



TEST REPORT

Reference No...... : WTD21D08078434E
Applicant..... : OpenEmbed M&C
Address..... : Room 607, Bldg 2, Minle industry park, Meiban Blvd, LongHua District, Shenzhen, China
Manufacturer..... : OpenEmbed M&C
Address..... : Room 607, Bldg 2, Minle industry park, Meiban Blvd, LongHua District, Shenzhen, China
Product..... : Edgebox
Model(s)..... : EdgeBox-RPI4
Standards..... : EN 55032:2015
EN 55035:2017
Date of Receipt sample ... : 2021-08-03
Date of Test..... : 2021-08-03 to 2021-08-18
Date of Issue..... : 2021-08-19
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested; this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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2 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD21D08078434E	2021-08-03	2021-08-03 to 2021-08-18	2021-08-19	original	-	Valid

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3 General Information

3.1 General Description of E.U.T.

Product : Edgebox

Model(s) : EdgeBox-RPI4

Remark : The product does not contain wireless functions.

3.2 Details of E.U.T.

Ratings : DC 10.8V-36V

3.3 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes No

If Yes, list the related test items and lab information:

Test Lab: Shenzhen Hongcai Testing Technology Co., Ltd.

Lab address: No. 30-9, Rhine Road, Xinsheng Community, Longgang Street, Longgang District, Shenzhen

Test items: Power-frequency magnetic fields and Surges-signal terminal test

3.4 Abnormalities from Standard Conditions

None.



4 Test Summary

EMISSION(EN 55032)		
Test Item	Test Standard	Result
Conducted Emissions from the AC mains power ports 150KHz to 30MHz	EN 55032	N/A
Asymmetric Mode Conducted Emissions 150KHz to 30MHz	EN 55032	Pass
Conducted Differential Voltage Emissions 30MHz to 2150MHz	EN 55032	N/A
Radiated Emissions, 30MHz to 1000MHz	EN 55032	Pass
Radiated Emissions, Above 1GHz	EN 55032	Pass
Harmonic Current	EN IEC 61000-3-2	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3	N/A
IMMUNITY(EN 55035)		
Test Item	Test Method	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2	Pass
Radiation Immunity	IEC 61000-4-3	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4	Pass
Surges	IEC 61000-4-5	Pass
Injected Currents	IEC 61000-4-6	Pass
Power-frequency magnetic fields	IEC 61000-4-8	Pass*
Voltage Dips and Voltage interruptions	IEC 61000-4-11	Pass

Remark:

Pass

Fail

N/A

*

Test item meets the requirement

Test item does not meet the requirement

Test case does not apply to the test object

Applicable only to equipment containing devices intrinsically susceptible to magnetic fields, such as CRT monitors, Hall effect elements, electrodynamic microphones, magnetic field sensors or audio frequency transformers.



5 Equipment Used during Test

5.1 Equipment List

Conducted Disturbance at telecommunication ports						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	EMI Test Receiver	R&S	ESCI	101155	2021-07-26	2022-07-25
2	ISN	SCHWARZBECK	CAT5 8158	CAT5-8158-0051	2021-04-26	2022-04-25
3	Cable	Laplace	RF300	-	2021-07-26	2022-07-25
3m Semi-anechoic Chamber for Radiation (Below 1GHz) TDK						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2021-04-26	2022-04-25
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2020-10-31	2021-10-30
3	Amplifier	ANRITSU	MH648A	M43381	2021-04-26	2022-04-25
4	Cable	HUBER+SUHNER	CBL2	525178	2021-04-26	2022-04-25
3m Fully Anechoic Room for Radiation (Above 1GHz)						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP	100091	2021-04-26	2022-04-25
2	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2021-04-30	2022-04-29
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2021-07-26	2022-07-25
4	Coaxial Cable (above 1GHz)	ZT26-NJ-NJ-8M/FA	1GHz-18GHz	NA	2021-04-26	2022-04-25
Electrostatic Discharge						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Electrostatic Discharge Simulator	SCHLODER	SESD 216	606144	2021-04-29	2022-04-28
Radio-frequency electromagnetic fields						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Signal Generator	R&S	SMB100A	105942	2021-07-26	2022-07-25
2	RF Power Amplifier	BONN Elektronik	BLWA0830-160/100/40D	128740	2021-07-26	2022-07-25
3	Gestockte Breitband (S tacked) Log.-per. Antenna	SCHWARZBECK	STLP9128D	043	2021-07-26	2022-07-25



5	Amplifier	NJNT	NTWPAS-2560025	2560025	2021-04-26	2022-04-25
Surge, EFT, Voltage dips and Interruption						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	All Modules Generator	SCHAFFNER	6150	34579	2021-07-26	2022-07-25
2	Capacitive Coupling Clamp	SCHAFFNER	CDN 8014	25311	2021-07-26	2022-07-25
3	Signal and Data Line Coupling Network	SCHAFFNER	CDN 117	25627	2021-07-26	2022-07-25
4	AC Power Supply	HENGYUAN	DTDGC-4	-	2021-07-26	2022-07-25
5	Surge generator	Lioncel	LSG-510CB	LG/EMC-12-001	2021-03-30	2022-03-29
6	Surge generator	Lioncel	LSG-506CT	LG/EMC-12-002	2021-03-30	2022-03-29
7	Matching impedance network	Lioncel	FHR-T82	LG/EMC-12-003	2021-03-30	2022-03-29
8	Surge three-phase coupling network	Lioncel	CN533P	LG/EMC-12-004	2021-03-30	2022-03-29
Conducted Immunity						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	RF Generator	TESEQ	NSG4070	25781	2021-07-26	2022-07-25
2	CDN M-Type	TESEQ	CDN M016	25112	2020-12-28	2021-12-27
3	EM-Clamp	TESEQ	KEMZ 801	25453	2021-07-26	2022-07-25
4	Attenuator 6dB	TESEQ	ATN6050	25376	2021-07-26	2022-07-25
Power-frequency magnetic fields						
1	Power frequency magnetic field generator	distance	EMS61000-8K	LG/EMC-10-001	2021-03-29	2022-03-28

5.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
laptop	Lenovo	ThinkCentre 6713	1701A53L4BC115
laptop	Dell	Vostro 3400	



5.3 Measurement Uncertainty

Parameter	Uncertainty (Note 1)
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Radiated Emission(30MHz-1000MHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~18GHz)	$\pm 5.47\text{dB}$

Note 1: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave, Tianhe District, Guangzhou, Guangdong, China.

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5.5 Test Mode

Test Item	Test Mode	Test Voltage
EN 55032		
Asymmetric Mode Conducted Emissions (150KHz to 30MHz)	Working mode	DC 24V
Radiated Emissions (30MHz-1GHz)	Working mode	DC 24V
Radiated Emissions (1GHz-6GHz)	Working mode	DC 24V
EN 55035		
Electrostatic Discharge(ESD) Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV Performance Criterion B	Working mode	DC 24V
Radio-frequency electromagnetic fields (RS) 3V/m,80% AM(1kHz), 80MHz to 1GHz 1.8GHz, 2.6GHz, 3.5GHz, 5GHz Performance Criterion A	Working mode	DC 24V
Electrical Fast Transients from the Analogue/Digital port (EFT) 1KV Performance Criterion B	Working mode	DC 24V
Electrical Fast Transients from the DC Network port (EFT) 2KV Performance Criterion B	Working mode	DC 24V
Surges from the Analogue/Digital port 1KV, 4KV Performance Criterion C 1KV Performance Criterion C 0.5KV Performance Criterion B	Working mode	DC 24V
Surges from the DC Network port 0.5KV Performance Criterion B	Working mode	DC 24V
Injected Currents from the Analogue/Digital port (CS) 0.15MHz to 10MHz for 3V r.m.s. 10MHz to 30MHz for 3 to 1Vr.m.s. 30MHz to 80MHz for 1V r.m.s. Performance Criterion A	Working mode	DC 24V
Injected Currents from the DC Network port (CS) 0.15MHz to 10MHz for 3V r.m.s. 10MHz to 30MHz for 3 to 1Vr.m.s. 30MHz to 80MHz for 1V r.m.s. Performance Criterion A	Working mode	DC 24V
Power frequency magnetic field 1A/m	Working mode	DC 24V
“*” shows the worst case mode which were recorded in this report.		



