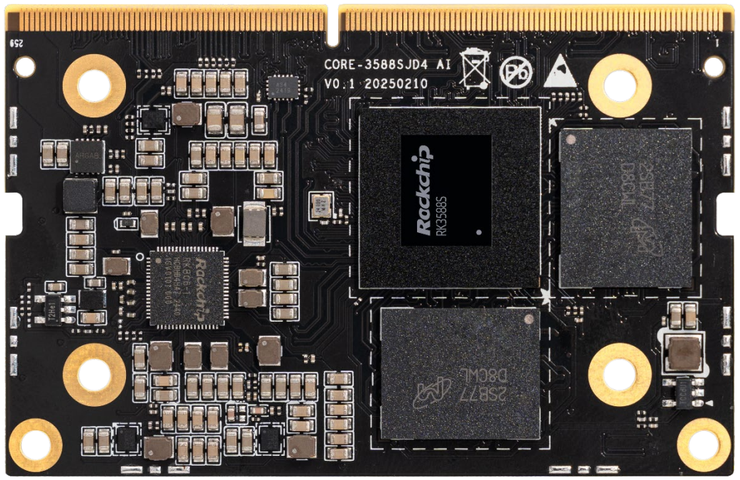
Core-3588SJD4 AI

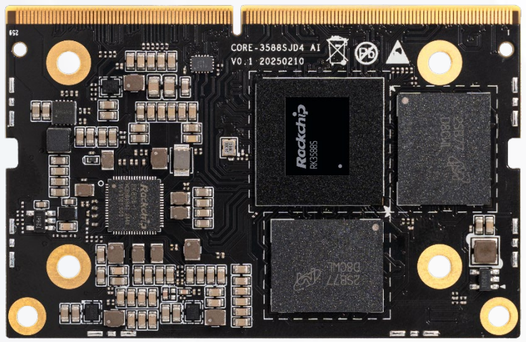
AI Core Board



V0.1 2025-8-27

T-CHIP INTELLIGENCE TECHNOLOGY

Product features



A new generation of AIOT processors

The new generation of octa-core 64-bit high-performance AIOT processor RK3588S, 8nm advanced process, and the main frequency is up to 2.4GHz.

6TOPS powerful computing power NPU

The computing power can reach 6TOPS, support INT4/INT8/INT16 hybrid computing, and can carry out more intelligent data processing, speech recognition, image analysis to meet the AI application requirements of most terminal devices for edge computing.

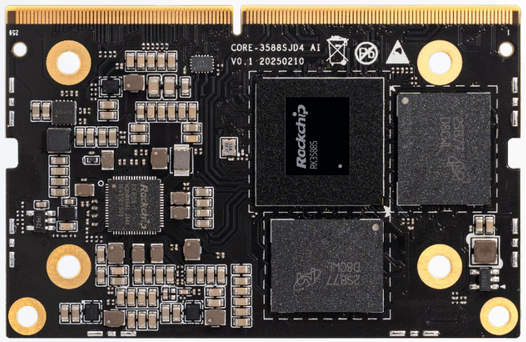
8K HD video codec

Supports 8K@60fps H.265/VP9, 8K@30fps H.264, 4K@60fps AV1 video decoding; 8K@30fps H.265/H.264 video encoding. Powerful video encoding and decoding capabilities can make the picture 8K high-definition presentation with more delicate image quality.

32GB LPDDR5 ultra large memory

Compared with LPDDR4, LPDDR5 has the characteristics of larger memory capacity, higher bandwidth, faster data transmission rate, and lower power consumption, which can meet the needs of memory space and response speed for the privatization of large models.

Product features



The private deployment of large language models

Support the privatization deployment of ultra-large-scale parametric models under the Transformer architecture, such as Deepseek-R1 series, Gemma series, Llama series, ChatGLM series, Qwen series, Phi series and other large language models.

Multiple deep learning frameworks

It supports traditional network architectures such as CNN, RNN, and LSTM, and supports the import and export of RKNN models; Support a variety of deep learning frameworks, including TensorFlow, TensorFlow Lite, PyTorch, Caffe, ONNX and Darknet. It also supports the development of custom operators.

Abundant expansion interfaces

The core board adopts 260Pin standard SODIMM interface, and has MIPI-CSI, DVP, HDMI2.1, SATA3.0, PCIe2.1, USB3.0, SPI, I2C, I2S, CAN, UART, SPDIF, SDIO3.0 and other expansion interfaces.

A wide range of applications

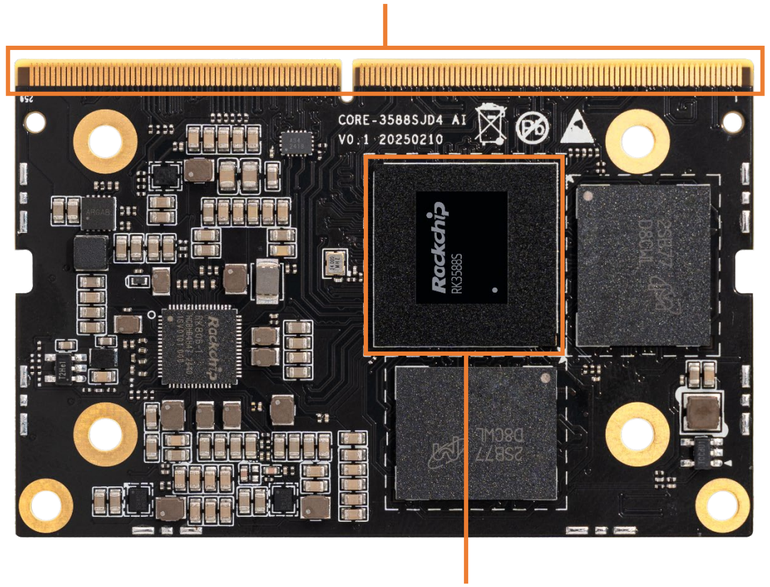
It is widely used in: edge computing, large model privatization deployment, artificial intelligence, computing services, intelligent security, smart home, smart industry and other fields.

