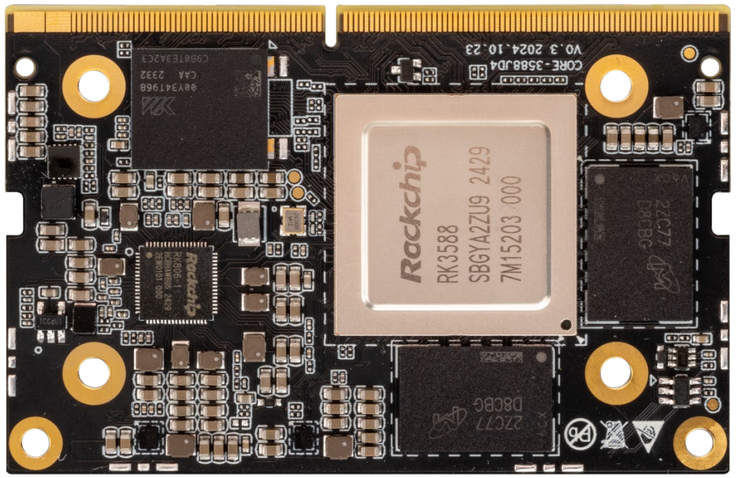
Core-3588JD4

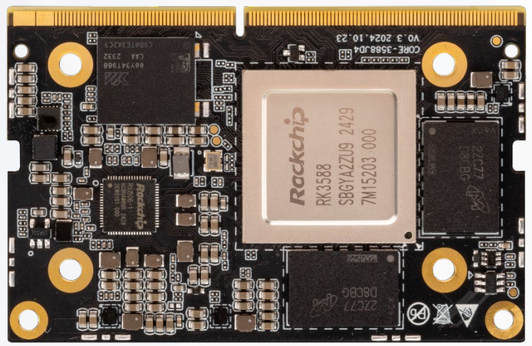
人工智能大模型核心板



V0.3　2024-12-24

天启智能科技

产品特点 Product features



全新一代旗舰级AIOT处理器

全新一代旗舰级八核64位高性能AIOT处理器RK3588，8nm先进工艺制程，主频高达2.4GHz

8K高清视频编解码

支持8K@60fps H.265/VP9、8K@30fps H.264视频解码；8K@30fps H.265/H.264视频编码，支持同编同解

6TOPS强劲算力NPU

算力可达6TOPS，支持INT4/INT8/INT16混合运算，能进行更智能的数据处理、语音识别、图像分析，满足大多数终端设备边缘计算AI应用需求

支持大型语言模型的私有化部署

支持 Transformer 架构下超大规模参数模型的私有化部署，如Gemma-2B、Qwen-1.8B、ChatGLM3-6B、Phi-3-3.8B等大型语言模型。支持Docker容器化管理技术

支持多种深度学习框架

支持CNN、RNN、LSTM等传统网络架构
支持多种深度学习框架，如TensorFlow、TensorFlow Lite、PyTorch、Caffe等

支持多种操作系统

支持Android和Linux OS、国产操作系统，并可支持UEFI启动；为产品研产提供安全稳定的系统环境，满足不同用户的需求

丰富的扩展接口

核心板采用260Pin标准SODIMM接口，拥有MIPI CSI、HDMI2.1、PCIe3.0、USB3.0、UART、SPI、PWM、UART等扩展接口

广泛的应用场景

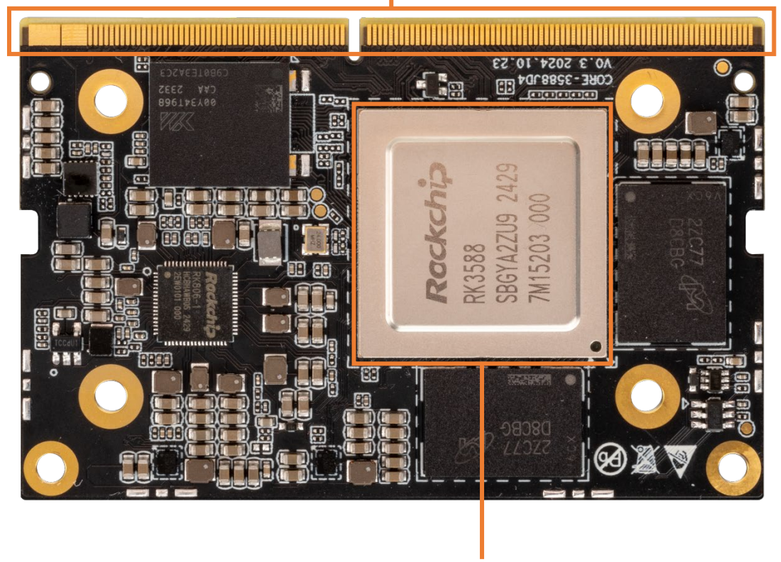
广泛适用于：ARM PC、边缘计算、云终端、云服务器、工业控制、人工智能、大模型私有化部署、智能安防等领域

规格参数 Specifications

规格参数		
基本参数	SOC	Rockchip RK3588
	CPU	八核64位（4×Cortex-A76+4×Cortex-A55），主频高达 2.4GHz
	GPU	ARM Mali-G610 MP4四核GPU，支持 OpenGL ES3.2/OpenCL 2.2/Vulkan1.1, 450 GFLOPS
	NPU	算力高达6TOPS(INT8)，支持INT4/INT8/INT16混合运算
	ISP	集成48MP ISP，支持HDR和3DNR
	编解码	硬解码：8K@60fps H.265/VP9/AVS2、8K@30fps H.264 AVC/MVC、4K@60fps AV1、1080P@60fps MPEG-2/-1/VC-1/VP8 硬编码：8K@30fps H.265/H.264
	内存	LPDDR4/LPDDR4x（4GB/8GB/16GB 可选，最高可配 32GB）
	存储	eMMC（32GB/64GB/128GB/256GB 可选）
	电源	5V（电压误差 ± 5%）
	功耗	最大功耗：13W(5V/2600mA)，典型功耗：2.9W(5V/580mA)，休眠功耗：0.085W(5V/17mA)
	系统	Android、Linux OS、国产操作系统
	软件支持	· 支持Transformer架构下超大规模参数模型的私有化部署，如Gemma-2B、ChatGLM3-6B、Qwen-1.8B、Phi-3-3.8B等大型语言模型 · 支持CNN、RNN、LSTM等传统网络架构，支持RKNN模型导入导出，支持多种深度学习框架，包括TensorFlow、TensorFlow Lite、PyTorch、Caffe、ONNX和Darknet，并支持自定义算子开发 · 支持Docker容器化管理技术
	接口	SODIMM（260 PIN，0.5mm间距）
	尺寸	69.6mm × 45.0mm × 4.6mm
	重量	≈18g
	环境	工作温度：-20℃ ~ 60℃　存储温度：-20℃ ~ 70℃　工作湿度: 10% ~ 90%RH（无凝露）
接口参数	网络	2 × 千兆以太网（提供MDI接口引出，核心板已板载以太网PHY芯片） 通过 SDIO3.0/PCIe3.0 接口，可扩展 WiFi6/蓝牙5.2 通过 USB3.1（Gen1）/USB2.0 接口，可扩展 5G/4G LTE
	视频输入	MIPI CSI (2×4Lanes/4×2Lanes/1×4Lanes + 2×2Lanes)
	视频输出	1 × HDMI2.1 TX/eDP1.3 TX（8K@60Hz，HDMI 支持 HDCP2.3；支持eDP1.3，4K@60Hz，支持HDCP1.3；HDMI 和 eDP 不能同时工作）
	音频输出	2 × I2S（2通道）、2 × SPDIF、1 × PDM（8 通道 ，支持多MIC阵列）
	USB	2 × USB3.1（Gen1）OTG、1 × USB3.1（Gen1）HOST、2 × USB2.0 HOST、2 × USB2.0 OTG
	PCIe	1 × PCIe3.0 (2×2lanes, 1×4lanes, 4×1lanes) 、3 × PCIe2.1 (1 lane)
	SATA	3 × SATA3.0（与PCIe2.1复用）
	看门狗	独立看门狗
	其它接口	8 × I2C、7 × UART、4 × SPI、2 × ADC、15 × PWM、1 × SDMMC、2 × CAN、GPIO

