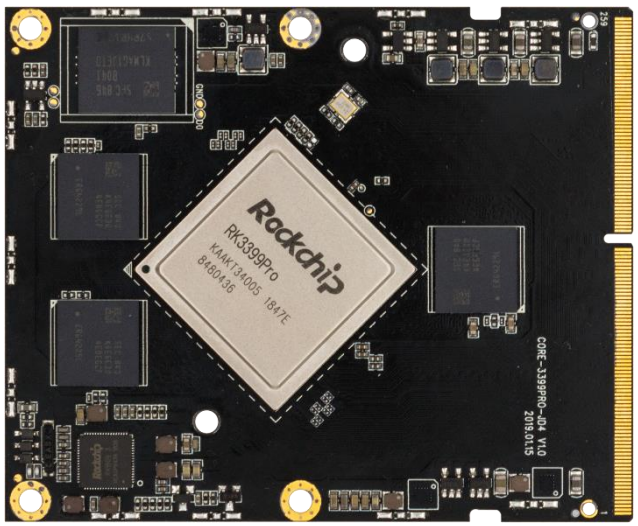
T-CHIP TECHNOLOGY

Core-3399Pro-JD4

Product Specification

V1.0



Version	Date	Updated content
V1.0	2019-05-07	Original version

Directory

1. Product Overview

1. **High-performance AI Processor RK3399Pro**

   Adopts big.LITTLE core processor architecture of ARM dual-core Cortex-A72 and quad-core Cortex-A53 at a high frequency as 1.8GHz, integrated Mali-T860 MP4 quad-core graphics processor with powerful general-purpose computing performance.

2. **AI Neural Network Processor NPU**

   Integrates AI neural network processor NPU, supports 8Bit/16Bit operation with computing power up to 3.0 Tops to meet various visual and audio AI applications.

3. **Rich Extension Interfaces**

   With rich interfaces such as I2C, SPI, UART, ADC, PWM, GPIO, PCIe, USB3.0, I2S (supports 8-way digital microphone array input), and so on.

4. **Powerful Hardware Decoding Capability**

   Supports multiple display output interfaces of DP1.2, HDMI 2.0, MIPI-DSI, eDP, dual-screen identical display/dual-screen differential display, supports 4K@60fps H.265/VP9, 4K@30fps H.264 video decoding, 1080P@60fps(VC-1, MPEG-1/2/4) multi-format video decoding, and 1080P@30fps H.264/AVC/VP8 video encoding.

5. **Stable And Reliable**

   With SODIMM 260P interface, the data transmission and expansion performance can be best achieved, immersion gold process pin, corrosion resistant, 4 studs fixed, stable and reliable. Designed measurement is 69.6mm x 85mm.

6. **Support For Multiple OS**

   Supports Android, Linux+QT, Ubuntu multiple operating system, the performance is stable and reliable

7. **Open Source**

   Complete with SDK, tutorial, technical information and development tools can be downloaded on the website, and provide development base plate for purchase, making development and learning easier.

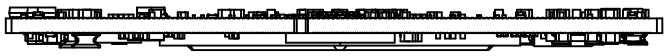
8. **Application**

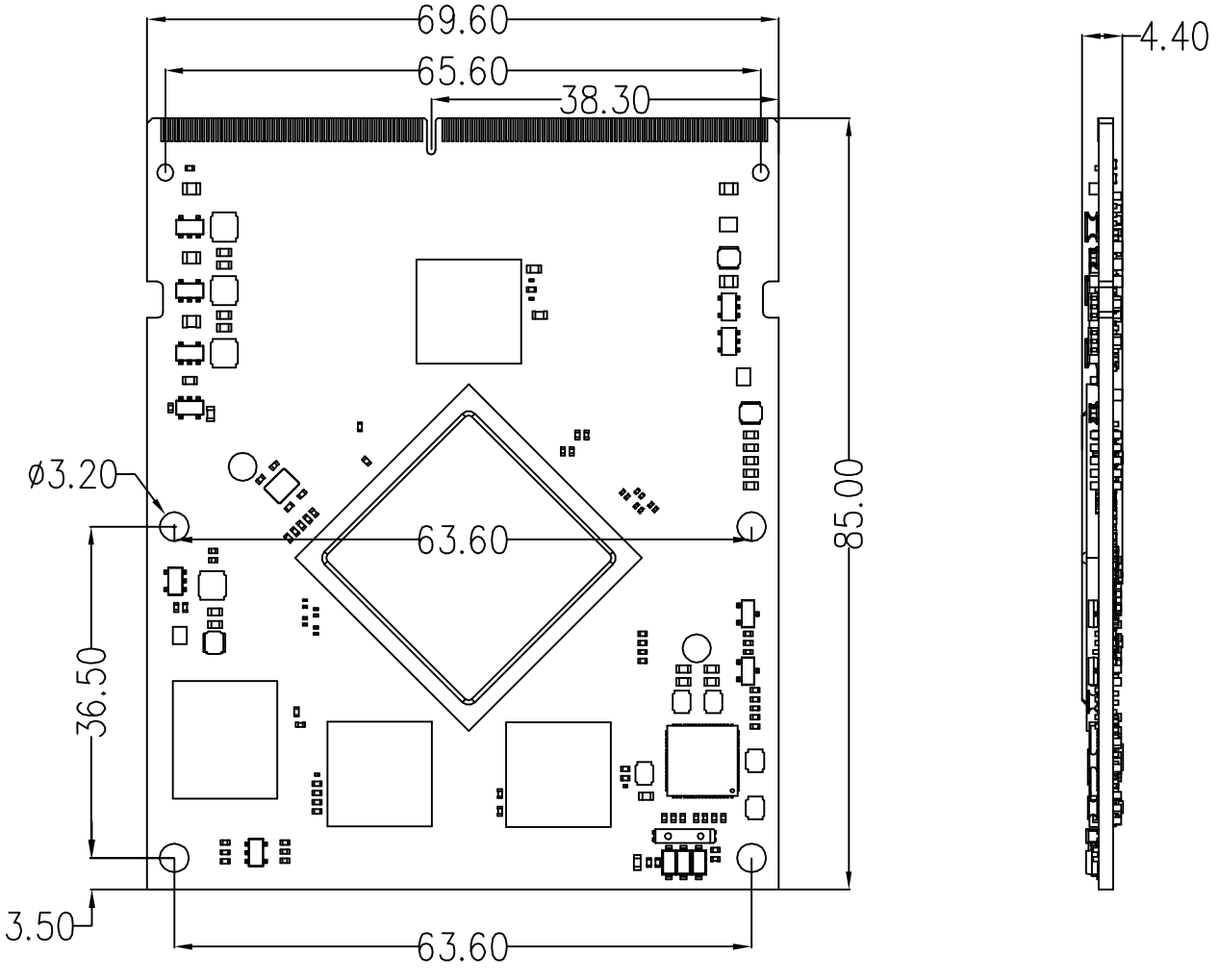
   It is suitable for cluster servers, high-performance computing/storage, computer vision, gaming equipment, commercial display equipment, medical equipment, vending machines, industrial computers, etc.

