EXHIBIT 5

RF EXPOSURE ASSESSMENT

Section 27.52 RF Exposure Requirement

Licensees and manufacturers are subject to the radio frequency radiation exposure requirements specified in sections 1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Section 1.1307 (b) Environmental Assessment Requirement for Equipment Authorization

Commission actions granting construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities, require the preparation of an Environmental Assessment (EA) if the particular facility, operation or transmitter would cause human exposure to levels of radiofrequency radiation in excess of the limits in §§ 1.1310 and 2.1093 of this chapter.

Response

The RF exposure assessment report is attached.

Global Product Compliance Laboratory
600-700 Mountain Avenue
Room 5B-108
Murray Hill, New Jersey 07974-0636 USA

RF Exposure Assessment Report

(FCC ID: 2AD8UFW2IMBOM1)

Regulation

47 CFR FCC Sections 1.1307 and 1.1310

Client

Nokia Solutions and Networks Oy

Product Evaluated

Flexi Zone Multiband Outdoor Micro Base Station (MBO) RF Transceiver Band 66 Module (PRI20183480)

GPCL Report Number
TR2018-0042 FCC MPE

GPCL Project Number
2018-0042

Date Issued
June 4, 2018

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Revisions

Date	Revision	Section	Change

The results documented in this report refer exclusively to the product specified, under the conditions and modes of operation as described herein.

Prepared By:

Signed: _____ 6/4/2018
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Reviewed By:

Signed: _____ 6/4/2018
R.J. Johnson — Date
GPCL Technical Manager

1. ATTESTATION OF TEST RESULTS

Company Name (Manufacturer)	Nokia Solutions and Network, OY 2000 W. Lucent Lane Naperville, IL 60563
FCC ID	2AD8UFW2IMBOM1
Product Name	Flexi Zone Multiband Outdoor Micro Base Station RF Transceiver Band 66 Module
Model Name	MBO B66
Test Requirement(s)	47 CFR FCC Part 27, 1.1307 and 1.1310
Other Reference(s)	FCC OET Bulletin 65, KDB 447498 D01
Frequency Band	1710-1780 MHz (Rx); 2110-2180 MHz (Tx) E-UTRAN Band 66
Test Report Number	TR2018-0042 FCC MPE
Test Laboratory	Global Product Compliance Laboratory 600-700 Mountain Avenue Room 5B-108 Murray Hill, New Jersey 07974-0636 USA

The above product has been evaluated and found to be in compliance with the Commission's Rules and Regulations set forth in the above standards. The data and the descriptions about the test setup, procedures and configuration presented in this report are accurate.

2. SUMMARY OF THE TEST RESULTS

Applied Standard(s): FCC 1.1310			
MBO B66 Equipped with Antenna	**Antenna Type**	**Exposure Envionment**	**Proposed RF Safety Distance (cm)**
#1 FA2EA	Omni-Direct	General Population/Uncontrolled	51
		Occupational/Controlled	23
#2-#5 FA2NB, FA2HA, FA2HC, FA2WA	Directional	General Population/Uncontrolled	113
		Occupational/Controlled	51

3. GENERAL INFORMATION

3.1. Product Descriptions

The Nokia Flexi Zone Multiband Outdoor Micro Base Station (MBO) is a small cell that consists of a common digital system module (host) and up to two LTE (Long Term Evolution) RF transceiver modules in various combinations and optional WiFi AP (Access Point) and Bluetooth (BT) RF transceivers. Each RF transceiver module supports 2 Tx/Rx branches. MBO digital system module supplies baseband signals, the baseband processing, control and timing to the radios.

The FW2IMBOM1 B66 RF Module (MBO B66) is a LTE Transceiver supporting a carrier bandwidth of 5/10/15/20 MHz and a maximum RF power output capability of 5W at each of its 2 MIMO transmit port outputs in the broadband extended AWS spectrum: AWS-1 (A-F, 2110-2155MHz) and AWS-3 (G-J, 2155-2180MHz).

There are multiple MBO variants which will use the B66 LTE RF Module. This data will be used in those MBO configuration specific (Maximum Permissible Exposure) reports (i.e. MBO B2/B66/BT and MBO B2/B66/BT/WiFi, etc.) as applicable. This RF exposure assessment is on MBO B66 FW2IMBOM1 (2.1GHz) only.

