FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

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

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, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Mode	Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
2.4G Wi-Fi	2412-2462	9.5	8.91	27.0	501.19	35	0.290	1
5G Wi-Fi	5150-5250	10.5	11.22	22.0	158.49	35	0.116	1
5G Wi-Fi	5250-5350	10.5	11.22	16.0	39.81	35	0.029	1
5G Wi-Fi	5470-5725	10.5	11.22	19.0	79.43	35	0.058	1
5G Wi-Fi	5725-5850	10.5	11.22	26.0	398.11	35	0.290	1

Note: 1. The tune up conducted power was declared by the applicant.
2. The 2.4G Wi-Fi can transmit at the same time with the 5G Wi-Fi.
3. For the 2.4G Wi-Fi, as it can support the beam-forming function, so the antenna gain should add the 10lg4, 3.5dBi+10lg4=9.5dBi.
4. For the 5G Wi-Fi, as it can support the beam-forming function, so the antenna gain should add the 10lg4, 4.5dBi+10lg4=10.5dBi.

Simultaneous transmitting consideration (worst case):

The ratio=$MPE_{2.4G\ Wi\text{-}Fi}$/limit+$MPE_{5G\ Wi\text{-}Fi}$/limit=0.290+0.290=0.580＜1.0

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 35cm from nearby persons.

Result: Pass