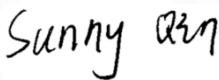


EMC Test Report

For

Applicant name: Ganzhou Novel Battery Technology Co.,Ltd.
Address: Ganzhou Electronic Information Industry Science and Technology City,
Longnan Economic and Technological Development Zone, Longnan
City, Ganzhou City, Jiangxi, P.R. China
EUT name: Rechargeable Li-polymer Cell
Brand name: N/A
Model number: 1376074

Issued By

Company name: BTF Testing Lab (Shenzhen) Co., Ltd.
Address: F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou
Community, Songgang Street, Bao'an District, Shenzhen, China
Report number: BTF250106E03201
Test standards: EN IEC 61000-6-3:2021
EN IEC 61000-6-1:2019
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021
Test conclusion: Pass
Date of sample receipt: 2025-01-06
Test date: 2025-01-07 to 2025-01-13
Date of issue: 2025-01-17
Test by: 
Colin Wu / Tester
Prepared by: 
Sunny Qin / Project
engineer
Approved by: 
Ryan.CJ / EMC Manager

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.

Revision History		
Version	Issue date	Revisions content
R_V0	2025-01-17	Original
Note: <i>Once the revision has been made, then previous versions reports are invalid.</i>		

Table of Contents

1 Introduction	4
1.1 Laboratory Location	4
1.2 Laboratory Facility	4
1.3 Announcement	4
2 Product Information	5
2.1 Application Information	5
2.2 Manufacturer Information	5
2.3 Factory Information	5
2.4 General Description of Equipment under Test (EUT)	5
3 Test Information	6
3.1 Test Standards	6
3.2 Basic Standards	6
3.3 Summary of Test	7
3.4 Uncertainty of Test	7
3.5 Additions to, deviations, or exclusions from the method	7
3.6 Test Auxiliary Equipment	8
3.7 Test Equipment List	8
4 Test Configuration	10
4.1 Environment Condition	10
4.2 Test mode	10
5 Test Items	11
5.1 Emission Tests	11
5.1.1 Radiation Emissions (30MHz-1GHz)	11
5.1.2 Radiated emissions (Above 1 GHz)	11
5.1.3 Conducted Emission	17
5.1.4 Harmonic Current emission	18
5.1.5 Voltage Changes, Voltage Fluctuations and Flicker	19
5.2 Immunity Tests	20
5.2.1 Test Performance Criteria for Immunity Test	20
5.2.2 Electrostatic Discharges (ESD)	21
5.2.3 Continuous RF Electromagnetic Field Disturbances	23
5.2.4 Electrical Fast Transients/Burst (EFT/B)	25
5.2.5 Surges	26
5.2.6 Continuous Induced RF Disturbances	28
5.2.7 Power Frequency Magnetic Field	30
5.2.8 Voltage Dips and Interruptions	31
6 Test Setup Photos	32
7 EUT Constructional Details (EUT Photos)	33

1 Introduction

1.1 Laboratory Location

Test location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone number:	+86-0755-23146130
Fax number:	+86-0755-23146130

1.2 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS - Registration No.: CNAS L17568**

BTF Testing Lab (Shenzhen) Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L17568.

1.3 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 Product Information

2.1 Application Information

Company name:	Ganzhou Novel Battery Technology Co.,Ltd.
Address:	Ganzhou Electronic Information Industry Science and Technology City, Longnan Economic and Technological Development Zone, Longnan City, Ganzhou City, Jiangxi, P.R. China

2.2 Manufacturer Information

Company name:	Ganzhou Novel Battery Technology Co.,Ltd.
Address:	Ganzhou Electronic Information Industry Science and Technology City, Longnan Economic and Technological Development Zone, Longnan City, Ganzhou City, Jiangxi, P.R. China

2.3 Factory Information

Company name:	Ganzhou Novel Battery Technology Co.,Ltd.
Address:	Ganzhou Electronic Information Industry Science and Technology City, Longnan Economic and Technological Development Zone, Longnan City, Ganzhou City, Jiangxi, P.R. China

2.4 General Description of Equipment under Test (EUT)

EUT name	Rechargeable Li-polymer Cell
Under test model name	1376074
Nominal Voltage	3.85V
Battery capacity	10000mAh
Energy	38.5Wh

3 Test Information

3.1 Test Standards

Identity	Document Title
EN IEC 61000-6-3:2021	Electromagnetic compatibility of multimedia equipment - Emission requirements
EN IEC 61000-6-1:2019	Electromagnetic compatibility of multimedia equipment - Immunity requirements
EN IEC 61000-3-2:2019+A1:2021	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3:2013+A2:2021	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

3.2 Basic Standards

Identity	Document Title
EN 61000-4-2:2009	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
EN IEC 61000-4-3:2020	Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
EN 61000-4-4:2012	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
EN 61000-4-5:2014+A1:2017	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
EN IEC 61000-4-6:2023	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
EN 61000-4-8:2010	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
EN IEC 61000-4-11:2020	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase

3.3 Summary of Test

Test Items	Test standard and basic standard	Result
Radiated emission	EN 61000-6-3	Pass
Conducted emission	EN 61000-6-1	N/A ²
Harmonic current emissions	EN IEC 61000-3-2	N/A ¹
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3	N/A ²
Electrostatic discharges (ESD)	EN 61000-6-1 EN 61000-4-2	Pass
Continuous RF electromagnetic field disturbances	EN 61000-6-1 EN IEC 61000-4-3	Pass*
Electrical fast transients/burst (EFT/B)	EN 61000-6-1 EN IEC 61000-4-4	N/A ²
Surges	EN 61000-6-1 EN 61000-4-5	N/A ²
Continuous induced RF disturbances	EN 61000-6-1 EN IEC 61000-4-6	N/A ²
Power frequency magnetic field	EN 61000-6-1 EN 61000-4-8	N/A ³
Voltage dips and interruptions	EN 61000-6-1 EN IEC 61000-4-11	N/A ²

Remark:

1. Pass: Meet the requirements.
2. N/A¹: not applicable. EUT power rating of less than 75W, so does not require testing.
3. N/A²: The DC products are not applicable to this project
4. N/A³: This product does not contain devices intrinsically susceptible to magnetic fields, such as CRT monitors, Hall effect elements, electro-dynamic microphones, magnetic field sensors or audio frequency transformers, so does not require testing.
5. Pass*: The test item is subcontracted to Shenzhen TCT Testing Technology Co., LTD., whose A2LA and CNAS qualification scope covers the testing capability of the test item.

3.4 Uncertainty of Test

Measurement	Value
Conducted Emission for LISN (9kHz ~ 150kHz)	±2.97 dB
Conducted Emission for LISN (150kHz ~ 30MHz)	±2.45 dB
Radiated Emission (30MHz ~ 1GHz)	±4.80 dB
Radiated Emission (1GHz ~ 18GHz)	±5.25 dB

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5 Additions to, deviations, or exclusions from the method

None

3.6 Test Auxiliary Equipment

Description	Manufacturer	Model	Serial No.	Length	Description
Resistive load	/	/	/	/	/

3.7 Test Equipment List

Note: All calibration information is from CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd.

Radiated Emission Test					
Test Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESCI7	101032	2024/10/25	2025/10/24
Signal Analyzer	Rohde & Schwarz	FSQ40	100010	2024/10/25	2025/10/24
Log periodic antenna	Schwarzbeck	VULB 9168	01328	2024/10/28	2025/10/27
Preamplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9744	00246	2024/09/24	2025/09/23
Horn Antenna	Schwarzbeck	BBHA9120D	2597	2024/10/30	2025/10/29
Preamplifier (1GHz ~ 18GHz)	Schwarzbeck	BBV9718D	00008	2024/09/24	2025/09/23
Test Software	Frad	EZ_EMC	Version: FA-03A2 RE+		

Conducted Emission Test					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESCI3	101422	2024/10/25	2025/10/24
V-LISN	Schwarzbeck	NSLK 8127	01073	2024/10/25	2025/10/24
Coaxial Switcher	Schwarzbeck	CX210	CX210	/	/
Pulse Limiter	Schwarzbeck	VTSD 9561-F	00953	/	/
Test Software	Frad	EZ_EMC	Version: EMC-CON 3A1.1+		

Harmonic Current Emissions & Voltage Changes, Voltage Fluctuations and Flicker Test					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Harmonic and Flicker system	ZES ZIMMER	HAF5000S	930670	2024/10/25	2025/10/24

Electrostatic Discharges (ESD) Test					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
ESD Generator	Prima	PESD6030	PR210823683	2024/10/28	2025/10/27

Electrical Fast Transients/Burst (EFT/B) Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EFT Generator	Prima	PEFT6030-3816	PR210343256	2024/10/25	2025/10/24

