



LCB3399Pro 核心模块  
产品手册  
V1.0

上海临滴科技有限公司

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## 版本历史

版本	日期	说明
V1.0	2019/10/20	初始版本

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# 1 产品概述

## 1.1 产品描述

LCB3399Pro 基于瑞芯微 RK3399Pro 芯片平台精心设计的一款全功能核心模块，尺寸仅有 75mm\*55mm。核心模块与底板的连接采用两颗 tyco/AMP 的 0.8mm pitch 双排 140Pin 板对板连接器，并通过 4 颗 M3 的螺丝固定，稳定可靠、易于安装和维护。

LCB3399Pro 包含 CPU（集成 NPU）、DDR、eMMC 和 PMU 部分。CPU 为 RK3399 Pro；DDR 采用市场主流型号 LPDDR3，双通道 64bit 带宽，更低功耗更快频率，可选 3GB/6GB 配置；eMMC 采用高速 eMMC 5.1 标准，可选 4GB~128GB 多种容量配置；PMU 由 RK809 及多路 DC-DC 和 LDO 组成，CPU 核心电压均支持 DVFS 动态调压。

LCB3399Pro 经过了严格的测试过程管理，可确保长时间稳定可靠工作。可为客户提供以下测试数据参考：功能项测试，电源电压的精度、纹波、过冲、跌落、上升时间及动态范围测试，各路电压上电时序测试，各路关键时钟信号的精度和频偏测试，全负荷工作时的功耗测试，全负荷工作时的温升测试等。

LCB3399Pro 采用模块化的设计理念，将需求相同、要求严格的核心部分单独设计为一个全功能模块，并经过全面的测试和批量化验证。用户基于该模块开发产品，可节省项目开发周期，降低企业成本，提高公司效率。

