

SBC3588 Hardware Manual

V1.202506



Boardcon Embedded Design

www.boardcon.com

1.Introduction

1.1.About this Manual

This manual is intended to provide the user with an overview of the board and benefits, complete features specifications, and set up procedures. It contains important safety information as well.

1.2.Feedback and Update to this Manual

To help our customers make the most of our products, we are continually making additional and updated resources available on the Boardcon website(www.boardcon.com,www.armdesigner.com).

These include manuals,application notes, programming examples, and updated software and hardware. Check in periodically to see what's new!

When we are prioritizing work on these updated resources, feedback from customers is the number one influence, If you have questions, comments or concerns about your product or project, please no hesitate to contact us at support@armdesigner.com.

1.3.Limited Warranty

Boardcon warrants this product to be free of defects in material and workmanship for a period of one year from date of buy. During this warranty period Boardcon will repair or replace the defective unit in accordance with the following process:

A copy of the original invoice must be included when returning the defective unit to Boardcon. This limited warranty does not cover damages resulting from lighting or other power surges, misuse, abuse, abnormal conditions of operation,or attempts to alter or modify the function of the product.

This warranty is limited to the repair or replacement of the defective unit. In no event shall Boardcon be liable or responsible for any loss or damages, including but not limited to any lost profits,incidental or consequential damages, loss of business or anticipatory profits arising from the use or inability to use this product.

Repairs make after the expiration of the warranty period are subject to a repair charge and the cost of return shipping. Please contact Boardcon to arrange for any repair service and to obtain repair charge information.

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1 SBC3588 Introduction

1.1 Summary

The SBC3588 adopts Rockchip RK3588, integrates quad-core Cortex-A76 and quad-core Cortex-A55 with separately NEON coprocessor, NPU computing power up to 6TOPs, enable various AI scenarios, it can process up to 8K video encoding and decoding, ultra-high definition rendering, with super image processing capability and powerful network communication function. The SBC3588 has various interfaces, supporting 4G, WiFi&BT, Gigabit Ethernet, MIPI Camera and more. Which is suitable for ARM-based PC and edge computing devices, personal mobile Internet devices and other digital multimedia applications.

SBC3588 is implemented with a CM3588 computer-on-module providing most of the functions and interfaces. The rich feature set of SBC3588 is customizable according to the price/performance needs of the target application. SBC3588 contains expansion connectors which accommodate a wide range of standard peripheral devices. Wide input range switched power supply is compatible with requirements for telecom and automotive applications. SBC3588 is provided with full ready-to-run Android 12, debian and buildroot SW packages and comprehensive user manual and designing guide.

1.2 Rockchip RK3588 Features

- **Microprocessor**
 - Quad-core Cortex-A76 up to 2.4G.
 - Quad-core Cortex-A55 up to 1.8G.
- **Memory Organization**
 - On board memory
 - LPDDR4X up to 8GB.
 - EMMC5.1 up to 128GB.
 - External memory.
 - SPI NOR
- **Cortex-M0**
 - Two Cortex-M0 cooperate with Cortex-A76/Cortex-A55.
 - Integrated sleep modes for low power consumption.
 - Serial Wire Debug reduces the number of pins required for debugging.

- **PWM**

- Four on-chip PWMs with interrupt-based operation.
- Support capture mode and continuous mode or one-shot mode.

- **Watchdog**

- Three Watchdogs in SoC with 32 bits counter width.

- **Interrupt Controller**

- Support 8 PPI interrupt source and 148 SPI interrupt sources input.
- Support 16 software-triggered interrupts.

- **3D Graphics Engine**

- Arm Mali-T610MP4 GPU up to 4K supply.
- High performance OpenGL ES/3.2, Vulkan1.0, OpenCL2.0.
- Provide MMU and L2 Cache with 512KB size

- **Power unit**

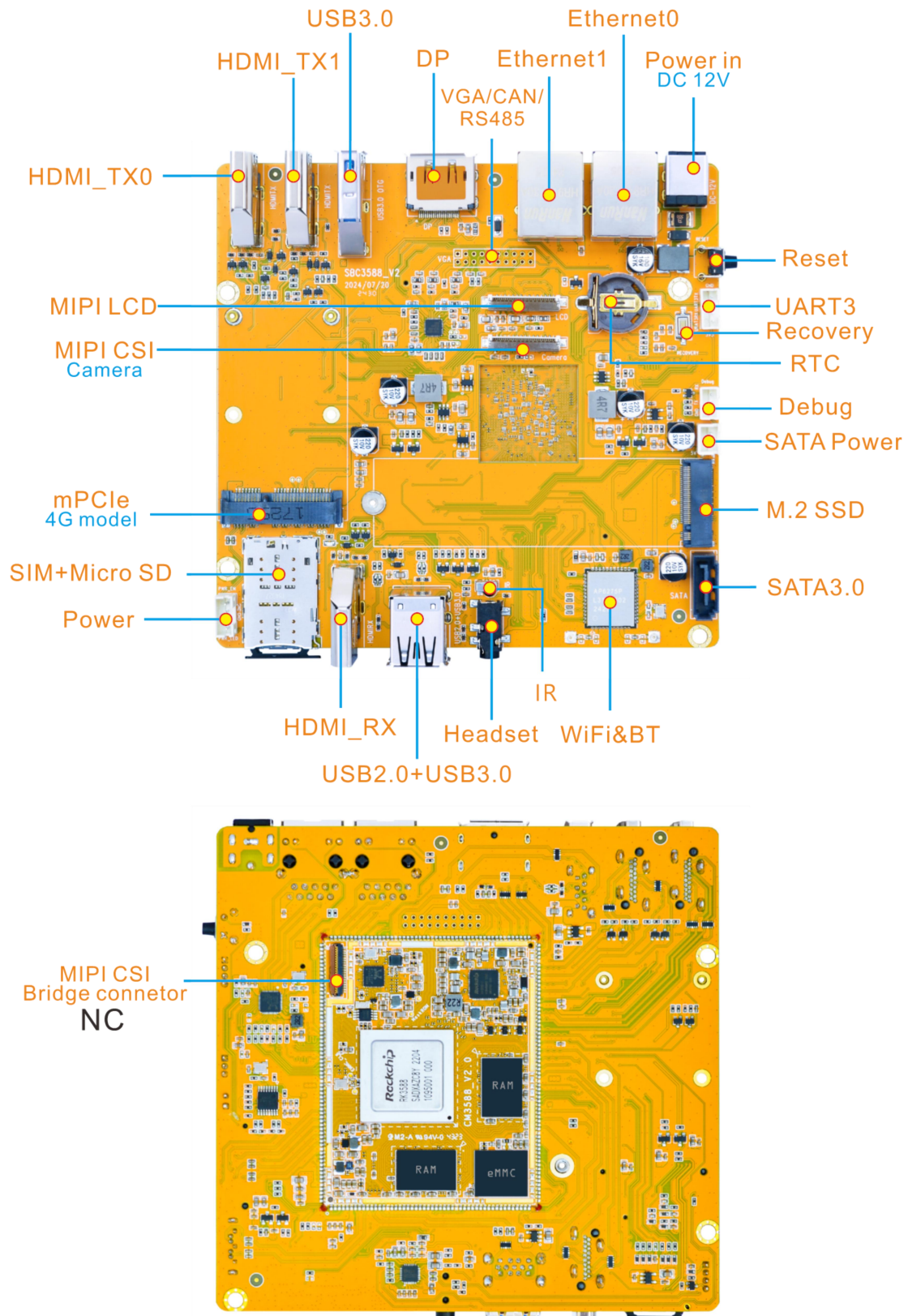
- RK3588 on board.
- Compatible with multiple mode power supply.
- Very low RTC consume current, less 7uA at 3V button Cell.

- **Temperature**

- Less 46°run video play (exposed board at 20°).
- Less 60°run AnTuTu test (exposed board at 20°)



