



P301-D wireless data transceiver Module

Product Brief

Version V1.0.3

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1 Introduction of P301-D module

P301-D is a 2.4/5.8G high-bandwidth wireless data transceiver module, consisting of a **wireless transmitter** (DEV) module and a **wireless receiver** (AP) module, based on the principle of TDD, using OFDM and MIMO and other key technologies to improve the utilization of the frequency band while providing longer transmission distance, supporting automatic frequency hopping, with the advantages of **long distance**, **strong anti-interference ability**, **low latency**, etc. As a highly integrated module product, P301-D can be widely used in UAV, security monitor, construction, live TV, special inspection and other fields to meet the demands of quick development application.

Single **AP module** can wirelessly connect 1 ~ 4 **DEV** modules; **AP** module and **DEV** module can transmit HD video, voice and data in both directions. The bandwidth rate of upstream and downstream can be flexibly configured according to the application scenario.

While module is not transmitting any information, it can automatically discontinue transmission and become standby mode for power saving. The module can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

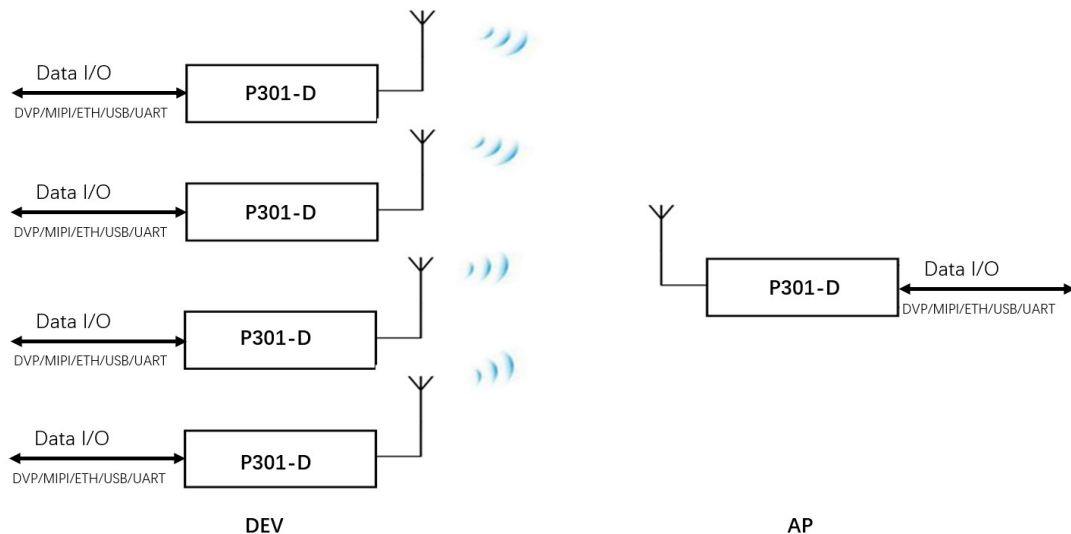


Figure-1 Working mode of P301-D module

2 Technical features of P301-D module

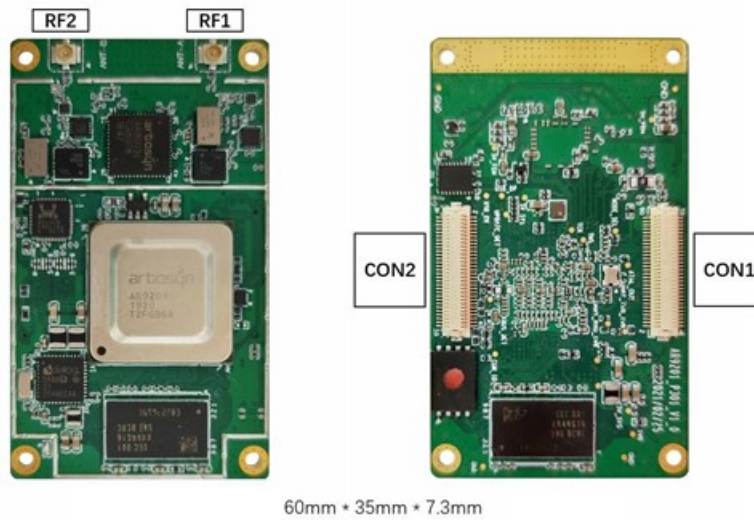
- Based on the principle of TDD, key technologies such as OFDM and MIMO are used to improve the frequency band utilization
- Support 64QAM, 16QAM, QPSK, BPSK modulation modes and multiple code rates for autonomous dynamic adjustment
- Support AES encryption and multiple security policies to prevent illegal listening and interception
- Adopt frequency hopping scheme, real-time monitoring of interference and automatic selection of frequency hopping range; automatic and fast frequency change and adjustment of modulation and coding strategy (MCS) according to the current channel interference situation