Specifications

Specifications		
Basic Specifications	SOC	RK3588S2
	CPU	Octa-core 64-bit (4× Cortex-A76 + 4× Cortex-A55), 8nm advanced process, with a frequency of up to 2.4GHz
	GPU	ARM Mali-G610 MP4 quad-core GPU, support OpenGL ES3.2/OpenCL 2.2/Vulkan1.1, 450 GFLOPS
	NPU	6 TOPS, support INT4/INT8/INT16/FP16 hybrid computing
	Codecs	Video decoding: 8K@60fps H.265/VP9/AVS2, 8K@30fps H.264 AVC/MVC, 4K@60fps AV1, 1080P@60fps MPEG-2/-1/VC-1/VP8 Video encoding: 8K@30fps H.265/H.264
	RAM	4GB/8GB/16GB/32GB 64-bit LPDDR5
	Storage	16GB/32GB/64GB/128GB eMMC
	Power	5V (voltage tolerance ±5%)
	Power consumption	Normal: 1.1W(5V/220mA), Max: 8.5W(5V/1700mA), Min(Sleep): 0.1W(5V/20mA)
	OS	Android, Ubuntu Desktop, Ubuntu Server, Debian, Buildroot, RTLinux, Kirin Linux * Supports UEFI boot mode
	Software support	Support the privatization deployment of ultra-large-scale parametric models under the Transformer architecture, such as Deepseek-R1 series, Gemma series, Llama series, ChatGLM series, Qwen series, Phi series and other large language models It supports traditional network architectures such as CNN, RNN, and LSTM, and supports the import and export of RKNN models; Support a variety of deep learning frameworks, including TensorFlow, TensorFlow Lite, PyTorch, Caffe, ONNX and Darknet. It also supports the development of custom operators Support Docker container management technology
	Interface type	SODIMM (260 PIN, 0.5mm pitch)
	Size	69.6mm × 45.0mm × 4.2mm
	Weight	≈17g
	Environment	Operating Temperature: -20℃ ~ 60℃, Storage Temperature: -20℃ ~ 70℃, Operating Humidity: 10% ~ 90%RH(non-condensing)
Interface Specifications	Internet	Integrated GMAC/SDIO3.0/USB3.0 interface, support 1 Gigabit Ethernet, expandable WiFi6/Bluetooth, 5G/4G LTE
	Video input	1 × MIPI D/C PHY (MIPI DPHY V2.0 (4lanes, 4.5Gbps/lane); MIPI CPHY V1.1 (3lanes, 2.5Gsps/lane)) 2 × MIPI-CSI DPHY (1×4Lanes or 2×2Lanes) 1 × DVP (8/10/12/16-bit standard DVP interface, up to 150MHz data input; Supports BT.601/BT.656 and BT.1120 VI interfaces)
	Video output	1 × HDMI2.1/eDP1.3 -- HDMI2.1: Highest 8K@60Hz, supports HDCP2.3 -- eDP1.3: 4K@60Hz, supports HDCP1.3 -- HDMI and eDP do not work at the same time
	Audio	2 × I2S (2ch, TX and RX supported, audio resolution 16~32 bits, sample rate up to 192KHz) 2 × SPDIF (Supports 2×16bit audio data storage and dual-phase stereo output) 2 × PDM (8ch, up to 8 channels, audio resolution 16 ~ 24 bits, sample rate up to 192KHz, support PDM master receive mode, support multi-MIC array)
	SATA	2 × SATA3.0 (Multiplexed with PCIe 2.1, one multiplexed with USB3.1 (Gen1) HOST)
	PCIe	2 × PCIe2.1 (Multiplexed with SATA 3.0, one multiplexed with USB3.1 (Gen1) HOST)
	USB	1 × USB3.1(Gen1) OTG, 1 × USB3.1(Gen1) HOST (Multiplexed with SATA and PCIe), 2 × USB2.0 HOST, 1 × USB2.0 OTG
	I2C	9 × I2C (Supports 7-bit and 10-bit address modes, data transfer rates up to 100k bits/s in standard mode and up to 400k bits/s in fast mode)
	SPI	4 × SPI (Each controller supports 2 chip select outputs; Support serial master and serial slave modes, software configurable)
	UART	10 × UART (Built-in 2×64-bit FIFOs for TX and RX, respectively; Supports 5-bit, 6-bit, 7-bit, and 8-bit serial data transmission and receiving, with baud rates up to 4Mbps; UART supports auto-flow mode)
	CAN	3 × CAN 2.0B (Support CAN standard frame and extended frame transceiver and receiver)
	ADC	2 × ADC (12-bit single-ended input SAR-ADC with sampling rate up to 1MS/s)
	Others	1 × SDMMC, PWM, GPIOs

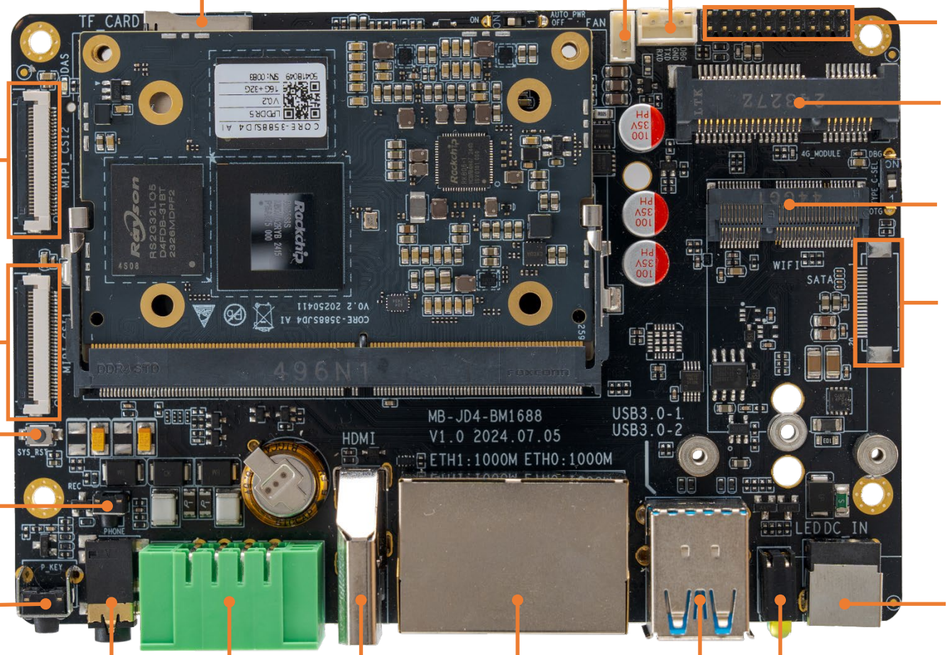
Core board Interface description

Goldfinger
(260 PIN, SODIMM, 0.5mm pitch)



Rockchip RK3588S2
(Main frequency up to 2.4GHz)

Mainboard Interface description



TF Card

FAN (4Pin-1.25mm)

Debug (3Pin-2.0mm)

Double-row pin headers
(2×10-20PIN-2.0mm)

Mini PCIe
(Expand 4G/3G)

M.2 E-KEY
(Expand WiFi/Bluetooth module)

No function, not mounted by default

MIPI CSI D/C PHY
(DPHY(1×4 lanes) or CPHY(3 lanes), 30Pin-0.5mm)

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

Reset

MaskRom

Power button

DC 12V
(5.5mm×2.1mm,
support 9V~24V wide voltage input)

3.5mm Audio jack
(Support MIC recording, CTIA)

Phoenix connector
(2×4Pin, 3.5mm pitch)

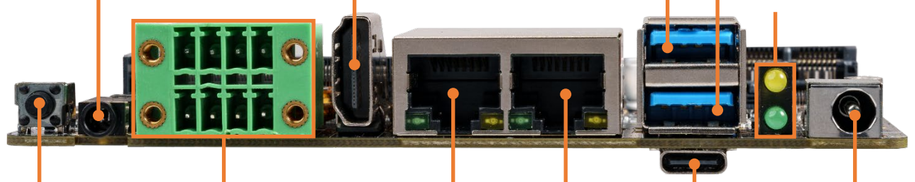
HDMI2.1
(8K@60fps)

Gigabit Ethernet
(RJ45/1000Mbps)

2×USB3.0

Work indicator

Mainboard Interface description



3.5mm Audio jack
(Support Mic recording, CTIA)

HDMI2.1
(8K@60fps)

USB3.0(1)
(Multiplexing with 5G)

USB3.0(2)
(Max: 1A)

Work indicator

Power button

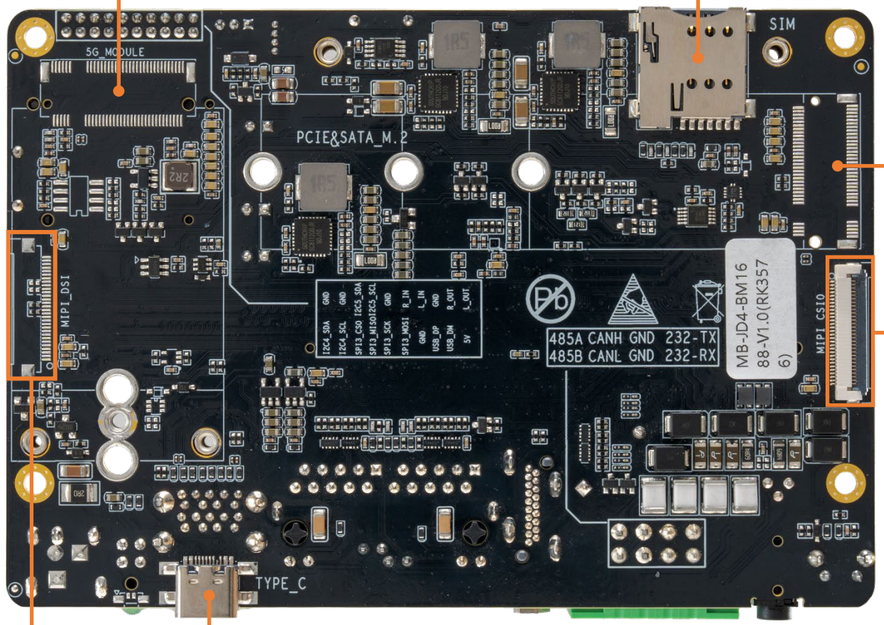
Phoenix connector
(2×4Pin, 3.5mm Pitch)
232-TX GND CANH 485A
232-RX GND CANL 485B

