

Prüfbericht-Nr.: Test Report No.:	50074869 002	Auftrags-Nr.: Order No.:	114061721	Seite 1 von 21 Page 1 of 21
Kunden-Referenz-Nr.: Client Reference No.:	N/A	Auftragsdatum: Order date:	21-Feb-2017	
Auftraggeber: Client:	U-Way Corporation., 3F.-2, No.125, Ln. 235, Baoqiao Rd., Xindian Dist., New Taipei City 23145, Taiwan (R.O.C.).			
Prüfgegenstand: Test item:	Insignia Fast Charging Pad Qi Charging Pad for Apple			
Bezeichnung / Typ-Nr.: Identification / Type No.:	SAMQT-1011/1012, NS-MWPC2, NS-MWPC2-C, NS-MWPCA5			
Auftrags-Inhalt: Order content:	FCC Part15C / RSS-216 Test report			
Prüfgrundlage: Test specification:	FCC 47CFR Part 15: Subpart C Section 15.209 RSS-216, Issue 2 January 2016 RSS-Gen, Issue 4 November 2014			
Wareneingangsdatum: Date of receipt:	3-Mar-2017			
Prüfmuster-Nr.: Test sample No.:	A000496041 002			
Prüfzeitraum: Testing period:	7-Mar-2017 – 22-Mar-2017			
Ort der Prüfung: Place of testing:	EMC Laboratory Taipei			
Prüflaboratorium: Testing laboratory:	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
01-Aug-2017 Amy S.R.Hsu /Engineer		01-Aug-2017 Arvin Ho/Department Manager		
Datum Date	Name / Stellung Name / Position	Unterschrift Signature	Datum Date	Name / Stellung Name / Position
Sonstiges / Other: 002 add model name NS-MWPCA5 and product name Qi Charging Pad for Apple. SAMQT-1011/1012, NS-MWPC2, NS-MWPC2-C, NS-MWPCA5 RF characteristics and PCB layout are the same, only difference in the model name and appearance color due to market strategy.				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: Passed

5.1.2 FIELD STRENGTH OF FUNDAMENTAL

RESULT: Passed

5.1.3 99% BANDWIDTH

RESULT: Passed

5.1.4 SPURIOUS EMISSION

RESULT: Passed

5.2.1 CONDUCTED EMISSIONS LINE AND NEUTRAL

RESULT: Passed

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix S: Photo Documentation

(File Name: 50074869APPENDIX S)

Appendix D: Test Result of Radiated Emissions

(File Name: 50074869APPENDIX D)

Test Specifications

The following standards were applied (in bold: product standards, otherwise: basic standards).

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.209 RSS-Gen, Issue 4 November 2014 RSS-216, Issue 2 January 2016 ANSI C63.10:2013

2. Test Sites

2.1 Test Facilities

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: 365730
IC Canada Registration No.: 9465A-1
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2016-Jul-1st to 2019-Jun-30th



Testing Laboratory
0759

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manu-facturer	Type	S/N	Last Calibration	Next Calibration
Test Software	Farad	EZ_EMC	Ver. TUV3A1	N/A	N/A
EMI Test Receiver	R&S	ESR7	101062	2016/09/12	2017/09/12
Spectrum Analyzer	R&S	FSV 40	100921	2016/04/21	2017/04/21
Spectrum Analyzer	Agilent	N9010A	MY53470241	2016/04/25	2017/04/24
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	2016/07/29	2017/07/29
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	2016/12/01	2017/12/01
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	060558	2016/11/17	2017/11/17
Bilog Antenna	TESEQ	CBL6111D	29804	2016/06/23	2017/06/23
Horn Antenna	ETS-Lindgren	3117	138160	2016/05/03	2017/05/03
Horn Antenna (18GHz~40GHz)	COM-POWER	AH840	101029	2016/10/11	2017/10/11
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2016/05/11	2017/05/11
EMI Test Receiver	R&S	ESC17	100797	2016/12/30	2017/12/30
Spectrum Analyzer	R&S	FSL3	101943	2015/09/07	2017/09/07
LISN (1 phase)	R&S	ENV216	101243	2016/06/02	2017/06/02