Surges Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Surge Generator	Prima	PSUG6010-2216	PR210955342	2024/10/25	2025/10/24
Isolation transformer	Prima	JMB-2KVA	LL-PLM2125	2024/10/25	2025/10/24

Power Frequency Magnetic Field Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
PFMF Generator	Prima	PFM61008TG	PR210881435	2024/10/25	2025/10/24

Voltage Dips and Interruptions Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Dips Generator	Prima	PDIP6010	PR20076499	2024/10/25	2025/10/24

Continuous Induced RF Disturbances Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Rf conduction immunity test system	Prima	CRF61006A	PR210681042	2024/10/25	2025/10/24
6DB ATTENUATOR	Prima	50W DC-3GHZ	T2A-50-6-3-N	2024/10/25	2025/10/24
CDN coupling	Prima	CRF-CDN-M216	PR210881044	2024/10/25	2025/10/24
CDN coupling	Prima	CRF-CDN-M316	PR210881049	2024/10/25	2025/10/24

Continuous RF Electromagnetic Field Disturbances Test

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Field Probe	Narda	EP-601	811ZX01057	2024/07/03	2025/07/02
Antenna	SKET	STLP9129_Plus	/	/	/
Amplifier	SKET	HAP_03G06G-80W	202004044	2024/07/03	2025/07/02
Amplifier	SKET	HAP_01G03G-75W	202104180	2024/07/03	2025/07/02
Amplifier	SKET	HAP_80M01G-250W	/	2024/02/23	2025/02/22
USB Power Sensor	Agilent	U2001A	MZ54330012	2024/02/23	2025/02/22
USB Power sensor	Agilent	U2000A	MY53410013	2024/02/23	2025/02/22
Signal Generator	Agilent	N5181A	MY50141997	2024/11/15	2025/11/14

4 Test Configuration

4.1 Environment Condition

Selected values during tests			
Temperature	Test voltage	Relative humidity	Ambient pressure
20°C to 25°C	DC 3.85V	30% to 60%	100 kPa to 102 kPa

4.2 Test mode

TM1	Discharge		
Test items		Test mode	Test By
Radiated Emission		TM 1	Colin Wu
Conducted Emission		N/A	N/A
Harmonic Current Emissions		N/A	N/A
Voltage Changes, Voltage Fluctuations and Flicker		N/A	N/A
Electrostatic Discharges (ESD)		TM 1	Ssxx.guo
Continuous RF Electromagnetic Field Disturbances		TM 1	Colin Li
Electrical Fast Transients/Burst (EFT/B)		N/A	N/A
Surges		N/A	N/A
Continuous Induced RF Disturbances		N/A	N/A
Power Frequency Magnetic Field		N/A	N/A
Voltage Dips and Interruptions		N/A	N/A

5 Test Items

5.1 Emission Tests

5.1.1 Radiation Emissions (30MHz-1GHz)

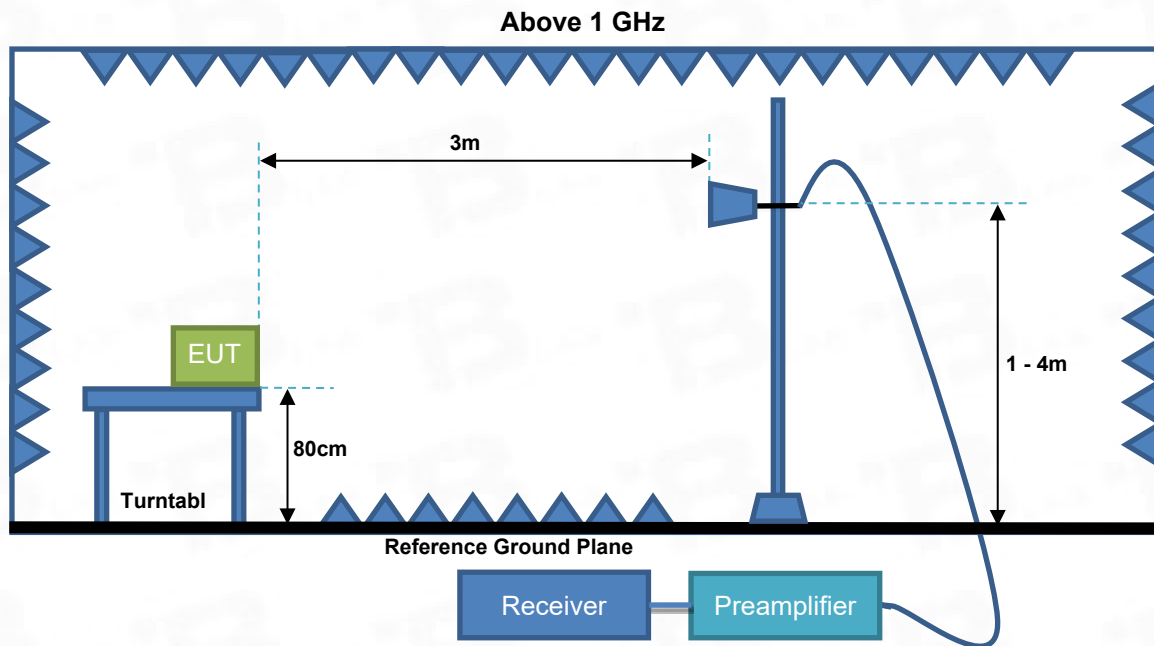
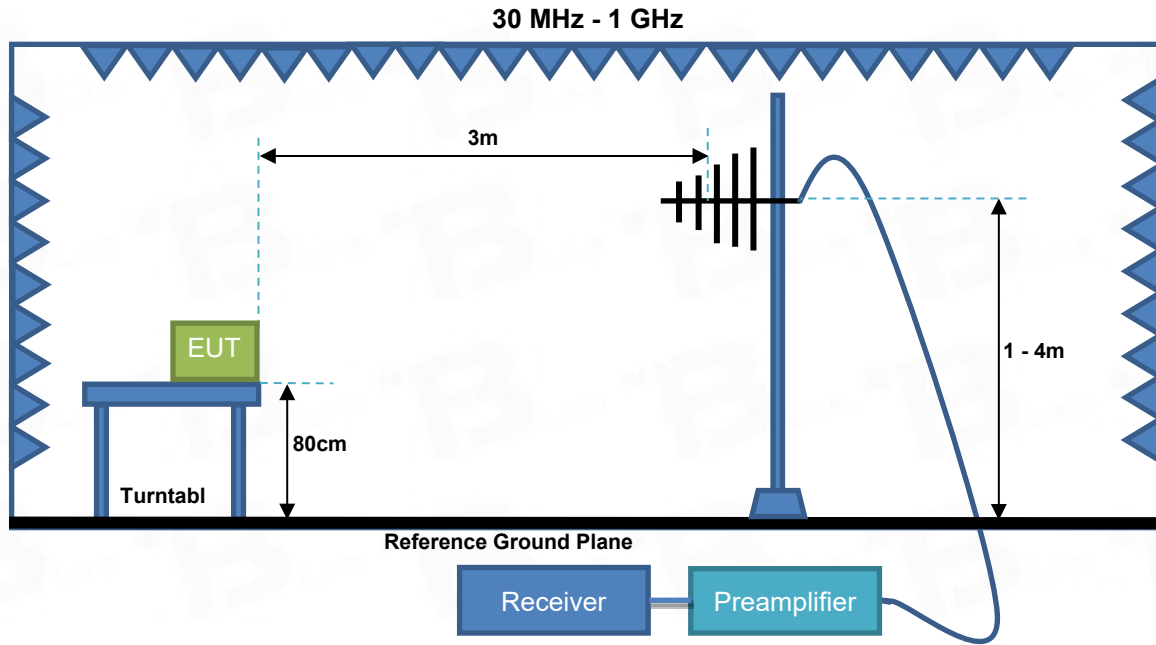
5.1.1.1 Limit

Test Requirement:	Table 3		
Test Method:	CISPR 16-2-3 Clause 7.3		
Test Limit:	Frequency range	Limits at 10m	Limits at 3m
	30 MHz to 230 MHz	30 dB(uV/m) quasi-peak	40 dB(uV/m) quasi-peak
	230 MHz to 1 000 MHz	37 dB(uV/m) quasi-peak	47 dB(uV/m) quasi-peak
	At transitional frequencies the lower limit applies.		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor		

