

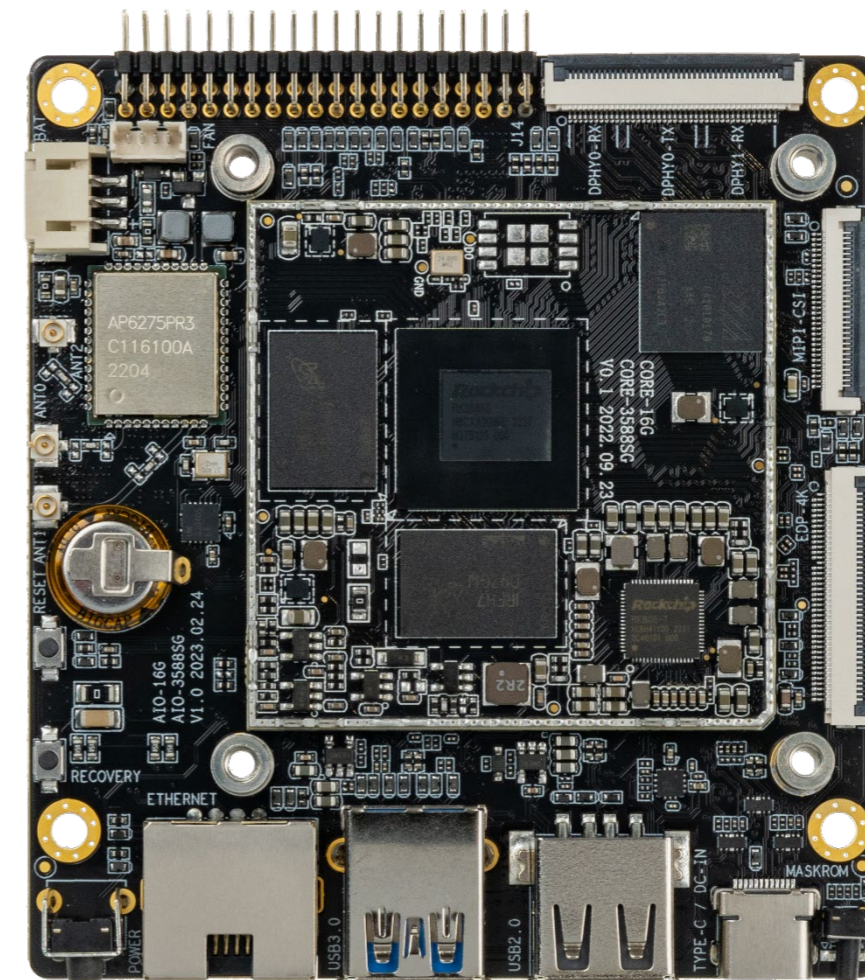


AIO-3588SG

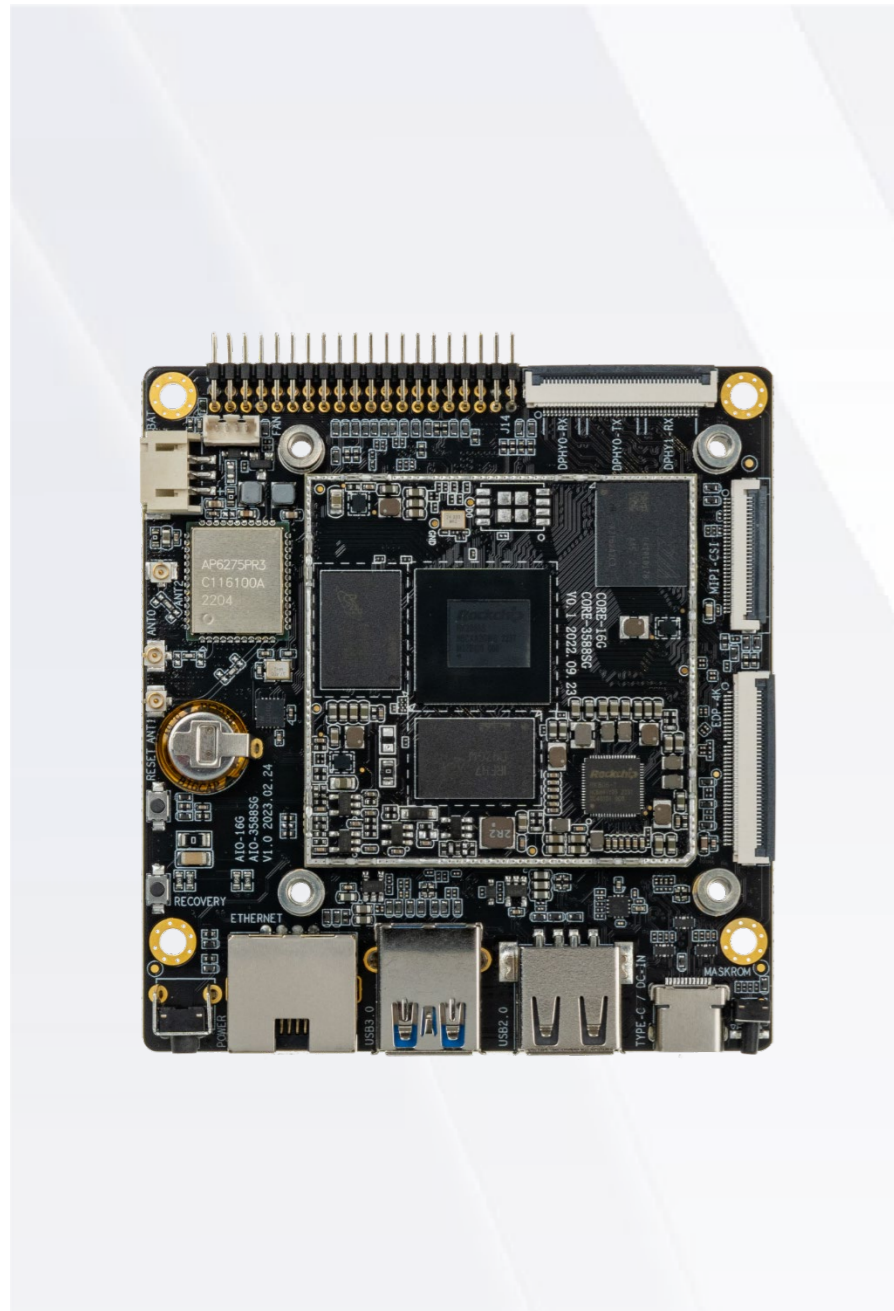
Octa-Core 8K AI Mainboard

V1.0 2024-2-18

T-CHIP INTELLIGENCE TECHNOLOGY



Product features



8-Core 64bit processor

8-Core 64bit processor RK3588S
8nm lithography process.
up to 2.4GHz



Super-large 32GB RAM

Up to 32GB RAM
Support LPDDR4/LPDDR4x/LPDDR5



8K H.265 / 6TOPS NPU

OpenGL ES3.2/2.0, Vulkan1.1
8K@60fps H.265/VP9 Decoding
8K@30fps H.265/H.264 Encoding
6TOPS NPU computing power



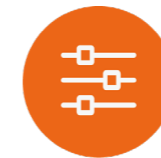
Network communication

1*Gigabit Ethernet(1000Mbps)
2.4G/5GHz Dual-band WiFi6
Bluetooth5.0



Operating systems

Android 12.0, Ubuntu
Debian11 and Buildroot、RTLinux
Kylin and UOS are supported



A variety of interfaces

EDP、MIPI-CSI、MIPI-DSI、USB3.1
、USB2.0、Gigabit Ethernet*1、CA
N、UART、VCC、I2C、SPI、SARADC

