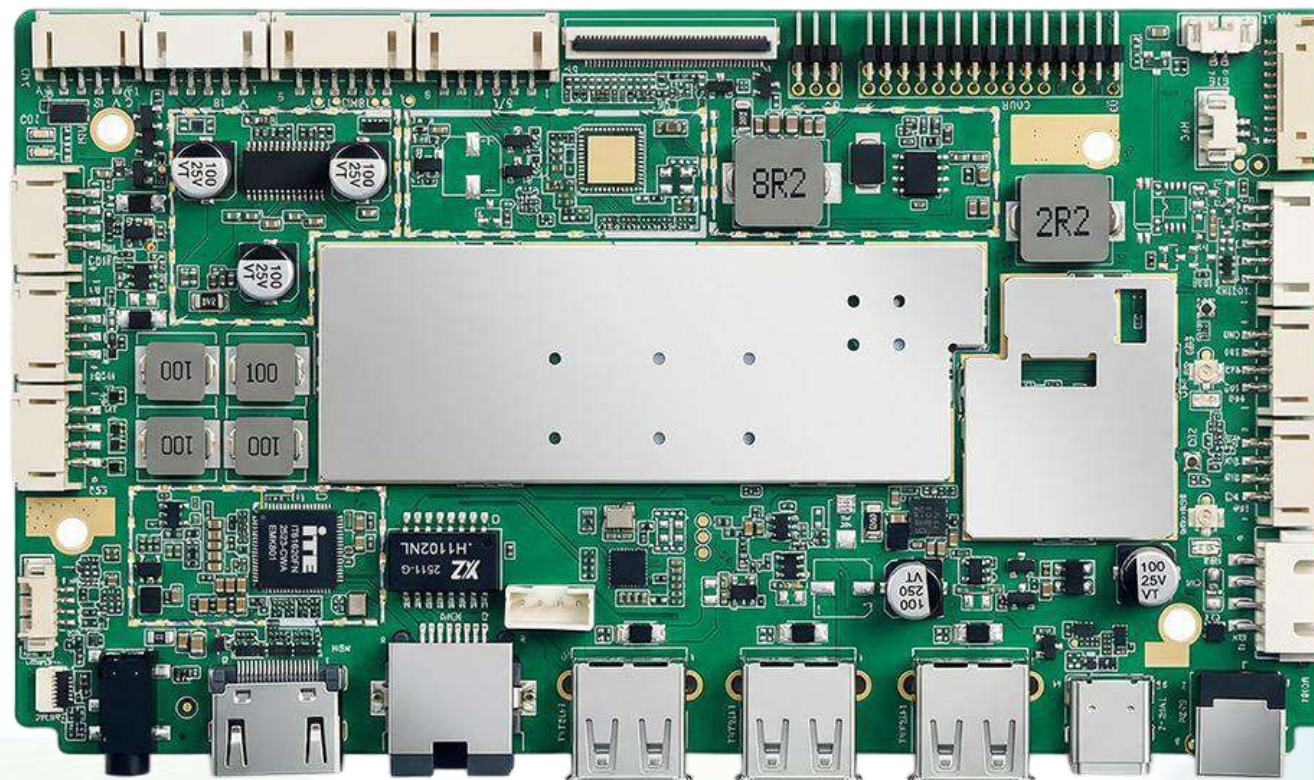


MTK8786-P8786

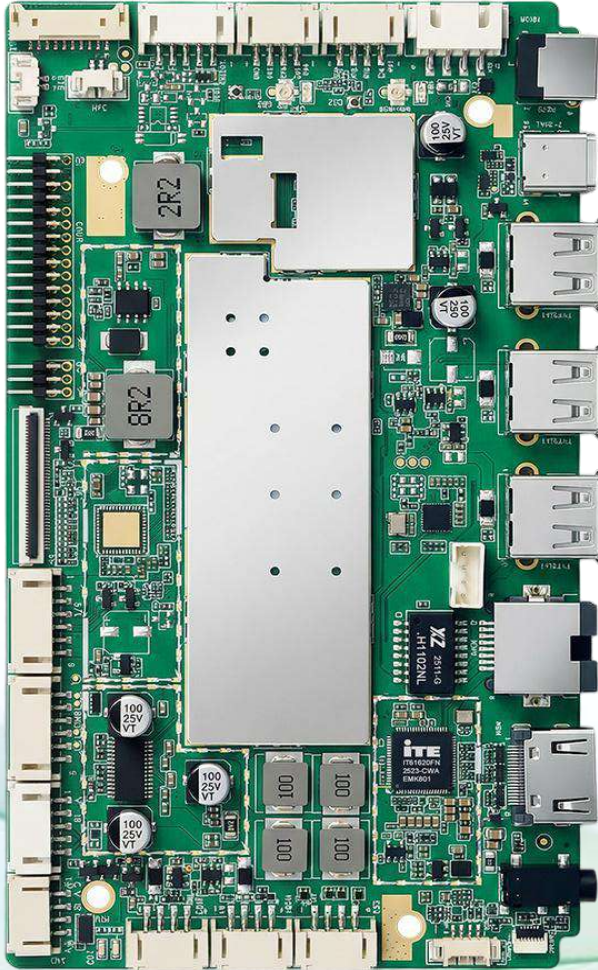
Smart mainboard



V1.0 2026-5

PORTWORLD

Product features



Octa-core AIOT processor MTK8786



New generation octa-core 64-bit high-performance AIOT processor
big-small core architecture (2 x A75 + 6 x A55)
Maximum frequency up to 2.0GHz

2K HD Display at 30fps High Frame Rate



Supports HDMI 2.0 Out, eDP 1.3 (2K@60fps), and MIPI DSI (2520 × 1080@60fps) interfaces, with triple independent display capability

Multiple Operating Systems



Supports Android 12

Comprehensive Peripheral Expansion Interfaces



Equipped with MIPI-CSI, MIPI DSI, USB 2.0, I2C, UART, and other expansion interfaces to meet diverse peripheral integration requirements.

Wide Application Scenarios



Widely applicable to edge computing, large model localization, smart commercial displays, cloud terminal products, industrial control hosts, and automotive electronics