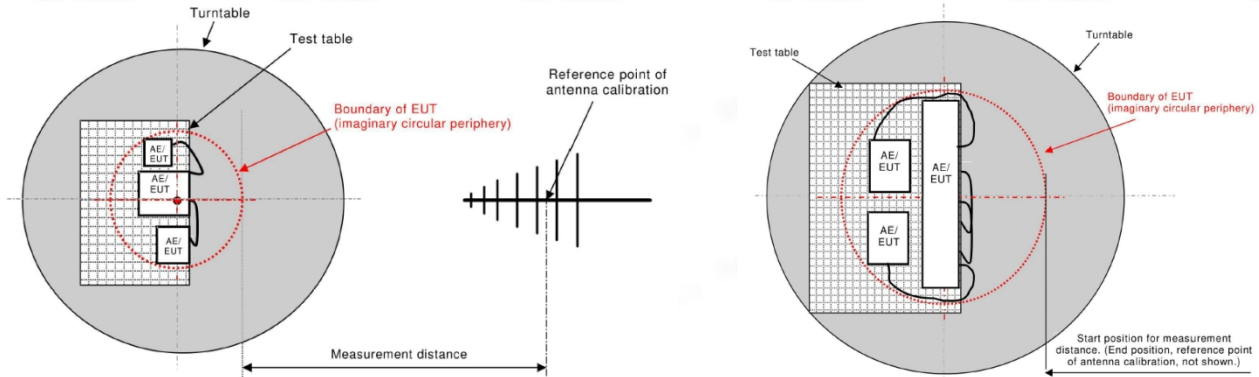
5.1.2 Radiated emissions (Above 1 GHz)

Test Requirement:	Table 3		
Test Method:	CISPR 16-2-3 Clause 7.3		
Test Limit:	Frequency range	Limits at 3m	
		Peak Limit (dBμV/m)	Average Limit (dBμV/m)
	1000-3000	70	50
	3000-6000	74	54
	At transitional frequencies the lower limit applies.		
Procedure:	Remark: An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor		

5.1.2.1 Test Setup



EUT Setup

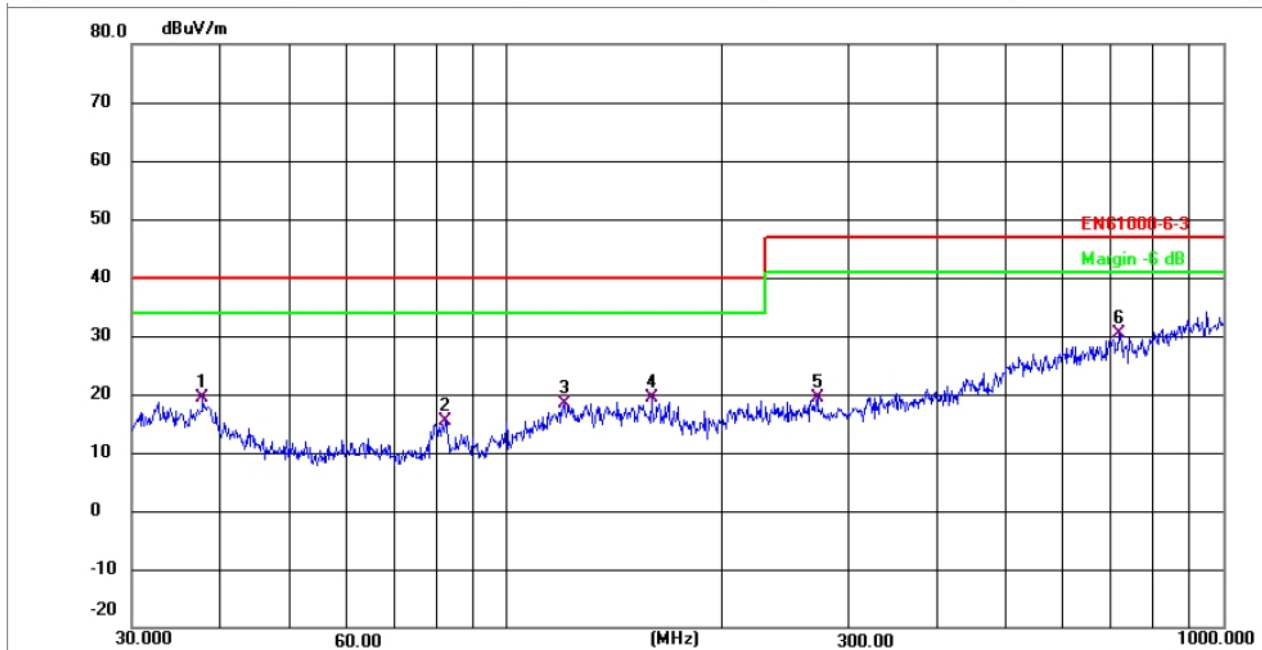


5.1.2.2 Test Procedures

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.

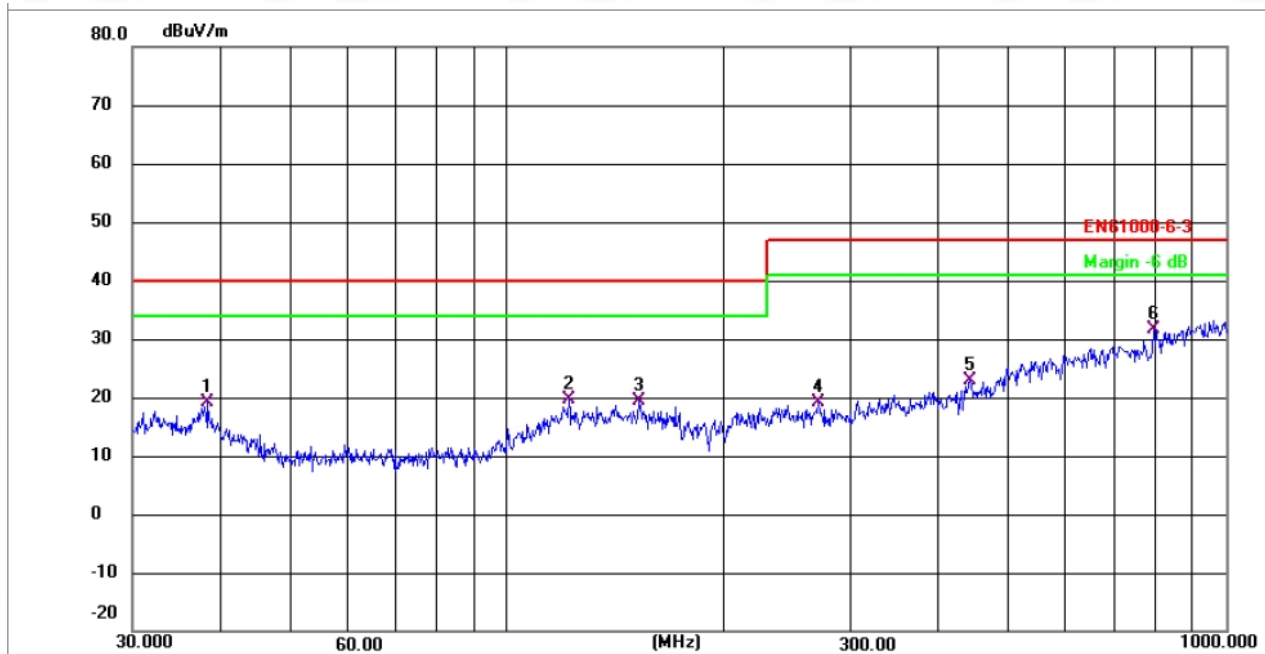
5.1.2.3 Test Result

Test antenna polarization: Vertical (30 MHz to 1 GHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	37.7460	29.10	-9.65	19.45	40.00	-20.55	QP	P
2	82.3588	38.14	-22.74	15.40	40.00	-24.60	QP	P
3	120.2766	40.61	-22.29	18.32	40.00	-21.68	QP	P
4	159.2251	41.26	-21.93	19.33	40.00	-20.67	QP	P
5	272.2776	40.22	-20.86	19.36	47.00	-27.64	QP	P
6 *	715.4265	48.05	-17.66	30.39	47.00	-16.61	QP	P

Test antenna polarization: Horizontal (30 MHz to 1 GHz)



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	38.2791	28.85	-9.64	19.21	40.00	-20.79	QP	P
2	121.5486	41.86	-22.27	19.59	40.00	-20.41	QP	P
3	152.3967	41.26	-21.99	19.27	40.00	-20.73	QP	P
4	270.3748	40.06	-20.88	19.18	47.00	-27.82	QP	P
5	440.9687	42.35	-19.49	22.86	47.00	-24.14	QP	P
6 *	794.7883	49.46	-17.84	31.62	47.00	-15.38	QP	P

Test antenna polarization: Vertical (Above 1 GHz)

Test Data: The internal working frequency is less than 108 MHz, so the evaluation test frequency of this project is 30 MHz-1GHz.

