



Nokia Corporation

Application
For
Certification

FCC ID: PYACR-200

Wireless Car Charger

Model: CR-200 (HW: V0.4; SW: V2.3.5.5321; ME: V0.3)

Transmitter

Report No.: 130320013SZN-001

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-01-12]

Prepared and Checked by:

Approved by:

Sign on file

Leo Lai
Engineer

Billy Li
Supervisor
Date: April 25, 2013

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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TRF No.: FCC 15C_Tx_b

Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch

6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: www.china.intertek-etlsemko.com

INTERTEK TESTING SERVICES

LIST OF EXHIBITS

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MEASUREMENT / TECHNICAL REPORT

Nokia Corporation
MODEL: CR-200 (HW: V0.4; SW: V2.3.5.5321; ME: V0.3)

FCC ID: PYACR-200

April 25, 2013

This report concerns (check one:) Original Grant ☒ Class II Change ☐

Equipment Type: DCD-Low Power Transmitter Below 1705 KHz

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes ☐ No ☒

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes ☐ No ☒

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-01-12 Edition] provision.

Report prepared by:

Billy Li
Intertek Testing Services Shenzhen Ltd.
Kejiyuan Branch
6F, D Block, Huahan Building, Langshan Road
Nanshan District, Shenzhen, P. R. China
Phone: (86 755) 8614 0645
Fax: (86 755) 8601 6751

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List of attached file

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated photos	radiated photos.pdf
External Photo	External Photos	external photos.pdf
Internal Photo	Internal Photos	internal photos.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
Block Diagram	Block Diagram	block.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	agency.pdf

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EXHIBIT 1

GENERAL DESCRIPTION

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1.0 General Description

1.1 Product Description

The Equipment under Test (EUT) is a Wireless Car Charger intended to be used in car environment and operating at the frequency range 135 KHz-205 KHz. The EUT is powered by Car Charger DC-22 with input of DC 12/24V and output of DC 12V, 0.75A. The EUT enables an easy and comfortable charging operation of mobile device without any connector plugging.

Antenna Type: Integral antenna (embedded coil antenna)

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is an application for certification of a transmitter for the Wireless Car Charger which is designed as a mobile device charger, and there is no corresponding unit for certification.

1.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The Semi-anechoic chamber used to collect the radiated data is **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

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EXHIBIT 2

SYSTEM TEST CONFIGURATION

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2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The EUT was powered by DC 12V during the test and only the worst data was reported in this report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data report in Exhibit 3.0.

The EUT was centred laterally (left to right facing the tabletop) on the Tabletop with the rear of the unit flush with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

N/A.

2.3 Special Accessories

No special accessory.

2.4 Equipment Modification

Any modifications installed previous to testing by Nokia Corporation will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

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2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Mobile Phone	NOKIA	Lumia 920
Cable	NOKIA	CA-223
DC Charger	NOKIA	DC-22

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EXHIBIT 3

EMISSION RESULTS

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3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Example

Assume a receiver reading of 62.0dB μ V is obtained. The antenna factor of 7.4dB and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is 32dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{dB}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

$$PD = 0\text{dB}$$

$$AV = -10\text{dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32\text{dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8\mu\text{V/m}$$

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3.2 Radiated Emission Data and Configuration Photograph

Worst Case Radiated Emission

At

406.427 MHz

Judgement: Passed by 9.1 dB

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

TEST PERSONNEL:

Sign on file

Leo Lai, Engineer

Typed / Printed Name

April 10, 2013

Date

INTERTEK TESTING SERVICES

Company: Nokia Corporation

Date of Test: April 10, 2013

Model: CR-200 (HW: V0.4; SW: V2.3.5.5321; ME: V0.3)

