Nokia Corporation

Application
For
Certification

FCC ID: PYADT-910

Nokia Wireless Charger DT-910

Model: DT-910 (Build No.: B4.2; MV: 0.6; HW: 0.8; SW: 2.3.3.5138)

Transmitter

Report No.: SZ12070474-1

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 [10-1-11]

Prepared and Checked by:	Approved by:
Sign on file	Digitally signed by Billy Li Location: Intertek Testing Services
Leo Lai Engineer	Billy Li Supervisor Date: 14 September, 2012

- 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.
- This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results referenced from this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF No.: FCC 15C_Tx_b

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LIST OF EXHIBITS

MEASUREMENT / TECHNICAL REPORT

Nokia Corporation
MODEL: DT-910 (Build No.: B4.2; MV: 0.6; HW: 0.8; SW: 2.3.3.5138)

FCC ID: PYADT-910

7 September, 2012

This report concerns (check one:) Original Grant ___X___ 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 ___X

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 ___X

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-11 Edition] provision.

Report prepared by:

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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
Test Setup Photo	Conducted photos	conducted 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

EXHIBIT 1

GENERAL DESCRIPTION

1.0 General Description

1.1 Product Description

The Equipment under Test (EUT) is a Nokia Wireless Charger DT-910 operating at the frequency range 135 KHz-205 KHz for mobile device. The EUT is powered by AC-301C adapter with Input: A.C. 100-240V, 50/60Hz, 0.3A, Output D.C. 12V, 0.75A, The EUT enables an easy and comfortable charging operation of mobile device without any connector plugging.

Antenna Type: 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 Nokia Wireless Charger DT-910 which is for mobile device charger, and there is no corresponding unit for certification.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. 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 and shielding room used to collect the radiated data and conducted data are **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).

EXHIBIT 2

SYSTEM TEST CONFIGURATION

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 AC 120V/60Hz 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 rear of unit shall be flushed 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.

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	N8
Cable	NOKIA	CA-211
AC Charger	NOKIA	AC-301C
Sleeve (Receiver)	N/A	N/A

EXHIBIT 3

EMISSION RESULTS

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.

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 dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
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 62.0dBμV 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 32dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0dBμV
AF = 7.4dB
CF = 1.6dB
AG = 29.0dB
PD = 0dB

AV = –10dB

FS = 62 + 7.4 + 1.6 – 29 + 0 + (–10) = 32dBμV/m

Level in μV/m = Common Antilogarithm [(32dBμV/m)/20] = 39.8μV/m

3.2 Radiated Emission Data and Configuration Photograph

Worst Case Radiated Emission
At
40.670 MHz

Judgement: Passed by 18.0 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

7 September, 2012
Date

Company: Nokia Corporation Date of Test: 7 September, 2012
Model: DT-910 (BUILD NO.: B4.2; MV: 0.6; HW: 0.8; SW: 2.3.3.5138)
Operating Mode: Transmit with Charging

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	0.170	59.7	0.0	14.8	74.5	103.0	-28.5
Vertical	0.510	32.7	0.0	15.1	47.8	73.5	-25.7
Horizontal	97.900	24.1	20.0	8.3	12.4	43.5	-31.1
Horizontal	165.320	26.9	20.0	10.1	17.0	43.5	-26.5
Horizontal	291.415	24.2	20.0	14.4	18.6	46.0	-27.4
Vertical	35.820	25.9	20.0	14.6	20.5	40.0	-19.5
Vertical	40.670	29.9	20.0	12.1	22.0	40.0	-18.0
Vertical	47.960	32.8	20.0	9.1	21.9	40.0	-18.1

NOTES:

1. Peak 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 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

Company: Nokia Corporation Date of Test: 7 September, 2012
Model: DT-910 (BUILD NO.: B4.2; MV: 0.6; HW: 0.8; SW: 2.3.3.5138)
Operating Mode: Transfer initiation & termination mode at 175KHz

