EMC TEST REPORT

For Electromagnetic Interference of

Report Reference No. ..... :	E01A23060175E01401
Prepared by (name + signature) ..... :	Luke Li
Reviewed by (name + signature) ..... :	Duke Liu
Approved by (name + signature)..... :	Tiger Xu
Date of Receipt of EUT ..... :	June 12, 2023
Date of Test ..... :	June 12, 2023 to June 19, 2023
Date of Issue ..... :	July 05, 2023
Testing Laboratory..... :	Dongguan Anci Electronic Technology Co., Ltd.
Address ..... :	1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong, China
Laboratory location..... :	EMC Laboratory
Applicant's name..... :	Global Tax Refund Holdings Company Limited
Address ..... :	6/F MANULIFE PLACE 348 KWUN TONG ROAD KL
Manufacturer's name ..... :	Shenzhen Ampower New Energy Co.，Ltd.
Address ..... :	Bloce AB.5/F Jinmeiwei Industrial Park ， Luhu Community，Guanhu Street，Longhua District，Shenzhen，China
Factory's name ……..:	ICON ENERGY SYSTEM (SHENZHEN) CO.,LTD
Address……..:	201, 301, 401, 501 of Plant B and 201, 301, 401, 501, No.4 Guanqing Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen City, Guangdong Province, P.R.China

Test specification:

EUT description..... :	Balcony Power Station
Trade Mark..... :	SunLit
Model/Type reference ……:	B215
Test Sample……..…..:	B215
Ratings……..:	Input: 10-80V, 20A, 800W Max. Output: 38.4V, 50A
Tested Power……..……:	DC 38.4V
Standards ..... :	EN 55032:2015/A1:2020 EN 55035: 2017/A11:2020

The device described above was tested by Dong Guan Anci Electronic Technology Co., Ltd. to determine the maximum emission levels emanated from the device and severity levels of the device endure and its performance criterion. The measurement results are contained in this test report and Dong Guan Anci Electronic Technology Co., Ltd. assumes full responsibility for the accuracy and completeness of these measurements. This report shows the EUT is technically compliance with the above official standards.

This report applies to the above sample only and shall not be reproduced in part without written approval of Dong Guan Anci Electronic Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 PRODUCT INFORMATION

1. Balcony Power Station designed for audio, video, information and communication technology, indoor use only.

2. This test report only reflects the worst data of the test mode.

All tests was performed on model B215.
The EUT passed the test.

1.2 Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	E01A23060175E01401

1.3 Details about the Test Laboratory

Test Site 1

Company name: Dongguan Anci Electronic Technology Co., Ltd.

Address: 1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr., China.

Test Site 2

Company name: Guangdong Dongguan Quality Supervision Testing Center

Address: No.2 South Industry Road, Dongguan Songshan Lake Sci.&Tech. Industrial Park, Guangdong Province, China

Standard	Test Item	Test Site
EN 55032:2015/A1:2020	Conducted Emission	N/A
	Radiated Emission Below 1 GHz	1
	Radiated Emission Above 1 GHz	N/A
EN 61000-4-2:2009	Electrostatic Discharge	1
EN 61000-4-3:2006/A1:2008/A2: 2010	RF electromagnetic field	1
EN 61000-4-4:2012	Fast transients	N/A
EN 61000-4-5:2014	Surges	N/A
EN 61000-4-6:2014	Injected Current	N/A
EN 61000-4-8:2010	Power Frequency Magnetic Field	N/A
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	N/A

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015/A1:2020	Conducted Emission	Class B	N/A	
	Radiated Emission Below 1 GHz	Class B	PASS	
	Radiated Emission Above 1 GHz	Class B	N/A	NOTE (1) NOTE (4)
Immunity (EN 55035: 2017/A11:2020)				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006 /A1:2008/A2: 2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	N/A	
EN 61000-4-5:2014	Surges	B	N/A	
EN 61000-4-6:2014	Injected Current	A	N/A	
EN 61000-4-8:2010	Power Frequency Magnetic Field	A	N/A	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C / C **NOTE (3)**	N/A	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) The power consumption of EUT is less than 75W and no Limits apply.

(3) Voltage dip: ＞95% reduction – Performance Criteria **B**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage Interruption: ＞95% reduction – Performance Criteria **C**

(4) 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 2GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1GHz, 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 40 GHz, whichever is less.

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U (dB)	NOTE
843	ANSI	150 KHz ~ 30MHz	2.74	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U(dB)	NOTE
S02	ANSI	30MHz ~ 1000MHz	V	3.52	
S02	ANSI	30MHz ~ 1000MHz	H	3.52	

2.2 DESCRIPTION OF TEST MODES

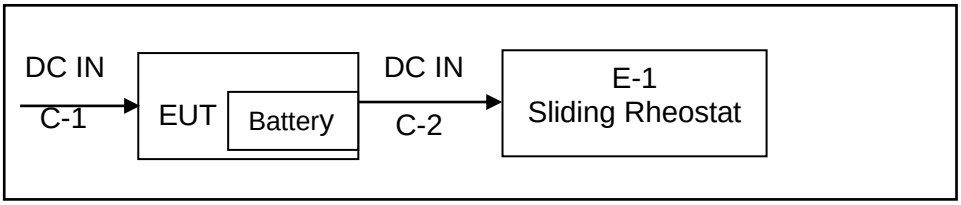
To investigate the maximum EMI characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Modes of Operation

For Radiated Emission Test	
Test Mode	Description
Mode 1	Discharging
Mode 2	Charging

For EMS Test	
Test Mode	Description
Mode 1	Discharging
Mode 2	Charging

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment
E-1	Sliding Rheostat
E-2	N/A

Item	Type of cable	Length
C-1	DC Cable	<0.8m
C-2	DC Cable	<0.8m

3. EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION(MAINS PORT) (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	☐Class A (dBuV)		☒Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note :

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

(3) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)

Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E024	EMI Test Receiver	ROHDE&SCHWARZ	ESPI	101144	2024-05-10
2	AN-E025	LISN	ROHDE&SCHWARZ	ENV216	101413	2024-05-10
3	AN-E029	RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19044022	2024-05-10
4	AN-E044	2# Shielded Room	chengyu	8m*4m*3m	N/A	2024-11-11
5	AN-E046	Test Software	Farad	EZ-EMC (Ver.ANCI-3A1)	N/A	N/A

Remark: ” N/A” denotes No Model No. , Serial No. or No Calibration specified.

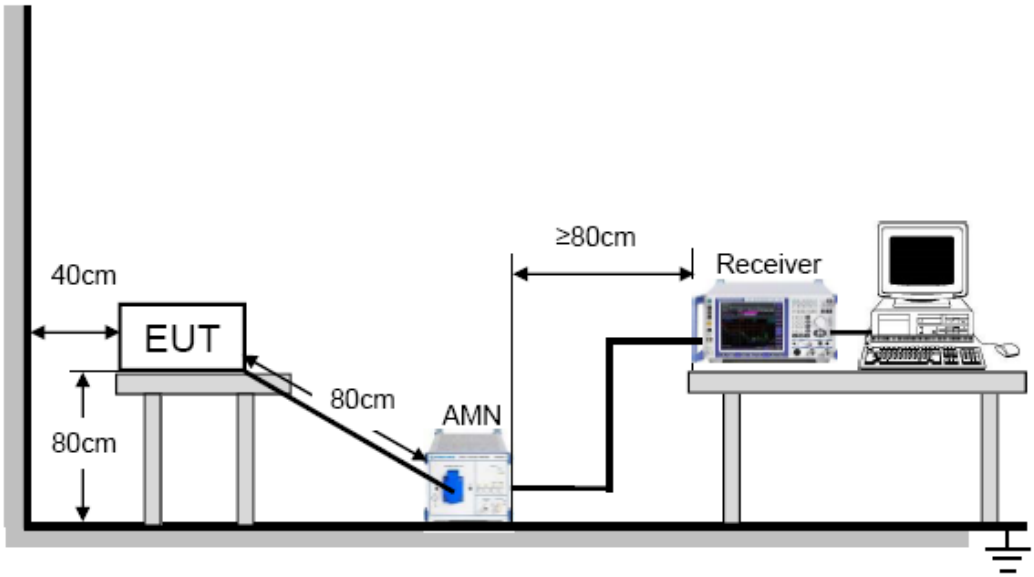
3.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.