Non-functional

Gigabit Ethernet
(RJ45/1000Mbps)

Type-C
(Flash/Dubug)

DC 12V
(5.5mm×2.1mm, support 9V~24V wide voltage input)



M.2 B-KEY
(Expand 5G, not mounted by default, reused with 4G and USB3.0(1))

SIM Card

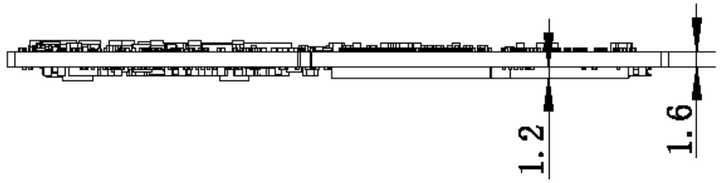
M.2
(Not mounted by default, SATA3.0/PCIe NVMe SSD 2242/2260/2280, multiplexed with USB3.0(1))

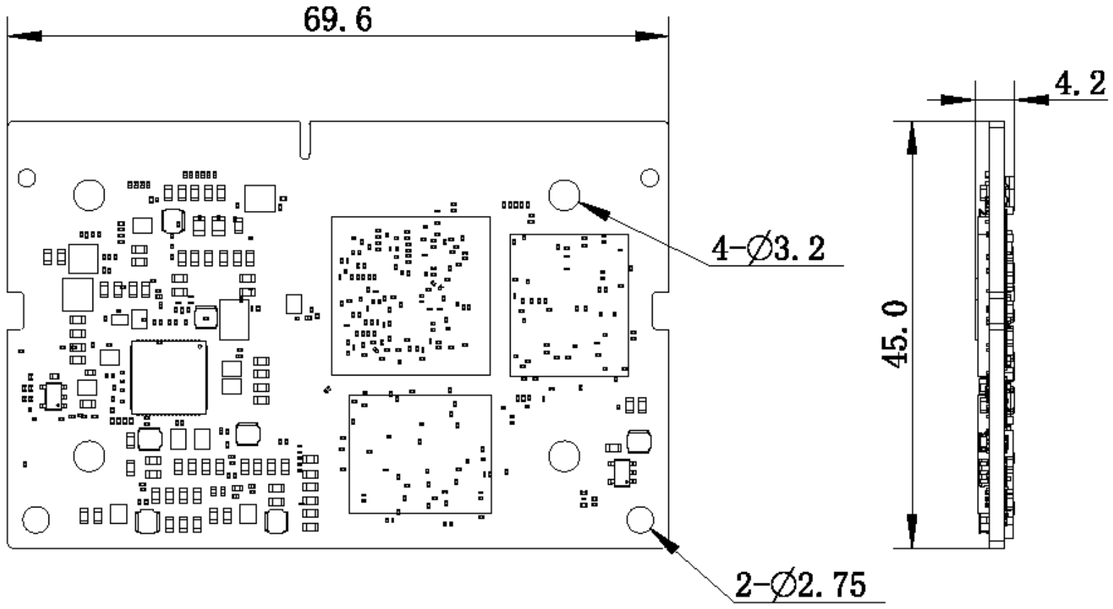
MIPI CSI DPHY
(1×4 lanes/2×2 lanes, 30Pin-0.5mm)

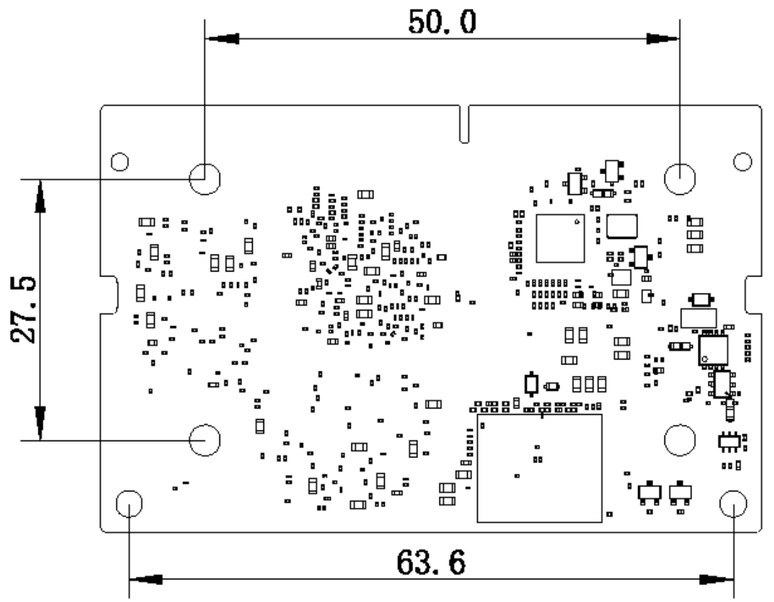
No function, not mounted by default

Type-C
(Flash/Dubug)

