# RF Exposure Report

**Report No.:** SA160719C17K

**FCC ID:** 2AKCZ-0D0

**Model:** APL45-0D0

**Received Date:** Mar. 16, 2018

**Test Date:** Mar. 28 ~ Apr. 04, 2018

**Issued Date:** Jun. 04, 2018

**Applicant:** SonicWall Inc.

**Address:** 1033 McCarthy Blvd., Milpitas, CA 95035, USA

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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**Release Control Record**

| Issue No. | Description | Date Issued |
|---|---|---|
| SA160719C17K | Original release | Jun. 04, 2018 |

## 1 Certificate of Conformity

|                   |                            |
|------------------:|----------------------------|
| **Product:**      | Wireless Access Point      |
| **Brand:**        | SONICWALL                  |
| **Model:**        | APL45-0D0                  |
| **Sample Status:**| Engineering sample         |
| **Applicant:**    | SonicWall Inc.             |
| **Test Date:**    | Mar. 28 ~ Apr. 04, 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 RF characteristics under the conditions specified in this report.

**Prepared by :**  _Pettie Chen_  ,  **Date:**  Jun. 04, 2018

Pettie Chen / Senior Specialist

**Approved by :**  _Bruce Chen_  ,  **Date:**  Jun. 04, 2018

Bruce Chen / Project Engineer

## 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$^2$) | 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 | $(180/f^2)$* | 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

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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 30cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 3    Calculation Result of Maximum Conducted Power

| Frequency Band (MHz) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm$^2$) | Limit (mW/cm$^2$) |
|---|---|---|---|---|---|
| WLAN 2.4GHz: CDD mode | | | | | |
| 2412-2462 | 23.17 | 7.32 | 30 | 0.099 | 1 |
| WLAN 2.4GHz: Beamforming mode | | | | | |
| 2412-2462 | 19.81 | 7.32 | 30 | 0.046 | 1 |
| WLAN 5GHz: CDD mode | | | | | |
| 5180-5240 | 22.83 | 9 | 30 | 0.135 | 1 |
| 5250-5350 | 22.81 | 9 | 30 | 0.134 | 1 |
| 5470-5725 | 22.39 | 9 | 30 | 0.122 | 1 |
| 5745-5825 | 22.63 | 9 | 30 | 0.129 | 1 |
| WLAN 5GHz: Beamforming mode | | | | | |
| 5180-5240 | 19.77 | 9 | 30 | 0.067 | 1 |
| 5250-5350 | 19.80 | 9 | 30 | 0.067 | 1 |
| 5470-5725 | 19.38 | 9 | 30 | 0.061 | 1 |
| 5745-5825 | 19.49 | 9 | 30 | 0.062 | 1 |
| BT LE | | | | | |
| 2402-2480 | 2.95 | 3.51 | 30 | 0.0004 | 1 |

Note:

2.4GHz Band: Directional gain = 4.31+ 10log(2) = 7.32dBi

5GHz Band: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20 + ... +} 10^{GN/20})^2/2]$= 9dBi

| Frequency Band | Max Power (dBm) | | Total Power (dBm) | Power Limit (dBm) |
|---|---|---|---|---|
| | WLAN | BT LE | | |
| 2.4GHz | 23.17 | 2.95 | 23.21 | 30 |

**Conclusion:**

The WLAN 2.4G & WLAN 5G & BT LE 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

WALN 2.4GHz + WALN 5GHz + BT LE = 0.099 + 0.135 + 0.0004 = 0.2344

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

**---END---**