FCC RF EXPOSURE REPORT

FCC ID: TE7CPE710

Project No.	:	1912C049
Equipment	:	5GHz 867Mbps 23dBi Outdoor CPE
Brand Name	:	tp-link
Test Model	:	CPE710
Series Model	:	N/A
Applicant	:	TP-Link Technologies Co., Ltd.
Address	:	Building 24(floors1,3,4,5) and 28(floors1-4) Central Scienceand 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 Scienceand Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Date of Receipt	:	Dec. 10, 2019
Date of Test	:	Dec. 11, 2019 ~ Jan. 13, 2020
Issued Date	:	Feb. 14, 2020
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2019121142
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	Feb. 14, 2020

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:

Group 1 Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	N/A	PCB	I-PEX	20.8
2	TP-LINK	N/A	PCB	I-PEX	20.8

Note:
This EUT supports CDD, and antenna gains are equal, so Directional gain = G_{ANT}+Array Gain, where Array Gain is as follows:
For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=20.8.
For power spectral density measurements, $N_{ANT} = 2$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain =10 log (N_{ANT}/ N_{SS}) dB =20.8+10log(2/1)dBi=23.81.
For fixed point-to-point operation,

1) For UNII-1: The directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. So the power spectral density limit is 17-(23.81-23)=16.19.
2) For UNII-3: The devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. So the power spectral density limit 30-(23.81-6)=12.19.

Group 2 Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	N/A	PCB	I-PEX	6.95
2	TP-LINK	N/A	PCB	I-PEX	6.95

Note:
This EUT supports CDD, and antenna gains are equal, so Directional gain = G_{ANT}+Array Gain, where Array Gain is as follows:
For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=6.95.
For power spectral density measurements, $N_{ANT} = 2$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain =10 log (N_{ANT}/ N_{SS}) dB =6.95+10log(2/1)dBi=9.96.
For fixed point-to-point operation,

1) For UNII-1: The directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. So the output power and power spectral density limit are not reduced.
2) For UNII-3: The devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. So the power spectral density limit 30-(9.96-6)=26.04.

2. TEST RESULTS

Group 1 Antenna

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
20.8	120.2264	28.42	695.0243	0.92082	1	Complies

Group 2 Antenna

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
6.95	4.9545	28.49	706.3176	0.03856	1	Complies

Note: The calculated distance is 85 cm.
Output power including tune up tolerance(tune up tolerance: 0.5 dBm).

End of Test Report