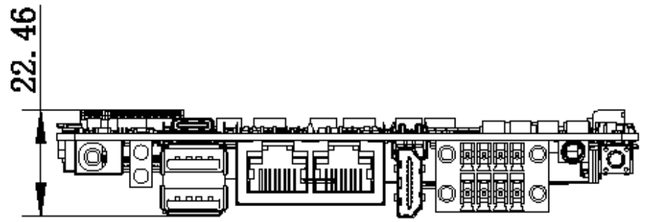
Core board Dimension

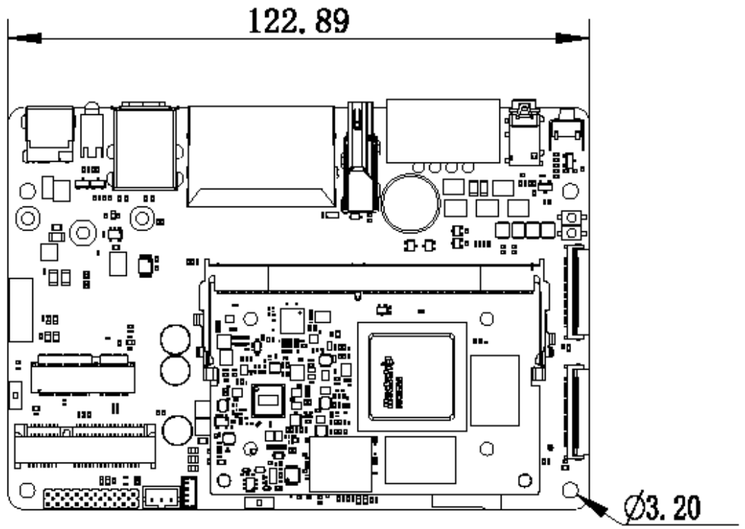


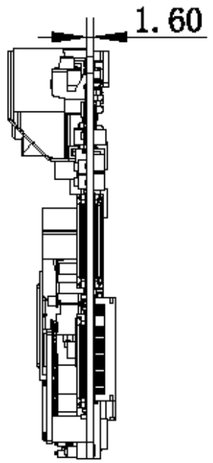


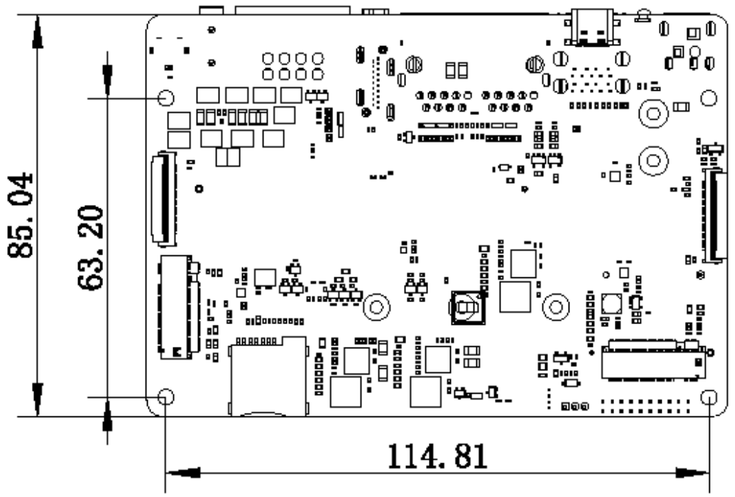


Mainboard Dimension









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	CORE-3588SJD4-AI pin definition	IO Power domain	RK3588S Pin NO.	IO Pull	Pad type	Function for Main BOARD (MB-JD4-BM1688)	Defual function description
1	GND	GND		G		GND	GND
3	MIPI_CSI0_D2N	-	BA42	I		MIPI_CSI0_RX_D2N	MIPI_CSI0_RX_D2N
5	MIPI_CSI0_D2P	-	AY42	I		MIPI_CSI0_RX_D2P	MIPI_CSI0_RX_D2P
7	GND	GND		G		GND	GND
9	MIPI_CSI0_CLK1N	-	AN38	I		MIPI_CSI0_RX_CLK1N	MIPI_CSI0_RX_CLK1N
11	MIPI_CSI0_CLK1P	-	AN37	I		MIPI_CSI0_RX_CLK1P	MIPI_CSI0_RX_CLK1P
13	GND	GND		G		GND	GND
15	MIPI_CSI0_D3N	-	AW42	I		MIPI_CSI0_RX_D3N	MIPI_CSI0_RX_D3N
17	MIPI_CSI0_D3P	-	AW41	I		MIPI_CSI0_RX_D3P	MIPI_CSI0_RX_D3P
19	GND	GND		G		GND	GND
21	MIPI_CSI1_D2N	-	AT42	I		MIPI_CSI1_RX_D2N	MIPI_CSI1_RX_D2N
23	MIPI_CSI1_D2P	-	AT41	I		MIPI_CSI1_RX_D2P	MIPI_CSI1_RX_D2P
25	GND	GND		G		GND	GND
27	MIPI_CSI1_CLK1N	-	AU42	I		MIPI_CSI1_RX_CLK1N	MIPI_CSI1_RX_CLK1N
29	MIPI_CSI1_CLK1P	-	AU41	I		MIPI_CSI1_RX_CLK1P	MIPI_CSI1_RX_CLK1P

Interface definition

31	GND	GND		G		GND	GND
33	MIPI_CSI1_D3N	-	AP41	I		MIPI_CSI1_RX_D3N	MIPI_CSI1_RX_D3N
35	MIPI_CSI1_D3P	-	AP42	I		MIPI_CSI1_RX_D3P	MIPI_CSI1_RX_D3P
37	GND	GND		G		GND	GND
39	TYPEC0_SSRX1N	-	BA10	AI/O		TYPEC0_SSRX1N	TYPEC0_SSRX1N
41	TYPEC0_SSRX1P	-	BB10	AI/O		TYPEC0_SSRX1P	TYPEC0_SSRX1P
43	GND	GND		G		GND	GND
45	TYPEC0_SSTX1N	-	BA11	AI/O		TYPEC0_SSTX1N	TYPEC0_SSTX1N
47	TYPEC0_SSTX1P	-	BB11	AI/O		TYPEC0_SSTX1P	TYPEC0_SSTX1P
49	GND	GND		G		GND	GND
51	MIPI_DPHY1_RX_D2N/MIPI_CPHY1_RX_TRIO2_A	-	BA28	O		MIPI_DPHY1_RX_D2N	MIPI_DPHY1_RX_D2N
53	MIPI_DPHY1_RX_D2P/MIPI_CPHY1_RX_TRIO2_B	-	BB28	O		MIPI_DPHY1_RX_D2P	MIPI_DPHY1_RX_D2P
55	GND	GND		G		GND	GND
57	HDMI_TX0_SBDN/EDP_TX0_AUXN	-	AY1	I		HDMI0_TX_SBDN	HDMI0_TX_SBDN
59	HDMI_TX0_SBDP/EDP_TX0_AUXP	-	BA1	I		HDMI0_TX_SBDP	HDMI0_TX_SBDP
61	GND	GND		G		GND	GND
63	HDMI_TX0_D2N/EDP_TX0_D2N	-	BA7	O		HDMI0_TX2N	HDMI0_TX2N
65	HDMI_TX0_D2P/EDP_TX0_D2P	-	BB7	O		HDMI0_TX2P	HDMI0_TX2P

Interface definition

67	GND	GND		G		GND	GND
69	HDMI_TX0_D1N/EDP_TX0_D1N	-	BB5	O		HDMI0_TX1N	HDMI0_TX1N
71	HDMI_TX0_D1P/EDP_TX0_D1P	-	BA5	O		HDMI0_TX1P	HDMI0_TX1P
73	GND	GND		G		GND	GND
75	HDMI_TX0_D0N/EDP_TX0_D0N	-	BA4	O		HDMI0_TX0N	HDMI0_TX0N
77	HDMI_TX0_D0P/EDP_TX0_D0P	-	BB4	O		HDMI0_TX0P	HDMI0_TX0P
79	GND	GND		G		GND	GND
81	HDMI_TX0_D3N/EDP_TX0_D3N	-	BB2	O		HDMI0_TX3N	HDMI0_TX3N
83	HDMI_TX0_D3P/EDP_TX0_D3P	-	BA2	O		HDMI0_TX3P	HDMI0_TX3P
85	GND	GND		G		GND	GND
87	PDM0_CLK1_M1/PWM2_M0/UART0_RX_M0/I2C4_SDA_M2/DP0_HPDIN_M1/GPIO0_C4_d	1.8V	AL38	I/O	DOWN	WD_EN	WD_EN
89	PDM1_SDI3_M1/UART4_RX_M2/SPI0_MOSI_M2/GPIO1_B2_d	1.8V	M38	I/O	DOWN	SPI0_MOSI_M2	SPI0_MOSI_M2
91	PDM1_CLK1_M1/SATA0_ACT_LED_M1/UART4_TX_M2/SPI0_CLK_M2/GPIO1_B3_d	1.8V	M37	I/O	DOWN	SPI0_CLK_M2	SPI0_CLK_M2
93	PDM1_SDI2_M1/SPI0_MISO_M2/GPIO1_B1_d	1.8V	G39	I/O	DOWN	SPI0_MISO_M2	SPI0_MISO_M2
95	PDM1_CLK0_M1/UART7_RX_M2/SPI0_CS0_M2/GPIO1_B4_u	1.8V	M39	I/O	UP	SPI0_CS0_M2	SPI0_CS0_M2
97	UART7_TX_M2/SPI0_CS1_M2/GPIO1_B5_u	1.8V	D40	I/O	UP	CAM3_PWDN	CAM3_PWDN
99	PCIE20X1_1_WAKEN_M2/I2C2_SCL_M4/UART6_TX_M1/SPI4_MOSI_M2/GPIO1_A1_d	1.8V	L40	I/O	DOWN	UART6_TX_M1	UART6_TX_M1
101	PCIE20X1_1_CLKREQN_M2/DP0_HPDIN_M2/I2C2_SDA_M4/UART6_RX_M1/SPI4_MISO_M2/GPIO1_A0_d	1.8V	G40	I/O	DOWN	UART6_RX_M1	UART6_RX_M1