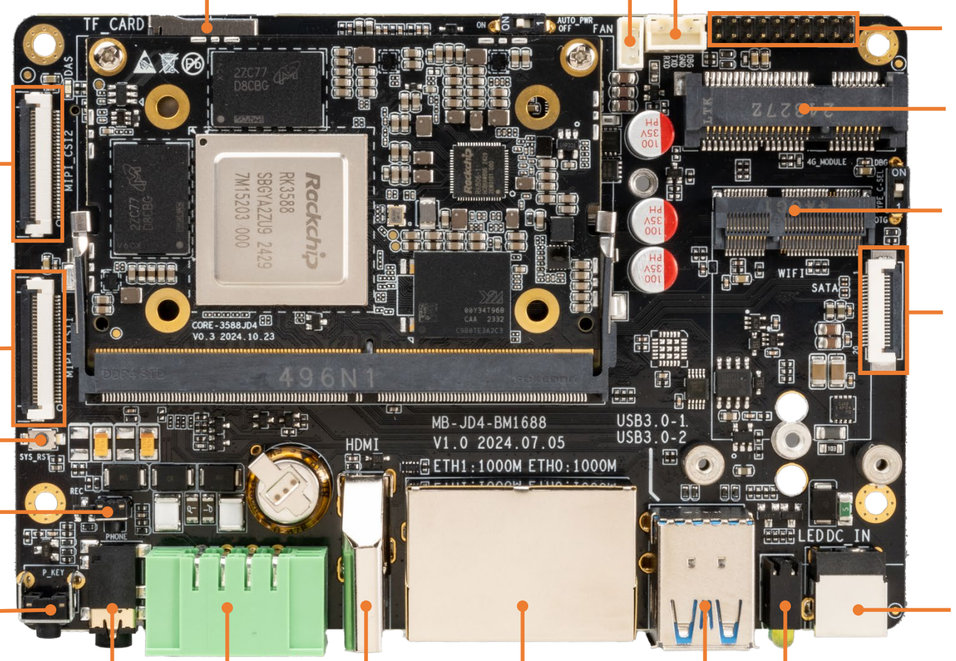
核心板接口描述　Core board Interface description

金手指
（260 PIN，SODIMM，0.5mm间距）



Rockchip RK3588
（主频最高2.4GHz）

主板接口描述 Mainboard Interface description



TF Card

FAN (4Pin-1.25mm)

Debug (3Pin-2.0mm)

双排排针
(2×10-20PIN-2.0mm)

Mini PCIe
(扩展4G/3G)

M.2 E-KEY
(扩展WiFi/蓝牙模块)

无功能，默认不贴

无功能，默认不贴

MIPI CSI DPHY
(1×4 lanes/2×2 lanes, 30Pin-0.5mm)

Reset

Recovery

电源键

DC 12V
(5.5mm×2.1mm，
支持9V~24V宽电压输入)

3.5mm音频接口
(支持MIC录音，美标CTIA)

凤凰端子座
(2×4Pin, 3.5mm间距)

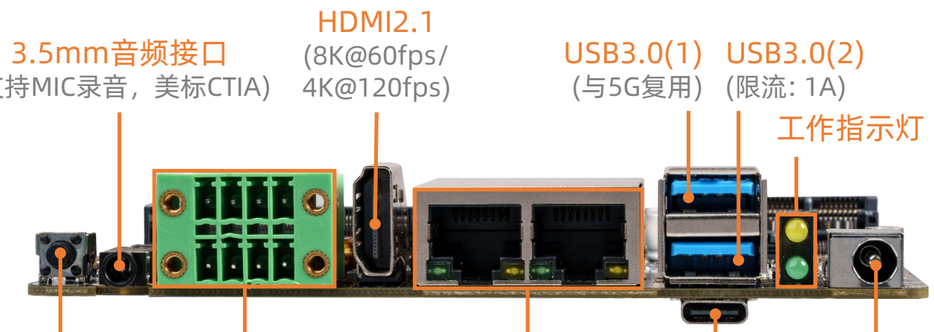
HDMI2.1
(8K@60fps/
4K@120fps)

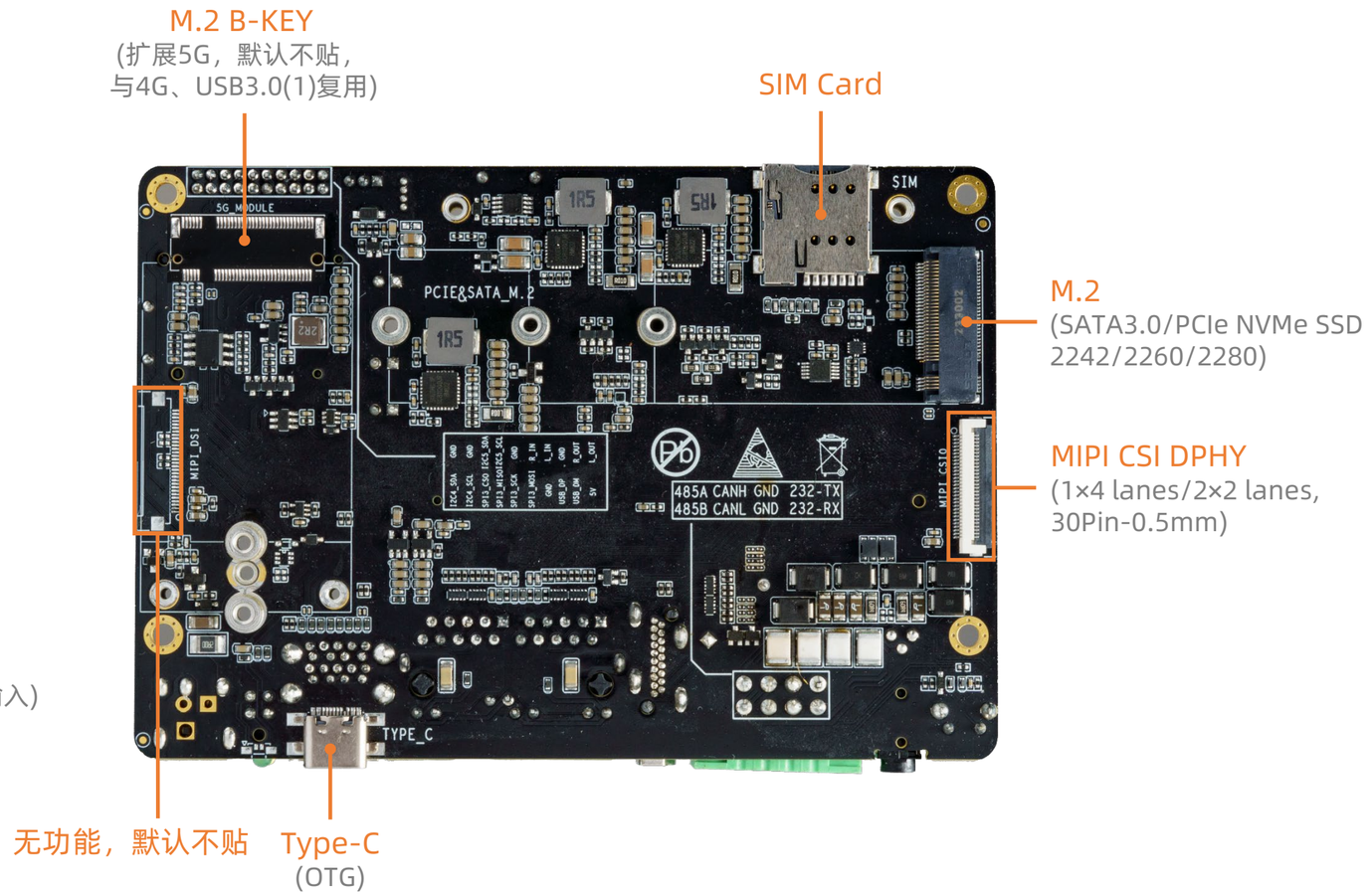
2×千兆以太网
(RJ45/1000Mbps)

