

## RF Exposure Report

**Report No.:** SA160112E05D

**FCC ID:** 2AD8UFW2IADPM01

**Test Model:** FW2IADPM01

**Received Date:** July 17, 2018

**Test Date:** Aug. 06, 2018

**Issued Date:** Sep. 06, 2018

**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:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by any government agencies

## Table of Contents

<b>Release Control Record .....</b>	<b>3</b>
<b>1     Certificate of Conformity .....</b>	<b>4</b>
<b>2     RF Exposure .....</b>	<b>5</b>
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
<b>3     Brief Summary of results .....</b>	<b>8</b>

### Release Control Record

Issue No.	Description	Date Issued
SA160112E05D	Original release.	Sep. 06, 2018

## 1 Certificate of Conformity

**Product:** Nokia FW2IA LTE Module

**Brand:** Nokia

**Test Model:** FW2IADPM01

**Test Sample S/N:** EB181010957

**Hardware Version:** X23


**Sample Status:** MASS-PRODUCTION

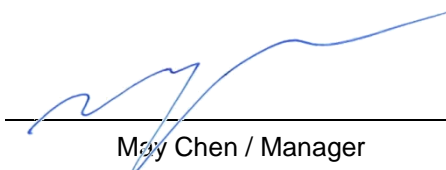
**Applicant:** Nokia Solutions and Networks

**Test Date:** Aug. 06, 2018

**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 EMC characteristics under the conditions specified in this report.

**Prepared by :**  , **Date:** Sep. 06, 2018  
Claire Kuan / Specialist

**Approved by :**  , **Date:** Sep. 06, 2018  
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)
(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

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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 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

**SC mode (Data was copied from the original test report, Report No.: SA160112E05A)**

Frequency Band (MHz)	EIRP Power (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2112.5-2177.5	912.011	20	0.1814	1

**MC mode**

**For LTE Band 66(Channel Bandwidth: 10MHz+15MHz GAP 15MHz)**

Operation Mode	Evaluation Frequency (MHz)	Max EIRP Power (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
LTE Band 66	2135+2162.5	774.46	20	0.15407	1

**For LTE Band 66 (Channel Bandwidth: 10MHz+15MHz GAP 20MHz)**

Operation Mode	Evaluation Frequency (MHz)	Max EIRP Power (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
LTE Band 66	2130+2162.5	785.24	20	0.15622	1

**For LTE Band 66 (Channel Bandwidth: 20MHz+20MHz GAP 20MHz)**

Operation Mode	Evaluation Frequency (MHz)	Max EIRP Power (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
LTE Band 66	2125+2165	831.76	20	0.16547	1

**For LTE Band 66 (Channel Bandwidth: 20MHz+20MHz Contiguous)**

Operation Mode	Evaluation Frequency (MHz)	Max EIRP Power (mW)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
LTE Band 66	2120+2140	853.1	20	0.16972	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

--- END ---