

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.

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

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Date: Sep. 07, 2017

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Approved by :

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Date: Sep. 07, 2017

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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/cm²

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 ²)	Limit (mW/cm ²)
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

WLAN 2.4GHz + WLAN 5GHz = $0.33379 / 1 + 0.05505 / 1 = 0.38884$

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

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