2×USB3.0

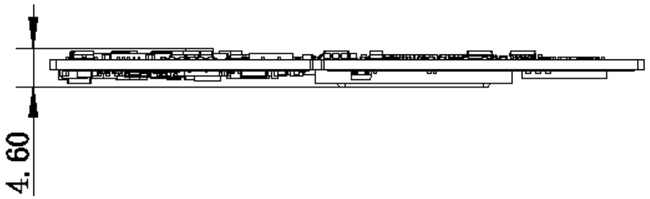
工作指示灯

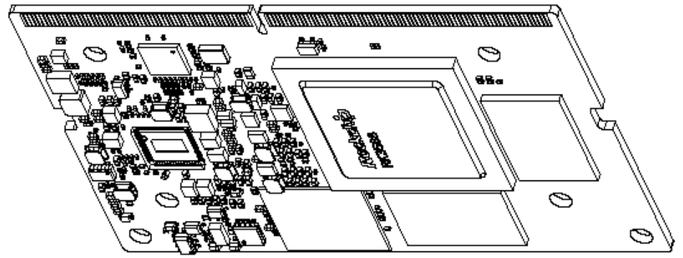
主板接口描述 Mainboard Interface description

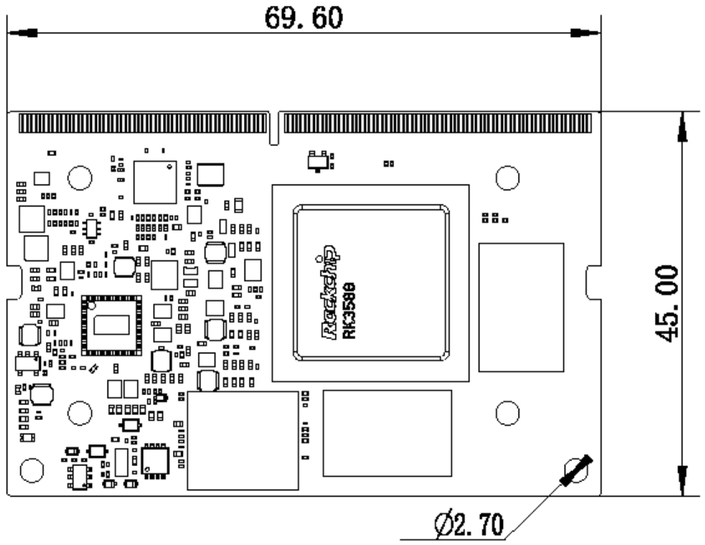


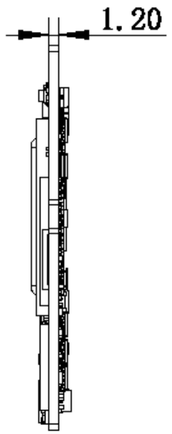


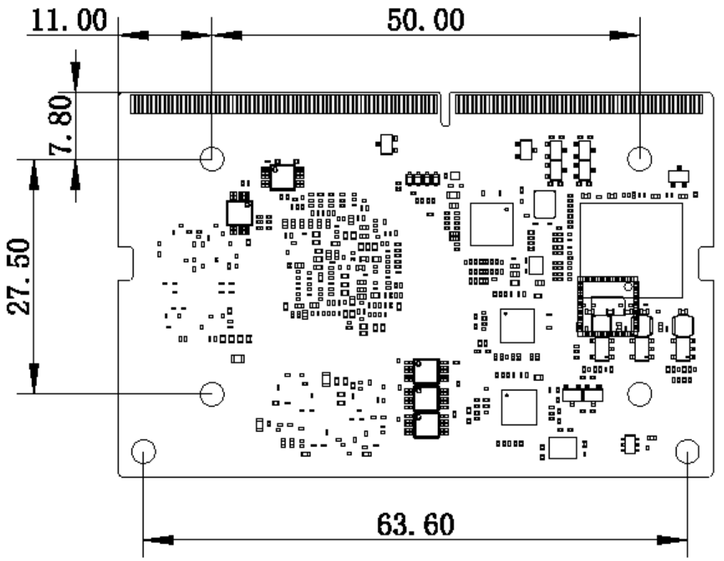
核心板尺寸　Core board Dimension



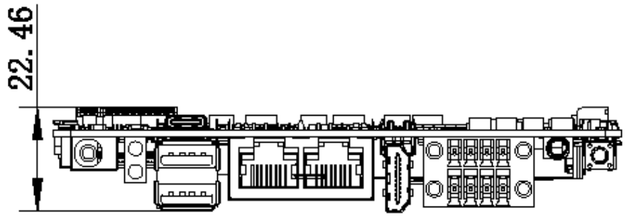


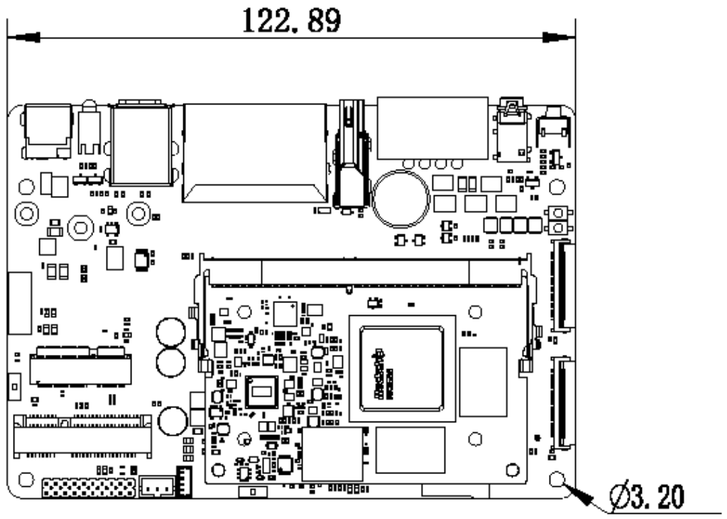


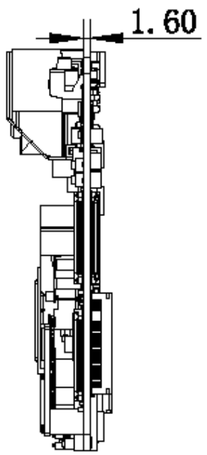


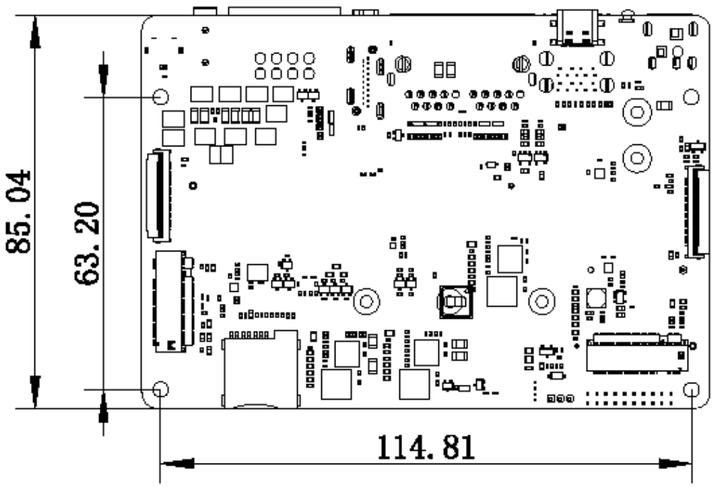


主板尺寸　Mainboard Dimension









接口定义 Interface definition

① : Pad types: I = input, O = output, I/O = input/output (bidirectional), G= Ground ,
P = power supply , DOWN = Internal pull down , UP = Internal pull UP L = Lowe Level H = High level”