Specifications

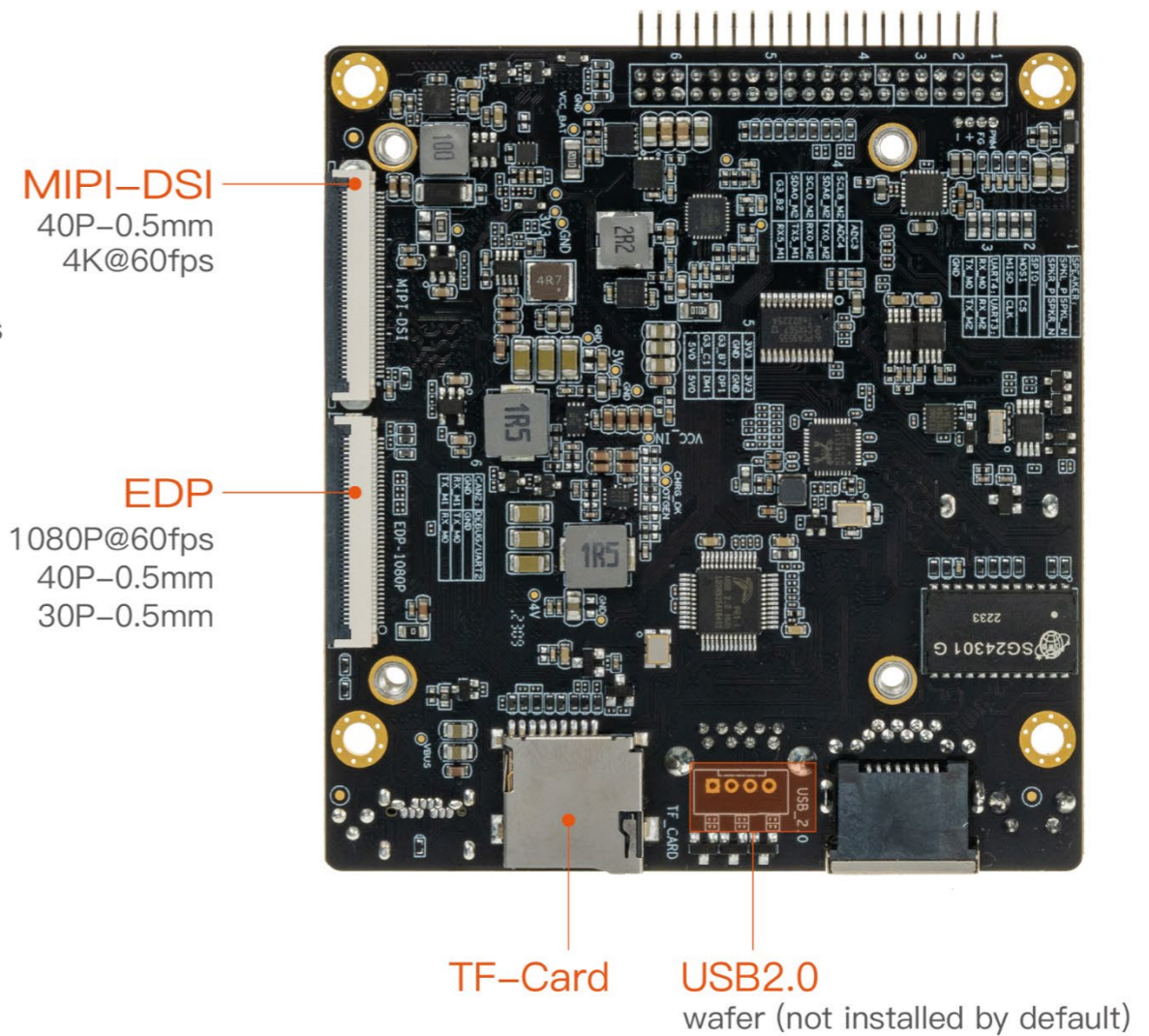
