

Shenzhen Uascent Technology Co., Ltd

Universal Ascent Holdings Limited

UAM056

Wi-Fi Single-band 1T1R 802.11b/g/n/ax

Module Datasheet

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| | | |
|---------------------|-------|-----------|
| Customer Approval : | _____ | Company |
| | _____ | Title |
| | _____ | Signature |
| | _____ | Date |
| | _____ | Uascent |

Revision History.

| Version | Date | Revision Content | Draft | Approved |
|---------|------------|------------------|-------|----------|
| 1.0 | 2024/12/11 | New version | Bella | |
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1 Overview.

1.1 Introduction.

UAM056 is a cost-effective WIFI+BLE module developed by Uascent Technology, supporting Bluetooth dual mode 5.2 and IEEE 802.11 b/g/n/ax protocol standards, lightweight TCP/IP protocol stack, STA, AP, and Direct modes, and Matter protocol. Users can use this module to add networking functions to existing devices or build independent network controllers.

1.2 Features.

- Operate at ISM frequency bands (2.4GHz).
- Standard IEEE 802.11b/g/n/ax.
- Support WiFi+Bluetooth 5.2.
- Support Wi-Fi and BLE coexist.
- Support BLE assists in fast Wi-Fi connection.
- Built-in single core RISC-V MCU with a main frequency of up to 320MHz, can be used as an application processor.
- Built-in 64KB ROM, 512KB SRAM, 4Mbit Flash, 32byte eFuse.
- Built-in TR switch, BALUN, LNA, PA, and PCB antenna.
- Support remote firmware OTA upgrade.
- Support STA, AP, STA+AP and Direct working modes.
- Support WPA/WPA2/WPA3 security protocol.

1.3 Recommended Operating Rating.

| Description | | Min | Typ | Max | Unit |
|--------------------------|---------------------|---------|-----|---------|-------|
| Ambient Temperature (TA) | | -30 | 25 | 105 | deg.C |
| Vcc | | 3.0 | 3.3 | 3.6 | V |
| (VOL) | Output low voltage | VSS | / | VSS+0.3 | V |
| (VOH) | Output high voltage | VCC-0.3 | / | VCC | V |

1.4 Reference power consumption for conventional continuous operation.

| Parameter | Condition / Notes | Typ. | Unit |
|-----------------|-------------------|------|------|
| TX model | | | |
| I _{RF} | 11b 11M | 280 | mA |
| I _{RF} | 11g 54M | 250 | mA |
| I _{RF} | 11n HT20 MCS7 | 250 | mA |
| I _{RF} | 11n HT40 MCS7 | 250 | mA |

| | | | |
|-----------------|----------------|-----|----|
| I _{RF} | 11ax HE20 MCS7 | 250 | mA |
| I _{RF} | 11ax HE40 MCS7 | 250 | mA |
| RX model | | | |
| I _{RF} | 11b 11M | 80 | mA |
| I _{RF} | 11g 54M | 80 | mA |
| I _{RF} | 11n HT20 MCS7 | 80 | mA |
| I _{RF} | 11n HT40 MCS7 | 80 | mA |
| I _{RF} | 11ax HE20 MCS7 | 80 | mA |
| I _{RF} | 11ax HE40 MCS7 | 80 | mA |

1.5 ESD Specifications

| Item | Description | Value | Unit |
|-----------------------|--|-------|------|
| Human Body Mode (HBM) | Electrostatic Discharge Tolerance under Human Body Model | ±4 | KV |
| CDM | Electrostatic Discharge Tolerance under Charged Device Model | ±0.2 | KV |

2 Module usage precautions.

When using the WIFI module of Uascent Technology, a certain tolerance should be reserved for the output current of the power supply. It is recommended that the output current of the power supply be $\geq 500\text{mA}$, and a suitable power supply IC packaging should be selected. When supplying LDO power, attention should be paid to the issue of heating, and when supplying DC-DC power, attention should be paid to the issue of overshoot at the moment of power on.

