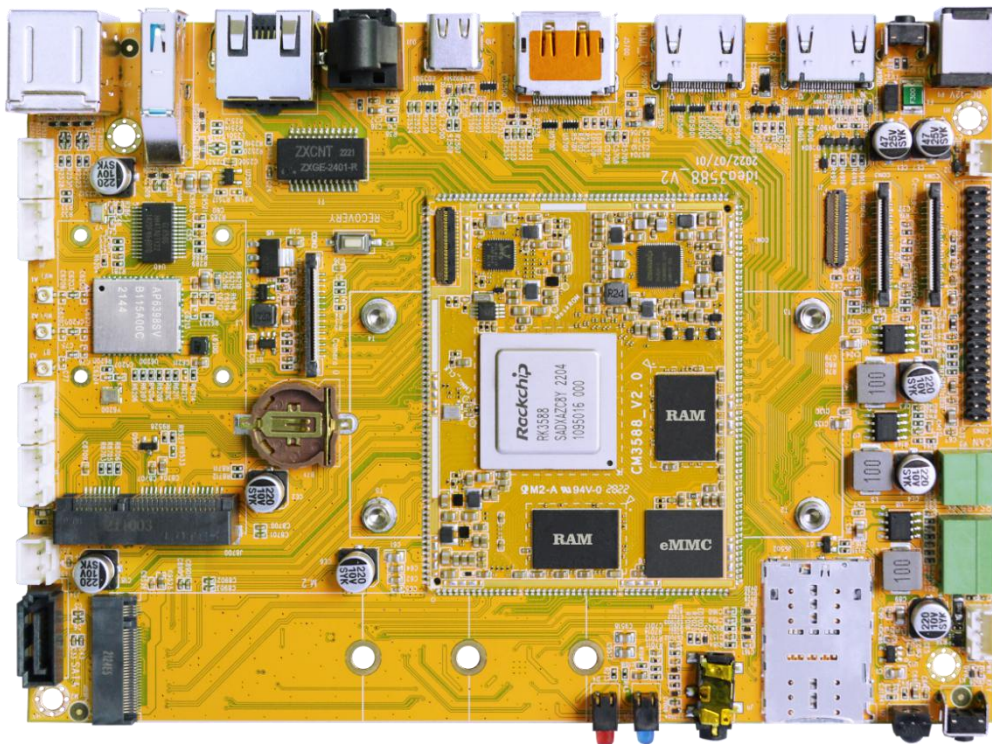


Idea3588 Hardware Manual

V2.20220808



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 lightning 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 made 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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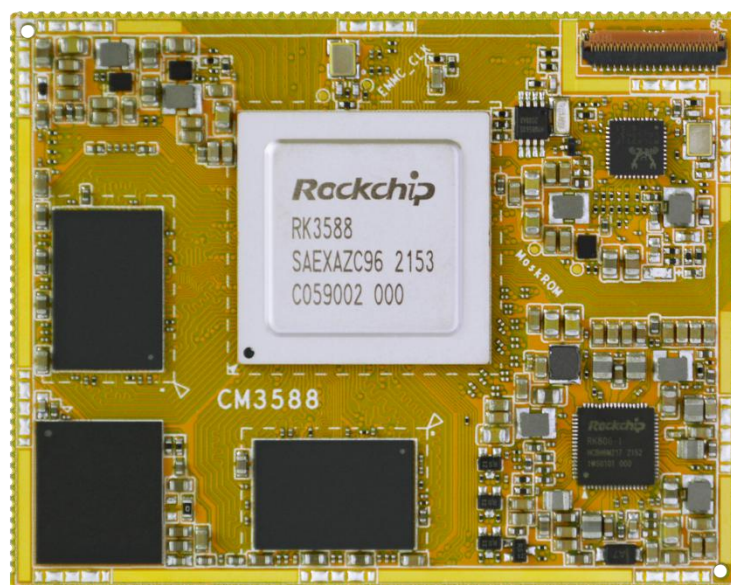
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1 CM3588 Introduction

1.1 Summary

The CM3588 adopts RK3588 chip, quad-core ARM Cortex-A76 MPCore processor and a quad-core ARM Cortex-A55 MPCore Processor , both are high-performance, low-power and cached application processor.

It is designed specifically for the high performance devices such as 8K TV box or recorder, VI devices, intelligent interactive devices, personal computers and robots. The high performance multimedia processing and acceleration engine solution can help customers to introduce new technologies more quickly and enhance the overall solution efficiency.



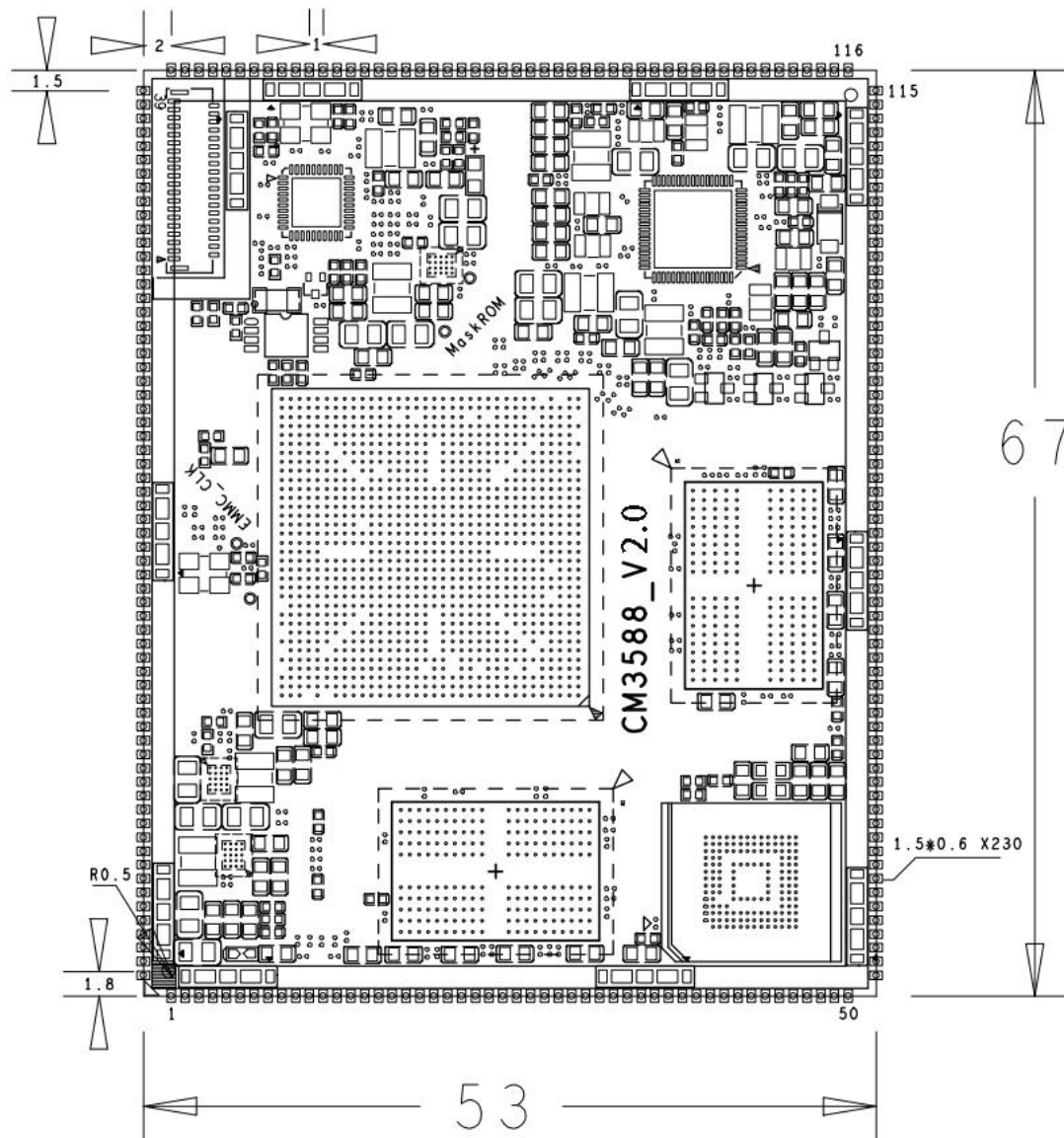
1.1 Features

Specification	
CPU	Rochchip RK3588, Quad-core Cortex-A76 + Quad-core Cortex-A55
GPU	ARM Mali-G610 MP4 OpenGL ES 1.1/2.0/3.2, OpenCL 2.2, Vulkan 1.2
NPU	Up to 6 TOPS
VPU	Supports 8K H.265, 8K VP9, 8K AVS2 video decoding, up to 60fps Supports 8K H.264 video decoding, up to 30fps Supports 4K AV1 video decoding, up to 60fps 1080P multi-format video decoding (VP8, MPEG-1/2, VC-1) Supports real-time 8K H.265/H.264 video encoding, up to 30fps Multi-channel encoder in parallel for less resolution
RAM	Onboard 4GB LPDDR4 (up to 32GB)



