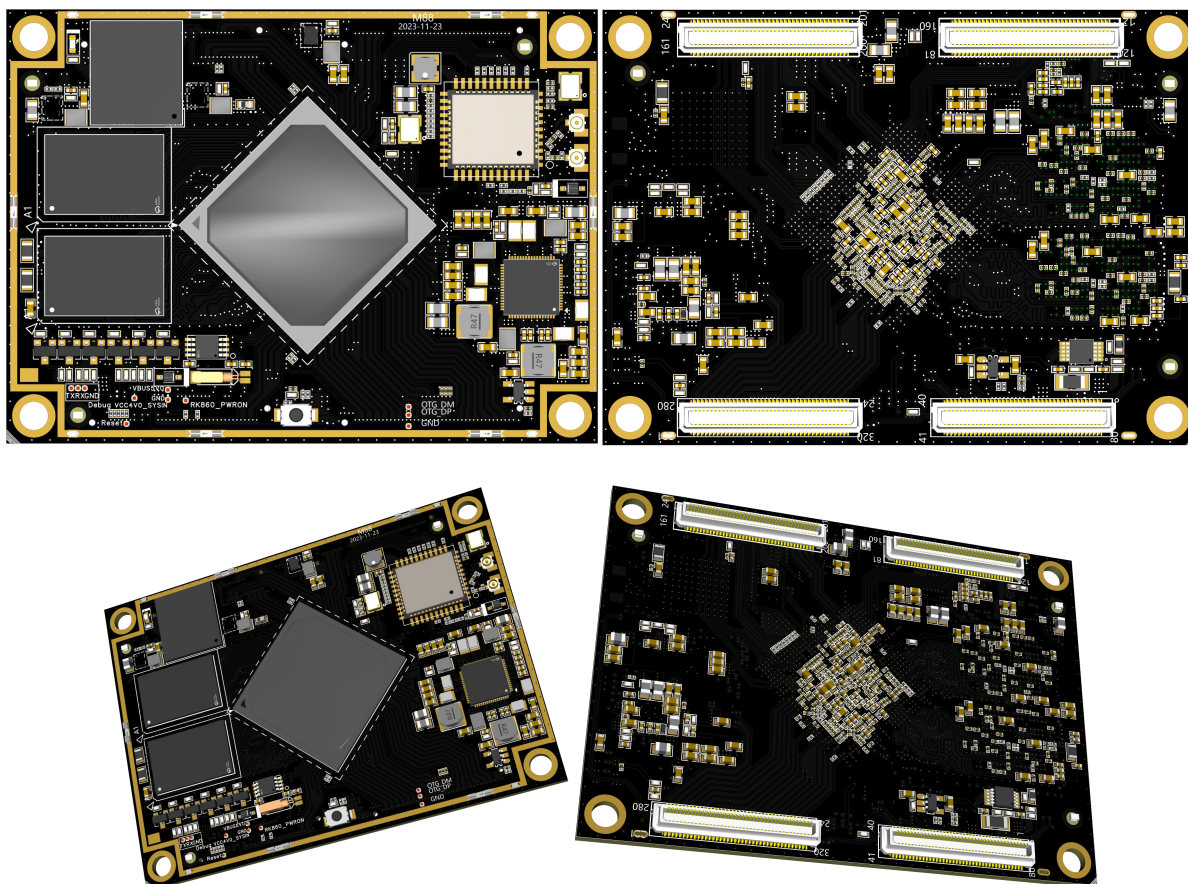


Document No.	Types	Version information	Release date	Secret level	
BST20231108	IO	V0.1	2023-11-08	public	

64-bit Industrial-grade core board

M88

V0.1



Version	Updated	Update Content
V0.1	2023-11-08	V0.1
V0.2	2023-11-24	Change IO

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Company Profile

Shenzhen BesTom Electronics Co., Ltd. was founded in 2008, focusing on the research and development of smart terminal devices, smart homes, etc. With "smart" as the core, it has formed a focus on different industries, different scales, and different applications such as governments, enterprises, and media. The series of products and targeted solutions are the most influential smart technology provider in China.



"Innovation, transforming new technology into productivity" is the core competitiveness of BesTom Electronics Co., Ltd. With a deep understanding of the software and Internet industry, BesTom Electronics Co., Ltd. combines software technology with Internet applications, combines industry-leading product concepts and rich product development experience to provide users with simplicity, convenience, safety and practicality. Collaborative application software products and solutions help customers achieve low-cost, low-risk, fast-start, and high-efficiency informatization goals. The cordial, open, and rigorous company culture and scientific and standardized management gather a large number of outstanding talents. BesTom Electronics Co., Ltd. has a management team composed of outstanding professional managers and a technical team composed of senior IT experts. Tacit cooperation in product development, promotion and maintenance, a deep understanding of the meaning of "customer-centric", "service" runs through every detail of the company's operation and management, and wins extensive trust and support from customers.

"Create Better" is the philosophy of the BesTom team. We hope that through BesTom's high-quality technical services, the research and development of various technological products can become more efficient and simple, and creative products can be integrated into life more smoothly.

1. Product introduction

1.1 Overview

1.2 RK3588 quad-core 64-bit processor

Quad core Cortex-A76 + Quad-core Cortex-A55 with 8nm

1.3 Integrated co-processors — GPU, VPU, NPU

ARM Mali G610 GPU

NPU: 6Tops, int4/int8/int16/FP16/BF16/TF32

MCU for low power control

Memory

64bit LPDDR4/LPDDR4x/LPDDR5

Support eMMC 5.1 with HS400, SDIO 3.0 with HS200, SFC

1.4 Various display interfaces

Multimedia

8K@60fps H.265/H.264/VP9/AV1/AVS2 video decoder

1080P other video decoders (VC-1, MPEG-1/2/4, VP8, AVS1)

8K@30fps video encoders for H.264/H.265

Display

Multiple display engine max to 8K

Dual HDMI2.1/eDP V1.4 Combo interface

Dual MIPI-DSI TX, 4 lanes

Dual DP v1.3 embed in USB 3.1, Audio, HDCP2.x

Video input

48M Pixel ISP with HDR&3DNR

Multiple (4*4lanes or 4*2lanes+2*4Lanes) MIPI CSI-2 and DVP interface

HDMI 2.0 input to 4K@60fps

1.5 Powerful wireless network communication

Supporting WiFi 6 (802.11ax) wireless network communication, high-speed transmission, lower packet loss rate and re-transmission rate, which more effectively for reduces data congestion, and allows more devices to connect to the network. Also can be connected to mobile 5G/4G module, allow the product to have a higher-rate, larger-capacity and lower-latency communication.