1.3 SBC3588 Specifications

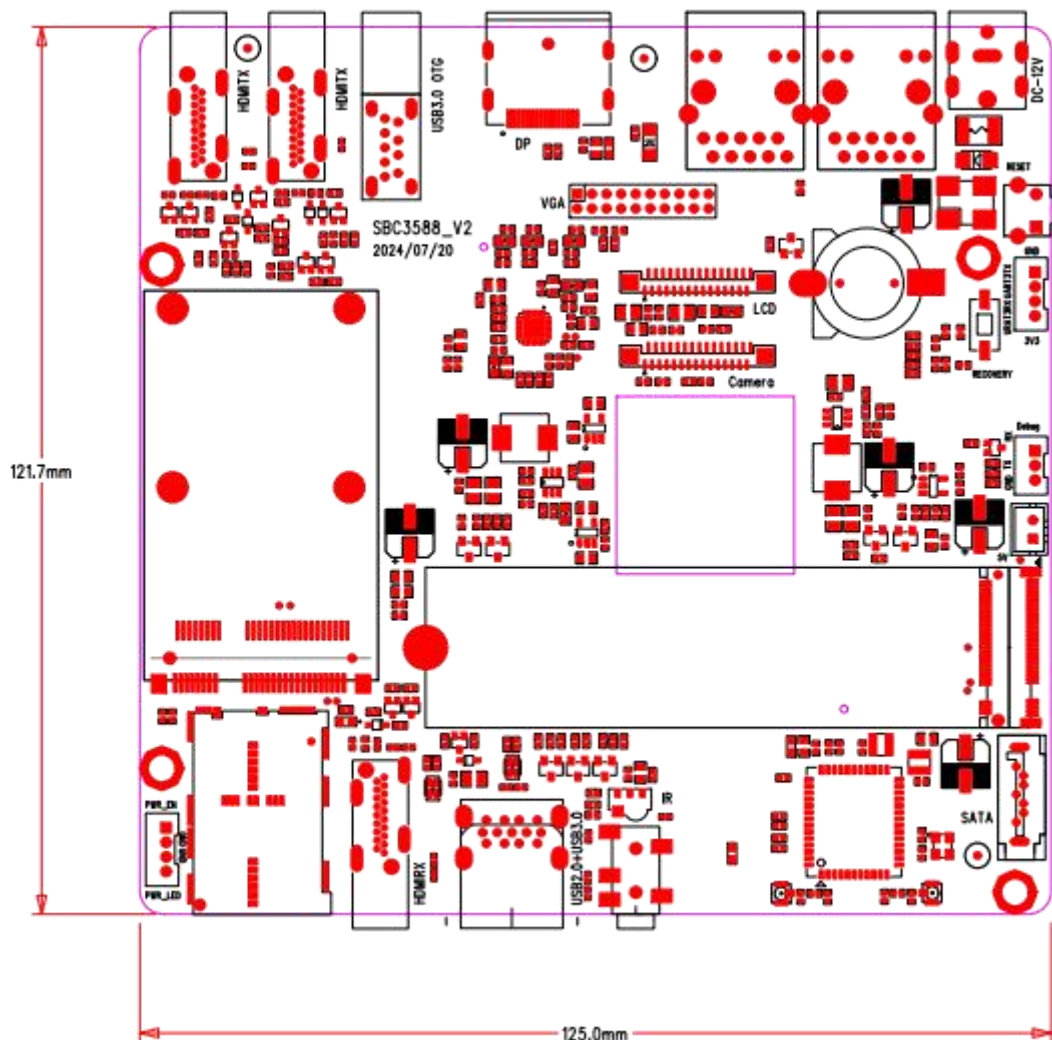


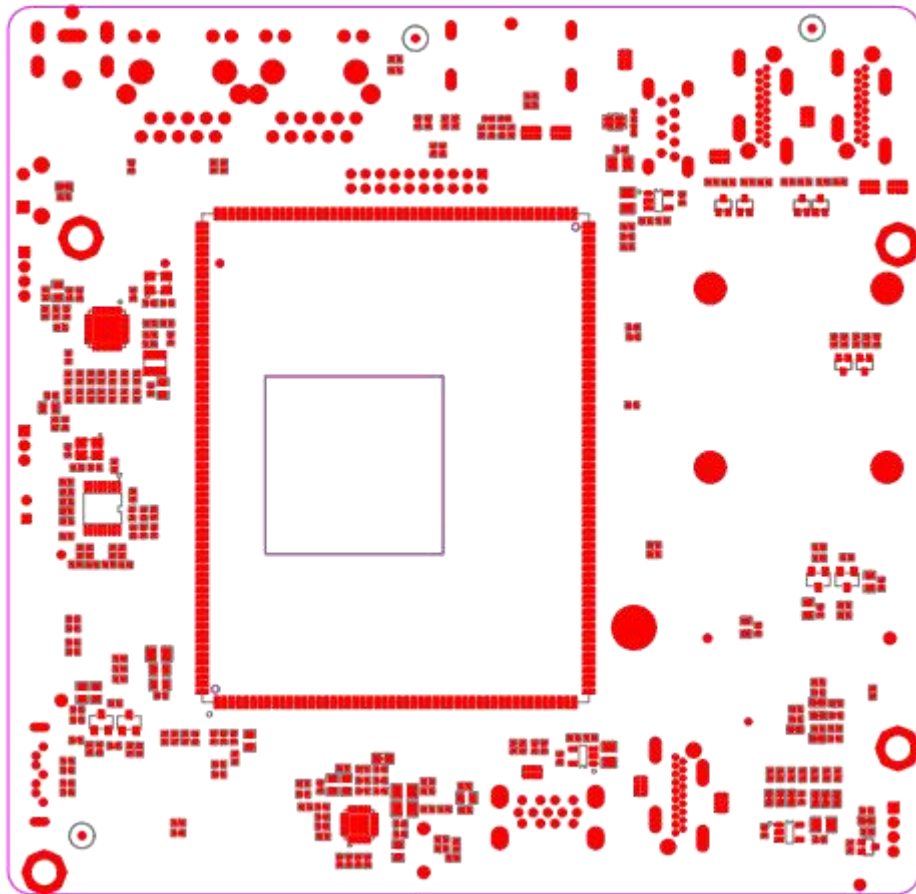


Feature	Specifications
CPU	Octa-core 64-bit size core architecture, Quad-core Cortex-A76+Quad-core Cortex-A55
GPU	•ARM Mali-G610 MC4 •OpenGL ES 1.1/2.0/3.1/3.2 •Vulkan 1.1,1.2 •OpenCL 1.1,1.2,2.0 •Embedded high performance 2D image acceleration module
Memory	8GB LPDDR4
Flash	32GB eMMC Flash
Power	DC 12V/3A
USB	1x USB2.0+ USB3.0 Host, dual-USB 1x USB3.0 Host / OTG, single-USB
UART3	1x 4pin connector. TTL level interface
Ethernet	Ethernet0 and Ethernet1 are Gigabit Ethernet RJ45 interface
DP	Display Port interface
HDMI	HDMI2.1 TX0, HDMI2.1 TX1, HDMI RX
MIPI LCD	MIPI LCD display interface up to 4Kp60
MIPI CSI	MIPI camera interface (IMX415)
Headset	Headset output / input interface
RTC	Real Time Clock, powered by external lithium battery
Debug	Debug the serial port, 3-pin connector
mPCIe	4G model interface (EC25)
SD card	1x T-Flash card
SIM card	1x SIM card slot
Keys&Switch	1x Power key, 1x Reset key, 1x Recovery key

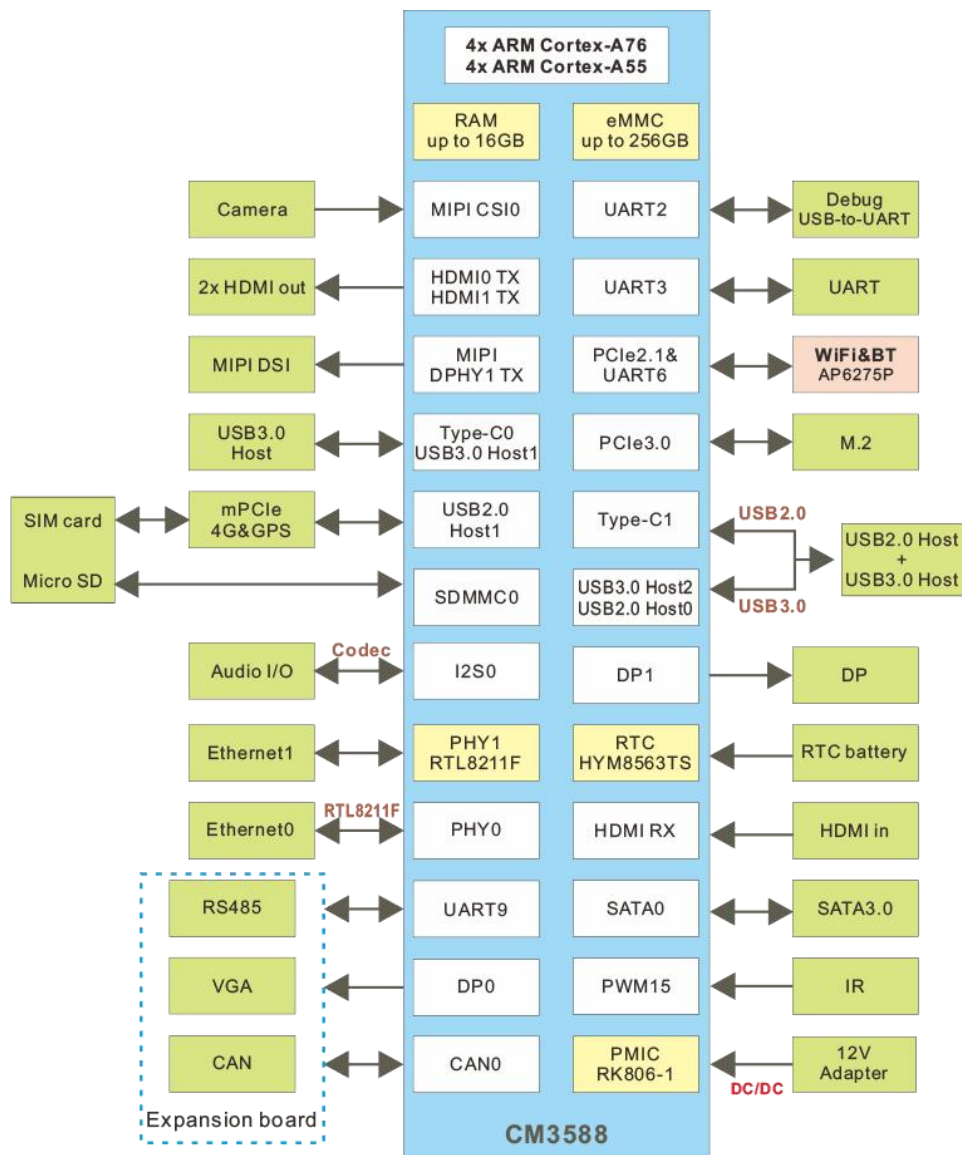
IR	infrared receiver
WIFI&BT	AP6275P Module.2.4/5G WiFi, Bluetooth 4.1
SATA3.0	SATA3.0 interface
SATA Power	SATA Power out interface, 5V
M.2 SSD	M.2 SSD interface
Dimension	121.7mm x 125mm

1.4 PCB Dimension





1.5 Block Diagram



1.6 CPU Introduction

The CPU module RK3588 is equipped with up to 8GB of LPDDR4 RAM and offers up to 128GB of eMMC5.1 Flash storage. It also supports an MXM3.0-314P card edge interface, providing flexibility and expandability for various applications.

CM3588 specifications

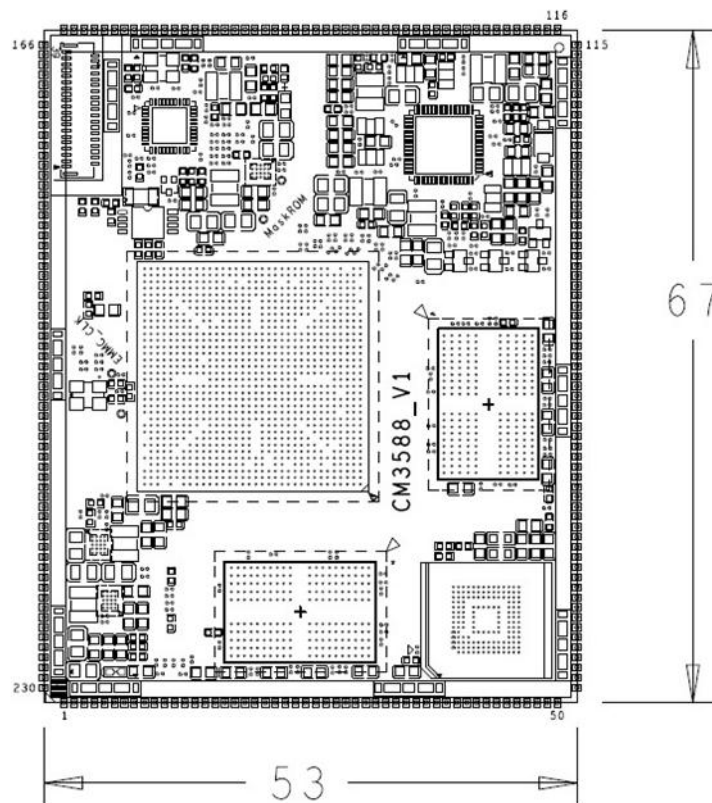
Pin number—230 pins

Dimension—67mm x 53mm

Layer—8 Layers, complying with EMS/EMI

Power supply—DC 3.3~4.5V Battery

Application—smart Device, advertising devices, all-in-one machines, POS systems, vehicle control terminals, etc.



