RF Exposure Report

Report No.:	SA160802E01B
FCC ID:	2AD8UFW2CA01
Test Model:	FW2CA
Received Date:	Aug. 02, 2016
Test Date:	Oct. 11, 2016
Issued Date:	Sep. 25, 2017
Applicant:	Nokia Solutions and Networks
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
SA160802E01B	Original release.	Sep. 25, 2017

1 Certificate of Conformity

Product:	Mini Macro Outdoor Pico BTS
Brand:	Nokia
Test Model:	FW2CA
Sample Status:	MASS-PRODUCTION
Applicant:	Nokia Solutions and Networks
Test Date:	Oct. 11, 2016
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE 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. 25, 2017

Claire Kuan / Specialist

Approved by : _____ , **Date:** Sep. 25, 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/cm2)	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/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 304cm away from the body of the user. So, this device is classified as **fixed device** and installations by professional service personnel.

2.4 Antenna Gain

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

Antenna Spec.						
Set	Antenna Condition	Brand	Model	Antenna Type	Gain(dBi)	Frequency (MHz)
1	LTE 1	Alpha Wireless	AW3439	PANEL Type	12.5	LTE B26 806-896
	LTE 2	Alpha Wireless	AW3439	PANEL Type	12.5	LTE B26 806-896
2	LTE 1	Alpha Wireless	AW3176	Omni Type	6	LTE B26 790-890
	LTE 2	Alpha Wireless	AW3176	Omni Type	6	LTE B26 790-890
3	LTE 1	Alpha Wireless	AW3543	Omni Type	4.5	LTE B26 806-896
	LTE 2	Alpha Wireless	AW3543	Omni Type	4.5	LTE B26 806-896

2.5 Calculation Result

All test data was copied from the original test report (Report No.: SA160802E01)

For General Population

LTE:

Operating Frequency (MHz)	Max. ERP Power (dBm)	Max. EIRP Power (dBm)	Max. EIRP Power (mW)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
865.1~ 866.5 (LTE B26)	56.10	58.25	667632.1	304	0.57488	0.5772

Note: Limit of Power Density = F/1500

Bluetooth module (FCC ID: 2AD8UNBTM01):

Operating Frequency (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2402-2480	9.099	1.45	304	0.00001	1

For Occupational

LTE:

Operating Frequency (MHz)	Max. ERP Power (dBm)	Max. EIRP Power (dBm)	Max. EIRP Power (mW)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
865.1~ 866.5 (LTE B26)	56.10	58.25	667632.1	136	2.87242	2.886

Note: Limit of Power Density = F/300

Bluetooth module (FCC ID: 2AD8UNBTM01):

Operating Frequency (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2402-2480	9.099	1.45	136	0.00005	5

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

For General Population

LTE + Bluetooth = 0.57488 / 0.5772 + 0.00001 / 1 = 0.996

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

For Occupational

LTE + Bluetooth = 2.87242 / 2.886 + 0.00005 / 5 = 0.995

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

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 26 + Bluetooth	1.36	3.04

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