1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1307 (b)(1), 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)			
Bluetooth	2402-2480	2.0	1.58	4.0	2.51	20	0.0008	1
BLE	2402-2480	2.0	1.58	6.0	3.98	20	0.0013	1
2.4G Wi-Fi	2412-2462	2.0	1.58	21.0	125.89	20	0.04	1
5G Wi-Fi	5150-5250	2.0	1.58	17.0	50.12	20	0.016	1
	5250-5350	2.0	1.58	17.0	50.12	20	0.016	1
	5470-5725	2.0	1.58	16.0	39.81	20	0.013	1
	5725-5850	2.0	1.58	17.0	50.12	20	0.016	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. The Bluetooth can't transmit at the same time with Wi-Fi.

Simultaneous transmitting consideration:

The ratio=$MPE_{2.4G}$/limit + $MPE_{5G\ i}$/limit=0.0016+0.04=0.0416＜1.0

So simultaneous exposure comply with the limit.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance