CE 认证

Certificate Number: CJ202309035C

ATTESTATION
of conformity with European Directives

Product	:	Transformer Winding Temperature Controller
Model No.	:	BWR-04AJ(TH)/XMT-22B; BWR-04AJ/XMT-22B/XMZ-155; BWR-04A; BWR-04J; BWR-06ASM; BWR-06ISM; BWY-803A; BWY-803AAG; BWY-804AJ; BWY-804A; BWY-804J; BWY-806ASM; BWY-806ISM
Trade mark	:	/
Issued to	:	Dalian Join Hands Photoelectric Technology Co.,Ltd.
Address	:	680, Nanmian Road,Jinzhou New District,Dalian
Manufacturer	:	Dalian Join Hands Photoelectric Technology Co.,Ltd.
Address	:	680, Nanmian Road,Jinzhou New District,Dalian
Technical characteristics	:	AC220V 5A 50Hz 1100W

The submitted sample of the above equipment has been tested for CE marking according to following standards:

Standards	*Report number*	*Report date*
EN IEC 61000-6-1-2019 **EN IEC 61000-6-3-2021** **EN IEC 61000-3-2:2019** **EN 61000-3-3:2013+A1:2019**	**CJBG202309035**	**2023/09/25**

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive
This verification does not imply assessment of the production of the product
The CE marking may be affixed if all relevant and effective European Directives with CE are applicable

CE

Bruce Zhao
General Manager
2023/10/07

Shanghai Chuangjing Testing Technology Co., Ltd
Room 302, Building 3, No.1288 ZhongChun Road, Minhang District, Shanghai, China
Tel: +86 21 5878 4268
Fax: +86 21 5878 4268
Web: www.kintest.cn

CE EMC TEST REPORT

Issued to

Dalian Join Hands Photoelectric Technology Co.,Ltd.

For

Transformer Winding Temperature Controller

Test Model	:	BWR-04AJ(TH)/XMT-22B
Trade Name	:	/
Standard	:	EN IEC 61000-6-1-2019 EN IEC 61000-6-3-2021 EN IEC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019
Test date	:	2023/09/13 – 2023/09/18
Issue date	:	2023/09/25

by

Shanghai Chuangjing Testing Technology Co., Ltd.

Tested by: Bella. Fang **(Bella Fang)**

Reviewer by: **(Benny Ye)**

Approved by: **(Bruce Zhao)**

DIRECTORY

Change History

Issue	Date	Reason for change
1.0	2023/09/25	First edition

1. General Information

1.1 Information of applicant

Applicant:	Dalian Join Hands Photoelectric Technology Co.,Ltd.
Address:	680, Nanmian Road,Jinzhou New District,Dalian
Manufacturer:	Dalian Join Hands Photoelectric Technology Co.,Ltd.
Address:	680, Nanmian Road,Jinzhou New District,Dalian

1.2 Test location

Lab:	Shanghai Chuangjing Testing Technology Co., Ltd.
Address:	Room 302, Building 3, No.1288, Zhongchun Road, Minhang District, Shanghai, China

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

CNAS (No. CNAS L 13748)

CNAS has accredited Shanghai Chuangjing Testing Technology Co., Ltd. To ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

1.3 Description of EUT

EUT Type	Transformer Winding Temperature Controller
Trade Name	/
Test Model	BWR-04AJ(TH)/XMT-22B
Serial Model	BWR-04AJ/XMT-22B/XMZ-155; BWR-04A; BWR-04J; BWR-06ASM; BWR-06ISM; BWY-803A; BWY-803AAG; BWY-804AJ; BWY-804A; BWY-804J; BWY-806ASM; BWY-806ISM
Model Difference	All models have the same internal circuit structure.
Operating Voltage	AC220V 5A 50Hz 1100W
EUT Type	Table Top
Classification of EUT	Class B
Highest internal Frequency	<108MHz

Note: 1. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2. Test Environment and measurement uncertainty

2.1 Environmental Conditions

Ambient temperature: 15~35°C
Relative humidity: 30~60%
Atmosphere pressure: 86-106kPa

2.2 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.
Uncertainty of Conducted Emission:±2.56dB
Uncertainty of Radiated Emission: ±3.97dB(below 1GHz); ±3.98dB(above 1GHz)

2.3 List of Equipments Used

Test Equipment	Manufacturer	Model No.	Serial No.	Next Cal. Date
EMI Test Receiver	R & S	ESR 26	CJSB2019010	2024.07.10
Antenna (below 1GHz)	Schwarzbeck	VULB 9168	CJSB2019011	2024.07.30
Antenna (above 1GHz)	Schwarzbeck	BBHA 9120D	CJSB2019012	2024.07.30
Pre-Amplifier (below 1GHz)	Com-Power	PAM-103	CJSB2019013	2024.06.24
EMI Test Receiver	PMM	PMM 9010	CJSB2019027	2024.06.24
LISN	Schwarzbeck	NSLK 8127	CJSB2019028	2024.06.24
ESD generator	Teseq	NSG 437	CJSB2019009	2024.06.26
Signal Generator	Teseq	ITS 6006	CJSB2019016	2024.06.24
Power Amplifier	Teseq	CBA 1G-300B	CJSB2019017	2024.06.24
Power Amplifier	Milmega	AS0860B50/50	CJSB2019019	2024.06.24
High Gain Antenna	Schwarzbeck	STLP 9129	CJSB2019022	2024.07.20
Transient disturbance rejection test system	Teseq	NSG 3040	CJSB2019032	2024.06.24
voltage regulator	Teseq	INA 6502	CJSB2019034	2024.06.24
Power frequency magnetic generator	Teseq	MFO 6502	CJSB2019035	2024.06.24
Harmonic Flicker test system	APS	ECTS2-140M	CJSB2019038	2024.06.24
Signal generator	Teseq	NSG 4070C-35	CJSB2019026	2024.06.24
CDN	Teseq	CDN M016S	CJSB2019039	2024.04.24

NOTE:
Equipments listed above have been calibrated and are in the period of validation.

