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TEST REPORT

Product Name : Battery Charger
Model Number : NBW54D601D3D01

Prepared for	:	Shenzhen AMC Technology Co., Ltd.
Address	:	(1-7 / F) 101, Building 3, No. 11, Baolong First Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, Guangdong, P.R. China.
Prepared by	:	EMTEK(DONGGUAN) CO., LTD.
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Report Number	:	EDG2310300252E01001R
Date(s) of Tests	:	November 27, 2023 to February 02, 2024
Date of issue	:	February 03, 2024

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TEST REPORT VERIFICATION

Applicant	:	Shenzhen AMC Technology Co., Ltd.
Manufacturer	:	Shenzhen AMC Technology Co., Ltd.
Factory	:	Shenzhen AMC Technology Co., Ltd.
EUT	:	Battery Charger
Model No.	:	NBW54D601D3D01
Rating	:	Input: AC 100-240V 50-60Hz 2.5A MAX Output: DC 53.6V 3.9A MAX

Measurement Procedure Used:

EN IEC 55014-1: 2021
EN IEC 61000-3-2: 2019+A1:2021, EN 61000-3-3:2013+A2:2021
EN IEC 55014-2: 2021
(IEC 61000-4-2:2008, IEC 61000-4-4:2012, IEC 61000-4-5: 2014+AMD1:2017, IEC 61000-4-6:2013/COR1:2015, IEC 61000-4-11: 2020)

The device described above is tested by EMTEK(DONGGUAN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK(DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN IEC 55014-1, EN IEC 61000-3-2, EN 61000-3-3 and EN IEC 55014-2 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK(DONGGUAN) CO., LTD.

Date of Test : November 27, 2023 to February 02, 2024

Prepared by : Galen Xiao / Editor

Reviewer : Tim Dong / Supervisor

Approved & Authorized Signer : Sam Lv / Manager

Modified Information

Version	Summary	Revision Date	Report No.
	Original Report	/	EDG2310300252E01001R

1. DESCRIPTION OF STANDARDS AND RESULTS

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted Disturbances at the AC mains port	EN IEC 55014-1: 2021	Table 5	Pass
Discontinuous Disturbance (Click)	EN IEC 55014-1: 2021	Clause 4.4	N/A
Disturbance Power (30 MHz to 300 MHz)	EN IEC 55014-1: 2021	Table 7,Table 8	N/A
Radiated Emission (30 MHz to 1000 MHz)	EN IEC 55014-1: 2021	Table 9	Pass
Radiated Emission (1 GHz to 6 GHz)	EN IEC 55014-1: 2021	Table 11	N/A
Harmonic Current Emissions	EN IEC 61000-3-2: 2019+A1:2021	Class A	Pass
Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A2:2021	Clause 5	Pass
IMMUNITY			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008	B	Pass
Radio frequency electromagnetic fields	IEC 61000-4-3:2020	A	N/A
Fast Transients (EFT)	IEC 61000-4-4:2012	B	Pass
Surges	IEC 61000-4-5: 2014+AMD1:2017	B	Pass
Injected Currents	IEC 61000-4-6:2013/COR1:2015	A	Pass
Voltage Dips, 100%	IEC 61000-4-11: 2020	C	Pass
Voltage Dips, 60%		C	Pass
Voltage Dips, 30%		C	Pass
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	Battery Charger
Model Number	:	NBW54D601D3D01
Trade Mark	:	N/A
Power Supply For Test	:	AC 230V 50Hz, AC 120V 60Hz
Operate Mode	:	Full load, Half load, No load
EUT Category	:	☐ Category I ☑ Category II ☐ Category III ☐ Category IV ☐ Category V
Highest clock frequency	:	☑ F≤15MHz, ☐ 15MHz＜F≤200MHz, ☐ F>200MHz
Applicant	:	Shenzhen AMC Technology Co., Ltd.
Address	:	(1-7 / F) 101, Building 3, No. 11, Baolong First Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, Guangdong, P.R. China.
Manufacturer	:	Shenzhen AMC Technology Co., Ltd.
Address	:	(1-7 / F) 101, Building 3, No. 11, Baolong First Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, Guangdong, P.R. China.
Factory	:	Shenzhen AMC Technology Co., Ltd.
Address	:	(1-7 / F) 101, Building 3, No. 11, Baolong First Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, Guangdong, P.R. China.
Date of sample received	:	November 27, 2023
Date of Test	:	November 27, 2023 to February 02, 2024

2.2. Description of Test Facility

Site Description

EMC Lab : Accredited by CNAS, 2020.08.27
The certificate is valid until 2024.07.05
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2018
The Certificate Registration Number is L3150

Name of Firm : EMTEK(DONGGUAN) CO., LTD.

