Global No.1 Testing laboratory Universal Certification Solution

FCC TEST REPORT

UCS Co.,Ltd.

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FCC Test Report for Declaration of Conformity

Report Number	UCSFC-1303-009			
Applicant	Company Name	MAPTech Co., Ltd		
	Address	#402 Gyeonggi Venture Yeonsung University, 572-5 Anyang 8-dong, Manan-gu, Anyang-si, Gyeonggi-do, Korea.		
Product	Product Name	Wireless Charger Receiver		
	Model No.	MWC-R524T		
	Manufacturer	MAPTech Co., Ltd		
	Serial No.	-	Country of origin	Korea
Other	Receipt Date	2013.02.07	Receipt Number	UCS-R-2013-115
	Issued Date	2013.03.18	Tested Date	2013.03.13 ~ 2013.03.13
Standard	FCC CFR 47 PART 15 SUBPART B, Section 15.101			
Tested by	S. M. Yang (sign)			
Approved by	Y. M. Choi (sign)			

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1. Applicant Information

Applicant Name	:	MAPTech Co., Ltd
Address	:	#402 Gyeonggi Venture Yeonsung University, 572-5 Anyang 8-dong, Manan-gu, Anyang-si, Gyeonggi-do, Korea.
Manufacturer	:	MAPTech Co., Ltd
Country of Origin	:	Korea

2. EUT Information

Product Name	:	Wireless Charger Receiver
Model	:	MWC-R524T
Input Rating	:	30 Vac Max

3. Laboratory Information

Laboratory Name	:	UCS Co., Ltd.
Location	:	476-4, Hwalcho-dong, Hwaseong-si, Kyunggi-do, Korea 445-150

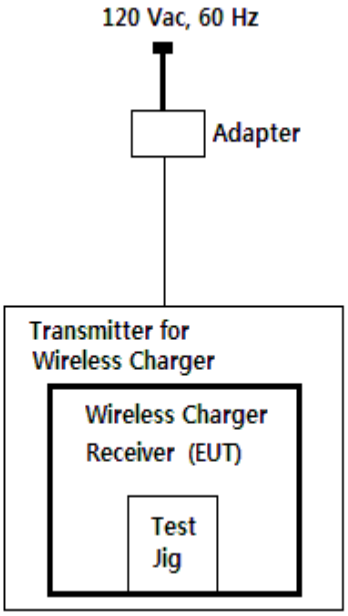
4. Test Configuration and condition

4.1 EUT Operating Condition

- The EUT was in the following operation mode during all testing
- After connected EUT with 10 ohm test jig, tested in connected with transmitter

- Tested Input Rating : 30 Vac form a Transmitter for wireless Charger(120 Vac, 60 Hz)

4.2 EUT Test Configuration Diagram



4.3 Peripheral equipments list for test

Equipment Name	Model	Serial Number	Manufacturer
Wireless Charger Receiver	MWC-R524T	-	MAPTech Co., Ltd
Test Jig (10 ohm)	-	-	-
Transmitter for Wireless Charger	MWC-T500T	20120827T0094	MAPTech Co., Ltd.
Adapter	SK02G-1900100U	-	SIMSUKIAN

4.4 Cable Connections

Start		End		Cable	
Name	**I/O Port**	**Name**	**I/O Port**	**Length**	**Spec.**
EUT	Mini USB male	Test Jig	Mini USB Female	-	-
Transmitter for Wireless Charger	DC IN	Adapter	DC OUT	0.8	Unshielded

5. Summary of Test Results and Measurement Procedures

5.1 Summary of test results

Standard	Test Item	Results
FCC Part 15 Subpart B	Conducted Emission	Met Class B / Pass
FCC Part 15 Subpart B	Radiated Emission	Met Class B / Pass

5.2 Preliminary Testing

It is often valuable to performing preliminary radiated measurements at a closer distance than specified for compliance to determine the emission characteristics of the EUT. At close-in distance, it is easier to determine the spectrum signature of EUT, and if applicable, the EUT configuration that emanate the maximum level of emissions. The data may not be precisely correlatable results.

5.3 Shielded Enclosure

To search the Radiated frequency outline of an EUT a shielded screen room may be used. If the shielded room is used for radiated data, the data page will state that the EUT was in a shielded enclosure. All data collected in a screen room for emission data, radiated emissions is for frequency outline only. If an EUT is placed in screen room for AC Powerline Conducted the data page will show that a screen room was used and data frequencies and levels will be correct and used for test data.

