RK3399HX Specification

V1.12

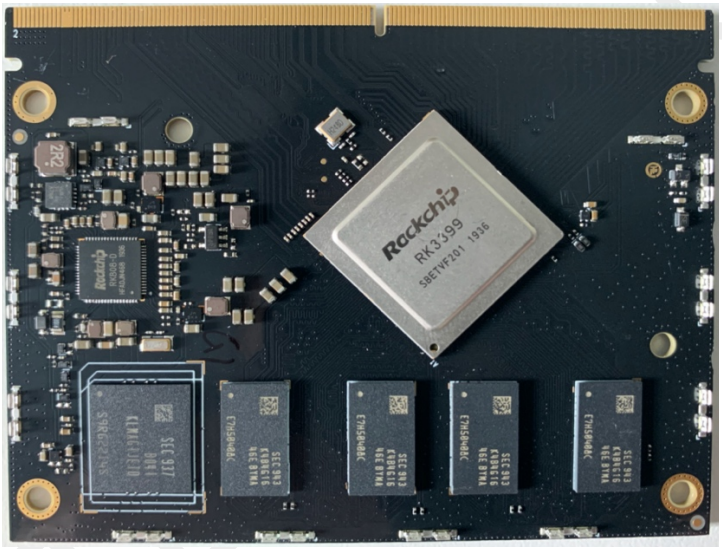
Version	Date	Remark
V1.0	2019-08-09	Initial
V1.11	2020-4-23	Update
V1.12	2020-4-28	Update Part5 –Board interface Mark

Content

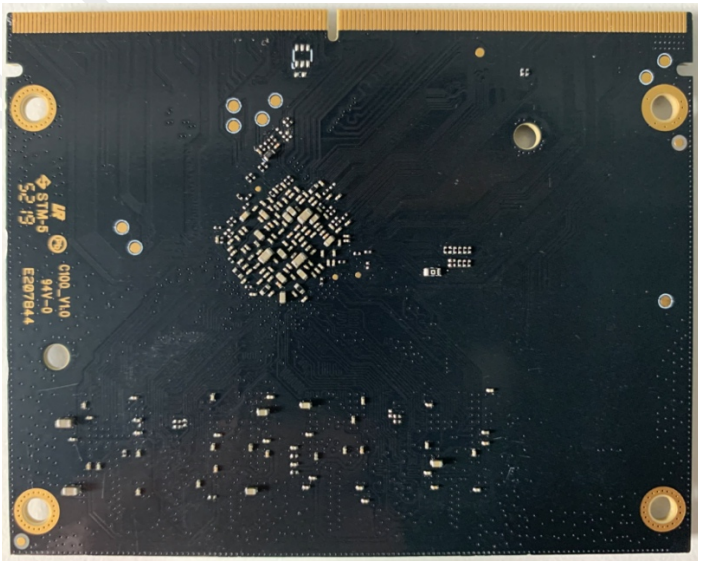
1、About Product

Rk3399HX is a well-designed core board, RK3399 six core 64 bit (a72x2 + a53x4) processor, with the 1.8GHz main frequency. Support multi-channel display: dual Mipi, HDMI, EDP, DisplayPort display interface, support dual screen & display, dual screen and separate display. It can support many network interfaces: dual band WiFi, Bluetooth 4.1, Gigabit Ethernet, mini PCIe (extended 4G communication module), with high-performance peripheral interfaces: 2 × USB3.0 interface, 1xPCIe M.2 (M-Key) interface，which can be used to extend NVMeSSD.

The core board design with 8-layer wiring technology, design size: 82mm x 63mm, the performance is stable and reliable, suitable for different application environments. With perfect system software: support Android, Linux, Ubuntu, Qilin OS and other systems, open source code is suitable for secondary development of enterprises, which can reduce the threshold of R&D and shorten the product R&D cycle.



