

# Module W708 Product Specification

| Version | Issue date | Changes                                                  | Remark |
|---------|------------|----------------------------------------------------------|--------|
| 0.1     | 2015/9/04  | Initial Version                                          |        |
| 0.2     | 2015/10/22 | Update GPIO sharing scheme                               |        |
| 0.3     | 2015/11/30 | Update package information. Correct PERST_N              |        |
| 0.4     | 2015/12/1  | Update industrial and commercial grade information       |        |
| 0.5     | 2016/10/15 | GPIO : Link2 change to UART_TXD2                         |        |
| 0.6     | 2017/5/18  | Update FCC approval information, Correct GPIO 27, 28, 29 |        |

## IMPORTANT

This document contains important Information and therefore should not be disclosed to third parties without prior written consent of amazipoint technology Ltd.

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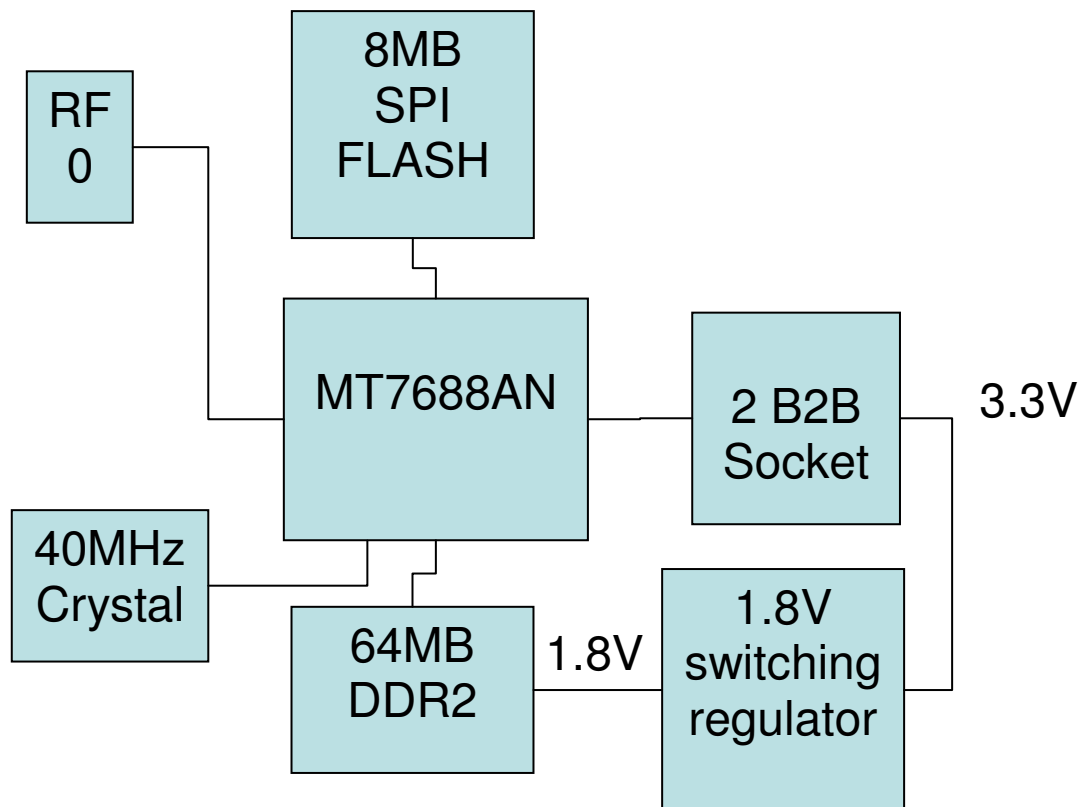
Signature:

|           |              |              |          |
|-----------|--------------|--------------|----------|
| Author:   | Reviewed by: | Approved by: | Remarks: |
| Martin Ho |              |              |          |

## 1. Introduction

W708 module is designed for easy-design-in low cost Wifi application。 It has WAN, LAN, UART, I2C, SPI, I2S, SDXC and GPIO interfaces. Support 1T1R 150N operation. 3.3V single power supply.

There are industrial grade and commercial grade two different configuration. For industrial grade, we use industrial grade DDR2 memory. component. For commercial grade, we use commercial grade DDR2 memory. component.