5.4 Data Reporting Format

The measurement results expressed in accordance with C63.4 and specified limits where applicable are presented in tabular or graphical form, or alternatively as recorder charts or photographs of a spectrum analyzer display, showing the level vs. frequency.

5.5 AC Powerline Conducted Emission Test

The EUT is set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-2009. The highest emissions were also analyzed in detail by operating the spectrum analyzer in fixed tuned mode to determine the precise amplitude of the emissions. On the other hand, the interconnecting cables were moved around the table to maximize the emissions, and the position of the peripheral devices were interchanged to check whether there is any changes in emissions.

NOTE : The resolution bandwidth and video bandwidth of test receiver is 9 kHz for Quasi-peak detection (QP) at frequency below 30 MHz. Q.P value A.V limit when do over by A.V mode conversion after measure .

5.6 Radiated Emission Test

The EUT and support equipment are set up on the turntable in an open field site. Desktop EUTs are set up on a wooden stand (test-table), 80 cm above the ground plane. All items on the table were placed at least 10 cm apart each other. Interconnecting cables which hang closer than 40 cm to the ground plane are folded back and forth to form a 30 cm by 40 cm long bundle, hanging approximately between the ground plane and table. The highest emissions were also analyzed, in detail, with the tuned aerial to search the precise amplitude of the emissions. On the other hand, the interconnecting cables were moved around the table and if the highest amplitudes is observed, the EUT is rotated in the horizontal plane while changing the antenna polarization to the vertical plane to maximize the field strength. Once the maximum field strength is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. The position of the peripheral devices are interchanged to check for any changes in emissions. In rare instances, the maximum field strength may occur with the antenna polarized between vertical and horizontal.

NOTE : The resolution bandwidth and video bandwidth of test receiver is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.

6. Test Results

6.1 Conducted Emission

Test Standard	FCC CFR 47 PART 15 SUBPART B, SECTION 15.107 (a)		
Test Configuration	Tested with program provided by customer		
Tested Date	2013.03.13		
Input Ratings	120 Vac, 60 Hz (30 Vac form a Transmitter for wireless Charger)		
Temperature	20.9 °C	**Humidity**	39.4 %R.H.
Test result	Met Class B / Pass		

6.1.1 Limit

Frequency (MHz)	**Class A (dBμV)**		**Class B (dBμV)**	
	Quasi-Peak	**Average**	**Quasi-Peak**	**Average**
0.15 ~ 0.5	79	66	66 ~ 56*	56 ~ 46*
0.5 ~ 5	73	60	56	46
5 ~ 30	73	60	60	50

* : The limit decreases linearly with the logarithm of frequency.

6.1.2 Test set-up and procedure

The mains terminal disturbance voltage was measured with the equipment under test(EUT) in a shield room.
The EUT was connected to an artificial mains network(LISN) placed on the floor.
The EUT was placed on non-metallic table 0.8 m above the metallic, grounded floor.
The distance to other metallic surface was at least 0.8 m.
Amplitude measurements were performed with a quasi-peak detector and an average detector.

6.1.3 Used test equipments

Equipment	**Model**	**Serial No.**	**Vendor**	**Next Cal. Date**	**Used**
Test Receiver	ESPI3	101171	R&S	2013.08.10	■
LISN	NSLK 8127	8127518	SCHWARZBECK	2013.09.28	■
LISN	L2-16A	1100X90603	PMM	2013.09.28	□

