EMC Test Report

Product Name:	**Version M waterproof intelligent power supply**
Model Number:	**BV-ISLW240 24MW**
Applicant:	**Blueview Elec-optic Tech Co., Ltd.**

KeySense Testing & Certification International Co., Ltd.

1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China

Test Report of EMC				
Product name	Version M waterproof intelligent power supply			
Model number	BV-ISLW240 24MW			
Applicant	**Name**	Blueview Elec-optic Tech Co., Ltd.		
	Address	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China		
Manufacturer	**Name**	Blueview Elec-optic Tech Co., Ltd.		
	Address	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China		
Factory	**Name**	Blueview Elec-optic Tech Co., Ltd.		
	Address	No.1000, Section 2, 2nd Konggang Road, Southwest Aviation Industrial Development Zone, Shuangliu District, Chengdu City, Sichuan Province, P.R.China		
Trade Name				
Receipt date	Mar 22, 2022	**Quantity**	1	
Standard	EN IEC 55015:2019+A11:2020 EN 61547:2009		EN IEC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019	
Test site	1F,Lab Building,No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China.			
Test period	Mar 22, 2022- Apr 01, 2022	**Issue Date**	Apr 20, 2022	
Test result	The equipment under test was found to be compliance with the requirements of the standards applied.			
Tested by: Bing. He	**Sign:**	**Date:** 2022.4.20		
Reviewed by: Lake. Wang	**Sign:**	**Date:** 2022.4.20	**(Stamp)**	
Approved by:Jack.Li (Supervisor)	**Sign:**	**Date:** 2022.4.20		

Contents

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION(EN IEC 55015:2019+A11:2020)				
Description of Test Item	Standard	Results	Remark	
Conducted disturbance at mains terminals	EN IEC 55015:2019+A11:2020	PASS	Minimum passing margin is -12.19dB at 21.9436MHz	
Radiated Electromagnetic Disturbance (9kHz to 30MHz)	EN IEC 55015:2019+A11:2020	PASS	Minimum passing margin is -22.23dB at 12.7366MHz	
Radiated Disturbance	EN IEC 55015:2019+A11:2020	PASS	Minimum passing margin is -2.20dB at 30.6379MHz	
Harmonic current emission	EN IEC 61000-3-2:2019	PASS	Meet the Class C requirement	
Voltage fluctuations &flicker	EN 61000-3-3:2013+A1:2019	PASS	Meet the Clause 5 requirement	
IMMUNITY(EN 61547:2009)				
Description of Test Item	Basic Standard	Results	Performance Criteria	Observation Criteria
Electrostatic discharge	EN 61000-4-2:2009	PASS	B	A
Radio-frequency Continuous radiated disturbance	EN IEC 61000-4-3:2020	PASS	A	A
Electrical fast transient	EN 61000-4-4:2012	PASS	B	A
Surge	EN 61000-4-5:2014/A1:2017	PASS	B	A
Radio-frequency Continuous conducted disturbance	EN 61000-4-6:2014/A1:2015	PASS	A	A
Voltage dips, 100% reduction	EN IEC 61000-4-11:2020	PASS	B	A
Voltage dips, 30% reduction		PASS	C	A
N/A is an abbreviation for Not Applicable.				
Final Judgment :**Pass**				

2 GENERAL INFORMATION

2.1 Description of Device(EUT)

Description:	Version M waterproof intelligent power supply
Model Number:	BV-ISLW240 24MW
Input:	100-240V~ 4.0A 50/60Hz
Output:	DC 24V/10A Rated Power:240W
Test Voltage:	AC 230V/50Hz& AC 120V/60Hz

Remark:

In Emission test, a pre-test shall be made over a range of 230 V (±10 V) and 110 V (±10 V), using a frequency of 50 Hz or 60 Hz, the rated voltage in order to check the level of disturbance varies considerably with the supply voltage, compliance test at 230V/50 Hz as worse case was found.

2.2 EUT operating mode(s)

To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating mode 1	Full load

2.3 Tested Supporting System Details

No.	Description	KST No.	Manufacturer	Model	Serial Number
1	Load	/	/	10A10Ω	/

☒ Cable Description

No.	From		To		Type of Cable		
	Device	I/O Port	Device	I/O Port	Length (m)	Shielded or Unshielded	Ferrite Core [Y/N]
1	EUT	DC port	load	/	0.6	U	N

* Shielded or Unshielded : Unshielded=U, Shielded=S

2.4 Block Diagram of connection between EUT and simulators

2.5 Test Facility

Site Description: 1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China

Name of Firm: KeySense Testing & Certification International Co., Ltd.

EMC Lab: Certificated by CNAS, CHINA

Registration No.:L9678

Date of registration: Feb 07, 2017

2.6 Measurement Uncertainty(95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in shielding room	2.5dB(150kHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	4.14dB(30M~1GHz,Polarize:V)
	4.25dB(30M~1GHz,Polarize:H)

2.7 Test Equipments

2.7.1 For Conducted Emission at the Mains Terminals Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal .Interval
Receiver	R&S	ESR3	102054	2021.12.06	1 year
LISN	AFJ	LS16	16011618383	2021.09.01	1 year

2.7.2 For Radiated Electromagnetic Disturbance test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal .Interval
Receiver	R&S	ESR3	102054	2021.12.06	1 year
Loop antenna	SCHWARZBECK	HXYZ 9170	HFCD9171-296	2021.12.06	3 year

2.7.3 For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Receiver	R&S	ESR3	102055	2021.12.06	1 year
Trilog-boardband antenna	SCHWARZBECK	VULB 9163D	9163-961	2021.12.28	3 years

2.7.4 For Harmonics Current Emission Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Harmonic & Flicker analyzer	California Instruments	100-CTS-230	1626A00278	2021.09.07	1 year
Programmable power supply	California Instruments	5001iX-CTS-400	1629A02598	2021.09.01	1 year

2.7.5 For Voltage Fluctuations & Flicker Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Harmonic & Flicker analyzer	California Instruments	100-CTS-230	1626A00278	2021.09.07	1 year
Programmable power supply	California Instruments	5001iX-CTS-400	1629A02598	2021.09.01	1 year

2.7.6 For Electrostatic discharge Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Electrostatic discharge generator	Noiseken	ESS-L1611	ESS1643151	2021.08.28	1 year

2.7.7 For Radio-frequency Continuous radiated disturbance Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal generator	R&S	SMC100A	105651	2021.12.06	1 year
Power amplifier	PRANA	MT400	1507-1746	2021.12.06	1 year
Trilog-boardband antenna	SCHWARZBECK	STLP 9128E	9128ES-136	2019.09.02	3years

2.7.8 For Electrical fast transient Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EFT generator	Noiseken	FNS-AX3-A16C	FNS1621762	2021.09.01	1 year

2.7.9 For Surge Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Surge generator	Noiseken	LSS-6230A	LSS1634248	2021.09.01	1 year

2.7.10 For Radio-frequency Continuous conducted disturbance Test

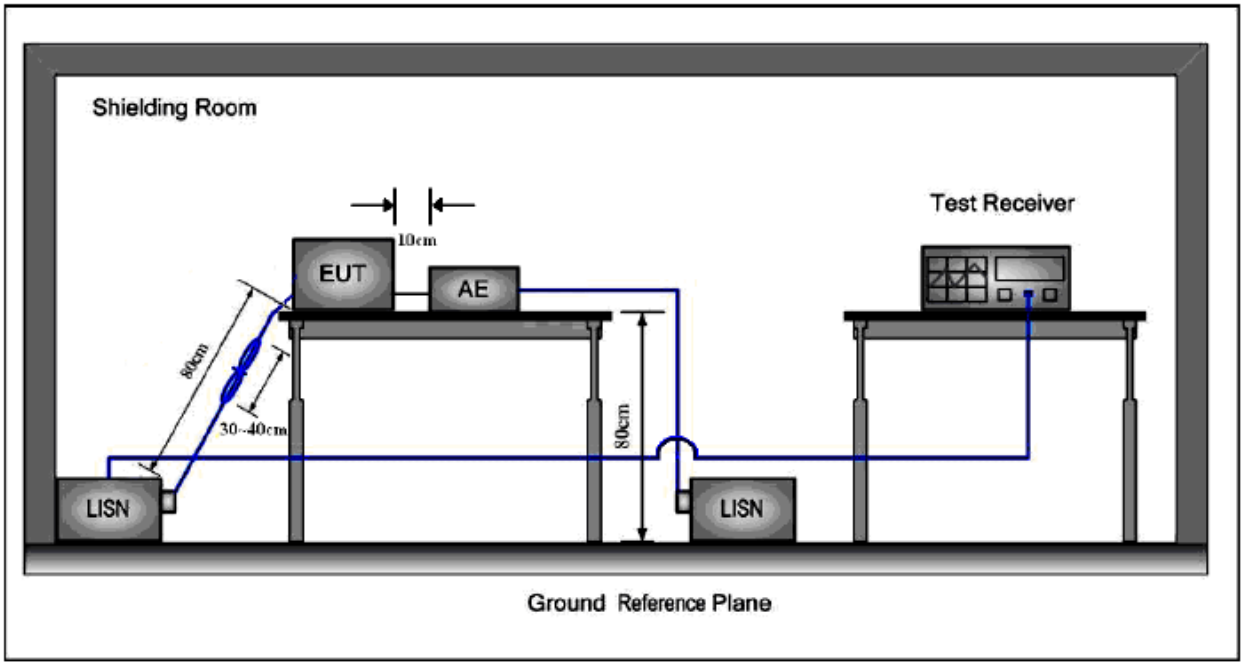
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal generator	R&S	SMC100A	105651	2021.12.06	1 year
Power amplifier	PRANA	DR220	1602-1819	2021.12.06	1 year
CND	TESEQ	M016	43434	2021.09.01	1 year

2.7.11 For Voltage dips and interruptions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Dips simulator	Noiseken	VDS-2002	VDS1510396	2021.09.01	1 year

3 CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

3.1 Block Diagram of Test Setup



3.2 Test Standard

EN IEC 55015:2019+A11:2020

3.3 Limits of mains terminal disturbance voltage

Frequency range [MHz]	Limits [dBμV]	
	Quasi-peak	Average
0.009 to 0.05	110	-
0.05 to 0.15	90 - 80	-
0,15 to 0,50	66 - 56 *	56 - 46 *
0,50 to 5	56.00	46.00
5 to 30	60.00	50.00

3.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Mar 22, 2022	23°C	64%	101.4kPa

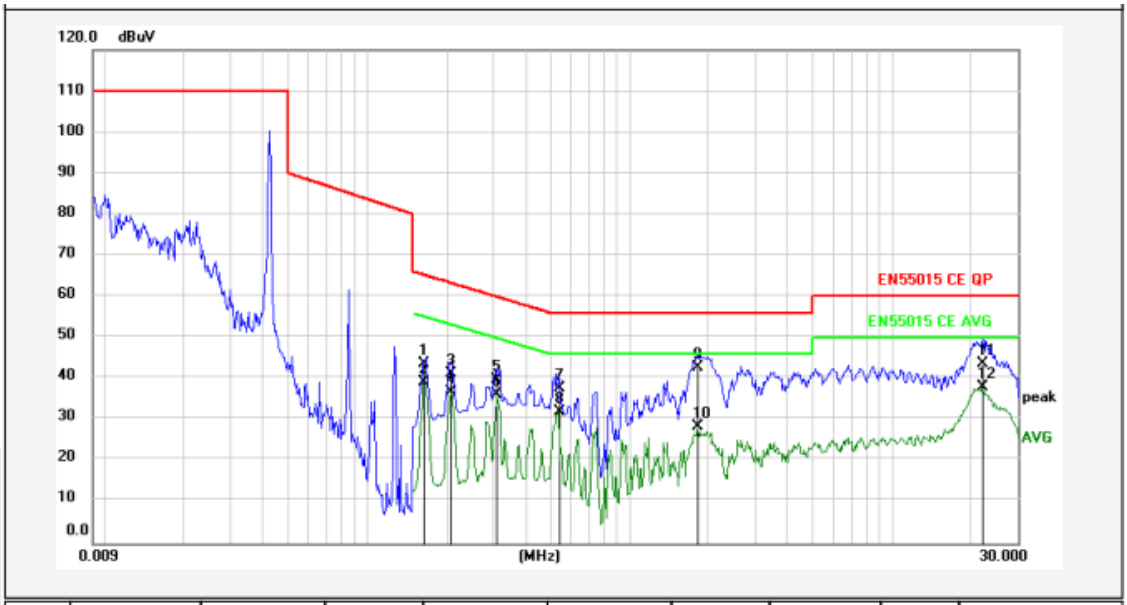
3.5 Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2).This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The side of power line was checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55015 on conducted Disturbance test.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 9kHz.
The frequency range from 150kHz to 30MHz is checked.

