0_TX_M2/GPIO4_A3_d | |
| S58 | AM29 | CIF_D2/BT1120_D2/I2S1_LRCK_M0/PCIE30X1_1_PERSTN_M1/SPI0_CLK_M1/GPIO4_A2_d | |
| S59 | AL30 | CIF_D1/BT1120_D1/I2S1_SCLK_M0/PCIE30X1_1_WAKEN_M1/UART9_CTSN_M1/SPI0_MOSI_M1/GPIO4_A1_d | |
| S60 | AK30 | CIF_D0/BT1120_D0/I2S1_MCLK_M0/PCIE30X1_1_CLKREQN_M1/UART9_RTSN_M1/SPI0_MISO_M1/GPIO4_A0_d | |
| S61 | AA27 | HDMI_TX0_HPD_M1/PCIE30X2_PERSTN_M2/HDMI_RX_HPDIN_M1/MCU_JTAG_TCK_M1/UART9_RX_M2/SPI0_CS0_M3/GPIO3_D4_d | |
| S62 | AB28 | PCIE30X4_BUTTON_RSTN/DP1_HPDIN_M0/MCU_JTAG_TMS_M1/UART9_TX_M2/PWM11_IR_M3/SPI0_CS1_M3/GPIO3_D5_d | |
| S63 | Y29 | GMAC1_PPSTRIG/I2C3_SDA_M1/UART7_TX_M1/SPI1_MISO_M1/GPIO3_C0_d | |
| S64 | Y27 | GMAC1_PPSCLK/PCIE30X2_BUTTON_RSTN/UART7_RX_M1/SPI1_CLK_M1/GPIO3_C1_d | |
| S65 | C25 | PDM1_SDI0_M1/PCIE30X1_1_PERSTN_M2/PWM3_IR_M3/SPI2_CS0_M0/GPIO1_A7_u | |
| S66 | C27 | PDM1_SDI1_M1/PCIE30X4_CLKREQN_M3/SPI2_CS1_ | |

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| | | M0/GPIO1_B0_u | |
| S67 | D25 | PDM1_SDI2_M1/PCIE30X4_WAKEN_M3/SPI0_MISO_M2/GPIO1_B1_d | |
| S68 | D26 | PDM1_SDI3_M1/PCIE30X4_PERSTN_M3/UART4_RX_M2/SPI0_MOSI_M2/GPIO1_B2_d | |
| S69 | | GND | |
| S70 | E26 | MIPI_CAMERA1_CLK_M0/SPDIF0_TX_M0/PCIE30X2_WAKEN_M3/HDMI_RX_HPDIN_M2/I2C5_SCL_M3/UART1_TX_M1/GPIO1_B6_d | |
| S71 | E27 | MIPI_CAMERA2_CLK_M0/SPDIF1_TX_M0/PCIE30X2_PERSTN_M3/HDMI_RX_CEC_M2/SATA2_ACT_LED_M1/I2C5_SDA_M3/UART1_RX_M1/PWM13_M2/GPIO1_B7_u | |
| S72 | F24 | MIPI_CAMERA3_CLK_M0/HDMI_RX_SCL_M2/I2C8_SCL_M2/UART1_RTSN_M1/PWM14_M2/GPIO1_D6_u | |
| S73 | F25 | MIPI_CAMERA4_CLK_M0/PCIE30X2_CLKREQN_M3/HDMI_RX_SDA_M2/I2C8_SDA_M2/UART1_CTSN_M1/PWM15_IR_M3/GPIO1_D7_u | |
| S74 | | GND | |
| S75 | | VCC_VDCEN | 上电自动开机电压（选择预留，可不用） |
| S76 | AH27 | ETH1_REFCLKO_25M/MIPI_CAMERA1_CLK_M1/I2C4_SCL_M0/GPIO3_A6_d | |
| S77 | AH30 | GMAC1_RXCLK/SDIO_CLK_M1/MIPI_CAMERA0_CLK_M1/FSPI_CLK_M2/I2C4_SDA_M0/UART8_CTSN_M1/GPIO3_A5_d | |
| S78 | AH29 | GMAC1_RXDV_CRS/MIPI_CAMERA4_CLK_M1/UART2_TX_M2/PWM2_M1/GPIO3_B1_d | |
| S79 | AG29 | GMAC1_RXD0/MIPI_CAMERA2_CLK_M1/PWM8_M0/GPIO3_A7_u | |
| S80 | AG28 | GMAC1_RXD1/MIPI_CAMERA3_CLK_M1/PWM9_M0/GPIO3_B0_u | |
| S81 | AD27 | GMAC1_RXD2/SDIO_D2_M1/I2S3_LRCK/AUDDSM_LP/FSPI_D2_M2/UART8_TX_M1/SPI4_CLK_M1/GPIO3_A2_u | |
| S82 | AE27 | GMAC1_RXD3/SDIO_D3_M1/I2S3_SDO/AUDDSM_RN/FSPI_D3_M2/UART8_RX_M1/SPI4_CS0_M1/GPIO3_A3_u | |
| S83 | AE29 | GMAC1_MCLKINOUT/I2S2_LRCK_M1/CAN1_TX_M0/UART3_RX_M1/PWM13_M0/GPIO3_B6_d | |
| S84 | AD28 | GMAC1_TXCLK/SDIO_CMD_M1/I2S3_SDI/AUDDSM_ | |

