

TEST REPORT

Applicant: Guangzhou Kinouwell Technology Co., Ltd
Address: Floor 6 NO.737 comprehensive building, Qiaoxing Avenue,
Panyu District, Guangzhou ,China
Manufacturer: Zhuhai Piwin New Energy Co., Ltd
Address: No. 15, Science and Technology 6th Road, Science and
Technology Innovation Coast, Tangjiawan Town, High-tech
Zone, Xiangzhou District, Zhuhai City

Equipment Under Test (EUT)

Product Name: EV CHARGER
Model No.: PEVC2201E, PEVC2107E, PEVC3106E, PEVC3107E,
PEVC3401E, PEVC3505E, PEVC3507E, PEVC3068E,
PEVC3013E

Applicable standards: EN IEC 61000-6-3:2021
EN IEC 61000-6-1:2019
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021

Date of Test: Dec. 10, 2021 To Dec. 21, 2021

Date of report issued: Dec. 21, 2021

Test Result : PASS *

Prepared by(Engineer): Jade Tang

Reviewer(Supervisor): Aaron Tan

Approved(Manager): Jack Ma



This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of ZRC International Certification (Shenzhen) Co., Ltd

2 Version

Version No.	Date	Description
00	Dec. 21, 2021	Original

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4 Test Summary

Test Item	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission	EN 61000-6-3	CISPR 16-2-3	Class B	PASS
Conducted Emission	EN 61000-6-3	CISPR 16-2-1	Class B	PASS
Harmonic Current Emission	EN 61000-3-2	EN 61000-3-2	Class A	PASS
Voltage Fluctuations and Flicker	EN 61000-3-3	EN 61000-3-3	Clause 5 of EN 61000-3-3	PASS
Electrostatic discharges	EN 61000-6-1	EN 61000-4-2	Contact $\pm 2, 4$ kV Air $\pm 2, 4, 8$ kV	PASS
Radiated Immunity	EN 61000-6-1	EN 61000-4-3	3V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients	EN 61000-6-1	EN 61000-4-4	AC ± 1.0 kV Earth ± 2.0 kV Signal Line 0.5kV	PASS
Surges	EN 61000-6-1	EN 61000-4-5	1kV Line to Line 2kV Line to Ground	PASS
Conducted Immunity	EN 61000-6-1	EN 61000-4-6	3Vrms (emf), 80%, 1kHz Amp. Mod.	PASS
Voltage Dips and Interruptions	EN 61000-6-1	EN 61000-4-11	0 % U_T^* for 0.5per 0 % U_T^* for 1per 0 % U_T^* for 250per 70 % U_T^* for 25per	PASS

Remark:

Pass: Comply with the essential requirements in the standard.

U_T^* is the nominal supply voltage.

N/A: Not applicable.

5 General Information

5.1 Client Information

Applicant:	Guangzhou Kinouwell Technology Co., Ltd
Address of Applicant:	Floor 6 NO.737 comprehensive building, Qiaoxing Avenue, Panyu District, Guangzhou ,China
Manufacturer:	Zhuhai Piwin New Energy Co., Ltd
Address of Manufacturer:	No. 15, Science and Technology 6th Road, Science and Technology Innovation Coast, Tangjiawan Town, High-tech Zone, Xiangzhou District, Zhuhai City

5.2 General Description of E.U.T

Product Name:	EV Charger
Model No.:	PEVC2201E, PEVC2107E, PEVC3106E, PEVC3107E, PEVC3401E, PEVC3505E, PEVC3507E, PEVC3068E, PEVC3013E
Power Supply:	Input: 380Vac, 50/60Hz;32A Output:400Vac,32A

5.3 Test mode

Test mode:	
Mode:	Normal mode

5.4 Description of Support Units

None.

5.5 Deviation from Standards

None.

5.6 Abnormalities from Standard Conditions

None.