Site Location : -1&2/F.,Building 2, Zone A, Zhongda Marine Biotechnology Reserch and Development Base, No.9, Xincheng Avenue, Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China

2.3. Description of Support Device

The EUT was tested together with the following accessories:

Kind of Equipment	Manufacturer	Type	SN
/	/	/	/

2.4. Measurement Uncertainty

Test Item		Uncertainty
Conducted Emission	:	2.08dB(9k~150kHz Conduction 1#) 2.42dB(150k-30MHz Conduction 1#)
Radiated Emission (3m Chamber)	:	3.32dB (30M~1GHz Polarize: H) 3.34dB (30M~1GHz Polarize: V)
Uncertainty for Flicker test	:	0.07%
Uncertainty for Harmonic test	:	1.8%
Uncertainty for test site temperature and humidity	:	0.6℃ 4%

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1. For Conducted Disturbances at the AC mains port

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde&Schwarz	ESCI	100137	2023/5/11	1 Year
2.	AMN	Rohde&Schwarz	ENV216	101209	2023/5/11	1 Year

3.2. For Radiated Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde&Schwarz	ESCI	101415	2023/5/11	1 Year
2.	Bi-log Hybrid Antenna	Schwarzbeck	VULB9163	141	2023/5/15	1 Year
3.	Pre-Amplifie	HP	8447F	OPTH64	2023/5/11	1 Year
4.	Signal Analyzer	R&S	FSV30	103039	2023/5/11	1 Year
5.	Horn Antenna	Schwarzbeck	BBHA9120D	1272	2023/5/15	1 Year
6.	Pre-Amplifie	LUNAR EM	PM1-18-40	J101000000 81	2023/5/11	1 Year

3.3. For Harmonic / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC variable frequency power supply	Teseq	100-CTS-230-TE SQ	1804A03259	2023/5/11	1 Year
2.	Harmonic current and voltage fluctuation analyzer	Teseq	5001IX-CTS-400-SCH	1805A03008	2023/5/11	1 Year

3.4. For Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	409	2023/5/15	1 Year

3.5. For Fast Transients Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMS comprehensive tester	HTEC	HCOMPACT7	190305	2023/5/11	1 Year
2.	Capacitive Coupling Clamp	RMTEST	HFK	0605-10	2023/5/11	1 Year

3.6. For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMS comprehensive tester	HTEC	HCOMPACT7	190305	2023/5/11	1 Year

3.7. For Injected Currents Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal generator	Rohde& Schwarz	SMB100A	103042	2023/5/11	1 Year
2.	Single channel power meter	Rohde& Schwarz	NRVS	101761	2023/5/11	1 Year
3.	6 db attenuator	AR-WORLDWIDE	6dB/50FH-006-100	324011	2023/5/11	1 Year
4.	CDN	SKET	CDN M2+M3	204303	2023/5/11	1 Year
5.	Power amplifier	BONN Elektronik	BSA 1515-25	97483	2023/5/11	1 Year

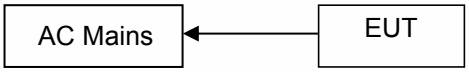
3.8. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMS comprehensive tester	HTEC	HCOMPACT7	190305	2023/5/11	1 Year
2.	Dips module	HTEC	HV1P16T	190302	2023/5/11	1 Year

4. CONDUCTED DISTURBANCES AT THE AC MAINS PORT

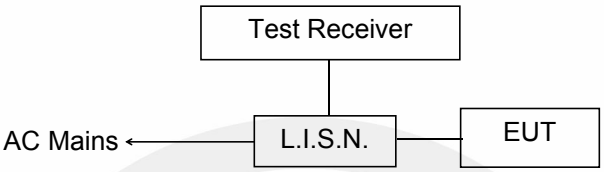
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT:Battery Charger)

4.1.2. Block Diagram of Test Setup



(EUT: Battery Charger)

4.2. Measurement Standard and Limits

4.2.1. Standard:

EN IEC 55014-1: 2021

4.2.2. Limits

Frequency (MHz)	Limit (dBμV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56 *	59 ~ 46 *
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN IEC 55014-1 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

EUT : Battery Charger
Model Number : NBW54D601D3D01

4.4. Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 4.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in measuring mode (Full load, Half load, No load) and measure them.

4.5. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN IEC 55014-1 regulations during conducted emission measurement.

The bandwidth of the test receiver (ESCI) is set at 200Hz in 9KHz~150KHz range and 9KHz in 150KHz~30MHz range.

