# ANTENNA REQUIREMENT

## 1. Standard Applicable

For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section §15.247 (b) if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the gain of the antenna exceeds 6dBi.

## 2. Antenna Connected Construction

Antenna used in this product is Chip type ( PCB antenna) gain of 0.8 dBi

## RF Exposure Evaluation

§FCC 1.1310 The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz) | Electric Field Strength(V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm2) | Average Time |
|---|---|---|---|---|
| (A) Limits for Occupational /Control Exposures | | | | |
| 300 - 1500 | -- | -- | F/300 | 6 |
| 1500-100000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/Uncontrol Exposures | | | | |
| 300 - 1500 | -- | -- | F/1500 | 6 |
| 1500-100000 | -- | -- | 1 | 30 |

### Friis transmission formula: Pd = (Pout*G)/(4*pi*R2)

Where Pd = power density in mW/cm2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
R = distance between observation point and center of the radiator in cm

Pd the limit of MPE, 1 mW/cm2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

### EUT Operating Condition

A software provided by client enabled the EUT to transmit and receive data at low, middle and high channel individually.

## Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data
Test Mode : Normal Operation

**Output Power into Antenna & RF Exposure Evaluation Distance**

| Channel | Channel Frequency (MHz) | Output Peak Power to Antenna (dBm) | Antenna Gain (dBi) | Power Density at 20cm (mW/cm2) | LIMITS (mW/cm2) |
|---|---|---|---|---|---|
| Low | 2402 | 2.93 | 0.8 | **0.000469** | **1** |
| Middle | 2441 | 4.37 | 0.8 | **0.000654** | |
| High | 2480 | 6.03 | 0.8 | **0.000958** | |

**NOTE :**

The power density Pd (4th column) at a distance of 20cm calculated from the friis transmission formula is far below the limit of 1 mW/ $cm^2$.