## 2. Technical specification

### a. Channel Plan

| country code | region        | channel  |
|--------------|---------------|----------|
| 0            | North America | CH1 ~ 11 |
| 1            | Others        | CH1 ~ 13 |
| 5            | Japan         | CH1 ~ 14 |
| 6            |               | CH3 ~ 9  |
| 7            |               | CH5 ~ 13 |

Note : The country code is configured before shipping and can not be changed by user.

## b. Specification Table

| Items                           |                 | Specification                                                                                                     |                    |       |                |       |
|---------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------|--------------------|-------|----------------|-------|
| Supported Standard and Protocol |                 | IEEE 802.11n, IEEE 802.11g, IEEE 802.11b, IEEE 802.3, IEEE 802.3u, CSMA/CA, CSMA/CD,TCP/IP,DHCP, ICMP, NAT, PPPoE |                    |       |                |       |
| Dimension                       |                 | 35*25 mm                                                                                                          |                    |       |                |       |
| Power consumption               |                 | < 250mA, 180mA typical                                                                                            |                    |       |                |       |
| Operating Temperature Range     |                 | -30 ~ 80 deg. C ( for commercial grade )<br>-40 ~ +85 deg. C ( for industrial grade )                             |                    |       |                |       |
| Storage Temperature Range       |                 | -40 ~ 90 deg. C                                                                                                   |                    |       |                |       |
| Humidity                        |                 | < 90%                                                                                                             |                    |       |                |       |
|                                 | WAN Port        | one 10/100M adaptive RJ45 port                                                                                    |                    |       |                |       |
|                                 | LAN Port        | one 10/100M adaptive RJ45 port                                                                                    |                    |       |                |       |
| RF Parameters                   | Frequency Range | 2.412~2.4835GHz, depends on country code, maybe 2.412~2462 or 2.412~2.472GHz                                      |                    |       |                |       |
|                                 | Baud Rate       | 1T1R :                                                                                                            |                    |       |                |       |
|                                 |                 | MCS<br>index                                                                                                      | Data rate (Mbit/s) |       |                |       |
|                                 |                 |                                                                                                                   | 20 MHz channel     |       | 40 MHz channel |       |
|                                 |                 |                                                                                                                   | 800ns              | 400ns | 800ns          | 400ns |
|                                 |                 | 0                                                                                                                 | 6.5                | 7.2   | 13.5           | 15    |
|                                 |                 | 1                                                                                                                 | 13                 | 14.4  | 27             | 30    |
|                                 |                 | 2                                                                                                                 | 19.5               | 21.7  | 40.5           | 45    |
|                                 |                 | 3                                                                                                                 | 26                 | 28.9  | 54             | 60    |
|                                 |                 | 4                                                                                                                 | 39                 | 43.3  | 81             | 90    |
|                                 |                 | 5                                                                                                                 | 52                 | 57.8  | 108            | 120   |
|                                 |                 | 6                                                                                                                 | 58.5               | 65    | 121.5          | 135   |
|                                 |                 | 7                                                                                                                 | 65                 | 72.2  | 135            | 150   |
|                                 |                 | IEEE 802.11g : 54/48/36/24/18/12/9/6(adaptive )                                                                   |                    |       |                |       |
|                                 |                 | IEEE 802.11b : 11/5.5/2/1M(adaptive )                                                                             |                    |       |                |       |