6 Emission Test Results

6.1 Asymmetric mode conducted emissions

Test Requirement..... : EN 55032
 Test Method..... : EN 55032
 Frequency Range..... : 150kHz to 30MHz
 Class/Severity..... : Class A/ Table A.11 of EN 55032
 Test Result : Pass Fail not applicable (Remark)

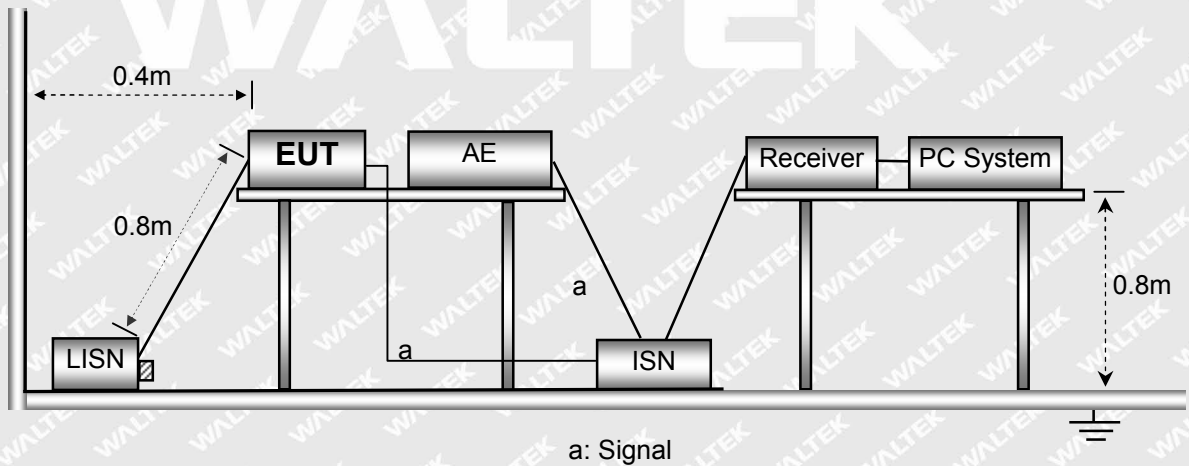
6.1.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23°C
 Humidity..... : 53.6%RH
 Atmospheric Pressure..... : 101.2kPa
 EUT Operation..... : Refer to section 5.5.

6.1.2 Block Diagram of Test Setup

The Asymmetric mode conducted emissions tests were performed in accordance with the EN 55032.



6.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for telecommunication port. Voltage Quasi-peak & average and Current Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.



6.1.4 Corrected Amplitude & Margin Calculation

The Result is calculated by adding the Factor from the Reading. The basic equation is as follows:

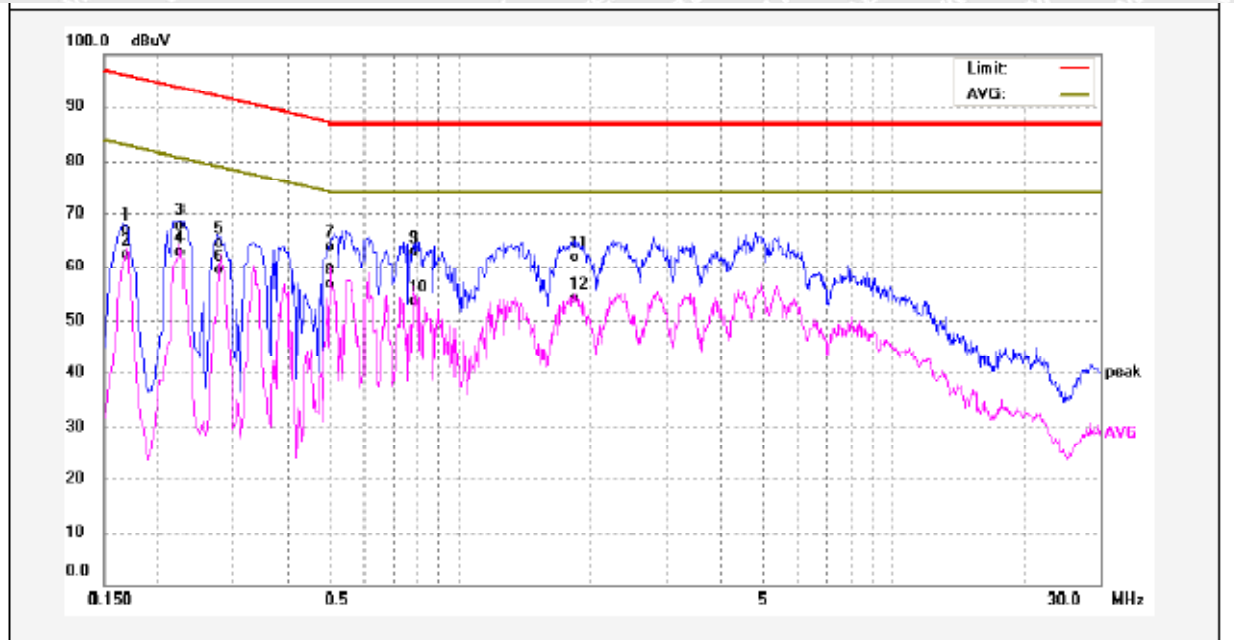
$$\text{Result} = \text{Reading} + \text{Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit.

For example, a margin of -6dB means the emission is 6dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Result} - \text{Limit}$$

6.1.5 Test Data



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	56.39	10.76	67.15	95.96	-28.81	QP	
2	0.1700	51.52	10.76	62.28	82.96	-20.68	AVG	
3	0.2260	57.19	10.66	67.85	93.59	-25.74	QP	
4	0.2260	52.25	10.66	62.91	80.59	-17.68	AVG	
5	0.2779	53.97	10.63	64.60	91.88	-27.28	QP	
6	0.2779	48.86	10.63	59.49	78.88	-19.39	AVG	
7	0.5020	53.25	10.52	63.77	87.00	-23.23	QP	
8	0.5020	46.10	10.52	56.62	74.00	-17.38	AVG	
9	0.7820	52.19	10.60	62.79	87.00	-24.21	QP	
10	0.7820	42.86	10.60	53.46	74.00	-20.54	AVG	
11	1.8380	51.38	10.60	61.98	87.00	-25.02	QP	
12	1.8380	43.37	10.60	53.97	74.00	-20.03	AVG	



6.2 Radiated Emissions, 30-1000MHz

Test Requirement..... : EN 55032
 Test Method..... : EN 55032
 Frequency Range..... : 30MHz to 1000MHz
 Class/Severity..... : Class A/ Table A.2 of EN 55032
 Test Result..... : Pass Fail not applicable (Remark)

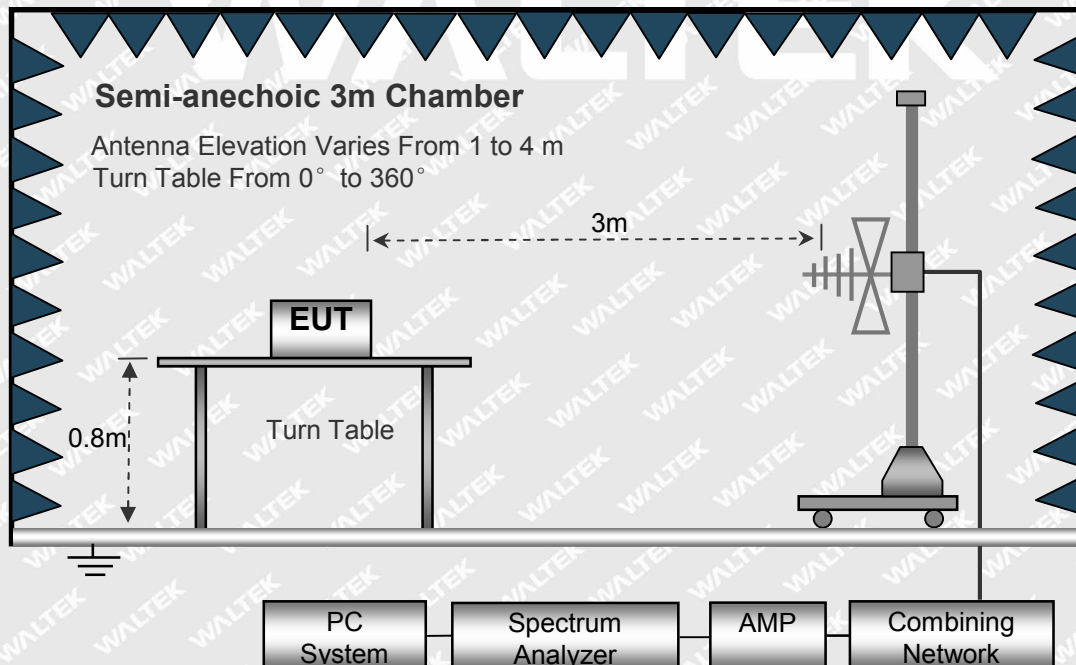
6.2.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23.1°C
 Humidity..... : 54.8%RH
 Atmospheric Pressure..... : 101.5kPa
 EUT Operation..... : Refer to section 5.5.

