TEST REPORT

No. I14Z45294-SRD01

for

ZTE Corporation

N9520 Wireless Charging Leather Cover、Wireless Charging

Model Name: TWC010, TWC9520R

FCC ID：SRQ-TWC010

with

Hardware Version: A/0

Software Version: /

Issued Date: Apr. 10th, 2014

TESTING
CNAS L0442

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of TMC Beijing.

Test Laboratory:

CNAS accreditation (ISO/IEC 17025(CNAS-CL01)): No. CNAS L0442

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-1

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

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CONTENTS

1. TEST LABORATORY 3

1.1. TESTING LOCATION 3
1.2. TESTING ENVIRONMENT 3
1.3. PROJECT DATA 3
1.4. SIGNATURE 3

2. CLIENT INFORMATION 4

2.1. APPLICANT INFORMATION 4
2.2. MANUFACTURER INFORMATION 4

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) 5

3.1. ABOUT EUT 5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST 5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST 5
3.4. GENERAL DESCRIPTION 6
3.5. EUT SET-UPS 6

4. REFERENCE DOCUMENTS 6

4.1. DOCUMENTS SUPPLIED BY THE APPLICANT 6
4.2. REGULATIONS AND STANDARDS 6

5. LABORATORY ENVIRONMENT 7

6. SUMMARY OF TEST RESULTS 8

6.1. SUMMARY OF TEST RESULTS 8
6.2. TERMS USED IN THE SUMMARY OF TEST RESULTS 8
6.3. STATEMENTS 9

7. TEST EQUIPMENTS UTILIZED 10

ANNEX A: MEASUREMENT RESULTS 11

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1. Test Laboratory

1.1. Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No 52, Huayuanbei Road, Haidian District, Beijing, P.R.China
Postal Code:	100191
Telephone:	+86-10-62304633-2678
Fax:	+86-10-62304633-2504

1.2. Testing Environment

Ambient Temperature:	15 ~ 25 ℃
Relative Humidity:	30 ~ 60 %
Air pressure	980 ~ 1040 mbar

See Section 5 and corresponding parts of this report for the general requirements and recorded climatic conditions for each test environments.

1.3. Project Data

Receipt of Sample:	Feb. 25th, 2014
Testing Start Date:	Mar. 28th, 2014
Testing End Date:	Apr. 03rd , 2014

1.4. Signature

胡晓宇

Hu Xiaoyu

(Prepared this test report)

杨军

Yang Jun

(Reviewed this test report)

Wang Hongbo

Deputy Director of the laboratory

(Approved this test report)

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2. Client Information

2.1. Applicant Information

Company Name:	ZTE Corporation
Address /Post:	ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
City:	ShenZhen
Country:	China
Telephone:	+86-21-68897541
Fax:	+86-21-50801070

2.2. Manufacturer Information

Company Name:	ZTE Corporation
Address /Post:	ZTE Plaza, #55 Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
City:	ShenZhen
Country:	China
Telephone:	+86-21-68897541
Fax:	+86-21-50801070

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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description:	Wireless charger product
Model Name:	TWC010, TWC9520R
FCC ID:	SRQ-TWC010
With WPT Function:	Yes
Specification:	WPC
Operation Temperature:	0°C to +50°C

Note1: High and low voltage values of extreme conditions are given by the manufacturer.

3.2. Internal Identification of EUT Used during the Test

Mobile phone identification

EUT ID*	Model	SN	HW Version
EUT1	TWC010	1445294UT01a	A/0
EUT2	TWC9520R	1445294AE001	/

*EUT ID: It is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE Used during the Test

AE ID*	Description	SN/IMEI
AE1	Mobile Phone	000039485642710
AE2	AC/DC adapter	1445294CH001
AE3	USB cable	1445294DC002

AE1

Model	N9520
Manufacturer	ZTE
HW version	cyyB
SW version	N9520V1.0.0B05

AE2

Model	STC-A515A USBA
Manufacturer	ZTE
input	100-240V~50/60Hz 300mA
Output	5.0V 1500mA

AE3

Model	/
Manufacturer	ZTE
Length of cable	120 cm

*AE ID: It is used to identify the test sample in the lab internally.

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3.4. General Description

The Equipment Under Test (EUT) is a model of Wireless Charger.
The EUT is powered by AC/DC adapter. The DC input of EUT is 5V/1500mA.
It includes normal option: AC/DC adapter.
Manual and specifications of the EUT were provided to fulfil the test.
Samples undergoing test were selected by the client.

3.5. EUT Set-ups

EUT Set-up No.	Combination of EUT and AE	Remarks
Set. WPT01	EUT1+EUT2+AE1+AE2	--

4. Reference Documents

4.1. Documents Supplied by the Applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Regulations and Standards

The following documents listed in this section are referred for testing.