6.1.4 Measurement results

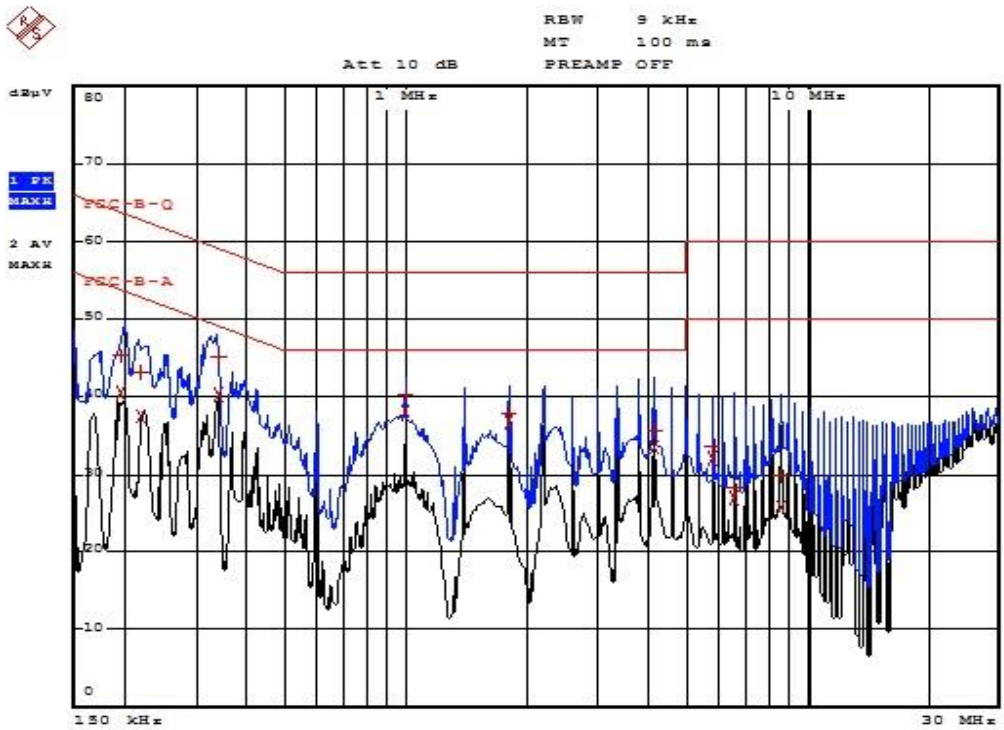
-. Frequency Range : 150 kHz ~ 30 MHz

-. Bandwidth : 9 kHz

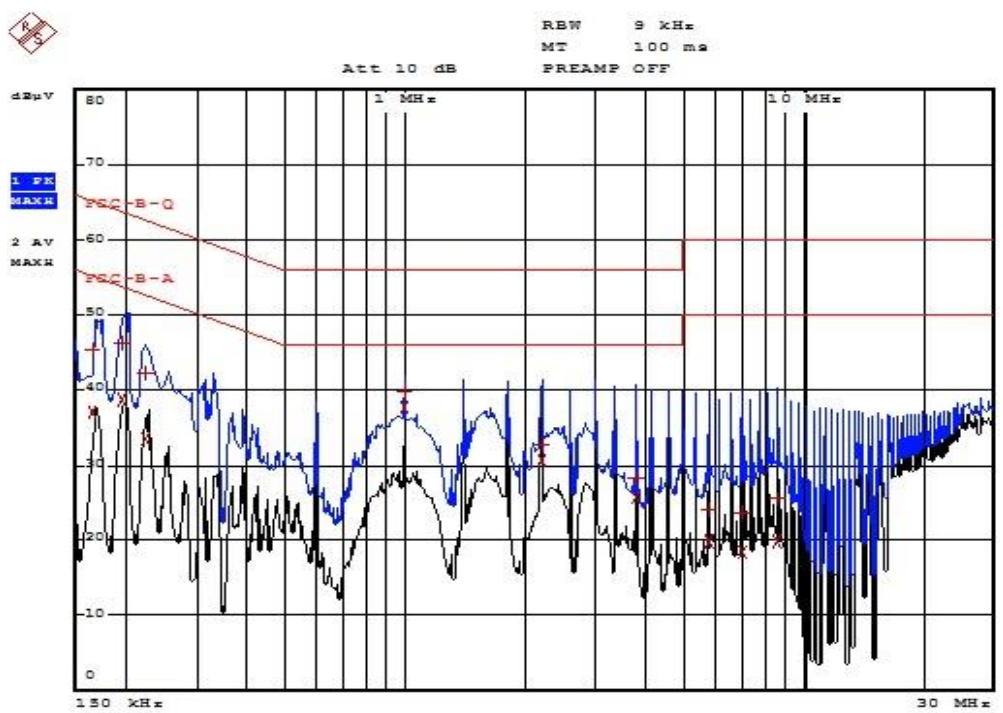
Frequency (MHz)	Factor (dB)		Line	Quasi-Peak (dBµV)				Average (dBµV)			
	LISN	Cable		Limit	Reading	Results	Margin	Limit	Reading	Results	Margin
0.17	0.03	0.04	V	64.96	45.50	45.57	19.39	54.96	36.99	37.06	17.90
0.20	0.03	0.04	V	63.61	46.34	46.41	17.20	53.61	38.53	38.60	15.01
0.34	0.03	0.05	H	59.20	45.02	45.10	14.10	49.20	40.24	40.32	8.88
1.00	0.04	0.10	H	56.00	40.30	40.44	15.56	46.00	38.09	38.23	7.77
1.80	0.06	0.13	H	56.00	37.98	38.17	17.83	46.00	36.66	36.85	9.15
5.79	0.11	0.31	H	60.00	33.41	33.83	26.17	50.00	32.03	32.45	17.55
6.59	0.12	0.34	H	60.00	28.25	28.71	31.29	50.00	26.96	27.42	22.58
8.59	0.16	0.38	H	60.00	29.81	30.34	29.66	50.00	25.53	26.06	23.94