Open Resources & Customization

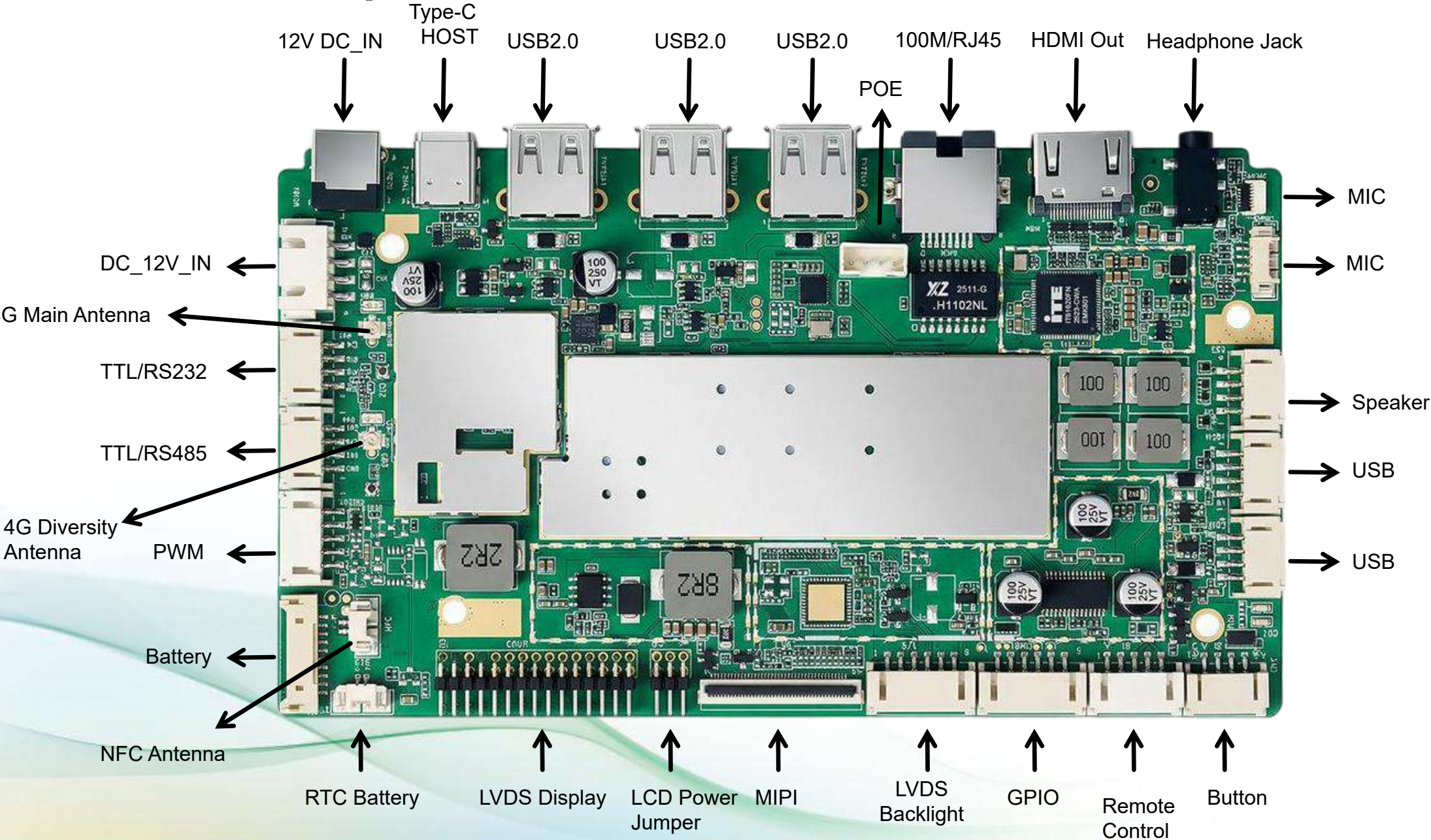


Provide full software development SDK, documentation, code samples, technical materials, and development tutorials, enabling users to perform deep customization.

