

MPE REPORT

案 號： 1902C049
產 品 名 稱： AC4000 MU-MIMO 三頻Wi-Fi路由器
型 號： Archer C4000
申請廠商（名稱）： 聯洲國際有限公司
申請廠商（地址）： 新北市板橋區中山路一段156號13樓

According to: LP0002 第 5.20.2 節

實驗室報告簽署人：



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0659

MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi r^2} = \frac{EIRP}{4\pi r^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Table for Filed Antenna:

For 2.4G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	N/A	Dipole	N/A	1.8
2	TP-LINK	N/A	Dipole	N/A	1.8
3	TP-LINK	N/A	Dipole	N/A	1.8

Note: This EUT supports CDD, and all antennas have the same gain,

(1) For Non-Beamforming function, Directional gain = $G_{ANT} + \text{Array Gain}$.

For power spectral density measurements, Array Gain = $10\log(N_{ANT}/N_{SS})$ dB,

that is Directional gain = $1.8 + 10\log(3/1)$ dBi = 6.57. So, the power density limit is $8 - 6.57 + 6 = 7.43$.

(2) For Beamforming function, Beamforming Gain: 4.77 dB.

So Directional gain = $4.77 + 1.8 = 6.57$. Then, the average output power limit is $30 - 6.57 + 6 = 29.43$.

The power density limit is $8 - 6.57 + 6 = 7.43$.

For 5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	TP-LINK	N/A	Dipole	N/A	1.8	UNII-1
2	TP-LINK	N/A	Dipole	N/A	1.8	UNII-1
3	TP-LINK	N/A	Dipole	N/A	1.8	UNII-1
4	TP-LINK	N/A	Dipole	N/A	1.8	UNII-3
5	TP-LINK	N/A	Dipole	N/A	1.8	UNII-3
6	TP-LINK	N/A	Dipole	N/A	1.8	UNII-3

Note: This EUT supports CDD, and all antennas have the same gain, so,

(1) For Non Beamforming function, Directional gain = $G_{ANT} + \text{Array Gain}$.

For power spectral density measurements, Array Gain = $10\log(N_{ANT}/N_{SS})$ dB, that is Directional gain = $1.8 + 10\log(3)$ dBi = 6.57. So, the UNII-1 power density limit is $17 - 6.57 + 6 = 16.43$, the UNII-3 power density limit is $30 - 6.57 + 6 = 29.43$.

(2) For Beamforming function, Beamforming Gain: 4.77 dB.

So Directional gain = $4.77 + 1.8 = 6.57$. Then, the UNII-1 and UNII-3 output power limit is $30 - 6.57 + 6 = 29.43$; the UNII-1 power density limit is $17 - 6.57 + 6 = 16.43$, the UNII-3 power density limit is $30 - 6.57 + 6 = 29.43$.

TEST RESULTS:

For WLAN 2.4G Non-Beamforming:

測試頻道: IEEE vht20

測試模式: TX

檢測器: RMS

測試日期: 108/03/13

環境溫度: 23°C

環境濕度: 68%

Directional Gain (dBi)	Directional Gain (numeric)	Average Output Power (dBm)	Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
6.57	4.5394	28.84	765.5966	0.44272	1	Complies

For WLAN 2.4G With Beamforming:

測試頻道: IEEE 802.11n (HT20)

測試模式: TX

檢測器: RMS

測試日期: 108/03/13

環境溫度: 23°C

環境濕度: 68%

Directional Gain (dBi)	Directional Gain (numeric)	Average Output Power (dBm)	Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
6.57	4.5394	28.81	760.3263	0.43967	1	Complies

For WLAN 5G Non-Beamforming:

測試頻道: IEEE 802.11n (HT40)

測試模式: TX

檢測器: RMS

測試日期: 108/03/14

環境溫度: 23°C

環境濕度: 68%

Directional Gain (dBi)	Directional Gain (numeric)	Conducted Output Power (dBm)	Conducted Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
6.57	4.5394	29.20	831.7638	0.48098	1	Complies

For WLAN 5G With Beamforming:

測試頻道: IEEE 802.11n (HT40)

測試模式: TX

檢測器: RMS

測試日期: 108/03/14

環境溫度: 23°C

環境濕度: 68%

Antenna Gain (dBi)	Antenna Gain (numeric)	Conducted Output Power (dBm)	Conducted Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
6.57	4.5394	29.17	826.0379	0.47767	1	Complies

Note: The evaluated distance is 25cm.

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