Shenzhen Uascent Technology Co., Ltd
Universal Ascent Holdings Limited

UAM087-Matter

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

Module Datasheet

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Customer Approval : _____ Company

_____ Title

_____ Signature

_____ Date

Revision History.

Version	Date	Revision Content	Draft	Approved
1.0	2024/04/25	New version	Bella	

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1 Overview.

1.1 Introduction.

UAM087 is a cost-effective WIFI+BLE module developed by Uascent Technology, supporting Bluetooth dual mode 5.2 and IEEE 802.11 b/g/n 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.

- Supports 20 MHz channel.
- Standard IEEE 802.11b/g/n.
- Support WiFi+Bluetooth 5.2.
- Support STBC.
- Built-in low-power 32-bit MCU speed up to 160MHz, can be used as an application processor.
- Support STA and AP and Direct working modes.
- Support BLE 1 Mbps.

1.3 Recommended Operating Rating.

Description		Min	Typ	Max	Unit
Ambient Temperature (TA)		-40	25	85	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 Mode			
I_{RF}	11b 11M	270	mA
I_{RF}	11g 54M	240	mA
I_{RF}	11n HT20 MCS7	230	mA
RX Mode			
I_{RF}	11b 11M	80	mA
I_{RF}	11g 54M	80	mA
I_{RF}	11n HT20 MCS7	80	mA

1.5 Low-power consumption

Parameter	Condition / Notes	Test time	Unit
DTIM 1 10	260	1 min	uA
DTIM 1 5	370	1 min	uA

1.6 ESD Specifications

Item	Description	Value	Unit
Human Body Mode (HBM)	Electrostatic Discharge Tolerance under Human Body Model	±2	KV
CDM	Electrostatic Discharge Tolerance under Charged Device Model	±0.5	KV

2 Module use 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 ≥ 500mA, and a suitable power supply IC packaging should be selected. When using LDO power, attention should be paid to the issue of thermal, and when using 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 ：BK7238
Operating Frequency	2.412～2.462GHz
Operating Voltage	3.0~3.6V
WIFI Standard	IEE 802.11b/g/n
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
Transmit Output Power	Wi-Fi: 802.11b@11Mbps 16±2dBm 802.11g@54Mbps 15±2dBm 802.11n@HT20 MCS7 14±2dBm
EVM	802.11b /11Mbps: EVM≦-10dB 802.11g /54Mbps: EVM≦-25dB 802.11n /HT20 MCS7: EVM≦-27dB
Receiver Sensitivity	802.11b@8% PER11Mbps≤ -88dBm

(HT20)	802.11g@10% PER 54Mbps≤-74dBm
	802.11n@10% PER MCS 7 ≤-71dBm
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 onboard antenna

4 Bluetooth Specification.

Features	Descriptions
Operating Frequency	2.402～2.480GHz
BLE version	5.1
Data rate	Typical : 1Mbps
Tx output power	20dBm(Max)
Rx sensitivity (PER 1500 packet data ≤ 30.8%)	-93dBm