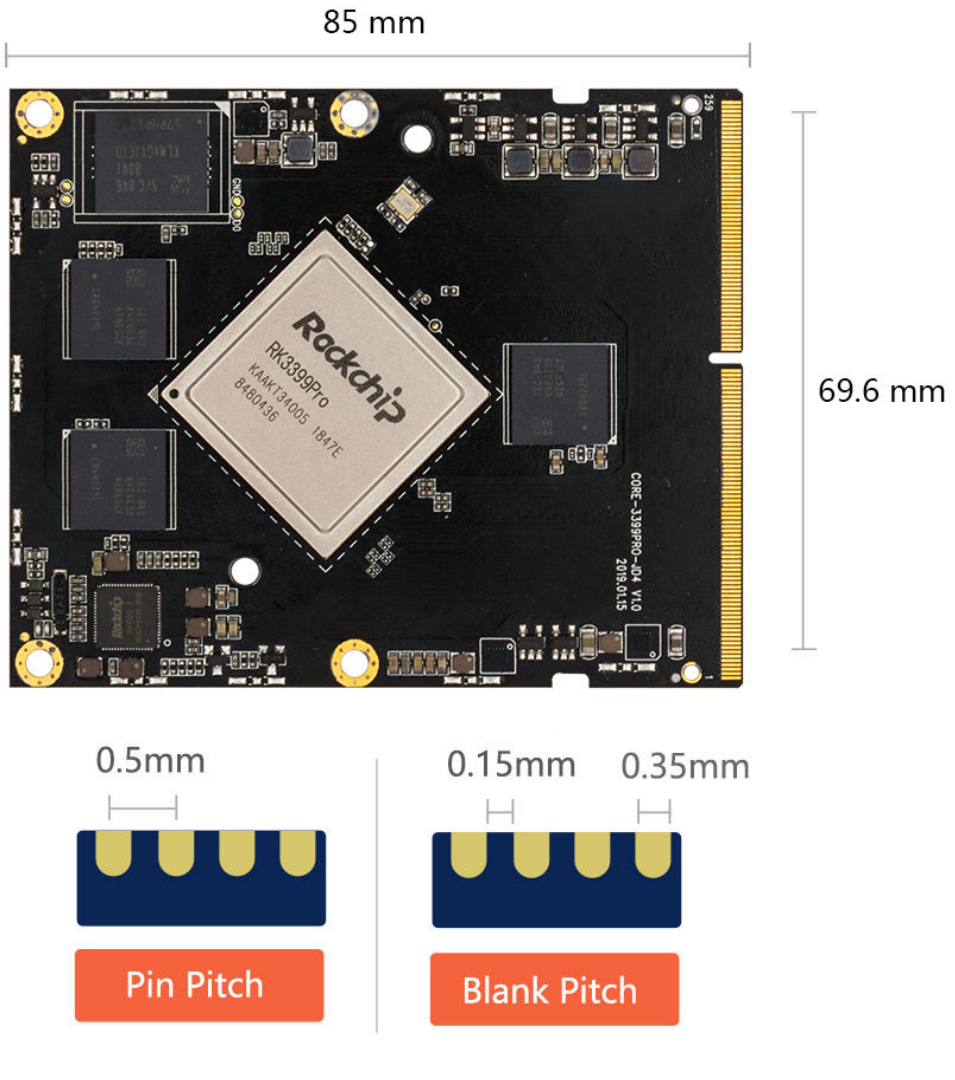
2. Product Specification

Specification	
SOC	Rockchip RK3399Pro
CPU	Dual-core Cortex-A72 + Quad-core Cortex-A53 big.LITTLE core CPU architecture, frequency up to 1.8GHz
GPU	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)
NPU	Built-in neural network processor NPU which with powerful computing performance: - Support 8bit/16bit operation with up to 3.0 TOPS performance. - Compared to tradition solution, the power consumption of the NPU is less than 1% of the GPU when performing AI operations. - Load Caffe / Mxnet / TensorFlow model directly.
VPU	Hardware decoding: 4K@60fps H.265/VP9, 4K@30fps H.264 video decoding, 1080P@60fps(VC-1, MPEG-1/2/4) multi-format video decoding Hardware encoding: 1080P@30fps H.264/AVC/VP8 video encoding Video post processor: de-interlacing, de-noising, edge/detail/color optimization
RAM	3GB LPDDR3 (NPU 1GB + CPU 2GB) 6GB LPDDR3 (NPU 2GB + CPU 4GB)
Storage	16GB high-speed eMMC 5.1 (16GB/32GB/128GB) Support TF Card Extended Storage Support M.2 PCIe M-KEY extend NVMe SSD
Hardware Features	
Ethernet	1×GMAC, providing RGMII/RMII interface, supporting 10/100/1000Mbps data transfer rate
WiFi	Extend WiFi & Bluetooth via SDIO3.0
Display	1×HDMI2.0 (support 4K@60Hz output and HDCP 1.4/2.2) 1×MIPI-DSI (support single channel 1080P@60fps output) 1×eDP1.3 (4 lanes with 10.8Gbps) 1×DP1.2 (DisplayPort, support 4K@60Hz output) Support dual-screen identical display/dual-screen differential display
Audio	1×HDMI 2.0 audio output 1×I2S (Support 8-way digital microphone array input) 1×Speaker (8Ω, 1.3W, Single track) 1×Phone, for audio output 1×Mic, for audio input
Camera	2×MIPI-CSI camera interface (Built-in dual-ISP, Maximum support single 13Mpixel or dual 8Mpixel)
USB	2×USB2.0 HOST, 1×USB3.0 OTG
PCIe	1×PCIe2.1
Interface	UART×5, ADC×4, I2C×9, PWM×3, GPIOs, SPI×5
Power	DC input voltage 5V
Power consumption	Min: 2.6W(5V/520mA), Normal: 3.75W(5V/750mA), Max: 6W(5V/1200mA)
OS / Software	
OS	Android, Linux+QT, Ubuntu
Software	- Provide AI development tools: support model fast conversion, Support API conversion, Support models such as TensorFlow / TF Lite / Caffe / ONNX / Darknet, and so on. - Provide AI application development interface: support Android NN API, provide RKNN cross-platform API, support for TensorFlow development under Linux.
Appearance	
Size	69.6mm × 85.0mm
Type	Gold finger (SODIMM 260P, 0.5mm pitch)
PCB	10-layer board design