5.7 Monitoring of EUT for All Immunity Test

Visual:	Monitor the EUT output voltage.
Audio:	N/A

6 Test Instruments List

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	ZRC250	Jul. 3 2020	Jul. 2 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	ZRC251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	ZRC203	Jun. 29 2021	Jun. 28 2022
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	ZRC214	Jun. 29 2021	Jun. 28 2022
5	Double-ridged horn antenna	SCHWARZBECK	9120D	ZRC208	Jun. 29 2021	Jun. 28 2022
6	RF Amplifier	HP	8347A	ZRC204	Jun. 29 2021	Jun. 28 2022
7	Broadband Preamplifier	SCHWARZBECK	BBV9718	ZRC535	Jun. 29 2021	Jun. 28 2022
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	ZRC	N/A	ZRC210	N/A	N/A
10	Coaxial Cable	ZRC	N/A	ZRC211	N/A	N/A
11	Thermo meter	KTJ	TA328	ZRC256	Jun. 29 2021	Jun. 28 2022

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	ZRC252	Jun. 29 2021	Jun. 28 2022
2	EMI Test Receiver	R&S	ESCI 7	ZRC552	Jun. 29 2021	Jun. 28 2022
3	Pulse Limiter	R&S	ESH3-Z2	ZRC224	Jun. 29 2021	Jun. 28 2022
4	Coaxial Switch	ANRITSU CORP	MP59B	ZRC225	Jun. 29 2021	Jun. 28 2022
5	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	ZRC226	Jun. 29 2021	Jun. 28 2022
6	Coaxial Cable	ZRC	N/A	ZRC227	N/A	N/A
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	ZRC233	Jun. 29 2021	Jun. 28 2022
9	ISN	EMTEST	FCC-TLISN-T8-02	ZRC563	Jun. 29 2021	Jun. 28 2022

EFT, Surge, Voltage dips and Interruption:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	EMTEST system	EMTEST	UCS500N	ZRC239	Jun. 29 2021	Jun. 28 2022
2	Thermo meter	KTJ	TA328	ZRC233	Jun. 29 2021	Jun. 28 2022
3	Capacitive Clamp	EMTEST	HFK	ZRC557	Jun. 29 2021	Jun. 28 2022

ESD:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	ESD Simulator	KIKUSUI	KES4021A	ZRC242	Jun. 29 2021	Jun. 28 2022
2	Thermo meter	KTJ	TA328	ZRC243	Jun. 29 2021	Jun. 28 2022

Harmonic/ Flicker:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	HARMONIC/FLICKER ANALYZER	KIKUSUI	KHA1000	ZRC235	Jun. 29 2021	Jun. 28 2022
2	AC POWER SUPPLY	KIKUSUI	PCR4000LE	ZRC236	Jun. 29 2021	Jun. 28 2022
3	LINE IMPEDANCE NETWORK	KIKUSUI	LIN1020JF	ZRC237	Jun. 29 2021	Jun. 28 2022
4	Thermo meter	KTJ	TA328	ZRC256	Jun. 29 2021	Jun. 28 2022

Conducted Immunity:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Signal Generator	SCHLODER	CDG-6000-25	ZRC553	Jun. 29 2021	Jun. 28 2022
2	CDN	SCHLODER	CDN-M2+3	ZRC554	Jun. 29 2021	Jun. 28 2022
3	EM-Clapm	SCHLODER	EMCL-20	ZRC555	Jun. 29 2021	Jun. 28 2022
4	ATT	SCHLODER	ATT-6DB-100	ZRC556	Jun. 29 2021	Jun. 28 2022

Radiated Immunity:						
Item	Test Equipment	Manufacturer	Model No.	Serial NO.	Cal.Date (mm-dd-yy)	Cal.Due Date (mm-dd-yy)
1	Signal Generator	Rohde & Schwarz	SMT03	100059	Jun. 29 2021	Jun. 28 2022
2	Power Amplifier	AR	150W1000	300999	Jun. 29 2021	Jun. 28 2022
3	Power Amplifier	AR	25S1G4AM1	305993	Jun. 29 2021	Jun. 28 2022
4	Power Amplifier	AR	150A220M6	305965	Jun. 29 2021	Jun. 28 2022
5	Broadband antenna	CHASE	CBL6111C	2576	Jun. 29 2021	Jun. 28 2022
6	Horn Antenna	AR	AT4002A	2783	Jun. 29 2021	Jun. 28 2022