Reference	Title	Version
CFR 47 Part 2	Part 2 — Frequency Allocations and Radio Treaty Matters; General Rules and Regulations.	2012
CFR 47 Part 15	Part 15 — Radio Frequency Devices. Subpart C — Intentional Radiators. § 15.35 Measurement detector functions and bandwidths. § 15.207 Conducted limits. § 15.209 Radiated emission limits, general requirements. § 15.215 Additional provisions to the general radiated emission limitations. § 15.225 Operation within the band 13.110–14.010 MHz.	2012
ANSI C63.4	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.	2009

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5. LABORATORY ENVIRONMENT

Semi-anechoic chamber SAC-1 (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Fully-Anechoic Chamber FAC-3 (8.6m×6.1m×3.85m) did not exceed following limits along the testing:

Temperature	Min. = 15 ℃, Max. = 25 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1 to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

Conducted Chamber did not exceed following limits along the testing:

Temperature	Min. = 15 ℃, Max. = 25 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

Control Room did not exceed following limits along the testing:

Temperature	Min. = 15 ℃, Max. = 25 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

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6. SUMMARY OF TEST RESULTS

6.1. Summary of Test Results

No	Test Cases	Clause in Regulation	Section in This Report	Verdict
1	Electric Field Radiated Emissions	CFR 47 § 15.209	A.1	P(Set. WPT01)
			A.2	P(Set. WPT01)
2	20dB Bandwidth	CFR 47 § 15.215(c)	A.3	P(Set. WPT01)
3	Conducted Emissions	CFR 47 § 15.207	A.4	P(Set. WPT01)
The measurement is carried out according to ANSI C63.4. See **ANNEX A** for details.				

6.2. Terms Used in the Summary of Test Results

Terms Used in Condition Column:

T nom	Normal Temperature
T min	Low Temperature
T max	High Temperature
V nom	Normal Voltage
V min	Low Voltage
V max	High voltage
H nom	Norm Humidity
A nom	Norm Air Pressure

Terms Used in Verdict Column:

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by TMC
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

Abbreviations:

AC	Alternating Current
AFH	Adaptive Frequency Hopping
BW	Band Width
E.I.R.P.	equivalent isotropical radiated power
ISM	Industrial, Scientific and Medical
RF	Radio Frequency
Tx	Transmitter

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6.3. Statements

The test cases listed in Section 6.1 of this report for the EUT specified in Section 3 were performed by TMC according to the reference documents in Section 4.

The EUT meets all applicable requirements of the regulations and standards in Section 4.2.

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7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1.	Thermal Chamber	PL-2G	343074	ESPEC	2014-05-12
2.	Spectrum Analyzer	RSA3408A	B 010277	Tektronix	2014-05-27
3.	H-field Antenna	HFH2-Z2	829324/0007	R&S	2014-07-02
4.	Test Receiver	ESCI 7	100948	R&S	2014-07-18
5.	Spectrum Analyzer	FSV	101047	R&S	2014-06-30
6.	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2014-04-17
7.	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-16
8.	Universal Radio Communication Tester	CMU200	109914	R&S	2014-04-18
9.	Vector Signal Generator	SMU200A	102082	R&S	2014-11-01

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ANNEX A: MEASUREMENT RESULTS

A.1. Electric Field Radiated Emissions (< 30MHz)

A.1.1. Reference

See Clause 13.4, Clause 8 and Annex E of ANSI C63.4-2009 specifically.
See Clause 4, Clause 5, and Clause 6 of ANSI C63.4-2009 generally.

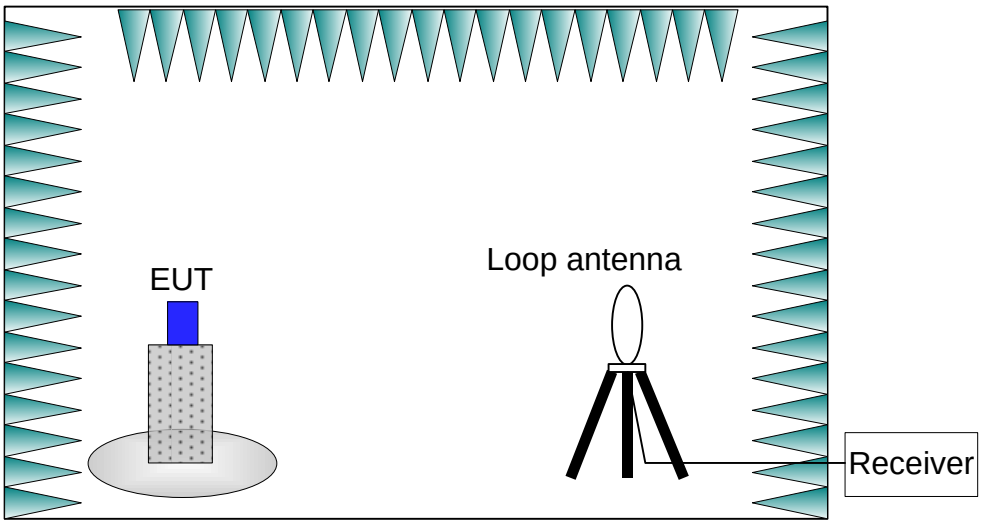
A.1.2. Measurement Methods

The transmitter carrier output levels (E-Field) from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 3m from the receiving antenna. The center of the receiving loop antenna is 1.0 meter above the ground. The E-field is measured with a shielded loop antenna connected to a measurement receiver. Detected E-field was maximized by rotating the EUT through 360° and adjusting the receiving antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes.

The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/VBW
0.009-0.15	100/300 Hz
0.15-30	10/30 kHz

The E-field measured at 3m is calculated as:
E-field (dBµV/m) = Rx (dBµV) + Cable Loss (dB) + AF@3m (dB/m)



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A.1.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of WPT.

The Charging State of WPT: the Receiver is put on the surface of the wireless charging pad under test, and the position where put on the surface should apply to the manual of the EUT.

The EUT is powered by an adapter.

During the measurements, the ambient temperature of the electromagnetic anechoic chamber is in the range of 15 ~ 25 ℃.

A.1.4. Test Layouts

See Annex C picture-1.

