EMC TEST REPORT

Prepared For:	
Product Name:	Wireless charger
Trade Mark:	
Model:	BM2245, BM2245B
Prepared By:	Shenzhen United Testing Technology Co., Ltd. 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China
Receipt Date:	Jun.05,2018
Test Date:	Jun.05,2018-Jun.15,2018
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Report No.:	UNIA2018051522-1ER-01

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TEST REPORT DECLARATION

Applicant	
Address	
Manufacturer	
Address	
EUT Description	Wireless Charger
Model Number	BM2245, BM2245B

Test Standards:

ETSI EN301 489-1 V2.2.0 (2017-03)
ETSI EN301 489-3 V2.1.1 (2017-03)
EN61000-4-2:2009
EN61000-4-3:2006+A1:2008+A2:2010

The EUT described above is tested by United Testing Technology (Hong Kong) Limited EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. United Testing Technology (Hong Kong) Limited EMC Laboratory is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the 2014/53/EU directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Prepared by: Kahn.Yang
Kahn yang/Editor

Reviewer: Sherwin Qian
Sherwin Qian/Supervisor

Approved & Authorized Signer:
Liuze/Manager

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted Disturbance	N/A
Radiated Emission	Pass
Harmonic Current	N/A
Voltage Fluctuation and Flicker	N/A
Electrostatic Discharge Immunity	Pass
Radiated Electromagnetic Fields Immunity	Pass
Electric Fast Transient Burst Immunity	N/A
Surge Immunity	N/A
Conducted Immunity	N/A
Voltage dips and interruptions Immunity	N/A

N/A* Please refer to Applicability overview tables in sections 7.1 and 7.2 of EN 301 489-1 requirements.

2. GENERAL INFORMATION

2.1. Report information

2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that UNI approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that UNI in any way guarantees the later performance of the product/equipment.

2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, UNI therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through UNI, unless the applicant has authorized UNI in writing to do so.

2.2. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	±3.42 dB ±3.42 dB	±4.0 dB ±3.6 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	±4.60 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	±4.40 dB	±5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	±4.20 dB	N/A
Mains Harmonic	Voltage	±3.11%	N/A
Voltage Fluctuations & Flicker	Voltage	±3.25%	N/A

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description	:	Wireless Charger
Applicant	:	
Model Number	:	BM2245
Operation Frequency	:	110-205KHz

3.2. Block Diagram of EUT Configuration

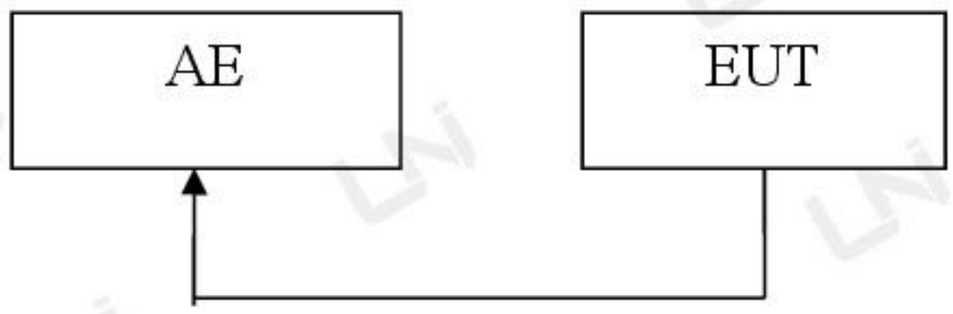


Figure 1 EUT SETUP

3.3. Support Equipment List

Table 2 Ancillary Equipment

Name	Model No	S/N	Manufacturer	Used
Mobile phone	G610	/	HUAWEI	YES
Laptop	E60A	/	LENOVO	NO

3.4. Operating Condition of EUT

Test mode 1: *Operating*

3.5. Test Conditions

Temperature: 18-25℃

Relative Humidity: 55-68 %

3.6. Modifications

No modification was made.

3.7. Abbreviations

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
EM	Electro Magnetic
EMC	Electro Magnetic Compatibility
EUT	Equipment Under Test
IF	Intermediate Frequency
RF	Radio Frequency
rms	root mean square
EMI	Electromagnetic Interference
EMS	Electromagnetic Susceptibility

3.8. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

4. TEST EQUIPMENT USED

4.1. Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	AMN	SCHWARZBECK	NNLK8121	8121370	2018.9.9
2	AMN	ETS	3810/2	00020199	2018.9.9
3	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	101210	2018.9.9
4	AAN	TESEQ	T8-Cat6	38888	2018.9.9