5 Pin Descriptions.

5.1 Pin Outline.
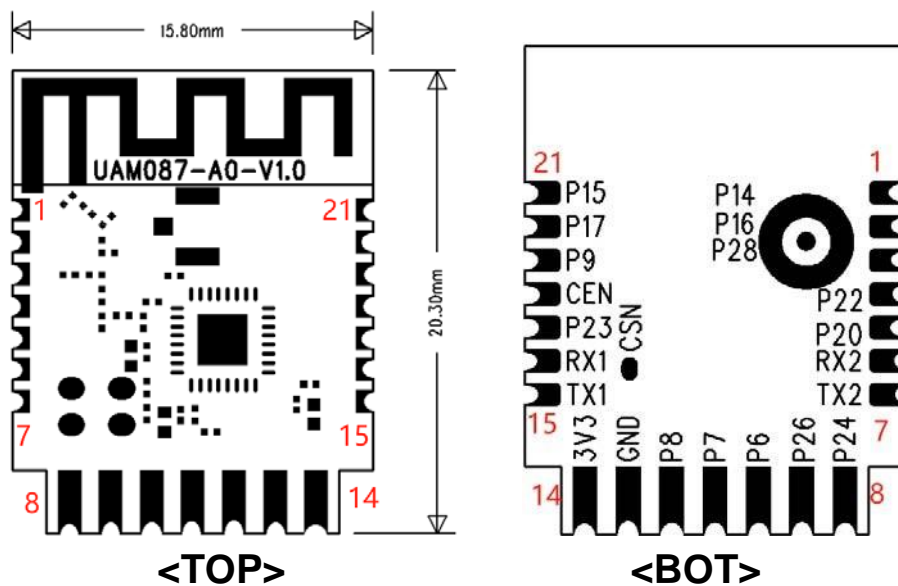
5.2 Pin Definition.

Pin No.	Name	Type	Description	Voltage
1	P14	I/O	GPIO14/SPI_SCK	
2	P16	I/O	GPIO16/SPI_MOSI	

3	P28	I/O	GPIO28/ADC4	
4	P22	I/O	GPIO22	
5	P20	I/O	GPIO20/ADC3	
6	RX2	I/O	GPIO1/UART_RX2/ADC5	
7	TX2	I/O	GPIO0/UART_TX2	
8	P24	I/O	GPIO24/PWM4/I2C_SCL/ADC2	
9	P26	I/O	GPIO26/PWM5/I2C_SDA/ADC1	
10	P6	I/O	GPIO6/CLK13M/PWM0/JTAG_TCK	
11	P07	I/O	GPIO7/PWM1/JTAG_TMS	
12	P8	I/O	GPIO8/PWM2/JTAG_TDI/CLK26M	
13	GND	P	Ground	
14	3V3	P	Supply 3.3V	3.3V
15	TX1	I/O	UART_TX1/GPIO11.Prohibit pull-up.The default state for MCU docking to the serial port needs to be configured as low level or high resistance state.	
16	RX1	I/O	UART_RX1/GPIO10.Prohibit pull-up.The default state for MCU docking to the serial port needs to be configured as low level or high resistance state.	
17	P23	I/O	GPIO23	
18	CEN	I/O	Reset pin	
19	P9	I/O	GPIO9/PWM3/JTAG_TDO	
20	P17	I/O	GPIO17/SPI_MISO/I2C_SDA	
21	P15	I/O	GPIO15/SPI_CSN/I2C_SCL	