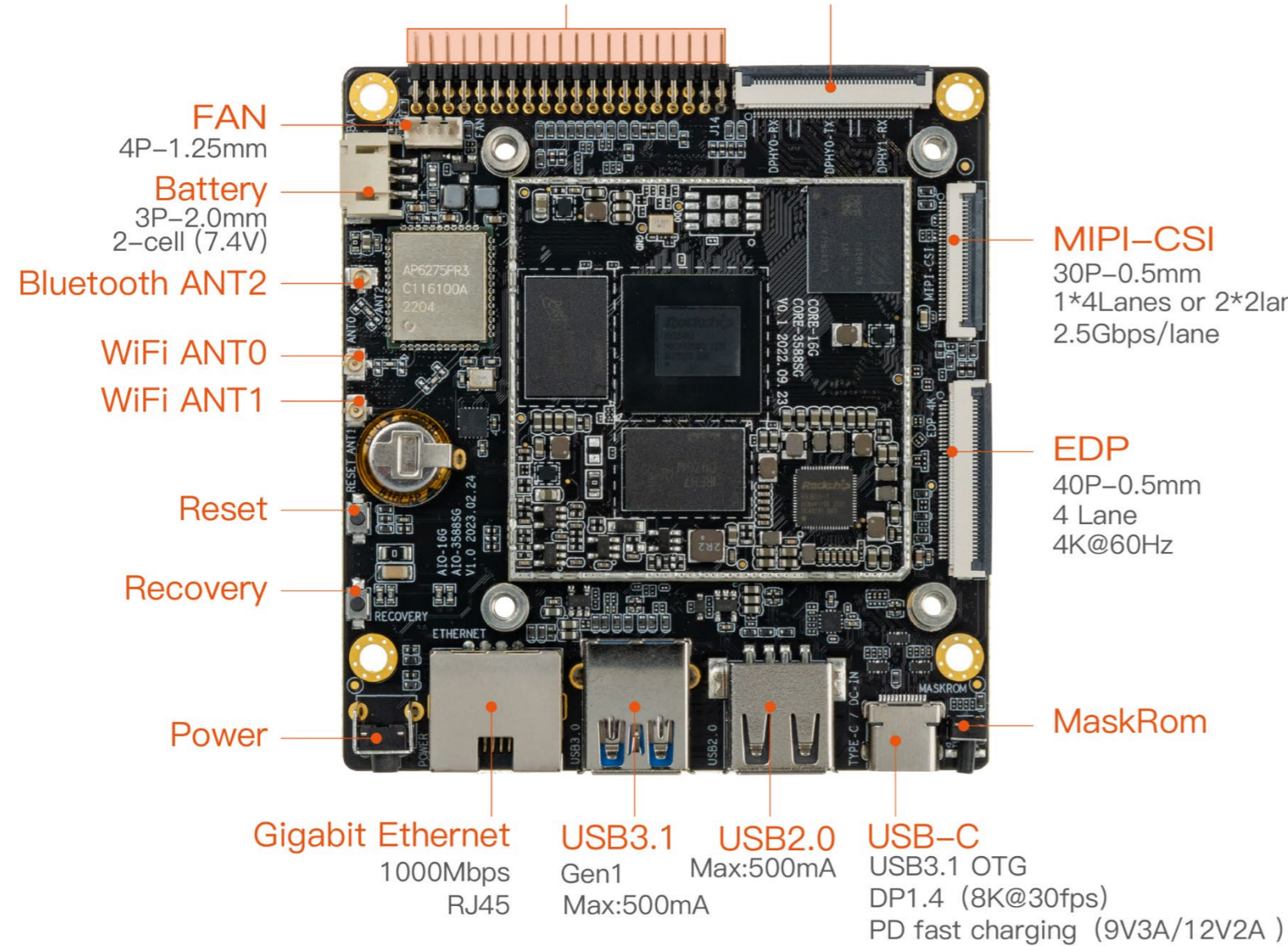


