# RF EXPOSURE EVALUATION

## EUT Specification

| | |
|---|---|
| **EUT** | Ambi Climate |
| **Frequency band (Operating)** | ☒WLAN: 2.412GHz ~ 2.462GHz<br>☐WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz<br>☐WLAN: 5.745GHz ~ 5.825GHz<br>☒Others(Bluetooth: 2.402GHz ~ 2.480GHz) |
| **Device category** | ☐Portable (<20cm separation)<br>☒Mobile (>20cm separation)<br>☐Others ___ |
| **Antenna diversity** | ☐Single antenna<br>☒Multiple antennas<br>☐Tx diversity<br>☐Rx diversity<br>☐Tx/Rx diversity |
| **Max. output power** | 5.07dBm(3.21mW)<br>4.61dBm (2.89mW) |
| **Antenna gain** | 2dBi for BLE(declared by manufacturer)<br>3.8dBi for WLAN |
| **Evaluation applied** | ☒MPE Evaluation<br>☐SAR Evaluation |

Limits for Maximum Permissible Exposure (MPE)

| Frequency Range(MHz) | Electric Field Strength(V/m) | Magnetic Field Strength(A/m) | Power Density($mW/cm^2$) | 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*$R^2$)

Where
Pd= Power density in mW/$cm^2$
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,1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Measurement Result

| Channel | Channel Frequency (MHz) | Max Output power (dBm) | Tolerance | Max Tune-UP power (mW) | Power density at 20cm (mW/$cm^2$) | Power density Limits (mW/$cm^2$) |
|---|---|---|---|---|---|---|
| **GFSK** | | | | | | |
| Low | 2402.00 | 4.81 | ±1.0 | 3.81 | 0.0012013 | 1 |
| Middle | 2442.00 | 5.00 | ±1.0 | 3.98 | 0.0012549 | 1 |
| High | 2480.00 | 5.07 | ±1.0 | 4.05 | 0.0012770 | 1 |
| **802.11n(HT20)** | | | | | | |
| Low | 2412.00 | 4.61 | ±1.5 | 4.08 | 0.0019471 | 1 |
| Middle | 2437.00 | 3.61 | ±1.5 | 3.20 | 0.0015271 | 1 |
| High | 2462.00 | 3.85 | ±1.5 | 3.43 | 0.0016369 | 1 |
| **802.11n(HT40)** | | | | | | |
| Low | 2422.00 | 3.84 | ±1.5 | 3.42 | 0.0016321 | 1 |
| Middle | 2437.00 | 3.53 | ±1.5 | 3.18 | 0.0015176 | 1 |
| High | 2452.00 | 3.12 | ±1.5 | 2.90 | 0.0013840 | 1 |