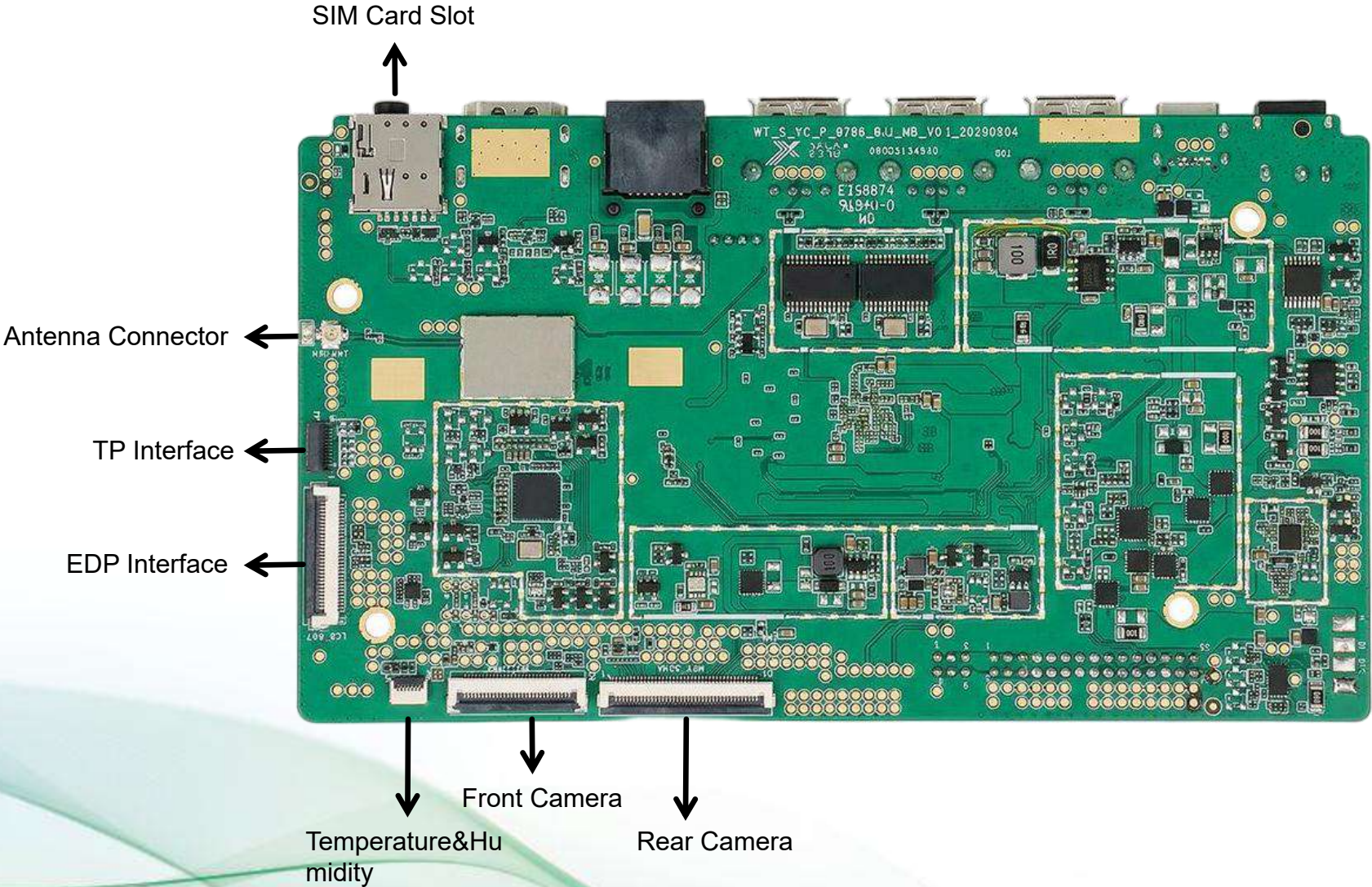
Specifications

Specifications		
Basic Parameters	SOC	MediaTek MTK8786
	CPU	Octa-core 64-bit processor (2×A75 + 6×A55), max frequency 2.0GHz
	GPU	ARM Mail-G52 MC2, supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1, embedded high-performance 2D acceleration hardware
	NPU	/
	Decoding Parameters	Decoding: 2K@30fps/1080P@60fps (H.264/H.265/VP9) Encoding: 2K@30fps/1080P@60fps (H.264/H.265)
	Memory	LPLPDDR4/LPDDR4X (4GB/8GB/16GB optional) Default: 4GB
	Storage	eMMC (16GB/32GB/64GB/128GB/256GB optional) Default: 32GB
	Power	12.0V (5.5mm × 2.1mm)
	System	Android12
	Size	MIPI:10.1" , EDP:15.6" , LVDS: 21.5"
	Environment	Operating temperature: -10°C~60°C; Storage temperature: -20°C~70°C; Operating humidity: 10%~90%RH (non-condensing)
Interfaces Parameters	Ethernet	1 × 100Mbps Ethernet (RJ45) with PoE Power Supply Dual-band WiFi 5 (2.4GHz/5GHz, supporting 802.11a/b/g/n/ac protocols) and Bluetooth 5.0; 4G LTE
