Prüfbericht-Nr.: *Test Report No.*:	**50258012 001**	**Auftrags-Nr.:** *Order No.*:	238101688	Seite 1 von 22 *Page 1 of 22*
Kunden-Referenz-Nr.: *Client Reference No.*:	N/A	**Auftragsdatum:** *Order date*:	27-Feb-2019	
Auftraggeber: *Client*:	Whetron Electronics Co.,Ltd, No.16,Singye Rd.,Ta Fa Ind.,TW-831 Daliao Dist., Kaohsiung City Taiwan,R.O.C.			
Prüfgegenstand: *Test item*:	2Wheel Smart Keyless Main System_AGE2			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	S100324800T			
Auftrags-Inhalt: *Order content*:	FCC Test Report for 125 kHz portion			
Prüfgrundlage: *Test specification*:	FCC 47CFR Part 15: Subpart C Section 15.207 and 15.209			

Wareneingangsdatum: *Date of receipt*:	9-Apr-2019
Prüfmuster-Nr.: *Test sample No.*:	A000883601-001
Prüfzeitraum: *Testing period*:	16-Apr-2019 - 7-May-2019
Ort der Prüfung: *Place of testing*:	EMC/RF Laboratory Taipei
Prüflaboratorium: *Testing laboratory*:	TUV Rheinland Taiwan Ltd.
Prüfergebnis*: *Test result**:	Pass

geprüft von / *tested by*:

14-Aug-2019 Mars Y.J. Lin/Project Engineer

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

14-Aug-2019 Jack H. C. Chang/Project Manager

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *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*

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT
RESULT: Passed

5.1.2 FIELD STRENGTH OF FUNDAMENTAL
RESULT: Passed

5.1.3 20DB BANDWIDTH
RESULT: Passed

5.1.4 SPURIOUS EMISSION
RESULT: Passed

5.2.1 CONDUCTED EMISSIONS LINE AND NEUTRAL
RESULT: N/A

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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 1: Photo Documentation
(File Name: 50258012 APPENDIX P)
Appendix D: Test Result of Radiated Emissions
(File Name: 50258012 APPENDIX 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 15.207 and 15.209 ANSI C63.10:2013

1.2 Decision Rule of conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard

2. Test Sites

2.1 Test Laboratory

TUV Rheinland Taiwan Ltd.
Taipei Testing Laboratories

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

2.2 Test Facility

TUV Rheinland Taiwan Ltd.

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

FCC RegistrationNo.: 340738
IC Canada Registration No.: TW3567
TAF Accredited NCC Test Lab. No.:3567
TAF ISO17025 Certification effective period: 6th-May-2019 to 05th-May-2022

Testing Laboratory
3567

2.3 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	ESR 7	101549	2018/11/12	2019/11/10
Spectrum Analyzer	R&S	FSV 40	101514	2019/02/07	2020/02/07
EXA Signal Analyzer	KEYSIGHT	N9010A	MY52221334	2018/06/04	2019/06/03
Preamplifier (30MHz -1GHz)	Hewlett Packard	8447D	2944A06641	2018/08/31	2019/08/31
Preamplifier (18 GHz -40 GHz)	EMC Instruments	EMC184045SE	980408	2018/06/08	2019/06/08
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	60649	2018/08/24	2019/08/24
Bilog Antenna	TESEQ	CBL6111D	29804	2018/07/02	2019/07/02
Horn Antenna	ETS-Lindgren	3117	138160	2018/06/01	2019/06/01
Horn Antenna (18GHz~40GHz)	COM-POWER	AH-840	101029	2018/12/22	2019/12/22
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2018/06/14	2019/06/13
EMI Test Receiver	R&S	ESR 7	101549	2018/11/12	2019/11/10
LISN (1 phase)	R&S	ENV216	101243	2018/06/18	2019/06/17
LISN	R&S	ENV216	101262	2018/06/22	2019/06/21
Spectrum Analyzer	Agilent	N9010A	MY53470241	2018/06/04	2019/06/03
power Meter	Anritsu	ML2495A	1901008	2019/04/29	2020/04/28
Power Sensor	Anritsu	MA2411B	1725269	2019/04/29	2020/04/28

2.4 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.