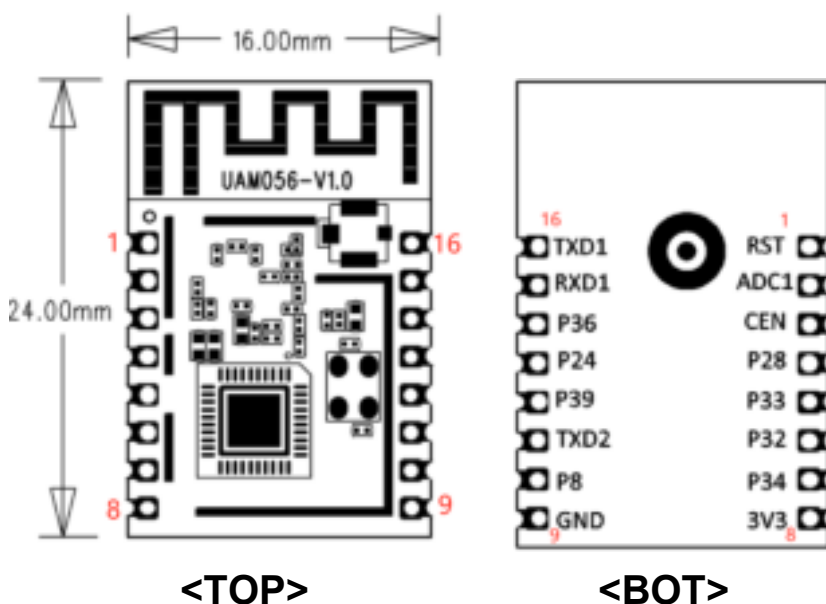
3 WiFi Specification.

| Features | Descriptions |
|---------------------|--|
| Main Chipset | BEKEN : BK7235 |
| Operating Frequency | 2.412~2.484GHz |
| Operating Voltage | 3.0~3.6V |
| WIFI Standard | IEEE 802.11b/g/n/ax |
| PHY Data rates | Wi-Fi: 802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps HT20 MCS0-MCS7 HT40 MCS0-MCS7 HE20 MCS0-MCS7 HE40 MCS0-MCS7 |
| Transmit Output | Wi-Fi: 802.11b@11Mbps 16±2dBm 802.11g@54Mbps 15±2dBm |

| | |
|--------------------------------|--|
| Power | 802.11n@HT20 MCS7 14±2dBm 802.11n@HT40 MCS7 14±2dBm 802.11ax@HE20 MCS7 14±2dBm 802.11ax@HE40 MCS7 14±2dBm |
| EVM | 802.11b /11Mbps: EVM ≤ -10dB 802.11g /54Mbps: EVM ≤ -25dB 802.11n /HT20 MCS7: EVM ≤ -27dB 802.11n /HT40 MCS7: EVM ≤ -27dB 802.11ax /HE20 MCS7: EVM ≤ -27dB 802.11nax/HE40 MCS7: EVM ≤ -27dB |
| Receiver Sensitivity (HT20) | 802.11b@8% PER 11Mbps ≤ -88dBm |
| | 802.11g@10% PER 54Mbps ≤ -74dBm |
| | 802.11n@10% PER MCS 7 ≤ -70dBm |
| Operating Channel | Wi-Fi 2.4GHz: 11: (Ch. 1-11) – United States(North America) 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan |
| Antenna | PCB antenna |

