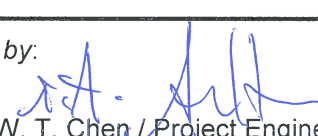


Prüfbericht-Nr.: Test Report No.:	50053072 001	Auftrags-Nr.: Order No.:	114054576	Seite 1 von 25 Page 1 of 25
Kunden-Referenz-Nr.: Client Reference No.:	N/A	Auftragsdatum: Order date:	10-Aug-2015	
Auftraggeber: Client:	N.V. Nederlandsche Apparatenfabriek "Nedap" , Parallelweg 2, 7141 DC Groenlo, The Netherlands			
Prüfgegenstand: Test item:	Transceiver HDP/FDP operating on 134.2 kHz			
Bezeichnung / Typ-Nr.: Identification / Type No.:	VP1801			
Auftrags-Inhalt: Order content:	FCC/ISED Test Report			
Prüfgrundlage: Test specification:	FCC 47CFR Part 15: Subpart C Section 15.207 and 15.209 RSS-210 (12-2010) 2.5.1 NCC Low-power Radio-frequency Devices Technical Regulations LP0002(2011)			
Wareneingangsdatum: Date of receipt:	11-Aug-2016			
Prüfmuster-Nr.: Test sample No.:	A000406281			
Prüfzeitraum: Testing period:	11-Aug-2015 - 15-Aug-2015			
Ort der Prüfung: Place of testing:	EMC Laboratory Taipei			
Prüflaboratorium: Testing laboratory:	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von / tested by:  22-Aug-2016 Ryan W. T. Chen / Project Engineer Datum Name / Stellung Unterschrift Date Name / Position Signature		kontrolliert von / reviewed by:  22-Aug-2016 Rene Charton / Senior Project Manager Datum Name / Stellung Unterschrift Date Name / Position Signature		
Sonstiges / Other:				
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 20dB AND 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 1: Photo Documentation

(File Name: 50053072APPENDIX P)

Appendix D: Test Result of Radiated Emissions

(File Name: 50053072APPENDIX D)

Test Specifications

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.207 and 15.209 RSS-210 Issue 8, December 2010 RSS-Gen, Issue 4, November 2014 ANSI C63.10:2013 LP0002(2011)(100年6月28日)

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.: 799772
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	2015/09/10	2016/09/10
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	2015/11/19	2016/11/19
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	060558	2015/11/19	2016/11/19
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	101031	2015/11/02	2016/11/02
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2016/05/11	2017/05/11
EMI Test Receiver	R&S	ESCI7	100797	2015/12/28	2016/12/27
Spectrum Analyzer	R&S	FSL3	101943	2015/09/07	2016/09/07
Temp. & Humid. Chamber	Giant Force	GCT-099-40-S	MAF0103-007	2015/07/13	2017/07/12
LISN (1 phase)	R&S	ENV216	101243	2016/06/02	2017/06/02
LISN	R&S	ENV216	101262	2016/06/16	2017/06/16

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	$\pm 10 \text{ \%}$

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a unit that provides electronic animal identification through RFID at 134.2 kHz .
There are two different types of antennas which are both tested in this report.

There is a large antenna dimensions 100 cm by 120 cm called Single Loop Walk Through and a small antenna dimensions 26.5 cm by 15.5 cm called VP6011.

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	Transceiver HDP/FDP operating on 134.2 kHz
Type Designation	VP1801
FCC ID	CGDVP1801
Canada ID	1444A-VP1801

Table 5: Technical Specification of EUT

Item	Value
Operating Frequencies	134.2 kHz
Channel number	1
Operation Voltage	24-27 Vdc
Modulation	Quasi-CW, 18Hz, 96% Duty Cycle

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

- Circuit 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: The Antennae are connected to the Control Box and there is a Quasi-CW signal applied to the antennae

