

AHMC7292S

User Manual

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Overview

AHMC7292S is world's first IEEE802.11ah module

The AHMC7292S IEEE802.11ah module series allows building long range, ultra-low power WiFi networks in Sub 1 GHz license-exempt bands. WiFi HaLow™ enables connectivity for many applications, including sensors and IoT devices.

The AHMC7292S support for standalone mode, High data throughput and complete SDK, getting started with this new WiFi standard will be straightforward.

Standalone Mode

In this mode, the target device doesn't need external drivers. It will be up and running by itself while power on. Since it's self-running device, it required a built-in firmware to define its routines and behaviors.

Other devices can talk to this device through a UART interface, send AT commands and receives data with it.



Specifications (US/FCC)

General Features	Description
Product Description	IEEE802.11ah Module
Major Chipset	Newracom NRC7292 (268-pin CABGA)
Host Interface	USB / UART / SPI / I2C
Dimension	30 x 51 x 4 mm
Form Factor	Full-size PCI Express Mini Card
Antenna	1T1R
Operating Voltage	3.3VD
Operating Temperature	-40°C~70 °C

RF Features	Description
WLAN Standard	IEEE802.11ah
Frequency Range	(US): Unit MHz 1MHz Bandwidth: 903.5-926.5 MHz 2MHz Bandwidth: 905-925 MHz 4MHz Bandwidth: 906-926 MHz
Modulation	OFDM with BPSK, QPSK, 16-QAM, 64-QAM
Channel Bandwidth	1/2/4 MHz
Output Power	19.9dBm
Receiver Sensitivity	-106 dBm (MCS0@1MHz) -88 dBm (MCS7@1MHZ)

Specifications (EU/CE)

General Features	Description
Product Description	IEEE802.11ah Module
Major Chipset	Newracom NRC7292 (268-pin CABGA)
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RF Features	Description
WLAN Standard	IEEE802.11ah
Frequency Range	(EU): Unit MHz 1MHz Bandwidth: 863.5, 864.5, 865.5, 866.5, 867.5
Modulation	OFDM with BPSK, QPSK, 16-QAM, 64-QAM
Channel Bandwidth	1MHz
Output Power	13 dBm (Average Typical)
Receiver Sensitivity	-106 dBm (MCS0@1MHz) -88 dBm (MCS7@1MHz)

Antenna Information (US/FCC)

Brand	Model Name	Antenna Type	Connector
ALFA	ARS-915P	Dipole	RP-SMA female

Frequency Range	Gain	VSWR	Impedance
902-928 MHz	0 dBi	≤ 2.0	50 Ω

Antenna Information (EU/CE)

Brand	Model Name	Antenna Type	Connector
ALFA	ARS-868P	Dipole	RP-SMA female

Frequency Range	Gain	VSWR	Impedance
863-870 MHz	0 dBi	≤ 2.0	50 Ω

NOTE: The antenna is just an optional accessory.

Mini Card Golden Finger

Top		Bottom	
1	SCK	3.3 V	2
3	SDO	GND	4
5	SDI	NC	6
7	CS	NC	8
9	GND	NC	10
11	NC	NC	12
13	NC	NC	14
15	GND	BOOT (XIP/ROM)	16
Mechanical key			
17	UART TX	GND	18
19	UART RX	NC	20
21	GND	PERSTn	22
23	NC	3.3 V	24
25	NC	GND	26
27	GND	NC	28
29	GND	I ² C SCL	30
31	NC	I ² C SDA	32
33	NC	GND	34
35	GND	USB 2.0 D- ¹	36
37	GND	USB 2.0 D+ ¹	38
39	3.3 V	GND	40
41	3.3 V	NC	42
43	GND	WLAN LED	44
45	NC	NC	46
47	NC	NC	48
49	NC	GND	50
51	NC	3.3 V	52

¹⁾ USB 2.0 interface is available only in AHMC7292SU version

Reference Schematic - UART

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

The module is limited to OEM installation ONLY.The OEM integrators are responsible for ensuring that the end-use has no manual or instructions to remove or install module.

2.4 Limited module procedures : Not applicable

2.5 Trace antenna designs : Not applicable

2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by 2.1093.

2.7 Antennas

This radio transmitter FCC ID:2AB8772921 has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna type:Dipole Antenna

Maximum Antenna gain:0dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following " Contains FCC ID: 2AB8772921 "

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.