

## RF Exposure Report

**Report No.:** SA170712E09A

**FCC ID:** 2AAAS-NM01

**Test Model:** NM01

**Received Date:** July 12, 2017

**Test Date:** Aug. 31, 2017

**Issued Date:** Sep. 07, 2017

**Applicant:** Vivint, Inc.

**Address:** 4931 North 300 West Provo, Utah 84604 United States

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

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**Report Issue History Record**

Attachment No.	Issue Date	Description
SA170712E09	Aug. 15, 2017	Original release.
SA170712E09A	Sep. 07, 2017	Changed Diplexer.

**Release Control Record**

Issue No.	Description	Date Issued
SA170712E09A	Original release.	Sep. 07, 2017

## 1 Certificate of Conformity

**Product:** Vivint 2.4GHz/5GHz WiFi Module

**Brand:** Vivint

**Test Model:** NM01

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Vivint, Inc.

**Test Date:** Aug. 31, 2017

**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 :**

*Cindy Hsin*

**Date:**

Sep. 07, 2017

Cindy Hsin / Specialist

**Approved by :**

*May Chen*

**Date:**

Sep. 07, 2017

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

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

where

Pd = power density in mW/cm<sup>2</sup>

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 20cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

The antennas provided to the EUT, please refer to the following table:

No.	PCB Chain No	Brand	Model	Antenna Gain(dBi)	Frequency range	Antenna Type	Connector type	Cable Length (mm)	Cable Loss (dB)	excluding cable loss Antenna Gain(dBi)
1	Chain 0	NA	TE 2108517-1	2.5	2.4~2.4835GHz	PIFA	I-pex	60	0.5	3
				2	5.15~5.85GHz				1	
2	Chain 1	NA	TE 2108517-1	2	2.4~2.4835GHz	PIFA	I-pex	230	1	3
				1.5	5.15~5.85GHz				1.5	

## 2.5 Calculation Result of Maximum Conducted Power

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	499.746	5.26	20	0.33379	1
5180-5240	89.413	4.76	20	0.05323	1
5260-5320	92.483	4.76	20	0.05505	1
5500-5700	68.637	4.76	20	0.04086	1
5745-5825	72.062	4.76	20	0.04290	1

### NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.26\text{dBi}$

5 GHz : Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.76\text{dBi}$

### Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} = 0.33379 / 1 + 0.05505 / 1 = 0.38884$

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

**--- END ---**