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

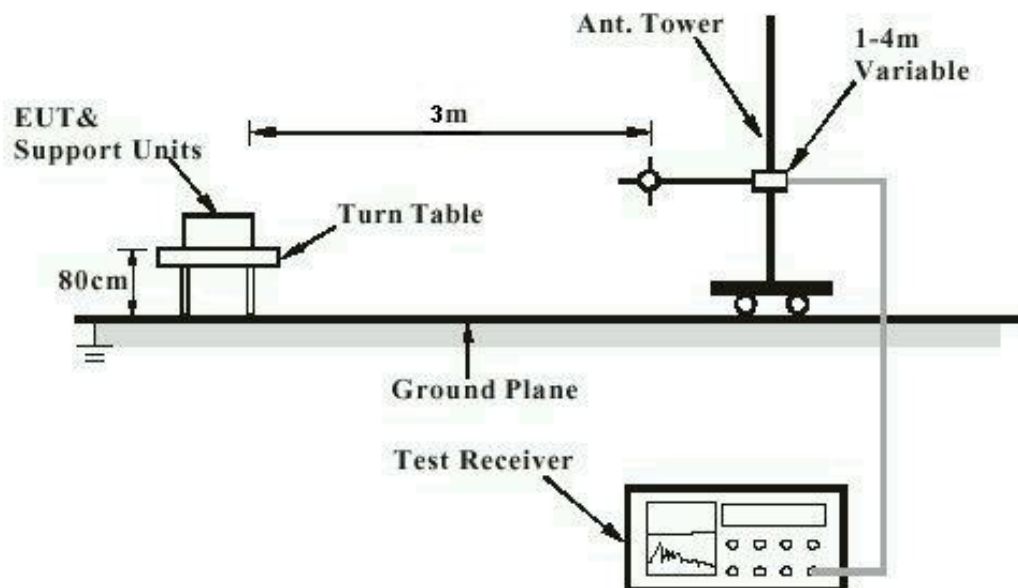
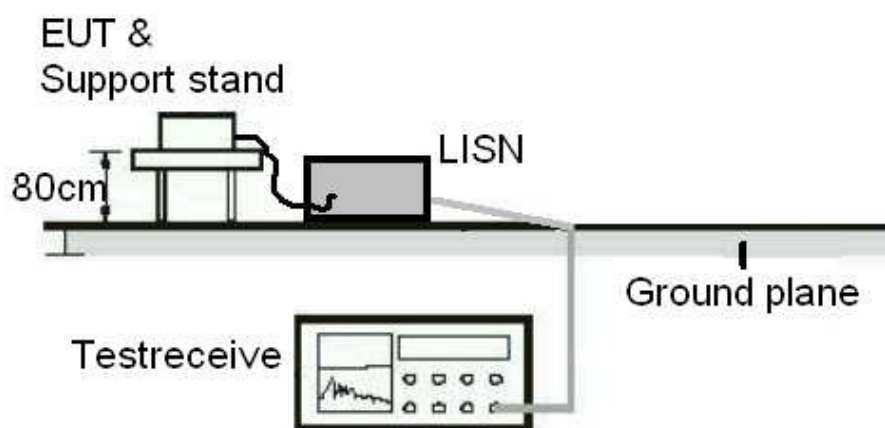


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)

5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:**Passed**

Standard	:	LP0002(2011): 2.2 Part 15.203 and RSS-Gen 7.1.4
Requirement	:	use of approved antennas only

The antenna cable has a proprietary connector 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
 RSS-210 (12-2010) 2.5.1
 LP0002(2011) 3.3.1
 Basic standard : ANSI C63.10:2013

Test setup

Test Channel : 134.2 kHz
 Operation Mode : A
 Atmospheric pressure : 100-103 kPa

Table 6: Field strength of fundamental, maximal level found

Single Loop Walk Through antenna

Frequency (kHz)	Level(10m) (dBuV/m)	Detector	Limit(10m) (dBuV/m)	Level(300m) (dBuV/m)	Limit(300m) (dBuV/m)	Remark	Result
134.2	75.19	peak	104.13	16.11	45.05	--	Pass
134.2	<75.19	average	84.13	<16.11	25.05	--	Pass