4 Pin Descriptions.

4.1 Pin Outline.



4.2 Pin Definition.

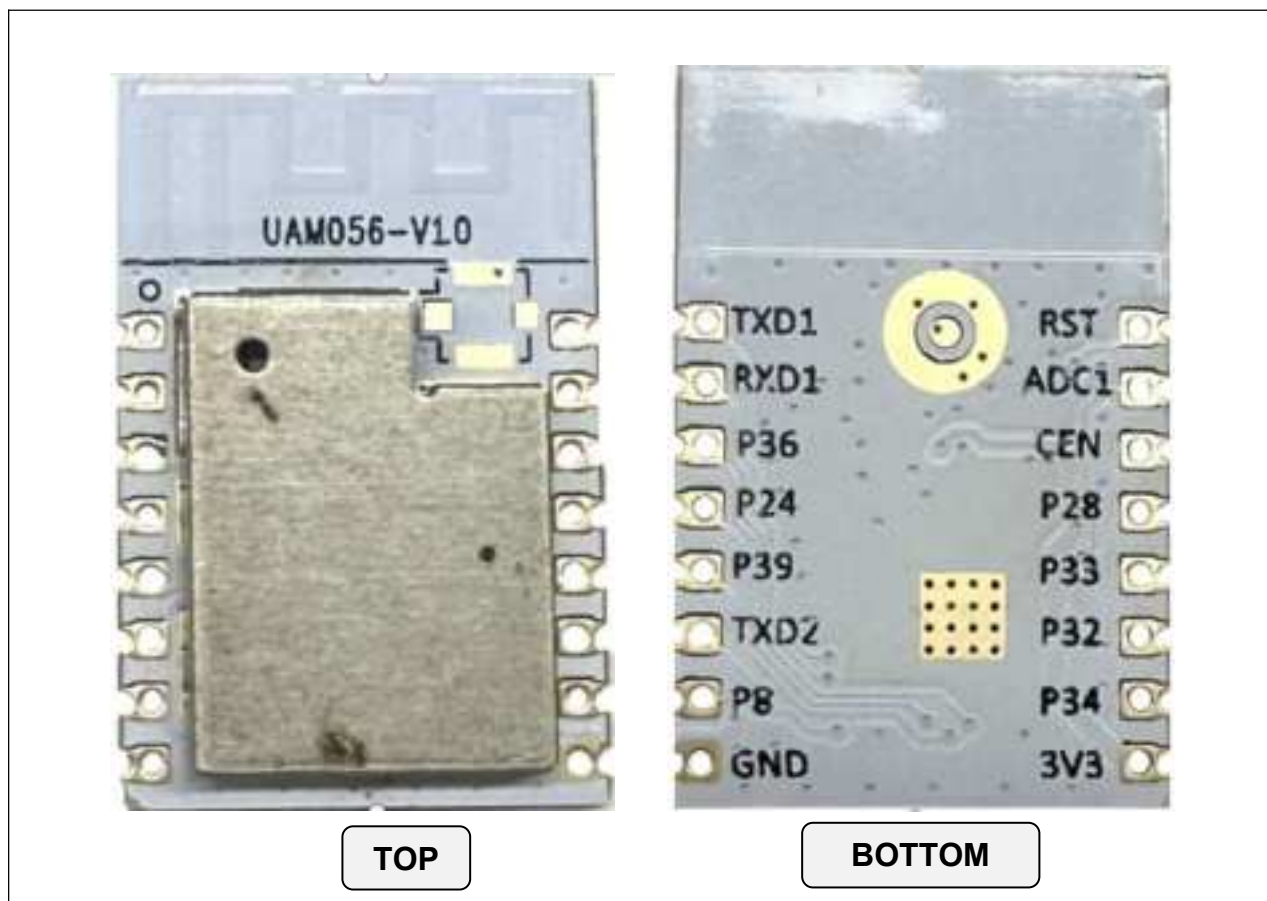
| Pin No. | Name | Type | Description | Voltage |
|---------|------|------|--|---------|
| 1 | RST | I | Module enabled (highly effective) internally pulled up, can be suspended without use | |

| | | | | |
|----|-----|-----|--|--|
| 2 | P25 | I/O | P25/IRDA/PWM5/ADC1 | |
| 3 | CEN | I | Module enabled (highly effective) internally pulled up, can be suspended without use | |
| 4 | P28 | I/O | P28/RXEN/ADC4/TS2 | |
| 5 | P33 | I/O | P33/PXD1/PWM7/TS7 | |
| 6 | P32 | I/O | P32/PXD0/PWM6/TS6 | |
| 7 | P34 | I/O | P34/PXD2/PWM8/TS8 | |
| 8 | 3V3 | P | Supply VCC(3.0V-3.6V) | |
| 9 | GND | P | Ground | |
| 10 | P8 | I/O | GPIO8/PWM2 (differential with PWM3) | |
| 11 | P0 | I/O | P0/TX2/SCL2 | |
| 12 | P39 | I/O | GPIO39/CIS_PXD7/Touch sensor 13 | |
| 13 | P24 | I/O | GPIO24/PWM4 (differential with PWM5)/ADC2 | |
| 14 | P36 | I/O | P36/PXD4/PWM10/TS10 | |
| 15 | P10 | I/O | P1/RX1/SDA2 | |
| 16 | P11 | I/O | P11/TX1 | |