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	0.175	59.5	0.0	14.3	73.8	102.7	-28.9
Vertical	0.525	32.8	0.0	14.7	47.5	73.2	-25.7
Horizontal	97.400	23.7	20.0	8.3	12.0	43.5	-31.5
Horizontal	169.220	24.5	20.0	10.0	14.5	43.5	-29.0
Horizontal	288.500	24.0	20.0	14.3	18.3	46.0	-27.7
Vertical	39.700	29.2	20.0	12.4	21.6	40.0	-18.4
Vertical	44.065	29.4	20.0	11.0	20.4	40.0	-19.6
Vertical	47.480	31.5	20.0	9.3	20.8	40.0	-19.2

NOTES:

1. Peak 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 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

3.4 Conducted Emission and Data Configuration Photograph

Worst Case Conducted Configuration
at
0.666 MHz

Judgement: Passed by 9.6 dB

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

TEST PERSONNEL:

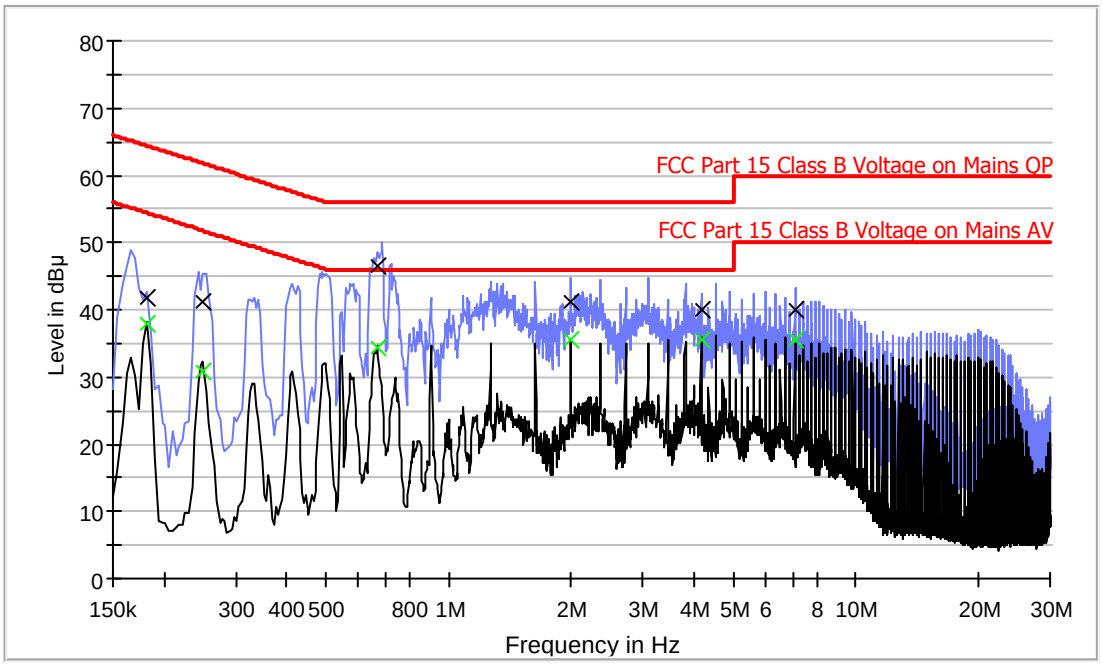
Sign on file

Leo Lai, Engineer
Typed/Printed Name

7 September, 2012
Date

Company: Nokia Corporation Date of Test: 7 September, 2012
Model: DT-910 (BUILD NO.: B4.2; MV: 0.6; HW: 0.8; SW: 2.3.3.5138)
Worst Case Operating Mode: Transmit with Charging

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.182000	41.8	L1	9.6	22.6	64.4
0.250000	41.1	L1	9.6	20.7	61.8
0.666000	46.4	L1	9.7	9.6	56.0
1.994000	41.3	L1	9.8	14.7	56.0
4.170000	40.0	L1	9.8	16.0	56.0
7.074000	39.9	L1	9.9	20.1	60.0