2.5 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 basics using in house standards or comparisons.

2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are ±3dB.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-7}
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Radiated emission of transmitter, valid up to 26 GHz	± 6 dB
Radiated emission of receiver, valid up to 26 GHz	± 6 dB
Temperature	± 2 ºC
Humidity	± 10 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Smart Keyless System working in the 433 MHz and 125kHzBand. This report relates to the 125kHz portion of the device.
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	2Wheel Smart Keyless Main System_AGE2
Type Designation	S100324800T
FCC ID	2ABPM-S100324800T

Table 5: Technical Specification of EUT

Item	Value
Operating Frequencies	125kHz
Channel number	1
Operation Voltage	12Vdc
Modulation	ASK

3.3 Independent Operation Modes

Basic operation modes are:

A. Transmitting

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Block Diagram
- Instruction Manual
- Rating Label
- Technical Description

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

Setup for testing: Test samples are modified to continuous transmitter mode which makes it possible to transmit when power on.

4.3 Special Accessories and Auxiliary Equipment

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

Kind of Equipment	Manufacturer	Model Name	S/N
--	--	--	--

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

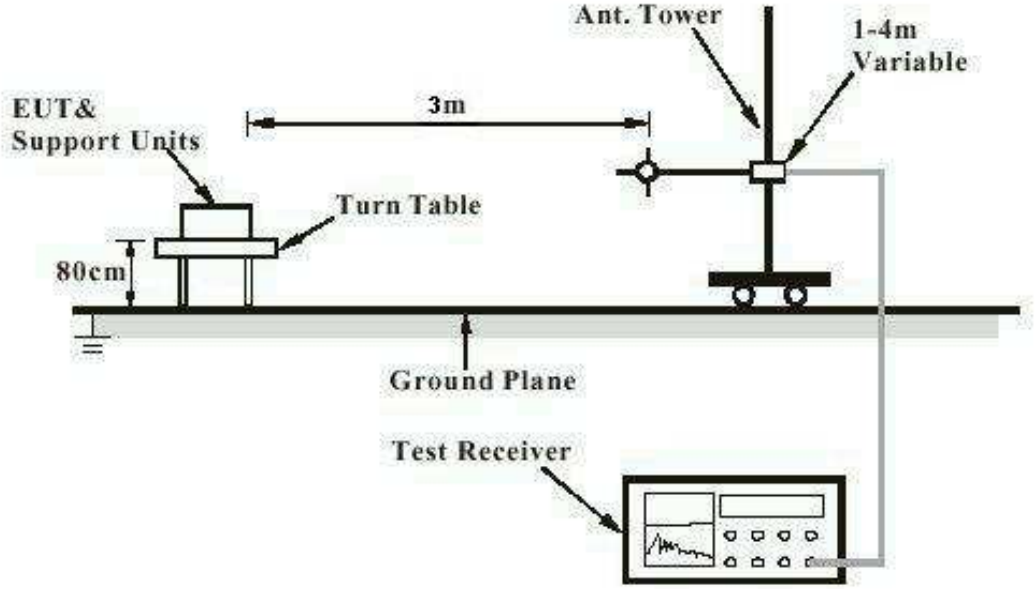
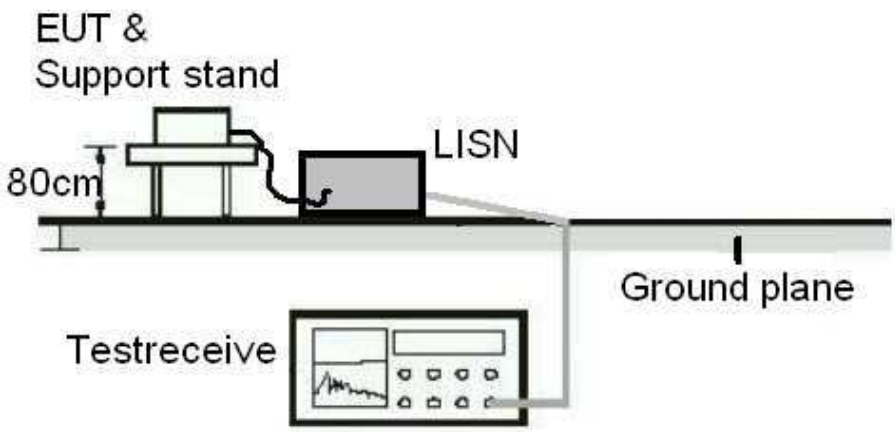