RK3399HK Side A



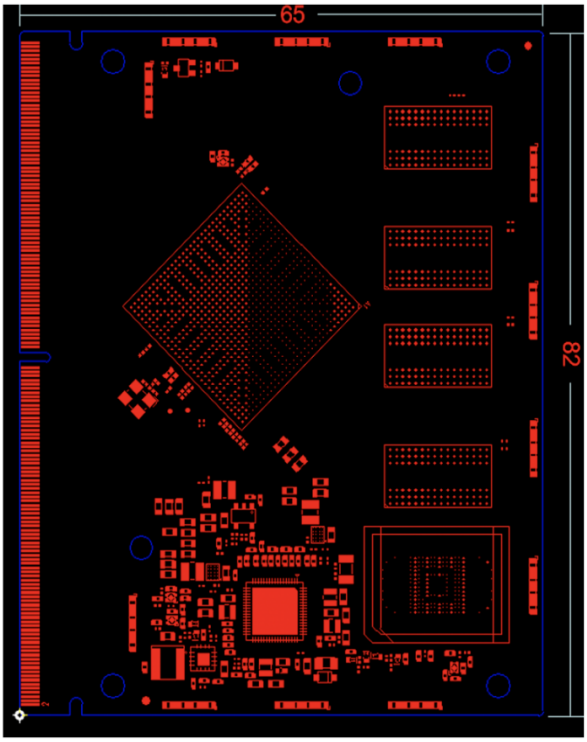
RK3399HK Side B

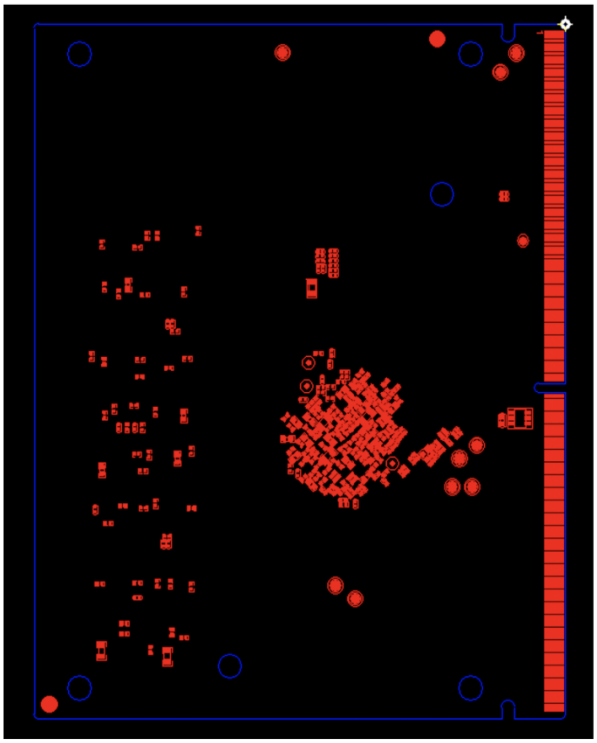
2、Specifications

General parametes	
CPU	Rockchip RK3399 (28 nm HKMG process)
Processor	ARM® 6 core 64 bit processor, with the 1.8GHz main frequency Based on big. Little large and small core architecture, dual core cortex-a72 (large core) + quad core cortex-a53 (small core)
Graphics processor	ARM® Mali-T860 MP4 Quad core GPU Support OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11 Support AFBC (Frame buffer compression)
Video processor	Support 4K VP9 and 4K 10bits H265/H264 Video decoding， 60fps 1080P Multi format video decoding (WMV, MPEG-1/2/4, VP8) 1080P video coding，support H.264，VP8 Video post processor: de-nterlacing, de-noising, edge / detail / color optimization
Power IC	RK808 PMU
RAM	2GB Dual channel 64Bit DDR3-1333MHz （1GB/2GB/4GB Option)
ROM	16GB high speed eMMC 5.1 （8GB/16GB/32GB/128GB option)
OS	Android 、Linux、Qilin OS
Hardware features	
Ethernet	Integrated GMAC Ethernet controller Support extended Realtek rtl8211e to realize 10 / 100 / 1000Mbps Ethernet
WiFi	extend the WiFi& Bluetooth module with SDIO interface Support 2.4GHz / 5GHz dual frequency WiFi，802.11a/b/g/n/ac protocol
Dispaly	Video output interface： - 1 x HDMI 2.0 , Support 4K@60HZ output & HDCP 1.4/2.2 - 1 x DP 1.2 (DisplayPort) , Support 4K@60fps Support dual screen & display, dual screen and separate display： - 1 x MIPI-DSI , Dual channel support, 2560x1600@60fps output - 1 x eDP 1.3 (4 lanes with 10.8Gbps)
Audio	1 x HDMI 2.0 & 1 x DP 1.2 (DisplayPort) , Audio output 1 x SPDIF Digital audio interface， 3 x I2S audio input/output, (I2S0/I2S2 support 8 channel input/output，I2S2 internal support HDMI/DP audio output)
Camera	1 x MIPI-CSI interface (conclude dual ISP，support 13Mpixel or dual 8Mpixel) 1 x DVP camera interface (can support 5Mpixel)
PCIe	1 x PCIe interface
USB	2 x USB2.0 Host，2 x USB3.0
Extension interface	SDMMC、I2C、I2S、SPI、UART、ADC、PWM、GPIO
Power supply	DC 5V

PCB Demension	
Demension	82mm x 63mm (thickness 1.2mm)
Interface type	MXM3.0 （ 314 PIN， 0.5mm gap ）
PCB	8-layer board design, gold deposition process