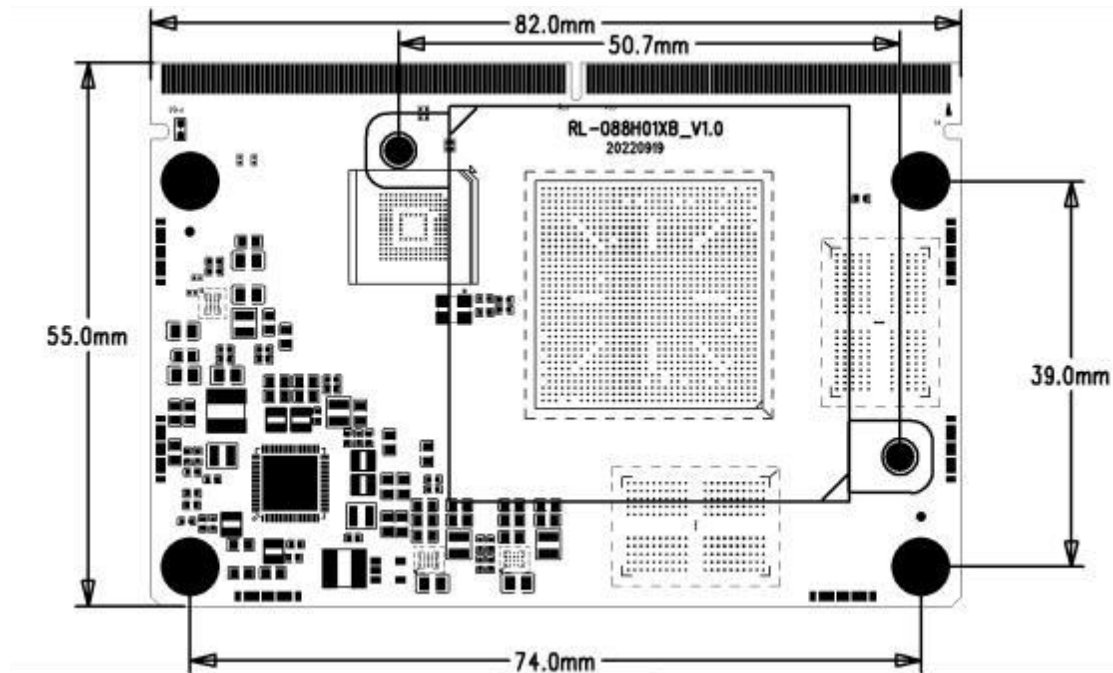
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| | | RP/UART8_RTSN_M1/SPI4_CS1_M1/GPIO3_A4_d | |
| S85 | AD29 | GMAC1_TXEN/I2S2_SCLK_M1/CAN1_RX_M0/UART3_TX_M1/PWM12_M0/GPIO3_B5_u | |
| S86 | AC28 | GMAC1_TXD0/I2S2_SDO_M1/UART2_RTSN/GPIO3_B3_u | |
| S87 | AC29 | GMAC1_TXD1/I2S2_MCLK_M1/UART2_CTSN/GPIO3_B4_u | |
| S88 | AA29 | GMAC1_TXD2/SDIO_D0_M1/I2S3_MCLK/FSPI_D0_M2/I2C6_SDA_M4/PWM10_M0/SPI4_MISO_M1/GPIO3_A0_u | |
| S89 | AA30 | GMAC1_TXD3/SDIO_D1_M1/I2S3_SCLK/AUDDSM_LN/FSPI_D1_M2/I2C6_SCL_M4/PWM11_IR_M0/SPI4_MOSI_M1/GPIO3_A1_u | |
| S90 | AA28 | GMAC1_PTP_REF_CLK/HDMI_TX1_HPD_M1/I2C3_SCL_M1/SPI1_MOSI_M1/GPIO3_B7_d | |
| S91 | AE28 | GMAC1_TXER/I2S2_SDI_M1/UART2_RX_M2/PWM3_IR_M1/GPIO3_B2_d | |
| S92 | Y31 | GMAC1_MDC/MIPI_TE0/I2C8_SCL_M4/UART7_RTSN_M1/PWM14_M0/SPI1_CS0_M1/GPIO3_C2_d | |
| S93 | Y30 | GMAC1_MDIO/MIPI_TE1/I2C8_SDA_M4/UART7_CTSN_M1/PWM15_IR_M0/SPI1_CS1_M1/GPIO3_C3_d | |
| S94 | AE30 | CLK32K_OUT1/GPIO2_C5_d | |
| S95 | AE31 | GMAC0_RXDV_CRS/UART7_RTSN_M0/PWM2_M2/SP_I3_CS0_M0/GPIO4_C2_d | |
| S96 | AE32 | GMAC0_RXCLK/SDIO_D2_M0/FSPI_D2_M1/I2C8_SCL_M1/UART6_RTSN_M0/GPIO2_B0_u | |
| S97 | AD32 | GMAC0_RXD0/I2C2_SCL_M1/UART1_CTSN_M0/SPI1_MISO_M0/GPIO2_C1_d | |
| S98 | AC30 | GMAC0_PPSCLK/TEST_CLKOUT_M1/HDMI_TX1_CEC_M0/UART9_RX_M0/SPI1_CS1_M0/GPIO2_C4_d | |
| S99 | AD31 | GMAC0_RXD1/I2C6_SDA_M2/UART9_TX_M0/SPI1_MOSI_M0/GPIO2_C2_d | |
| S100 | AD30 | ETH0_REFCLKO_25M/I2S2_SDI_M0/I2C6_SCL_M2/SP_I1_CS0_M0/GPIO2_C3_d | |
| S101 | AC32 | GMAC0_RXD2/SDIO_D0_M0/FSPI_D0_M1/UART6_RX_M0/GPIO2_A6_u | |
| S102 | AC31 | GMAC0_RXD3/SDIO_D1_M0/FSPI_D1_M1/UART6_TX_M0/GPIO2_A7_u | |
| S103 | AB31 | GMAC0_PTP_REFCLK/FSPI_CS0N_M1/HDMI_TX1_SDA_M0/I2C4_SDA_M1/UART7_RX_M0/GPIO2_B4_u | |
| S104 | AB30 | GMAC0_PPSTRING/FSPI_CS1N_M1/HDMI_TX1_SCL_M0/I2C4_SCL_M1/UART7_TX_M0/GPIO2_B5_u | |