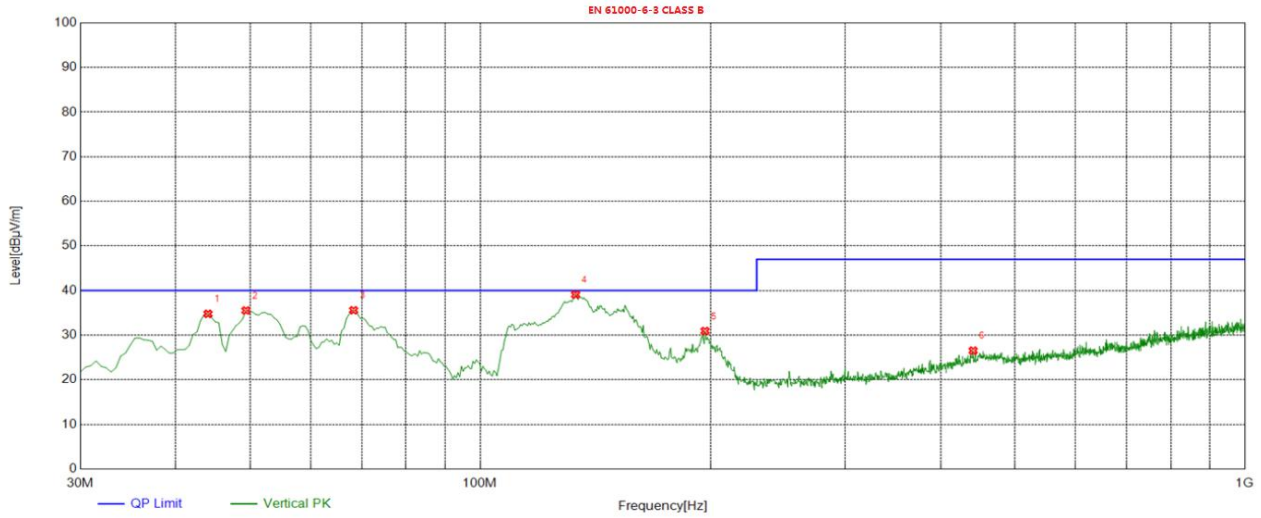
7 Emission Test Results

7.1 Radiated Emission

Test Requirement:	EN 61000-6-3		
Test Method:	CISPR 16-2-3		
Test Frequency Range:	30MHz to 1GHz		
Class / Severity:	Class B		
Measurement Distance:	3m		
Limit:	Frequency	Limit (dB μ V/m @3m)	Value
	30MHz-230MHz	40.00	Quasi-peak
	230MHz-1GHz	47.00	Quasi-peak
Test setup:			
Test Procedure:	<ol style="list-style-type: none"> 1. The radiated emissions test was conducted in a semi-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT. 4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. 		
Test environment:	Temp.: 22 °C	Humid.: 52%	Press.: 1 012mbar
Measurement Record:	Uncertainty: \pm 4.50dB		
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details, only show the test data of the worst case mode		
Test results:	Pass		