3.1.7 TEST RESULTS

EUT：	/	**Model No. ：**	/
Temperature：	/	**Relative Humidity：**	/
Pressure：	/	**Test Power ：**	/
Test Mode ：	/		

Remark：

(1) Reading in which marked as QP means measurements by using Quasi-Peak Detector, and AV means measurements by using Average Detector.

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't
perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

(3) Measuring frequency range from 150KHz to 30MHz.

(4）This test was carried out in conducted emission shielded room.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	☐Class A (at 3m)	☒Class B (at 3m)
	dBuV/m	dBuV/m
30 – 230	50	40
230 – 1000	57	47

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (GHz)	☐Class A (dBuV/m) (at 3m)		☐Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1 ~ 3	76	56	70	50
3 ~ 6	80	60	74	54

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

NOTE:

(1) The limit for radiated test was performed according to EN 55032/CISPR 32.
(2) The tighter limit applies at the band edges;
(3) Emission level (dBuV/m) = 20log Emission level (uV/m),
3m Emission level = 10m Emission level + 20log(10m/3m);
(4) The bandwidth of the Receiver is set at 120 kHz.
(5) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor,
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use),
Margin Level = Measurement Value - Limit Value.

3.2.2 MEASUREMENT INSTRUMENTS LIST

3m Radiated Emission Measurement 30MHz-1GHz

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E060	EMI Test Receiver	Rohde & Schwarz	ESCI	100302	2024-05-10
2	AN-E061	Pre-Amplifier	Anritsu	MH648A	M57886	2024-05-10
3	AN-E076	Bilog Antenna	Schwarzbeck	VULB9163	VULB9163-1290	2024-05-10
4	AN-E063	RF Cable	N/A	ZT06S-NJ-NJ-11M	19060398	2024-05-10
5	AN-E064	RF Cable	N/A	ZT06S-NJ-NJ-0.5M	19060400	2024-05-10
6	AN-E065	RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19060404	2024-05-10
7	AN-E056	3m Semi-anechoic Chamber	chengyu	9m*6m*6m	N/A	2024-11-11
8	AN-E069	Test Software	Farad	EZ-EMC (Ver.FA-03A2 RE)	N/A	N/A

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

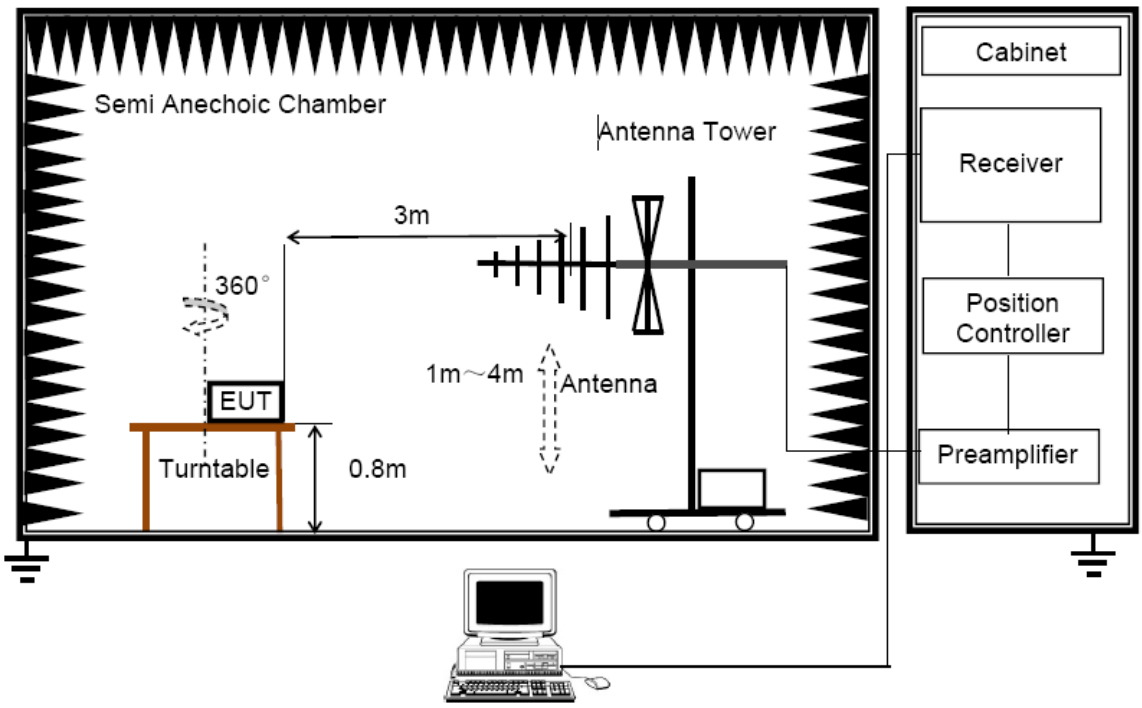
3.2.3 TEST PROCEDURE

a. The measuring distance of at 3m or 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP



3.2.6 EUT OPERATING CONDITIONS

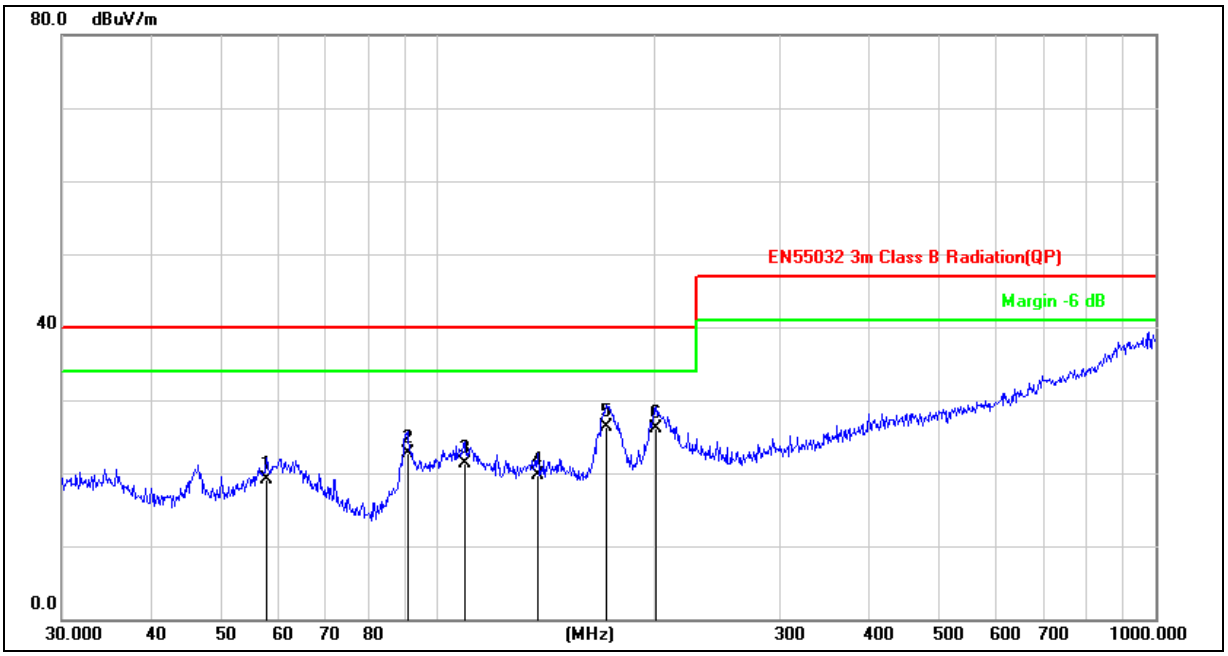
The EUT tested system was configured as the statements of 3.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.7 TEST RESULTS

