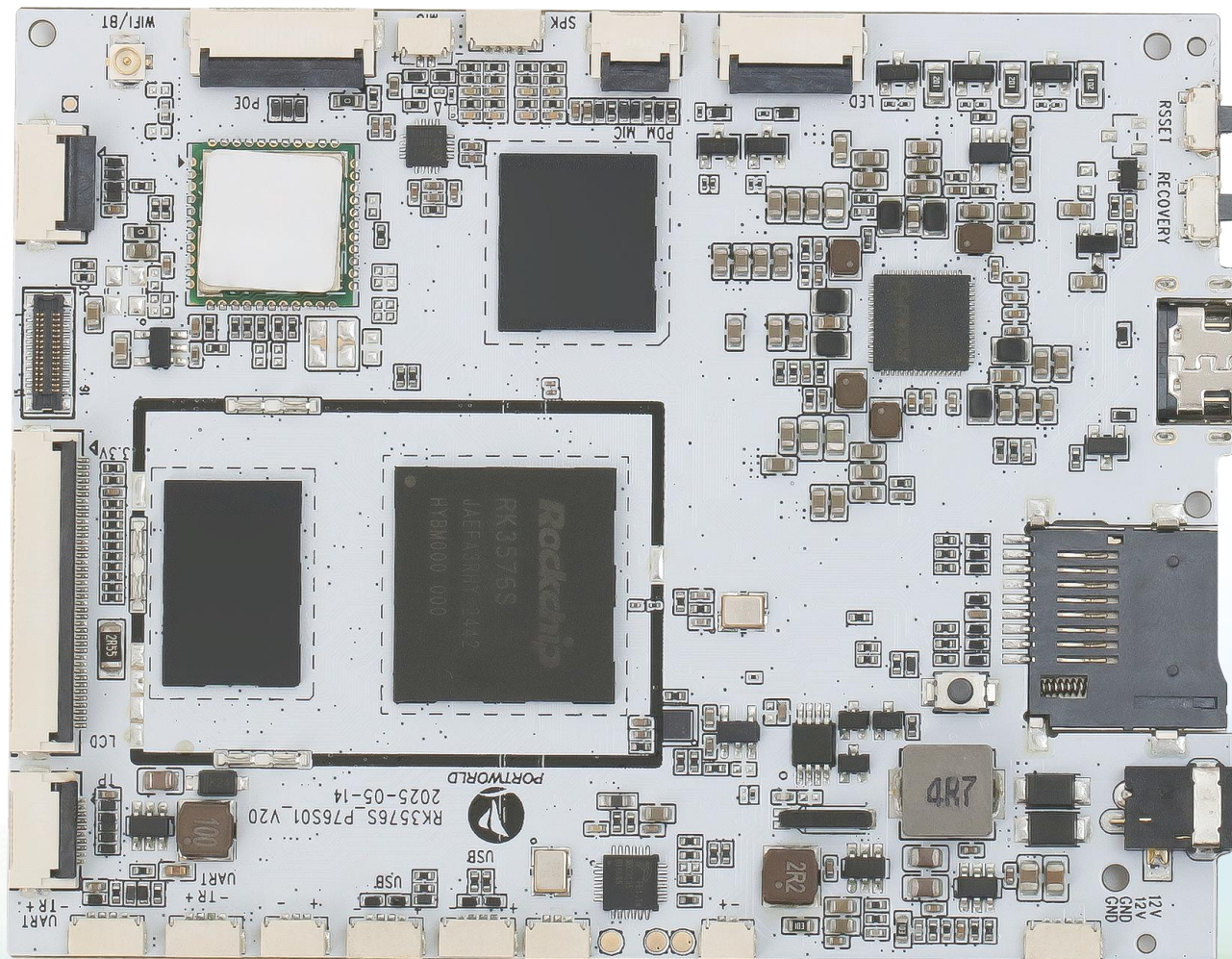




RK3576S-P76S01

Smart mainboard



V1.0 2025 -9 -4

PORTWORLD



Rich Peripheral Expansion Interfaces

Including MIPI-DSI, I2C, UART, RS485, RS232, SPK, MIC, and KNX, enable direct control and expansion with external devices.



