

MPE ESTIMATION

FCC ID: 2A49R-UMPRO

1, Limit for General Population/ Uncontrolled Exposures

Frequency	Power density (mW/ cm ²)	Averaging time(minutes)
300MHz----1.5GHz	F/1500	30
1.5GHz---100GHz	1.0	30

2, Estimation Result

For 2.4G/5G WIFI:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm ²)
BLE	9.71	9±1(10)	10.000	-0.05	0.99	0.00197
EDR	9.83	9±1(10)	10.000	-0.05	0.99	0.00197
2.4G WIFI Ant1	14.44	14±1(15)	31.623	-3.78	0.42	0.00264
2.4G WIFI Ant2	14.40	14±1(15)	31.623	-0.05	0.99	0.00622
MIMO	/	/	/	/	/	0.00886
5.2G WIFI Ant1	6.93	6±1(7)	5.012	0.46	1.11	0.00111
5.2G WIFI Ant2	7.38	7±1(8)	6.310	-5.02	0.31	0.00040
MIMO	/	/	/	/	/	0.00151
5.8G WIFI Ant1	7.18	7±1(8)	6.310	2.17	1.65	0.00207
5.8G WIFI Ant2	6.93	6±1(7)	5.012	-3.69	0.43	0.00043
MIMO	/	/	/	/	/	0.00250
WiFi6E Ant1	11.13	11±1(12)	15.849	2.59	1.82	0.00573
WiFi6E Ant2	11.94	11±1(12)	15.849	-0.63	0.86	0.00273
MIMO	/	/	/	/	/	0.00846

$$Pd = \frac{Pout * G}{4\pi r^2};$$

Note:

Note: The estimation distance is 20cm

Note: PK Output power= conducted power.

Conducted power see the test report **HK2412177766-1E/2E/3E/4E/5E/6E**,

BT antenna gain=-0.05dBi

2.4G antenna 1 gain=-3.78dBi, 2.4G antenna 2 gain=-0.05dBi;

5.2G antenna 1 gain=0.46dBi, 5.2G antenna 2 gain=-5.02dBi;

5.8G antenna 1 gain=2.17dBi, 5.8G antenna 2 gain=-3.69dBi.

WiFi6E antenna 1 gain=2.59dBi, WiFi6E antenna 2 gain=-0.63dBi.

2.4G WIFI MPE (max)= 0.00886 (mW/cm²)

5G WIFI MPE (max)= 0.00250 (mW/cm²)

WiFi6E MPE (max)=0.00846 (mW/cm²)

2.4GHz & 5GHz/6GHz technology cannot be transmitted at the same time.

Simultaneously MPE

2.4GWiFi + Bluetooth = 0.00886 + 0.00197 = 0.01083

5GWiFi + Bluetooth = 0.00250 + 0.00197 = 0.00447

6GWiFi + Bluetooth = 0.00846 + 0.00197 = 0.01043

When the minimum test separation distance is >20 cm, a distance of 20 cm is applied to determine RF Exposure test exclusion. The test exclusion threshold is 0.01083 which is < 1.0, RF Exposure testing is not required.

-----The End-----