

**FCC ID: BEJQ50441HA**

According to KDB 447498 D01 General RF Exposure Guidance v06.

**1. SAR test exclusion threshold**

For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

**Appendix C**

**SAR Test Exclusion Thresholds for < 100 MHz and < 200 mm**

Approximate SAR test exclusion power thresholds at selected frequencies and test separation distances are illustrated in the following table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

| MHz  | < 50 | 50   | 60   | 70   | 80   | 90   | 100  | 110  | 120  | 130  | 140  | 150  | 160  | 170  | 180  | 190  | mm |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| 100  | 237  | 474  | 481  | 487  | 494  | 501  | 507  | 514  | 521  | 527  | 534  | 541  | 547  | 554  | 561  | 567  | mW |
| 50   | 308  | 617  | 625  | 634  | 643  | 651  | 660  | 669  | 677  | 686  | 695  | 703  | 712  | 721  | 729  | 738  |    |
| 10   | 474  | 948  | 961  | 975  | 988  | 1001 | 1015 | 1028 | 1041 | 1055 | 1068 | 1081 | 1095 | 1108 | 1121 | 1135 |    |
| 1    | 1422 | 1442 | 1462 | 1482 | 1502 | 1522 | 1542 | 1562 | 1582 | 1602 | 1622 | 1642 | 1662 | 1682 | 1702 | 1422 |    |
| 0.1  | 948  | 1896 | 1923 | 1949 | 1976 | 2003 | 2029 | 2056 | 2083 | 2109 | 2136 | 2163 | 2189 | 2216 | 2243 | 2269 |    |
| 0.05 | 1019 | 2039 | 2067 | 2096 | 2125 | 2153 | 2182 | 2211 | 2239 | 2268 | 2297 | 2325 | 2354 | 2383 | 2411 | 2440 |    |
| 0.01 | 1185 | 2370 | 2403 | 2437 | 2470 | 2503 | 2537 | 2570 | 2603 | 2637 | 2670 | 2703 | 2737 | 2770 | 2803 | 2837 |    |

The output power and operating frequency of the device are:

| Frequency [kHz] | Distance [mm] | Element   | Highest Emissions @10m [dBµV/m] | EIRP [dB m] | EIRP [mW] | Limit [mW] |
|-----------------|---------------|-----------|---------------------------------|-------------|-----------|------------|
| 30 ~ 65         | < 50          | Element 1 | 70.2                            | -14.57      | 0.035     | 997.7      |
|                 |               | Element 2 | 75.0                            | -9.77       | 0.105     |            |
|                 |               | Element 3 | 74.0                            | -10.77      | 0.084     |            |
|                 |               | Element 4 | 70.8                            | -13.97      | 0.040     |            |
|                 |               | Element 5 | 73.2                            | -11.57      | 0.070     |            |

- Aggregated maximum power = 0.035 + 0.105 + 0.084 + 0.040 + 0.070 = 0.334 mW

**Note;**

- EIRP (dB m) = E (dBµV/m) + 20 log (10(m)) - 104.77
- The limit was calculated using interpolation derivations below.

$$y_3 = \frac{(x_2 - x_3)y_1 + (x_3 - x_1)y_2}{x_2 - x_1}$$

Where;

x: frequency for MHz

y: thresholds level for mW

- The general usage distance is more than 20 cm, but this product evaluated at 50 mm conservatively.

## 2. Output power into antenna & RF exposure evaluation distance

### WLAN (2.4G)

#### - Maximum tune up tolerance

| Operating Frequency (MHz) | Output Average Power to Antenna (dB m) | Antenna Gain (dB i) | Power Density at 20 cm (mW/cm <sup>2</sup> ) | Limits (mW/cm <sup>2</sup> ) |
|---------------------------|--|---------------------|--|------------------------------|
| 2 412 ~ 2 462             | 20                                     | 1.58                | 0.028 624                                    | 1                            |

#### Note:

- The power density Pd (5th column) at a distance of 20 cm calculated from the Friis transmission formula is far below the limit of 1 mW/cm<sup>2</sup>.
- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum 20 cm between the radiator and your body.
- The antenna gain of this transmitter is less than 6 dB i and must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.

**Conclusion: No SAR is required.**

### 3. Simultaneous transmission of RF Exposure test exclusion for worst case configuration.

Element: the ratio is 0.334 / 997.7

WLAN: the ratio is 0.028 102 / 1

Confirm the sum result of individual MPEs ratio is  $\leq 1.0$ ;

Element + WLAN:  $(0.334 / 997.7) + (0.028 624 / 1) = 0.029 \leq 1.0$

So, this device meets the KDB447498 D01 v06 section 7.2 requirement of "Simultaneous transmission MPE test exclusion".