

RAK634 Module Specification V1.0

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1. General Description

RAK634 is a wireless router module, designed base on MT7628N chipset . fully complies with IEEE802.11b/g/n standards ,it can be applied in the fields of IP camera , smart home and IOT . It support both wire and wireless connection, wireless transmission rate can reach up to 300Mbps , it has excellent RF performance and wireless transmission is more stable.



Figure 1-1 Top View

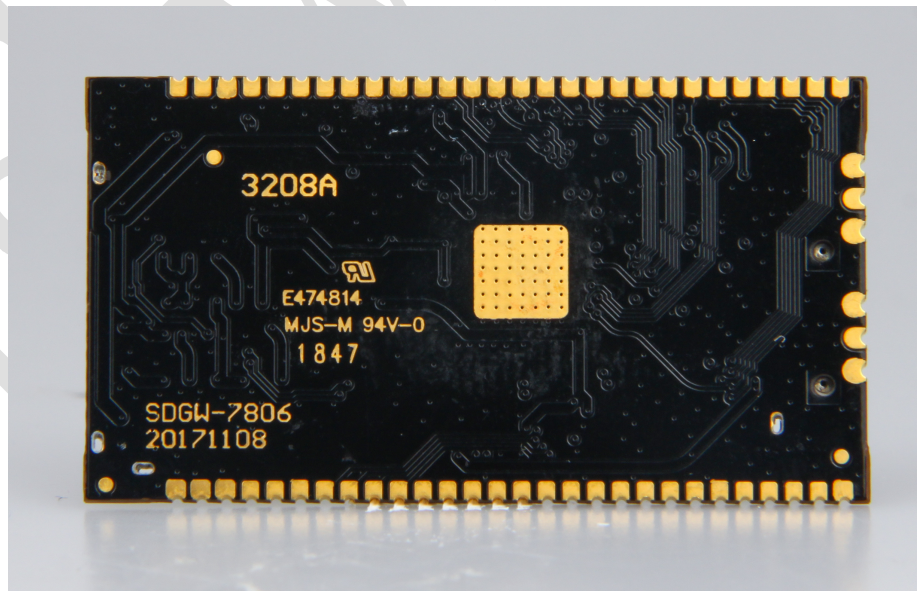


Figure 1-2 Bottom View

2. Features & Application

Features

- Operating Frequencies : 2.4~2.4835GHz
- IEEE Standards : IEEE 802.11b/g/n
- Wireless data rate can reach up to 300Mbps
- Connect to the external antenna through i-pex connector or layout
- Power Supply:3.3V±0.2V

Application

- Support IP Camera
- Support Security monitor
- Support Smart house
- Support Intelligent wireless control
- Support wireless security NVR systems