Test antenna polarization: Horizontal (Above 1 GHz)

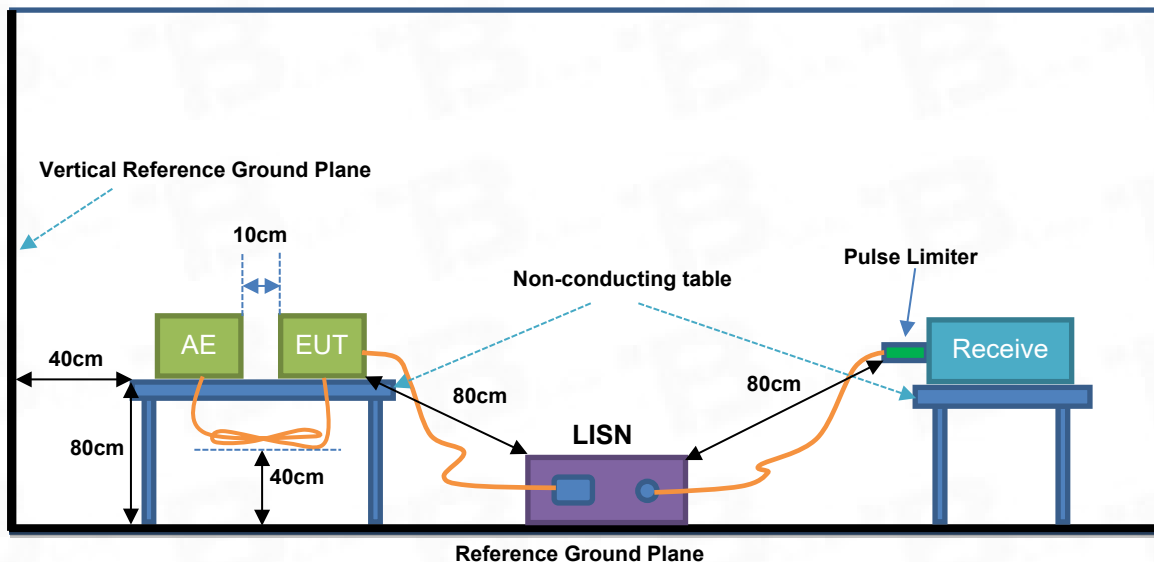
Test Data: The internal working frequency is less than 108 MHz, so the evaluation test frequency of this project is 30 MHz-1GHz.

5.1.3 Conducted Emission

5.1.3.1 Limit

Test Requirement:	Table 4	
Test Method:	CISPR 16-2-1 Clause 7	
Test Limit:	Frequency range	Limits
	0,15 MHz to 0,5 MHz	66 dB(uV) to 56 dB(uV) quasi-peak 56 dB(uV) to 46 dB(uV) average Limits decrease linearly with the logarithm of the frequency
	0,5 MHz to 5 MHz	56 dB(uV) quasi-peak 46 dB(uV) average
	5 MHz to 30 MHz	60 dB(uV) quasi-peak 50 dB(uV) average
	At transitional frequencies the lower limit applies.	
Procedure:	An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor	

5.1.3.2 Test Setup



5.1.3.3 Test Procedures

The EUT is connected to the power mains through a LISN which provides 50 Ω /50 μ H of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.

5.1.3.4 Test Result

Test phase:

Note: The DC products are not applicable to this project.

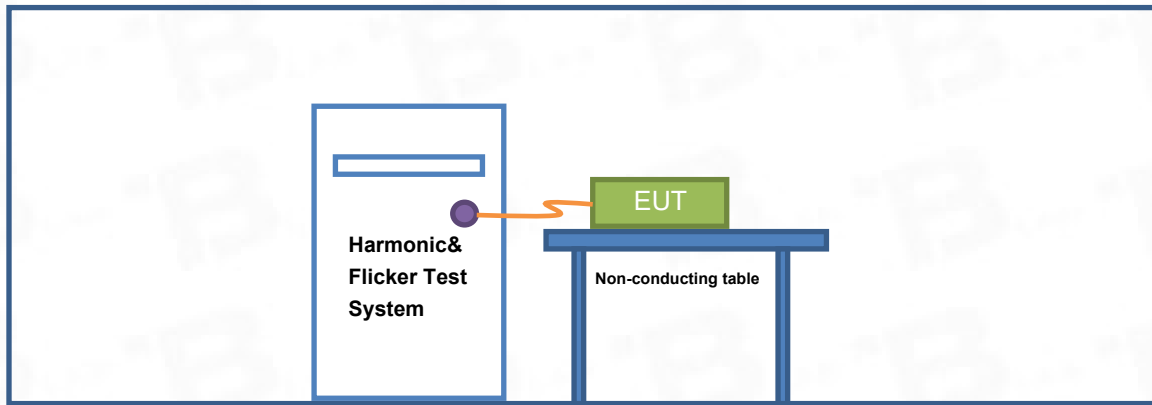
5.1.4 Harmonic Current emission

5.1.4.1 Limit

Limits for Class A equipment				Limits for Class D equipment		
odd harmonic		Even harmonics		Harmonic order (n)	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
Harmonic order (n)	Maximum permissible harmonic current A	Harmonic order (n)	Maximum permissible harmonic current A			
3	2.30	2	1.08	3	3.4	2.30
5	1.14	4	0.43	5	1.9	1.14
7	0.77	6	0.30	7	1.0	0.77
9	0.40	8≤n≤40	0.23X8/n	9	0.5	0.40
11	0.33			11	0.35	0.33
13	0.21			15≤n≤	3.85/n	0.15X15/n
15≤n≤	0.15X15/n			39		
39						

Note: For Class B equipment, the harmonics of the input current shall not exceed the values given in Table "limits for Class A equipment" multiplied by a factor of 1.5.

5.1.4.2 Test Setup



5.1.4.3 Test Procedures

The EUT is placed on the top of a wooden table 0.8m above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

5.1.4.4 Test Result

Note: This product has a power rating of less than 75W, in accordance with EN IEC 61000-3-2 Clause 7, and does not require testing.

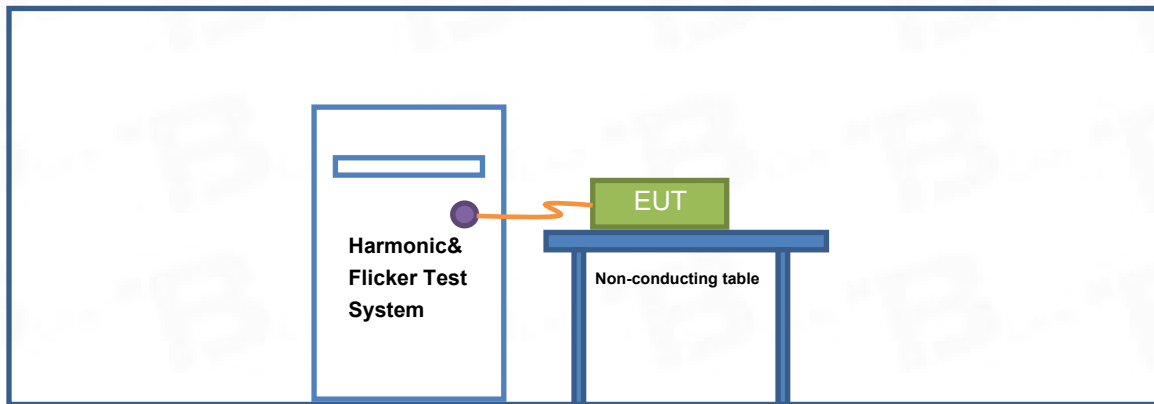
For more information, see Clause 7 of EN IEC 61000-3-2.

5.1.5 Voltage Changes, Voltage Fluctuations and Flicker

5.1.5.1 Limit

Test Item	Limit	Note
P_{st}	1.0	Short-term flicker indicator
P_{lt}	0.65	Long-term flicker indicator
T_{dt}	0.5	Maximum time that dt exceeds 3%
d_{max} (%)	4%	Maximum relative voltage change
d_c (%)	3.3%	Relative steady-state voltage change

5.1.5.2 Test Setup



5.1.5.3 Test Procedures

During the Flicker measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours. The test specifications refer the next table.

No.	Specification	Value
1	Test Frequency	50 Hz
2	Test Voltage	230 VAC
3	Waveform	Sine
4	Test Time	10 minutes for P_{st} ; 2 hours for P_{lt}

5.1.5.4 Test Result

Test phase:

Note: The DC products are not applicable to this project.

