

RF Exposure Report

C2PC (Class II Permissive Change)

Report No.: SA160112E05E

FCC ID: 2AD8UFW2IADPM01

Test Model: FW2IADPM01

Received Date: Nov. 09, 2018

Test Date: Nov. 27, 2018 ~ Feb. 23, 2019

Issued Date: Feb. 26, 2019

Applicant: Nokia Solutions and Networks

Address: 2000 W. Lucent Lane, Naperville, IL 60563, USA

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

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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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 RF Exposure	5
2.1 Limits for Maximum Permissible Exposure (MPE).....	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
2.4 Antenna Gain	6
2.5 Calculation Result	7
3 Brief Summary of Results	8



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Release Control Record

Issue No.	Description	Date Issued
SA160112E05E	Original release.	Feb. 26, 2019

1 Certificate of Conformity

Product: Nokia FW2IA LTE Module

Brand: Nokia

Test Model: FW2IADPM01

Sample Status: MASS-PRODUCTION

Applicant: Nokia Solutions and Networks

Test Date: Nov. 27, 2018 ~ Feb. 23, 2019

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General Rf Exposure Guidance V06

IEEE STD C95.1

FCC Part 1 (Section 1.1310)

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:** Feb. 26, 2019

Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Feb. 26, 2019

Bruce Chen / Project Engineer

Note:

1. This is a supplementary report of Report No.: SA160112E05A. The differences between them are as below information:

- ◆ LTE B66 add NB-IOT In-band
- ◆ LTE B66 add NB-IOT Guard Band

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)
(A)Limits For Occupational / Control Exposures				
300-1500	F/300	6
1500-100,000	5	6
(B)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/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

For Occupational

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 fixed station and installations by professional service personnel.

For General Population

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 fixed station and installations by professional service personnel.

2.4 Antenna Gain

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

Antenna Spec.					
Antenna No	Brand	Model	Antenna Type	Gain(dBi)	Frequency (GHz)
LTE Ant1(Main)	Nokia	FW2IADPM01	Slot Antenna	6.03	1.7~2.7
Antenna No	Brand	Model	Antenna Type	Gain(dBi)	Frequency (GHz)
LTE Ant2(Aux)	Nokia	FW2IADPM01	Slot Antenna	4.64	1.7~2.7

Cable Spec.				
Brand	Model	Connector Type	Cable Loss(dB)	Cable Length (mm)
NA	NA	Right angle MMCX Plug	peak gain included	287

2.5 Calculation Result

Calculation for Maximum EIRP

For Occupational

Operation Mode	Channel Bandwidth	Conducted Output Power (dBm)	Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
LTE Band 66 NB-IOT In-band	5	26.41	6.03	20	0.349	5
	10	26.39	6.03	20	0.347	5
	15	26.38	6.03	20	0.347	5
	20	26.41	6.03	20	0.349	5
LTE Band 66 NB-IOT Guard Band	10	26.43	6.03	20	0.351	5
	15	26.38	6.03	20	0.347	5
	20	26.46	6.03	20	0.353	5

For General Population

Operation Mode	Channel Bandwidth	Conducted Output Power (dBm)	Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
LTE Band 66 NB-IOT In-band	5	26.41	6.03	20	0.349	1
	10	26.39	6.03	20	0.347	1
	15	26.38	6.03	20	0.347	1
	20	26.41	6.03	20	0.349	1
LTE Band 66 NB-IOT Guard Band	10	26.43	6.03	20	0.351	1
	15	26.38	6.03	20	0.347	1
	20	26.46	6.03	20	0.353	1

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
LTE Band 66	0.2	0.2

Note: Compliance Boundaries apply to both In Band and Guard Band NB IoT configurations.

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