3.6 Test Data

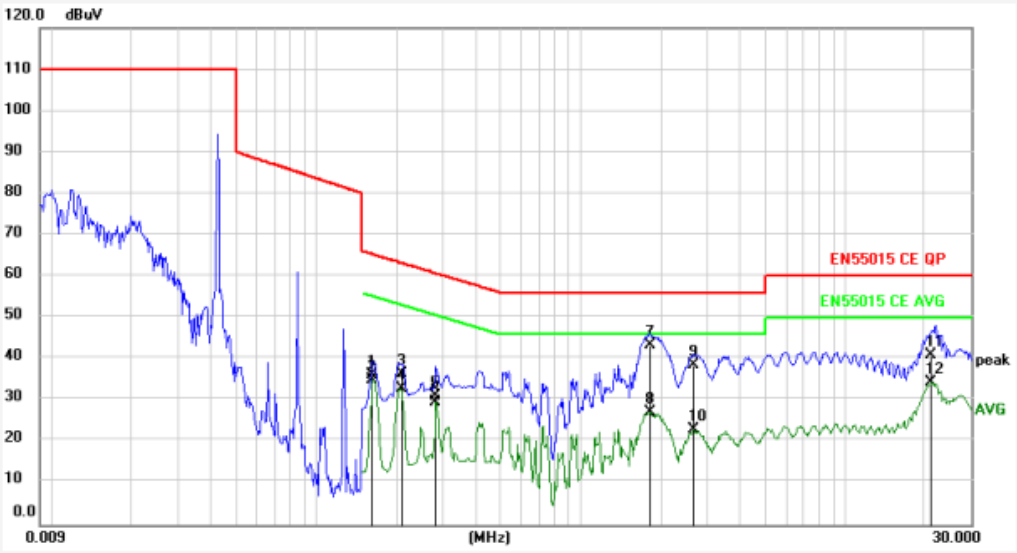
EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.22
Phase:	Live	Test Voltage:	AC 230V /50Hz
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1636	33.04	10.44	0.22	43.70	65.28	-21.58	QP	
2	0.1636	28.56	10.44	0.22	39.22	55.28	-16.06	AVG	
3	0.2086	30.60	10.44	0.23	41.27	63.26	-21.99	QP	
4	0.2086	26.10	10.44	0.23	36.77	53.26	-16.49	AVG	
5	0.3121	29.11	10.44	0.24	39.79	59.91	-20.12	QP	
6	0.3121	25.59	10.44	0.24	36.27	49.91	-13.64	AVG	
7	0.5326	26.96	10.44	0.24	37.64	56.00	-18.36	QP	
8	0.5326	21.40	10.44	0.24	32.08	46.00	-13.92	AVG	
9	1.8196	32.00	10.47	0.21	42.68	56.00	-13.32	QP	
10	1.8196	17.56	10.47	0.21	28.24	46.00	-17.76	AVG	
11	21.9436	32.73	10.77	0.2	43.70	60.00	-16.30	QP	
12	21.9436	26.84	10.77	0.2	37.81	50.00	-12.19	AVG	

Remarks: 1. Result=Reading+Lisn+Cab_L
2. If the average limit is met when using a quasi-peak detector. the EUT shall be deemed to meet both limits and measurement with average detctor is unnecessary.

EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.22
Phase:	Neutral	Test Voltage:	AC 230V /50Hz
Operator:	Bing	Note:	

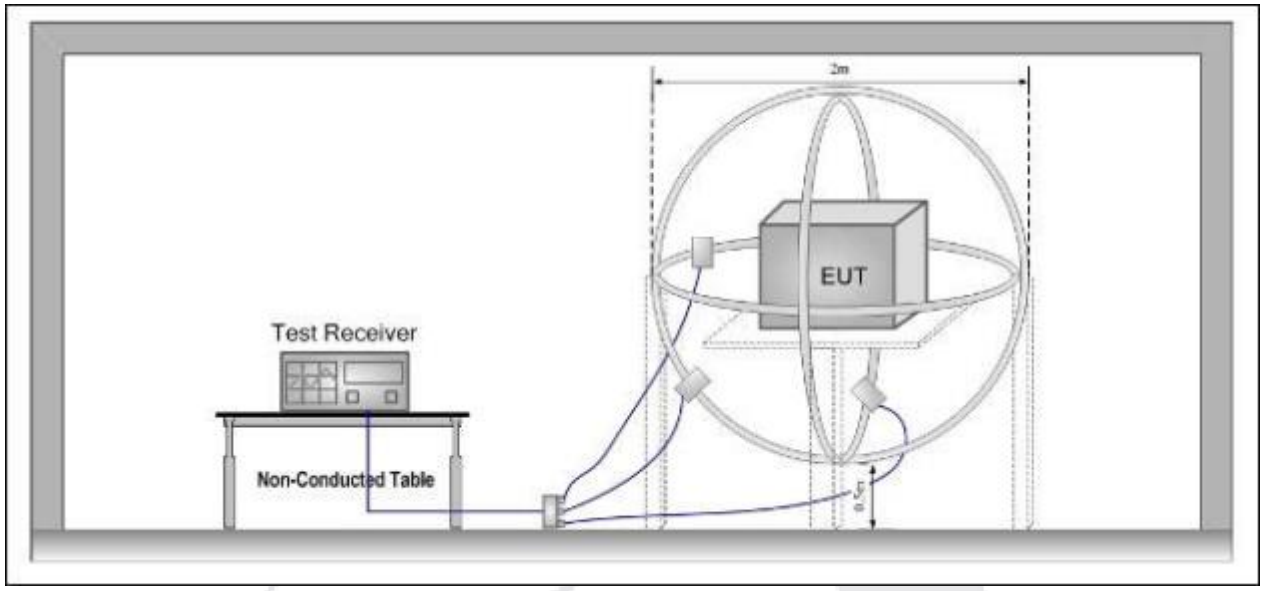


No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1636	25.46	10.44	0.22	36.12	65.28	-29.16	QP	
2	0.1636	24.23	10.44	0.22	34.89	55.28	-20.39	AVG	
3	0.2086	25.91	10.44	0.23	36.58	63.26	-26.68	QP	
4	0.2086	22.09	10.44	0.23	32.76	53.26	-20.50	AVG	
5	0.2850	20.24	10.44	0.24	30.92	60.67	-29.75	QP	
6	0.2850	18.87	10.44	0.24	29.55	50.67	-21.12	AVG	
7	1.8376	32.77	10.47	0.2	43.44	56.00	-12.56	QP	
8	1.8376	16.54	10.47	0.2	27.21	46.00	-18.79	AVG	
9	2.6926	27.80	10.48	0.2	38.48	56.00	-17.52	QP	
10	2.6926	12.36	10.48	0.2	23.04	46.00	-22.96	AVG	
11	21.1966	29.88	10.78	0.2	40.86	60.00	-19.14	QP	
12	21.1966	23.37	10.78	0.2	34.35	50.00	-15.65	AVG	

Remarks: 1. Result=Reading+Lisn+Cab_L
2. If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detctor is unnecessary.

4 RADIATED ELECTROMAGNETIC DISTURBANCE TEST

4.1 Block Diagram of Test Setup



4.2 Test Standard

EN IEC 55015:2019+A11:2020

4.3 Limits for radiated disturbance

Frequency MHz	Limits for loop diameter 2m dB(μA) Quasi Peak Level
0.009 to 0.070	88
0.070 to 0.150	88 to 58
0.150 to 3.0	58 to 22
3.0 to 30.0	22

NOTE 1 At the transition frequency, the lower limit applies

NOTE 2 Decreasing linearly with the logarithm of the frequency. For electrodeless Full loads and luminaires, the limit in the frequency range of 2.2 MHz to 3.0 MHz is 58 dB (μA) for 2 m, 51 dB (μA) for 3 m and 45 dB (μA) for 4 m loop diameter.

4.4 Operating Condition of EUT

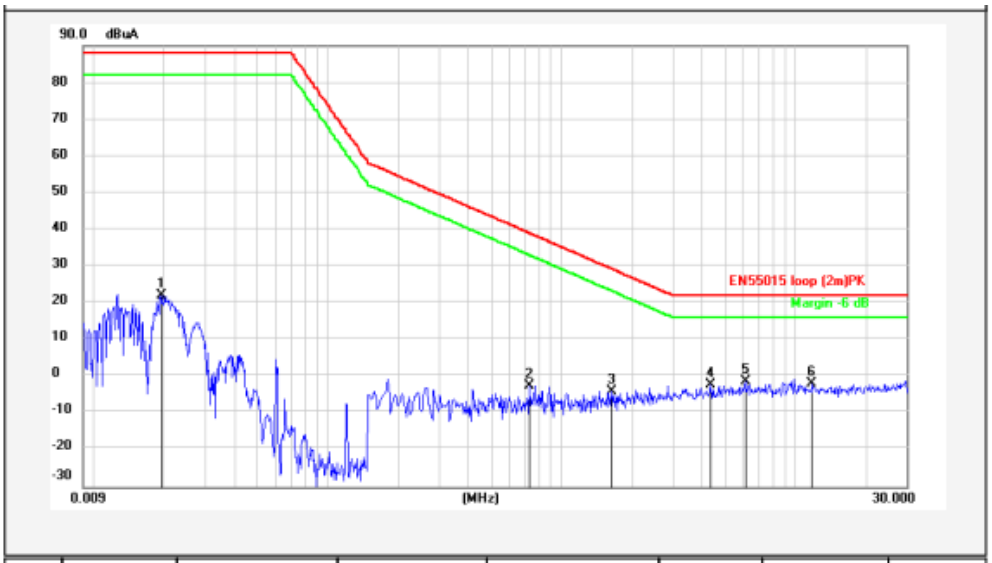
Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Mar 22, 2022	20° C	59%	100.9kPa

4.5 Test Procedure

1. The magnetic component was measured by means of a loop antenna. The Chargingequipment was placed in the centre of the antenna. The position of the mains lead was optimized for maximum current induction.
2. The induced current in the loop antenna was measured by means of a current probe (1 V/A) and the CISPR measuring receiver. During the measurements the EUT remains in a fixed position. By means of a coaxial switch, The currents in the three large loop antennas, originating from the three mutually orthogonal magnetic field components, were measured in sequence. Each value was fulfil the requirements given.
3. There were no special instructions for the supply wiring.
4. The distance between the outer perimeter of the LAS(Loop Antenna System) and nearby objects, such as floor and walls, was at least 0.5 m.
5. To avoid unwanted capacitive coupling between the EUT and the LAS, the maximum dimensions of the EUT allowed a distance of at least 0.20 m between the EUT and the standardized 2 m large loop antennas of the LAS.