PIN	(J5) CORE-3588JD4 pin definition	Pad type	IO Pull	IO Power domain	RK3588 Pin	Function for Mainboard (MB-JD4-RK3588)	Defual function description
1	GND	G		GND		GND	GND
3	MIPI_CSI0_D2N	I		-	AK34	MIPI_CSI0_D2N	MIPI_CSI0_D2N
5	MIPI_CSI0_D2P	I		-	AK33	MIPI_CSI0_D2P	MIPI_CSI0_D2P
7	GND	G		GND		GND	GND
9	MIPI_CSI0_CLK1N	I		-	AM34	MIPI_CSI0_CLK1N	MIPI_CSI0_CLK1N
11	MIPI_CSI0_CLK1P	I		-	AM33	MIPI_CSI0_CLK1P	MIPI_CSI0_CLK1P
13	GND	G		GND		GND	GND
15	MIPI_CSI0_D3N	I		-	AL34	MIPI_CSI0_D3N	MIPI_CSI0_D3N
17	MIPI_CSI0_D3P	I		-	AL33	MIPI_CSI0_D3P	MIPI_CSI0_D3P
19	GND	G		GND		GND	GND
21	MIPI_CSI1_D2N	I		-	AK32	MIPI_CSI1_D2N	MIPI_CSI1_D2N
23	MIPI_CSI1_D2P	I		-	AK31	MIPI_CSI1_D2P	MIPI_CSI1_D2P
25	GND	G		GND		GND	GND
27	MIPI_CSI1_CLK1N	I		-	AM32	MIPI_CSI1_CLK1N	MIPI_CSI1_CLK1N
29	MIPI_CSI1_CLK1P	I		-	AM31	MIPI_CSI1_CLK1P	MIPI_CSI1_CLK1P

接口定义 Interface definition

31	GND	G		GND		GND	GND
33	MIPI_CSI1_D3N	I		-	AL32	MIPI_CSI1_D3N	MIPI_CSI1_D3N
35	MIPI_CSI1_D3P	I		-	AL31	MIPI_CSI1_D3P	MIPI_CSI1_D3P
37	GND	G		GND		GND	GND
39	TYPEC0_SSRX1N/DP0_TX0N	I		-	AP13	TYPEC0_SSRX1N	TYPEC0_SSRX1N
41	TYPEC0_SSRX1P/DP0_TX0P	I		-	AN13	TYPEC0_SSRX1P	TYPEC0_SSRX1P
43	GND	G		GND		GND	GND
45	TYPEC0_SSTX1N/DP0_TX1N	O		-	AN14	TYPEC0_SSTX1N	TYPEC0_SSTX1N
47	TYPEC0_SSTX1P/DP0_TX1P	O		-	AP14	TYPEC0_SSTX1P	TYPEC0_SSTX1P
49	GND	G		GND		GND	GND
51	USB20_HOST1_DM	I/O		-	AM7	USB20_HOST1_DM	USB20_HOST1_DM
53	USB20_HOST1_DP	I/O		-	AL7	USB20_HOST1_DP	USB20_HOST1_DP
55	GND	G		GND		GND	GND
57	HDMI0_TX_SBDN/eDP0_TX_AUXN	I/O		-	AG1	HDMI_TX_SBDN	HDMI_TX_SBDN
59	HDMI0_TX_SBDP/eDP0_TX_AUXP	I/O		-	AG2	HDMI_TX_SBDP	HDMI_TX_SBDP
61	GND	G		GND		GND	GND
63	HDMI0_TX2N/eDP0_TX_D2N	O		-	AL1	HDMI_TX2N	HDMI_TX2N
65	HDMI0_TX2P/eDP0_TX_D2P	O		-	AL2	HDMI_TX2P	HDMI_TX2P

接口定义 Interface definition

67	GND	G		GND		GND	GND
69	HDMI0_TX1N/eDP0_TX_D1N	O		-	AK2	HDMI_TX1N	HDMI_TX1N
71	HDMI0_TX1P/eDP0_TX_D1P	O		-	AK3	HDMI_TX1P	HDMI_TX1P
73	GND	G		GND		GND	GND
75	HDMI0_TX0N/eDP0_TX_D0N	O		-	AJ1	HDMI_TX0N	HDMI_TX0N
77	HDMI0_TX0P/eDP0_TX_D0P	O		-	AJ2	HDMI_TX0P	HDMI_TX0P
79	GND	G		GND		GND	GND
81	HDMI0_TX3N/eDP0_TX_D3N	O		-	AH2	HDMI_TXCN	HDMI_TXCN
83	HDMI0_TX3P/eDP0_TX_D3P	O		-	AH3	HDMI_TXCP	HDMI_TXCP
85	GND	G		GND		GND	GND
87	UART0_RX_M0/DP0_HPDIN_M1/PDM0_CLK1_M1/PCIE30X1_0_WAKEN_M0/I2C4_SDA_M2/PWM2_M0/GPIO0_C4_d	I/O	UP	1.8V	R30	WD_CTL (GPIO0_C4_u)	WD_CTL, Active H
89	PCIE30X2_CLKREQN_M2/I2C7_SCL_M2/UART9_RTSN_M2/SPI0_MOSI_M3/GPIO3_D2_d	I/O	DOWN	1.8V	AG25	SPI0_MOSI_M3/GPIO3_D2_d	SPI0_MOSI_M3
91	PCIE30X2_WAKEN_M2/I2C7_SDA_M2/UART9_CTSN_M2/PWM10_M2/SPI0_CLK_M3/GPIO3_D3_d	I/O	DOWN	1.8V	AG24	SPI0_CLK_M3/GPIO3_D3_d	SPI0_CLK_M3
93	PCIE20X1_2_PERSTN_M0/UART4_TX_M1/PWM9_M2/SPI0_MISO_M3/GPIO3_D1_d	I/O	DOWN	1.8V	AG23	SPI0_MISO_M3/GPIO3_D1_d	SPI0_MISO_M3
95	HDMI_TX0_HPD_M1/PCIE30X2_PERSTN_M2/MCU_JTAG_TCK_M1/UART9_RX_M2/SPI0_CS0_M3/GPIO3_D4_d	I/O	DOWN	1.8V	AA27	SPI0_CS0_M3/GPIO3_D4_d	SPI0_CS0_M3
97	PCIE30X4_BUTTON_RSTN/DP1_HPDIN_M0/MCU_JTAG_TMS_M1/UART9_TX_M2/PWM11_IR_M3/SPI0_CS1_M3/GPIO3_D5_d	I/O	DOWN	1.8V	AB28	CAM3_PWDN/GPIO3_D5_d	CAM3_PWDN
99	PCIE30X1_1_WAKEN_M2/DP1_HPDIN_M2/SATA1_ACT_LED_M1/I2C2_SCL_M4/UART6_TX_M1/SPI4_MOSI_M2/GPIO1_A1_d	I/O	DOWN	1.8V	A25	UART6_TX (to 485)	UART6_TX