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| S105 | U33 | LITCPU_AVS/SPI3_CLK_M2/GPIO0_D3_u | |
| S106 | V31 | I2S1_SDI2_M1/PDM0_SDI0_M1/I2C6_SDA_M0/UART1_RTSN_M2/PWM6_M0/SPI0_MISO_M0/PCIE30X4_WAKEN_M0/GPIO0_C7_d | |
| S107 | W31 | I2S1_SDI3_M1/PDM0_SDI1_M1/I2C6_SCL_M0/UART1_CTSN_M2/PWM7_IR_M0/SPI3_MISO_M2/PCIE30X4_PERSTN_M0/GPIO0_D0_d | |
| S108 | T29 | I2S1_SDI1_M1/NPU_AVS/UART0_RTSN/PWM5_M1/SPI0_CLK_M0/PCIE30X4_CLKREQN_M0/SATA_CP_POD/GPIO0_C6_u | |
| S109 | P30 | I2S1_SDI0_M1/GPU_AVS/UART0_TX_M0/I2C4_SCL_M2/DP1_HPDIN_M1/PWM4_M0/PCIE30X1_0_PERSTN_M0/GPIO0_C5_u | |
| S110 | R30 | PDM0_CLK1_M1/PWM2_M0/UART0_RX_M0/I2C4_SDA_M2/DP0_HPDIN_M1/PCIE30X1_0_WAKEN_M0/GPIO0_C4_d | |
| S111 | | GND | |
| S112 | P29 | I2S1_MCLK_M1/JTAG_TCK_M2/I2C1_SCL_M0/UART2_TX_M0/PCIE30X1_1_CLKREQN_M0/GPIO0_B5_d | |
| S113 | R29 | I2S1_SCLK_M1/JTAG_TMS_M2/I2C1_SDA_M0/UART2_RX_M0/PCIE30X1_1_WAKEN_M0/GPIO0_B6_d | |
| S114 | T28 | I2S1_LRCK_M1/PWM0_M0/I2C2_SCL_M0/CAN0_TX_M0/SPI0_CS1_M0/PCIE30X1_1_PERSTN_M0/GPIO0_B7_d | |
| S115 | T31 | PDM0_CLK0_M1/PWM1_M0/I2C2_SDA_M0/CAN0_RX_M0/SPI0_MOSI_M0/PCIE30X1_0_CLKREQN_M0/GPIO0_C0_d | |
| S116 | P33 | REFCLK_OUT/GPIO0_A0_d | |
| S117 | P31 | SDMMC_DET/GPIO0_A4_u | |
| S118 | K29 | CLK32K_IN/CLK32K_OUT0/GPIO0_B2_u | |
| S119 | L30 | SPI2_CS1_M2/I2C1_SCL_M1/UART0_RX_M1/GPIO0_B0_z | |
| S120 | | GND | |
| S121 | J31 | PCIE20_2_RXP/SATA30_2_RXP/USB30_SSRXP | |
| S122 | J30 | PCIE20_2_RXN/SATA30_2_RXN/USB30_SSRXN | |
| S123 | H30 | PCIE20_2_TXP/SATA30_2_TXP/USB30_SSTXP | |
| S124 | H29 | PCIE20_2_TXN/SATA30_2_TXN/USB30_SSTXN | |
| S125 | G31 | PCIE20_2_REFCLKP | |
| S126 | G30 | PCIE20_2_REFCLKN | |
| S127 | | GND | |
| S128 | G29 | I2C3_SDA_M0/UART3_RX_M0/SPI4_MISO_M0/GPIO1_C0_z | |
| S129 | G27 | I2C3_SCL_M0/UART3_TX_M0/SPI4_MOSI_M0/GPIO1_ | |

