

# FCC RF EXPOSURE REPORT

## FCC ID: TE7EAP2250D

**Project No.** : 2204C180  
**Equipment** : AC1200 Wireless MU-MIMO Gigabit Indoor/Outdoor Access Point  
**Brand Name** : tp-link  
**Test Model** : EAP225-Outdoor  
**Series Model** : N/A  
**Applicant** : TP-Link Technologies Co., Ltd.  
**Address** : Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park,Nanshan Shenzhen, 518057 China  
**Manufacturer** : TP-Link Technologies Co., Ltd.  
**Address** : Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park,Nanshan Shenzhen, 518057 China  
**Date of Receipt** : Apr. 29, 2022  
**Date of Test** : Apr. 29, 2022 ~ May 07, 2022  
**Issued Date** : May 09, 2022  
**Report Version** : R01  
**Test Sample** : Engineering Sample  
**Standard(s)** : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091  
FCC Title 47 Part 2.1091

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

*Chella Zheng*

Prepared by : Chella Zheng

*Chay Cai*

Approved by : Chay Cai



TESTING CERT #5123.02

Add: No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792

People's Republic of China

Tel: +86-769-8318-3000

Web: [www.newbtl.com](http://www.newbtl.com)

**REPORT ISSUED HISTORY**

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-3-2204C180	R00	Compared with original report (FA790815), the product has below changes: a. Changed the PHY chip. b. Changed the power supply, the isolated POE circuit is changed to non-isolated POE, adjusted DC-DC. The above changes do not affect the test results. The rest are kept the same.	May 07, 2022	Invalid
BTL-FCCP-3-2204C180	R01	Updated the date of test.	May 09, 2022	Valid

## 1. TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China.

BTL's Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

## 2. 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

Antenna Specification:

For 2.4GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101501275	Dipole	RP-SMA-F	3.36
2	tp-link	3101501275	Dipole	RP-SMA-F	3.36

Note:

- This EUT supports CDD, and all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ . For power measurements, Array Gain=0dB ( $N_{ANT} \leq 4$ ), so the Directional gain=3.36 dBi. For power spectral density measurements,  $N_{ANT}=2$ ,  $N_{SS} = 1$ . So the Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 3.36 + 10\log(2/1)\text{dBi} = 6.37$  dBi. Then, the power spectral density limit is  $8 - (6.37 - 6) = 7.63$ .
- The antenna gain is provided by the manufacturer.

Table for Antenna Configuration:

Operating Mode	TX Mode	2TX
IEEE 802.11b		V (Ant. 1 + Ant. 2)
IEEE 802.11g		V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)		V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1 + Ant. 2)

For 5GHz:

Antenna Specification:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1	tp-link	3101501275	Dipole	RP-SMA-F	5.19	UNII-1
2	tp-link	3101501275	Dipole	RP-SMA-F	5.19	
1	tp-link	3101501275	Dipole	RP-SMA-F	4.56	UNII-3
2	tp-link	3101501275	Dipole	RP-SMA-F	4.56	

Note:

- This EUT supports CDD, and all antennas have the same gain, Directional gain =  $G_{ANT} + \text{Array Gain}$ .  
 For power measurements, Array Gain=0dB ( $N_{ANT} \leq 4$ ), so the UNII-1 Directional gain=5.19 dBi, the UNII-3 Directional gain=4.56 dBi.  
 For power spectral density measurements,  $N_{ANT}=2$ ,  $N_{SS} = 1$ .  
 So the UNII-1 Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})$  dBi=5.19+10log(2/1)dBi=8.20 dBi, the UNII-3 Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})$  dBi=4.56+10log(2/1)dBi=7.57 dBi  
 Then, the UNII-1 power spectral density limit is 17-(8.20-6)=14.80, the UNII-3 power spectral density limit is 30-(7.57-6)=28.43.
- Beamforming Gain: 3dB. Then the UNII-1 Directional gain=3+5.19=8.19 dBi, the UNII-3 Directional gain=3+4.56=7.56 dBi. So the UNII-1 output power limit is 30-(8.19-6)=27.81 dBm, the UNII-3 output power limit is 30-(7.56-6)=28.44 dBm.
- Elevation angle above 30 degree Max Gain: -2.22dBi
- Elevation angle above 30 degree Max Gain is provided by original report.
- The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11a		V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT20)		V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)		V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)		V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)		V (Ant. 1 + Ant. 2)

For Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11n(HT20)		V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)		V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)		V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)		V (Ant. 1 + Ant. 2)

### 3. TEST RESULTS

For 2.4GHz:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
3.36	2.1677	29.56	903.6495	0.38990	1	Complies

For 5GHz UNII-1 Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
8.19	6.5917	23.45	221.3095	0.29037	1	Complies

**For the max simultaneous transmission MPE:**

Ratio		Total	Limit of Ratio	Test Result
2.4GHz	5GHz			
0.38990	0.29037	0.68027	1	Complies

Note: The calculated distance is 20 cm.  
Output power including tune up tolerance.

**End of Test Report**