

**EXHIBIT 13****RF EXPOSURE ASSESSMENT****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.

**Section 1.1310 Radio Frequency Radiation Exposure Limits**

The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Section 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter. Further information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation."

Response

The Nokia Flexi Zone Multiband Outdoor Micro Base Station (MBO) is typically installed on poles or walls in fixed locations. Therefore, MBO is neither a portable nor a mobile wireless device. The maximum configuration of the MBO B2/B66/WiFi consists of four RF transceiver modules: MBO B2 FW2FMBOM1 (1.9GHz), MBO B66 FW2IMBOM1 (2.1GHz), WiFi AP FZCWMBOM1 (2.4GHz and 5GHz) and Bluetooth NBTM01 (2.4GHz). This RF exposure assessment is on MBO B66 FW2IMBOM1 (2.1GHz) only. The RF exposure assessment for the overall Nokia Flexi Zone MBO Base Station system will be evaluated separately to ensure the compliance.

The MBO BTS can have either directly-connected omnidirectional stick 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 information on Nokia supplied antennas is provided in Table 13.1.

The limits specified in FCC Section 1.1310 Table 1(B) for occupational/controlled exposure and general population/uncontrolled exposure, which are tabulated below in Table 13.2, shall be met.

All of the transmitters installed in MBO BTS operate in the frequency range of 1.9GHz - 5GHz. The maximum power density thus needs to be less than 1.0 mW/cm<sup>2</sup> for general population/uncontrolled environment and 5.0 mW/cm<sup>2</sup> for occupational/controlled environment.

Per FCC's OST/OET Bulletin Number 65, the appropriate EIRP (equivalent or effective isotropically radiated power) limits can be calculated based on the relationship between power density and EIRP, i.e.,

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

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

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

**Table 13.1 MBO B66 Antenna**

Antenna	Model	Antenna Gain (dBi)
Omni LTE	FA2EA (473120A) & 1.7-2.2GHz	Peak: 5; (Typ: 3.5, Min: 2)

**Table 13.2 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)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Average Time  E  <sup>2</sup> ,  H  <sup>2</sup> 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 om MHz; \*Plane-wave equivalent power density.

**Table 13.3 (a) Minimum RF Safety Distances for Uncontrolled Exposure**

Module	Freq Band (GHz)	Maxi Total P <sub>out</sub> (2x2) (dBm)	Antenna Gain (dBi)	Maximum Total EIRP (dBm)	Maximum Total EIRP (mW)	Limit of Power Density S (mW/cm <sup>2</sup> )	RF Safety Distance (cm)
MBO B66	2.1	40	5	45	31622.78	1	50.2

**Table 13.3 (b) Power Density at the Proposed Minimum RF Safety Distance**

Module	Freq Band (GHz)	Maxi Total P <sub>out</sub> (2x2) (dBm)	Maxi Antenna Gain (dBi)	Maximum Total EIRP (dBm)	Maximum Total EIRP (mW)	RF Safety Distance (cm)	Limit of Power Density S (mW/cm <sup>2</sup> )
MBO B66	2.1	40	5	45	31622.78	51	0.9675

**Table 13.4 (a) Minimum RF Safety Distances for Controlled Exposure**

Module	Freq Band (GHz)	Maxi Total P <sub>out</sub> (2x2) (dBm)	Antenna Gain	Maximum Total EIRP (dBm)	Maximum Total EIRP (mW)	Limit of Power Density S (mW/cm <sup>2</sup> )	RF Safety Distance (cm)
MBO B66	2.1	40	5	45	31622.78	5	22.4

**Table 13.4 (b) Power Density at the Proposed Minimum RF Safety Distance**

Module	Freq Band (GHz)	Maxi Total P <sub>out</sub> (2x2) (dBm)	Antenna Gain (dBi)	Maximum Total EIRP (dBm)	Maximum Total EIRP (mW)	RF Safety Distance (cm)	Limit of Power Density S (mW/cm <sup>2</sup> )
MBO B66	2.1	40	5	45	31622.78	23	4.7570

Therefore, the RF safety distance for the Nokia Flexi Zone MBO B66 RF module shall be larger than 23 cm for occupational/controlled exposure and larger than 51 cm for general population/uncontrolled exposure.

Results

The results are summarized below in Tables 13.5.

**Table 13.5 Minimum RF Safety Distances for MBO B66 RF Module**

<b>Exposure</b>	<b>RF Safety Distance (cm)</b>	<b>Total Power Density S (mW/cm<sup>2</sup>)</b>	<b>Limit of Power Density S (mW/cm<sup>2</sup>)</b>
Occupational/Controlled	23	4.7570	5
General Population/Uncontrolled	51	0.9675	1