6.2.2 Block Diagram of Test Setup

The Radiation Emission test was performed in accordance with EN 55032.



6.2.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.



6.2.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

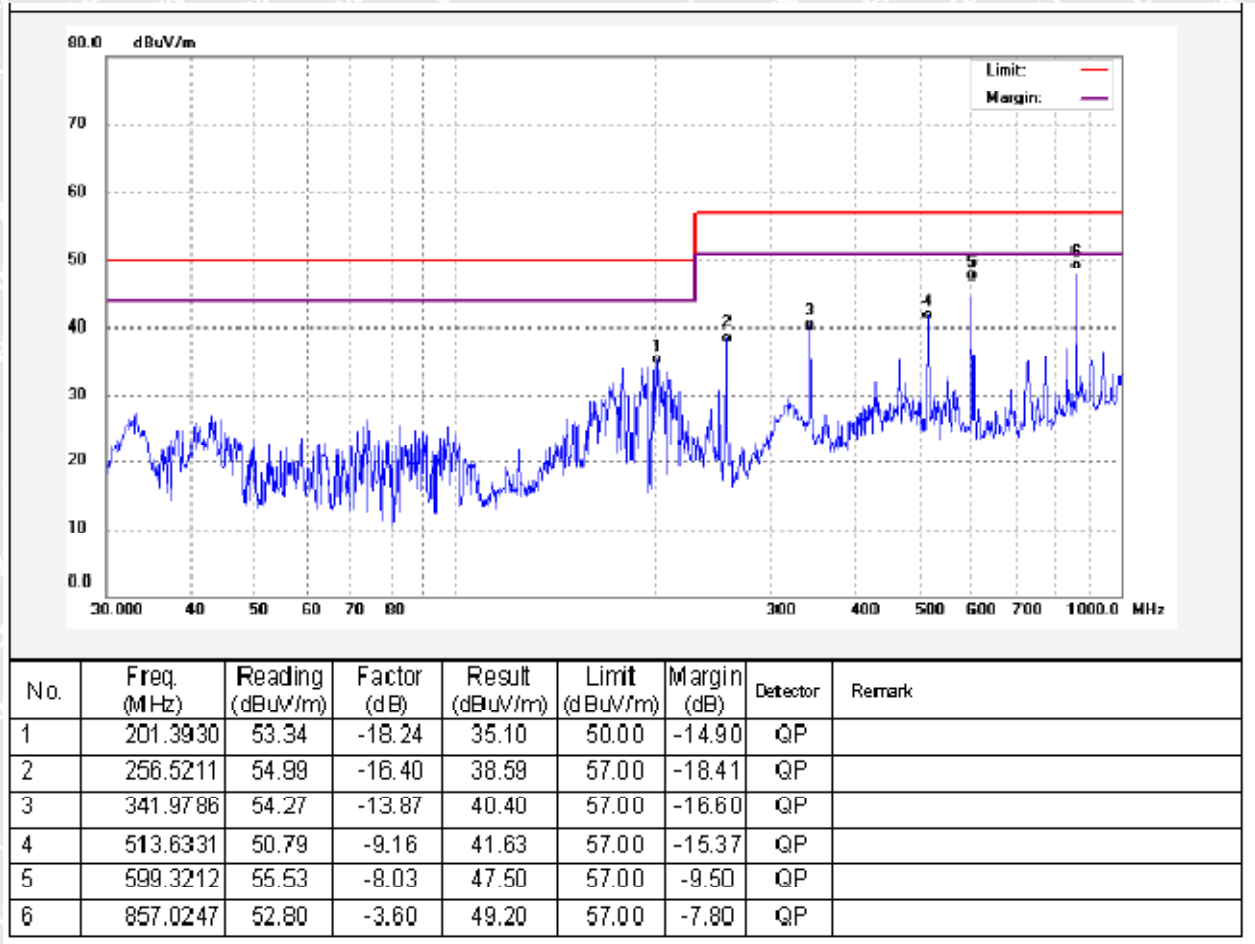
$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB means the emission is 6dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

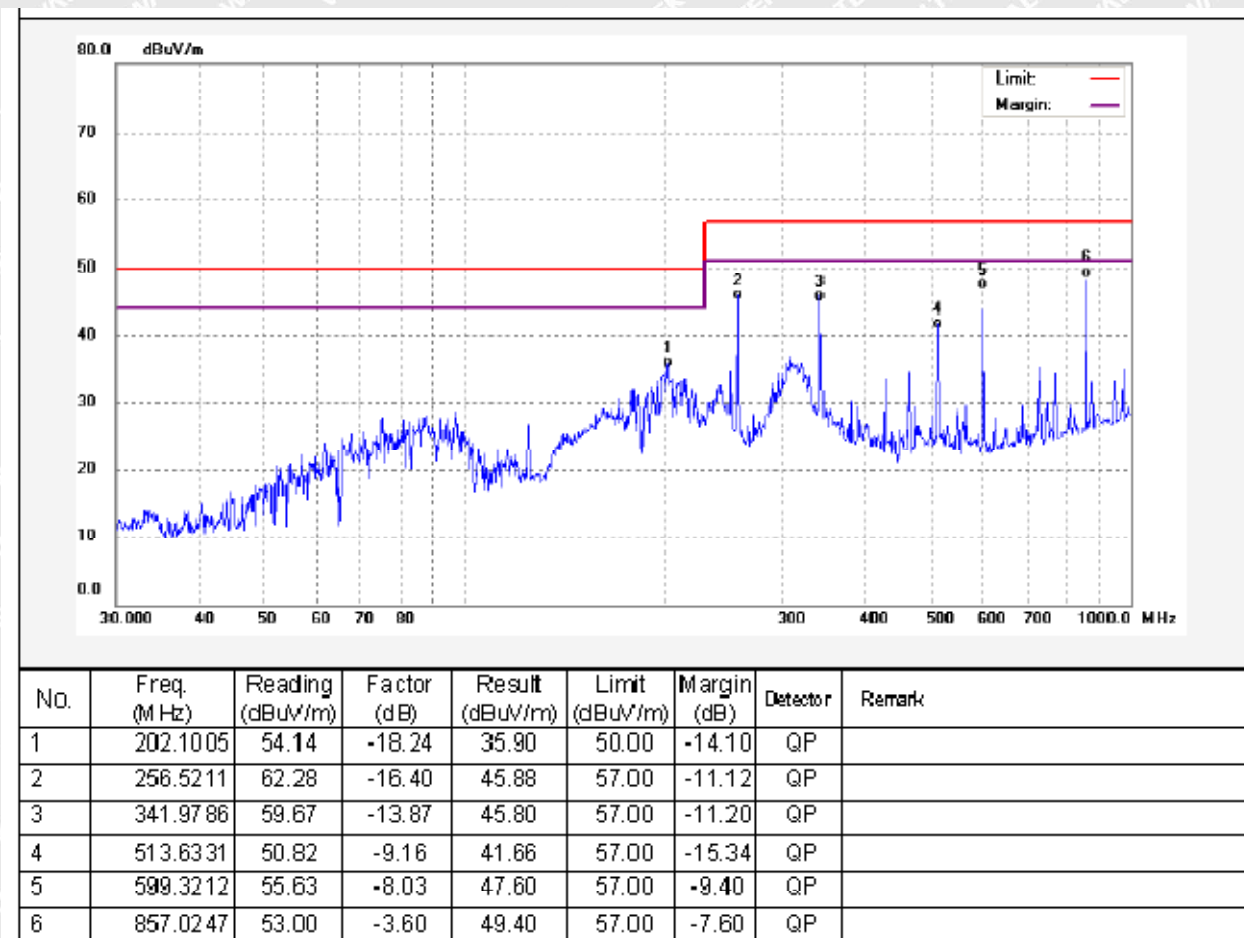
6.2.5 Test Data

Antenna Polarization: Vertical





Antenna Polarization: Horizontal





6.3 Radiation Emission, Above 1000MHz

Test Requirement..... : EN 55032
 Test Method..... : EN 55032
 Frequency Range..... : Above 1000MHz
 Class/Severity..... : Class A/ Table A.3 of EN 55032
 Test Result : Pass Fail not applicable (Remark)