4.2. Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Horn Antenna	Sunol	DRH-118	A101415	2018.9.29
2	Broadband Hybrid Antenna	Sunol	JB1 Antenna	A090215	2018.9.29
3	Amplifier	HP	8449B	3008A00160	2018.9.9
4	Amplifier	HP	8447D	2944A07999	2018.9.9
5	EMI TEST RECEIVER	ROHDE&SCHWARZ	ESR3	101891	2018.9.9
6	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2018.9.9
7	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2018.9.8
8	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2018.9.8
9	Broadband Hybrid Antenna	Schwarzbeck	VULB9163	VULB9163#958	2018.9.8
10	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2019.1.12
11	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2018.11.02
12	Loop Antenna	Beijing daze Technology	ZN30401	13015	2018.9.9
13	EM CAMLP	SCHWARZBECK	MDS21	03350	2018.9.12
14	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2019.03.14
15	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2018.10.24

4.3. Harmonic / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Power Analyzer	California Instrumnets	PACS-1	X71719	2018.9.28
2	AC Power Source	California Instrumnets	5001ix	HK53570	2018.9.9

4.4. Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	ESD Simulator	EM TEST	ESD30C/P30	1202-17	2018.9.9

4.5. Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Surge Generator	Shanghai Lioncel	LSG-506S	LSG506S0160601	2018.9.7
2	CDN	Shanghai Lioncel	CDN-532S	CDN532S0160601	2018.9.7

4.6. Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EFT/B Generator	Shanghai Lioncel	EFT-404S	EFT404S0160601	2018.9.7

4.7. Power-frequency magnetic fields Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Magnetic Field Test System	Shanghai Lioncel	PMF801C-T	PMF801C-T	2018.9.9

4.8. Voltage dips and interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	AC Power Source	California Instrumnets	5001ix	HK53570	2018.9.9

5. CONDUCTED DISTURBANCE TEST

5.1. Test Standard and Limit

5.1.1.Test Standard

ETSI EN301 489-1 V2.2.0 (2017-03)
ETSI EN301 489-3 V2.1.1 (2017-03)

5.1.2.Test Limit

Table 10 Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency

5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver is used to test the emissions from both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

5.4. Test Data

N/A

6. RADIATED DISTURBANCE TEST

6.1. Test Standard and Limit

6.1.1.Test Standard

ETSI EN301 489-1 V2.2.0 (2017-03)
ETSI EN301 489-3 V2.1.1 (2017-03)

6.1.2.Test Limit

Table 11 Radiated Disturbance Test Limit (Class B)

Frequency	Limit (dBμV/m)
	Quasi-peak Level
30MHz~230MHz	40
230MHz~1000MHz	47

* The lower limit shall apply at the transition frequency.
* The test distance is 3m.

Frequency range	Average Limit (dBμV/m)	Peak Limit (dBμV/m)
1000MHz~3000MHz	50	70
3000MHz~6000MHz	54	74

NOTE: The lower limit applies at the transition frequency

6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

6.4. Test Data

PASS

Please refer to APPENDIX I.

7. HARMONIC CURRENT EMISSION TEST

7.1. Test Standard and Limit

7.1.1.Test Standard

EN61000-3-2: 2014

7.1.2.Limits

Table 12 Harmonic Current Test Limit (Class A)

Harmonic order (n)	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15≤n≤	0.15×15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8≤n≤	0.23×8/n

7.2. Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the Power of the EUT and use the test system to test the harmonic current level.

7.3. Test Data

N/A

Note:

Not Applicable, Equipment with a rated power of 75 W or less, other than lighting equipment, are out included in this standard.

8. VOLTAGE FLUCTUATION AND FLICKER TEST

8.1. Test Standard and Limit

8.1.1.Test Standard

EN61000-3-3: 2013

8.1.2.Limit

Table 13 Flicker Test Limit

Test items	Limits
Pst	1.0
dc	3.3%
dmax	4.0%
dt	Not exceed 3.3% for 500ms

8.2. Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test the harmonic current level.

8.3. Test Data

N/A

9. ELECTROSTATIC DISCHARGE IMMUNITY TEST

9.1. Test Requirements

9.1.1.Test Standard

EN 61000-4-2: 2009

9.1.2.Test Level

Table 14 Test Level for ESD Immunity Test

Port	Test Specification
Enclosure Port	8kV air discharge 4kV contact discharge

9.1.3.Performance criterion: B

9.2. Test Procedure

9.2.1.Contact Discharge:

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

9.2.2.Air Discharge:

Air discharge is used where contact discharge can't be applied. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

9.2.3.Indirect discharge for horizontal coupling plane

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT.