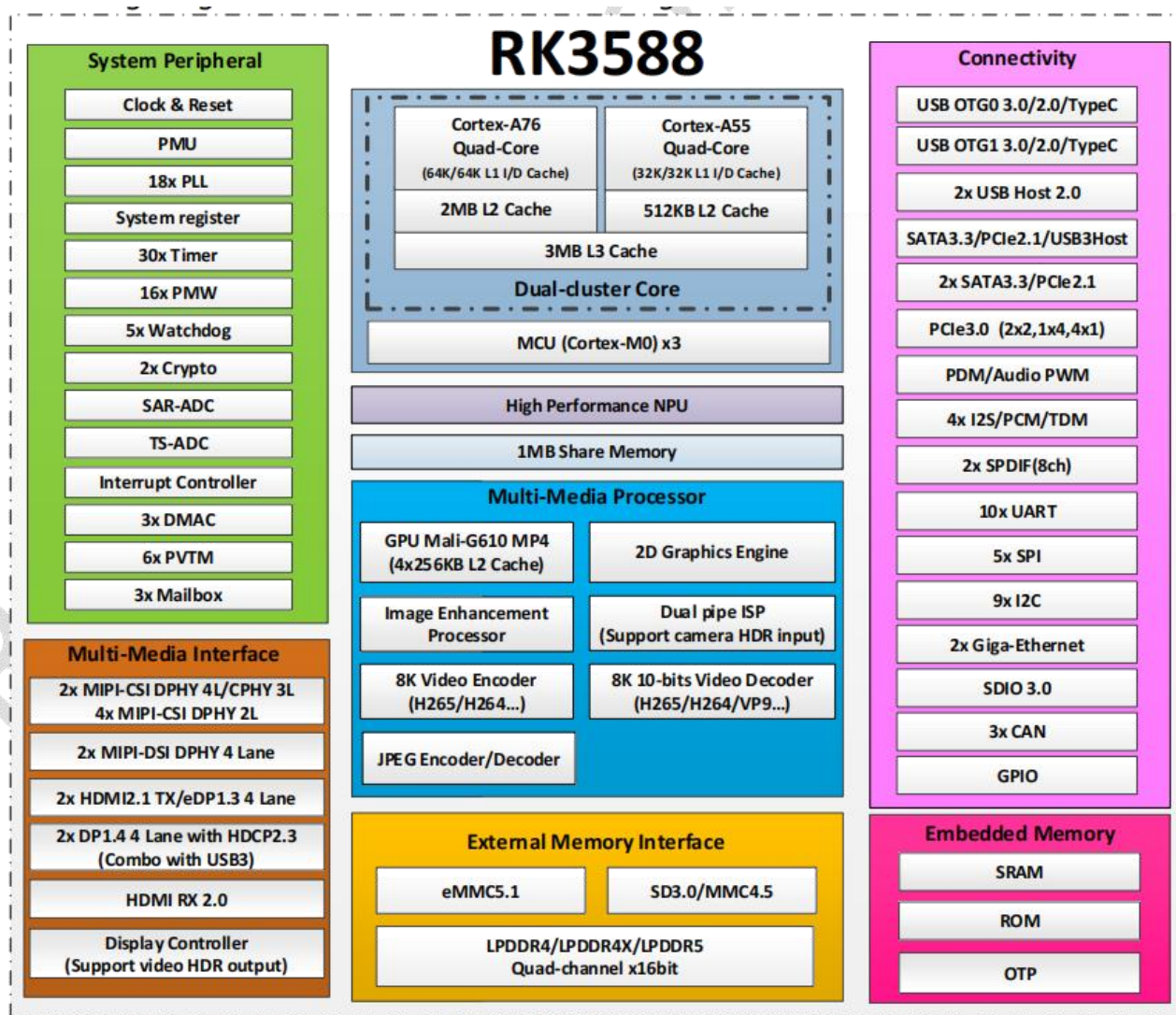
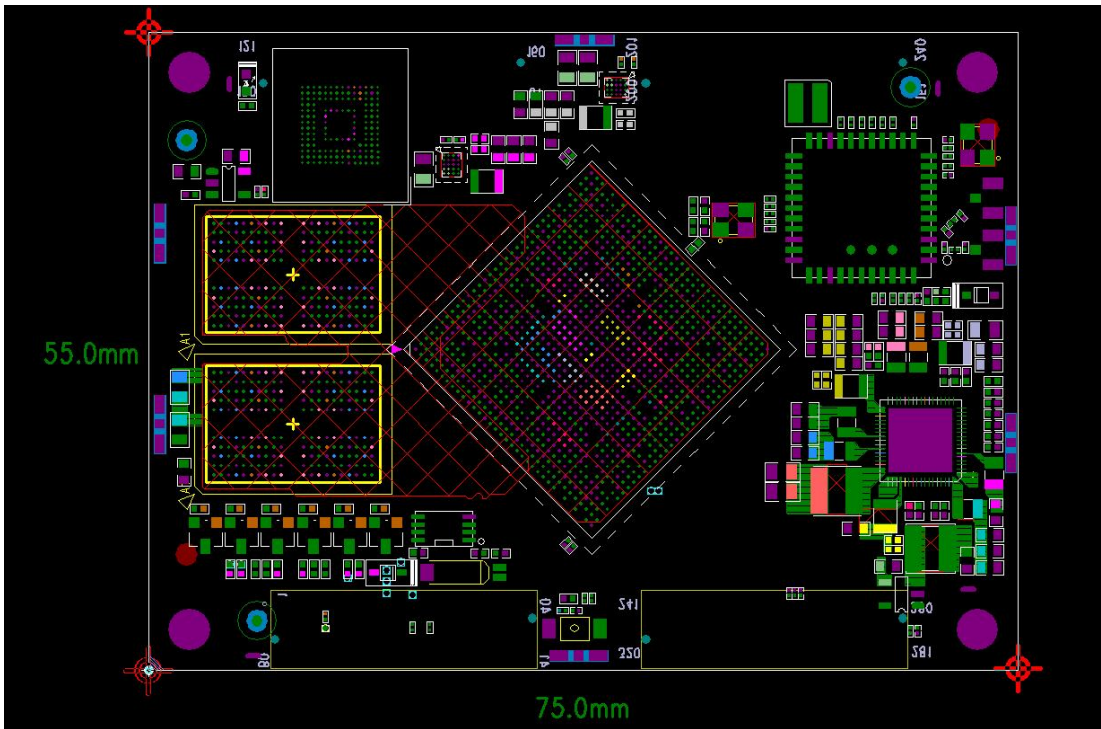


Fig.1-1 Block Diagram

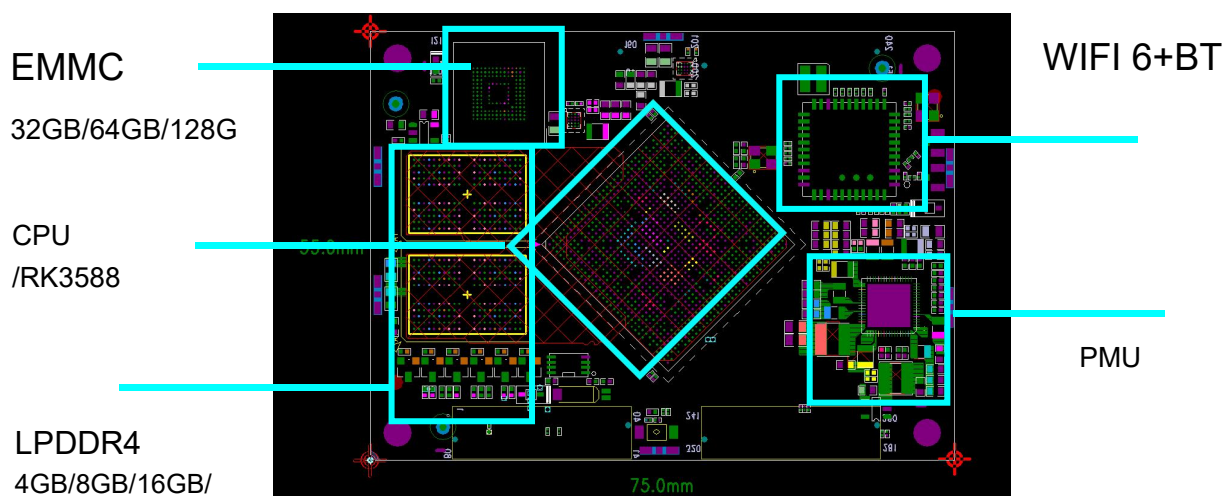
2. Specifications

Parameters	
Master chip	Rockchip RK3588
Processor	Quad core Cortex-A76 + Quad-core Cortex-A55, up to 2.6Ghz
Graphics processor	ARM Mali G610 OpenGL ES3.2/OpenCL2.2/Vulkan1.1 450 GFLOPS
NPU	Hashrate up to 6.0 Tops, integrated high-performance AI accelerator RKNN NPU Support Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/ Darknet/ MXNet mainstream architecture model one-click conversion
Video processor	Support 8K@60fps H.265 / H.264 / VP9 decoder Support 8K@30fps H.265 / H.264 encoder Support 8M ISP
RAM	4GB/ 8GB/16GB LPDDR4X Support DDR3/DDR3L/LPDDR3/DDR4/LPDDR4/LPDDR4X
Storage	Support 16GB/32GB/64GB/128GB eMMC 5.1 Support M.2 PCIe 3.0 × 1 Support SATA 3.0 × 1 (extend 2.5 inch SSD/HDD) Support SD card x1 (extended SD/TF card)
Hardware features	
Ethernet	Support dual Gigabit Ethernet (1000Mbps)
Wireless Network	Support M.2 extended 5G Support Mini PCIe to expand 4G LTE Support WiFi6 (802.11 ax) onboard Support BT5.0+
Display	Support multi-screen different display, up to three-screen different display output 1 × HDMI2.1, support 8K@60fps 2 × DP1.4, support 8K@60fps 2 × MIPI-DSI 2 × MIPI-CSI 1 × HDMI RX2.0
Audio	4×I2S 2xSPIF
USB	1 × USB 3.0 OTG 1 × USB 3.0 Host 2 × USB 2.0 Host
Webcam	4 × MIPI CSI camera input