3. Test Standards and Results

Test detailed items required and results are listed as below (the latest versions of basic standards are applied):

Emission Part for EN IEC 61000-6-3:2021			
Item	Standard	Remarks	Result
Conducted Emission (main port)	EN IEC 61000-6-3:2021	Meet limit	PASS
Radiated Emission (below 1000MHz)	EN IEC 61000-6-3:2021	Meet limit	PASS
Harmonic	EN IEC 61000-3-2:2019	Meet Class A limit	PASS
Flicker	EN 61000-3-3:2013+A1:2019	Meet Pst, dc, dmax, Tmax requirements	PASS

Highest Frequency	Upper Frequency
Below 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 times the highest frequency or 6GHz, whichever is less

Immunity Part for EN IEC 61000-6-1:2019				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN IEC 61000-6-1:2019	IEC 61000-4-2:2008	±4kV Contact Discharge ±8kV Air Discharge	PASS
Radiated Immunity	EN IEC 61000-6-1:2019	IEC 61000-4-3:2006 +A1:2007+A2:2010	80-1000MHz: 3V/m 1.4-6GHz: 1V/m 80%,1kHz AM Mod	PASS
Electrical Fast Transients/Burst at Power Port	EN IEC 61000-6-1:2019	IEC 61000-4-4:2012	±1kV 5/50ns Tr/Td 5/100kHz	PASS
Surge at AC Power Port	EN IEC 61000-6-1:2019	IEC 61000-4-5:2014	±1kv for Line to Line 1.2/50μs Tr/Td	PASS
Conducted Immunity at Power Port (150kHz-80MHz)	EN IEC 61000-6-1:2019	IEC 61000-4-6:2013	0.15-80MHz:3 Vrms 80%,1kHz AM Mod	PASS
Power frequency magnetic field	EN IEC 61000-6-1:2019	IEC 61000-4-8:2009	3A/m at 50, 60Hz	PASS
Voltage Dips, short interruption and voltage variation	EN IEC 61000-6-1:2019	IEC 61000-4-11:2004	0%(0.5), 0%(1), 70%(25),0%(250)	PASS

4. Test Conditions Setting

4.1 Test Configuration Description

The system is connected normally, placing a kilogram weight on the tray, observing the weighing display, the accuracy is one in three thousand.

4.2 Test Mode

Mode 1: normal operation mode.

5. Emission Tests

5.1 Conducted Emission Measurement

5.1.1 Limits of Conducted Emission

Power port

Frequency (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66~56	56~46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

NOTE:
(1)The limit is applicable to Class B ITE.
(2)The lower limit shall apply at the band edges.
(3)The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

5.1.2 Test Procedure

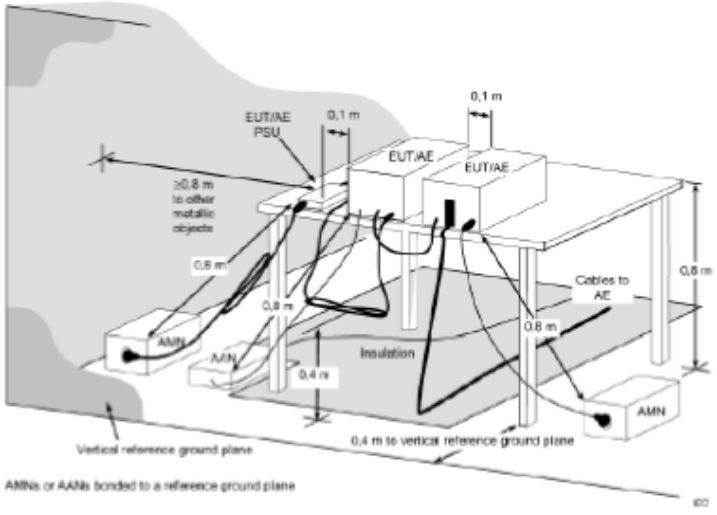
The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument.

The test frequency range is from 150kHz to 30MHz. 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.

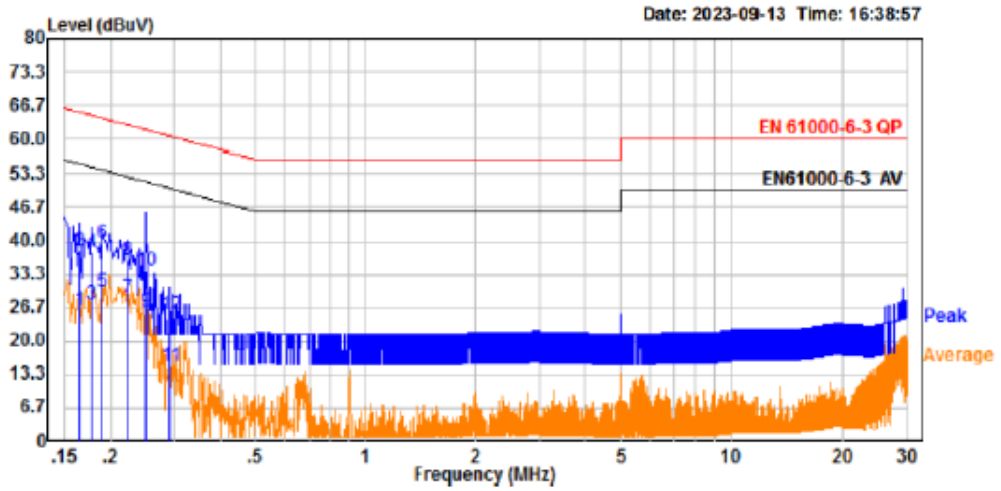
5.1.3 Test Setup

For Power port



5.1.4 Test Result

Test mode:	Mode 1	Phase:	Line
Comment: /			

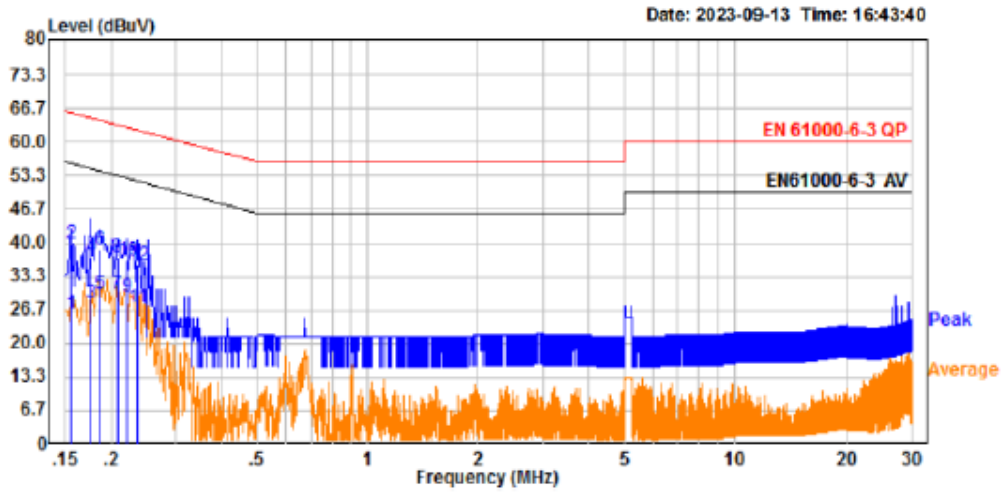


Frequency	Result [dBuV]		Limit [dBuV]		Margin [dB]	
[MHz]	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.16	38.12	26.38	65.26	55.26	27.14	28.88
0.18	37.82	27.61	64.58	54.58	26.76	26.97
0.19	39.51	30.03	64.04	54.04	24.53	24.01
0.22	36.23	28.65	62.68	52.68	26.45	24.03
0.25	34.16	26.00	61.77	51.77	27.61	25.77
0.29	25.23	15.00	60.48	50.48	35.25	35.48