Antenna VP6011

Frequency (kHz)	Level(3m) (dBuV/m)	Detector	Limit(3m) (dBuV/m)	Level(300m) (dBuV/m)	Limit(300m) (dBuV/m)	Remark	Result
134.2	77.60	peak	125.05	-2.4	45.05	--	Pass
134.2	<77.60	average	105.05	<-2.4	25.05	--	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 and 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 20dB Bandwidth (worst case)

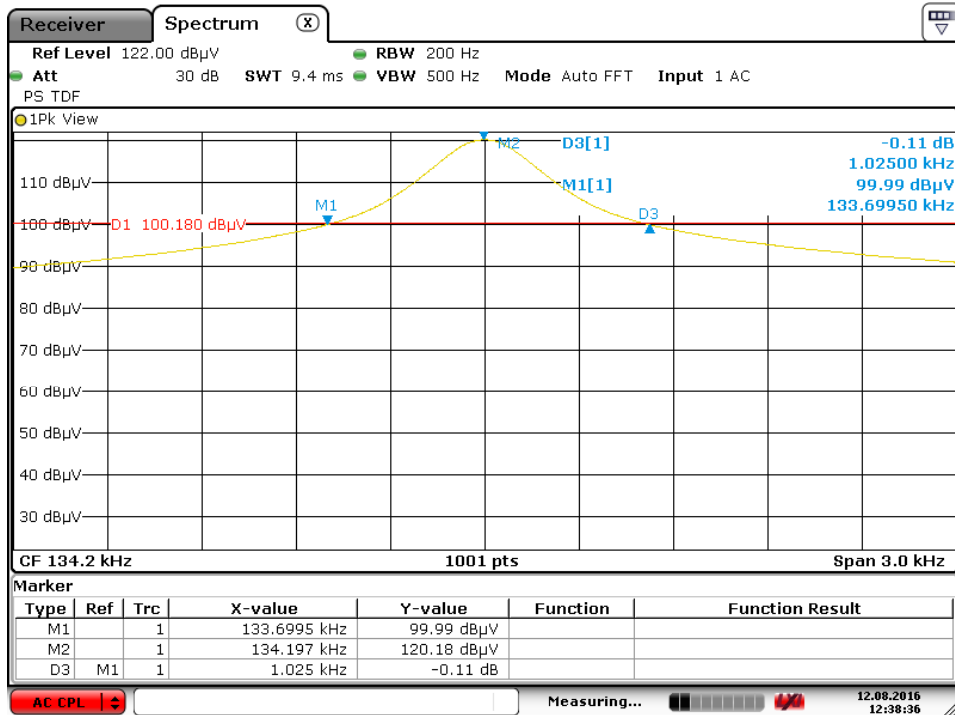
Frequency	20dB Bandwidth	
134.2 kHz	1.025 kHz	

Table 8: Test result of 99% Bandwidth (worst case)