Type	Specifications
SOC	RK3588S
CPU	Octa-core 64-bit (4*Cortex-A76+4*Cortex-A55), 8nm lithography process, frequency up to 2.4GHz
GPU	ARM Mali-G610 MP4 quad-core GPU, support OpenGL ES3.2 / OpenCL 2.2 / Vulkan1.1, 450 GFLOPS
NPU	6 TOPS, support INT4/INT8/INT16 mixed operation, support framework switching of TensorFlow / MXNet / PyTorch / Caffe
VPU	Video decoding: 8K@60fps H.265/VP9/AVS2, 8K@30fps H.264 AVC/MVC, 4K@60fps AV1, 1080P@60fps MPEG-2/-1/VC-1/VP8 Video encoding: 8K@30fps encoding, support H.265 / H.264
RAM	4GB/8GB/16GB (Up to 32GB optional) 64bit LPDDR4/LPDDR4x/LPDDR5
Storage	16GB/32GB/64GB/128GB/256GB eMMC
Ethernet	Gigabit Ethernet (1000Mbps) * 1
Wireless Network	2.4G/5GHz dual-band WiFi6, 802.11 a/b/g/n/ac/ax, Bluetooth5.0
Video Output	1 * MIPI-DSI (up to 4K@60fps), 1 * DP1.4 (up to 8K@30fps), 1 * eDP1.3 (2 Lane /up to 4K@60Hz) *Up to three-screen output with different displays can be achieved
Video Input	1* MIPI-CSI (30P-0.5mm, 1*4Lane or 2*2lanes, 2.5Gbps/lane)
Audio	1*DP1.4 audio output, 1*Speaker (it is connected to the 4Pin of Header-40P-2.0mm)
USB	1 * USB3.1 (Gen1), 2 * USB2.0 (one of them is connected to the 4Pin of Header-40P-2.0mm),1 * USB-C (DP1.4(8K@30fps)/OTG/PD fast charging)
Other Interfaces	Header-40P-2.0mm (CAN/UART/VCC/USB2.0/I2C/SPI/SARADC/SPEAKER/Debug) FPC-40P-0.5mm (DPHY0-RX/DPHY0-TX/DPHY1-RX)
Power	DC 9-36V, 2.5A and higher (PD power adapter is recommended) Android
OS	12.0, Ubuntu, Debian11, Buildroot, RTLinux, Kylin Linux
Size	88mm * 81mm
Weight	≈71g
Power Consumption	Max: 15.6w(12V/1.3A) Normal: 5w (12V/0.42A) Mini: 0.18w (12V/15mA)
Environment	Operating Temperature: -20°C ~ 60°C, Storage Temperature: -20°C ~ 70°C, Operating humidity: 10% ~ 90%RH (non-condensing)