Storage	Onboard 8GB eMMC flash (up to 128GB)
Dimension	67 x 53mm

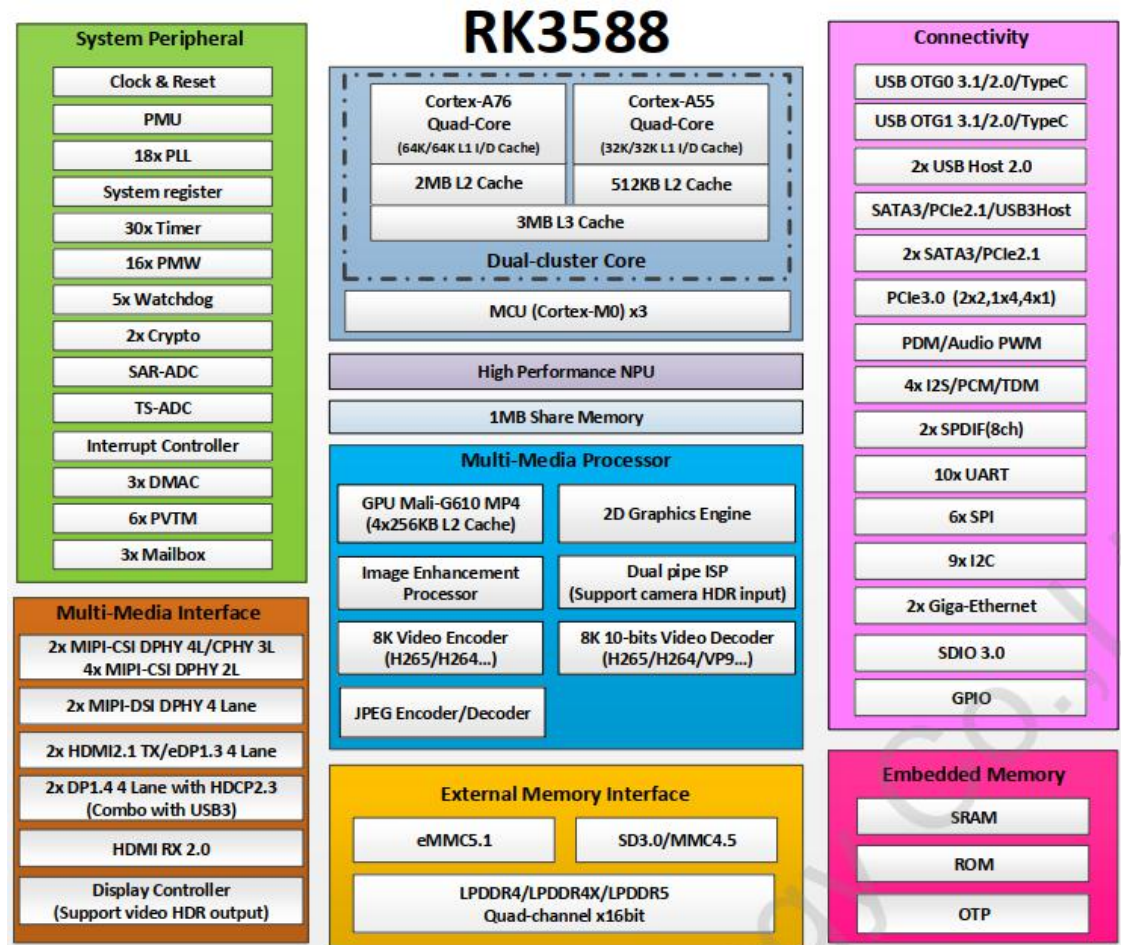
1.2 PCB Dimension





1.3 Block Diagram

The following diagram shows the basic block diagram.



1.4 Pin Definition

Pin	Signal	Description or functions	GPIO serial	IO Voltage
1	GPIO4_B0_d	BT1120_CLKOUT/CIF_CLK IN/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_TX0_HPD_M1/HDMI_RX_HPDO UT_M1	3.3V
6	VCC_1V8	1.8V IO power output (PMU_Buck10)	(Max:500mA)	1.8V
7	SATA30_0_RXN	PCIE20_0_RXN/SATA30_0_RXN		0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
8	SATA30_0_RXP	PCIE20_0_RXP/SATA30_0_RXP		0.5V
9	SATA30_0_TXN	PCIE20_0_TXN/SATA30_0_TXN		0.5V
10	SATA30_0_TXP	PCIE20_0_TXP/SATA30_0_TXP		0.5V
11	USB30_2_SSRXP	PCIE20_2_RXP/SATA30_2_RXP/USB30_2_SSRXP		0.5V
12	USB30_2_SSRXN	PCIE20_2_RXN/SATA30_2_RXN/USB30_2_SSRXN		0.5V
13	USB30_2_SSTXP	PCIE20_2_TXP/SATA30_2_TXP/USB30_2_SSTXP		0.5V
14	USB30_2_SSTXN	PCIE20_2_TXN/SATA30_2_TXN/USB30_2_SSTXN		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_RTSM/PWM3_IR_M2/SPI4_CLK_M0	GPIO1_C2_d	1.8V
21	I2S0_SCLK_TX_1V8	UART3_CTSN/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_RTSM/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_CTSN/I2C4_SCL_M4	GPIO1_C7_d	1.8V
27	I2C4_SDA_M3_1V8	UART6_RTSM_M1/PWM0_M2/SPI4_CLK_M2	GPIO1_A2_d (PU2.2K)	1.8V
28	I2C4_SCL_M3_1V8	UART6_CTSN_M1/PWM1_M2/SPI4_CS0_M2	GPIO1_A3_d (PU2.2K)	1.8V
29	I2C2_SDA_M4_1V8	UART6_RX_M1/DP0_HPDI_N_M2/SPI4_MISO_M2	GPIO1_A0_d (PU2.2K)	1.8V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
30	I2C2_SCL_M4_1V8	UART6_TX_M1/DP1_HPDI N_M2/SPI4_MOSI_M2	GPIO1_A1_d (PU2.2K)	1.8V
31	MIPI_CAM2_CLKO_ M0_1V8	UART1_RX_M1/SPDIF1_T X_M0/PWM13_M2/	GPIO1_B7_u	1.8V
32	GND	Ground		0V
33	PDM1_CLK0_M1_1V 8	SPI0_CS0_M2	GPIO1_B4_u	1.8V
34	PDM1_SDI3_M1_1V8	SPI0_MOSI_M2/UART4_R X_M2/PCIE30X4_PERSTN _M3	GPIO1_B2_d	1.8V
35	PDM1_SDI2_M1_1V8	SPI0_MISO_M2/PCIE30X4 _WAKEN_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_ M3/PCIE30X1_1_PERSTN _M2	GPIO1_A7_u	1.8V
38	PDM1_CLK1_M1_1V 8	UART4_TX_M2/SPI0_CLK _M2/PCIE30X1_0_WAKEN _M2	GPIO1_B3_d	1.8V
39	HDMIIRX_HPDOOUT_ M2_1V8	UART1_TX_M1/SPDIF0_T X_M0/PCIE30X2_WAKEN_ 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_CLKREQN_M0	GPIO0_C6_u	3.3V
44	PWM2_M0	DP0_HPDIIN_M1/PDM0_C LK1_M1/PCIE30X1_0_WA KEN_M0	GPIO0_C4_d	3.3V
45	UART2_TX_M0_DEB UG	PCIE30X1_1_CLKREQN_ M0 /JTAG_TCK_M2	GPIO0_B5_d (Debug UART)	3.3V
46	UART2_RX_M0_DEB UG	PCIE30X1_1_WAKEN_M0/ JTAG_TMS_M2	GPIO0_B6_d (Debug UART)	3.3V
47	CAN0_RX_M0	SPI0_MOSI_M0/PDM0_CL K0_M1/I2C2_SDA_M0	GPIO0_C0_d /PWM1_M0	3.3V
48	CAN0_TX_M0	SPI0_CS1_M0/I2C2_SCL_ M0/PCIE30X1_1_PERSTN _M0	GPIO0_B7_d /PWM0_M0	3.3V
49	UART7_TX_M1		GPIO3_C0_d	3.3V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
50	UART7_RX_M1		GPIO3_C1_d	3.3V
51	GND	Ground		0V
52	HDMITX0_SCL_M0	SPI3_CLK_M1/I2C5_SDA_M1/BT1120_D13	GPIO4_B7_u	3.3V
53	SATA1_ACT_LED_M0	UART9_RX_M1/SPI3_MISO_M1/BT1120-D11	GPIO4_B5_d /PWM12_M1	3.3V
54	SATA0_ACT_LED_M0	I2C5_SCL_M1/SPI3_MOSI_M1/BT1120_D12	GPIO4_B6_d /PWM13_M1	3.3V
55	HDMITX0_SDA_M0	SPI3_CS0_M1/I2C8_SCL_M3/BT1120_D14	GPIO4_C0_u	3.3V
56	PCIE30X4_WAKEn_M2_L	UART5_RX_M1/CAN2_TX_M0/SPI3_CS1_M3/CIF_D9 /HDMI_TX1_SDA_M1	GPIO3_C5_u	3.3V
57	PCIE30X4_PERSTn_M2_L	SPI3_MISO_M3 /CIF_D10 /HDMI_TX1_SCL_M1	GPIO3_C6_u	3.3V
58	PCIE30X4_CLKREQn_M2_L	UART5_TX_M1/CAN2_RX_M0/SPI3_CS0_M3/CIF_D8 /HDMI_TX1_CEC_M2	GPIO3_C4_u	3.3V
59	HDMI_RX_SDA_M1	UART9_CTSN_M2/SPI0_CLK_M3/I2C7_SDA_M2/CIF_D15	GPIO3_D3_d /PWM10_M2	3.3V
60	HDMI_RX_SCL_M1	UART9_RTSN_M2/SPI0_MOSI_M3/I2C7_SCL_M2/CIF_D14	GPIO3_D2_d/ PCIE30X2_CLKREQN_M2	3.3V
61	HDMI_RX_CEC	UART4_TX_M1/SPI0_MISO_M3 /CIF_D13	GPIO3_D1_d /PWM9_M2	3.3V
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	SPI3_MOSI_M3/CIF_D11/HDMI_TX0_SCL_M2	GPIO3_C7_u/PCIE20X1_2_CLKREQN_M0	3.3V
64	HDMITX0_CEC_M0	SPI3_CS1_M1/I2C8_SDA_M3/SPDIF1_TX_M2/BT1120_D15	GPIO4_C1_d	3.3V
65	GPIO4_B2_U	CAN1_RX_M1/UUART8_RTSN_M0/SPI0_CS0_M1/BT1120_D8	PWM14_M1/CIF_HREF/I2C7_SCL_M3	3.3V
66	PWM15_IR_M1	CAN1_TX_M1/UART8_CTSN_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