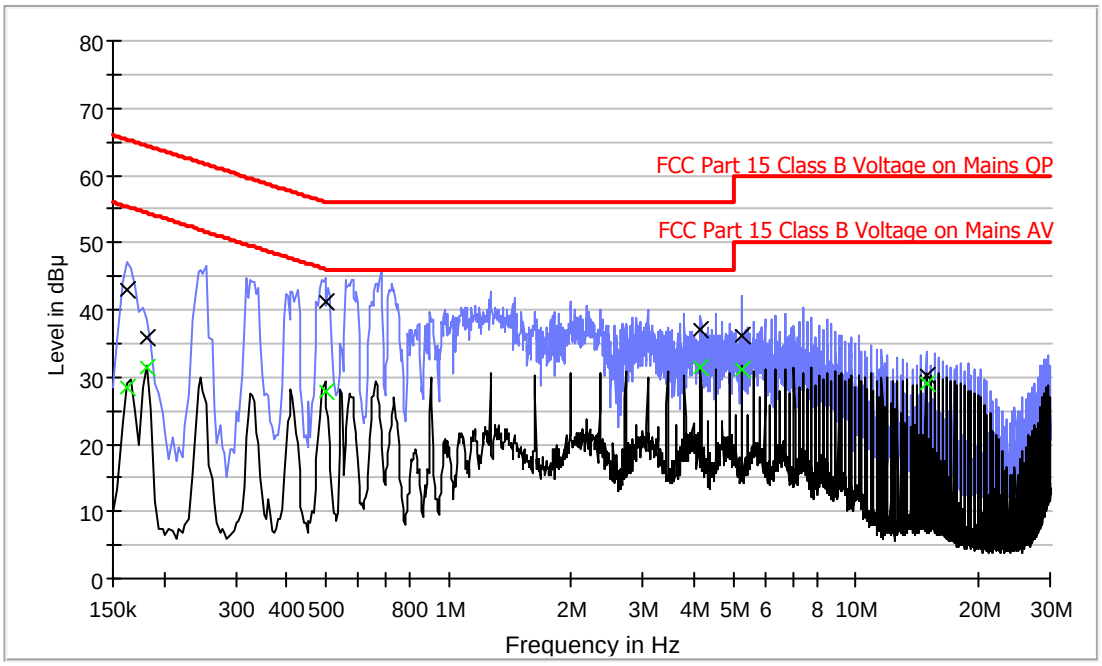
Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.182000	38.0	L1	9.6	16.4	54.4
0.250000	30.9	L1	9.6	20.9	51.8
0.666000	34.3	L1	9.7	11.7	46.0
1.994000	35.6	L1	9.8	10.4	46.0
4.170000	35.4	L1	9.8	10.6	46.0
7.074000	35.4	L1	9.9	14.6	50.0

Test Engineer: Leo Lai

Company: Nokia Corporation Date of Test: 7 September, 2012
Model: DT-910 (BUILD NO.: B4.2; MV: 0.6; HW: 0.8; SW: 2.3.3.5138)
Worst Case Operating Mode: Transmit with Charging

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.162000	42.9	N	9.6	22.5	65.4
0.182000	35.8	N	9.6	28.6	64.4
0.498000	41.2	N	9.6	14.8	56.0
4.166000	36.9	N	9.8	19.1	56.0
5.254000	36.2	N	9.9	23.8	60.0
14.854000	30.3	N	10.1	29.7	60.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.162000	28.4	N	9.6	27.0	55.4
0.182000	31.4	N	9.6	23.0	54.4
0.498000	27.9	N	9.6	18.1	46.0
4.166000	31.4	N	9.8	14.6	46.0
5.254000	31.2	N	9.9	18.8	50.0
14.854000	29.0	N	10.1	21.0	50.0

Test Engineer: Leo Lai

EXHIBIT 4

EQUIPMENT PHOTOGRAPHS

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

5.0 **Product Labelling**

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

EXHIBIT 6

TECHNICAL SPECIFICATIONS

6.0 Technical Specifications

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

EXHIBIT 7

INSTRUCTION MANUAL

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.

EXHIBIT 8

MISCELLANEOUS INFORMATION

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. For line-conducted emissions, the range scanned is 150KHz to 30MHz.

EXHIBIT 9

TEST EQUIPMENT LIST

9.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	02-Jul-11	02-Jan-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	11-Mar-12	11-Mar-13
SZ061-06	Loop Antenna	Electro-Metrics	EM-6876	217	11-Mar-12	11-Mar-13
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	03-Mar-12	03-Mar-13
SZ062-02	RF Cable	RADIALL	RG 213U	--	17-Mar-12	17-Sep-12
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	05-Nov-11	05-Nov-12
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	05-Nov-11	05-Nov-12
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Sep-10	16-Sep-13