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Standard	:	Part 15.203
Requirement	:	use of approved antennas only

The antenna and the transmitter are one assembly with no possibility of replacement with a non-approved antenna by a normal the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Field strength of fundamental

RESULT: **Passed**

Test standard : FCC Part 15.209

Basic standard : ANSI C63.10:2013

Test setup

Test Frequency : 125kHz
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
125	98.99	Peak	125.67	18.99	45.67	--	Pass
125	90.40	QP	105.67	90.40	25.67	--	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 20dB Bandwidth

RESULT: **Passed**

Test standard : For reference purpose
Basic standard : ANSI C63.10:2013,

Test setup

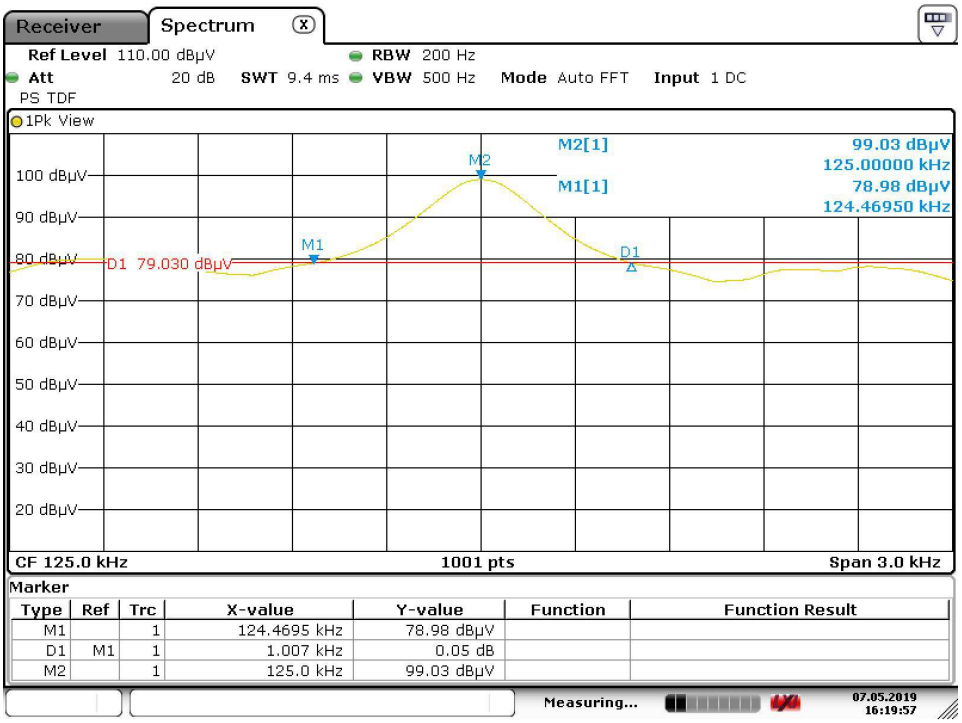
Operation Mode : A

Atmospheric pressure : 100-103 kPa

Table 7: Test result of 20dB Bandwidth

Frequency	20dB Bandwidth
125kHz	1.007 kHz

Test Plot of 20dB BW



Date: 7.MAY.2019 16:19:58

5.1.4 Spurious Emission

RESULT: **Passed**

Test standard	:	FCC part 15. 209
Basic standard	:	ANSI C63.10: 2013
Limits	:	Radiated emissions must comply with the radiated emission limits specified in FCC 15.209(a) .
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	125kHz
Operation mode	:	A

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

For details refer to Appendix D.

.