Pin Definition

Pin	Signal	Description or functions	GPIO serial	IO Voltage
1	GPIO4_B0_d	BT1120_CLKOUT/CIF_CLKI N/PCIE30X2_PERSTn_M1	SPI2_CS1_M1	3.3V
2	DP1_HPDIN_M0	UART9_TX_M2/SPI0_CS1_ M3/PWM11_IR_M3	GPIO3_D5_d	3.3V
3	I2C6_SDA_M0	SPI0_MISO_M0/PWM6_M0 /PCIE30X4_WAKEn_M0	GPIO0_C7_d (PU2.2K)	3.3V
4	I2C6_SCL_M0	PWM7_IR_M0 /PCIE30X4_PERSTn_M0	GPIO0_D0_d (PU2.2K)	3.3V
5	GPIO3_D4_d	UART9_RX_M2/SPI0_CS0_ M3/PCIE30X2_PERSTn_M2	HDMI_TX0HPD_M1 /HDMI_RXHPDO_M1	3.3V
6	VCC_1V8	1.8V IO power output (PMU_Buck10)	(Max:500mA)	1.8V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
7	SATA30_0_RXN	SATA3 CH0 RXN		0.5V
8	SATA30_0_RXP	SATA3 CH0 RXP		0.5V
9	SATA30_0_TXN	SATA3 CH0 TXN		0.5V
10	SATA30_0_TXP	SATA3 CH0 TXP		0.5V
11	USB30_2_SSRXP	SATA3/USB30 CH2 RXP		0.5V
12	USB30_2_SSRXN	SATA3/USB30 CH2 RXN		0.5V
13	USB30_2_SSTXP	SATA3/USB30 CH2 TXP		0.5V
14	USB30_2_SSTXN	SATA3/USB30 CH2 TXN		0.5V
15	GND	Ground		0V
16	I2S0_SDO2_SDI3_1V8	UART6_RX_M2/I2C7_SDA_M0/SPI1_MOSI_M2	GPIO1_D1_d /PDM0_SDI1_M0	1.8V
17	I2S0_SDO3_SDI2_1V8	UART4_TX_M0/PWM0_M1/SPI1_CLK_M2	GPIO1_D2_d /PDM0_SDI2_M0	1.8V
18	I2S0_SDI1_1V8	UART4_RX_M0/PWM1_M1/SPI1_CS0_M2	GPIO1_D3_d /PDM0_SDI3_M0	1.8V
19	I2S0_SDI0_1V8		GPIO1_D4_d	1.8V
20	I2S0_MCLK_1V8	UART3_RTS_M0/PWM3_IR_M2/SPI4_CLK_M0	GPIO1_C2_d	1.8V
21	I2S0_SCLK_TX_1V8	UART3_CTS_M0/PWM7_IR_M2/SPI4_CS0_M0	GPIO1_C3_d	1.8V
22	I2S0_SCLK_RX_1V8	PWM11_IR_M2/SPI4_CS1_M0/I2C2_SDA_M3	GPIO1_C4_d /PDM0_CLK1_M0	1.8V
23	I2S0_LRCK_TX_1V8	UART4_RTS_M0 /I2C2_SCL_M3	GPIO1_C5_d	1.8V
24	I2S0_LRCK_RX_1V8	PWM15_IR_M2 /I2C4_SDA_M4	GPIO1_C6_d /PDM0_CLK0_M0	1.8V
25	I2S0_SDO1_1V8	UART6_TX_M2/I2C7_SCL_M0/SPI1_MISO_M2	GPIO1_D0_d	1.8V
26	I2S0_SDO0_1V8	UART4_CTS_M0 /I2C4_SCL_M4	GPIO1_C7_d	1.8V
27	I2C4_SDA_M3_1V8	UART6_RTS_M1/PWM0_M2 /SPI4_CLK_M2	GPIO1_A2_d (PU2.2K)	1.8V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
28	I2C4_SCL_M3_1V8	UART6_CTS_M1/PWM1_M2 /SPI4_CS0_M2	GPIO1_A3_d (PU2.2K)	1.8V
29	I2C2_SDA_M4_1V8	UART6_RX_M1/PD0_HPDI N_M2/SPI4_MISO_M2	GPIO1_A0_d (PU2.2K)	1.8V
30	I2C2_SCL_M4_1V8	UART6_TX_M1/PD1_HPDI N_M2/SPI4_MOSI_M2	GPIO1_A1_d (PU2.2K)	1.8V
31	MIPI_CAM2_CLKO_M0_1V8	UART1_RX_M1/SPDIF1_TX _M0/PWM13_M2/	GPIO1_B7_u	1.8V
32	GND	Ground		0V
33	PDM1_CLK0_M1_1V8	SPI0_CS0_M2	GPIO1_B4_u	1.8V
34	PDM1_SDI3_M1_1V8	SPI0_MOSI_M2/UART4_RX _M2/PCIE30X4_PERST_M3	GPIO1_B2_d	1.8V
35	PDM1_SDI2_M1_1V8	SPI0_MISO_M2 /PCIE30X4_WAKE_M3	GPIO1_B1_d	1.8V
36	PDM1_SDI1_M1_1V8	SPI2_CS1_M0 /PCIE30X4_CLKREQn_M3	GPIO1_B0_u	1.8V
37	PDM1_SDI0_M1_1V8	SPI2_CS0_M0/PWM3_IR_M 3/PCIE30X1_1_PERST_M2	GPIO1_A7_u	1.8V
38	PDM1_CLK1_M1_1V8	UART4_TX_M2/SPI0_CLK_ M2/PCIE30X1_0_WAKE_M2	GPIO1_B3_d	1.8V
39	HDMIIRX_HPDIOUT_M2_1V8	UART1_TX_M1/SPDIF0_TX _M0/PCIE30x2_WAKE_M3	GPIO1_B6_u	1.8V
40	HDMITX1_HPDIIN_M0_1V8	SPI2_CLK_M0	GPIO1_A6_d	1.8V
41	HDMITX0_HPDIIN_M0_1V8	SPI2_MOSI_M0	GPIO1_A5_d	1.8V
42	TYPEC0_SBU2_DC		GPIO0_D3_u	3.3V
43	TYPEC0_SBU1_DC	SPI0_CLK_M0/PWM5_M1 /PCIE30x4_CLKREQ_M0	GPIO0_C6_u	3.3V
44	PWM2_M0	DP0_HPDIIN_M1/PDM0_CLK _M1/PCIE30x1_0_Wake_M0	GPIO0_C4_d	3.3V
45	UART2_TX_M0_DEBU	PCIE30x1_1_CLKREQ_M0	GPIO0_B5_d	3.3V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
	G	/JTAG_TCK_M2	(Debug UART)	
46	UART2_RX_M0_DEBU G	PCIE30x1_1_WAKE_M0 /JTAG_TMS_M2	GPIO0_B6_d (Debug UART)	3.3V
47	CAN0_RX_M0	SPI0_MOSI_M0/PDM0_CLK 0_M1/I2C2_SDA_M0	GPIO0_C0_d /PWM1_M0	3.3V
48	CAN0_TX_M0	SPI0_CS1_M0/I2C2_SCL_M 0/PCIE30x1_PERST_M0	GPIO0_B7_d /PWM0_M0	3.3V
49	UART7_TX_M1		GPIO3_C0_d	3.3V
50	UART7_RX_M1		GPIO3_C1_d	3.3V
51	GND	Ground		0V
52	HDMITX0_SCL_M0	SPI3_CLK_M1/I2C5_SDA_M 1/BT1120_D13	GPIO4_B7_u	3.3V
53	SATA1_ACT_LED_M0	UART9RX_M1/SPI3MISO_M 1/BT1120-D11/HDMIRx_cec0	GPIO4_B5_d /PWM12_M1	3.3V
54	SATA0_ACT_LED_M0	I2C5SCL_M1/SPI3MOSI_M1 /BT1120_D12/HDMIRx_hpd0	GPIO4_B6_d /PWM13_M1	3.3V
55	HDMITX0_SDA_M0	SPI3_CS0_M1/I2C8_SCL_M 3/BT1120_D14	GPIO4_C0_u	3.3V
56	PCIE30X4_WAKEn_M 2_L	UART5Rx_M1/CAN2_Tx_M0 /SPI3_CS1_M3/CIF_D9 /HDMI_TX1_SDA_M1	GPIO3_C5_u	3.3V
57	PCIE30X4_PERSTn_M 2_L	SPI3_MISO_M3/CIF_D10 /HDMI_TX1_SCL_M1	GPIO3_C6_u	3.3V
58	PCIE30X4_CLKREQn_ M2_L	UART5Tx_M1/CAN2_Rx_M0 /SPI3_CS0_M3/CIF_D8 /HDMI_TX1_CEC_M1	GPIO3_C4_u	3.3V
59	HDMI_RX_SDA_M1	UART9CTS_M2/SPI0CLK_M 3/I2C7SDA_M2/CIF_D15	GPIO3_D3_d /PWM10_M2	3.3V
60	HDMI_RX_SCL_M1	UART9RTS_M2/SPI0MOSI_ M3/I2C7SCL_M2/CIF_D14	GPIO3_D2_d/ PCIE30x2_clkreq_M2	3.3V
61	HDMI_RX_CEC	UART4_TX_M1/SPI0_MISO _M3/CIF_D13	GPIO3_D1_d /PWM9_M2	3.3V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
62	I2C5_SDA_M0	UART4_RX_M1/SPI3_CLK_M3/CIF_D12/HDMI_TX0_SDA_M2	GPIO3_D0_u /PWM8_M2	3.3V
63	I2C5_SCL_M0	SPI0_MOSI_M3/CIF_D11/HDMI_TX0_SCL_M2	GPIO3_C7_u/PCIE2 0X1_2_CLKREQ_M0	3.3V
64	HDMITX0_CEC_M0	SPI3_CS1_M1/I2C8SDA_M3 /SPDIF1TX_M2/BT1120_D15	GPIO4_C1_d	3.3V
65	GPIO4_B2_U	CAN1RX_M1/UART8RTS_M0/SPI0CS0_M0/BT1120_D8	PWM14_M1/CIF_HREF/I2C7_SCL_M3	3.3V
66	PWM15_IR_M1	CAN1TX_M1/UART8CTS_M0/I2C7_SDA_M3/BT1120_D9	GPIO4_B3_u /CIF_VSYNC	3.3V
67	USB_OTG_PWREN_H _GPIO4_A7	SPI2_CS0_M1/I2C5_SDA_M2/BT1120_D7/CIF_D7	GPIO4_A7_d	3.3V
68	GND	Ground		0V
69	USB20_HOST0_DM			1.8V
70	USB20_HOST0_DP			1.8V
71	USB20_HOST1_DM			1.8V
72	USB20_HOST1_DP			1.8V
73	TYPEC1_USB20_OTG _DM			1.8V
74	TYPEC1_USB20_OTG _DP			1.8V
75	SDMMC0_CMD	CAN0_TX_M1/UART5_RX_M0/PDM1_CLK1_M0	GPIO4_D4_u /PWM7_IR_M1	3.3V
76	SDMMC0_D3	UART5_RTS_M0/PDM1_SDI0_M0/I2C8_SDA_M0	GPIO4_D3_u /PWM10_M1	3.3V
77	SDMMC0_D2	UART5_CTS_M0/PDM1_SDI1_M0/I2C8_SCL_M0	GPIO4_D2_u	3.3V
78	SDMMC0_D1	UART2_RX_M1/PDM1_SDI2_M0/I2C3_SDA_M4	GPIO4_D1_u /PWM9_M1	3.3V
79	SDMMC0_D0	UART2_TX_M1/PDM1_SDI3_M0/I2C3_SCL_M4	GPIO4_D0_u /PWM8_M1	3.3V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
80	SDMMC0_CLK	CAN0_RX_M1/UART5_TX_ M0/PDM1_CLK0_M0	GPIO4_D5_d	3.3V
81	GND	Ground		0V
82	HDMI_RX_CLKP			0.5V
83	HDMI_RX_CLKN			0.5V
84	HDMI_RX_D0N			0.5V
85	HDMI_RX_D0P			0.5V
86	HDMI_RX_D2N			0.5V
87	HDMI_RX_D2P			0.5V
88	HDMI_RX_D1N			0.5V
89	HDMI_RX_D1P			0.5V
90	HDMI0_TX_SBDP/eDP 0_TX_AUXP	HDMI0_TX_eARC+ /eDP0_TX_AUXP	(Default HDMI)	0.5V
91	HDMI0_TX_SBDN/eDP 0_TX_AUXN	HDMI0_TX_eARC- /eDP0_TX_AUXN	(Default HDMI)	0.5V
92	HDMI0_TX3P	HDMI0TX_CLKP/eDP0TX3P	(Default HDMI)	0.5V
93	HDMI0_TX3N	HDMI0TX_CLKN/eDP0TX3N	(Default HDMI)	0.5V
94	HDMI0_TX2P	HDMI0_TX/eDP0_TX2P	(Default HDMI)	0.5V
95	HDMI0_TX2N	HDMI0_TX/eDP0_TX2N	(Default HDMI)	0.5V
96	HDMI0_TX1P	HDMI0_TX/eDP0_TX1P	(Default HDMI)	0.5V
97	HDMI0_TX1N	HDMI0_TX/eDP0_TX1N	(Default HDMI)	0.5V
98	HDMI0_TX0P	HDMI0_TX/eDP0_TX0P	(Default HDMI)	0.5V
99	HDMI0_TX0N	HDMI0_TX/eDP0_TX0N	(Default HDMI)	0.5V
100	VCC_3V3	3.3V IO power output (PMU_Buck8)	(Max:500mA)	3.3V
101	HDMI1_TX_SBDP/eDP 1_TX_AUXP	HDMI1_TX_eARC+ /eDP1_TX_AUXP	(Default EDP)	0.5V
102	HDMI1_TX_SBDN/eDP 1_TX_AUXN	HDMI1_TX_eARC- /eDP1_TX_AUXN	(Default EDP)	0.5V
103	HDMI1_TX3P	HDMI1TX_CLKP/eDP1TX3P	(Default EDP)	0.5V