A.1.5. Limits

Frequency Range (MHz)	E-field Strength Limit @ 30m (mV/m)	E-field Strength Limit @ 3m (dBμV/m)
0.009-0.490	2400/F(kHz)	129-94
0.490-1.705	24000/F(kHz)	74-63
1.705-30	30	70
Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula: $\text{Extrapolation(dB)} = 40\log_{10}(\text{Measurement Distance}/\text{Specification Distance})$		

A.1.6. Measurement Results

Measurement results of normal conditions see Figure A-1. The result displayed take into account applicable antenna factors and cable losses.

Conclusions: Set. WPT01, **PASS**;

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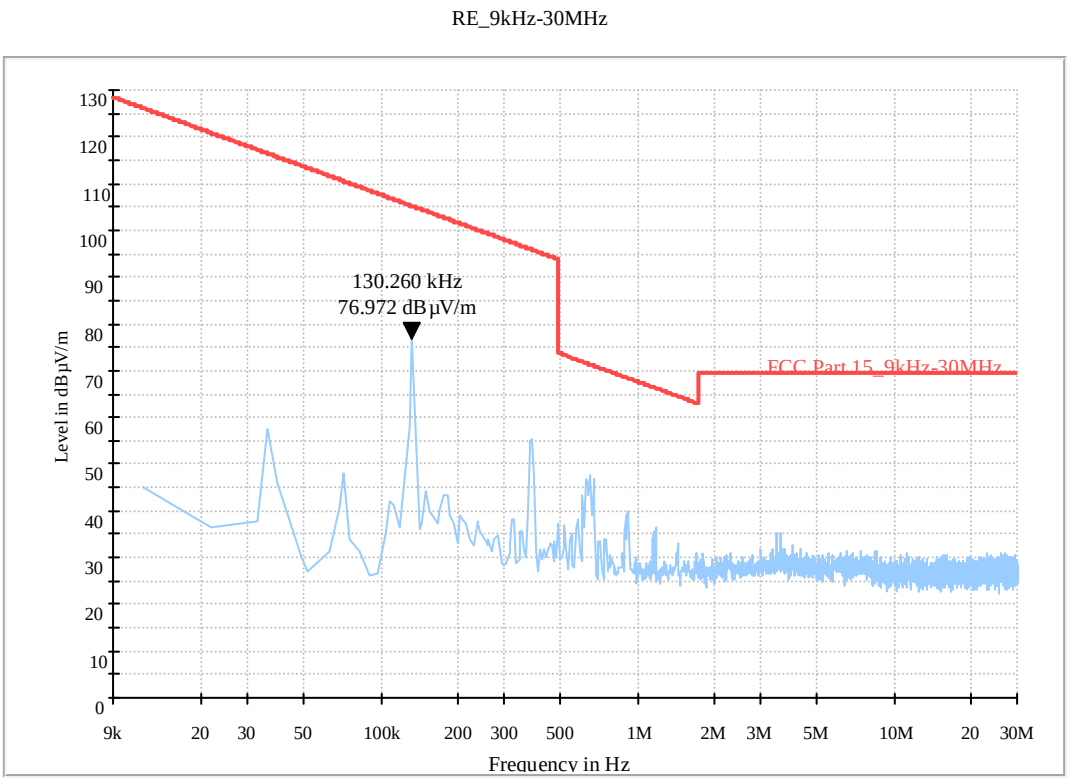

Figure A-1: Set. WPT01

A.1.7. Measurement Uncertainty

Measurement uncertainty: *U* = 4.0 dB, k=2

A.2. Electric Field Radiated Emissions (≥30MHz)

A.2.1. Reference

See Clause 13.4, Clause 8, and Annex E of ANSI C63.4-2009 specifically.
See Clause 4, Clause 5, and Clause 6 of ANSI C63.4-2009 generally.

A.2.2. Measurement Methods

The electric field radiated emissions from the EUT are measured in a semi-anechoic chamber. The EUT is placed on a non-conductive stand of 80cm high, and at a measurement distance of 10m from the receiving antenna. The receiving antennas connected to a measurement receiver comply with Clause 15 of ANSI C63.2-1996 and Clause 4.1.5 of ANSI C63.4-2009. In order to search for maximum field strength emitted from the EUT, the receiving antenna can be moved between the height of 1.0 m to 4.0 m. Detected E-field was maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna positions for both vertical and horizontal antenna polarizations. The maximization processes were repeated with the EUT positioned respectively in its three orthogonal axes. The measurements were performed with the peak detector and if required, the quasi-peak detector.