接口定义 Interface definition

101	PCIE30X1_1_CLKREQN_M2/DP0_HPDIN_M2/I2C2_SDA_M4/UART6_RX_M1/SPI4_MISO_M2/GPIO1_A0_d	I/O	DOWN	1.8V	A24	UART6_RX (to 485)	UART6_RX
103	VOP_POST_EMPTY/I2C4_SDA_M3/UART6_RTSN_M1/PWM0_M2/SPI4_CLK_M2/GPIO1_A2_d	I/O	DOWN	1.8V	A26	RS485_RE/DE (GPIO1_A2_d)	RS485_RE/DE
105	I2C4_SCL_M3/UART6_CTSN_M1/PWM1_M2/SPI4_CS0_M2/GPIO1_A3_d	I/O	DOWN	1.8V	A27	GPIO1_A3_d	NC
107	GND	G		GND		GND	GND
109	TYPEC0_USB20_OTG_DM	I/O		-	AM12	TYPEC0_OTG_DM	TYPEC0_OTG_DM
111	TYPEC0_USB20_OTG_DP	I/O		-	AL12	TYPEC0_OTG_DP	TYPEC0_OTG_DP
113	GND	G		GND		GND	GND
115	TYPEC1_USB20_OTG_DM	I/O		-	AL9	TYPEC1_OTG_DM	TYPEC1_OTG_DM
117	TYPEC1_USB20_OTG_DP	I/O		-	AK9	TYPEC1_OTG_DP	TYPEC1_OTG_DP
119	GND	G		GND		GND	GND
121	USB20_HOST0_DM	I/O		-	AL6	USB20_HOST0_DM	USB20_HOST0_DM
123	USB20_HOST0_DP	I/O		-	AK6	USB20_HOST0_DP	USB20_HOST0_DP
125	GND	G		GND		GND	GND
127	I2C0_SDA_M1/UART7_CTSN_M0/PWM7_IR_M3/SPI3_CLK_M0/GPIO4_C6_d	I/O	DOWN	1.8V	AF33	GPIO4_C6_d	4G_PWR_EN
129	GND	G		GND		GND	GND
131	PCIE30_PORT0_RX0N	I		-	G34	PCIE30_PORT0_RX0N	PCIE30_PORT0_RX0N
133	PCIE30_PORT0_RX0P	I		-	G33	PCIE30_PORT0_RX0P	PCIE30_PORT0_RX0P
135	GND	G		GND		GND	GND

接口定义 Interface definition

137	PCIE30_PORT0_RX1N	I		-	F33	PCIE30_PORT0_RX1N	PCIE30_PORT0_RX1N
139	PCIE30_PORT0_RX1P	O		-	F32	PCIE30_PORT0_TX1P	PCIE30_PORT0_TX1P
141	GND	G		GND		GND	GND
143	I2S1_SDO1_M0/PCIE30X1_1_BUTTON_RSTN/I2C7_SCL_M3/UART8_RTSN_M0/PWM14_M1/SPI0_CS0_M1/CAN1_RX_M1/GPIO4_B2_u	I/O	UP	3.3V	AK25	CAN1_RX_M1	CAN1_RX_M1
145	I2S1_SDO2_M0/PCIE20X1_2_BUTTON_RSTN/I2C7_SDA_M3/UART8_CTSN_M0/PWM15_IR_M1/CAN1_TX_M1/GPIO4_B3_u	I/O	UP	3.3V	AM25	CAN1_TX_M1	CAN1_TX_M1
147	SARADC_IN6	O		1.8V	AL17	SARADC_IN6	ADC6 Input (HW ID)
149	PCIE30_PORT1_RX0N	I		-	A32	PCIE30_PORT1_RX0N	PCIE30_PORT1_RX0N
151	PCIE30_PORT1_RX0P	I		-	B32	PCIE30_PORT1_RX0P	PCIE30_PORT1_RX0P
153	GND	G		GND		GND	GND
155	PCIE30_PORT1_RX1N	I		-	B31	PCIE30_PORT1_RX1N	PCIE30_PORT1_RX1N
157	PCIE30_PORT1_RX1P	I		-	C31	PCIE30_PORT1_RX1P	PCIE30_PORT1_RX1P
159	GND	G		GND		GND	GND
161	TYPEC1_SSRX1N/DP1_TX0N	I		-	AP8	TYPEC1_SSRX1N	TYPEC1_SSRX1N
163	TYPEC1_SSRX1P/DP1_TX0P	I		-	AN8	TYPEC1_SSRX1P	TYPEC1_SSRX1P
165	GND	G		GND		GND	GND
167	PCIE20_0_RXN/SATA30_0_RXN	I		-	N34	PCIE20_0_RXN/SATA30_0_RXN	PCIE20_0_RXN/SATA30_0_RXN
169	PCIE20_0_RXP/SATA30_0_RXP	I		-	N33	PCIE20_0_RXP/SATA30_0_RXP	PCIE20_0_RXP/SATA30_0_RXP
171	GND	G		GND		GND	GND

接口定义 Interface definition

173	PCIE20_0_REFCLKN	O		-	L33	PCIE20_0_REFCLKN	PCIE20_0_REFCLKN
175	PCIE20_0_REFCLKP	O		-	L32	PCIE20_0_REFCLKP	PCIE20_0_REFCLKP
177	GND	G		GND		GND	GND
179	PCIE_WAKE*	O		3.3V		PCIE20x1_2_WAKEN_M1 PCIE30x1_0_WAKEN_M2 PCIE30x1_1_WAKEN_M1 PCIE30X4_WAKEN_M3	PCIE_WAKE* INPUT, Active L
181	SATA0_ACT_LED_M0/PWM13_M1/SPI3_MOSI_M1/I2C5_SCL_M1/PCIE30X4_PERSTN_M1/GPIO4_B6_d	I/O	DOWN	3.3V	AJ27	PCIE30x4_PERSTN	PCIE30x4_PERSTN OUTPUT, Active L
183	PCIE30X1_0_CLKREQN_M1/UART0_TX_M2/GPIO4_A3_d	I/O	DOWN	3.3V	AL29	PCIE20x1_2_PERSTN	PCIE20x1_2_PERSTN OUTPUT, Active L
185	PCIE30X1_0_WAKEN_M1/I2C3_SCL_M2/UART0_RX_M2/SPI2_MISO_M1/GPIO4_A4_d	I/O	DOWN	3.3V	AL28	I2C3_SCL_M2	I2C3_SCL Core board Pull up resistance 2.2K
187	I2S1_SDI0_M0/PCIE30X1_0_PERSTN_M1/I2C3_SDA_M2/UART3_TX_M2/SPI2_MOSI_M1/GPIO4_A5_d	I/O	DOWN	3.3V	AK27	I2C3_SDA_M2	I2C3_SDA Core board Pull up resistance 2.2K
189	I2C4_SCL_M1/UART7_TX_M0/FSPI_CS1N_M1/GPIO2_B5_u	I/O	UP	3.3V	AB30	I2C4_SCL_M1	I2C4_SCL Core board Pull up resistance 2.2K
191	I2C4_SDA_M1/UART7_RX_M0/FSPI_CS0N_M1/GPIO2_B4_u	I/O	UP	3.3V	AB31	I2C4_SDA_M1	I2C4_SDA Core board Pull up resistance 2.2K
193	I2S0_SDO0/I2C4_SCL_M4/UART4_CTSN/GPIO1_C7_d	I/O	DOWN	1.8V	E29	I2S0_SDO0	I2S0_SDO0
195	I2S0_SDI0/GPIO1_D4_d	I/O	DOWN	1.8V	D28	I2S0_SDI0	I2S0_SDI0
197	I2S0_LRCK/I2C2_SCL_M3/UART4_RTSN/GPIO1_C5_d	I/O	DOWN	1.8V	D30	I2S0_LRCK_TX	I2S0_LRCK_Output
199	I2S0_SCLK/I2C6_SCL_M1/UART3_CTSN/PWM7_IR_M2/SPI4_CS0_M0/GPIO1_C3_d	I/O	DOWN	1.8V	E31	I2S0_SCLK_TX	I2S0_SCLK_Output
201	GND	G		GND		GND	GND
203	MIPI_CAMERA1_CLK_M0/SPDIF0_TX_M0/PCIE30X2_WAKEN_M3/I2C5_SCL_M3/UART1_TX_M1/GPIO1_B6_u	I/O	UP	1.8V	E26	UART1_TX_M1	UART1_TX_M1