Frequency	99% Bandwidth	
134.2 kHz	1.681 kHz	

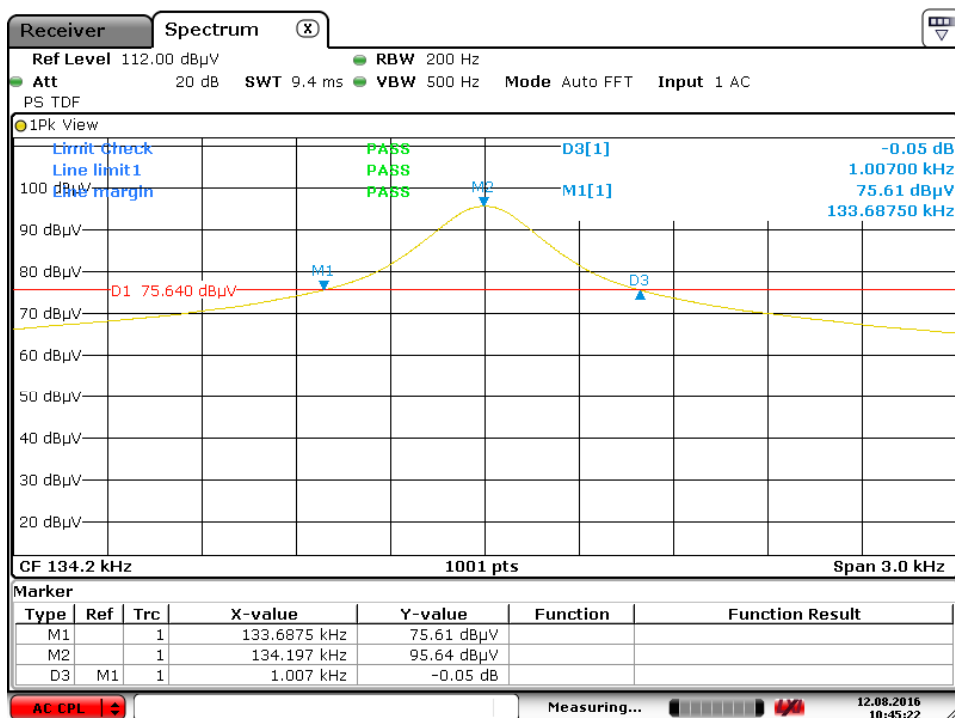
Test Plot of 20dB BW

Single Loop Walk Through antenna



Date: 12.AUG.2016 12:38:36

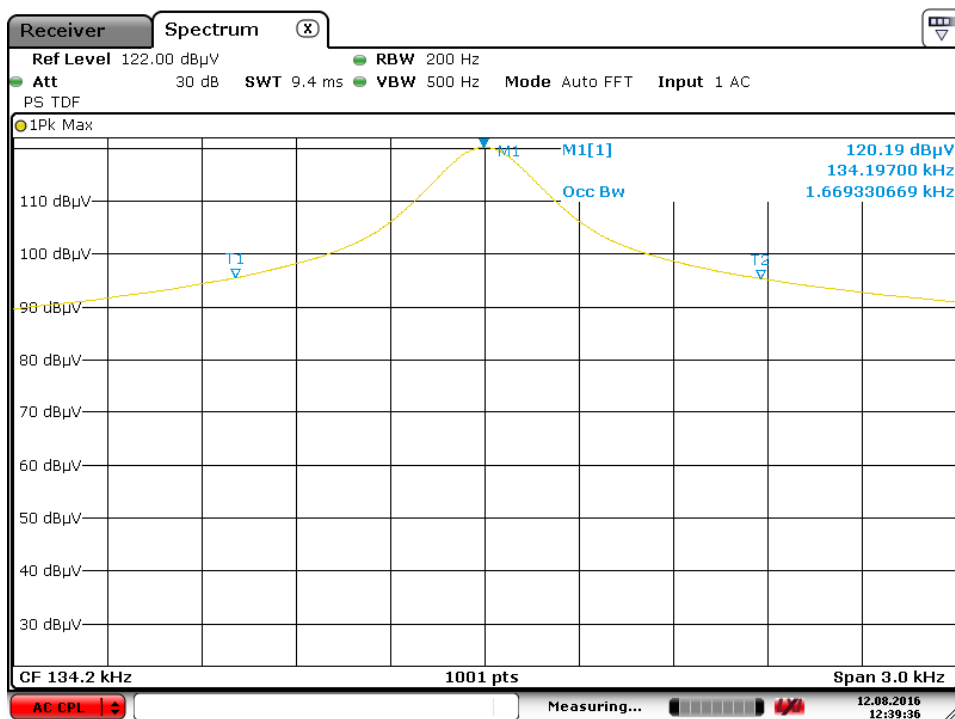
Antenna VP6011



Date: 12.AUG.2016 10:45:22

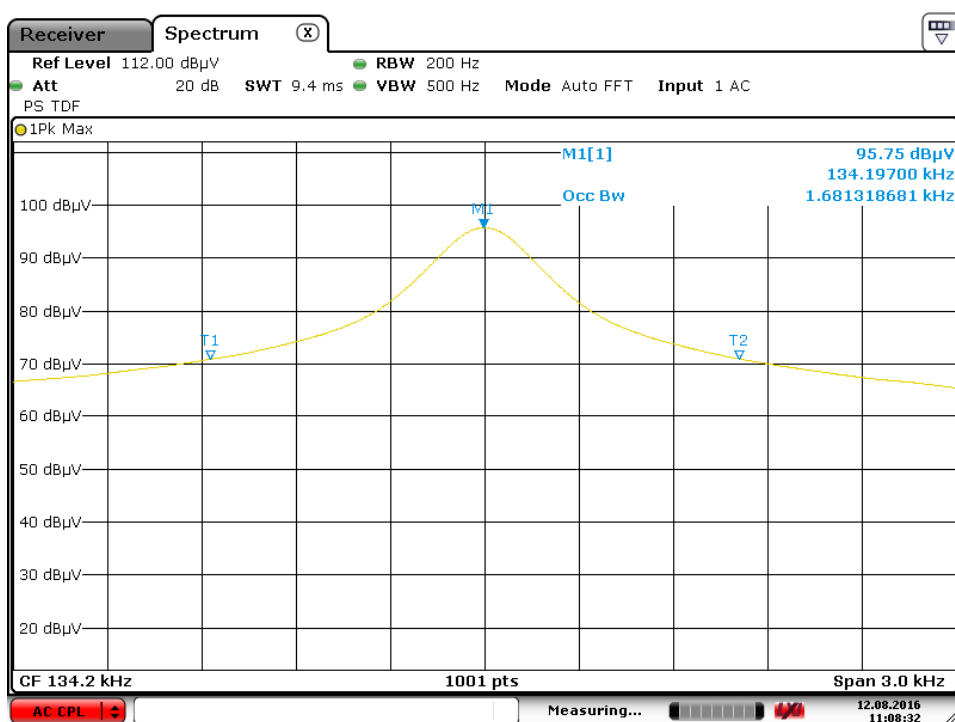
Test Plot of 99% BW

Single Loop Walk Through antenna



Date: 12.AUG.2016 12:39:36

Antenna VP6011



Date: 12.AUG.2016 11:08:32

5.1.4 Spurious Emission

RESULT:**Passed**

Test standard : FCC part 15. 209
RSS-Gen
LP0002(2011) 2.8

Basic standard : ANSI C63.10: 2013

Limits : Radiated emissions 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 : 134.2 kHz

Operation mode : A

Remark: Testing was carried out within frequency range 9kHz to 1 GHz.

For details refer to Appendix D.

.

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 LP0002: 2.3
Limits	:	Mains Conducted emissions as defined in LP0002: 2.3 , must comply with the mains conducted emission limits specified in LP0002: 2.3
Kind of test site	:	Shielded Room

