# AC695X  module technical specifications V1.2

# Directory

## Document version

| Version | Date | Edit | Description | Remarks |
|---------|------|------|-------------|---------|
| 1.0 | 23-5-1 | Paul | first draft | |
| 1.1 | 23-5-25 | 谭甘荣 | Add picture information and at instructions | |
| 1.2 | 23-6-12 | 谭甘荣 | Add physical photos | |

# 1.    Introduction

AC695X module adopts Jerry Bluetooth BLE dual mode chip, built-in high-performance transceiver and powerful baseband processor, supporting classic Bluetooth (SPP/HID)+BLE applications. The built-in FLASH program memory is suitable for secondary development and better meets customer needs.

# 2.    Features

- Working voltage 1.8V to 4.5V

- Complies with Bluetooth V5.3 BLE core specifications

- Maximum transmission power 0dBm

- Integrated RISC 32 bit CPU with up to 96Mhz main frequency

- 256 KB/512KB FLASH and 72 KB data RAM

- Equipped with hardware interfaces such as SPI, UART, PWM, USB, IIC, MCPWM, ADC, etc

- Support for built-in charging function (up to 250mA)

## 3.    Appearance of finished products
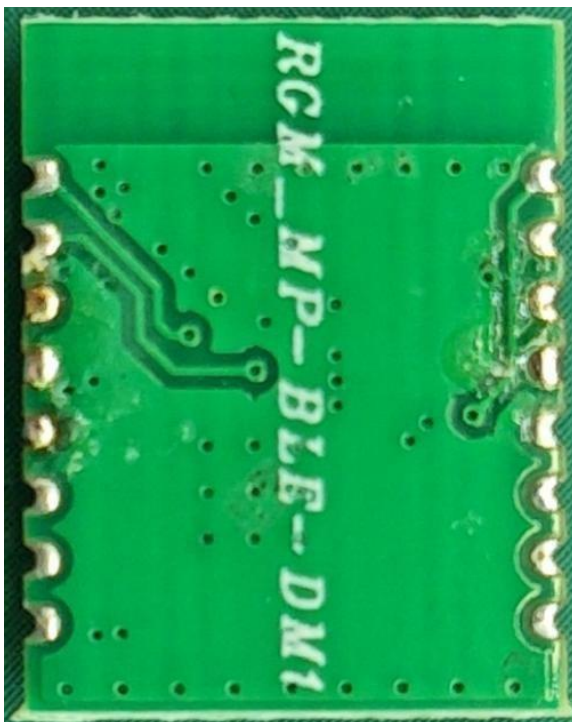
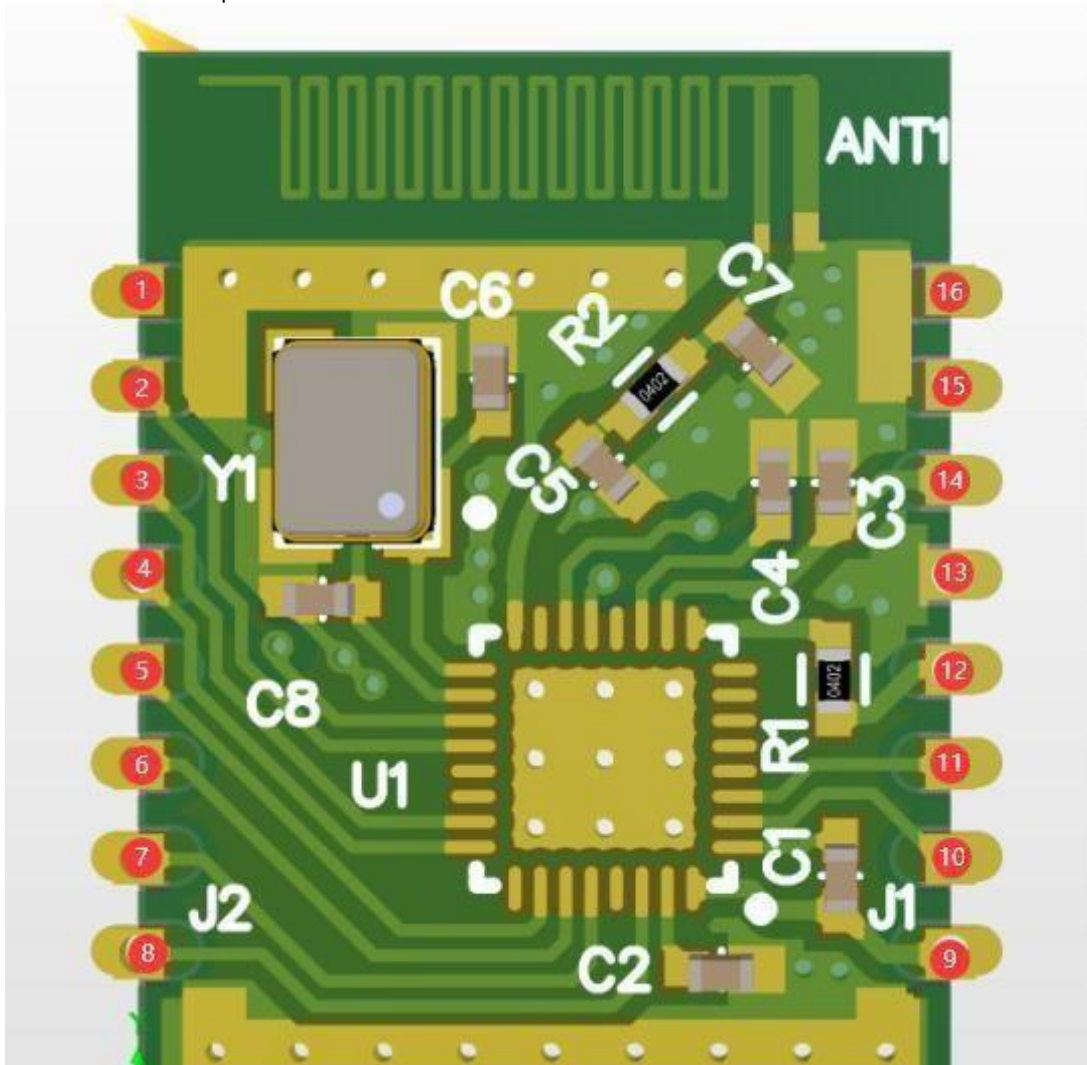