3、Spec & Demension

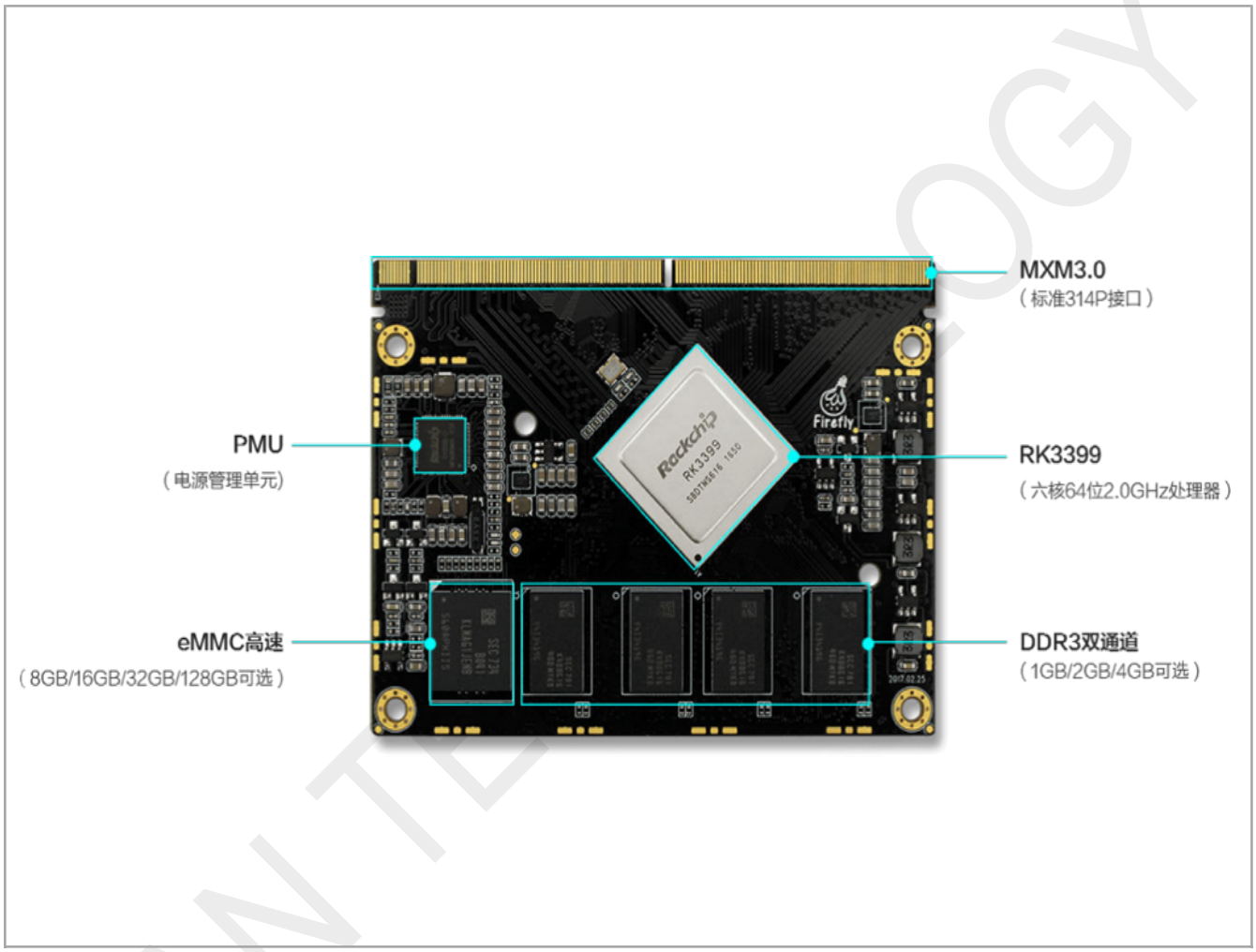




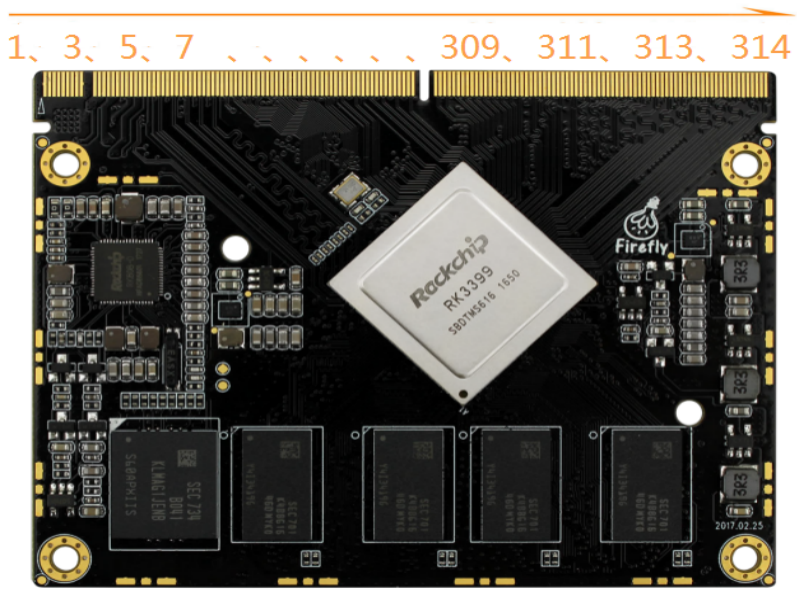
4、Interface definition

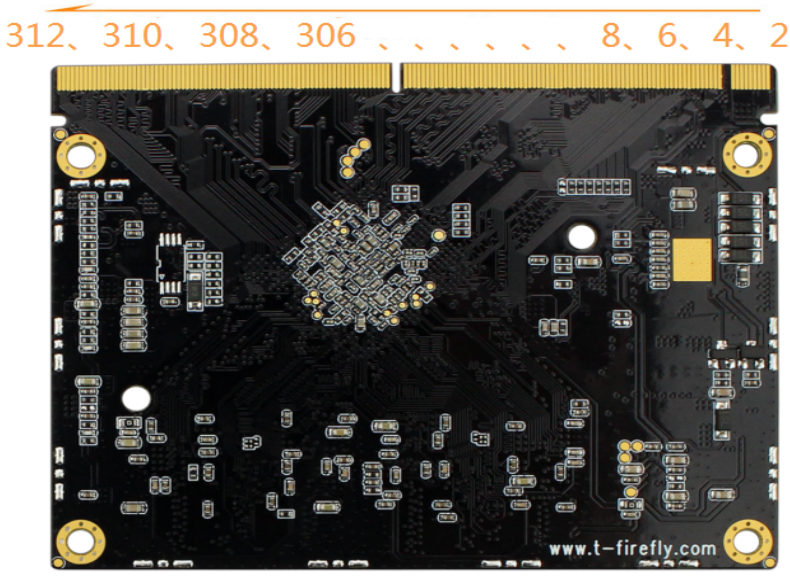
4.1、Overview：

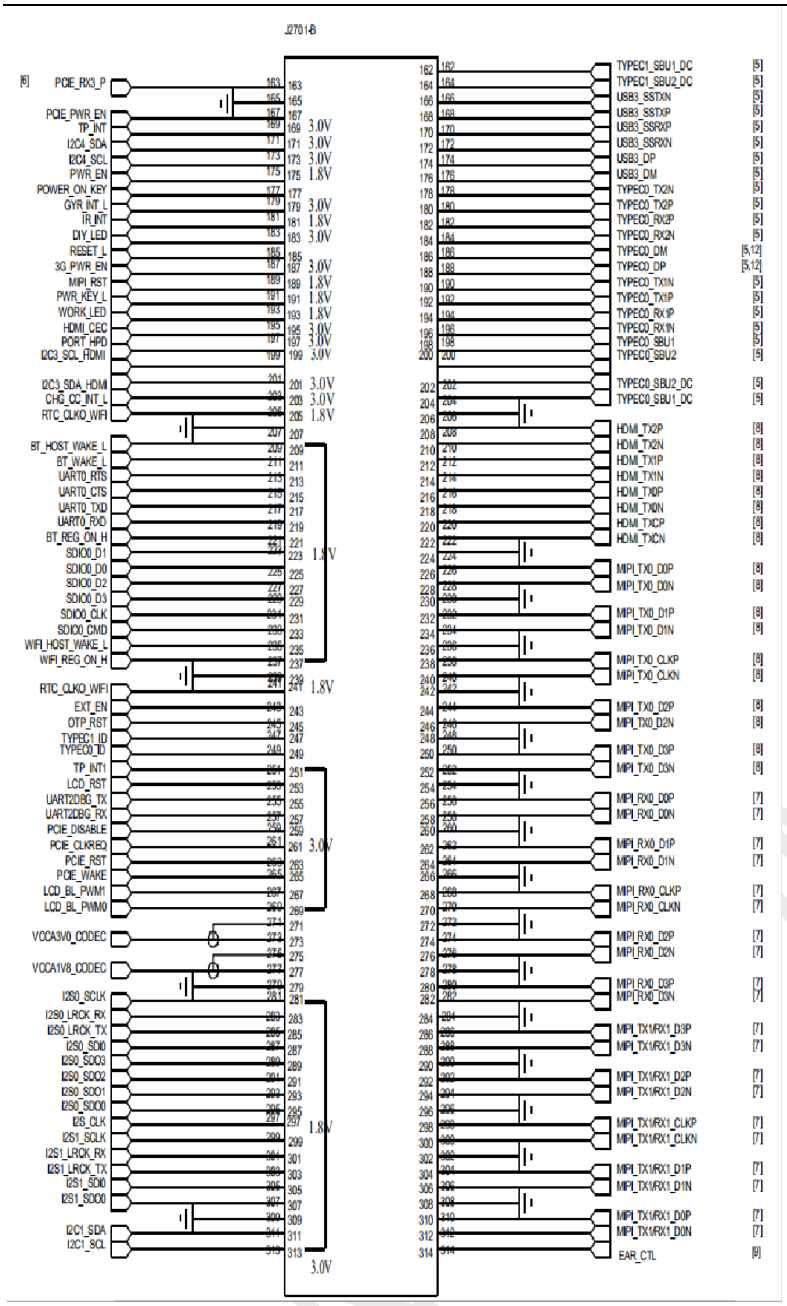
Mxm3.0-314p interface is used to lead out the whole chip. The best performance of data transmission and expansion is achieved. The gold deposition process pin is corrosion-resistant, and 4 studs are fixed, which is firm and reliable.