接口定义 Interface definition

205	MIPI_CAMERA2_CLK_M0/SPDIF1_TX_M0/PCIE30X2_PERSTN_M3/SATA2_ACT_LED_M1 /I2C5_SDA_M3/UART1_RX_M1/PWM13_M2/GPIO1_B7_u	I/O	UP	1.8V	E27	UART1_RX_M1	UART1_RX_M1
207	MIPI_CAMERA3_CLK_M0/I2C8_SCL_M2/UART1_RTSN_M1/PWM14_M2/GPIO1_D6_u	I/O	UP	1.8V	F24	GPIO1_D6_u	GPIO1_D6_u
209	MIPI_CAMERA4_CLK_M0/PCIE30X2_CLKREQN_M3/I2C8_SDA_M2/UART1_CTSN_M1/ PWM15_IR_M3/GPIO1_D7_u	I/O	UP	1.8V	F25	GPIO1_D7_u	PCIE_PWR_EN
211	I2S0_MCLK/I2C6_SDA_M1/UART3_RTSN/PWM3_IR_M2/SPI4_CLK_M0/GPIO1_C2_d	I/O	DOWN	1.8V	F30	I2S0_MCLK	I2S0_MCLK
213	I2S1_SDI3_M1/PDM0_SDI1_M1/I2C6_SCL_M0/UART1_CTSN_M2/PWM7_IR_M0/SPI3_ MISO_M2/PCIE30X4_PERSTN_M0/GPIO0_D0_d	I/O	DOWN	3.3V	W31	I2C6_SCL_M0	I2C6_SCL_M0 Core board Pull up resistance 2.2K
215	I2S1_SDI2_M1/PDM0_SDI0_M1/I2C6_SDA_M0/UART1_RT SN_M2/PWM6_M0/SPI0_MISO_M0/PCIE30X4_WAKEN_M0/G PIO0_C7_d	I/O	DOWN	3.3V	V31	I2C6_SDA_M0	I2C6_SDA_M0 Core board Pull up resistance 2.2K
217	NC					NC	NC
219	SDMMC_D0/PDM1_SDI3_M0/JTAG_TCK_M1/I2C3_SCL_M4/UART2_TX_M1/PWM8_M 1/GPIO4_D0_u	I/O	UP	3.3V	AD2	SDMMC_D0	SDMMC_D0 Core board Pull up resistance 10K
221	SDMMC_D1(GPIO4_D1_u)----default GPIO4_A7:L PCIE30x1_0_CLKREQn_M2(GPIO1_B5_u)----GPIO4_A7:H （Switching between two functions through GPO4A_A7）	I/O	UP	3.3V	AD1/E25	SDMMC_D1	SDMMC0_D1 Core board Pull up resistance 10K
223	SDMMC_D2/PDM1_SDI1_M0/JTAG_TCK_M0/I2C8_SCL_M0/UART5_CTSN_M0/GPIO4_ D2_u	I/O	UP	3.3V	AF2	SDMMC_D2	SDMMC_D2 Core board Pull up resistance 10K
225	SDMMC_D3（GPIO4_D3_u)----default GPIO4_A7:L PCIE30x1_1_CLKREQn_M1(GPIO4_A0_d)----GPIO4_A7:H （Switching between two functions through GPO4A_A7）	I/O	UP	3.3V	AF1	SDMMC_D3	SDMMC_D3 Core board Pull up resistance 10K
227	SDMMC_CMD（GPIO4_D4_u）----default GPIO4_A7:L PCIE20_2_REFCLKN----GPIO4_A7:H （Switching between two functions through GPO4A_A7）	I/O	UP	3.3V	AE2	SDMMC_CMD	SDMMC_CMD Core board Pull up resistance 10K
229	SDMMC_CLK（GPIO4_D5_d）----default GPIO4_A7:L PCIE20_2_REFCLKP----GPIO4_A7:H （Switching between two functions through GPO4A_A7）	I/O	DOWN	3.3V	AE1	SDMMC_CLK	SDMMC_CLK Core board Pull up resistance 10K
231	GND	G		GND		GND	GND
235	RTC_BAT	O		3.0V/5.0V		RTC_BAT INPUT	RTC_BAT INPUT

接口定义 Interface definition

237	POWER_EN (DEFAULT:NC)	O		5.0V		NC	NC
239	SYS_RESET* (System Reset Input，Active L)	I		1.8V	M31	RESET_L	System Reset Input, Active L Core board Pull up resistance 10K
241	GND	G		GND		GND	GND
243	GND	G		GND		GND	GND
245	GND	G		GND		GND	GND
247	GND	G		GND		GND	GND
249	GND	G		GND		GND	GND
251	VCC5V0_IN	P		5.0V		VCC5V0_IN	Core board Power Input: 5.0V +/-5% Normal: 560mA(2.8W) Max: 2600mA(13.0W) Sleep:35mA(0.175W)
253	VCC5V0_IN	P		5.0V		VCC5V0_IN	
255	VCC5V0_IN	P		5.0V		VCC5V0_IN	
257	VCC5V0_IN	P		5.0V		VCC5V0_IN	
259	VCC5V0_IN	P		5.0V		VCC5V0_IN	
PIN	**(J5) CORE-3588JD4 pin definition**	**Pad type**	**IO Pull**	**IO Power domain**	**RK3588 Pin Number**	**Function for Mainboard (MB-JD4-BM1688)**	**Defual function description**
2	GND	G		GND		GND	GND
4	MIPI_CSI0_D0N	I		-	AG34	MIPI_CSI0_D0N	MIPI_CSI0_D0N
6	MIPI_CSI0_D0P	I		-	AG33	MIPI_CSI0_D0P	MIPI_CSI0_D0P
8	GND	G		GND		GND	GND
10	MIPI_CSI0_CLK0N	I		-	AJ34	MIPI_CSI0_CLK0N	MIPI_CSI0_CLK0N

接口定义 Interface definition

12	MIPI_CSI0_CLK0P	I		-	AJ33	MIPI_CSI0_CLK0P	MIPI_CSI0_CLK0P
14	GND	G		GND		GND	GND
16	MIPI_CSI0_D1N	I		-	AH34	MIPI_CSI0_D1N	MIPI_CSI0_D1N
18	MIPI_CSI0_D1P	I		-	AH33	MIPI_CSI0_D1P	MIPI_CSI0_D1P
20	GND	G		GND		GND	GND
22	MIPI_CSI1_D0N	I		-	AG32	MIPI_CSI1_D0N	MIPI_CSI1_D0N
24	MIPI_CSI1_D0P	I		-	AG31	MIPI_CSI1_D0P	MIPI_CSI1_D0P
26	GND	G		GND		GND	GND
28	MIPI_CSI1_CLK0N	I		-	AJ32	MIPI_CSI1_CLK0N	MIPI_CSI1_CLK0N
30	MIPI_CSI1_CLK0P	I		-	AJ31	MIPI_CSI1_CLK0P	MIPI_CSI1_CLK0P
32	GND	G		GND		GND	GND
34	MIPI_CSI1_D1N	I		-	AH32	MIPI_CSI1_D1N	MIPI_CSI1_D1N
36	MIPI_CSI1_D1P	I		-	AH31	MIPI_CSI1_D1P	MIPI_CSI1_D1P
38	GND	G		GND		GND	GND
40	PCIE20_1_RXN/SATA30_1_RXN	I		-	J34	PCIE20_1_RXN/SATA30_1_RXN	NC
42	PCIE20_1_RXP/SATA30_1_RXP	I		-	J33	PCIE20_1_RXP/SATA30_1_RXP	NC
44	GND	G		GND		GND	GND
46	PCIE20_1_TXN/SATA30_1_TXN	O		-	K34	PCIE20_1_TXN/SATA30_1_TXN	NC

接口定义 Interface definition

48	PCIE20_1_TXP/SATA30_1_TXP	O		-	K33	PCIE20_1_TXP/SATA30_1_TXP	NC
50	GND	G		GND		GND	GND
52	PCIE20_1_REFCLKN	O		-	H33	PCIE20_1_REFCLKN	NC
54	PCIE20_1_REFCLKP	O		-	H32	PCIE20_1_REFCLKP	NC
56	GND	G		GND		GND	GND
58	PCIE20_2_RXN/SATA30_2_RXN/USB30_2_SSRXN	I		-	J30	PCIE20_2_RXN/SATA30_2_RXN/USB30_2_SSRXN	NC
60	PCIE20_2_RXP/SATA30_2_RXP/USB30_2_SSRXP	I		-	J31	PCIE20_2_RXP/SATA30_2_RXP/USB30_2_SSRXP	NC
62	GND	G		GND		GND	GND
64	PCIE20_2_TXN/SATA30_2_TXN/USB30_2_SSTXN	O		-	H29	PCIE20_2_TXN/SATA30_2_TXN/USB30_2_SSTXN	NC
66	PCIE20_2_TXP/SATA30_2_TXP/USB30_2_SSTXP	O		-	H30	PCIE20_2_TXP/SATA30_2_TXP/USB30_2_SSTXP	NC
68	GND	G		GND		GND	GND
70	PHY1_MDI0+	I/O		-		PHY1_MDI0+	From RTL8211F
72	PHY1_MDI0-	I/O		-		PHY1_MDI0-	From RTL8211F
74	PHY1_MDI1+	I/O		-		PHY1_MDI1+	From RTL8211F
76	PHY1_MDI1-	I/O		-		PHY1_MDI1-	From RTL8211F
78	GND	G		GND		GND	GND
80	PHY1_MDI2+	I/O		-		PHY1_MDI2+	From RTL8211F
82	PHY1_MDI2-	I/O		-		PHY1_MDI2-	From RTL8211F