4.6 Test Data

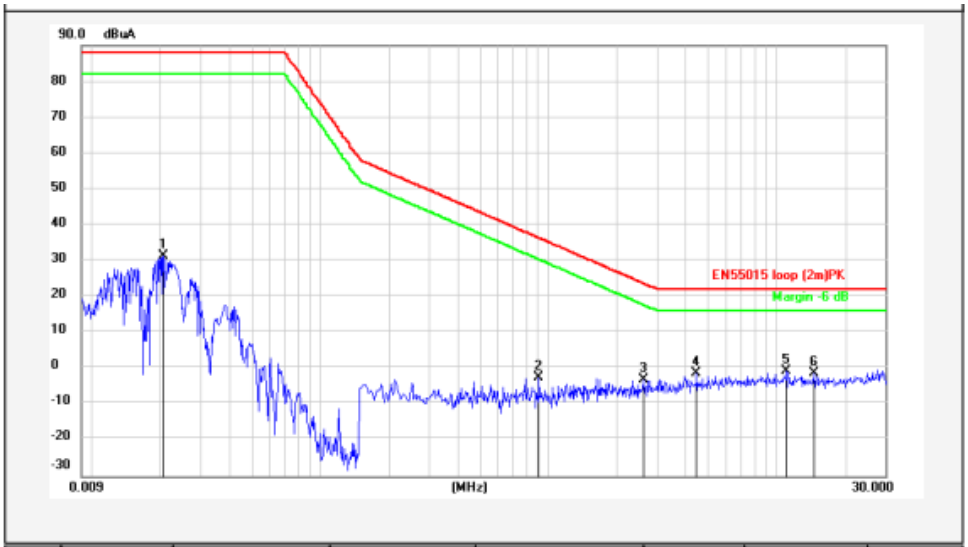
EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.22
Polarization:	X	Test Voltage:	AC 230V/50Hz
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuA)	Cable (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector
1	0.0194	22.00	0.04	22.04	88.00	-65.96	peak
2	0.7306	-2.66	0.21	-2.45	38.97	-41.42	peak
3	1.6531	-4.29	0.21	-4.08	29.16	-33.24	peak
4	4.3530	-2.58	0.33	-2.25	22.00	-24.25	peak
5	6.1440	-1.89	0.41	-1.48	22.00	-23.48	peak
6	11.8366	-2.53	0.49	-2.04	22.00	-24.04	peak

Remarks: 1. Result=Reading+Cab_L

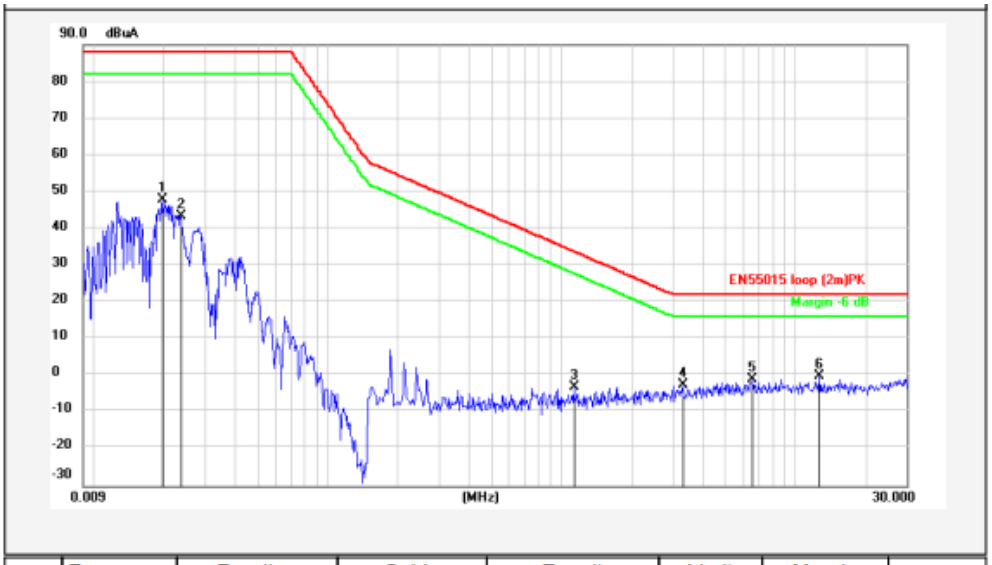
EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.22
Polarization:	Y	Test Voltage:	AC 230V/50Hz
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuA)	Cable (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector
1	0.0206	31.39	0.04	31.43	88.00	-56.57	peak
2	0.9106	-2.84	0.19	-2.65	36.33	-38.98	peak
3	2.6206	-3.34	0.25	-3.09	23.62	-26.71	peak
4	4.4791	-1.81	0.34	-1.47	22.00	-23.47	peak
5	11.0626	-1.25	0.48	-0.77	22.00	-22.77	peak
6	14.6851	-1.92	0.55	-1.37	22.00	-23.37	peak

Remarks: 1. Result=Reading+Cab_L

EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.22
Polarization:	Z	Test Voltage:	AC 230V/50Hz
Operator:	Bing	Note:	



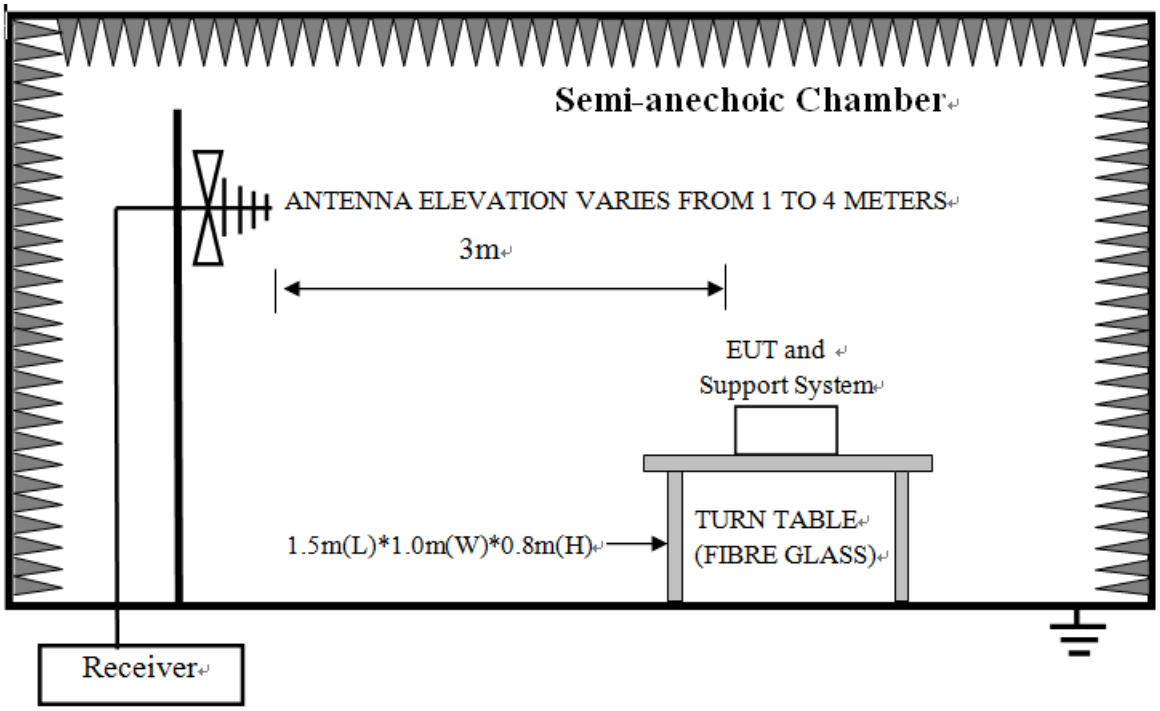
No.	Frequency (MHz)	Reading (dBuA)	Cable (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector
1	0.0198	47.76	0.04	47.80	88.00	-40.20	peak
2	0.0235	43.39	0.04	43.43	88.00	-44.57	peak
3	1.1356	-3.48	0.19	-3.29	33.67	-36.96	peak
4	3.3091	-2.79	0.29	-2.50	22.00	-24.50	peak
5	6.6211	-1.44	0.42	-1.02	22.00	-23.02	peak
6	12.7366	-0.74	0.51	-0.23	22.00	-22.23	peak

Remarks: 1. Result=Reading+Cab_L

5 RADIATED EMISSION TEST

5.1 Block Diagram of Test Setup

30~1000MHz:



5.2 Test Standard

EN IEC 55015:2019+A11:2020

5.3 Limits for radiated disturbance

Frequency MHz	Distance	Limits dB(μV)/m
30 ~ 230	3m	40(Quasi Peak)
230 ~ 1000	3m	47(Quasi Peak)

5.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Mar 23, 2022	21°C	66%	100.6kPa

5.5 Test Procedure

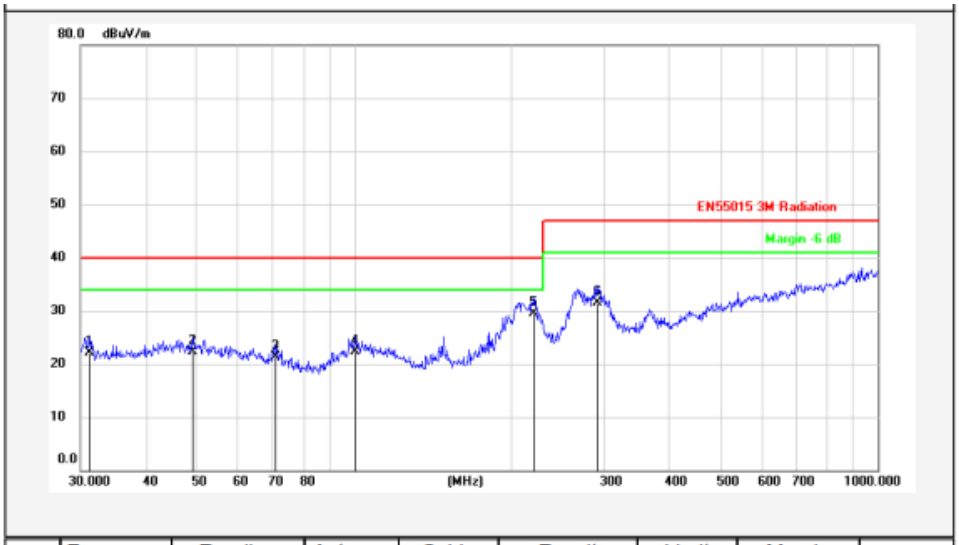
The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth setting on the test receiver was 120 kHz.

5.6 Test Data

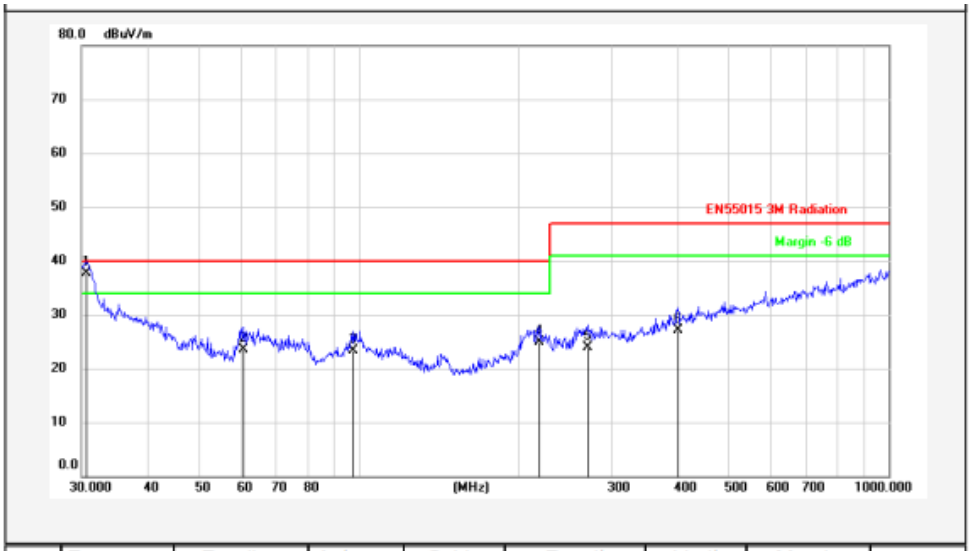
EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.23
Polarization:	Horizontal	Test Voltage:	AC 230V /50Hz
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.1798	8.86	11.92	1.32	22.10	40.00	-17.90	QP
2	49.1865	6.67	14.1	1.53	22.30	40.00	-17.70	QP
3	70.5836	9.76	10.01	1.63	21.40	40.00	-18.60	QP
4	100.5806	7.64	12.68	2.08	22.40	40.00	-17.60	QP
5	220.6171	14.60	11.91	2.99	29.50	40.00	-10.50	QP
6	291.0360	14.58	13.63	3.29	31.50	47.00	-15.50	QP

Remarks:1. Result=Reading+Antenna+Cable
2. If Peak Result complies with QP Limit, QP Result is deemed to comply with QP Limit.