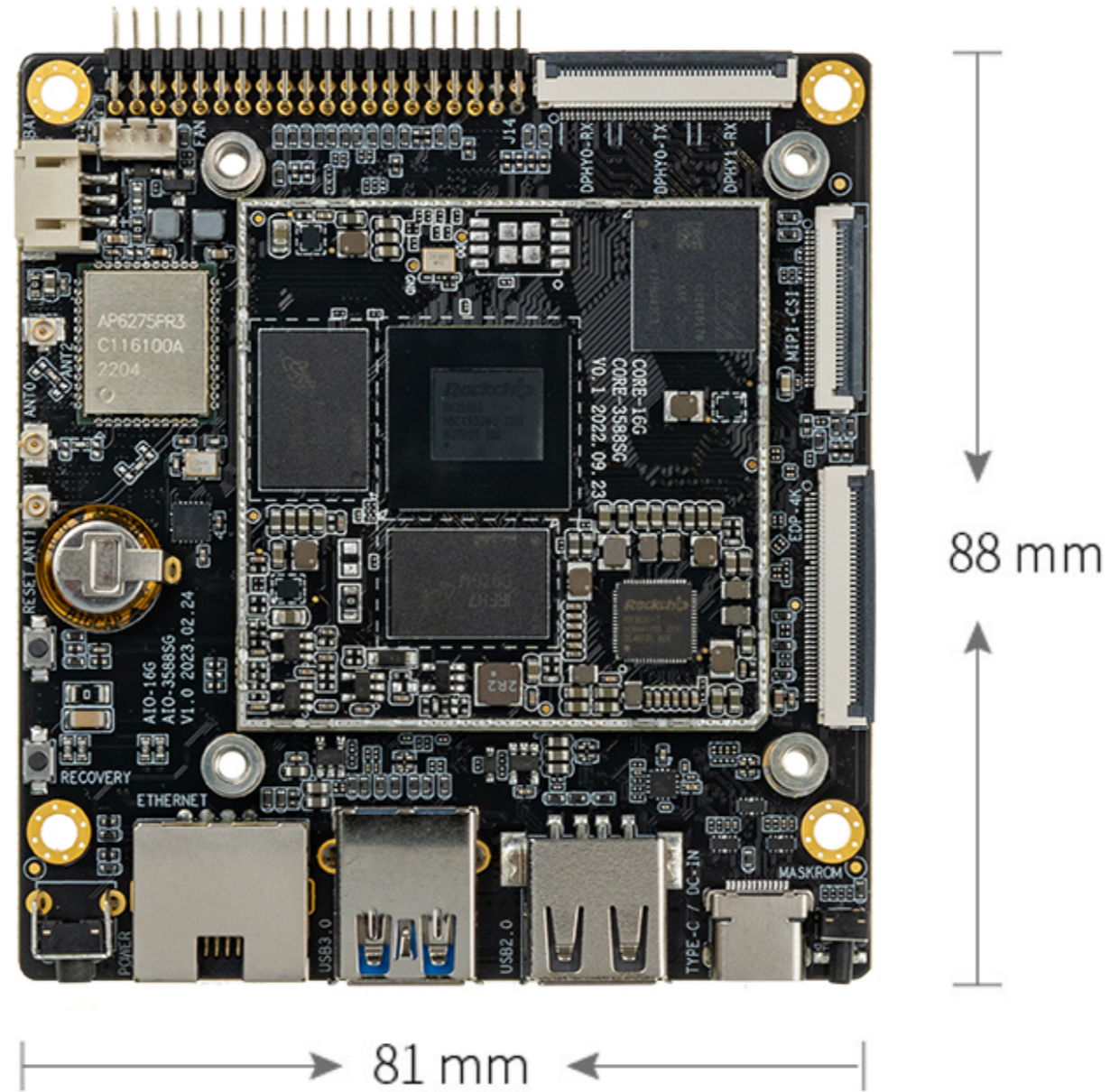
Interface description



Header-2*20P-2.0mm FPC-40P-0.5mm
 CAN/UART/VCC/USB2.0/I2C/SPI/SARADC/SPEAKER/Debug MIPI DPHY0-RX / MIPI DPHY0-TX / MIPI DPHY1-RX



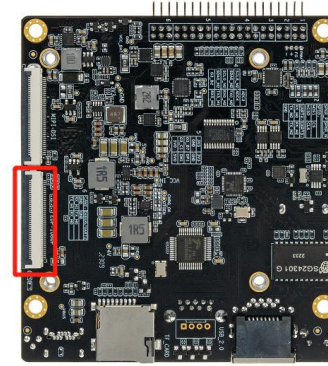
Dimension



Interface Definition



1. (J5)EDP 40 PIN 0.5mm Pitch (White)



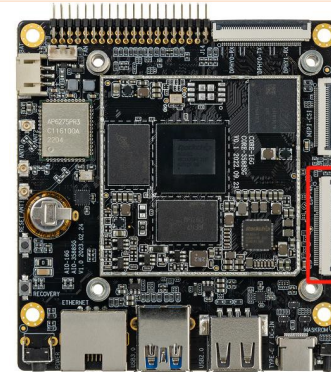
NO.	Definition	Power/V	NO.	Definition	Power/V
1	NC		21	GND	
2	GND		22	EDP_BL_EN (pull down resistance 10K)	3.3V
3	EDP_TX_D1N (series capacitor 100nF)	-	23	EDP_BL_PWM14_M1(pull up resistance 10K)	3.3V
4	EDP_TX_D1P (series capacitor 100nF)	-	24	NC	
5	GND		25	NC	
6	EDP_TX_D0N (series capacitor 100nF)	-	26	VCC_EDP (5V Output)	5V
7	EDP_TX_D0P (series capacitor 100nF)	-	27	VCC_EDP (5V Output)	5V
8	GND		28	VCC_EDP (5V Output)	5V
9	EDP_AUXP (series capacitor 100nF)	-	29	VCC_EDP (5V Output)	5V
10	EDP_AUXN (series capacitor 100nF)	-	30	NC	
11	GND		31	HUB_HOST_DM3	-
12	VCC3V3_EDP (3.3V Output)	3.3V	32	HUB_HOST_DP3	-
13	VCC3V3_EDP (3.3V Output)	3.3V	33	GND	
14	NC		34	VCC3V3_EDP (3.3V Output)	3.3V
15	GND		35	VCC3V3_EDP (3.3V Output)	3.3V
16	GND		36	EDP_TP_EN (from PCA9555)	3.3V
17	EDP_HPDI_M1 (series resistor 1K)	1.8V	37	I2C6_SCL_M3 (pull up resistance 2.2K)	3.3V