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are $\pm 3\text{dB}$.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	$\pm 1.5 \text{ dB}$
Adjacent channel power	$\pm 3 \text{ dB}$
Radiated emission of transmitter, valid up to 26 GHz	$\pm 6 \text{ dB}$
Radiated emission of receiver, valid up to 26 GHz	$\pm 6 \text{ dB}$
Temperature	$\pm 2 \text{ }^{\circ}\text{C}$
Humidity	$\pm 10 \%$

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Wireless Charging Pad. As an option, the device can have an external 130 kHz Card reader. This test report is for the 130 kHz portion.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 Ratings and System Details

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	Insignia Fast Charging Pad Qi Charging Pad for Apple
Type Designation	SAMQT-1011/1012, NS-MWPC2, NS-MWPC2-C, NS-MWPCA5
FCC ID	2ALAP-001101
IC ID	22492-001101
HVIN	NS-MWPC2-C

Table 5: Technical Specification of EUT

Item	Value
Operating Frequencies	112 – 205KHz
Channel number	1
Operation Voltage	AC/DC adaptor input: 100 - 240 VAC 50/60Hz 0.4A ; output: 5 - 12V, 2.15 - 2A
Modulation	CW with load modulation similar to WPC qi standard

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting
 - 1. Middle channel

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test procedure:

Power on the EUT and put Load device on it. EUT will start providing wireless power. Power transmission and load status detection is done simultaneously using the fundamental frequency in the range of 112 – 205 KHz.

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

None.

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

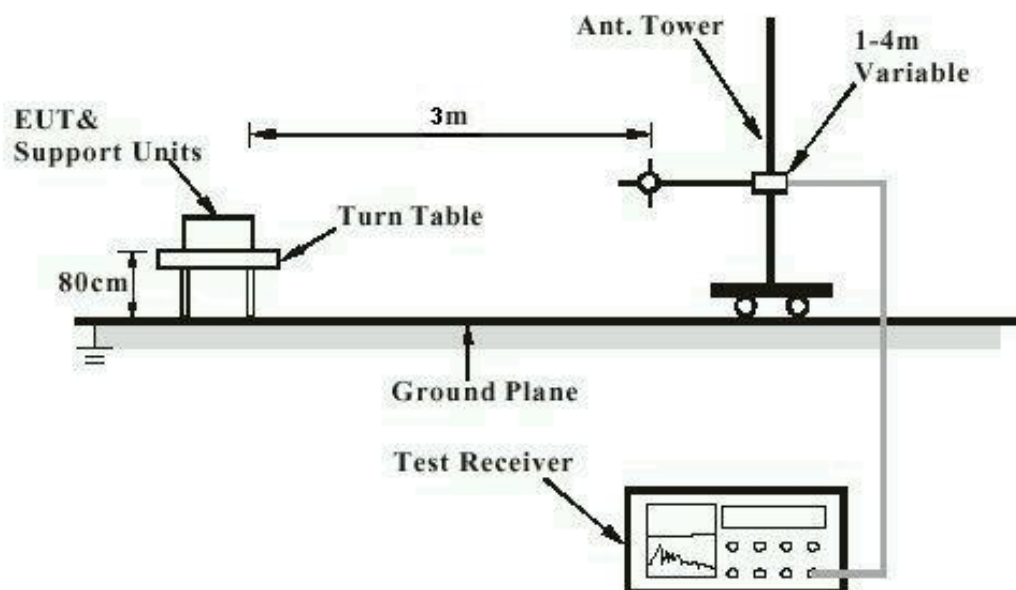
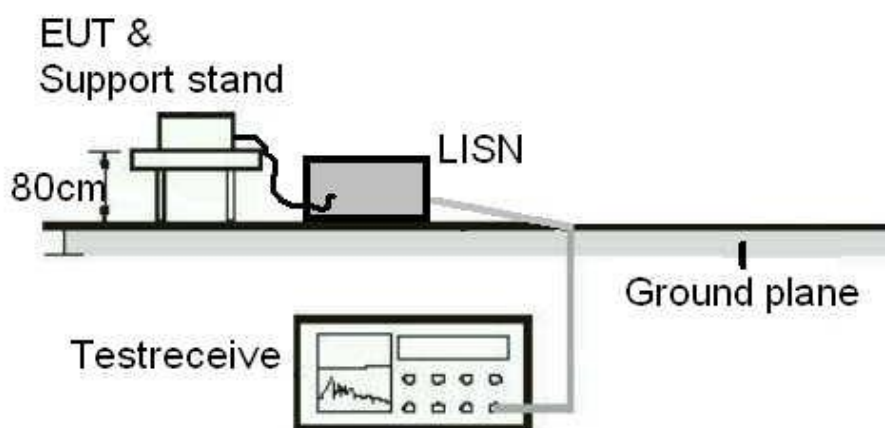


