

## APPENDIX C - RF EXPOSURE EVALUATION

### Applicable Standard

According to subpart §1.1310, 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.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (V/m)</b>	<b>Magnetic Field Strength (A/m)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>Averaging Time (minutes)</b>
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; \* = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

### Calculation formula:

Prediction of power density at the distance of the applicable MPE limit

S = PG/4πR<sup>2</sup> = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

**Calculated Data:**

Frequency (MHz)	Antenna Gain		Conducted output power including Tune-up Tolerance		Evaluation Distance (cm)	Power Density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
	(dBi)	(numeric)	(dBm)	(mW)			
903.5-926.5	-3.95	0.40	24	251.19	20.00	0.0201	0.6
2412-2462	2.13	1.63	26	398.11	20.00	0.1294	1.0
5856	6.48	4.45	-11.50	0.07	20.00	0.0001	1.0

Note:

For 5G, The power of EUT: E Field@3m is 89.99dBuV/m = -5.21dBm (0.30mW)

E[dBuV/m] = EIRP[dBm] + 95.2 for d = 3 m.

Conducted output power = -5.21 dBm - 6.48dBi = -11.69 dBm

Conducted output power = EIRP(dBm) - Antenna Gain(dBi)

The Conducted output power including Tune-up Tolerance provided by manufacturer

The WLAN 2.4G / 5G/900M can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$= S_{2.4G}/S_{limit-2.4G} + S_{5G}/S_{limit-5G} + S_{900M}/S_{limit-900M}$$

$$= 0.1294/1 + 0.0001/1 + 0.0201/0.6$$

$$= 0.16$$

$$< 1.0$$

**Result:** The device meet FCC MPE at 20 cm distance

**\*\*\*\*\* END OF REPORT \*\*\*\*\***