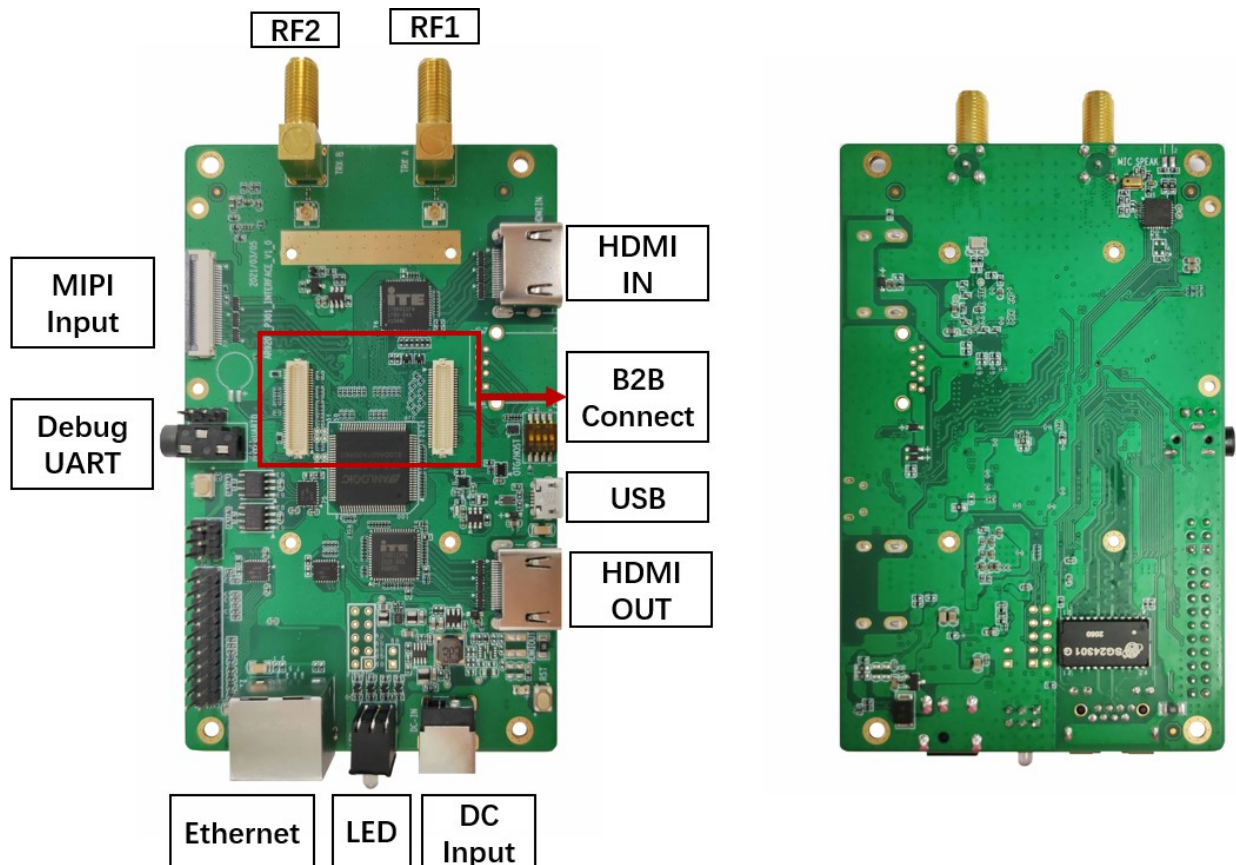
Product brief of P301-D

□ Built-in H.265 encoder with advanced encoder bit rate control algorithm and seamlessly interfaced with automatic MCS adjustment of baseband, which is more suitable for wireless link transmission while ensuring image quality.

3 Hardware form of P301-D module



Front Figure-2: P301-D Module Back



Front Figure-3: P301-D EVB Board Back

4 Key specifications of P301-D module

Category	Parameters	Description
System	Memory	4Gbit DDR4
	Flash	256Mbit SPI NOR Flash
	Size	60mm*35mm*6.5mm (shield included)
	Weight	20g (shield,thermal conductivity pad included)
	Power consumption	2.4G 2T2R transmitter < 7.7W@25dBm 2.4G 1T2R receiver < 3.69W 5.8G 2T2R transmitter < 7.03W@25dBm 5.8G 1T2R receiver < 4.2W
	Power supply	DC 5V
	Interface	60pin*2 B2B
	Temperature range	working temperature: -30~55℃ storage temperature: -40~120℃
	Wireless transmission latency	30ms
	Video transmission latency	100ms@1080P60(DVPinput->DVPoutput)
Interface	USB	USB 3.0 Host/Device
	Ethernet	10/100/1000M self-adapting
	CAN	2
	UART	3
Video	Video interface	BT.1120/BT.656 24Bit RGB888 MIPI CSI-4 lane
	Codec type	H.264 BP/MP/HP encoding and decoding H.265 MAIN/MAIN10 @L5.0 High-tier encoding and decoding MJPEG/JPEG Extended Sequential encoding and decoding
	Codec resolution	H.264: 1080P@60fps H.265: 4Kx2K@30fps+1080p@30fps MJPEG/JPEG: 4Kx2K@30fps
Wireless	Maximum transmitting power	28±1dBm 2.4GHz 26±1dBm 5.8GHz Note: 2.4G frequency band adopts high-gain PA. When using it, be sure to connect the antenna as a load at the antenna end to prevent no-load reflection from damaging the PA
	Channel bandwidth	10MHz/20MHz/40MHz

