RF Exposure Evaluation Report

APPLICANT	:	**TP-Link Technologies Co., Ltd.**
EQUIPMENT	:	**AC1200 Wi-Fi Range Extender With Power Outlet Pass-through**
BRAND NAME	:	**TP-Link**
MODEL NAME	:	**RE360**
FCC ID	:	**TE7RE360**
STANDARD	:	**47 CFR Part 2.1091**

We, SPORTON International (ShenZhen) INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON International (ShenZhen) INC., the test report shall not be reproduced except in full.

Mark Qu

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA722212	Rev. 01	Initial issue of report	Jun. 14, 2017

1. Administration Data

1.1. Testing Laboratory

Testing Laboratory	
Test Site	SPORTON International (ShenZhen) INC.
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan District, Shenzhen City, Guangdong Province, China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595

Applicant	
Company Name	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

Manufacturer	
Company Name	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	AC1200 Wi-Fi Range Extender With Power Outlet Pass-through
Brand Name	TP-Link
Model Name	RE360
FCC ID	TE7RE360
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz
Mode	WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80
Antenna Type	WLAN Ant.1: Omni Antenna WLAN Ant.2: Omni Antenna
Antenna Gain	**WLAN 2.4GHz:** Ant. 1: 1.97 dBi Ant. 2: 1.95 dBi **WLAN 5.2GHz:** Ant. 1: 2.86 dBi Ant. 2: 2.87 dBi **WLAN 5.8GHz:** Ant. 1: 2.20 dBi Ant. 2: 2.88 dBi
Antenna Function for Transmitter	

	Ant. 1	Ant. 2
802.11 b/g/a/n/ac MIMO	V	V

EUT Stage	Identical Prototype

Remark:
1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. For WLAN2.4GHz and WLAN 5GHz, MIMO power is higher than SISO power, so chose MIMO power to do MPE evaluation.

3. Maximum RF average output power among production units

<WLAN 2.4GHz>

Frequency	Mode	Maximum Average Power (dBm)
WLAN 2.4GHz	802.11b	22.5
	802.11g	26.0
	802.11n-HT20	24.0
	802.11n-HT40	18.5

<WLAN 5GHz>

Frequency	Mode	Maximum Average Power (dBm)
WLAN 5.2GHz	802.11a	25.5
	802.11n-HT20	24.5
	802.11n-HT40	24.0
	802.11ac-VHT20	24.0
	802.11ac-VHT40	24.0
	802.11ac-VHT80	18.0
WLAN 5.8GHz	802.11a	25.0
	802.11n-HT20	25.0
	802.11n-HT40	25.0
	802.11ac-VHT20	24.5
	802.11ac-VHT40	24.5
	802.11ac-VHT80	23.5

4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm ^2)
WLAN2.4GHz 802.11b	2412.0	4.97	22.5	27.47	0.56	558.47	0.11	1.00
WLAN2.4GHz 802.11g	2412.0	4.97	26	30.97	1.25	1250.26	0.25	1.00
WLAN2.4GHz 802.11n-HT20	2412.0	4.97	24	28.97	0.79	788.86	0.16	1.00
WLAN2.4GHz 802.11n-HT40	2422.0	4.97	18.5	23.47	0.22	222.33	0.04	1.00
WLAN5.2GHz 802.11a	5180.0	5.88	25.5	31.38	1.37	1374.04	0.27	1.00
WLAN5.2GHz 802.11n-HT20	5180.0	5.88	24.5	30.38	1.09	1091.44	0.22	1.00
WLAN5.2GHz 802.11n-HT40	5190.0	5.88	24	29.88	0.97	972.75	0.19	1.00
WLAN5.2GHz 802.11ac-VHT20	5180.0	5.88	24	29.88	0.97	972.75	0.19	1.00
WLAN5.2GHz 802.11ac-VHT40	5190.0	5.88	24	29.88	0.97	972.75	0.19	1.00
WLAN5.2GHz 802.11ac-VHT80	5210.0	5.88	18	23.88	0.24	244.34	0.05	1.00
WLAN5.8GHz 802.11a	5745.0	5.56	25	30.56	1.14	1137.63	0.23	1.00
WLAN5.8GHz 802.11n-HT20	5745.0	5.56	25	30.56	1.14	1137.63	0.23	1.00
WLAN5.8GHz 802.11n-HT40	5755.0	5.56	25	30.56	1.14	1137.63	0.23	1.00
WLAN5.8GHz 802.11ac-VHT20	5745.0	5.56	24.5	30.06	1.01	1013.91	0.20	1.00
WLAN5.8GHz 802.11ac-VHT40	5755.0	5.56	24.5	30.06	1.01	1013.91	0.20	1.00
WLAN5.8GHz 802.11ac-VHT80	5775.0	5.56	23.5	29.06	0.81	805.38	0.16	1.00

Note: For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
MIMO gain is calculated according to formula.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.