EUT：	Balcony Power Station	Model No. ：	B215
Temperature：	24.5℃	Relative Humidity：	53.2 %
Pressure：	1008 hPa	Test Power ：	DC 38.4V
Test Mode ：	1.Discharging 2.Charging		

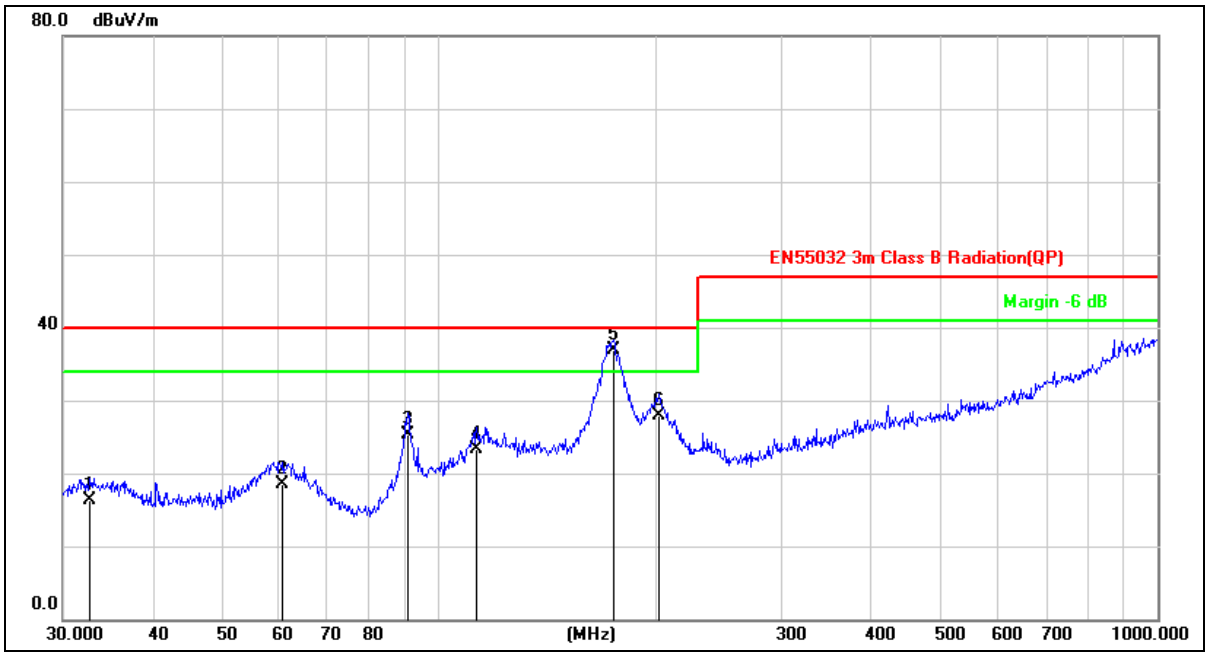
Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Detector or Peak Detector.
(2) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
(3) Measuring frequency range from 30MHz to 1000MHz.
(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.
(5) This test was carried out in 3m anechoic chamber.



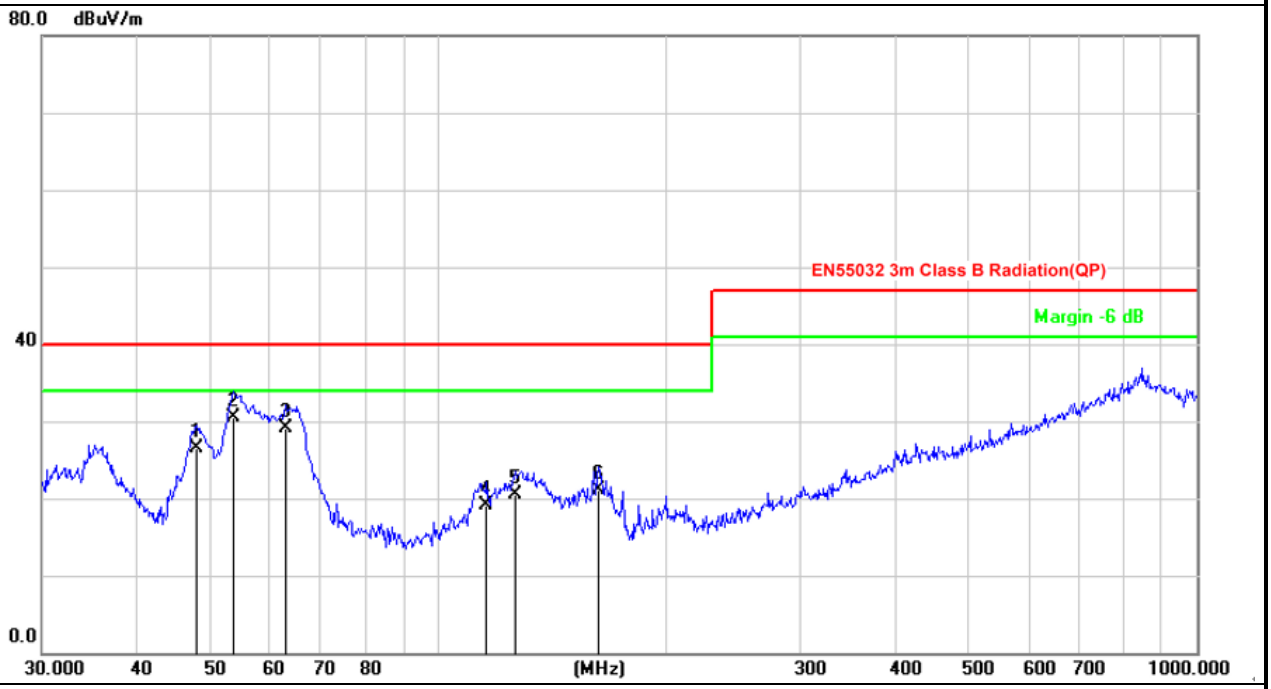
Site:	**LAB**	**Antenna::Vertical**	**Temperature(C):24.5(C)**
Limit:	**EN55032 3m Class B Radiation(QP)**		**Humidity(%):53.2%**
EUT:	**Balcony Power Station**	**Test Time:**	**2023-06-13**
M/N.:	**B215**	**Power Rating:**	**DC 38.4V**
Mode:	**Discharging**	**Test Engineer:**	**Luffy**
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	57.7962	24.86	-5.76	19.10	40.00	-20.90	QP
2	90.8554	30.11	-7.39	22.72	40.00	-17.28	QP
3	109.0286	25.83	-4.53	21.30	40.00	-18.70	QP
4	137.9028	28.25	-8.57	19.68	40.00	-20.32	QP
5	171.9946	34.88	-8.58	26.30	40.00	-13.70	QP
6	201.3930	31.12	-5.02	26.10	40.00	-13.90	QP