5.2 Mains Conducted Emissions

5.2.1 Conducted Emissions Line and Neutral

RESULT: **N/A**

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

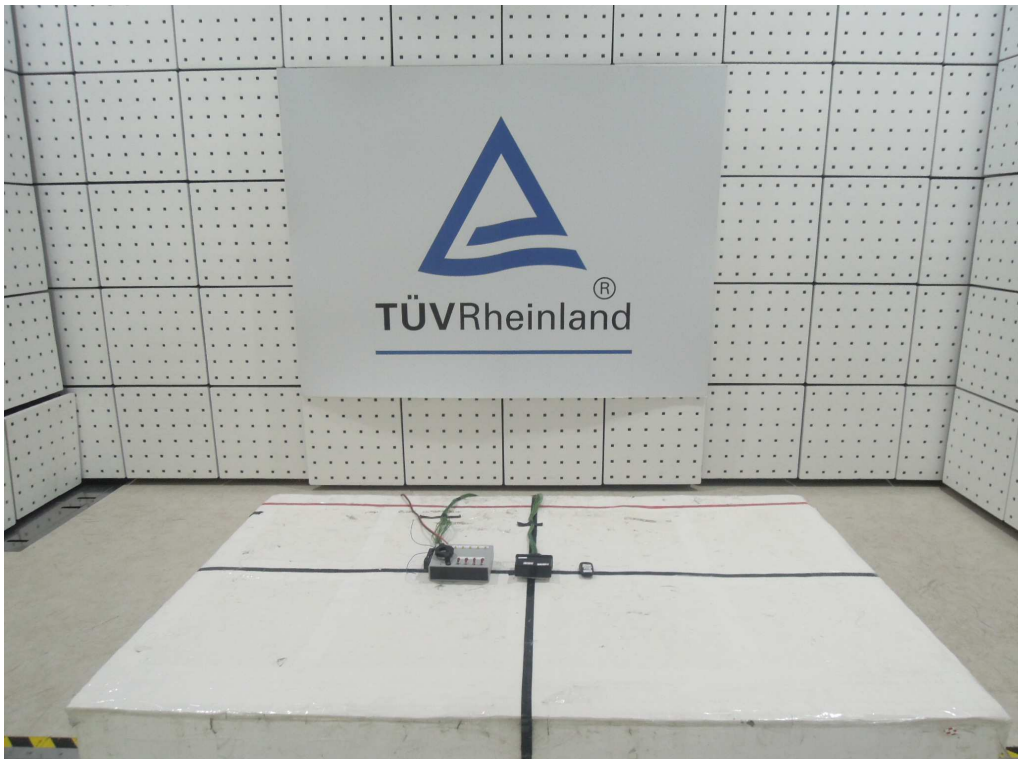
Test setup

Test Channel	:	125kHz
Operation mode	:	A

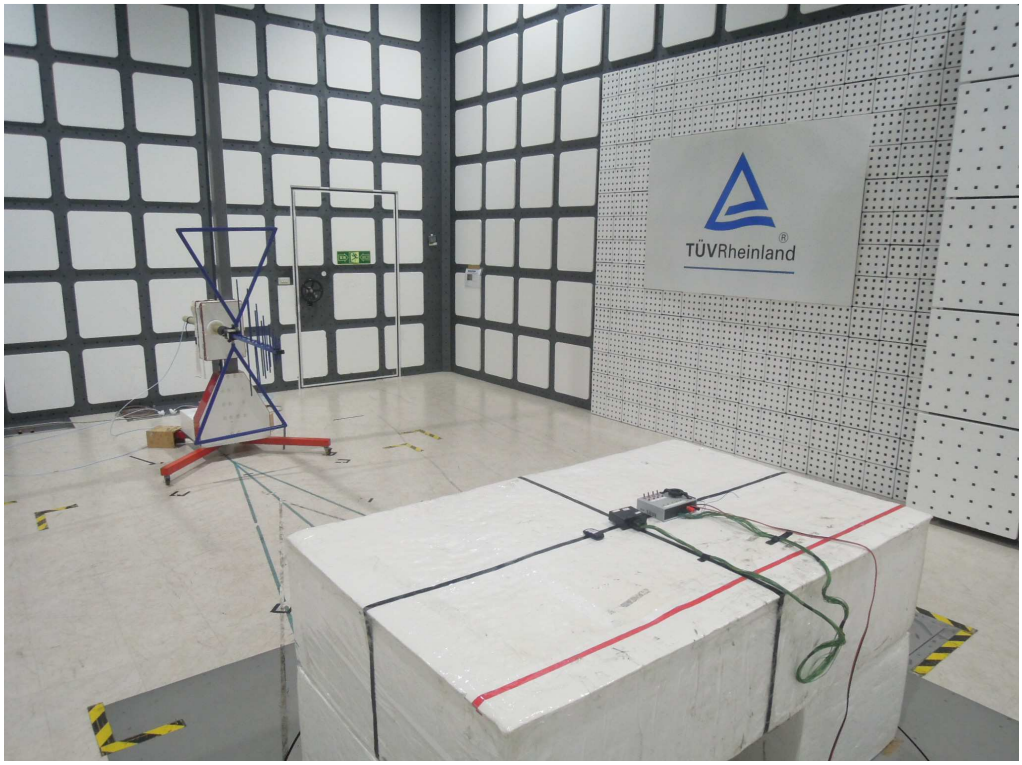
Remark: not applicable because this is a DC power device.