	Video Input	1 × MIPI Camera Input USB Camera input
	Video Output	1 × eDP (1×2 lanes) 1 × MIPI-DSI DPHY (1080 × 2520\@60fps, 40Pin-0.5mm, 1×4 lanes) or dual 8-bit LVDS 1920×1080 output
	Watchdog	Software Watchdog
	USB Interface	5 × USB 2.0 Host, 1 × Type-C OTG/HOST
	Expansion Interfaces	1 × TTL Serial Ports (optional RS485/RS232, default TTL), 1 × Debug Serial Port 1 × Remote Control, 1 × Red LED, 1 × Green LED Supports speaker interface, up to two 8Ω 5W dual-channel speakers; 1 × 3.5mm audio jack (supports MIC recording, CTIA standard) Supports 1 × MIC input 4 × General-purpose GPIOs 1 × Touch Interface

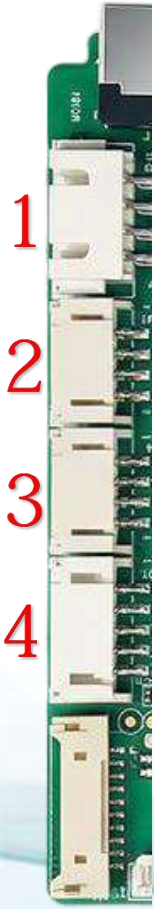
Interface description



Interface description



Interface definition



1、Power (2.5mm*4P)

Appearance	Number	Definition	Description
	1	12V	+
	2	12V	+
	3	GND	GND
	4	GND	GND

2、UART 0 / RS232 (2.0mm*4P)

Appearance	Number	Definition	Description
	1	VCC_3V3	+
	2	RX	Receive
	3	TX	Send
	4	GND	-