3. System Block Diagram

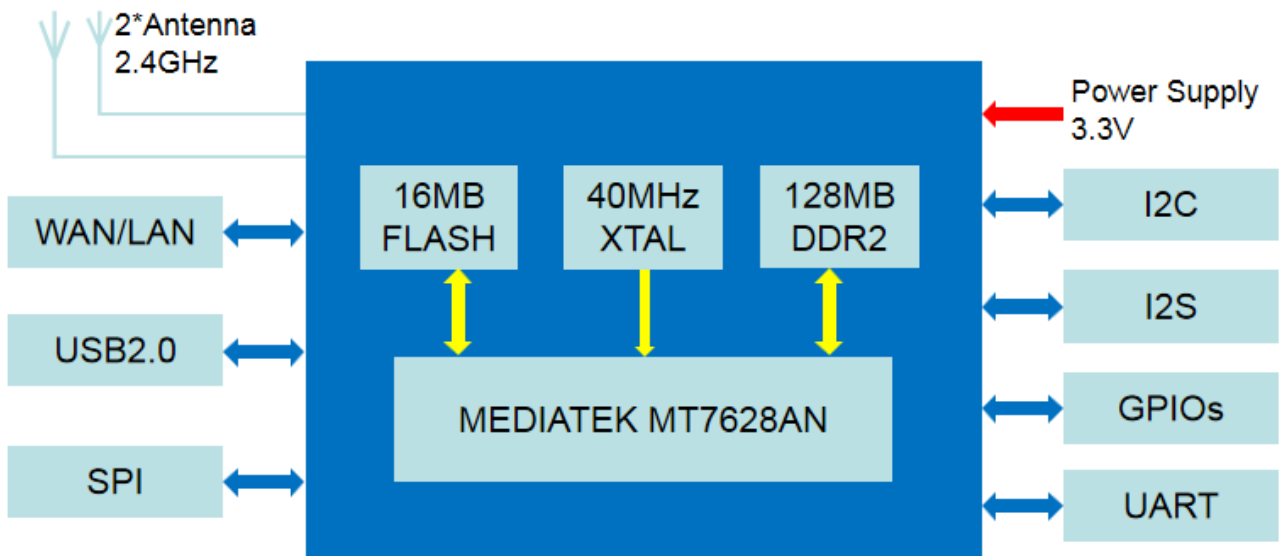


Figure 3-1 RAK634 Module System Diagram

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4. Electrical Specification

4.1 General specification

ITEMS	CONTENTS
Operating Frequency	2.400-2.4835GHz
IEEE Standard	802.11b/g/n
Modulation	11b: CCK, DQPSK, DBPSK 11g: 64-QAM,16-QAM, QPSK, BPSK 11n: 64-QAM,16-QAM, QPSK, BPSK
Data rates	11b:1,2,5.5 and 11Mbps 11g:6,9,12,18,24,36,48 and 54 Mbps 11n:MCS0-15 , HT20 reach up to 144.4Mbps, HT40 reach up to 300Mbps
RX Sensitivity	-95dBm (Min)
TX Power	20dBm (Max)
Host Interface	1*WAN, 4*LAN, Host USB2.0 , I2C , SD-XC, I2S/PCM, 2*UART,SPI,multiple GPIO
Antenna Type	(1)Connect to the external antenna through i-pex connector; (2)Layout and connect with other type connector;
Dimension	Typical (LX W X H): 47.6mm x 26mm x 2.5mm Tolerance: ± 0.15 mm
Operation Temperature	-10°C to +50°C
Storage Temperature	-40°C to +70°C
Operation Voltage	3.3V \pm 0.2V/800mA

4.2 RF Specifications

<p>TX Power</p>	<p>802.11b-11Mbps:19±1.5dBm</p> <p>802.11g-54Mbps:16±1.5dBm</p> <p>802.11n -HT20-65Mbps:16±1.5dBm</p> <p>802.11n -HT40-135Mbps: 15±1.5dBm</p>
<p>TX Constellation Error(EVM)</p>	<p>802.11b: <-22dB@11Mbps</p> <p>802.11g: <-28dB@54Mbps</p> <p>802.11n -HT20:<-28dB@65Mbps</p> <p>802.11n -HT40:< -28dB@135Mbps</p>
<p>Receiver Minimum Input Sensitivity@PER</p>	<p>1Mbps: -95dBm@PER<8%;</p> <p>11Mbps:-88dBm@PER<8%;</p> <p>54Mbps:-75dBm@PER<10%;</p> <p>11n-HT20-65Mbps:-72dBm@PER<10%;</p> <p>11n-HT40-135Mbps:-68dBm@PER<10%;</p>

4.3 RF Test Report-ANT0

Mode	Rate (Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH1	CH7	CH13	CH1	CH7	CH13	CH1	CH7	CH13
11b	1	18.33	18.86	19.30	-31.70	-31.36	-32.89	-97.0	-97.0	-97.0
	11	18.42	18.45	19.06	-27.21	-28.86	-27.42	-89.0	-89.0	-89.0
11g	9	17.86	17.82	18.12	-17.24	-18.32	-17.34	-92.0	-92.0	-92.0
	54	15.84	15.56	16.87	-32.13	-32.64	-32.79	-76.0	-76.0	-76.0
11n	MCS0	17.69	17.43	18.07	-18.72	-18.72	-18.06	-90.0	-90.0	-90.0
HT20	MCS7	15.87	15.39	16.86	-31.80	-31.81	-31.23	-74.0	-74.0	-74.0
Mode	Rate (Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH3	CH7	CH11	CH3	CH7	CH11	CH3	CH7	CH11
11n	MCS0	17.57	17.27	17.60	-18.85	-19.71	-18.65	-87.0	-87.0	-87.0
HT40	MCS7	15.92	15.34	15.76	-32.55	-32.82	-32.64	-71.0	-71.0	-71.0