104	HDMI1_TX3N	HDMI1TX_CLKN/eDP1TX3N	(Default EDP)	0.5V
105	HDMI1_TX0N	HDMI1_TX/eDP1_TX0N	(Default EDP)	0.5V
106	HDMI1_TX0P	HDMI1_TX/eDP1_TX0P	(Default EDP)	0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
107	HDMI1_TX1N	HDMI1_TX/eDP1_TX1N	(Default EDP)	0.5V
108	HDMI1_TX1P	HDMI1_TX/eDP1_TX1P	(Default EDP)	0.5V
109	HDMI1_TX2N	HDMI1_TX/eDP1_TX2N	(Default EDP)	0.5V
110	HDMI1_TX2P	HDMI1_TX/eDP1_TX2P	(Default EDP)	0.5V
111	GND	Ground		0V
112	DP1_TX0N	TYPEC1_RX1N/DP1_TX0N	(Default DP)	0.5V
113	DP1_TX0P	TYPEC1_RX1P/DP1_TX0P	(Default DP)	0.5V
114	DP1_TX1N	TYPEC1_TX1N/DP1_TX1N	(Default DP)	0.5V
115	DP1_TX1P	TYPEC1_TX1P/DP1_TX1P	(Default DP)	0.5V
116	DP1_TX2N	TYPEC1_RX2N/DP1_TX2N	(Default DP)	0.5V
117	DP1_TX2P	TYPEC1_RX2P/DP1_TX2P	(Default DP)	0.5V
118	DP1_TX3P	TYPEC1_TX2P/DP1_TX3P	(Default DP)	0.5V
119	DP1_TX3N	TYPEC1_TX2N/DP1_TX3N	(Default DP)	0.5V
120	DP1_AUXP	TYPEC1_SBU1/DP1_AUXP	(Default DP)	0.5V
121	DP1_AUXN	TYPEC1_SBU2/DP1_AUXN	(Default DP)	0.5V
122	GND	Ground		0V
123	TYPEC0_USB20_OTG_DP	USB download Port		1.8V
124	TYPEC0_USB20_OTG_DM	USB download Port		1.8V
125	TYPEC0_SBU1/DP0_AUXP	TYPEC0_SBU1/DP0_AUXP	(Default TYPE-C)	0.5V
126	TYPEC0_SBU2/DP0_AUXN	TYPEC0_SBU2/DP0_AUXN	(Default TYPE-C)	0.5V
127	PWR_EN	Power Key input		3.3~4.2V
128	TYPEC0_USB20_OTG_ID	USB20 OTG ID input		1.8V
129	TYPEC0_USB20_VBUS_DET	USB OTG VBUS detect input		3.3V
130	MIPI_DPHY1_TX_D0P			0.5V
131	MIPI_DPHY1_TX_D0N			0.5V
132	MIPI_DPHY1_TX_D1P			0.5V
133	MIPI_DPHY1_TX_D1N			0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
134	MIPI_DPHY1_TX_CLK P			0.5V
135	MIPI_DPHY1_TX_CLK N			0.5V
136	MIPI_DPHY1_TX_D2P			0.5V
137	MIPI_DPHY1_TX_D2N			0.5V
138	MIPI_DPHY1_TX_D3P			0.5V
139	MIPI_DPHY1_TX_D3N			0.5V
140	GND	Ground		0V
141	TYPEC0_SSRX1N	TYPEC0_RX1N/DP0_TX0N	(Default TYPE-C)	0.5V
142	TYPEC0_SSRX1P	TYPEC0_RX1P/DP0_TX0P	(Default TYPE-C)	0.5V
143	TYPEC0_SSTX1P	TYPEC0_TX1P/DP0_TX1P	(Default TYPE-C)	0.5V
144	TYPEC0_SSTX1N	TYPEC0_TX1N/DP0_TX1N	(Default TYPE-C)	0.5V
145	TYPEC0_SSRX2N	TYPEC0_RX2N/DP0_TX2N	(Default TYPE-C)	0.5V
146	TYPEC0_SSRX2P	TYPEC0_RX2P/DP0_TX2P	(Default TYPE-C)	0.5V
147	TYPEC0_SSTX2P	TYPEC0_TX2P/DP0_TX3P	(Default TYPE-C)	0.5V
148	TYPEC0_SSTX2N	TYPEC0_TX2N/DP0_TX3N	(Default TYPE-C)	0.5V
149	GND	Ground		0V
150	SPDIF0_TX_M1	UART9TX_M1/BT1120_D10/ PCIE30X4_CLKREQ_M1 /DP0_HPDIN_M0	GPIO4_B4_u /PWM11_IR_M1	3.3V
151	PCIE30X1_1_PERSTn _M1_L	SPI0_CLK_M1 /BT1120_D2/CIF_D2	GPIO4_A2_d	3.3V
152	UART3_RX_M2	SPI2_CLK_M1/I2C5_SCL_M 2/BT1120_D6/CIF_D6/ PCIE30X2_CLKREQ_M1	GPIO4_A6_d	3.3V
153	UART3_TX_M2	SPI2_MOSI_M1/I2C3_SDA_ M2/BT1120_D5/CIF_D5/ PCIE30X1_0_PERST_M1	GPIO4_A5_d	3.3V
154	UART0_RX_M2	SPI2_MISO_M1/I2C3_SCL_ M2/BT1120_D4/CIF_D4/ PCIE30X1_0_WAKE_M1	GPIO4_A4_d	3.3V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
155	UART0_TX_M2	BT1120_D3/CIF_D3/ PCIE30X1_0_CLKREQ_M1	GPIO4_A3_d	3.3V
156	PCIE30x1_1_CLKREQ n_M1_L	SPI0_MISO_M1/UART9_RT S_M1/BT1120_D0/CIF_D0	GPIO4_A0_d	3.3V
157	PCIE30X1_1_WAKEn_ M1_L	SPI0_MOSI_M1/UART9_CT S_M1/BT1120_D1/CIF_D1	GPIO4_A1_d	3.3V
158	PHY1_MDI0+			0.5V
159	PHY1_MDI0-			0.5V
160	PHY1_MDI1+			0.5V
161	PHY1_MDI1-			0.5V
162	PHY1_MDI2+			0.5V
163	PHY1_MDI2-			0.5V
164	PHY1_MDI3+			0.5V
165	PHY1_MDI3-			0.5V
166	PHY1_LED2/CFG_LD O1	Ethernet Speed LED	(PD 10K)	3.3V
167	PHY1_LED1/CFG_LD O0	Ethernet Link LED	(PD 10K)	3.3V
168	GND	Ground		0V
169	RECOVERY_SARADC _VIN1	Program need short to GND when power on.	(PU 10K)	1.8V
170	SARADC_VIN5			1.8V
171	VCC_RTC	RTC button Cell power input		1.8~3.3V
172	RTC32KOUT_WIFI	32.768kHz output	(PU 10K)	1.8V
173	SDMMC_DET_1V8	SD Card Detection	(Need pull up)	1.8V
174	MIPI_CSI0_RX_CLK1P	CSI0_RX1_CLKP		0.5V
175	MIPI_CSI0_RX_CLK1N	CSI0_RX1_CLKN		0.5V
176	MIPI_CSI0_RX_D3P	CSI0_RX0_D3P/RX1_D1P		0.5V
177	MIPI_CSI0_RX_D3N	CSI0_RX0_D3N/RX1_D1N		0.5V
178	MIPI_CSI0_RX_D2P	CSI0_RX0_D2P/RX1_D0P		0.5V
179	MIPI_CSI0_RX_D2N	CSI0_RX0_D2N/RX1_D0N		0.5V
180	MIPI_CSI0_RX_CLK0P	CSI0_RX0_CLKP		0.5V
181	MIPI_CSI0_RX_CLK0N	CSI0_RX0_CLKN		0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
182	MIPI_CSI0_RX_D1P	CSI0_RX0_D1P		0.5V
183	MIPI_CSI0_RX_D1N	CSI0_RX0_D1N		0.5V
184	MIPI_CSI0_RX_D0P	CSI0_RX0_D0P		0.5V
185	MIPI_CSI0_RX_D0N	CSI0_RX0_D0N		0.5V
186	GND	Ground		0V
187	I2S2_SDO_M0_GMAC 0-MCK_1V8	SPI3_CS1_M0 /I2C7_SCL_M1	GPIO4_C3_d /PWM4_M1	1.8V
188	SDIO_CLK_M0_GMAC 0-TCK_1V8	I2C3_SDA_M3 /FSPI_CLK_M1	GPIO2_B3_d	1.8V
189	I2S2_LRCK_M0_GMA C0-TE_1V8	UART1_RTS_M0/SPI1_CLK _M0/I2C2_SDA_M1	GPIO2_C0_d	1.8V
190	GMAC0-TD0_1V8	UART1_RX_M0/I2S2_MCLK _M0/I2C5_SCL_M4	GPIO2_B6_d	1.8V
191	I2S2_SCLK_M0_GMA C0-TD1_1V8	UART1_TX_M0 /I2C5_SDA_M4	GPIO2_B7_d	1.8V
192	SDIO_D3_M0_GMAC0 -TD2_1V8	UART6_CTS_M0/FSPI_D3_ M1/I2C8_SDA_M1	GPIO2_B1_u	1.8V
193	SDIO_CMD_M0_GMA C0-TD3_1V8	I2C3_SCL_M3	GPIO2_B2_u	1.8V
194	SDIO_D2_M0_GMAC0 -RCK_1V8	UART6_RTS_M0/FSPI_D2_ M1/I2C8_SCL_M1	GPIO2_B0_u	1.8V
195	GMAC0-RV_1V8	UART7_RTS_M0 /SPI3_CS0_M0	GPIO4_C2_d /PWM2_M2	1.8V
196	GMAC0-RD0_1V8	UART1_CTS_M0/SPI1_MIS O_M0/I2C2_SCL_M1	GPIO2_C1_d	1.8V
197	UART9_TX_M0_GMAC 0-RD1_1V8	SPI1_MOSI_M0 /I2C6_SDA_M2	GPIO2_C2_d	1.8V
198	SDIO_D0_M0_GMAC0 -RD2_1V8	UART6_RX_M0 /FSPI_D0_M1	GPIO2_A6_u	1.8V
199	SDIO_D1_M0_GMAC0 -RD3_1V8	UART6_TX_M0 /FSPI_D1_M1	GPIO2_A7_u	1.8V
200	GND	Ground		0V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
201	PCIE20_1_TXP/SATA3 0_1_TXP	PCIE or SATA interface		0.5V
202	PCIE20_1_TXN/SATA3 0_1_TXN	PCIE or SATA interface		0.5V
203	PCIE20_1_RXP/SATA3 0_1_RXP	PCIE or SATA interface		0.5V
204	PCIE20_1_RXN/SATA3 0_1_RXN	PCIE or SATA interface		0.5V
205	PCIE20_1_REFCLKP			0.5V
206	PCIE20_1_REFCLKN			0.5V
207	PCIE30_PORT0_RX0P			0.5V
208	PCIE30_PORT0_RX0N			0.5V
209	PCIE30_PORT0_RX1P			0.5V
210	PCIE30_PORT0_RX1N			0.5V
211	PCIE30_PORT0_REFC LKP_IN			0.5V
212	PCIE30_PORT0_REFC LKN_IN			0.5V
213	PCIE30_PORT0_TX0P			0.5V
214	PCIE30_PORT0_TX0N			0.5V
215	PCIE30_PORT0_TX1P			0.5V
216	PCIE30_PORT0_TX1N			0.5V
217	GND	Ground		0V
218	UART9_RX_M0_1V8	SPI1_CS1_M0 /HDMI_TX1_CEC_M0	GPIO2_C4_d	1.8V
219	UART9_CTSn_M0_GM AC0-MDI_1V8	SPI3_MOSI_M0	GPIO4_C5_d /PWM6_M2	1.8V
220	UART9_RTSn_M0_GM AC0-MDC_1V8	SPI3_MISO_M0 /I2C7_SDA_M1	GPIO4_C4_d /PWM5_M2	1.8V
221	SPI3_CLK_M0_1V8	UART_7CTS_M0 /GMAC0_TXER	GPIO4_C6_d /PWM7_IR_M3	1.8V
222	I2S2_SDI_M0_1V8	SPI1_CS0_M0/I2C6_SCL_M 2/ETH0_REFCLKO_25M	GPIO2_C3_d	1.8V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
223	I2C3_SDA_M0_1V8	UART3_RX_M0 /SPI4_MISO_M0	GPIO1_C0_z (PU2.2K)	1.8V
224	I2C3_SCL_M0_1V8	UART3_TX_M0 /SPI4_MOSI_M0	GPIO1_C1_z (PU2.2K)	1.8V
225	RESET_L	System Reset(to RST_KEY)		1.8V
226	GND	Ground		0V
227	VCC_SYS	System Power Input		4.0V
228	VCC_SYS	System Power Input		4.0V
229	VCC_SYS	System Power Input		4.0V
230	VCC_SYS	System Power Input		4.0V