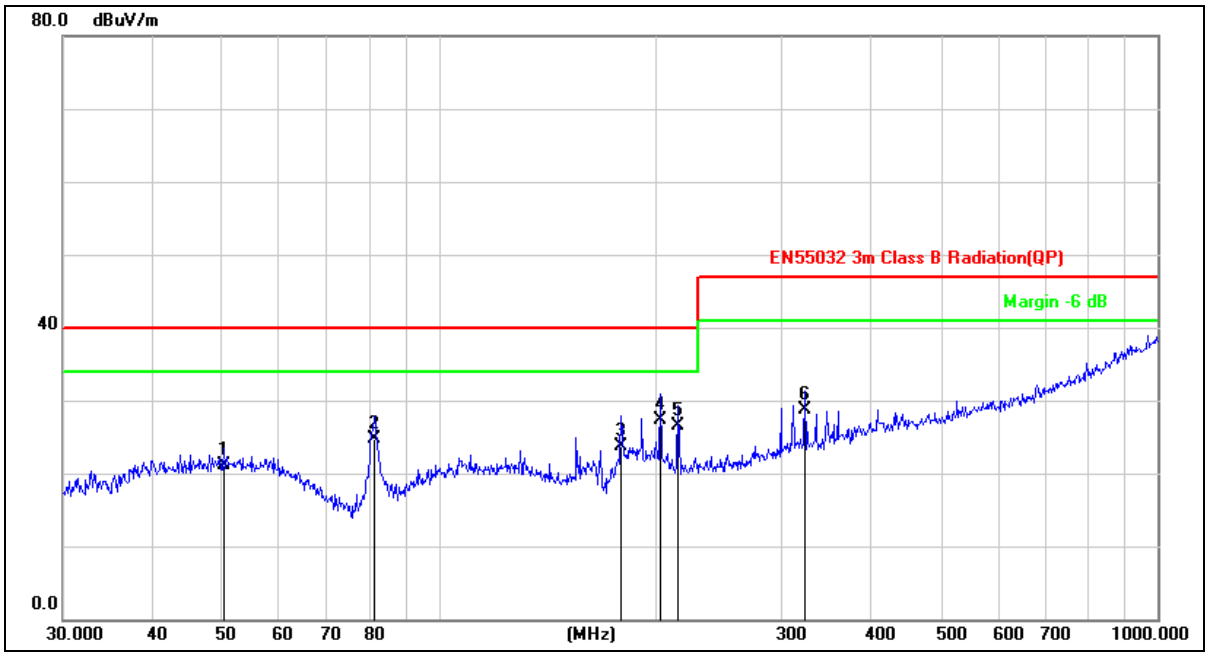
Site:	**LAB**	**Antenna::Horizontal**	**Temperature(C):24.3(C)**
Limit:	**EN55032 3m Class B Radiation(QP)**		**Humidity(%):53.2%**
EUT:	**Balcony Power Station**	**Test Time:**	**2023-06-13**
M/N.:	**B215**	**Power Rating:**	**DC 38.4V**
Mode:	**Discharging**	**Test Engineer:**	**Luffy**
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	32.7486	23.62	-7.32	16.30	40.00	-23.70	QP
2	60.7044	23.60	-5.07	18.53	40.00	-21.47	QP
3	90.5374	32.78	-7.48	25.30	40.00	-14.70	QP
4	112.9196	28.06	-4.81	23.25	40.00	-16.75	QP
5	175.0368	45.43	-8.53	36.90	40.00	-3.10	QP
6	202.8104	32.90	-5.00	27.90	40.00	-12.10	QP



Site:	**LAB**	**Antenna::Vertical**	**Temperature(C):24.5(C)**
Limit:	**EN55032 3m Class B Radiation(QP)**		**Humidity(%):53.2%**
EUT:	**Balcony Power Station**	**Test Time:**	**2023-06-13**
M/N.:	**B215**	**Power Rating:**	**DC 38.4V**
Mode:	**Charging**	**Test Engineer:**	**Luffy**
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	47.9939	36.57	-10.00	26.57	40.00	-13.43	QP
2	53.6931	39.82	-9.33	30.49	40.00	-9.51	QP
3	62.8708	38.07	-8.91	29.16	40.00	-10.84	QP
4	115.7256	30.90	-11.78	19.12	40.00	-20.88	QP
5	126.3285	32.29	-11.83	20.46	40.00	-19.54	QP
6	162.6106	32.67	-11.53	21.14	40.00	-18.86	QP



Site:	**LAB**	**Antenna::Horizontal**	**Temperature(C):24.3(C)**
Limit:	**EN55032 3m Class B Radiation(QP)**		**Humidity(%):53.2%**
EUT:	**Balcony Power Station**	**Test Time:**	**2023-06-13**
M/N.:	**B215**	**Power Rating:**	**DC 38.4V**
Mode:	**Charging**	**Test Engineer:**	**Luffy**
Note:			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	50.2324	25.24	-4.19	21.05	40.00	-18.95	QP
2	81.4970	35.22	-10.54	24.68	40.00	-15.32	QP
3	179.3863	32.13	-8.47	23.66	40.00	-16.34	QP
4	203.5228	32.34	-4.99	27.35	40.00	-12.65	QP
5	215.2678	31.37	-4.83	26.54	40.00	-13.46	QP
6	323.3204	30.28	-1.52	28.76	47.00	-18.24	QP

4. IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	Test Specification	Test Mode Test Ports	Perform. Criteria	Remark
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B	PASS
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B	PASS
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz, 1800, 2600, 3500, 5000 MHz 3V/m(rms), 1 KHz, 80%, AM modulated	Enclosure	A	PASS
3. EFT/Burst IEC/EN 61000-4-4	1.0KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	AC Power Port	B	N/A
	0.5 KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B	N/A
4. Surges IEC/EN 61000-4-5	1 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-N	B	N/A
	2 KV(5P/5N) 1.2/50(8/20) Tr/Th us	L-PE N-PE	B	N/A
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 10 MHz 3V (rms), 10 MHz to 30 MHz 3V ~1V (rms), 30 MHz to 80 MHz 1V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	CTL/Signal Port	A	N/A
		AC Power Port	A	N/A
		DC Power Port	A	N/A

6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50Hz or 60Hz, 1A/m	Enclosure	A	N/A
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip＞95% / 30% Interruption＞95%	AC Power Port	B / C C See Remark(2)	N/A

* Remark:

(1) "N/A": denotes test is not applicable in this Test Report.
(2) Voltage dip: ＞95% reduction – Performance Criteria **B**
Voltage dip: 30% reduction – Performance Criteria **C**
Voltage Interruption: ＞95% reduction – Performance Criteria **C**
(3) Test Location: This test was carried out in EMS Test Location.

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 55035:2017+A11:2020** standard, the general performance criteria as following:

Criterion A	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 is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion B	After the test, the equipment shall continue to operate as intended without operator Intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon 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. During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. 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 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. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **3.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge: 2kV/4kV/8kV (Direct) Contact Discharge: 2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	Contact and Air
Discharge Period:	1 second minimum

4.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Simulator	TESEQ	NSG437	336	2024-05-10

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.4.3 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

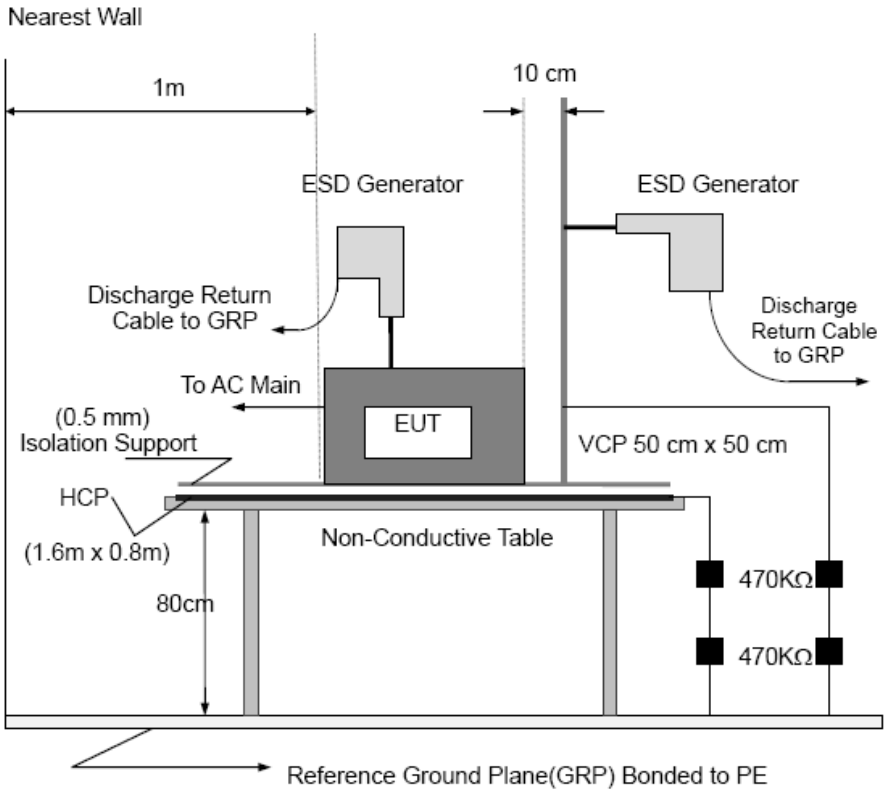
b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT
The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT
The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.6 TEST RESULTS