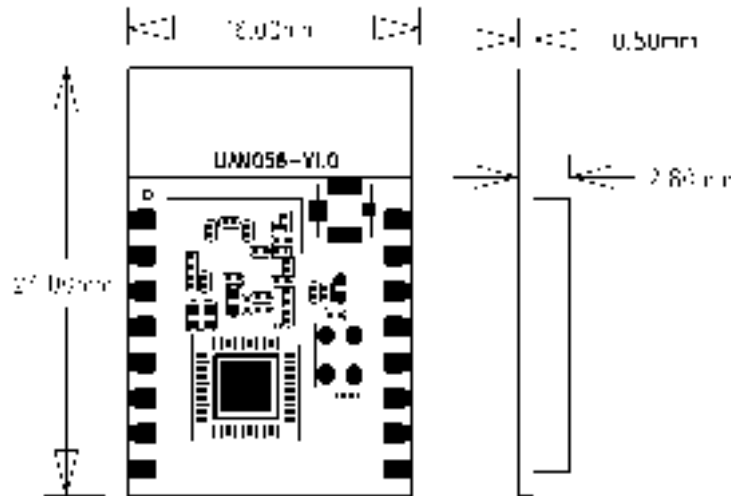
※ P:POWER I:INPUT O:OUTPUT

5 Dimensions.

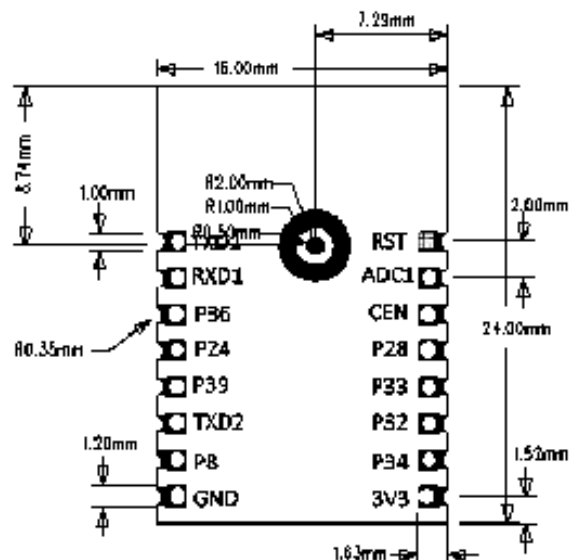
5.1 Module Picture.



L:24.00 x W:16.00 x H:2.8 (±0.2) unit=mm

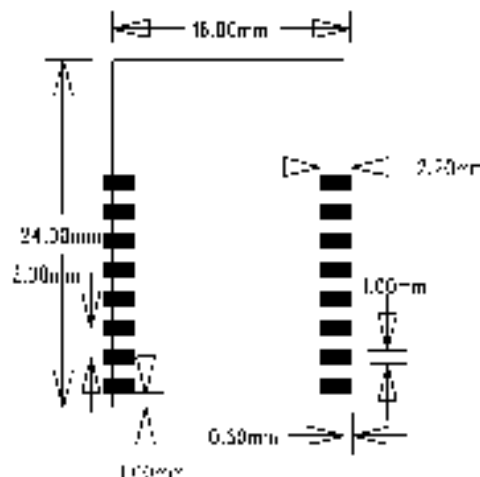


5.2 Module Mechanical Dimensions.



BOTTOM (unit=mm)

5.3 PCB Layout Reference.



(unit=mm)