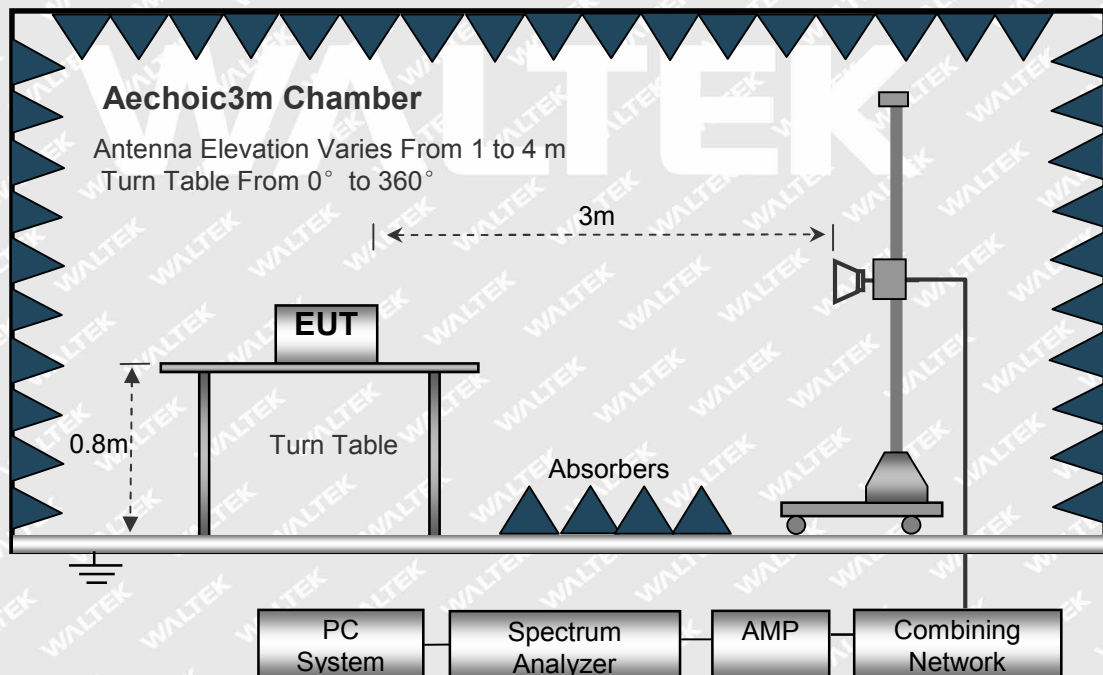
6.3.1E.U.T. Operation

Operating Environment:

Temperature..... : 23.5°C
 Humidity..... : 52.3%RH
 Atmospheric Pressure..... : 101.3kPa
 EUT Operation..... : Refer to section 5.5.

6.3.2Block Diagram of Test Setup

The RadiationEmissiontest was performed in accordance with EN 55032.



6.3.3Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Average measurements were performed if peak emissions were within 6dB of the average limit line.

The test Frequency range judgment basis:

If the highest frequency of the internal sources of the EUT is less than 108 MHz, the



measurement shall only be made up to 1 GHz.

If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.

If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.

If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

6.3.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit.

For example, a margin of -6dB means the emission is 6dB below the maximum limit. The equation for margin calculation is as follows:

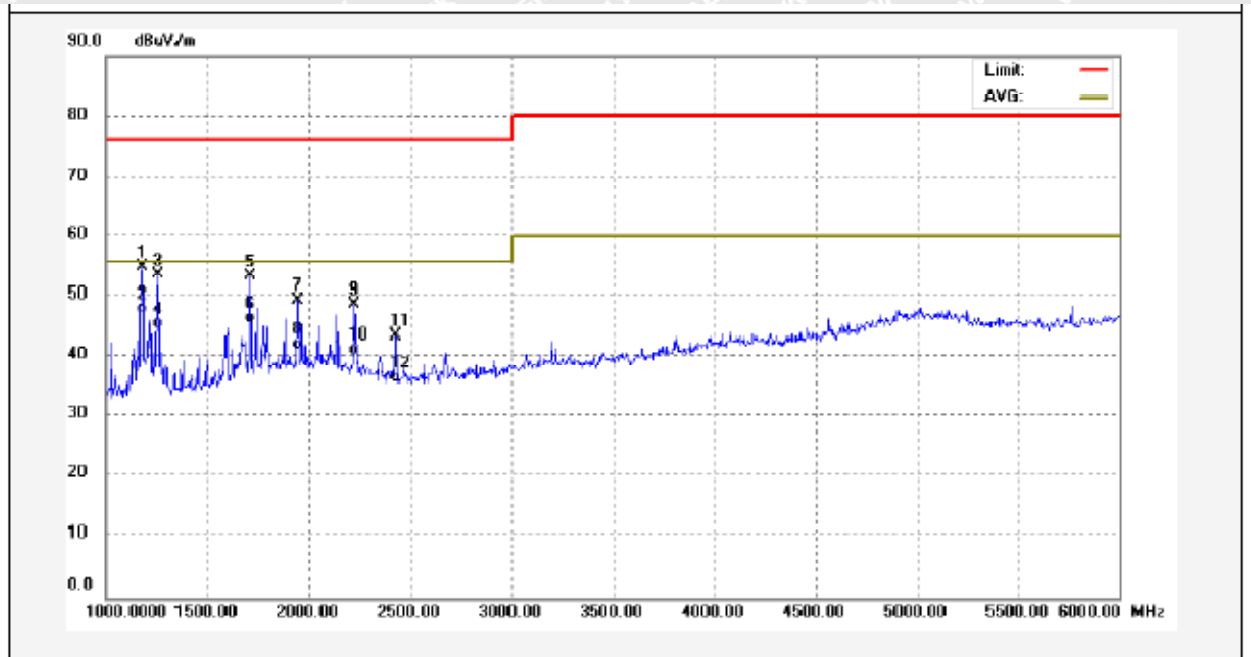
$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

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6.3.5 Test Data

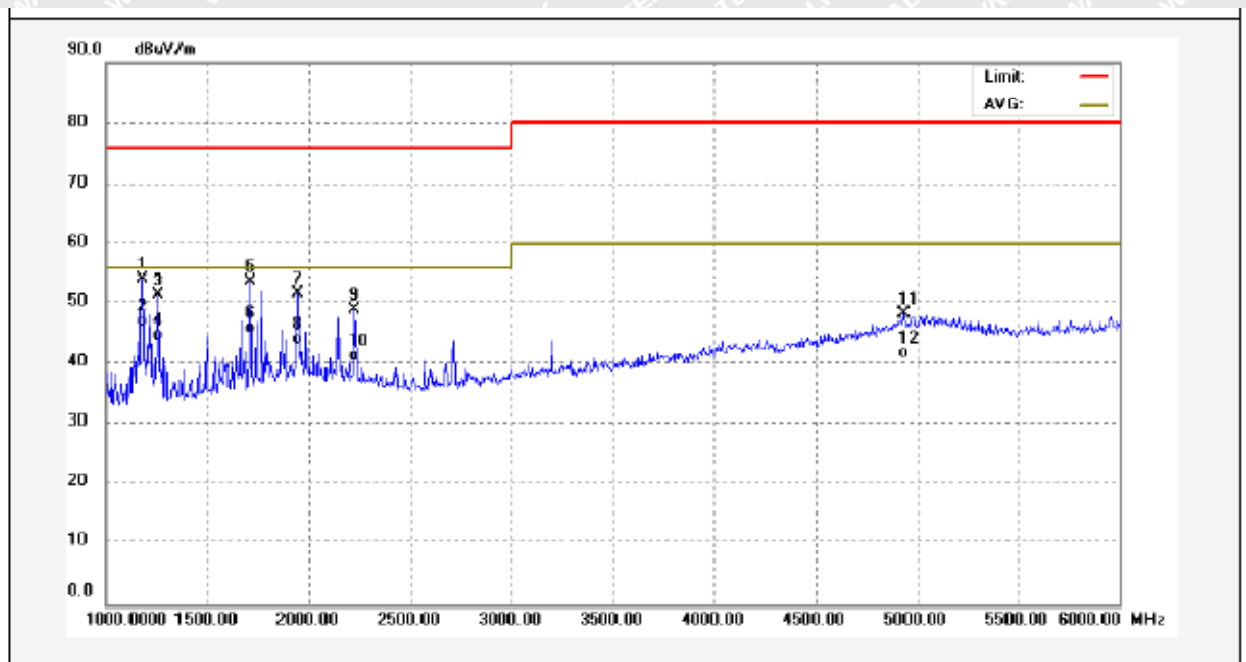
Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1175.000	70.53	-15.51	55.02	76.00	-20.98	peak	
2	1175.000	63.52	-15.51	48.01	56.00	-7.99	AVG	
3	1255.000	68.81	-15.07	53.74	76.00	-22.26	peak	
4	1255.000	60.67	-15.07	45.60	56.00	-10.40	AVG	
5	1710.000	65.67	-12.32	53.35	76.00	-22.65	peak	
6	1710.000	58.79	-12.32	46.47	56.00	-9.53	AVG	
7	1945.000	60.11	-10.74	49.37	76.00	-26.63	peak	
8	1945.000	52.84	-10.74	42.10	56.00	-13.90	AVG	
9	2225.000	60.01	-11.19	48.82	76.00	-27.18	peak	
10	2225.000	52.58	-11.19	41.39	56.00	-14.61	AVG	
11	2430.000	55.52	-11.95	43.57	76.00	-32.43	peak	
12	2430.000	48.60	-11.95	36.65	56.00	-19.35	AVG	



Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1175.000	67.45	-13.28	54.17	76.00	-21.83	peak	
2	1175.000	60.38	-13.28	47.10	56.00	-8.90	AVG	
3	1255.000	64.29	-12.87	51.42	76.00	-24.58	peak	
4	1255.000	57.74	-12.87	44.87	56.00	-11.13	AVG	
5	1710.000	64.07	-10.35	53.72	76.00	-22.28	peak	
6	1710.000	56.47	-10.35	46.12	56.00	-9.88	AVG	
7	1945.000	60.60	-8.91	51.69	76.00	-24.31	peak	
8	1945.000	53.11	-8.91	44.20	56.00	-11.80	AVG	
9	2225.000	57.17	-8.26	48.91	76.00	-27.09	peak	
10	2225.000	49.82	-8.26	41.56	56.00	-14.44	AVG	
11	4935.000	52.58	-4.24	48.34	80.00	-31.66	peak	
12	4935.000	46.10	-4.24	41.86	60.00	-18.14	AVG	



7 Immunity Test Results

7.1 Performance Criteria

Performance criterion A: The apparatus shall continue to operate as intended during the test.

No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test.

No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operations specified in the instructions for use.

For further details, please refer to EN 55035.

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7.2 Electrostatic Discharge (ESD)

Test Requirement.....	: EN 55035
Test Method.....	: IEC 61000-4-2
Test Result	: Pass
Discharge Impedance	: 330 Ω / 150pF
Discharge Voltage	Air Discharge: ± 8 kV Contact Discharge: ± 4 kV HCP & VCP: ± 4 kV
Polarity.....	: Positive & Negative
Number of Discharge	: Minimum 10 times at each test point
Discharge Mode	: Single Discharge
Discharge Period.....	: 1 second minimum

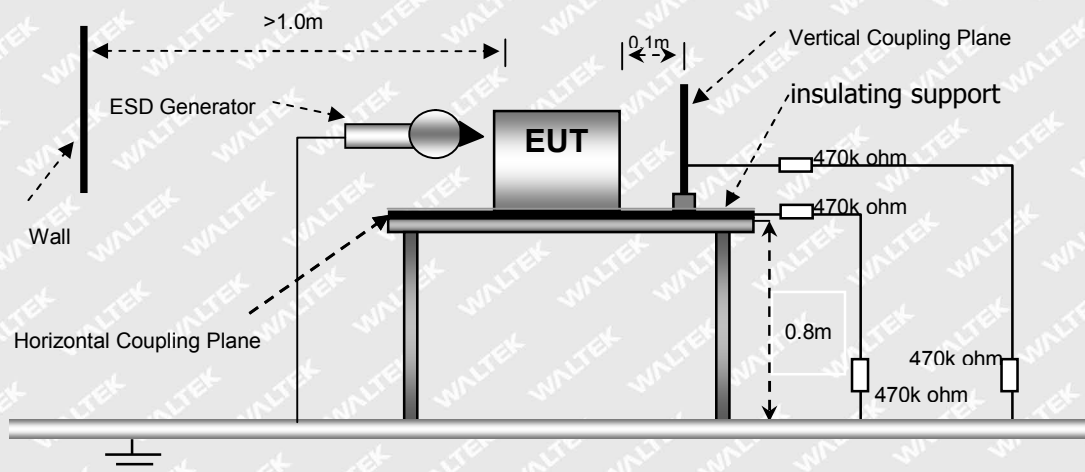
7.2.1 E.U.T. Operation

Operating Environment:

Temperature.....	: 22.8 \pm 0.5 $^{\circ}$ C
Humidity.....	: 54.7%RH
Barometric Pressure.....	: 100.8kPa
EUT Operation.....	: Refer to section 5.5.

7.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2.





7.2.3 Direct Discharge Test Results

Observations: Test points: 1. All Exposed Surface & Seams;
2. All metallic part

Direct Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Contact Discharge	Air Discharge
±8	B	1	N/A	Pass
±4	B	2	Pass	N/A

7.2.4 Indirect Discharge Test Results

Observations: Test points: 1. All sides.

Indirect Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Horizontal Coupling	Vertical Coupling
±4	B	1	Pass	Pass

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7.3 Radio-frequency electromagnetic fields

Test Requirement.....	: EN 55035
Test Method.....	: IEC 61000-4-3
Test Result	: Pass
FrequencyRange	: 80MHz to 1GHz 1.8GHz, 2.6GHz, 3.5GHz, 5GHz
Test level	: 3V/m
Modulation	: 80%, 1kHz Amplitude Modulation.
Face of EUT	: Front, Back, Left, Right
Antenna polarisation.....	: Horizontal&Vertical

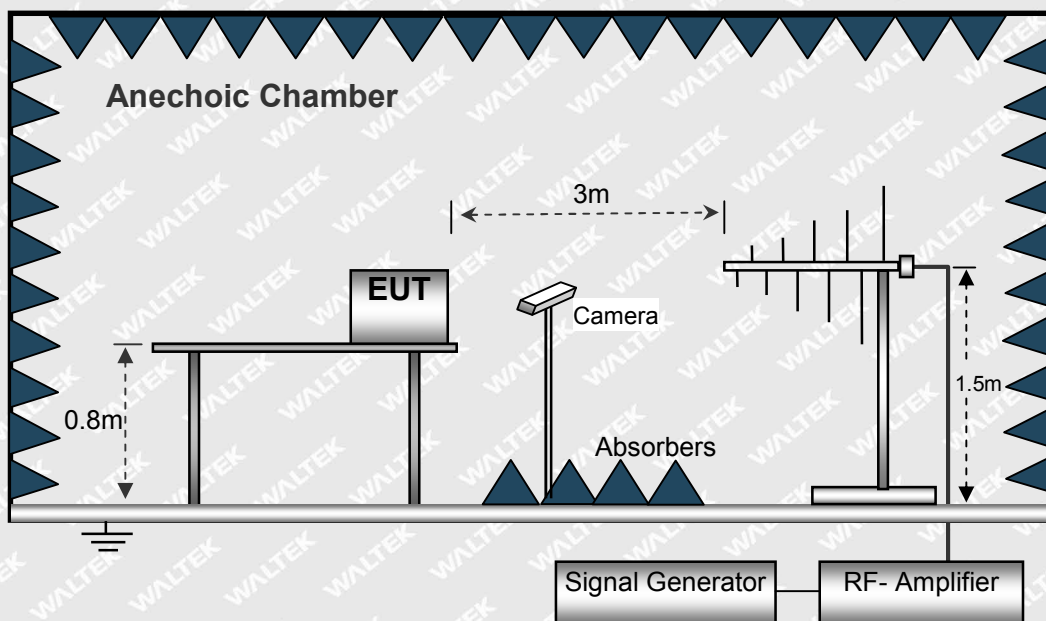
7.3.1 E.U.T. Operation

Operating Environment:

Temperature.....	: 21.7°C
Humidity.....	: 52.4% RH
Barometric Pressure.....	: 102.4kPa
EUT Operation.....	: Refer to section 5.5.

7.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.