Wide Range of Applications

Widely applied in scenarios such as smart home control panels, automation control, industrial control, and building intercom systems.



Open Resources & Customization

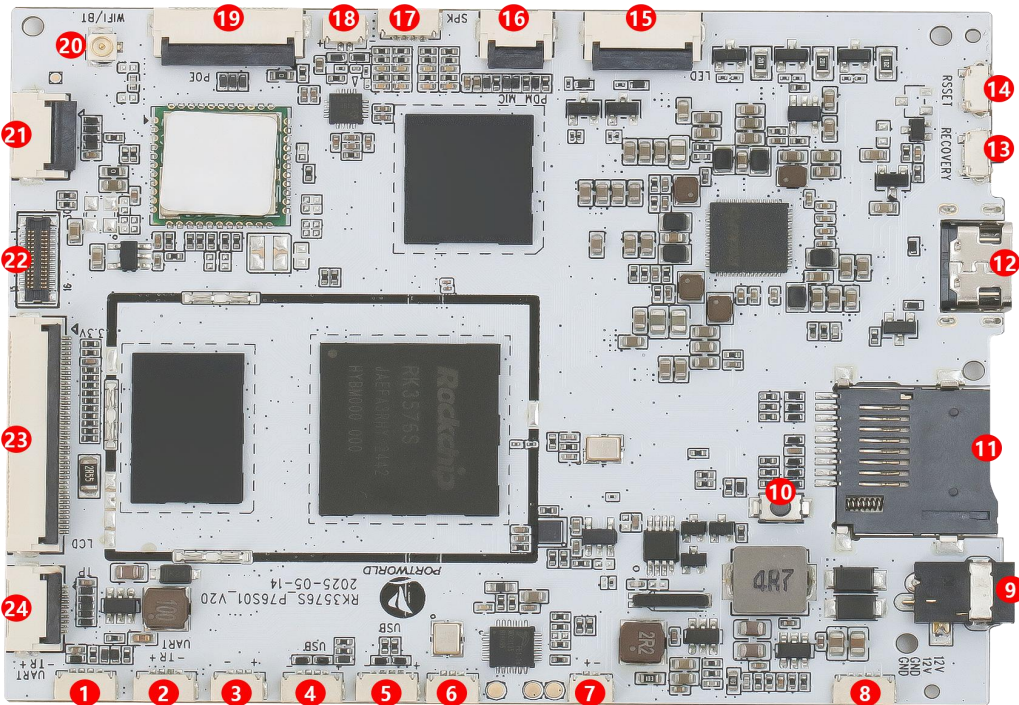
Provide full software development SDK, documentation, code samples, technical materials, and development tutorials, enabling users to perform deep customization.