5.2 Immunity Tests

5.2.1 Test Performance Criteria for Immunity Test

5.2.1.1 General Performance Criteria

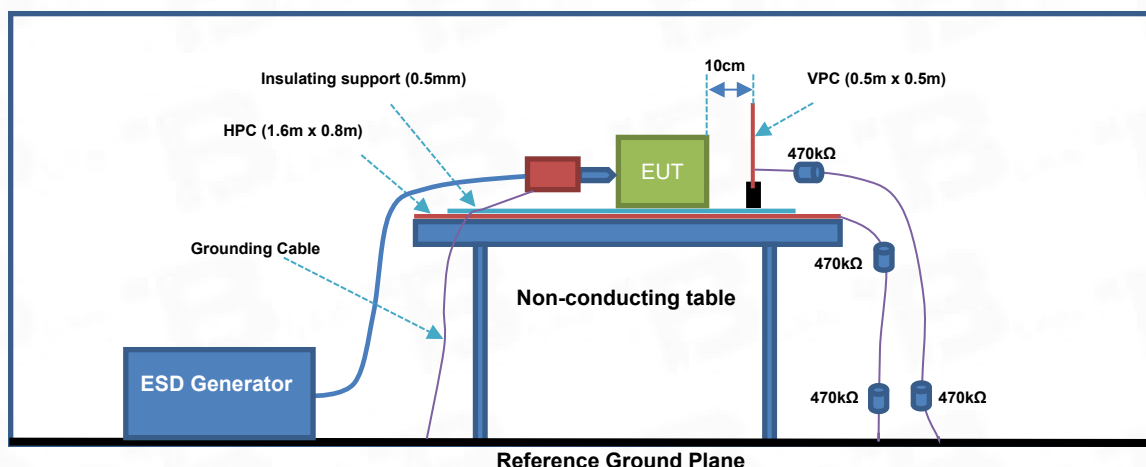
Type	Description
Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. 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 by what the user may reasonably expect from the equipment if used as intended.
Criterion B	During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed

5.2.2 Electrostatic Discharges (ESD)

5.2.2.1 Test Specification

Specification	Value
Test Method	EN 61000-4-2
Discharge Impedance	330 Ohm / 150 pF
Discharge Voltage	Contact Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$ Air Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$, $\pm 8\text{kV}$ HCP/VCP: $\pm 2\text{kV}$, $\pm 4\text{kV}$
Polarity	Positive / Negative
Number of Discharge	Minimum 10 times at each test point
Discharge Mode	Single discharge
Discharge Period	1 second minimum

5.2.2.2 Test Setup



5.2.2.3 Test Procedure

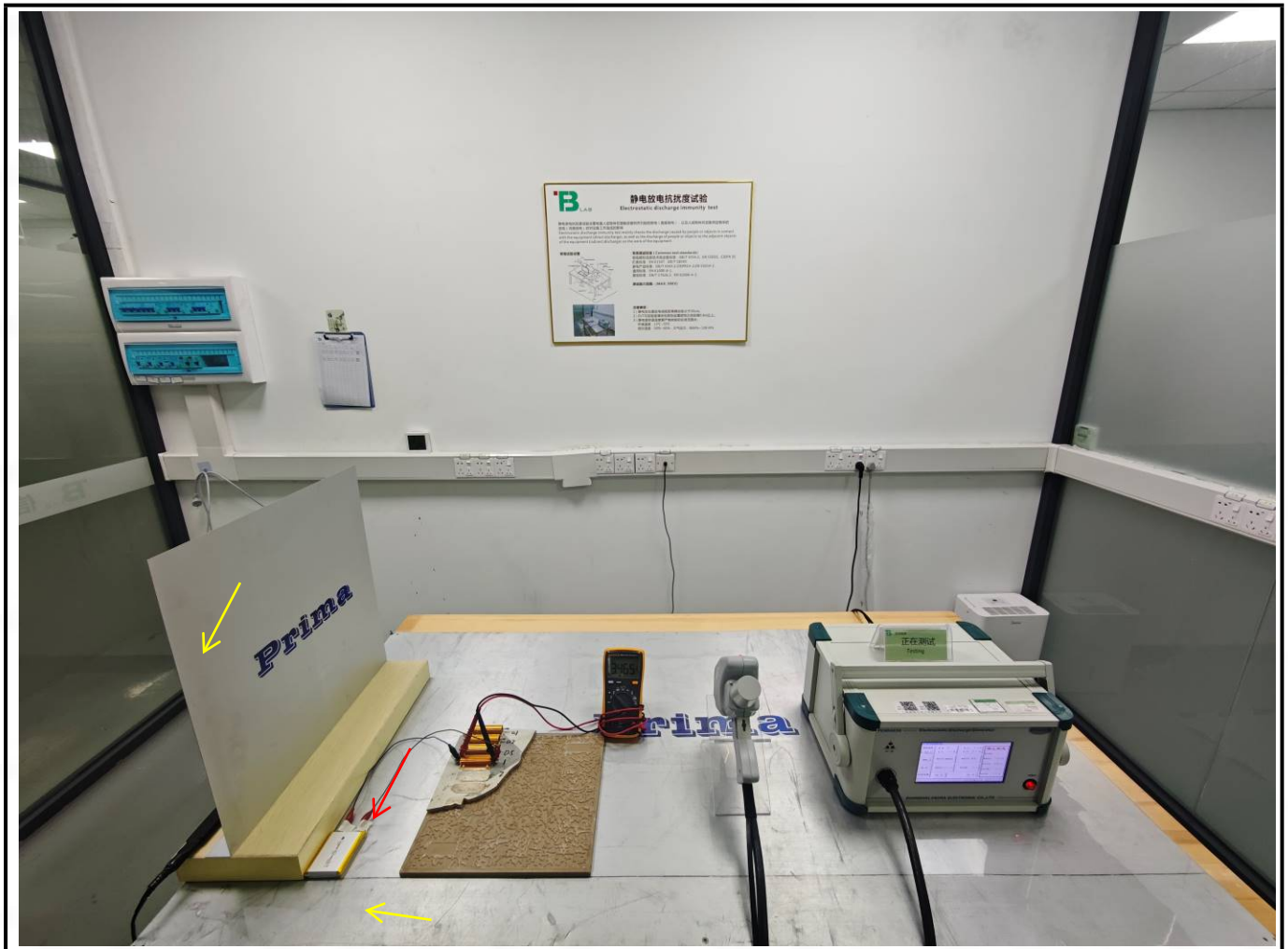
- Electrostatic discharges are applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- The test is performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges is at least 1 second.
- The ESD generator is held perpendicularly to the surface to which the discharge is applied and the return cable is at least 0.2 meters from the EUT.
- Contact discharges are applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges are applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator is removed from the EUT and re-triggered for a new single discharge. The test is repeated until all discharges were completed.
- At least ten single discharges (in the most sensitive polarity) are applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator is positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- At least ten single discharges (in the most sensitive polarity) are applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m*0.5m) is placed vertically to and 0.1 meters from the EUT.

5.2.2.4 Test Result

Direct discharge				
Discharge Voltage (kV)	Type of discharge	Test points	Observations Criterion	Result
$\pm 2, \pm 4$	Contact	I	N/A	Pass
$\pm 2, \pm 4, \pm 8$	Air	II	A	Pass
Indirect discharge				
Discharge Voltage (kV)	Type of discharge	Test points	Observation Performance	Result
$\pm 2, \pm 4$	Contact	Edge of the HCP	A	Pass
$\pm 2, \pm 4$	Contact	Centre of the VCP	A	Pass

A: No degradation in performance of the EUT was observed.
I: Contact discharge test points, Please refer to yellow arrows as below plots.
II: Air discharge test points, Please refer to red arrows as below plots.

