



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

Alcatel-Lucent USA, Inc.
Building 5B-111
600 Mountain Avenue
Murray Hill, NJ 07974

September 20, 2016

Sid Sanders - President
Timco Engineering Inc.
849 N.W. State Road 45
P.O. Box 370
Newberry, Florida 32669

Dear Mr. Sanders:

The Alcatel-Lucent **AWS LTE B66a RRH 4x45W** was previously authorized, as original equipment, for the AWS-1 spectrum 2110 – 2155 MHz, under FCC ID: AS5BBTRX-28 with Grant Date 3/08/2016.

Alcatel-Lucent USA Inc., part of the Nokia family of companies, hereby requests that the FCC authorize a Class II Permissive Change, under AS5BBTRX-28, to add the additional spectrum AWS-3 2155 – 2180 MHz. This change is by software only. The LTE B66a RRH (Remote Radio Head) can operate either as 4x45W MIMO (4T4R) or as 2x90W MIMO (2T4R), with a total composite RF power of 180 W (52.55 dBm). Either single or dual carriers (both contiguous and non-contiguous) are supported with bandwidths (BW) of 5 MHz, 10 MHz, 15 MHz and 20 MHz, and corresponding emission designators 5M00F9W, 10M0F9W, 15M0F9W and 20M0F9W, respectively, with supported operation under the 3GPP2 Long Term Evolution (LTE) communication standard. Three LTE modulation schemes are also supported: QPSK (Quadrature Phase-Shift Keying), 16QAM and 64QAM (Quadrature Amplitude Modulation).

This authorization request is for **AWS LTE B66a RRH 4x45W** operation with the bandwidths (BW), modulations and emission designators previously cited, and over the AWS-3 spectrum 2155 – 2180 MHz (AWS Blocks G, H, I, J), subject to PART 27—MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES, Subpart C—Technical Standards, §27.53 Emission Limits, (h) AWS Emission Limits. The measurement exhibits attached to this application demonstrate full compliance with FCC Part 27, Subpart C, 27.53 (h), 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:	AS5BBTRX-28
Rules Part Number:	Part 27 Subpart C, Part 27.53 (h) AWS Emission Limits
Frequency Range:	Transmit 2155 – 2180 MHz (Blocks G-H-I-J)
Output Power:	90 Watts Maximum per Antenna Port 2T4R; 45 W for 4T4R
Frequency Tolerance:	± 0.05 ppm
Emission Designator:	5M00F9W, 10M0F9W, 15M0F9W and 20M0F9W

Attached are the FCC Form 731 (Application for Equipment Authorization – Radio Frequency Devices), the required measurement data and exhibits specific to this request for Class II Permissive Change authorization of the **AWS LTE B66a RRH 4x45W**. 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 section, are assembled and presented in accordance with the *Table of Contents* attachment.

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
Global Product Compliance Laboratory
Phone: 908-582-5575
email: ray.johnson@nokia-bell-labs.com

Primary Administrative Contact

Raymond J. Johnson
Technical Manager
Global Product Compliance Laboratory
Building 5B-111
600 Mountain Avenue
Murray Hill, NJ 07974
Phone: 908-582-5575
email: ray.johnson@nokia-bell-labs.com

Filing Engineer

Michael P. Farina
Global Product Compliance Laboratory
Building 28-114M
600 Mountain Avenue
Murray Hill, NJ 07974
Phone 908-582-3857
email: michael.farina@nokia.com

Att. Table of Contents for the **AWS LTE B66a RRH 4x45W** Product Certification Report

TABLE OF CONTENTS

Cover Letter

<u>Exhibit #</u>	<u>FCC Rule Number</u>	<u>Description</u>	
Exhibit 1	Section 2.1033(a)	FCC Form 731	
Exhibit 2	Section 2.911 (d)	Qualifications and Certifications	
Exhibit 3	Section 2.1033(c) (1,2,4,5,6,7,8,9,10)	Manufactures, FCC Identifier, Emission, Frequency Range, RF Power Range, Dc Voltages, Tune-Up	
Exhibit 4	Section 2.1033(c) (11)	Drawing of the Identification Label	
Exhibit 5	Section 2.1033(c) (3)	Instruction Manual (Installation Manual or Users Manual)	(Confidential)
Exhibit 6A	Section 2.1033(c) (10)	Block Diagram, Operational Description	(Confidential)
Exhibit 6B	Section 2.1033(c) (10)	Schematic Diagrams	(Confidential)
Exhibit 7	Section 2.1033(c) (12)	Internal Photographs of the Equipment	(Confidential)
Exhibit 8	Section 2.1033(c) (13)	Description of Modulation System and Circuitry	(Confidential)
Exhibit 9	Section 2.1033(c) (12)	External Photographs of the Equipment	

Test Report Exhibit 10

<u>Section #</u>	<u>FCC Rule Number</u>	<u>Description of Test Report Exhibits</u>
2.	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
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