EUT:	Version M waterproof intelligent power supply	Model Name:	BV-ISLW240 24MW
Test Mode:	Full load	Test Date:	2022.3.23
Polarization:	Vertical	Test Voltage:	AC 230V /50Hz
Operator:	Bing	Note:	

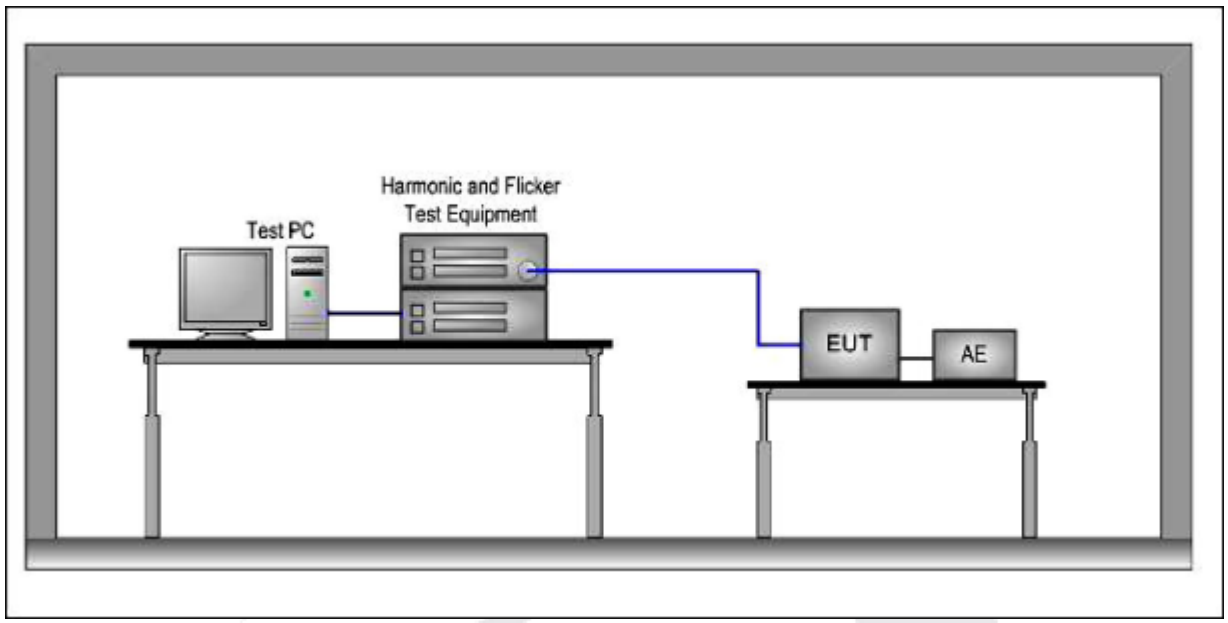


No.	Frequency (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Cable (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.6379	24.62	11.86	1.32	37.80	40.00	-2.20	QP
2	60.7044	10.20	11.97	1.43	23.60	40.00	-16.40	QP
3	97.7983	9.23	12.13	2.04	23.40	40.00	-16.60	QP
4	219.0753	10.04	11.88	2.98	24.90	40.00	-15.10	QP
5	270.3748	7.34	13.46	3.2	24.00	47.00	-23.00	QP
6	400.4319	8.86	14.41	3.93	27.20	47.00	-19.80	QP

Remarks:1. Result=Reading+Antenna+Cable
2. If Peak Result complies with QP Limit, QP Result is deemed to comply with QP Limit.

6 HARMONIC CURRENT EMISSION TEST

6.1 Block Diagram of Test Setup



6.2 Test Standard

EN IEC 61000-3-2:2019, Class C

6.3 Limits of Harmonic Current

Limits for Class C equipment	
Harmonic order n	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	30 • λ*
5	10
7	7
9	5
11≤n≤39 （odd harmonics only）	3
*λ is the circuit power factor	

6.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Mar 22, 2022	24°C	54%	101.3kPa

The details of test modes are as follows：

No.	Test Mode
1.	Full load

6.5 Test Procedure

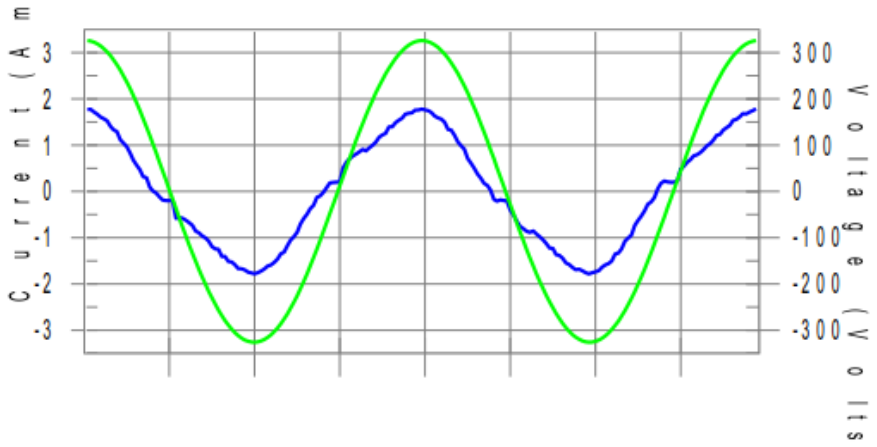
The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The 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.

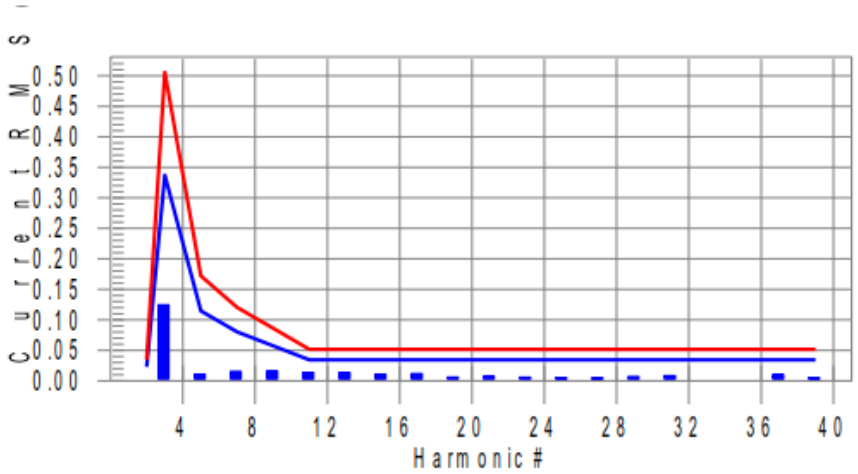
6.6 Test Data

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class C limit line **European Limits**



Test result: Pass **Worst harmonics H11-26.7% of 150% limit, H11-39.8% of 100% limit**

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Test Result: Pass **Source qualification: Normal**
THC(A): 0.131 **I-THD(%): 11.4** **POHC(A): 0.020** **POHC Limit(A): 0.109**

Highest parameter values during test:

V_RMS (Volts):	230.61	Frequency(Hz):	50.00
I_Peak (Amps):	1.814	I_RMS (Amps):	1.156
I_Fund (Amps):	1.147	Crest Factor:	1.570
Power (Watts):	260.9	Power Factor:	0.979

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	0.023	N/A	0.003	0.034	N/A	Pass
3	0.124	0.337	36.9	0.125	0.506	24.8	Pass
4	0.002	0.000	N/A	0.002	0.000	N/A	Pass
5	0.011	0.115	9.5	0.011	0.172	6.5	Pass
6	0.001	0.000	N/A	0.001	0.000	N/A	Pass
7	0.016	0.080	19.5	0.016	0.120	13.4	Pass
8	0.000	0.000	N/A	0.000	0.000	N/A	Pass
9	0.016	0.057	27.6	0.016	0.086	18.6	Pass
10	0.000	0.000	N/A	0.000	0.000	N/A	Pass
11	0.014	0.034	39.8	0.014	0.052	26.7	Pass
12	0.000	0.000	N/A	0.000	0.000	N/A	Pass
13	0.014	0.034	39.4	0.014	0.052	26.4	Pass
14	0.000	0.000	N/A	0.000	0.000	N/A	Pass
15	0.011	0.034	31.7	0.011	0.052	21.3	Pass
16	0.000	0.000	N/A	0.000	0.000	N/A	Pass
17	0.012	0.034	34.7	0.012	0.052	23.4	Pass
18	0.000	0.000	N/A	0.000	0.000	N/A	Pass
19	0.006	0.034	N/A	0.006	0.052	N/A	Pass
20	0.000	0.000	N/A	0.000	0.000	N/A	Pass
21	0.008	0.034	21.9	0.008	0.052	14.8	Pass
22	0.000	0.000	N/A	0.000	0.000	N/A	Pass
23	0.006	0.034	N/A	0.006	0.052	N/A	Pass
24	0.000	0.000	N/A	0.000	0.000	N/A	Pass
25	0.005	0.034	N/A	0.005	0.052	N/A	Pass
26	0.000	0.000	N/A	0.000	0.000	N/A	Pass
27	0.005	0.034	N/A	0.005	0.052	N/A	Pass
28	0.000	0.000	N/A	0.000	0.000	N/A	Pass
29	0.007	0.034	20.3	0.007	0.052	14.3	Pass
30	0.000	0.000	N/A	0.000	0.000	N/A	Pass
31	0.008	0.034	24.4	0.008	0.052	16.5	Pass
32	0.000	0.000	N/A	0.000	0.000	N/A	Pass
33	0.002	0.034	N/A	0.003	0.052	N/A	Pass
34	0.000	0.000	N/A	0.000	0.000	N/A	Pass
35	0.001	0.034	N/A	0.002	0.052	N/A	Pass
36	0.000	0.000	N/A	0.000	0.000	N/A	Pass
37	0.010	0.034	30.2	0.010	0.052	20.3	Pass
38	0.000	0.000	N/A	0.000	0.000	N/A	Pass
39	0.005	0.034	N/A	0.005	0.052	N/A	Pass
40	0.000	0.000	N/A	0.001	0.000	N/A	Pass

Test Result: Pass **Source qualification: Normal**

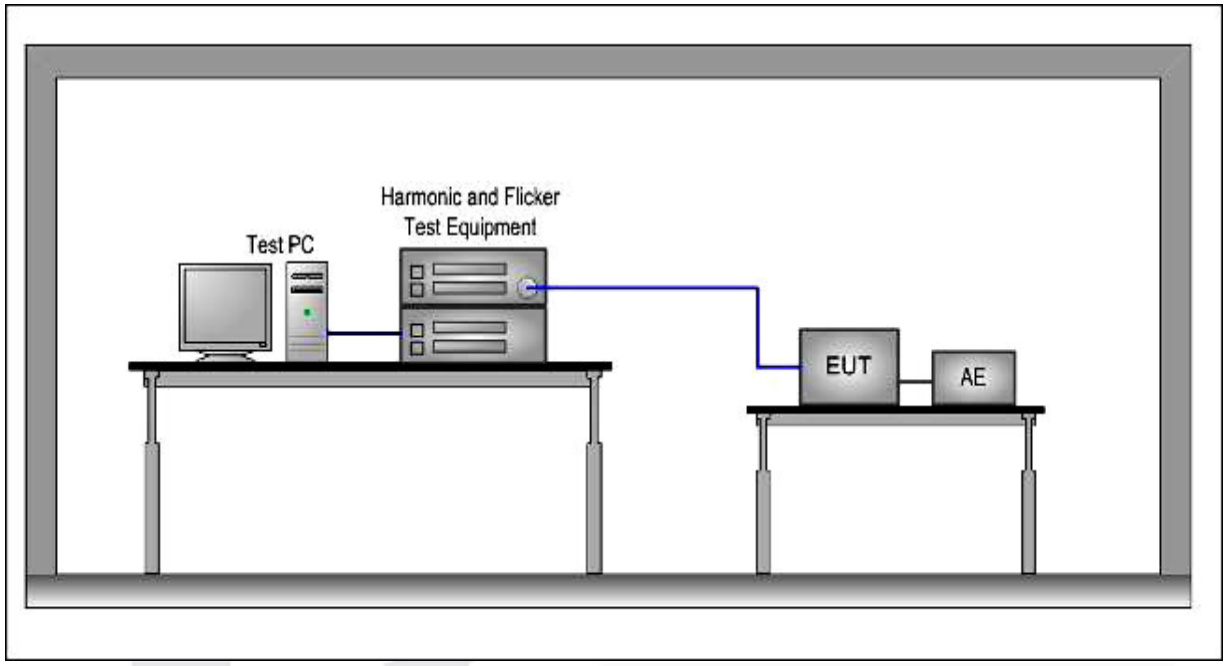
Highest parameter values during test:

Voltage (Vrms):	230.61	Frequency(Hz):	50.00
I_Peak (Amps):	1.814	I_RMS (Amps):	1.156
I_Fund (Amps):	1.147	Crest Factor:	1.570
Power (Watts):	260.9	Power Factor:	0.979

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.067	0.461	14.51	OK
3	0.459	2.075	22.14	OK
4	0.038	0.461	8.20	OK
5	0.032	0.922	3.44	OK
6	0.022	0.461	4.81	OK
7	0.071	0.692	10.21	OK
8	0.012	0.461	2.54	OK
9	0.048	0.461	10.47	OK
10	0.011	0.461	2.39	OK
11	0.032	0.231	14.00	OK
12	0.014	0.231	6.24	OK
13	0.014	0.231	5.95	OK
14	0.007	0.231	2.93	OK
15	0.004	0.231	1.71	OK
16	0.007	0.231	2.96	OK
17	0.010	0.231	4.17	OK
18	0.005	0.231	2.34	OK
19	0.006	0.231	2.41	OK
20	0.011	0.231	4.74	OK
21	0.004	0.231	1.84	OK
22	0.004	0.231	1.75	OK
23	0.007	0.231	2.87	OK
24	0.003	0.231	1.19	OK
25	0.006	0.231	2.82	OK
26	0.002	0.231	0.90	OK
27	0.005	0.231	2.38	OK
28	0.003	0.231	1.18	OK
29	0.011	0.231	4.60	OK
30	0.003	0.231	1.32	OK
31	0.011	0.231	4.89	OK
32	0.002	0.231	0.83	OK
33	0.005	0.231	2.32	OK
34	0.003	0.231	1.15	OK
35	0.002	0.231	0.89	OK
36	0.002	0.231	1.05	OK
37	0.016	0.231	6.80	OK
38	0.002	0.231	1.00	OK
39	0.007	0.231	3.02	OK
40	0.007	0.231	2.89	OK

7 VOLTAGE FLUCTUATIONS & FLICKER TEST

7.1 Block Diagram of Test Setup



7.2 Test Standard

EN 61000-3-3:2013+A1:2019

7.3 Limits of Voltage Fluctuation and Flick

Test Item	Limit	Note
Pst	1.0	Pst means Short-term flicker indicator
Plt	0.65	Plt means long-term flicker indicator
Tmax	500ms	Tmax means maximum time that d(t) exceeds 3.3%
dmax(%)	4%	dmax means maximum relative voltage change.
dc(%)	3.3%	dc means relative steady-state voltage change.

7.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Mar 22, 2022	24°C	54%	101.3kPa

The details of test modes are as follows：

No.	Test Mode
1.	Full load

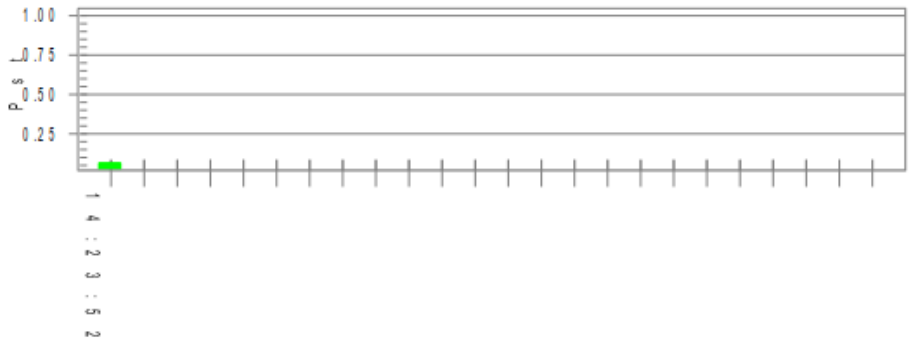
7.5 Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters 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.

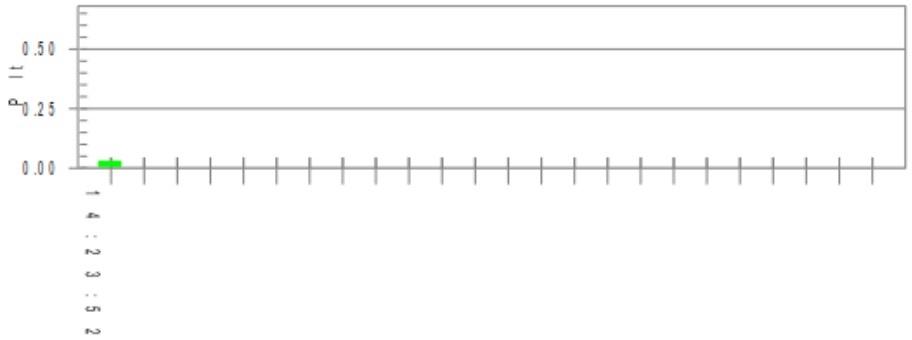
7.6 Test Data

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**230.41**			
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.028**	**Test limit:**	**0.650**	**Pass**

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8 IMMUNITY TEST RESULT

Description of Performance Criteria:

Performance criteria A

During and 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 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.

Performance criteria 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 phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaces by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is 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 except from the equipment if used as intended.

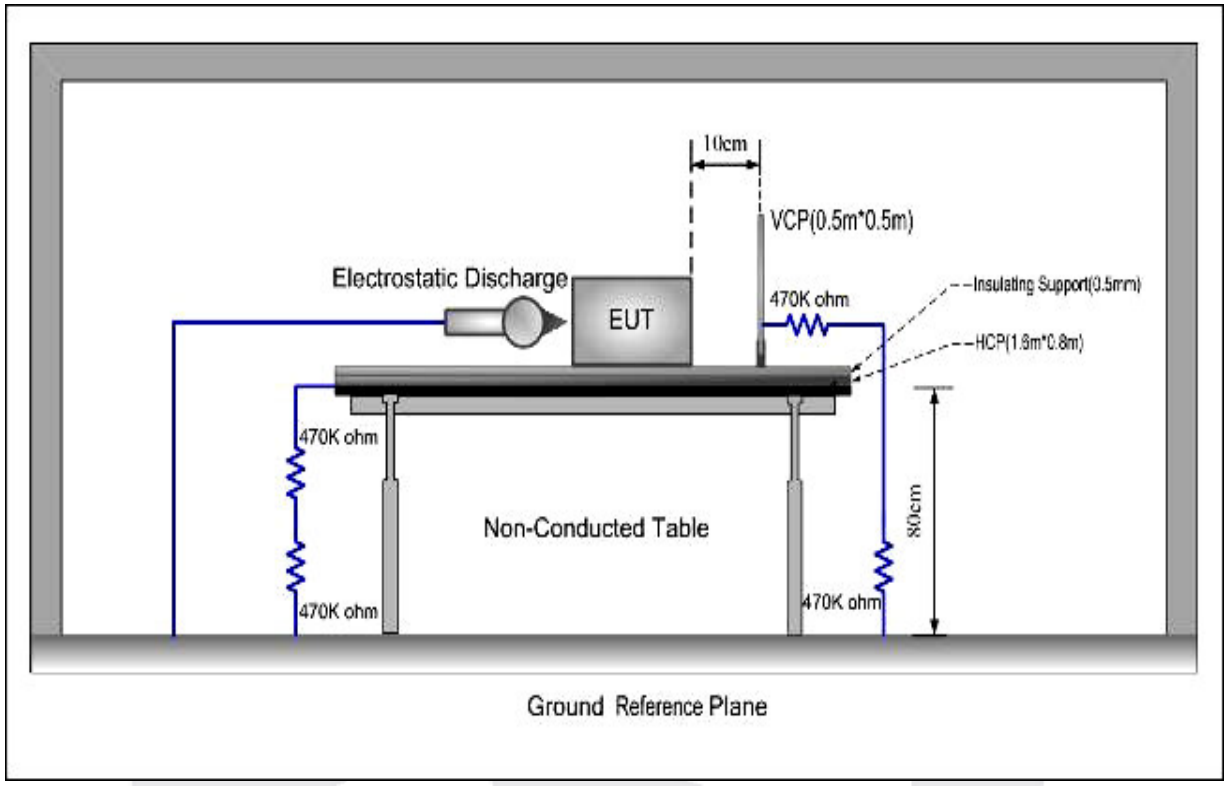
Performance criteria C

During and after testing, a temporary 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 backup, shall not be lost.

9 ELECTROSTATIC DISCHARGE TEST

9.1 Block Diagram of Test Setup



9.2 Test Standard

EN 61547:2009 (EN 61000-4-2)
(Severity Level 1&2&3 for Air Discharge at 2kV 4kV 8kV;
Severity Level 1&2 for Contact Discharge at 2kV 4kV)

9.3 Severity Levels and Performance Criterion

Severity Levels	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)	Performance criterion
1.	2	2	B
2.	4	4	
3.	6	8	
4.	8	15	
x	Special	Special	

9.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	Full load

9.5 Test Procedure

9.5.1 Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed.

9.5.2 Contact Discharge:

All the procedure was same as Section 8.5.1. except that the generator was re-triggered for a new single discharge and repearted 50 times for each pre-selected test point. The tip of the discharge electrode was touch the EUT before the discharge switch was operated.

9.5.3 Indirect discharge for horizontal coupling plane

At least 20 single discharges were applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

9.5.4 Indirect discharge for vertical coupling plane

At least 20 single discharge were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.6 Test Data

Electrostatic Discharge Test Results

EUT	:	Version M waterproof intelligent power supply	Temperature	:	22℃
M/N	:	BV-ISLW240 24MW	Humidity	:	55%
Test Voltage	:	AC 230V/50Hz	Test Date	:	2022.3.24
Test Engineer	:	Bing	Pressure	:	101.3kPa
Required Performance	:	B	Actual Performance	:	A

Air Discharge: ±2kV ±4kV ±8kV	# For Air Discharge each Point Positive ＞25 times and negative ＞25 times discharge
Contact Discharge: ±2kV ±4kV	# For Contact Discharge each point positive ＞25 times and negative ＞25 times discharge

For the time interval between successive single discharges an initial value of one second.
After discharge to the ungrounded part of EUT, it needs the bleeder resistor to remove the charge prior to next ESD pulse

