

**Timco Engineering Inc.
FCC Authorized Telecommunications
Certification Body (TCB)**

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

August 30, 2018

Bruno Clavier- General Manager
Timco Engineering Inc.
849 N.W. State Road 45
P.O. Box 370
Newberry, Florida 32669

Dear Mr. Clavier

The Nokia **AirScale 28 GHz Radio Unit (AEUA)** is the subject of this request for a new FCC Product Certification under **FCC ID: VBNAEUA-01**. The **AEUA** is an 800 MHz bandwidth LTE / New Radio Transceiver with a total power output capability of 57 dBm EIRP per polarization for a total power of 60 dBm EIRP. It operates as a 2x2 MIMO transmitter in the **Part 30 Upper Microwave Flexible Use Service** spectrum utilizing **5G New Radio (NR)** technology. Nokia Bell Labs, part of the Nokia family of companies, hereby requests certification for single carrier operation utilizing this **5G New Radio** OFDM based air interface. This is a new design and all of the required supporting exhibits are attached.

This application is for unrestricted certification under Part 30 in the 27.5 – 28.35 GHz portion of the Upper Microwave Flexible Use Service spectrum. The **AEUA AirScale 28 GHz Radio Unit** implements two 16x16 active element phased array modules to provide 2x2 MIMO operation using **97M5G7W** emissions designators in the **Upper Microwave Flexible Use Service** spectrum (27-5 – 28.35 GHz) as allowed under **47CFR Part 30**.

The measurement exhibits attached to this application demonstrate full compliance with FCC Part 30 following the procedural requirements specified in FCC Part 2 Subpart J – Equipment Authorization Procedures.

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

Equipment Identification:	VBNAEUA-01
Rules Part Number:	Part 30
Emissions Designator:	97M5G7W (5G-NR) (LTE-TDD Based)
Frequency Range:	Transmit/ Receive: 27.5 – 28.35
Output Power:	57 dBm EIRP per polarization, 60 dBm EIRP Total Output for 2 polarizations operating in a 2x2 MIMO configuration
Frequency Tolerance:	± 0.05 ppm

Because of the developmental nature of **5G-NR** and planned multicarrier operation, a FCC Class II change at a later date is planned. At that time additional emissions designators, multi carrier operation and the latest release of **5G New Radio (NR)** will be addressed.

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-CBRS FW2QMBOM1**. The technical or non-technical contact at Nokia Bell Labs will comply with any request for additional information should the need arise. The attached exhibits with the applicable FCC Rule section are assembled and presented in accordance with the *Table of Contents* attachment. Included is a formal letter requesting confidentiality for the following exhibits:

List of Confidential Exhibits

<u>Exhibit #</u>	<u>FCC Rule Section</u>	<u>Exhibit Title</u>
Exhibit 5	Section 2.1033(c)(8,9)	Active Circuit Devices Drive Levels, Tune-Up procedure
Exhibit 6	Section 2.1033(c)(10,13)	Block Diagram, Operational Description, Circuitry for determining frequency)
Exhibit 7	Section 2.1033(c)(10)	Complete Circuit Diagrams)
Exhibit 8	Section 2.1033(c)(12,3)	Instruction Book (Installation Manual or Users Manual)
Exhibit 9	Section 2.1033(c)(12)	Internal Photographs of the Equipment

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



Raymond J. Johnson
Technical Manager
FCC Compliance Test Group
Nokia, Global Product Compliance Laboratory
Phone: +1 908 679 6220
email: ray.johnson@nokia-bell-labs.com

Primary Administrative Contact

Raymond J. Johnson
Technical Manager
FCC Compliance Test Group
Nokia, Global Product Compliance Laboratory
Building 5A-127
600 Mountain Avenue
Murray Hill, NJ 07974
Phone: +1 908 679 6220
email: ray.johnson@nokia-bell-labs.com

Filing Engineer

W. Steve Majkowski NCE
Filing Lead Engineer
Nokia, Global Product Compliance Laboratory
Building 5B-103
600 Mountain Avenue
Murray Hill, NJ 07974
Phone +1 908 608-8004
email: steve.majkowski@nokia-bell-labs.com

Att. Table of Contents for the **AirScale 28 GHz Radio Unit (AEUA)** Product Certification Report

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Request for Confidentiality

Exhibit

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2	Section 2.911(d)	Qualifications and Certifications	
3	Section 2.1033(c)(1,2, 4-7)	Manufacturers, FCC Identifier, Emission, Range of RF Power & Frequency	
4	Section 2.1033(c)(11)	Drawing of the Identification Label	
5	Section 2.1033(c)(8,9)	Active Circuit Devices Drive Levels, Tune-Up procedure	(Confidential)
6	Section 2.1033(c)(10,13)	Block Diagram, Operational Description, Circuitry for determining frequency	(Confidential)
7	Section 2.1033(c)(10)	Complete Circuit Diagrams	(Confidential)
8	Section 2.1033(c)(12,3)	Instruction Book (Installation Manual or Users Manual)	(Confidential)
9	Section 2.1033(c)(12)	Internal Photographs of the Equipment	(Confidential)
10	Section 2.1033(c)(12)	External Photographs of the Equipment	
11	Section 2.1033(c)(10, 13)	Description of Modulation System,	
12	Section 2.1033(c)(21)	Photographs of the Test Setups	

Test Report

Section

<u>Number</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
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4.5	Section 2.1053	Field Strength of Spurious Radiation
4.6	Section 2.1055	Measurement of Frequency Stability
4.8	Section 2.1041(b)	List of Test Equipment
4.9	Section 2.1033(c)(21)	Photographs of the Test Setups
4.10		Facilities and Accreditation