

## RF Exposure Report

**Report No.:** SA171204E07

**FCC ID:** Q87-03331

**Test Model:** WHW01

**Series Model:** VLP01, A01

**Received Date:** Dec. 04, 2017

**Test Date:** Dec. 08, 2017 to Jan. 12, 2018

**Issued Date:** Feb. 06, 2018

**Applicant:** Linksys LLC

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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### Release Control Record

| Issue No.   | Description       | Date Issued   |
|-------------|-------------------|---------------|
| SA171204E07 | Original release. | Feb. 06, 2018 |

## 1 Certificate of Conformity

**Product:** Velop

**Brand:** Linksys

**Test Model:** WHW01

**Series Model:** VLP01, A01

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Linksys LLC

**Test Date:** Dec. 08, 2017 to Jan. 12, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Wendy Wu , **Date:** Feb. 06, 2018  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Feb. 06, 2018  
May Chen / Manager

## 2 RF Exposure

### 2.1 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) |
|-------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| 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 <sup>2</sup> )*              | 30                     |
| 30-300                                                | 27.5                          | 0.073                         | 0.2                                 | 30                     |
| 300-1500                                              | ...                           | ...                           | f/1500                              | 30                     |
| 1500-100,000                                          | ...                           | ...                           | 1.0                                 | 30                     |

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE 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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

| WLAN      |           |              |                    |                      |              |                |
|-----------|-----------|--------------|--------------------|----------------------|--------------|----------------|
| Ant No.   | Brand     | Model        | Antenna Gain (dBi) | Frequency rang (GHz) | Antenna type | Connector type |
| 1         | ARISTOTLE | AP571-P11-P2 | 2.4                | 2.4~2.4835           | PCB          | i-pex(MHF)     |
|           |           |              | 3.6                | 5.15~5.85            |              |                |
| 2         | ARISTOTLE | AP571-P22-P5 | 1.36               | 2.4~2.4835           | PCB          | i-pex(MHF)     |
|           |           |              | 3.5                | 5.15~5.85            |              |                |
| Bluetooth |           |              |                    |                      |              |                |
| Ant No.   | Brand     | Model        | Antenna Gain (dBi) | Frequency rang (GHz) | Antenna type | Connector type |
| 1         | ARISTOTLE | AP571-BT-1   | 1.48               | 2.4~2.4835           | PCB          | i-pex(MHF)     |

## 2.5 Calculation Result of Maximum Conducted Power

### WLAN:

| Frequency Band (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462            | 474.875        | 4.91               | 20            | 0.29262                             | 1                           |
| 5180-5240            | 658.559        | 6.56               | 20            | 0.59337                             | 1                           |
| 5745-5825            | 700.831        | 6.56               | 20            | 0.63146                             | 1                           |

NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 4.91\text{dBi}$

5GHz:

UNII-1 & UNII-3: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 6.56\text{dBi}$

### BT-EDR

| Frequency Band (MHz) | Max. Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2402-2480            | 6.324           | 1.48               | 20            | 0.00177                             | 1                           |

### BT-LE

| Frequency Band (MHz) | Max. Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2402-2480            | 6.109           | 1.48               | 20            | 0.00171                             | 1                           |

### Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz + Bluetooth =  $0.29262 / 1 + 0.63146 / 1 + 0.00177 / 1 = 0.92585$

**Therefore the maximum calculations of above situations are less than the "1" limit.**

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