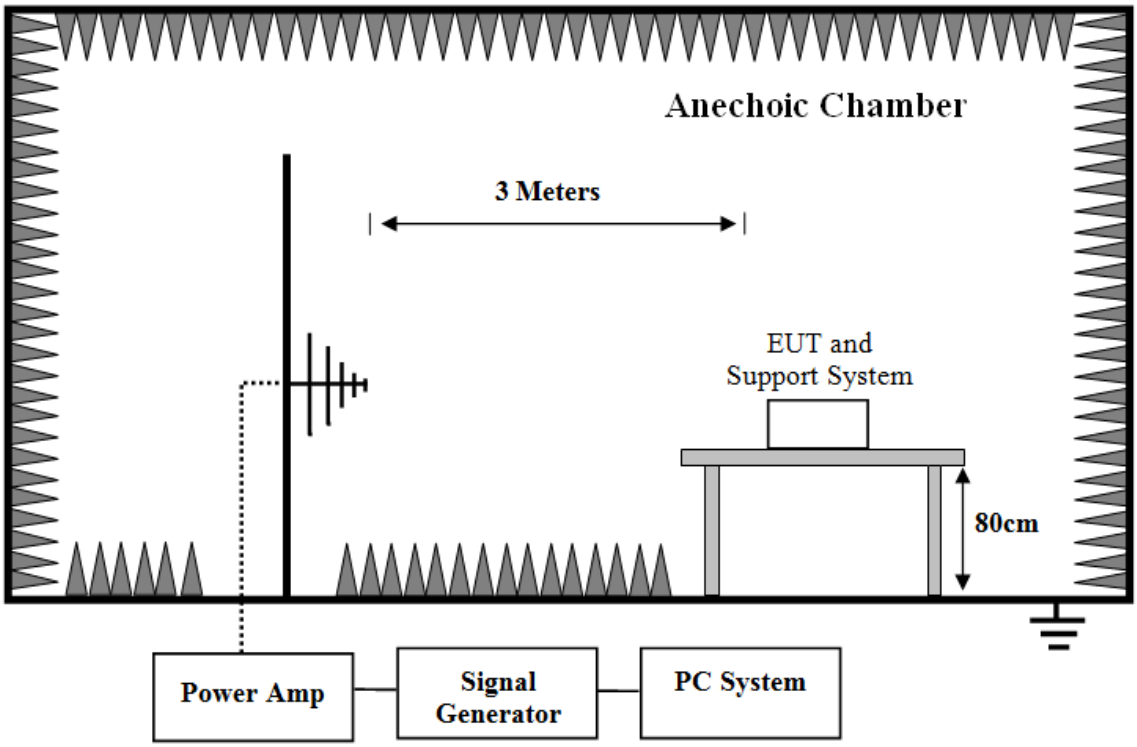
Discharge Voltage (kV)	**Type of discharge**	**Dischargeable Points**	**Performance**		**Result (Pass/Fail)**
			Required	**Observation**	
±2	Contact	Center of VCP	B	A	**Pass**
±4	Contact	Center of HCP	B	A	**Pass**
±4	Contact	1	B	A	**Pass**
±8	Air	2	B	A	**Pass**

1	Metal Shell	8	/
2	Gap	9	/
3	/	10	/
4	/	11	/
5	/	12	/
6	/	13	/
7	/	14	/

Performance:
The EUT was no change compared with initial operation during the test.

10 Radio Frequency Electromagnetic Field Immunity Test

10.1 Block Diagram of Test Setup



10.2 Test Standard

EN 61547:2009 (EN 61000-4-3),

Frequency Range：80-1000MHz

Severity Level 2 at 3V/m

Radio Frequency Electromagnetic Field Immunity Test levels

Level	Test field strength V/m
1	1
2	3
3	10
4	30
X	Special
Note: X is an opoen test level and the associated field strength may be any value. This level may be given in the product standard.	

10.3 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	Full load

10.4 Test Procedure

The field sensor is placed on the EUT table (0.8 meter above the ground) which is 3 meters away from the transmitting antenna. Through the signal generator, power amplifier and transmitting antenna to produce a uniformity field strength (3V/m measured by field sensor) around the EUT table from frequency range specified and records the signal generator‘s output level at the same time for whole measured frequency range. Then, put EUT and its simulators on the EUT turn table and keep them 3 meters away from the transmitting antenna which is mounted on an antenna tower and fixes at 1 meter height above the ground. Using the recorded signal generator’s output level to measure the EUT from frequency range specified and both horizontal & vertical polarization of antenna must be set and measured. Each of the four sides of EUT must be faced this transmitting antenna and measures individually.

All the scanning conditions are as follows **:**

Test Level	
Frequency	80-1000MHz
Test level	3V/m (Severity Level 2)
Antenna polarization	Horizontal & Vertical
Modulation	80%, 1kHz Amplitude Modulation
Steps increment	1%

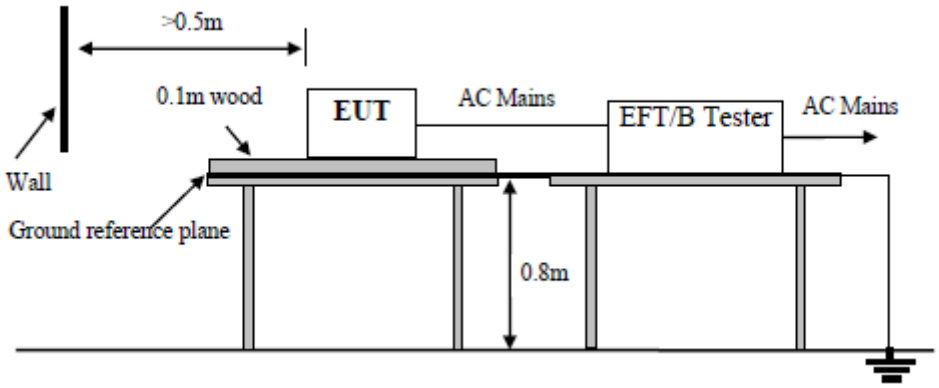
10.5 Test Data

Radio-frequency Continuous radiated disturbance Test Results

Field Strength (V/m)	Test Frequency (MHz)	Test mode (worst case)	Polarization of antenna	Required Performance	Actual Performance	Result
3	80-1000MHz,	Full load	H	A	A	PASS
			V	A	A	

11 ELECTRICAL FAST TRANSIENT/BURST TEST

11.1 . Block Diagram of Test Setup



11.2 Test Standard

EN 61547:2009 (EN 61000-4-4)

11.3 Severity Levels and Performance Criterion

Open Circuit Output Test Voltage ±10%			
Severity Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines	Performance criterion
1.	0.5KV	0.25KV	B
2.	1KV	0.5KV	
3.	2KV	1KV	
4.	4KV	2KV	
X	Special	Special	
The use of 5 kHz repetition frequency is traditional, however, 100 kHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. With some products, there may be no clear distinction between power ports and signal ports, in which case it is up to product committees to make this determination for test purposes.			
a "X" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification.			

11.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	Full load

11.5 Test Procedure

The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. The length of signal and power cable between EUT and EFT generator was 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

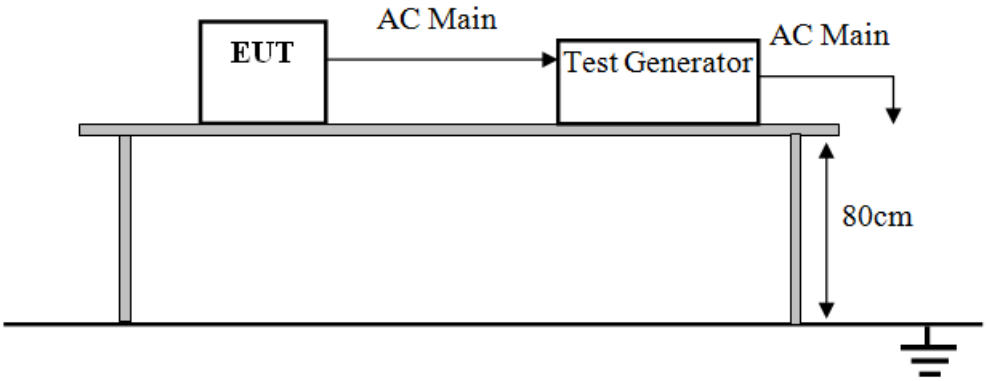
11.6 Test Data

Electrical fast transient Test Results

Coupling Ports		Coupling Voltage	Inject Method	Result
AC Power Ports	L-N	±1 kV	Direct	Pass
	L-N-PE	±1 kV	Direct	Pass
Remark: There was no change compared with initial operation during the test.				

12 SURGE TEST

12.1 Block Diagram of Test Setup



12.2 Test Standard

EN 61547:2009 (EN 61000-4-5)

12.3 Severity Levels and Performance Criterion

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

12.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	Full load

12.5 Test Procedure

2Ω effective output impedance of the generator was used for L-N test.12Ω effective output impedance of the generator was used for L-PE,N-PE test.

5 positive and 5 negative (polarity) tests were applied successively synchronized to the voltage phase, 90°, 270°to L-N respectively. The repetition rate was 1 per minute during test.

(1). For input and AC power ports:
The EUT was connected to the power mains by using a coupling device which coupled the surge interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration was 1 minute.
(2). For signal lines and control lines ports:
None.
(3). For DC input and DC output power ports:
None.

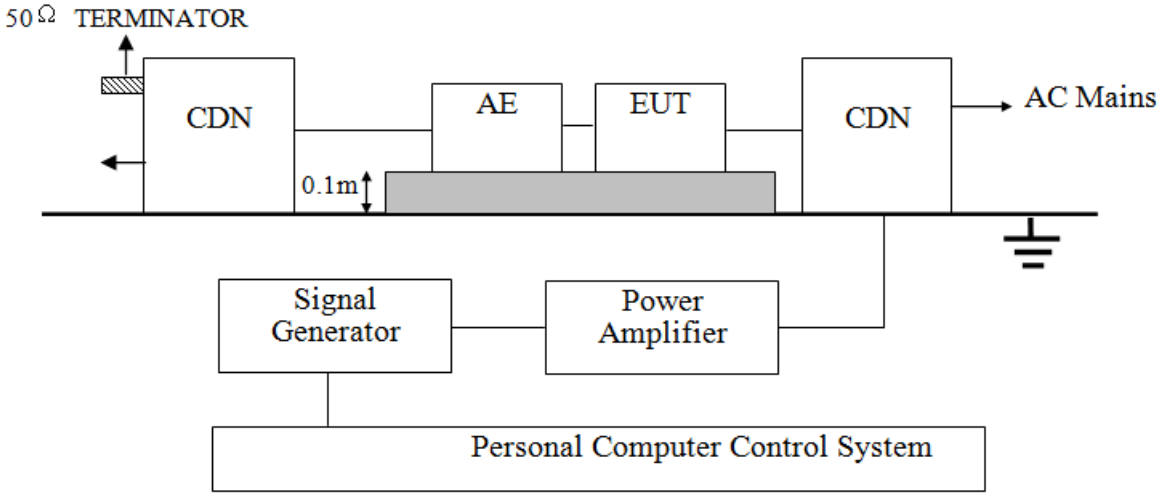
12.6 Test Data

Surge Immunity Test Results

Coupling Ports		Coupling Voltage	Coupling Phase / Result			
			0°	90°	180°	270°
AC power ports	L-N	+/-1kV Direct	/	Pass	/	Pass
	L-PE	+/-2kV Direct	/	Pass	/	Pass
	N-PE	+/-2kV Direct	/	Pass	/	Pass
Remark: There was no change compared with initial operation during the test.						

13 RADIO-FREQUENCY CONTINUOUS CONDUCTED DISTURBANCE TEST

13.1 Block Diagram of Test Setup



13.2 Test Standard

EN 61547:2009 (EN 61000-4-6)

13.3 Severity Levels and Performance Criterion

Level	Voltage Level (e.m.f.) V
1.	1
2.	3
3.	10
X	Special

13.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	Full load

13.5 Test Procedure

The EUT were placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) was placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT were as short as possible, and their height above the ground reference plane were between 30 and 50 mm (where possible).