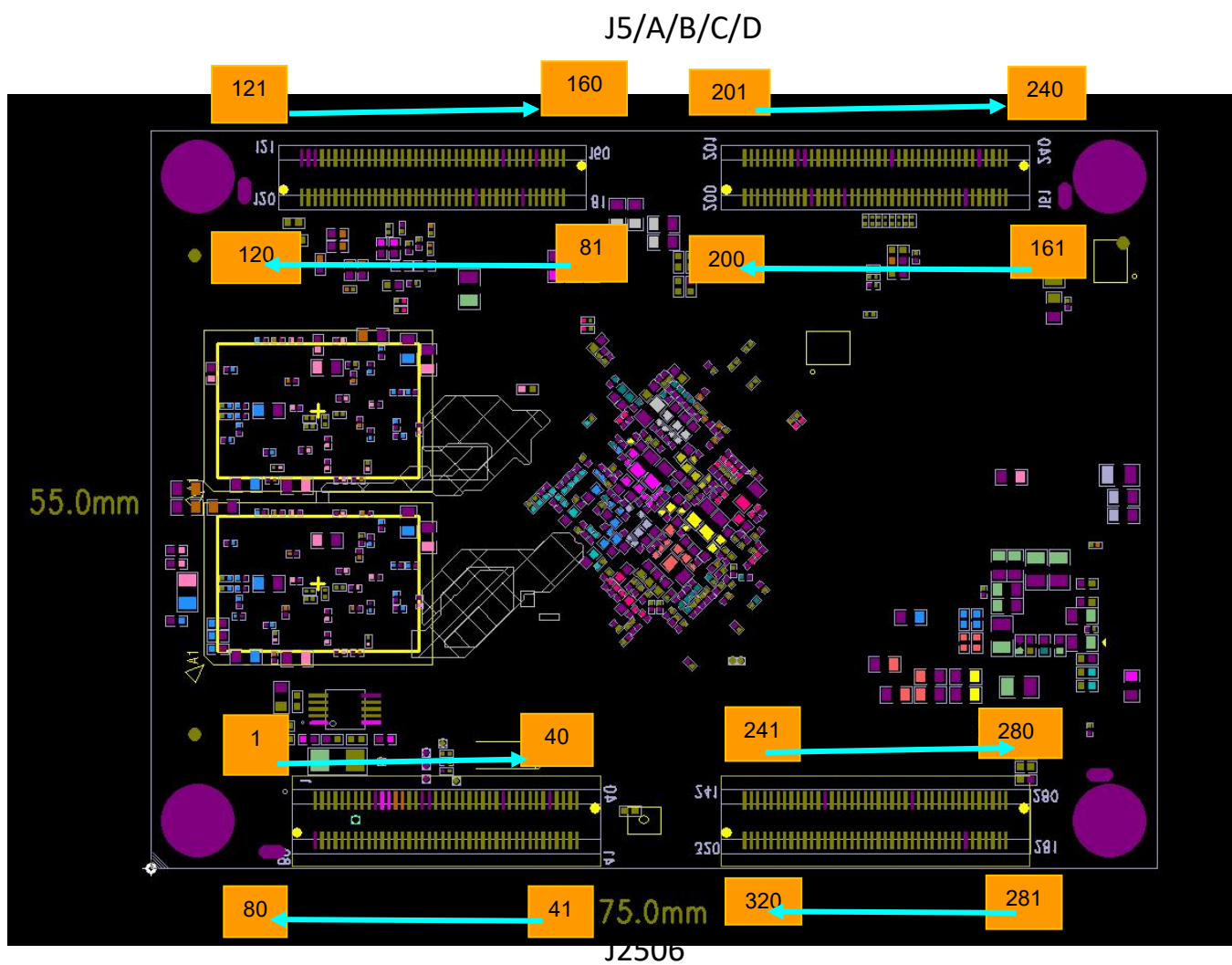
Extension ports	Multiple UART, I2C, I2S, SDMMC, GPIO TDM PDM CAN
System Software	
OS	Android 、 Linux
Appearance pecifications	
Size	
Exterior	BTB carrier Header: AXK5F80537YG/AXK6F80337YG *4
Core board size	55mm*75mm*8mm(BTB H3.0mm)
Pin pitch	0.5mm
Number of pins	320 PIN (4*80)
Power Supply	4V/8A
Temperature	Operating Temperature : 5°C ~ 65°C Storage Temperature: -40°C~85°C Storage Humidity :10% ~ 80 %
PCB specifications	12-layer board design

3. Interface Definition

The M88 core board leads to all the pins of the chip, and the performance of data transmission and expansion is maximized. The pins of the immersion gold process are corrosion-resistant, firm and reliable.



Picture 3-1 Top



Picture3-2 buttom

Notes1: 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 = low level, H = high level, AI=analog input, AO=analog output, AI/O=analog input/output

J5-A

PIN	Core board pin definition	Pad type	IO Pull	IO Power domain	Pin Number	Pin Name
1	UART2_TX_DEBUG_3V3	I				UART2_TX_DEBUG_3V3
2	UART2_RX_DEBUG_3V3	I				UART2_RX_DEBUG_3V3
3	SDMMC_DET_L	G				SDMMC_DET_L
4	VCC_3V3_S3	O				I2C2_SCL_M0/CAN0_TX_M0_3V3
5	VCC_3V3_S3	O				I2C2_SDA_M0/CAN0_RX_M0_3V3
6	VCC_1V8_S3	O				HDMIIRX_HPDPDOUT_H
7	VCC_1V8_S3	O				HDMITX1_HPDPIN_M0
8	VCC4V0_SYSIN	O				I2C6_SDA_3V3
9	VCC4V0_SYSIN	O				I2C6_SCL_3V3
10	VCC4V0_SYSIN	O				GND
11	VCC4V0_SYSIN	O				VCC_3V3_S3
12	VCC4V0_SYSIN	O				VCC_3V3_S3
13	VCC4V0_SYSIN	O				VCC_1V8_S3
14	GND	G				VCC_1V8_S3
15	GND	O				VCC4V0_SYSIN
16	GND	O				VCC4V0_SYS
17	GND	O				GND
18	GND	O				GND
19	LCD_RST_H	O				LCD_RST_H
20	TYPEC0_USB20_OTG_ID	O				TYPEC0_USB20_OTG_ID
21	TYPEC0_USB20_VBUSDET	O				TYPEC0_USB20_VBUSDET
22	RK860_PWRON_L	O				RK860_PWRON_L
23	SDMMC0_CLK	O				SDMMC0_CLK
24	SDMMC0_CMD	O				SDMMC0_CMD
25	SDMMC0_D3	G				SDMMC0_D3
26	SDMMC0_D2	I/O	UP			SDMMC0_D2
27	SDMMC0_D1	I				SDMMC0_D1
28	SDMMC0_D0	I/O	UP			SDMMC0_D0