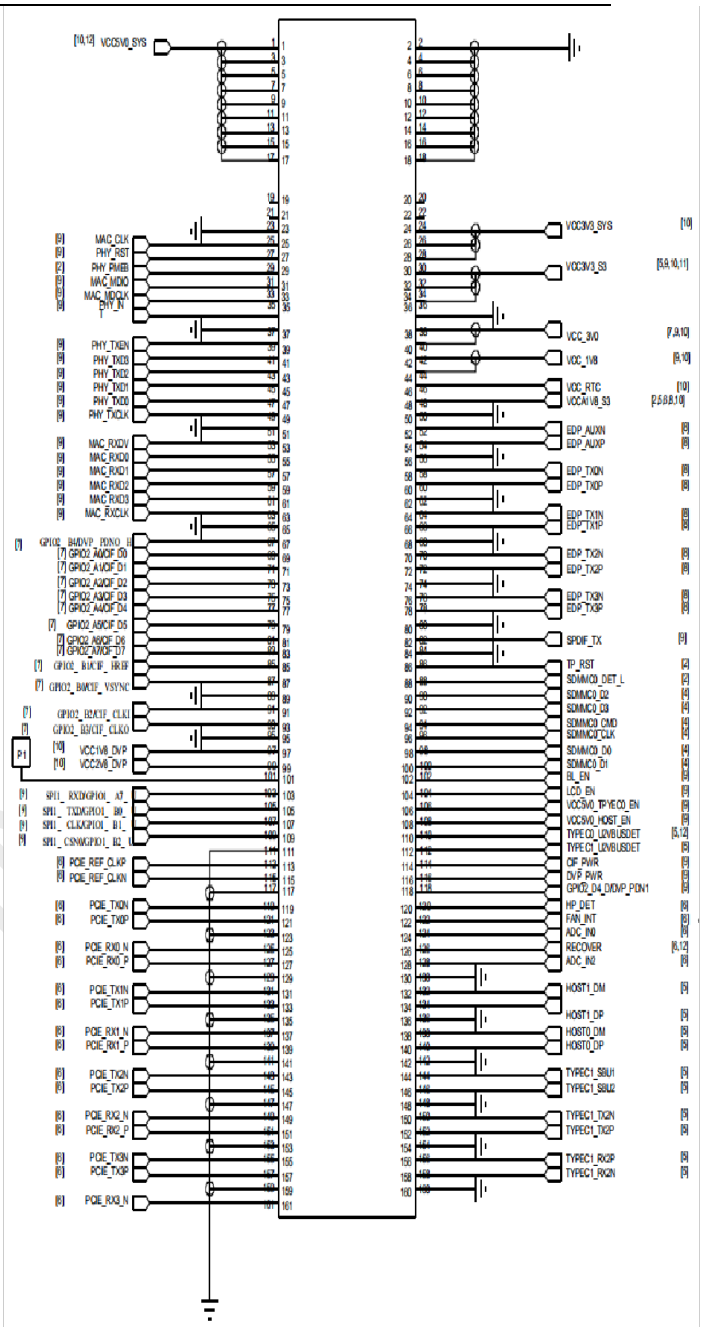


4.2、Pin number identification









PIN	Core board pin definition	Default function	Defual function description	IO Power domain	Pad type IO Pull
1	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
3	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
5	VCC_SYS	5V System power supply	Input Voltage4.8V-5.5V		
7	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
9	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
11	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
13	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
15	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
17	VCC_SYS	5V System power supply	Input Voltage 4.8V-5.5V		
19	NC	NC			
21	NC	NC			
23	GND	Power ground	Power ground		
25	MAC_CLK	GPIO3_B3/MAC_CLK/I2C5_SCL	MAC reference clock output, I2C serial port 5, need external pull-up	3.3V	I/O UP
27	PHY_RST	GPIO3_B7/MAC_CRS/UART3_RX	MAC carrier sense detect	3.3V	I/O UP
29	PHY_PMEB	GPIO0_A1/DDRIO_PWROFF/TCPD_CCDB_E	PHY Power Management Event	1.8V	I/O UP
31	MAC_MDIO	GPIO3_B5/MAC_MDIO/UART1_TX	MAC management command and data	3.3V	I/O UP
33	MAC_MDC	GPIO3_B0/MAC_MDC/SPI0_CSN1	MAC management clock	3.3V	I/O UP
35	PHY_INT	GPIO3_B2/MAC_RXER/I2C5_SDA	PHY interrupt input, I2C serial port 5, need external pull-up	3.3V	I/O UP
37	GND	GND	GND		
39	PHY_TXEN	GPIO3_B4/MAC_TXEN/UART1_RX	MAC transmit enable	3.3V	I/O UP
41	PHY_TXD3	GPIO3_A1/MAC_TXD3/SPI4_TXD	MAC transmit data	3.3V	I/O DOWN
43	PHY_TXD2	GPIO3_A0/MAC_TXD2/SPI4_RXD	MAC transmit data	3.3V	I/O DOWN

45	PHY_TXD1	GPIO3_A5/MAC_TXD1/SPI0_TXD	MAC transmit data	3.3V	I/O DOWN
47	PHY_TXD0	GPIO3_A4/MAC_TXD0/SPI0_RXD	MAC transmit data	3.3V	I/O DOWN
49	PHY_TXCLK	GPIO3_C1/MAC_TXCLK/UART3_RTSN	MAC transmit clock	3.3V	I/O UP
51	GND	GND	GND		
53	MAC_RXDV	GPIO3_B1/MAC_RXDV	MAC receive data valid	3.3V	I/O DOWN
55	MAC_RXD0	GPIO3_A6/MAC_RXD0/SPI0_CLK	MAC receive data	3.3V	I/O UP
57	MAC_RXD1	GPIO3_A7/MAC_RXD1/SPI0_CSN0	MAC receive data	3.3V	I/O UP
59	MAC_RXD2	GPIO3_A2/MAC_RXD2/SPI4_CLK	MAC receive data	3.3V	I/O UP
61	MAC_RXD3	GPIO3_A3/MAC_RXD3/SPI4_CSN0	MAC receive data	3.3V	I/O UP
63	MAC_RXCLK	GPIO3_B6/MAC_RXCLK/UART3_TX	MAC receive clock	3.3V	I/O UP
65	GND	GND	GND		
67	GPIO2_B4/DVP_PDN0_H	GPIO2_B4/SPI2_CSN0	Camera power down control output for front	3.0V	I/O UP
69	GPIO2_A0/CIF_D0	GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA	Camera data port	3.0V	I/O UP
71	GPIO2_A1/CIF_D1	GPIO2_A1/VOP_D1/CIF_D1/I2C2_SCL	Camera data port	3.0V	I/O UP
73	GPIO2_A2/CIF_D2	GPIO2_A2/VOP_D2/CIF_D2	Camera data port	3.0V	I/O DOWN
75	GPIO2_A3/CIF_D3	GPIO2_A3/VOP_D3/CIF_D3	Camera data port	3.0V	I/O DOWN
77	GPIO2_A4/CIF_D4	GPIO2_A4/VOP_D4/CIF_D4	Camera data port	3.0V	I/O DOWN
79	GPIO2_A5/CIF_D5	GPIO2_A5/VOP_D5/CIF_D5	Camera data port	3.0V	I/O DOWN
81	GPIO2_A6/CIF_D6	GPIO2_A6/VOP_D6/CIF_D6	Camera data port	3.0V	I/O DOWN
83	GPIO2_A7/CIF_D7	GPIO2_A7/VOP_D7/CIF_D7/I2C7_SDA	Camera data port	3.0V	I/O UP
85	GPIO2_B1/CIF_HREF	GPIO2_B1/SPI2_RXD/CIF_HREF/I2C6_SDA	Camera href input,I2C serial port 6, for battery, need external pull up	3.0V	I/O UP
87	GPIO2_B0/CIF_VSYNC	GPIO2_B0/VOP_CLK/CIF_VSYNC/I2C7_SCL	Camera vsync input	3.0V	I/O UP
89	GND	GND	GND		

91	GPIO2_B2/CIF_CLKI	GPIO2_B2/SPI2_TXD/CIF_CLKIN/I2C6_SCL	Camera clock input, I2C serial port 6,for battery, need external pull up	3.0V	I/O UP
93	GPIO2_B3/CIF_CLKO	GPIO2_B3/SPI2_CLK/VOP_DEN/CIF_CLKOUT	Camera clock output	3.0V	I/O UP
95	GND	Power ground	Power ground		
97	VCC1V8_DVP	1.8V Power supply	Output Voltage 1.8V,Rated output current 150mA		
99	VCC2V8_DVP	2.8V Power supply	Output Voltage 2.8V,Rated output current 150mA		
101	VCCA	System startup power supply	Input Voltage 3.3V-5.5V, Rated input current 50mA		