※ P:POWER   I:INPUT   O:OUTPUT

6 Dimensions.

6.1 Module Picture.

L:20.30 x W:15.80 x H:2.7 (±0.2) unit=mm
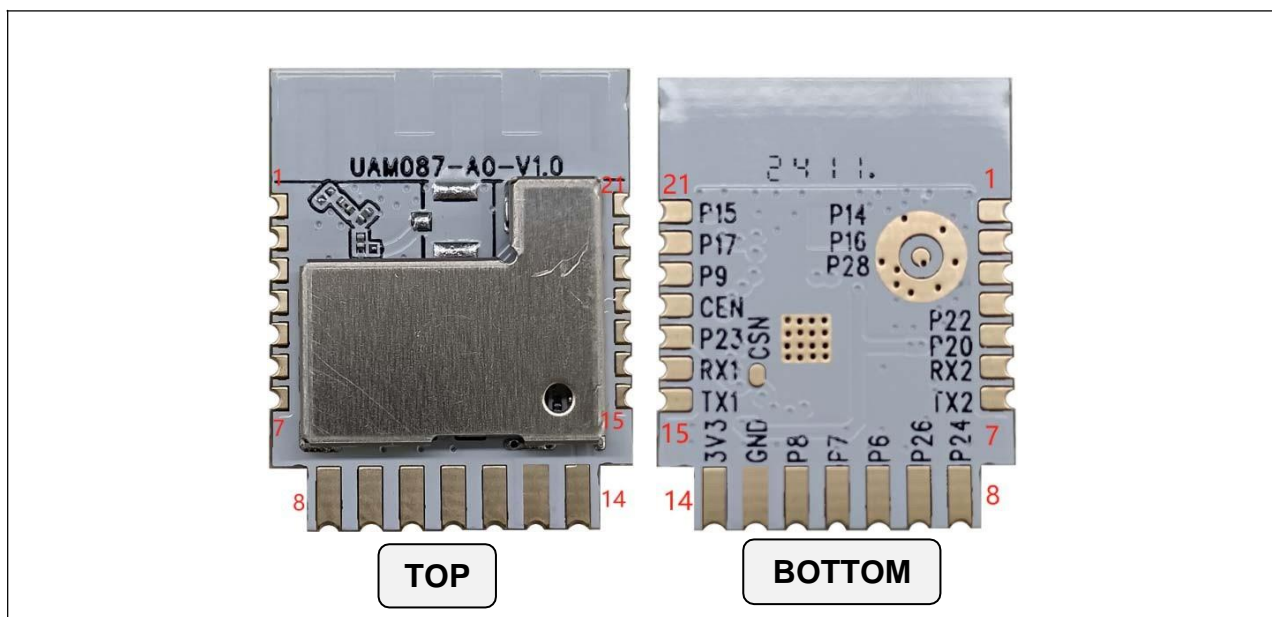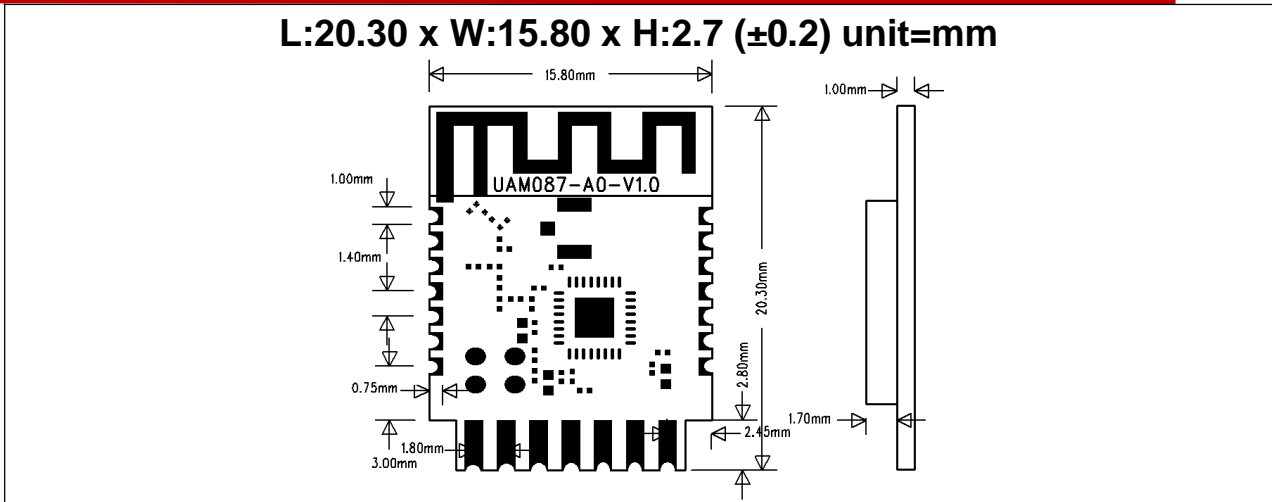
6.2 Module Mechanical Dimensions.

BOTTOM (unit=mm)
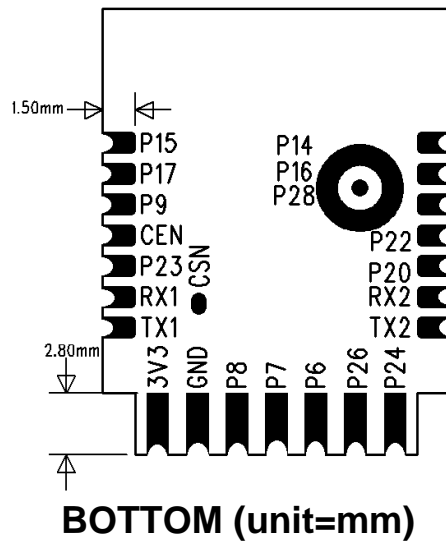
## 6.3 PCB Layout Reference.