Maximum transmission rate	60Mbps
Sensitivity	2.4G SLOT: -101dBm BPSK 10M repeat off 2.4G BR: -103dBm BPSK 5M repeat off 5.8G SLOT: -101dBm BPSK 10M repeat off 5.8G BR: -103dBm BPSK 5M repeat off
Frequency hopping solution	Downlink: Automatic channel shift frequency Uplink: sub-band frequency hopping
Maximum transmission distance	15Km (empty and undisturbed circumstances, line-of-sight propagation)
Networking method	Point to multipoint
Chipset	AR9201+AR8003S
Frequency band	2.3~2.7GHz 4.9~5.9GHz

5 Interface signal of P301-D module

CON1

B2B_Pin_ Number	Pin_Name	B2B_Pin_ Number	Pin_Name
1	VDD_5V_SYS	2	UART_RX0_1V8
3	VDD_5V_SYS	4	UART_TX0_1V8
5	VDD_5V_SYS	6	AR9201_UART_TX1_1V8
7	VDD_5V_SYS	8	AR9201_UART_RX2_1V8
9	GND	10	AR9201_UART_RX1_1V8
11	GND	12	AR9201_UART_TX2_1V8
13	MDI1N	14	MDI2P
15	MDI1P	16	MDI2N
17	MDI0N	18	MDI3P
19	MDI0P	20	MDI3N
21	SOC_I2C_SCLK1	22	SOC_I2C_SDA1
23	RTC_VBBAT	24	AR9201_UART_RX3_1V8
25	SOCADC_IN2	26	AR9201_UART_TX3_1V8
27	SOC_PWM3	28	SOC_I2S_CLK0
29	SOC2SPI_DI_M0	30	SOC_I2S_SDO0
31	P301_M_RST_n	32	SOC_PWM4
33	SOC2SPI_CLK_M0	34	SOC_PWM2
35	SOC2SPI_CLK_MS3	36	SOCADC_IN4
37	SOC_I2S_WS0	38	SOCADC_IN3
39	GND	40	SOC2SPI_CS_MS3
41	GND	42	SOC2SPI_DI_MS3
43	SOC2SPI_DO_M0	44	SOC2SPI_CS_M0
45	SOC_PWM1	46	SOC2SPI_DO_MS3
47	SOCADC_IN1	48	GND
49	AR8003S_ANT_SW_SEL	50	MODE_SEL
51	ETH_LED_100M	52	SOC_I2S_SDI0
53	VDD_5V_FEM	54	GND
55	VDD_5V_FEM	56	GND
57	VDD_5V_FEM	58	GND
59	VDD_5V_FEM	60	ETH_LED_10M

CON2

B2B_Pin_ Number	Pin_Name	B2B_Pin_ Number	Pin_Name
1	SOC2USB_DN	2	SOC2DVP_PCLK0
3	SOC2USB_DP	4	GND
5	GND	6	SOC2DVP_QE2_6
7	SOC2DVP_QE1_6	8	SOC2DVP_QE1_0
9	SOC2DVP_QE1_2	10	SOC2DVP_QE2_7
11	SOC2DVP_HSYNC0	12	SOC2DVP_QE1_5
13	SOC2DVP_QE1_7	14	SOC2DVP_QE1_3
15	SOC2DVP_QE0_0	16	SOC2DVP_QE1_1
17	SOC2DVP_QE1_4	18	SOC2DVP_QE2_4
19	SOC2DVP_VSYNC0	20	SOC2DVP_QE2_5
21	SOC2DVP_QE0_1	22	SOC2DVP_DE0
23	SOC2DVP_QE0_3	24	SOC2DVP_QE2_3
25	SOC2DVP_QE0_6	26	SOC2DVP_QE2_1
27	SOC2DVP_QE0_5	28	SOC2DVP_QE0_2
29	SOC2USB_RX0P	30	SOC2DVP_QE2_0
31	SOC2USB_RX0N	32	SOC2DVP_QE2_2
33	SOC2USB_TX0P	34	SOC2DVP_QE0_4
35	SOC2USB_TX0N	36	GND
37	GND	38	SOC2DVP_QE0_7
39	SOC2MIPI_MCLK	40	USB_VBUS_DET
41	GND	42	GND
43	SOC2CAM_MIPI0_D 1P	44	SOC2CAM_MIPI0_D0 P
45	SOC2CAM_MIPI0_D 1N	46	SOC2CAM_MIPI0_D0 N
47	GND	48	GND
49	SOC2CAM_MIPI0_D 3P	50	SOC2CAM_MIPI0_CL KN
51	SOC2CAM_MIPI0_D 3N	52	SOC2CAM_MIPI0_CL KP
53	SOC2CAM_MIPI0_D 2P	54	GND
55	SOC2CAM_MIPI0_D 2N	56	USB_CON_ID
57	GND	58	USB_PWR_PAD
59	SOC_I2C_SCLK2	60	SOC_I2C_SDA2