WiFi Module
Model: TT-AH019M
Datasheet

Version 1.0

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Module application Introduction

TT-AH019M standard module is the Wi-Fi module which supports 802.11b/g/n. It can work with other circuit(application) through the UART port, let the device to be internet connected, together with APP/cloud server to let user can smart control the device by APP and voice(Alexa/Google assistant and so on). The module combined the RF Transceiver/MAC/ baseband processing/All Wi-Fi protocol/configuration information and Network protocol stack. It can be wide range used for smart home device/ remote monitoring aids/ Medical devices and other fields.

The module software uses the advanced Ayla Networks IOT platform. Ayla Networks is the lead company who bring out the Agile Internet of things cloud platform in the industry. Ayla end to end solution can link the device, cloud and portable APP. So, it can provide the safe link/ Big Data Analysis and abundant user experience for our customer and end-user.

Ayla's enterprise level Internet of things cloud platform is serving many of the world's top companies, building control, HVAC, household appliances, lighting and other devices connected to intelligent system to achieve cloud management, and can anytime and anywhere access to mobile applications.

Platform Introduction

Safe connect

1. 128-bit SSL encryption: protection of user privacy, end to end to ensure the security of customer data and information.
2. Key protection: the device key is burned to the network module before the module is out of the factory to ensure the security and reliability.
3. Multi-layer authentication: the cloud strengthens the authentication of equipment, App, and users to ensure data integrity and prevents illegal replication.

Strengthen APP function

1. Rule engine: Based on cloud intelligence, the trigger mechanism based on almost any behavior or scene can be implemented.
2. Activity plan: complete automation of equipment activity according to user defined open / close plan
3. Event notification: allow users to get event notifications via email, SMS, or push.
4. Role based access control: allows users to grant access to roles for family members, visitors, technical support personnel, and other roles.
5. OAuth certification: allow consumers to log in through Google, Facebook, or WeChat accounts.

Data Intelligence

1. Data visualization: use the Ayla platform's built-in business intelligence report and visualization tools to view and analyze the data you have collected.
2. Internet of things analysis: identify user behavior and trends in order to improve products, diagnose problems and find new opportunities.
3. Cloud user settings: the user's preferences and settings are kept in the cloud, and a seamless experience is realized in the various devices of the user.
4. "Cloud to cloud" API interface: import / export third party data to extend product function and application integration.

iFutureHome APP function spec

Modules	Function	Function description
User modules	Register/log in	Account registration/Password setting/ User log in
	Retrieve password	User password find
	Personal information	Allow the change the user's Profile picture, name and password
	Version information	View the Version information
	Help	Link to the company website or add help file
Device modules	Add device	Setting device network/Name the device/Add device to end-user/ Cannot connect to network if no WIFI.
	Delete device	Delete the device form end-user
	Modify device	Modify the device name
	Time setting	Setting single timing/ circulation timing/period timing
	Device information view	View device control record/view device's Mac address
	Control the device	Click to control the device/Timing control the device/Voice control device's brightness/Voice control power on/off
		Remote control the device through 4G/WIFI/hotspot/LAN network
	Timer control device	Set single timing/cycle timing/display timing control the device
	F/W update	Upgrade the device F/W
Scene modules	Add scene	User-defined scene name/User-defined scene photo/Add scene can control device/ Setting scene device's status
	Delete scene	Delete current scene
	Modify scene	Modify scene's name/modify scene photo/modify scene can control device/ modify scene device's status
	Control scene	Click control scene/Voice control scene (Scene explanation: Add several devices under scene and set different

		status for each device. After clicking the relative scene, the device under the scene will follow the set status to perform
Voice Assistant	Amazon Alexa Voice Assistant	English/German/Japanese Language
	Google Home Voice Control	English/German/Japanese Language
	Alibaba Tmall Genie	Chinese Language