5.2.2.5 ESD Test points as below:

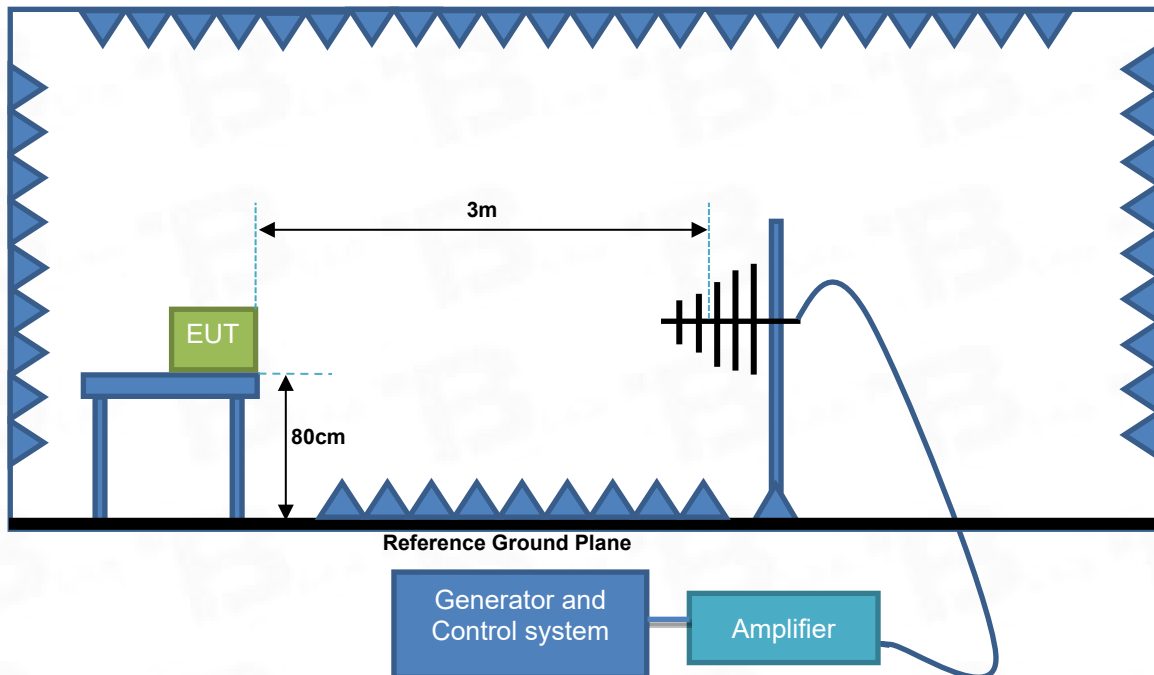


5.2.3 Continuous RF Electromagnetic Field Disturbances

5.2.3.1 Test Specification

Specification	Value
Test Method	EN IEC 61000-4-3
Frequency Range	80MHz to 1GHz, 1.4GHz to 6GHz
Field Strength	3 V/m (unmodulated, r.m.s)
Modulation	1 kHz sine wave, 80%, AM modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3 m
Antenna Height	1.5 m
Dwell Time	≤5 seconds

5.2.3.2 Test Setup



5.2.3.3 Test Procedure

1. The testing is performed in a fully anechoic chamber. The transmit antenna is located at a distance of 3 meters from the EUT.
2. The test signal is 80% amplitude modulated with a 1 kHz sine wave.
3. The frequency range is swept from 80 MHz to 1000 MHz and 1800/2600/3500/5000 ($\pm 1\%$) MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep does not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size is 1% of fundamental.
4. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
5. The field strength level is 3 V/m.
6. The test is performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides, but only the worst side data is reported in this report.

5.2.3.4 Test Result

Continuous RF electromagnetic radiated field disturbances swept test

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations Criterion	Verdict
80 MHz-1 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time = 5s	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass
A: No degradation in the performance of the E.U.T. was observed.						

Continuous RF electromagnetic radiated field disturbances spot test

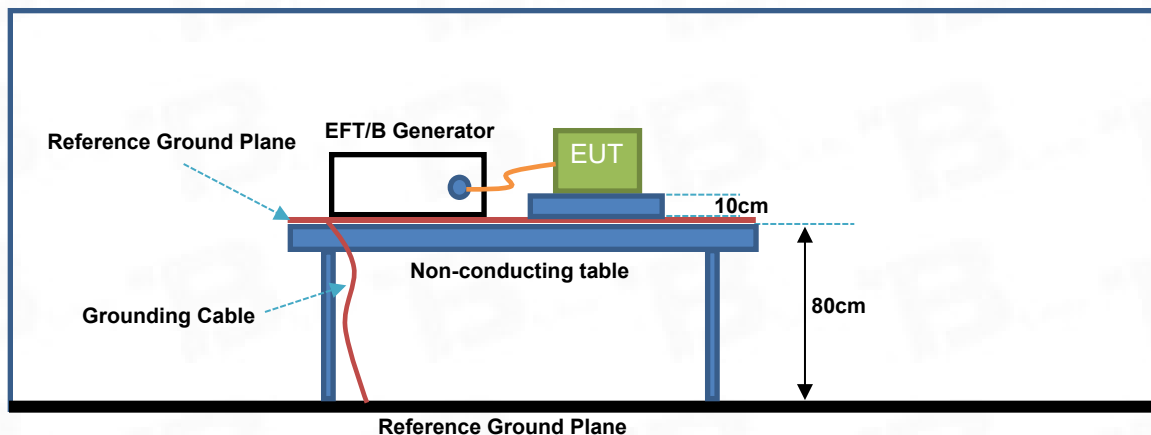
Frequency (+/-1%)	Level	Modulation	Antenna Polarization	EUT Face	Observations Criterion	Verdict
1.4GHz-6GHz	3V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time = 5s	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass
A: No degradation in the performance of the E.U.T. was observed.						

5.2.4 Electrical Fast Transients/Burst (EFT/B)

5.2.4.1 Test Specification

Specification	Value
Test method	EN 61000-4-4
Test Voltage	AC Power Port: 1 kV
	DC Power Ports, Analogue/ Digital data Ports: 0.5 kV
Polarity	Positive / Negative
Impulse Frequency	5 kHz, 100 kHz for CPE xDSL ports
Impulse Wave Shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	> 1 min

5.2.4.2 Test Setup



5.2.4.3 Test Procedure

1. The EUT is tested with 1000 V discharges to the AC power input leads, and 500 V for DC Power Ports and Analogue/ Digital data Ports.
2. Both positive and negative polarity discharges are applied.
3. The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 m.
4. The duration time of each test sequential is 1min.
5. The transient / burst waveform is in accordance with IEC 61000-4-4, 5/50 ns.

5.2.4.4 Test Result

Test phase:

Note: The DC products are not applicable to this project.

5.2.5 Surges

5.2.5.1 Test Specification

Specification	Value		
Test method	EN 61000-4-5		
Ports class	AC Power Port	DC Power Port	Analogue/ Digital data Port
Waveform	1.2/50 μs	1.2/50 μs	1.2/50 μs (coaxial or shielded)
Test Voltage	2 kV (line to ground) 1 kV (line to line)	0.5 kV (line to reference ground)	1 kV See note 4,5
Polarity	Positive / Negative		
Phase Angle	90°, 270°	N/A	
Repetition Rate	60 seconds		
Times	5 times per condition		

Note1: Port type: unshielded symmetrical Apply: lines to ground; Port type: coaxial or shielded Apply: shield to ground.

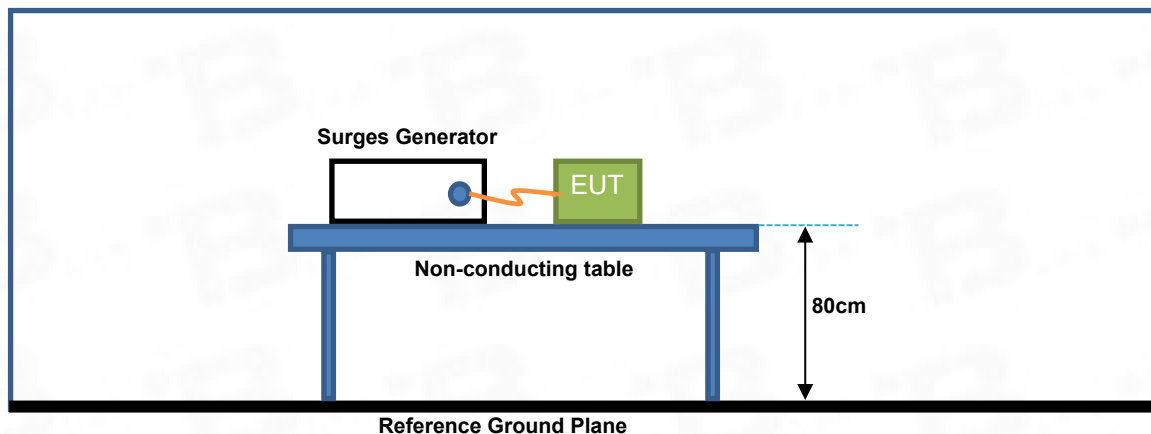
Note2: The test level 1kV and 4kV should apply where primary protection is intended; The test level 1kV should apply where primary protection is not intended.

Note3: The test level 0.5kV apply to coaxial or shielded.

Note 4: Applicable only to ports interfacing with long distance lines (see 3.6).

Note 5: Where the normal functioning cannot be achieved because of the impact of the coupling/decoupling network (CDN) on the EUT, the test shall be done with the reduced functionality. A rationale shall be given in the test report for doing so. After the test and the removal of the CDN, the normal function shall not be affected.

5.2.5.2 Test Setup



5.2.5.3 Test Procedure

The EUT and the auxiliary equipment are placed on a table of 0.8 m heights above a metal ground reference plane. The size of ground plane is greater than 1m*1m and project beyond the EUT by at least 0.1 m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT is less than 2 meters (provided by the manufacturer).

The EUT is connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise is applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).

The surges are applied line to line and line(s) to earth. When testing line to earth the test voltage is applied successively between each of the lines and earth. Set up to the test level specified increased the test voltage. All lower levels including the selected test level are tested. The polarity of each surge level included positive and negative test pulses.