EUT:	Balcony Power Station	Model No. :	B215
Temperature:	25℃	**Relative Humidity:**	55.1 %
Pressure:	1009 hPa	**Test Power :**	DC 38.4V
Test Engineer:	Rock	**Test Date:**	2023-06-15
Test Mode:	1. Discharging 2.Charging		

Mode	**Air Discharge**								**Contact Discharge**							
	2KV		**4KV**		**8KV**		**12KV**		**2KV**		**4KV**		**6KV**		**8KV**	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	--	--	A	A	A	A	--	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	A	A	B	B	--	--	--	--
3	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4			--	--	--	--	--	--	--	--	--	--				
Criteria	**B**								**B**							
Result	**A**								**A**							
Judgment	**PASS**								**PASS**							

Mode	**HCP Discharge**								**VCP Discharge**							
	2KV		**4KV**		**6KV**		**8KV**		**2KV**		**4KV**		**6KV**		**8KV**	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Front sides	-	--	A	A	--	--	--	--	-	--	A	A	--	--	--	--
Rear sides	--	--	A	A	--	--	--	--	--	--	A	A	--	--	--	--
Left sides	--	--	A	A	-	--	--	--	--	--	A	A	-	--	--	--
Right sides	-	--	A	A	--	--	--	--	-	--	A	A	--	--	--	--
Criteria	**B**								**B**							
Result	**A**								**A**							
Judgment	**PASS**								**PASS**							

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
Direct discharges: Minimum 50 times (Positive/Negative) at each point.
Air discharges / Indirect (HCP/VCP): Minimum 20 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be described as following
4) The Indirect (HCP/VCP) discharges description of test point as following:
1.left side 2.right side 3.front side 4.rear side
5) N/A - denotes test is not applicable in this test report
7) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

Test location description:

No	Description	No	Description
1	EUT Gap	4	
2	DC Port	5	
3		6	

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz, 1800, 2600, 3500, 5000 MHz
Field Strength:	3 V/m
Modulation:	1kHz 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:	at least 3 seconds

4.5.2 MEASUREMENT INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Signal Generator	Aglilet	N5171B-50B	MY53050160	2023-08-24
Amplifier	A&R	150W1000M3	313157	2023-07-25
Amplifier	A&R	50SIG6M1	0342835	2023-07-25
Power Meter	Boonton	4232A	150102	2023-07-14
Isotropic Field Probe	A&R	FL7006	0342652	2023-10-24
Log-periodic Antenna	SCHWARZBECK	STLP 9128E	9128E-012	2023-12-06
Microwave log-periodic antenna	SCHWARZBECK	STLP 9149	9149.222	2023-12-06

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.5.3 TEST PROCEDURE

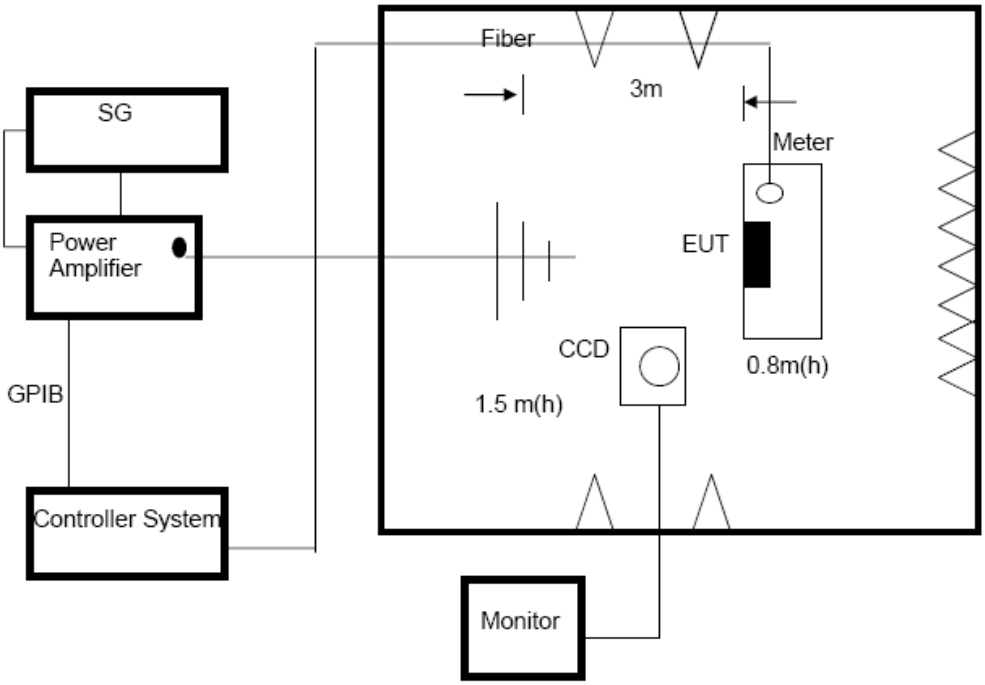
The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The field strength level was 3V/m.
b. The frequency range is swept from 80 MHz to 1000 MHz, 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT
The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT
The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.6 TEST RESULTS

EUT：	Balcony Power Station	Model No. ：	B215
Temperature：	22.6℃	**Relative Humidity：**	54.8 %
Pressure：	1009 hPa	**Test Power ：**	DC 38.4V
Test Engineer：	Luffy	**Test Date：**	2023-06-15
Test Mode：	1. Discharging 2.Charging		

Frequency Range (MHz)	Polarity of Antenna	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80MHz - 1000MHz	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**A**	**A**	**PASS**
			Rear			
			Left			
			Right			

Frequency Range (MHz)	Polarity of Antenna	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
1800, 2600, 3500, 5000 MHz	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**A**	**A**	**PASS**
			Rear			
			Left			
			Right			

Note:

1) H/V denotes the Horizontal/Vertical polarity of Antenna.
2) N/A - denotes test is not applicable in this test report.
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

4.6 EFT/BURST TESTING

4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line：±0.5、1 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

4.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Electrical Intelligent Transient Generator	Everfine	EMS61000-4B	G114921CA1341115	2024-05-10

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.6.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
The other condition as following manner:

a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.

b. Both positive and negative polarity discharges were applied.