29	GND	I/O	UP			GND
30	HDMI_RX_D0N	I/O	DOWN			HDMI_RX_D0N
31	HDMI_RX_D0P	I/O	DOWN			HDMI_RX_D0P
32	HDMI_RX_CLKN	I/O	DOWN			HDMI_RX_CLKN
33	HDMI_RX_CLKP	I/O	DOWN			HDMI_RX_CLKP
34	HDMI_RX_D2N	I/O	DOWN			HDMI_RX_D2N
35	HDMI_RX_D2P	I/O	DOWN			HDMI_RX_D2P
36	GND	I/O	DOWN			GND
37	HDMI0_TX0N_PORT/EDP0_TX_D0N	I/O	DOWN			HDMI0_TX0N_PORT/EDP0_TX_D0N
38	HDMI0_TX0P_PORT/EDP0_TX_D0P	I/O	DOWN			HDMI0_TX0P_PORT/EDP0_TX_D0P
39	HDMI0_TX1N_PORT/EDP0_TX_D1N	I/O	DOWN			HDMI0_TX1N_PORT/EDP0_TX_D1N
40	HDMI0_TX1P_PORT/EDP0_TX_D1P	G				HDMI0_TX1P_PORT/EDP0_TX_D1P
41	HDMI0_TX2P_PORT/EDP0_TX_D2P	I/O	DOWN			HDMI0_TX2P_PORT/EDP0_TX_D2P
42	HDMI0_TX2N_PORT/EDP0_TX_D2N	I/O	DOWN			HDMI0_TX2N_PORT/EDP0_TX_D2N
43	HDMI0_TX3P_PORT/EDP0_TX_D3P	I/O	DOWN			HDMI0_TX3P_PORT/EDP0_TX_D3P
44	HDMI0_TX3N_PORT/EDP0_TX_D3N	I/O	DOWN			HDMI0_TX3N_PORT/EDP0_TX_D3N
45	HDMI0_TX_SBDP/EDP0_TX_AUXP	I/O	DOWN			HDMI0_TX_SBDP/EDP0_TX_AUXP
46	HDMI0_TX_SBDN/EDP0_TX_AUXN	I/O	DOWN			HDMI0_TX_SBDN/EDP0_TX_AUXN
47	HDMI_RX_D1P	I/O	DOWN			HDMI_RX_D1P
48	HDMI_RX_D1N	I/O	DOWN			HDMI_RX_D1N
49	HDMI_RX_SDA_M1	I/O	DOWN			HDMI_RX_SDA_M1
50	HDMI_RX_SCL_M1	I/O	DOWN			HDMI_RX_SCL_M1
51	PMIC_EXT_EN_OUT/HDMI_RX_CEC	I/O	DOWN			PMIC_EXT_EN_OUT/HDMI_RX_CEC
52	HDMITX1_SCL_M1	I/O	DOWN			HDMITX1_SCL_M1
53	HDMITX1_SDA_M1	I/O	DOWN			HDMITX1_SDA_M1
54	I2C5_SDA_M0_MIP1	I/O	DOWN			I2C5_SDA_M0_MIP1
55	I2C5_SCL_M0_MIP1	I/O	DOWN			I2C5_SCL_M0_MIP1
56	HDMITX0_SDA_M0	I/O	DOWN			HDMITX0_SDA_M0

57	HDMI1_TX_ON_H	I/O	DOWN			HDMI1_TX_ON_H
58	HDMI0_TX_ON_H	I/O	DOWN			HDMI0_TX_ON_H
59	HDMITX0_CEC_M0	I/O	DOWN			HDMITX0_CEC_M0
60	HDMITX1_CEC_M2	I/O	DOWN			HDMITX1_CEC_M2
61	HDMITX0_SCL_M0	O				HDMITX0_SCL_M0
62	PCIE30X4_PERSTN_M1_L	O				PCIE30X4_PERSTN_M1_L
63	PCIE30X4_PRSTN_L	G				PCIE30X4_PRSTN_L
64	PCIE30X4_CLKREQN_M1_L	O				PCIE30X4_CLKREQN_M1_L
65	PCIE30X4_WAKEN_M1_L	O				PCIE30X4_WAKEN_M1_L
66	PCIEX1_0_WAKEN_M1_L	O				PCIEX1_0_WAKEN_M1_L
67	PCIEX1_0_PERSTN_M1_L	O				PCIEX1_0_PERSTN_M1_L
68	PCIEX1_0_CLKREQN_M1_L	O				PCIEX1_0_CLKREQN_M1_L
69	PCIEX1_1_CLKREQN_M1_L	O				PCIEX1_1_CLKREQN_M1_L
70	PCIEX1_1_WAKEN_M1_L	O				PCIEX1_1_WAKEN_M1_L
71	PCIEX1_1_PERSTN_M1_L	O				PCIEX1_1_PERSTN_M1_L
72	GSSENSOR_INT_L	O				GSSENSOR_INT_L
73	LCD_BL_EN_H	O				LCD_BL_EN_H
74	RESET_L	G				RESET_L
75	I2C3_SCL_M0_MIPI	I				I2C3_SCL_M0_MIPI
76	I2C3_SDA_M0_MIPI	I				I2C3_SDA_M0_MIPI
77	I2C7_SDA_M0_CODEEC	I				I2C7_SDA_M0_CODEEC
78	I2C7_SCL_M0_CODEEC	I				I2C7_SCL_M0_CODEEC
79	WIFI_WAKE_HOST_H	I				WIFI_WAKE_HOST_H
80	GND	I				GND

J5-B

PIN	Core board pin definition	Pad type	IO Pull	IO Power domain	Pin Number	Pin Name
81	PCIE30_PORT1_TX2P	I				PCIE30_PORT1_TX2P
82	PCIE30_PORT1_TX2N	I				PCIE30_PORT1_TX2N
83	PCIE30_PORT1_TX3P	G				PCIE30_PORT1_TX3P
84	PCIE30_PORT1_TX3N	O				PCIE30_PORT1_TX3N
85	PCIE30_PORT1_REFCLKN_IN	O				PCIE30_PORT1_REFCLKN_IN
86	PCIE30_PORT1_REFCLKP_IN	O				PCIE30_PORT1_REFCLKP_IN
87	GND	O				GND
88	PCIE30_PORT0_TX1N	O				PCIE30_PORT0_TX1N
89	PCIE30_PORT0_TX1P	O				PCIE30_PORT0_TX1P
90	PCIE30_PORT0_TX0N	O				PCIE30_PORT0_TX0N