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Standard : Part 15.203 and RSS-Gen 7.1.4
Requirement : use of approved antennas only

The antenna is Loop Antenna with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

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5.1.2 Field strength of fundamental

RESULT:

Passed

Test standard : FCC Part 15.209
 RSS-216
 Basic standard : ANSI C63.10:2013

Test setup

Test Channel : 130 KHz
 Operation Mode : A
 Atmospheric pressure : 100-103 kPa

Table 6: Field strength of fundamental, maximal level found

Frequency (kHz)	Level(3m) (dBuV/m)	Detector	Limit(3m) (dBuV/m)	Level(300m) (dBuV/m)	Limit(300m) (dBuV/m)	Remark	Result
130	70.68	AVG	104.9	-9.32	24.9	--	Pass

Remark: For details refer to Appendix D

Limits:

Frequency	Electric Field Strength (µV/m)	Measurement Distance (m)
9-490 kHz	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	30
1,705-30 MHz	30	30

9-90 kHz and 110-490 kHz: Average detector.

5.1.3 99% Bandwidth

RESULT:

Passed

Test standard : RSS Gen
 Basic standard : ANSI C63.10:2013,

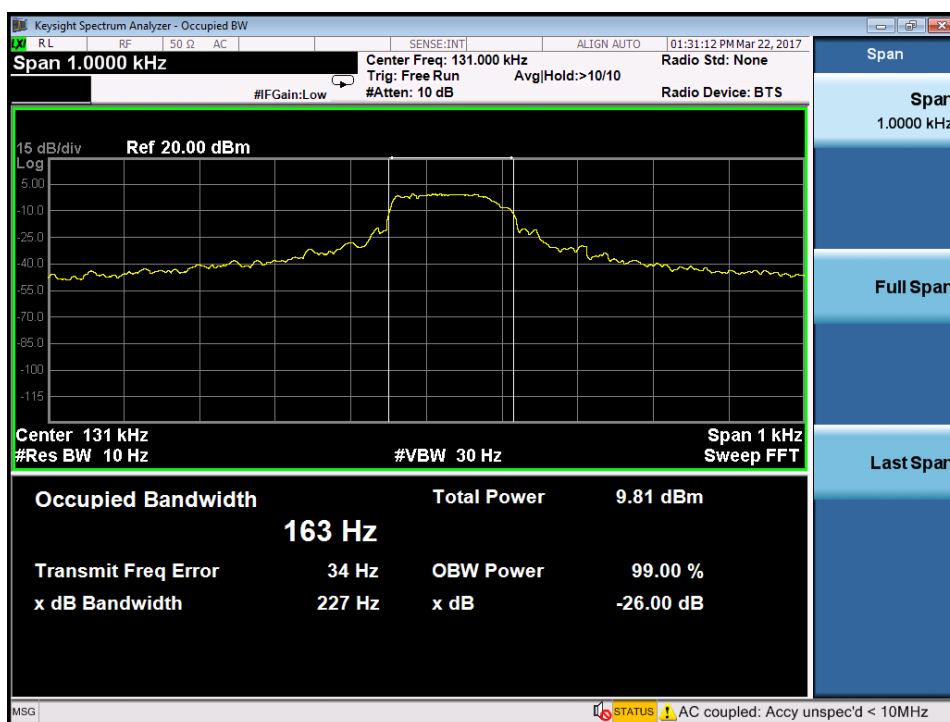
Test setup

Operation Mode : A
 Atmospheric pressure : 100-103 kPa

Table 7: Test result of 99% Bandwidth

Frequency	99% Bandwidth
130 kHz	163Hz

Test Plot of 99% BW



5.1.4 Spurious Emission

RESULT:**Passed**

Test standard	:	FCC part 15. 209 RSS-Gen
Basic standard	:	ANSI C63.10: 2013
Limits	:	Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) OR FCC 15.209(a) AND 2.8 Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) AND 2.8
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	130kHz
Operation mode	:	A

Remark: Testing was carried out within frequency range 9kHz to the tenth harmonic.

For details refer to Appendix D.

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5.2 Mains Conducted Emissions

5.2.1 Conducted Emissions Line and Neutral

RESULT:**Passed**

Test standard	:	FCC Part 15.207 FCC Part 15.107 RSS-Gen
Limits	:	Mains Conducted emissions as defined in RSS-Gen, must comply with the mains conducted emission limits specified in RSS- Gen 2.3
Kind of test site	:	Shielded Room