Interface definition

103	VOP_POST_EMPTY/I2C4_SDA_M3/UART6_RTSN_M1/PWM0_M2/SPI4_CLK_M2/GPIO1_A2_d	1.8V	D38	I/O	DOWN	UART6_RTSN_M1	UART6_RTSN_M1
105	I2C4_SCL_M3/UART6_CTSN_M1/PWM1_M2/SPI4_CS0_M2/GPIO1_A3_d	1.8V	L39	I/O	DOWN	UART6_CTSN_M1	UART6_CTSN_M1
107	GND	GND		G		GND	GND
109	TYPEC0_USB20_OTG_DM	-	AY10	AI/O		TYPEC0_OTG_DM	TYPEC0_OTG_DM
111	TYPEC0_USB20_OTG_DP	-	AY11	AI/O		TYPEC0_OTG_DP	TYPEC0_OTG_DP
113	GND	GND		G		GND	GND
115	USB20_HOST0_DM	-	AV6	AI/O		USB20_HOST0_DM	USB20_HOST0_DM
117	USB20_HOST0_DP	-	AW6	AI/O		USB20_HOST0_DP	USB20_HOST0_DP
119	GND	GND		G		GND	GND
121	USB20_HOST1_DM	-	AW7	AI/O		USB20_HOST1_DM	USB20_HOST1_DM
123	USB20_HOST1_DP	-	AV7	AI/O		USB20_HOST1_DP	USB20_HOST1_DP
125	GND	GND		G		GND	GND
127	PMIC_SLEEP3/GPIO0_C1_d	1.8V	AM38	I/O	DOWN	BL_EN	BL_EN
129	GND	GND		G		GND	GND
131	PCIE20_0_RXN/SATA30_0_RXN	-	J41	I		PCIE20_0_RXN	PCIE20_0_RXN
133	PCIE20_0_RXP/SATA30_0_RXP	-	J42	I		PCIE20_0_RXP	PCIE20_0_RXP
135	GND	GND		G		GND	GND
137	NC					NC	NC

Interface definition

139	NC					NC	NC
141	GND	GND		G		GND	GND
143	CIF_HREF/BT1120_D8/I2S1_SDO1_M0/PCIE20X1_1_BUTTON_RSTN/DDRPHY_CH2_DTB2/I2C7_SCL_M3/UART8_RTSN_M0/PWM14_M1/SPI0_CS0_M1/CAN1_RX_M1/GPIO4_B2_u	3.3V	AT15	I/O	UP	CAN1_RX_M1	CAN1_RX_M1
145	CIF_VSYNC/BT1120_D9/I2S1_SDO2_M0/PCIE20X1_2_BUTTON_RSTN/DDRPHY_CH2_DTB3/I2C7_SDA_M3/UART8_CTSN_M0/PWM15_IR_M1/CAN1_TX_M1/GPIO4_B3_u	3.3V	AV23	I/O	UP	CAN1_TX_M1	CAN1_TX_M1
147	SARADC_IN2	1.8V	AV11	I		SARADC_VIN2	ADC2 Input （core board pull up resistance 10K ）
149	NC					NC	NC
151	NC					NC	NC
153	GND	GND		G		GND	GND
155	NC					NC	NC
157	NC					NC	NC
159	GND	GND		G		GND	GND
161	USB30_2_SSRXN **(Defalt,GPIO0_C7:H)**	-	C42	I		USB30_2_SSRXN	USB30_2_SSRXN
163	USB30_2_SSRXP **(Defalt,GPIO0_C7:H)**	-	D42	I		USB30_2_SSRXP	USB30_2_SSRXP
165	GND	GND		G		GND	GND
167	PCIE20_2_RXN/SATA30_2_RXN (Option, ,GPIO0_C7:L)	-	C42	I		PCIE20_2_RXN	PCIE20_2_RXN
169	PCIE20_2_RXP/SATA30_2_RXP (Option, ,GPIO0_C7:L)	-	D42	I		PCIE20_2_RXP	PCIE20_2_RXP
171	GND	GND		G		GND	GND

Interface definition

173	PCIE20_2_REFCLKN	-	F42	AI/O		PCIE20_2_REFCLKN	PCIE20_2_REFCLKN
175	PCIE20_2_REFCLKP	-	F41	AI/O		PCIE20_2_REFCLKP	PCIE20_2_REFCLKP
177	GND	GND		G		GND	GND
179	PCIE20X1_2_WAKEN_M0/Gpio3_D0; PCIE20X1_1_WAKEN_M1/Gpio4_A1	3.3V	AW31/AW18	I/O	DOWN	PCIE_WAKE*	PCIE_WAKE*
181	CIF_D13/PCIE20X1_2_PERSTN_M0/UART4_TX_M1/PWM9_M2/SPI0_MISO_M3/GPIO3_D1_d	3.3V	AY27	I/O	DOWN	PCIE20X1_2_PERSTN_M0	PCIE20X1_2_PERSTN_M0 （core board pull up resistance 10K ）
183	CIF_D2/BT1120_D2/I2S1_LRCK_M0/PCIE20X1_1_PERSTN_M1/DDRPHY_CH0_DTB2/SPI0_CLK_M1/GPIO4_A2_d	3.3V	AV26	I/O	DOWN	PCIE20X1_1_PERSTN_M1	PCIE20X1_1_PERSTN_M1
185	CIF_D4/BT1120_D4/DDRPHY_CH1_DTB_0/I2C3_SCL_M2/UART0_RX_M2/SPI2_MISO_M1/GPIO4_A4_d	3.3V	AW19	I/O	DOWN	I2C3_SCL_M2	I2C3_SCL_M2 （core board pull up resistance 2.2K ）
187	CIF_D5/BT1120_D5/I2S1_SDI0_M0/DDRPHY_CH1_DTB_1/I2C3_SDA_M2/UART3_TX_M2/SPI2_MOSI_M1/GPIO4_A5_d	3.3V	AU15	I/O	DOWN	I2C3_SDA_M2	I2C3_SDA_M2 （core board pull up resistance 2.2K ）
189	CIF_D6/BT1120_D6/I2S1_SDI1_M0/DDRPHY_CH1_DTB2/I2C5_SCL_M2/UART3_RX_M2/SPI2_CLK_M1/GPIO4_A6_d	3.3V	AV18	I/O	DOWN	I2C5_SCL_M2	I2C5_SCL_M2 （core board pull up resistance 2.2K ）
191	CIF_D7/BT1120_D7/I2S1_SDI2_M0/DDRPHY_CH1_DTB3/I2C5_SDA_M2/SPI2_CS0_M1/GPIO4_A7_d	3.3V	AW26	I/O	DOWN	I2C5_SDA_M2	I2C5_SDA_M2 （core board pull up resistance 2.2K ）
193	I2S0_SDO0/I2C4_SCL_M4/UART4_CTSN/GPIO1_C7_d	1.8V	P41	I/O	DOWN	I2S0_SDO0	I2S0_SDO0 (Data Out)
195	I2S0_SDI0/GPIO1_D4_d	1.8V	N42	I/O	DOWN	I2S0_SDI0	I2S0_SDI0 (Data In)
197	I2S0_LRCK/I2C2_SCL_M3/UART4_RTSN/GPIO1_C5_d	1.8V	P39	I/O	DOWN	I2S0_LRCK_TX	I2S0_LRCK_ Output
199	I2S0_SCLK/I2C6_SCL_M1/UART3_CTSN/PWM7_IR_M2/SPI4_CS0_M0/GPIO1_C3_d	1.8V	M42	I/O	DOWN	I2S0_SCLK_TX	I2S0_SCLK_ Output
201	GND	GND		G		GND	GND
203	MCU_JTAG_TMS_M1/UART9_TX_M2/PWM11_IR_M3/SPI0_CS1_M3/GPIO3_D5_d	1.8V	AW30	I/O	DOWN	UART9_TX_M2	UART9_TX_M2
205	HDMI_TX0_HPD_M1/MCU_JTAG_TCK_M1/UART9_RX_M2/SPI0_CS0_M3/GPIO3_D4_d	1.8V	AV31	I/O	DOWN	UART9_RX_M2	UART9_RX_M2