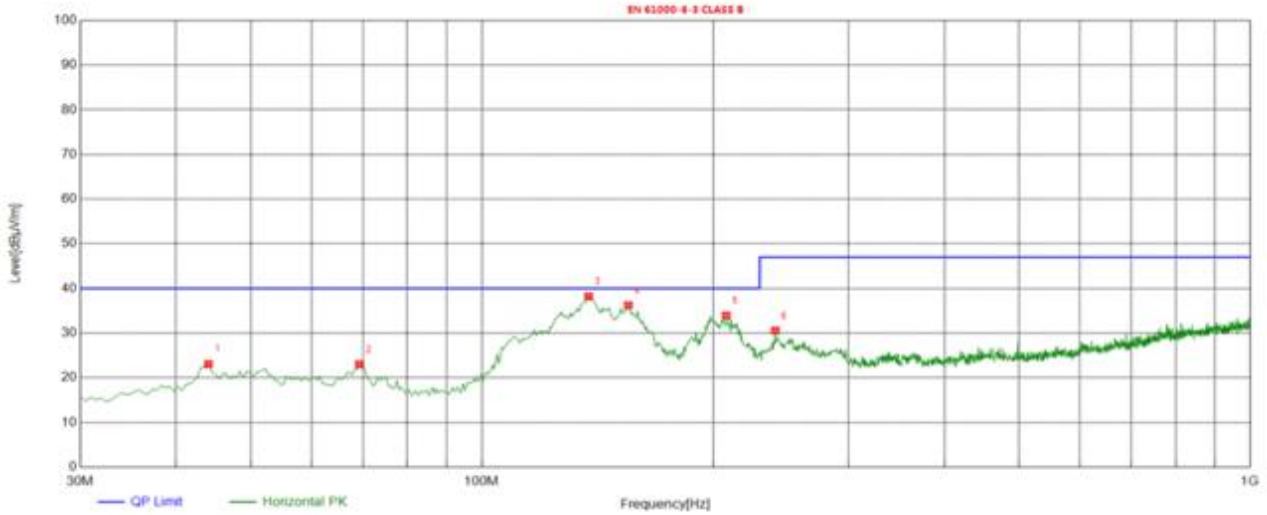
Measurement Data

Test mode:	Normal mode	Polarization:	Horizontal
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Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.0650	32.78	-13.82	40.00	7.22	100	12	Vertical
2	49.4000	33.53	-13.65	40.00	6.47	100	135	Vertical
3	68.3150	33.58	-17.25	40.00	6.42	100	12	Vertical
4	133.305	36.09	-18.77	40.00	3.91	100	176	Vertical
5	196.840	30.92	-15.36	40.00	9.08	100	166	Vertical
6	441.280	26.51	-9.36	47.00	20.49	100	56	Vertical

Test mode:	Normal mode	Polarization:	Vertical
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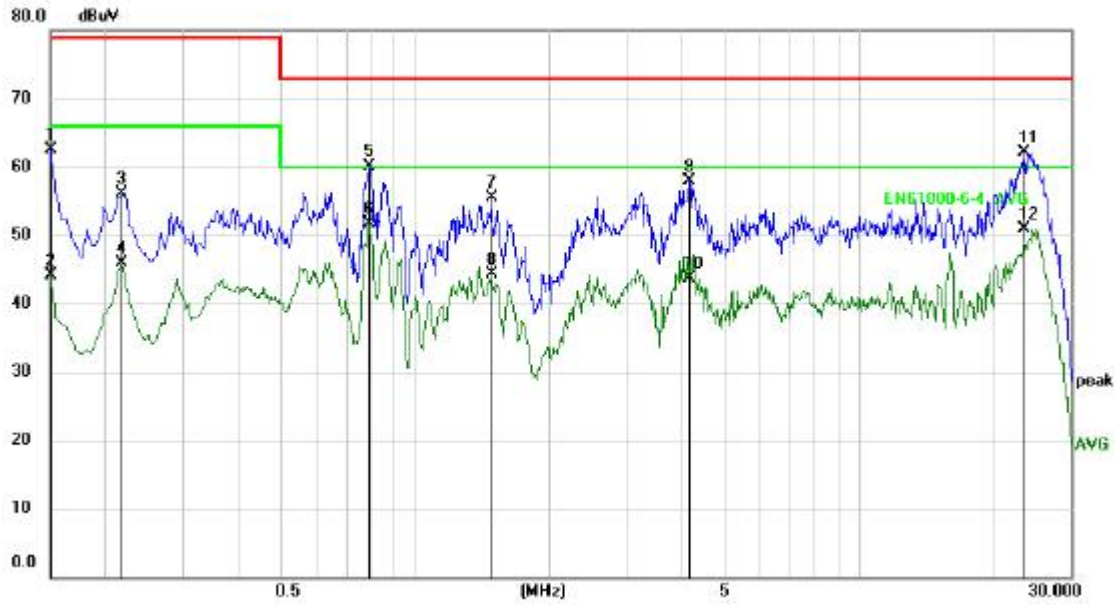
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.0650	21.06	-13.82	40.00	18.94	100	21	Horizontal
2	69.2850	21.04	-17.49	40.00	18.96	100	337	Horizontal
3	137.670	36.22	-19.04	40.00	3.78	100	14	Horizontal
4	155.130	34.23	-18.57	40.00	5.77	100	348	Horizontal
5	207.995	31.94	-14.85	40.00	8.06	100	341	Horizontal
6	240.975	30.59	-13.81	47.00	16.41	100	0	Horizontal

7.2 Conducted Emission

Test Requirement:	EN 61000-6-3		
Test Method:	CISPR 16-2-3		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class B		
Limit:	Frequency range (MHz)	Limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test setup:	<p><i>Remark</i> EUT: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>		
Test procedure:	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (LISN). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to EN55032 Class B on conducted measurement. 		
Test environment:	Temp.: 22 °C	Humid.: 51%	Press.: 1012mbar
Measurement Record:	Uncertainty: ± 3.45dB		
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