Hardware Spec

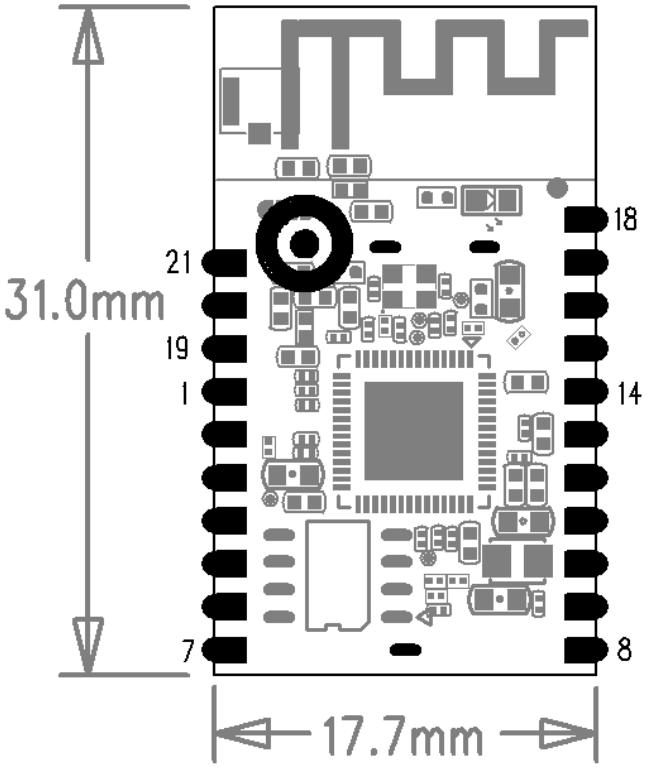
Model	PCB	TT-AH019M
CPU	Model	RTL8711AM
	Frequency	166MHz
Memory	Internal ROM	512KByte
	Internal SRAM	448KByte
	External FLASH	2MByte
Wi-Fi	Protocol	802.11 b/g/n, 1T1R
	Frequency	2.4GHz
	Maximum data rate	150Mbps@40MHz
UART	UART0	Rate up to 4MHz
	UART LOG	Debug console
PWM	Max 4PCS	0~100% duty can be configurable, minimum resolution is 32us
I2C	Max 3PCS	Support Standard/Fast/High-speed mode, Master or Slave I2C operation
SPI	1PCS	SPI0, Support Master/Slave mode, and Slave only, Support DMA to offload CPU bandwidth
I2S	1PCS	I2S1, Support 8/16/24/32/48/96 KHz, 44.1/88.2KHz, Support 16 or 24 bits format, support Master or Slave mode

Electrical Characteristics

Parameter	Minimum	Typical	Maximum	Units
Ambient Operating Temperature	0	-	70	℃
VDD33	3.0	3.3	3.6	V
IDD33	-	-	450	mA