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207	CIF_D14/I2C7_SCL_M2/UART9_RTSN_M2/SPI0_MOSI_M3/GPIO3_D2_d	1.8V	AY30	I/O	DOWN	UART9_RTSN_M2	UART9_RTSN_M2
209	CIF_D15/I2C7_SDA_M2/UART9_CTSN_M2/PWM10_M2/SPI0_CLK_M3/GPIO3_D3_d	1.8V	AY31	I/O	DOWN	UART9_CTSN_M2	UART9_CTSN_M2
211	I2S0_MCLK/I2C6_SDA_M1/UART3_RTSN/PWM3_IR_M2/SPI4_CLK_M0/GPIO1_C2_d	1.8V	U36	I/O	DOWN	I2S0_MCLK	I2S0_MCLK
213	MIPI_CAMERA0_CLK_M0/SPDIF1_TX_M1/I2S1_SDO0_M0/SATA2_ACT_LED_M0/DDRPHY_CH2_DTB1/I2C6_SCL_M3/UART8_RX_M0/SPI0_CS1_M1/GPIO4_B1_u	3.3V	AU22	I/O	UP	I2C6_SCL_M3	I2C6_SCL_M3 （core board pull up resistance 2.2K ）
215	CIF_CLKIN/BT1120_CLKOUT/I2S1_SDI3_M0/DDRPHY_CH2_DTB0/I2C6_SDA_M3/UART8_TX_M0/SPI2_CS1_M1/GPIO4_B0_d	3.3V	AW27	I/O	DOWN	I2C6_SDA_M3	I2C6_SDA_M3 （core board pull up resistance 2.2K ）
217	MODULE ID (Pull-down resistor 1KΩ)	1.8V	AW30	I/O	DOWN	NC	NC
219	SDMMC_D0/PDM1_SDI3_M0/JTAG_TCK_M1/I2C3_SCL_M4/UART2_TX_M1/PWM8_M1/GPIO4_D0_u	3.3V/1.8V Auto	AV2	I/O	UP	SDMMC_D0	SDMMC_D0 to TF Card,
221	SDMMC_D1/PDM1_SDI2_M0/JTAG_TMS_M1/I2C3_SDA_M4/UART2_RX_M1/PWM9_M1/GPIO4_D1_u		AR2	I/O	UP	SDMMC_D1	SDMMC_D1 to TF Card,
223	SDMMC_D2/PDM1_SDI1_M0/JTAG_TCK_M0/I2C8_SCL_M0/UART5_CTSN_M0/GPIO4_D2_u		AV1	I/O	UP	SDMMC_D2	SDMMC_D2 to TF Card,
225	SDMMC_D3/PDM1_SDI0_M0/JTAG_TMS_M0/I2C8_SDA_M0/UART5_RTSN_M0/PWM10_M1/GPIO4_D3_u		AT1	I/O	UP	SDMMC_D3	SDMMC_D3 to TF Card,
227	SDMMC_CMD/PDM1_CLK1_M0/MCU_JTAG_TCK_M0/CAN0_TX_M1/UART5_RX_M0/PWM7_IR_M1/GPIO4_D4_u		AU1	I/O	UP	SDMMC_CMD	SDMMC_CMD to TF Card,
229	SDMMC_CLK/PDM1_CLK0_M0/TEST_CLKOUT_M0/MCU_JTAG_TMS_M0/CAN0_RX_M1/UART5_TX_M0/GPIO4_D5_d		AR1	I/O	DOWN	SDMMC_CLK	SDMMC_CLK to TF Card,
231	GND	GND		G		GND	GND
233	PMIC_EXT_EN_OUT	5.0V		O		PMIC_EXT_EN_OUT	PMIC_EXT_EN_Output Active H
235	RTC_BAT	3.0V/5V	P	I/O	DOWN	RTC_BAT INPUT	RTC_BAT INPUT
237	POWER_EN (Default :NC)					VDC Input--NC	NC
239	NPOR (System Reset Input)	1.8V	V42	I	UP	RESET_L	System Reset Input, Active L

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241	GND	GND		G		GND	GND
243	GND	GND		G			
245	GND	GND		G			
247	GND	GND		G			
249	GND	GND		G			
251	VCC5V0_SYS	5.0V		P		VCC5V0_SYS Input	Input Voltage 5.0V +/-5% Sleep.: 0.05W(5.0V/10mA) Normal:1.0W(5.0V/200mA) Max: 12.5W(5.0V/2.5A) Recommended Power Supply: 5.0V/3.0A
253	VCC5V0_SYS	5.0V		P			
255	VCC5V0_SYS	5.0V		P			
257	VCC5V0_SYS	5.0V		P			
259	VCC5V0_SYS	5.0V		P			
PIN	**CORE-3588SJD4-AI pin definition**	**IO Power domain**	**RK3588S Pin NO.**	**IO Pull**	**Pad type**	**Function for Main BOARD (MB-JD4-BM1688)**	**Defual function description**
2	GND	GND		G		GND	GND
4	MIPI_CSI0_D0N	-	BB38	I		MIPI_CSI0_RX_D0N	MIPI_CSI0_RX_D0N
6	MIPI_CSI0_D0P	-	BA38	I		MIPI_CSI0_RX_D0P	MIPI_CSI0_RX_D0P
8	GND	GND		G		GND	GND
10	MIPI_CSI0_CLK0N	-	BA41	I		MIPI_CSI0_RX_CLK0N	MIPI_CSI0_RX_CLK0N
12	MIPI_CSI0_CLK0P	-	BB41	I		MIPI_CSI0_RX_CLK0P	MIPI_CSI0_RX_CLK0P
14	GND	GND		G		GND	GND

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16	MIPI_CSI0_D1N	-	AY40	I		MIPI_CSI0_RX_D1N	MIPI_CSI0_RX_D1N
18	MIPI_CSI0_D1P	-	BA40	I		MIPI_CSI0_RX_D1P	MIPI_CSI0_RX_D1P
20	GND	GND		G		GND	GND
22	MIPI_CSI1_D0N	-	AL41	I		MIPI_CSI1_RX_D0N	MIPI_CSI1_RX_D0N
24	MIPI_CSI1_D0P	-	AL42	I		MIPI_CSI1_RX_D0P	MIPI_CSI1_RX_D0P
26	GND	GND		G		GND	GND
28	MIPI_CSI1_CLK0N	-	AN41	I		MIPI_CSI1_RX_CLK0N	MIPI_CSI1_RX_CLK0N
30	MIPI_CSI1_CLK0P	-	AN42	I		MIPI_CSI1_RX_CLK0P	MIPI_CSI1_RX_CLK0P
32	GND	GND		G		GND	GND
34	MIPI_CSI1_D1N	-	AK42	I		MIPI_CSI1_RX_D1N	MIPI_CSI1_RX_D1N
36	MIPI_CSI1_D1P	-	AK41	I		MIPI_CSI1_RX_D1P	MIPI_CSI1_RX_D1P
38	GND	GND		G		GND	GND
40	MIPI_DPHY1_RX_D0N/MIPI_CPHY1_RX_TRIO0_A	-	BB23	O		MIPI_DPHY1_RX_D0N	MIPI_DPHY1_RX_D0N
42	MIPI_DPHY1_RX_D0P/MIPI_CPHY1_RX_TRIO0_B	-	BA23	O		MIPI_DPHY1_RX_D0P	MIPI_DPHY1_RX_D0P
44	GND	GND		G		GND	GND
46	MIPI_DPHY1_RX_CLKN/MIPI_CPHY1_RX_TRIO1_B	-	BB26	O		MIPI_DPHY1_RX_CLKN	MIPI_DPHY1_RX_CLKN
48	MIPI_DPHY1_RX_CLKP/MIPI_CPHY1_RX_TRIO1_C	-	BA26	O		MIPI_DPHY1_RX_CLKP	MIPI_DPHY1_RX_CLKP
50	GND	GND		G		GND	GND

