# Safety Human Exposure

## 1.1 Radio Frequency Exposure Compliance

### 1.1.1 Electromagnetic Fields

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test item | : | Home Gateway |
| Identification / Type No. | : | E1320 |
| FCC ID | : | Q78-E1320 |
| Test standard | : | CFR47 FCC Part 2: Section 2.1091 |
| | | CFR47 FCC Part 1: Section 1.1310 |
| | | FCC KDB Publication 447498 |
| | | FCC KDB Publication 865664 D02 v01r02 |

➢ **Product Classification**

This device defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

➢ **Radio Frequency Exposure Limit**

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($mW/cm^2$) |
|---|---|---|---|
| 300-1,500 | -- | -- | f/1500 |
| 1,500-100,000 | -- | -- | 1.0 |

➢ **Radio Frequency Exposure Calculation Formula**

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. $mW/cm^2$)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

***or:***

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

**a) EUT RF Exposure Evaluation standalone operations(worse case)**

| Mode | *Max Time-average Power with Tune-up (Worst-case) (dBm) | Directional Gain (dBi) | Distance (cm) | Power Density ($mW/cm^2$) | FCC Limit ($mW/cm^2$) |
|---|---|---|---|---|---|
| 2.4G Wi-Fi | 19.00 | 8.0 | 20 | 0.100 | 1.0 |
| 5G Wi-Fi | 25.70 | 9.8 | 20 | 0.706 | 1.0 |

Note:

1. *2.4GHz Band RF Output Power: Refer to CN22M62P 001
2. *5GHz Bands RF Output Power: Refer to CCN22M62P 002

**b) Simultaneous transmission MPE:**

Per KDB 447498 D01, simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on calculated or measured field strengths or power density, is ≤ 1.0.

Simultaneous transmission Scenarios

| No. | Simultaneous transmission Scenarios |
|---|---|
| 1 | 2.4GHz Wi-Fi + 5GHz Wi-Fi |

| **Simultaneous transmission Scenarios** | **Sum for the MPE ratio** | **Limit** | **Verdict** |
|---|---|---|---|
| 2.4GHz Wi-Fi + 5GHz Wi-Fi | 0.100/1+0.706/1=0.806 | 1.0 | Compliance |

- **Conclusion**

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.