FCC RF EXPOSURE REPORT

FCC ID: TE7C80

Project No.	:	1907C038
Equipment	:	AC1900 MU-MIMO Wi-Fi Router
Brand Name	:	tp-link
Test Model	:	Archer C80
Series Model	:	N/A
Applicant	:	TP-Link Technologies Co., Ltd.
Address	:	Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Manufacturer	:	TP-Link Technologies Co., Ltd.
Address	:	Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Date of Receipt	:	Jul. 03, 2019
Date of Test	:	Jul. 05, 2019 ~ Aug. 21, 2019
Issued Date	:	Oct. 29, 2019
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG190703116
Standard(s)	:	FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091 FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

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

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Oct. 29, 2019

1. 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 2.4GHz:

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

Note:
This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT}+Array Gain, where Array Gain is as follows:
(1) Non Beamforming Function,
For power spectral density measurements, N_{ANT} = 3, N_{SS} = 1. So Directional gain = G_{ANT} + Array Gain =10log (N_{ANT}/ N_{SS}) dB =3+10log(3/1)dBi=7.77. Then, the power density limit is 8-(7.77-6)=6.23.
For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=3.
(2) Beamforming Function, Beamforming Gain: 4.77 dB. So Directional gain = 4.77+3=7.77. Then, the average output power limit is 30-(7.77-6)=28.23. The power density limit is 8-(7.77-6)=6.23.

For 5GHz:

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

Note:
This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT}+Array Gain, where Array Gain is as follows:
(1) Non Beamforming Function,
For power spectral density measurements, N_{ANT} = 3, N_{SS} = 1. So Directional gain = G_{ANT} + Array Gain =10log (N_{ANT}/ N_{SS}) dB =3+10log(3/1)dBi=7.77.
Then, the UNII-1 power spectral density limit is 17-(7.77-6)=15.23, the UNII-3 power density limit is 30-(7.77-6)=28.23.
For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=3.
(2) Beamforming Function, Beamforming Gain: 4.77 dB. So Directional gain = 4.77+3=7.77.
Then, the UNII-1 and UNII-3 output power limit is 30-(7.77-6)=28.23; the UNII-1 power density limit is 17-(7.77-6)=15.23, the UNII-3 power density limit is 30-(7.77-6)=28.23.

2. TEST RESULTS

For 2.4GHz Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Average Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3.00	1.9953	28.49	706.3176	0.16598	1	Complies

For 2.4GHz With Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Average Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
7.77	5.9841	28.13	650.1297	0.45821	1	Complies

For 5GHz UNII-1 Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3.00	1.9953	27.07	509.3309	0.11969	1	Complies

For 5GHz UNII-3 Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
3.00	1.9953	28.60	724.4360	0.17024	1	Complies

For 5GHz UNII-1 With Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power \ (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
7.77	5.9841	26.96	496.5923	0.35000	1	Complies

For 5GHz UNII-3 With Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
7.77	5.9841	28.38	688.6523	0.48536	1	Complies

For the max simultaneous transmission MPE:

Power Density (S) (mW/cm^2)	Power Density (S) (mW/cm^2)	Total	Limit of Power Density (S) (mW/cm^2)	Test Result
2.4GHz	5GHz			
0.45821	0.48536	0.94357	1	Complies

Note: The calculated distance is 26 cm.
Output power including tune up tolerance.

End of Test Report