|                     |                   |                                                                                                                                                                                           |
|---------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Number of Channel | Support channel 1 ~14, actual channel numbers depends on setting of country code                                                                                                          |
|                     | Modulation Scheme | DBPSK 、DQPSK 、CCK and OFDM(BPSK/QPSK/16-QAM/64-QAM)                                                                                                                                       |
|                     | Sensitivity @ PER | 150M : -68dBm@10% PER ; 130M : -68dBm@10% PER ;<br>108M : -68dBm@10% PER ; 54M : -72dBm@10% PER<br>11M : -85dBm@8% PER ; 6M : -88dBm@10% PER<br>1M : -90dBm@8% PER ;                      |
|                     | Output Power      | 802.11b: 16 dBm $\pm$ 1.5dBm@11Mbps (1T1R total power)<br>802.11g: 14.5 dBm $\pm$ 1.5dBm@54Mbps<br>802.11n HT20: 14.5 dBm $\pm$ 1.5dBm @MCS7<br>802.11n HT40: 14.5 dBm $\pm$ 1.5dBm @MCS7 |
|                     | Antenna           | One IPEX I connectors for one external antenna( 1T1R)                                                                                                                                     |
| WIFI Operation Mode |                   | Client/AP                                                                                                                                                                                 |
| System Service      |                   | Virtual Server : Internal web server for browser to access                                                                                                                                |
| Device Management   |                   | Area setting<br>Restore to default factory setting<br>Software upgrade<br>Reboot<br>Change password                                                                                       |
| WLAN Security Mode  |                   | OPENWEP<br>SHAREDWEP<br>WEPAUTO<br>WPA<br>WPA-PSK<br>WPA2<br>WPA2-PSK<br>WPAPSKWPA2PSK<br>WPA1WPA2(WPA and WPA2 hybrid mode)                                                              |

802.1x

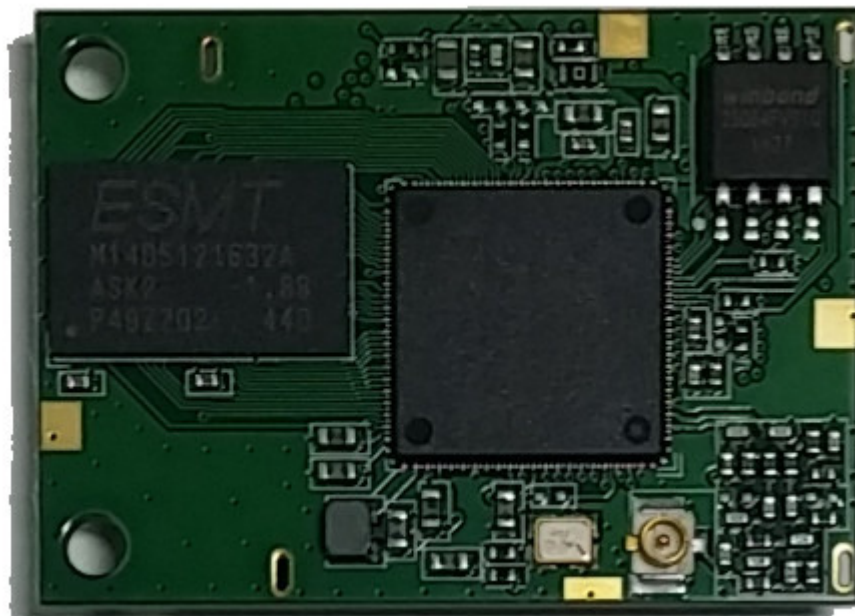
### 3. Software features

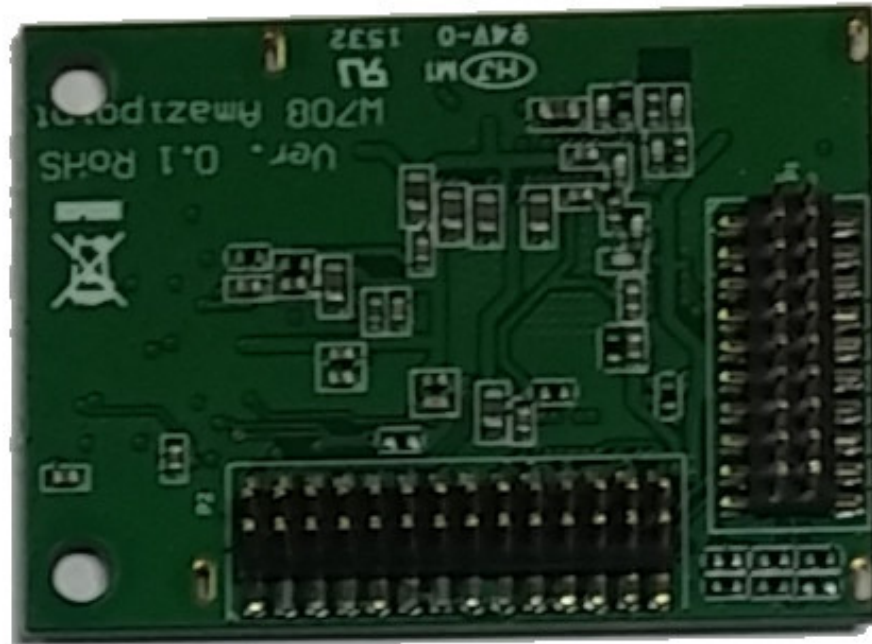
- Support WPS
- Support AP ( Access point ) 、 Client ( Wifi Station) mode
- **AP mode**
  - Default operation mode. In this mode, the module work as an Access Point, don't need any configuration.
  - User can use PC via RJ45 or smart phone via Wifi to login AP mode and change the default configuration ( through browser).
- **Client mode**
  - In this mode, module is a Wifi station.