PCBA GPIO Define and Dimension

1. PCBA Dimension：17.7 x 31.0 x 3.8 mm



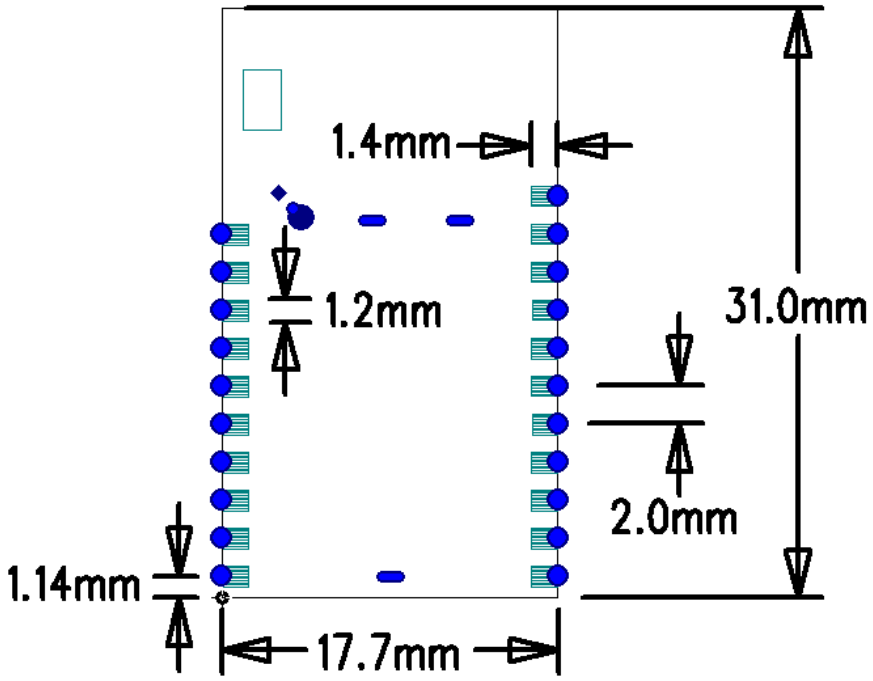
2. GPIO Function Define

PCB Pins	Symbol	Type	Description
1,14	GND	P	Ground
2,13	VDD33	P	Power
3	CHIP_EN	I	0: Disable chip in shutdown mode
4	GPIOA_7	I/O	UART0/UART2 TX
5	GPIOA_6	I/O	UART0 RX
6	GPIOC_2	I/O	Relay 3 GPIO, High active; Option: PWM2 out
7,8	GPIOE_2	I/O	Relay 2 GPIO, High active; Option: PWM3 out
9	GPIOE_4	I/O	Relay 4 GPIO, High active; Option:I2C3_SCL;
10	GPIOC_3	I/O	Status LED, Low active;
11	GPIOC_1	I/O	Key input, High active;
12	GPIOC_0	I/O	Relay 1 GPIO, High active; Option: PWM0 out
15	GPIOC_4	I/O	I2C1_SDA;
16	GPIOC_5	I/O	I2C1_SCL;
17	GPIOB_0	I/O	UART_LOG_OUT
18	GPIOB_1	I/O	UART_LOG_IN
19	GPIOE_3	I/O	I2C3_SDA;
20	GPIOE_0	I/O	I2C2_SCL; Option: PWM0 out
21	GPIOE_1	I/O	I2C2_SDA; Option: PWM1 out