9.2.4.Indirect discharge for vertical coupling plane

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.3. Test Data

Table 15 ESD Immunity Test Data

Location	Voltage	Amount of test points	Discharge Method	Results
Slots	±2, ±4, ±8	10	A	Pass
Surface	±2, ±4, ±8	10	A	Pass
VCP	±2, ±4	8	C	Pass
HCP	±2, ±4	8	C	Pass

10. RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

10.1.Test Requirements

10.1.1.Test Standard

EN 61000-4-3: 2006+A2: 2010

10.1.2.Test Level

Table 16 Test Level for Radiated Electromagnetic Field Immunity Test

Port	Test Specification
Enclosure Port	80-1000MHz, 1.4GHz-2.7GHz 3 V/m 80 % AM (1kHz)

10.1.3.Performance criterion: A

10.2.Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually .In order to judge the EUT performance.

10.3.Test Data

Table 17 Radiated Electromagnetic Field Immunity Test Data

Frequency Rang (MHz)	80 MHz –1GHz, 1.4GHz-2.7GHz	
Field Strength (V/m)	3V/m	
Steps (%)	1%	
	Horizontal	Vertical
Front	Pass	Pass
Rear	Pass	Pass
Left	Pass	Pass
Right	Pass	Pass

11. ELECTRICAL FAST TRANSIENTS/BURSTS IMMUNITY TEST

11.1.Test Requirements

11.1.1.Test Standard

EN 61000-4-4: 2012

11.1.2.Level

Table 18 Test Level for EFT Immunity Test

Port	Test Specification
AC Power input	1kV (peak) 5/50 ns Tr/Th 5kHz repetition frequency
Signal line	1kV (peak) 5/50 ns Tr/Th 5kHz repetition frequency

11.1.3.Performance criterion: B

11.2.Test Procedure

11.2.1.For AC mains power ports:

The EUT is connected to the power mains by using a coupling device, which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 1minute.

11.3.Test Data

N/A

12. TRANSIENTS AND SURGES TEST

12.1. Test Requirements

12.1.1.Test Standard

EN 61000-4-5: 2014

12.1.2.Level

Table 19 Test Level for Surge

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.1.3.Performance criterion: B

12.2. Test Procedure

Set up the EUT and test generator For line to line coupling mode, provide a 0.5KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test. Different phase angles are done individually. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.3. Test Data

N/A

13. CONDUCTED IMMUNITY TEST

13.1. Test Requirements

13.1.1.Test Standard

EN 61000-4-6: 2014+AC: 2015

13.1.2.Level

Table 20 Test Level for Conducted Immunity

Port	Test Specification
Input and output AC power port	0.15MHz~80MHz 3V(r.m.s.) (unmodulated)

13.1.3.Performance criterion: A

13.2. Test Procedure

Setup the EUT, CDN and test generators as shown above. The test is performed with the generator contacted to each CDN in turn. The frequency range is swept form 150kHz to 230MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

13.3. Test Data

N/A

14. VOLTAGE DIPS AND INTERRUPTIONS IMMUNITY TEST

14.1. Test Requirements

14.1.1.Test Standard

EN 61000-4-11: 2004

14.1.2. Level

Table 21 Test Level for Voltage Dips and Interruptions

Port	Environmental phenomenon	Voltage dip and short interruptions %U_T	Cycle
Input AC power port	Voltage dips	0 %	0.5
		0 %	1
	Voltage interruptions	70 %	25
		0 %	250