Explanation: This module is a customized and certifiedmodel from Dongguan Meipai Electronic Technology Co.,Ltd. It comes standard with a shielding cover and laserengraving certification number.
There are no other models.

## 4.    Package size
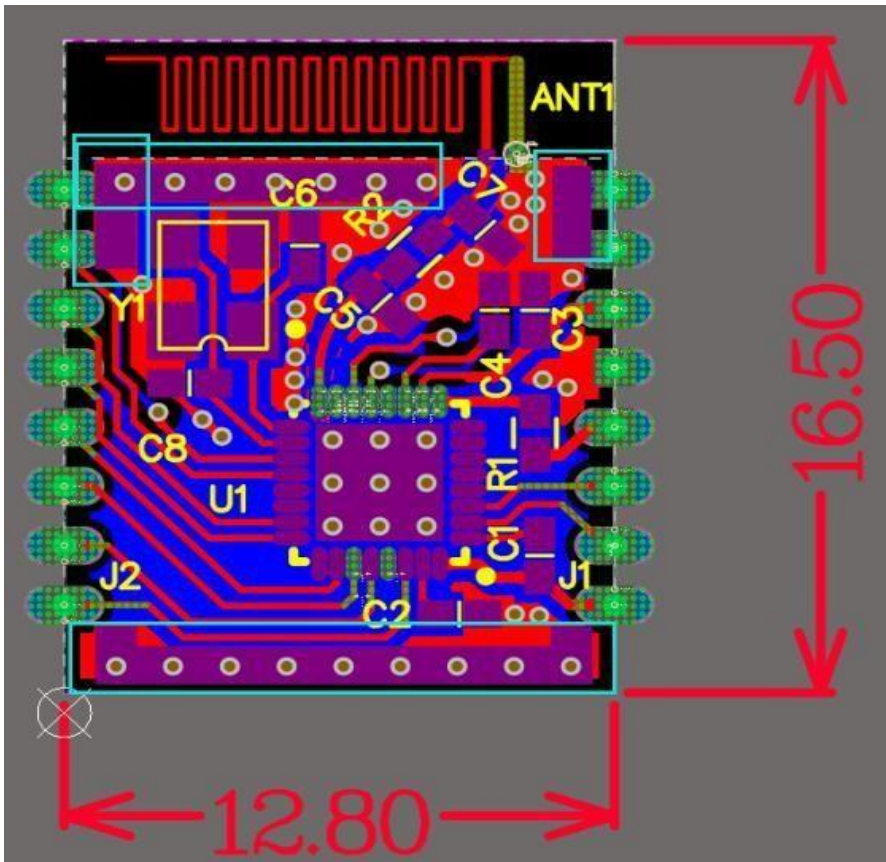
# 5.Pin Description



| Pin | hardware function | Pin | hardware function |
|---|---|---|---|
| 1 | BLE_RX：MIDI DIN Interface reception | 16 | PB1：reserve IO |
| 2 | BLE_TX：MIDI DIN Interface sending | 15 | PB2：LED Status output pin |
| 3 | USBDM：Firmware burning interface | 14 | VBAT：power supply IO |
| 4 | USBDP：Firmware burning interface | 13 | GND：Chip digital circuit grounding pin |
| 5 | PA9：reserve IO | 12 | VBT：Firmware burning interface |
| 6 | PA1：Audio Connection status pin, high level indicates connection status | 11 | DACR：Right channel DAC output pin |
| 7 | PA0：BLE Connection status pin, high level indicates connection status | 10 | DACL：Left channel DAC output pin |
| 8 | MIC：Keep MIC audio input delicious | 9 | AGND：Chip analog circuit grounding pin |

# 6. Electrical parameters

| Parameter | Description | Minimum value | Typical value | Maximum value | unit |
|---|---|---|---|---|---|
| VBAT | Supply voltage | 2.4 | 3.7 | 4.5 | V |
| LDOIN | Charging voltage | 4.5 | 5.0 | 5.5 | V |
| VDDIO | Voltage output input | 1.8 | 3.0 | 3.6 | V |
| BTAVDD | Voltage output | 1 | 1.3 | 1.4 | V |
| VOH | IO output high | 2.7 | _ | _ | V |
| VOL | IO output low | _ | _ | 0.33 | V |

# 7. RF parameters

| Parameter | Description | Minimum value | Typical value | Maximum value | unit |
|---|---|---|---|---|---|
| Operate frequency | frequency range | 2400 | - | 2480 | MHZ |
| RF transmit power | Transmitting power | | 0 | 0 | dBm |
| 20dB Bandwidth | Modulation bandwidth | | 950 | | Khz |
| Sensitivity | Receiving sensitivity | | -92 | | dBm |

# 8. Precautions

A. During the application process of the module, please pay attention to avoiding the influence of external interference sources such as lines on the module, and avoiding the formation of a series circuit between the module power supply circuit and the high-power circuit unit to improve the overall RF performance of the entire machine.

B.   Wireless signals, including Bluetooth applications, are greatly affected by the surrounding environment. Obstacles such as trees and metals can absorb wireless signals to a certain extent, thus affecting the distance of data transmission in practical applications.

C.   The Bluetooth module needs to be placed in a shell with the existing system. Due to the shielding effect of the metal shell on wireless RF signals, it is recommended not to install it in a metal shell.