Remark:

1. Result value = Reading level + Correct Factor
2. Correct Factor = cable loss + 10dB attenuation
3. Margin = Limit – Result

Test mode:	Mode 1	Phase:	Neutral
Comment: /			



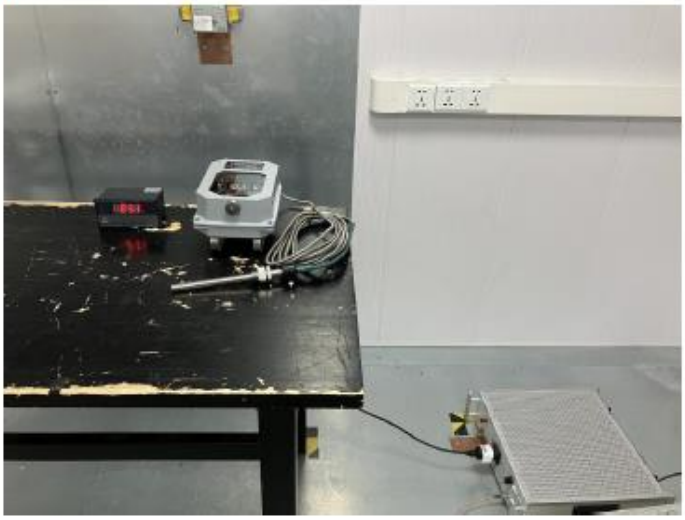
Frequency	Result [dBuV]		Limit [dBuV]		Margin [dB]	
[MHz]	Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
0.16	39.73	25.96	65.68	55.68	25.95	29.72
0.18	37.03	28.01	64.68	54.68	27.65	26.67
0.19	38.68	29.76	64.22	54.22	25.54	24.46
0.21	37.03	30.00	63.29	53.29	26.26	23.29
0.22	36.63	29.34	62.75	52.75	26.12	23.41
0.24	35.69	27.05	62.25	52.25	26.56	25.20

Remark:

1. Result value = Reading level + Correct Factor
2. Correct Factor = cable loss + 10dB attenuation
3. Margin = Limit – Result

5.1.5 Test Photo

For Power port



5.2 Radiated Emission Measurement

5.2.1 Limits of Radiated Emission

Below 1GHz

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)
30 - 230	40
230 - 1000	47

NOTE:
(1)The limit is applicable to Class B ITE at 3m measurement distance.
(2)The lower limit shall apply at the transition frequency.
(3)Additional provisions may be required for cases where interference occurs.

5.2.2 Test Procedure

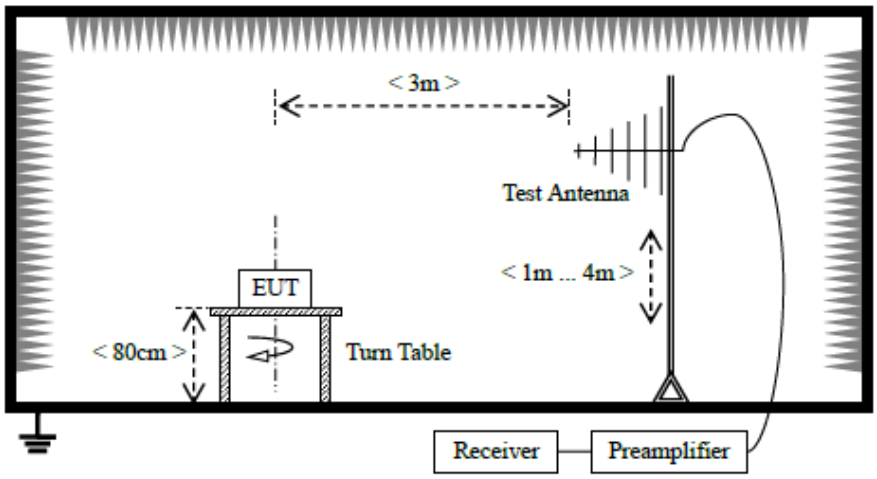
The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For each suspected emission, the EUT is arranged to its worst case and then the Test Antenna is tuned to the heights from 1 to 4m and the Turn Table is tuned from 0 to 360 degrees to find the maximum reading.

The Test Antenna is a bi-log one, and its height is varied from 1 to 4m above the ground to determine the maximum value of the field strength. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests.

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors.

5.2.3 Test Setup



5.2.4 Test Result

Test mode:	Mode 1	Polarity:	Horizontal
Frequency:	30-1000MHz		
Comment: /			

Frequency	Result	Limit	Margin	Detector
[MHz]	[dBuV/m]	[dBuV/m]	[dB]	[QP/AV]
30.5385	18.79	40.00	21.21	QP
100.1071	29.31	40.00	10.69	QP
112.1785	33.14	40.00	6.86	QP
146.2013	34.42	40.00	5.58	QP
152.2111	34.20	40.00	5.80	QP
188.3474	33.37	40.00	6.63	QP

Remark:

1. Result value = Reading level + Correct Factor
2. Correct Factor = cable loss + antenna gain - Pre-amp
3. Margin = Limit – Result value

Test mode:	Mode 1	Polarity:	Vertical
Frequency:	30-1000MHz		
Comment: /			

Frequency	Result	Limit	Margin	Detector
[MHz]	[dBuV/m]	[dBuV/m]	[dB]	[QP/AV]
30.9579	27.82	40.00	12.18	QP
32.5189	28.13	40.00	11.87	QP
35.4025	30.15	40.00	9.85	QP
39.7492	28.59	40.00	11.41	QP
43.0347	32.17	40.00	7.83	QP
143.0195	37.80	40.00	2.20	QP

Remark:

1. Result value = Reading level + Correct Factor
2. Correct Factor = cable loss + antenna gain - Pre-amp
3. Margin = Limit – Result value

5.2.5 Test Photo

5.3 Harmonics Current Measurement

5.3.1 Limits of Harmonics Current Measurement

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15x15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23x8/n

Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15<=n<=39	3.85/n	0.15x15/n

NOTE:

1. Class A and Class D are classified according to item 7.4.3.

2. According to section 7 of EN 61000-3-2, the above limits for all equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

5.3.2 Test Procedure

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

The classification of EUT is according to section 5 of EN 61000-3-2.