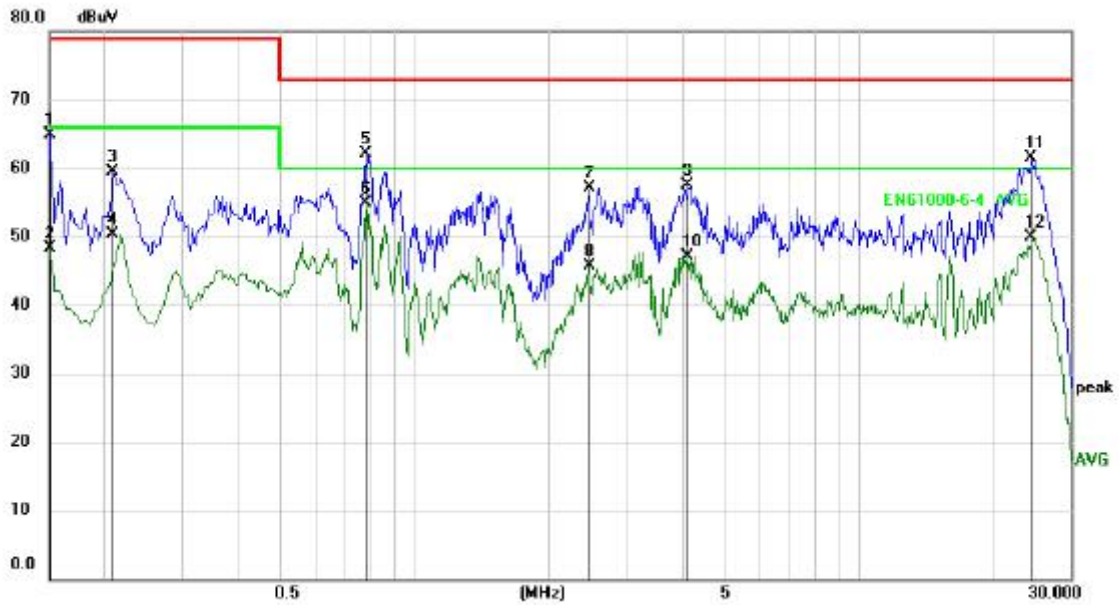
Measurement Data

Test mode:	Charging mode	Phase Polarity:	Line
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No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	52.75	9.77	62.52	79.00	-16.48	QP	
2		0.1500	34.34	9.77	44.11	66.00	-21.89	AVG	
3		0.2175	46.38	9.76	56.14	79.00	-22.86	QP	
4		0.2175	36.12	9.76	45.88	66.00	-20.12	AVG	
5		0.7845	50.19	9.83	60.02	73.00	-12.98	QP	
6	*	0.7845	41.80	9.83	51.63	60.00	-8.37	AVG	
7		1.4865	45.67	9.78	55.45	73.00	-17.55	QP	
8		1.4865	34.45	9.78	44.23	60.00	-15.77	AVG	
9		4.1550	48.04	9.87	57.91	73.00	-15.09	QP	
10		4.1550	33.81	9.87	43.68	60.00	-16.32	AVG	
11		23.5230	51.90	10.11	62.01	73.00	-10.99	QP	
12		23.5230	40.84	10.11	50.95	60.00	-9.05	AVG	

Test mode:	Charging mode	Phase Polarity:	Neutral
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No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1500	55.04	9.77	64.81	79.00	-14.19	QP	
2	0.1500	38.58	9.77	48.35	66.00	-17.65	AVG	
3	0.2085	49.66	9.76	59.42	79.00	-19.58	QP	
4	0.2085	40.54	9.76	50.30	66.00	-15.70	AVG	
5	0.7755	52.30	9.83	62.13	73.00	-10.87	QP	
6 *	0.7755	44.99	9.83	54.82	60.00	-5.18	AVG	
7	2.4630	47.25	9.81	57.06	73.00	-15.94	QP	
8	2.4630	35.86	9.81	45.67	60.00	-14.33	AVG	
9	4.1100	47.66	9.87	57.53	73.00	-15.47	QP	
10	4.1100	37.25	9.87	47.12	60.00	-12.88	AVG	
11	24.4050	51.45	10.12	61.57	73.00	-11.43	QP	
12	24.4050	39.74	10.12	49.86	60.00	-10.14	AVG	