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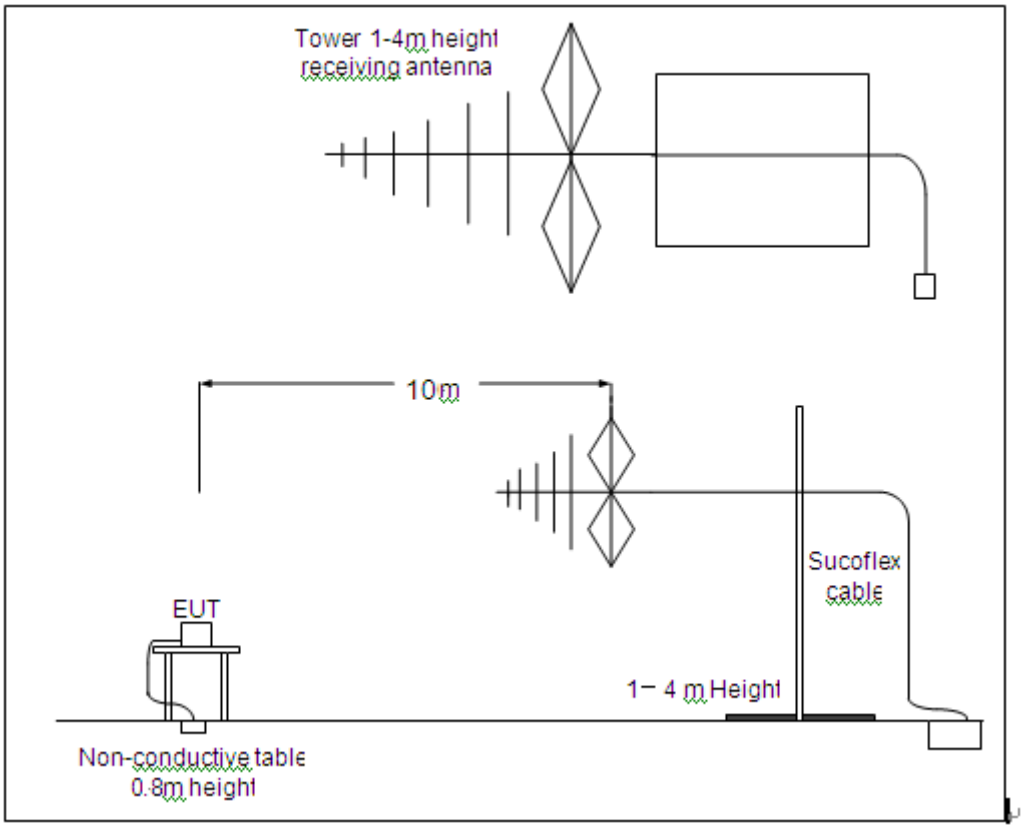
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/VBW
30-1000	120kHz



A.2.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of WPT.

EUT1 had been connected to a travel adapter.

During the measurements, the ambient temperature of the electromagnetic anechoic chamber is in the range of 15 ~ 25 ℃.

A.2.4. Test Layouts

See Annex C picture-2

A.2.5. Limits

Frequency Range (MHz)	E-field Strength Limit @ 3m (mV/m)	E-field Strength Limit @ 3m (dBμV/m)	E-field Strength Limit @ 10m (dBμV/m)
30-88	100	40	30
88-216	150	43.5	33.5
216-960	200	46	36
960-1000	500	54	44

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A.2.6. Measurement Results

Measurement results of normal conditions see Figure A-2. The result displayed take into account applicable antenna factors and cable losses.

Conclusions: Set. WPT01, **PASS**.

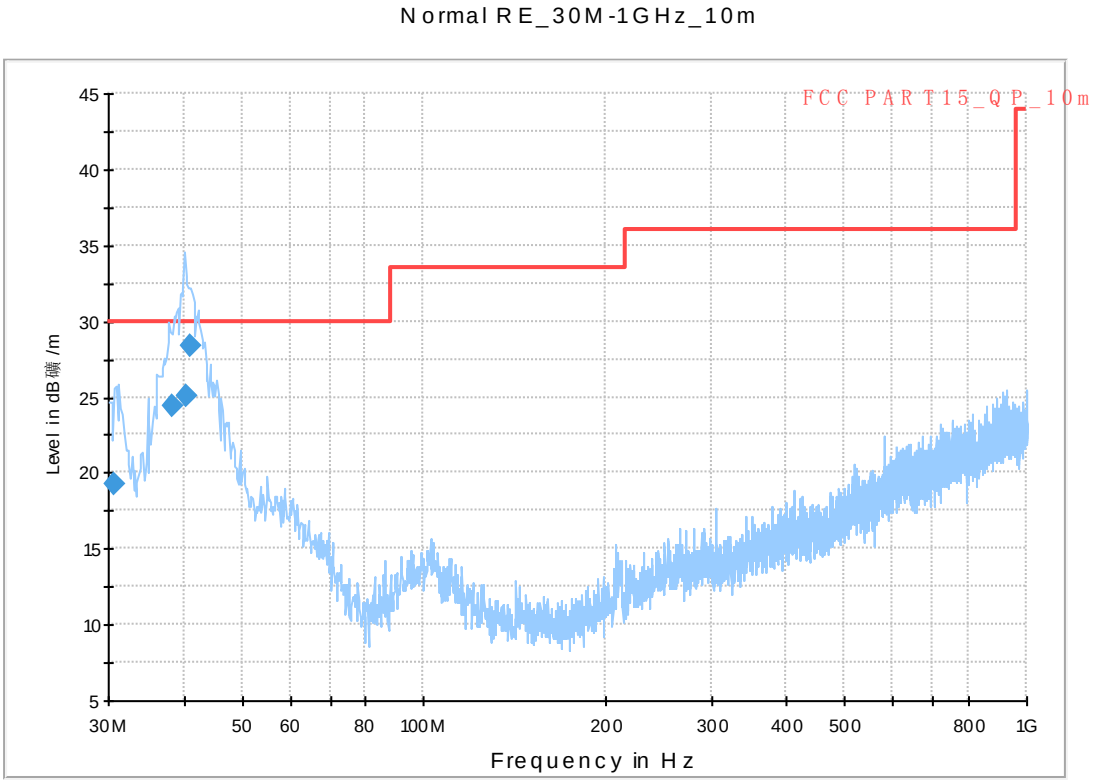

Figure A-2: Set. WPT01

Final Result 1

Frequency	QuasiPeak	Height	Polarization	Azimuth	Corr.	Margin	Limit	Comment
30.612500	19.3	215.0	V	210.0	-21.8	10.7	30.0	
38.301250	24.4	100.0	V	194.0	-19.7	5.6	30.0	
40.485000	25.0	225.0	V	270.0	-19.6	5.0	30.0	
41.155000	28.4	125.0	V	270.0	-19.7	1.6	30.0	

A.2.7. Measurement Uncertainty

Measurement uncertainty: *U* =3.9 dB, k=2

A.3. 20dB Bandwidth

A.3.1. Reference

See Clause 13.7 of ANSI C63.4-2009 specifically.