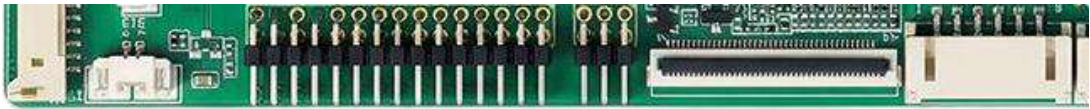
3、UART1 / RS485 (2.0mm*4P)

Appearance	Number	Definition	Description
	1	VCC_3V3	+
	2	RX	Receive
	3	TX	Send
	4	GND	-

4、PWM Interface (2.0mm*5P)

Appearance	Number	Definition	Description
	1	12V	+
	2	PWM0	PWM0
	3	PWM1	PWM1
	4	PWM2	PWM2
	5	GND	-

Interface definition



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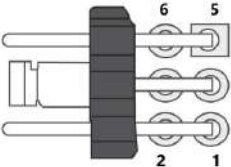
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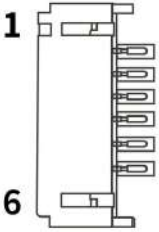
5、RTC Battery (1.25mm*2P)

Appearance	Number	Definition	Description
	1	BAT+	+
	2	BAT-	-

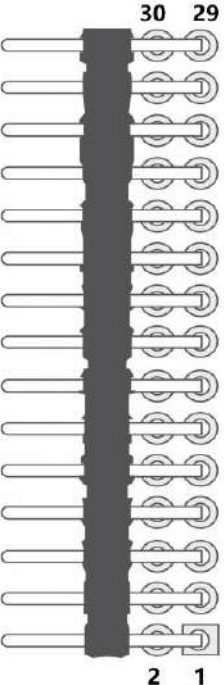
6、LVDS Power Jumper(6PIN*2.0mm)

Appearance	Number	Definition	Description
	1	VCC_LCD	Panel Voltage
	2	12V	12V
	3	VCC_LCD	Panel Voltage
	4	5V	Panel Voltage
	5	VCC_LCD	Panel Voltage
	6	3.3V	Panel Voltage

7、LVDS Backlight Interface (2.0mm*6P)

Appearance	Number	Definition	Description
	1	GND	Ground
	2	GND	Ground
	3	PWM	Backlight Brightness
	4	EN	Backlight On/Off
	5	12V	Panel Backlight
	6	12V	Power Supply

8、LVDS Display (2.0mmX15*30P)

Appearance	Number	Definition	Description
	1	VCC	Power
	2	VCC	Power
	3	VCC	Power
	4	GND	Ground
	5	GND	Ground
	6	GND	Ground
	7	D0N	LVDS Signal
	8	D0P	LVDS Signal
	9	D1N	LVDS Signal
	10	D1P	LVDS Signal
	11	D2N	LVDS Signal
	12	D2P	LVDS Signal
	13	GND	Ground
	14	GND	Ground
	15	CLK0N	LVDS Signal
	16	CLK0P	LVDS Signal
	17	D3N	LVDS Signal
	18	D3P	LVDS Signal
	19	D5N	LVDS Signal
	20	D5P	LVDS Signal
	21	D6N	LVDS Signal
	22	D6P	LVDS Signal
	23	D7N	LVDS Signal
	24	D7P	LVDS Signal
	25	GND	Ground
	26	GND	Ground
	27	CLK1N	LVDS Signal
	28	CLK1P	LVDS Signal
	29	D8N	LVDS Signal
	30	D8P	LVDS Signal

Interface definition



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10、GPIO Interface (2.0mm*6P)

Appearance	Number	Definition	Description
	1	VCC_3V3	+
	2	IO1	IO interface 1
	3	IO2	IO interface 2
	4	IO3	IO interface 3
	5	IO4	IO interface 4
	6	GND	Ground

11、Remote Interface (2.0mm*5P)

Appearance	Number	Definition	Description
	1	VCC	3.3V Power Supply
	2	GND	Ground
	3	IR	Remote
	4	RED	Red LED Indicator
	5	GED	Green LED Indicator

12、Button Interface (2.0mm*4P)

Appearance	Number	Definition	Description
	1	K1	Volume +
	2	K2	Volume -
	3	PWR	Off/On
	4	GND	Ground

9、MIPI_LCD (FPC0.5*40P)