5.2.5.4 Test Result

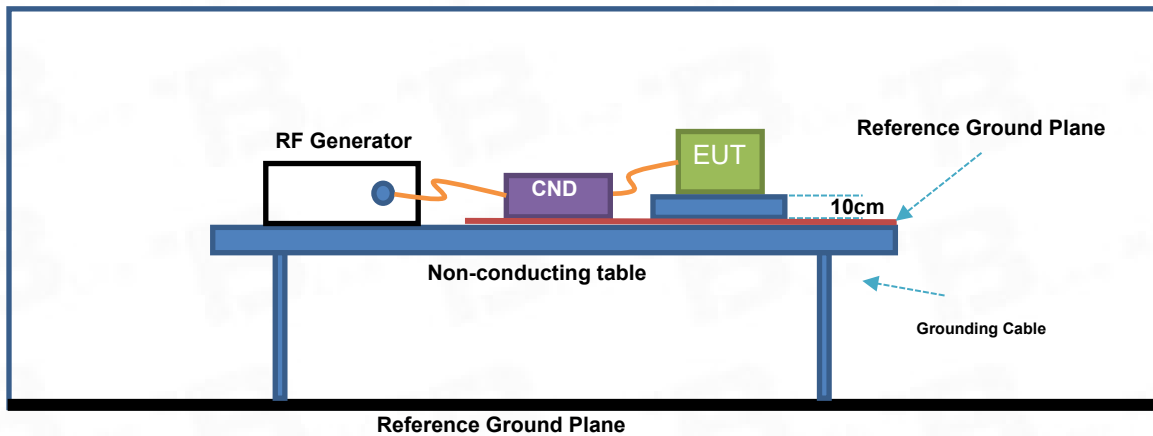
Note: The DC products are not applicable to this project.

5.2.6 Continuous Induced RF Disturbances

5.2.6.1 Test Specification

Specification	Value
Test method	EN IEC 61000-4-6
Frequency Range	0.15 MHz – 80 MHz
Field Strength	3 V
Modulation	1 kHz sine wave, 80% AM
Frequency Step	1% of fundamental
Coupled Cable	AC Power Line; DC Power Line; Analogue/Digital data Line

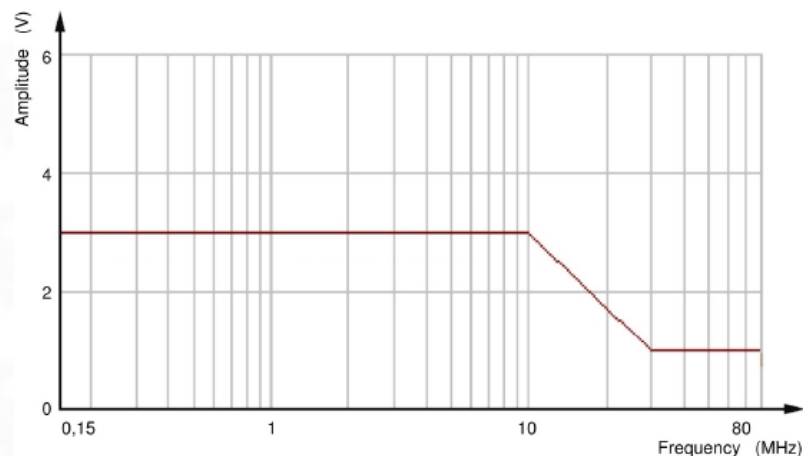
5.2.6.2 Test Setup



5.2.6.3 Test Procedure

The EUT shall be tested within its intended operating and climatic conditions.

The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50 Ohm load resistor.



The test signal is 80% amplitude modulated with a 1 kHz sine wave. The field strength level refer follow figure.

The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The sweep rate shall not exceed 1.5×10^{-3} decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.

The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.

Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

5.2.6.4 Test Result

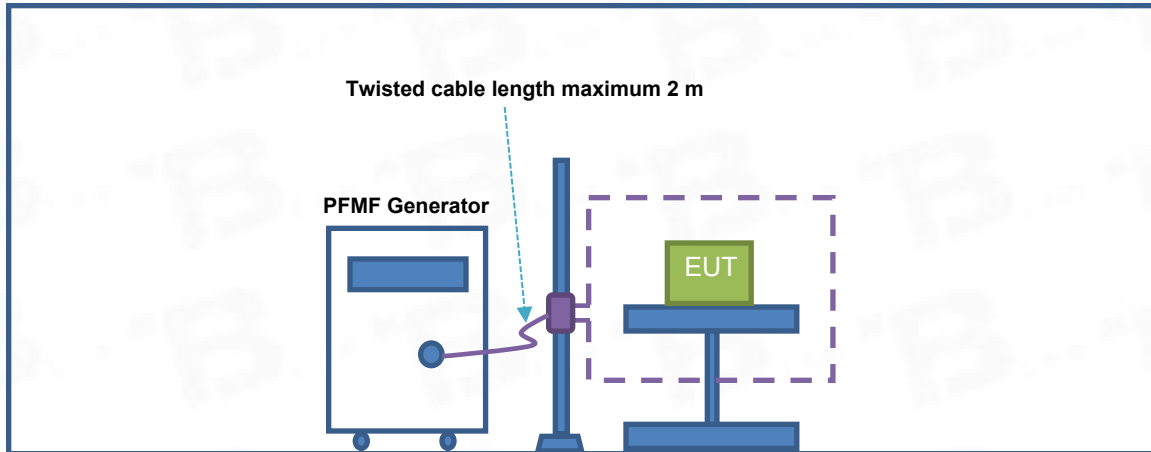
Note: The DC products are not applicable to this project.

5.2.7 Power Frequency Magnetic Field

5.2.7.1 Test Specification

Specification	Value
Test method	EN 61000-4-8
Field Frequency	50/60 Hz
Test Level	3 A/m
Test Duration	5 min

5.2.7.2 Test Setup



5.2.7.3 Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 15.1.

5.2.7.4 Test Result

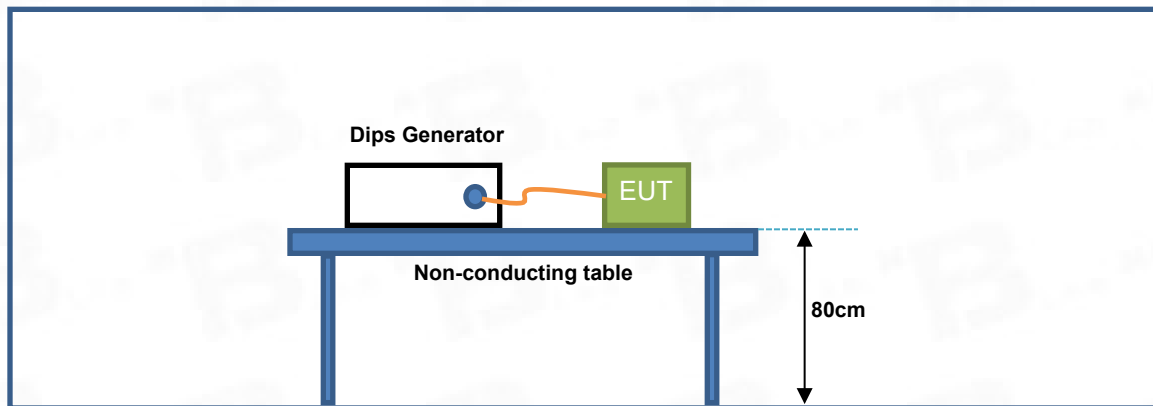
Note: This product does not containing devices intrinsically susceptible to magnetic fields, such as CRT monitors, Hall effect elements, electro-dynamic microphones, magnetic field sensors or audio frequency transformers, so does not require testing.

5.2.8 Voltage Dips and Interruptions

5.2.8.1 Test Specification

Specification	Value
Test method	EN IEC 61000-4-11
Voltage Dips	0% residual voltage for 0.5 cycle 0% residual voltage for 1 cycles 70% residual voltage for 25/30 cycles (for 50/60Hz)
Voltage Interruptions	0% residual voltage for 250/300 cycles (for 50/60Hz)
Voltage Phase Angle	0°, 90°, 270°

5.2.8.2 Test Setup



5.2.8.3 Test Procedure

The power cord is used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.

The EUT is tested:

- Voltage dip: 0% residual voltage for 0.5 cycle, with a sequence of three dips with intervals of 10 s minimum.
- Voltage dip: 0% residual voltage for 1 cycles , with a sequence of three dips with intervals of 10 s minimum.
- Voltage dip: 70% residual voltage for 25/30 cycles (for 50/60Hz), with a sequence of three dips with intervals of 10 s minimum.
- Voltage interruption: 0% residual voltage for 250/300 cycles (for 50/60Hz), with a sequence of three dips with intervals of 10 s minimum.