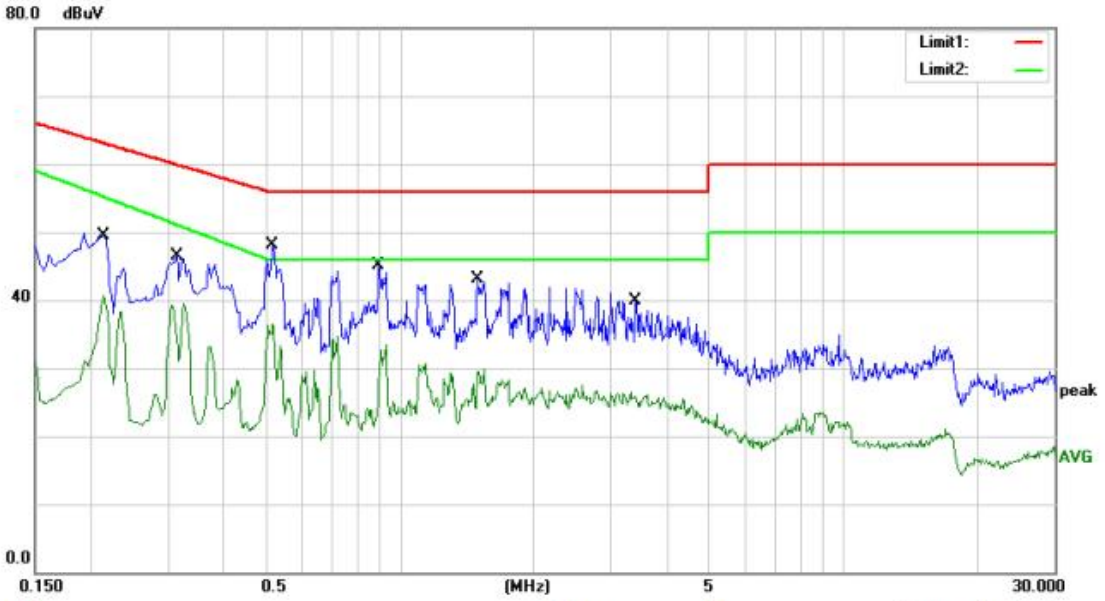
The frequency range from 150KHz to 30MHz is checked.

4.6. Measurement Results

PASS.

The frequency range from 150KHz to 30MHz is investigated.

All the modes were tested and the worst data are attached the following pages.

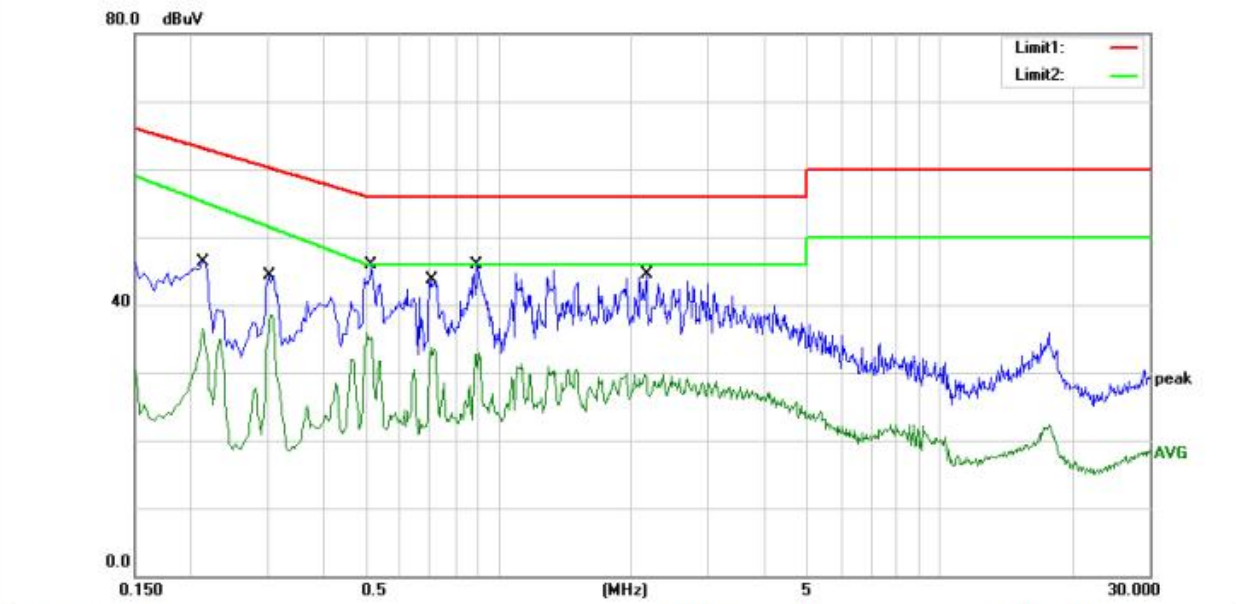


Site site #1 Phase: L1 Temperature: 25
Limit: EN IEC 55014-1 QP (CE) Power: AC 110V/60Hz Humidity: 58 %
Mode: Full Load
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2140	32.37	17.04	49.41	63.05	-13.64	QP	
2		0.2140	23.64	17.04	40.68	55.16	-14.48	AVG	
3		0.3140	29.40	17.10	46.50	59.86	-13.36	QP	
4		0.3140	22.30	17.10	39.40	51.02	-11.62	AVG	
5	*	0.5180	31.02	17.10	48.12	56.00	-7.88	QP	
6		0.5180	19.44	17.10	36.54	46.00	-9.46	AVG	
7		0.8980	28.13	17.02	45.15	56.00	-10.85	QP	
8		0.8980	16.49	17.02	33.51	46.00	-12.49	AVG	
9		1.5020	25.98	17.07	43.05	56.00	-12.95	QP	
10		1.5020	12.88	17.07	29.95	46.00	-16.05	AVG	
11		3.4100	22.80	17.01	39.81	56.00	-16.19	QP	
12		3.4100	9.44	17.01	26.45	46.00	-19.55	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jayce