7.3 Harmonics Test Results

Test Requirement:	EN 61000-3-2
Test Method:	N/A (See Remark)
Remark:	<p>There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2. For further details, please refer to Clause 7, Note 1 of EN 61000-3-2 which states:</p> <p>“For the following categories of equipment limits are not specified in this edition of the standard. Note 1: Equipment with a rated power of 75W or less, other than lighting equipment.”</p>

7.4 Flicker Test Result

Test Requirement:	EN 61000-3-3		
Test Method:	EN 61000-3-3		
Class/Severity:	Clause 5 of EN 61000-3-3		
Measurement Time:	10 min		
Detector:	As per EN 61000-3-3		
Test environment:	Temp.: 22°C	Humid.: 51%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data

	EUT values	Limit	Result
Pst	0.023	1.00	PASS
Plt	0.000	0.65	PASS
Dc[%]	0.000	3.30	PASS
Dmax %]	0.053	4.00	PASS
Dt [s]	0.000	0.50	PASS

8 Immunity Test Results

8.1 Performance Criteria Description in EN 61000-6-1

Criterion A:	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus 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, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.	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.
Criterion B:	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.	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 replaced 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 expect from the equipment if used as intended.
Criterion C:	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.	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.

8.2 Electrostatic Discharge

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-4-2
Discharge Voltage:	Contact Discharge: ±2kV, ±4kV Air Discharge: ±2kV, ±4kV, ±8kV HCP/VCP: ±2kV, ±4kV
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Performance Criterion:	B
Test setup:	
Test Procedure:	<p>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 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed</p> <p>2. Contact Discharge: The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated.</p> <p>3. Indirect discharge for horizontal coupling plane At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT.</p> <p>4. Indirect discharge for vertical coupling plane At least 10 single discharges 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.</p>
Test environment:	Temp.: 22 °C Humid.: 51% Press.: 1012mbar
Test mode:	Refer to section 6 for details

Test Instruments:	Refer to section 5.3 for details
Test results:	Passed

Measurement Record:

Test points:	I: N/A			
	II: Seams, USB Port, Indicator light, DC Input Port			
Direct discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observations (Performance Criterion)	Result
± 4	Contact	I	N/A	N/A
± 8	Air	II	A	Pass
Indirect discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observation Performance	Result
± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	A	Pass
± 4	VCP-Front/Back /Left/Right	Center of the VCP	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

8.3 Radiated Immunity

Test Requirement:	EN 61000-6-1		
Test Method:	EN 61000-4-3		
Frequency range:	80MHz to 1GHz, 1.4GHz to 2GHz		
Test Level:	3V/m		
Modulation:	80%, 1kHz Amplitude Modulation		
Performance Criterion:	A		
Test setup:			
Test Procedure:	<ol style="list-style-type: none"> 1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items. 2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length. 3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area). 4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Were the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value. 5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s. 6. The test normally was performed with the generating antenna facing each side of the EUT. 7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. 8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT. 		
Test environment:	Temp.: 22°C	Humid.: 52%	Press.: 1012mbar
Test Instruments:	Refer to section 6 for details		
Test mode:	Refer to section 5.3 for details		

Test results:	Passed
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Measurement Record:

Frequency	Level (V/m)	EUT Face	Dwell time	Observations	Result
80MHz-1GHz	3	Front	2s	A	Pass
		Back		A	Pass
		Left		A	Pass
		Right		A	Pass
		Top		A	Pass
		Underside		A	Pass
1.4GHz-2GHz	3	Front	2s	A	Pass
		Back		A	Pass
		Left		A	Pass
		Right		A	Pass
		Top		A	Pass
		Underside		A	Pass

Remarks:

A: No degradation in the performance of the E.U.T. was observed.

8.4 Electrical Fast Transients

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-4-4
Test Level:	1.0kV on AC port 2.0kV on Earth 0.5kV on Signal Lines
Polarity:	Positive & Negative
Repetition Frequency:	5kHz
Burst Period:	300ms
Test Duration:	2 minute per level & polarity
Performance Criterion:	B
Test setup:	<p>The diagram illustrates the test setup. An EMC Tester and an EUT (Under Test Equipment) are placed on a non-conducted table. The table is supported by a wood support that is 0.1m + 0.01m thick. The table is 80cm high. A ground reference plane is located below the table, with a 10cm gap between the table and the ground plane. A grounding cable is connected to the table. The ground reference plane is a 1m*1m metallic sheet with a minimum thickness of 0.65mm.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT and its simulators were placed on the 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. 2. 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. 3. 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. 4. The length of power lines between the coupling device and the EUT is 0.5m 5. The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. 6. Test on Signal Ports, Telecommunication Ports and Control Ports: The EUT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 2 minutes. 7. Test on power supply ports: The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal. 8. Each of the Line and Neutral conductors is impressed with burst noise for 2 minutes. 9. The length of the signal and power lines between the coupling device and the EUT is 0.5m
Test environment:	Temp.: 22 °C Humid.: 54% Press.: 1012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details