The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

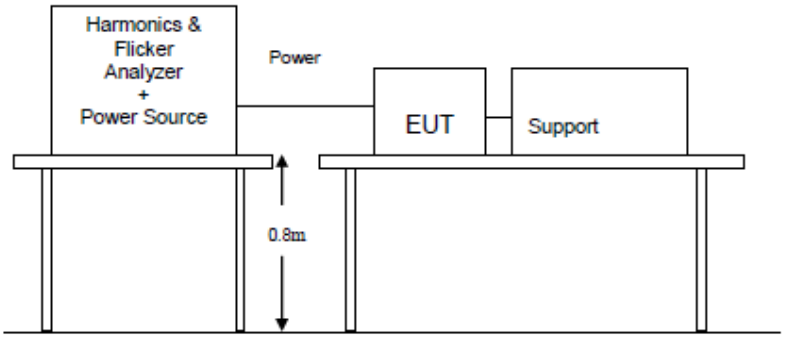
Class B: Portable tools; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

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 time necessary for the EUT to be exercised.

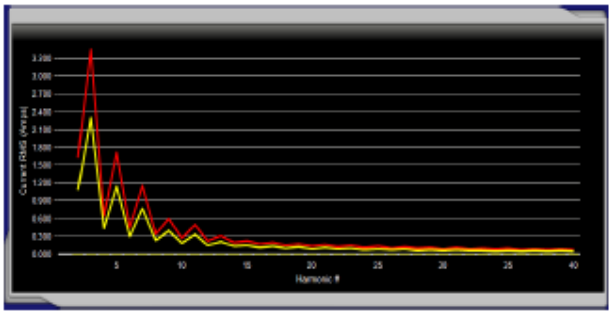
5.3.3 Test Setup

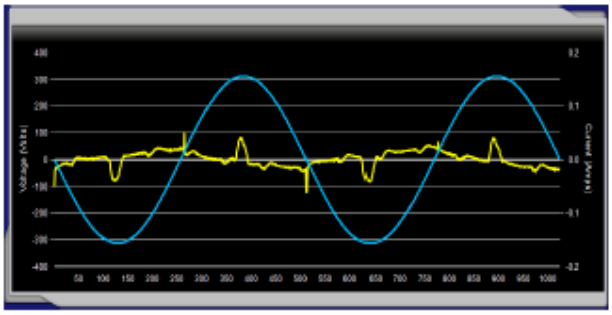


For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

5.3.4 Test Result

Test mode:	Mode 1	Classification:	Class A
Comment: /			





Harm No.	Harm. Ave.	Harm. Limit (100%)	% Of Limits	Result (Ave.)	Result (Max.)	Harm. Win.	Harm. Win. (150%)	% Of Max
2	0.0012	1.0800	0.1	PASS	PASS	0.0013	1.6200	0.1
3	0.0058	2.3000	0.3	PASS	PASS	0.0059	3.4500	0.2
4	0.0003	0.4300	0.1	PASS	PASS	0.0004	0.6450	0.1
5	0.0044	1.1400	0.4	PASS	PASS	0.0045	1.7100	0.3
6	0.0011	0.3000	0.4	PASS	PASS	0.0011	0.4500	0.2
7	0.0041	0.7700	0.5	PASS	PASS	0.0042	1.1550	0.4
8	0.0003	0.2300	0.1	PASS	PASS	0.0004	0.3450	0.1
9	0.0038	0.4000	0.9	PASS	PASS	0.0039	0.6000	0.6
10	0.0003	0.1840	0.1	PASS	PASS	0.0003	0.2760	0.1
11	0.0031	0.3300	0.9	PASS	PASS	0.0031	0.4950	0.6

12	0.0003	0.1530	0.2	PASS	PASS	0.0003	0.2295	0.1
13	0.0032	0.2100	1.5	PASS	PASS	0.0033	0.3150	1.1
14	0.0002	0.1310	0.2	PASS	PASS	0.0002	0.1965	0.1
15	0.0022	0.1500	1.5	PASS	PASS	0.0022	0.2250	1.0
16	0.0002	0.1150	0.2	PASS	PASS	0.0002	0.1725	0.1
17	0.0019	0.1320	1.5	PASS	PASS	0.0020	0.1980	1.0
18	0.0003	0.1020	0.3	PASS	PASS	0.0003	0.1530	0.2
19	0.0013	0.1180	1.1	PASS	PASS	0.0013	0.1770	0.8
20	0.0010	0.0920	1.1	PASS	PASS	0.0010	0.1380	0.8
21	0.0011	0.1070	1.0	PASS	PASS	0.0011	0.1605	0.7
22	0.0001	0.0830	0.1	PASS	PASS	0.0001	0.1245	0.1
23	0.0006	0.0970	0.6	PASS	PASS	0.0006	0.1455	0.4
24	0.0001	0.0760	0.2	PASS	PASS	0.0002	0.1140	0.2
25	0.0004	0.0900	0.5	PASS	PASS	0.0004	0.1350	0.3
26	0.0005	0.0700	0.7	PASS	PASS	0.0005	0.1050	0.5
27	0.0002	0.0830	0.3	PASS	PASS	0.0002	0.1245	0.2
28	0.0002	0.0650	0.3	PASS	PASS	0.0002	0.0975	0.2
29	0.0002	0.0770	0.3	PASS	PASS	0.0002	0.1155	0.2
30	0.0001	0.0610	0.2	PASS	PASS	0.0002	0.0915	0.2
31	0.0003	0.0720	0.5	PASS	PASS	0.0004	0.1080	0.3
32	0.0001	0.0570	0.2	PASS	PASS	0.0002	0.0855	0.2
33	0.0004	0.0680	0.6	PASS	PASS	0.0004	0.1020	0.4
34	0.0001	0.0540	0.2	PASS	PASS	0.0002	0.0810	0.2
35	0.0004	0.0640	0.6	PASS	PASS	0.0004	0.0960	0.4
36	0.0001	0.0510	0.3	PASS	PASS	0.0002	0.0765	0.3
37	0.0004	0.0600	0.6	PASS	PASS	0.0004	0.0900	0.4
38	0.0001	0.0480	0.3	PASS	PASS	0.0002	0.0720	0.2
39	0.0004	0.0570	0.6	PASS	PASS	0.0004	0.0855	0.4
40	0.0002	0.0460	0.4	PASS	PASS	0.0002	0.0690	0.3