7.3.3 Test Results

Test Frequency (MHz)	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80-1000MHz 1800MHz, 2600MHz, 3500MHz, 5000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass
	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass

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7.4 Electrical Fast Transients (EFT)

Test Requirement.....	: EN 55035
Test Method.....	: IEC 61000-4-4
Test Result	: Pass
Polarity.....	: Positive & Negative
Repetition Frequency	: 100 kHz : only for single lines of xDSL equipment 5 kHz : other
Burst Duration.....	: 300ms
Test Duration	: 2 minutes per level & polarity

7.4.1 E.U.T. Operation

Operating Environment:

Temperature..... : 21.9°C

Humidity..... : 53.5%RH

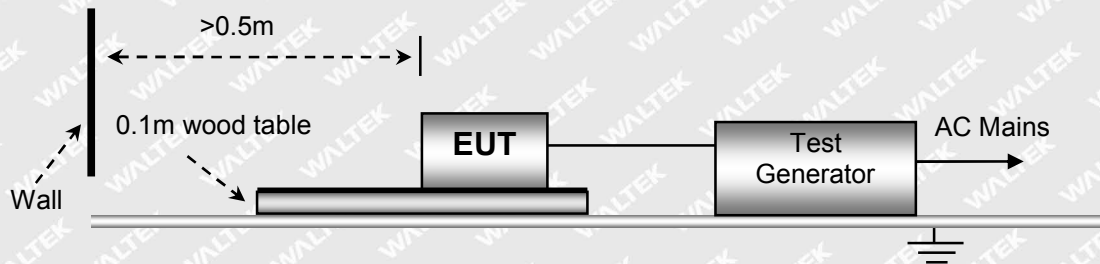
Barometric Pressure..... : 102.3kPa

EUT Operation..... : Refer to section 5.5.

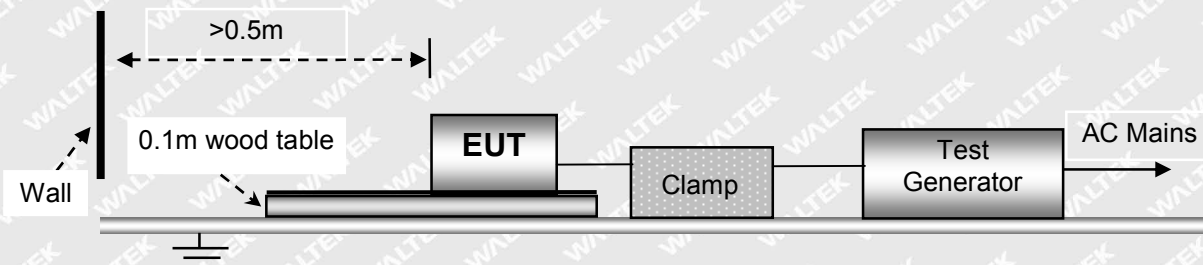
7.4.2 Block Diagram of Test Setup

The Electrical Fast Transients Immunity test was performed in accordance with the IEC 61000-4-4.

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:





7.4.3 Test Results

TestPort	Test Level(kV)	Performance Criterion	Result
AC Mains	□1.0	B	N/A
Analogue/Digital	□1.0	B	PASS ^a
DC Network	□2.0	B	PASS ^a

Remark:

- a Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3 m.

Test according to the test level required by the manufacturer.

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7.5 Surges

Test Requirement.....	: EN 55035
Test Method.....	: IEC 61000-4-5
Test Result	: Pass
Wave-Shape.....	: Combination Wave 1.2/50 us Open Circuit Voltage 8/20 us Short Circuit Current
Generator Source Impedance ...	: 2 ohm between networks 12 ohm between network and ground
Interval.....	: 60s between each surge
No. of surges	: 5 positive at 90° 5 negative at 270°

7.5.1 E.U.T. Operation

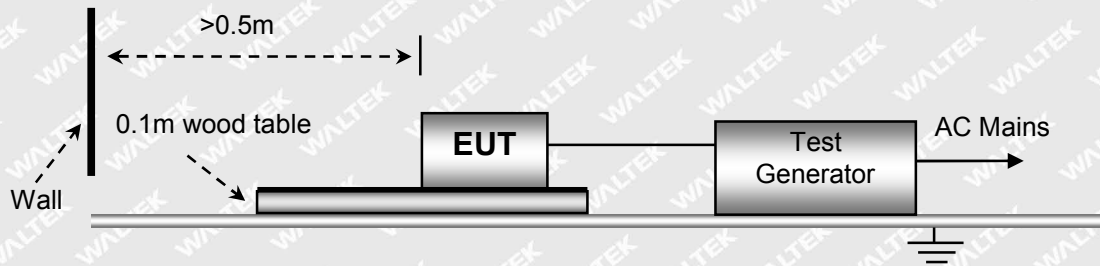
Operating Environment:

Temperature.....	: 22.5 °C
Humidity.....	: 53.1%RH
Barometric Pressure.....	: 101.2kPa
EUT Operation.....	: Refer to section 5.5.

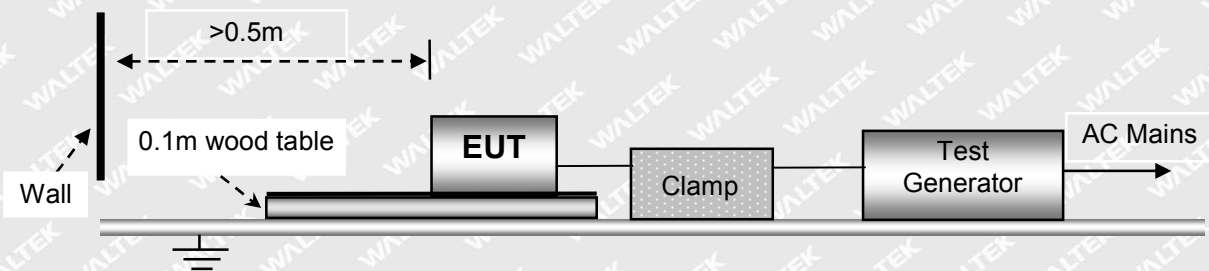
7.5.2 Block Diagram of Test Setup

The Surges Immunity test was performed in accordance with the IEC 61000-4-5.

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:





7.5.3 Test Results

TestPort	Applied Voltage (kV)	Performance criterion	Result
AC Mains (Between Live And Neutral)	□1	B	N/A
AC Mains (Between Live And Earth)	□2	B	N/A
AC Mains (Between Neutral And Earth)	□2	B	N/A
Analogue/Digital	□1 and 4	C	N/A ^{abcf}
	□1.0	C	PASS ^{abdf}
	□0.5	B	N/A ^{aef}
DC Network	□0.5	B	PASS ^{af}

Remark:

- a Applicable only to ports which according to the manufacturer's specification may connect directly to outdoor cables.
- b Port type: unshielded symmetrical, Apply: lines to ground.
- c Apply where primary protection is intended
- d Apply where primary protection is not intended
- e Port type: coaxial or shielded, Apply: shield to ground
- f Applicable only to cables which according to the manufacturer's specification supports communication on cable lengths greater than 3 m.

Test according to the test level required by the manufacturer.



7.6 Injected Currents Immunity

Test Requirement.....	: EN 55035
Test Method.....	: IEC 61000-4-6
Test Result	: Pass
FrequencyRange.....	: 0.15MHz to 80MHz
Test level	: 0.15MHz to 10MHz for 3V r.m.s. 10MHz to 30MHz for 3 to 1Vr.m.s. 30MHz to 80MHz for 1V r.m.s. (unmodulatedemf into 150 □)
Modulation.....	: 80%, 1kHz Amplitude Modulation.

7.6.1 E.U.T. Operation

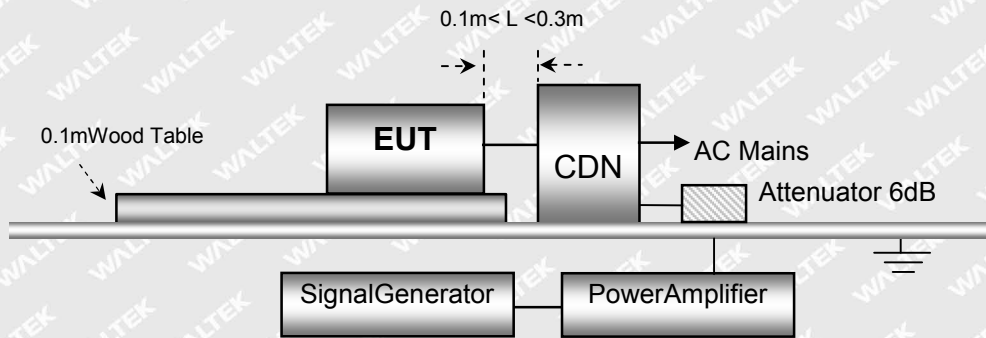
Operating Environment:

Temperature.....	: 23.4□C
Humidity.....	: 51.2% RH
Barometric Pressure	: 103.2kPa
EUT Operation.....	: Refer to section 5.5.

