



RF Exposure Evaluation Report

APPLICANT : TP-LINK TECHNOLOGIES CO., LTD.
EQUIPMENT : AC750 Wi-Fi Range Extender with Smart Plug
BRAND NAME : TP-LINK
MODEL NAME : RE270K
FCC ID : TE7RE270K
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.

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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA683003	Rev. 01	Initial issue of report	Oct. 26, 2016

**1. Administration Data****1.1. Testing Laboratory**

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.
Test Site Location	1F & 2F,Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. 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	AC750 Wi-Fi Range Extender with Smart Plug														
Brand Name	TP-LINK														
Model Name	RE270K														
FCC ID	TE7RE270K														
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 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	Dipole Antenna														
Antenna Function for Transmitter	<table><tr><td></td><td>Chain Port 1</td><td>Chain Port 2</td></tr><tr><td>802.11 a/n/ac</td><td>V</td><td>-</td></tr><tr><td>802.11 b/g/n SISO</td><td>V</td><td>V</td></tr><tr><td>802.11 b/g/n MIMO</td><td>V</td><td>V</td></tr></table>				Chain Port 1	Chain Port 2	802.11 a/n/ac	V	-	802.11 b/g/n SISO	V	V	802.11 b/g/n MIMO	V	V
	Chain Port 1	Chain Port 2													
802.11 a/n/ac	V	-													
802.11 b/g/n SISO	V	V													
802.11 b/g/n MIMO	V	V													
EUT Stage	Production Unit														
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. WLAN operation in 5600 MHz ~ 5650 MHz is notched.															
3. There are two antennas, antenna 1 supports WLAN 2.4GHz and WLAN 5GHz, and antenna 2 only supports WLAN 2.4GHz.															
4. Since each SISO antenna power is less than per chain MIMO antenna power, we only evaluate MPE in MIMO antenna mode for WLAN 2.4GHz.															

**3. Maximum RF average output power among production units****<WLAN 2.4GHz Antenna 1+2>**

Mode		Maximum Average Power (dBm)
2.4GHz	802.11b	24.0
	802.11g	23.0
	802.11n-HT20	23.0
	802.11n-HT40	20.5

<WLAN 5GHz Antenna 1>

Mode		Maximum Average Power (dBm)
5.2GHz	802.11a	21.0
	802.11n-HT20	21.0
	802.11n-HT40	21.0
	802.11ac-VHT20	21.0
	802.11ac-VHT40	21.0
	802.11ac-VHT80	14.0
5.3GHz	802.11a	21.0
	802.11n-HT20	21.0
	802.11n-HT40	21.0
	802.11ac-VHT20	21.0
	802.11ac-VHT40	21.0
	802.11ac-VHT80	12.5
5.5GHz	802.11a	21.0
	802.11n-HT20	20.5
	802.11n-HT40	20.5
	802.11ac-VHT20	20.5
	802.11ac-VHT40	20.0
	802.11ac-VHT80	12.5
5.8GHz	802.11a	21.0
	802.11n-HT20	21.0
	802.11n-HT40	21.0
	802.11ac-VHT20	21.0
	802.11ac-VHT40	20.5
	802.11ac-VHT80	20.0

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/f ²)	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/f ²)	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 20cm 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	4.94	24.00	28.94	0.78	783.43	0.16	1.00
WLAN2.4GHz 802.11g	2412.0	4.94	23.00	27.94	0.62	622.30	0.12	1.00
WLAN2.4GHz 802.11n-HT20	2412.0	4.94	23.00	27.94	0.62	622.30	0.12	1.00
WLAN2.4GHz 802.11n-HT40	2422.0	4.94	20.50	25.44	0.35	349.95	0.07	1.00
WLAN5.2GHz 802.11a	5180.0	1.95	21.00	22.95	0.20	197.24	0.04	1.00
WLAN5.2GHz 802.11n-HT20	5180.0	1.95	21.00	22.95	0.20	197.24	0.04	1.00
WLAN5.2GHz 802.11n-HT40	5190.0	1.95	21.00	22.95	0.20	197.24	0.04	1.00
WLAN5.2GHz 802.11ac-VHT20	5180.0	1.95	21.00	22.95	0.20	197.24	0.04	1.00
WLAN5.2GHz 802.11ac-VHT40	5190.0	1.95	21.00	22.95	0.20	197.24	0.04	1.00
WLAN5.2GHz 802.11ac-VHT80	5210.0	1.95	14.00	15.95	0.04	39.36	0.01	1.00
WLAN5.3GHz 802.11a	5260.0	1.96	21.00	22.96	0.20	197.70	0.04	1.00
WLAN5.3GHz 802.11n-HT20	5260.0	1.96	21.00	22.96	0.20	197.70	0.04	1.00
WLAN5.3GHz 802.11n-HT40	5270.0	1.96	21.00	22.96	0.20	197.70	0.04	1.00
WLAN5.3GHz 802.11ac-VHT20	5260.0	1.96	21.00	22.96	0.20	197.70	0.04	1.00
WLAN5.3GHz 802.11ac-VHT40	5270.0	1.96	21.00	22.96	0.20	197.70	0.04	1.00
WLAN5.3GHz 802.11ac-VHT80	5290.0	1.96	12.50	14.46	0.03	27.93	0.01	1.00
WLAN5.5GHz 802.11a	5500.0	1.92	21.00	22.92	0.20	195.88	0.04	1.00
WLAN5.5GHz 802.11n-HT20	5500.0	1.92	20.50	22.42	0.17	174.58	0.03	1.00
WLAN5.5GHz 802.11n-HT40	5510.0	1.92	20.50	22.42	0.17	174.58	0.03	1.00
WLAN5.5GHz 802.11ac-VHT20	5500.0	1.92	20.50	22.42	0.17	174.58	0.03	1.00
WLAN5.5GHz 802.11ac-VHT40	5510.0	1.92	20.00	21.92	0.16	155.60	0.03	1.00
WLAN5.5GHz 802.11ac-VHT80	5530.0	1.92	12.50	14.42	0.03	27.67	0.01	1.00
WLAN5.8GHz 802.11a	5745.0	1.92	21.00	22.92	0.20	195.88	0.04	1.00
WLAN5.8GHz 802.11n-HT20	5745.0	1.92	21.00	22.92	0.20	195.88	0.04	1.00
WLAN5.8GHz 802.11n-HT40	5755.0	1.92	21.00	22.92	0.20	195.88	0.04	1.00
WLAN5.8GHz 802.11ac-VHT20	5745.0	1.92	21.00	22.92	0.20	195.88	0.04	1.00
WLAN5.8GHz 802.11ac-VHT40	5755.0	1.92	20.50	22.42	0.17	174.58	0.03	1.00
WLAN5.8GHz 802.11ac-VHT80	5775.0	1.92	20.00	21.92	0.16	155.60	0.03	1.00

Note: For conservativeness, the lowest 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.