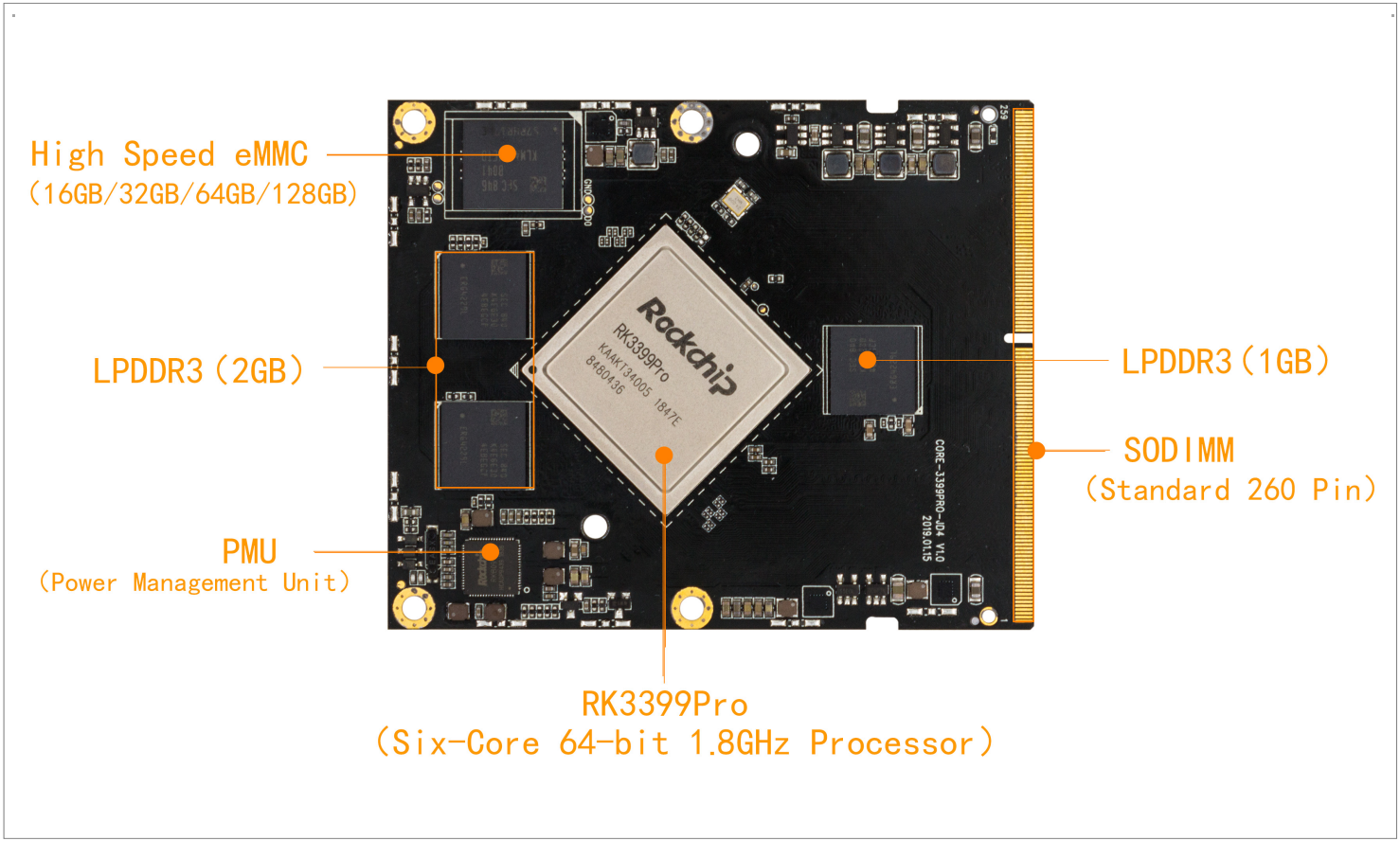
3. Core Board PCB Size



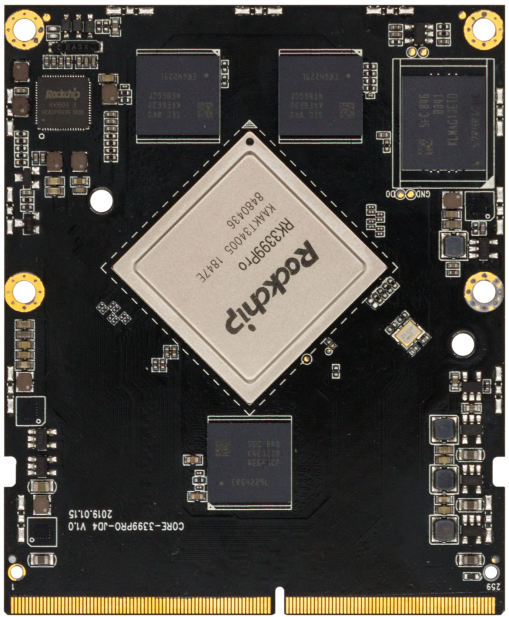


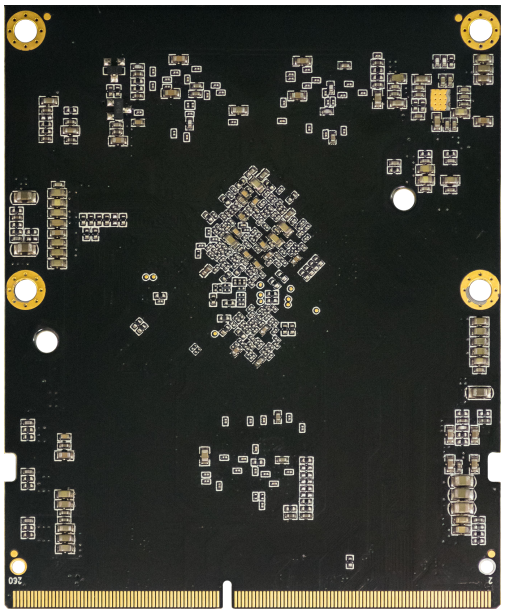

85 mm
69.6 mm
Rockchip
RK3399Pro
CORE-3399PRO-JD4 V1.0
2019.01.15
0.5mm
Pin Pitch
0.15mm
0.35mm
Blank Pitch

4. Core Board Interface definition



Pin Arrangement

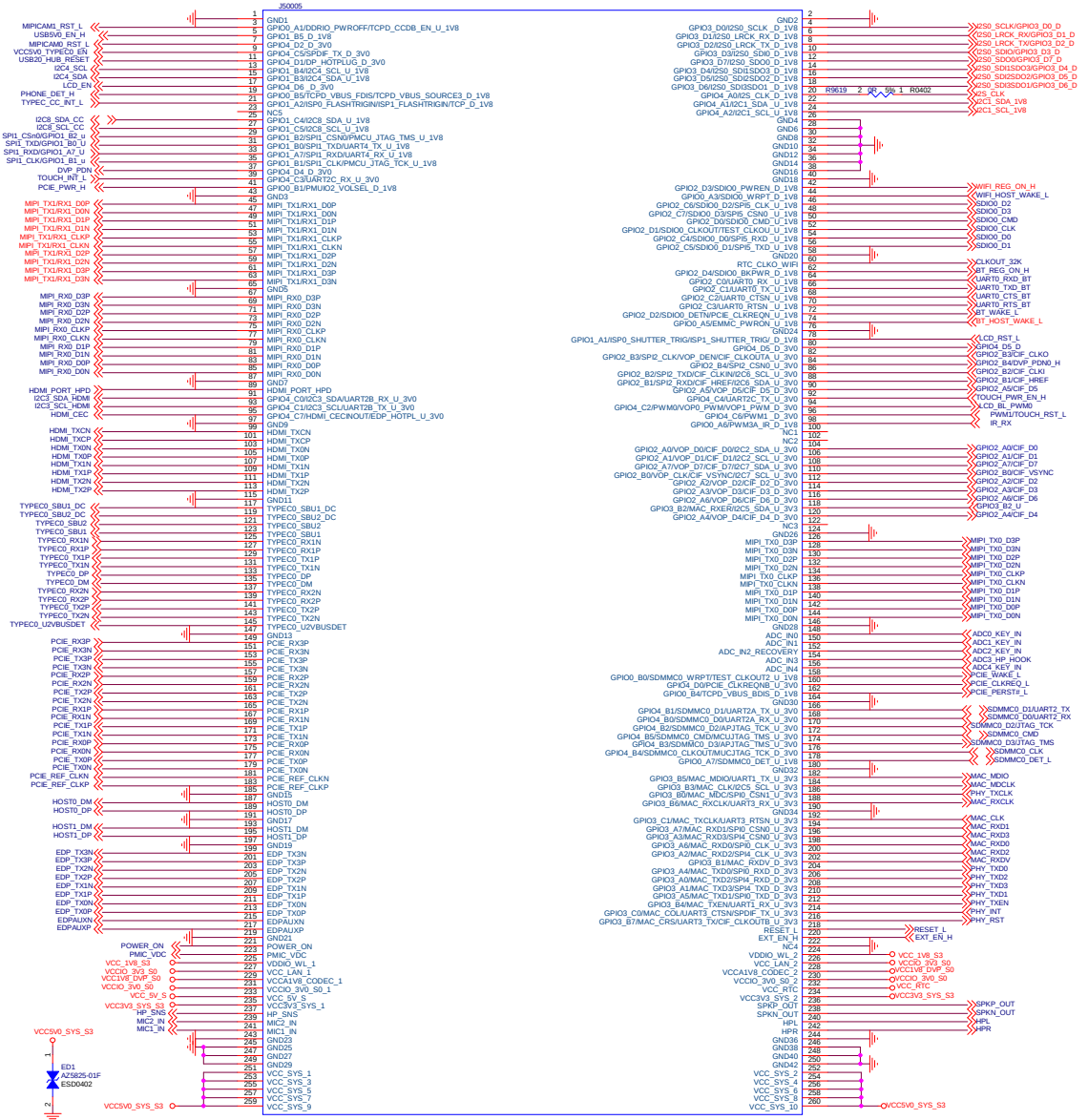




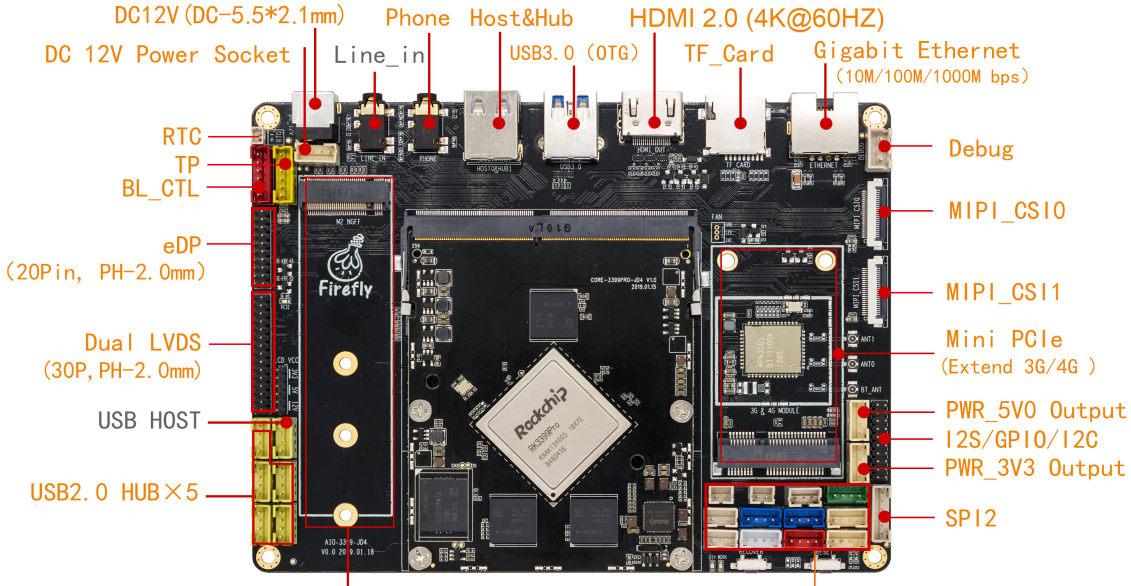
1、3、5、7、9、11 ..... 253、255、257、259

260、258、256、254 ..... 12、10、8、6、4、2

(Please zoom in to view details)