Test results:	Passed
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Measurement Record:

Lead under Test	Level (kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	± 1.0	Direct	A	Pass
N	± 1.0	Direct	A	Pass
L-N	± 1.0	Direct	A	Pass

Remark:

A: No degradation in the performance of the E.U.T. was observed.

8.5 Surges

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-4-5
Test Level:	1kV line to line: Differential mode 2kV line to earth: Common mode
Polarity:	Positive & Negative
Generator source impedance:	2Ω (line-line coupling) 12Ω (line-earth coupling)
Test signal specification:	Rise time=1.2us, Duration time=50us; Test Interval: 60s between each surge;
No. of surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.
Performance Criterion:	Criterion B
Test setup:	<p>The diagram illustrates the test setup. An EMC Tester and the Equipment Under Test (EUT) are positioned on a non-conducted table. The table is supported by legs and is 80 cm high. A grounding cable is connected to the table. The EUT is placed on the table, and its bottom surface is 10 cm above the ground reference plane. The ground reference plane is shown as a horizontal line at the base of the table.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. For line-to-line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral lines to ground are same except test level is 2kV. 2. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test. 3. Different phase angles are done individually. 4. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.
Test environment:	Temp.: 22 °C Humid.: 53% Press.: 1012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Record:

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)
L-N	± 1 kV	5	60s	0, 90, 180, 270	A

Remark:

A: No degradation in the performance of the E.U.T. was observed.

8.6 Conducted Immunity

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-4-6
Frequency range:	0.15MHz to 80MHz
Test Level:	3V rms on AC Ports (unmodulated emf into 150Ω) 3V rms on Signal Lines (unmodulated emf into 150Ω)
Modulation:	80%, 1kHz Amplitude Modulation
Performance Criterion:	A
Test setup:	
Test Procedure:	<ol style="list-style-type: none"> 1. Let the EUT work in test mode and test it. 2. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible). 3. The disturbance signal described below is injected to EUT through CDN. 4. The EUT operates within its operational mode(s) under intended climatic conditions after power on. 5. The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave. 6. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally; the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. 7. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.
Test environment:	Temp.: 22 °C Humid.: 51% Press.: 1012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Record:

Frequency	Injected Position	Test Level	Modulation	Step Size	Dwell Time	Observations (Performance Criterion)
150kHz to 80MHz	AC Main	3Vrms	80%, 1kHz Amp. Mod.	1%	2s	A

Remark:

A: No loss of function was observed.

8.7 Voltage Dips and Voltage Interruptions

Test Requirement:	EN 61000-6-1
Test Method:	EN 61000-4-11
No. of Dips /Interruptions:	3 per Level
Performance Criterion:	0% of UT (Supply Voltage) for 0.5 Periods: B; 0% of UT for 1 Periods: B; 0% of UT for 250 Periods: C; 70% of UT for 25 Periods: C;
Test setup:	<p>The diagram illustrates the test setup. An EMC Tester and an EUT are placed on a non-conducted table. The table is 80cm high and has a grounding cable connected to it. The EUT is positioned 10cm above the table surface. A Ground Reference Plane is indicated at the base of the table and the floor.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT and test generator were setup as shown on above setup photo. 2. The interruptions are introduced at selected phase angles with specified duration. 3. Record any degradation of performance.
Test environment:	Temp.: 26 °C Humid.: 53% Press.: 1012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Record:

Test Level % U _T	Duration (Periods)	Phase angle	No of dropout	Observations (Performance Criterion)
0	0.5	0°, 90°, 180°, 270°	3	A
0	1	0°, 90°, 180°, 270°	3	A
70	25	0°, 90°, 180°, 270°	3	A
0	250	0°, 90°, 180°, 270°	3	B