Interface Definition



18	GND		38	I2C6_SDA_M3 (pull up resistance 2.2K)	3.3V
19	GND		39	EDP_TP_INT	3.3V
20	GND		40	EDP_TP_RST (from PCA9555)	3.3V

2. (J22)EDP 40 PIN 0.5mm Pitch (White)



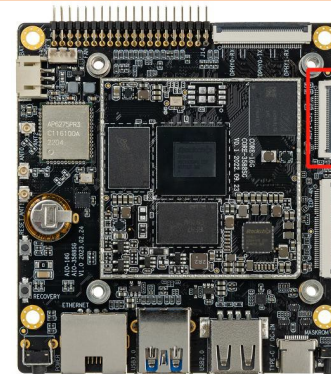
NO.	Definition	Power/V	NO.	Definition	Power/V
1	NC		21	VCC3V3_EDP (3.3V Output)	3.3V
2	GND		22	NC	
3	EDP_TX_D3N (series capacitor 100nF)	-	23	GND	
4	EDP_TX_D3P (series capacitor 100nF)	-	24	GND	
5	GND		25	GND	
6	EDP_TX_D2N (series capacitor 100nF)	-	26	GND	
7	EDP_TX_D2P (series capacitor 100nF)	-	27	EDP_HPDIN_M1 (series resistor 1K)	1.8V
8	GND		28	GND	
9	EDP_TX_D1N (series capacitor 100nF)	-	29	GND	
10	EDP_TX_D1P (series capacitor 100nF)	-	30	GND	
11	GND		31	GND	
12	EDP_TX_D0N (series capacitor 100nF)	-	32	EDP_BL_EN (pull down resistance 10K)	3.3V
13	EDP_TX_D0P (series capacitor 100nF)	-	33	EDP_BL_PWM14_M1(pull up resistance 10K)	3.3V



Interface Definition

14	NC		34	NC	
15	EDP_AUXP (series capacitor 100nF)	-	35	NC	
16	EDP_AUXN (series capacitor 100nF)	-	36	VCC_EDP (5V Output)	5V
17	GND		37	VCC_EDP (5V Output)	5V
18	VCC3V3_EDP (3.3V Output)	3.3V	38	VCC_EDP (5V Output)	5V
19	VCC3V3_EDP (3.3V Output)	3.3V	39	VCC_EDP (5V Output)	5V
20	VCC3V3_EDP (3.3V Output)	3.3V	40	NC	

3. (J7)Camera MIPI CSI 30 PIN 0.5mm Pitch (White)



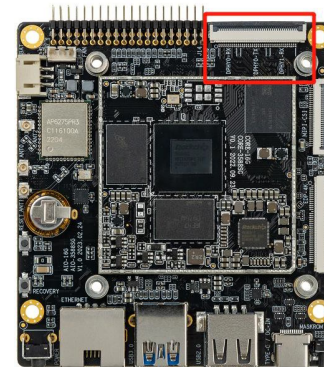
NO.	Definition	Power/V	NO.	Definition	Power/V
1	I2C7_SDA_M0_CODEC (pull up resistance 2.2K)	1.8V	16	GND	
2	I2C7_SCL_M0_CODEC (pull up resistance 2.2K)	1.8V	17	MIPI_CSI0_RX_CLK0P	-
3	MIPI_CAM1_PDN_L	1.8V	18	MIPI_CSI0_RX_CLK0N	-
4	MIPI_RESET0_CAM	1.8V	19	GND	
5	GND		20	MIPI_CSI0_RX_D2P	-
6	MIPI_MCLK1	1.8V	21	MIPI_CSI0_RX_D2N	-



Interface Definition

7	MIPI_CAM2_PDN_L	1.8V	22	GND	
8	MIPI_RESET1_CAM	1.8V	23	MIPI_CSI0_RX_D3P	-
9	MIPI_MCLK2	1.8V	24	MIPI_CSI0_RX_D3N	-
10	GND		25	GND	
11	MIPI_CSI0_RX_D0P	-	26	MIPI_CSI0_RX_CLK1P	-
12	MIPI_CSI0_RX_D0N	-	27	MIPI_CSI0_RX_CLK1N	-
13	GND		28	GND	
14	MIPI_CSI0_RX_D1P	-	29	VCC5V0_SYS (5V Output)	5V
15	MIPI_CSI0_RX_D1N	-	30	VCC5V0_SYS (5V Output)	5V