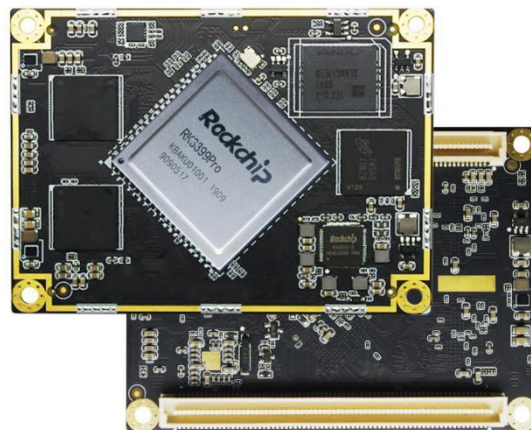


图 1-1

## 1.2 产品框图

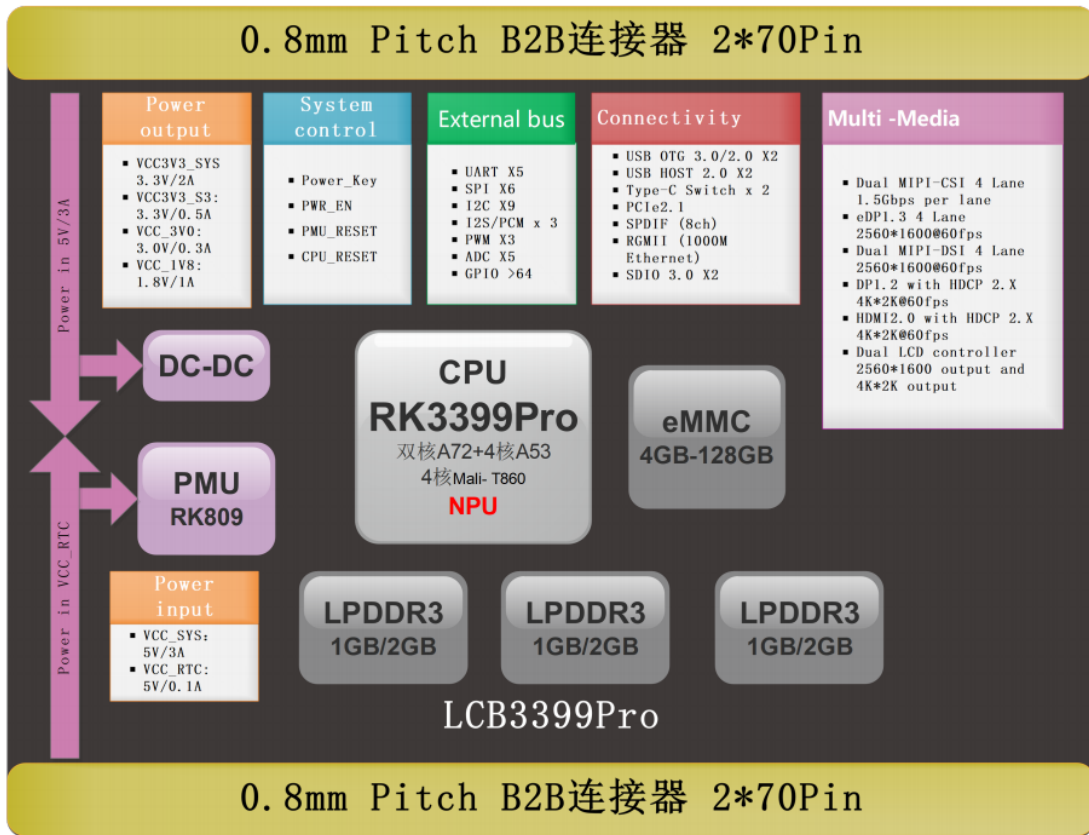


图 1-2

## 2 外观和尺寸

### 2.1 产品尺寸

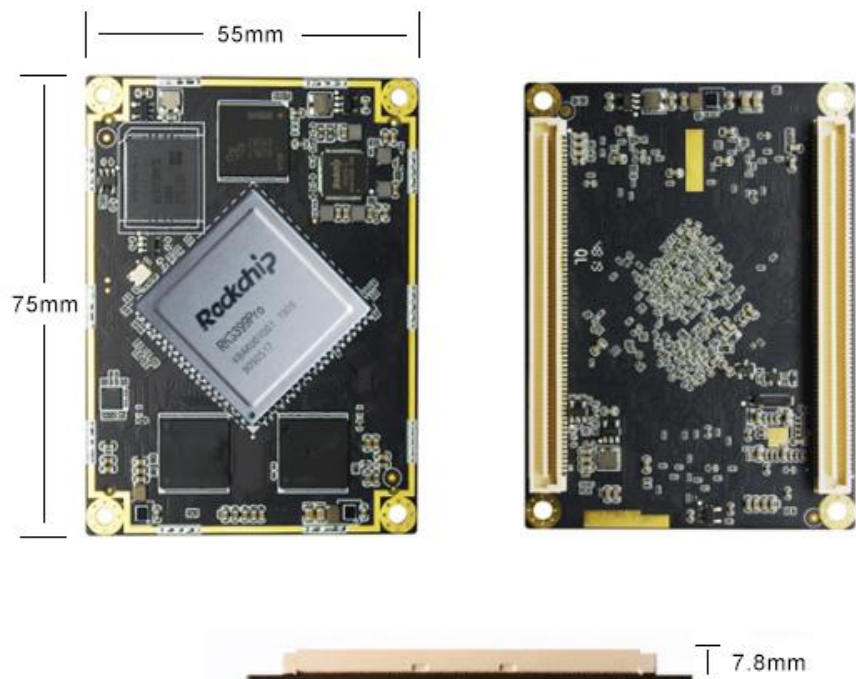


图 2-1

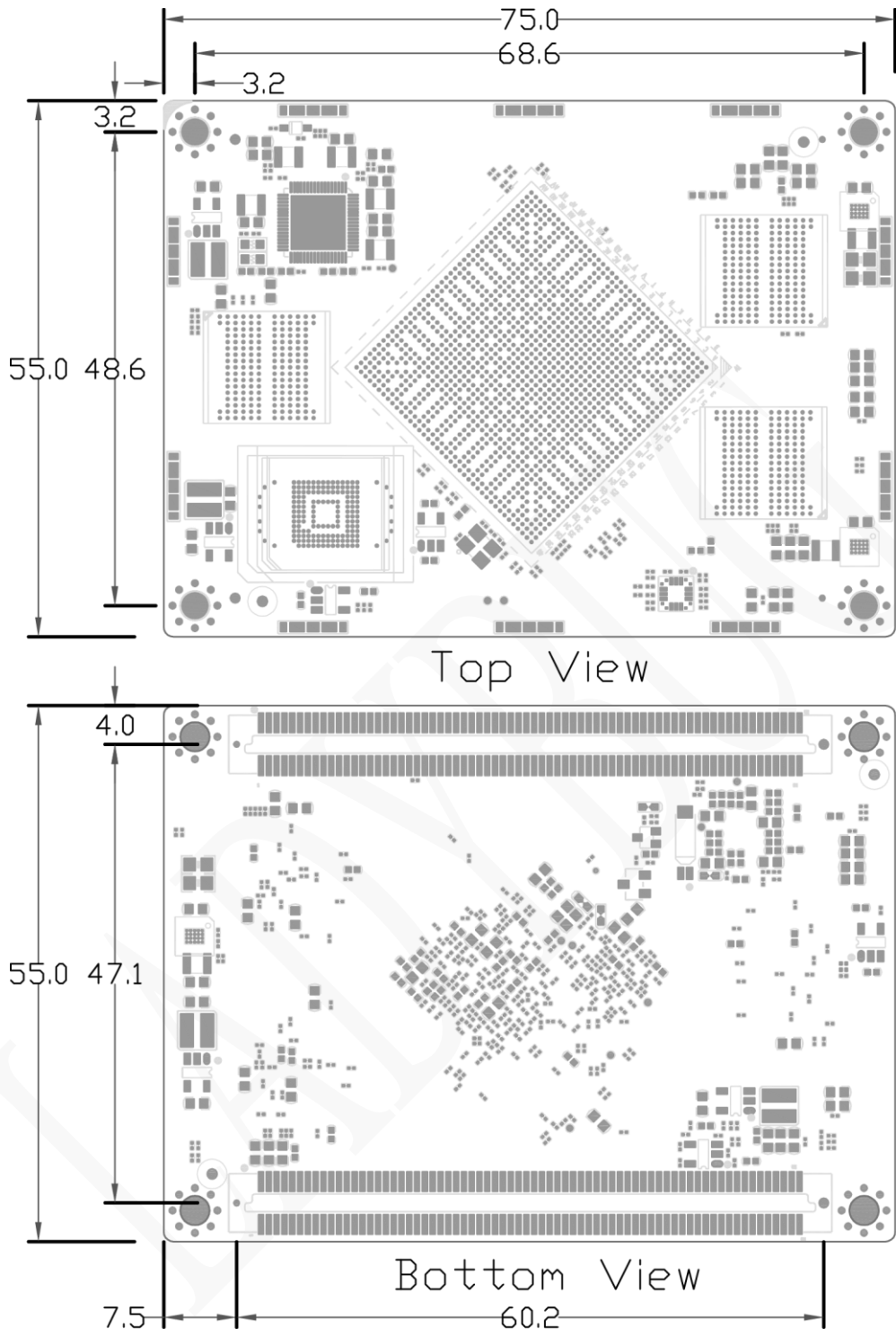


图 2-2

## 2.2 B2B 连接器

LCB3399Pro 采用 2 颗 tyco Electronics/AMP 的 B2B 连接器，该连接器为 0.8mm Pitch 2\*70Pin 的公座，型号：5177986-6，如图 2-3 和 2-4 所示。