The frequency range was swept from 0.15 MHz - 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

The rate of sweep shall not exceed 1.5*10-3decades/s.Where the frequency was swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value

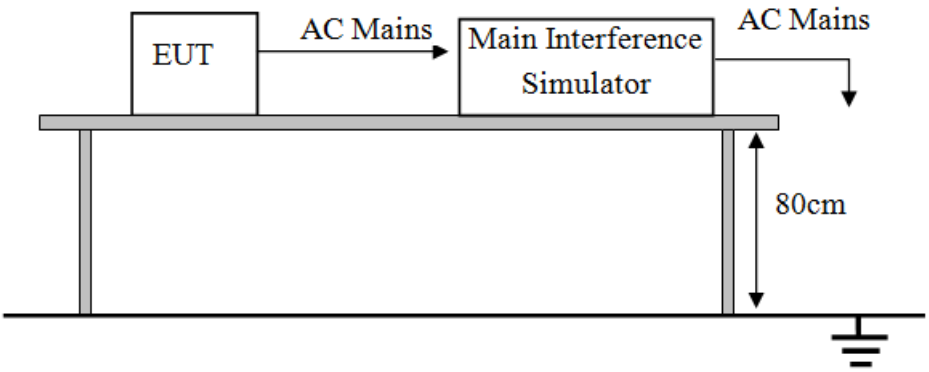
13.6 Test Data

Radio-frequency Continuous conducted disturbance Test Results

Voltage (V)	Test Frequency (MHz)	Test mode (worst case)	Injection Method	Required	Observation	Result
3	0.15 –80 MHz	Full load	CDN-M3	A	A	PASS

14 VOLTAGE DIPS AND INTERRUPTIONS TEST

14.1 Block Diagram of Test Setup



14.2 Test Standard

EN 61547:2009 (EN 61000-4-11)

14.3 Severity Levels and Performance Criterion

Test category	reduction	Periods	Performance criterion
Voltage dips	100%	0.5P	B
Voltage dips	30%	10P	C

14.4 Operating Condition of EUT

The details of test modes are as follows:

No.	Test Mode
1.	Full load

14.5 Test Procedure

1) The EUT and test generator were setup as shown on Section 14.1.
2) The interruptions are introduced at selected phase angles with specified duration.
3) Record any degradation of performance.

14.6 Test Data

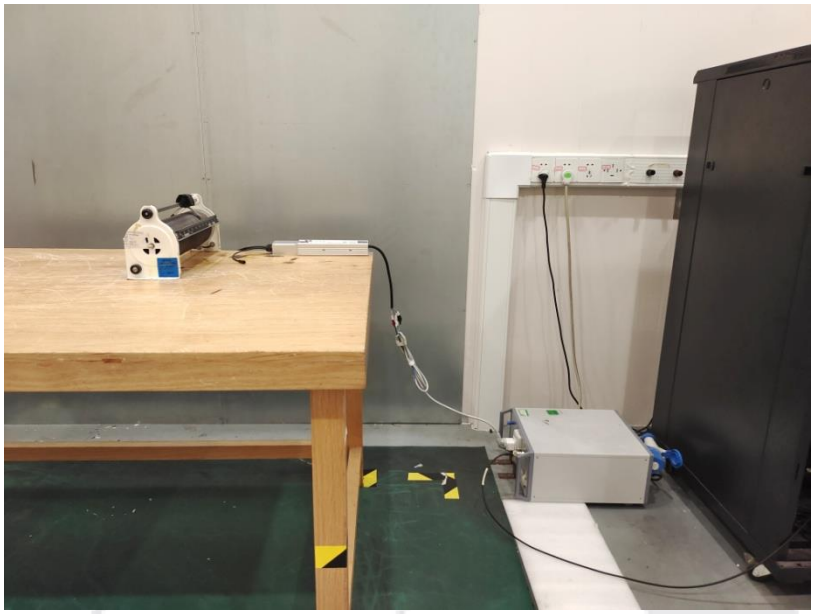
Voltage Dips and Short Interruptions Immunity Test Result

Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in period)	Criterion	Result
0	100	0.5P	B	PASS
70	30	25P	C	PASS

Remark: The light was flashing during the test, but self-recoverable after the test

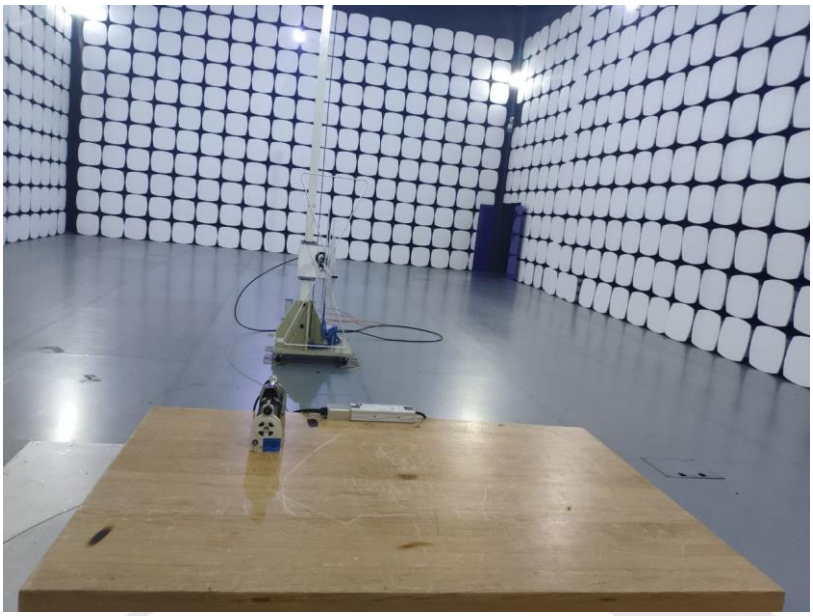
15 Test setup photo

Conducted disturbance at mains terminals Test



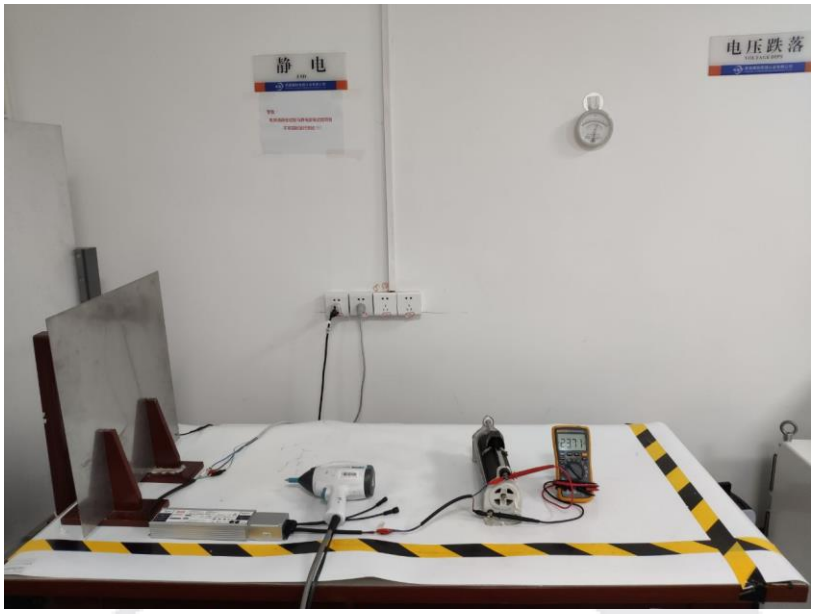
Radiated Electromagnetic Disturbance Test

Radiated Disturbance Test

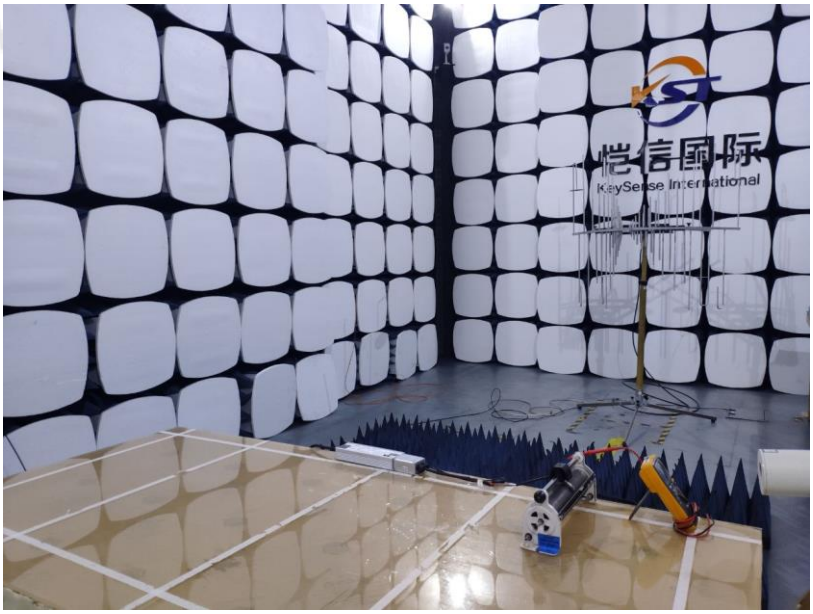


Harmonic current emission & Voltage fluctuations &flicker Test

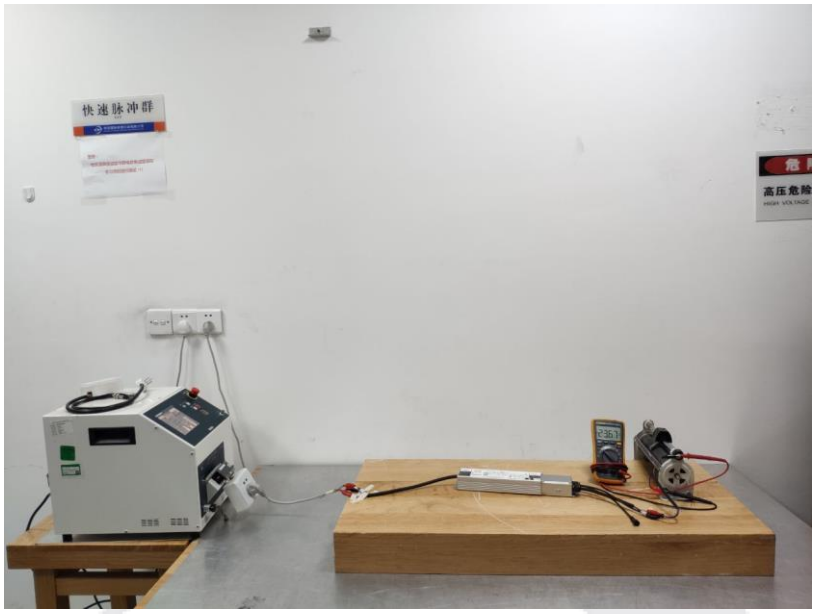
Electrostatic discharge Test



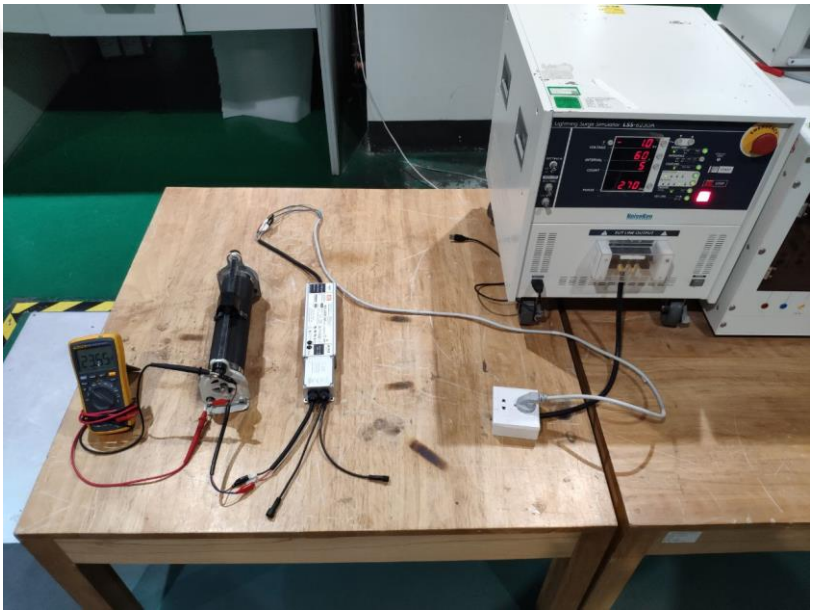
Radio-frequency Continuous radiated disturbance Test