5.3.5 Test Photo

5.4 Voltage Fluctuations and Flick Measurement

5.4.1 Limits of Voltage Fluctuations and Flick

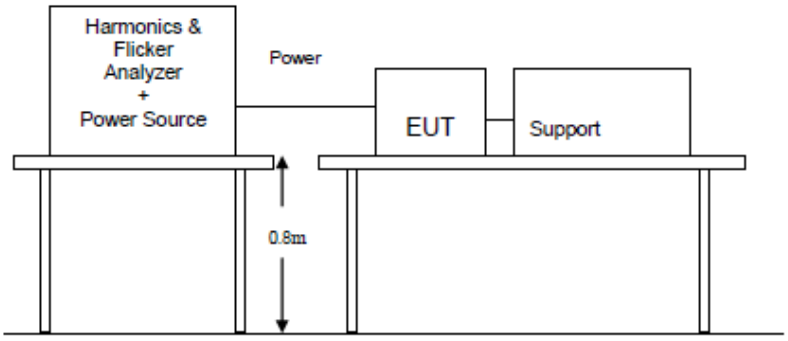
Test Item	Limit	Note
P_{st}	1.0	Short-term flicker indicator
P_{lt}	0.65	Long-term flicker indicator
T_{dt}(ms)	500	Maximum time that dt exceeds 3%
d_{max} (%)	4%	Maximum relative voltage change
d_c (%)	3.3%	Relative steady-state voltage change

5.4.2 Test Procedure

The EUT is placed on the top of a wooden table 0.8m above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions.

During the flick 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.

5.4.3 Test Setup

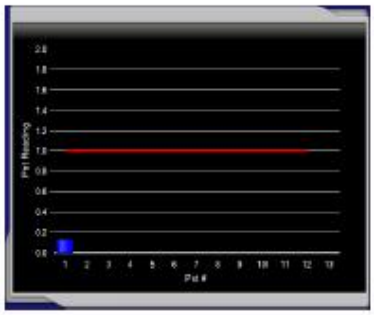


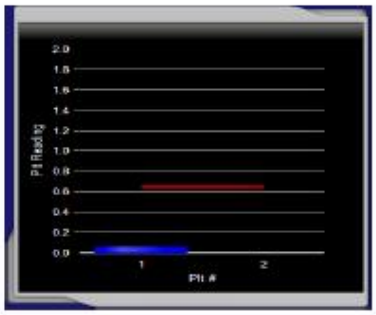
Test Specification:

No.	Specification	Value
1	Test Frequency	50Hz
2	Test Voltage	220VAC
3	Waveform	Sine
4	Test Time	10 minutes for P_{st}; 2 hours for P_{lt}

5.4.4 Test Result

Test mode:	Mode 1	Classification:	Class A
Comment: /			





Phase A

Vrms (Volts):	**220.69**	**Frequency (Hz):**	**50.00**
I_rms (Amps):	**0.015**	**Power (W):**	**-0.2**
V-THD (%):	**0.050**	**T-Max (ms):**	**0 (500)**
dmax (%):	**0.000 (4.000)**	**Hi dmax (%):**	**0.000 (4.000)**
dc (%):	**0.000 (3.300)**	**Hi dc (%):**	**0.000 (3.300)**
Pst-1 :	**0.128 (1.000)**		
Plt :	**0.056 (0.650)**		

5.4.5 Test Photo

6. Immunity Tests

6.1 Performance Criteria for EUT

For EN IEC 61000-6-1-2019

Criteria 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.
Criteria 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.
Criteria 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. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

6.2 Electrostatic Discharge Immunity

6.2.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-2
Discharge Impedance	330Ohm / 150pF
Discharge Voltage	Air Discharge: ±8kV; Contact Discharge: ±4kV
Polarity	Positive / Negative
Number of Discharge	Minimum 20 times at each test point
Discharge Mode	Single discharge
Discharge Period	1 second minimum

6.2.2 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.

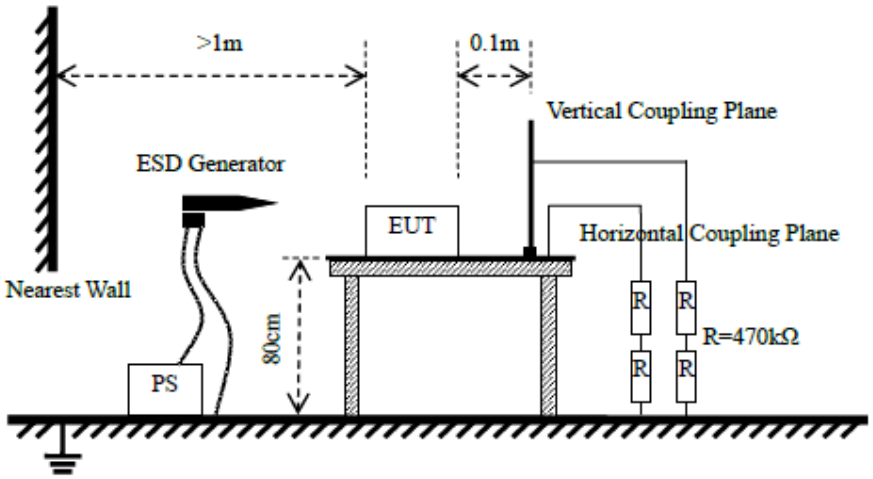
Contact discharges are applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

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.

6.2.3 Test Setup



6.2.4 Test Result

The EUT performance complies with the performance criteria. All modes are tested.

Details please refer to test photo and test point photograph.

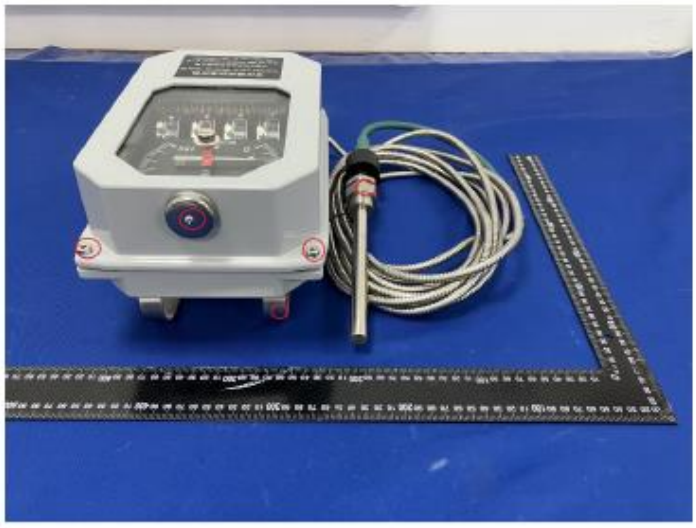
1. All insulated enclosure and seams
2. All accessible metal ports of the enclosure

Test Mode	Test Points	Discharge Level (kV)	Discharge Mode	Performance Criterion	Result
Mode 1	Circle	±4	Contact	B	PASS
	HCP	±4	Contact	A	PASS
	VCP	±4	Contact	A	PASS
	BOX	±8	Air Discharge	A	PASS