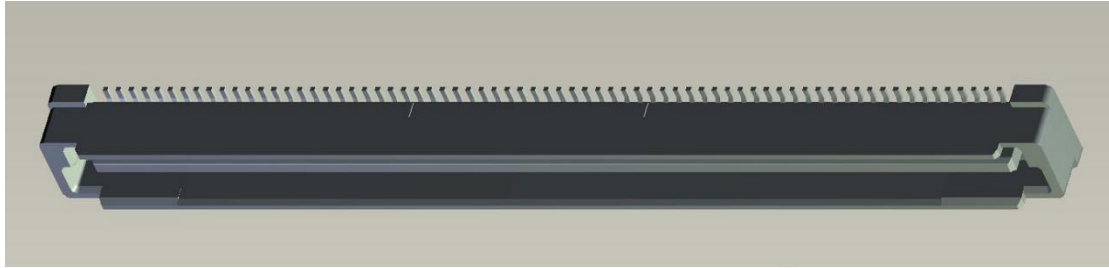


图 2-3

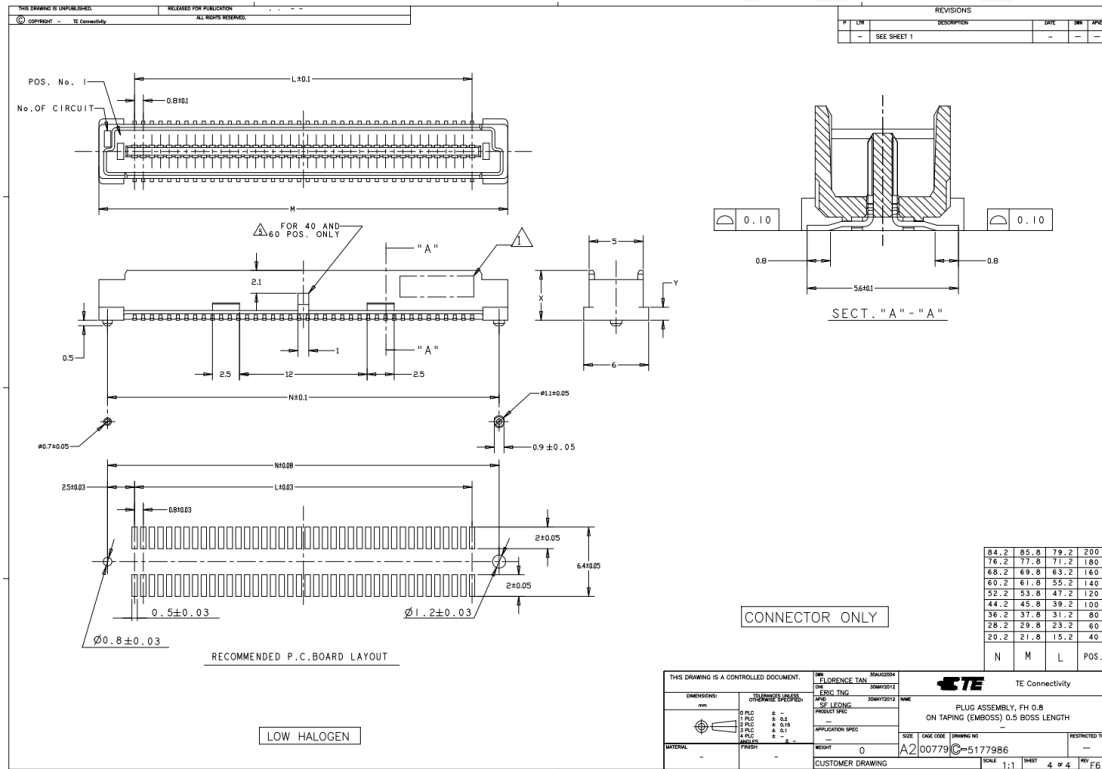


图 2-4

底板上应选择对应的连接器母座型号，常规合高为：5mm，型号为：5177985-6，如图 2-5 和 2-6 所示。

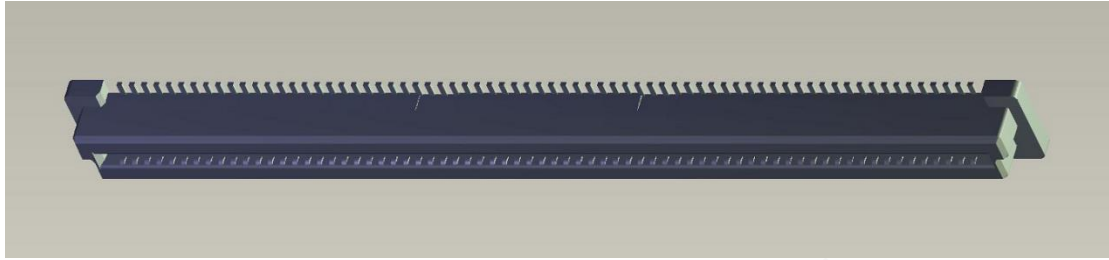


图 2-5

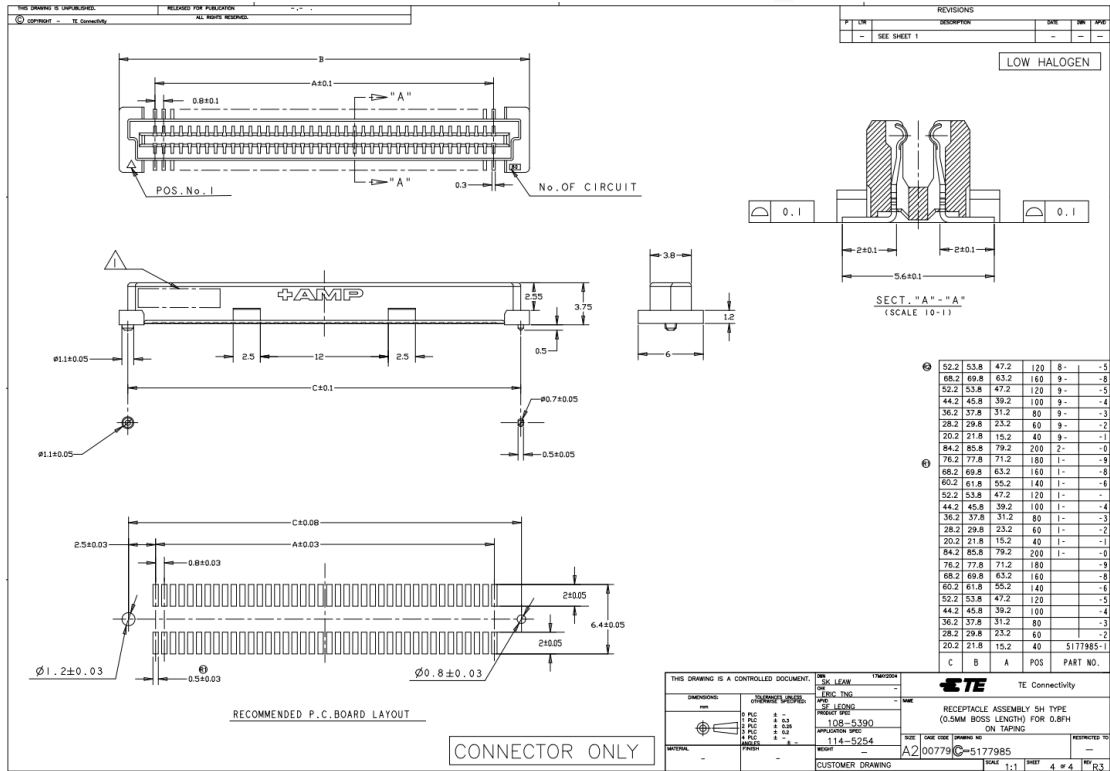


图 2-6

# 3 产品参数

表 3-1

Function	Description
CPU	RK3399Pro, Big.Little architecture: Dual Cortex-A72 + Quad Cortex-A53, 64-bit CPU.Frequency is up to 1.8GHz
GPU	Mali-T860MP4 GPU, OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11
NPU	NPU up to 3.0TOPS, Support 8-bit/16-bit Inference, Support TensorFlow/Caffe Model
DDR	LPDDR3, 3GB/6GB (Optional)
eMMC	eMMC 5.1, 8GB/16GB/32GB/64GB/128GB(Optional)
PMU	RK809.Support a variety of power supply
Camera Interface	Two ISP built-in Dual MIPI-CSI 4 Lane of 1.5 Gbps/Lane ITU-R BT 601/656 compliant Maximum input resolution of one ISP is 14M pixels
Display Interface	Two VOP embedded Dual MIPI-DSI 4 Lane of 1.5 Gbps/Lane up to 2560x1600@60fps eDP1.3 4 Lane of 2.7/1.62 Gbps/lane DP1.2 4 Lane with HDCP2.2 up to 4kx2k at 60Hz resolution HDMI2.0 3 Lane with HDCP2.2
USB Interface	OTG*1, HOST*2, TYPE-C*2
TYPE-C Interface	Dual Type-C PHY with Type-C V1.1 and USB PD2.0 Attach/detach detection and signaling as DFP, UFP and DRP Support USB3.0 Type-C and DisplayPort 1.2 Alt Mode Up to 5Gbps data rate for USB3.0 Up to 5.4Gbps (HBR2) data rate for DP1.2
Audio Interface	Three I2S/PCM built-in SPDIF supported Audio resolution from 16bits to 32bits Sample rate up to 192KHz Provides master and slave work mode, software configurable Support 3 I2S formats (normal, left-justified, right-justified) Support 4 PCM formats (early, late1, late2, late3) Support two 16-bit audio data store together in one 32-bit wide location Support 16, 20, 24 bits audio data transfer in linear PCM mode
Connectivity	Compatible with SDIO 3.0 protocol GMAC 10/100/1000M Ethernet Controller Six on-chip SPI controllers Five on-chip UART controllers inside Nine on-chip I2C controllers Five groups of GPIO (GPIO0~GPIO4), totally have 122 GPIOs One PCIe port compatible with PCI Express V2.1 and dual operation mode (RC and EP)

	Six-channel single-ended 10-bit SAR-ADC up to 1MS/s sampling rate
OS	Android / ubuntu / Buildroot
PCB interface	B2B, 280 Pin
PCB size	L* W* H(mm) : 75 * 55 *7.8 (PCB 1.2mm)

# 4 接口定义

## 4.1 pin 脚编号

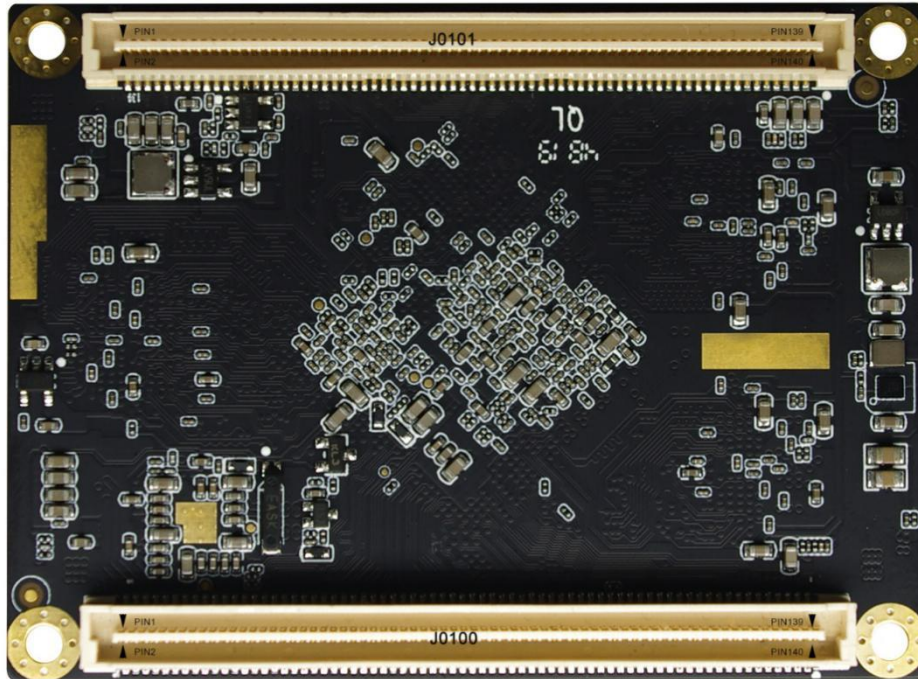


图 4-1

## 4.2 pin 脚描述

Num	Pin Name	Pin Type	Default Type	I/O Pull	Description	Default Pin function	power domain
J0100.1	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.2	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.3	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.4	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.5	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.6	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.7	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.8	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.9	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.10	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.11	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.12	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.13	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A