### 4. Development tool :

We provide development tool for easy connection of power, RS-232, LAN, WAN, and USB port.

### 5. Module Dimension : 35\*25 mm

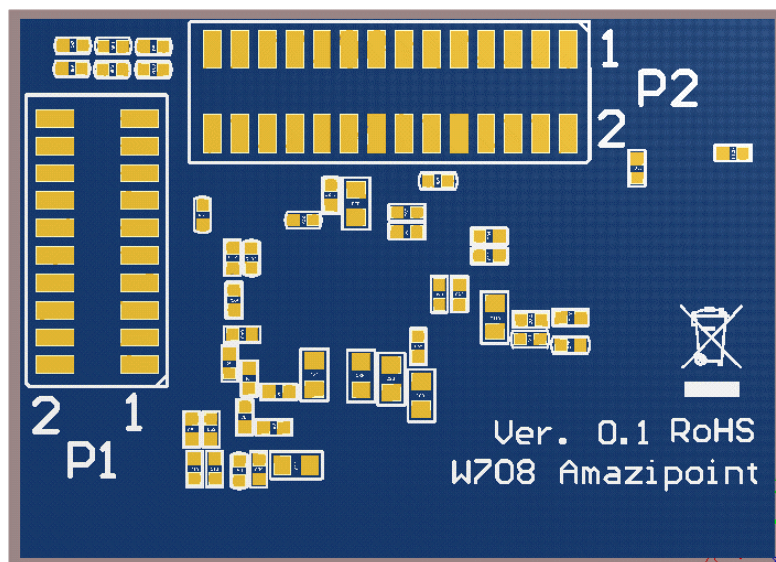




There are two 1.27mm pitch header on the bottom side of module P1 and P2.

## 6. Pin Assignment

Bottom view for showing P1, P2 and pin 1/pin 2 position on bottom side of W708 module :



P1 :

| Multi 1 | Multi 2 | GPIO   | Main      |           |           | Main     | GPIO   | Multi 2 | Multi 1 |
|---------|---------|--------|-----------|-----------|-----------|----------|--------|---------|---------|
|         |         | GPIO23 | SD_CDT    | <b>1</b>  | <b>2</b>  | SD_CMD   | GPIO27 |         |         |
|         |         | GPIO25 | SD_D0     | <b>3</b>  | <b>4</b>  | SD_D3    | GPIO28 |         |         |
|         |         | GPIO24 | SD_D1     | <b>5</b>  | <b>6</b>  | SD_D2    | GPIO29 |         |         |
|         |         | GPIO22 | SD_WP     | <b>7</b>  | <b>8</b>  | SD_CLK   | GPIO26 |         |         |
|         |         | GPIO37 | REF_CLKO  | <b>9</b>  | <b>10</b> | POR      |        |         |         |
|         |         | GPIO39 | LINK4     | <b>11</b> | <b>12</b> | GPIO0    | GPIO11 | REFCLK  |         |
|         |         | GPIO40 | LINK3     | <b>13</b> | <b>14</b> | SPI_MISO | GPIO9  |         |         |
|         |         | GPIO6  | SPI_CS1   | <b>15</b> | <b>16</b> | TXD0     | GPIO12 |         |         |
|         |         | GPIO7  | SPI_CLK   | <b>17</b> | <b>18</b> | RXD0     | GPIO13 |         |         |
|         |         | GPIO20 | URAT_TXD2 | <b>19</b> | <b>20</b> | SPI_MOSI | GPIO8  |         |         |