Pin	Signal	Description or functions	GPIO serial	IO Voltage
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_OT G_DM			1.8V
74	TYPEC1_USB20_OT G_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_RTSN_M0/PDM1_ SDI0_M0/I2C8_SDA_M0	GPIO4_D3_u /PWM10_M1	3.3V
77	SDMMC0_D2	UART5_CTSN_M0/PDM1_ SDI1_M0/I2C8_SCL_M0	GPIO4_D2_u	3.3V
78	SDMMC0_D1	UART2_RX_M1/PDM1_SDI 2_M0/I2C3_SDA_M4	GPIO4_D1_u /PWM9_M1	3.3V
79	SDMMC0_D0	UART2_TX_M1/PDM1_SDI 3_M0/I2C3_SCL_M4	GPIO4_D0_u /PWM8_M1	3.3V
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/eD P0_TX_AUXP	HDMI_TX0_SBDP/EDP_TX 0_AUXP	(Default HDMI)	0.5V
91	HDMI0_TX_SBDN/eD P0_TX_AUXN	HDMI_TX0_SBDN/EDP_T X0_AUXN	(Default HDMI)	0.5V
92	HDMI0_TX3P	HDMI_TX0_D3P/EDP_TX0 _D3P	(Default HDMI)	0.5V
93	HDMI0_TX3N	HDMI_TX0_D3N/EDP_TX0 _D3N	(Default HDMI)	0.5V
94	HDMI0_TX2P	HDMI_TX0_D2P/EDP_TX0 _D2P	(Default HDMI)	0.5V
95	HDMI0_TX2N	HDMI_TX0_D2N/EDP_TX0 _D2N	(Default HDMI)	0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
96	HDMI0_TX1P	HDMI_TX0_D1P/EDP_TX0_D1P	(Default HDMI)	0.5V
97	HDMI0_TX1N	HDMI_TX0_D1N/EDP_TX0_D1N	(Default HDMI)	0.5V
98	HDMI0_TX0P	HDMI_TX0_D0P/EDP_TX0_D0P	(Default HDMI)	0.5V
99	HDMI0_TX0N	HDMI_TX0_D0N/EDP_TX0_D0N	(Default HDMI)	0.5V
100	VCC_3V3	3.3V IO power output (PMU_Buck8)	(Max:500mA)	3.3V
101	HDMI1_TX_SBDP/eDP1_TX_AUXP	HDMI_TX1_SBDP/EDP_TX1_AUXP	(Default EDP)	0.5V
102	HDMI1_TX_SBDN/eDP1_TX_AUXN	HDMI_TX1_SBDN/EDP_TX1_AUXN	(Default EDP)	0.5V
103	HDMI1_TX3P	HDMI_TX1_D3P/EDP_TX1_D3P	(Default EDP)	0.5V
104	HDMI1_TX3N	HDMI_TX1_D3N/EDP_TX1_D3N	(Default EDP)	0.5V
105	HDMI1_TX0N	HDMI_TX1_D0N/EDP_TX1_D0N	(Default EDP)	0.5V
106	HDMI1_TX0P	HDMI_TX1_D0P/EDP_TX1_D0P	(Default EDP)	0.5V
107	HDMI1_TX1N	HDMI_TX1_D1N/EDP_TX1_D1N	(Default EDP)	0.5V
108	HDMI1_TX1P	HDMI_TX1_D1P/EDP_TX1_D1P	(Default EDP)	0.5V
109	HDMI1_TX2N	HDMI_TX1_D2N/EDP_TX1_D2N	(Default EDP)	0.5V
110	HDMI1_TX2P	HDMI_TX1_D2P/EDP_TX1_D2P	(Default EDP)	0.5V
111	GND	Ground		0V
112	DP1_TX0N	TYPEC1_SSRX1N/DP1_TX0N	(Default DP)	0.5V
113	DP1_TX0P	TYPEC1_SSRX1P/DP1_TX0P	(Default DP)	0.5V
114	DP1_TX1N	TYPEC1_SSTX1N/DP1_TX1N	(Default DP)	0.5V
115	DP1_TX1P	TYPEC1_SSTX1P/DP1_TX1P	(Default DP)	0.5V
116	DP1_TX2N	TYPEC1_SSRX2N/DP1_TX2N	(Default DP)	0.5V
117	DP1_TX2P	TYPEC1_SSRX2P/DP1_TX2P	(Default DP)	0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
		X2P		
118	DP1_TX3P	TYPEC1_SSTX2P/DP1_TX 3P	(Default DP)	0.5V
119	DP1_TX3N	TYPEC1_SSTX2N/DP1_TX 3N	(Default DP)	0.5V
120	DP1_AUXP	TYPEC1_SBU1/DP1_AUX P	(Default DP)	0.5V
121	DP1_AUXN	TYPEC1_SBU2/DP1_AUX N	(Default DP)	0.5V
122	GND	Ground		0V
123	TYPEC0_USB20_OT G_DP	USB download Port		1.8V
124	TYPEC0_USB20_OT G_DM	USB download Port		1.8V
125	TYPEC0_SBU1/DP0_ AUXP	TYPEC0_SBU1/DP0_AUX P	(Default TYPE-C)	0.5V
126	TYPEC0_SBU2/DP0_ AUXN	TYPEC0_SBU2/DP0_AUX N	(Default TYPE-C)	0.5V
127	PWR_EN	Power Key input		3.3~4.2V
128	TYPEC0_USB20_OT G_ID	USB20 OTG ID input		1.8V
129	TYPEC0_USB20_VB USDET	USB OTG VBUS detect input		3.3V
130	MIPI_DPHY1_TX_D0 P			0.5V
131	MIPI_DPHY1_TX_D0 N			0.5V
132	MIPI_DPHY1_TX_D1 P			0.5V
133	MIPI_DPHY1_TX_D1 N			0.5V
134	MIPI_DPHY1_TX_CL KP			0.5V
135	MIPI_DPHY1_TX_CL KN			0.5V
136	MIPI_DPHY1_TX_D2 P			0.5V
137	MIPI_DPHY1_TX_D2 N			0.5V
138	MIPI_DPHY1_TX_D3 P			0.5V
139	MIPI_DPHY1_TX_D3			0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
	N			
140	GND	Ground		0V
141	TYPEC0_SSRX1N	TYPEC0_SSRX1N/DP0_TX0N	(Default TYPE-C)	0.5V
142	TYPEC0_SSRX1P	TYPEC0_SSRX1P/DP0_TX0P	(Default TYPE-C)	0.5V
143	TYPEC0_SSTX1P	TYPEC0_SSTX1P/DP0_TX1P	(Default TYPE-C)	0.5V
144	TYPEC0_SSTX1N	TYPEC0_SSTX1N/DP0_TX1N	(Default TYPE-C)	0.5V
145	TYPEC0_SSRX2N	TYPEC0_SSRX2N/DP0_TX2N	(Default TYPE-C)	0.5V
146	TYPEC0_SSRX2P	TYPEC0_SSRX2P/DP0_TX2P	(Default TYPE-C)	0.5V
147	TYPEC0_SSTX2P	TYPEC0_SSTX2P/DP0_TX3P	(Default TYPE-C)	0.5V
148	TYPEC0_SSTX2N	TYPEC0_SSTX2N/DP0_TX3N	(Default TYPE-C)	0.5V
149	GND	Ground		0V
150	SPDIF0_TX_M1	UART9_TX_M1/BT1120_D10/PCIE30X4_CLKREQN_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_M2/BT1120_D6/CIF_D6/PCIE30X2_CLKREQN_M1	GPIO4_A6_d	3.3V
153	UART3_TX_M2	SPI2_MOSI_M1/I2C3_SDA_M2/BT1120_D5/CIF_D5 /PCIE30X1_0_PERSTN_M1	GPIO4_A5_d	3.3V
154	UART0_RX_M2	SPI2_MISO_M1/I2C3_SCL_M2/BT1120_D4/CIF_D4 /PCIE30X1_0_WAKEN_M1	GPIO4_A4_d	3.3V
155	UART0_TX_M2	BT1120_D3/CIF_D3 /PCIE30X1_0_CLKREQN_M1	GPIO4_A3_d	3.3V
156	PCIE30x1_1_CLKREQn_M1_L	SPI0_MISO_M1/UART9_RTSN_M1/BT1120_D0/CIF_D0	GPIO4_A0_d	3.3V
157	PCIE30X1_1_WAKEn_M1_L	SPI0_MOSI_M1/UART9_CTSN_M1/BT1120_D1/CIF_D1	GPIO4_A1_d	3.3V
158	PHY1_MDI0+			0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
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	MIPI_CSI0_CLK1P		0.5V
175	MIPI_CSI0_RX_CLK1N	MIPI_CSI0_CLK1N		0.5V
176	MIPI_CSI0_RX_D3P	MIPI_CSI0_D3P		0.5V
177	MIPI_CSI0_RX_D3N	MIPI_CSI0_D3N		0.5V
178	MIPI_CSI0_RX_D2P	MIPI_CSI0_D2P		0.5V
179	MIPI_CSI0_RX_D2N	MIPI_CSI0_D2N		0.5V
180	MIPI_CSI0_RX_CLK0P	MIPI_CSI0_CLK0P		0.5V
181	MIPI_CSI0_RX_CLK0N	MIPI_CSI0_CLK0N		0.5V
182	MIPI_CSI0_RX_D1P	MIPI_CSI0_D1P		0.5V
183	MIPI_CSI0_RX_D1N	MIPI_CSI0_D1N		0.5V
184	MIPI_CSI0_RX_D0P	MIPI_CSI0_D0P		0.5V
185	MIPI_CSI0_RX_D0N	MIPI_CSI0_D0N		0.5V
186	GND	Ground		0V
187	I2S2_SDO_M0_GMAC0-MCK_1V8	SPI3_CS1_M0 /I2C7_SCL_M1	GPIO4_C3_d /PWM4_M1	1.8V
188	SDIO_CLK_M0_GMAC0-TCK_1V8	I2C3_SDA_M3 /FSPI_CLK_M1	GPIO2_B3_d	1.8V
189	I2S2_LRCK_M0_GMAC0-TE_1V8	UART1_RTSM_M0/SPI1_CLK_M0 /I2C2_SDA_M1	GPIO2_C0_d	1.8V
190	GMAC0-TD0_1V8	UART1_RX_M0/I2S2_MCL	GPIO2_B6_d	1.8V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
		K_M0 /I2C5_SCL_M4		
191	I2S2_SCLK_M0_GMAC C0-TD1_1V8	UART1_TX_M0 /I2C5_SDA_M4	GPIO2_B7_d	1.8V
192	SDIO_D3_M0_GMAC 0-TD2_1V8	UART6_CTSN_M0/FSPI_D 3_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_GMAC 0-RCK_1V8	UART6_RTSN_M0/FSPI_D 2_M1 /I2C8_SCL_M1	GPIO2_B0_u	1.8V
195	GMAC0-RV_1V8	UART7_RTSN_M0/SPI3_C S0_M0	GPIO4_C2_d /PWM2_M2	1.8V
196	GMAC0-RD0_1V8	UART1_CTSN_M0/SPI1_M ISO_M0/I2C2_SCL_M1	GPIO2_C1_d	1.8V
197	UART9_TX_M0_GMA C0-RD1_1V8	SPI1_MOSI_M0 /I2C6_SDA_M2	GPIO2_C2_d	1.8V
198	SDIO_D0_M0_GMAC 0-RD2_1V8	UART6_RX_M0 /FSPI_D0_M1	GPIO2_A6_u	1.8V
199	SDIO_D1_M0_GMAC 0-RD3_1V8	UART6_TX_M0 /FSPI_D1_M1	GPIO2_A7_u	1.8V
200	GND	Ground		0V
201	PCIE20_1_TXP/SATA 30_1_TXP	PCIE or SATA interface		0.5V
202	PCIE20_1_TXN/SATA 30_1_TXN	PCIE or SATA interface		0.5V
203	PCIE20_1_RXP/SATA 30_1_RXP	PCIE or SATA interface		0.5V
204	PCIE20_1_RXN/SATA 30_1_RXN	PCIE or SATA interface		0.5V
205	PCIE20_1_REFCLKP			0.5V
206	PCIE20_1_REFCLKN			0.5V
207	PCIE30_PORT0_RX0 P			0.5V
208	PCIE30_PORT0_RX0 N			0.5V
209	PCIE30_PORT0_RX1 P			0.5V
210	PCIE30_PORT0_RX1 N			0.5V
211	PCIE30_PORT0_REF CLKP_IN			0.5V
212	PCIE30_PORT0_REF CLKN_IN			0.5V



