MPE ESTIMATION

FCC ID: 2BBFC-GM03

1, Per FCC Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices, the 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

Note: F= Frequency in MHz

2, Estimation Result

BW236:

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	4.11	4±1(5)	3.16	4.77	3	0.00189
2.4GWIFI	18.41	18±1(19)	79.43	4.77	3	0.04743
5.2GWIFI	14.20	14±1(15)	31.62	4.36	2.73	0.01718
5.8GWIFI	12.08	12±1(13)	19.95	4.54	2.84	0.01084
Note: $Pd = \frac{Pout * G}{4\pi r^2}$;						
Note: The estimation distance is 20cm The device could transmit simultaneously in 2.4G/ 5G. could not transmit simultaneously in BT and 2.4G.						
Note: PK Output power= conducted power. Conducted power see the test report HK2304181489-1E/4E/6E/7E. Gantenna gain=4.77dBi						

ESP32:

Mode	Max PK Output power(dBm)	Tune Up Power(dBm)	Max Tune Up power(mW)	Antenna Gain(dBi)	Antenna Gain (linear)	MPE (mW/cm²)
EDR	4.86	4±1(5)	3.16	4.77	3	0.00189
BLE	5.13	5±1(6)	3.98	4.77	3	0.00238
2.4GWIFI	18.69	18±1(19)	79.43	4.77	3	0.04743
Note: $Pd = \frac{Pout * G}{4\pi r^2}$;						
Note: The estimation distance is 20cm The device could not transmit simultaneously in BT and 2.4G						
Note: PK Output power= conducted power. Conducted power see the test report HK2304181489-2E/3E/5E.						

ESP32MPE max (2.4WiFi) and BW236MPE max (2.4WiFi) Simultaneous evaluation:

0.04743 +0.04743= 0.09486 <1

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 0.09486 mW/cm² which is< 1.0mW/cm², RF Exposure testing is not required.

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