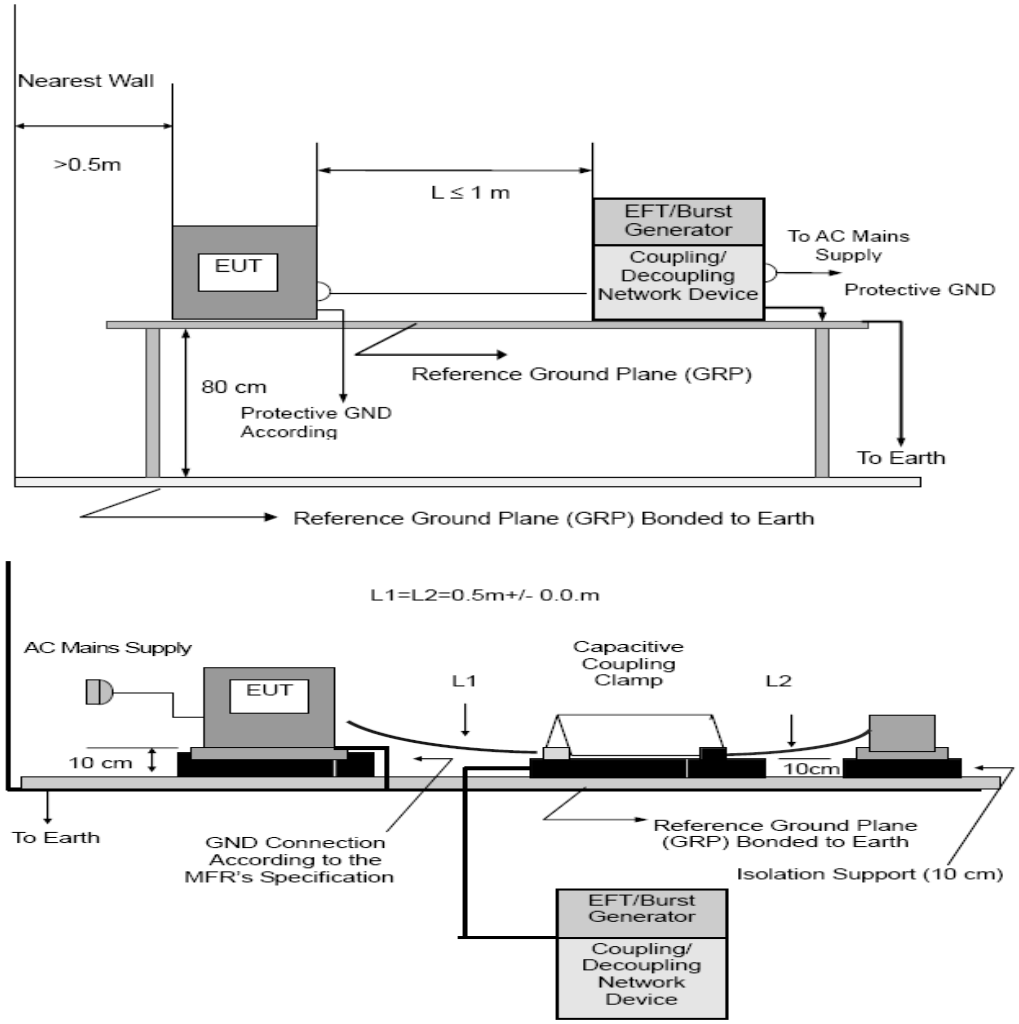
c. The duration time of each test sequential was 1 minute

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT
The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT
The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.6 TEST RESULTS

EUT：	/	**Model No. ：**	/
Temperature：	/	**Relative Humidity：**	/
Pressure：	/	**Test Power ：**	/
Test Engineer：	/	**Test Date：**	/
Test Mode：	/		

Mode	AC Power Line		DC Power Line		Signal/Control Line	
Test Level	1KV		0.5KV		0.5KV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P		P		P	
	N		N		N	
Neutral (N)	P		P		P	
	N		N		N	
Ground (PE)	P		P		P	
	N		N		N	
DC Power Line	P		P		P	
	N		N		N	
Signal/Control Line	P		P		P	
	N		N		N	
Criteria	**B**		**B**		**B**	
Result	**--**		**--**		**--**	
Judgment	**N/A**		**N/A**		**N/A**	

1) P/N denotes the Positive/Negative polarity of the output voltage.

2) N/A - denotes test is not applicable in this test report

3) Criteria A: There was no change operated with initial operating during the test.

4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

5) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line：0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0° /90° /180° /270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.7.2 MEASUREMENT INSTRUMENTS

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E054	Immunity Teat System	EMC PARTNER	IMU3000 S-T	105684-2060	2024-05-10
2	AN-E055	Signal line coupled decoupling network	EMC PARTNER	CDN-UTP8 ED3	1558	2024-05-10

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.7.3 TEST PROCEDURE

a. For EUT:
The surge is to be applied to the EUT terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

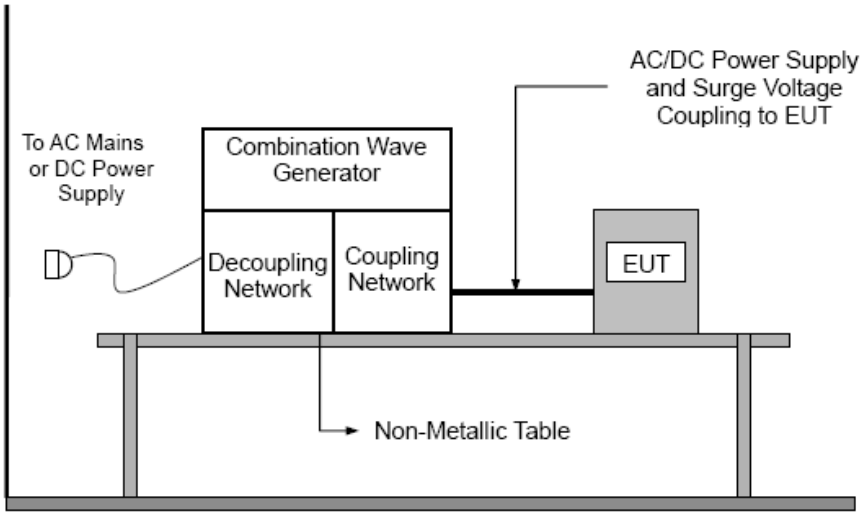
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:
The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 TEST RESULTS

EUT：	/	**Model No. ：**	/
Temperature：	/	**Relative Humidity：**	/
Pressure：	/	**Test Power ：**	/
Test Engineer：	/	**Test Date：**	/
Test Mode：	/		

Wave Form	**1.2/50(8/20) us**						**Criteria**	**Judgment**
EUT Ports Tested	**Polarity**	**Phase**	**Voltage**					
			0.5kV	**1kV**	**1.5kV**	**2kV**		
L - N	+/-	0°					**B**	**N/A**
	+/-	90°						
	+/-	180°						
	+/-	270°						
L - PE	+/-	0°					**B**	**N/A**
	+/-	90°						
	+/-	180°						
	+/-	270°						
N - PE	+/-	0°					**B**	**N/A**
	+/-	90°						
	+/-	180°						
	+/-	270°						

Note:

1) N/A - denotes test is not applicable in this Test Report

4.8 INJECTION CURRENT TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	3V (rms), 0.15MHz ~ 10MHz; 3V ~1V (rms), 10MHz ~ 30MHz; 1V (rms), 30MHz ~ 80MHz;
Field Strength:	3V (rms), 3V ~1V (rms), 1V (rms)
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

4.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT10-75	102D1253	2024-05-29
2	CDN	FRANKONIA	CDN M2+M3	A3011059	2023-07-23
3	Electromagnetic Clamp	FRANKONIA	KEMZ-801	21044	2023-07-23