Remark:
1. Measurement (dB μ V) = AMN Factor (dB) + Cable Loss (dB) + Reading (dB μ V)
2. Over (dB) = Measurement (dB μ V) - Limit (dB μ V)

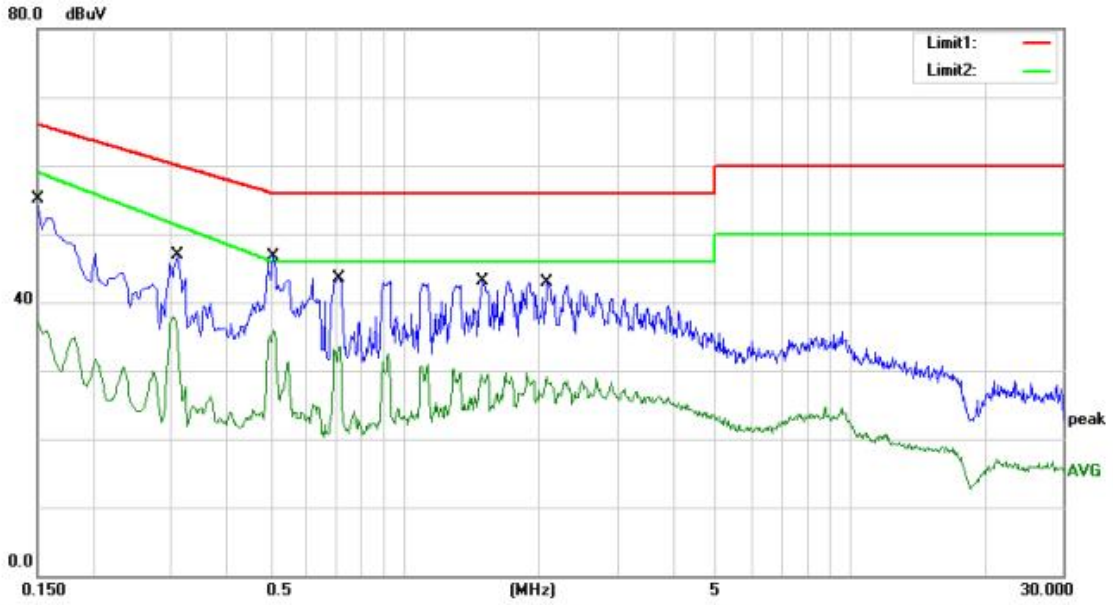


Site site #1 Phase: N Temperature: 25
Limit: EN IEC 55014-1 QP (CE) Power: AC 110V/60Hz Humidity: 58 %
Mode: Full Load
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2140	29.26	17.04	46.30	63.05	-16.75	QP	
2		0.2140	19.51	17.04	36.55	55.16	-18.61	AVG	
3		0.3020	27.27	17.11	44.38	60.19	-15.81	QP	
4		0.3020	21.45	17.11	38.56	51.44	-12.88	AVG	
5		0.5180	28.78	17.10	45.88	56.00	-10.12	QP	
6	*	0.5180	18.87	17.10	35.97	46.00	-10.03	AVG	
7		0.7060	26.78	17.01	43.79	56.00	-12.21	QP	
8		0.7060	16.70	17.01	33.71	46.00	-12.29	AVG	
9		0.8980	28.89	17.02	45.91	56.00	-10.09	QP	
10		0.8980	15.88	17.02	32.90	46.00	-13.10	AVG	
11		2.1700	27.33	17.09	44.42	56.00	-11.58	QP	
12		2.1700	12.66	17.09	29.75	46.00	-16.25	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jayce

Remark:
1. Measurement (dB μ V) = AMN Factor (dB) + Cable Loss (dB) + Reading (dB μ V)
2. Over (dB) = Measurement (dB μ V) - Limit (dB μ V)