D.   The antenna part of the Bluetooth module is a PCB antenna. Due to metal weakening the function of the antenna, it is strictly prohibited to lay or route wires under the module antenna when laying the board. It would be better if it could be hollowed out
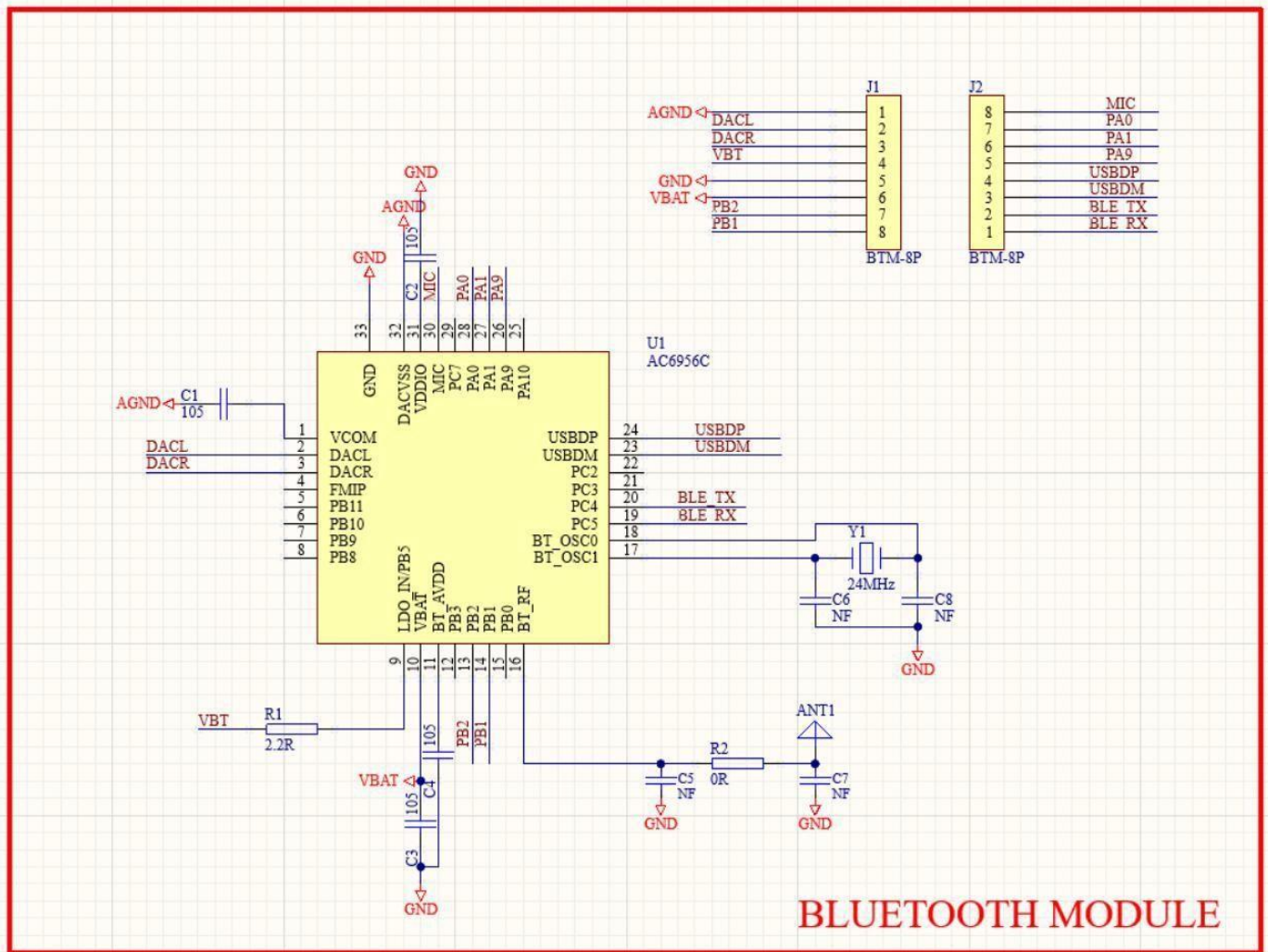
# 9. Recommended reflux temperature
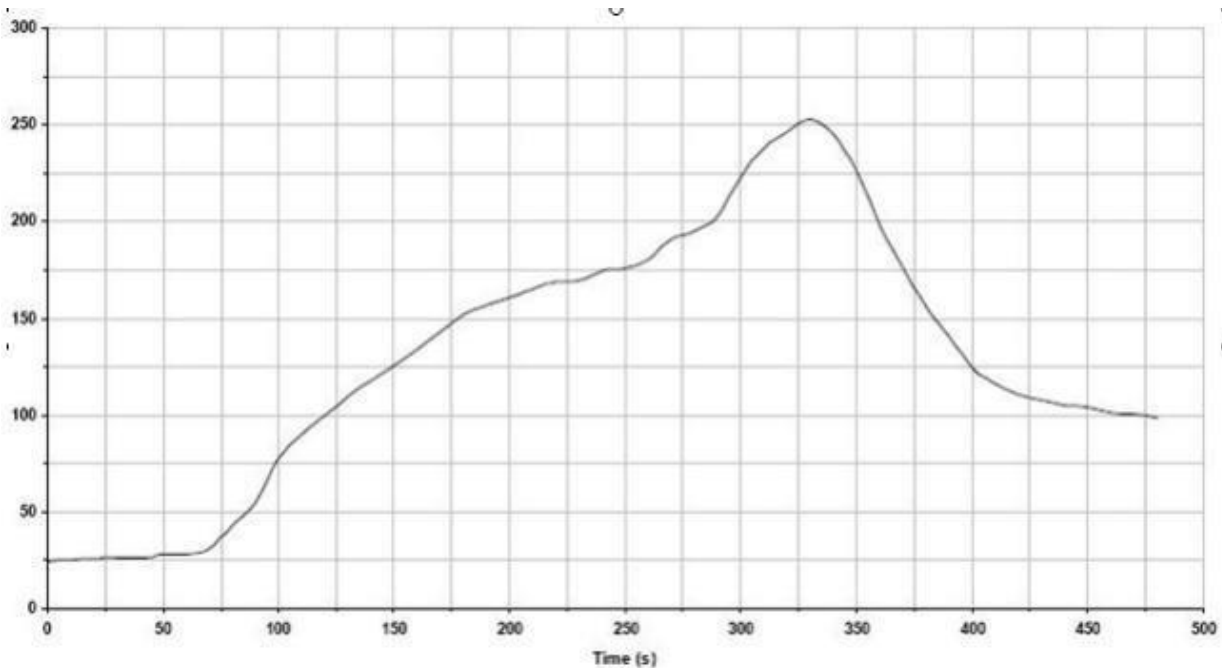