J0100.14	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.15	VCC5V0_SYS_S3	P	I	N/A	Power input 5V/5A	Main power supply	N/A
J0100.16	GND	P	I	N/A	Main GND	Main power supply	N/A
J0100.17	GPIO3_B2 MAC_RXER I2C5_SDA	I/O	I	up	MAC receive error	No used for RGMII	APIO1 (3.3V I/O)
J0100.18	VCCIO_3V3_S0	P	O	N/A	Power output 3.3V/0.5A	output for external devices IO supply	N/A
J0100.19	GPIO3_B4 MAC_TXEN UART1_RX	I/O	I	up	MAC transmit enable	PHY_TXEN	APIO1 (3.3V I/O)
J0100.20	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.21	GPIO3_A5 MAC_TXD1 SPI0_TXD	I/O	I	down	MAC transmit data	PHY_TXD1	APIO1 (3.3V I/O)
J0100.22	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.23	GPIO3_A1 MAC_TXD3 SPI4_TXD	I/O	I	down	MAC transmit data	PHY_TXD3	APIO1 (3.3V I/O)
J0100.24	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.25	GPIO3_A0 MAC_TXD2 SPI4_RXD	I/O	I	down	MAC transmit data	PHY_TXD2	APIO1 (3.3V I/O)
J0100.26	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.27	GPIO3_A4 MAC_TXD0 SPI0_RXD	I/O	I	down	MAC transmit data	PHY_TXD0	APIO1 (3.3V I/O)
J0100.28	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.29	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.30	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.31	GPIO3_C1 MAC_TXCLK UART3_RTSN	I/O	I	up	MAC transmit clock	PHY_TXCLK	APIO1 (3.3V I/O)
J0100.32	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.33	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.34	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.35	GPIO3_B3 MAC_CLK I2C5_SCL	I/O	I	up	MAC reference clock output	MAC_CLK	APIO1 (3.3V I/O)
J0100.36	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A
J0100.37	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.38	RFU	N/A	N/A	N/A	Reserve for future used	N/A	N/A

J0100.39	GPIO3_B6 MAC_RXCLK UART3_RX	I/O	I	up	MAC receive clock	MAC_RXCLK	APIO1 (3.3V I/O)
J0100.40	GPIO2_B4 SPI2_CSN0	I/O	I	up	Camera power down control output for front	DVP_PDN0_H	APIO2 (1.8V I/O)
J0100.41	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.42	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.43	GPIO3_A3 MAC_RXD3 SPI4_CSN0	I/O	I	up	MAC receive data	MAC_RXD3	APIO1 (3.3V I/O)
J0100.44	EDP_AUXP	I/O	I/O	N/A	eDP AUX channel	eDP AUX channel	N/A
J0100.45	GPIO3_B1 MAC_RXDV	I/O	I	down	MAC receive data valid	MAC_RXDV	APIO1 (3.3V I/O)
J0100.46	EDP_AUXN	I/O	I/O	N/A	eDP AUX channel	eDP AUX channel	N/A
J0100.47	GPIO3_A6 MAC_RXD0 SPI0_CLK	I/O	I	up	MAC receive data	MAC_RXD0	APIO1 (3.3V I/O)
J0100.48	EDP_TX0P	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.49	GPIO3_A7 MAC_RXD1 SPI0_CSN0	I/O	I	up	MAC receive data	MAC_RXD1	APIO1 (3.3V I/O)
J0100.50	EDP_TX0N	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.51	GPIO3_A2 MAC_RXD2 SPI4_CLK	I/O	I	up	MAC receive data	MAC_RXD2	APIO1 (3.3V I/O)
J0100.52	EDP_TX1P	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.53	GPIO3_B5 MAC_MDIO UART1_TX	I/O	I	up	MAC management command and data	MAC_MDIO	APIO1 (3.3V I/O)
J0100.54	EDP_TX1N	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.55	GPIO3_B0 MAC_MDC SPI0_CSN1	I/O	I	up	MAC management clock	MAC_MDC	APIO1 (3.3V I/O)
J0100.56	EDP_TX2P	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.57	GPIO3_C0 MAC_COL UART3_CTSN SPDIF_TX	I/O	I	up	MAC collision detect	PHY_INT	APIO1 (3.3V I/O)
J0100.58	EDP_TX2N	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.59	GPIO3_B7 MAC_CRSD UART3_TX CIF_CLKOUTB	I/O	I	up	MAC carrier sense detect	PHY_RST	APIO1 (3.3V I/O)
J0100.60	EDP_TX3P	I/O	O	N/A	eDP data lane	eDP data lane	N/A

J0100.61	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.62	EDP_TX3N	I/O	O	N/A	eDP data lane	eDP data lane	N/A
J0100.63	MIPI_MCLK	I/O	O	N/A	clock out for external devices	clock out for cameras	N/A
J0100.64	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.65	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.66	GPIO1_B3 I2C4_SDA	I/O	I	up	I2C serial port 4,need external pull-up	I2C4_SDA	PMUIO2 (1.8V I/O)
J0100.67	GPIO2_B3 SPI2_CLK VOP_DEN CIF_CLKOUTA	I/O	I	up	Camera clock output	CIF_CLK_OUT	APIO2 (1.8V I/O)
J0100.68	GPIO1_B4 I2C4_SCL	I/O	I	up	I2C serial port 4,need external pull-up	I2C4_SCL	PMUIO2 (1.8V I/O)
J0100.69	GPIO2_A5 VOP_D5 CIF_D5	I/O	I	down	Camera data port	CIF_D5	APIO2 (1.8V I/O)
J0100.70	GPIO1_C5 I2C8_SCL	I/O	I	up	I2C serial port 8,for CC,need external pull-up	I2C8_SCL_CC	PMUIO2 (1.8V I/O)
J0100.71	GPIO2_B1 SPI2_RXD CIF_HREF I2C6_SDA	I/O	I	up	Camera href input	CIF_HREF	APIO2 (1.8V I/O)
J0100.72	GPIO1_C4 I2C8_SDA	I/O	I	up	I2C serial port 8,for CC,need external pull-up	I2C8_SDA_CC	PMUIO2 (1.8V I/O)
J0100.73	GPIO2_A6 VOP_D6 CIF_D6	I/O	I	down	Camera data port	CIF_D6	APIO2 (1.8V I/O)
J0100.74	GPIO0_A3 SDIO0_WRPT	I/O	I	down	WIFI module wake up AP	WIFI_HOST_WAKE_L	PMUIO1 (1.8V I/O)
J0100.75	GPIO2_A0 VOP_D0 CIF_D0 I2C2_SDA	I/O	I	up	Camera data port	CIF_D0	APIO2 (1.8V I/O)
J0100.76	GPIO4_B5 SDMMC0_CMD MCUJTAG_TMS	I/O	I	up	SDMMC0 command output JTAG TMS for MCU	SDMMC0_CMD	SDMMC0 (1.8V/3.0V auto)
J0100.77	GPIO2_A7 VOP_D7 CIF_D7 I2C7_SDA	I/O	I	up	Camera data port	CIF_D7	APIO2 (1.8V I/O)
J0100.78	GPIO4_B3 SDMMC0_D3 APJTAG_TMS	I/O	I	up	SDMMC0 data port JTAG TMS for AP	SDMMC0_D3/JTAG_TMS	SDMMC0 (1.8V/3.0V auto)