接口定义 Interface definition

84	PHY1_MDI3+	I/O		-		PHY1_MDI3+	From RTL8211F
86	PHY1_MDI3-	I/O		-		PHY1_MDI3-	From RTL8211F
88	SPI2_CS1_M0/PCIE30X4_CLKREQN_M3/PDM1_SDI1_M1/GPIO1_B0_u	I/O	UP	3.3V	C27	HDMI0_TX_ON_H	HDMI0_TX_ON_H OUTPUT H: HDMI2.0(TMDS) mode L: HDMI2.1(FRL) mode.
90	PHY1_LED_LINK	I/O		3.3V		PHY1_LED_LINK (/PHY1_LED1/CFG_LDO0)	From RTL8211F
92	PHY1_LED2/CFG_LDO1	I/O		3.3V		PHY1_LED2/CFG_LDO1	From RTL8211F
94	SPDIF1_TX_M2/PCIE20X1_2_PERSTN_M1/HDMI_TX0_CEC_M0/I2C8_SDA_M3/PWM6_M1/SPI3_CS1_M1/GPIO4_C1_d	I/O	DOWN	1.8V	AK24	HDMI_TX0_CEC	HDMI_TX0_CEC
96	SPI2_MOSI_M0/HDMI_TX0_HPD_M0/GPIO1_A5_d	I/O	DOWN	1.8V	B26	HDMI_TX0_HPD	HDMI_TX0_HPD
98	SPI3_CS0_M1/I2C8_SCL_M3/HDMI_TX0_SDA_M0/PCIE20X1_2_WAKEN_M1/GPIO4_C0_u	I/O	UP	1.8V	AJ25	HDMI_TX0_SDA	HDMI_TX0_SDA
100	SPI3_CLK_M1/I2C5_SDA_M1/HDMI_TX0_SCL_M0/PCIE20X1_2_CLKREQN_M1/GPIO4_B7_u	I/O	UP	1.8V	AJ28	HDMI_TX0_SCL	HDMI_TX0_SCL
102	GND	G		GND		GND	GND
104	I2S0_SDO2/I2S0_SDI3/PDM0_SDI1_M0/I2C7_SDA_M0/UART6_RX_M2/SPI1_MOSI_M2/GPIO1_D1_d	I/O	DOWN	1.8V	F27	SPI1_MOSI_M2/GPIO1_D1_d	NC
106	I2S0_SDO3/I2S0_SDI2/PDM0_SDI2_M0/I2C1_SCL_M4/UART4_TX_M0/PWM0_M1/SPI1_CLK_M2/GPIO1_D2_d	I/O	DOWN	1.8V	F28	SPI1_CLK_M2/GPIO1_D2_d	NC
108	I2S0_SDO1/I2C7_SCL_M0/UART6_TX_M2/SPI1_MISO_M2/GPIO1_D0_d	I/O	DOWN	1.8V	F26	SPI1_MISO_M2/GPIO1_D0_d	NC
110	I2S0_SDI1/PDM0_SDI3_M0/I2C1_SDA_M4/UART4_RX_M0/PWM1_M1/SPI1_CS0_M2/GPIO1_D3_d	I/O	DOWN	1.8V	E28	SPI1_CS0_M2/GPIO1_D3_d	NC
112	PDM0_SDI0_M0/SPI1_CS1_M2/GPIO1_D5_d	I/O	DOWN	1.8V	G26	CAM4_PWDN	CAM4_PWDN
114	SPI2_MISO_M0/GPIO1_A4_d	I/O	DOWN	1.8V	B25	CAM0_PWDN	CAM0_PWDN
116	ETH1_REFCLKO_25M/MIPI_CAMERA1_CLK_M1/I2C4_SCL_M0/GPIO3_A6_d	I/O	DOWN	1.8V	AH27	CAM0_MCLK	CAM0_MCLK OUTPUT,

接口定义 Interface definition

118	PDM1_CLK0_M1/PCIE30X1_0_PERSTN_M2/UART7_RX_M2/SPI0_CS0_M2/GPIO1_B4_u	I/O	UP	1.8V	E24	CAM0_RESET	CAM0_RESET OUTPUT, Active L
120	SPI2_CLK_M0/GPIO1_A6_d	I/O	DOWN	1.8V	C24	CAM1_PWDN	CAM1_PWDN
122	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	I/O	UP	1.8V	AL24	CAM1_MCLK	CAM1_MCLK OUTPUT,
124	FSPI_CS0N_M2/PCIE30X4_CLKREQN_M2/CAN2_RX_M0/UART5_TX_M1/SPI3_CS0_M3/ GPIO3_C4_u	I/O	UP	1.8V	AH26	BT_WAKE_AP	BT_WAKE_AP
126	I2C3_SDA_M1/UART7_TX_M1/SPI1_MISO_M1/GPIO3_C0_d	I/O	DOWN	1.8V	Y29	BT_DISABLE	BT_DISABLE
128	LITCPU_AVS/SPI3_CLK_M2/GPIO0_D3_u	I/O	UP	1.8V	U33	WIFI_DISABLE	WIFI_DISABLE
130	PCIE30X2_BUTTON_RSTN/UART7_RX_M1/SPI1_CLK_M1/GPIO3_C1_d	I/O	DOWN	1.8V	Y27	CAM1_RESET	CAM1_RESET OUTPUT, Active L
132	GND	G		GND		GND	GND
134	PCIE30_PORT0_TX0N	O			D33	PCIE30_PORT0_TX0N	PCIE30_PORT0_TX0N
136	PCIE30_PORT0_TX0P	O			D32	PCIE30_PORT0_TX0P	PCIE30_PORT0_TX0P
138	GND	G		GND		GND	GND
140	PCIE30_PORT0_TX1N	O			C34	PCIE30_PORT0_TX1N	PCIE30_PORT0_TX1N
142	PCIE30_PORT0_TX1P	I			C33	PCIE30_PORT0_TX1P	PCIE30_PORT0_TX1P
144	GND	G		GND		GND	GND
146	SARADC_IN3	O		1.8V	AN17	SARADC_VIN3	ADC3_HP_HOOK Input
148	PCIE30_PORT1_TX0N	O			A30	PCIE30_PORT1_TX0N	PCIE30_PORT1_TX0N
150	PCIE30_PORT1_TX0P	O			B30	PCIE30_PORT1_TX0P	PCIE30_PORT1_TX0P
152	GND	G		GND		GND	GND