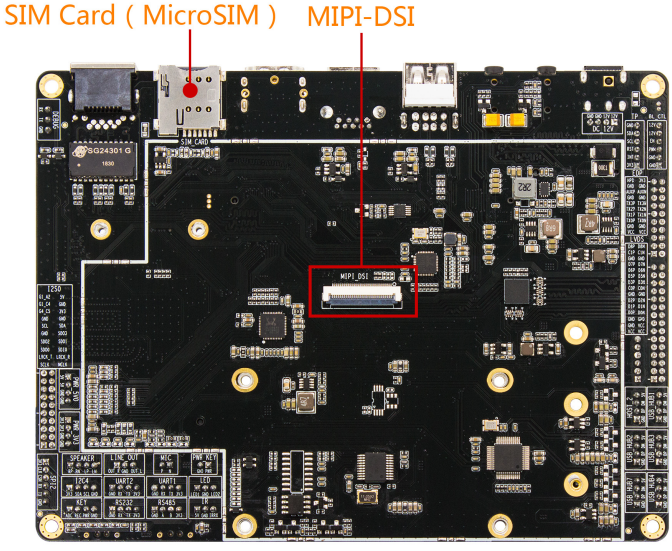


5. Mainboard Interface definition

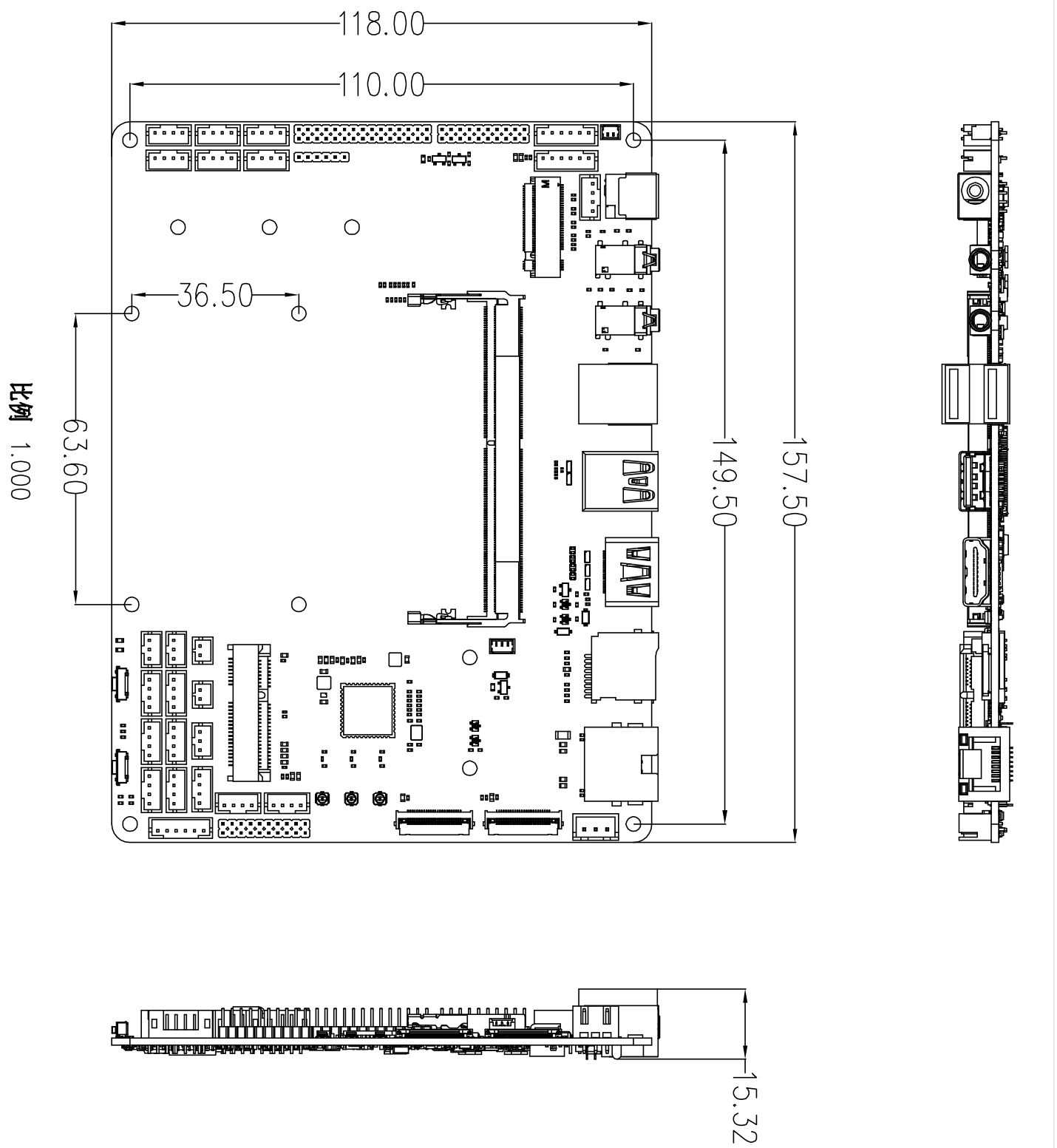


PWR_KEY	MIC	Line_Out	Speaker
LED	UART1	UART2	I2C4
IR	RS485	RS232	KEY (ADC/REC/PWR/GND)

PS: This backplane is compatible with Core-3399ProJD4 and Core-3399JD4.
When the core board is Core-3399ProJD4, It doesn't support these functions:
USB Host、Line_in、Line_Out