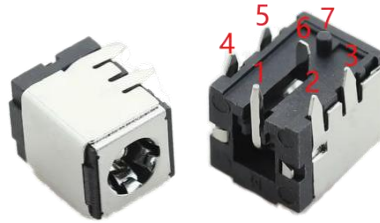
Note:

Could be add DC common resistor for level shift circuit when HDMI1 used.

When DP1 exchange to TYPE C or USB3.0 need change some parts.Connect to me please.

2 Peripherals Introduction

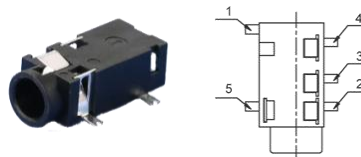
2.1 DC-12V(P1)



The DC JACK is metal enclosure full package, 7-pin plug Type. Typical 12V/3A DC adapter.

Pin	Signal	Description	Pin	Signal	Description
1	VDD12V	Main power supply. DC 12V power in	2	GND	Ground
3	GND	Ground	4	GND	Ground
5	GND	Ground	6	GND	Ground
7	NC	Not connect			

2.2 Audio I/O(J9)



The SBC3588 adopts audio codec ES8388, provides stereo audio output/input.

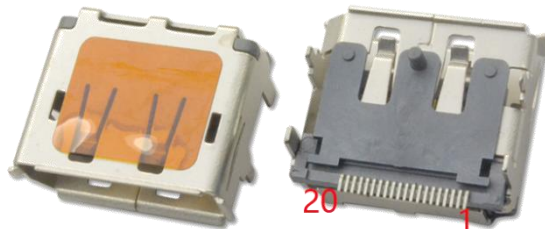
Feature

- Low power
- Integrated ADC and DAC
- IIS transfer audio data
- Stereo output, support recording

Pin	Signal	Description	Pin	Signal	Description
1	HP_GND	Headphone Ground	2	ROUT2	Headphone amplifier output_Right channel
3	LOUT2	Headphone amplifier output_Left channel	4	HP_DET_L	The signal pin for detecting the insertion status of the headphones
5	INP_PHONE_MIC	Receive audio			

		signal	
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2.3 DP(J10)



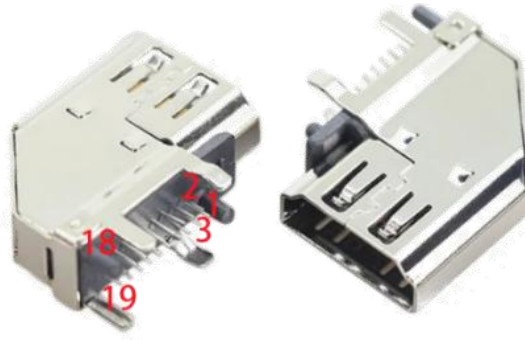
SBC3588 DP supports up to 8K@30fps output, regular 20pins, with width 16.50mm and thickness 4.76mm.

Feature

- The rolled edge design is convenient for surface mount installation
- Four-foot fixing to ensure stable connection.
- Equipped with positioning pillars for accurate alignment and assembly.
- It has a spring but no jamming points, is easy to plug and unplug, reduces wear and tear and extends service life.

Pin	Signal	Description	Pin	Signal	Description
1	DP1_TX0P	DisplayPort 1 Transmitted Data+	2	GND	Ground
3	DP1_TX0N	DisplayPort 1 Transmitted Data-	4	DP1_TX1P	DisplayPort 1 Transmitted Data+
5	GND	Ground	6	DP1_TX1N	DisplayPort 1 Transmitted Data-
7	DP1_TX2P	DisplayPort 1 Transmitted Data+	8	GND	Ground
9	DP1_TX2N	DisplayPort 1 Transmitted Data-	10	DP1_TX3P	DisplayPort 1 Transmitted Data+
11	GND	Ground	12	DP1_TX3N	DisplayPort 1 Transmitted Data-
13	GND	Ground	14	GND	Ground
15	DP_TX_AUXP	DisplayPort Auxiliary Transmitted Data+	16	GND	Ground
17	DP_TX_AUXN	DisplayPort Auxiliary Transmitted Data-	18	DP_TX_HPD_PORT	DisplayPort Hot Plug Detect Port
19	GND	Ground	20	VCC_3V3	3.3V Power Supply

2.4 HDMI RX(J6)/TX(J2,J5)



SBC3588 HDMI supports up to 8Kp60 output and up to 4Kp60 input, regular 19pins HDMI type A, with high 14.00mm and thickness 4.55mm.

Features

- Transmits high-quality audio signals, including support for various audio formats and audio synchronization.
- Features a nickel-plated copper shell for enhanced durability and corrosion resistance.
- Compatible with a wide range of HDMI-enabled devices, including smart TVs, gaming consoles and more.
- Side(side insertion)type, making it easy to integrate into various devices.