Remark: “H”: Hot Line, “N”: Neutral Line

6.1.5 Measurement graph



HOT



NEUTRAL

6.2 Radiated Emission

Test Standard	FCC CFR 47 PART 15 SUBPART B, SECTION 15.109(a)		
Test Configuration	Tested with program provided by customer		
Tested Date	2013.03.13		
Input Ratings	120 Vac, 60 Hz (30 Vac form a Transmitter for wireless Charger)		
Temperature(℃)	20.2 °C	**Humidity**	17.5 %R.H.
Test result	Met Class B / Pass		

6.2.1 Limit

Frequency (MHz)	Class B (μV/m) @ 3 m	Class A (μV/m) @ 10 m
30 ~ 88	100	90
88 ~ 216	150	150
216 ~960	200	210
Above 960	500	300

6.2.2 Test set-up and procedure

A pretest was performed at 3 m distance in a semi-anechoic chamber for searching correct frequency.
The final test was done at a 10 m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.
Cables were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.
Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.2.3 Used test equipments

Equipment	Model	Serial No.	Vendor	Next Cal. Date	Used
Test Receiver	ESPI3	101171	R&S	2013.08.10	■
Broadband Antenna	VULB9163	398	SCHWARZBECK	2014.09.12	■
Antenna Master	ACT-A400	2009814001	Audix Coporation	-	■
Turn Table	ACT-T200	20090812001	Audix Coporation	-	■
Amplifier	310	291723	SOMOMA	2013.09.26	■
10 m OATS	-	-	Semitec	-	■

6.2.4 Radiated emission measurement results

-. Frequency Range : 30 MHz ~ 1 000 MHz

-. Bandwidth : 120 kHz

-. Distance : 3 m

Frequency (MHz)	Reading (dBμV/m)	Antenna Polarity (H/V)	Height (m)	Angle (°)	Antenna Factor (dB/m)	Cable Loss (dB)	Limit (dBμV/m)	Results (dBμV/m)	Margin (dB)
36.74	20.75	V	1.0	130	13.56	1.84	40.00	36.15	3.85
158.84	18.66	V	1.0	40	9.41	4.19	43.52	32.26	11.26
202.88	21.06	V	2.0	110	10.97	4.83	43.52	36.86	6.66

Appendix-A : Test Setup Photographs

-. Conducted Emission Setup Photographs

-. Radiated Emission Setup Photographs

Appendix-B : External Photographs of EUT

Appendix-C : Internal Photographs of EUT

Appendix-D : Information to the user in user's manual

(Proposed format to be included in the user's manual)

DECLARATION OF CONFORMITY

PRODUCT NAME	Wireless charger Receiver
MODEL NUMBER	MWC-R524T
FCC RULES	Tested to comply with FCC Part 15, Class B
OPERATING ENVIRONMENT	FOR HOME OR OFFICE USE

FCC COMPLIANCE STATEMENT:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

INFORMATION TO USER:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one more of the following measures:

-. Reorient or relocate the receiving antenna.
-. Increase the separation between the equipment and receiver.
-. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-. Consult the dealer or an experienced radio/TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the equipment

THE PARTY RESPONSIBLE FOR PRODUCT COMPLIANCE

(YOUR CORPORATE NAME)

(STREET, CITY, STATE, USA)

(TELEPHONE NO: (XXX) YYY-ZZZZ)

(ABOVE NAME AND ADDRESS MUST BE LOCATED WITHIN THE UNITED STATES)

Appendix-E : Declaration of conformity labelling requirements

The labelling requirements for a device subject to the DoC procedure are specified in Section 15.19(b). The label should include the FCC logo along with the Trade Name and Model Number, which satisfies the unique identifier requirement of Section 2.1074 if it represents the identical equipment tested for DoC compliance.

§15.19(b)(1)(i) Products subject to authorization under a Declaration of Conformity shall be labelled as follows:


When the device is so small or for such use that it is not practicable to place the statement specified under paragraph 15.19(b)(1) on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silkscreened, indelibly printed or otherwise permanently marked on a permanent attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.