103	SPI1_RXD/GPIO1_A7_U	GPIO1_A7/SPI1_RXD/PMCU_UART4DBG_RX	SPI bus port 1, for FW boot, Uart4 serial port data input, for PMCU debug	3.0V	I/O UP
105	SPI1_TXD/GPIO1_B0_U	GPIO1_B0/SPI1_TXD/PMCU_UART4DBG_TX	SPI bus port 1, for FW boot, Uart4 serial port data output, for PMCU debug	3.0V	I/O UP
107	SPI1_CLK/GPIO1_B1_U	GPIO1_B1/SPI1_CLK/PMCU_JTAG_TCK	SPI bus port 1, for FW boot JTAG TCK for PMCU	3.0V	I/O UP
109	SPI1_CSN0/GPIO1_B2_U	GPIO1_B2/SPI1_CSN0/PMCU_JTAG_TMS	SPI bus port 1, for FW boot JTAG TMS for PMCU	3.0V	I/O UP
111	GND	GND	GND		
113	PCIE_REF_CLKP	PCIE_RCLK_100M_P	PCIE 100MHz reference clock as input to PLL		
115	PCIE_REF_CLKN	PCIE_RCLK_100M_N	PCIE 100MHz reference clock as input to PLL		
117	GND	GND	GND		
119	PCIE_TX0N	PCIE_TX_0N	PCIE differential lane 0 negative output		
121	PCIE_TX0P	PCIE_TX_0P	PCIE differential lane 0 positive output		
123	GND	GND	GND		
125	PCIE_RX0_N	PCIE_RX_0N	PCIE differential lane 0 negative input		
127	PCIE_RX0_P	PCIE_RX_0P	PCIE differential lane 0 positive input		
129	GND	GND	GND		
131	PCIE_TX1N	PCIE_TX_1N	PCIE differential lane 1 negative output		

133	PCIE_TX1P	PCIE_TX_1P	PCIE differential lane 1 positive output		
135	GND	GND	GND		
137	PCIE_RX1_N	PCIE_RX_1N	PCIE differential lane 1 negative input		
139	PCIE_RX1_P	PCIE_RX_1P	PCIE differential lane 1 positive input		
141	GND	GND	GND		
143	PCIE_TX2N	PCIE_TX_2N	PCIE differential lane 2 negative output		
145	PCIE_TX2P	PCIE_TX_2P	PCIE differential lane 2 positive output		
147	GND	GND	GND		
149	PCIE_RX2_N	PCIE_RX_2N	PCIE differential lane 2 negative input		
151	PCIE_RX2_P	PCIE_RX_2P	PCIE differential lane 2 positive input		
153	GND	GND	GND		
155	PCIE_TX3N	PCIE_TX_3N	PCIE differential lane 3 negative output		
157	PCIE_TX3P	PCIE_TX_3P	PCIE differential lane 3 positive o		
159	GND	Power ground	Power ground		
161	PCIE_RX3_N	PCIE_RX_3N	PCIE differential lane 3 negative input		
163	PCIE_RX3_P	PCIE_RX_3P	PCIE differential lane 3 positive input		
165	GND	Power ground	Power ground		
167	PCIE_PWR_EN	GPIO1_C1/SPI3_CLK	PCIE Power enable control	3.0V	I/O DOWN
169	TP_INT	GPIO1_C4/I2C8_SDA	Touch pannel interrupt input 0	3.0V	I/O UP
171	I2C4_SDA	GPIO1_B3/I2C4_SDA	I2C serial port 4,for MEMS, Core board interiorl pull up Resistor 2.2K	3.0V	I/O UP
173	I2C4_SCL	GPIO1_B4/I2C4_SCL	I2C serial port 4,for MEMS, Core board interiorl pull up Resistor 2.2K	3.0V	I/O UP
175	PWR_EN	PWR_EN	System power enable signal input 1V- 5.5V		

177	POWER_ON	POWER_ON	Power on Signal Input,External connection Power key, active low		
179	GYR_INT_L	GPIO1_D0/DFTJTAG_CLK/TCPD_VBUS_SOURCE2	Gyroscope interrupt input	3.0V	I/O DOWN
181	IR_INT	GPIO0_A6/PWM3A_IR	IR receiver input	1.8V	I/O DOWN
183	DIY_LED	GPIO0_B5/TCPD_VBUS_SOURCE3/TCPD_VBUS_FDIS	user-defined LED Control	1.8V	I/O DOWN
185	RESET_L	RESET	system reset signal Input, External NO connection(NC)		
187	3G_PWR_EN	GPIO0_A2/WIFI_26MHZ	3G/4G power enable	1.8V	I/O DOWN
189	MIPI_RST	GPIO0_B0/SDMMC0_WRPT/TEST_CLKOUT2	LCD panel reset output	1.8V	I/O UP
191	PWR_KEY_L	GPIO0_A5/EMMC_PWRON	Power key detect input	1.8V	I/O UP
193	WORK_LED	GPIO2_D3/SDIO0_PWREN	System working state refers to LED	1.8V	I/O DOWN
195	HDMI_CEC	GPIO4_C7/HDMI_CECINOUT/EDP_HOTPLUG	HDMI CEC communication	3.0V	I/O UP
197	PORT_HPD	HDMI_HPD	HDMI Hot Plug Detection interrupt with 5V, tolerance		
199	I2C3_SCL_HDMI	GPIO4_C1/I2C3_SCL_HDMI/UART2DBG_TX	I2C serial port 3,for HDMI, need external pull-up	3.0V	I/O UP
201	I2C3_SDA_HDMI	GPIO4_C0/I2C3_SDA_HDMI/UART2DBG_RX	I2C serial port 3,for HDMI, need external pull-up	3.0V	I/O UP
203	CHG_CC_INT_L	GPIO1_A2/ISP_FLASHTRIGIN/TCPD_CC1_VCONN_EN	Charge and cc controler interrupt input	3.0V	I/O DOWN
205	RTC_CLK_OUT	RTC_CLK_OUT	32.768K clock output	1.8V	

207	GND	GND	GND		
209	BT_HOST_WAKE_L	GPIO0_A4/SDIO0_INTn	BT module wake up AP	1.8V	I/O DOWN
211	BT_WAKE_L	GPIO2_D2/SDIO0_DETN/PCIE_CLKREQN	AP wake up BT module	1.8V	I/O UP
213	UART0_RTS	GPIO2_C3/UART0_RTSN	UART0 serial port, for BT module	1.8V	I/O UP
215	UART0_CTS	GPIO2_C2/UART0_CTSN	UART0 serial port, for BT module	1.8V	I/O UP
217	UART0_TXD	GPIO2_C1/UART0_TX	UART0 serial port, for BT module	1.8V	I/O UP
219	UART0_RXD	GPIO2_C0/UART0_RX	UART0 serial port, for BT module	1.8V	I/O UP

