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/cm^2, **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**

Radio Type	Frequency range (MHz)	Conducted Average Power (dBm)	Maximum Tune-up (dBm)	Power Density (mW/cm2)	Limit (mW/cm2)	Result
Bluetooth	2402-2480	4.32	4.50	0.001	1.0000	Pass
2.4G WIFI	2412-2462	17.68	18.00	0.016	1.0000	Pass

Consider the Bluetooth and 2.4G WIFI can transmitting simultaneously, the total transmitting MPE rate as below formula:

MPE rate=Power density of BT/limit + Power density of WIFI/limit <1

The worst case is Bluetooth and 2.4G WIFI transmitting simultaneously, the result as below:

Evaluation mode	Power density/limit	Sum of the MPE rate	limit
Bluetooth	0.001	0.017	1
2.4G WIFI	0.016		

Note:

1) *The maximum antenna gain is 1.1dBi (BT and 2.4G WIFI)*
2) *The exposure evaluation safety distance is 20cm.*