Operating Mode: Transmit with Charging

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
Vertical	0.170	59.1	0.0	14.8	73.9	103.0	-29.1
Vertical	0.510	44.0	0.0	15.1	59.1	73.5	-14.4
Horizontal	252.201	42.2	20.0	8.3	30.5	46.0	-15.5
Horizontal	406.427	46.8	20.0	10.1	36.9	46.0	-9.1
Horizontal	419.262	41.9	20.0	14.4	36.3	46.0	-9.7
Vertical	37.760	30.5	20.0	14.6	25.1	40.0	-14.9
Vertical	207.995	38.5	20.0	12.1	30.6	43.5	-12.9
Vertical	255.710	42.8	20.0	9.1	31.9	46.0	-14.1

NOTES:

1. Average detector is used for 9~90 KHz, 110~490 KHz and Quasi-Peak detector is used for other frequency band.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Loop Antenna was used for the frequency band below 30MHz.
5. The formula of limit at frequencies below 30MHz is extrapolated according to FCC part 15.31 (f) as below.
Limit dB μ V/m at 3m = Limit dB μ V/m at 300m + 40log(300/3) dB
Limit dB μ V/m at 3m = Limit dB μ V/m at 30m + 40log(30/3) dB

Test Engineer: Leo Lai

TRF No.: FCC 15C_Tx_b

FCC ID: PYACR-200

Report No.: 130320013SZN-001

INTERTEK TESTING SERVICES

Company: Nokia Corporation

Date of Test: April 10, 2013

Model: CR-200 (HW: V0.4; SW: V2.3.5.5321; ME: V0.3)

Operating Mode: Transfer initiation & termination mode at 186KHz

Table 1

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Vertical	0.186	57.3	0.0	14.8	72.1	102.2	-30.1
Vertical	0.373	50.9	0.0	15.1	66.0	96.2	-30.2
Horizontal	256.084	43.9	20.0	8.3	32.2	46.0	-13.8
Horizontal	406.685	45.7	20.0	10.1	35.8	46.0	-10.2
Horizontal	412.060	42.3	20.0	14.4	36.7	46.0	-9.3
Vertical	32.867	30.6	20.0	14.6	25.2	40.0	-14.8
Vertical	38.269	33.7	20.0	12.1	25.8	40.0	-14.2
Vertical	214.300	40.2	20.0	9.1	29.3	43.5	-14.2

NOTES:

1. Average detector is used for 9~90 KHz, 110~490 KHz and Quasi-Peak detector is used for other frequency band.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Loop Antenna was used for the frequency band below 30MHz.
6. The formula of limit at frequencies below 30MHz is extrapolated according to FCC part 15.31 (f) as below.
Limit dBuV/m at 3m = Limit dBuV/m at 300m + 40log(300/3) dB
Limit dBuV/m at 3m = Limit dBuV/m at 30m + 40log(30/3) dB

Test Engineer: Leo Lai

TRF No.: FCC 15C_Tx_b

FCC ID: PYACR-200

Report No.: 130320013SZN-001

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EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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4.0 **Equipment Photographs**

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

EXHIBIT 5
PRODUCT LABELLING

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5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

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EXHIBIT 6

TECHNICAL SPECIFICATIONS

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6.0 **Technical Specifications**

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf and circuit.pdf respectively.

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EXHIBIT 7

INSTRUCTION MANUAL

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7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold / leased in the United States.

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EXHIBIT 8

MISCELLANEOUS INFORMATION

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8.0 **Miscellaneous Information**

This miscellaneous information includes emission measuring procedure.

8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitter operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2009.

The Transmitter equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjust through all three orthogonal axes to obtain maximum emission levels. For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed.

The IF bandwidth used for measurement of radiated signal strength was 10 KHz for emission below 30 MHz and 120 KHz for emission from 30 MHz to 1000 MHz.

For radiated emission, the frequency range scanned is 9KHz to 1GHz.

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EXHIBIT 9

TEST EQUIPMENT LIST

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9.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	30-Jun-12	30-Jun-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	12-Mar-13	12-Mar-14
SZ061-06	Loop Antenna	Electro-Metrics	EM-6876	217	21-May-12	21-May-13
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	2-Mar-13	2-Mar-14
SZ062-02	RF Cable	RADIALL	RG 213U	--	26-Feb-13	26-Aug-13