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52	MIPI_DPHY1_RX_D1N/MIPI_CPHY1_RX_TRIO0_C	-	BA25	O		MIPI_DPHY1_RX_D1N	MIPI_DPHY1_RX_D1N
54	MIPI_DPHY1_RX_D1P/MIPI_CPHY1_RX_TRIO1_A	-	BB25	O		MIPI_DPHY1_RX_D1P	MIPI_DPHY1_RX_D1P
56	GND	GND		G		GND	GND
58	MIPI_DPHY1_RX_D3N/MIPI_CPHY1_RX_TRIO2_C	-	BB29	O		MIPI_DPHY1_RX_D3N	MIPI_DPHY1_RX_D3N
60	MIPI_DPHY1_RX_D3P/NO_USE	-	BA29	O		MIPI_DPHY1_RX_D3P	MIPI_DPHY1_RX_D3P
62	GND	GND		G		GND	GND
64	NC					NC	
66	NC					NC	
68	GND	GND		G		GND	GND
70	NC					NC	
72	NC					NC	
74	NC					NC	
76	NC					NC	
78	GND	GND		G		GND	GND
80	NC					NC	
82	NC					NC	
84	NC					NC	
86	NC					NC	

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88	BT1120_D12/SATA0_ACT_LED_M0/DDRPHY_CH3_DTB2/I2C5_SCL_M1/PWM13_M1/SPI3_MOSI_M1/GPIO4_B6_d	3.3V	AW22	I/O	DOWN	HDMI0_TX_ON_H	HDMI0_TX_ON_H
90	NC					NC	
92	NC					NC	
94	BT1120_D15/SPDIF1_TX_M2/PCIE20X1_2_PERSTN_M1/HDMI_TX0_CEC_M0/I2C8_SDA_M3/PWM6_M1/SPI3_CS1_M1/GPIO4_C1_d	3.3V	AY26	I/O	DOWN	HDMI_TX0_CEC_M0	HDMI_TX0_CEC_M0
96	HDMI_TX0_HPD_M0/SPI2_MOSI_M0/GPIO1_A5_d	1.8V	M40	I/O	DOWN	HDMI_TX0_HPD_M0	HDMITX0_HPD Input, Active H
98	BT1120_D14/PCIE20X1_2_WAKEN_M1/HDMI_TX0_SDA_M0/I2C8_SCL_M3/SPI3_CS0_M1/GPIO4_C0_u	3.3V	AW23	I/O	UP	HDMI_TX0_SDA_M0	HDMI_TX0_SDA_M0
100	BT1120_D13/PCIE20X1_2_CLKREQN_M1/HDMI_TX0_SCL_M0/DDRPHY_CH3_DTB3/I2C5_SDA_M1/SPI3_CLK_M1/GPIO4_B7_u	3.3V	AV22	I/O	UP	HDMI_TX0_SCL_M0	HDMI_TX0_SCL_M0
102	GND	GND		G		GND	GND
104	I2S0_SDO2/I2S0_SDI3/PDM0_SDI1_M0/I2C7_SDA_M0/UART6_RX_M2/SPI1_MOSI_M2/GPIO1_D1_d	1.8V	U38	I/O	DOWN	SPI1_MOSI_M2	SPI1_MOSI_M2
106	I2S0_SDO3/I2S0_SDI2/PDM0_SDI2_M0/I2C1_SCL_M4/UART4_TX_M0/PWM0_M1/SPI1_CLK_M2/GPIO1_D2_d	1.8V	P40	I/O	DOWN	SPI1_CLK_M2	SPI1_CLK_M2
108	I2S0_SDO1/I2C7_SCL_M0/UART6_TX_M2/SPI1_MISO_M2/GPIO1_D0_d	1.8V	U37	I/O	DOWN	SPI1_MISO_M2	SPI1_MISO_M2
110	I2S0_SDI1/PDM0_SDI3_M0/I2C1_SDA_M4/UART4_RX_M0/PWM1_M1/SPI1_CS0_M2/GPIO1_D3_d	1.8V	R39	I/O	DOWN	SPI1_CS0_M2	SPI1_CS0_M2
112	PDM0_SDI0_M0/SPI1_CS1_M2/GPIO1_D5_d	1.8V	P38	I/O	DOWN	SPI1_CS1_M2	SPI1_CS1_M2
114	SPI2_MISO_M0/GPIO1_A4_d	1.8V	G37	I/O	DOWN	MIPI_CAM1_PDN_L	MIPI_CAM1_PDN_L
116	MIPI_CAMERA1_CLK_M0/SPDIF0_TX_M0/I2C5_SCL_M3/UART1_TX_M1/GPIO1_B6_u	1.8V	L38	I/O	UP	MIPI_CAMERA1_CLK_M0	MIPI_CAMERA1_CLK_M0
118	MIPI_CAMERA2_CLK_M0/SPDIF1_TX_M0/SATA2_ACT_LED_M1/I2C5_SDA_M3/UART1_RX_M1/PWM13_M2/GPIO1_B7_u	1.8V	F37	I/O	UP	MIPI_CAMERA2_CLK_M0	MIPI_CAMERA2_CLK_M0
120	SPI2_CLK_M0/GPIO1_A6_d	1.8V	D39	I/O	DOWN	MIPI_CAM2_PDN_L	MIPI_CAM2_PDN_L

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122	MIPI_CAMERA3_CLK_M0/I2C8_SCL_M2/UART1_RTSN_M1/PWM14_M2/GPIO1_D6_u	1.8V	L37	I/O	UP	MIPI_CAMERA3_CLK_M0	MIPI_CAMERA3_CLK_M0
124	ETH1_REFCLKO_25M/MIPI_CAMERA1_CLK_M1/I2C4_SCL_M0/GPIO3_A6_d	1.8V	AV37	I/O	DOWN	GPIO3_A6_d	BT_M2_WAKE_AP
126	GMAC1_PPSTRIG/I2C3_SDA_M1/UART7_TX_M1/SPI1_MISO_M1/GPIO3_C0_d	1.8V	AR36	I/O	DOWN	GPIO3_C0_d	BT_DISABLE_L
128	LITCPU_AVS/SPI3_CLK_M2/GPIO0_D3_u	1.8V	AG37	I/O	UP	GPIO0_D3_u	WIFI_DISABLE_L
130	GMAC1_PPSCLK/UART7_RX_M1/SPI1_CLK_M1/GPIO3_C1_d	1.8V	AW38	I/O	DOWN	GPIO3_C1_d	CAM I2C Switch
132	GND	GND		G		GND	GND
134	PCIE20_0_TXN/SATA30_0_TXN	-	H42	O		PCIE20_0_TXN	PCIE20_0_TXN
136	PCIE20_0_TXP/SATA30_0_TXP	-	H41	O		PCIE20_0_TXP	PCIE20_0_TXP
138	GND	GND		G		GND	GND
140	NC					NC	
142	NC					NC	
144	GND	GND		G		GND	GND
146	SARADC_IN3	1.8V	AV13	I		SARADC_VIN3_HP_HOOK	ADC3 Input （core board pull up resistance 10K ）
148	NC					NC	
150	NC					NC	
152	GND	GND		G		GND	GND
154	NC					NC	
156	NC					NC	