**P2 :**

| Multi 1 | Multi 2 | GPIO   | Main      |           |           | Main      | GPIO   | Multi 2 | Multi 1 |
|---------|---------|--------|-----------|-----------|-----------|-----------|--------|---------|---------|
|         |         | GPIO4  | I2C_SCLK  | <b>1</b>  | <b>2</b>  | I2C_SD    | GPIO5  |         |         |
|         |         |        | TXO1_P    | <b>3</b>  | <b>4</b>  | RXI0_P    |        |         |         |
|         |         |        | TXO1_N    | <b>5</b>  | <b>6</b>  | RXI0_N    |        |         |         |
|         |         | GPIO2  | I2S_WS    | <b>7</b>  | <b>8</b>  | LINK0     | GPIO43 |         |         |
|         |         | GPIO36 | PERST_N   | <b>9</b>  | <b>10</b> | GND       |        |         |         |
| PWM_CH1 |         | GPIO46 | RXD1      | <b>11</b> | <b>12</b> | USB_P     |        |         |         |
|         |         | GPIO38 | WDT_RST_N | <b>13</b> | <b>14</b> | USB_N     |        |         |         |
|         |         |        | 3.3VD     | <b>15</b> | <b>16</b> | GND       |        |         |         |
|         |         |        | 3.3VD     | <b>17</b> | <b>18</b> | TXO0_P    |        |         |         |
|         |         | GPIO1  | I2S_DO    | <b>19</b> | <b>20</b> | TXO0_N    |        |         |         |
| PWM_CH0 |         | GPIO45 | TXD1      | <b>21</b> | <b>22</b> | RXI1_N    |        |         |         |
|         |         | GPIO0  | I2S_DI    | <b>23</b> | <b>24</b> | RXI1_P    |        |         |         |
|         |         | GPIO42 | LINK1     | <b>25</b> | <b>26</b> | I2S_CLK   | GPIO3  |         |         |
|         |         | GPO44  | WLAN_LED  | <b>27</b> | <b>28</b> | UART_RXD2 | GPIO21 |         |         |

**P1 :**

| Pin # | Function | Direction | Description      |
|-------|----------|-----------|------------------|
| 1     | SD_CDT   | In        | SDXC Card Detect |
| 2     | SD_CMD   | Out       | SDXC Command     |
| 3     | SD_D0    | In/Out    | SDXC Data0       |
| 4     | SD_D3    | In/Out    | SDXC Data3       |

|    |          |        |                                  |
|----|----------|--------|----------------------------------|
| 5  | SD_D1    | In/Out | SDXC Data1                       |
| 6  | SD_D2    | In/Out | SDXC Data2                       |
| 7  | SD_WP    | In     | SDXC Write Protect               |
| 8  | SD_CLK   | Out    | SDXC Clock                       |
| 9  | REF_CLKO | Out    | Reference clock output           |
| 10 | POR      | In     | Power on reset input, low active |
| 11 | LINK4    | Out    | Link LED for port 4              |
| 12 | GPIO0    | Out    | GPIO0 or WPS push button         |
| 13 | LINK3    | In/Out | Link LED for port 3              |
| 14 | SPI_MISO | In     | SPI MISO signal                  |
| 15 | SPI_CS1  | Out    | SPI chip select signal 1         |
| 16 | TXD0     | A      | Console UART TXD signal          |
| 17 | SPI_CLK  | Out    | SPI clock output                 |
| 18 | RXD0     | A      | Console UART RXD signal          |
| 19 | LINK2    | Out    | Link LED for port 2              |
| 20 | SPI_MOSI | Out    | SPI MOSI signal                  |

## P2 :

| Pin # | Function  | Direction | Description            |
|-------|-----------|-----------|------------------------|
| 1     | I2C_SCLK  | In/Out    | I2C Clock signal       |
| 2     | I2C_SD    | In/Out    | I2C Data signal        |
| 3     | TXO1_P    | A         | Tx positive for port 1 |
| 4     | RXI0_P    | A         | Rx positive for port 0 |
| 5     | TXO1_N    | A         | Tx negative for port 1 |
| 6     | RXI0_N    | A         | Rx negative for port 0 |
| 7     | I2S_WS    |           | I2S word select        |
| 8     | LINK0     | Out       | Link LED for port 0    |
| 9     | PERST_N   |           | PCIe device reset      |
| 10    | GND       |           | Power ground           |
| 11    | RXD1      |           | UART1 RXD signal       |
| 12    | USB_P     | In/Out    | USB signal poistive    |
| 13    | WDT_RST_N | Out       | Watchdog reset         |
| 14    | USB_N     | In/Out    | USB signal negative    |
| 15    | 3.3VD     | Power In  | 3.3V input             |
| 16    | GND       |           | Power ground           |