91	PCIE30_PORT0_TX0P	O			PCIE30_PORT0_TX0P
92	PCIE30_PORT0_REFCLK_IN	O			PCIE30_PORT0_REFCLK_IN
93	PCIE30_PORT0_REFCLKP_IN	O			PCIE30_PORT0_REFCLKP_IN
94	GND	G			GND
95	MIPI_CAM4_CLKOUT	O			MIPI_CAM4_CLKOUT
96	MIPI_CAM3_CLKOUT	O			MIPI_CAM3_CLKOUT
97	MIPI_CAM2_CLKOUT	O			MIPI_CAM2_CLKOUT
98	MIPI_CAM1_CLKOUT	O			MIPI_CAM1_CLKOUT
99	MIPI_CAM2_PDN_L	O			MIPI_CAM2_PDN_L
100	MIPI_CAM3_PDN_L	O			MIPI_CAM3_PDN_L
101	MIPI_CAM4_PWREN_H	O			MIPI_CAM4_PWREN_H
102	MIPI_CAM3_PWREN_H	O			MIPI_CAM3_PWREN_H
103	HDMITX0_HPDIN_M0	O			HDMITX0_HPDIN_M0
104	HDMIIRX_DET_L	O			HDMIIRX_DET_L
105	UART7_TX_M2	G			UART7_TX_M2
106	UART7_RX_M2	I/O	UP		UART7_RX_M2
107	I2C2_SCL_M0/CAN0_TX_M0_3V3	I			I2C2_SCL_M0/CAN0_TX_M0_3V3
108	I2C2_SDA_M0/CAN0_RX_M0_3V3	I/O	UP		I2C2_SDA_M0/CAN0_RX_M0_3V3
109	HDMIIRX_HPDOOUT_H	I/O	UP		HDMIIRX_HPDOOUT_H
110	HDMITX1_HPDIN_M0	I/O	DOWN		HDMITX1_HPDIN_M0
111	I2C6_SDA_3V3	I/O	DOWN		I2C6_SDA_3V3
112	I2C6_SCL_3V3	I/O	DOWN		I2C6_SCL_3V3
113	TYPEC5V_PWREN_H	I/O	DOWN		TYPEC5V_PWREN_H
114	DP1_HPDIN_M0	I/O	DOWN		DP1_HPDIN_M0
115	UART9_CTSN_M0_BT	I/O	DOWN		UART9_CTSN_M0_BT
116	PWM15_M2	I/O	DOWN		PWM15_M2
117	UART9_RTSN_M0_BT	I/O	DOWN		UART9_RTSN_M0_BT
118	HP_DET_L	I/O	DOWN		HP_DET_L
119	DC_IN/32KOUT_WIFI	I/O	DOWN		DC_IN/32KOUT_WIFI
120	VCC_RTC	G			VCC_RTC
121	GND	I/O	DOWN		GND
122	GND	I/O	DOWN		GND
123	GND	I/O	DOWN		GND
124	TP_RST_L	I/O	DOWN		TP_RST_L
125	TP_INT_L	I/O	DOWN		TP_INT_L
126	HOST_WAKE_BT_H	I/O	DOWN		HOST_WAKE_BT_H
127	BT_WAKE_HOST_H	I/O	DOWN		BT_WAKE_HOST_H

128	I2C4_SDA_M1_SENSOR	I/O	DOWN			I2C4_SDA_M1_SENSOR
129	I2C4_SCL_M1_SENSOR	I/O	DOWN			I2C4_SCL_M1_SENSOR
130	PCIE_PWREN_H	I/O	DOWN			PCIE_PWREN_H
131	CC_INT_L	I/O	DOWN			CC_INT_L
132	WIFI_REG_ON_H	I/O	DOWN			WIFI_REG_ON_H
133	HOST_WAKE_WL	I/O	DOWN			HOST_WAKE_WL
134	BT_REG_ON_H	I/O	DOWN			BT_REG_ON_H
135	I2S0_SCLK_TX	I/O	DOWN			I2S0_SCLK_TX
136	I2S0_MCLK	I/O	DOWN			I2S0_MCLK
137	I2S0_LRCK_TX	I/O	DOWN			I2S0_LRCK_TX
138	I2S0_SDO0	I/O	DOWN			I2S0_SDO0
139	I2S0_SDI0	I/O	DOWN			I2S0_SDI0
140	MIPI_CAM4_PDN_L	I/O	DOWN			MIPI_CAM4_PDN_L
141	MIPI_CAM1/2_RESET_L	O				MIPI_CAM1/2_RESET_L
142	MIPI_CAM3/4_RESET_L	O				MIPI_CAM3/4_RESET_L
143	MIPI_CAM1_PDN_L	G				MIPI_CAM1_PDN_L
144	MIPI_CAM2_PWREN_H	O				MIPI_CAM2_PWREN_H
145	MIPI_CAM1_PWREN_H	O				MIPI_CAM1_PWREN_H
146	UART9_TX_M0_BT	O				UART9_TX_M0_BT
147	UART9_RX_M0_BT	O				UART9_RX_M0_BT
148	GPIO3_B2_3V3	O				GPIO3_B2_3V3
149	UART6_RX_M1	O				UART6_RX_M1
150	UART6_TX_M1	O				UART6_TX_M1
151	GND	O				GND
152	PCIE30_PORT0_RX0P	O				PCIE30_PORT0_RX0P
153	PCIE30_PORT0_RX0N	O				PCIE30_PORT0_RX0N
154	PCIE30_PORT0_RX1P	G				PCIE30_PORT0_RX1P
155	PCIE30_PORT0_RX1N	I				PCIE30_PORT0_RX1N
156	GND	I				GND
157	PCIE30_PORT1_RX3N	I				PCIE30_PORT1_RX3N
158	PCIE30_PORT1_RX3P	I				PCIE30_PORT1_RX3P
159	PCIE30_PORT1_RX2N	I				PCIE30_PORT1_RX2N
160	PCIE30_PORT1_RX2P	I				PCIE30_PORT1_RX2P
161	MIPI_DPHY0_RX_CLKN	I				MIPI_DPHY0_RX_CLKN
162	MIPI_DPHY0_RX_CLKP	I				MIPI_DPHY0_RX_CLKP
163	MIPI_DPHY0_RX_D2N	G				MIPI_DPHY0_RX_D2N
164	MIPI_DPHY0_RX_D2P	O				MIPI_DPHY0_RX_D2P
165	MIPI_DPHY0_RX_D3N	O				MIPI_DPHY0_RX_D3N
166	MIPI_DPHY0_RX_D3P	O				MIPI_DPHY0_RX_D3P

167	GND	O			GND
168	ETH1_REFCLKO_25M	O			ETH1_REFCLKO_25M
169	GMAC1_RXCLK	O			GMAC1_RXCLK
170	GMAC1_RXDV_CRS	O			GMAC1_RXDV_CRS
171	GMAC1_RXD0	O			GMAC1_RXD0
172	GMAC1_RXD1	O			GMAC1_RXD1
173	GMAC1_RXD2	O			GMAC1_RXD2
174	GMAC1_RXD3	G			GMAC1_RXD3
175	GMAC1_MCLKINOUT	O			GMAC1_MCLKINOUT
176	GMAC1_TXCLK	O			GMAC1_TXCLK
177	GMAC1_TXEN	O			GMAC1_TXEN
178	GMAC1_TXD0	O			GMAC1_TXD0
179	GMAC1_TXD1	O			GMAC1_TXD1
180	GMAC1_TXD2	O			GMAC1_TXD2
181	GMAC1_TXD3	O			GMAC1_TXD3
182	GMAC1_MDIO	O			GMAC1_MDIO
183	GMAC1_MDC	O			GMAC1_MDC
184	GMAC1_RSTN_L	O			GMAC1_RSTN_L
185	GND	G			GND
186	I2S2_LRCK_M0_BT	I/O	UP		I2S2_LRCK_M0_BT
187	I2S2_SCLK_M0_BT	I			I2S2_SCLK_M0_BT
188	I2S2_SDI_M0_BT	I/O	UP		I2S2_SDI_M0_BT
189	I2S2_SDO_M0_BT	I/O	UP		I2S2_SDO_M0_BT
190	GND	I/O	DOWN		GND
191	PCIE20_0_REFCLKP	I/O	DOWN		PCIE20_0_REFCLKP
192	PCIE20_0_REFCLKN	I/O	DOWN		PCIE20_0_REFCLKN
193	PCIE20_1_RXP/SATA30_1_RXP	I/O	DOWN		PCIE20_1_RXP/SATA30_1_RXP
194	PCIE20_1_RXN/SATA30_1_RXN	I/O	DOWN		PCIE20_1_RXN/SATA30_1_RXN
195	PCIE20_2_RXP/SATA30_2_RXP	I/O	DOWN		PCIE20_2_RXP/SATA30_2_RXP
196	PCIE20_2_RXN/SATA30_2_RXN	I/O	DOWN		PCIE20_2_RXN/SATA30_2_RXN
197	PCIE20_2_TXP/SATA30_2_TXP	I/O	DOWN		PCIE20_2_TXP/SATA30_2_TXP
198	PCIE20_2_TXN/SATA30_2_TXN	I/O	DOWN		PCIE20_2_TXN/SATA30_2_TXN
199	PCIE20_2_REFCLKP	I/O	DOWN		PCIE20_2_REFCLKP
200	PCIE20_2_REFCLKN	G			PCIE20_2_REFCLKN
161	MIPI_DPHY0_RX_CLKN	I/O	DOWN		MIPI_DPHY0_RX_CLKN
162	MIPI_DPHY0_RX_CLKP	I/O	DOWN		MIPI_DPHY0_RX_CLKP
163	MIPI_DPHY0_RX_D2N	I/O	DOWN		MIPI_DPHY0_RX_D2N
164	MIPI_DPHY0_RX_D2P	I/O	DOWN		MIPI_DPHY0_RX_D2P