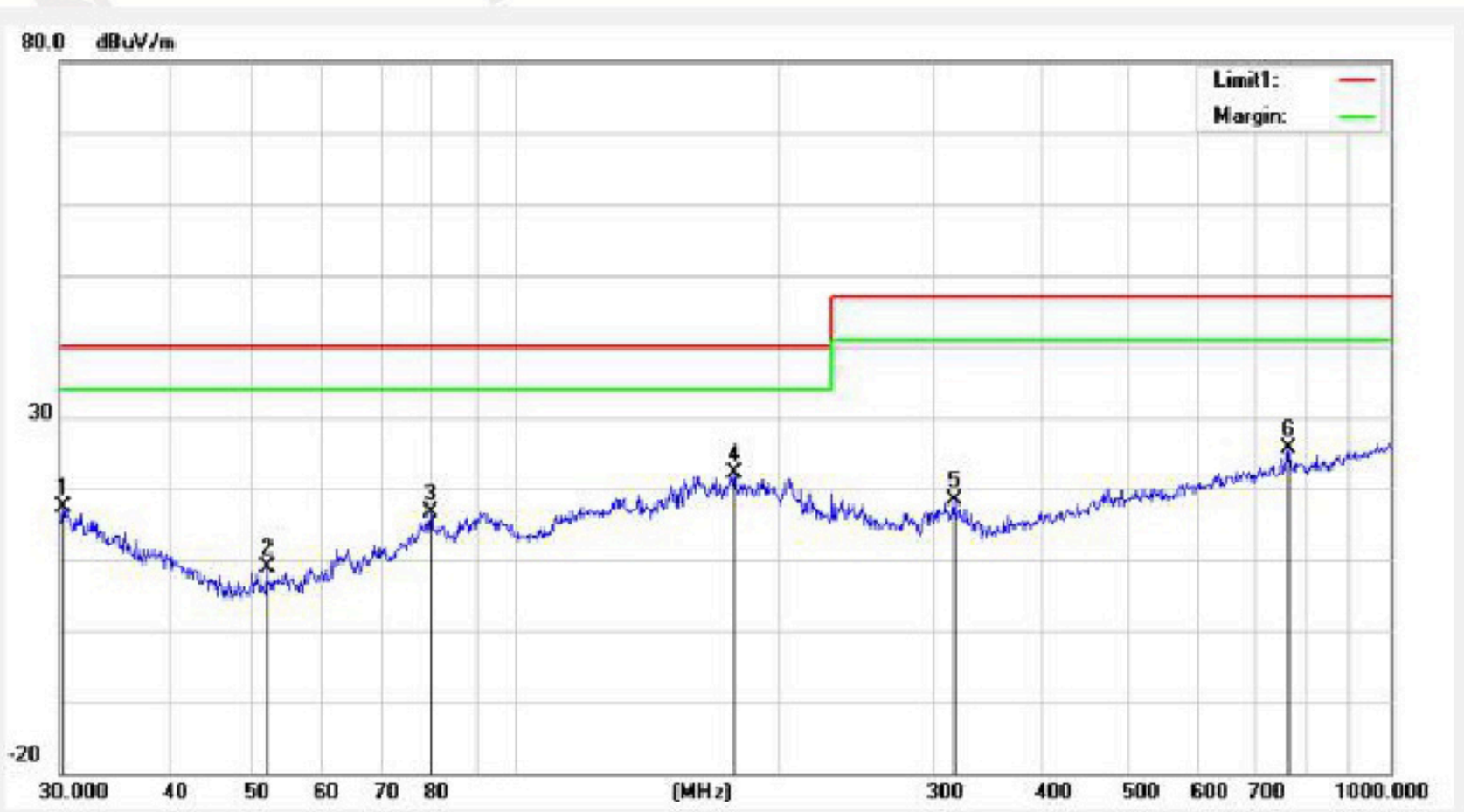
14.2. Test Procedure

Refer to EN 61000-4-11

14.3. Test Data

N/A

APPENDIX I

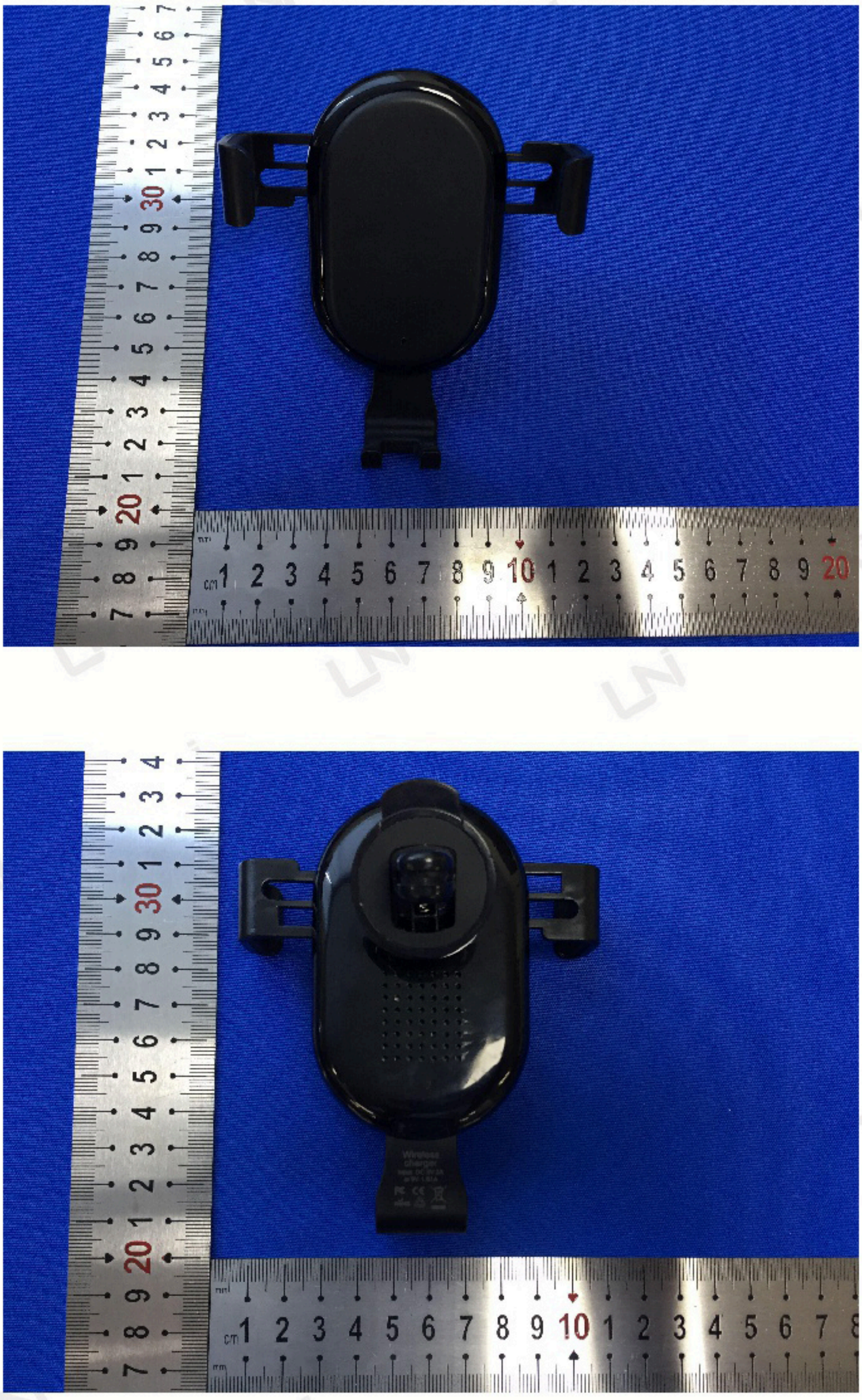


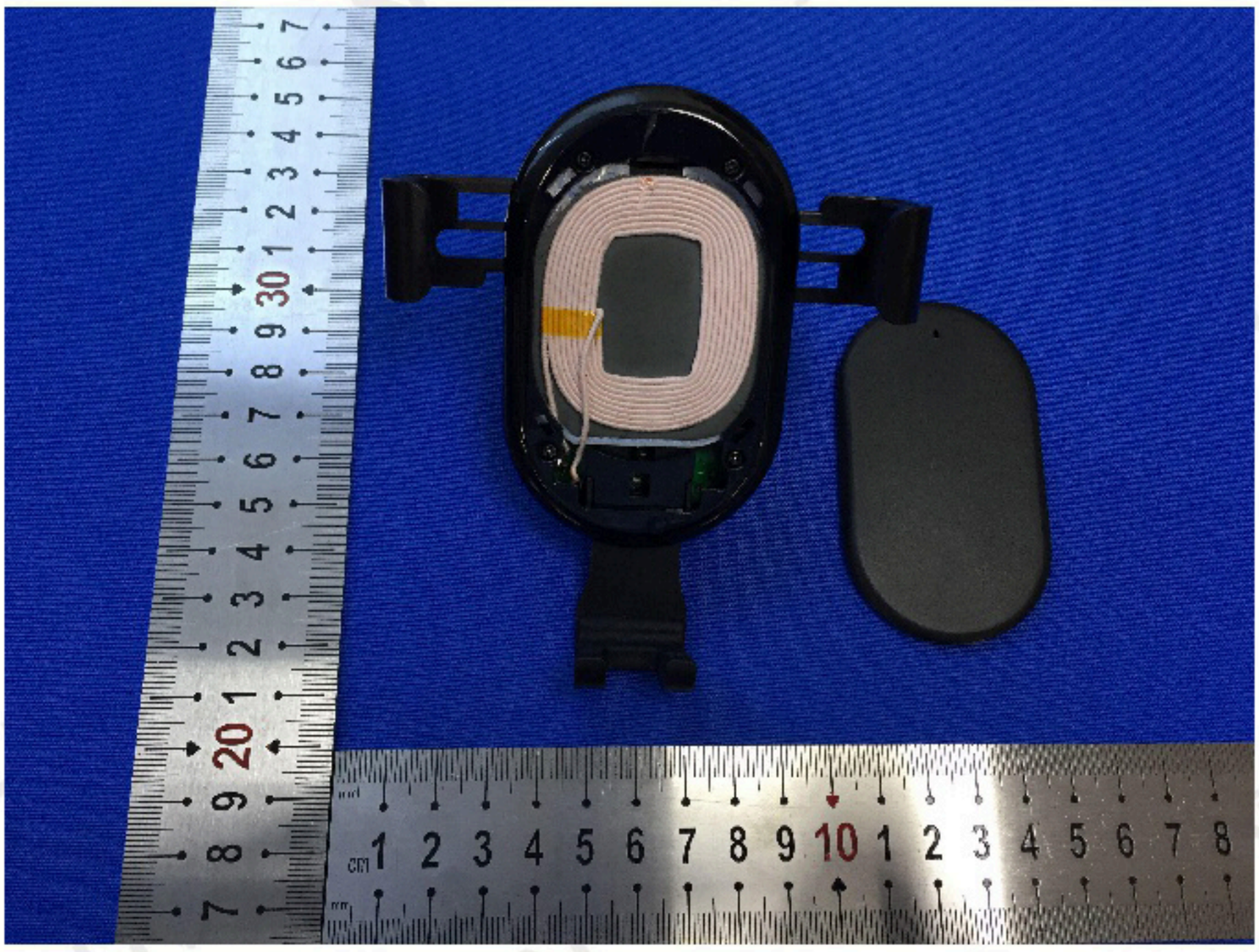
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.3173	27.78	-10.34	17.44	40.00	-22.56			peak
2	51.8430	32.79	-23.81	8.98	40.00	-31.02			peak
3	79.8003	35.03	-18.37	16.66	40.00	-23.34			peak
4*	177.5092	35.36	-13.22	22.14	40.00	-17.86			peak
5	316.5890	30.34	-12.04	18.30	47.00	-28.70			peak
6	763.3757	29.13	-3.61	25.52	47.00	-21.48			peak

