Nemko Korea Co., Ltd.

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FCC EVALUATION REPORT FOR CERTIFICATION

Project No. : NK-24-R-222
Applicant : DRTECH Corporation
Suite No.1, 2 Floor / Suite No.2, 3 Floor, 29, Dunchon-daero 541 beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13216, Republic of Korea

Dates of receipt : May 28, 2024
Dates of Issue : December 27, 2024
Test Site :
Nemko Korea Co., Ltd.

FCC ID :	**RNH-EXPDWPCS**
Applicant :	**DRTECH Corporation**
Brand Name :	DRTECH
Model:	**EXPD-WPCS**
Additional Model(s):	**-**
EUT Type:	**Wireless Charger**
Classification:	**FCC Part 15** **Low Power Transmitter Below 1705 kHz**
Date of Test:	**December 11, 2024 ~ December 23, 2024**
Applied Standard:	**FCC Part 1 Subpart I** **FCC Part 2 Subpoart J**

The device bearing the brand name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.
This report is not related to KS Q ISO/IEC 17025 and KOLAS accreditation.

Tested By : Hyeonseung Lee
Test Engineer

Reviewed By : Hoonpyo Lee
Technical Manager

Revision History

Rev.	Issue Date	Revisions	Revised By
00	December 27, 2024	Initial issue	Hyeonseung Lee

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1. INTRODUCTION

1.1 Test facility

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2014), the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013) was used in determining radiated and conducted emissions emanating.

These measurement tests were conducted at **Nemko Korea Co., Ltd.**
The site address 165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, 17042, Rep. of Korea.

1.2 Accreditation and listing

Accreditation type		Accreditation number
	CAB Accreditation for DOC	Designation No. KR0026
	KOLAS Accredited Lab. (Korea Laboratory Accreditation Scheme)	Registration No. KT155
Industry Canada	Canada IC Registered site	Site No. 29506
	VCCI registration site(RE/CE/Telecom CE)	Member No. 2118
	EMC CBTL	TL124
	KCC(RRL)Designated Lab.	Registration No. KR0026

2. EUT INFORMATION & TEST CONDITIONS

2.1 EUT Information

2.1.1 Specifications

EUT Type	Wireless Charger
Model Name	EXPD-WPCS
Frequency of Operation	127.7 kHz
Modulation type	ASK
Antenna Specification	Internal type
EUT Rated Voltage	- USB-C Adaptor : 5 A, DC 20 V - Wireless Charger : 0.75 A, DC 20 V (15 W)
Test Voltage	DC 20 V (USB-C Adaptor : AC 120 V, 60 Hz)
Remarks	-

2.2 Operation During Test

During the test, the X-ray detector was charged on the EUT to ensure continuous measurement of the wireless charging signal.

2.2.1 Worst-case Configuration and Mode

The EUT was tested in mobile mode in the following configurations:

Test Configuration	Test Frequency	Description
1	127.7 kHz	DUT is powered by switching power adaptor. No WPT client used. (Stand-by mode)
2	127.7 kHz	DUT is powered by switching power adaptor. Direct contact during charging between the EUT and X-ray detector

Note 1. EUT is only used for wireless charging of X-ray detectors manufactured by DRTECH Corporation.