Pin	Signal	Description or functions	GPIO serial	IO Voltage
213	PCIE30_PORT0_TX0_P			0.5V
214	PCIE30_PORT0_TX0_N			0.5V
215	PCIE30_PORT0_TX1_P			0.5V
216	PCIE30_PORT0_TX1_N			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_G MAC0-MDI_1V8	SPI3_MOSI_M0	GPIO4_C5_d /PWM6_M2	1.8V
220	UART9_RTSn_M0_G MAC0-MDC_1V8	SPI3_MISO_M0 /I2C7_SDA_M1	GPIO4_C4_d /PWM5_M2	1.8V
221	SPI3_CLK_M0_1V8	UART7_CTSN_M0/GMAC0 _TXER	GPIO4_C6_d /PWM7_IR_M3	1.8V
222	I2S2_SDI_M0_1V8	SPI1_CS0_M0/I2C6_SCL_M2 /ETH0_REFCLKO_25M	GPIO2_C3_d	1.8V
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:

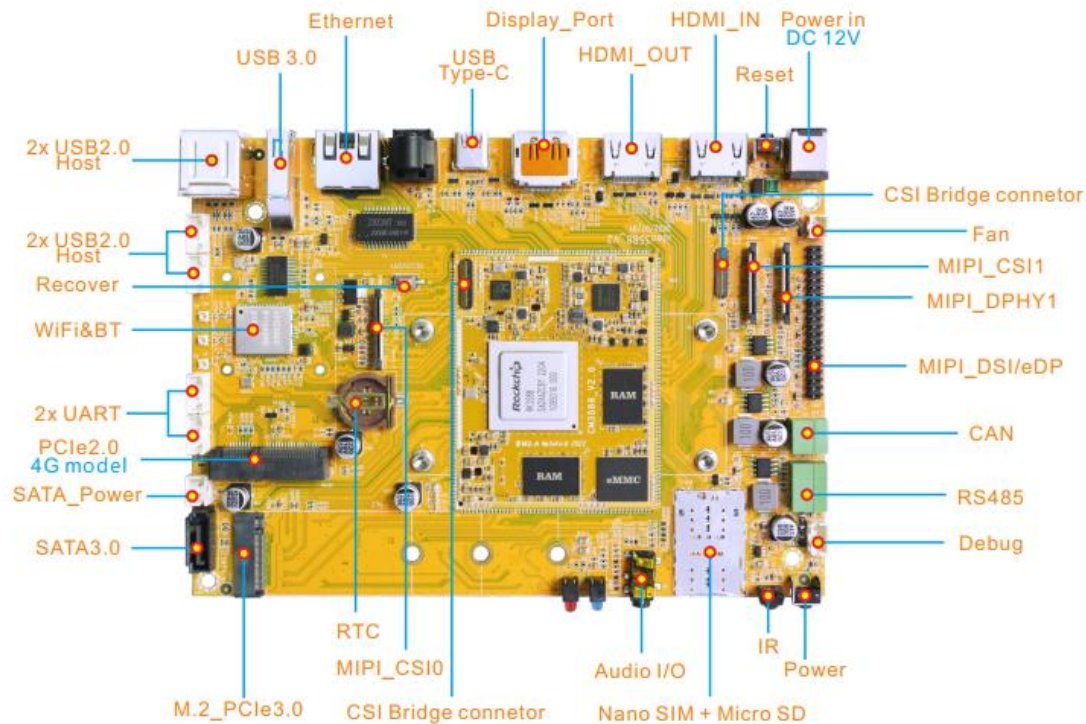
Could be add DC common resistor for level shift circuit when HDMI1 used.

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

2 Idea3588 Introduction

1.1 Summary

Idea3588 SBC is comprised of a CM3588 module with 4GB (up to 32GB) RAM and 8GB (up to 128GB) eMMC flash and carrier board, supports NVMe storage, offers DisplayPort and HDMI, and MIPI DSI/eDP video interface, MIPI CSI for 4K camera module, Gigabit Ethernet, USB 3.1 Type-C, HDMI in, WiFi, Bluetooth 5.1, as well as optional 4G cellular connectivity, and PCIe slots.



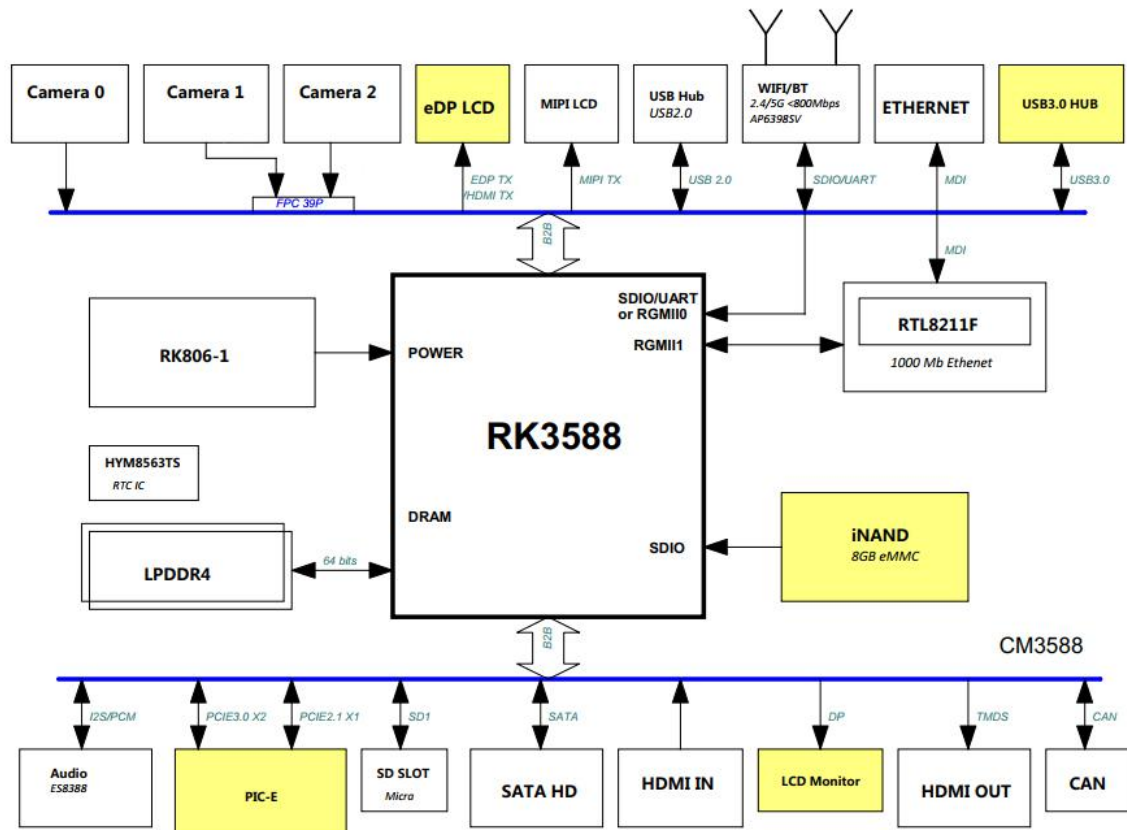
1.2 Features

Specification		
Power Supply		12V/3A DC input jack
USB		1x USB3.1 Type-C 4x USB2.0 Host 2.0 (1x Dual-USB AF connector, 2x 4pin connector) 1x USB3.0 Host
Connectivity		Gigabit Ethernet RJ45 port via Realtek RTL8211F-CG controller 2T2R 802.11 a/b/g/n/ac Wi-Fi + BT 5.1 Module(AP6398SV) Mini PCIe socket with Nano SIM card port to support 4G LTE Modem or PCIe WIFI Modem
Serial		1x Serial port for debug, 3-pin connector 2x UART, 4-pin connectors 1x RS485
Video	Output	HDMI2.1 TX support up to 7680x4320@60Hz MIPI DSI/eDP support up to 4K@60Hz DP1.4 TX support up to 7680x4320@30Hz
	Input	HDMI2.0 RX support up to 4K@60Hz
Audio		3.5mm audio I/O jack 8-channel audio via HDMI
Storage		Support 1x MicroSD card Support 1x SATA3.0 Support 1x M.2 PCIe SSD



Camera	3x Cameras, 30-pin FPC connector
Keys	Recover, Reset, Power
Other features	RTC with battery connector; IR receiver, CAN, Fan
Dimension	Based board - 165 x 120mm

1.3 Block Diagram



1.4 Peripherals Introduction

1.4.1 Power(P1)

The DC JACK(P1) is 6-pin plug Type, its inner diameter is 2.1mm.



