FCC §1.1307 (b) (3) & §2.1091- MPE-Based Exemption

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.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemptionfrom further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

Ris the minimum separation distance in meters
f = frequency in MHz

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

Result

For worst case:

Mode	Frequency (MHz)	Tune up conducted power	Antenna Gain		ERP		Evaluation Distance (m)	ERP Limit (W)
		(dBm)	(dBi)	(dBd)	(dBm)	(W)		
2.4G Wi-Fi	2412-2462	21.5	3.1	0.95	22.45	0.176	0.3	1.728
5G Wi-Fi	5150-5250	20.5	2.2	0.05	20.55	0.114	0.3	1.728
	5725-5850	20.5	2.2	0.05	20.55	0.114	0.3	1.728
WCDMA B2	1850-1910	24.0	3.5	1.35	25.35	0.343	0.3	1.728
WCDMA B4	1710-1755	24.0	3.5	1.35	25.35	0.343	0.3	1.728
WCDMA B5	824-849	25.0	2.0	-0.15	24.85	0.305	0.3	0.949
LTE B2	1850-1910	23.0	3.5	1.35	24.35	0.272	0.3	1.728
LTE B4	1710-1755	23.5	3.5	1.35	24.85	0.305	0.3	1.728
LTE B5	824-849	23.5	2.0	-0.15	23.35	0.216	0.3	0.949
LTE B7	2500-2570	24.0	0.3	-1.85	22.15	0.164	0.3	1.728
LTE B12	699-716	24.0	2.1	-0.05	23.95	0.248	0.3	0.805
LTE B41	2496-2690	27.0	0.3	-1.85	25.15	0.327	0.3	1.728
LTE B48	3550-3700	23.0	-0.6	-2.75	20.25	0.106	0.3	1.728
LTE B66	1710-1780	23.5	3.5	1.35	24.85	0.305	0.3	1.728
LTE B71	663-698	24.0	1.8	-0.35	23.65	0.232	0.3	0.764
5G n48	3550-3700	23.5	-0.6	-2.75	20.75	0.119	0.3	1.728
5G n66	1710-1780	24.0	3.6	1.45	25.45	0.351	0.3	1.728
5G n71	663-698	24.5	1.8	-0.35	24.15	0.260	0.3	0.764

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
2. The 2.4G Wi-Fi can transmit at the same time with the 5G Wi-Fi.
3. 0dBd=2.15dBi

Simultaneous transmitting consideration (worst case):

The ratio= $ERP_{2.4G\ Wi\text{-}Fi}/ ERP_{Limit} + ERP_{5G\ Wi\text{-}Fi}/ ERP_{Limit} + ERP_{WCDMA}/ERP_{Limit}+ERP_{5G\ NR}/ ERP_{Limit}$
=0.176/1.728+0.114/1.728+0.305/0.949+0.260/0.764=0.830＜1.0

So simultaneous exposure is compliant.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 30cm from nearby persons.

Result: Compliant.