6. Mainboard PCB Size



PIN	Core board pin definition	Default function	Defual function description	IO Power domain	Pad type IO Pull
1	GND_1	GND	GND		
3	GPIO0_A1/DDRIO_PWROFF/TCPD_CCDB_EN_U	MIPICAM1_RST_L	MIPI Camera reset 1	1.8V	I/O UP
5	GPIO1_B5_D	USB5V0_EN_H	USB HOST 5V output power enable	1.8V	I/O DOWN
7	GPIO4_D2_D	MIPICAM0_RST_L	MIPI Camera reset 0	3.0V	I/O DOWN
9	GPIO4_C5/SPDIF_TX_D	VCC5V0_TYPEC0_EN	TYPEC0 5V output power enable	3.0V	I/O DOWN
11	GPIO4_D1/DP_HOTPLUG_D	USB20_HUB_RESET	USB2.0 HUB reset	3.0V	I/O DOWN
13	GPIO1_B4/I2C4_SCL_U	I2C4_DDC_SCL	I2C serial port 4,for MEMS, Core board interiorl pull up Resistor 4.7K	3.0V	I/O UP
15	GPIO1_B3/I2C4_SDA_U	I2C4_DDC_SDA	I2C serial port 4,for MEMS, Core board interiorl pull up Resistor 4.7K	3.0V	I/O UP
17	GPIO4_D6 _D	LCD_EN	LCD panel power enable	3.0V	I/O DOWN
19	GPIO0_B5/TCPD_VBUS_FDIS/TCPD_VBUS_SOURCE3_D	PHONE_DET_H	Headphone insert detect input	1.8V	I/O DOWN
21	GPIO1_A2/ISP0_FLASHTRIGIN/ISP1_FLASHTRIGIN/TCP_D	TYPEC_CC_INT_L	Charge and cc controler interrupt input	1.8V	I/O DOWN
23	NC5	NC			
25	GPIO1_C4/I2C8_SDA_U	I2C8_SDA_CC	I2C serial port 8, need external pull-up	1.8V	I/O UP
27	GPIO1_C5/I2C8_SCL_U	I2C8_SCL_CC	I2C serial port 8, need external pull-up	1.8V	I/O UP
29	GPIO1_B2/SPI1_CSN0/PMCU_JTAG_TMS_U	SPI1_CSn0/GPIO1_B2_u	SPI bus port 1	1.8V	I/O UP
31	GPIO1_B0/SPI1_TXD/UART4_TX_U	SPI1_TXD/GPIO1_B0_U	SPI bus port 1,UART4 serial port	1.8V	I/O UP
33	GPIO1_A7/SPI1_RXD/UART4_RX_U	SPI1_RXD/GPIO1_A7_U	SPI bus port 1,UART4 serial port	1.8V	I/O UP
35	GPIO1_B1/SPI1_CLK/PMCU_JTAG_TCK_U	SPI1_CLK/GPIO1_B1_u	SPI bus port 1	1.8V	I/O UP
37	GPIO4_D4_D	DVP_PDN	Camera power down control output for rear	3.0V	I/O DOWN
39	NC	NC			
41	GPIO0_B1/PMUIO2_VOLSEL_D	PCIE_PWR_H	PCIE power enable	1.8V	I/O DOWN
43	GND3	GND	GND		
45	MIPI_TX1/RX1_D0P	MIPI_TX1/RX1_D0P	MIPI-DSI1/CSI1 differential lane 0 positive		
47	MIPI_TX1/RX1_D0N	MIPI_TX1/RX1_D0N	MIPI-DSI1/CSI1 differential lane 0 negative		
49	MIPI_TX1/RX1_D1P	MIPI_TX1/RX1_D1P	MIPI-DSI1/CSI1 differential lane 1 positive		
51	MIPI_TX1/RX1_D1N	MIPI_TX1/RX1_D1N	MIPI-DSI1/CSI1 differential lane 1 negative		
53	MIPI_TX1/RX1_CLKP	MIPI_TX1/RX1_CLKP	MIPI-DSI1/CSI1 differential clock lane positive		
55	MIPI_TX1/RX1_CLKN	MIPI_TX1/RX1_CLKN	MIPI-DSI1/CSI1 differential clock lane negative		
57	MIPI_TX1/RX1_D2P	MIPI_TX1/RX1_D2P	MIPI-DSI1/CSI1 differential lane 2 positive		
59	MIPI_TX1/RX1_D2N	MIPI_TX1/RX1_D2N	MIPI-DSI1/CSI1 differential lane 2 negative		
61	MIPI_TX1/RX1_D3P	MIPI_TX1/RX1_D3P	MIPI-DSI1/CSI1 differential lane 3 positive		
63	MIPI_TX1/RX1_D3N	MIPI_TX1/RX1_D3N	MIPI-DSI1/CSI1 differential lane 3 negative		

65	GND5	GND	GND		
67	MIPI_RX0_D3P	MIPI_RX0_D3P	MIPI-CSI0 differential lane 3 positive		
69	MIPI_RX0_D3N	MIPI_RX0_D3N	MIPI-CSI0 differential lane 3 positive		
71	MIPI_RX0_D2P	MIPI_RX0_D2P	MIPI-CSI0 differential lane 2 positive		
73	MIPI_RX0_D2N	MIPI_RX0_D2N	MIPI-CSI0 differential lane 2 negative		
75	MIPI_RX0_CLKP	MIPI_RX0_CLKP	MIPI-CSI0 differential clock lane positive		
77	MIPI_RX0_CLKN	MIPI_RX0_CLKN	MIPI-CSI0 differential clock lane negative		
79	MIPI_RX0_D1P	MIPI_RX0_D1P	MIPI-CSI0 differential lane 1 positive		
81	MIPI_RX0_D1N	MIPI_RX0_D1N	MIPI-CSI0 differential lane 1 negative		
83	MIPI_RX0_D0P	MIPI_RX0_D0P	MIPI-CSI0 differential lane 0 positive		
85	MIPI_RX0_D0N	MIPI_RX0_D0N	MIPI-CSI0 differential lane 0 negative		
87	GND_9	GND	GND		
89	PORT_HPD	HDMI_HPD	HDMI Hot Plug Detection interrupt with 5V tolerance		
91	GPIO4_C0/I2C3_SDA/UART2B_RX_U	I2C3_SDA_HDMI	I2C serial port 3,for HDMI, need external pull-up	3.0V	I/O UP
93	GPIO4_C1/I2C3_SCL/UART2B_TX_U	I2C3_SCL_HDMI	I2C serial port 3,for HDMI, need external pull-up	3.0V	I/O UP
95	GPIO4_C7/HDMI_CECINOUT/EDP_HOTPLUG_U	HDMI_CEC	HDMI CEC communication	3.0V	I/O UP
97	GND_11	GND	GND		
99	HDMI_TXCN	HDMI_TXCN	HDMI differential pixel clock negative		
101	HDMI_TXCP	HDMI_TXCP	HDMI differential pixel clock positive		
103	HDMI_TX0N	HDMI_TX0N	HDMI channel 0 differential serial data negative		
105	HDMI_TX0P	HDMI_TX0P	HDMI channel 0 differential serial data positive		
107	HDMI_TX1N	HDMI_TX1N	HDMI channel 1 differential serial data negative		
109	HDMI_TX1P	HDMI_TX1P	HDMI channel 1 differential serial data positive		
111	HDMI_TX2N	HDMI_TX2N	HDMI channel 2 differential serial data negative		
113	HDMI_TX2P	HDMI_TX2P	HDMI channel 2 differential serial data positive		
115	GND_13	GND	GND		
117	TYPEC0_AUXP_PD_PU	TYPEC0_AUXP_PD_PU	TYPEC0 AUX pull-up/pull-down polarityreversal pins.		
119	TYPEC0_AUXM_PU_PD	TYPEC0_AUXM_PU_PD	TYPEC0 AUX pull-up/pull-down polarityreversal pins.		
121	TYPEC0_AUXM	TYPEC0_AUXM	TYPEC0 AUX differential TX/RX serial data		
123	TYPEC0_AUXP	TYPEC0_AUXP	TYPEC0 AUX differential TX/RX serial data		
125	TYPEC0_RX1M	USB3_SSRXN	TYPEC0 negative half of first Super Speed RX differential pair		
127	TYPEC0_RX1P	USB3_SSRXP	TYPEC0 positive half of first Super Speed RX differential pair		
129	TYPEC0_TX1P	USB3_SSTXP	TYPEC0 positive half of first Super Speed TX differential pair.		

