# FCC RADIO EXPOSURE TEST REPORT

| | | |
|---|---|---|
| FCC ID | : | TE7RE550 |
| Equipment | : | AC1750 Wi-Fi Range Extender<br>AC1900 MU-MIMO Wi-Fi Range Extender |
| Brand Name | : | tp-link |
| Model Name | : | RE450, RE550 |
| Applicant | : | TP-Link Technologies Co., Ltd.<br>Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park,Nanshan Shenzhen, 518057 China |
| Manufacturer | : | TP-Link Technologies Co., Ltd.<br>Building 24 (floors 1,3,4,5) and 28 (floors1-4), Central Science and Technology Park,Nanshan Shenzhen, 518057 China |
| Standard | : | 47 CFR Part 2.1091 |

**The product was received on Jul. 16, 2020, and testing was started from Jul. 27, 2020 and completed on Oct. 22, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.**

Approved by: Cliff Chang

*SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory*
*No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)*

TEL : 886-3-656-9065
FAX : 886-3-656-9085

# Table of Contents

# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FA552242-02 | 01 | Initial issue of report | Nov. 17, 2020 |
| FA552242-02 | 02 | Revised the equipment name from “AC1900 Wi-Fi Range Extender” to “AC1900 MU-MIMO Wi-Fi Range Extender". | Nov. 25, 2020 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|---|
| 2 | - | Exposure evaluation | PASS | - |

| Declaration of Conformity: |
|---|
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| **Comments and Explanations:** |
| The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification. |

**Reviewed by: Sam Chen**

**Report Producer: Vicky Huang**

# 1 General Description

## 1.1 EUT General Information

| RF General Information | | | |
|---|---|---|---|
| **Evaluation Mode** | **Frequency Range (MHz)** | **Operating Frequency (MHz)** | **Modulation Type** |
| 2.4GHz WLAN | 2400-2483.5 | 2412-2462 | 802.11b: DSSS (DBPSK, DQPSK, CCK)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| 5GHz WLAN | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5240<br>5260-5320<br>5500-5700<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |

## 1.2 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

| Brand Name | Equipment Name | Model Name | Description |
|---|---|---|---|
| tp-link | AC1750 Wi-Fi Range Extender | RE450 | All the equipment and model names are identical; the difference equipment name and model name served as marketing strategy. |
| | AC1900 MU-MIMO Wi-Fi Range Extender | RE550 | |

Note:

1. From the above models, model: RE450 was selected as representative model for the test and its data was recorded in this report.
2. The above information was declared by manufacturer.

## 1.3 Table for EUT support type

| Function |
|---|
| AP Router |
| Extender |

## 1.4 Testing Location

| Testing Location | | |
|---|---|---|
| ☐ | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973 |
| ☒ | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

# 2 Maximum Permissible Exposure

## 2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm²) | Averaging Time \|E\|²,\|H\|² or S (minutes) |
|---|---|---|---|---|
| 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

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm²) | Averaging Time \|E\|²,\|H\|² or S (minutes) |
|---|---|---|---|---|
| 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 |

Note: f = frequency in MHz ; *Plane-wave equivalent power density

## 2.2 MPE Calculation Method

The MPE was calculated at 21 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

**E** = Electric field (V/m)

**P** = RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

***Pd*** = $\frac{30 \times P \times G}{377 \times d^2}$

## 2.3 Calculated Result and Limit

**Exposure Environment: General Population / Uncontrolled Exposure**

| Mode | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S ($mW/cm^2$) | S Limit ($mW/cm^2$) |
|---|---|---|---|---|---|---|---|---|---|
| 2.4G;D1D | 6.77 | 26.78 | 33.55 | 0.50 | 34.05 | 2.54097 | 21 | 0.45851 | 1.00000 |
| 5.2G;D1D | 7.77 | 25.68 | 33.45 | 0.50 | 33.95 | 2.48313 | 21 | 0.44808 | 1.00000 |
| 5.3G;D1D | 7.77 | 22.11 | 29.88 | 0.11 | 29.99 | 0.99770 | 21 | 0.18003 | 1.00000 |
| 5.6G;D1D | 7.77 | 22.20 | 29.97 | 0.02 | 29.99 | 0.99770 | 21 | 0.18003 | 1.00000 |
| 5.8G;D1D | 7.77 | 26.28 | 34.05 | 0.50 | 34.55 | 2.85102 | 21 | 0.51446 | 1.00000 |

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WLAN 5GHz

| Mode | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S ($mW/cm^2$) | S Limit ($mW/cm^2$) | Ratio (S/Limit) |
|---|---|---|---|---|---|---|---|---|---|---|
| 2.4G;D1D | 6.77 | 26.78 | 33.55 | 0.50 | 34.05 | 2.54097 | 21 | 0.45851 | 1.00000 | 0.45851 |
| 5.8G;D1D | 7.77 | 26.28 | 34.05 | 0.50 | 34.55 | 2.85102 | 21 | 0.51446 | 1.00000 | 0.51446 |
| | | | | | | | | | Sum Ratio | 0.97297 |
| | | | | | | | | | Ratio Limit | 1 |

Note: The above antenna gain was declared by manufacturer.

———THE END———