4.4 RF Test Report-ANT1

Mode	Rate (Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH1	CH7	CH13	CH1	CH7	CH13	CH1	CH7	CH13
11b	1	18.65	18.80	19.32	-30.17	-29.10	-29.93	-96.0	-96.0	-96.0
	11	18.75	18.71	19.12	-29.21	-28.69	-29.89	-88.0	-88.0	-88.0
11g	9	18.26	18.21	18.25	-19.66	-22.0	-19.43	-91.0	-91.0	-91.0
	54	15.93	16.44	16.87	-32.27	-34.91	-31.44	-75.0	-75.0	-75.0
11n	MCS0	18.16	18.05	18.67	-19.71	-21.19	-19.43	-90.0	-90.0	-90.0
HT20	MCS7	16.13	16.49	16.39	-32.25	-33.77	-32.86	-74.0	-73.0	-73.0
Mode	Rate (Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH3	CH7	CH11	CH3	CH7	CH11	CH3	CH7	CH11
11n	MCS0	17.15	17.42	17.48	-20.41	-23.86	-19.03	-86.0	-87.0	-86.0
HT40	MCS7	15.06	15.56	15.34	-32.28	-33.65	-32.51	-70.0	-71.0	-70.0

5. Module Hardware Description

5.1 Pin definition

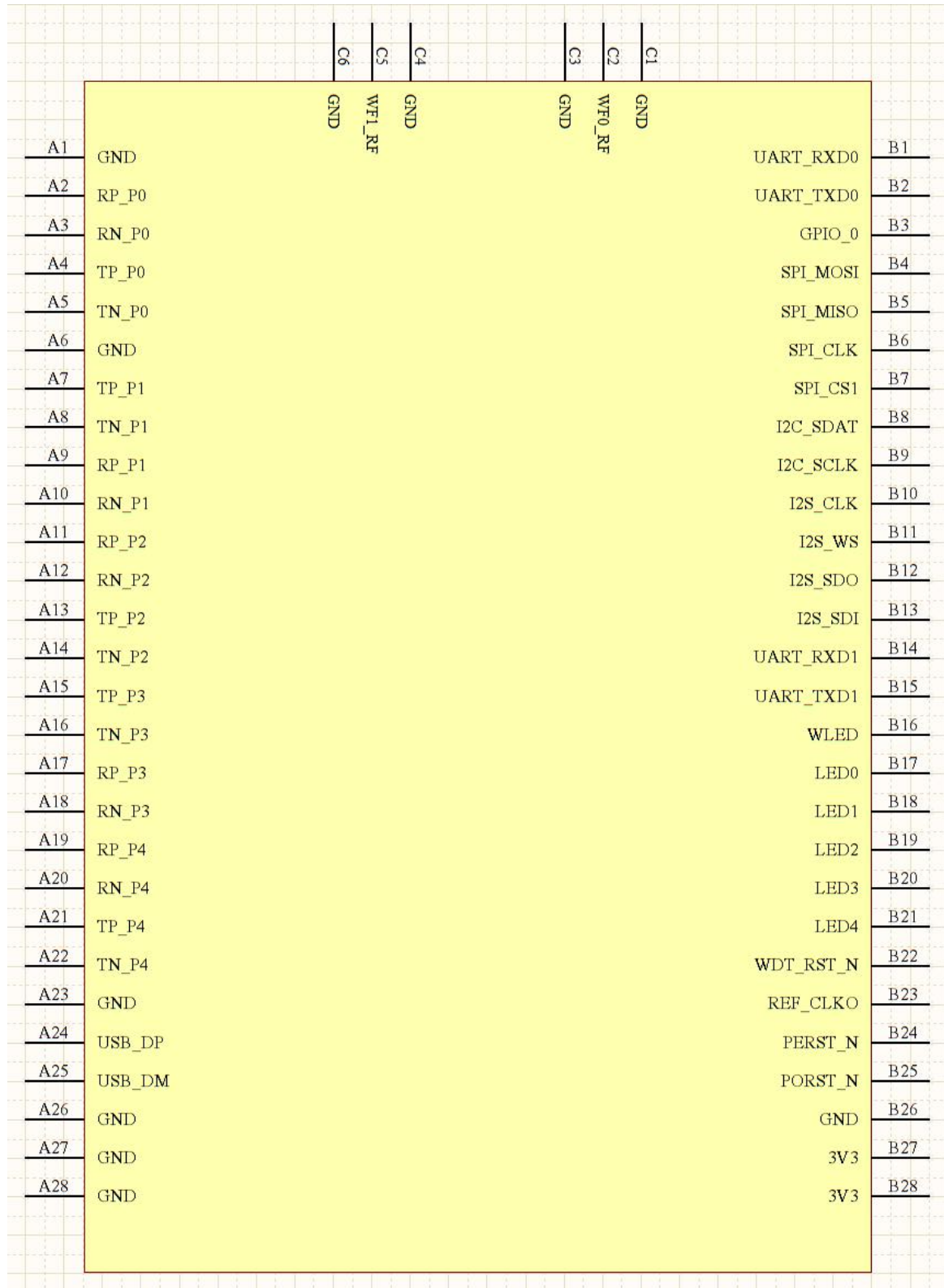


Figure 5-1 Pin Diagram

Table 5-1: Pin Definition

Pin	Name	Pin Description	Pins of MT7628N
A1	GND	Ground	
A2	RP_P0	10/100 PHY Port#0 RXIP0	33
A3	RN_P0	10/100 PHY Port#0 RXIN0	34
A4	TP_P0	10/100 PHY Port#0 TXOP0	35
A5	TN_P0	10/100 PHY Port#0 TXON0	36
A6	GND	Ground	
A7	TP_P1	10/100 PHY Port#1 TXOP1; GPIO#14	40
A8	TN_P1	10/100 PHY Port#1 TXON1; GPO#15	42
A9	RP_P1	10/100 PHY Port#1 RXIP1 ; GPIO#16	43
A10	RN_P1	10/100 PHY Port#1 RXIN1 ; GPIO#17	44
A11	RP_P2	10/100 PHY Port#2 RXIP2 ; GPO#18	45
A12	RN_P2	10/100 PHY Port#2 RXIN2 ; GPO#19	46
A13	TP_P2	10/100 PHY Port#2 TXOP2 ;UART_TXD2; GPIO#20	47
A14	TN_P2	10/100 PHY Port#2 TXON2 ;UART_RXD2;GPIO#21	48
A15	TP_P3	10/100 PHY Port#3 TXOP3 ;SD_WP; GPIO#22	49
A16	TN_P3	10/100 PHY Port#3 TXON3 SD_CD; GPIO#23	50
