

# RF Exposure Evaluation Result

## 1. Requirement

Systems operating under the provisions of FCC 47 CFR 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.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

### Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

## 2. Calculation Method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

- E** = Electric field (V/m)
  - P** = Peak RF output power (mW)
  - G** = EUT Antenna numeric gain (numeric)=
  - d** = Separation distance between radiator and human body (m)
- The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance,  $d=0.2m$ , as well as the gain of the used antenna, the RF power density can be obtained.

### 3. Estimation Result

Mode	Frequency (MHz)	PK Output power (dBm)	Output power (mW)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE ratios (mW/cm <sup>2</sup> )
11b	2412	22.46	/	3.4	2.19	/
	2442	22.04	/	3.4	2.19	/
	2462	22.16	/	3.4	2.19	/
11g	2412	22.60	/	3.4	2.19	/
	2442	22.56	/	3.4	2.19	/
	<b>2462</b>	<b>22.67</b>	/	<b>3.4</b>	<b>2.19</b>	/
11n HT 20	2412	23.47	/	6.4	4.37	/
	2442	23.34	/	6.4	4.37	/
	2462	22.80	/	6.4	4.37	/
11n HT40	2422	23.51	/	6.4	4.37	/
	<b>2442</b>	<b>23.56</b>	/	<b>6.4</b>	<b>4.37</b>	/
	2452	23.24	/	6.4	4.37	/
11a	5745	9.65	/	3.4	2.19	/
	5785	9.31	/	3.4	2.19	/
	5825	10.67	/	3.4	2.19	/
11n HT20	5745	13.89	/	6.4	4.37	/
	5785	12.91	/	6.4	4.37	/
	5825	12.28	/	6.4	4.37	/
11n HT40	5755	12.96	/	6.4	4.37	/
	5795	12.54	/	6.4	4.37	/
11a	5180	10.57	/	3.4	2.19	/
	5200	10.38	/	3.4	2.19	/
	5240	10.22	/	3.4	2.19	/
11n HT20	5180	13.46	/	6.4	4.37	/
	5200	13.64	/	6.4	4.37	/
	5240	13.59	/	6.4	4.37	/
11n HT40	5190	12.63	/	6.4	4.37	/
	5230	12.65	/	6.4	4.37	/
Max Power	<b>2462</b>	<b>22.67+2</b>	<b>293</b>	<b>3.4</b>	<b>2.19</b>	<b>0.128</b>
	<b>2442</b>	<b>23.56+2</b>	<b>360</b>	<b>6.4</b>	<b>4.37</b>	<b>0.313</b>

Note: The estimation distance is 20cm

**Power tolerance: +/-2dBm**

**Conclusion: PASS**

Evaluation Test Engineer:



Leo Liu  
(Lead Engineer)



Kevin Feng  
(Lab Manager)