Specifications

Specifications

Basic Parameters	SOC	Rockchip RK3576
	CPU	Octa-core 64-bit processor (4 × A72 + 4 × A53), 8nm advanced process, max frequency 2.1GHz
	GPU	GS2 MC3 @ 1GHz, supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1, embedded high-performance 2D acceleration hardware
	NPU	3 TOPS NPU, supports INT4/INT8/INT16/FP16/BF16/FP32 mixed operations
	Decoding Parameters	Decoding: 8K@30fps/4K@120fps; H.265/HEVC, VP9, AVS2, AV1; 4K@60fps; H.264/AVC Encoding: 4K@60fps; H.265/HEVC, H.264/AVC
	Memory	LPLPDDR4/LPDDR4X (4GB/8GB/16GB optional) Default: 4GB
	Storage	eMMC (16GB/32GB/64GB/128GB/256GB optional) Default: 32GB
	Power	12.0V (voltage tolerance ± 5%, expandable with PCE, DC power supply, AC power supply)
	System	Android、Ubuntu、Buildroot、Debian,etc
	size	70mm × 90mm
	Power Consumption	Min: 0.096W(12V/8mA), Normal: 1.2W(12V/100mA), Max: 8.4W (5.0V/1050mA)
	Environment	Operating temperature: -10℃~60℃; Storage temperature: -20℃~70℃; Operating humidity: 10%~90%RH (non-condensing)
Interfaces Parameters	Ethernet	1 × 100Mbps Ethernet (RJ45) (POE powered)
	WiFi	Dual-band WiFi6 (2.4GHz/5GHz), 802.11a/b/g/n/ac/ax protocol, Bluetooth 5.4
	Display	1 × MIPI DSI (4lane 2560 × 1600@60fps)
	Audio	2 × Speaker output (1.2W 8Ω), single-mode analog MIC
	USB	1 × USB-C (OTG USB2.0) (max current: 500mA), 2 × USB2.0 (current limited to 500mA)
	Touch	support I2C touch and USB touch
	camera	1 × MIPI CSI
	Interfaces	2 × UART, RGB light, GPIO × 2, temperature & humidity
	Expansion Interfaces	Temperature & humidity sensor, RS485, RS232, KNX, UART, etc.

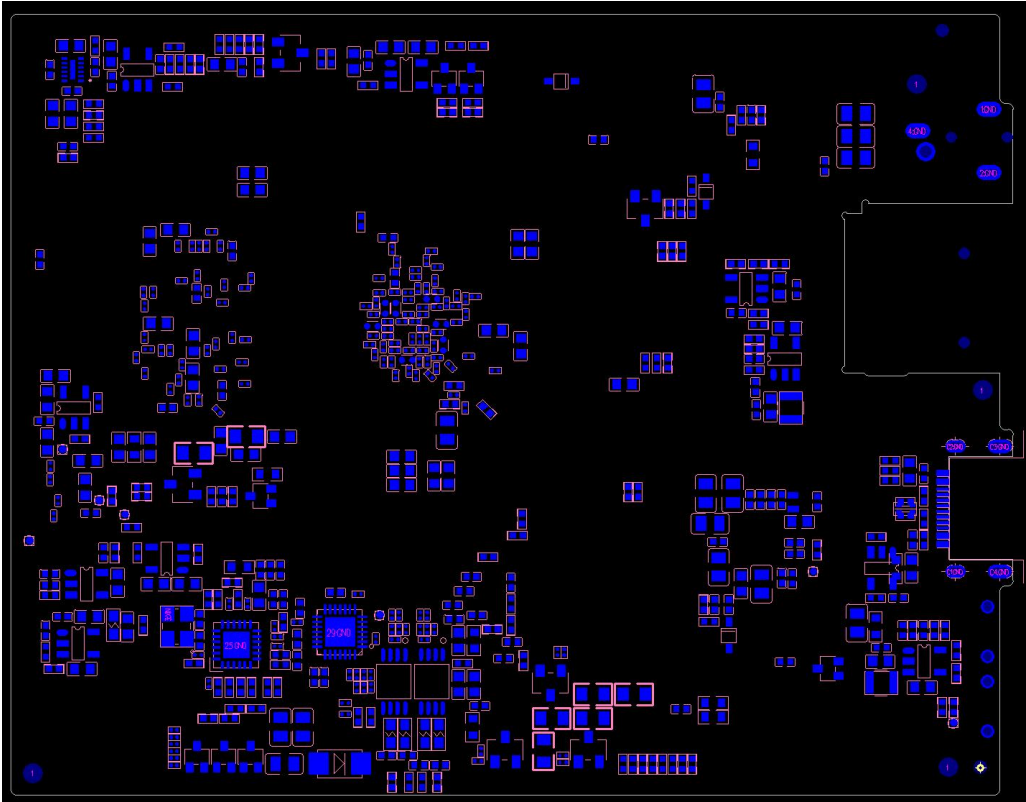
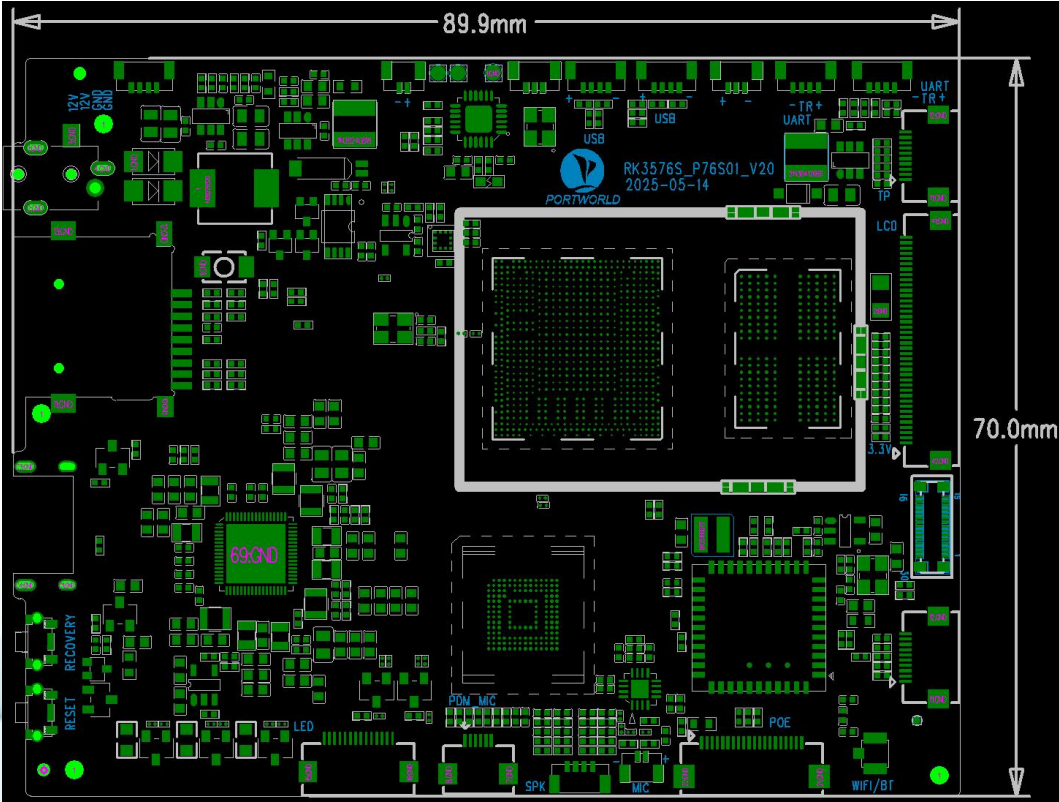
Interface description



