



# MPE ESTIMATION

FCC ID: 2BCRN-SPARKLEK1

1, According to §1.1310, Limit for General Population/ Uncontrolled Exposures

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

Note: F= Frequency in MHz

## 2, Estimation Result

|          | Frequency (MHz) | Max PK Output power (dBm) | Tune Up Power (dBm) | Max Tune Up power(mW) | Antenna Gain(dBi) | Antenna Gain (numerical) | MPE (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Ratios  |
|----------|-----------------|---------------------------|---------------------|-----------------------|-------------------|--------------------------|---------------------------|-----------------------------|---------|
| 2.4GTX   | 2402            | 4.91                      | 4±1(5)              | 3.16                  | 4.24              | 2.65                     | 0.00167                   | 1.0                         | 0.00167 |
| 2.4GWiFi | 2437            | 18.38                     | 17.5±1(18.5)        | 70.79                 | 3.36              | 2.17                     | 0.03055                   | 1.0                         | 0.03055 |
| 5.2GWiFi | 5190            | 10.01                     | 9.5±1(10.5)         | 11.22                 | 3.46              | 2.22                     | 0.00495                   | 1.0                         | 0.00495 |
| 5.8GWiFi | 5785            | 10.38                     | 9.5±1(10.5)         | 11.22                 | 3.51              | 2.24                     | 0.00501                   | 1.0                         | 0.00501 |

Note: Max PK Output power(dBm)= 100.11(dBuV/m) - 95.2 = 4.91(dBm)

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

Note:

Note: The estimation distance is 20cm

Note:

PK Output power= conducted power in mW.

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna in cm

Conducted power see the test report **HK2601120080-1E/2E/3E/4E**,

2.4GTX antenna gain=4.24dBi, 2.4GWIFI antenna gain=3.36dBi, 5.2G antenna gain=3.46dBi,

5.8G antenna gain=3.51dBi.

Simultaneously MPE Ratios: 2.4GTX + 2.4GWiFi = 0.00167 + 0.03055 = 0.03222

The device could not transmit simultaneously in 2.4GWiFi and 5GWiFi.

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 0.03222 which is < 1.0; RF Exposure testing is not required.

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