See Clause 4, Clause 5, and Clause 6 of ANSI C63.4-2009 generally.

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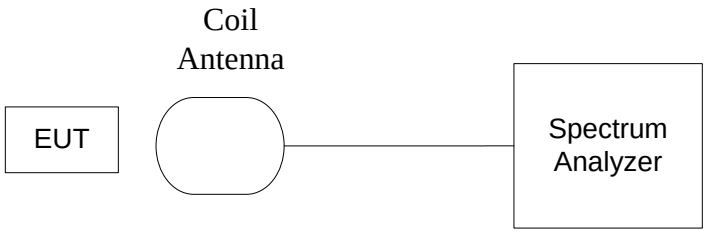
A.3.2. Measurement Methods

The transmitter output signal was picked up by coil antenna to the spectrum analyzer.
The transmitter output signal was picked up by coil antenna connected to the spectrum analyzer.
The bandwidth of the center frequency was measured with 500Hz RBW, and 100 kHz span.



A.3.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of WPT.
During the measurements, the ambient temperature is in the range of 15 ~ 25 ℃.

A.3.4. Limits

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

A.3.5. Measurement Results

Measurement results see Figure A-3.
Conclusions: Set. WPT01, **PASS**.

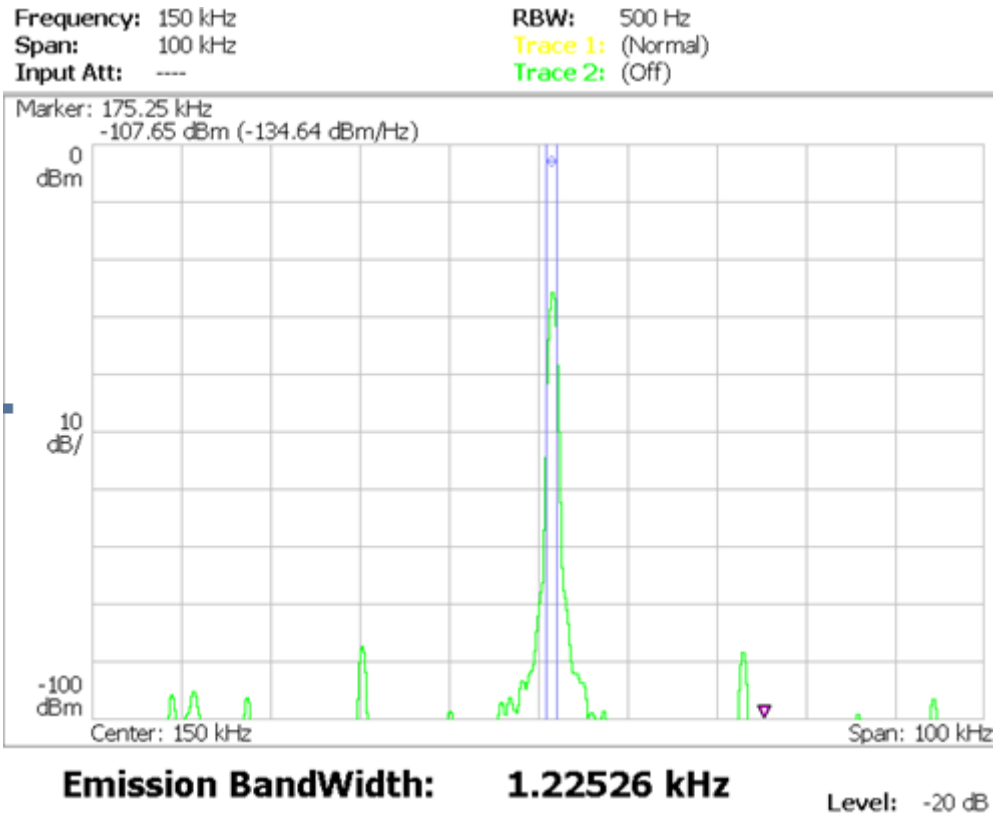


Figure A-3: Set. WPT01

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A.3.6. Measurement Uncertainty