Number	Discription
1	Serial Port & GPIO (UART9)
2	Serial Port & GPIO (UART6)
3	Human Motion Sensor
4	USB HOST
5	USB HOST
6	Debug Serial Port
7	RTC Battery Connector

Number	Discription
8	12V Output/Input Terminal
9	DC Power Jack
10	MASKROM Button
11	TF Card Slot
12	TYPE-C
13	Recovery Button (RECOVERY)
14	Reset Button (RESET)
15	RGB Light & Key
16	PDM Microphone
17	Dual Speakers (SPK×2)
18	Analog MIC
19	Ethernet-UART1-GPIO-DC IN
20	WiFi/BT Antenna Connector
21	Light Sensor Interface
22	MIPI Camera Interface
23	LCD & MIPI Camera Dual-purpose Interface
24	Touch Panel (TP) Interface

Dimension



Interface definition



1、UART 9 (0.8mm*4P)

Appearance	Number	Definition	Discription
	1	3.3V	Power Positive (+)
	2	RX	UART Receive (RX)
	3	TX	UART Transmit (TX)
	4	GND	Power Negative (-)

2、UART6 (0.8mm*4P)

Appearance	Number	Definition	Discription
	1	3.3V	Power Positive (+)
	2	RX	UART Receive (RX)
	3	TX	UART Transmit (TX)
	4	GND	Power Negative (-)