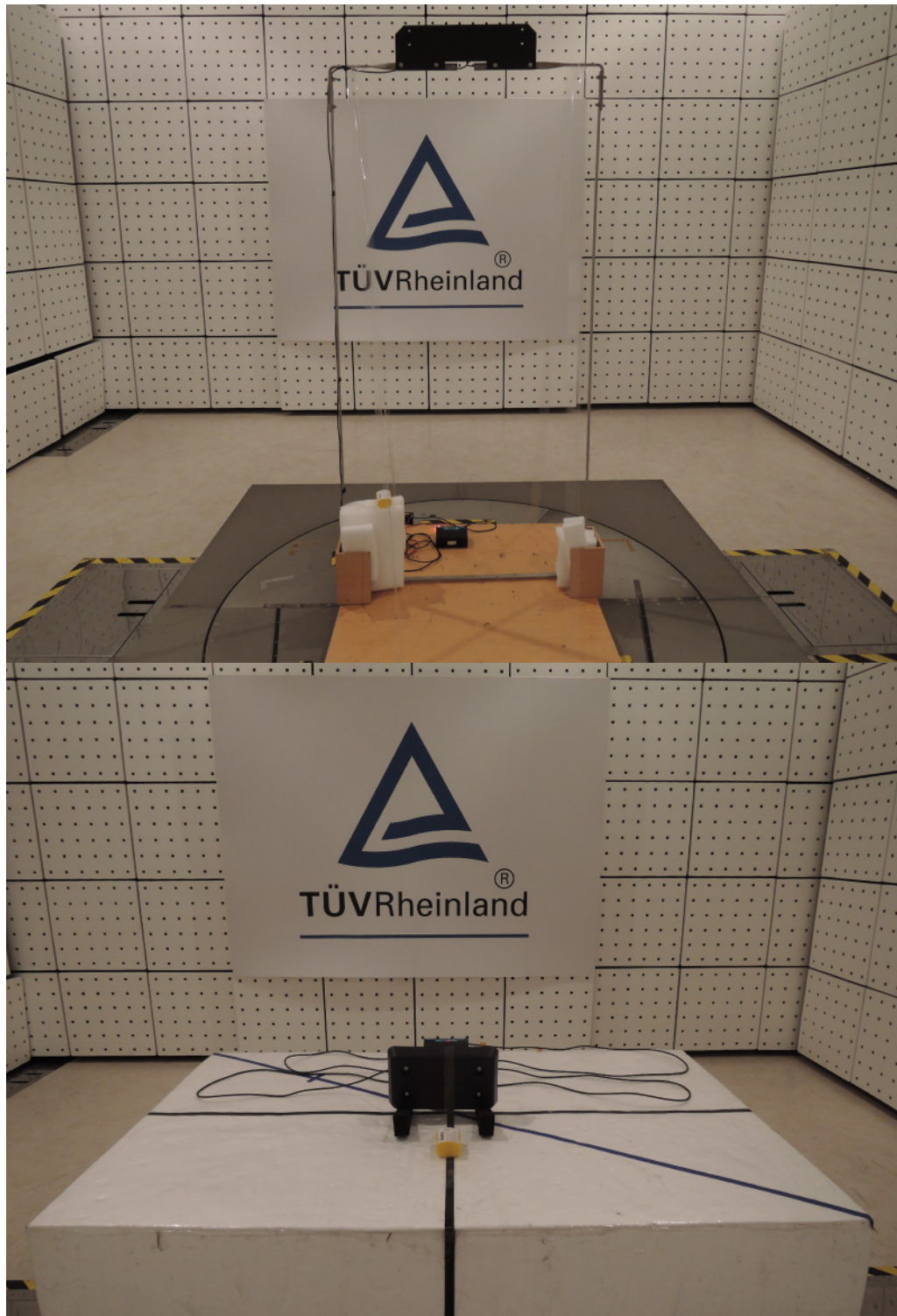
Test setup

Test Channel	:	Middle
Operation mode	:	134.2 kHz

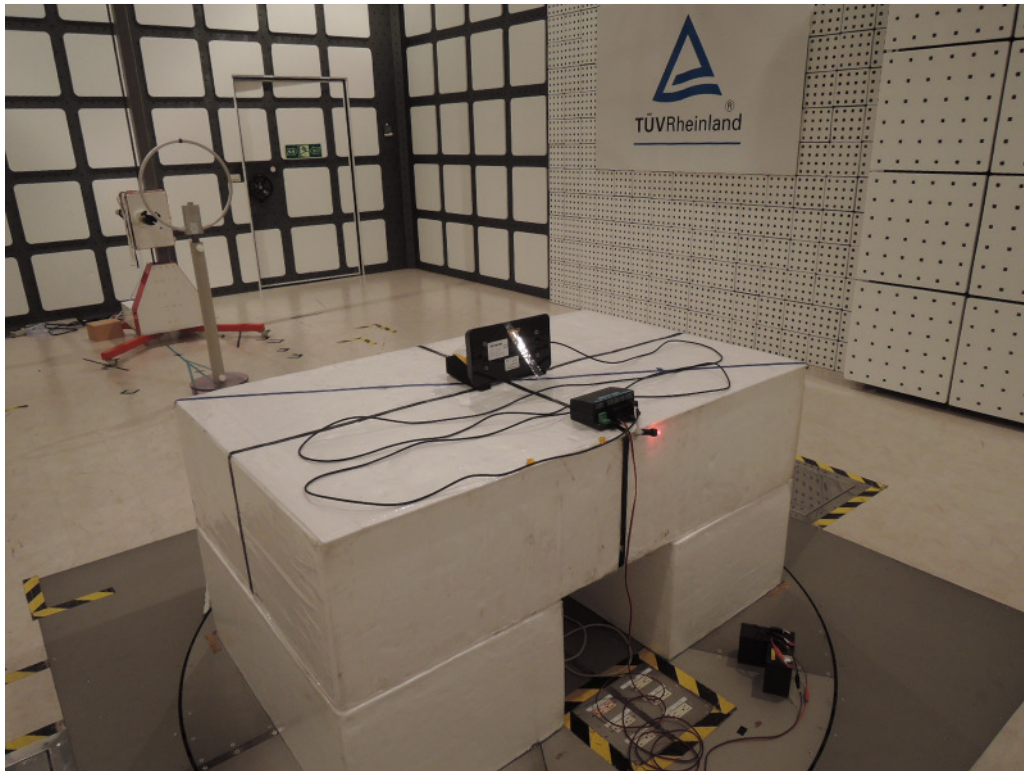
Remark: For details refer to Appendix D.

