RF Exposure Report

Report No.:	SA160530E01
FCC ID:	2AD8UFZCWI4A1
Test Model:	WI4A-AC400i
Received Date:	May 30, 2016
Test Date:	July 14 to Aug. 08, 2016
Issued Date:	Sep. 30, 2016
Applicant:	Nokia Solutions and Networks.OY
Address:	1455 West Shure Drive, Arlington Heights, IL 60004, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
SA160530E01	Original release.	Sep. 30, 2016

1 Certificate of Conformity

Product:	Wireless Access Point
Brand:	NOKIA
Test Model:	WI4A-AC400i
Hardware Version:	AM2
Sample Status:	ENGINEERING SAMPLE
Applicant:	Nokia Solutions and Networks.OY
Test Date:	July 14 to Aug. 08, 2016
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992 RSS-102 Issue 5 (2015-03)

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 : _____ , **Date:** Sep. 30, 2016

Midoli Peng / Specialist

Approved by : _____ , **Date:** Sep. 30, 2016

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^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

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 43cm 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:

Antenna spec.

Antenna No	PCB Chain No.	Brand	Model	Antenna Type	Gain(dBi)	Frequency (MHz)
1	Chain 2	Galtronics	02102140-06226A1	PIFA	3.92	2400
					3.99	2450
					4.28	2500
					3.81	5150
					3.71	5250
					4.06	5350
					5.83	5725
					6.21	5825
2	Chain 3	Galtronics	02102140-06226A2	PIFA	2.27	2400
					1.81	2450
					1.84	2500
					5.67	5150
					5.95	5250
					5.83	5350
					5.38	5725
					5.38	5825
3	Chain 1	Galtronics	02102140-06226A3	PIFA	2.42	2400
					2.45	2450
					2.71	2500
					5.69	5150
					5.41	5250
					5.2	5350
					4.92	5725
					5.07	5825
4	Chain 0	Galtronics	02102140-06226A4	PIFA	2.88	2400
					3.22	2450
					3.82	2500
					4.85	5150
					4.66	5250
					4.32	5350
					5.02	5725
					4.87	5825

Cable Spec.

Antenna No	Brand	Model	Connector Type	Cable Loss(dB)	Cable Length (mm)
1	Galtronics	RG-137	i-pex(MHF)	1.5	175
2	Galtronics	RG-137	i-pex(MHF)	1.3	130
3	Galtronics	RG-137	i-pex(MHF)	0.5	50
4	Galtronics	RG-137	i-pex(MHF)	0.8	75

2.5 Calculation Result of Maximum Conducted Power

For General Population

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	884.423	9.33	43	0.32622	1
5180-5240	534.298	11.14	43	0.29898	1
5745-5825	951.593	11.45	43	0.57188	1

Note: 1.For 2.4GHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4$] = 9.33dBi
2. For 5GHz UNII-1: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4$] = 11.14dBi
3. For 5GHz UNII-3: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4$] = 11.45dBi

For Occupational

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	884.423	9.33	20	1.50796	5
5180-5240	534.298	11.14	20	1.38201	5
5745-5825	951.593	11.45	20	2.64351	5

Note: 1.For 2.4GHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4$] = 9.33dBi
2. For 5GHz UNII-1: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4$] = 11.14dBi
3. For 5GHz UNII-3: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4$] = 11.45dBi

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

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

Model	Scenario	The formula of calculated the MPE	Calcualtion Power Density	Limit	Results
General Population)	WLAN 2.4GHz + WLAN 5GHz	0.32622/1 + 0.57188/1	0.89810	1	Pass
Occupational	WLAN 2.4GHz + WLAN 5GHz	1.50796/5 + 2.64351/5	0.83029	1	Pass

3 Brief Summary of results

The wireless device described within this report has been shown to be capable of compliance with the basic restrictions related to human exposure to electromagnetic fields for both General public and Occupational. The calculations shown in this report were made in accordance the procedures specified in the applied test specification(s)

Configuration	Required Compliance Boundary(m)	
	Occupational	General Population
2.4GHz WiFi + 5GHz WiFi	0.20	0.43

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