Measurement uncertainty: *U* =77 Hz, k=2

A.4. Conducted emission

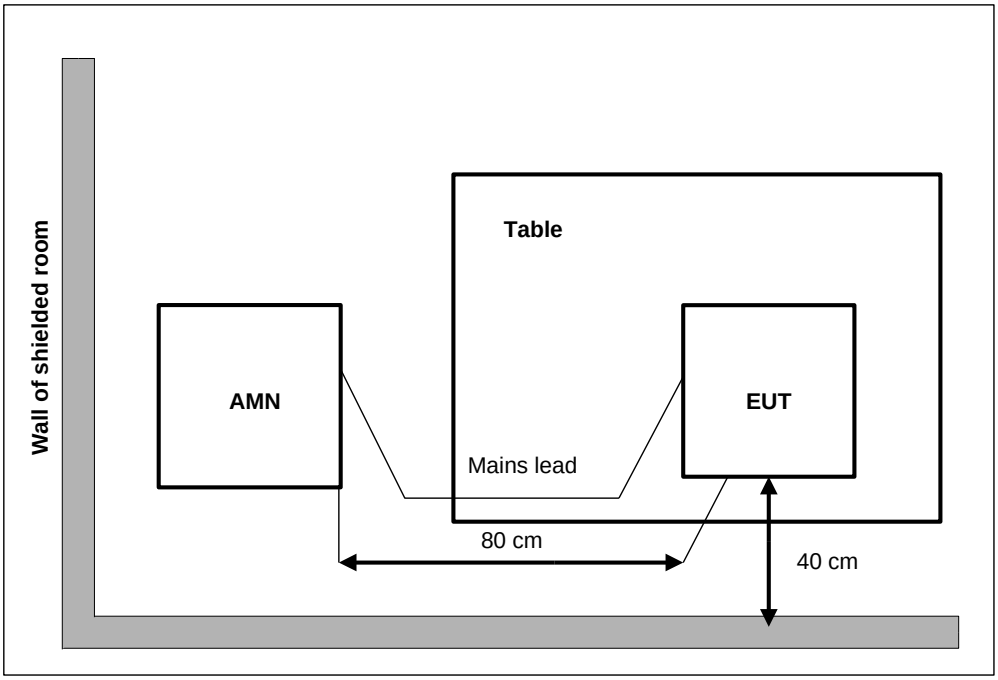
A.4.1. Reference

See Clause 13.3 and Clause 7 of ANSI C63.4-2009 specifically.
See Clause 4, Clause 5, and Clause 6 of ANSI C63.4-2009 generally.

A.4.2. Measurement Methods

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.
The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/VBW
0.15-30	9kHz



A.4.3. EUT Operating Mode and Test Conditions

The measurement of EUT is carried out under the transmit state of WPT.
The EUT is powered by a travel adapter.
During the measurements, the ambient temperature is in the range of 15 ~ 25 ℃.

A.4.4. Test Layouts

See Annex C picture-3.

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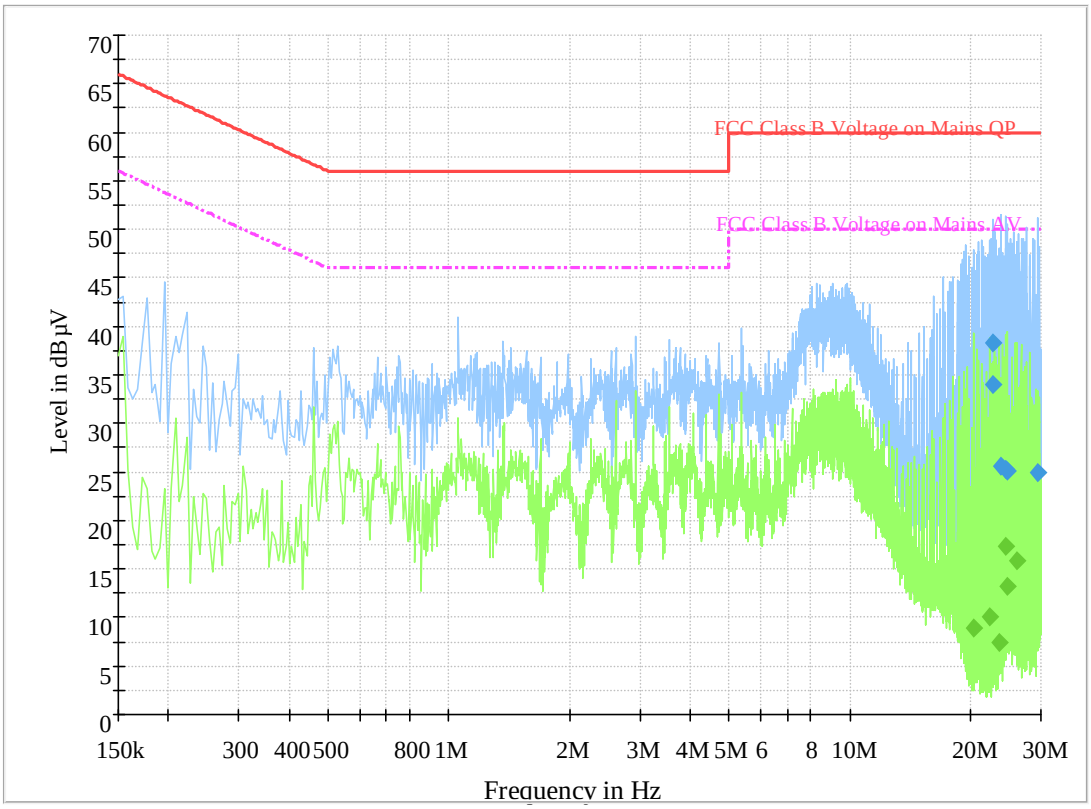
A.4.5. Limits

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Average Limit (dBμV)
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

A.4.6. Measurement Results

Measurement results see Figure A-4.

Conclusions: Set. WPT01, **PASS**.