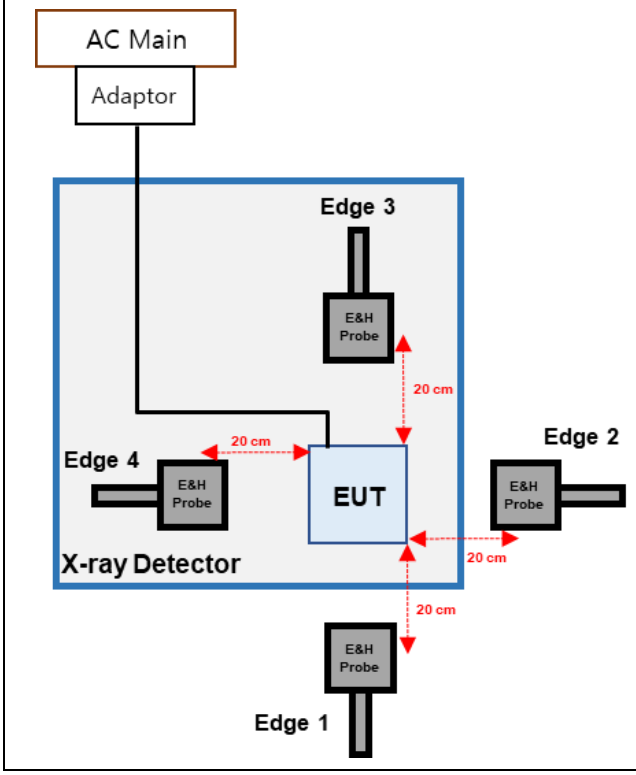
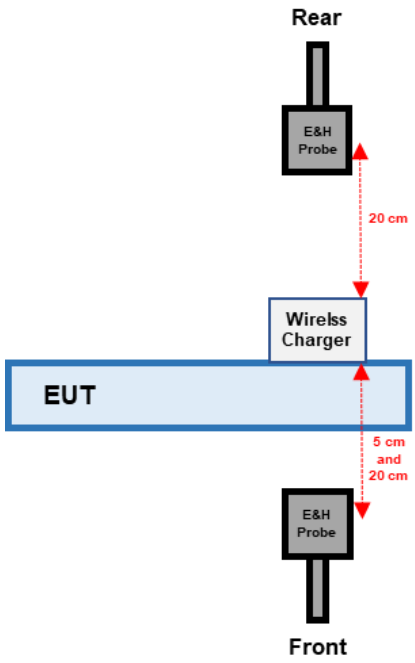
2.2.1 KDB 680106 D01 SECTION 5 EQUIPMENT APPROVAL CONSIDERATIONS

Requirement	Device
(1) The power transfer frequency is below 1 MHz.	Yes. The operating frequency is 127.7 kHz.
(2) The output power from each transmitting element (e.g., coil) is less than or equal to 15 watts	Yes. The maximum power is 15 W.
(3) A client device providing the maximum permitted load is placed in physical contact with the transmitter (i.e., the surfaces of the transmitter and client device enclosures need to be in physical contact)	Yes. The client device is placed directly in contact with the transmitter.
(4) Only § 2.1091-Mobile exposure conditions apply (i.e., this provision does not cover § 2.1093-Portable exposure conditions).	Yes. EUT is mobile only
(5) The E-field and H-field strengths, at and beyond 20 cm surrounding the device surface, are demonstrated to be less than 50% of the applicable MPE limit, per KDB 447498, Table 1. These measurements shall be taken along the principal axes of the device, with one axis oriented along the direction of the estimated maximum field strength, and for three points per axis or until a 1/d (inverse distance from the emitter structure) field strength decay is observed. Symmetry considerations may be used for test reduction purposes. The device shall be operated in documented worst-case compliance scenarios (i.e., the ones that lead to the maximum field components), and while all the radiating structures (e.g., coils or antennas) that by design can simultaneously transmit are energized at their nominal maximum power.	Yes. The EUT's field strength levels are less than 50% of the MPE limit.
(6) For systems with more than one radiating structure, the conditions specified in (5) must be met when the system is fully loaded (i.e., clients absorbing maximum power available), and with all the radiating structures operating at maximum power at the same time, as per design conditions. If the design allows one or more radiating structures to be powered at a higher level while other radiating structures are not powered, then those cases must be tested as well. For instance, a device may use three RF coils powered at 5 W, or one coil powered at 15 W: in this case, both scenarios shall be tested.	Yest. The transfer system includes only single primary and secondary coils.

2.3 Support Equipment

EUT	DRTECH Corporation Model : EXPD-WPCS	S/N: N/A Identical Proto-type
SWITCHING POWER ADAPTOR	DONGGUAN SHILONG FUHUA ELECTRONIC CO., LTD. Model : UES140A3-SPC	S/N : N/A
X-ray Detector	DRTECH Corporation Model : EXPD 4343N1	S/N: N/A Identical Proto-type

2.4 Setup Drawing

Front View	Side View
	

Note 1. DUT to Client device (X-ray detector) test Configuration 1 and 2.
Note 2. Measurements were taken using a probe placed 20 cm around the device and 5 cm in front of the device.