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| | | C1_z | |
| S130 | F30 | I2S0_MCLK/I2C6_SDA_M1/UART3_RTSN/PWM3_IR_M2/SPI4_CLK_M0/GPIO1_C2_d | |
| S131 | E31 | I2S0_SCLK/I2C6_SCL_M1/UART3_CTSN/PWM7_IR_M2/SPI4_CS0_M0/GPIO1_C3_d | |
| S132 | E30 | PDM0_CLK1_M0/I2C2_SDA_M3/PWM11_IR_M2/SPI4_CS1_M0/GPIO1_C4_d | |
| S133 | D30 | I2S0_LRCK/I2C2_SCL_M3/UART4_RTSN/GPIO1_C5_d | |
| S134 | D29 | PDM0_CLK0_M0/I2C4_SDA_M4/PWM15_IR_M2/GPIO1_C6_d | |
| S135 | E29 | I2S0_SDO0/I2C4_SCL_M4/UART4_CTSN/GPIO1_C7_d | |
| S136 | F26 | I2S0_SDO1/I2C7_SCL_M0/UART6_TX_M2/SPI1_MISO_M2/GPIO1_D0_d | |
| S137 | F27 | I2S0_SDO2/I2S0_SDI3/PDM0_SDI1_M0/I2C7_SDA_M0/UART6_RX_M2/SPI1_MOSI_M2/GPIO1_D1_d | |
| S138 | F28 | I2S0_SDO3/I2S0_SDI2/PDM0_SDI2_M0/I2C1_SCL_M4/UART4_TX_M0/PWM0_M1/SPI1_CLK_M2/GPIO1_D2_d | |
| S139 | E28 | I2S0_SDI1/PDM0_SDI3_M0/I2C1_SDA_M4/UART4_RX_M0/PWM1_M1/SPI1_CS0_M2/GPIO1_D3_d | |
| S140 | D28 | I2S0_SDI0/GPIO1_D4_d | |
| S141 | G26 | PDM0_SDI0_M0/SPI1_CS1_M2/GPIO1_D5_d | |
| S142 | D27 | PDM1_CLK1_M1/PCIE30X1_0_WAKEN_M2/SATA0_ACT_LED_M1/UART4_TX_M2/SPI0_CLK_M2/GPIO1_B3_d | |
| S143 | E24 | PDM1_CLK0_M1/PCIE30X1_0_PERSTN_M2/UART7_RX_M2/SPI0_CS0_M2/GPIO1_B4_u | |
| S144 | E25 | PCIE30X1_0_CLKREQN_M2/UART7_TX_M2/SPI0_CS1_M2/GPIO1_B5_u | |
| S145 | | PMIC_EXT_EN_OUT | 底板 DC-DC 开关使能 |
| S146 | | PWRON_L | 开关机控制 |
| S147 | M31 | NPOR_u | 复位 |
| S148 | | GND | |
| S149 | | VCCA_3V3_S0 | 3.3V Output Max:300mA |
| S150 | | VCC_1V8_S0 | 1.8V Output Max:200mA |
| S151 | | VCC_1V8_S3 | 1.8V Output (Pin:P149/S151 Total Max:400mA) |
| S152 | | VCC_3V3_S3 | 3.3V Output |