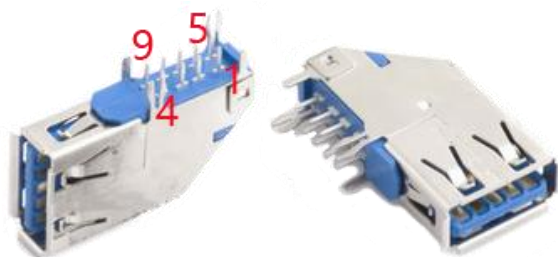
J6					
Pin	Signal	Description	Pin	Signal	Description
1	HDMI_RX_D2P	HDMI Data 2 Positive	2	GND	Ground
3	HDMI_RX_D2N	HDMI Data 2 Negative	4	HDMI_RX_D1P	HDMI Data 1 Positive
5	GND	Ground	6	HDMI_RX_D1N	HDMI Data 1 Negative
7	HDMI_RX_D0P	HDMI Data 0 Positive	8	GND	Ground
9	HDMI_RX_D0N	HDMI Data 0 Negative	10	HDMI_RX_CLK P	HDMI Clock Positive
11	GND	Ground	12	HDMI_RX_CLK N	HDMI Clock Negative
13	HDMI_RX_CE C_PORT	HDMI Consumer Electronics Control	14	NC	Not connect
15	HDMI_RXDDC_SCL_PORT	HDMI DDC I2C Clock Line	16	HDMI_RXDDC_SDA_PORT	HDMI DDC I2C Data Line
17	GND	Ground	18	VCC5V_HDMIRX_PORT	5V power supply
19	HDMI_RX_HP D_PORT	HDMI Hot Plug Detect			

J2					
Pin	Signal	Description	Pin	Signal	Description
1	HDMI1_TX2P_PORT	HDMI1 Transmit Data 2+	2	GND	Ground
3	HDMI1_TX2N_PORT	HDMI1 Transmit Data 2-	4	HDMI1_TX1P_PORT	HDMI1 Transmit Data 1+
5	GND	Ground	6	HDMI1_TX1N_PORT	HDMI1 Transmit Data 1-
7	HDMI1_TX0P_PORT	HDMI1 Transmit Data 0+	8	GND	Ground
9	HDMI1_TX0N_PORT	HDMI1 Transmit Data 0-	10	HDMI1_TX3P_PORT	HDMI1 Transmit Data 3+
11	GND	Ground	12	HDMI1_TX3N_PORT	HDMI1 Transmit Data 3-
13	HDMI1_TX_CEC_PORT	HDMI1 Consumer Electronics Control	14	HDMI1_eARC+	HDMI1 Extended Audio Return Channel+
15	HDMI1_TX_SCL_PORT	HDMI1 I2C Clock Line	16	HDMI1_TX_SDA_PORT	HDMI1 I2C Data Line
17	GND	Ground	18	VCC5V_HDMI_TX1	5V Power Supply
19	HDMI1_TX_HP_D_PORT	HDMI1 Hot Plug Detect Port			

J5					
Pin	Signal	Description	Pin	Signal	Description
1	HDMI0_TX2P_PORT	HDMI0 Transmit Data 2+	2	GND	Ground
3	HDMI0_TX2N_PORT	HDMI0 Transmit Data 2-	4	HDMI0_TX1P_PORT	HDMI0 Transmit Data 1+
5	GND	Ground	6	HDMI0_TX1N_PORT	HDMI0 Transmit Data 1-
7	HDMI0_TX0P_PORT	HDMI0 Transmit Data 0+	8	GND	Ground
9	HDMI0_TX0N_PORT	HDMI0 Transmit Data 0-	10	HDMI0_TX3P_PORT	HDMI0 Transmit Data 3+
11	GND	Ground	12	HDMI0_TX3N_PORT	HDMI0 Transmit Data 3-
13	HDMI0_TX_CEC_PORT	HDMI0 Consumer Electronics Control	14	HDMI0_eARC+	HDMI0 Extended Audio Return Channel+
15	HDMI0_TX_SCL_PORT	HDMI0 I2C Clock Line	16	HDMI0_TX_SDA_PORT	HDMI0 I2C Data Line

17	GND	Ground	18	VCC5V_HDMI_TX0	5V power supply
19	HDMI0_TX_HP D_PORT	HDMI0 Transmit Hot Plug Detect			

2.5 USB 3.0 OTG(J12)



SBC3588 USB3.0 OTG port, it is used to download image and ADB transfer file, or use a docking station to connect USB device. Regular 9pins, with high 14.70mm and thickness 5.12mm.

Feature

- Providing super speed data transfer capabilities.
- The connector adopts the AF (Angled Female) side insertion design, which is convenient for plugging and unplugging as well as connecting devices.
- Supports USB Type-C OTG function, allowing the device to switch between host and device modes, providing a wider range of application scenarios.

Pin	Signal	Description	Pin	Signal	Description
1	VCC5V0_USB30_HOST0	5V Power Supply for USB 3.0 Host 0	2	TYPEC0_DM	USB Type-C Data Minus
3	TYPEC0_DP	USB Type-C Data Plus	4	GND	Ground
5	USB30_HOST1_SSRXN	USB 3.0 Host 1 Single-Ended RX Negative	6	USB30_HOST1_SSRXP	USB 3.0 Host 1 Single-Ended RX Positive
7	GND	Ground	8	USB30_HOST1_SSTXN	USB 3.0 Host 1 Single-Ended TX Negative
9	USB30_HOST1_SSTXP	USB 3.0 Host 1 Single-Ended TX Positive			

2.6 USB 2.0+USB 3.0(P3)



SBC3588 provides 1x USB 2.0/3.0 Host. The USB_A_30 interface is designed to support both USB 2.0 and USB 3.0 standards, providing backward compatibility and high-speed data transfer capabilities. It is used to connect a wide range of USB devices, such as external hard drives, USB flash drives, USB hubs, and other peripherals and supports hot-plug functionality.

Feature

- Supports USB 2.0 (480 Mbps) and USB 3.0 (5 Gbps) data transfer rates.
- Backward compatible with USB 2.0 devices.
- Supports automatic switching between bus-and self-powered modes.
- Provides robust power management for connected devices.
- Compliant with USB 2.0/3.0 specifications.

Pin	Signal	Description	Pin	Signal	Description
1	VCC5V0_USB30_HOST1	5V Power Supply for USB 3.0 Host 1	2	USB20_HOST0_DM	USB 2.0 Host 0 Data Minus
3	USB20_HOST0_DP	USB 2.0 Host 0 Data Plus	4	GND	Ground
5	USB30_HOST2_SSRXN	USB 3.0 Host 2 Single-Ended RX Negative	6	USB30_HOST2_SSRXP	USB 3.0 Host 2 Single-Ended RX Positive
7	GND	Ground	8	USB30_HOST2_SSTXN	USB 3.0 Host 2 Single-Ended TX Negative
9	USB30_HOST2_SSTXP	USB 3.0 Host 2 Single-Ended TX Positive	10	VCC5V0_USB30_HOST1	5V Power Supply for USB 3.0 Host 1
11	TYPEC1_DM	USB Type-C Data Minus	12	TYPEC1_DP	USB Type-C Data Plus
13	GND	Ground	14	GND	Ground
15	GND	Ground	16	GND	Ground
17	GND	Ground			

2.7 Ethernet(JP1,JP2)



SBC3588 adopts RTL8211F as the Ethernet chip. RJ45 connector.

Feature

- Supports 10/100/1000-Mbps data transfer rates with the RGMII interfaces
- Supports both full-duplex and half-duplex operation
- Supports IEEE 802.1Q VLAN tag detection for reception frames

JP1					
Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	PHY0_MD I0+	Ethernet PHY0 Media Dependent Interface 0 Positive
3	PHY0_MDI 0-	Ethernet PHY0 Media Dependent Interface 0 Negative	4	PHY0_MD I1+	Ethernet PHY0 Media Dependent Interface 1 Positive
5	PHY0_MDI 2+	Ethernet PHY0 Media Dependent Interface 2 Positive	6	PHY0_MD I2-	Ethernet PHY0 Media Dependent Interface 2 Negative
7	PHY0_MDI 1-	Ethernet PHY0 Media Dependent Interface 1 Negative	8	PHY0_MD I3+	Ethernet PHY0 Media Dependent Interface 3 Positive
9	PHY0_MDI 3-	Ethernet PHY0 Media Dependent Interface 3 Negative	10	GND	Ground
11	PHY0_LED 2/CFG_LD O1	Ethernet PHY0 LED2 or Configuration for LDO1	12	GND	Ground
13	GND	Ground	14	PHY0_LED1/CFG_LDO0	Ethernet PHY0 LED1 or Configuration for LDO0

JP2					
Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	PHY1_MD	Ethernet PHY0 Media

				I0+	Dependent Interface 0 Positive
3	PHY1_MDI 0-	Ethernet PHY0 Media Dependent Interface 0 Negative	4	PHY1_MD I1+	Ethernet PHY0 Media Dependent Interface 1 Positive
5	PHY1_MDI 2+	Ethernet PHY0 Media Dependent Interface 2 Positive	6	PHY1_MD I2-	Ethernet PHY0 Media Dependent Interface 2 Negative
7	PHY1_MDI 1-	Ethernet PHY0 Media Dependent Interface 1 Negative	8	PHY1_MD I3+	Ethernet PHY0 Media Dependent Interface 3 Positive
9	PHY1_MDI 3-	Ethernet PHY0 Media Dependent Interface 3 Negative	10	GND	Ground
11	PHY1_LED 2/CFG_LD O1	Ethernet PHY0 LED2 or Configuration for LDO1	12	GND	Ground
13	GND	Ground	14	PHY1_LED1/CFG_LDO0	Ethernet PHY0 LED1 or Configuration for LDO0

2.8 SSD(J8900)



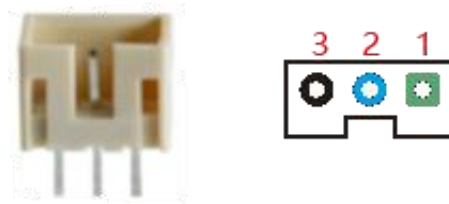
M.2 M key socket (PCIe) for NVMe SSD.

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	VCC3V3_PCI E30	3.3V PCIe 3.0 Supply
3	GND	Ground	4	VCC3V3_PCI E30	3.3V PCIe 3.0 Supply
5	NC	Not connect	6	NC	Not connect
7	NC	Not connect	8	NC	Not connect
9	NC	Not connect	10	NC	Not connect
11	NC	Not connect	20	NC	Not connect
21	GND	Ground	22	NC	Not connect
23	NC	Not connect	24	NC	Not connect



25	NC	Not connect	26	NC	Not connect
27	GND	Ground	28	NC	Not connect
29	PCIE30_PORT0_RX1N	PCle 3.0 RX1 Negative	30	NC	Not connect
31	PCIE30_PORT0_RX1P	PCle 3.0 RX1 Positive	32	NC	Not connect
33	GND	Ground	34	NC	Not connect
35	PCIE30_TX1_N	PCle 3.0 TX1 Negative	36	NC	Not connect
37	PCIE30_TX1_P	PCle 3.0 TX1 Positive	38	NC	Not connect
39	GND	Ground	40	NC	Not connect
41	PCIE30_PORT0_RX0N	PCle 3.0 RX0 Negative	42	NC	Not connect
43	PCIE30_PORT0_RX0P	PCle 3.0 RX0 Positive	44	NC	Not connect
45	GND	Ground	46	NC	Not connect
47	PCIE30_TX0_N	PCle 3.0 TX0 Negative	48	NC	Not connect
49	PCIE30_TX0_P	PCle 3.0 TX0 Positive	50	PCIE30X2_PE_RSTn_3V3_L	PCle 3.0 Reset
51	GND	Ground	52	PCIE30X2_CL_KREQn_3V3_L	PCle 3.0 Clock Request
53	PCIE30_REFCLKN_CON	PCle 3.0 Ref Clock Negative	54	PCIE30X2_WAKEn_3V3_L	PCle 3.0 Wake
55	PCIE30_REFCLKP_CON	PCle 3.0 Ref Clock Positive	56	NC	Not connect
57	GND	Ground	58	NC	Not connect
67	NC	Not connect	68	NC	Not connect
69	NC	Not connect	70	VCC3V3_PCI E30	3.3V PCle 3.0 Supply
71	GND	Ground	72	VCC3V3_PCI E30	3.3V PCle 3.0 Supply
73	GND	Ground	74	VCC3V3_PCI E30	3.3V PCle 3.0 Supply
75	GND	Ground			

2.9 Debug(J3)



3-pin connector. The debug serial port baud rate is 1500000.