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

6.2.5 Test photo

Test point photograph
□ : Air discharge
O : Contact discharge



6.2.6 Test photo

6.3 Radiated, Radio Frequency Electromagnetic Field Immunity Test

6.3.1 Test Specification

Basic Standard	IEC 61000-4-3
Frequency Range	80MHz-1000MHz; 1.4GHz-6GHz
Field Strength	3V/m
Modulation	1 kHz sine wave, 80%, AM modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3m
Antenna Height	1.5m
Dwell Time	3 seconds

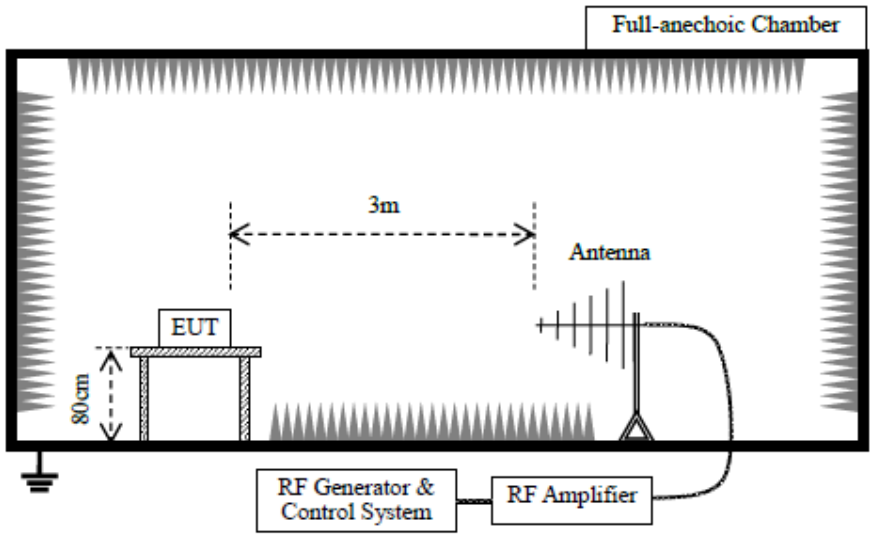
6.3.2 Test Procedure

The test procedure was in accordance with EN 61000-4-3.

The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

1. The test signal was 80% amplitude modulated with a 1 kHz sine wave.
2. The frequency range was swept from 80 MHz to 6000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
3. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
4. The field strength level was 3V/m and 1V/m at 80MHz-1000MHz,1.4GHz-6GHz.
5. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

6.3.3 Test Setup



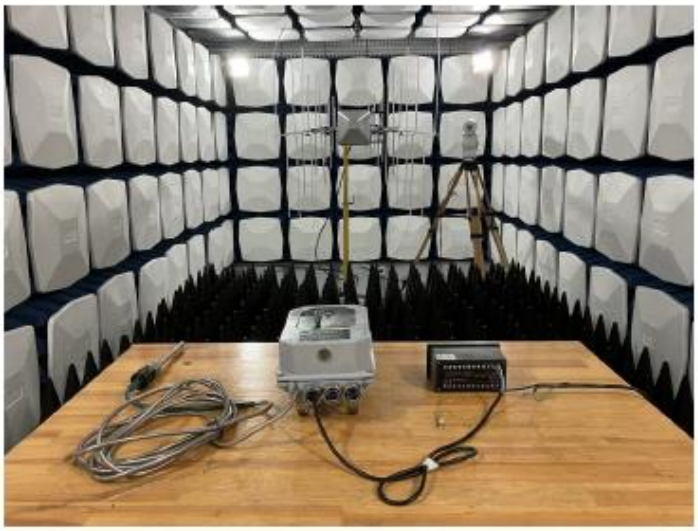
6.3.4 Test Result

The EUT performance complied with the performance criteria. All modes are tested.

EUT Operating Mode	Antenna Polarity	Frequency (MHz)	Field Strength (V/m)	EUT Face	Performance Criterion	Result
Mode 1	Vertical	80MHz-1000MHz, 1.4GHz-6GHz	3V/m	Front	A	Pass
	Horizontal				A	Pass
	Vertical			Rear	A	Pass
	Horizontal				A	Pass
	Vertical			Left	A	Pass
	Horizontal				A	Pass
	Vertical			Right	A	Pass
	Horizontal				A	Pass

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

6.3.5 Test Photo



6.4 Electrical Fast Transient / Burst Immunity

6.4.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-4
Test Voltage	Power port: ±1kV
Polarity	Positive / Negative
Impulse Frequency	5/100kHz
Impulse Wave Shape	5/50ns
Burst Duration	15ms
Burst Period	300ms
Test Duration	2 minute per level & polarity

6.4.2 Test Procedure.

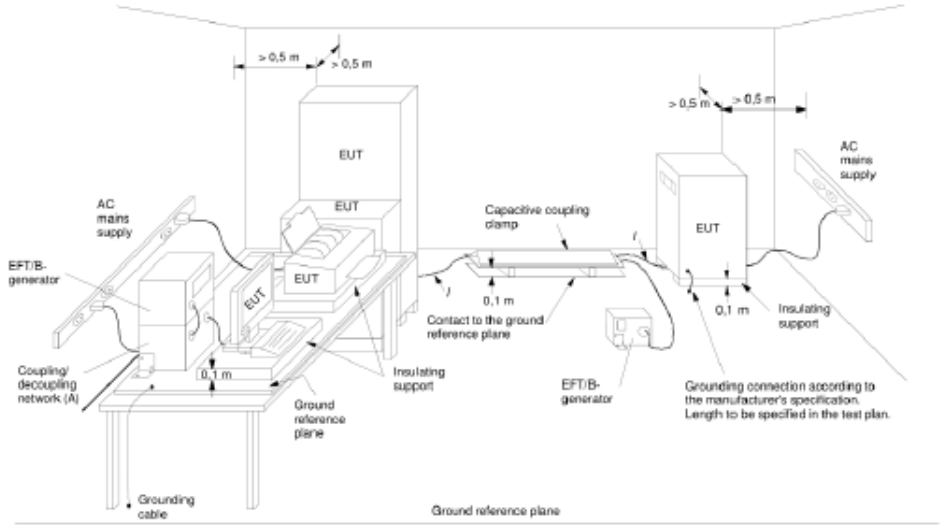
Both positive and negative polarity discharges are applied.

The length of the "hot wire" from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1m.

The duration time of each test sequential is 2min.

The transient / burst waveform is in accordance with IEC 61000-4-4, 5/50ns.