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158	GND	GND		G		GND	GND
160	PCIE20_0_REFCLKN	-	K41	AI/O		PCIE20_0_REFCLKN	PCIE20_0_REFCLKN
162	PCIE20_0_REFCLKP	-	L42	AI/O		PCIE20_0_REFCLKP	PCIE20_0_REFCLKP
164	GND	GND		G		GND	GND
166	USB30_2_SSTXN **(Defalt,GPIO0_C7:H)**	-	D41	O		USB30_2_SSTXN	USB30_2_SSTXN
168	USB30_2_SSTXP **(Defalt,GPIO0_C7:H)**	-	E41	O		USB30_2_SSTXP	USB30_2_SSTXP
170	GND	GND		G		GND	GND
172	PCIE20_2_TXN/SATA30_2_TXN **(Option, ,GPIO0_C7:L)**	-	D41	O		PCIE1_TXN	PCIE1_TXN
174	PCIE20_2_TXP/SATA30_2_TXP **(Option, ,GPIO0_C7:L)**	-	E41	O		PCIE1_TXP	PCIE1_TXP
176	GND	GND		G		GND	GND
178	I2S1_SDI0_M1/GPU_AVS/UART0_TX_M0/I2C4_SCL_M2/PWM4_M0/GPIO0_C5_u	1.8V	AG38	I/O	UP	MOD_SLEEP	MOD_SLEEP （core board pull up resistance 4.7K ）
180	CIF_D11/PCIE20X1_2_CLKREQN_M0/HDMI_TX0_SCL_M2/I2C5_SCL_M0/SPI3_MOSI_M3/GPIO3_C7_u	3.3V	AU30	I/O	UP	PCIE20X1_2_CLKREQN_M0	PCIE1_CLKREQ* （core board pull up resistance 10K ）
182	CIF_D0/BT1120_D0/I2S1_MCLK_M0/PCIE20X1_1_CLKREQN_M1/DDRPHY_CH0_DTB0/UART9_RTSN_M1/SPI0_MISO_M1/GPIO4_A0_d	3.3V	AV19	I/O	DOWN	PCIE20X1_1_CLKREQN_M1	PCIE0_CLKREQ*
184	PHY1_MDI0-	-		I/O		PHY1_MDI0-	From RTL8211F
186	PHY1_MDI0+	-		I/O		PHY1_MDI0+	From RTL8211F
188	PHY1_LED_LINK	-		I/O		PHY1_LED_LINK	From RTL8211F
190	PHY1_MDI1-	-		I/O		PHY1_MDI1-	From RTL8211F
192	PHY1_MDI1+	-		I/O		PHY1_MDI1+	From RTL8211F

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194	PHY1_LED2/CFG_LDO1	-		I/O		PHY1_LED2/CFG_LDO1	From RTL8211F
196	PHY1_MDI2-	-		I/O		PHY1_MDI2-	From RTL8211F
198	PHY1_MDI2+	-		I/O		PHY1_MDI2+	From RTL8211F
200	GND	GND		G		GND	GND
202	PHY1_MDI3-	-		I/O		PHY1_MDI3-	From RTL8211F
204	PHY1_MDI3+	-		I/O		PHY1_MDI3+	From RTL8211F
206	SDMMC_DET/GPIO0_A4_u	1.8V	AC38	I/O	UP	SDMMC_DET_L	SDMMC0_DET Input, Active L
208	PDM0_CLK0_M0/I2C4_SDA_M4/PWM15_IR_M2/GPIO1_C6_d	1.8V	M41	I/O	DOWN	GPIO1_C6_d	FAN_TACH
210	32KOUT_WIFI	1.8V		O		32KOUT_WIFI	clock 32.768KHz Output for WIFI
212	CIF_D8/FSPI_CS0N_M2/CAN2_RX_M0/UART5_TX_M1/SPI3_CS0_M3/GPIO3_C4_u	1.8V	AU34	I/O	UP	HP_DET_L	HP_DET_L, Input, Active L
214	SARADC_IN0_BOOT （BOOT_KEY must be retained for update)	1.8V	AW15	I		SARADC_VIN0_BOOT	ADC0 Input （BOOT Mode) （core board pull up resistance 100K ）
216	MIPI_CAMERA4_CLK_M0/I2C8_SDA_M2/UART1_CTSN_M1/PWM15_IR_M3/GPIO1_D7_u	1.8V	G38	I/O	UP	CAM2_PWDN	CAM2_PWDN
218	PDM1_SDI0_M1/PCIE20X1_1_PERSTN_M2/PWM3_IR_M3/SPI2_CS0_M0/GPIO1_A7_u	1.8V	H38	I/O	UP	SD0_PWR_EN	SD0_PWR_EN,, Active H
220	GMAC1_PTP_REF_CLK/I2C3_SCL_M1/SPI1_MOSI_M1/GPIO3_B7_d	1.8V	AY34	I/O	DOWN	GPIO3_B7_d	GPIO3_B7_d
222	GMAC1_TXER/I2S2_SDI_M1/UART2_RX_M2/PWM3_IR_M1/GPIO3_B2_d	1.8V	AW34	I/O	DOWN	GPIO3_B2_d	GPIO3_B2_d
224	GMAC1_MCLKINOUT/I2S2_LRCK_M1/CAN1_TX_M0/UART3_RX_M1/PWM13_M0/GPIO3_B6_d	1.8V	AW37	I/O	DOWN	GPIO3_B6_d	GPIO3_B6_d
226	PDM1_SDI1_M1/SPI2_CS1_M0/GPIO1_B0_u	1.8V	H39	I/O	UP	GPIO1_B0_u	GPIO1_B0_u
228	PDM0_CLK1_M0/I2C2_SDA_M3/PWM11_IR_M2/SPI4_CS1_M0/GPIO1_C4_d	1.8V	U35	I/O	DOWN	SATA_LED	SATA_LED

Interface definition

230	I2S1_SDI1_M1/NPU_AVS/UART0_RTSN/PWM5_M1/SPI0_CLK_M0/SATA_CP_POD/GPIO0_C6_u	1.8V	AH42	I/O	UP	FAN_PWM	FAN_PWM OUTPUT
232	I2C1_SCL_M2/CAN2_RX_M1/HDMI_TX0_SDA_M1/SPI3_CS0_M2/SATA_CPDET/GPIO0_D4_u	1.8V	AL39	I/O	UP	I2C1_SCL_M2	I2C1_SCL_M2 (core board pull up resistance 2.2K)
234	I2S1_SDO3_M1/CPU_BIG1_AVS/I2C1_SDA_M2/CAN2_TX_M1/HDMI_TX0_SCL_M1/SPI3_CS1_M2/SATA_MP_SWITCH/GPIO0_D5_u	1.8V	AM39	I/O	UP	I2C1_SDA_M2	I2C1_SDA_M2 (core board pull up resistance 2.2K)
236	I2S1_MCLK_M1/JTAG_TCK_M2/I2C1_SCL_M0/UART2_TX_M0/PCIE20X1_1_CLKREQN_M0/GPIO0_B5_d	1.8V	AH39	I/O	DOWN	UART2_TX_M0	**UART2_TX_M0 for system Debug**
238	I2S1_SCLK_M1/JTAG_TMS_M2/I2C1_SDA_M0/UART2_RX_M0/PCIE20X1_1_WAKEN_M0/GPIO0_B6_d	1.8V	AH40	I/O	DOWN	UART2_RX_M0	**UART2_RX_M0 for system Debug**
240	POWER_ON (Manual power on signal)	5.0V		I		PWRON_L	Power Key Input,Acive L
242	GND	GND		G		GND	GND
244	GND	GND		G			
246	GND	GND		G			
248	GND	GND		G			
250	GND	GND		G			
252	VCC5V0_SYS	5.0V		P		VCC5V0_SYS Input	Input Voltage 5.0V +/-5% Sleep.: 0.05W(5.0V/10mA) Normal:1.0W(5.0V/200mA) Max: 12.5W(5.0V/2.5A) Recommended Power Supply: 5.0V/3.0A
254	VCC5V0_SYS	5.0V		P			
256	VCC5V0_SYS	5.0V		P			
258	VCC5V0_SYS	5.0V		P			
260	VCC5V0_SYS	5.0V		P			

T-CHIP INTELLIGENCE TECHNOLOGY

Contact Us
(+86)18688117175

E-mail
global@t-firefly.com

Website
www.t-firefly.com

Address
Room 2101, Hongyu Building, #57 Zhongshan 4Rd, East District, Zhongshan, Guangdong, China.