Site site #1 Phase: L1 Temperature: 25

Limit: EN IEC 55014-1 QP (CE) Power: AC 230V/50Hz Humidity: 58 %

Mode: Full Load

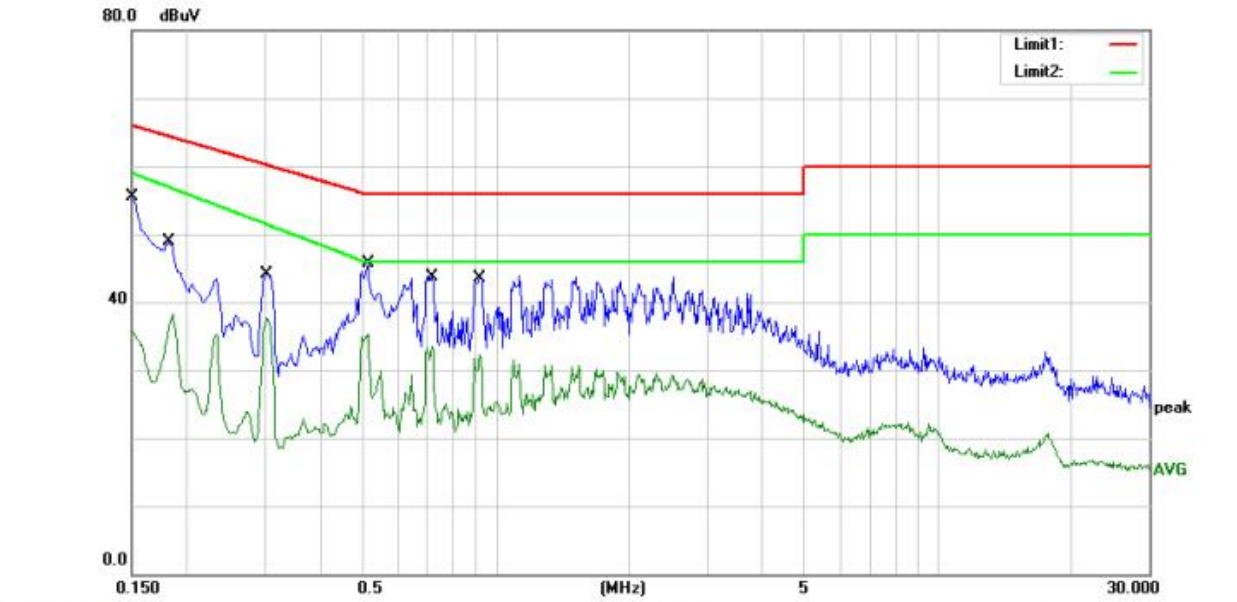
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	38.14	17.06	55.20	66.00	-10.80	QP	
2		0.1500	20.52	17.06	37.58	59.00	-21.42	AVG	
3		0.3100	29.83	17.10	46.93	59.97	-13.04	QP	
4		0.3100	20.71	17.10	37.81	51.16	-13.35	AVG	
5	*	0.5100	29.53	17.11	46.64	56.00	-9.36	QP	
6		0.5100	18.72	17.11	35.83	46.00	-10.17	AVG	
7		0.7140	26.49	17.01	43.50	56.00	-12.50	QP	
8		0.7140	16.56	17.01	33.57	46.00	-12.43	AVG	
9		1.5020	26.02	17.07	43.09	56.00	-12.91	QP	
10		1.5020	12.43	17.07	29.50	46.00	-16.50	AVG	
11		2.1060	25.62	17.10	42.72	56.00	-13.28	QP	
12		2.1060	12.00	17.10	29.10	46.00	-16.90	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jayce

Remark:

1. Measurement (dB μ V) = AMN Factor (dB) + Cable Loss (dB) + Reading (dB μ V)
2. Over (dB) = Measurement (dB μ V) - Limit (dB μ V)



Site site #1 Phase: N Temperature: 25

Limit: EN IEC 55014-1 QP (CE) Power: AC 230V/50Hz Humidity: 58 %

Mode: Full Load

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	38.46	17.06	55.52	66.00	-10.48	QP	
2		0.1500	18.94	17.06	36.00	59.00	-23.00	AVG	
3		0.1820	31.81	17.04	48.85	64.39	-15.54	QP	
4		0.1820	21.24	17.04	38.28	56.91	-18.63	AVG	
5		0.3020	26.90	17.11	44.01	60.19	-16.18	QP	
6		0.3020	20.57	17.11	37.68	51.44	-13.76	AVG	
7	*	0.5140	28.60	17.10	45.70	56.00	-10.30	QP	
8		0.5140	18.20	17.10	35.30	46.00	-10.70	AVG	
9		0.7180	26.76	17.01	43.77	56.00	-12.23	QP	
10		0.7180	16.46	17.01	33.47	46.00	-12.53	AVG	
11		0.9220	26.51	17.02	43.53	56.00	-12.47	QP	
12		0.9220	15.28	17.02	32.30	46.00	-13.70	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jayce

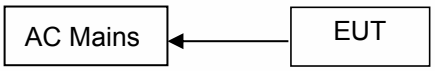
Remark:

1. Measurement (dB μ V) = AMN Factor (dB) + Cable Loss (dB) + Reading (dB μ V)
2. Over (dB) = Measurement (dB μ V) - Limit (dB μ V)

5. DISCONTINUOUS DISTURBANCE

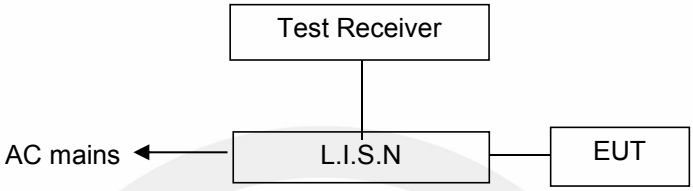
5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators



(EUT: Battery Charger)

5.1.2. Block Diagram of Test Setup



(EUT: Battery Charger)

5.2. Measurement Standard and limit

5.2.1. Test Standard

EN IEC 55014-1: 2021

5.2.2. Test Limit

According to standard EN IEC 55014-1, if click rate (N) less 5/min and the time of this Discontinuous Disturbance does not exceed 10ms, then the limit value are omitted.

5.3. EUT Configuration

The configuration of EUT is same as Section 5.1.