6.4.3 Test Setup



6.4.4 Test Result

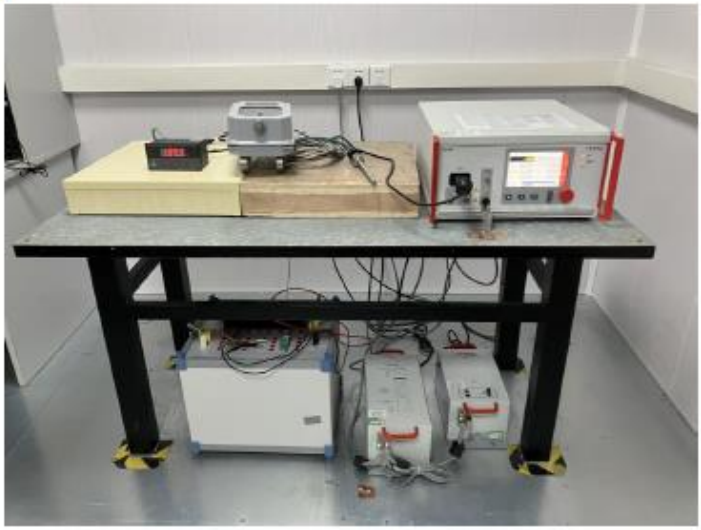
The EUT performance complies with the performance criteria. All modes are tested.

Test Mode	Test Point	Test Level (kV)	CDN/Clamp	Performance Criterion	Result
Mode 1	AC Power port	±1	CDN	A	PASS

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

6.4.5 Test Photo

For Power port



6.5 Surge Immunity

6.5.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-5
Waveform	Voltage: 1.2/50μs; Current: 8/20μs
Test Voltage	AC Power Port: line to line ±1kV;
Polarity	Positive / Negative
Phase Angle	0,90,180,270
Repetition Rate	60 seconds
Times	5 times per condition

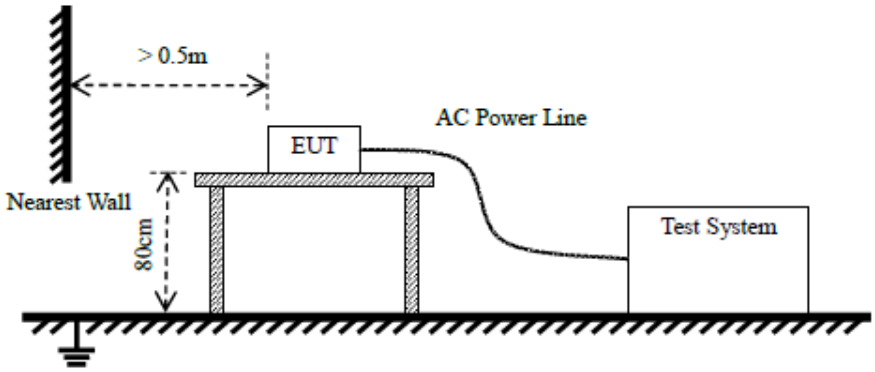
6.5.2 Test Procedure

The EUT and the auxiliary equipment are placed on a table of 0.8m 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 0.1m 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. Steps 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.

6.5.3 Test Setup



6.5.4 Test Result

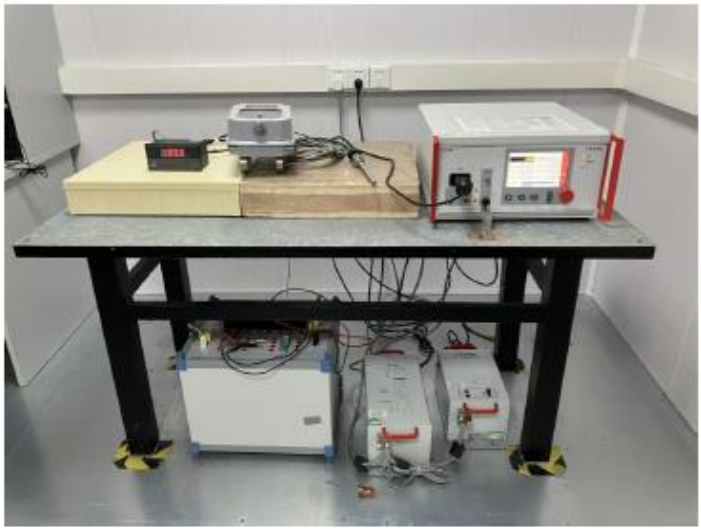
The EUT performance complies with the performance criteria. All modes are tested.

Test Mode	Test Line	Voltage (kV)	Impedance (Ω)	Phase(deg)	Performance Criterion	Result
Mode 1	L-N	±1	2	0,90,180,270	A	PASS

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

6.5.5 Test Photo

For Power port



6.6 Immunity to Conducted Disturbance s Induced by RF Fields

6.6.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-6
Frequency Range	0.15MHz - 80MHz
Field Strength	3Vrms
Modulation	1kHz sine wave, 80% AM
Frequency Step	1% of fundamental
Coupled Cable	Power Port
Coupling Device	CDN

6.6.2 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 50Ohm load resistor.

The test signal is 80% amplitude modulated with a 1kHz sine wave.

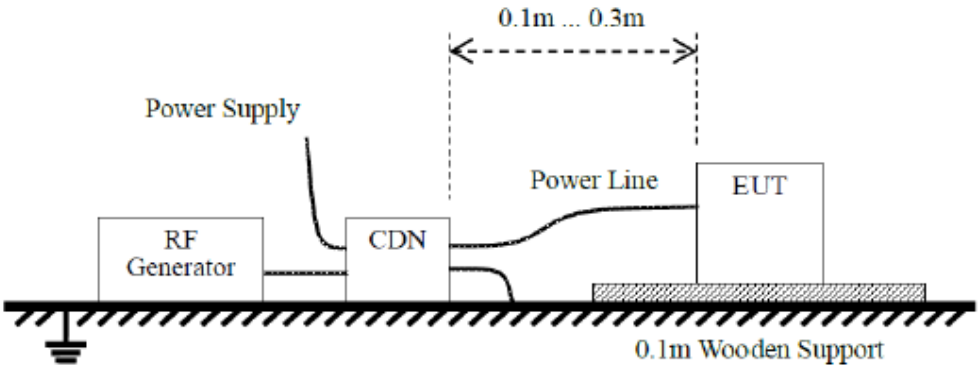
The frequency range is swept from 150kHz to 80MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The sweep rate shall not exceed 1.5*10-3 decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency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

6.6.3 Test Setup

Power port



6.6.4 Test Result

The EUT performance complies with the performance criteria. All modes are tested.