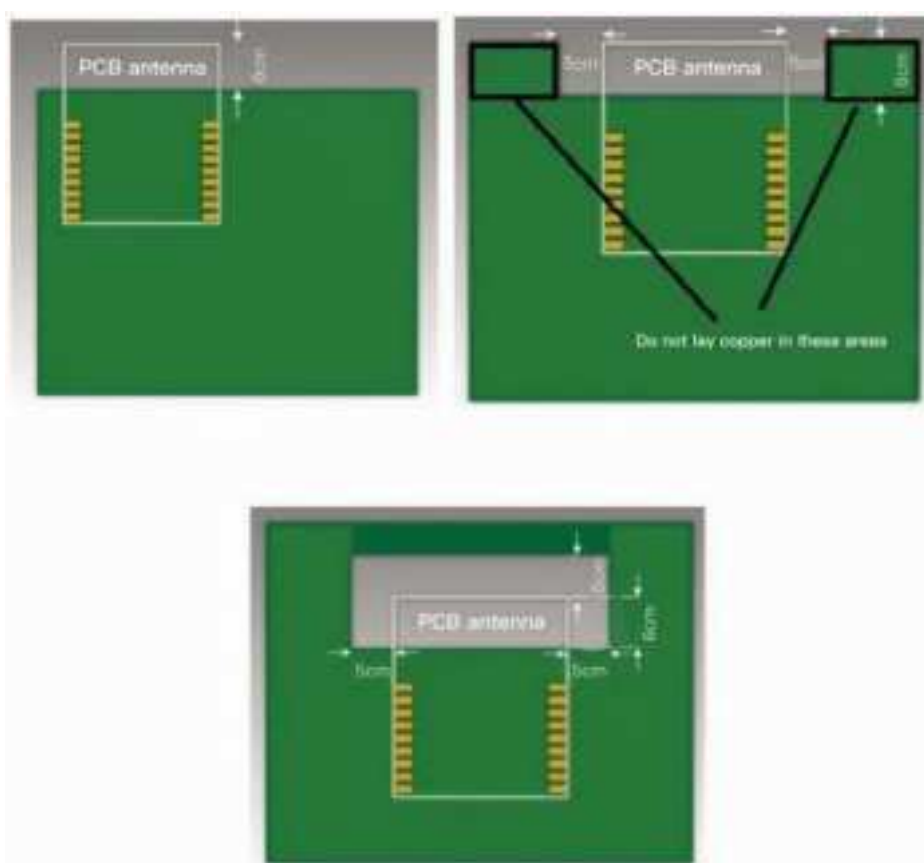
6 Antenna Information.

6.1 Antenna type.

This module antenna type is PCB on-board antenna with antenna gain of -1.3dBi (MAX)

6.2 Module layout considerations.

The UAM056 module shall be welded to the PCB board. In order to obtain the best RF performance. Under the PCB on-board antenna, there should be no copper laying, device and wiring. During PCB design, the corresponding area should be cleared. As shown in the following figure.