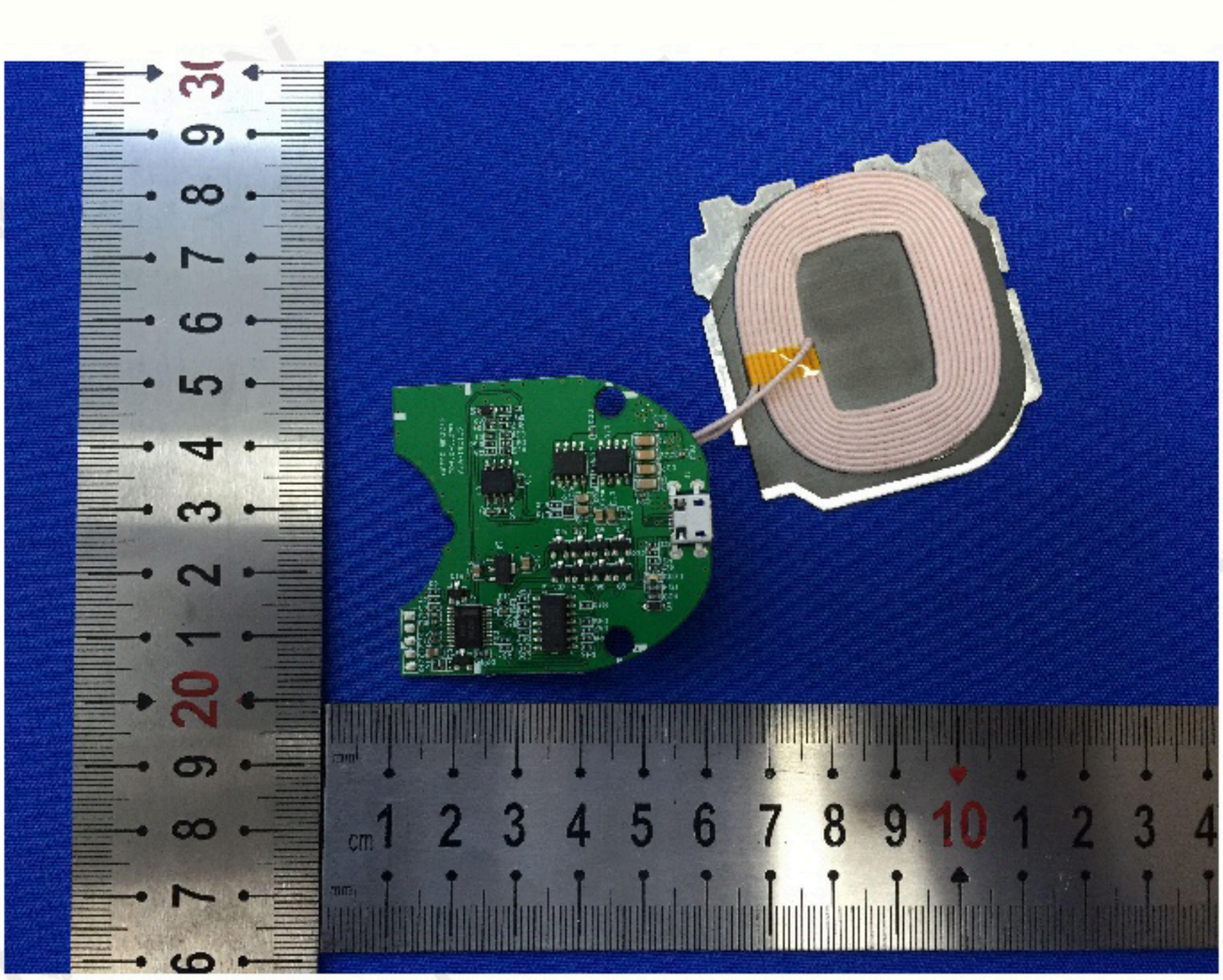
No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	30.0000	41.25	-10.08	31.17	40.00	-8.83			peak
2*	79.8003	53.51	-18.37	35.14	40.00	-4.86			peak
3	122.8340	43.02	-12.26	30.76	40.00	-9.24			peak
4	176.8878	37.48	-13.12	24.36	40.00	-15.64			peak
5	360.4477	36.95	-11.39	25.56	47.00	-21.44			peak
6	893.8567	30.52	-1.79	28.73	47.00	-18.27			peak