(unit=mm)
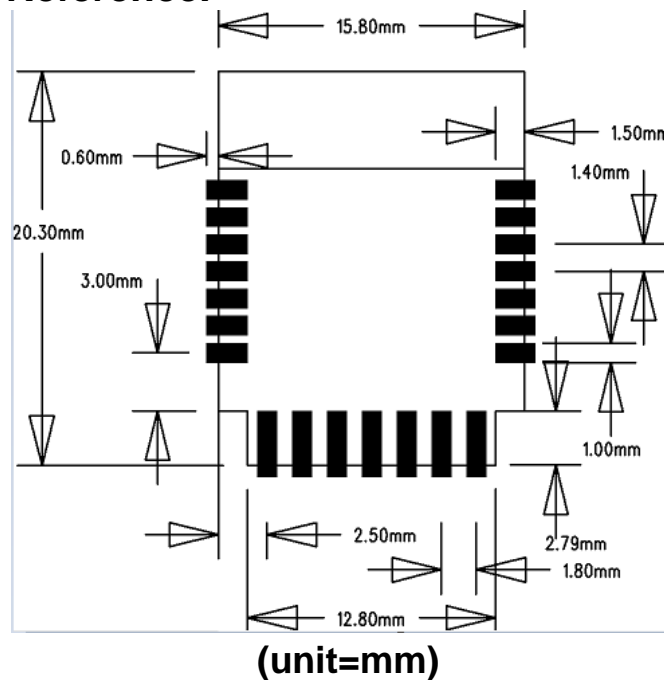
7 Antenna Information.