Appearance	Number	Definition	Description
	1	LED+	Backlight Positive (+)
	2	LED+	Backlight Positive (+)
	3	NC	/
	4	AVEE	-5.6V
	5	NC	/
	6	NC	/
	7	LED-	Backlight Negative (-)
	8	LED-	Backlight Negative (-)
	9	AVDD	+5.6V
	10	GND	GND
	11	MIPI_TX3P	MIPI Signal
	12	MIPI_TX3N	MIPI Signal
	13	GND	GND
	14	MIPI_TX2P	MIPI Signal
	15	MIPI_TX2N	MIPI Signal
	16	GND	GND
	17	MIPI_TX_CLKP	MIPI Signal
	18	MIPI_TX_CLKN	MIPI Signal
	19	GND	GND
	20	MIPI_TX1P	MIPI Signal
	21	MIPI_TX1N	MIPI Signal
	22	GND	GND
	23	MIPI_TX0P	MIPI Signal
	24	MIPI_TX0N	MIPI Signal
	25	GND	GND
	26	TE	TE
	27	MIPI_RST	Reset (1.8V logic level)
	28	VDD_1.8V	1.8V Power Supply
	29	VDD_3.3V	3.3V Power Supply
	30	NC	/
	31	NC	/
	32	GND	GND
	33	TP_SDA	TP_data
	34	TP_SCL	TP_clock
	35	TP_EINT	TP_interrupt
	36	TP_RST	TP_Reset
	37	TP_VCC	TP2.8V Power Supply
	38	NC	/
	39	NC	/
	40	NC	/

Interface definition



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13、USB Interface (2.0mm*4P)

Appearance	Number	Definition	Description
	1	+5V	Power
	2	D-	DM
	3	D+	DP
	4	GND	Ground

14、USB Interface (2.0mm*4P)

Appearance	Number	Definition	Description
	1	+5V	Power
	2	D-	DM
	3	D+	DP
	4	GND	Ground

15、Speaker Interface (2.0mm*4P)

Appearance	Number	Definition	Description
	1	RPK+	右声道+
	2	RPK-	右声道-
	3	LPK-	左声道-
	4	LPK+	左声道+

16、Analog Column Microphone (1.25mm*4P)

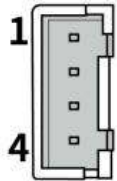
Appearance	Number	Definition	Description
	1	VIN0_P	Main MIC+
	2	VIN0_N	Main MIC-
	3	VIN2_P	Auxiliary MIC+
	4	VIN2_N	Auxiliary MIC-

17、Analog Silicon Microphone (Analog SiMic) (0.5mm*6P)

Appearance	Number	Definition	Description
	1	VIN0_P	Main MIC+
	2	VIN0_N	Main MIC-
	3	GND	Ground
	4	VIN2_P	Auxiliary MIC+
	5	VIN2_N	Auxiliary MIC-
	6	MICBIAS0	MIC Power Supply

Interface definition

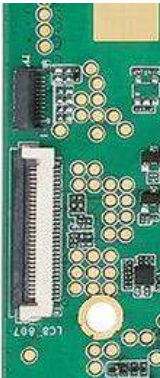


18、PoE Power Supply (2.0mm*4P)			
Appearance	Number	Definition	Description
	1	CT1	Communication Data 1
	2	CT2	Communication Data 2
	3	CT3	Communication Data 3
	4	CT4	Communication Data 4

Interface definition

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19、TP Touch Panel(FPC0.5*10P)			
Appearance	Number	Definition	Description
	1	GND	Power Ground
	2	GND	Power Ground
	3	TP_RESET	Reset
	4	TP_INT	Interrupt Input
	5	GND	Ground
	6	SCL	Clock
	7	SDA	Data
	8	VCC_TP	3.3V Power Supply
	9	GND	Ground
	10	GND	Ground

20、EDP Interface (FPC0.5*30P)			
Appearance	Number	Definition	Description
	1	/	/
	2	GND	Ground
	3	TX1N	eDP Signal
	4	TX1P	eDP Signal
	5	GND	Ground
	6	TX0N	eDP Signal
	7	TX0P	eDP Signal
	8	GND	Ground
	9	AUXP	eDP Signal
	10	AUXN	eDP Signal
	11	GND	Ground
	12	VCC	3.3V Power Supply
	13	VCC	3.3V Power Supply
	14	/	/
	15	GND	Ground
	16	GND	Ground
	17	HPD	HPD信号
	18	GND	Ground
	19	GND	Ground
	20	GND	Ground
	21	GND	Ground
	22	EN	Enable Pin
	23	ADJ	PWM Control Pin
	24	TX2N	eDP Signal
	25	TX2P	eDP Signal
	26	VDD	3.3V Power Supply
	27	VDD	3.3V Power Supply
	28	VDD	3.3V Power Supply
	29	VDD	3.3V Power Supply
	30	/	/