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.8.3 TEST PROCEDURE

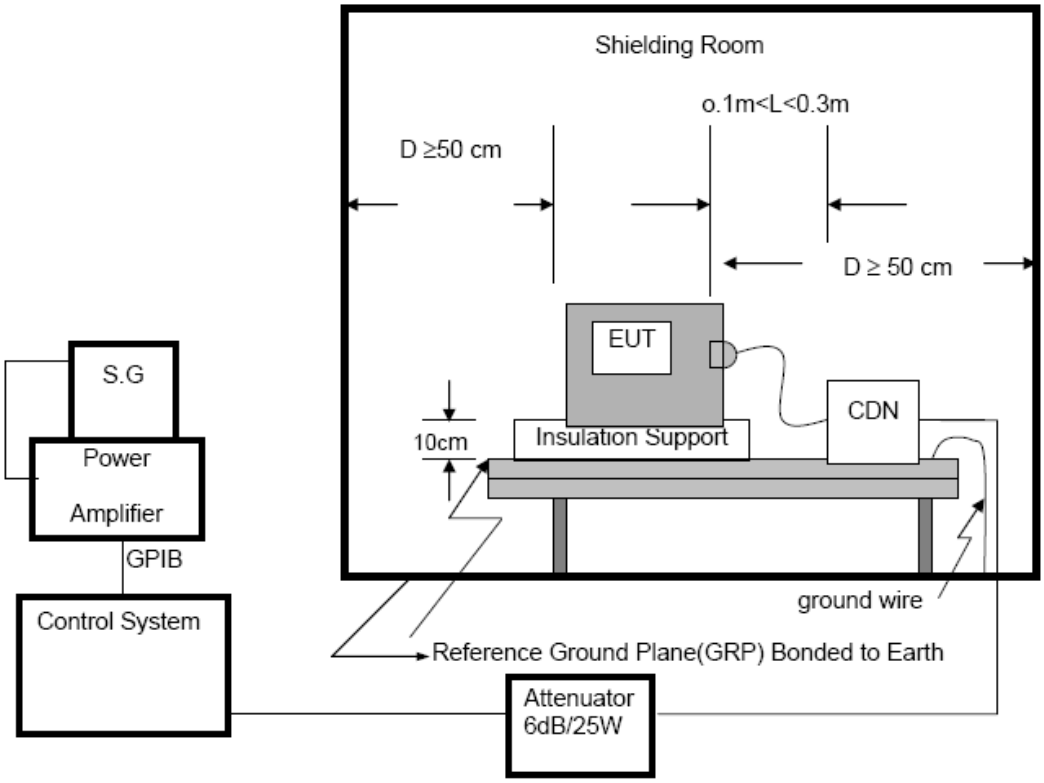
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
The other condition as following manner:

a. The field strength level was 3V (rms), 3V ~1V (rms), 1V (rms).
b. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

FLOOR-STANDING EQUIPMENT
The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.6 TEST RESULTS

EUT：	/	**Model No. ：**	/
Temperature：	/	**Relative Humidity：**	/
Pressure：	/	**Test Power ：**	/
Test Engineer：	/	**Test Date：**	/
Test Mode：	/		

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---10	3V(rms) AM Modulated	**A**	**--**	**N/A**
	10 ---30	3V~1V (rms) AM Modulated	**A**	**--**	**N/A**
	30 ---80	1V(rms) AM Modulated	**A**	**--**	**N/A**
Input/ Output DC. Power Port	0.15 ---10	3V(rms) AM Modulated	**A**	**--**	**N/A**
	10 ---30	3V~1V (rms) AM Modulated	**A**	**--**	**N/A**
	30 ---80	1V(rms) AM Modulated	**A**	**--**	**N/A**
Signal Line (N/A)	0.15 ---10	3V(rms) AM Modulated	**A**	**--**	**N/A**
	10 ---30	3V~1V (rms) AM Modulated	**A**	**--**	**N/A**
	30 ---80	1V(rms) AM Modulated	**A**	**--**	**N/A**

Note:

1) N/A - denotes test is not applicable in this Test Report.

4.9 VOLTAGE INTERRUPTION/DIPS TESTING

4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance**:**	B (For >95% Voltage Dips) C (For 30% Voltage Dips) C (For >95% Voltage Interruptions)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°~360°
Test Cycle:	3 times

4.9.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Voltage Dips And Interruptions Generator	Everfine	EMS61000-11K	G113317CA834 1117	2024-05-10

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

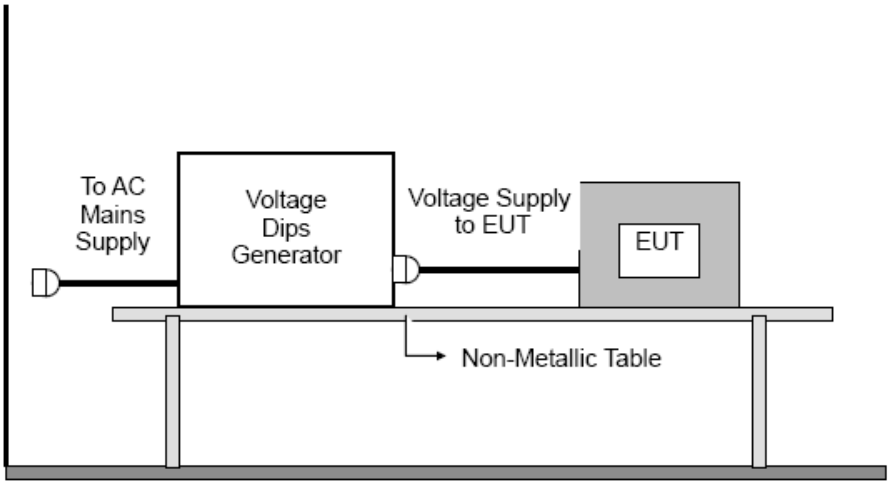
4.9.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.9.4 DEVIATION FROM TEST STANDARD

No deviation

4.9.5 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.9.6 TEST RESULTS

EUT：	/	**Model No. ：**	/
Temperature：	/	**Relative Humidity：**	/
Pressure：	/	**Test Power ：**	/
Test Engineer：	/	**Test Date：**	/
Test Mode：	/		

Input Rating: AC 120V/230V, 50Hz

Voltage Reduction	Periods	Perform Criteria	Results	Judgment
Voltage dip ＞95%	0.5	**B**	**--**	**N/A**
Voltage dip 30%	25	**C**	**--**	**N/A**
Interruption＞95%	250	**C**	**--**	**N/A**

Input Rating: AC 120V/230V, 60Hz

Voltage Reduction	Periods	Perform Criteria	Results	Judgment
Voltage dip ＞95%	0.5	**B**	**--**	**N/A**
Voltage dip 30%	30	**C**	**--**	**N/A**
Interruption＞95%	300	**C**	**--**	**N/A**

Note:

1) N/A - denotes test is not applicable in this test report.

4.10 POWER-FREQUENCY MAGNETIC FILDS

4.10.1 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic Field Tester	EMC-PARTNER	MF1000-1	121	2024-01-20

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.10.2 TEST LEVEL AND PERFORMANCE CRITERION

Level	Magnetic Field Strength A/m	Performance criterion
1	1	A

Performance criteria A description: During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended

.

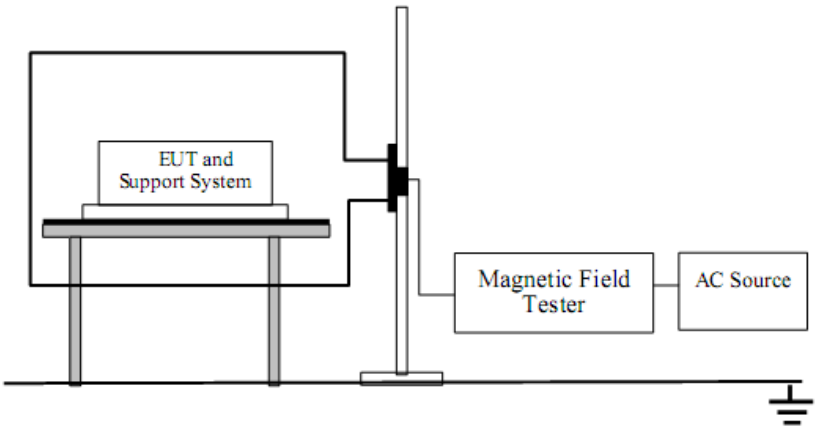
4.10.3 TEST PROCEDURE

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 13.3 The induction coil shall then be rotated by 90 ein order to expose the EUT to the test field with different orientations. .