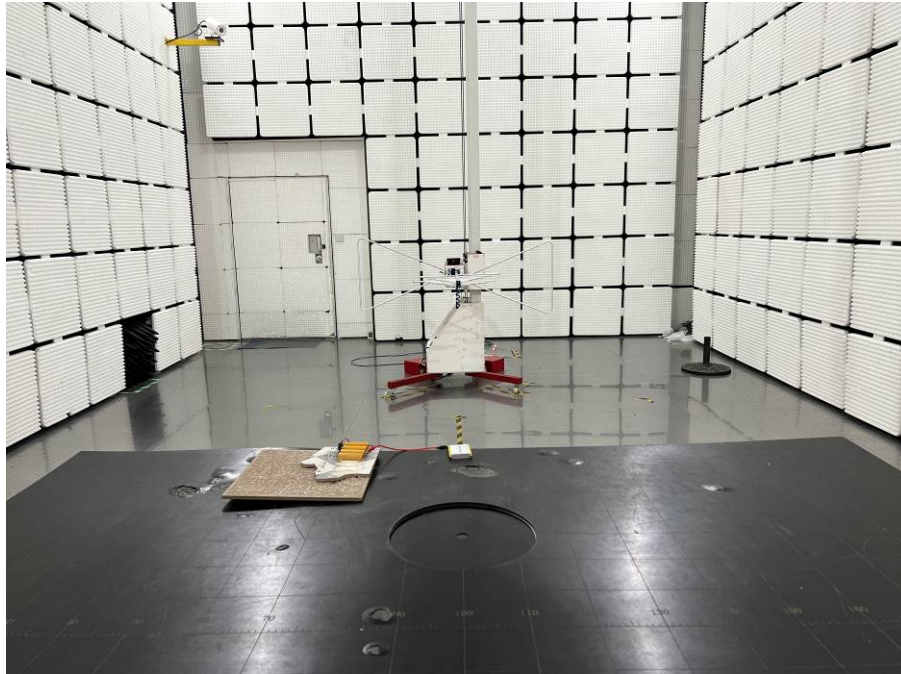
Changes to occur at 0-degree crossover point of the voltage waveform. If the EUT does not demonstrate compliance when tested with 0 degree switching, the test shall be repeated with the switching occurring at both 90 degrees and 270 degrees. If EUT satisfies these alternative requirements, then it fulfils the requirements. This condition shall be recorded in the test report.

5.2.8.4 Test Result

Note: The DC products are not applicable to this project.

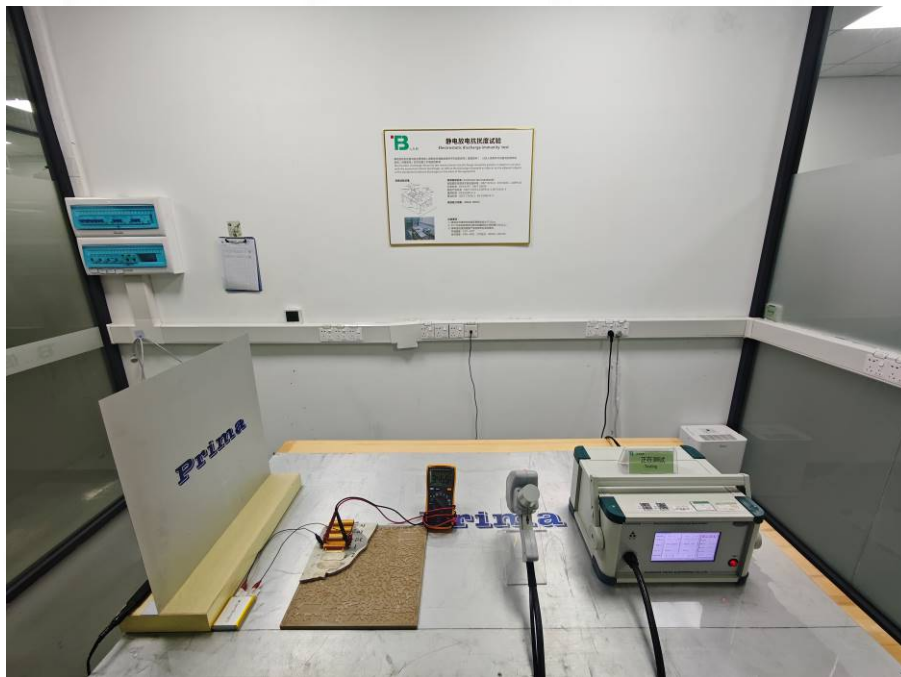
6 Test Setup Photos

Radiated Emission Test

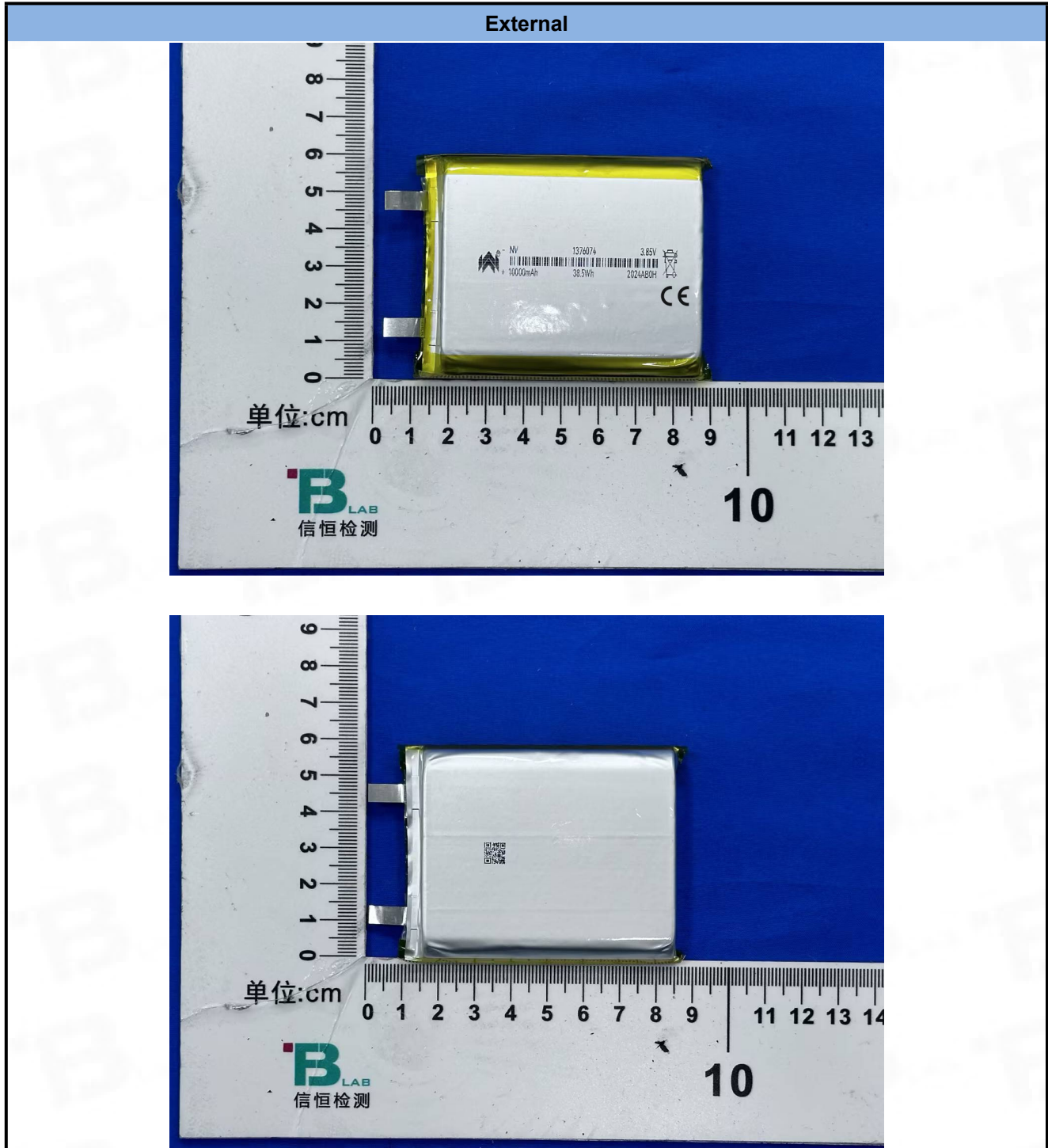


30 MHz – 1 GHz

Electrostatic Discharges (ESD) Test



7 EUT Constructional Details (EUT Photos)





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--END OF REPORT--