Remark:

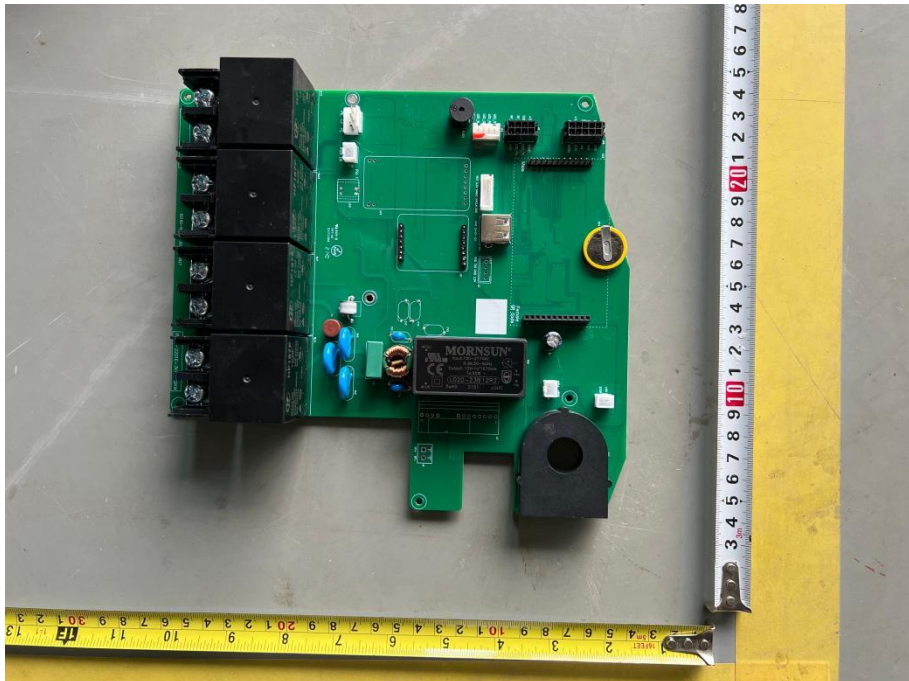
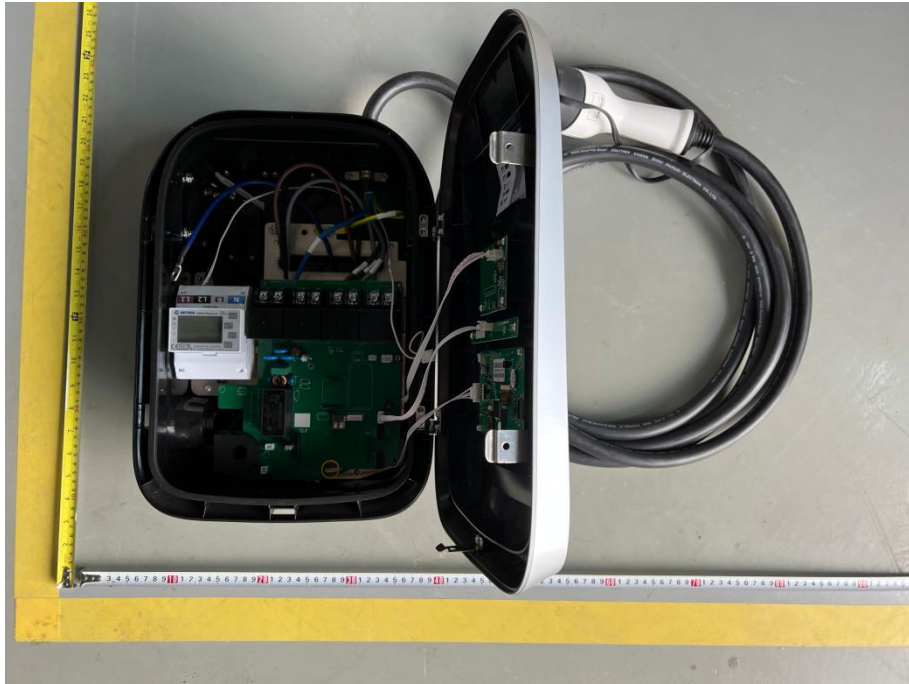
A: No loss of function was observed.

B: Dips to 0%, Duration 250P, EUT stopped operation, but it can be resumed by itself after test.

9 Photographs of the EUT







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