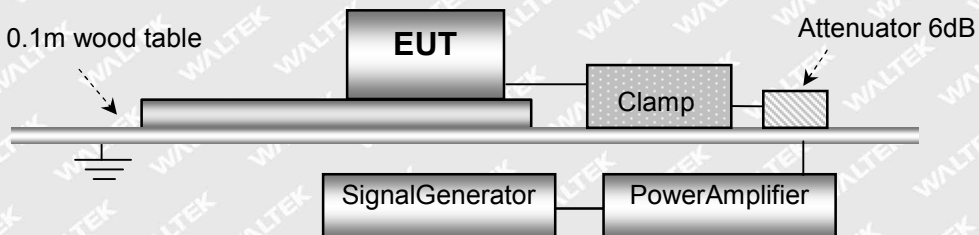
7.6.2 Block Diagram of Test Setup

The Injected Currents Immunity test was performed in accordance with the IEC 61000-4-6.

For AC Mains or DC Input:



For Signal or Telecommunication Ports:





7.6.3 Test Results

Frequency Range	Line	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result
0.15MHz to 10MHz	AC mains	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	N/A
10MHz to 30MHz		3 to 1Vr.m.s.					N/A
30MHz to 80MHz		1Vr.m.s.					N/A
0.15MHz to 10MHz	Analogue/ Digital	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	PASS ^a
10MHz to 30MHz		3 to 1Vr.m.s.					PASS ^a
30MHz to 80MHz		1Vr.m.s.					PASS ^a
0.15MHz to 10MHz	DC Network	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	1s	A	PASS ^a
10MHz to 30MHz		3 to 1Vr.m.s.					PASS ^a
30MHz to 80MHz		1Vr.m.s.					PASS ^a

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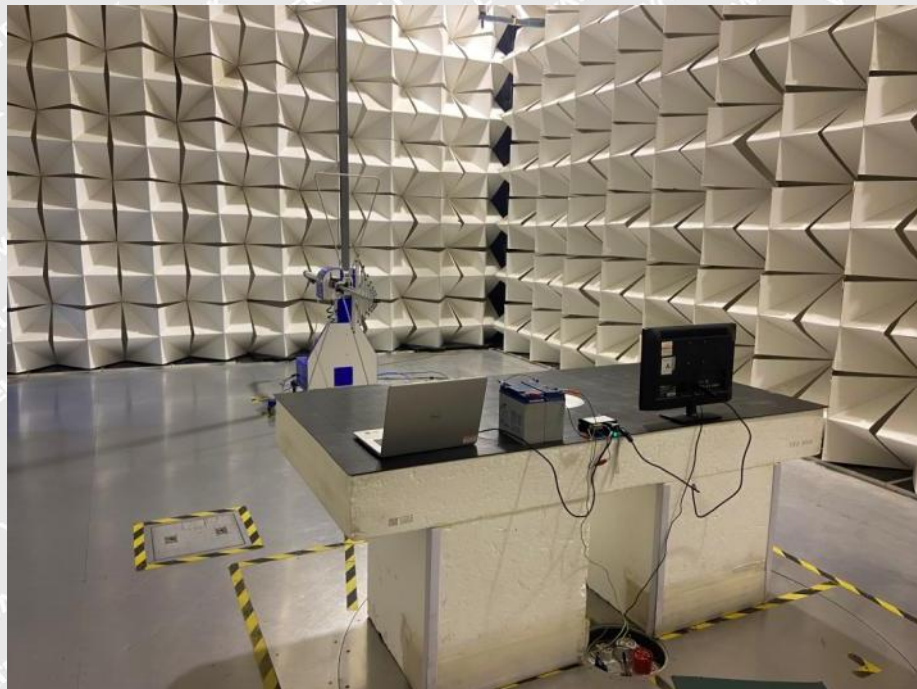


