

RF EXPOSURE EVALUATION

According to FCC 1.1310 and KDB 447498 D01 V06, The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 * P * G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Average RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 * P * G}{377 * D^2}$$

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

Measurement Result

2.4G WIFI:

Operation Frequency: WIFI 802.11b/g/n/ax HT20: 2412-2462MHz,

WIFI 802.11n HT40:2422-2452MHz

Power density limited: $1\text{mW}/\text{cm}^2$

Power density limited: $1\text{mW}/\text{cm}$

Antenna Type: Monopole Antenna

2.4G WIFI Antenna1&2 :2.51dBi;

R=20cm

$\text{mW}=10^{(\text{dBm}/10)}$

WLAN2.4G SISO Max power MODE

Antenna	Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result
			(dBm)		tune-up power		Gain		(mW/cm2)
					(dBm)	(mW)	(dBi)	Numeric	
Ant 1	2412	802.11b	14.9	14±1	15	31.623	2.51	1.78	0.0112
Ant 1	2437		14.72	14±1	15	31.623	2.51	1.78	0.0112
Ant 1	2462		14.72	14±1	15	31.623	2.51	1.78	0.0112
Ant 2	2412	802.11b	15.14	15.5±1	16.5	44.668	2.51	1.78	0.0158
Ant 2	2437		14.6	15.5±1	16.5	44.668	2.51	1.78	0.0158
Ant 2	2462		16.17	15.5±1	16.5	44.668	2.51	1.78	0.0158
Ant 1	2412	802.11g	14.67	14±1	15	31.623	2.51	1.78	0.0112
Ant 1	2437		14.42	14±1	15	31.623	2.51	1.78	0.0112
Ant 1	2462		14.63	14±1	15	31.623	2.51	1.78	0.0112
Ant 2	2412	802.11g	14.66	14±1	15	31.623	2.51	1.78	0.0112
Ant 2	2437		14.01	14±1	15	31.623	2.51	1.78	0.0112
Ant 2	2462		14.67	14±1	15	31.623	2.51	1.78	0.0112
Ant 1	2412	802.11n20	13.13	13±1	14	25.119	2.51	1.78	0.0089
Ant 1	2437		12.74	13±1	14	25.119	2.51	1.78	0.0089
Ant 1	2462		13	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2412	802.11n20	13.49	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2437		12.91	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2462		13.45	13±1	14	25.119	2.51	1.78	0.0089
Ant 1	2422	802.11n40	12.87	12±1	13	19.953	2.51	1.78	0.0071
Ant 1	2437		12.73	12±1	13	19.953	2.51	1.78	0.0071
Ant 1	2452		12.46	12±1	13	19.953	2.51	1.78	0.0071
Ant 2	2422	802.11n40	13.3	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2437		12.67	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2452		12.52	13±1	14	25.119	2.51	1.78	0.0089
Ant 1	2412	802.11ax20	13.4	13±1	14	25.119	2.51	1.78	0.0089
Ant 1	2437		13.15	13±1	14	25.119	2.51	1.78	0.0089
Ant 1	2462		13.09	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2412	802.11ax20	13.71	14±1	15	31.623	2.51	1.78	0.0112
Ant 2	2437		13.09	14±1	15	31.623	2.51	1.78	0.0112
Ant 2	2462		14.23	14±1	15	31.623	2.51	1.78	0.0112
Ant 1	2422	802.11ax40	12.96	12±1	13	19.953	2.51	1.78	0.0071
Ant 1	2437		12.89	12±1	13	19.953	2.51	1.78	0.0071
Ant 1	2452		12.5	12±1	13	19.953	2.51	1.78	0.0071
Ant 2	2422	802.11ax40	13.4	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2437		12.83	13±1	14	25.119	2.51	1.78	0.0089
Ant 2	2452		12.7	13±1	14	25.119	2.51	1.78	0.0089

Conclusion:

For the max result : 0.0158<1mW/cm² for Power density, compliance with RF exposure.

Signature:

Date: 2025-04-14

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