4.10.4 DEVIATION FROM TEST STANDARD

No deviation

4.10.5 TEST SETUP



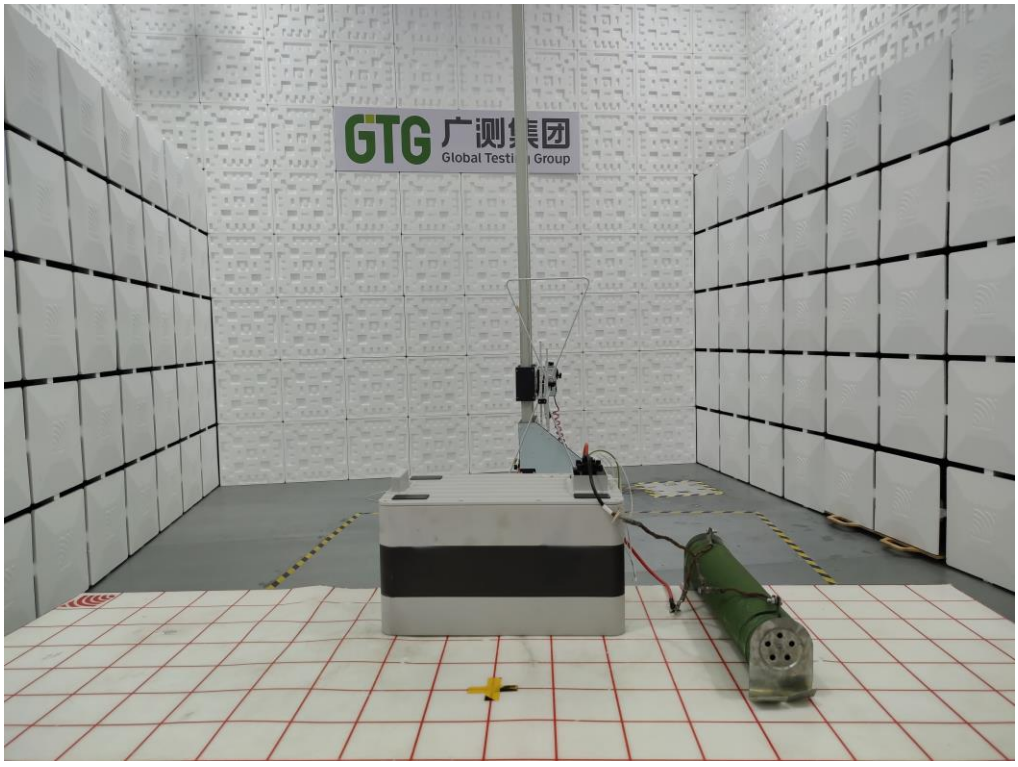
4.10.6 TEST RESULTS

N/A

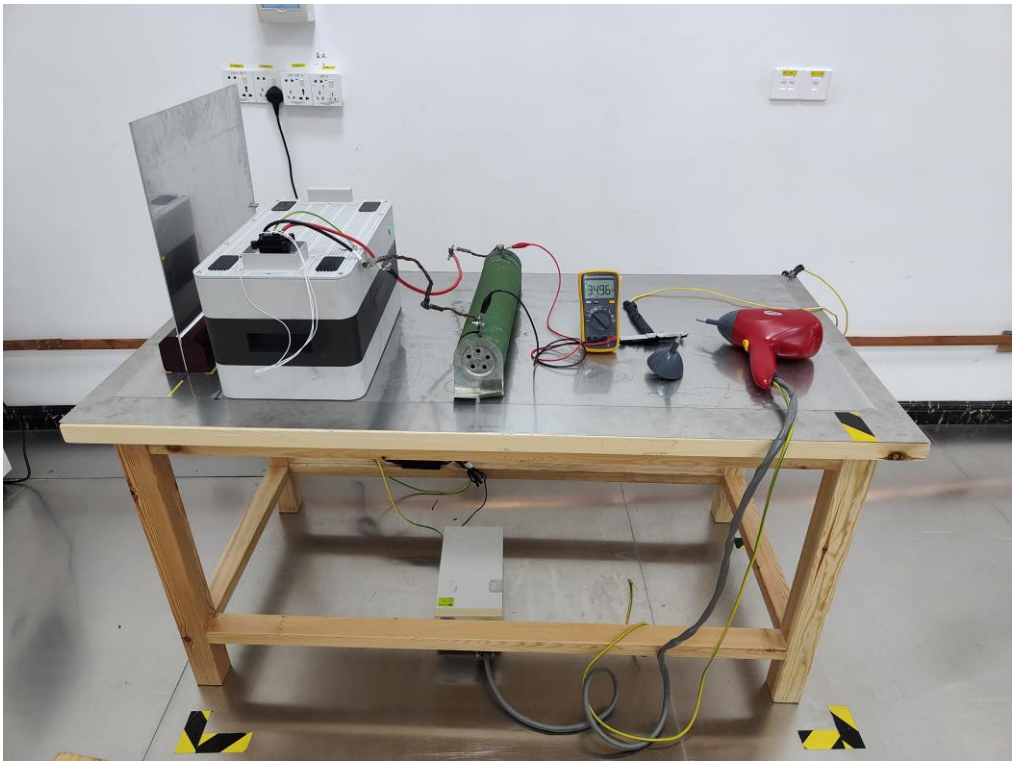
5. ATTACHMENT

5.1 EUT TEST PHOTO

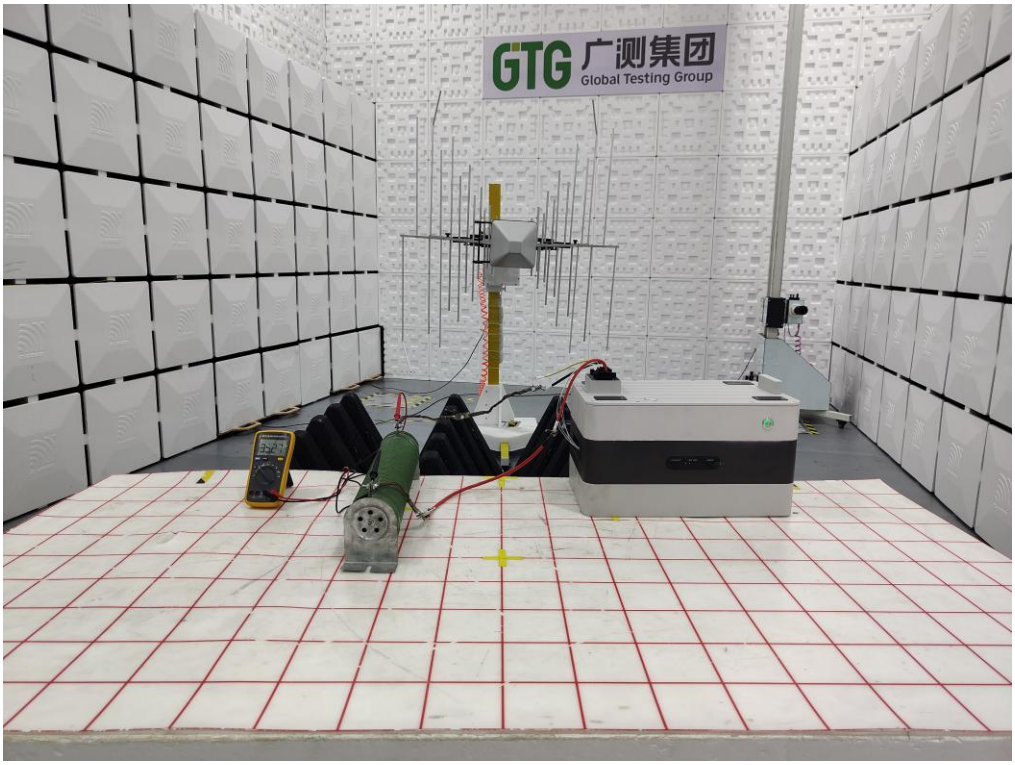
Radiated Measurement Photo



ESD Measurement Photo



RS Photo



5.2 EUT PHOTO

Figure 1: Overall view of unit

Figure 2: Overall view of unit

--- End of Report ---