6. Photographs of the Test Set-Up

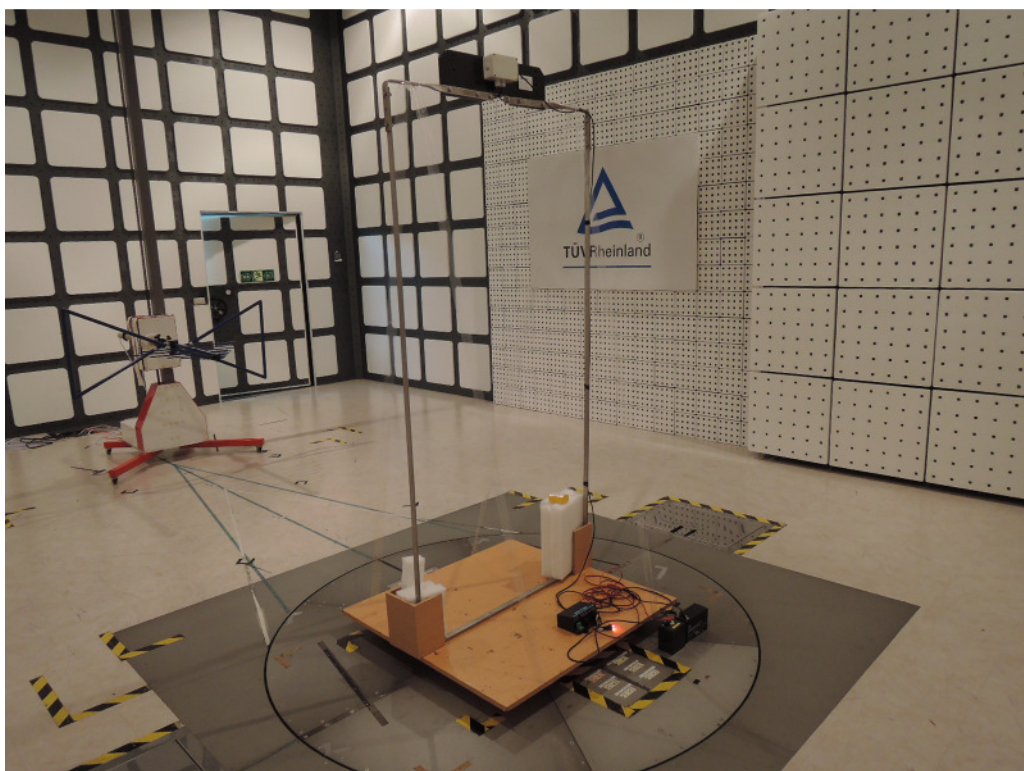
Photograph 1: Set-up for Spurious Emissions TX (Front View) Chamber