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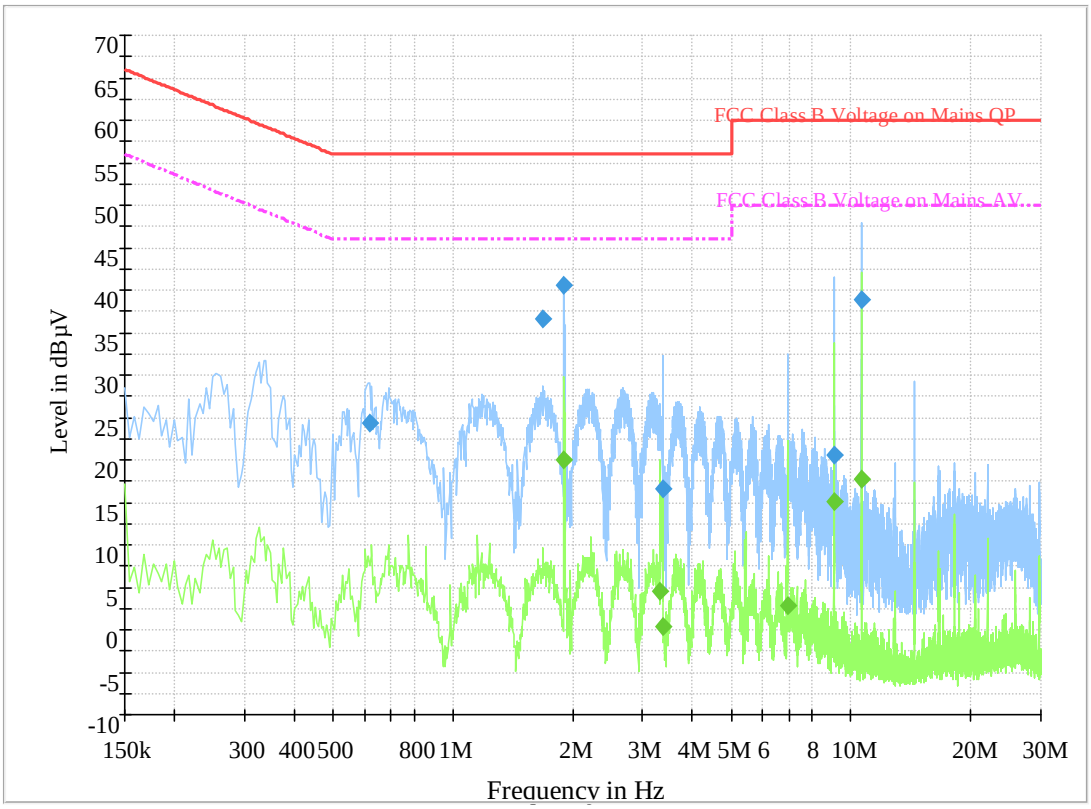

Figure A-4: Test result of EUT at test set. WPT01

Final Result 1

Frequency	QuasiPeak	PE	Line	Corr.	Margin	Limit
22.780500	38.4	GND	N	9.5	21.6	60.0
22.789500	34.1	GND	N	9.5	25.9	60.0
23.869500	25.6	GND	N	9.6	34.4	60.0
24.486000	25.3	GND	L1	9.5	34.7	60.0
24.697500	25.0	GND	N	9.6	35.0	60.0
29.341500	25.0	GND	N	9.8	35.0	60.0

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Final Result 2

Frequency	Average	PE	Line	Corr.	Margin	Limit
20.319000	8.9	GND	L1	9.4	41.1	50.0
22.429500	10.0	GND	L1	9.4	40.0	50.0
23.671500	7.5	GND	L1	9.5	42.5	50.0
24.486000	17.4	GND	L1	9.5	32.6	50.0
24.787500	13.1	GND	L1	9.5	36.9	50.0
26.232000	15.9	GND	L1	9.5	34.1	50.0

A.4.7. Measurement Uncertainty

Measurement uncertainty: U = 3.2 dB, k=2

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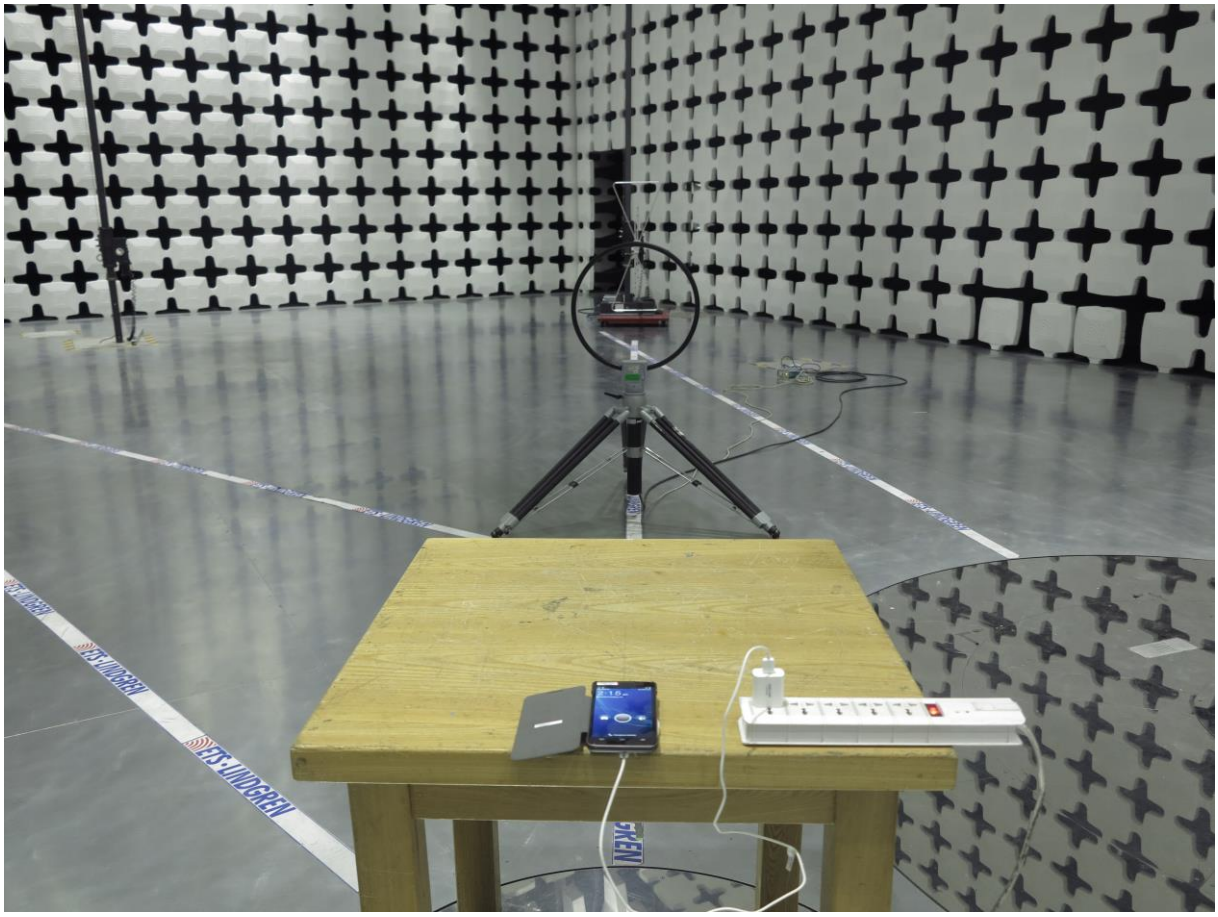
ANNEX C: TEST LAYOUT