Pin	Signal	Description	Pin	Signal	Description
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1	VDD12V	Main power supply, DC voltage 12V input.	2	GND	Ground
3	GND	Ground	4	GND	Ground
5	GND	Ground	6	GND	Ground

1.4.2 HDMI2.0 RX (J4900)

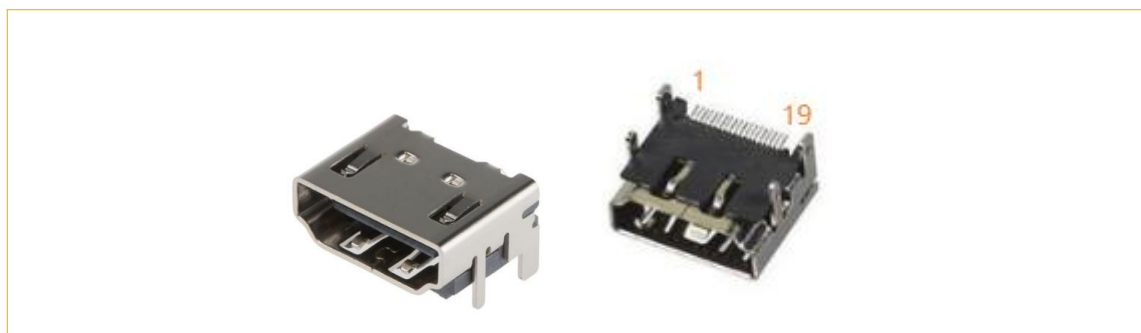
The Idea3588 supports HDMI2.0 RX, backward compatible with HDMI1.4b, supports RGB/YUV444 /YUV422/YUV420 format, and supports up to 4K@60Hz input.



Pin	Signal	Description	Pin	Signal	Description
1	HDMI_RX_D2P	TMDS data Lane2 input	2	GND	Ground
3	HDMI_RX_D2N		4	HDMI_RX_D1P	TMDS data Lane1 input
5	GND	Ground	6	HDMI_RX_D1N	
7	HDMI_RX_D0P	TMDS data Lane0 input	8	GND	Ground
9	HDMI_RX_D0N		10	HDMI_RX_CLKP	TMDS clock input
11	GND	Ground	12	HDMI_RX_CLKN	
13	HDMI_RX_CEC_PORT	HDMI CEC signal	14	NC	Not connect
15	HDMI_RXDDC_SCL_PORT	HDMI DDC serial Clock	16	HDMI_RXDDC_SDA_PORT	HDMI DDC serial data line
17	GND	Ground	18	VCC5V_HDMIRX_PORT	VCC 5v input
19	HDMI_RX_HPD_PORT	HDMI Hot plug detection			

1.4.3 HDMI2.1 TX (J5000)

HDMI TX mode: the maximum resolution supports 8K@60Hz, and supports RGB/YUV444/YUV420 (Up to 10bit) format.



Pin	Signal	Description	Pin	Signal	Description
1	HDMI0_TX2P_PORT	RFL mode Lane2 output	2	GND	Ground
3	HDMI0_TX2N_PORT	TMDS data Lane2 output	4	HDMI0_TX1P_PORT	RFL mode Lane1 output
5	GND	Ground	6	HDMI0_TX1N_PORT	TMDS data Lane1 output
7	HDMI0_TX0P_PORT	RFL mode Lane0 output	8	GND	Ground
9	HDMI0_TX0N_PORT	TMDS data Lane0 output	10	HDMI0_TX3P_PORT	RFL mode Lane3 output
11	GND	Ground	12	HDMI0_TX3N_PORT	TMDS clock output
13	HDMI0_TX_CEC_PORT	HDMI CEC signal	14	HDMI0_eARC+	ARC channel
15	HDMI0_TX_SCL_PORT	HDMI serial Clock	16	HDMI0_TX_SDA_PORT	HDMI serial data line
17	GND	Ground	18	VCC5V_HDMI_TX0	5V power supply
19	HDMI0_TX_HPD_PORT	HDMI Hot plug detection			

1.4.4 DP TX(J5700)

The Idea3588 supports 2 DP TX 1.4a interface (which combo with USB3.1 Gen1), support RGB/YUV (Up to 10bit) format, the maximum output resolution can reach 8K@30Hz.

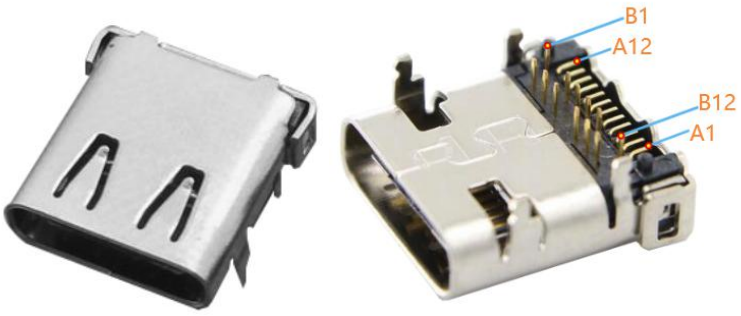


Pin	Signal	Description	Pin	Signal	Description
1	DP1_TX0P	DP1 data Lane0 output	2	GND	Ground
3	DP1_TX0N		4	DP1_TX1P	DP1 data Lane1 output
5	GND	Ground	6	DP1_TX1N	
7	DP1_TX2P	DP1 data Lane2 output	8	GND	Ground
9	DP1_TX2N		10	DP1_TX3P	DP1 data Lane3 output
11	GND	Ground	12	DP1_TX3N	
13	Config0	Ground	14	Config1	Ground
15	DP_TX_AUXP	DP1 AUX channel	16	GND	Ground
17	DP_TX_AUXN		18	DP_TX_HPD_P	DP Hot plug

				ORT	detection
19	GND	Ground	20	VDD3V3	3V3 power supply

1.4.5 USB Type-C(J10)

The USB Type-C interface supports download mode, supports transfer between USB and DP display (multiplexed with DP TX), and supports ADB mode.



Pin	Signal	Description	Pin	Signal	Description
A1	GND	Ground	A2	TYPEC0_TX1P	Transmitter serial data +
A3	TYPEC0_TX1N	Transmitter serial data -	A4	VBUS5V0_TYPEC0	5V power supply
A5	TYPEC0_CC1	Configuration channel	A6	TYPEC0_DP	USB data DP
A7	TYPEC0_DM	USB data DM	A8	TYPEC0_SBU1	Sideband use (SBU)
A9	VBUS5V0_TYPEC0	5V power supply	A10	TYPEC0_RX2N	Receiver serial data -
A11	TYPEC0_RX2P	Receiver serial data +	A12	GND	Ground
B1	GND	Ground	B2	TYPEC0_TX2P	Transmitter serial data +
B3	TYPEC0_TX2N	Transmitter serial data -	B4	VBUS5V0_TYPEC0	5V power supply
B5	TYPEC0_CC2	Configuration channel	B6	TYPEC0_DP	USB data DP
B7	TYPEC0_DM	USB data DM	B8	TYPEC0_SBU2	Sideband use (SBU)
B9	VBUS5V0_TYPEC0	5V power supply	B10	TYPEC0_RX1N	Receiver serial data -
B11	TYPEC0_RX1P	Receiver serial data +	B12	GND	Ground

1.4.6 Ethernet (JP1)

The Idea3588 adopts RTL8211F as the Ethernet chip, RJ45 connector. Supports 10/100/1000 Mbps data transfer rates.



Pin	Signal	Description	Pin	Signal	Description
1	DA+	Bi-directional transmit/receive pair A	2	DA-	Bi-directional transmit/receive pair A
3	DB+	Bi-directional transmit/receive pair B	4	DC+	Bi-directional transmit/receive pair C
5	DC-	Bi-directional transmit/receive pair C	6	DB-	Bi-directional transmit/receive pair B
7	DD+	Bi-directional transmit/receive pair D	8	DD-	Bi-directional transmit/receive pair D
9	GND	Ground	10	GND	Ground
11	PHY1_LED2/CFG_LDO1	LED2 indicator(Speed)	12	GND	Ground
13	PHY1_LED1/CFG_LDO0	LED1 indicator(Link)	14	GND	Ground

1.4.7 USB3.0 HOST(J2501)

The USB3.0 up to 5Gbps data rate.



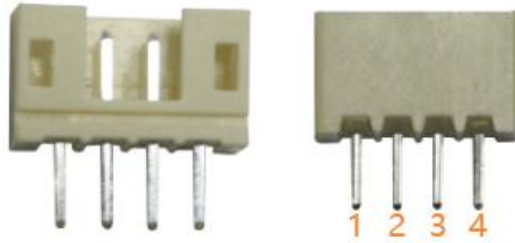
Pin	Signal	Description	Pin	Signal	Description
1	VCC5V0_USB30_HOST2	5V power supply	2	USB20_HOST0D M	Data output for USB HS/FS/LS mode
3	USB20_HOST0DP	Data input for USB HS/FS/LS mode	4	GND	Ground
5	USB30_HOST2_S	Data input for USB	6	USB30_HOST2_	Data input for USB

	SRXN	SS mode		SSRXP	SS mode
7	GND	Ground	8	USB30_HOST2_SSTXN	Data output in USB SS mode
9	USB30_HOST2_STXP	Data output in USB SS mode	10	GND	Ground
11	GND	Ground	12	GND	Ground
13	GND	Ground			

1.4.8 USB2.0 HOST(P3,J17,J6)

The Idea3588 provides 4x USB2.0 - 1x Dual-USB AF connector, 2x 4pin connector. The 4-ch USB HOST interfaces are extended by GL850G which is a fully compliant with the USB 2.0 hub specification and is designed to work with USB host as a high-speed hub. It is used to connect USB mouse, U disk, and other USB devices. Support hot-plug.

					
P3					
Pin	Signal	Description	Pin	Signal	Description
1	VCC5V0_USB20_HOST	5V power supply	2	TYPEC1_USB20_HOST_DM	Data output for USB HS/FS/LS mode
3	TYPEC1_USB20_HOST_DP	Data input for USB HS/FS/LS mode	4	GND	Ground
5	VCC5V0_USB20_HOST	5V power supply	6	USB20_HOST1D M	Data output in USB HS/FS/LS mode
7	USB20_HOST1DP	Data input for USB HS/FS/LS mode	8	GND	Ground
					
J17					
Pin	Signal	Description	Pin	Signal	Description
1	VDD5V	5V power supply	2	USB_DM3	Data output in USB HS/FS/LS mode
3	USB_DP3	Data input for USB HS/FS/LS mode	4	GND	Ground

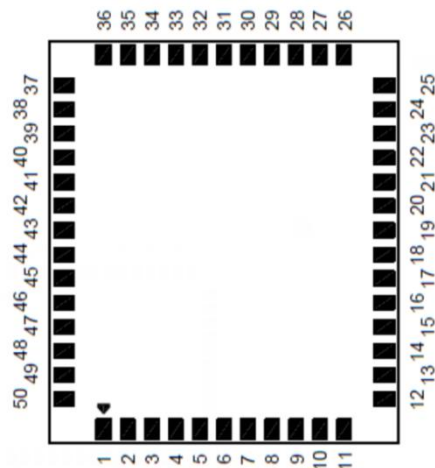


J6

Pin	Signal	Description	Pin	Signal	Description
1	VDD5V	5V power supply	2	USB_DM4	Data output in USB HS/FS/LS mode
3	USB_DP4	Data input for USB HS/FS/LS mode	4	GND	Ground

1.4.9 WiFi&Bluetooth(U6200)

The AP6398SV is a fully Wi-Fi and Bluetooth functionalities module with seamless roaming capabilities and advance security, also it could interact with different vendors' 802.11a/b/g/n/ac 2x2 Access Points with MIMO standard and can accomplish up to speed of 867Mbps with dual stream in 802.11ac to connect the wireless LAN.