3. TEST METHODOLOGY

1. FCC CFR 47 Part 1.1310, Part 2.1091, Part2.1093.
2. KDB 447498 D01 General RF Exposure Guidance v06.
3. KDB 447498 D03 Supplement C Cross-Reference v01.
4. KDB 680106 D01 Wireless Power Transfer v04.

4. DESCRIPTION OF TESTS

4.1 Maximum Permissible RF Exposure

Limits

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter.

Table 1 to § 1.1310(e)(1)—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*($900/f^2$)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*($180/f^2$)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density

According to KDB 680106 D01 Wireless Power Transfer v04, Section 3.2 Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of section 1.1310.
(Electric field strength: 614 V/m, Magnetic field strength: 1.63 A/m)

5. TEST DATA

5.1 Maximum Permissible RF Exposure

E-Field & H-Field MEASUREMENTS

Note: Peak measurements were performed. RMS values were calculated from the peak measurement.

Please refer to the formula for calculating the RMS values: [Field Strength x √ Duty Cycle].

Additional test was performed in each Test mode by moving the probe surrounding the device to find the maximum exposure.

Test Result of Test Configuration 1: WPT on Stand-by

Frequency (kHz)	Position	Test Distance (cm)	Client Battery State	Measured Electric Field (V/m)	Electric Field Limit (V/m)	Measured Magnetic Field (A/m)	Magnetic Field Limit (A/m)
127.7	Front	20	-	0.301	614	0.153	1.63
	Rear	20	-	0.471	614	**0.198**	1.63
	Edge 1	20	-	0.300	614	0.150	1.63
	Edge 2	20	-	0.302	614	0.153	1.63
	Edge 3	20	-	0.303	614	0.153	1.63
	Edge 4	20	-	0.311	614	0.151	1.63

Test Result of Test Configuration 2: Operating mode with Client device(X-ray Detector)

Frequency (kHz)	Position	Test Distance (cm)	Client Battery State	Measured Electric Field (V/m)	Electric Field Limit (V/m)	Measured Magnetic Field (A/m)	Magnetic Field Limit (A/m)
127.7	Front	20	< 15 %	0.581	614	0.151	1.63
	Rear	20	< 15 %	0.427	614	0.154	1.63
	Edge 1	20	< 15 %	0.598	614	0.150	1.63
	Edge 2	20	< 15 %	**0.954**	614	0.150	1.63
	Edge 3	20	< 15 %	0.887	614	0.151	1.63
	Edge 4	20	< 15 %	0.421	614	0.150	1.63
	Front	20	= 50 %	0.707	614	0.150	1.63
	Rear	20	= 50 %	0.382	614	0.151	1.63
	Front	20	> 85 %	0.707	614	0.150	1.63
	Rear	20	> 85 %	0.402	614	0.154	1.63
	Front	5	< 15 %	**2.165**	614	**0.214**	1.63

Test Summary of Results

Electric Field Limit			Magnetic Field Limit		
Maximum Measured Data (V/m)	RF Exposure (V/m)	Percentage (%)	Maximum Measured Data (A/m)	RF Exposure (A/m)	Percentage (%)
0.954	614	0.16	0.198	1.63	12.12
Conclusion: E-Field & H-Field result are less than 50% of the MPE Limit.					

6. TEST EQUIPMENT

No.	Instrument	Manufacture	Model	Serial No.	Calibration Date	Next Calibration Date
1	DIGITAL MULTIMETER	EZ DIGITAL	DM-334	2111395	2023-10-11	2024-10-11
2	Humidity Temperature Recorder	Lutron	MHB-382SD	AK.26553	2023-10-18	2024-10-18
3	Electric and Magnetic Field Probe	Narda	EHP-200AC	180ZX00639	2024-10-23	2025-10-23

END REPORT