A17	RP_P3	10/100 PHY Port#3 RXIP3 SD_D1; GPIO#24	51
A18	RN_P3	10/100 PHY Port#3 RXIN3 SD_D0; GPIO#25	52
A19	RP_P4	10/100 PHY Port#4 RXIP4 SD_CLK; GPIO#26	53
A20	RN_P4	10/100 PHY Port#4 RXIN4 SD_CMD; GPIO#27	54
A21	TP_P4	10/100 PHY Port#4 TXOP4 SD_D3; GPIO#28	55
A22	TN_P4	10/100 PHY Port#4 TXON4 SD_D2; GPIO#29	56
A23	GND	Ground	
A24	USB_DP	USB Port D+	61
A25	USB_DM	USB Port D-	62
A26	GND	Ground	
A27	GND	Ground	
A28	GND	Ground	
B1	UART_RXD0	UART-RX debug	31
B2	UART_TXD0	UART-TX debug	30
B3	GPIO_0	GPIO#11	29
B4	SPI_MOSI	SPI master output/slave input	27

B5	SPI_MISO	SPI master input/slave output	26
B6	SPI_CLK	SPI clock	25
B7	SPI_CS1	SPI chip select 1	24
B8	I2C_SDAT	I2C data	21
B9	I2C_SCLK	I2C clock	20
B10	I2S_CLK	I2S clock;GPIO#3	19
B11	I2S_WS	I2S word select ;GPIO#2	18
B12	I2S_SDO	I2S data output ;GPIO#1	17
B13	I2S_SDI	I2S data input ;GPO#0	16
B14	UART_RXD1	UART1_Lite RXD	148
B15	UART_TXD1	UART1_Lite TXD	147
B16	WLED	WLAN Activity LED	144
B17	LED0	10/100M PHY Port#0 activity LED,JTAG_TDO; GPIO#43	143
B18	LED1	10/100M PHY Port#1 activity LED,JTAG_TDI ; GPIO#42	142
B19	LED2	10/100M PHY Port#2 activity LED,JTAG_TMS; GPIO#41	141
B20	LED3	10/100M PHY Port#3 activity LED,JTAG_CLK; GPIO#40	140
B21	LED4	10/100M PHY Port#4 activity LED,JTAG_TRST_N ; GPO#39	139
B22	WDT_RST_N	Watchdog timeout reset	137
B23	REF_CLKO	Reference clock output	136
B24	PERST_N	PCIe device reset	135
B25	PORST_N	Power on reset	138
B26	GND	Ground	
B27	3.3V	Power Supply	
B28	3.3V	Power Supply	
C1	GND	Ground	
C2	WF0_RF	WF0 main path RF antenna Pin	3,4,5,6
C3	GND	Ground	
C4	GND	Ground	
C5	WF1_RF	WF1 main path RF antenna Pin	11,12
C6	GND	Ground	

