RF Exposure Evaluation Declaration

FCC ID:	2AD8UFZMFWH201
Applicant:	Nokia Solutions and Networks, OY
Application Type:	Certification
Product:	Flexi Zone 2400
Model No.:	FWH2
Brand Name:	Nokia
FCC Classification:	Licensed Non-Broadcast Station Transmitter (TNB)
Test Procedure(s):	KDB 447498 D01v06

Reviewed By: Paddy Chen
(Paddy Chen)

Approved By:
(Chenz Ker)

Testing Laboratory
3261

Revision History

Report No.	Version	Description	Issue Date	Note
1812TW0108-U2	Rev. 01	Initial Report	05-03-2019	Valid

§2.1033 General Information

Applicant:	Nokia Solutions and Networks, OY
Applicant Address:	2000 W. Lucent Lane, Naperville, Illinois, United States, 60563
Manufacturer:	Nokia Solutions and Networks, OY
Manufacturer Address:	2000 W. Lucent Lane, Naperville, Illinois, United States, 60563
Test Site:	MRT Technology (Taiwan) Co., Ltd
Test Site Address:	No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Fuxing Rd., Taoyuan, Taiwan (R.O.C)

- **MRT facility is a FCC registered (Reg. No. 153292) test facility with the site description report on file and is designated by the FCC as an Accredited Test Film.**
- **MRT facility is an IC registered (MRT Reg. No. 21723-1) test laboratory with the site description on file at Industry Canada.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (TAF) under the American Association for Laboratory Accreditation Program (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC, Industry Taiwan, EU and TELEC Rules.**

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	Flexi Zone 2400
Model No.:	FWH2
Brand Name:	Nokia
Serial No.:	EB183400030
Hardware Version:	FWH2, 474328A.X11
Software Version:	TLF18A
GPS Working Frequency:	1575.42MHz
FCC ID of Built-in Bluetooth Module:	2AD8UNBTM01
LTE Operating Band:	LTE TDD Band 53
Frequency Range:	Uplink: 2483.5 ~ 2495 MHz; Downlink: 2483.5 ~ 2495 MHz
Carriers:	Up to 1 carrier
Carrier Bandwidth:	10MHz
Type of Modulation:	QPSK, 16QAM, 64QAM, 256QAM
T_X & R_X Configuration:	$2T_X$ & $2R_X$
Maximum Output Power:	Conducted Power: 29.87dBm EIRP: 34.88dBm
Emission Designator:	Refer to section 1.2
Antenna Information:	Refer to section 1.3 Transmit Antenna is connected directly to the 6dB attenuator
Accessory Information:	
Attenuator:	Position: One attenuator connected directly to the FWH2 main and diversity antenna ports. Attenuation: 6dB Nokia Part Number: 091860A

1.2. Emission Designator

Channel Bandwidth 10MHz:	QPSK: 8M95G7D
	16QAM: 8M95W7D
	64QAM: 8M96W7D
	256QAM: 8M95W7D

1.3. Antenna Information

Technology	Antenna Type	Nokia Part Number	Antenna Gain
LTE Band 53	Omni Antenna	473227A	2dBi

2. RF Exposure Evaluation

2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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 Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula: Pd = (Pout*G)/(4*pi*r2)

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

Pd is the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

Product	Flexi Zone 2400
Test Item	RF Exposure Evaluation (For General Population)

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Safety Distance (cm)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
LTE Band 53	2483.5 ~ 2495	34.88	20	0.6120	1
Bluetooth	2402 ~ 2480	9.59	20	0.0018	1

Product	Flexi Zone 2400
Test Item	RF Exposure Evaluation (For Occupational)

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Safety Distance (cm)	Power Density (mW/cm^2)	Limit of Power Density (mW/cm^2)
LTE Band 53	2483.5 ~ 2495	34.88	20	0.6120	5
Bluetooth	2402 ~ 2480	9.59	20	0.0018	5

2.3. Summary of Test Result

The maximum calculations of above situations

Model	Configuration	The formula of calculated the MPE (mW/cm^2)	Calculation Power Density (mW/cm^2)	Limit	Result
General Population	LTE + Bluetooth	0.6210 + 0.0018	0.6228	1	Pass
Occupational	LTE + Bluetooth	0.6210 + 0.0018	0.6228	5	Pass

The wireless device described within this report has been shown to be capable of compliance with 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 specifications

Configuration	Required Compliance Boundary (cm)	
	General Population	Occupational
LTE + Bluetooth	20	20

The End