RF Exposure Evaluation Report

APPLICANT	:	TP-LINK TECHNOLOGIES CO., LTD.
EQUIPMENT	:	AC1200 Wi-Fi Range Extender
BRAND NAME	:	TP-LINK
MODEL NAME	:	RE350K
MARKETING NAME	:	AC1200 Wi-Fi Range Extender
FCC ID	:	TE7RE350K
STANDARD	:	47 CFR Part 2.1091

We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Eric Huang / Deputy Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA5N0208	Rev. 01	Initial issue of report	Dec. 14, 2015

1. Administration Data

1.1. Testing Laboratory

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

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
Brand Name	TP-LINK
Model Name	RE350K
FCC ID	TE7RE350K
Marketing Name	AC1200 Wi-Fi Range Extender
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	・802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. Maximum RF average output power among production units

2.4GHz WLAN ANT 1 / ANT 2				
Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
802.11b	CH 1	2412	1Mbps	22.00
	CH 6	2437		24.50
	CH 11	2462		22.00
802.11g	CH 1	2412	6Mbps	17.00
	CH 6	2437		21.00
	CH 11	2462		17.00
802.11n-HT20	CH 1	2412	MCS0	17.00
	CH 6	2437		21.00
	CH 11	2462		17.00
802.11n-HT40	CH 3	2422	MCS0	13.00
	CH 6	2437		16.00
	CH 9	2452		13.00

2.4GHz WLAN ANT 1+2				
Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
802.11b	CH 1	2412	1Mbps	25.00
	CH 6	2437		28.00
	CH 11	2462		25.00
802.11g	CH 1	2412	6Mbps	20.00
	CH 6	2437		24.00
	CH 11	2462		20.00
802.11n-HT20	CH 1	2412	MCS0	20.00
	CH 6	2437		24.00
	CH 11	2462		20.00
802.11n-HT40	CH 3	2422	MCS0	16.00
	CH 6	2437		19.00
	CH 9	2452		16.00

5.2GHz WLAN ANT 1 / ANT2				
Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
802.11a	CH 36	5180	6Mbps	18.50
	CH 44	5220		23.50
	CH 48	5240		23.50
802.11n-HT20	CH 36	5180	MCS0	18.50
	CH 44	5220		23.50
	CH 48	5240		23.50
802.11n-HT40	CH 38	5190	MCS0	14.00
	CH 46	5230		20.00
802.11ac-VHT20	CH 36	5180	MCS0	18.50
	CH 44	5220		23.50
	CH 48	5240		23.50
802.11ac-VHT40	CH 38	5190	MCS0	14.00
	CH 46	5230		20.00
802.11ac-VHT80	CH 42	5210	MCS0	12.00

5.2GHz WLAN ANT 1+2				
Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
802.11a	CH 36	5180	6Mbps	22.00
	CH 44	5220		26.50
	CH 48	5240		26.50
802.11n-HT20	CH 36	5180	MCS0	22.00
	CH 44	5220		26.50
	CH 48	5240		26.50
802.11n-HT40	CH 38	5190	MCS0	18.00
	CH 46	5230		23.00
802.11ac-VHT20	CH 36	5180	MCS0	22.00
	CH 44	5220		26.50
	CH 48	5240		26.50
802.11ac-VHT40	CH 38	5190	MCS0	18.00
	CH 46	5230		23.00
802.11ac-VHT80	CH 42	5210	MCS0	15.00

5.8GHz WLAN ANT 1 / ANT 2				
Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
802.11a	CH 149	5745	MCS0	20.00
	CH 157	5785		23.50
	CH 165	5825		20.00
802.11n-HT20	CH 149	5745	MCS0	20.00
	CH 157	5785		23.50
	CH 165	5825		20.00
802.11n-HT40	CH 151	5755	MCS0	20.00
	CH 159	5795		20.00
802.11ac-VHT20	CH 149	5745	MCS0	20.00
	CH 157	5785		23.50
	CH 165	5825		20.00
802.11ac-VHT40	CH 151	5755	MCS0	20.00
	CH 159	5795		20.00
802.11ac-VHT80	CH 155	5775	MCS0	18.00

5.8GHz WLAN ANT 1+2				
Mode	Channel	Frequency (MHz)	Data Rate	Tune-Up Limit
802.11a	CH 149	5745	MCS0	23.00
	CH 157	5785		26.50
	CH 165	5825		23.00
802.11n-HT20	CH 149	5745	MCS0	23.00
	CH 157	5785		26.50
	CH 165	5825		23.00
802.11n-HT40	CH 151	5755	MCS0	23.00
	CH 159	5795		23.00
802.11ac-VHT20	CH 149	5745	MCS0	23.00
	CH 157	5785		26.50
	CH 165	5825		23.00
802.11ac-VHT40	CH 151	5755	MCS0	23.00
	CH 159	5795		23.00
802.11ac-VHT80	CH 155	5775	MCS0	20.00

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)
2.4GHz WLAN	2412.0	2.21	28.00	30.210	1.050	1049.542	0.209	1.000
5GHz WLAN	5180.0	3.89	26.50	30.390	1.094	1093.956	0.218	1.000

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band**.**

Conclusion:

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