

## HFCL Limited

8, Commercial Complex, Masjid Moth, Greater Kailash - 2,  
New Delhi-110048, India

Federal Communications Commission  
Authorization and Evaluation Division  
Equipment Authorization Branch  
7435 Oakland Mills Road  
Columbia, MD 21046

### **Applicant's declaration concerning RF Radiation Exposure**

We hereby indicate that the product

Product description: Dual band 2X2:2 Outdoor Access Point (AP) with integrated antenna  
Model No: ion4

The equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The integral antennas used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter within the host device.

A safety statement concerning minimum separation distances from enclosure of the Product: Dual band 2X2:2 Outdoor Access Point (AP) with integrated antenna will be integrated in the user's manual to provide end-users with transmitter operating conditions for satisfying RF exposure compliance.

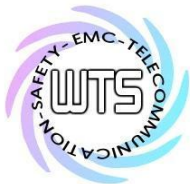
The appropriate information can be drawn from the test report no: W6M22001-19621-C-1, W6M22001-19621-C-54 and the accompanying calculations.

Company: HFCL Limited

Address: 8, Commercial Complex, Masjid Moth, Greater Kailash - 2, New Delhi-110048,  
India

Date: 2020-01-21

Signature 



Registration number: W6M22001-19621-C-1

FCC ID: 2AUI5ION4

### 3.2 Equivalent Isotropic Radiated Power (EIRP)

FCC Rule: 15.247(b)(3)

EIRP = max. conducted output power + antenna gain

EIRP = 21.84 dBm+(11.01 dBi [antenna gain claimed by manufacturer]=32.85 dBm = 1927.5249 mW

### 3.3 Exemption Limits for Routine Evaluation according to 47 CFR FCC Part 2 Subpart J, section 2.1091

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

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 levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20 cm normally can be maintained between the user and the device.

#### MPE Calculation Method

##### (A) Limits for Occupational/Controlled 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)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

##### (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 <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



# **Worldwide Testing Services(Taiwan) Co., Ltd.**

Registration number: W6M22001-19621-C-1  
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E = Electric field (V/m) P = output power (W) G = EUT Antenna numeric gain (numeric)  
d = Separation distance between radiator and human body (m)

The formula can be changed to  $Pd \cdot \frac{30 \times P \times G}{377 \times d^2}$  mW/cm<sup>2</sup>.

$$Pd \cdot \frac{30 \times P \times G}{377 \times d^2}$$

Established separation distance is 20 cm.

Operating frequency band: 802.11b, g, n 20MHz: 2412-2462 MHz, 802.11n 40MHz: 2422-2452 MHz,

The product meets RF exposure requirement.

Because the power density of 0.3836 mW/cm<sup>2</sup> at 2462 MHz is below the power density limit of 1 mW/cm<sup>2</sup>.

Limits:

<b>Limit for General Population / Uncontrolled Exposure</b>	
<b>Frequency (MHz)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>
1500 – 100.000	1.0



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**3.6 Automatic Discontinuation of transmission, FCC 15.407 (c)**

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure.

This function will be declared by manufacturer.

**3.7 Reserved, FCC 15.407 (d)**

**3.8 Indoor Operation Restriction, FCC 15.407 (e)**

Within the 5.15–5.25 GHz band, U- NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations. This equipment has to be declared by manufacturer of the final product as content of the user manual.

**3.9 Equivalent Isotropic Radiated Power (EIRP), FCC 15.407 (f)**

Band 1

EIRP = max. conducted output power + antenna gain

EIRP = 19.55 dBm + (11.01 dBi [antenna gain claimed by manufacturer]) = 30.56 dBm = 1137.6273 mW

Band 4

EIRP = max. conducted output power + antenna gain

EIRP = 19.38 dBm + (11.01 dBi [antenna gain claimed by manufacturer]) = 30.39 dBm = 1093.9564 mW

Test equipment used: ETSTW-RE 055



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**3.10 Exemption Limits for Routine Evaluation according to 47 CFR FCC Part 2 Subpart J, section 2.1091**

FCC OET Bulletin 65 Edition 97.01 determines the equations for predicting RF fields and applicable limits.

The prediction for power density in the far-field but will over-predict power density in the near field, where it could be used for walking a “worst case” or conservative prediction.

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 levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20 cm normally can be maintained between the user and the device.

**(A) Limits for Occupational/Controlled 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)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

**(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 <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

E = Electric field (V/m) P = output power (W) G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to mW/cm<sup>2</sup>.

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



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## **Band 1**

Established separation distance is 20 cm.

Operating frequency band: 5180-5240 MHz

The product meets RF exposure requirement.

Because the power density of  $0.2264 \text{ mW/cm}^2$  at 5180 MHz is below the power density limit of  $1 \text{ mW/cm}^2$ .

## **Band 4**

Established separation distance is 20 cm.

Operating frequency band: 5745-5825 MHz

The product meets RF exposure requirement.

Because the power density of  $0.2176 \text{ mW/cm}^2$  at 5795 MHz is below the power density limit of  $1 \text{ mW/cm}^2$ .

Limits:

<b>Limit for General Population / Uncontrolled Exposure</b>	
Frequency (MHz)	Power Density ( $\text{mW/cm}^2$ )
1500 – 100.000	1.0