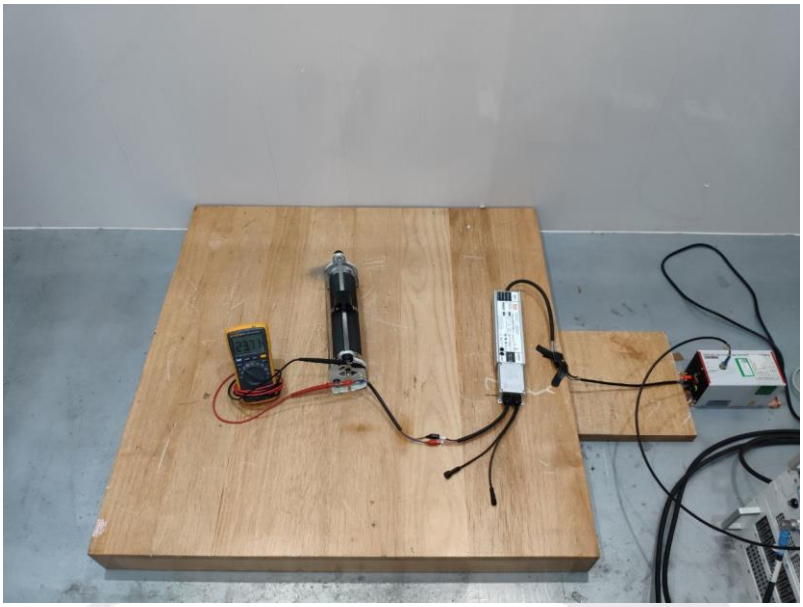
Electrical fast transient Test



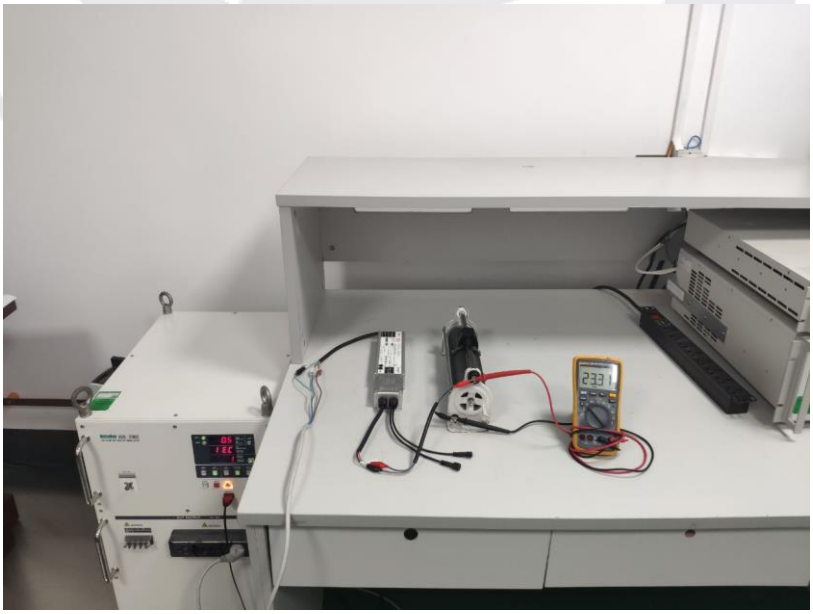
Surge Test



Radio-frequency, Continuous conducted disturbance Test

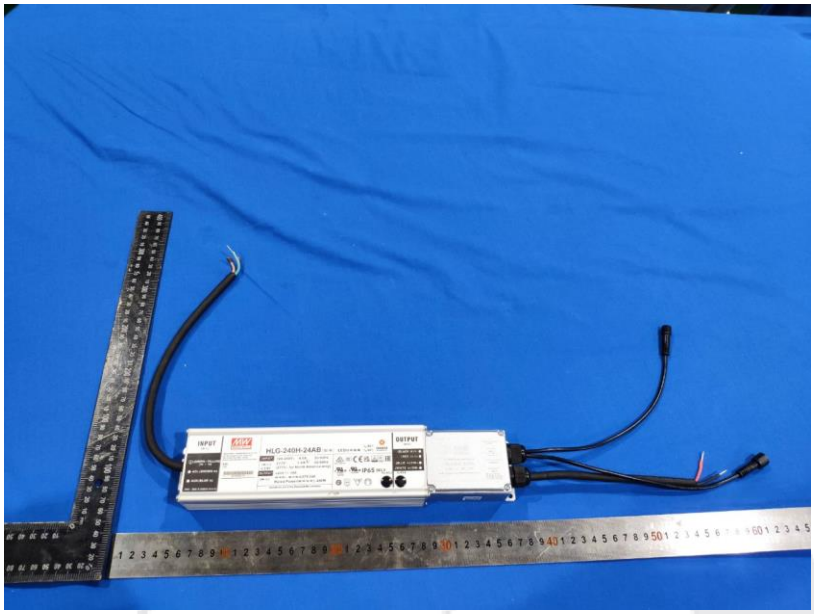


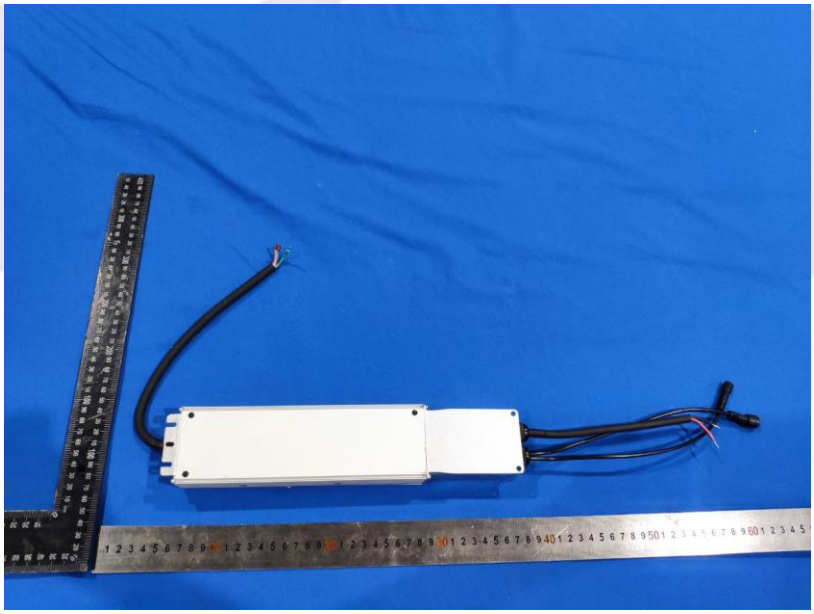
Voltage dips & interruption Test



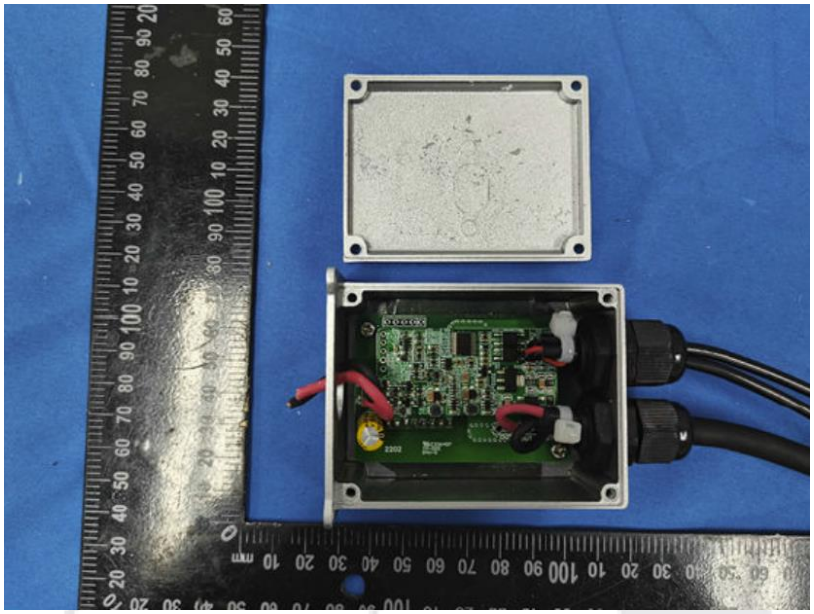
16 PHOTOS OF THE EUT

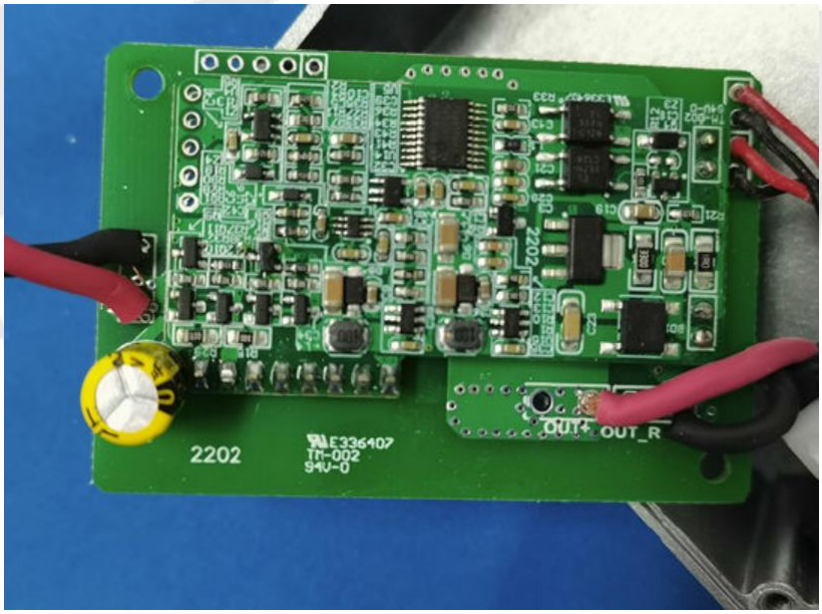
EUT photos



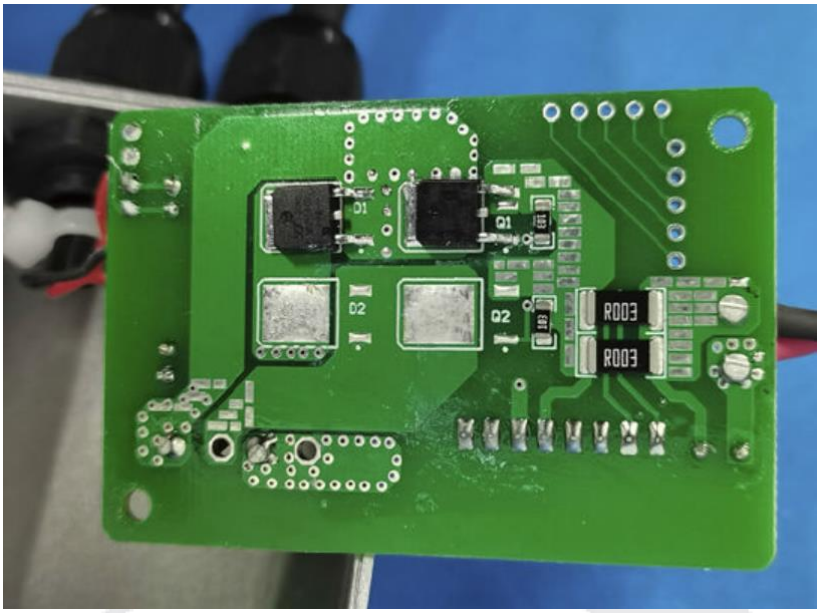


EUT photos





EUT photos



End of Report

Statement

1. The calibration and measurement of test equipments used in our laboratory are traceable to National primary standard of measurement and BIPM.
2. The report is invalid without the special test seal of the company.
3. The test report is invalid without the signature of main tester,examiner and approver.
4. The report is invalid if altered and added or deleted.
5. The test results in this report only apply to the tested samples.
6. This test report shall not be reproduced except in full, without the written approval of our laboratory.
7. “☆”item cannot be Accredited by CNAS.
8. Any objections must be raised to KeySense within 15days since the date when report is received.

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Address: 1-3F,Lab Building,No.29 District,ZhongKai Hi-Tech Industrial Development Park,Huizhou,Guangdong,China

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