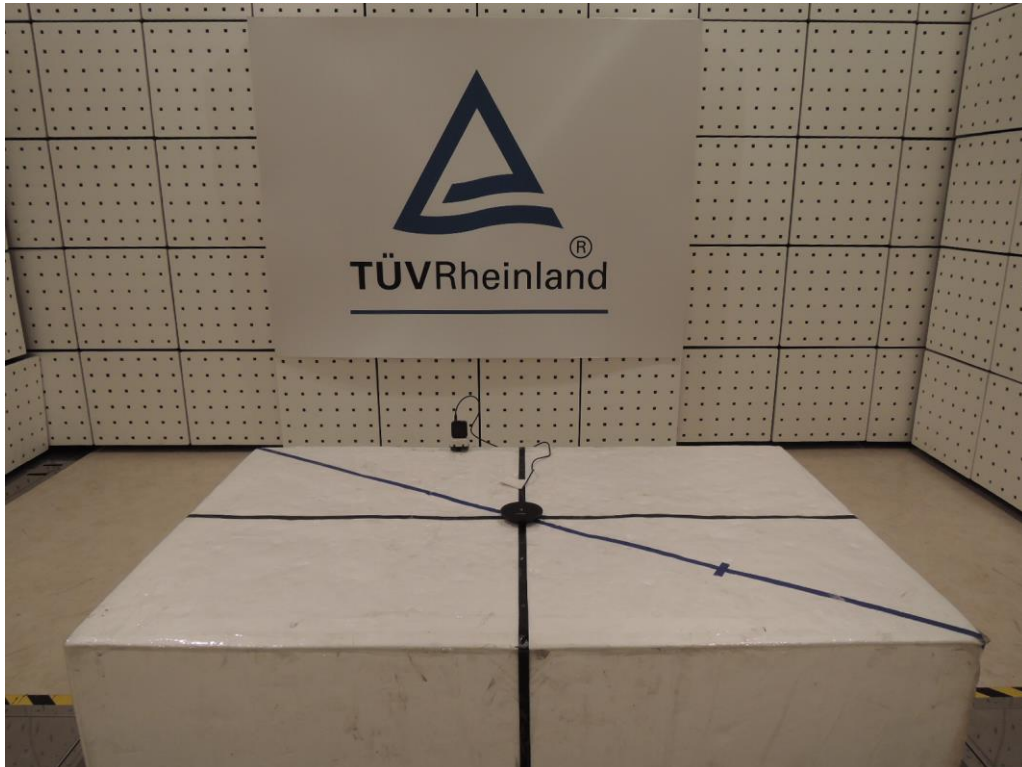
Test setup

Operation mode : A

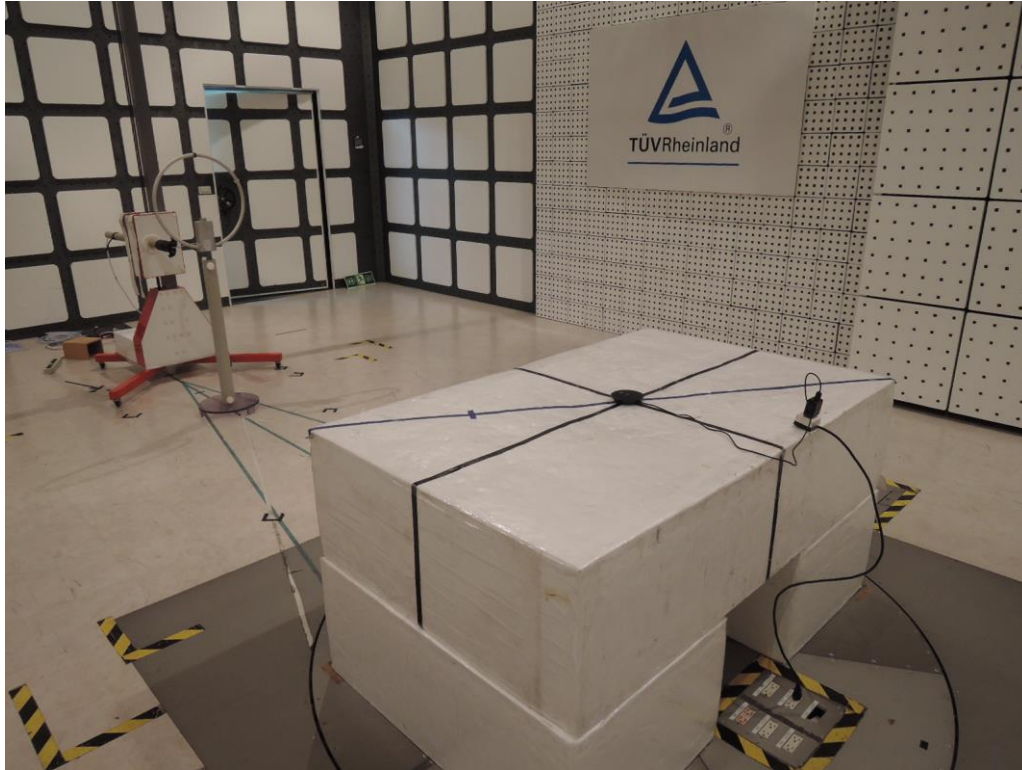
Remark: For details refer to Appendix D.