Note: Current limited to 500mA

3、Human Motion input (0.8mm*3P)

Appearance	Number	Definition	Discription
	1	GND	Power GND
	2	GPIO0_D3	GPIO Digital input

4、USB (0.8mm*4P)

Appearance	Number	Definition	Discription
	1	GND	Ground
	2	USB_DP	USB signal
	3	USB_DP	USB signal
	4	5V	power 5V

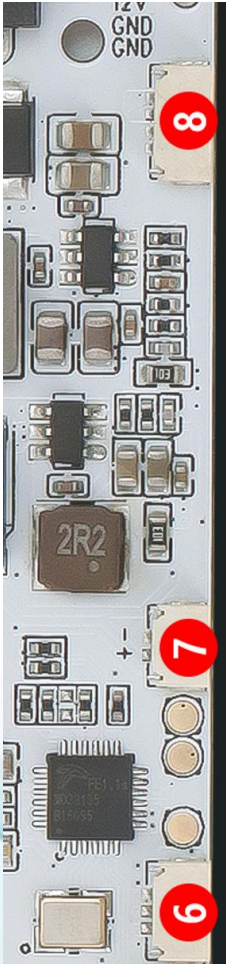
Note: Current limited to 500mA

5、USB (0.8mm*4P)

Appearance	Number	Definition	Discription
	1	GND	GND
	2	USB_DP	USB Signal
	3	USB_DP	USB signal
	4	5V	power 5V

Note: Current limited to 500mA

Interface definition



6、 Debug Serial Port (0.8mm*3P)

Appearance	Number	Definition	Discription
	1	RX	Receive
	2	TX	Transmit
	3	GND	Ground

7、 RTC battery (0.8mm*2P)

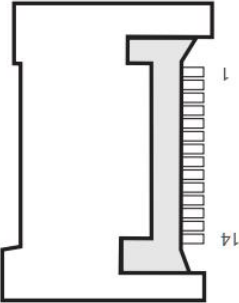
Appearance	Number	Definition	Discription
	1	VBAT	Battery Positive Terminal
	2	GND	Battery Negative Terminal

8、 12V POWER JACK (0.8mm*4P)

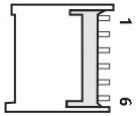
Appearance	Number	Definition	Discription
	1	GND	Ground
	2	GND	Ground
	3	VCC_12V	Power Positive
	4	VCC_12V	Power Positive

Interface definition

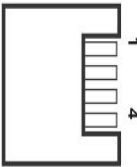
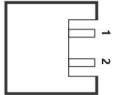
15、RGB light & key(FPC0.5*14P)

Appearance	Number	Definition	Discription
	1	power 5Vor12V	power
	2	LEDL0-	LED control
	3	LEDH0-	LED control
	4	LEDL1-	LED control
	5	LEDH1-	LED control
	6	LEDL2-	LED control
	7	LEDH2-	LED control
	8	LEDL3-	LED control
	9	LEDH3-	LED control
	10	GND	Ground
	11	ADC0	key
	12	PWRON_L	power key
	13	GND	Ground
	14	GND	Ground

16、PDM(FPC0.5*6P)

Appearance	Number	Definition	Discription
	1	GND	Ground
	2	GND	Ground
	3	PDM0_SDI0_M3	Data
	4	PDM0_SDI1_M3	Data
	5	PDM0_CLK0_M3	Clock
	6	VCC_3V3	Ground

17、Speaker*2 (0.8mm*4P)

Appearance	Number	Definition	Discription
	1	SPK1_N	Left Channel Negative Output
	2	SPK1_P	Left Channel Positive Output
	3	SPK2_N	Right Channel Negative Output
	4	SPK2_P	Right Channel Positive Output
	Channel 1 (L) = Left Channel, Channel 2 (R) = Right Channel		

18、Analog MIC (0.8mm*2P)

Appearance	Number	Definition	Discription
	1	MIC-	Microphone Negative
	2	MIC+	Microphone Positive



