

FCC ID : 2BBOU10923

RF EXPOSURE EVALUATION

According to FCC 1.1310: 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)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

11.1 Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

Pd= Power density in mW/cm²

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm

Pd the limit of MPE, 1mW/cm², If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

RF Exposure Information: The radiated output power of this device meets the limits of FCC/IC radio frequency exposure limits. This device should be operated with a minimum separation distance of 20cm between the equipment and a person's body.

11.2 Measurement Result

WIFI 2.4G

Directional gain: 6.9 dBi

modulation	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
802.11n20	19.03	18 to 20	20	4.9	0.098	1

WIFI 6E (6ID)

Directional gain power: 6.3 dBi

modulation	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
U-NII-5: 5955-6415MHz	16.29	15 to 17	17	4.3	0.043	1
U-NII-6: 6435-6515MHz	16.47	15 to 17	17	4.3	0.043	1
U-NII-7: 6535-6865MHz	16.93	15 to 17	17	4.3	0.043	1
U-NII-8: 6885-7115MHz	15.38	14 to 16	16	4.3	0.034	1

WIFI 6E (6XD)

Directional gain power :6.3 dBi

modulation	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
U-NII-5: 5955-6415MHz	16.30	15 to 17	17	4.3	0.043	1
U-NII-6: 6435-6515MHz	17.17	16 to 18	18	4.3	0.054	1
U-NII-7: 6535-6865MHz	17.73	16 to 18	18	4.3	0.054	1
U-NII-8: 6885-7115MHz	16.87	15 to 17	17	4.3	0.043	1

CONCLUSION of simultaneous transmitter

Both of the WIFI2.4G module and WIFI 6E module can transmit simultaneously, the formula of calculated the MPE is:

CPD1/LPD1+CPD2/LPD2+.....etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Therefore the worst-case situation is $0.098+0.054 = 0.152$ which is less than "1",

This confirmed that the device comply with FCC 1.1310 MPE limit.