J0100.79	GPIO2_A3 VOP_D3 CIF_D3	I/O	I	down	Camera data port	CIF_D3	APIO2 (1.8V I/O)
J0100.80	GPIO4_B1 SDMMC0_D1 UART2A_TX	I/O	I	up	SDMMC0 data port	SDMMC0_D1/UART2_TX	SDMMC0 (1.8V/3.0V auto)
J0100.81	GPIO2_A2 VOP_D2 CIF_D2	I/O	I	down	Camera data port	CIF_D2	APIO2 (1.8V I/O)
J0100.82	GPIO4_B4 SDMMC0_CLKOUT MCUJTAG_TCK	I/O	I	down	SDMMC0 clock output JTAG TCK for MCU	SDMMC0_CLK	SDMMC0 (1.8V/3.0V auto)
J0100.83	GPIO2_A4 VOP_D4 CIF_D4	I/O	I	down	Camera data port	CIF_D4	APIO2(1.8V I/O)
J0100.84	GPIO4_B0 SDMMC0_D0 UART2A_RX	I/O	I	up	SDMMC0 data port	SDMMC0_D0/UART2_RX	SDMMC0 (1.8V/3.0V auto)
J0100.85	GPIO2_B0 VOP_CLK CIF_VSYNC I2C7_SCL	I/O	I	up	Camera vsync input	CIF_VSYNC	APIO2(1.8V I/O)
J0100.86	GPIO4_B2 SDMMC0_D2 APJTAG_TCK	I/O	I	up	SDMMC0 data port JTAG TCK for AP	SDMMC0_D2/JTAG_TCK	SDMMC0 (1.8V/3.0V auto)
J0100.87	GPIO2_A1 VOP_D1 CIF_D1 I2C2_SCL	I/O	I	up	Camera data port	CIF_D1	APIO2 (1.8V I/O)
J0100.88	GPIO0_A7 SDMMC0_DET	I/O	I	up	SDMMC0 detect input	SDMMC0_DET_L	PMUIO1 (1.8V I/O)
J0100.89	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.90	GPIO1_A2 ISP0_FLASHTRIGIN ISP1_FLASHTRIGIN	I/O	I	down	CC logic controler interrupt input	TYPECC_INT_L	PMUIO2 (1.8V I/O)
J0100.91	GPIO2_B2 SPI2_TXD CIF_CLKIN I2C6_SCL	I/O	I	up	Camera clock input	CIF_CLKI	APIO2 (1.8V I/O)
J0100.92	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.93	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.94	HOST1_DP	I/O	N/A	N/A	USB data port	USB data port	N/A

J0100.95	GPIO0_B0 SDMMC0_WRPT TEST_CLKOUT2	I/O	I	up	N4 interrupt input	N4_INT_L	PMUIO1 (1.8V I/O)
J0100.96	HOST1_DM	I/O	N/A	N/A	USB data port	USB data port	N/A
J0100.97	GPIO0_A1 DDRIO_PWROFF	I/O	I	up	MIPI CAMERA RST	CAM_RST_L	PMUIO1 (1.8V I/O)
J0100.98	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.99	GPIO0_B5	I/O	I	down	Headphone insert detect input	PHONE_DET_H	PMUIO1 (1.8V I/O)
J0100.100	NPU_CIF_D4	I/O	I	down	NPU Camera data port	NPU_CIF_D4	NPU VCCIO2 (1.8V IO)
J0100.101	GPIO0_B4	I/O	I	down	N4 reset output	N4_RST	PMUIO1 (1.8V I/O)
J0100.102	NPU_CIF_D7	I/O	I	down	NPU Camera data port	NPU_CIF_D7	NPU VCCIO2 (1.8V IO)
J0100.103	GPIO0_B1 PMUIO2_VOLSEL	I/O	I	down	N4 power enable	N4_PWREN	PMUIO1 (1.8V I/O)
J0100.104	NPU_CIF_D8	I/O	I	down	NPU Camera data port	NPU_CIF_D8	NPU VCCIO2 (1.8V IO)
J0100.105	VCC_RTC_S5	P	I	N/A	Power input(5V/0.1A) for internal RTC	Power input(5V/0.1A) for internal RTC	N/A
J0100.106	NPU_CIF_D2	I/O	I	down	NPU Camera data port	NPU_CIF_D2	NPU VCCIO2 (1.8V IO)
J0100.107	GPIO0_A5 EMMC_PWRON	I/O	I	up	BT module wake up AP	BT_HOST_WAKE_L	PMUIO1 (1.8V I/O)
J0100.108	NPU_CIF_D0	I/O	I	down	NPU Camera data port	NPU_CIF_PDN0	NPU VCCIO2 (1.8V IO)
J0100.109	GPIO1_B5	I/O	I	down	USB HOST power enable	USB5V0_EN_H	PMUIO2 (1.8V I/O)
J0100.110	NPU_CIF_D3	I/O	I	down	NPU Camera data port	NPU_CIF_D3	NPU VCCIO2 (1.8V IO)
J0100.111	GPIO1_B0 SPI1_TXD UART4_TX	I/O	I	up	Reserve	Reserve	PMUIO2 (1.8V I/O)
J0100.112	NPU_CIF_HREF	I/O	I	down	Camera href input	NPU_CIF_HREF	NPU VCCIO2 (1.8V IO)
J0100.113	GPIO1_B2 SPI1_CSN0 PMCU_JTAG_TMS	I/O	I	up	Reserve	Reserve	PMUIO2 (1.8V I/O)
J0100.114	NPU_CIF_D5	I/O	I	down	NPU Camera data port	NPU_CIF_D5	NPU VCCIO2 (1.8V IO)
J0100.115	GPIO1_A7 SPI1_RXD UART4_RX	I/O	I	up	Reserve	Reserve	PMUIO2 (1.8V I/O)

J0100.116	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.117	GPIO1_B1 SPI1_CLK PMCU_JTAG_TCK	I/O	I	up	Reserve	Reserve	PMUIO2 (1.8V I/O)
J0100.118	NPU_CIF_CLKOUT	I/O	I	down	Camera clock output	NPU_CIF_CLKOUT	NPU VCCIO2 (1.8V IO)
J0100.119	GPIO0_A6 PWM3A_IR	I/O	I	down	IR receiver input	IR_RX	PMUIO1 (1.8V I/O)
J0100.120	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.121	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.122	NPU_CIF_CLKIN	I/O	I	down	Camera clock input	NPU_CIF_CLKIN	NPU VCCIO2 (1.8V IO)
J0100.123	VCC3V3_SYS_S3	P	O	N/A	Power output(3.3V/1A) for external devices	Power output(3.3V/1A) for external devices	N/A
J0100.124	GND	P	N/A	N/A	N/A	N/A	N/A
J0100.125	VCC3V3_SYS_S3	P	O	N/A	Power output(3.3V/1A) for external devices	Power output(3.3V/1A) for external devices	N/A
J0100.126	NPU_CIF_D10	I/O	I	down	NPU Camera data port	NPU_CIF_RST	NPU VCCIO2 (1.8V IO)
J0100.127	VCC_BUCK5_S3	P	O	N/A	Power output(2.3V/1A) for external devices	Power output(3.3V/1A) for external devices	N/A
J0100.128	NPU_CIF_D1	I/O	I	down	NPU Camera data port	NPU_CIF_PDN1	NPU VCCIO2 (1.8V IO)
J0100.129	VCC_BUCK5_S3	P	O	N/A	Power output(2.3V/1A) for external devices	Power output(3.3V/1A) for external devices	N/A
J0100.130	NPU_CIF_D6	I/O	I	down	NPU Camera data port	NPU_CIF_D6	NPU VCCIO2 (1.8V IO)
J0100.131	ADC_IN4	A	N/A	N/A	SAR-ADC input channel4	Reserve	SAR ADC (1.8V ADC)
J0100.132	NPU_CIF_D11	I/O	I	down	NPU Camera data port	NPU_CIF_PWREN_H	NPU VCCIO2 (1.8V IO)
J0100.133	ADC_IN1	A	N/A	N/A	SAR-ADC input channel1	Reserve	SAR ADC (1.8V ADC)
J0100.134	NPU_CIF_VSYNC	I/O	I	down	Camera vsync input	NPU_CIF_VSYNC	NPU VCCIO2 (1.8V IO)
J0100.135	ADC_IN2	A	N/A	N/A	AD Key Array input	ADC2_KEY_IN	SAR ADC (1.8V ADC)
J0100.136	NPU_CIF_D9	I/O	I	down	NPU Camera data port	NPU_CIF_D9	NPU VCCIO2 (1.8V IO)
J0100.137	ADC_IN3	A	N/A	N/A	Headphone MIC input	ADC3_HP_HOOK	SAR ADC (1.8V ADC)
J0100.138	NPU_I2C3_SCL	I/O	I	up	NPU I2C serial port 3,for Camera,need external pull-up	NPU_I2C3_SCL	NPU VCCIO2 (1.8V IO)