131	TYPEC0_TX1M	USB3_SSTXN	TYPEC0 negative half of first Super Speed TX differential pair		
133	TYPEC0_DP	TYPEC0_DP	TYPEC0 Data Plus port		
135	TYPEC0_DM	TYPEC0_DM	TYPEC0 Data Minus por		
137	TYPEC0_RX2M	TYPEC0_RX2M	TYPEC0 negative half of second SuperSpeedRX differential pair.		
139	TYPEC0_RX2P	TYPEC0_RX2P	TYPEC0 positive half of second SuperSpeedRX differential pair.		
141	TYPEC0_TX2P	TYPEC0_TX2P	TYPEC0 positive half of second SuperSpeedTX differential pair.		
143	TYPEC0_TX2M	TYPEC0_TX2M	TYPEC0 negative half of second SuperSpeedTX differential pair.		
145	TYPEC0_U2VBUSDET	TYPEC0_U2VBUSDET	TYPEC0 connected / vbus power detect for USB2.0		
147	GND_14	GND	GND		
149	PCIE_RX3_P	PCIE_RX3_P	PCIE differential lane 3 positive input		
151	PCIE_RX3_N	PCIE_RX3_N	PCIE differential lane 3 negative input		
153	PCIE_TX3P	PCIE_TX3P	PCIE differential lane 3 positive output		
155	PCIE_TX3N	PCIE_TX3N	PCIE differential lane 3 negative output		
157	PCIE_RX2_P	PCIE_RX2_P	PCIE differential lane 2 positive input		
159	PCIE_RX2_N	PCIE_RX2_N	PCIE differential lane 2 negative input		
161	PCIE_TX2P	PCIE_TX2P	PCIE differential lane 2 positive output		
163	PCIE_TX2N	PCIE_TX2N	PCIE differential lane 2 negative output		
165	PCIE_RX1_P	PCIE_RX1_P	PCIE differential lane 1 positive input		
167	PCIE_RX1_N	PCIE_RX1_N	PCIE differential lane 1 negative input		
169	PCIE_TX1P	PCIE_TX1P	PCIE differential lane 1 positive output		
171	PCIE_TX1N	PCIE_TX1N	PCIE differential lane 1 negative output		
173	PCIE_RX0_P	PCIE_RX0_P	PCIE differential lane 0 positive input		
175	PCIE_RX0_N	PCIE_RX0_N	PCIE differential lane 0 negative input		
177	PCIE_TX0P	PCIE_TX0P	PCIE differential lane 0 positive output		
179	PCIE_TX0N	PCIE_TX0N	PCIE differential lane 0 negative output		
181	PCIE_RCLK_100M_N	PCIE_RCLK_100M_N	PCIE 100MHz reference clock as input to PLL		
183	PCIE_RCLK_100M_P	PCIE_RCLK_100M_P	PCIE 100MHz reference clock as input to PLL		
185	GND_18	GND	GND		
187	HOST0_DP	HOST0_DP	USB HOST0 Data Plus port		
189	HOST0_DM	HOST0_DM	USB HOST0 Data Minus port		
191	GND_19	GND	GND		
193	HOST1_DP	HOST1_DP	USB HOST1 Data Plus port		
195	HOST1_DM	HOST1_DM	USB HOST1 Data Minus port		

197	GND_20	GND	GND		
199	EDP_TX3N	EDP_TX3N	eDP differential lane 3 negative output		
201	EDP_TX3P	EDP_TX3P	eDP differential lane 3 positive output		
203	EDP_TX2N	EDP_TX2N	eDP differential lane 2 negative output		
205	EDP_TX2P	EDP_TX2P	eDP differential lane 2 positive output		
207	EDP_TX1N	EDP_TX1N	eDP differential lane 1 negative output		
209	EDP_TX1P	EDP_TX1P	eDP differential lane 1 positive output		
211	EDP_TX0N	EDP_TX0N	eDP differential lane 0 negative output		
213	EDP_TX0P	EDP_TX0P	eDP differential lane 0 positive output		
215	EDP_AUXN	EDP_AUXN	eDP differential AUX channel positive output		
217	EDP_AUXP	EDP_AUXP	eDP differential AUX channel negative output		
219	GND_25	GND	GND		
221	POWER_ON	POWER_ON	Power on Signal Input, External connection Power key , active low		
223	PMIC_VDC	Adapter voltage detect input	Input Voltage 3V–12V		
225	VDDIO_WL_1	1.8V Power supply(LDO)	Output Voltage 1.8V,Rated output current 200mA		
227	VCC_LAN_1	3.3V Power supply(DCDC)	Output Voltage 3.3V,Rated output current 1A		
229	VCCA1V8_CODEC_1	1.8V Power supply(LDO)	Output Voltage 1.8V,Rated output current 400mA		
231	VCCA3V0_CODEC_1	3.0V Power supply(LDO)	Output Voltage 1.8V,Rated output current 300mA		
233	VCC_5V_S	System startup power supply	Input Voltage 3.3V–5.5V, Rated input current 50mA		
235	VCC3V3_SYS	3.3V Power supply(DCDC)	Output Voltage 3.3V,Rated output current 1A		
237	HP_SNS	HP_SNS	Reference ground for the headphone		
239	MIC2_IN	MIC2_IN	Negative input of the Microphone		
241	MIC1_IN	MIC1_IN	Positive input of the Microphone		
243	GND23	Power ground	Power ground		
245	GND25	Power ground	Power ground		
247	GND27	Power ground	Power ground		
249	GND29	Power ground	Power ground		
251	VCC_SYS_1	5V System power supply	Input Voltage 4.8V-5.5V		
253	VCC_SYS_3	5V System power supply	Input Voltage 4.8V-5.5V		
255	VCC_SYS_5	5V System power supply	Input Voltage 4.8V-5.5V		
257	VCC_SYS_7	5V System power supply	Input Voltage 4.8V-5.5V		
259	VCC_SYS_9	5V System power supply	Input Voltage 4.8V-5.5V		
2	GND2	GND	GND		

4	GPIO3_D0/I2S0_SCLK _D	I2S0_SCLK	I2S 0 port, for audio codec	1.8V	I/O DOWN
6	GPIO3_D1/I2S0_LRCK_RX_D	I2S0_LRCK_RX	I2S 0 port, for audio codec	1.8V	I/O DOWN
8	GPIO3_D2/I2S0_LRCK_TX_D	I2S0_LRCK_TX	I2S 0 port, for audio codec	1.8V	I/O DOWN
10	GPIO3_D3/I2S0_SDI0_D	I2S0_SDI0	I2S 0 port, for audio codec	1.8V	I/O DOWN
12	GPIO3_D7/I2S0_SDO0_D	I2S0_SDO0	I2S 0 port, for audio codec	1.8V	I/O DOWN
14	GPIO3_D4/I2S0_SDI1SDO3_D	I2S0_SDO3	I2S 0 port, for audio codec	1.8V	I/O DOWN
16	GPIO3_D5/I2S0_SDI2SDO2_D	I2S0_SDO2	I2S 0 port, for audio codec	1.8V	I/O DOWN
18	GPIO3_D6/I2S0_SDI3SDO1 _D	I2S0_SDO1	I2S 0 port, for audio codec	1.8V	I/O DOWN
20	GPIO4_A0/I2S_CLK_D	I2S_CLK	I2S MCLK, for both I2S0 and I2S1	1.8V	I/O DOWN
22	GPIO4_A1/I2C1_SDA _U	I2C1_SDA	I2C serial port 1,for Audio, Core board interiorl pull up Resistor 2.2K	1.8V	I/O UP
24	GPIO4_A2/I2C1_SCL_U	I2C1_SCL	I2C serial port 1,for Audio, Core board interiorl pull up Resistor 2.2K	1.8V	I/O UP
26	GND4	GND	GND		
28	3399PRO_ID	3399PRO_ID	Core board interiorl pull up Resistor 10K to 3.0V		
30	GND8	GND			
32	GND10	GND			
34	GND12	GND			
36	GND14	GND			
38	GND16	GND			
40	GND18	GND			
42	GPIO2_D3/SDIO0_PWREN_D	WIFI_REG_ON_H	WIFI module power enable	1.8V	I/O DOWN
44	GPIO0_A3/SDIO0_WRPT_D	WIFI_HOST_WAKE_L	WIFI module wake up AP	1.8V	I/O DOWN
46	GPIO2_C6/SDIO0_D2/SPI5_CLK_U	SDIO0_D2	SDIO0 data port , for WIFI module	1.8V	I/O UP
48	GPIO2_C7/SDIO0_D3/SPI5_CSN0 _U	SDIO0_D3	SDIO1 data port , for WIFI module	1.8V	I/O UP
50	GPIO2_D0/SDIO0_CMD_U	SDIO0_CMD	SDIO0 command output , for WIFI module	1.8V	I/O UP
52	GPIO2_D1/SDIO0_CLKOUT/TEST_CLKOU_U	SDIO0_CLK	SDIO0 clock output, for WIFI module	1.8V	I/O UP
54	GPIO2_C4/SDIO0_D0/SPI5_RXD _U	SDIO0_D0	SDIO0 data port , for WIFI module	1.8V	I/O UP
56	GPIO2_C5/SDIO0_D1/SPI5_TXD_U	SDIO0_D1	SDIO0 data port , for WIFI module	1.8V	I/O UP
58	GND20	GND	GND		
60	RTC_CLKO_WIFI	RTC_CLKO_WIFI	32.768K clock output to WIFI	1.8V	
62	GPIO2_D4/SDIO0_BKPWR_D	BT_REG_ON_H	BT module power enable	1.8V	I/O DOWN
64	GPIO2_C0/UART0_RX _U	UART0_RXD_BT	UART0 serial port, for BT module	1.8V	I/O UP
66	GPIO2_C1/UART0_TX_U	UART0_TXD_BT	UART0 serial port, for BT module	1.8V	I/O UP
68	GPIO2_C2/UART0_CTSN_U	UART0_CTS_BT	UART0 serial port, for BT module	1.8V	I/O UP