The MBO BTS can have either directly-connected antennas supplied by Nokia or customer-supplied remote antennas. In this evaluation, only Nokia supplied antennas were evaluated. The customers will be responsible for the RF exposure compliance with installing customer-supplied antennas.

The MBO is typically installed on poles or walls in fixed locations. Therefore, MBO is neither a portable nor a mobile wireless device. The specifications of the MBO B66 are provided below:

Table 3.1.1 Product Specifications on MBO Band 66*

Product	Model Name	Technologies	TX Freq (GHz)	Max Total Output Power (dBm rms)
B66	FW2IMBOM1	LTE-FDD, 5/10/15/20 MHz BW	2.11-2.18	40

*Maximum Total Output Power has taken MIMO into consideration.

3.2. Antenna Information

The information on the Nokia supplied antennas to be used by EUT were given below:

Table 3.2.1 Antenna Data from Manufacturers

Ant	Ant Type	Model Name	Max Gain for B66 (dBi)
1	Omni-Direc	FA2EA (473120A), 1.7-2.2GHz	**5** (Typ: 3.5, Min: 2)
2	Directional	FA2NB (474073A LTE WiFi LTE), 1.7-2.7GHz	**12** (Typ: 10, Min: 9)
3	Directional	FA2HA (473460A, LTE LTE), 1.7-2.7GHz	**12** (Typ: 10, Min: 9)
4	Directional	FA2HC (474786A, LTE LTE LTE), 1.7-2.7GHz	**12** (Typ: 10, Min: 9)
5	Directional	FA2WA (473461A, LTE LAA LTE), 1.7-2.7GHz	**12** (Typ: 10, Min: 9)

4. REQUIRED EVALUATION AND RESULTS

4.1. Regulatory Requirements

The assessment in this report was performed for MBO Band 66, operatng in 2.1GHz AWS band.

The regulatory requirements for the RF exposure compliance of RF transceivers were specified in 47 CFR FCC Parts 27 and 1.

The FCC 27.52 and 1.1310 sets out the requirements and measurement techniques used to evaluate RF exposure compliance of radiocommunication apparatus:

I. FCC Section 27.52 RF Exposure Requirements

Licensees and manufacturers are subject to the radio frequency radiation exposure requirements specified in sections 1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Technical information showing the basis for this statement must be submitted to the Commission upon request.

II. FCC Section 1.1307(b) Evaluation Environmental Assessment Requirement for Equipment Authorization

Commission actions granting construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities, require the preparation of an Environmental Assessment (EA) if the particular facility, operation or transmitter would cause human exposure to levels of radiofrequency radiation in excess of the limits in FCC Sections 1.1310 and 2.1093.

III. FCC Section 1.1310 Radio Frequency Radiation Exposure Limits

At operating frequencies less than or equal to 6 GHz, the limits for maximum permissible exposure (MPE), derived from whole-body SAR limits and listed in Table 1 of Section 1.1310, may be used instead of whole-body SAR limits to evaluate the environmental impact of human exposure to RF radiation as specified in Section 1.1307(b), except for portable devices as defined in § 2.1093 as these evaluations shall be performed according to the SAR provisions in Section 2.1093 of this chapter.

At operating frequencies above 6 GHz, the MPE limits shall be used in all cases to evaluate the environmental impact of human exposure to RF radiation as specified in Section 1.1307(b).

The MPE limits listed in Table 1 of Section 1.1310 are for continuous exposure, that is, for indefinite time periods. Exposure levels higher than the limits are permitted for shorter exposure times, as long as the average exposure over the specified averaging time in Table 1 is less than the limits. Detailed information regarding procedures for evaluating compliance with all of these exposure limits can be found in the FCC's OET Bulletin 65, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields,” and in supplements to Bulletin 65.

The exposure limits specified for occupational/controlled exposure and general population/uncontrolled exposure, which are tabulated below shall be met.

Table 4.1.1 Limits for Occupational/Controlled Exposure and General Population/Uncontrolled Exposure (FCC Section 1.1310 Table 1(B))

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magentic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Average Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
(A) Limits for Occupational/Controlled Exposure				
300 - 1500			f/300	6
1500 – 100,000			5.0	6
(B) Limits for General Population/Uncontrolled Exposure				
300 - 1500			f/1500	30
1500 – 100,000			1.0	30

Note: f = frequency in MHz.