Interface definition



21、Light Sensor (FPC0.5*10P)			
Appearance	Number	Definition	Discription
	1	GND	POWER
	2	SDA	Data
	3	SCL	clock
	4	INT	Interrupt
	5	VCC_3V3	power
	6	NC	NC
	7	NC	NC
	8	NC	NC
	9	NC	NC
	10	GND	Ground

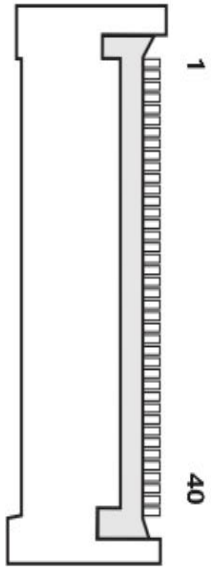
22、MIPI Camera(0.4BTB 2*15Pin)			
Appearance	Number	Definition	Discription
	1	GND	Ground
	2	MIPI_MCLK	MIPI Signal
	3	GND	Ground
	4	MIPI_PDN1	Power Down Enable Signal
	5	MIPI_RST	Reset signal
	6	SDA	IIC data
	7	SCL	IIC clock
	8	GND	Ground
	9	VCC_DVP	2.8V power
	10	GND	Ground
	11	VCC	2.8V power
	12	GND	Ground
	13	VCC	1.8V power
	14	VCC	1.8V power
	15	GND	Ground
	16	GND	Ground
	17	MIPI_D0N	MIPI Signal
	18	MIPI_D0P	MIPI Signal
	19	GND	Ground
	20	MIPI_D1N	MIPI Signal
	21	MIPI_D1P	MIPI Singal
	22	GND	Ground
	23	MIPI_CLKN	MIPI Signal
	24	MIPI_CLKP	MIPI Signal
	25	GND	Ground
	26	MIPI_D2N	MIPI Signal
	27	MIPI_D2P	MIPI signal
	28	GND	Ground
	29	MIPI_D3N	MIPI Signal
	30	MIPI_D3P	MIPI 信号

Interface definition



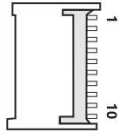
23、MIPI_LCD Display (FPC0.5*40P)

Appearance	Number	Definition	Discription
	1	NC	/
	2	VDD_LCD	3.3V Power
	3	VDD_LCD	3.3V Power
	4	NC	/
	5	MIPI_RST	Reset (1.8V Level)
	6	NC	/
	7	GND	Ground
	8	MIPI_TX0N	MIPI signal
	9	MIPI_TX0P	MIPI signal
	10	GND	
	11	MIPI_TX1N	MIPI signal
	12	MIPI_TX1P	MIPI signal
	13	GND	
	14	MIPI_TX_CLKN	MIPI signal
	15	MIPI_TX_CLKP	MIPI signal
	16	GND	
	17	MIPI_TX2N	MIPI signal
	18	MIPI_TX2P	MIPI signal
	19	GND	
	20	MIPI_TX3N	MIPI signal
	21	MIPI_TX3P	MIPI signal
	22	GND	Ground
	23	NC	/
	24	NC	/
	25	GND	/Ground
	26	NC	/
	27	NC	/
	28	NC	/
	29	VCC_LCD18	1.8V power
	30	GND	Ground
	31	LED-	Backlight Negative
	32	LED-	Backlight Negative
	33	NC	/
	34	NC	/
	35	AVEE	-5.6V
	36	NC	/
	37	NC	/
	38	AVDD	+5.6V
	39	LED+	Backlight Positive
	40	LED+	背光正极



24、TP Touch Panel (FPC0.5*10P)

Appearance	Number	Definitio n	Discription
	1	GND	power
	2	GND	power
	3	VCC_TP	3.3Vpower
	4	SDA	Data
	5	SCL	Clock
	6	GND	Ground
	7	TP_INT	Interrupt Input
	8	TP_RESET	Reset
	9	GND	Ground
	10	GND	Ground



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