Test Mode	Test Point	Frequency (MHz)	Field Strength (V rms)	Coupled Mode	Performance Criterion	Result
Mode1	AC Power Port	0.15 - 80	3	CDN	A	PASS

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

6.6.5 Test Photo

For Power port

6.7 Power Frequency Magnetic Field

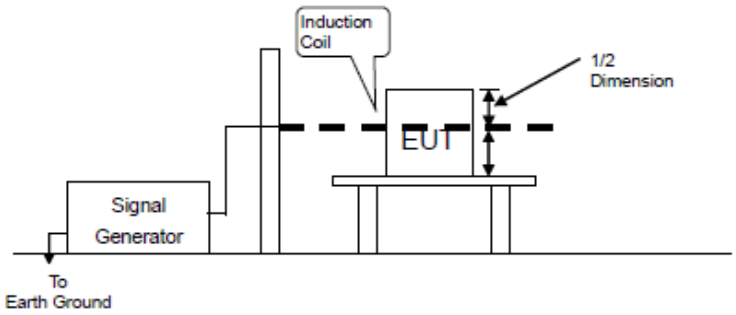
6.7.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-8
Frequency Range	50Hz, 60Hz
Field Strength	3 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1mx1m

6.7.2 Test Procedure

Please refer to EN 61000-4-8 for the measurement methods.

6.7.3 Test setup



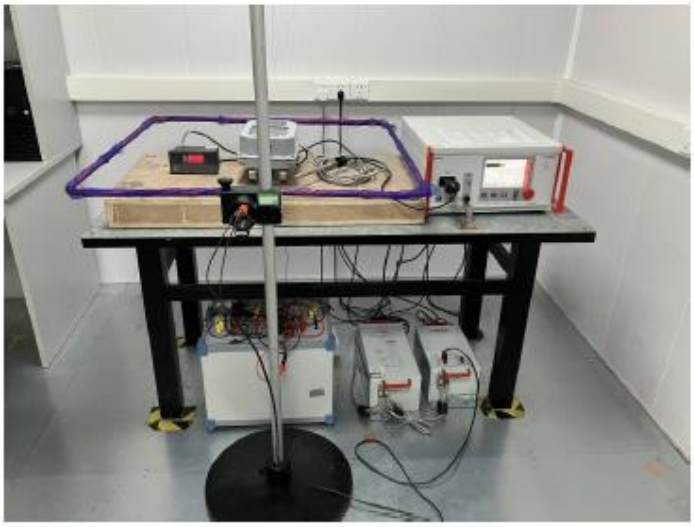
NOTE:
Tabletop equipment
The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.
Floor-Standing Equipment
The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

6.7.4 Test result

Test Mode	Direction	Field Strength (A/m)	Performance Criterion	Result
Mode 1	X	3	A	PASS
	Y	3	A	PASS
	Z	3	A	PASS

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

6.7.5 Test photo



6.8 Voltage Dips, short interruption and voltage variation immunity test

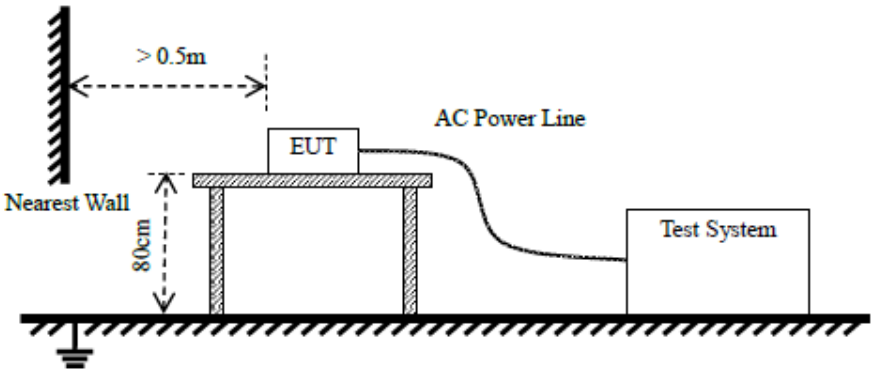
6.8.1 Test Specification

Specification	Value
Basic Standard	IEC 61000-4-11
Performance Criterion	0%(0.5), 0%(1), 70%(25), 0%(250)
Time between dropout	10s
Number of dips/interruptions	3 per level

6.8.2 Test Procedure

Please refer to IEC 61000-4-11 for the measurement methods.

6.8.3 Test setup

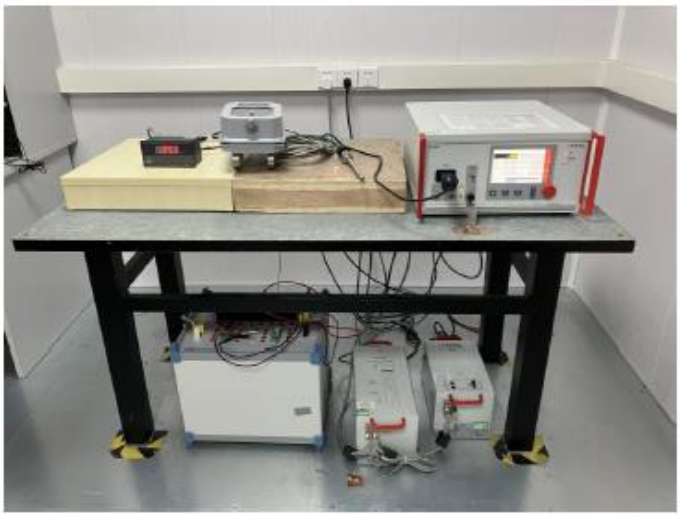


6.8.4 Test Result

Level % UT	Duration	No. of DIPS	Performance Criterion	Result
0	10ms	3	A	PASS
0	20ms	3	A	PASS
70	500ms	3	A	PASS
0	5s	3	B	PASS

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.
C: During the test, the EUT shutdown, after test can manually restore the EUT.

6.8.5 Test photo



Annex A Photos of the EUT


8.8.8.8.
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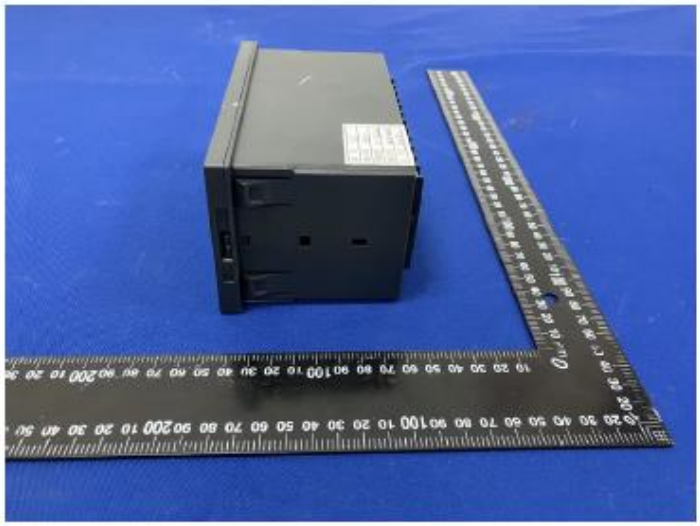

** END OF REPORT **