6. Photographs of the Test Set-Up

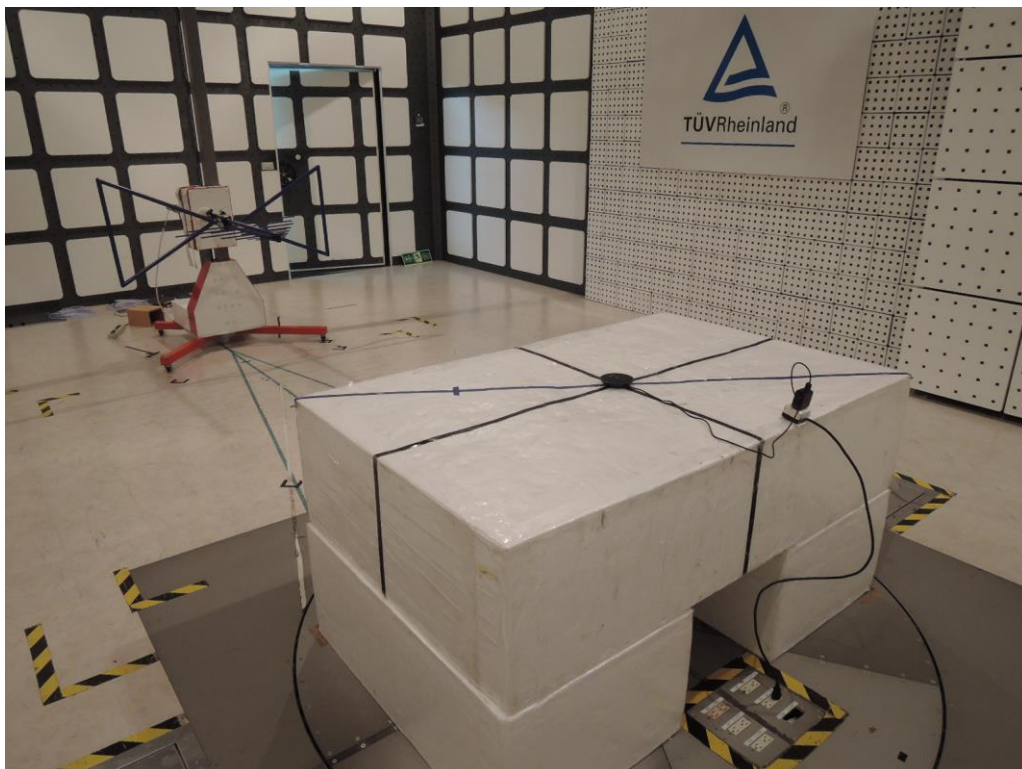
Photograph 1: Set-up for Spurious Emissions (Front View)