165	MIPI_DPHY0_RX_D3N	I/O	DOWN		MIPI_DPHY0_RX_D3N
166	MIPI_DPHY0_RX_D3P	I/O	DOWN		MIPI_DPHY0_RX_D3P
167	GND	I/O	DOWN		GND
168	ETH1_REFCLKO_25M	I/O	DOWN		ETH1_REFCLKO_25M
169	GMAC1_RXCLK	I/O	DOWN		GMAC1_RXCLK
170	GMAC1_RXDV_CRS	I/O	DOWN		GMAC1_RXDV_CRS
171	GMAC1_RXD0	I/O	DOWN		GMAC1_RXD0
172	GMAC1_RXD1	I/O	DOWN		GMAC1_RXD1
173	GMAC1_RXD2	I/O	DOWN		GMAC1_RXD2
174	GMAC1_RXD3	I/O	DOWN		GMAC1_RXD3
175	GMAC1_MCLKINOUT	I/O	DOWN		GMAC1_TXCLK
176	GMAC1_TXCLK	I/O	DOWN		GMAC1_TXEN
177	GMAC1_TXEN	I/O	DOWN		GMAC1_TXD0
178	GMAC1_TXD0	I/O	DOWN		GMAC1_TXD1
179	GMAC1_TXD1	I/O	DOWN		GMAC1_TXD2
180	GMAC1_TXD2	I/O	DOWN		GMAC1_TXD3
181	GMAC1_TXD3	O			GMAC1_MDIO
182	GMAC1_MDIO	O			GMAC1_MDC
183	GMAC1_MDC	G			GMAC1_RSTN_L
184	GMAC1_RSTN_L	O			GND
185	GND	O			I2S2_LRCK_M0_BT
186	I2S2_LRCK_M0_BT	O			I2S2_SCLK_M0_BT
187	I2S2_SCLK_M0_BT	O			I2S2_SDI_M0_BT
188	I2S2_SDI_M0_BT	O			I2S2_SDO_M0_BT
189	I2S2_SDO_M0_BT	O			GND
190	GND	O			PCIE20_0_REFCLKP
191	PCIE20_0_REFCLKP	O			PCIE20_0_REFCLKN
192	PCIE20_0_REFCLKN	O			PCIE20_1_RXP/SATA30_1_RXP
193	PCIE20_1_RXP/SATA30_1_RXP	O			PCIE20_1_RXN/SATA30_1_RXN
194	PCIE20_1_RXN/SATA30_1_RXN	G			PCIE20_2_RXP/SATA30_2_RXP
195	PCIE20_2_RXP/SATA30_2_RXP	I			PCIE20_2_RXN/SATA30_2_RXN
196	PCIE20_2_RXN/SATA30_2_RXN	I			PCIE20_2_TXP/SATA30_2_TXP
197	PCIE20_2_TXP/SATA30_2_TXP	I			PCIE20_2_TXN/SATA30_2_TXN
198	PCIE20_2_TXN/SATA30_2_TXN	I			PCIE20_2_REFCLKP
199	PCIE20_2_REFCLKP	I			PCIE20_2_REFCLKN
200	PCIE20_2_REFCLKN	I			GMAC1_MCLKINOUT

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PIN	Core board pin definition	Pad type	IO Pull	IO Power domain	Pin Number	Pin Name
201	PCIE20_1_REFCLKN	I				PCIE20_1_REFCLKN
202	PCIE20_1_REFCLKP	I				PCIE20_1_REFCLKP
203	PCIE20_1_TXN/SATA30_1_TXN	G				PCIE20_1_TXN/SATA30_1_TXN
204	PCIE20_1_TXP/SATA30_1_TXP	O				PCIE20_1_TXP/SATA30_1_TXP
205	SATA30_0_TXP	O				SATA30_0_TXP
206	SATA30_0_TXN	O				SATA30_0_TXN
207	SATA30_0_RXN	O				SATA30_0_RXN
208	SATA30_0_RXP	O				SATA30_0_RXP
209	GND	O				GND
210	GND	O				GND
211	MIPI_CSI1_RX_D0P	O				MIPI_CSI1_RX_D0P
212	MIPI_CSI1_RX_D0N	O				MIPI_CSI1_RX_D0N
213	MIPI_CSI1_RX_D1P	O				MIPI_CSI1_RX_D1P
214	MIPI_CSI1_RX_D1N	G				MIPI_CSI1_RX_D1N
215	MIPI_CSI1_RX_CLK0P	O				MIPI_CSI1_RX_CLK0P
216	MIPI_CSI1_RX_CLK0N	O				MIPI_CSI1_RX_CLK0N
217	MIPI_CSI1_RX_D2P	O				MIPI_CSI1_RX_D2P
218	MIPI_CSI1_RX_D2N	O				MIPI_CSI1_RX_D2N
219	MIPI_CSI1_RX_D3P	O				MIPI_CSI1_RX_D3P
220	MIPI_CSI1_RX_D3N	O				MIPI_CSI1_RX_D3N
221	MIPI_CSI1_RX_CLK1P	O				MIPI_CSI1_RX_CLK1P
222	MIPI_CSI1_RX_CLK1N	O				MIPI_CSI1_RX_CLK1N
223	GND	O				GND
224	MIPI_CSI0_RX_D0N	O				MIPI_CSI0_RX_D0N
225	MIPI_CSI0_RX_D0P	G				MIPI_CSI0_RX_D0P
226	MIPI_CSI0_RX_D1N	I/O	UP			MIPI_CSI0_RX_D1N
227	MIPI_CSI0_RX_D1P	I				MIPI_CSI0_RX_D1P
228	MIPI_CSI0_RX_CLK0N	I/O	UP			MIPI_CSI0_RX_CLK0N
229	MIPI_CSI0_RX_CLK0P	I/O	UP			MIPI_CSI0_RX_CLK0P
230	MIPI_CSI0_RX_D2N	I/O	DOWN			MIPI_CSI0_RX_D2N
231	MIPI_CSI0_RX_D2P	I/O	DOWN			MIPI_CSI0_RX_D2P
232	MIPI_CSI0_RX_D3N	I/O	DOWN			MIPI_CSI0_RX_D3N
233	MIPI_CSI0_RX_D3P	I/O	DOWN			MIPI_CSI0_RX_D3P
234	MIPI_CSI0_RX_CLK1N	I/O	DOWN			MIPI_CSI0_RX_CLK1N
235	MIPI_CSI0_RX_CLK1P	I/O	DOWN			MIPI_CSI0_RX_CLK1P