J0100.139	ADC_IN0	A	N/A	N/A	SAR-ADC input channel0	Reserve	SAR ADC (1.8V ADC)
J0100.140	NPU_I2C3_SDA	I/O	I	up	NPU I2C serial port 3,for Camera,need external pull-up	NPU_I2C3_SDA	NPU VCCIO2 (1.8V IO)
J0101.1	GPIO3_D3 I2S0_SDI0	I/O	I	down	I2S 0 port, for MIC Array	Reserve for MIC Array	APIO5 (1.8V I/O)
J0101.2	GPIO4_C6 PWM1	I/O	I	down	Touch panel reset output	TOUCH_RST_L	APIO4 (3.0V IO)
J0101.3	GPIO3_D5 I2S0_SDI2SDO2	I/O	I	down	I2S 0 port, for MIC Array	Reserve for MIC Array	APIO5 (1.8V I/O)
J0101.4	GPIO4_A1 I2C1_SDA	I/O	I	up	I2C serial port 1,for Audio,need external pull-up	I2C1_SDA_1V8	APIO5 (1.8V I/O)
J0101.5	GPIO3_D0 I2S0_SCLK	I/O	I	down	I2S 0 port, for MIC Array	Reserve for MIC Array	APIO5 (1.8V I/O)
J0101.6	GPIO4_A2 I2C1_SCL	I/O	I	up	I2C serial port 1,for Audio,need external pull-up	I2C1_SCL_1V8	APIO5 (1.8V I/O)
J0101.7	GPIO4_D2	I/O	I	down	Reserve	Reserve	APIO4 (3.0V IO)
J0101.8	GPIO4_D6	I/O	I	down	LCD power enable	LCD_EN	APIO4 (3.0V IO)
J0101.9	GPIO3_D6 I2S0_SDI3SDO1	I/O	I	down	I2S 0 port, for MIC Array	Reserve for MIC Array	APIO5 (1.8V I/O)
J0101.10	GPIO4_C0 I2C3_SDA UART2B_RX	I/O	I	up	I2C serial port 3,for HDMI,need external pull-up	I2C3_SDA_HDMI	APIO4 (3.0V IO)
J0101.11	GPIO3_D7 I2S0_SDO0	I/O	I	down	Compass interrupt input	COMP_INT_H	APIO5 (1.8V I/O)
J0101.12	GPIO4_C1 I2C3_SCL UART2B_TX	I/O	I	up	I2C serial port 3,for HDMI,need external pull-up	I2C3_SCL_HDMI	APIO4 (3.0V IO)
J0101.13	GPIO4_D0 PCIE_CLKREQNB	I/O	I	up	Reserve	Reserve	APIO4 (3.0V IO)
J0101.14	GPIO4_C4 UART2C_TX	I/O	I	up	TOUCH power control output	TOUCH_PWR_EN_H	APIO4 (3.0V IO)
J0101.15	GPIO3_D1 I2S0_LRCK_RX	I/O	I	down	I2S 0 port, for MIC Array	Reserve for MIC Array	APIO5 (1.8V I/O)
J0101.16	GPIO4_C3 UART2C_RX	I/O	I	up	TOUCH interrupt input	TOUCH_INT_L	APIO4 (3.0V IO)
J0101.17	GPIO3_D2 I2S0_LRCK_TX	I/O	I	down	G-sensor interrupt input	GSENSOR_INT_L	APIO5 (1.8V I/O)
J0101.18	GPIO2_D2 SDIO0_DET_N PCIE_CLKREQN	I/O	I	up	AP wake up BT module	BT_WAKE_L	APIO3 (1.8V I/O)

J0101.19	GPIO3_D4 I2S0_SDI1SDO3	I/O	I	down	I2S 0 port, for MIC Array	Reserve for MIC Array	APIO5 (1.8V I/O)
J0101.20	GPIO4_D1 DP_HOTPLUG	I/O	I	down	USB2.0 HUB reset output	USB20_HUB_RESET	APIO4 (3.0V IO)
J0101.21	GPIO4_D5	I/O	I	down	Reserve	Reserve	APIO4 (3.0V IO)
J0101.22	GPIO2_C1 UART0_TX	I/O	I	up	UART0 serial port, for BT module	UART0_TXD_BT	APIO3 (1.8V I/O)
J0101.23	GPIO4_C5 SPDIF_TX	I/O	I	down	USB Type-C0 power control output	VCC5V0_TYPEC0_EN	APIO4 (3.0V IO)
J0101.24	GPIO2_D4 SDIO0_BKPWR	I/O	I	down	BT module power enable	BT_REG_ON_H	APIO3 (1.8V I/O)
J0101.25	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.26	GPIO2_C2 UART0_CTSN	I/O	I	up	UART0 serial port, for BT module	UART0_CTS_BT	APIO3 (1.8V I/O)
J0101.27	MIPI_TX1 RX1_D0N	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.28	GPIO4_D4	I/O	I	down	Camera power down control output for rear	DVP_PDN1_3V3	APIO4 (3.0V IO)
J0101.29	MIPI_TX1 RX1_D0P	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.30	GPIO2_C3 UART0_RTSM	I/O	I	up	UART0 serial port, for BT module	UART0_RTS_BT	APIO3 (1.8V I/O)
J0101.31	MIPI_TX1 RX1_D1N	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.32	GPIO4_C2 PWM0 VOP0_PWM VOP1_PWM	I/O	I	down	LCD panel backlight brightness control output	LCD_BL_PWM	APIO4 (3.0V IO)
J0101.33	MIPI_TX1 RX1_D1P	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.34	GPIO4_C7 HDMI_CECINOUT EDP_HOTPLUG	I/O	I	up	HDMI CEC communication	HDMI_CEC	APIO4 (3.0V IO)
J0101.35	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.36	MIC1_IN	A	I	N/A	Microphone channel 1 input	Microphone channel 1 input	N/A
J0101.37	MIPI_TX1 RX1_CLKN	I/O	N/A	N/A	MIPI-DSII/CSI1 clock lane	MIPI-DSII/CSI1 clock lane	N/A
J0101.38	MIC2_IN	A	I	N/A	Microphone channel 2 input	Microphone channel 2 input	N/A
J0101.39	MIPI_TX1 RX1_CLKP	I/O	N/A	N/A	MIPI-DSII/CSI1 clock lane	MIPI-DSII/CSI1 clock lane	N/A
J0101.40	HPR	A	O	N/A	Headphone right channel output	Headphone right channel output	N/A

J0101.41	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.42	HP_SNS	A	O	N/A	Headphone GND output	Headphone GND output	N/A
J0101.43	MIPI_TX1 RX1_D2N	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.44	HPL	A	O	N/A	Headphone left channel output	Headphone left channel output	N/A
J0101.45	MIPI_TX1 RX1_D2P	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.46	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.47	MIPI_TX1 RX1_D3N	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.48	MIPI_TX0_D3N	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.49	MIPI_TX1 RX1_D3P	I/O	N/A	N/A	MIPI-DSII/CSI1 data lane	MIPI-DSII/CSI1 data lane	N/A
J0101.50	MIPI_TX0_D3P	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.51	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.52	MIPI_TX0_D2P	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.53	HDML_TXCN	/O	N/A	N/A	HDMI clock lane	HDMI clock lane	N/A
J0101.54	MIPI_TX0_D2N	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.55	HDML_TXCP	/O	N/A	N/A	HDMI clock lane	HDMI clock lane	N/A
J0101.56	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.57	HDML_TX0N	/O	N/A	N/A	HDMI data lane	HDMI data lane	N/A
J0101.58	MIPI_TX0_CLKN	I/O	N/A	N/A	MIPI-DSI0 clock lane	MIPI-DSI0 clock lane	N/A
J0101.59	HDML_TX0P	/O	N/A	N/A	HDMI data lane	HDMI data lane	N/A
J0101.60	MIPI_TX0_CLKP	I/O	N/A	N/A	MIPI-DSI0 clock lane	MIPI-DSI0 clock lane	N/A
J0101.61	HDML_TX1N	/O	N/A	N/A	HDMI data lane	HDMI data lane	N/A
J0101.62	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.63	HDML_TX1P	/O	N/A	N/A	HDMI data lane	HDMI data lane	N/A
J0101.64	MIPI_TX0_D1P	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.65	HDML_TX2N	/O	N/A	N/A	HDMI data lane	HDMI data lane	N/A
J0101.66	MIPI_TX0_D1N	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.67	HDML_TX2P	/O	N/A	N/A	HDMI data lane	HDMI data lane	N/A
J0101.68	MIPI_TX0_D0N	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.69	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.70	MIPI_TX0_D0P	I/O	N/A	N/A	MIPI-DSI0 data lane	MIPI-DSI0 data lane	N/A
J0101.71	TYPECO_RX1N	/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data receive	USB3.0 PHY0 SuperSpeed differential data receive	N/A
J0101.72	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.73	TYPECO_RX1P	/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data receive	USB3.0 PHY0 SuperSpeed differential data receive	N/A
J0101.74	TYPECO_SBU1	I/O	N/A	N/A	TYPECO AUX differential TX/RX serial data	TYPECO AUX differential TX/RX serial data	N/A