5.2 Package information

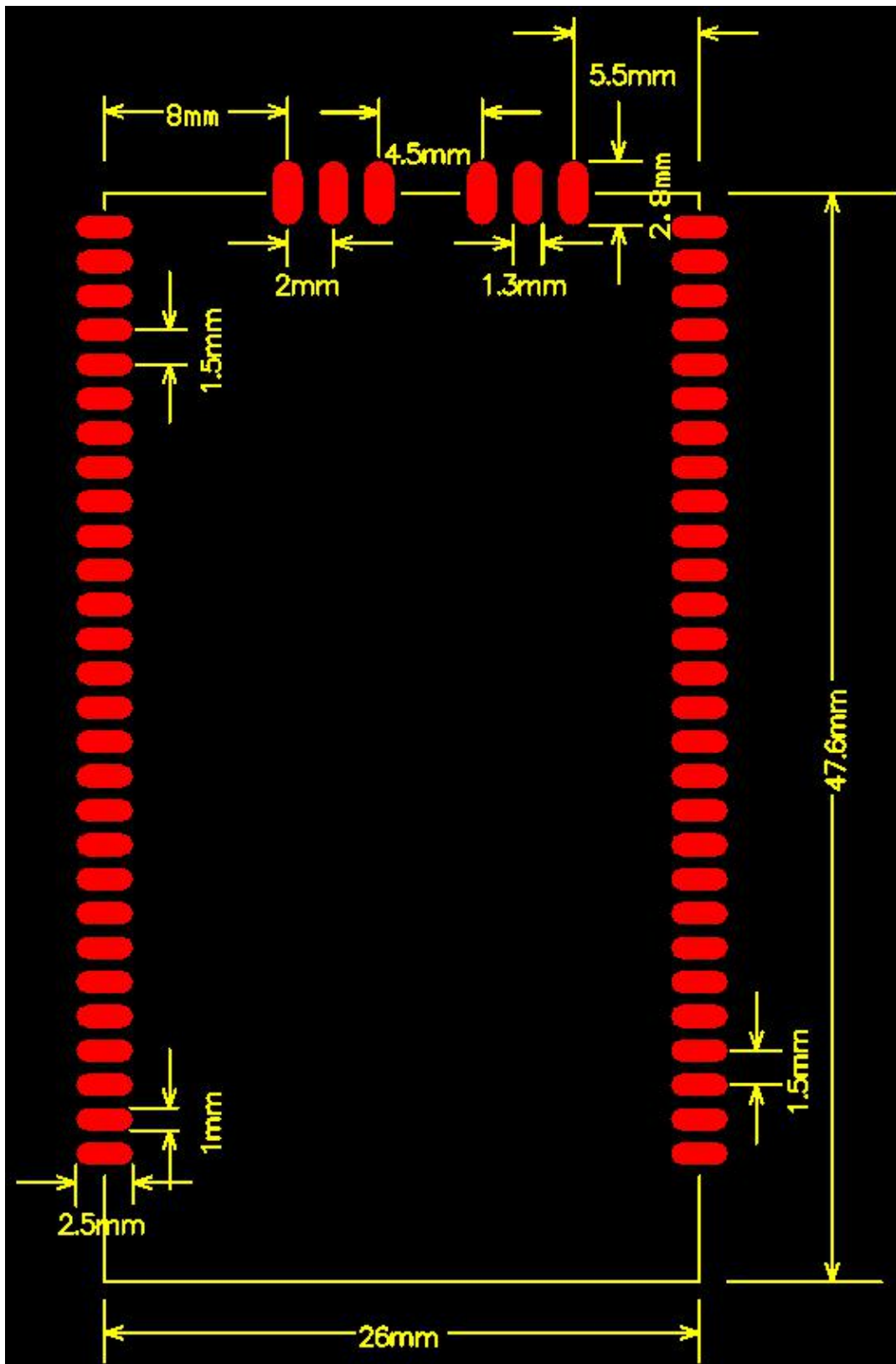


Figure 5-2 Module Package (mm)

6. Contact information

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7. Change Note

Version	Date	Change
V1.0	2017-10-23	Create Document

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