Key features of the profile:
- Initial Ramp=1-2.5℃/sec to 175℃    equilibrium
- Equilibrium time=60 to 80 seconds
- Ramp to Maximum temperature (250℃)=3℃/sec Max
- Time above liquidus temperature(217℃): 45 - 90 seconds
- Device absolute maximum reflow temperature: 250℃

# 10. Schematic diagram



BLUETOOTH MODULE

## 11.  AT instruction description:

Functional Overview:

This module is a standard blue string communication module suitable for blue string communication applications, with a transmission distance of about 20m

AT commands query, set MAC address, Baud, Device Name, etc., and support saving after power failure. Basic characteristics:

1. The default DeviceName is: XHG_ BLE;

2. The theoretical maximum transmission rate is 10KB/s, and the specific transmission rate difference varies depending on the phone connection interval and Bluetooth version;

3. The broadcast data, broadcast interval, and recovery settings can be set through AT commands;

4. Serial port TX: PB4; RX: PB5; The default Baud is 115200

5. In connection mode, PA7 can be pulled down for 200ms to achieve disconnection;

6. The connecting indicator light can be connected through PA2 (connected as high, disconnected as low);

7. Enable    FFE0    service    UUID:

FFE1 feature value attribute READ | NOTIFY.

FFE2 eigenvalue attribute WRITE | WRITE_ WithOUT_ RESPONSE

## AT instruction list:

## Note: All AT instructions must end r n;

| AT instruct | Correct response | Error response | notes |
|---|---|---|---|
| AT+OK? | OK | No response or ERR:1 | Test Command |
| AT+REST | OK<br>Output after successful reset:<br>IM_READY | ERR:1 | Reset Bluetooth chip |
| AT+ERASEUSER | OK | ERR:1 | Factory reset |

| AT+GVER? | VERSION<br>OK | ERR:1 | Obtain version number |
|---|---|---|---|
| AT+NAME? | +NAME:name<br><br>OK | ERR:1 | Obtain Bluetooth broadcast name |
| AT+LBDADDR? | +LBDADDR:address<br>OK | ERR:1 | Obtain Bluetooth address |
| AT+BAUD? | +BAUD:BAUD<br>OK | ERR:1 | Get Baud |
| AT+ADV? | +ADV:1 或者 0<br><br>OK | ERR:1 | Obtain whether it is broadcasting |
| AT+ADVPARAM? | +ADVPARAM:Broadcast interval parameters<br><br>OK | ERR:1 | Obtain broadcast interval time=parameter*0.625ms |
| AT+ADVDATA? | +ADVDATA:broadcast data | ERR:1 | Obtain broadcast data |

| | OK | | |
|---|---|---|---|
| AT+SRDATA? | +SRDATA:Scan reply data<br><br>OK | ERR:1 | Obtaining Scan Reply Data |
| AT+NAME=[name]<br>Example：AT+NAME=ble | OK | ERR:1 | Set Bluetooth name to support power down saving<br><br>The example Bluetooth name is' ble ' |
| AT+LBDADDR=地址Example：<br><br>AT+LBDADDR=112233445566 | OK | ERR:1 | Set Bluetooth address to support power down saving<br><br>The example Bluetooth address is:66 55 44 33 22<br>11 |
| AT+BAUD=[baud]<br>Example：AT+BAUD=[9600] | OK | ERR:1 | To set the Baud, the following Baud is supported: 9600, 19200, 38400, 57600, 115200, 128000, 256000, 460800, 921600, 1000000<br>Supports power down saving |
| AT+ADV=[data]<br>Example：关闭广播AT+ADV=[0] | OK | ERR:1 | Set whether to broadcast or not<br><br>0: Stop broadcasting; 1: Turn on broadcast |
| AT+ADVPARAM=[adv_interval]<br>Example：<br>AT+ADVPARAM=[160] | OK | ERR:1 | Set broadcast interval: broadcast time<br><br>=ADV_ Interval * 0.625ms, example broadcast time is:<br><br>160 * 0.625ms=100ms |
| AT+ADVDATA=[data] Example：<br>AT+ADVDATA=[020106030200fc] | OK | ERR:1 | Set ADV broadcast data<br><br>It needs to be set according to the List of Bluetooth profiles, otherwise the APP will display<br><br>Abnormal display |
| AT+SRDATA=[data]<br>Example：<br>AT+SRDATA=[0409303132] | OK | ERR:1 | Set Scan Reply Data<br><br>It needs to be set according to the List of Bluetooth profiles, otherwise the APP will display<br><br>Abnormal display |
| AT+DISC=[cid]<br>Example：AT+DISC=[8] | OK<br>IM_DISC:8 | ERR:1 | Set Bluetooth disconnection<br><br>Cid default 8 |
| AT>[cid]<br>Example：AT>[8] | OK | ERR:1 | Setting mode<br><br>Cid, the channel number that needs to be operated on<br><br>9: In AT Command pattern<br><br>8: For transparent mode |

## System response instructions：

1. Chip power on initialization completed: IM_ READY
2. Bluetooth connection successful and notify enabled: IM_ CONN: 8
3. Bluetooth disconnection: IM_ DISC: 8

NOTE: 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.

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.

This device complies with FCC radiation exposure limits set forth for an uncontrolledenvironment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

CAUTION: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.

2. This module is limited to installation in fixed applications, according to Part 2.1091(b).

3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s).

The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

End Product Labeling

When the module is installed in the host device, the FCC/IC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2AXTO-AC695X"

The FCC ID can be used only when all FCC compliance requirements are met.