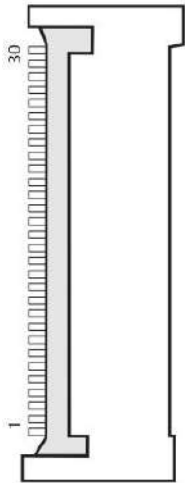
Interface definition



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21、Temperature&Humidity (0.5mm*6P)			
Appearance	Number	Definition	Description
	1	VCC3.3V	Power Supply Positive (+)
	2	VCC3.3V	Power Supply Positive (+)
	3	SDA	Data
	4	SCL	Clock
	5	GND	Ground
	6	GND	Ground

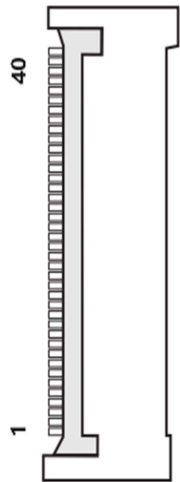
22、MIPI Front Camera (FPC0.5mm*30P)			
Appearance	Number	Definition	Description
	1	VCMAIO	1.8V Power Supply
	2	VCAMA	2.8V Power Supply
	3	VCAMD	1.2V Power Supply
	4	AF	2.8V Power Supply
	5	RST	Reset Signal
	6	PDN	Power Down Signal
	7	CLK	Clock Signal
	8	GND	Ground
	9	SDA	I2C Data
	10	SCL	I2C Clock
	11	GND	Ground
	12	RCN	MIPI Signal (Negative)
	13	RCP	MIPI Signal (Positive)
	14	GND	Ground
	15	RDN0	MIPI Signal (Negative)
	16	RDP0	MIPI Signal (Positive)
	17	GND	Ground
	18	RDN1	MIPI Signal (Negative)
	19	RDP1	MIPI Signal (Positive)
	20	GND	Ground
	21	LED_B	LED Indicator (Blue)
	22	LED_G	LED Indicator (Green)
	23	LED_R	LED Indicator (Red)
	24	VBAT	Battery Voltage
	25	VIO1.8V	1.8V Power Supply
	26	HALL	Hall Sensor Signal
	27	SDA	ALS I ² C Data
	28	SCL	ALS I ² C Clock
	29	EINT_ALPS	ALS Interrupt
	30	VIO2.8V	2.8V Power Supply



Interface definition



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23、MIPI Rear Camera (FPC0.5*40P)			
Appearance	Number	Definition	Description
	1	GND	Ground
	2	VCAMIO	1.8VPower Supply
	3	VCAMA	2.8VPower Supply
	4	VCAMD	1.2VPower Supply
	5	AF	2.8VPower Supply
	6	RST	Reset Signal
	7	PDN	Power Down Signal
	8	GND	Ground
	9	CLK	Clock Signal
	10	GND	Ground
	11	RCN	MIPI Signal (Negative)
	12	RCP	MIPI Signal (Positive)
	13	GND	Ground
	14	RDN0	MIPI Signal (Negative)
	15	RDP0	MIPI Signal (Positive)
	16	GND	Ground
	17	RDN1	MIPI Signal (Negative)
	18	RDP1	MIPI Signal (Positive)
	19	GND	Ground
	20	RDN2	MIPI Signal (Negative)
	21	RDP2	MIPI Signal (Positive)
	22	GND	Ground
	23	RDN3	MIPI Signal (Negative)
	24	RDP3	MIPI Signal (Positive)
	25	GND	Ground
	26	SCL	I ² C Clock
	27	SDA	I ² C Data
	28	GND	Ground
	29	NC	/
	30	FLASH_LED+	Flash LED Positive (+)
	31	NC	/
	32	NC	/
	33	FLASH_LED-	Flash LED Negative (-)
	34	FLASH_LED-	Flash LED Negative (-)
	35~40	NC	/



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