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Project No: CB10505398

Maximum Permissible Exposure Report

Applicant's company	Linksys LLC
Applicant Address	121 Theory Drive, Irvine, CA 92617, USA
FCC ID	Q87-LAPAC1750PO
Manufacturer's company	Linksys LLC
Manufacturer Address	121 Theory Drive, Irvine, CA 92617, USA

Product Name	AC1750 Pro Dual Band Access Point
Brand Name	LINKSYS
Model Name	LAPAC1750PRO
Ref. Standard(s)	47 CFR FCC Part 2 Subpart J, section 2.1091
Received Date	Feb. 24, 2016
Final Test Date	May 27, 2016
Submission Type	Class II Change

Testing Laboratory
1190

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SPORTON INTERNATIONAL INC.

Table of Contents

1. GENERAL DESCRIPTION 1
1.1. EUT General Information 1
1.2. Table for Class II Change 1
1.3. Testing Location 2
2. MAXIMUM PERMISSIBLE EXPOSURE 3
2.1. Limit of Maximum Permissible Exposure 3
2.2. MPE Calculation Method 3
2.3. Calculated Result and Limit 4

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA4N1172-39	Rev. 01	Initial issue of report	Jun. 21, 2016

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) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.2. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 431102

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Changing applicant address and manufacturer address to "121 Theory Drive, Irvine, CA 92617, USA" from "131 Theory Drive Irvine California 92617 United States". 2. Changing brand name to "LINKSYS" from "Linksys".	It does not need to test.
3. Adding a new adapter (Model No.: HK-AY-120A200-US). 4. Adding measurement of PoE (Model No.: P1021A), and it is would not be marketed.	It does not affect the Maximum Permissible Exposure.
5. Updating test rule of 5GHz band 1 to "New Rules" from "Old Rules". 6. Updating test rule of 5GHz band 4 to "15.407 (b)(4)(i) of New Rules (ET Docket No. 13–49; FCC 16–24)" from "Old Rules". 7. Changing the separation distance between radiator and human body to "0.21m" from "0.25m".	Maximum Permissible Exposure.

Note: The maximum combined average output power of 2.4GHz is based on original test report, it is for Maximum Permissible Exposure calculated use.

1.3. Testing Location

Testing Location			
☐	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
		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.
		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)*	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)*	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 = Peak 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

For 5GHz Band:

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11ac MCS2/Nss1 (VHT20): 26.17 dBm

Distance (cm)	Test Freq. (MHz)	Directional Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
21	5745	9.65	9.2257	26.17	414.4643	0.6903	1	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For 2.4GHz Band:

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11n MCS0 (HT20): 27.48 dBm

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
21	2437	4.40	2.7542	27.48	559.3469	0.2781	1	Complies

Conclusion:

Both of the WLAN 2.4GHz Band and WLAN 5GHz Band can transmit simultaneously, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ...etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is 0.2781 / 1 + 0.6903 / 1= 0.9684, which is less than "1". This confirmed that the device complies.