7.1 Antenna type.

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

7.2 Module layout considerations.

The UAM087-A0 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.
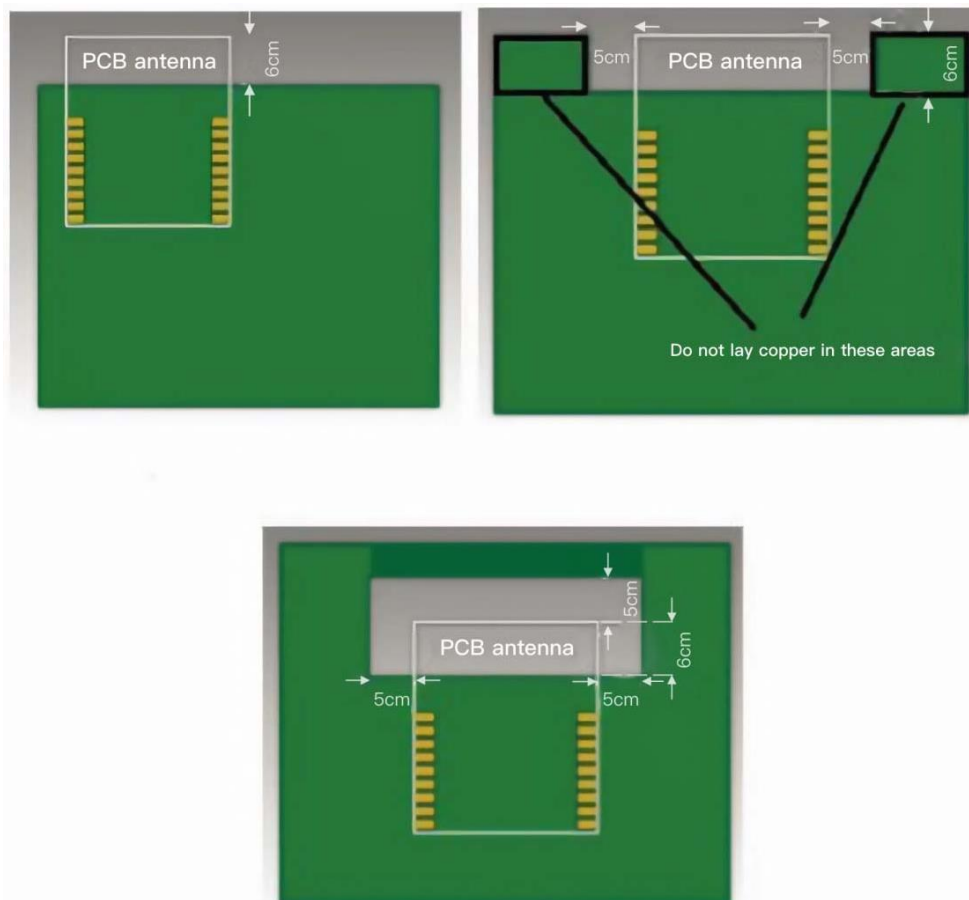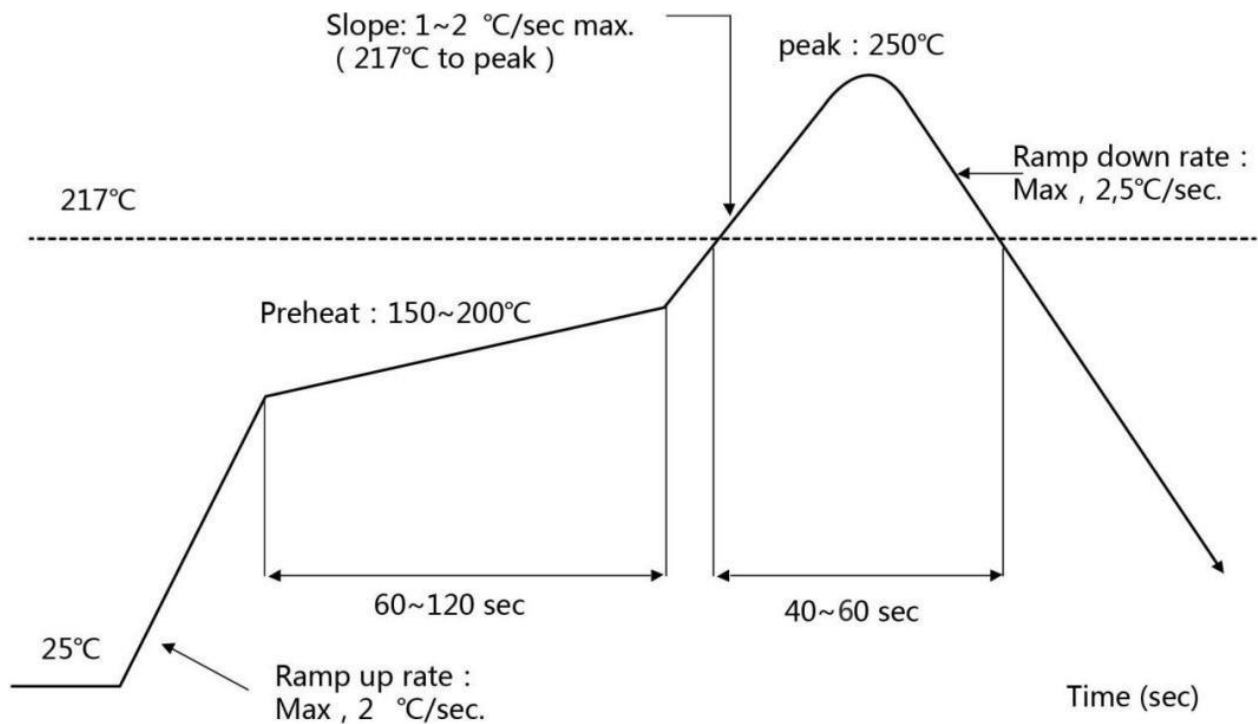
8 Environmental Requirements.

