



## RF Exposure Evaluation Declaration

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**FCC ID:** TE7RE230V2

**APPLICANT:** TP-Link Technologies Co., Ltd.

**Application Type:** Certification

**Product:** AC750 Wi-Fi Range Extender  
AC1200 Wi-Fi Range Extender

**Model No.:** RE230, RE330

**Trademark:** tp-link

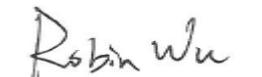
**FCC Classification:** Digital Transmission System (DTS)  
Unlicensed National Information Infrastructure (NII)

**Test Date:** December 22, 2020

Reviewed By:

  
( Kevin Guo )

Approved By:

  
( Robin Wu )



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

### Revision History

Report No.	Version	Description	Issue Date	Note
2008RSU036-U5	Rev. 01	Initial Report	12-30-2020	Valid

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## 1. General Information

## 1.1. Applicant

TP-Link Technologies Co., Ltd.

Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park, Nanshan  
Shenzhen, 518057 China

## 1.2. Manufacturer

TP-Link Technologies Co., Ltd.

Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park, Nanshan  
Shenzhen, 518057 China

### 1.3. Testing Facility

<input checked="" type="checkbox"/>	<b>Test Site – MRT Suzhou Laboratory</b>
	<b>Laboratory Location (Suzhou - Wuzhong)</b> D8 Building, No.2 Tian’edang Rd., Wuzhong Economic Development Zone, Suzhou, China
	<b>Laboratory Location (Suzhou - SIP)</b> 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China
	<b>Laboratory Accreditations</b>
	A2LA: 3628.01CNAS: L10551
	FCC: CN1166ISED: CN0001
	VCCI: R-20025, G-20034, C-20020, T-20020
<input type="checkbox"/>	<b>Test Site – MRT Shenzhen Laboratory</b>
	<b>Laboratory Location (Shenzhen)</b> 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China
	<b>Laboratory Accreditations</b>
	A2LA: 3628.02CNAS: L10551
	FCC: CN1284ISED: CN0105
<input type="checkbox"/>	<b>Test Site – MRT Taiwan Laboratory</b>
	<b>Laboratory Location (Taiwan)</b> No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
	<b>Laboratory Accreditations</b>
	TAF: L3261-190725
	FCC: 291082, TW3261ISED: TW3261

## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

Product Name	AC750 Wi-Fi Range Extender AC1200 Wi-Fi Range Extender
Model No.	RE230, RE330
Brand Name:	tp-link
Wi-Fi Specification:	802.11a/b/g/n/ac

Note: There is the same hardware design, PCB layout between the models, different models and product names for different marketing requirements. Only RE230 (Product name: AC750 Wi-Fi Range Extender) was selected for final tests.

### 2.2. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T <sub>x</sub> Paths	Max Antenna Gain (dBi)	Beamforming Directional Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
PCB Antenna	2412 ~ 2462	2	2.0	--	2.0	5.01
	5150 ~ 5850	2	3.0	6.01	3.0	6.01

Note 1: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT} + \text{Array Gain}$ , where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,  
Array Gain =  $10 \log (N_{ANT} / N_{SS})$  dB;

- For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB for  $N_{ANT} \leq 4$ ;

Note 2: The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac, not include 802.11a/b/g. BF Directional gain =  $G_{ANT} + 10 \log (N_{ANT})$ .

Note 3: All information is provided by the manufacturer.

### 3. RF Exposure Evaluation

#### 3.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

### 3.2. Test Result of RF Exposure Evaluation

Product	AC750 Wi-Fi Range Extender
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 2.2.

Test Mode	Frequency Band (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
802.11b/g/n	2412 ~ 2462	21.83	2.0	23.83
802.11a/n/ac	5180 ~ 5240 5260 ~ 5320 5500 ~ 5720 5745 ~ 5825	23.34	6.01 <sup>Note</sup>	29.35

Note: This is beamforming mode.

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Safety Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
802.11b/g/n	2412 ~ 2462	23.83	20	0.0481	1
802.11a/n/ac	5180 ~ 5240 5260 ~ 5320 5500 ~ 5720 5745 ~ 5825	29.35	20	0.1713	1

#### CONCLUSION:

WLAN 2.4GHz Band and WLAN 5GHz can transmit simultaneously.

The max Power Density at R (20 cm) =  $0.0481\text{mW/cm}^2 + 0.1713\text{mW/cm}^2 = 0.2194\text{mW/cm}^2 < 1\text{mW/cm}^2$ .

So the safety distance is 20cm for device installed without any other radio equipment.

\_\_\_\_\_ The End \_\_\_\_\_

## **Appendix A - EUT Photograph**

Refer to "2008RSU036-UE" file.