236	GND	I/O	DOWN			GND
237	MIPI_DPHY0_RX_D1P	I/O	DOWN			MIPI_DPHY0_RX_D1P
238	MIPI_DPHY0_RX_D1N	I/O	DOWN			MIPI_DPHY0_RX_D1N
239	MIPI_DPHY0_RX_D0P	I/O	DOWN			MIPI_DPHY0_RX_D0P
240	MIPI_DPHY0_RX_D0N	G				MIPI_DPHY0_RX_D0N
201	PCIE20_1_REFCLKN	I/O	DOWN			PCIE20_1_REFCLKN
202	PCIE20_1_REFCLKP	I/O	DOWN			PCIE20_1_REFCLKP
203	PCIE20_1_TXN/SATA30_1_TXN	I/O	DOWN			PCIE20_1_TXN/SATA30_1_TXN
204	PCIE20_1_TXP/SATA30_1_TXP	I/O	DOWN			PCIE20_1_TXP/SATA30_1_TXP
205	SATA30_0_TXP	I/O	DOWN			SATA30_0_TXP
206	SATA30_0_TXN	I/O	DOWN			SATA30_0_TXN
207	SATA30_0_RXN	I/O	DOWN			SATA30_0_RXN
208	SATA30_0_RXP	I/O	DOWN			SATA30_0_RXP
209	GND	I/O	DOWN			GND
210	GND	I/O	DOWN			GND
211	MIPI_CSI1_RX_D0P	I/O	DOWN			MIPI_CSI1_RX_D0P
212	MIPI_CSI1_RX_D0N	I/O	DOWN			MIPI_CSI1_RX_D0N
213	MIPI_CSI1_RX_D1P	I/O	DOWN			MIPI_CSI1_RX_D1P
214	MIPI_CSI1_RX_D1N	I/O	DOWN			MIPI_CSI1_RX_D1N
215	MIPI_CSI1_RX_CLK0P	I/O	DOWN			MIPI_CSI1_RX_CLK0P
216	MIPI_CSI1_RX_CLK0N	I/O	DOWN			MIPI_CSI1_RX_CLK0N
217	MIPI_CSI1_RX_D2P	I/O	DOWN			MIPI_CSI1_RX_D2P
218	MIPI_CSI1_RX_D2N	I/O	DOWN			MIPI_CSI1_RX_D2N
219	MIPI_CSI1_RX_D3P	I/O	DOWN			MIPI_CSI1_RX_D3P
220	MIPI_CSI1_RX_D3N	I/O	DOWN			MIPI_CSI1_RX_D3N
221	MIPI_CSI1_RX_CLK1P	O				MIPI_CSI1_RX_CLK1P
222	MIPI_CSI1_RX_CLK1N	O				MIPI_CSI1_RX_CLK1N
223	GND	G				GND
224	MIPI_CSI0_RX_D0N	O				MIPI_CSI0_RX_D0N
225	MIPI_CSI0_RX_D0P	O				MIPI_CSI0_RX_D0P
226	MIPI_CSI0_RX_D1N	O				MIPI_CSI0_RX_D1N
227	MIPI_CSI0_RX_D1P	O				MIPI_CSI0_RX_D1P
228	MIPI_CSI0_RX_CLK0N	O				MIPI_CSI0_RX_CLK0N
229	MIPI_CSI0_RX_CLK0P	O				MIPI_CSI0_RX_CLK0P
230	MIPI_CSI0_RX_D2N	O				MIPI_CSI0_RX_D2N
231	MIPI_CSI0_RX_D2P	O				MIPI_CSI0_RX_D2P
232	MIPI_CSI0_RX_D3N	O				MIPI_CSI0_RX_D3N

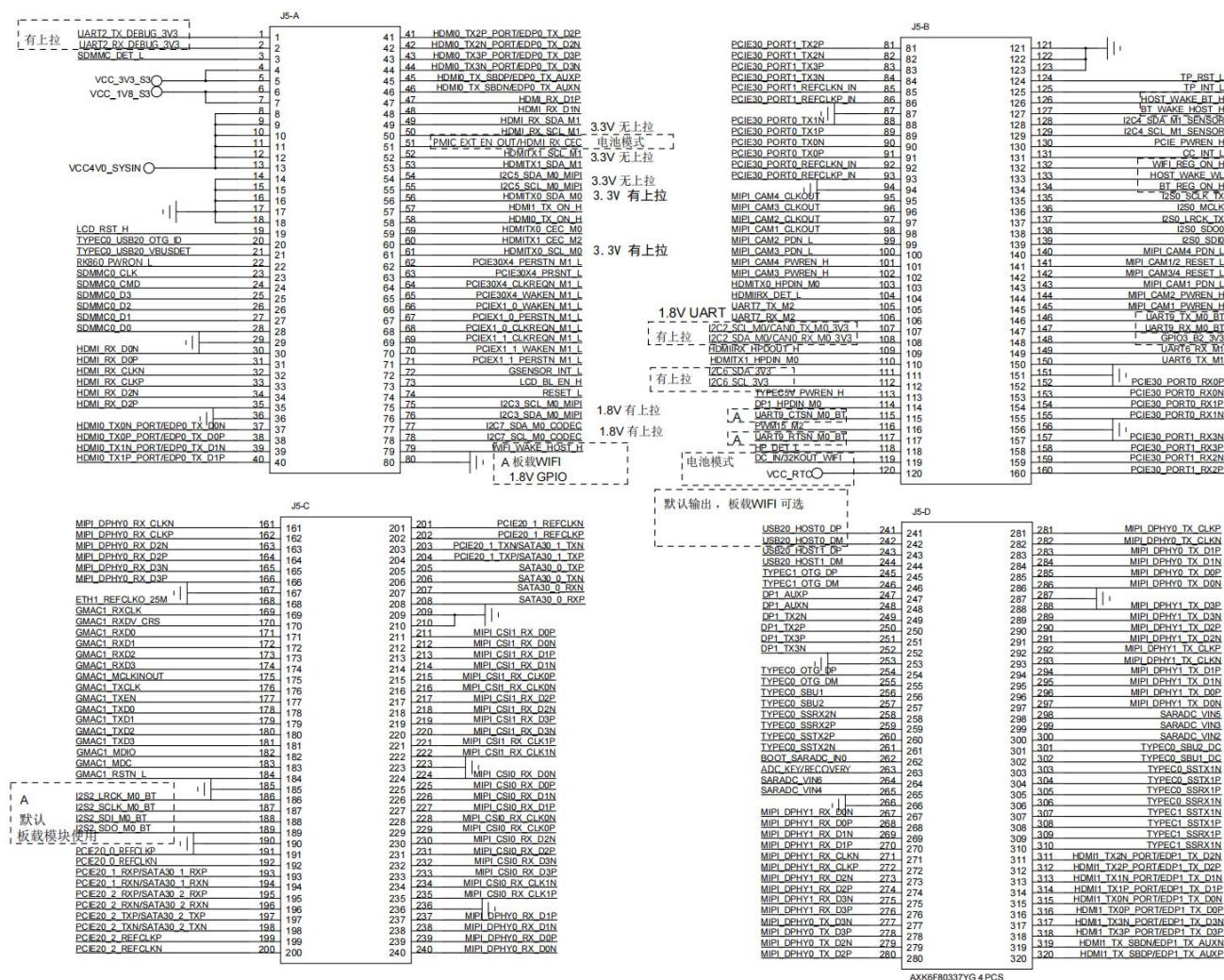
233	MIPI_CSI0_RX_D3P	O				MIPI_CSI0_RX_D3P
234	MIPI_CSI0_RX_CLK1N	G				MIPI_CSI0_RX_CLK1N
235	MIPI_CSI0_RX_CLK1P	I				MIPI_CSI0_RX_CLK1P
236	GND	I				GND
237	MIPI_DPHY0_RX_D1P	I				MIPI_DPHY0_RX_D1P
238	MIPI_DPHY0_RX_D1N	I				MIPI_DPHY0_RX_D1N
239	MIPI_DPHY0_RX_D0P	I				MIPI_DPHY0_RX_D0P
240	MIPI_DPHY0_RX_D0N	I		1.8V		MIPI_DPHY0_RX_D0N