|    |           |          |                             |
|----|-----------|----------|-----------------------------|
| 17 | 3.3VD     | Power In | 3.3V input                  |
| 18 | TXO0_P    | A        | Tx positive for port 0      |
| 19 | I2S_DO    | out      | I2S data out                |
| 20 | TXO0_N    | A        | Tx negative for port 0      |
| 21 | TXD1      | Out      | UART1 TXD                   |
| 22 | RXI1_N    | A        | Rx negative for port 1      |
| 23 | I2S_DI    | In       | I2S data in                 |
| 24 | RXI1_P    | A        | Rx positive for port 1      |
| 25 | LINK1     | Out      | Link LED for port 1         |
| 26 | I2S_CLK   | out      | I2S clock signal            |
| 27 | WLAN_LED  | Out      | WLAN LED output, active low |
| 28 | UART_RXD2 | In       | UART2 RXD                   |

## 7. Memory configuration

Depending on customer's request, the module can be shipped with following configuration :

Flash size : 2MB, 4MB, 8MB, 16MB, 32MB, 64MB

DDR2 size : 64MB, 128MB

## 8. Mechanical Application Notes

1. CON0 is IPEX1 connectors on top side
2. P1 is 2\*10 pins 1.27mm male header on bottom side for signals
3. P2 is 2\*14 pins 1.27mm male header on bottom side for signals
4. Footprint of P1, P2 is as following :



W708 is packaged with stacked PS tray :

- Tray size : for each element, the size is 45\*35\*12 mm, there are 8\*8 elements for each tray. There are 25 trays in each carton. So, total 1600 pieces maximum for each carton.



- Carton size : 500 x 400 x 300 mm
- Carton Label ( packing list ) :

**Amazipoint Tech. Ltd.**

2F, No. 113, Zhongyang Rd., Xindian Dist.,  
New Taipei City, Taiwan(R.O.C)  
Phone: +886-2-82191011  
Fax: +886-2-82191011

## Packing List

DATE: 2015/11/30  
Q.O. # SO-2015-11001

Customer

XXXXXXXXXXXXXXXX

YYYYYY

ZZZZZ

PO # : XXXXXXXX

| REQUISITIONER | SHIP VIA | F.O.B. | SHIPPING TERMS |
|---------------|----------|--------|----------------|
|               |          |        |                |

| ITEM #    | DESCRIPTION                                | QTY | UNIT PRICE(USD) | TOTAL |
|-----------|--------------------------------------------|-----|-----------------|-------|
| W708-8-64 | MT7688 module with 8MB flash,<br>64MB DDR2 |     |                 |       |
|           |                                            |     |                 |       |

## 10. Ordering Information

The part number for placing order is W708-MM-NN-G.

- MM is bytes of SPI flash and NN is bytes for DDR2.
- G : C for commercial grade or I for industrial grade.
- For example with the standard memory configuration 8MB Flash, 64MB DDR2 and commercial grade, the part number is W708-8-64-I.

## 11. FCC Warning Statement

### FEDERAL COMMUNICATIONS COMMISSION REGULATIONS

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.

### 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.

### FCC RF Radiation Exposure Statement

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

### Important Note

In the event that these conditions can not be example certain laptop configurations or collocation with another transmitter, then the FCC authorization is no longer considered valid the FCC ID can not be used on the final product. In these circumstances, OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

### End Product Labeling

This transmitter module is authorized only for use in device where antenna may be installed such that 2.5 cm may be maintained between antenna and users (for example access points, routers, wireless ADSL and similar equipment). The final end product must be labeled in a area with the following: “ Contains FCC ID: 2ALWN-W708”.

### Manual Information for End Users

The end user must not have manual instructions to remove or install device. The user manual for end users must include the following information in a prominent

location:

“IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located operating in conjunction with any other antenna or transmitter.” as a result of e-mail transmission.”