Picture C-1: Field Strength Measurements (Below 30MHz)

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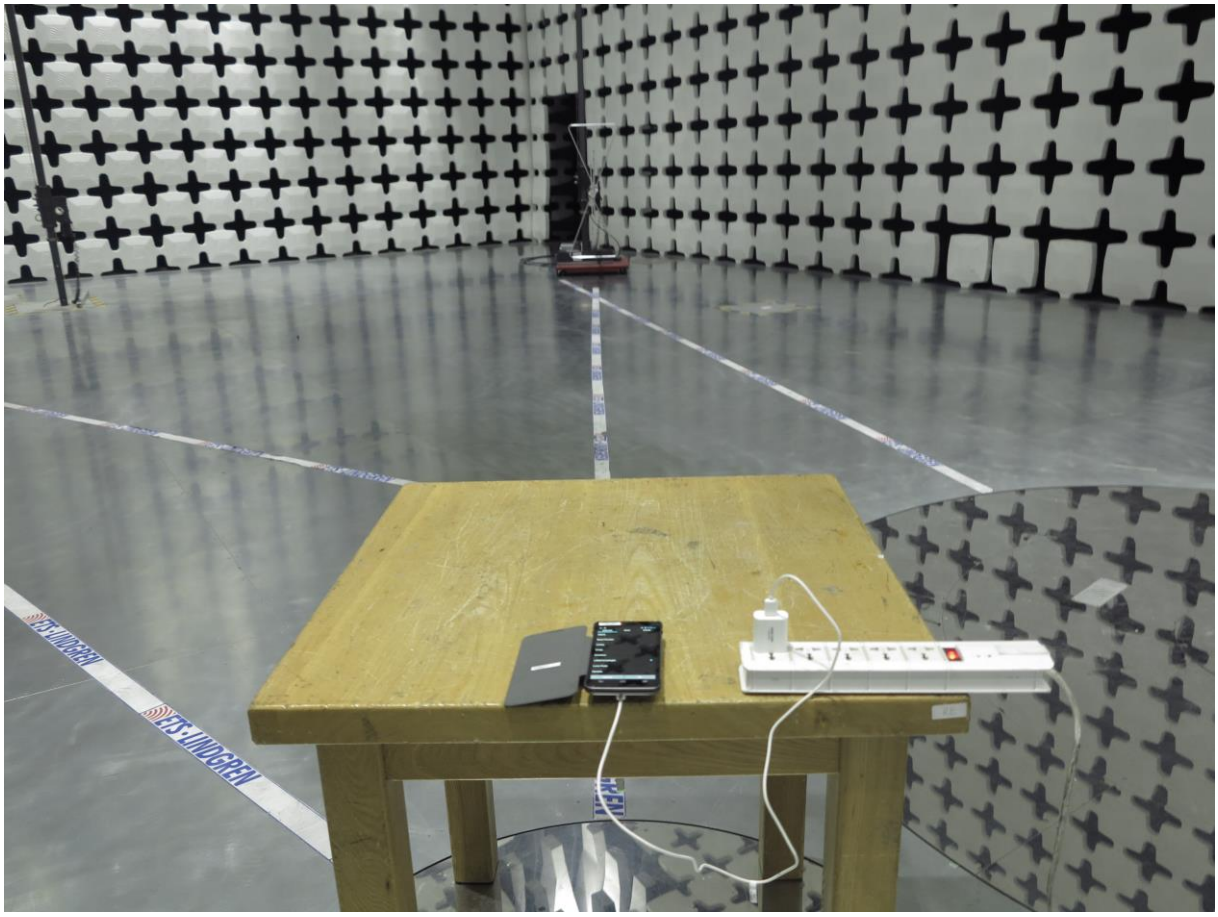

Picture C-2: Field Strength Measurements (Above 30MHz)

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Picture C-3: Conducted emission

*****END OF REPORT*****

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