J0101.75	TYPECO_TX1P	I/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data transmit	USB3.0 PHY0 SuperSpeed differential data transmit	N/A
J0101.76	TYPECO_SBU2	I/O	N/A	N/A	TYPECO AUX differential TX/RX serial data	TYPECO AUX differential TX/RX serial data	N/A
J0101.77	TYPECO_TX1N	I/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data transmit	USB3.0 PHY0 SuperSpeed differential data transmit	N/A
J0101.78	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.79	TYPECO_RX2N	/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data receive	USB3.0 PHY0 SuperSpeed differential data receive	N/A
J0101.80	TYPECO_DM	I/O	N/A	N/A	USB2.0 OTG0 Data port	USB2.0 OTG0 Data port	N/A
J0101.81	TYPECO_RX2P	/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data receive	USB3.0 PHY0 SuperSpeed differential data receive	N/A
J0101.82	TYPECO_DP	I/O	N/A	N/A	USB2.0 OTG0 Data port	USB2.0 OTG0 Data port	N/A
J0101.83	TYPECO_TX2P	I/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data transmit	USB3.0 PHY0 SuperSpeed differential data transmit	N/A
J0101.84	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.85	TYPECO_TX2N	I/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data transmit	USB3.0 PHY0 SuperSpeed differential data transmit	N/A
J0101.86	USB20_OTG1_DM	I/O	N/A	N/A	USB2.0 OTG1 Data port	USB2.0 OTG1 Data port	N/A
J0101.87	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.88	USB20_OTG1_DP	I/O	N/A	N/A	USB2.0 OTG1 Data port	USB2.0 OTG1 Data port	N/A
J0101.89	USB30_RX1M	/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data receive	USB3.0 PHY0 SuperSpeed differential data receive	N/A
J0101.90	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.91	USB30_RX1P	/O	N/A	N/A	USB3.0 PHY0 SuperSpeed differential data receive	USB3.0 PHY0 SuperSpeed differential data receive	N/A
J0101.92	HDMI_PORT_HPD	I/O	N/A	N/A	HDMI Hot Plug Detection interrupt with 5V tolerance	HDMI Hot Plug Detection interrupt with 5V tolerance	N/A
J0101.93	USB30_TX1P	/O	N/A	N/A	USB3.0 PHY1 SuperSpeed differential data transmit	USB3.0 PHY1 SuperSpeed differential data transmit	N/A
J0101.94	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.95	USB30_TX1M	/O	N/A	N/A	USB3.0 PHY1 SuperSpeed differential data transmit	USB3.0 PHY1 SuperSpeed differential data transmit	N/A
J0101.96	TYPECO_SBU2_DC	I/O	N/A	N/A	TYPECO AUX pull-up/pull-down polarity reversal pins	TYPECO AUX pull-up/pull-down polarity reversal pins	N/A
J0101.97	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.98	TYPECO_SBU1_DC	I/O	N/A	N/A	TYPECO AUX pull-up/pull-down polarity reversal pins	TYPECO AUX pull-up/pull-down polarity reversal pins	N/A
J0101.99	NPU_MIPL_RX_D3P	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.100	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.101	NPU_MIPL_RX_D3N	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A

J0101.102	TYPECO_U2VBUSDET	I/O	N/A	N/A	USB2.0 OTG0 inserted detect	USB2.0 OTG0 inserted detect	N/A
J0101.103	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.104	TYPECO_ID	I/O	N/A	N/A	TYPECO ID detect input	TYPECO ID detect input	N/A
J0101.105	NPU_MIPL_RX_CLKP	I/O	N/A	N/A	NPU MIPI-CSI differential clock lane	NPU MIPI-CSI differential clock lane	N/A
J0101.106	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.107	NPU_MIPL_RX_CLKN	I/O	N/A	N/A	NPU MIPI-CSI differential clock lane	NPU MIPI-CSI differential clock lane	N/A
J0101.108	NPU_MIPL_RX_D2P	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.109	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.110	NPU_MIPL_RX_D2N	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.111	NPU_MIPL_RX_D1N	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.112	GPIO2_D3 SDIO0_PWREN	I/O	I	down	WIFI module power enable	WIFI_REG_ON_H	APIO3 (1.8V I/O)
J0101.113	NPU_MIPL_RX_D1P	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.114	NPU_UART2_TX	I/O	I	up	NPU UART2 serial port, for NPU debug	Test Point	NPU VCCIO6 (3.3V IO)
J0101.115	NPU_MIPL_RX_D0N	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.116	NPU_UART2_RX	I/O	I	up	NPU UART2 serial port, for NPU debug	Test Point	NPU VCCIO6 (3.3V IO)
J0101.117	NPU_MIPL_RX_D0P	I/O	N/A	N/A	NPU MIPI-CSI differential data lane	NPU MIPI-CSI differential data lane	N/A
J0101.118	32K_OUT	I/O	O	up	32768HZ clock output	32768HZ clock output	PMUIO2 (1.8V I/O)
J0101.119	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.120	VCCIO_3V0_S0	P	O	N/A	Power output (3.0V/0.3A) for external devices IO supply	Power output (3.0V/0.3A) for external devices IO supply	N/A
J0101.121	VCC3V0_SD_S0	P	O	N/A	Power output (3.0V/0.4A) for SD card	Power output (3.0V/0.4A) for SD card	N/A
J0101.122	EXT_PWR_EN	I/O	O	N/A	external DC-DC enable signal output	external DC-DC enable signal output	N/A
J0101.123	GPIO2_C4 SDIO0_D0 SPI5_RXD	I/O	I	up	SDIO0 data port ,for WIFI module	SDIO0_D0	APIO3 (1.8V I/O)
J0101.124	SYS_RST	I/O		up	CPU reset signal input	CPU reset signal input	PMUIO2 (1.8V I/O)

J0101.125	GPIO2_D0 SDIO0_CMD	I/O	I	up	SDIO0 command output,for WIFI module	SDIO0_CMD	APIO3 (1.8V I/O)
J0101.126	GPIO2_C7 SDIO0_D3 SPI5_CSN0	I/O	I	up	SDIO0 data port ,for WIFI module	SDIO0_D3	APIO3 (1.8V I/O)
J0101.127	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.128	GPIO2_C5 SDIO0_D1 SPI5_TXD	I/O	I	up	SDIO0 data port ,for WIFI module	SDIO0_D1	APIO3 (1.8V I/O)
J0101.129	GPIO2_D1 SDIO0_CLKOUT TEST_CLKOUT1	I/O	I	up	SDIO0 clock output,for WIFI module	SDIO0_CLK	APIO3 (1.8V I/O)
J0101.130	GPIO2_C6 SDIO0_D2 SPI5_CLK	I/O	I	up	SDIO0 data port ,for WIFI module	SDIO0_D2	APIO3 (1.8V I/O)
j0101.131	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.132	GPIO2_C0 UART0_RX	I/O	I	up	UART0 serial port, for BT module	UART0_RXD_BT	APIO3 (1.8V I/O)
J0101.133	KEY_PWR_ON	I/O	I	up	power on signal input	power on signal input	VCC_RTC_S5
J0101.134	VCC_1V8_S3	P	O	N/A	Power output(1.8V/0.3A) for external devices IO supply	Power output(1.8V/0.3A) for external devices IO supply	N/A
J0101.135	DCIN_PWR_ON	P	I	N/A	Adapter voltage detect input	Adapter voltage detect input	N/A
J0101.136	GND	P	N/A	N/A	N/A	N/A	N/A
J0101.137	VCC_1V8_S0	P	O	N/A	Power output(1.8V/0.3A) for external devices IO supply	Power output(1.8V/0.3A) for external devices IO supply	N/A
J0101.138	SPKN_OUT	A	O	N/A	speaker output signal	speaker output signal	N/A
J0101.139	VCC1V8_DVP_S0	P	O	N/A	Power output(1.8V/0.3A) for external devices IO supply	Power output(1.8V/0.3A) for external devices IO supply	N/A
J0101.140	SPKP_OUT	A	O	N/A	speaker output signal	speaker output signal	N/A

