

## 5 FCC §15.247(i), § 1.1307(b)(3)(i) – RF Exposure

### 5.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1307(b)(3)(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

For single RF sources (*i.e.*, any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

## 5.2 RF Exposure Evaluation Result

### Project info

| Band      | Freq (MHz) | Tunp-up Power (dBm) | Ant Gain (dBi) | Distances (mm) | Duty (%) | Tunp-up Power (mW) | ERP (dBm) | ERP (mW) |
|-----------|------------|---------------------|----------------|----------------|----------|--------------------|-----------|----------|
| WIFI 2.4G | 2462       | 25.5                | 6              | 200            | 100%     | 354.81             | 29.35     | 860.99   |

Option A The available maximum time-averaged power is no more than 1 mW

| Band      | Freq (MHz) | Result Option A |
|-----------|------------|-----------------|
| WIFI 2.4G | 2462       | not exempt      |

### Option B

The available maximum time-averaged power or effective radiated power (ERP), whichever is greater.

This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).

| Band      | Freq (MHz) | Pth (mW) | X     | ERP 20cm (mW) | Ratio | Result Option B |
|-----------|------------|----------|-------|---------------|-------|-----------------|
| WIFI 2.4G | 2462       | 3060.00  | 1.903 | 3060          | 0.28  | exempt          |

**Result:** The device meets the exemption requirement.