3. Pin Function Group Table

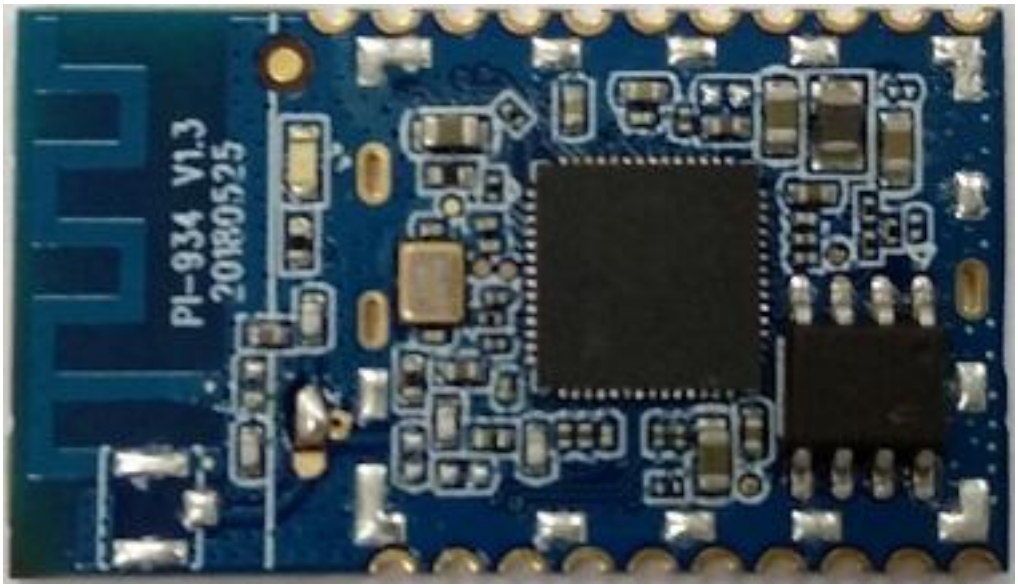
PIN name	JTAG	SDD	SDH	MII	UART Group	I2C Group	SPI Group	I2S Group	PCM Group	WL_LED	PWM	ETE	WKDT	GPIO INT	Default State	SCHMT
GPIOA_0		D2	D2	RX_CK	UART2_IN		SPI1_MISO							GPIO_INT	PH	O
GPIOA_1		D3	D3	RXD0	UART2_CTS		SPI1_MOSI							GPIO_INT	HI	
GPIOA_2		CMD	CMD	RXD1	UART2_RTS		SPI1_CLK								PH	O
GPIOA_3		CLK	CLK	RXD2	UART0_RTS										PH	O
GPIOA_4		D0	D0	RXD3	UART2_OUT		SPI1_CS								PH	
GPIOA_5		D1	D1	RXDV	UART0_CTS								D_SBY0		PH	
GPIOA_6		INT	CD	RXERR	UART0_IN										PH	
GPIOA_7			WP	COL	UART0_OUT										HI	
GPIOB_0					LOG_OUT							ETE0	D_SLP0		HI	
GPIOB_1					LOG_IN					WL_LED0		ETE1			PH	
GPIOB_2						I2C3_SCL						ETE2			HI	O
GPIOB_3						I2C3_SDA						ETE3		GPIO_INT	PH	
GPIOB_4										WL_LED0	PWM0			GPIO_INT	PH	
GPIOB_5										WL_LED0	PWM1				PH	O
GPIOC_0				TXD2	UART0_IN		SPI0_CS0	I2S1_WS	PCM1_SYNC		PWM0	ETE0			HI	
GPIOC_1				TXD1	UART0_CTS		SPI0_CLK	I2S1_CLK	PCM1_CLK		PWM1	ETE1		GPIO_INT	HI	O
GPIOC_2				TXD0	UART0_RTS		SPI0_MOSI	I2S1_SD_TX	PCM1_OUT		PWM2	ETE2			HI	
GPIOC_3				TX_CK	UART0_OUT		SPI0_MISO	I2S1_MCK	PCM1_IN		PWM3	ETE3		GPIO_INT	HI	O
GPIOC_4				TXD3		I2C1_SDA	SPI0_CS1	I2S1_SD_RX						GPIO_INT	HI	
GPIOC_5				TXEN		I2C1_SCL	SPI0_CS2							GPIO_INT	HI	O
GPIOD_4				MDC	UART2_IN	I2C0_SDA	SPI1_CS		PCM1_SYNC		PWM0	ETE0		GPIO_INT	PH	O
GPIOD_5				MDIO	UART2_CTS	I2C0_SCL	SPI1_CLK		PCM1_CLK		PWM1	ETE1	D_SBY2	GPIO_INT	PH	O
GPIOD_6	JTAG				UART2_RTS	I2C1_SCL	SPI1_MOSI	I2S0_SD_RX	PCM1_OUT		PWM2	ETE2		GPIO_INT	PH	O
GPIOD_7					UART2_OUT	I2C1_SDA	SPI1_MISO		PCM1_IN		PWM3	ETE3		GPIO_INT	PH	O
GPIOE_0	TRST			UART	UART0_OUT	I2C2_SCL	SPI0_CS0	I2S0_WS	PCM0_SYNC		PWM0				PH	O
GPIOE_1	TDI				UART0_RTS	I2C2_SDA	SPI0_CLK	I2S0_CLK	PCM0_CLK		PWM1			GPIO_INT	PH	O
GPIOE_2	TDO				UART0_CTS	I2C3_SCL	SPI0_MOSI	I2S0_SD_TX	PCM0_OUT		PWM2			GPIO_INT	PH	O
GPIOE_3	TMS				UART0_IN	I2C3_SDA	SPI0_MISO	I2S0_MCK	PCM0_IN		PWM3		D_SBY3	GPIO_INT	PH	O
GPIOE_4	CLK					I2C3_SCL	SPI0_CS1								PH	O
GPIOE_5						I2C3_SDA	SPI0_CS2							GPIO_INT	PH	O

4. PCB Module Package



5. PCB Photo

1） Top View



2） Bottom View

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note 1: This module certified that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3: Additional testing and certification may be necessary when multiple modules are used.

Note 4: The module may be operated only with the antenna with which it is authorized. Any antenna that is of the same type and of equal or less directional gain as an antenna that is authorized with the intentional radiator may be marketed with, and used with, that intentional radiator.

Note 5: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier’s Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, SUNVALLEYTEK INTERNATIONAL, INC. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

Note 6: FCC ID label on the final system must be labeled with “Contains FCC ID: 2AFDGTT-AH019M” or “Contains transmitter module FCC ID: 2AFDGTT-AH019M”.

Note 7: For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.