70	GPIO2_C3/UART0_RTSN _U	UART0_RTS_BT	UART0 serial port, for BT module	1.8V	I/O UP
72	GPIO2_D2/SDIO0_DETN/PCIE_CLKREQN_U	BT_WAKE_L	AP wake up BT module	1.8V	I/O UP
74	GPIO0_A5/EMMC_PWRON_U	BT_HOST_WAKE_L	BT module wake up AP	1.8V	I/O UP
76	GND24	GND	GND		
78	GPIO1_A1/ISP0_SHUTTER_TRIG/ISP1_SHUTTER_TRIG/_D	LCD_RST_L	LCD panel reset output	1.8V	I/O DOWN
80	GPIO4_D5_D	GPIO4_D5_D	GPIO	3.0V	I/O DOWN
82	GPIO2_B3/SPI2_CLK/VOP_DEN/CIF_CLKOUTA_U	SPI2_CLK/GPIO2_B3	SPI bus port 2	3.0V	I/O UP
84	GPIO2_B4/SPI2_CSN0_U	SPI2_CSN0/GPIO2_B4	SPI bus port 2	3.0V	I/O UP
86	GPIO2_B2/SPI2_TXD/CIF_CLKIN/I2C6_SCL_U	SPI2_TXD/GPIO2_B2	SPI bus port 2	3.0V	I/O UP
88	GPIO2_B1/SPI2_RXD/CIF_HREF/I2C6_SDA_U	SPI2_RXD/GPIO2_B1	SPI bus port 2	3.0V	I/O UP
90	GPIO2_A5/VOP_D5/CIF_D5_D	CIF_PWR	Camera power enable0	3.0V	I/O DOWN
92	NC	NC			
94	GPIO4_C2/PWM0/VOP0_PWM/VOP1_PWM_D	LCD_BL_PWM0	LCD panel backlight brightness control output	3.0V	I/O DOWN
96	GPIO4_C6/PWM1 _D	PWM1	PWM1 output	3.0V	I/O DOWN
98	GPIO0_A6/PWM3A_IR_D	IR_RX	IR receiver input	1.8V	I/O DOWN
100	GPIO4_C3/UART2C_RX_U	UART2C_RX	Uart2 serial port data input, for AP debug	3.0V	I/O UP
102	GPIO4_C4/UART2C_TX_U	UART2C_TX	Uart2 serial port data output ,for AP debug	3.0V	I/O UP
104	GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA_U	GPIO2_A0/I2C2_SDA	I2C serial port 2, need external pull–up	3.0V	I/O UP
106	GPIO2_A1/VOP_D1/CIF_D1/I2C2_SCL_U	GPIO2_A1/I2C2_SCL	I2C serial port 2, need external pull–up	3.0V	I/O UP
108	GPIO2_A7/VOP_D7/CIF_D7/I2C7_SDA_U	GPIO2_A7/I2C7_SDA	I2C serial port 7, need external pull–up	3.0V	I/O UP
110	GPIO2_B0/VOP_CLK/CIF_VSYNC/I2C7_SCL_U	GPIO2_B0/I2C7_SCL	I2C serial port 7, need external pull–up	3.0V	I/O UP
112	GPIO2_A2/VOP_D2/CIF_D2_D	GPIO2_A2	GPIO	3.0V	I/O DOWN
114	GPIO2_A3/VOP_D3/CIF_D3_D	GPIO2_A3	GPIO	3.0V	I/O DOWN
116	GPIO2_A6/VOP_D6/CIF_D6_D	GPIO2_A6	GPIO	3.0V	I/O DOWN
118	GPIO3_B2/MAC_RXER/I2C5_SDA_U_3V3	GPIO3_B2	GPIO	3.0V	I/O DOWN
120	GPIO2_A4/VOP_D4/CIF_D4_D_3V0	GPIO2_A4	GPIO	3.0V	I/O DOWN
122	NC3	NC			
124	GND26	GND			
126	MIPI_TX0_D3P	MIPI_TX0_D3P	MIPI–DSI0 differential lane 3 positive		
128	MIPI_TX0_D3N	MIPI_TX0_D3N	MIPI–DSI0 differential lane 3 negative		
130	MIPI_TX0_D2P	MIPI_TX0_D2P	MIPI–DSI0 differential lane 2 positive		
132	MIPI_TX0_D2N	MIPI_TX0_D2N	MIPI–DSI0 differential lane 2 negative		
134	MIPI_TX0_CLKP	MIPI_TX0_CLKP	MIPI–DSI0 differential clock lane positive		

136	MIPI_TX0_CLKN	MIPI_TX0_CLKN	MIPI–DSI0 differential clock lane negative		
138	MIPI_TX0_D1P	MIPI_TX0_D1P	MIPI–DSI0 differential lane 1 positive		
140	MIPI_TX0_D1N	MIPI_TX0_D1N	MIPI–DSI0 differential lane 1 negativ		
142	MIPI_TX0_D0P	MIPI_TX0_D0P	MIPI–DSI0 differential lane 0 positive		
144	MIPI_TX0_D0N	MIPI_TX0_D0N	MIPI–DSI0 differential lane 0 negativ		
146	GND28	GND			
148	ADC_IN0	ADC_IN0	Battery voltage input, Board ID detect input,Core board interiorl pull up Resistor 10K	1.8V	
150	ADC_IN1	ADC_IN1	ADC input, Core board interiorl pull up Resistor 10K	1.8V	
152	ADC_IN2_RECOVERY	RECOVER	AD keyboard input, Core board interiorl pull up Resistor 10K	1.8V	
154	ADC_IN3	ADC_IN3	ADC input, Core board interiorl pull up Resistor 10K	1.8V	
156	ADC_IN4	ADC_IN4	ADC input, Core board interiorl pull up Resistor 10K	1.8V	
158	GPIO0_B0/SDMMC0_WRPT/TEST_CLKOUT2_U	PCIE_WAKE_L	AP wake up PCIE	1.8V	I/O UP
160	GPIO4_D0/PCIE_CLKREQNB_U	PCIE_CLKREQ_L	PCIE CLKREQN	3.0V	I/O UP
162	GPIO0_B4/TCPD_VBUS_BDIS_D	PCIE_PERST#_L	PCIE Reset	1.8V	I/O DOWN
164	GND30	GND			
166	GPIO4_B1/SDMMC0_D1/UART2A_TX_U	SDMMC0_D1	SDMMC0 data port	1.8V/3.0V auto	I/O UP
168	GPIO4_B0/SDMMC0_D0/UART2A_RX_U	SDMMC0_D0	SDMMC0 data port	1.8V/3.0V auto	I/O UP
170	GPIO4_B2/SDMMC0_D2/APJTAG_TCK_U	SDMMC0_D2	SDMMC0 data port , JTAG TCK for AP	1.8V/3.0V auto	I/O UP
172	GPIO4_B5/SDMMC0_CMD/MCUJTAG_TMS_U	SDMMC0_CMD	SDMMC0 command output, JTAG TMS for MCU	1.8V/3.0V auto	I/O UP
174	GPIO4_B3/SDMMC0_D3/APJTAG_TMS_U	SDMMC0_D3	SDMMC0 data port , JTAG TMS for AP	1.8V/3.0V auto	I/O UP
176	GPIO4_B4/SDMMC0_CLKOUT/MUCJTAG_TCK_D	SDMMC0_CLK	SDMMC0 clock output, JTAG TCK for MCU	1.8V/3.0V auto	I/O DOWN
178	GPIO0_A7/SDMMC0_DET_U	SDMMC0_DET	SDMMC0 detect input	1.8V	I/O UP
180	GND32	GND			
182	GPIO3_B5/MAC_MDIO/UART1_TX_U	MAC_MDIO	MAC management command and data	3.3V	I/O UP
184	GPIO3_B3/MAC_CLK/I2C5_SCL_U	MAC_MDC	MAC management clock	3.3V	I/O UP
186	GPIO3_B0/MAC_MDC/SPI0_CSN1_U	PHY_TXCLK	MAC transmit clock	3.3V	I/O UP
188	GPIO3_B6/MAC_RXCLK/UART3_RX_U	MAC_RXCLK	MAC receive clock	3.3V	I/O UP
190	GND34	GND			
192	GPIO3_C1/MAC_TXCLK/UART3_RTSN_U_3V3	MAC_CLK	MAC reference clock output , I2C serial port 5, need external pull–up	3.3V	I/O UP
194	GPIO3_A7/MAC_RXD1/SPI0_CSN0_U_3V3	MAC_RXD1	MAC receive data	3.3V	I/O UP
196	GPIO3_A3/MAC_RXD3/SPI4_CSN0_U_3V3	MAC_RXD3	MAC receive data	3.3V	I/O UP
198	GPIO3_A6/MAC_RXD0/SPI0_CLK_U_3V3	MAC_RXD0	MAC receive data	3.3V	I/O UP

