FCC RF EXPOSURE REPORT

FCC ID: TE7M9PLUSV22

The test data of 2.4G WIFI and 5G WIFI UNII-1 were reissue from the FCC ID: TE7M9PLUSV22, model name: Deco M9 Plus.

Product changes are as follows:

a. The original Bluetooth chip CSR8811 (package is QFN40) is replaced by AC6368A/B (package is SOP8);
b. The crystal of the original chip is 26MHz, while the crystal of the new chip is 24MHz;
c. The Bluetooth antenna will not be changed;
d. The software functions remain unchanged, and they are all used as on-boarding. In the new chip, the new driver is used.
e. Change the circuit of Bluetooth part of PCB

Project No.	:	1908C067C
Equipment	:	AC2200 Smart Home Mesh Wi-Fi System
Brand Name	:	tp-link
Test Model	:	Deco M9 Plus
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	:	Aug. 09, 2019 Jul. 01, 2021
Date of Test	:	Aug. 09, 2019 ~ Nov. 09, 2019 Jul. 02, 2021 ~ Mar. 04, 2022
Issued Date	:	Mar. 17, 2022
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG19081571, DG2021070161
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.

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TESTING CERT #5123.02

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Mar. 17, 2022

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 LE:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	N/A	PCB	N/A	1.26

Note: The antenna gain is provided by the manufacturer.

For Zigbee:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101502636	PCB	I-PEX	1.20

Note: The antenna gain is provided by the manufacturer.

For 2.4GHz

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101502635	PCB	I-PEX	1.20
2	tp-link	3101502634	PCB	I-PEX	1.20

Note:
(1) This EUT supports CDD, and all antennas have the same gain,
a. For Non Beamforming function, Directional gain=G_{ANT}+Array Gain,
For output power measurements, Array Gain=0 ($N_{ANT} \leqslant 4$), so, Directional gain=1.20
For power spectral density measurements, Array Gain=10log(N_{ANT}/N_{SS}) dB,
so Directional gain=1.20+10log(2/1)=4.21
b. For Beamforming function, Beamforming Gain: 3.0 dB, so Directional gain=3.0+1.20=4.20
(2) The antenna gain and beamforming gain are provided by the manufacturer.

For 5GHz:
For UNII-1:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101502551	Internal	I-PEX	0.80
2	tp-link	3101502551	Internal	I-PEX	0.80

Note: (1) This EUT supports CDD, and all antennas have the same gain,
a.For Non Beamforming function, Directional gain=G_{ANT}+Array Gain,
For output power measurements, Array Gain=0 ($N_{ANT} \leq 4$), so, Directional gain=0.8
For power spectral density measurements, Array Gain=10log(N_{ANT}/N_{SS}) Db
Directional gain=0.8+10log(2/1)=3.81.
b.For Beamforming function, Beamforming gain: 3.0 dB, so Directional gain=3.0+0.8=3.80
(2)The antenna gain and beamforming gain are provided by the manufacturer.

For UNII-3:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
3	tp-link	3101502637	Internal	I-PEX	0.80
4	tp-link	3101502552	Internal	I-PEX	0.80

Note: (1). This EUT supports CDD, and all antennas have the same gain,

a.For Non Beamforming function, Directional gain=G_{ANT}+Array Gain,
For output power measurements, Array Gain=0 ($N_{ANT} \leq 4$), so, Directional gain=0.8
For power spectral density measurements, Array Gain=10log(N_{ANT}/N_{SS}) Db
Directional gain=0.8+10log(2/1)=3.81.

b.For Beamforming function, Beamforming gain: 3.0 dB, so Directional gain=3.0+0.8=3.80

(2).The antenna gain and beamforming gain are provided by the manufacturer.

The worst case for 2TX as follow:
For 2.4GHz:
For Non Beamforming:

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 Beamforming:

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

For 5GHz:
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)

2. TEST RESULTS

For LE:

Antenna Gain (dBi)	Antenna 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
1.26	1.3366	5.70	3.7154	0.00099	1	Complies

For Zigbee:

Antenna Gain (dBi)	Antenna 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
1.20	1.3183	19.95	98.8553	0.02594	1	Complies

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
1.20	1.3183	28.60	724.4360	0.19009	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
4.20	2.6303	26.50	446.6836	0.23386	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
0.8	1.2023	29.14	820.3515	0.19631	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
0.8	1.2023	28.51	709.5778	0.16980	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
3.80	2.3988	27.11	514.0437	0.24544	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
3.80	2.3988	26.86	485.2885	0.23171	1	Complies

For the max simultaneous transmission MPE:

Ratio				Total	Limit of Ratio	Test Result
LE	Zigbee	2.4GHz	5GHz			
0.00099	0.02594	0.23386	0.24544	0.50623	1	Complies

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

End of Test Report