接口定义 Interface definition

154	PCIE30_PORT1_TX1N	O			B29	PCIE30_PORT1_TX1N	PCIE30_PORT1_TX1N
156	PCIE30_PORT1_TX1P	O			C29	PCIE30_PORT1_TX1P	PCIE30_PORT1_TX1P
158	GND	G		GND		GND	GND
160	PCIE0_CLK_N	O				PCIE0_CLK_N OUTPUT (From US5D304)	PCIE0_CLK_N OUTPUT ---default GPIO1_B1： L
162	PCIE0_CLK_P	O				PCIE0_CLK_P OUTPUT (From US5D304)	PCIE0_CLK_P OUTPUT
164	GND	G		GND		GND	GND
166	TYPEC1_SSTX1N/DP1_TX1N	O			AN9	TYPEC1_SSTX1N	TYPEC1_SSTX1N
168	TYPEC1_SSTX1P/DP1_TX1P	O			AP9	TYPEC1_SSTX1P	TYPEC1_SSTX1P
170	GND	G		GND		GND	GND
172	PCIE20_0_TXN/SATA30_0_TXN	O			M33	PCIE20_0_TXN/SATA30_0_TXN	PCIE20_0_TXN/SATA30_0_TXN
174	PCIE20_0_TXP/SATA30_0_TXP	O			M34	PCIE20_0_TXP/SATA30_0_TXP	PCIE20_0_TXP/SATA30_0_TXP
176	GND	G		GND		GND	GND
178	PWM4_M0/UART0_TX_M0/DP1_HPDIN_M1/I2S1_SDI0_M1/PCIE30X1_0_PERSTN_M0/I2C4_SCL_M2/GPU_AVS/GPU_AVS/GPIO0_C5_u	I/O	UP	1.8V	P30	MOD_SLEEP*	Sleep Output, Active L Core board Pull up resistance 4.7K
180	SPDIF0_TX_M1/PWM11_IR_M1/DP0_HPDIN_M0/UART9_TX_M1/I2S1_SDO3_M0/PCIE30X4_CLKREQN_M1/GPIO4_B4_u	I/O	UP	1.8V	AL26	PCIE30X4_CLKREQN	PCIE30X4_CLKREQN (To PCIE WIFI)
182	PCIE20X1_2_CLKREQN_M0/I2C5_SCL_M0/SPI3_MOSI_M3/HDMI_TX0_SCL_M2/GPIO3_C7_u	I/O	UP	3.3V	AJ24	PCIE20x1_2_CLKREQN	PCIE20x1_2_CLKREQN (To M.2 SSD)
184	PHY0_MDI0-	I/O		-		PHY0_MDI0-	From RTL8211F
186	PHY0_MDI0+	I/O		-		PHY0_MDI0+	From RTL8211F
188	PHY0_LED_LINK	I/O		-		PHY0_LED_LINK	From RTL8211F

接口定义 Interface definition

190	PHY0_MDI1-	I/O		-		PHY0_MDI1-	From RTL8211F
192	PHY0_MDI1+	I/O		-		PHY0_MDI1+	From RTL8211F
194	PHY0_LED2/CFG_LDO1	I/O		-		PHY0_LED2/CFG_LDO1	From RTL8211F
196	PHY0_MDI2-	I/O		-		PHY0_MDI2-	From RTL8211F
198	PHY0_MDI2+	I/O		-		PHY0_MDI2+	From RTL8211F
200	GND	G		GND		GND	GND
202	PHY0_MDI3-	I/O		-		PHY0_MDI3-	From RTL8211F
204	PHY0_MDI3+	I/O		-		PHY0_MDI3+	From RTL8211F
206	SDMMC_DET/GPIO0_A4_u	I/O	UP	1.8V	P31	SDMMC_DET_L	SDMMC_DET Input , Active L Core board Pull up resistance 100K
208	PDM0_CLK0_M0/I2C4_SDA_M4/PWM15_IR_M2/GPIO1_C6_d	I/O	DOWN	1.8V	D29	PWM15_M2	FAN_TACH INPUT
210	32KOUT_WIFI	O		1.8V		32KOUT_WIFI	clock 32.768KHz Output for WIFI
212	ETH0_REFCLKO_25M/I2S2_SDI_M0/I2C6_SCL_M2/SPI1_CS0_M0/GPIO2_C3_d	I/O	DOWN	1.8V	AD30	HP_DET	HP_DET INPUT, Active H
214	SARADC_IN0_BOOT	I		1.8V	AM16	BOOT_SARADC_IN0	ADC0 Input (BOOT Mode: L---Maskrom) Core board Pull up resistance 100K
216	I2S2_SDO_M0/I2C7_SCL_M1/PWM4_M1/SPI3_CS1_M0/GPIO4_C3_d	I/O	DOWN	1.8V	AF34	GPIO4_C3_d	WIFI_PWR_EN
218	PDM1_SDI0_M1/PCIE30X1_1_PERSTN_M2/PWM3_IR_M3/SPI2_CS0_M0/GPIO1_A7_u	I/O	UP	1.8V	C25	SD0_PWR_EN	SD Card Power EN, Active H
220	I2C3_SCL_M1/SPI1_MOSI_M1/GPIO3_B7_d	I/O	DOWN	1.8V	AA28	GPIO3_B7_d	AP_WAKE_BT
222	I2S2_SDI_M1/UART2_RX_M2/PWM3_IR_M1/GPIO3_B2_d	I/O	DOWN	1.8V	AE28	GPIO3_B2_d	PHONE_CTL, Active H
224	I2S2_LRCK_M1/CAN1_TX_M0/UART3_RX_M1/PWM13_M0/GPIO3_B6_d	I/O	DOWN	1.8V	AE29	GPIO3_B6_d	SATA_DEVSLP

接口定义 Interface definition

226	SPI0_MOSI_M2/PCIE30X4_PERSTN_M3/PDM1_SDI3_M1/ART4_RX_M2/GPIO1_B2_d	I/O	UP	1.8V	D26	GPIO1_B2_d	HUB20_PWR_EN
228	PDM0_CLK1_M0/I2C2_SDA_M3/PWM11_IR_M2/SPI4_CS1_M0/GPIO1_C4_d	I/O	DOWN	1.8V	E30	GPIO1_C4_d	USB30_VCC5V0_EN, Active H
230	I2S1_SDI1_M1/NPU_AVS/UART0_RTSN/PWM5_M1/SPI0_CLK_M0/PCIE30X4_CLKREQN_M0/SATA_CP_POD/GPIO0_C6_u	I/O	UP	1.8V	T29	PWM5_M1	FAN_PWM OUTPUT
232	I2S1_LRCK_M1/PWM0_M0/I2C2_SCL_M0/CAN0_TX_M0/SPI0_CS1_M0/PCIE30X1_1_PERSTN_M0/GPIO0_B7_d	I/O	DOWN	1.8V	T28	GPIO0_B7_d	DIY_LED
234	PDM0_CLK0_M1/PWM1_M0/I2C2_SDA_M0/CAN0_RX_M0/SPI0_MOSI_M0/PCIE30X1_0_CLKREQN_M0/GPIO0_C0_d	I/O	DOWN	1.8V	T31	GPIO0_C0_d	NC
236	I2S1_MCLK_M1/JTAG_TCK_M2/I2C1_SCL_M0/UART2_TX_M0/PCIE30X1_1_CLKREQN_M0/GPIO0_B5_d	I/O	DOWN	1.8V	P29	UART2_TX_M0_DEBUG	UART2_TX_M0 (System DEBUG)
238	I2S1_SCLK_M1/JTAG_TMS_M2/I2C1_SDA_M0/UART2_RX_M0/PCIE30X1_1_WAKEN_M0/GPIO0_B6_d	I/O	DOWN	1.8V	R29	UART2_RX_M0_DEBUG	UART2_RX_M0 (System DEBUG)
240	PWRON_L (to RK806-1)	I		5.0V		PWRON_L	Power_Key Input, Active L
242	GND	G		GND		GND	GND
244	GND	G		GND		GND	GND
246	GND	G		GND		GND	GND
248	GND	G		GND		GND	GND
250	GND	G		GND		GND	GND
252	VCC5V0_IN	P		5.0V		**VCC5V0_IN**	**Core board Power Input: 5.0V +/-5%** **Normal: 560mA(2.8W)** **Max: 2600mA(13.0W)** **Sleep:35mA(0.175W)**
254	VCC5V0_IN	P		5.0V		**VCC5V0_IN**	
256	VCC5V0_IN	P		5.0V		**VCC5V0_IN**	
258	VCC5V0_IN	P		5.0V		**VCC5V0_IN**	
260	VCC5V0_IN	P		5.0V		**VCC5V0_IN**	

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