221	BT_REG_ON_H	GPIO0_B1/PMUIO2_1833_VOLSEL	BT module power enable, Core board interiorl pull up Resistor 10K	1.8V	I/O DOWN
223	SDIO0_D1	GPIO2_C5/SDIO0_D1/SPI5_TXD	SDIO0 data port , for WIFI module	1.8V	I/O UP
225	SDIO0_D0	GPIO2_C4/SDIO0_D0/SPI5_RXD	SDIO0 data port , for WIFI module	1.8V	I/O UP
227	SDIO0_D2	GPIO2_C6/SDIO0_D2/SPI5_CLK	SDIO0 data port , for WIFI module	1.8V	I/O UP
229	SDIO0_D3	GPIO2_C7/SDIO0_D3/SPI5_CSN0	SDIO0 data port , for WIFI module	1.8V	I/O UP
231	SDIO0_CLK	GPIO2_D1/SDIO0_CLKOUT/TEST_CLKOUT1	SDIO0 clock output, for WIFI module	1.8V	I/O UP
233	SDIO0_CMD	GPIO2_D0/SDIO0_CMD	SDIO0 command output , for WIFI module	1.8V	I/O UP
235	WIFI_HOST_WAKE_L	GPIO0_A3/SDIO0_WRPT	WIFI module wake up AP	1.8V	I/O DOWN
237	WIFI_REG_ON_H	GPIO0_B2	WIFI module power enable	1.8V	I/O DOWN
239	GND	GND	GND		
241	RTC_CLKO_WIFI	RTC_CLKO_WIFI	32.768K clock output to WIFI	1.8V	
243	EXT_EN	EXT_EN	External Power enable output, Voltage 5V		
245	RESET_KEY	RESET_KEY	system reset signal Input, External connection Reset key, active low		
247	TYPEC1_ID	TYPEC1_ID	TYPEC1 ID detect input,200kohm internal pull up to USB_AVDD_1V8		
249	TYPEC0_ID	TYPEC0_ID	TYPEC0 ID detect input,200kohm internal pull up to USB_AVDD_1V8		
251	TP_INT1	GPIO4_D4	Touch pannel interrupt input 1	3.0V	I/O DOWN
253	LCD_RST	GPIO4_D5	LCD panel CABC enable LCD panel reset output	3.0V	I/O DOWN
255	UART2DBG_TX	GPIO4_C4/UART2DBG_TX	Uart2 serial port data output ,for AP debug	3.0V	I/O UP
257	UART2DBG_RX	GPIO4_C3/UART2DBG_RX	Uart2 serial port data input, for AP debug	3.0V	I/O UP
259	PCIE_DISABLE	GPIO4_D3	PCIE Disable	3.0V	I/O DOWN
261	PCIE_CLKREQ	GPIO4_D0/PCIE_CLKREQN	PCIE_CLKREQ	3.0V	I/O UP

263	PCIE_RST	GPIO4_D1/HOTPLUG	PCIE Reset	3.0V	I/O DOWN
265	PCIE_WAKE	GPIO4_D2	AP wake up PCIE	3.0V	I/O DOWN
267	LCD_BL_PWM1	GPIO4_C6/PWM1	LCD panel backlight brightness control output0	3.0V	I/O DOWN
269	LCD_BL_PWM0	GPIO4_C2/PWM0/VOP1_PWM_CABC	LCD panel backlight brightness control output1		I/O DOWN
271	VCCA3V0_CODEC	3.0V Power supply	Output Voltage 3.0V,Rated output current 300mA		
273	VCCA3V0_CODEC	3.0V Power supply	Output Voltage 3.0V,Rated output current 300mA		
275	VCCA1V8_CODEC	1.8V Power supply	Output Voltage 1.8V,Rated output current 300mA		
277	VCCA1V8_CODEC	1.8V Power supply	Output Voltage 1.8V,Rated output current 300mA		
279	GND	GND	GND		
281	I2S0_SCLK	GPIO3_D0/I2S0_SCLK	I2S 0 port, for audio codec	1.8V	I/O DOWN
283	I2S0_LRCK_RX	GPIO3_D1/I2S0_LRCK_RX	I2S 0 port, for audio codec	1.8V	I/O DOWN
285	I2S0_LRCK_TX	GPIO3_D2/I2S0_LRCK_TX	I2S 0 port, for audio codec	1.8V	I/O DOWN
287	I2S0_SDI0	GPIO3_D3/I2S0_SDI0	I2S 0 port, for audio codec	1.8V	I/O DOWN
289	I2S0_SDO3	GPIO3_D4/I2S0_SDI1SDO3	I2S 0 port, for audio codec	1.8V	I/O DOWN
291	I2S0_SDO2	GPIO3_D5/I2S0_SDI2SDO2	I2S 0 port, for audio codec	1.8V	I/O DOWN
293	I2S0_SDO1	GPIO3_D6/I2S0_SDI3SDO1	I2S 0 port, for audio codec	1.8V	I/O DOWN
295	I2S0_SDO0	GPIO3_D7/I2S0_SDO0	I2S 0 port, for audio codec	1.8V	I/O DOWN
297	I2S_CLK	GPIO4_A0/I2S_CLK	I2S MCLK, for both I2S0 and I2S1	1.8V	I/O DOWN
299	I2S1_SCLK	GPIO4_A3/I2S1_SCLK	I2S 1 port, for BT module	1.8V	I/O DOWN
301	I2S1_LRCK_RX	GPIO4_A4/I2S1_LRCK_RX	I2S 1 port, for BT module	1.8V	I/O DOWN
303	I2S1_LRCK_TX	GPIO4_A5/I2S1_LRCK_TX	I2S 1 port, for BT module	1.8V	I/O DOWN
305	I2S1_SDI0	GPIO4_A6/I2S1_SDI0	I2S 1 port, for BT module	1.8V	I/O DOWN
307	I2S1_SDO0	GPIO4_A7/I2S1_SDO0	I2S 1 port, for BT module	1.8V	I/O DOWN

309	GND	GND	GND		

311	I2C1_SDA	GPIO4_A1/I2C1_SDA	I2C serial port 1,for Audio, Core board interiorl pull up Resistor 2.2K	1.8V	I/O UP
313	I2C1_SCL	GPIO4_A2/I2C1_SCL	I2C serial port 1,for Audio, Core board interiorl pull up Resistor 2.2K	1.8V	I/O UP
314	EAR_CTL	GPIO4_C5/SPDIF_TX	Earphone output control	3.0V	I/O DOWN
2	GND	Power ground	Power ground		
4	GND	Power ground	Power ground		
6	GND	Power ground	Power ground		
8	GND	Power ground	Power ground		
10	GND	Power ground	Power ground		
12	GND	Power ground	Power ground		
14	GND	Power ground	Power ground		
16	GND	Power ground	Power ground		
18	GND	Power ground	Power ground		
20	NC	NC			
22	NC	NC			
24	VCC3V3_SYS	3.3V System power supply	Output Voltage 3.3V,Rated output current 1A		
26	VCC3V3_SYS	3.3V System power supply	Output Voltage 3.3V,Rated output current 1A		
28	VCC3V3_SYS	3.3V System power supply	Output Voltage 3.3V,Rated output current 1A		
30	VCC3V3_S3	3.3V Power supply	Output Voltage 3.3V,Rated output current 200mA		
32	VCC3V3_S3	3.3V Power supply	Output Voltage 3.3V,Rated output current 200mA		
34	VCC3V3_S3	3.3V Power supply	Output Voltage 3.3V,Rated output current 200mA		
36	GND	Power ground	Power ground		