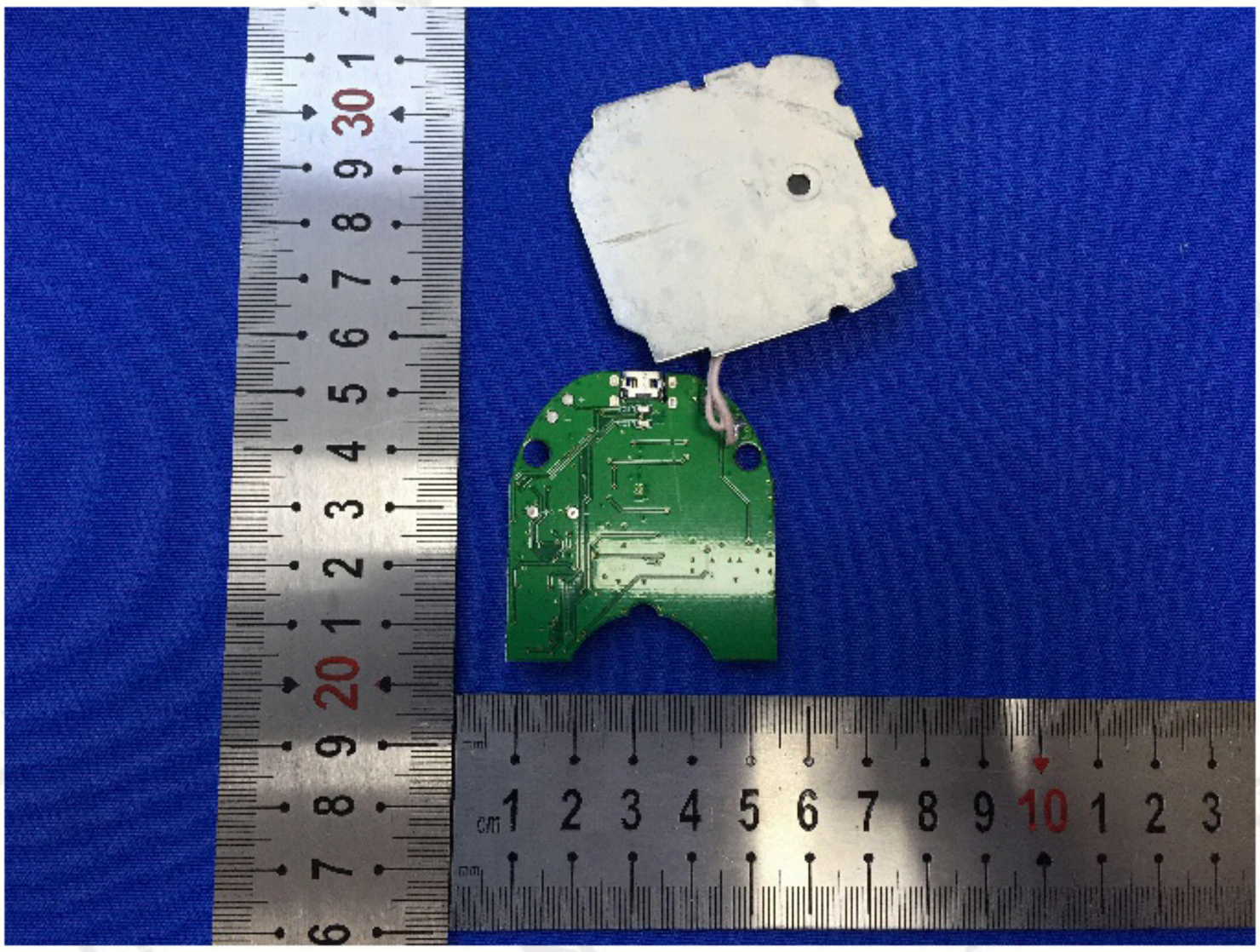
Note: Result=Reading+Factor Over Limit=Result-Limit