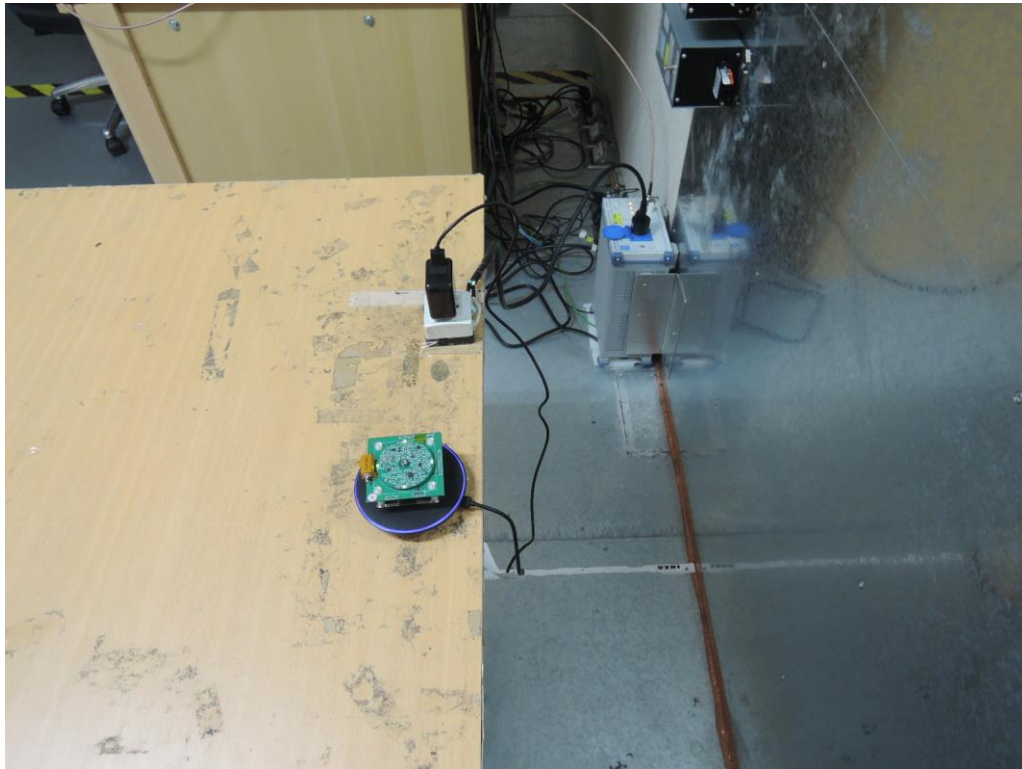
Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for for Mains Conducted testing Back



Photograph 5: Set-up for for Mains Conducted testing Front



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