4. (J19)MIPI D/C 40 PIN 0.5mm Pitch (White)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	MIPI_DPHY0_RX_D3P	-	21	MIPI_DPHY0_TX_D1N/MIPI_CPHY0_TX_TRIO0_C	-
2	MIPI_DPHY0_RX_D3N/MIPI_CPHY0_RX_TRIO2_C	-	22	MIPI_DPHY0_TX_D1P/MIPI_CPHY0_TX_TRIO1_A	-
3	MIPI_DPHY0_RX_D2P/MIPI_CPHY0_RX_TRIO2_B	-	23	GND	
4	MIPI_DPHY0_RX_D2N/MIPI_CPHY0_RX_TRIO2_A	-	24	MIPI_DPHY0_TX_D0N/MIPI_CPHY0_TX_TRIO0_A	-
5	MIPI_DPHY0_RX_CLKP/MIPI_CPHY0_RX_TRIO1_C	-	25	MIPI_DPHY0_TX_D0P/MIPI_CPHY0_TX_TRIO0_B	-
6	MIPI_DPHY0_RX_CLKN/MIPI_CPHY0_RX_TRIO1_B	-	26	GND	



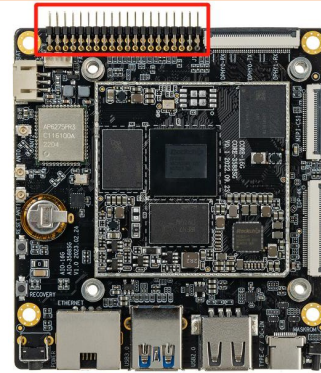
Interface Definition

7	MIPI_DPHY0_RX_D1P/MIPI_CPHY0_RX_TRIO1_A	-	27	MIPI_DPHY1_RX_D3P	-
8	MIPI_DPHY0_RX_D1N/MIPI_CPHY0_RX_TRIO0_C	-	28	MIPI_DPHY1_RX_D3N/MIPI_CPHY1_RX_TRIO2_C	-
9	MIPI_DPHY0_RX_D0P/MIPI_CPHY0_RX_TRIO0_B	-	29	GND	
10	MIPI_DPHY0_RX_D0N/MIPI_CPHY0_RX_TRIO0_A	-	30	MIPI_DPHY1_RX_D2P/MIPI_CPHY1_RX_TRIO2_B	-
11	GND		31	MIPI_DPHY1_RX_D2N/MIPI_CPHY1_RX_TRIO2_A	-
12	MIPI_DPHY0_TX_D3N/MIPI_CPHY0_TX_TRIO2_C	-	32	GND	
13	MIPI_DPHY0_TX_D3P	-	33	MIPI_DPHY1_RX_CLKP/MIPI_CPHY1_RX_TRIO1_C	-
14	GND		34	MIPI_DPHY1_RX_CLKN/MIPI_CPHY1_RX_TRIO1_B	-
15	MIPI_DPHY0_TX_D2N/MIPI_CPHY0_TX_TRIO2_A	-	35	GND	
16	MIPI_DPHY0_TX_D2P/MIPI_CPHY0_TX_TRIO2_B	-	36	MIPI_DPHY1_RX_D1P/MIPI_CPHY1_RX_TRIO1_A	-
17	GND		37	MIPI_DPHY1_RX_D1N/MIPI_CPHY1_RX_TRIO0_C	-
18	MIPI_DPHY0_TX_CLKN/MIPI_CPHY0_TX_TRIO1_B	-	38	GND	
19	MIPI_DPHY0_TX_CLKP/MIPI_CPHY0_TX_TRIO1_C	-	39	MIPI_DPHY1_RX_D0P/MIPI_CPHY1_RX_TRIO0_B	-
20	GND		40	MIPI_DPHY1_RX_D0N/MIPI_CPHY1_RX_TRIO0_A	-

Interface Definition



5. (J14)20*2 PIN Header, 2.0mm Pitch (Black)