38	VCC_3V0	3.0V Power supply	Output Voltage 3.0V,Rated output current 200mA		
40	VCC_3V0	3.0V Power supply	Output Voltage 3.0V,Rated output current 200mA		
42	VCC_1V8	1.8V Power supply	Output Voltage 1.8V,Rated output current 1A		
44	VCC_1V8	1.8V Power supply	Output Voltage 1.8V,Rated output current 1A		
46	VCC_RTC	RTC Power supply	Input Voltage 3V-5.5V		

48	VCCA1V8_S3	1.8V Power supply	Output Voltage 1.8V,Rated output current 200mA		
50	GND	Power ground	Power ground		
52	EDP_AUXN	EDP_AUXN	eDP differential AUX channel positive output		
54	EDP_AUXP	EDP_AUXP	eDP differential AUX channel negative output		
56	GND	GND	GND		
58	EDP_TX0N	EDP_TX0N	eDP differential lane 0 negative output		
60	EDP_TX0P	EDP_TX0P	eDP differential lane 0 positive output		
62	GND	GND	GND		
64	EDP_TX1N	EDP_TX1N	eDP differential lane 1 negative output		
66	EDP_TX1P	EDP_TX1P	eDP differential lane 1 positive output		
68	GND	GND	GND		
70	EDP_TX2N	EDP_TX2N	eDP differential lane 2 negative output		
72	EDP_TX2P	EDP_TX2P	eDP differential lane 2 positive output		
74	GND	GND	GND		
76	EDP_TX3N	EDP_TX3N	eDP differential lane 3 negative output		
78	EDP_TX3P	EDP_TX3P	eDP differential lane 3 positive output		
80	GND	GND	GND		
82	SPDIF_TX	GPIO3_C0/MAC_COL/UART3_CTSN	MAC collision detect	3.3V	I/O UP

84	GND	GND	GND		
86	TP_RST	GPIO0_B4/TCPD_VBUS_BDIS	Touch pannelreset output	1.8V	I/O DOWN
88	SDMMC0_DET_L	GPIO0_A7/SDMMC0_DET	SDMMC0 detect input	1.8V	I/O UP
90	SDMMC0_D2	GPIO4_B2/SDMMC0_D2/APJTAG_TCK	SDMMC0 data port, JTAG TCK for AP	1.8V/3.0V auto	I/O UP
92	SDMMC0_D3	GPIO4_B3/SDMMC0_D3/APJTAG_TMS	SDMMC0 data port, JTAG TMS for AP	1.8V/3.0V auto	I/O UP
94	SDMMC0_CMD	GPIO4_B5/SDMMC0_CMD/MCUJTAG_TMS	SDMMC0 command output , JTAG TMS for MCU	1.8V/3.0V auto	I/O UP
96	SDMMC0_CLK	GPIO4_B4/SDMMC0_CLKOUT/MUCJTAG_TCK	SDMMC0 clock output, JTAG TCK for MCU	1.8V/3.0V auto	I/O DOWN
98	SDMMC0_D0	GPIO4_B0/SDMMC0_D0/UART2DBG_RX	SDMMC0 data port	1.8V/3.0V auto	I/O UP
100	SDMMC0_D1	GPIO4_B1/SDMMC0_D1/UART2DBG_TX	SDMMC0 data port	1.8V/3.0V auto	I/O UP
102	BL_EN	GPIO1_A1/ISP_SHUTTER_TRIG/TCPD_CC0_VCONN_EN	LCD panel backlight power enable	3.0V	I/O DOWN
104	LCD_EN	GPIO1_A4/ISP_PRELIGHT_TRIG	LCD panel power enable	3.0V	I/O DOWN
106	VCC5V0_TYPEC0_EN	GPIO1_A3/ISP_FLASHTRIGOUT	TYPEC0 5V output power enable	3.0V	I/O DOWN
108	VCC5V0_HOST_EN	GPIO1_A0/ISP_SHUTTER_EN/TCPD_VBUS_SINK_EN	USB HOST 5V output power enable	3.0V	I/O DOWN
110	TYPEC0_U2VBUSDET	TYPEC0_U2VBUSDET	TYPEC0 connected / vbus power detect for USB2.0		
112	TYPEC1_U2VBUSDET	TYPEC1_U2VBUSDET	TYPEC1 connected / vbus power detect for USB2.0		
114	CIF_PWR	GPIO1_C6/DFTJTAG_TDI/TCPD_VBUS_SOURCE0	Camera power enable0	3.0V	I/O DOWN
116	DVP_PWR	GPIO1_C7/DFTJTAG_TDO/TCPD_VBUS_SOURCE1	Camera power enable1	3.0V	I/O DOWN
118	GPIO2_D4_D/DVP_PDN1	GPIO2_D4/SDIO0_BKPWR	Camera power down control output for rear	1.8V	I/O DOWN
120	HP_DET	ADC_IN4	Headphone insert detect input	1.8V	
122	FAN_INT	ADC_IN3	Fan insert detect input	1.8V	
124	ADC_IN0	ADC_IN0	Battery voltage input, Board ID detect input	1.8V	
126	RECOVER	ADC_IN1	AD keyboard input	1.8V	
128	ADC_IN2	ADC_IN2	AD keyboard input	1.8V	

130	GND	GND	GND		
132	HOST1_DM	HOST1_DM	USB HOST1 Data Minus port		
134	HOST1_DP	HOST1_DP	USB HOST1 Data Plus port		
136	GND	GND	GND		
138	HOST0_DM	HOST0_DM	USB HOST0 Data Minus port		
140	HOST0_DP	HOST0_DP	USB HOST0 Data Plus port		
142	GND	GND	GND		
144	TYPEC1_SBU1	TYPEC1_AUXP	TYPEC1 AUX differential TX/RX serial data		
146	TYPEC1_SBU2	TYPEC1_AUXM	TYPEC1 AUX differential TX/RX serial data.		
148	GND	GND	GND		
150	TYPEC1_TX2N	TYPEC1_TX2M	TYPEC1 negative half of second Super Speed,TX differential pair.		
152	TYPEC1_TX2P	TYPEC1_TX2P	TYPEC1 positive half of second Super Speed, TX differential pair.		
154	GND	GND	GND		
156	TYPEC1_RX2P	TYPEC1_RX2P	TYPEC1 positive half of second Super Speed, RX differential pair		
158	TYPEC1_RX2N	TYPEC1_RX2M	TYPEC1 negative half of second Super Speed, RX differential pair		
160	GND	Power ground	Power ground		
162	TYPEC1_SBU1_DC	TYPEC1_AUXP_PD_PU	TYPEC1 AUX pull-up/pull-down polarity reversal pins.		
164	TYPEC1_SBU2_DC	TYPEC1_AUXM_PU_PD	TYPEC1 AUX pull-up/pull-down polarity reversal pins.		
166	USB3_SSTXN	TYPEC1_TX1M	TYPEC1 negative half of first Super Speed TX, differential pair		
168	USB3_SSTXP	TYPEC1_TX1P	TYPEC1 positive half of first Super Speed TX, differential pair.		
170	USB3_SSRXP	TYPEC1_RX1P	TYPEC1 positive half of first Super Speed RX, differential pair		
172	USB3_SSRXN	TYPEC1_RX1M	TYPEC1 negative half of first Super Speed RX, differential		