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PIN	Core board pin definition	Pad type	IO Pull	IO Power domain	Pin Number	Pin Name
241	USB20_HOST0_DP	I				USB20_HOST0_DP
242	USB20_HOST0_DM	I				USB20_HOST0_DM
243	USB20_HOST1_DP	G				USB20_HOST1_DP
244	USB20_HOST1_DM	O				USB20_HOST1_DM
245	TYPEC1_OTG_DP	O				TYPEC1_OTG_DP
246	TYPEC1_OTG_DM	O				TYPEC1_OTG_DM
247	DP1_AUXP	O				DP1_AUXP
248	DP1_AUXN	O				DP1_AUXN
249	DP1_TX2N	O				DP1_TX2N
250	DP1_TX2P	O				DP1_TX2P
251	DP1_TX3P	O				DP1_TX3P
252	DP1_TX3N	O				DP1_TX3N
253	GND	O				GND
254	TYPEC0_OTG_DP	G				TYPEC0_OTG_DP
255	TYPEC0_OTG_DM	O				TYPEC0_OTG_DM
256	TYPEC0_SBU1	O				TYPEC0_SBU1
257	TYPEC0_SBU2	O				TYPEC0_SBU2
258	TYPEC0_SSRX2N	O				TYPEC0_SSRX2N
259	TYPEC0_SSRX2P	O				TYPEC0_SSRX2P
260	TYPEC0_SSTX2P	O				TYPEC0_SSTX2P
261	TYPEC0_SSTX2N	O				TYPEC0_SSTX2N
262	BOOT_SARADC_IN0	O				BOOT_SARADC_IN0
263	ADC_KEY/RECOVERY	O				ADC_KEY/RECOVERY
264	SARADC_VIN6	O				SARADC_VIN6
265	SARADC_VIN4	G				SARADC_VIN4

266	GND	I/O	UP		GND
267	MIPI_DPHY1_RX_D0N	I			MIPI_DPHY1_RX_D0N
268	MIPI_DPHY1_RX_D0P	I/O	UP		MIPI_DPHY1_RX_D0P
269	MIPI_DPHY1_RX_D1N	I/O	UP		MIPI_DPHY1_RX_D1N
270	MIPI_DPHY1_RX_D1P	I/O	DOWN		MIPI_DPHY1_RX_D1P
271	MIPI_DPHY1_RX_CLKN	I/O	DOWN		MIPI_DPHY1_RX_CLKN
272	MIPI_DPHY1_RX_CLKP	I/O	DOWN		MIPI_DPHY1_RX_CLKP
273	MIPI_DPHY1_RX_D2N	I/O	DOWN		MIPI_DPHY1_RX_D2N
274	MIPI_DPHY1_RX_D2P	I/O	DOWN		MIPI_DPHY1_RX_D2P
275	MIPI_DPHY1_RX_D3N	I/O	DOWN		MIPI_DPHY1_RX_D3N
276	MIPI_DPHY1_RX_D3P	I/O	DOWN		MIPI_DPHY1_RX_D3P
277	MIPI_DPHY0_TX_D3N	I/O	DOWN		MIPI_DPHY0_TX_D3N
278	MIPI_DPHY0_TX_D3P	I/O	DOWN		MIPI_DPHY0_TX_D3P
279	MIPI_DPHY0_TX_D2N	I/O	DOWN		MIPI_DPHY0_TX_D2N
280	MIPI_DPHY0_TX_D2P	G			MIPI_DPHY0_TX_D2P
281	MIPI_DPHY0_TX_CLKP	I/O	DOWN		MIPI_DPHY0_TX_CLKP
282	MIPI_DPHY0_TX_CLKN	I/O	DOWN		MIPI_DPHY0_TX_CLKN
283	MIPI_DPHY0_TX_D1P	I/O	DOWN		MIPI_DPHY0_TX_D1P
284	MIPI_DPHY0_TX_D1N	I/O	DOWN		MIPI_DPHY0_TX_D1N
285	MIPI_DPHY0_TX_D0P	I/O	DOWN		MIPI_DPHY0_TX_D0P
286	MIPI_DPHY0_TX_D0N	I/O	DOWN		MIPI_DPHY0_TX_D0N
287	GND	I/O	DOWN		GND
288	MIPI_DPHY1_TX_D3P	I/O	DOWN		MIPI_DPHY1_TX_D3P
289	MIPI_DPHY1_TX_D3N	I/O	DOWN		MIPI_DPHY1_TX_D3N
290	MIPI_DPHY1_TX_D2P	I/O	DOWN		MIPI_DPHY1_TX_D2P
291	MIPI_DPHY1_TX_D2N	I/O	DOWN		MIPI_DPHY1_TX_D2N
292	MIPI_DPHY1_TX_CLKP	I/O	DOWN		MIPI_DPHY1_TX_CLKP
293	MIPI_DPHY1_TX_CLKN	I/O	DOWN		MIPI_DPHY1_TX_CLKN
294	MIPI_DPHY1_TX_D1P	I/O	DOWN		MIPI_DPHY1_TX_D1P
295	MIPI_DPHY1_TX_D1N	I/O	DOWN		MIPI_DPHY1_TX_D1N
296	MIPI_DPHY1_TX_D0P	I/O	DOWN		MIPI_DPHY1_TX_D0P
297	MIPI_DPHY1_TX_D0N	I/O	DOWN		SARADC_VIN5
298	SARADC_VIN5	I/O	DOWN		SARADC_VIN3
299	SARADC_VIN3	I/O	DOWN		SARADC_VIN2
300	SARADC_VIN2	I/O	DOWN		TYPEC0_SBU2_DC
301	TYPEC0_SBU2_DC	O			TYPEC0_SBU1_DC

302	TYPEC0_SBU1_DC	O				TYPEC0_SSTX1N
303	TYPEC0_SSTX1N	G				TYPEC0_SSTX1P
304	TYPEC0_SSTX1P	O				TYPEC0_SSRX1P
305	TYPEC0_SSRX1P	O				TYPEC0_SSRX1N
306	TYPEC0_SSRX1N	O				TYPEC1_SSTX1N
307	TYPEC1_SSTX1N	O				TYPEC1_SSTX1P
308	TYPEC1_SSTX1P	O				TYPEC1_SSRX1P
309	TYPEC1_SSRX1P	O				TYPEC1_SSRX1N
310	TYPEC1_SSRX1N	O				HDMI1_TX2N_PORT/EDP1_TX_D2N
311	HDMI1_TX2N_PORT/EDP1_TX_D2N	O				HDMI1_TX2P_PORT/EDP1_TX_D2P
312	HDMI1_TX2P_PORT/EDP1_TX_D2P	O				HDMI1_TX1N_PORT/EDP1_TX_D1N
313	HDMI1_TX1N_PORT/EDP1_TX_D1N	O				HDMI1_TX1P_PORT/EDP1_TX_D1P
314	HDMI1_TX1P_PORT/EDP1_TX_D1P	G				HDMI1_TX0N_PORT/EDP1_TX_D0N
315	HDMI1_TX0N_PORT/EDP1_TX_D0N	I				HDMI1_TX0P_PORT/EDP1_TX_D0P
316	HDMI1_TX0P_PORT/EDP1_TX_D0P	I				HDMI1_TX3N_PORT/EDP1_TX_D3N
317	HDMI1_TX3N_PORT/EDP1_TX_D3N	I				HDMI1_TX_SBDN/EDP1_TX_AUXN
318	HDMI1_TX_SBDN/EDP1_TX_AUXN	I				HDMI1_TX3P_PORT/EDP1_TX_D3P
319	HDMI1_TX3P_PORT/EDP1_TX_D3P	I				HDMI1_TX_SBDP/EDP1_TX_AUXP
320	HDMI1_TX_SBDP/EDP1_TX_AUXP	I				MIPI_DPHY1_TX_D0N



4. system software

Types	Description
OS	Android 、 Linux
Start method	Can support TF card, EMMC, U disk boot, making the system boot more convenient and fast

5. Application



Picture 5-1 Application

Application areas		
Smart NVRs	Cloud terminals	Vehicle center consoles
Industrial control	AI Edge computing	Face recognition gates

6. Contact us

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