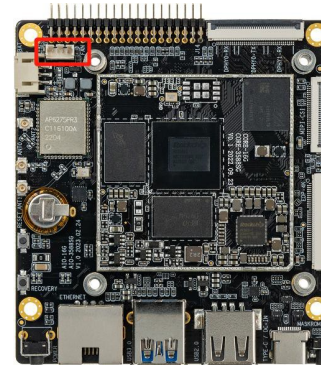
NO.	Definition	Power/V	NO.	Definition	Power/V
1	CAN2_TX_M1	1.8V	2	UART2_RX_M0	3.3V
3	CAN2_RX_M1	1.8V	4	UART2_TX_M0	3.3V
5	GND		6	GND	
7	VCC5V0_SYS (5V Output)	5V	8	VCC5V0_SYS (5V Output)	5V
9	GPIO3_C1_D	1.8V	10	USB20_HOST1_DM	-
11	GPIO3_B7_D	1.8V	12	USB20_HOST1_DP	-
13	GND		14	GND	
15	VCC3V3_SYS (3.3V Output)	3.3V	16	VCC3V3_SYS (3.3V Output)	3.3V
17	GPIO3_B2_D	1.8V	18	UART5_RX_M1	1.8V
19	I2C0_SDA_M2 (pull up resistance 2.2K)	1.8V	20	UART5_TX_M1	1.8V
21	I2C0_SCL_M2 (pull up resistance 2.2K)	1.8V	22	UART0_RX_M2	3.3V
23	I2C8_SDA_M2 (pull up resistance 2.2K)	1.8V	24	UART0_TX_M2	3.3V
25	I2C8_SCL_M2 (pull up resistance 2.2K)	1.8V	26	SARADC_VIN4_HP_HOOK	1.8V
27	GND		28	SARADC_VIN3	1.8V
29	UART4_TX_M0	1.8V	30	UART3_TX_M2	3.3V
31	UART4_RX_M0	1.8V	32	UART3_RX_M2	3.3V

Interface Definition



33	SPI0_MISO_M2	1.8V	34	SPI0_CLK_M2	1.8V
35	SPI0_MOSI_M2	1.8V	36	SPI0_CS0_M2	1.8V
37	SPEKL_N (2.7W/4 Ω , 1.65W/8 Ω)	5V	38	SPEKR_N (2.7W/4 Ω , 1.65W/8 Ω)	5V
39	SPEKL_P (2.7W/4 Ω , 1.65W/8 Ω)	5V	40	SPEKR_P (2.7W/4 Ω , 1.65W/8 Ω)	5V

6. (J15)FAN 4 PIN 1.25mm Pitch Wafer Holder (White)

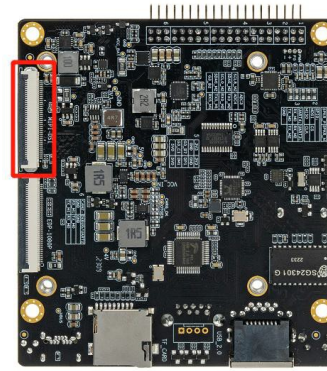


NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	VCC5V0_SYS (5V Output)	5V
3	FAN_FG	1.8V	4	PWM1_CONN	1.8V

Interface Definition



7. (J18)MIPI DSI 40PIN 0.5mm Pitch (White)



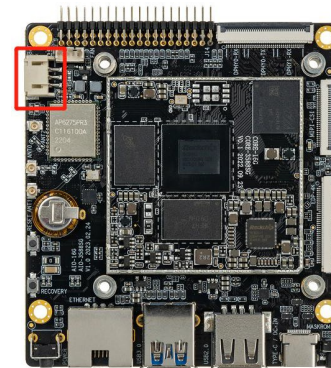
NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC3V3_EDP (3.3V Output)	3.3V	21	MIPI_DPHY1_TX_D3P	-
2	NC		22	GND	
3	TP0_RST_L (pull up resistance 10K)	3.3V	23	NC	
4	TP0_INT_L (pull up resistance 10K)	3.3V	24	NC	
5	I2C6_SDA_M3 (pull up resistance 2.2K)	3.3V	25	LCD0_RST (pull up resistance 10K)	3.3V
6	I2C6_SCL_M3 (pull up resistance 2.2K)	3.3V	26	NC	
7	GND		27	NC	
8	MIPI_DPHY1_TX_D0N	-	28	VCC_LCD1V8 (1.8V Output)	1.8V
9	MIPI_DPHY1_TX_D0P	-	29	NC	
10	GND		30	AVEE_5V5 (-5.5V Output)	-5.5V
11	MIPI_DPHY1_TX_D1N	-	31	AVEE_5V5 (-5.5V Output)	-5.5V
12	MIPI_DPHY1_TX_D1P	-	32	NC	
13	GND		33	AVDD_5V5 (+5.5V Output)	5.5V
14	MIPI_DPHY1_TX_CLKN	-	34	AVDD_5V5 (+5.5V Output)	5.5V
15	MIPI_DPHY1_TX_CLKP	-	35	VCC_LEDK	
16	GND		36	VCC_LEDK	

Interface Definition



17	MIPI_DPHY1_TX_D2N	-	37	VCC_LEDK	
18	MIPI_DPHY1_TX_D2P	-	38	VCC_LEDA	36V
19	GND		39	VCC_LEDA	36V
20	MIPI_DPHY1_TX_D3N	-	40	VCC_LEDA	36V

8. (J11)BAT 3 PIN 2.0mm Pitch wafer Holder (White)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	VBAT+	8.4V	2	NTC	
3	VBAT-				



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