Pin	Signal	Description	Pin	Signal	Description
1	UART2_RX_DEBUG	UART2 serial data input	2	UART2_TX_DEBUG	UART2 serial data output
3	GND	Ground			

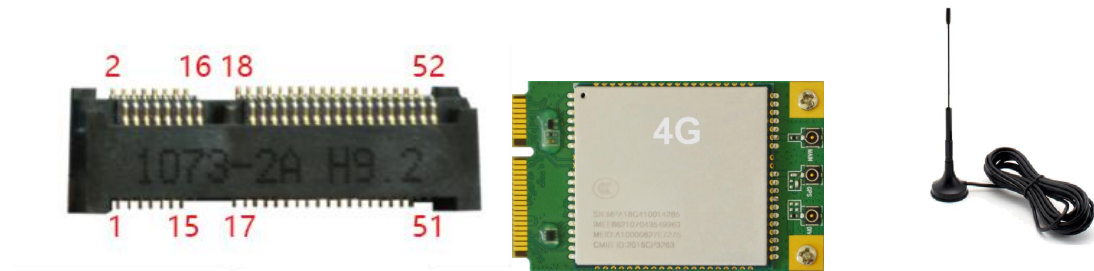
2.10 User Buttons(K1, K2)



Key	Signal	Description	Key	Signal	Description
K1	Reset_KEY	Reset	K2	RECOVER_KEY	Recover

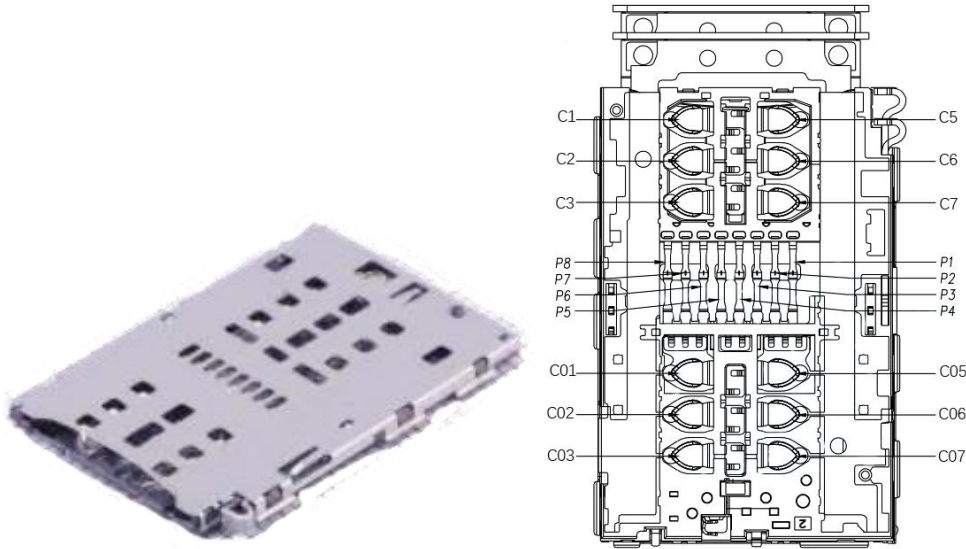
2.11 4G Module(J8700)

SBC3588 adopts the standard PCI Express®MiniCard form factor (MiniPCle) and provides global network coverage on the connectivity of LTE. It delivers 50Mbps-up and 100Mbps-down data rates on LTE FDD networks and can also be fully backward compatible with existing UMTS and GSM/GPRS networks.



Pin	Signal	Description	Pin	Signal	Description
1	OUT1	Line output	2	VCC3V3_MINIPCI	3.3V MiniPCIe Supply
3	GND	Ground	4	GND	Ground
5	MICP	MIC+	6	NC	Not connect
7	MICN	MIC-	8	SIM_VCC	SIM power
9	GND	Ground	10	SIM_DATA	SIM data
11	NC	Not connect	12	SIM_CLK	SIM Clock
13	NC	Not connect	14	SIM_RST	SIM Reset
15	GND	Ground	16	NC	Not connect
17	NC	Not connect	18	GND	Ground
19	NC	Not connect	20	NC	Not connect
21	GND	Ground	22	PCIE_RST	PCIe Reset
23	NC	Not connect	24	VCC3V3_MINIPCI	3.3V MiniPCIe Supply
25	NC	Not connect	26	GND	Ground
27	GND	Ground	28	NC	Not connect
29	GND	Ground	30	NC	Not connect
31	NC	Not connect	32	NC	Not connect
33	NC	Not connect	34	GND	Ground
35	GND	Ground	36	MINIPCI_USB_DM	MiniPCIe USB Data-
37	GND	Ground	38	MINIPCI_USB_DP	MiniPCIe USB Data+
39	VCC3V3_MINIPCI	3.3V MiniPCIe Supply	40	GND	Ground
41	VCC3V3_MINIPCI	3.3V MiniPCIe Supply	42	LED_WWAN	LED
43	GND	Ground	44	NC	Not connect
45	NC	Not connect	46	NC	Not connect
47	NC	Not connect	48	NC	Not connect
49	NC	Not connect	50	GND	Ground
51	NC	Not connect	52	VCC3V3_MINIPCI	3.3V MiniPCIe Supply

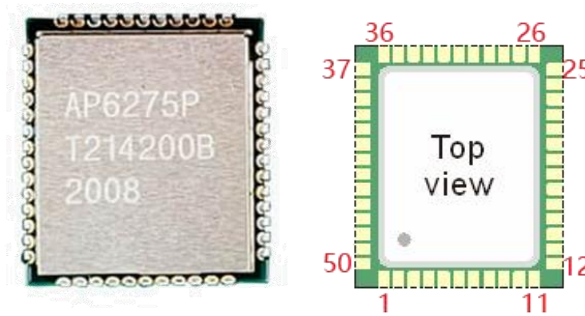
2.12 SIM+SD(J9502)



SBC3588 adopts the advanced Nano SIM card connector designed for seamless integration with wireless communication devices. It supports the standard Nano SIM card format, making it compatible with a wide range of 3G/4G modules for efficient wireless transmission.

Pin	Signal	Description	Pin	Signal	Description
P1	SDMMC0_D2	SDMMC0 Data Line 2	P2	SDMMC0_D3	SDMMC0 Data Line 3
P3	SDMMC0_CMD	SDMMC0 Command Signal	P4	VDD5V	5V Power Supply
P5	SDMMC0_CLK	SDMMC0 Clock Signal	P6	GND	Ground
P7	SDMMC0_D0	SDMMC0 Data Line 0	P8	SDMMC0_D1	SDMMC0 Data Line 1
C1	SIM_VCC	SIM Power Supply	C2	SIM_RST	SIM Reset Signal
C3	SIM_CLK	SIM Clock Signal	C5	GND	Ground
C6	SIM_VCC	SIM Power Supply	C7	SIM_DATA	SIM Data Signal
C01	SIM_VCC	SIM Power Supply	C02	SIM_RST	SIM Reset Signal
C03	SIM_CLK	SIM Clock Signal	C05	GND	Ground
C06	SIM_VCC	SIM Power Supply	C07	SIM_DATA	SIM Data Signal

2.13 WiFi&Bluetooth(U4)



AP6275P is a fully Wi-Fi and Bluetooth functionalities module with seamless roaming capabilities and advance security, The module complies with IEEE 802.11 a/b/g/n/ac/ax 2x2 Access Points with MIMO standard and can accomplish up to speed of 1200Mbps with dual stream in 802.11ax to connect the wireless LAN. Furthermore AP6275P included PCIe interface for Wi-Fi, UART/PCM interface for Bluetooth.

Features

- Dual-stream spatial multiplexing up to 1200 Mbps data rate.
- 20,40,80 MHz channels with optional SGI. (1024 QAM modulation), IEEE 802.11ax beam forming.
- Supports 2 antennas with two for shared BT and WLAN port.
- BT host digital interface:
 - HCI UART (up to 4 Mbps)
 - PCM for audio data
- Complies with Bluetooth Core Specification Version 5.0 with provisions for supporting future specifications. With Bluetooth Class 1 or Class2 transmitter operation.
- Supports extended synchronous connections (eSCO), for enhanced voice quality by allowing for retransmission of dropped packets.
- Adaptive frequency hopping (AFH) for reducing radio frequency interference.

