

MPE REPORT

案 號： 1806C097
產 品 名 稱： AC1750無線雙頻Gigabit吸頂式基地台
型 號： EAP245
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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MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

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

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	PIFA	N/A	3.48
2	TP-LINK	N/A	PIFA	N/A	3.49
3	TP-LINK	N/A	PIFA	N/A	2.45

Note:

This EUT supports MIMO 3X3, any transmit signals are correlated with each other, so Directional gain = $10\log[(10G1/20+10G2/20+...10GN/20)2/N]$ dBi, that is Directional gain = $10\log[(103.48/20+103.49/20+102.45/20)2/3]$ dBi = 7.92. So, the output power limit is 30-7.92+6=28.08, the power density limit is 8-7.92+6=6.08.

The worst case for 3TX as follow:

Operating Mode	TX Mode	3TX
802.11b		V (ANT 1+ANT 2+ANT 3)
802.11g		V (ANT 1+ANT 2+ANT 3)
802.11n(20 MHz)		V (ANT 1+ANT 2+ANT 3)
802.11n(40 MHz)		V (ANT 1+ANT 2+ANT 3)

For 5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1		N/A	PIFA	N/A	3.97
2		N/A	PIFA	N/A	3.89
3		N/A	PIFA	N/A	3.92

Note:

- (1) This EUT supports MIMO 3X3, any transmit signals are correlated with each other, so Directional gain = $10\log[(10G1/20+10G2/20+...10GN/20)2/N]$ dBi, that is Directional gain = $10\log[(103.97/20+103.89/20+103.92/20) 2/3]$ dBi = 8.70; So, the UNII-1, UNII-3 output power limit is $30-8.70+6=27.30$. The UNII-1 power density limit is $17-8.70+6=14.30$, the UNII-3 power density limit is $30-8.70+6=27.30$.
- (2) Beamforming gain: 4.77dBi, so Directional gain = $4.77+3.97=8.74$ dBi. Then, the UNII-1, UNII-3 output power limit is $30-8.74+6=27.26$. The UNII-1 power density limit is $17-8.74+6=14.26$, the UNII-3 power density limit is $30-8.74+6=27.26$.

The worst case for 3TX as follow:

Operating Mode	TX Mode	3TX
802.11a		V (ANT 1+ ANT 2+ANT 3)
802.11n (20 MHz)		V (ANT 1+ ANT 2+ANT 3)
802.11n (40 MHz)		V (ANT 1+ ANT 2+ANT 3)
802.11ac (20 MHz)		V (ANT 1+ ANT 2+ANT 3)
802.11ac (40 MHz)		V (ANT 1+ ANT 2+ANT 3)
802.11ac (80 MHz)		V (ANT 1+ ANT 2+ANT 3)

TEST RESULTS:**For 2.4G**

測試頻道: IEEE 802.11 b
檢 測 器: RMS
環境溫度: 27°C

測試模式: TX
測試日期: 107/06/27
環境濕度: 48%

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
7.92	6.1944	26.18	414.9540	0.51162	1	Complies

For 5G

Non Beamforming

For UNII-1

測試頻道: IEEE 802.11ac (40 MHz)

測試模式: TX

檢 測 器: RMS

測試日期: 107/06/27

環境溫度: 27°C

環境濕度: 48%

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
8.70	7.4131	25.18	329.6097	0.4864	1	Complies

For UNII-3

測試頻道: IEEE 802.11ac (80 MHz)

測試模式: TX

檢 測 器: RMS

測試日期: 107/06/27

環境溫度: 27°C

環境濕度: 48%

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
8.70	7.4131	25.01	316.9567	0.46768	1	Complies

Beamforming

For UNII-1

測試頻道: IEEE 802.11ac (40 MHz)

測試模式: TX

檢 測 器: RMS

測試日期: 107/06/27

環境溫度: 27°C

環境濕度: 48%

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
8.74	7.4817	25.09	322.8494	0.48078	1	Complies

For UNII-3

測試頻道: IEEE 802.11ac (80 MHz)

測試模式: TX

檢 測 器: RMS

測試日期: 107/06/27

環境溫度: 27°C

環境濕度: 48%

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
8.74	4.1783	25.72	373.2502	0.3104	1	Complies

Note: The evaluated distance is 20cm.

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