8 Photographs–Test Setup

8.1 Photograph–Asymmetric Mode Conducted Emissions Test Setup



8.2 Photograph–Radiation Emission Test Setup 30MHz-1000MHz





8.3 Photograph– RadiationEmission Test Setup Above 1GHz

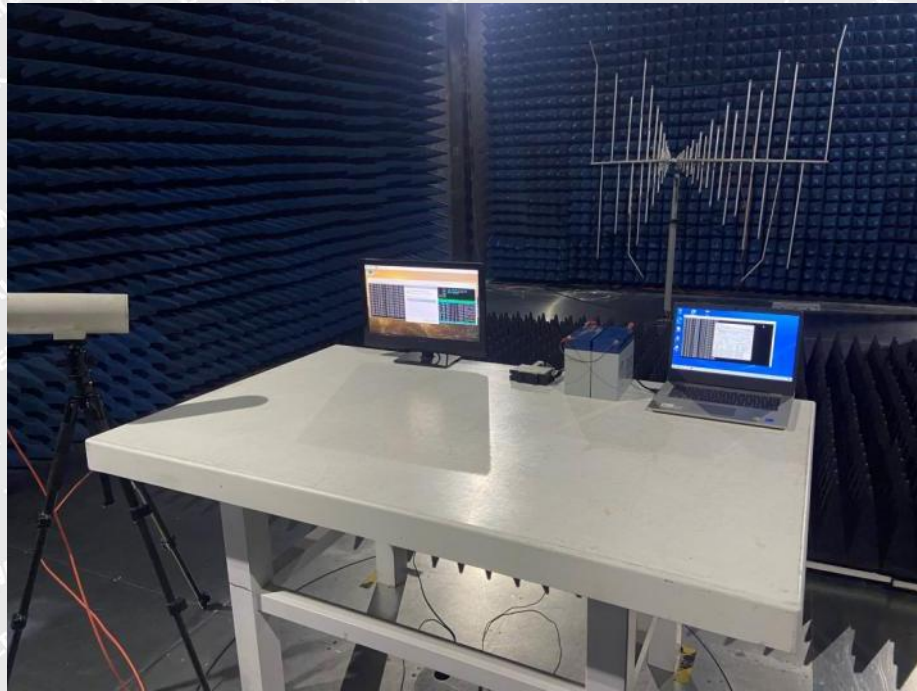


8.4 Photograph – ESD Immunity Test Setup

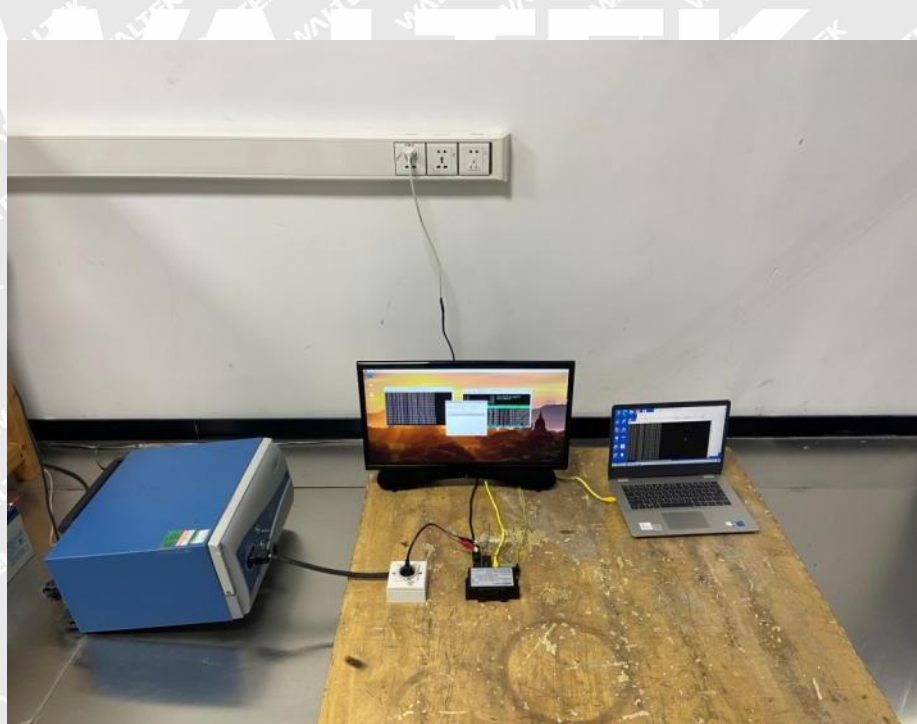




8.5 Photograph –Radio-frequency electromagnetic fields Test Setup

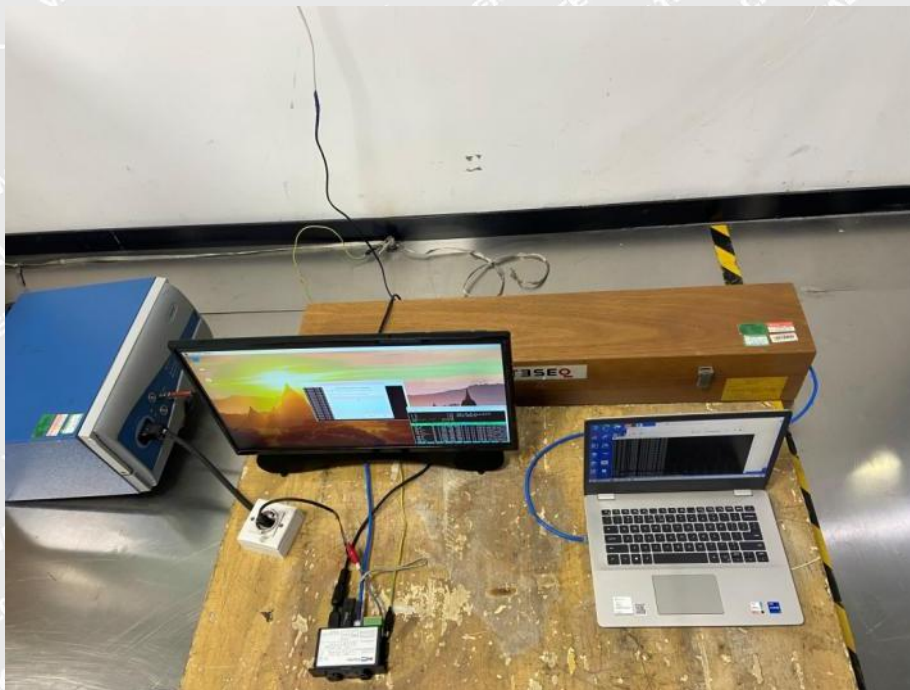


8.6 Photograph – EFT&Surges Immunity DC Mains Test Setup





8.7 Photograph –EFT Immunity Analogue/Digital Port Test Setup

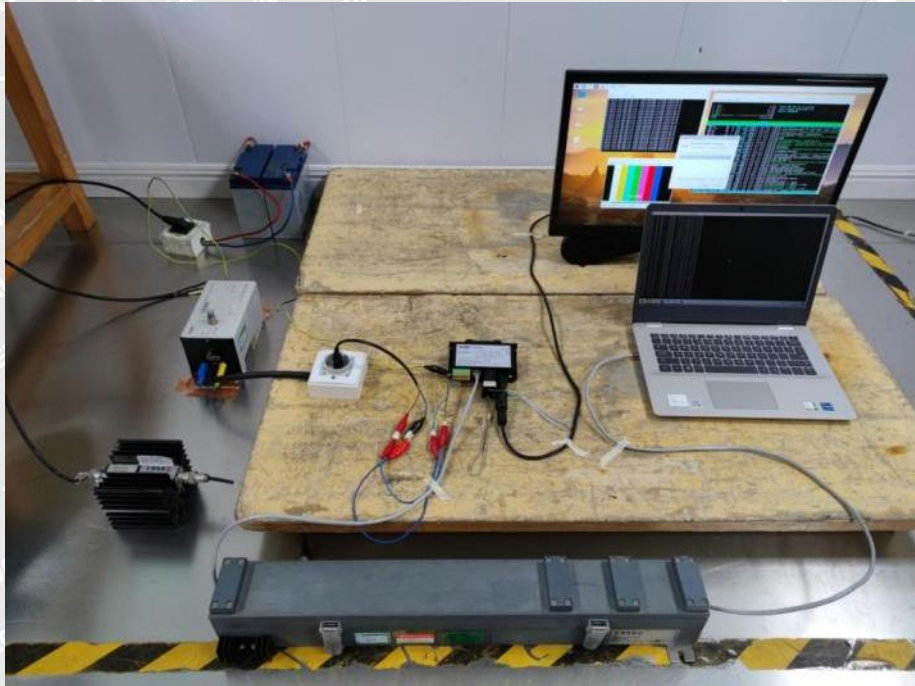


8.8 Photograph –Surges Immunity Analogue/Digital Port Test Setup

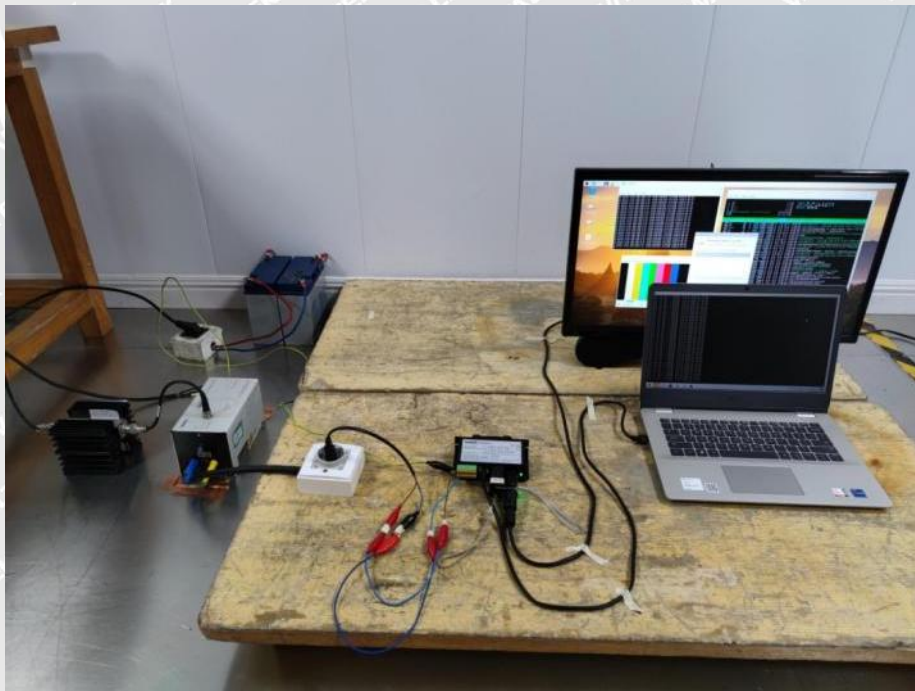




8.9 Photograph – Injected Currents Immunity Analogue/Digital Port Test Setup

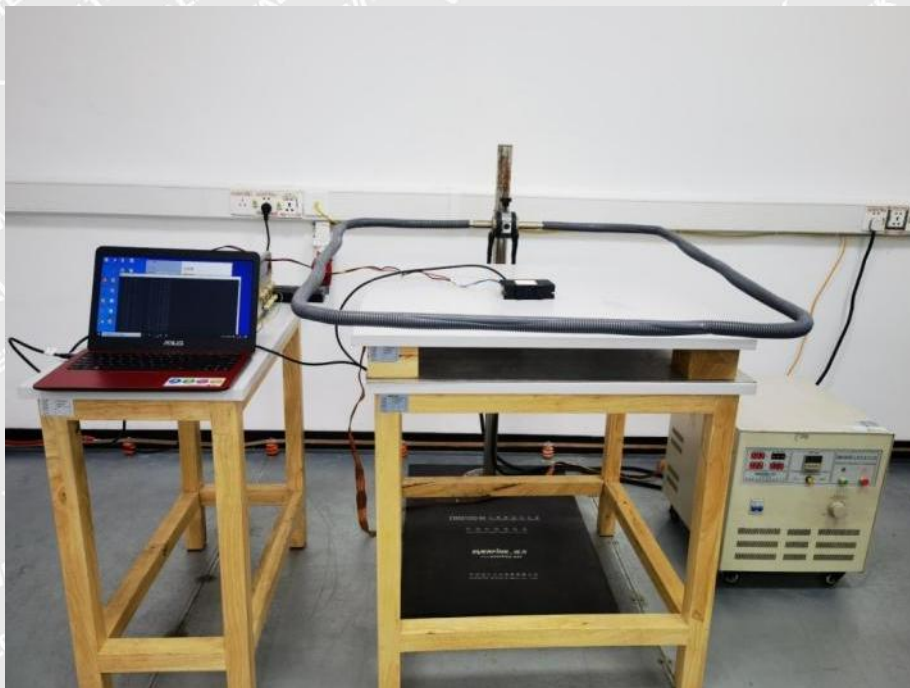


8.10 Photograph – Injected Currents Immunity DC Mains Test Setup





8.11 Photograph –Power-frequency magnetic fields Test Setup



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9 Photographs—Constructional Details







=====End of Report=====