**Notes1:**

- ①:Pin Type: I = input, O = output, I/O = input/output (bidirectional), P=power supply, A = Analog input
- ②:I/O Pull: u=default pull-up, d=default pull-down, Z=default high-Z, fix up=default pull-up and can't be configured to pull-down
- ③:Output Drive Unit is mA, only Digital IO has driver strength value;

# 5 电源设计

## 5.1 电源供电拓扑图

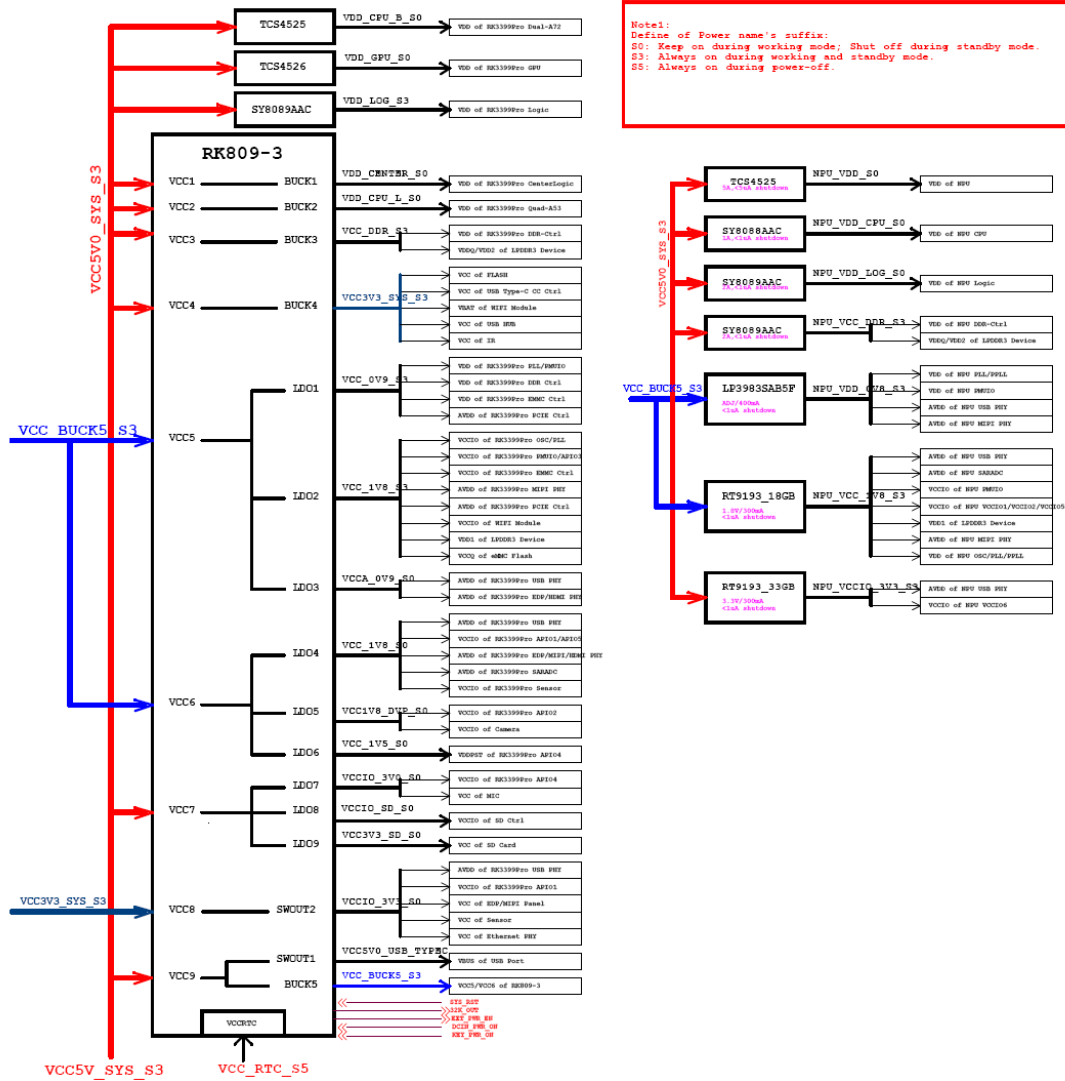


图 5-1

## 5.2 开机条件

- VCC\_RTC\_S5 电压高于 4.8V;
- VCC5V0\_SYS\_S3 提供 5V 电压和 4A 以上电流;
- DCIN\_PWR\_ON 为强制开机信号，当其电压高于 4.8V 时系统开机且不能被 Power\_Key 按键关机；当 DCIN\_PWR\_ON 悬空时，可通过 Power\_Key 按键开机，当该信号拉低超过 500ms 时系统开机；

# 6 应用场景

## 6.1 应用示例



智能零售



机器视觉



智能安防



多屏交互



辅助驾驶



智慧校园

图 6-1

## 6.2 应用框图

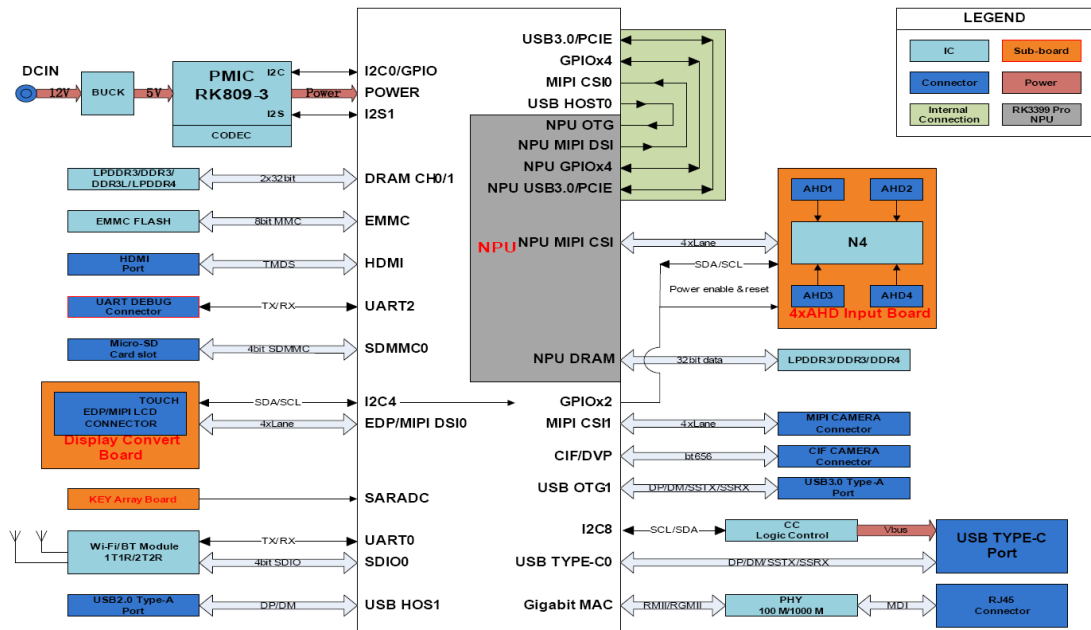


图 6-2

# 7 支持与服务

## 7.1 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；

## 7.2 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；