			pair		
174	USB3_DP	TYPEC1_DP	TYPEC1 Data Plus port		
176	USB3_DM	TYPEC1_DM	TYPEC1 Data Minus port		
178	TYPEC0_TX2N	TYPEC0_TX2M	TYPEC0 negative half of second Super Speed,TX differential pair		
180	TYPEC0_TX2P	TYPEC0_TX2P	TYPEC0 positive half of second Super Speed, TX differential pair		
182	TYPEC0_RX2P	TYPEC0_RX2P	TYPEC0 positive half of second Super Speed, RX differential pair.		
184	TYPEC0_RX2N	TYPEC0_RX2M	TYPEC0 negative half of second Super Speed, RX differential pair		
186	TYPEC0_DM	TYPEC0_DM	TYPEC0 Data Minus port		
188	TYPEC0_DP	TYPEC0_DP	TYPEC0 Data Plus port		
190	TYPEC0_TX1N	TYPEC0_TX1M	TYPEC0 negative half of first Super Speed TX, differential pair.		
192	TYPEC0_TX1P	TYPEC0_TX1P	TYPEC0 positive half of first Super Speed TX, differential pair.		
194	TYPEC0_RX1P	TYPEC0_RX1P	TYPEC0 positive half of first Super Speed RX,differential pair		
196	TYPEC0_RX1N	TYPEC0_RX1M	TYPEC0 negative half of first Super Speed RX, differential pair.		
198	TYPEC0_SBU1	TYPEC0_AUXP	TYPEC0 AUX differential TX/RX serial data.		
200	TYPEC0_SBU2	TYPEC0_AUXM	TYPEC0 AUX differential TX/RX serial data.		
202	TYPEC0_SBU2_DC	TYPEC0_AUXM_PU_PD	TYPEC0 AUX pull-up/pull-down polarity reversal pins.		
204	TYPEC0_SBU1_DC	TYPEC0_AUXP_PD_PU	TYPEC0 AUX pull-up/pull-down polarity, reversal pins.		
206	GND	GND	GND		
208	HDMI_TX2P	HDMI_TX2P	HDMI channel 2 differential serial data positive		
210	HDMI_TX2N	HDMI_TX2N	HDMI channel 2 differential serial data negative		
212	HDMI_TX1P	HDMI_TX1P	HDMI channel 1 differential serial data positive		

214	HDMI_TX1N	HDMI_TX1N	HDMI channel 1 differential serial data negative		
216	HDMI_TX0P	HDMI_TX0P	HDMI channel 0 differential serial data positive		
218	HDMI_TX0N	HDMI_TX0N	HDMI channel 0 differential serial data negative		
220	HDMI_TXCP	HDMI_TCP	HDMI differential pixel clock positive		
222	HDMI_TXCN	HDMI_TCN	HDMI differential pixel clock negative		
224	GND	GND	GND		
226	MIPI_TX0_D0P	MIPI_TX0_D0P	MIPI-DSI0 differential lane 0 positive		
228	MIPI_TX0_D0N	MIPI_TX0_D0N	MIPI-DSI0 differential lane 0 negative		
230	GND	GND	GND		
232	MIPI_TX0_D1P	MIPI_TX0_D1P	MIPI-DSI0 differential lane 1 positive		
234	MIPI_TX0_D1N	MIPI_TX0_D1N	MIPI-DSI0 differential lane 1 negative		
236	GND	GND	GND		
238	MIPI_TX0_CLKP	MIPI_TX0_CLKP	MIPI-DSI0 differential clock lane positive		
240	MIPI_TX0_CLKN	MIPI_TX0_CLKN	MIPI-DSI0 differential clock lane negative		
242	GND	GND	GND		
244	MIPI_TX0_D2P	MIPI_TX0_D2P	MIPI-DSI0 differential lane 2 positive		
246	MIPI_TX0_D2N	MIPI_TX0_D2N	MIPI-DSI0 differential lane 2 negative		
248	GND	GND	GND		
250	MIPI_TX0_D3P	MIPI_TX0_D3P	MIPI-DSI0 differential lane 3 positive		
252	MIPI_TX0_D3N	MIPI_TX0_D3N	MIPI-DSI0 differential lane 3 negative		
254	GND	GND	GND		
256	MIPI_RX0_D0P	MIPI_RX0_D0P	MIPI-CSI0 differential lane 0 positive		
258	MIPI_RX0_D0N	MIPI_RX0_D0N	MIPI-CSI0 differential lane 0 negative		

260	GND	GND	GND		
262	MIPI_RX0_D1P	MIPI_RX0_D1P	MIPI-CSI0 differential lane 1 positive		
264	MIPI_RX0_D1N	MIPI_RX0_D1N	MIPI-CSI0 differential lane 1 negative		
266	GND	GND	GND		
268	MIPI_RX0_CLKP	MIPI_RX0_CLKP	MIPI-CSI0 differential clock lane positive		
270	MIPI_RX0_CLKN	MIPI_RX0_CLKN	MIPI-CSI0 differential clock lane negative		
272	GND	Power ground	Power ground		
274	MIPI_RX0_D2P	MIPI_RX0_D2P	MIPI-CSI0 differential lane 2 positive		
276	MIPI_RX0_D2N	MIPI_RX0_D2N	MIPI-CSI0 differential lane 2 negative		
278	GND	GND	GND		
280	MIPI_RX0_D3P	MIPI_RX0_D3P	MIPI-CSI0 differential lane 3 positive		
282	MIPI_RX0_D3N	MIPI_RX0_D3N	MIPI-CSI0 differential lane 3 negative		
284	GND	GND	GND		
286	MIPI_TX1/RX1_D3P	MIPI_TX1/RX1_D3P	MIPI-DSI1/CSI1 differential lane 3 positive		
288	MIPI_TX1/RX1_D3N	MIPI_TX1/RX1_D3N	MIPI-DSI1/CSI1 differential lane 3 negative		
290	GND	GND	GND		
292	MIPI_TX1/RX1_D2P	MIPI_TX1/RX1_D2P	MIPI-DSI1/CSI1 differential lane 2 positive		
294	MIPI_TX1/RX1_D2N	MIPI_TX1/RX1_D2N	MIPI-DSI1/CSI1 differential lane 2 negative		
296	GND	GND	GND		
298	MIPI_TX1/RX1_CLKP	MIPI_TX1/RX1_CLKP	MIPI-DSI1/CSI1 differential clock lane positive		
300	MIPI_TX1/RX1_CLKN	MIPI_TX1/RX1_CLKN	MIPI-DSI1/CSI1 differential clock lane negative		
302	GND	GND	GND		
304	MIPI_TX1/RX1_D1P	MIPI_TX1/RX1_D1P	MIPI-DSI1/CSI1 differential lane 1 positive		
306	MIPI_TX1/RX1_D1N	MIPI_TX1/RX1_D1N	MIPI-DSI1/CSI1 differential lane 1 negative		
308	GND	GND	GND		

310	MIPI_TX1/RX1_D0P	MIPI_TX1/RX1_D0P	MIPI-DSI1/CSI1 differential lane 0 positive		
312	MIPI_TX1/RX1_D0N	MIPI_TX1/RX1_D0N	MIPI-DSI1/CSI1 differential lane 0 negative		

5、Core board & Extend board