

MPE ESTIMATION

FCC ID: 2A49R-X1PRO

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 BT, 2.4GWIFI, 5GWIFI and WIFI6E:

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	-2.56	-2±1(-1)	0.79	-0.50	0.89	0.00014
EDR	0.91	0±1(1)	1.26	-0.50	0.89	0.00022
2.4G WIFI Ant1	13.79	13±1(14)	25.12	-0.50	0.89	0.00446
2.4G WIFI Ant2	14.07	14±1(15)	31.62	0.96	1.25	0.00785
MIMO	/	/	/	/	/	0.01231
5.2G WIFI Ant1	10.14	10±1(11)	12.59	1.22	1.32	0.00332
5.2G WIFI Ant2	9.39	9±1(10)	10.00	0.89	1.23	0.00244
MIMO	/	/	/	/	/	0.00576
5.3G WIFI Ant1	9.75	9±1(10)	10.00	0.81	1.21	0.00240
5.3G WIFI Ant2	9.49	9±1(10)	10.00	0.89	1.23	0.00244
MIMO	/	/	/	/	/	0.00484
5.6G WIFI Ant1	9.94	9±1(10)	10.00	3.93	2.47	0.00492
5.6G WIFI Ant2	9.48	9±1(10)	10.00	2.84	1.92	0.00383
MIMO	/	/	/	/	/	0.00875
5.8G WIFI Ant1	6.23	6±1(7)	5.01	3.40	2.19	0.00218
5.8G WIFI Ant2	6.20	6±1(7)	5.01	3.25	2.11	0.00211
MIMO	/	/	/	/	/	0.00429
5.9G WIFI Ant1	3.18	3±1(4)	2.51	2.42	1.75	0.00087
5.9G WIFI Ant2	3.01	3±1(4)	2.51	3.25	2.11	0.00106
MIMO	/	/	/	/	/	0.00193
WiFi6E Ant1	6.44	6±1(7)	5.01	3.52	2.25	0.00224
WiFi6E Ant2	7.55	7±1(8)	6.31	3.35	2.16	0.00272
MIMO	/	/	/	/	/	0.00496

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

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/7E/8E**,

BT antenna gain=-0.50dBi

2.4G antenna 1 gain=-0.50dBi, 2.4G antenna 2 gain=0.96dBi;

5.2G antenna 1 gain=1.22dBi, 5.2G antenna 2 gain=0.89dBi;

5.3G antenna 1 gain=0.81dBi, 5.3G antenna 2 gain=0.89dBi;

5.6G antenna 1 gain=3.93dBi, 5.6G antenna 2 gain=2.84dBi;

5.8G antenna 1 gain=3.40dBi, 5.8G antenna 2 gain=-3.25dBi.

5.9G antenna 1 gain=2.42dBi, 5.9G antenna 2 gain=3.25dBi;

WiFi6E antenna 1 gain=3.52dBi, WiFi6E antenna 2 gain=3.35dBi.

2.4G WIFI MPE (max)= 0.01231 (mW/cm²)

5.2G WIFI MPE (max)= 0.00576 (mW/cm²)

5.3G WIFI MPE (max)= 0.00484 (mW/cm²)

5.6G WIFI MPE (max)= 0.00875 (mW/cm²)

5.8G WIFI MPE (max)= 0.00429 (mW/cm²)

5.9G WIFI MPE (max)= 0.00193 (mW/cm²)

WiFi6E MPE (max)= 0.00496 (mW/cm²)

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

Simultaneously MPE

2.4GWiFi + Bluetooth = 0.01231 + 0.00022 = 0.01253

5.2GWiFi + Bluetooth = 0.00576 + 0.00022 = 0.00598

5.3GWiFi + Bluetooth = 0.00484 + 0.00022 = 0.00506

5.6GWiFi + Bluetooth = 0.00875 + 0.00022 = 0.00897

5.8GWiFi + Bluetooth = 0.00429 + 0.00022 = 0.00451

5.9GWiFi + Bluetooth = 0.00193 + 0.00022 = 0.00215

WiFi6E + Bluetooth = 0.00496 + 0.00022 = 0.00518

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 0.01253 which is < 1.0, RF Exposure testing is not required.

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