

RF Exposure Evaluation

LIMIT

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 Exposures				
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
300–1500	-	-	f/300	6
1500–100,000	-	-	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
300–1500	-	-	f/1500	30
1500–100,000	-	-	1.0	30

Note: f = frequency in MHz

EVALUATION METHOD

Transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/cm², **P_{out}** = output power to antenna in mW, **G** = gain of antenna in linear scale;

P_i = 3.1416, **R** = distance between observation point and center of the radiator in cm

TEST RESULT

☒ **Passed** ☐ **Not Applicable**

Frequency range (MHz)	Type	Conducted Average Power (dBm)	Maximum Tune-up (dBm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
2412-2462	802.11b	12.31	13.00	0.00629	1.0	Pass
2412-2462	802.11g	12.24	13.00	0.00629	1.0	Pass
2412-2462	802.11n((HT20)	12.80	12.00	0.005	1.0	Pass
2422-2452	802.11n((HT40)	13.11	12.00	0.005	1.0	Pass
5150-5250	Band1	15.94	16.00	0.01255	1.0	Pass
5725-5850	Band4	15.75	16.00	0.01255	1.0	Pass

Consider the 2.4G wifi,5.1G wifi and5.8G wifi can transmitting simultaneously, the total transmitting MPE rate as below formula:

$$\text{MPE rate} = \text{Power density of 2.4G} / \text{limit} + \text{Power density of 5.1G} / \text{limit} + \text{Power density of 5.8G} / \text{limit} < 1$$

Evaluation mode	Power density/limit	Sum of the MPE rate	limit
2.4G WIFI	0.00629	0.03139	1
5.1GWIFI	0.01255		
5.8GWIFI	0.01255		

Note:

- 1) The maximum antenna gain is 2dBi
- 2) The exposure evaluation safety distance is 20cm.