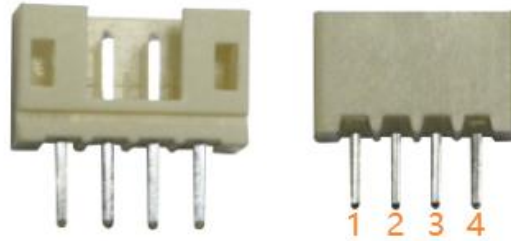
Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	A1	RF(BT&WIFI) I/O port0(Connect to IPEX)
3	GND	Ground	4	GND	Ground
5	GND	Ground	6	GND	Ground
7	GND	Ground	8	GND	Ground
9	A2	RF(WIFI) I/O port1(Connect to IPEX)	10	GND	Ground
11	GND	Ground	12	A3	WL GPIO 1(Connect to



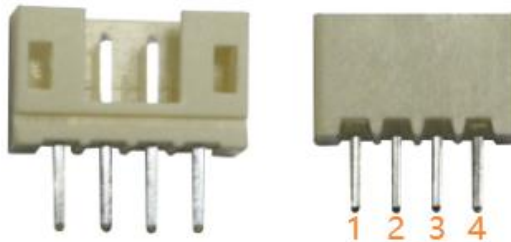
					IPEX)
13	XTAL_OUT	External Crystal out	14	XTAL_IN	External Crystal in/ Single clock source input
15	WIFI_REG_ON_H	Low asserting reset for WiFi core	16	WIFI_WAKE_HO ST_H	WLAN to wake-up HOST
17	WIFI_CMD	SDIO command line	18	WIFI_CLK	SDIO clock line
19	WIFI_D3	SDIO data line 3	20	WIFI_D2	SDIO data line 2
21	WIFI_D0	SDIO data line 0	22	WIFI_D1	SDIO data line 1
23	GND	Ground	24	SDIO_VSEL	VCCIO_WL
25	VIN_LDO	Internal Buck voltage generation pin	26	VIN_LDO_OUT	Internal Buck voltage generation pin
27	PCM_SYNC_BT	BT PCM sync	28	PCM_IN_BT	BT PCM data input
29	PCM_OUT_BT	BT PCM data output	30	PCM_CLK_BT	BT PCM CLK
31	RTC32KOUT_WIF I	External Low Power Clock input (32.768KHz)	32	GND	Ground
33	NC	Not connect	34	VCCIO_WL	I/O Voltage supply input
35	NC	Not connect	36	VCC3V3_WL_VB AT	Main power voltage source input
37	NC	Not connect	38	BT_REG_ON_H	Low asserting reset for Bluetooth core
39	GND	Ground	40	UART9_RX_M0_ 1V8	Bluetooth UART interface
41	UART9_TX_M0_G MAC0-RD1_1V8	Bluetooth UART interface	42	UART9_CTSn_M 0_GMAC0-MDI_ 1V8	Bluetooth UART interface
43	UART9_RTSn_M0 _GMAC0-MDC_1V 8	Bluetooth UART interface	44	NC	Not connect
45	NC	Not connect	46	NC	Not connect
47	GND	Ground	48	NC	Not connect
49	HOST_WAKE_BT _H	HOST wake-up Bluetooth device	50	BT_WAKE_HOS T_H	Bluetooth device to wake-up HOST

1.4.10 UART0/3(J2/J5)

The Idea3588 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.


J2(UART0)

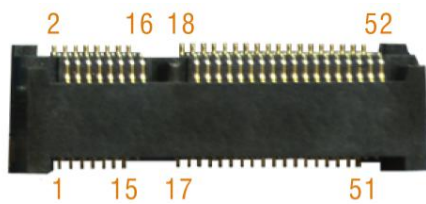
Pin	Signal	Description	Pin	Signal	Description
1	VDD3V3	3V3 power supply	2	UART0_RX_M2	UART0 data input
3	UART0_TX_M2	UART0 data output	4	GND	Ground


J5(UART3)

Pin	Signal	Description	Pin	Signal	Description
1	VDD3V3	3V3 power supply	2	UART3_RX_M2	UART3 data input
3	UART3_TX_M2	UART3 data output	4	GND	Ground

1.4.11 4G Module(J8700)

The MiniPCIe2.0 Slot for 4G module. It delivers 50Mbps-up and 100Mbps-down data rates on 4G FDD networks and can also be fully backward compatible with existing UMTS and GSM/GPRS networks.



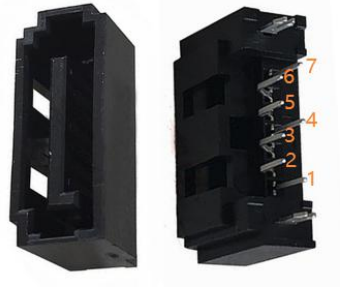
Pin	Signal	Description	Pin	Signal	Description
1	LOUT1/ROUT1/P CIE30X1_1_WAK En_M1_L	Line output/WAKE#	2	VCC3V3_MINIP CIE	3V3 power supply
3	LOUT1/ROUT1	Line output/COEX1	4	GND	Ground
5	MICP	MIC +	6	NC	Not connect
7	MICN/PCIEx1_1_ CLKREQn_M1_L	MIC -/CLKREQ#	8	SIM_VCC	SIM power
9	GND	Ground	10	SIM_DATA	SIM data
11	PCIE20_1_REFCL	PCIe reference	12	SIM_CLK	SIM Clock



	KN	clock input			
13	PCIE20_1_REFCLKP	PCIe reference clock input	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	PCIE30X1_1_PERRSTn_M1_L	PCIe global reset output (RC mode) PCIe global reset input (EP mode)
23	PCIE20_1_RXN/SATA30_1_RXN	PCIe data input	24	VCC3V3_MINIPCI	3V3 power supply
25	PCIE20_1_RXP/SATA30_1_RXP	PCIe data input	26	GND	Ground
27	GND	Ground	28	NC	Not connect
29	GND	Ground	30	TP8700	TP8700 TP_0.7
31	MINIPCI20_TX_N	PCIe data output	32	TP8701	TP8701 TP_0.7
33	MINIPCI20_TX_P	PCIe data output	34	GND	Ground
35	GND	Ground	36	MINIPCI_USB_DM	USB Host data DM
37	GND	Ground	38	MINIPCI_USB_DP	USB Host data DP
39	VCC3V3_MINIPCI	3V3 power supply	40	GND	Ground
41	VCC3V3_MINIPCI	3V3 power supply	42	LED_WWAN	LED indicator
43	GND	Ground	44	NC	Not connect
45	TP8702	TP8702 TP_0.7	46	NC	Not connect
47	TP8703	TP8703 TP_0.7	48	NC	Not connect
49	NC	Not connect	50	GND	Ground
51	NC	Not connect	52	VCC3V3_MINIPCI	3V3 power supply

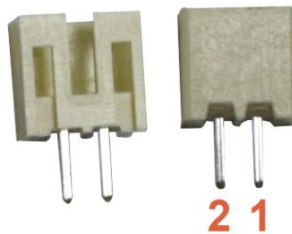
1.4.12 SATA&SATA-POWER(J34/J33)

The Idea3588 SATA interface support a maximum data rate of 6Gbps.



J34(SATA)

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	SATA0_SSTXP	SATA data output
3	SATA0_SSTXN	SATA data output	4	GND	Ground
5	SATA0_SSRXN	SATA data input	6	SATA0_SSRXP	SATA data input
7	GND	Ground			

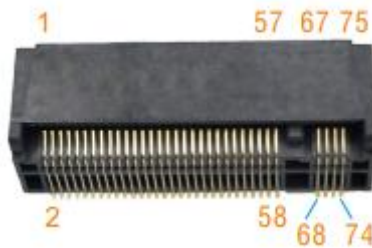


J33(SATA POWER)

Pin	Signal	Description	Pin	Signal	Description
1	SATA_PWR	5V power supply	2	GND	Ground

1.4.13 M.2_PClE3.0(J8900)

M.2 PCIe3.0 socket for NVMe SSD.



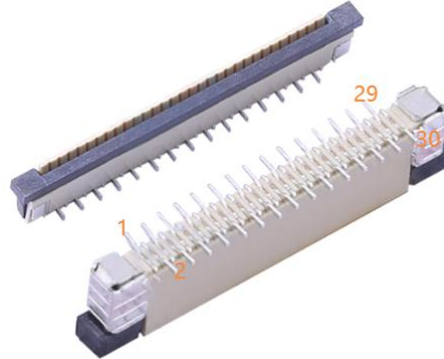
Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	VCC3V3_PClE30	3V3 power supply
3	GND	Ground	4	VCC3V3_PClE30	3V3 power supply
5	NC	Not connect	6	NC	Not connect
7	NC	Not connect	8	NC	Not connect
9	NC	Not connect	10	TP8903	TP8903 TP_0.7
11	NC	Not connect	12		
13			14		