8.1 Recommended Reflow Profile.

Referred to IPC/JEDEC standard.
Peak Temperature : <250°C
Number of Times : ≤2 times

8.2 Note.

Note:Take and use the module, please insure 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 ℃ 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 ℃, 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 ℃, ≦ 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 ℃, 8 hours.

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

8.3 Humidity sensitive control.

CAUTION

This bag contains
MOISTUR-SENSITIVE DEICES

LEVEL

3

If blank, see adjacent
bar code label

1. Calculatied shelf life an sealed bag: 12 months at < 40℃ and <90% relative humidity(RH)

2. Peak package body temperature :_____260_____℃

3. After bag is opened ,devices that will be subjected to reflow solder of other high temperature process must
   a) Mounted within:_____168_____hrs. of factory confitions ≤30℃/60%RH, OR
   b) Stored at<10% RH

4. Devices require bake,before mounting, if:
   a) Humidity Indicator Care is > 10% when read at 23 ± 5℃
   b) 3a or 3b not met.

5. If baking is required , devices may be baked for 48 hrs. at 125 ± 5℃

   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

   bag Seal Date : _____

   Note : level and body temperature defined by IPC/JEDEC J-STD-020

9 Package.

9.1 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.

HUMIDITY INDICATOR
10% 20% 30% 40% 50% 60%
DANGER If PINK, CHANGE DESICCANT   Read at Lavender Between Pink & Blue

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.

10 Transport regulations.

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

11 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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12 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.

FCC Statements:

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: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

Important Note: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Federal Communications Commission of the U.S. Government (FCC) and the Canadian Government authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator shall be responsible for re-evaluating the end-product (including the transmitter) and obtaining a separate FCC authorization in the U.S. and Canada.
OEM Integrators – End Product Labeling Considerations: This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: " Contains, FCC ID: 2A68EJX-UAM087". The grantee's FCC ID can be used only when all FCC compliance requirements are met.
OEM Integrators – End Product Manual provided to the End User: The OEM integrator shall not provide information to the end user regarding how to install or remove this RF module in end product user manual. The end user manual must include all required regulatory information and warnings as outlined in this document.

2.2 List of applicable FCC rules
The device compliance with FCC Part 15.247

2.3 Summarize the specific operational use conditions
The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required for the installed module

2.4 Limited module procedures
Device is single module approval

2.5 Trace antenna designs
PCB onboard antenna, antenna gain is -1.3dBi the antenna size as below
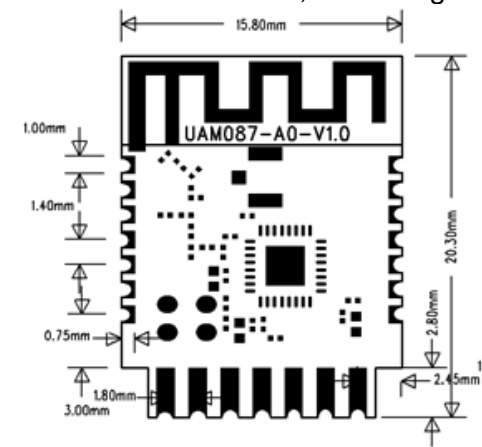
2.6 RF exposure considerations
Compliance with FCC Part 2.1091
This device is intended only for OEM integrators under the following conditions: 1.The antenna must be installed such that 20 cm is maintained between the antenna and users. 2. The transmitter module may not be co-located with any other transmitter or antenna. As long as the two conditions above are met, additional transmitter testing will not be required.

2.7 Antennas
PCB onboard antenna, antenna gain is -1.3dBi.

2.8 Label and compliance information
The label compliance with FCC requirement and the end product must be labeled in a visible area with the following: " Contains, FCC ID: 2A68EJX-UAM087"

2.9 Information on test modes and additional testing requirements
The module under Continuous transmit ion and lager than 98% duty cycle

2.10 Additional testing, Part 15 Subpart B disclaimer
The test results compliance with FCC Part 15B requirement.