RF Exposure Evaluation Declaration

FCC ID:	2AXJ4M4V4
APPLICANT:	TP-Link Corporation Limited
Application Type:	Certification
Product:	AC1200 Whole Home Mesh Wi-Fi System
Model No.:	Deco M4
Brand Name:	tp-link
FCC Classification:	Digital Transmission System (DTS) Unlicensed National Information Infrastructure (NII)
Test Procedure(s):	KDB 447498 D01v06

Reviewed By: Paddy Chen
(Paddy Chen)

Approved By: Chenz Ker
(Chenz Ker)

Testing Laboratory
3261

Revision History

Report No.	Version	Description	Issue Date	Note
2111TW0006-U3	V1.0	Original report	2022-01-04	Valid

CONTENTS

General Information

Applicant	TP-Link Corporation Limited
Applicant Address	Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hongkong
Manufacturer	TP-Link Corporation Limited
Manufacturer Address	Room 901, 9/F., New East Ocean Centre, 9 Science Museum Road, Tsim Sha Tsui, Kowloon, Hongkong
Test Site	MRT Technology (Taiwan) Co., Ltd
Test Site Address	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)
MRT FCC Registration No.	291082

Test Facility / Accreditations

1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.

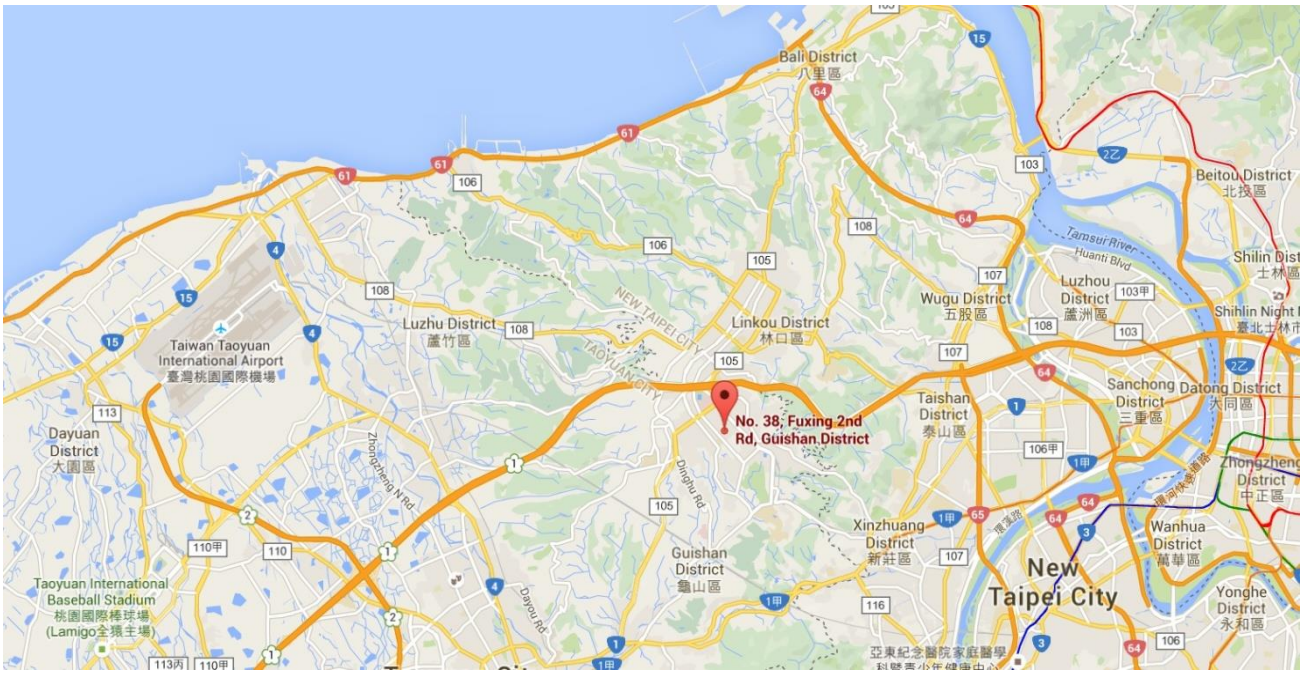
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	AC1200 Whole Home Mesh Wi-Fi System
Model No.	Deco M4
Wi-Fi Specification	802.11a/b/g/n/ac
Power Type	AC Power Adapter
Operating Environment	Indoor Use
Antenna Information	Refer to Section 2.2
Accessories	
AC Power Adapter	Model: T120150-2B1 Input: 100-240V ~ 50/60Hz, 0.6A Output: 12V, 1.5A

Note: The information shown above was provided by manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.

2.2. Description of Available Antennas

Antenna Type	Frequency Band (GHz)	Max Peak Gain (dBi)	CDD Directional Gain (dBi)	
			For Power	For PSD
Wi-Fi Antenna (2*2 MIMO)				
Dipole	2.4 ~ 2.5	1.5	1.5	4.51
	5.15 ~ 5.25	1.0	1.0	4.01
	5.725 ~ 5.85	1.0	1.0	4.01

Note:

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

For CDD transmissions, directional gain is calculated as follows, N_{ANT} =2, N_{SS} = 1.

If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + 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 = 3.01;

- For power measurements on IEEE 802.11 devices,

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

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^2)	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: $Pd = (Pout*G)/(4*pi*r^2)$

Where
Pd = power density in mW/cm^2
Pout = 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

Pd is the limit of MPE, $1mW/cm^2$. 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

Product	AC1200 Whole Home Mesh Wi-Fi System
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 2.2.

Test Mode	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Max EIRP (dBm)
802.11b/g/n	2412 ~ 2462	25.80	1.5	27.3
802.11a/n/ac	5180 ~ 5240, 5745 ~ 5825	26.90	1.0	27.9

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Compliance Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
802.11b/g/n	2412 ~ 2462	27.3	20.00	0.1068	1
802.11a/n/ac	5180 ~ 5240, 5745 ~ 5825	27.9	20.00	0.1227	1

CONCLUSION:

WLAN 2.4GHz, WLAN 5GHz can transmit simultaneously.

The max Power Density at R (20 cm) = $0.1068mW/cm^2 + 0.1227mW/cm^2 = 0.2295mW/cm^2 < 1mW/cm^2$.

Therefore, the compliance distance is 20cm.

The End

Appendix - External Photograph

Refer to “2111TW0006-External photo” file.

Appendix - Internal Photograph

Refer to “2111TW0006-Internal photo” file.