

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: $Pd = (Pout * G) / (4 * \pi * r^2)$

Where

Pd = power density in mW/cm², **Pout** = output power to antenna in mW, **G** = gain of antenna in linear scale;

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

TEST RESULT

☒ **Passed**

☐ **Not Applicable**

Type	Frequency (MHz)	Conducted Average Power (dBm)	Maximum Tune-up (dBm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
2.4G WIFI	2437	12.91	13.00	0.00961	1.0000	Pass
5G WIFI Band 1	5180	14.75	15.00	0.03175	1.0000	Pass
5G WIFI Band 4	5755	15.36	16.00	0.03654	1.0000	Pass
LTE Band 2	1880	23.84	25.00	0.09610	1.0000	Pass
LTE Band 4	1712.5	23.68	24.00	0.09263	1.0000	Pass
LTE Band 5	844	24.19	25.00	0.10417	0.5627	Pass
LTE Band 12	699.7	23.74	24.00	0.09391	0.4665	Pass
LTE Band 13	782.0	23.85	24.00	0.09632	0.5213	Pass
LTE Band 66	1710.7	23.81	24.00	0.09544	1.0000	Pass
LTE Band 71	680.5	23.47	24.00	0.08825	0.4537	Pass

Consider the LTE and WIFI can transmitting simultaneously, the total transmitting MPE rate as below formula:

$$\text{MPE rate} = \text{Power density of LTE/limit} + \text{Power density of Wifi/limit} < 1$$

The worst case is LTE and WIFI transmitting simultaneously, the result as below:

Evaluation mode	Power density/limit		Sum of the MPE rate	limit	Result
	Cellular	WiFi			
LTE + 2.4G WIFI	0.20131	0.00961	0.21092	1	Pass
LTE + 5G WIFI	0.20131	0.03654	0.23785	1	Pass

Note:

- 1) The maximum antenna gain is 7.28dBi
- 2) The exposure evaluation safety distance is 20cm.