4.2. RF Exposure Assessment

The regulatory requirements and limits were provided in Section 4.1. The product specifications on RF transceivers and antennas were provided in Section 3.

The limits at the operation frequencies of transmitters installed in EUT were calculated and provided in Table 4.2.1, where all of the transmitters installed in MBO BTS operate in the frequency range above 1.5GHz, but below 6GHz.

Table 4.2.1 Power Density Limits for Occupational/Controlled Exposure and General Population/Uncontrolled for MBO BX/B66/BT/WiFi System

Environment	Frequency Range (MHz)	Min Power Density (S) (mW/cm^2)
Occupational/Controlled	1900-6000	5
General Population/Uncontrolled	1900-6000	1

Per IEEE C95.3 Annex B Equation (37) or FCC's OST/OET Bulletin Number 65, the appropriate safety distance can be calculated based on the relationship between power density limit and EIRP (equivalent or effective isotopically radiated power), i.e.,

$$S = \frac{EIRP}{4\pi R^2}, \qquad (1)$$

where S is the power density in mW/cm^2, R is the distance to the center of radiation of the antenna in cm and EIRP is in mW.

When all transmitters or channels operate simultaneously, the EIRP and thus power density from all transmitters gives the worst-case scenario.

The RF exposure assessment was conducted on the MBO B66.

Table 4.2.2(a) Minimum RF Safety Distances of MBO B66 for Uncontrolled Exposure

Ant No	Freq Band (GHz)	Max Total P_{out} (2x2) (dBm)	Antenna Gain (dBi)	Max Total EIRP (dBm)	Max Total EIRP (mW)	Limit of Pwr Density S (mW/cm^2)	RF Safety Distance (cm)
1	2.11	40	5	45	31622.78	1	50.2
2-5	2.11	40	12	52	158489.32	1	112.3

Table 4.2.2(b) Minimum RF Safety Distances of MBO B66 for Controlled Exposure

Ant No	Freq Band (GHz)	Max Total P_{out} (2x2) (dBm)	Antenna Gain (dBi)	Max Total EIRP (dBm)	Max Total EIRP (mW)	Limit of Pwr Density S (mW/cm^2)	RF Safety Distance (cm)
1	2.11	40	5	45	31622.78	5	22.4
2-5	2.11	40	12	52	158489.32	5	50.22

With the minimum RF safety distances of MBO B66 at 51cm for uncontrolled exposure and at 23cm for controlled exposure for the omni-directional antenna #1 and the minimum RF safety distances of MBO B66 at 113cm for uncontrolled exposure and at 51cm for controlled exposure for the directional antennas #2-#5,

Table 4.2.3(a) Minimum RF Safety Distances of MBO B66 for Uncontrolled Exposure

Ant No	Freq Band (GHz)	Max P_{out} (2x2) (dBm)	Ant Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Safety Distance (cm)	S (mW/cm^2)	Lmt S (mW/cm^2)	Results
1	2.11	40	5	45	31622.8	51	0.97	1	Pass
2-5	2.11	40	12	52	158489.3	113	0.99	1	Pass

Table 4.2.3(b) Minimum RF Safety Distances of MBO B66 for Controlled Exposure

Ant No	Freq Band (GHz)	Max P_{out} (2x2) (dBm)	Ant Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Safety Distance (cm)	S (mW/cm^2)	Lmt S (mW/cm^2)	Results
1	2.11	40	5	45	31622.8	23	4.76	5	Pass
2-5	2.11	40	12	52	158489.3	51	4.85	5	Pass

Therefore,

Table 4.2.4 Proposed FCC RF Safety Distances for MBO Band 66

Antenna	Antenna Type	Exposure	RF Safety Distance (cm)
#1 FA2EA	Omni-Direct	General Population/Uncontrolled	51
		Occupational/Controlled	23
#2-#5 FA2NB, FA2HA, FA2HC, FA2WA	Directional	General Population/Uncontrolled	113
		Occupational/Controlled	51

5. REFERENCES

[1]. Title 47 Code of Federal Regulations (CFR) Parts 1, 2 and 27.

[2]. FCC OET Bulletin 65 and Supplements, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, August 1997

[3]. KDB 447498 D01, RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices, Oct 2015, V06

[4]. IEEE C95.3, IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz–300 GHz, 2002 (R2008).