200	GPIO3_A2/MAC_RXD2/SPI4_CLK_U_3V3	MAC_RXD2	MAC receive data	3.3V	I/O UP
202	GPIO3_B1/MAC_RXDV_D_3V3	MAC_RXDV	MAC receive data valid	3.3V	I/O DOWN
204	GPIO3_A4/MAC_TXD0/SPI0_RXD_D_3V3	PHY_TXD0	MAC transmit data	3.3V	I/O DOWN
206	GPIO3_A0/MAC_TXD2/SPI4_RXD_D_3V3	PHY_TXD2	MAC transmit data	3.3V	I/O DOWN
208	GPIO3_A1/MAC_TXD3/SPI4_TXD_D_3V3	PHY_TXD3	MAC transmit data	3.3V	I/O DOWN
210	GPIO3_A5/MAC_TXD1/SPI0_TXD_D_3V3	PHY_TXD1	MAC transmit data	3.3V	I/O DOWN
212	GPIO3_B4/MAC_TXEN/UART1_RX_U_3V3	PHY_TXEN	MAC transmit enable	3.3V	I/O UP
214	GPIO3_C0/MAC_COL/UART3_CTSN/SPDIF_TX_U_3V3	PHY_INT	PHY interrupt input, I2C serial port 5, need external pull–up	3.3V	I/O UP
216	GPIO3_B7/MAC_CRS/UART3_TX/CIF_CLKOUTB_U_3V3	PHY_RST	MAC carrier sense detect	3.3V	I/O UP
218	RESET_L	RESET	system reset signal Input, External connection Reset key, active low		
220	EXT_EN_H	PMIC_EXT_EN	External Power enable output, Voltage 5V		
222	GND26	GND	GND		
224	VDDIO_WL_2	1.8V Power supply(LDO)	Output Voltage 1.8V,Rated output current 200mA		
226	VCC_LAN_2	3.3V Power supply(DCDC)	Output Voltage 3.3V,Rated output current 1A		
228	VCCA1V8_CODEC_2	1.8V Power supply(LDO)	Output Voltage 1.8V,Rated output current 400mA		
230	VCCIO_3V0_S0_2	3.0V Power supply(LDO)	Output Voltage 1.8V,Rated output current 300mA		
232	VCC_RTC	RTC Power supply	Input Voltage 3.3V-5.5V		
234	VCC3V3_SYS_2	3.3V Power supply(DCDC)	Output Voltage 3.3V,Rated output current 1A		
236	SPKP_OUT	SPKP_OUT	Positive speaker driver output		
238	SPKN_OUT	SPKN_OUT	Negative speaker driver output.		
240	HPL	HPL	Left channel output of the headphone		
242	HPR	HPR	Right channel output of the headphone		
244	GND36	Power ground	Power ground		
246	GND38	Power ground	Power ground		
248	GND40	Power ground	Power ground		
250	GND42	Power ground	Power ground		
252	VCC_SYS_2	5V System power supply	Input Voltage 4.8V-5.5V		
254	VCC_SYS_4	5V System power supply	Input Voltage 4.8V-5.5V		
256	VCC_SYS_6	5V System power supply	Input Voltage 4.8V-5.5V		
258	VCC_SYS_8	5V System power supply	Input Voltage 4.8V-5.5V		
260	VCC_SYS_10	5V System power supply	Input Voltage 4.8V-5.5V		

1. Company Profile

T-Chip Intelligent Technology Co., Ltd. was founded in 2005. It has more than 10 years of research and development experience in scientific and technological products, has 6 invention patents and more than 30 computer software copyrights, and is a national high-tech enterprise. We focus on the research and development, design, production and sales of open source intelligent hardware, internet of things and digital audio products, and provide the overall solution for intelligent hardware products meanwhile.

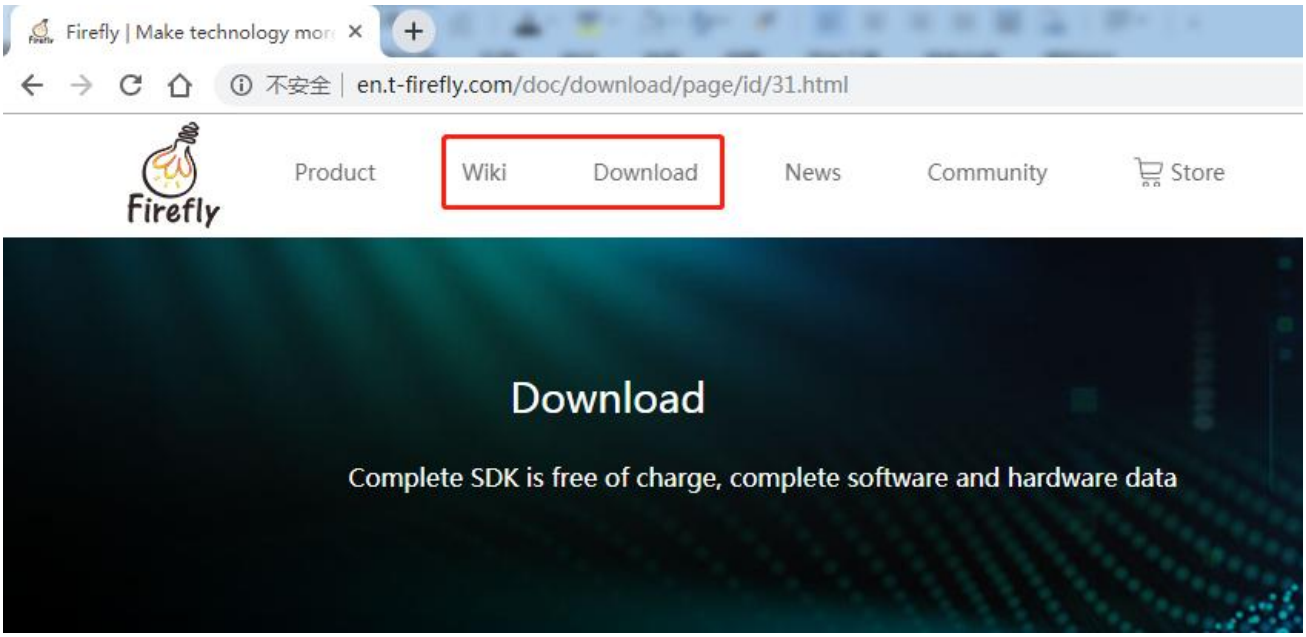
Firefly is a brand owned by T-chip Technology. It operates open source products, open source communities and online stores. It has a large number of enterprise users and developer users, and its products are well received by users. Firefly open source products include open source boards, core boards, industry mainboards, etc. The open-source board series is the recommended board card by chip original factory Rockchip and obtain the support of native SDK. The core boards and industrial mainboards are widely used in commercial displays, advertisement integrated machines, intelligent POS, face recognition terminals, internet of things, intelligent cities, etc. At present, there are more than 100,000 users, including over 2,000 enterprise users. And well-known users include ARM, Google, Baidu, Tencent, Alibaba, etc.

Firefly team has more than 60 research and development members and has the research and development capabilities in schematic design, PCB layout, mainboard production, embedded development, system development, application program development, etc., which accelerates the research and development process for many technology entrepreneurs and start-ups, and provides professional technical services..

" Make technology more simple, Make life more intelligent " is the idea of Firefly team. We hope to make the research and development of various technology products efficient and simple, and let intelligent technology integrate in our lives through the open source products and technical services of Firefly.

2. Source code acquisition

Please visit the official website : （ please click here ）



3.Contact Us

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