5.4. Operating Condition of EUT

Step 1: Setup the EUT as shown Section 5.1.

Step 2: Turn on the power of all equipments.

Step 3: After that, let EUT work in test mode (/) and measure it.

5.5. Test Procedure

This test is done when switch operations in thermostatically controlled appliances, automatic program controlled machines and other electrically controlled or operated appliances may generate Discontinuous Disturbance (Click). The measurement of disturbance shall be performed at the following restricted number of frequencies: 150KHz, 500KHz, 1.4MHz and 30MHz. At each frequency, for appliances which stop automatically, duration of the minimum number of complete programs necessary to produce 40 counted clicks or, where relevant, 40 counted clicks have not been produced, the test is stopped at the end of the program in course. The relevant click rate N. The appliance under test shall be deemed to comply with the limit if not more than a quarter of the number of the counted click registered during the observation time.

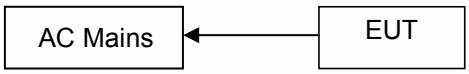
5.6. Test Results

N/A.

6. RADIATED EMISSION (UP TO 1GHZ)

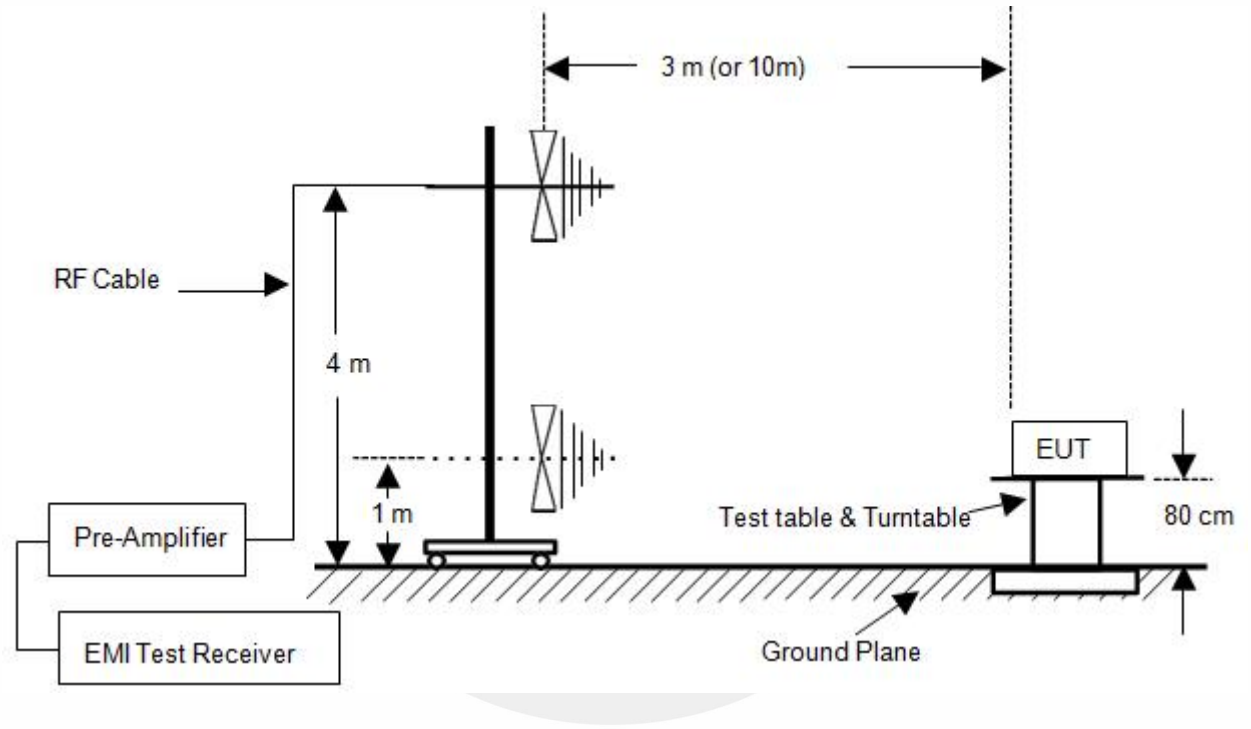
6.1. Block Diagram of Test

6.1.1. Block diagram of connection between the EUT and simulators



(EUT: Battery Charger)

6.1.2. Block diagram of test setup (In chamber)



(EUT: Battery Charger)

6.2. Measurement Standard and limit

6.2.1. Test Standard

EN IEC 55014-1: 2021

6.2.2. Test Limits

All emanations from a device or system shall not exceed the level of field strengths specified below:

Table 9

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBmV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

6.3. EUT Configuration on Test

The EN IEC 55014 regulations test method must be used to find the maximum emission during Radiated Emission measurement.

EUT	:	Battery Charger
Model Number	:	NBW54D601D3D01

6.4. Operating Condition of EUT

Step 1: Turn on the power.

Step 2: Let the EUT work in test mode (Full load, Half load, No load) and measure it.