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



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



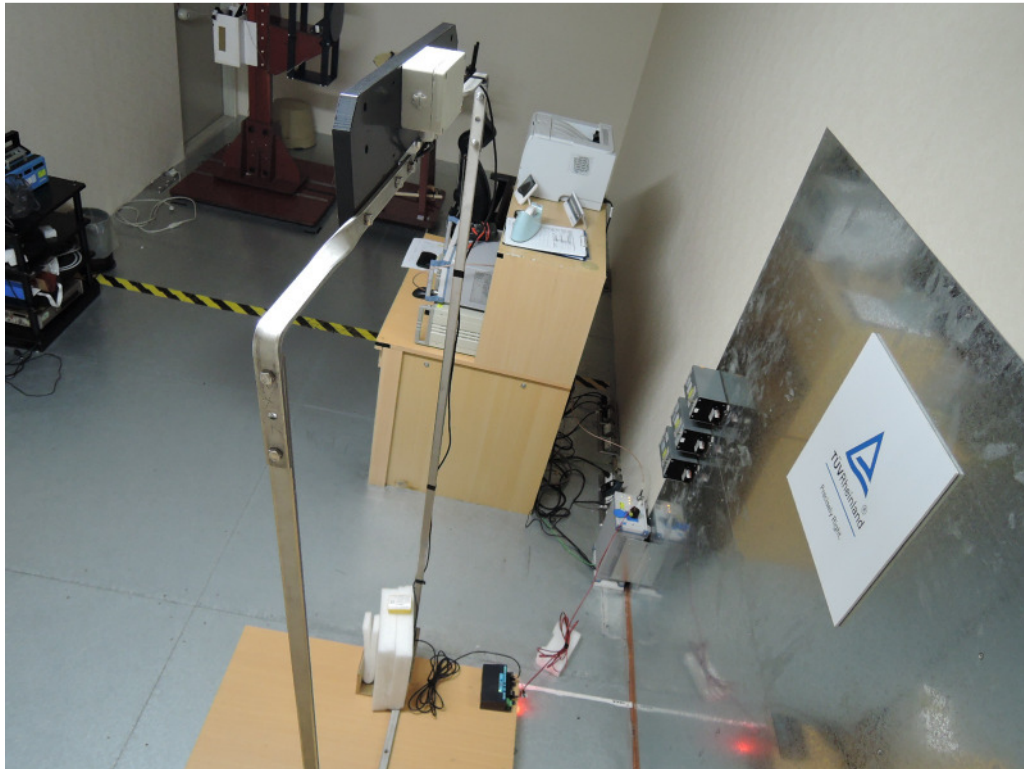
Photograph 4: Set-up for Fundamental Emissions (VP6011)



Photograph 5: Set-up for Fundamental Emissions (Single Loop Walk Through antenna)



Photograph 6: Set-up for for Mains Conducted testing Back



Photograph 7: Set-up for Mains Conducted testing Front



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