15			16		
17			18		
19			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 data input	30	NC	Not connect
31	PCIE30_PORT0_RX1P	PCle data input	32	NC	Not connect
33	GND	Ground	34	NC	Not connect
35	PCIE30_TX1_N	PCle data output	36	NC	Not connect
37	PCIE30_TX1_P	PCle data output	38	TP8902	TP8902 TP_0.7
39	GND	Ground	40	NC	Not connect
41	PCIE30_PORT0_RX0N	PCle data input	42	NC	Not connect
43	PCIE30_PORT0_RX0P	PCle data input	44	NC	Not connect
45	GND	Ground	46	NC	Not connect
47	PCIE30_TX0_N	PCle data output	48	NC	Not connect
49	PCIE30_TX0_P	PCle data output	50	PCIE30X2_PER STn_3V3_L	PCle global reset output (RC mode)
51	GND	Ground	52	PCIE30X2_CLK REQn_3V3_L	PCle reference clock request input (RC mode)
53	PCIE30_REFCLK N_CON	PCle reference clock	54	PCIE30X2_WAK En_3V3_L	PCle Wakeup Input (RC Mode)
55	PCIE30_REFCLK P_CON	PCle reference clock	56	TP8901	TP8901 TP_0.7
57	GND	Ground	58	TP8900	TP8900 TP_0.7
59			60		
61			62		
63			64		
65			66		
67	NC	Not connect	68	NC	Not connect
69	NC	Not connect	70	VCC3V3_PCIE30	3V3 power supply
71	GND	Ground	72	VCC3V3_PCIE30	3V3 power supply
73	GND	Ground	74	VCC3V3_PCIE30	3V3 power supply
75	GND	Ground			

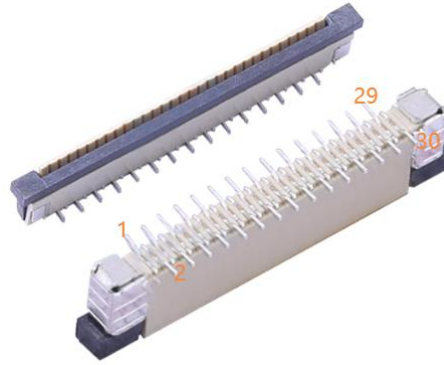
1.4.14 CAMERA(CON2/3/4)

The Idea3588 provides three 30-pin MIPI connectors, both using the camera DC-IM415-1214V1, support up to 3840(H) x 2160(V) output.

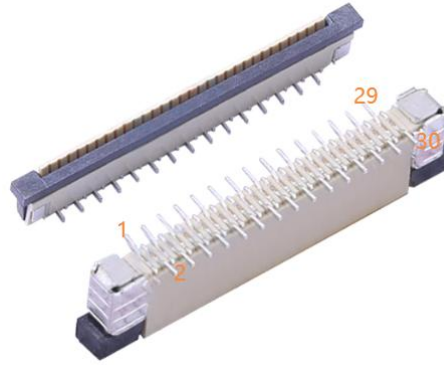


CON2(camera0)

Pin	Signal	Description	Pin	Signal	Description
1	NC	Not connect	2	AF_2V8	AF 2V8 power supply
3	DVDD1V2	1V2 power supply	4	VCC1V8_DVP	1V8 power supply
5	NC	Not connect	6	GND	Ground
7	AVDD2V8_DVP	2V8 power supply	8	GND	Ground
9	I2C2_SDA_M4_1V8	I2C2 data line	10	I2C2_SCL_M4_1V8	I2C2 clock line
11	CAMERA_RST_0	Camera0 reset	12	MIPI_CSI_PWD_N0	enable pin
13	GND	Ground	14	MIPI_CLK0	MIPI clock
15	GND	Ground	16	MIPI_CSI0_RX_D3P	MIPI CSI0 data Lane3 input
17	MIPI_CSI0_RX_D3N	MIPI CSI0 data Lane3 input	18	GND	Ground
19	MIPI_CSI0_RX_D2P	MIPI CSI0 data Lane2 input	20	MIPI_CSI0_RX_D2N	MIPI CSI0 data Lane2 input
21	GND	Ground	22	MIPI_CSI0_RX_D1P	MIPI CSI0 data Lane1 input
23	MIPI_CSI0_RX_D1N	MIPI CSI0 data Lane1 input	24	GND	Ground
25	MIPI_CSI0_RX_CLK0P	MIPI CSI0 clock 0 input	26	MIPI_CSI0_RX_CLK0N	MIPI CSI0 clock 0 input
27	GND	Ground	28	MIPI_CSI0_RX_D0P	MIPI CSI0 data Lane0 input
29	MIPI_CSI0_RX_D0N	MIPI CSI0 data Lane0 input	30	GND	Ground


CON3(camera1)

Pin	Signal	Description	Pin	Signal	Description
1	NC	Not connect	2	AF_2V8	AF 2V8 power supply
3	DVDD1V2	1V2 power supply	4	VCC1V8_DVP	1V8 power supply
5	NC	Not connect	6	GND	Ground
7	AVDD2V8_DVP	2V8 power supply	8	GND	Ground
9	I2C4_SDA_M3_1V8	I2C4 data line	10	I2C4_SCL_M3_1V8	I2C4 clock line
11	CAMERA_RST_1	Camera1 reset	12	MIPI_CSI_PWD_N1	enable pin
13	GND	Ground	14	MIPI_CLK1	MIPI clock
15	GND	Ground	16	MIPI_CSI1_RX_D3P	MIPI CSI1 data Lane3 input
17	MIPI_CSI1_RX_D3N	MIPI CSI1 data Lane3 input	18	GND	Ground
19	MIPI_CSI1_RX_D2P	MIPI CSI1 data Lane2 input	20	MIPI_CSI1_RX_D2N	MIPI CSI1 data Lane2 input
21	GND	Ground	22	MIPI_CSI1_RX_D1P	MIPI CSI1 data Lane1 input
23	MIPI_CSI1_RX_D1N	MIPI CSI1 data Lane1 input	24	GND	Ground
25	MIPI_CSI1_RX_CLK0P	MIPI CSI1 clock 0 input	26	MIPI_CSI1_RX_CLK0N	MIPI CSI1 clock 0 input
27	GND	Ground	28	MIPI_CSI1_RX_D0P	MIPI CSI1 data Lane0 input
29	MIPI_CSI1_RX_D0N	MIPI CSI1 data Lane0 input	30	GND	Ground


CON4(camera2)

Pin	Signal	Description	Pin	Signal	Description
1	NC	Not connect	2	AF_2V8	AF 2V8 power supply
3	DVDD1V2	1V2 power supply	4	VCC1V8_DVP	1V8 power supply
5	NC	Not connect	6	GND	Ground
7	AVDD2V8_DVP	2V8 power supply	8	GND	Ground
9	I2C2_SDA_M4_1V8	I2C2 data line	10	I2C2_SCL_M4_1V8	I2C2 clock line
11	CAMERA_RST_2	Camera2 reset	12	MIPI_CSI_PWD_N2	enable pin
13	GND	Ground	14	MIPI_CLK2	MIPI clock
15	GND	Ground	16	MIPI_DPHY1_RX_X_D3P	MIPI_DPHY1 Data Lane3 input
17	MIPI_DPHY1_RX_D3N	MIPI_DPHY1 Data Lane3 input	18	GND	Ground
19	MIPI_DPHY1_RX_D2P	MIPI_DPHY1 Data Lane2 input	20	MIPI_DPHY1_RX_D2N	MIPI_DPHY1 Data Lane2 input
21	GND	Ground	22	MIPI_DPHY1_RX_D1P	MIPI_DPHY1 Data Lane1 input
23	MIPI_DPHY1_RX_D1N	MIPI_DPHY1 Data Lane1 input	24	GND	Ground
25	MIPI_DPHY1_RX_CLKP	MIPI_DPHY1 clock input	26	MIPI_DPHY1_RX_CLKN	MIPI_DPHY1 clock input
27	GND	Ground	28	MIPI_DPHY1_RX_D0P	MIPI_DPHY1 Data Lane0 input
29	MIPI_DPHY1_RX_D0N	MIPI_DPHY1 Data Lane0 input	30	GND	Ground

1.4.15 CSI Bridge connetor(J1)

Connect to the CSI Bridge connetor on the CM3588 using a special cable,the purpose is to connect the data pins of camera1 and camera2 to the CPU board. On the idea3588 board, the camera is default connected to camera0 (CON2) and camera1 (CON3).

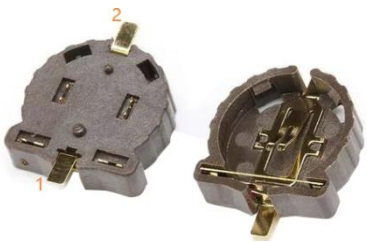


Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	MIPI_DPHY1_RX_D0P	MIPI_DPHY1 Data Lane0 input
3	MIPI_DPHY1_RX_D0N	MIPI_DPHY1 Data Lane0 input	4	GND	Ground
5	MIPI_DPHY1_RX_D1P	MIPI_DPHY1 Data Lane1 input	6	MIPI_DPHY1_RX_D1N	MIPI_DPHY1 Data Lane1 input
7	GND	Ground	8	MIPI_DPHY1_RX_CLKP	MIPI_DPHY1 clock input
9	MIPI_DPHY1_RX_CLKN	MIPI_DPHY1 clock input	10	GND	Ground
11	MIPI_DPHY1_RX_D2P	MIPI_DPHY1 Data Lane2 input	12	MIPI_DPHY1_RX_D2N	MIPI_DPHY1 Data Lane2 input
13	GND	Ground	14	MIPI_DPHY1_RX_D3P	MIPI_DPHY1 Data Lane3 input
15	MIPI_DPHY1_RX_D3N	MIPI_DPHY1 Data Lane3 input	16	GND	Ground
17	GND	Ground	18	MIPI_CSI1_RX_CLK1P	MIPI_CSI1 clock1 input
19	MIPI_CSI1_RX_CLK1N	MIPI_CSI1 clock1 input	20	GND	Ground
21	MIPI_CSI1_RX_D3P	MIPI CSI1 data Lane3 input	22	MIPI_CSI1_RX_D3N	MIPI CSI1 data Lane3 input
23	GND	Ground	24	MIPI_CSI1_RX_D2P	MIPI CSI1 data Lane2 input
25	MIPI_CSI1_RX_D2N	MIPI CSI1 data Lane2 input	26	GND	Ground
27	MIPI_CSI1_RX_CLK0P	MIPI CSI1 clock 0 input	28	MIPI_CSI1_RX_CLK0N	MIPI CSI1 clock 0 input
29	GND	Ground	30	MIPI_CSI1_RX_D1P	MIPI CSI1 data Lane1 input
31	MIPI_CSI1_RX_D1N	MIPI CSI1 data Lane1 input	32	GND	Ground
33	MIPI_CSI1_RX_D0P	MIPI CSI1 data Lane0 input	34	MIPI_CSI1_RX_D0N	MIPI CSI1 data Lane0 input

	0P	Lane0 input		D0N	Lane0 input
35	GND	Ground	36	GND	Ground
37	MIPI_CAM3_CLK O_M0_1V8	MIPI clock	38	GND	Ground
39	MIPI_CAM4_CLK O_M0_1V8	MIPI clock			

1.4.16 RTC Power(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	battery positive	2	GND	Ground

1.4.17 HD/POWER LED(D1/4)

					
D1(HD LED)					
Pin	Signal	Description	Pin	Signal	Description
1	SATA0_ACT_LED_M0	GPIO4_B6_d	2	GND	Ground
					
D4(POWER LED)					
Pin	Signal	Description	Pin	Signal	Description
1	VCC_3V3	3V3 supply input	2	GND	Ground

1.4.18 EARPHONE(J9 3.5mm jack)

The Idea3588 adopts audio codec ES8388 to provide stereo audio output/input.