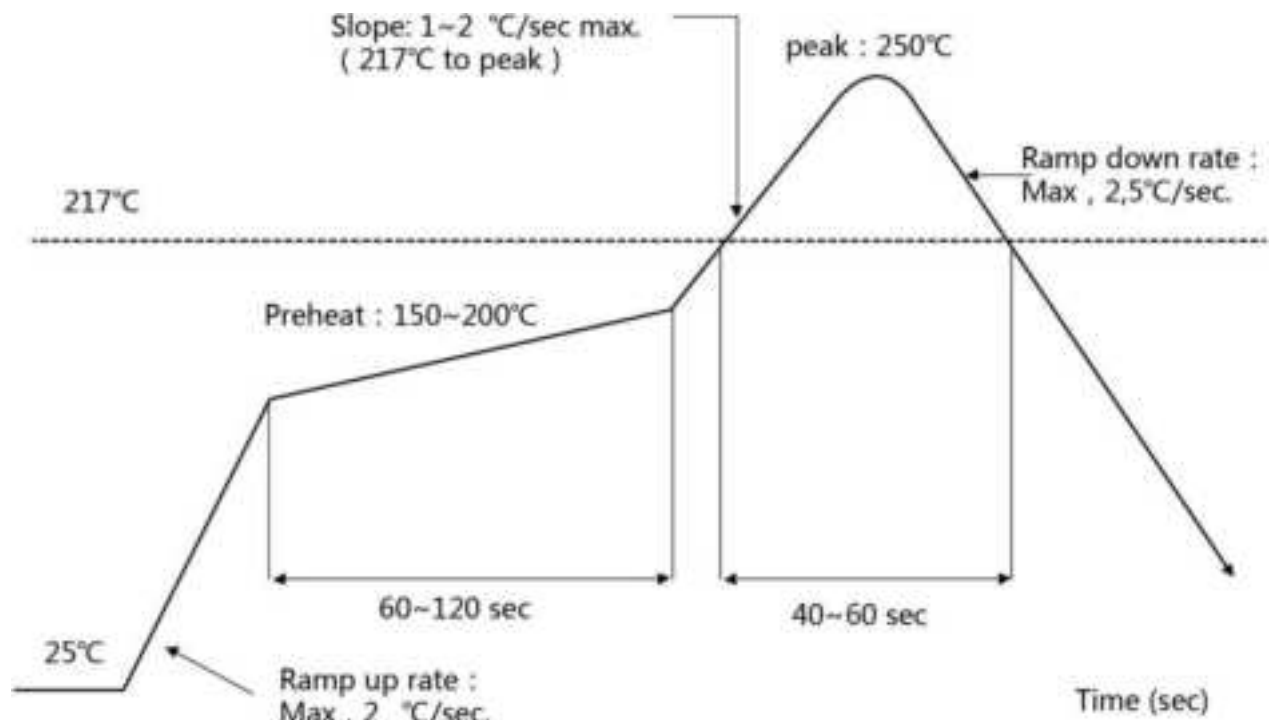
7 Environmental Requirements.

7.1 Recommended Reflow Profile.

Referred to IPC/JEDEC standard.

Peak Temperature : <245°C

Number of Times : ≤2 times



7.2 Note.

Note: Take and use the module, please ensure the electrostatic protective measures.

1. Reflow soldering temperature should be according to the customer the main size of the products, such as the temperature set at 250 ± 5 °C for the MID motherboard.

About the module packaging, storage and use of matters needing attention are as follows:

2. The module of the reel and storage life of vacuum packing: 1). Shelf life: 8 months, storage environment conditions: temperature in: < 40 °C, relative humidity: $< 90\%$ r.h.

3. The module vacuum packing once opened, time limit of the assembly:

Card: 1) check the humidity display value should be less than 30% (in blue), such as: 30% ~ 40% (pink), or greater than 40% (red) the module have been moisture absorption.

2.) factory environmental temperature humidity control: ≤ -30 °C, $\leq 60\%$ r.h..

3). Once opened, the workshop the preservation of life for 168 hours.


4. Once opened, such as when not used up within 168 hours:

1). The module must be again to remove the module moisture absorption.

2). The baking temperature: 125 °C, 8 hours.

3). After baking, put the right amount of desiccant to seal packages.

7.3 Humidity sensitive control.

| | | |
|---|--|--|
|  | <h2 style="margin: 0;">CAUTION</h2> <p style="margin: 0;">This bag contains MOISTUR-SENSITIVE DEICES</p> | <p style="margin: 0;">LEVEL</p> <div style="border: 1px solid black; padding: 10px; display: inline-block;"><h1 style="margin: 0;">3</h1></div> <p style="margin: 0; font-size: small;">If blank, see adjacent bar code label</p> |
| <p>1. Calculatied shelf life an sealed bag: 12 months at < 40℃ and <90% relative humidity(RH)</p> | | |
| <p>2. Peak package body temperature : _____ 260 _____℃</p> | | |
| <p>3. After bag is opened ,devices that will be subjected to reflow solder of other high temperature process must</p> <ul style="list-style-type: none">a) Mounted within: _____ 168 _____ hrs. of factory confitions ≤30℃/60%RH, ORb) Stored at<10% RH | | |
| <p>4. Devices require bake,before mounting, if:</p> <ul style="list-style-type: none">a) Humidity Indicator Care is > 10% when read at 23 ± 5℃b) 3a or 3b not met. | | |
| <p>5. If baking is required , devices may be baked for 48 hrs. at 125 ± 5℃</p> | | |
| <p>Note : If device containers cannot be subjected to high temperature of shorted bake times are desired, reference IPC/JDEC J-STD-033 for bake procedure</p> | | |
| <p>bag Seal Date : _____</p> | | |
| <p>Note : level and body temperature defined by IPC/JEDEC J-STD-020</p> | | |