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	WL/BT_ANT0	WIFI/Buletooth Antenna
3	GND	Ground	4	GND	Ground
5	GND	Ground	6	GND	Ground
7	GND	Ground	8	GND	Ground
9	WL_ANT1	RF I/O port1	10	GND	Ground
11	GND	Ground	12	PCIE20_PERSTn_1V8	PCIe 2.0 Perst(Reset Signal,1.8V Level)
13	XIN_WIFI	WIFI Crystal Input	14	XOUT_WIFI	WIFI Crystal Output

15	WIFI_REG_ON	WIFI Regulator On	16	WIFI_WAKE_HOS T_H	WIFI Wake Host Signal
17	NC	Not Connect	18	NC	Not Connect
19	NC	Not Connect	20	NC	Not Connect
21	NC	Not Connect	22	NC	Not Connect
23	GND	Ground	24	PCIE20_WAKEn_ 1V8	PCle 2.0 Wake Signal(1.8V Level)
25	GND	Ground	26	GND	Ground
27	GND	Ground	28	GND	Ground
29	GND	Ground	30	GND	Ground
31	32KOUT_WIFI	WIFI 32kHz Clock Output	32	GND	Ground
33	REFCLKN_WIFI	WIFI Reference Clock Negative	34	VCC_1V8	1.8V Power Supply
35	REFCLKP_WIFI	WIFI Reference Clock Positive	36	VCC3V3_PCIEWL _VBAT	3.3V Power Supply for PCle/Wifi
37	PCIE20_CLKRE Qn_1V8	PCle 2.0 Clock Request Signal	38	BT_REG_ON	Bluetooth Regulator On
39	GND	Ground	40	UART6_RX_M1	UART 6 Receive Signal
41	UART6_TX_M1	UART 6 Transmit Signal(M1)	42	UART6_CTSn_M1	UART 6 Clear to Send Signal(M1)
43	UART6_RTSn_M 1	UART 6 Request to Send Signal(M1)	44	PCIE_RXN	PCle Receive Negative
45	PCIE_RXP	PCle Receive Positive	46	PCIE_TXN	PCle Transmit Negative
47	PCIE_TXP	PCle Transmit Positive	48	NC	Not Connect
49	HOST_WAKE_B T	Host Wake Signal for Bluetooth	50	BT_WAKE_HOST _H	Bluetooth Wake Host Signal

2.14 RTC(BT1)

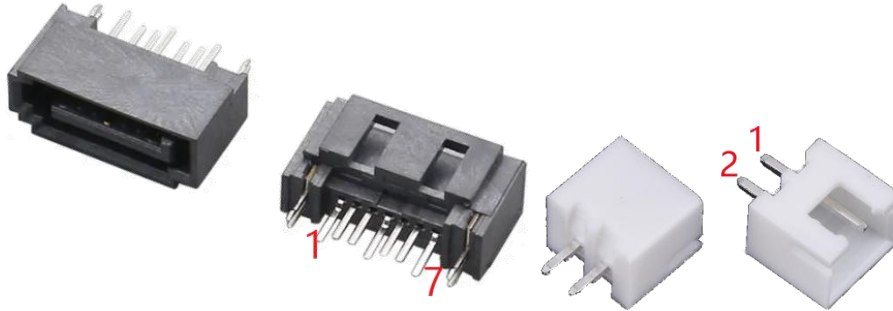
The backup battery(3V)is used to ensure the RTC (frequency 32.768KHz) is still able to work after power off.Lithium cell model: CR1220.





Pin	Signal	Description	Pin	Signal	Description
1	VCC_RTC	3V battery	2	GND	Ground

2.15 SATA(J11,J8)



The SATA is a 7-pin DIP vertical hard disk interface, used for connecting SATA data and SATA power.

J11					
Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	SATA30_TXP	SATA Transmit Positive
3	SATA30_TXN	SATA Transmit Negative	4	GND	Ground
5	SATA30_RXP	SATA Receive Positive	6	SATA30_RXN	SATA Receive Negative
7	GND	Ground			

J8					
Pin	Signal	Description	Pin	Signal	Description
1	SATA-5V	5V Power supply	2	GND	Ground

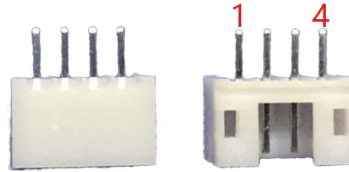
2.16 IR(U2)



The IR is a side-mounted infrared receiver with 4-pin, mainly used for receiving infrared remote control signals. It supports a carrier frequency of 38kHz and can efficiently demodulate infrared signals.

Pin	Signal	Description	Pin	Signal	Description
1	PWM15_IR_M1	PWM Signal(IR)	2	VCC_3V3	3.3V Power Supply
3	GND	Ground	4	GND	Ground

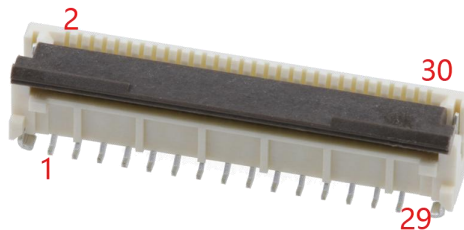
2.17 UART3(J15)



The SBC3588 UART interface support 5bit, 6bit, 7bit, 8bit serial data transmit or receive, support different input clock for UART operation to get up to 4Mbps baud rate, support auto flow control mode for all UART and standard asynchronous communication bits such as start, stop and parity.

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	UART3_TX_M2	UART3 Transmit
3	UART3_RX_M2	UART3 Receive	4	VCC_3V3	3.3V Power Supply

2.18 Camera(CON2)

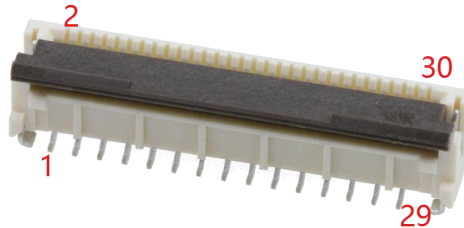


The SBC3568 utilizes an FFC/FPC Connector for camera connections, which features a 0.50mm pitch and 30 circuits in a compact vertical design with a height of 4.05mm.

Pin	Signal	Description	Pin	Signal	Description
1	NC	Not connect	2	AF_2V8	Power supply(2.8V)
3	DVDD1V2	Digital Power(1.2V)	4	VCC1V8_DVP	Power supply(1.8V)
5	NC	Not connect	6	GND	Ground
7	AVDD2V8_DVP	Analog Power(2.8V)	8	GND	Ground
9	I2C3_SDA_M0_1V8	I2C Data Line(1.8V)	10	I2C3_SCL_M0_1V8	I2C Clock Line(1.8V)
11	CAMERA_RST_0	Camera Reset Signal	12	MIPI_CSI_PWDN0	MIPI CSI Power Down
13	GND	Ground	14	MIPI_CLK0	MIPI Clock Signal

15	GND	Ground	16	MIPI_CSI0_RX_D3P	MIPI Data Lane 3+
17	MIPI_CSI0_RX_D3N	MIPI Data Lane 3-	18	GND	Ground
19	MIPI_CSI0_RX_D2P	MIPI Data Lane 2+	20	MIPI_CSI0_RX_D2N	MIPI Data Lane 2-
21	GND	Ground	22	MIPI_CSI0_RX_D1P	MIPI Data Lane 1+
23	MIPI_CSI0_RX_D1N	MIPI Data Lane 1-	24	GND	Ground
25	MIPI_CSI0_RX_CLK0P	MIPI Clock Lane+	26	MIPI_CSI0_RX_CLK0N	MIPI Clock Lane-
27	GND	Ground	28	MIPI_CSI0_RX_D0P	MIPI Data Lane 0+
29	MIPI_CSI0_RX_D0N	MIPI Data Lane 0-	30	GND	Ground

2.19 MIPI LCD(J7)

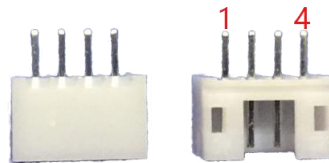


SBC3588 MIPI LCD supports up to 4Kp60 output, regular 30pins.

Pin	Signal	Description	Pin	Signal	Description
1	VDD5V	5V Power Supply	2	VDD5V	5V Power Supply
3	VDD5V	5V Power Supply	4	GND	Ground
5	VCC_3V3	3.3V Power Supply	6	PWM2_M0	PWM Signal(Channel 2,Module 0)
7	PCIE30X1_1_PE_RSTn_M1_L	PCIe Gen3 x1 Lane 1 Reset(Low Active)	8	GND	Ground
9	I2S0_SDO1_1V8	I2S Slot Data Out 1(1.8V)	10	I2S0_SDO2_SDI3_1V8	I2S Slot Data Out 2/Slot Data In 3(1.8V)
11	I2S0_SDO3_SDI2_1V8	I2S Slot Data Out 3/Slot Data In 2(1.8V)	12	I2S0_SDI1_1V8	I2S Slot Data In 1(1.8V)
13	GND	Ground	14	MIPI_DPHY1_TX_	MIPI DPHY Lane 1

				D0P	Data 0 Positive
15	MIPI_DPHY1_TX_D0N	MIPI DPHY Lane 1 Data 0 Negative	16	GND	Ground
17	MIPI_DPHY1_TX_D1P	MIPI DPHY Lane 1 Data 1 Positive	18	MIPI_DPHY1_TX_D1N	MIPI DPHY Lane 1 Data 1 Negative
19	GND	Ground	20	GND	Ground
21	MIPI_DPHY1_TX_CLKP	MIPI DPHY Lane 1 Clock Positive	22	MIPI_DPHY1_TX_CLKN	MIPI DPHY Lane 1 Clock Negative
23	GND	Ground	24	GND	Ground
25	MIPI_DPHY1_TX_D2P	MIPI DPHY Lane 1 Data 2 Positive	26	MIPI_DPHY1_TX_D2N	MIPI DPHY Lane 1 Data 2 Negative
27	GND	Ground	28	MIPI_DPHY1_TX_D3P	MIPI DPHY Lane 1 Data 3 Positive
29	MIPI_DPHY1_TX_D3N	MIPI DPHY Lane 1 Data 3 Negative	30	GND	Ground

2.20 Power(J4)



The SBC3588 adopts a 4-pin connector with an external power key.

Pin	Signal	Description	Pin	Signal	Description
1	PWR_EN	Power Enable	2	GND	Ground
3	GND	Ground	4	PWR_LED	Power LED Indicator

2.21 VGA(CON5)



VGA design a multi-functional signal interface to integrate different signal types onto a single physical interface for connection and communication with other devices or modules. The signal types include:

- VGA video signal
- CAN bus signal
- RS485 signal

Pin	Signal	Description	Pin	Signal	Description
1	VGA_R_CON	VGA Red Channel	2	VGA_G_CON	VGA Green Channel
3	VGA_B_CON	VGA Blue Channel	4	VGA_GND	VGA Ground
5	GND	Ground	6	VGA_HSYNC_CON	VGA Horizontal Synchronization
7	VGA_VSYNC_CON	VGA Vertical Synchronization	8	VGA_DDC_SDA	VGA Display Data Channel (SDA)
9	VGA_DDC_SCL	VGA Display Data Channel (SCL)	10	GND	Ground
11	SATA1_ACT_LED_M0	SATA1 Activity LED	12	SPDIF0_TX_M1	S/PDIF Audio Transmit
13	PCIE30X1_1_WAKEn_M1_L	PCIe x1 Wake Signal	14	PCIEx1_1_CLKREQn_M1_L	PCIe x1 Clock Request
15	GND	Ground	16	GND	Ground
17	CAN0_TX_M0	CAN Bus Transmit	18	CAN0_RX_M0	Bus Receive
19	GND	Ground	20	UART0_RX_M2	UART Receive

3 Product Configurations

3.1 Standard Contents

NO.	Item	Qty.(PCS)	Description
1	SBC3588 board	1	Standard Content (8GB RAM, 32GB eMMC)
2	U-disk/CD-ROM	1	Android SDK, Debian / Buildroot SDK, Documents, tools, Schematic Drawing, datasheets, etc.
3	Ethernet cable	1	1.5m Crossover cable
4	Serial Cable	1	CH9102X
5	USB Cable	1	USB-A
6	Power adaptor	1	12V/3A DC
7	Antenna	2	WIFI&Bluetooth Antenna

3.2 Optional Parts

- MIPI camera Module (IMX415)
- LCD Module (10.1-inch MIPI panel)
- 4G Module
- SSD