6. Photographs of the Test Set-Up

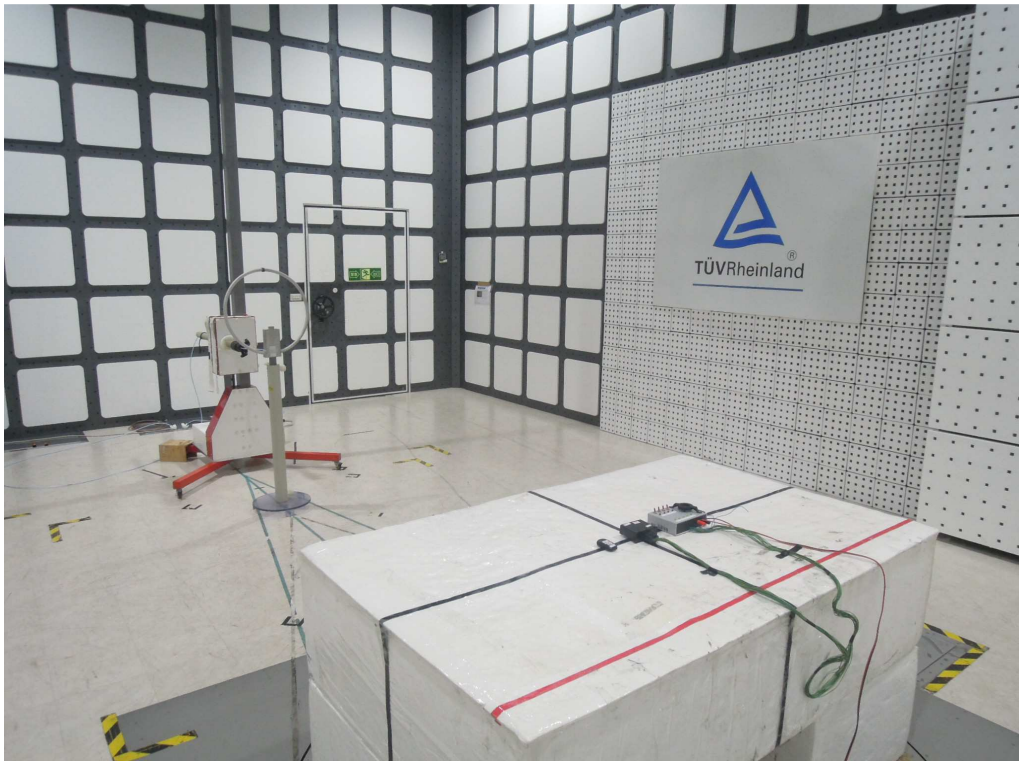
Photograph 1: Set-up for Radiated Emissions TX (Front View)



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



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



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