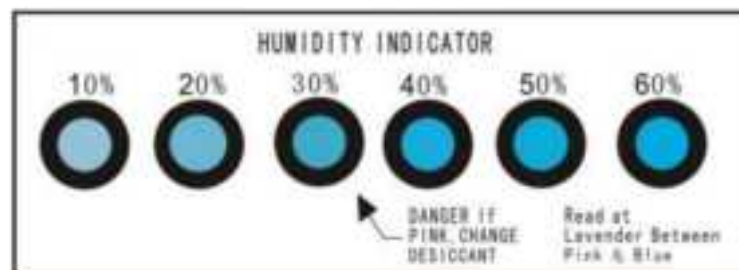
8 Package style.

8.1 Packaging Detail.

The module and the humidity indicator card are placed together in vacuum anti-static packaging, separated by a certain amount of paper, and neatly placed in the packaging box. The packaging must have reliable moisture-proof and anti-collision measures.

Note1:

There is a "triangular arrow" on the humidity indicator card indicating at 30%RH (as shown in the picture below). If the chemical changes to pink in the circle it points to, the element is damp and needs baking.



Note2:

Please confirm the packaging style with our sales staff before purchasing this product. If no packing style is specified before purchase, we will ship the goods by our own choice of packing method.

9 Transport regulations.

In the process of logistics or express transportation, attention should be paid to handling with care to avoid direct rain and snow.

10 Disclaimer and copyright notice.

All information in this document is provided according to the product status quo and subject to change without notice.

The contents of this document disclaim any warranties, including any warranties of fitness for sale, fitness for a particular purpose or non-infringement, and any warranties mentioned elsewhere in any proposal, specification or sample.

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11 Attention.

Due to product version upgrade or other reasons, the content of this manual may be changed. Shenzhen Uascent Technology Co., Ltd. reserves the right to modify the content of this manual without any notice or prompt. If users need to obtain the latest product information, please apply for the final document with our company. This manual is only used as a guide. Shenzhen Uascent Technology Co., Ltd. tries its best to provide the latest information in this manual, but does not guarantee that the content of the manual is completely accurate.

None of the statements, information and recommendations contained in this manual constitute any warranty, express or implied.

12 List of applicable FCC rules.

FCC Part 15.247

Label and compliance information

FCC ID label on the final system must be labeled with “Contains FCC ID: 2A68EJX-UAM056” or “Contains transmitter module FCC ID: 2A68EJX-UAM056” .

Information on test modes and additional testing requirements

Contact Shenzhen Uascent Technology Co., Ltd will provide stand-alone modular transmitter test mode. Additional testing and certification may be necessary when multiple modules are used in a host.

Additional testing, Part 15 Subpart B disclaimer

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 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, Hangzhou BroadLink Technology Co., Ltd. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

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: 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.

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: 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 4: 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.

Note 5: 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.

IC WARNING

This device contains licence-exempt transmitter(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L' émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d' Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L' exploitation est autorisée aux deux conditions suivantes:

1. L' appareil ne doit pas produire de brouillage;
2. L' appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d' en compromettre le fonctionnement.

IC Radiation Exposure Statement:

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures. Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

This equipment complies with IC RSS-102 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.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

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

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

The final end product must be labeled in a visible area with the following " Contains IC: 31130-UAM056".