FCC RF EXPOSURE REPORT

FCC ID: TE7A10V2

Project No.	:	2003C215
Equipment	:	AC2600 MU-MIMO Wi-Fi Router
Brand Name	:	tp-link
Test Model	:	Archer A10
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	:	Mar. 27, 2020
Date of Test	:	Mar. 30, 2020 ~ Jun. 03, 2020
Issued Date	:	Jul. 06, 2020
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG20200327177.
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	Jun. 17, 2020
R01	Updated the calculated distance and results.	Jul. 06, 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
For WLAN 2.4GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101502911	PCB	I-PEX	2.98
2	tp-link	3101502910	Dipole	I-PEX	2.98
3	tp-link	3101502908	Dipole	I-PEX	2.98
4	tp-link	3101502909	Dipole	I-PEX	2.98

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

1) Non Beamforming function, Directional gain = G_{ANT}+Array Gain,
For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=2.98.
For power spectral density measurements, $N_{ANT} = 4$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =2.98+10log(4/1)dBi=9.00. Then, the power spectral density limit is 8-(9.00-6)=5.00.
2) Beamforming function, Beamforming Gain: 6dB. So the Directional gain=6+2.98=8.98.
Then, the average output power limit is 30-(8.98-6)=27.02, the power spectral density limit is 8-(8.98-6)=5.02.

Non Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11b	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11g	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11n (HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

For WLAN 5GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	Note
1	tp-link	3101502909	Dipole	I-PEX	4.98	UNII-1
2	tp-link	3101502908	Dipole	I-PEX	4.98	UNII-1
3	tp-link	3101502910	Dipole	I-PEX	4.98	UNII-1
4	tp-link	3101502911	PCB	I-PEX	4.98	UNII-1
1	tp-link	3101502909	Dipole	I-PEX	3.64	UNII-3
2	tp-link	3101502908	Dipole	I-PEX	3.64	UNII-3
3	tp-link	3101502910	Dipole	I-PEX	3.64	UNII-3
4	tp-link	3101502911	PCB	I-PEX	3.64	UNII-3

Note:

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

1) Non Beamforming function, Directional gain = G_{ANT}+Array Gain,
   a) For UNII-1:
   For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=4.98.
   For power spectral density measurements, $N_{ANT} = 4$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =4.98+10log(4/1)dBi=11.00. Then, the power spectral density limit is 17-(11.00-6)=12.00.
   b) For UNII-3:
   For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=3.64.
   For power spectral density measurements, $N_{ANT} = 4$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =3.64+10log(4/1)dBi=9.66. Then, the power spectral density limit is 30-(9.66-6)=26.34.
2) Beamforming function, Beamforming Gain: 6dB. So,
   a) For UNII-1:
   The Directional gain=6+4.98=10.98. Then, the average output power limit is 30-(10.98-6)=25.02, the power spectral density limit is 17-(10.98-6)=12.02.
   b) For UNII-3:
   The Directional gain=6+3.64=9.64. Then, the average output power limit is 30-(9.64-6)=26.36, the power spectral density limit is 30-(9.64-6)=26.36.

Non Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11a	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac (VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac (VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac (VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11n (HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n (HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac (VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac (VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac (VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

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
2.98	1.9861	27.25	530.8844	0.09328	1	Complies

For 2.4GHz 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
8.98	7.9068	26.64	461.3176	0.32268	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
4.98	3.1477	27.33	540.7543	0.15058	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^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
10.98	12.5314	25.00	316.2278	0.35056	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
3.64	2.3121	29.2	831.7638	0.17012	1	Complies

For 5GHz UNII-3 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
9.64	9.2045	26.3	426.5795	0.34735	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			
0.32268	0.35056	0.67324	1	Complies

Note: The calculated distance is 30 cm.
Output power including tune up tolerance.

End of Test Report