| | | | |
|------|--|------------|---------------------------------|
| | | | (Pin:P150/S152 Total Max:800mA) |
| S153 | | GND | |
| S154 | | VCC4V0_SYS | 核心板主供电 |
| S155 | | VCC4V0_SYS | |
| S156 | | VCC4V0_SYS | |
| S157 | | VCC4V0_SYS | |
| S158 | | VCC4V0_SYS | |

五. 结构图



图五（平面结构尺寸图）

六. 运输、存储、使用条件

1. 储存环境：防静电，防潮，防积压，防冲击
2. 输入电压：DC4V 电源纹波小于 50mv
4. 适宜工作环境温度：0 ~ 60°C
5. 极限工作环境温度：-20 ~ 70°C
6. 空气环境相对湿度：20% ~ 90%
7. 正常存储环境温度：-20~ 60°C

七. 物理尺寸

82.00mm×55.00mm×5.00mm（长 L×宽 W×高 H）

八. 温馨提示

使用注意事项;

- 1, 注意装配过程中的静电保护措施;
- 2, 底板设计严格按照连接器的规格及接口定义, 不能有各接口之间的任何连接错误;
- 3, 注意底板与核心板电源输入接口管脚定义对应, 不能插反或电压不匹配;
- 4, 4V 电源输入功率大于 6A, 纹波需小于 50MV, 根据具体使用环境灵活选择合适的电源 DC-DC 芯片;
- 5, 注意核心板的几路电源输出注意不要超功率使用。

谢谢各位能在宝贵的时间内仔细阅读本文档!