



Timco Engineering Inc.

**FCC Authorized Telecommunications
Certification Body (TCB)**

December 7, 2017

Sid Sanders - President

Timco Engineering Inc.

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P.O. Box 370

Newberry, Florida 32669

Nokia Bell Labs

Nokia, Global Product Compliance Laboratory

600-700 Mountain Avenue

Room 5B-108

Dear Mr. Sanders:

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. Each RF transceiver module supports 2 Tx/Rx branches. Additionally, the product supports a Bluetooth module NBTM01 and an optional WiFi AP (Access Point) RF module FZCWMBOM1 which have previously been certified.

The **FW2QMBOM1 B48 CBRS RF Module (MBO B48)** is a new LTE-TDD Transceiver supporting 10, 15 and 20 MHz carrier bandwidths and has a maximum RF power output capability of 2W at each of its 2 MIMO transmit port outputs. The **MBO B48** transceiver module, the subject of this application, is always co-located with an MBO digital system (host) module, and

- is housed in a sealed enclosure;
- contains its own power supply DC-DC regulation on the module;
- is equipped with the antennas that are only permitted to be directly connected to the MBO B48 module and are specifically offered by Nokia for direct attachments;
- is limited to be installed and operate only on the common Nokia Flexi Zone MBO system module (host) unit where the model numbers reflect the actual RF Module configuration;
- has its own permanently affixed FCC ID and label under **2AD8UFW2QMBOM1**;
- is verified to be compliant with FCC Part 15 Subpart B Class B Compliance for radiated emissions and AC power port conducted emissions when installed in the final system module/host maximum configuration;
- complies with the RF exposure requirements with the minimum safety distances provided in RF exposure exhibit for the **MBO B48** module and in the user's manual for various system configurations, evaluated with the highest available antenna gain of Nokia authorized antennas;
- the **MBO B48** and its end product is a non-consumer product, certified and housed in a sealed enclosure, and is only accessible and installed by trained/approved maintenance personnel. This product is not marketed or available to the general public.
- the **MBO B48** and its end product are factory assembled/ calibrated and are not field serviceable.

Per KDB 996369 D01 Clause III, Nokia hereby requests a Limited Single Modular certification for the MBO B48 transceiver, under **FCC ID: 2AD8UFW2QMBOM1**, operating with 10M00F9W, 15M00F9W and 20M00F9W Emissions designators in the **Citizens Band Radio Service (CBRS)** under **Part 90 Subpart Z**. This application is for certification using an unrestricted contention based protocol as allowed under **Part 90 Subpart Z** for the **3650-3700 MHz** portion of the **CBRS** band. The **MBO B48** will use 2x2W MIMO operation in the **Citizens Band Radio Service** spectrum (3650-3700 MHz) as allowed under **Title 47CFR Part 90 Subpart Z**.



Certification for operation in the **Part 96** spectrum, utilizing a SAS, and operating over the full 3550-3700 MHz range will be addressed in an FCC Class II change at a later date. The measurement exhibits attached to this application demonstrate full compliance with FCC **47CFR Part 90 Subpart Z** following the procedural requirements specified in FCC Part 2 Subpart J – Equipment Authorization Procedures and FCC Pre-Approval Guidance which are detailed in the confidential Operational Description Exhibit.

The data, summarized below, is in the form presently used by the Commission's Radio Equipment List.

Equipment Identification:	2AD8UFW2QMBOM1
Rules Part Number:	Part 90 Subpart Z – Citizens Band Radio Service
Frequency Range:	Transmit/Receive 3650-3700 MHz (LTE-TDD)
Output Power:	0.02 to 2 Watts per output, 4 Watts total per module.
Frequency Tolerance:	± 0.05 ppm
Emission Designators:	10M00F9W, 15M00F9W, 20M00F9W
Grant Notes:	MO, 4W total for 2 ports, Multicarrier, 2xMIMO Operation

This module is limited to Nokia Flexi Zone Multiband Outdoor Micro Base Station as described in this filing. RF exposure compliance is addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of §1.1307(b)(3). Compliance of this device in all final product configurations is the responsibility of the Grantee.

Attached are the FCC Form 731 (Application for Equipment Authorization – Radio Frequency Devices), the required measurement data and exhibits specific to this request for authorization of the MBO B48 transceiver. The technical or non-technical contact at Nokia will comply with any request for additional information should the need arise. The attached exhibits with the applicable FCC Rule sections are assembled and presented in accordance with the *Table of Contents* attachment. Included is a formal letter requesting confidentiality for the following exhibits:

<u>Exhibit #</u>	<u>FCC Rule Section</u>	<u>Exhibit Title</u>
Exhibit 5	Section 2.1033(c) (6, 8, 9, 10, 13)	Operational Description
Exhibit 6	Section 2.1033(c) (10)	Block Diagram
Exhibit 7	Section 2.1033(c) (10)	Circuit Schematic Diagrams
Exhibit 8	Section 2.1033(c) (3)	User's Manual
Exhibit 9	Section 2.1033(c) (12)	Internal Photographs

Should there be any questions or procedural issues please feel free to contact me by email and/or phone.

Sincerely,

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Att. Table of Contents for the **Nokia Flexi Zone Multiband Outdoor Micro Base Station (MBO)** Product Certification Report

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Cover Letter

Requests for Permanent and Short-Term Confidentiality with NDA (Non-Disclosure Agreement)

<u>Exhibit #</u>	<u>FCC Rule Number</u>	<u>Description</u>	<u>Notes</u>
Exhibit 1	Section 2.1033(a)	FCC Form 731	
Exhibit 2	Section 2.911 (d)	Qualifications	
Exhibit 3	Section 2.1033(c) (1,2,4,5,7)	Manufacturer, FCC Identifier, Emission Types Frequency Range and Maximum Power Rating	
Exhibit 4	Section 2.1033(c) (11)	Drawing of the Identification Label	
Exhibit 5	Section 2.1033(c) (6,8,9,10,13)	Operational Descriptions	Confidential
Exhibit 6	Section 2.1033(c) (10)	Block Diagram	Confidential
Exhibit 7	Section 2.1033(c) (10)	Circuit Schematic Diagrams	Confidential
Exhibit 8	Section 2.1033(c) (3)	User's Manual	Confidential
Exhibit 9	Section 2.1033(c) (12)	Internal Photographs	Confidential
Exhibit 10	Section 2.1033(c) (12)	External Photographs of the Equipment	
Exhibit 11	Section 2.1033(c) (21)	Test Setup Drawings or Photographs	
Exhibit 12	Section 2.1033(c)(14)	Test Report	
Exhibit 13	Section 1.1310	RF Exposure Report	

Test Report Exhibit 12

Test Report

<u>Paragraph#</u>	<u>FCC Rule Number</u>	<u>Description of Test Report Exhibits</u>
4	Section 2.1033(c)(14)	Listing of Required Measurements
4.1	Section 2.1046	Measurement of Radio Frequency Power Output
4.2	Section 2.1047	Measurement of Modulation Characteristics
4.3	Section 2.1049	Measurement of Occupied Bandwidth and Edge of Band Emissions
4.4	Section 2.1051	Measurement of Spurious Emissions at Antenna
4.5	Section 2.1053	Field Strength of Spurious Radiation
4.6	Section 2.1055	Measurement of Frequency Stability
4.7	Part 90 Subpart Z	Contention Protocol Response (Listen Before Transmit)
4.8	Section 2.947 (d)	List of Test Equipment
4.9	Section 2.1033(c) (21)	Photographs of the Test Setups
4.10	Section 2.948	Facilities and Accreditation