Feature

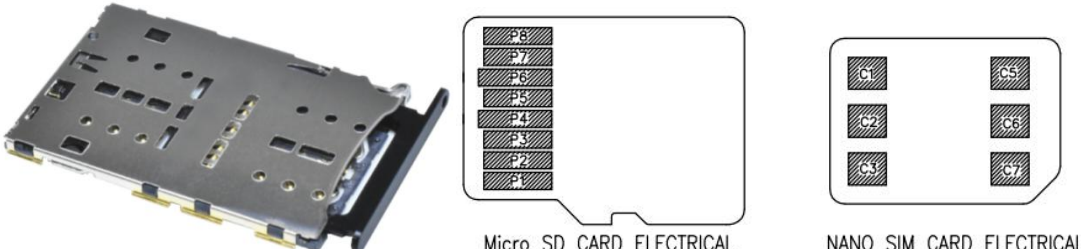
- Low power
- Integrated ADC and DAC
- IIS transfer audio data
- Stereo output, support recording



Pin	Signal	Description	Pin	Signal	Description
1	HP_GND	Ground	2	ROUT2	Headphone amplifier output _Right channel
3	LOUT2	Headphone amplifier output _Left channel	4	HP_DET_L	Headphone Detect
5	INP_PHONE_MIC	Single-end input for microphone			

1.4.19 Nano SIM+Micro SD(J9502)

All-in-one card holder,support TF card and SIM card.



Pin	Signal	Description	Pin	Signal	Description
P1	SDMMC0_D2	SD data send/receive	P2	SDMMC0_D3	SD data send/receive
P3	SDMMC0_CMD	SD command	P4	VCCIO_SD	SD power supply
P5	SDMMC0_CLK	SD clock transmission	P6	GND	Ground
P7	SDMMC0_D0	SD data	P8	SDMMC0_D1	SD data



		send/receive			send/receive
1	NC	Not connect	2	NC	Not connect
3	GND	Ground	4	GND	Ground
5	GND	Ground	6	GND	Ground
7	SDMMC_DET_1V6	SDMMC detection switch	8	GND	Ground
9	GND	Ground	10	GND	Ground
11	GND	Ground	12	GND	Ground
13	GND	Ground			
C1	SIM_VCC	SIM power supply	C2	SIM_RST	SIM Reset
C3	SIM_CLK	SIM Clock			
C5	GND	Ground	C6	SIM_VCC	SIM power supply
C7	SIM_DATA	SIM data			
C01	SIM_VCC	SIM power supply	C02	SIM_RST	SIM Reset
C03	SIM_CLK	SIM Clock			
C05	GND	Ground	C06	SIM_VCC	SIM power supply
C07	SIM_DATA	SIM data			

1.4.20 IR(U2)

					
Pin	Signal	Description	Pin	Signal	Description
1	PWM15_IR_M1	IR reception	2	GND	Ground
3	VCC_3V3	3V3 power supply			

1.4.21 DEBUG(J3)

Debug serial connector, baud rate is 1500000.

					
Pin	Signal	Description	Pin	Signal	Description
1	UART2_RX_M0_D	UART2 data input	2	UART2_TX_M0_	UART2 data output

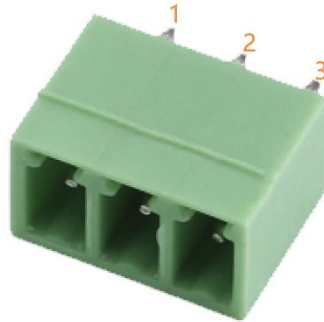


	EBUG		DEBUG	
3	GND	Ground		

1.4.22 RS485(P4)

SN75176B Differential bus transceiver.

- Bidirectional Transceivers
- $\pm 200\text{mV}$ Receiver Input Sensitivity
- 50mV Type Receiver Input Hysteresis



Pin	Signal	Description	Pin	Signal	Description
1	RS485_B	RS-485 Data Line	2	RS485_A	RS-485 Data Line
3	GND	Ground			

1.4.23 CAN(P2)

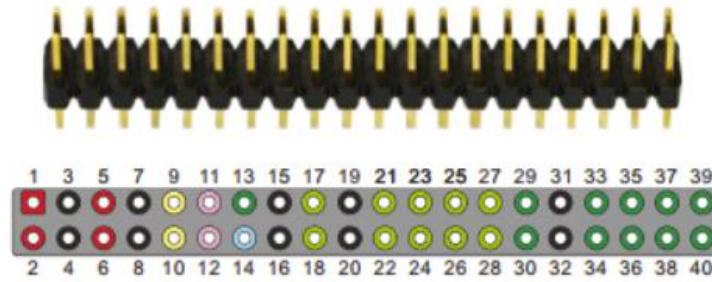
The Idea3588 CAN bus support CAN 2.0B protocol and support 1Mbps, 8Mbps. support transmit or receive CAN standard frame and extended frame, and support transmit or receive data frame, remote frame, overload frame, error frame and frame interval.



Pin	Signal	Description	Pin	Signal	Description
1	CAN1L	CAN Low-Level Voltage I/O	2	CAN1H	CAN High-Level Voltage I/O

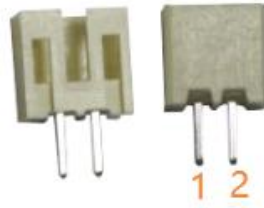
1.4.24 MIPI/EDP(CON5)

eDP TX mode: maximum resolution supports 4K@60Hz, supports RGB/YUV422 (Up to 10bit) format.



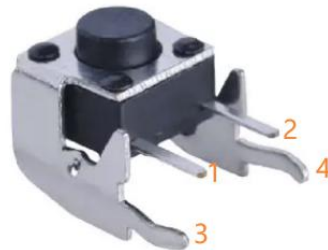
Pin	Signal	Description	Pin	Signal	Description
1	VDD5V	5V5 power supply	2	VDD5V	5V5 power supply
3	GND	Ground	4	GND	Ground
5	VCC3V3_LCD	3V3 power supply	6	VCC3V3_LCD	3V3 power supply
7	GND	Ground	8	GND	Ground
9	I2C_SCL_TP	I2C2 clock line	10	I2C_SDA_TP	I2C data line
11	TOUCH_RST	Touch screen reset	12	TOUCH_INT	Touch screen Interrupt
13	LCD_PWREN_H	LCD Power enable	14	LCD_BL_PWM	LCD Backlight PWM output
15	GND	Ground	16	GND	Ground
17	EDP_TX_AUXP	eDP AUX channel	18	EDP_TX_AUXN	eDP AUX channel
19	GND	Ground	20	GND	Ground
21	EDP_TX_D3P	eDP data Lane3 output	22	EDP_TX_D3N	eDP data Lane3 output
23	EDP_TX_D2P	eDP data Lane2 output	24	EDP_TX_D2N	eDP data Lane2 output
25	EDP_TX_D1P	eDP data Lane1 output	26	EDP_TX_D1N	eDP data Lane1 output
27	EDP_TX_D0P	eDP data Lane0 output	28	EDP_TX_D0N	eDP data Lane0 output
29	MIPI_DPHY1_TX_CLKP	MIPI_DPHY1 clock output	30	MIPI_DPHY1_TX_CLKN	MIPI_DPHY1 clock output
31	GND	Ground	32	GND	Ground
33	MIPI_DPHY1_TX_D3P	MIPI_DPHY1 Data Lane3 output	34	MIPI_DPHY1_TX_D3N	MIPI_DPHY1 Data Lane3 output
35	MIPI_DPHY1_TX_D2P	MIPI_DPHY1 Data Lane2 output	36	MIPI_DPHY1_TX_D2N	MIPI_DPHY1 Data Lane2 output
37	MIPI_DPHY1_TX_D1P	MIPI_DPHY1 Data Lane1 output	38	MIPI_DPHY1_TX_D1N	MIPI_DPHY1 Data Lane1 output
39	MIPI_DPHY1_TX_D0P	MIPI_DPHY1 Data Lane0 output	40	MIPI_DPHY1_TX_D0N	MIPI_DPHY1 Data Lane0 output

1.4.25 FAN(J4)



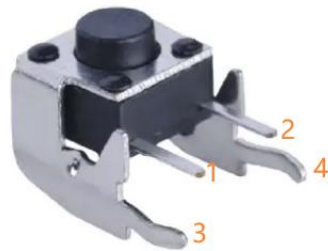
Pin	Signal	Description	Pin	Signal	Description
1	GPIO3_D4_d	GPIO control set to low voltage(GND)	2	VDD12V	12V power supply

1.4.26 KEY(K1/2/3)



K1(POWER KEY)

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	PWR_EN	POWER
3	GND	Ground	4	GND	Ground



K3(RESET KEY)

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	2	RESET_L	RESET
3	GND	Ground	4	GND	Ground



K2(RECOVERY KEY)

Pin	Signal	Description	Pin	Signal	Description
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1	GND	Ground	2	RECOVERY_SA RADC_VIN1	RECOVERY
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3 Product Configurations

3.1 Standard Contents

NO.	Item	Qty. (PCS)	Description
1	Idea3588 board	1	Standard Content (4GB RAM, 8GB eMMC) with WIFI and BT
2	TF card / CD-ROM	1	Android/Debian BSP, Documents, tools, Schematic Drawing, datasheets
3	Ethernet cable	1	1.5m Crossover cable
4	Serial Cable	1	CP2102
5	USB Cable	1	USB Type_C
6	Power adaptor	1	12V/3A DC
7	WIFI antenna	1	WIFI&Bluetooth antenna

3.2 Optional Parts

- MIPI camera Module (DC-IM415-1214V1 with CSI Bridge cable)
- LCD Module (10.1-inch edp panel)
- 4G Module
- SSD
- SATA