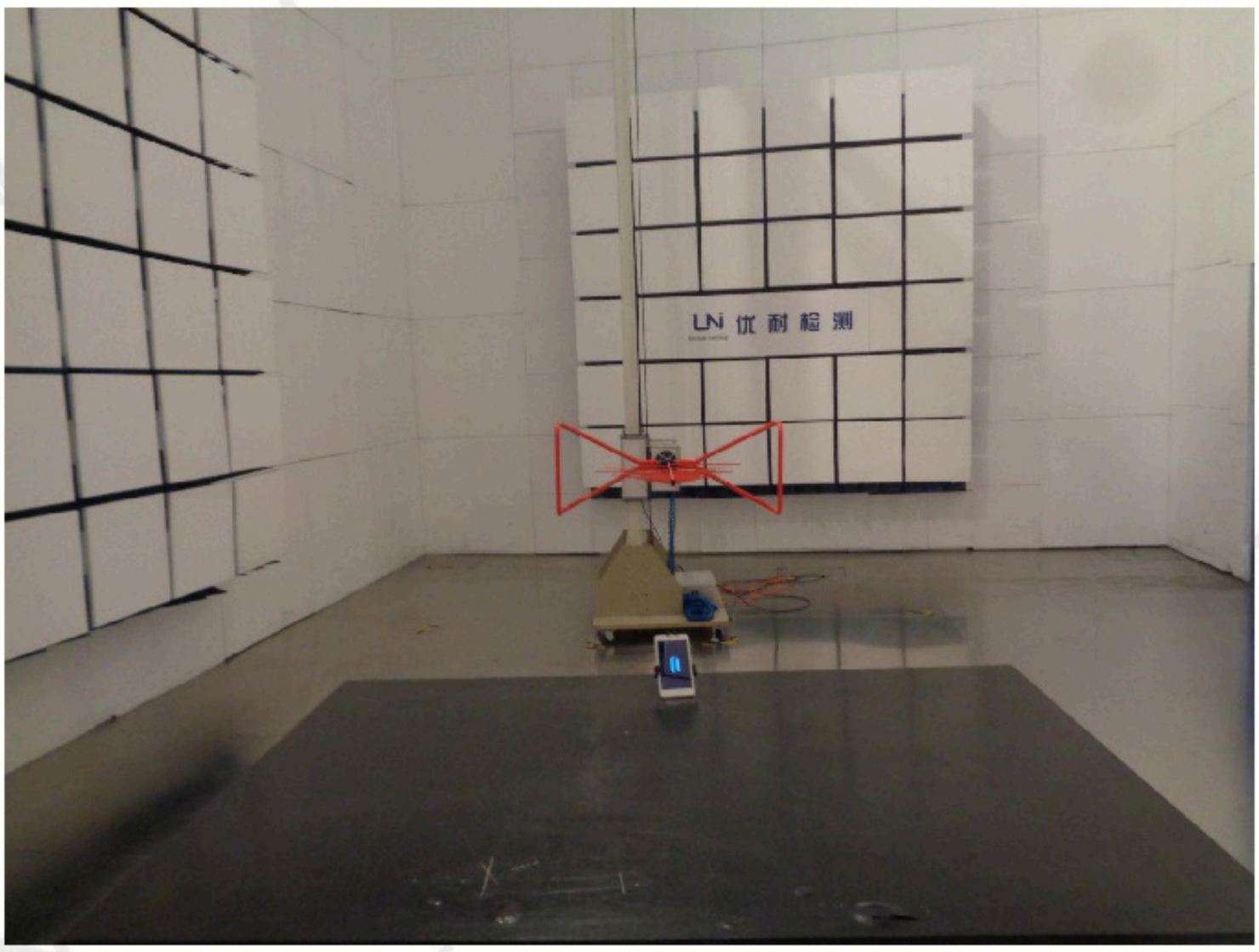
APPENDIX II











End of Report