6.5. Test Procedure

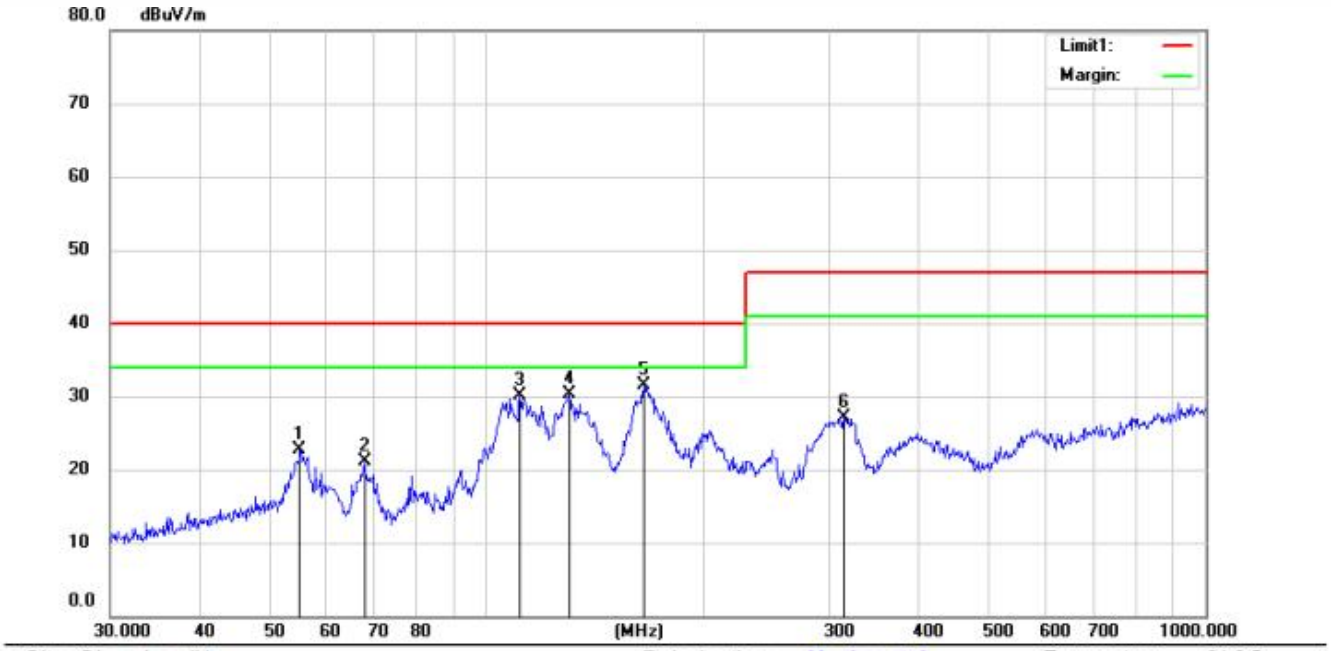
The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meter to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

6.6. Test Results

Pass.

All the modes were tested and the worst data are attached the following pages.



Site Chamber #1 Polarization: *Horizontal* Temperature: 21.9 C

Limit: EN IEC 55014-1_3m(RE) Power: AC 120V/60Hz Humidity: 55 %

Mode: Full Load

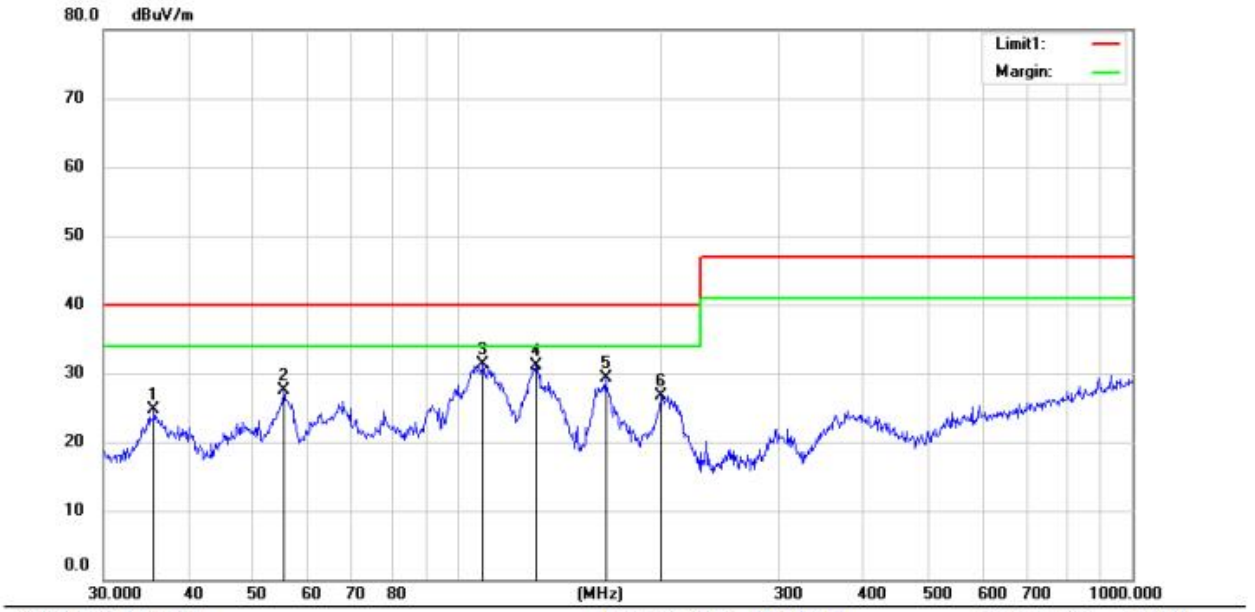
Note:

No.	Mk.	Freq.	Reading Level	Ant. Factor	Pre Amp Gain	Cable loss	Measure-ment	Limit	Over		HI	Degree	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Detector	cm	deg.	Comment
1		55.0274	38.84	13.49	30.5	0.92	22.75	40.00	-17.25	QP			
2		67.6751	40.17	10.36	30.54	1.1	21.09	40.00	-18.91	QP			
3		111.3468	48.51	11.26	30.83	1.16	30.10	40.00	-9.90	QP			
4		130.3790	51.34	8.38	30.73	1.3	30.29	40.00	-9.71	QP			
5	*	165.4866	51.38	9.23	30.54	1.52	31.59	40.00	-8.41	QP			
6		314.3765	40.50	14.22	29.83	2.22	27.11	47.00	-19.89	QP			

*:Maximum data x:Over limit !:over margin Operator: Ccyf

Remark:

1. Measurement (dB μ V/m) = Antenna Factor(dB) -Amp Factor(dB) +Cable Loss(dB) + Reading(dB μ V/m)
2. Over (dB) = Measurement (dB μ V/m) - Limit (dB μ V/m)



Site Chamber #1 Polarization: *Vertical* Temperature: 21.9 C

Limit: EN IEC 55014-1_3m(RE) Power: AC 120V/60Hz Humidity: 55 %

Mode: Full Load

Note:

No.	Mk.	Freq.	Reading Level	Ant. Factor	Pre Amp Gain	Cable loss	Measure-ment	Limit	Over		HI	Degree	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Detector	cm	deg.	Comment
1		35.6240	42.89	11.67	30.54	0.6	24.62	40.00	-15.38	QP			
2		55.4147	43.66	13.4	30.5	0.93	27.49	40.00	-12.51	QP			
3	*	109.4116	49.59	11.5	30.84	1.15	31.40	40.00	-8.60	QP			
4		130.8370	52.14	8.37	30.73	1.3	31.08	40.00	-8.92	QP			
5		166.0680	48.97	9.26	30.54	1.52	29.21	40.00	-10.79	QP			
6		200.6880	43.76	11.62	30.36	1.71	26.73	40.00	-13.27	QP			

*:Maximum data x:Over limit !:over margin Operator: Ccyf

Remark:

1. Measurement (dB μ V/m) = Antenna Factor(dB) -Amp Factor(dB) +Cable Loss(dB) + Reading(dB μ V/m)
2. Over (dB) = Measurement (dB μ V/m) - Limit (dB μ V/m)

Site Chamber #1 Polarization: *Horizontal* Temperature: 21.8 C

Limit: EN IEC 55014-1_3m(RE) Power: AC 230V/50Hz Humidity: 62 %

Mode: Full Load

Note:

No.	Mk.	Freq.	Reading Level	Ant. Factor	Pre Amp Gain	Cable loss	Measure-ment	Limit	Over		HI	Degree	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Detector	cm	deg.	Comment
1		105.2716	47.41	11.5	30.86	1.12	29.17	40.00	-10.83	QP			
2	*	129.0146	51.17	8.54	30.74	1.29	30.26	40.00	-9.74	QP			
3		172.5987	48.37	9.55	30.51	1.56	28.97	40.00	-11.03	QP			
4		205.6750	43.46	11.76	30.33	1.75	26.64	40.00	-13.36	QP			
5		315.4806	40.78	14.24	29.83	2.23	27.42	47.00	-19.58	QP			
6		373.3110	37.52	15.61	29.82	2.99	26.30	47.00	-20.70	QP			

*:Maximum data x:Over limit !:over margin Operator: Ccyf

Remark:

1. Measurement (dB μ V/m) = Antenna Factor(dB) -Amp Factor(dB) +Cable Loss(dB) + Reading(dB μ V/m)
2. Over (dB) = Measurement (dB μ V/m) - Limit (dB μ V/m)

Site Chamber #1 Polarization: *Vertical* Temperature: 21.8 C

Limit: EN IEC 55014-1_3m(RE) Power: AC 230V/50Hz Humidity: 62 %

Mode: Full Load

Note:

No.	Mk.	Freq.	Reading Level	Ant. Factor	Pre Amp Gain	Cable loss	Measure-ment	Limit	Over		HI	Degree	
		MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	Detector	cm	deg.	Comment
1		55.8046	41.46	13.31	30.5	0.94	25.21	40.00	-14.79	QP			
2		82.9384	47.47	8.31	30.63	1.06	26.21	40.00	-13.79	QP			
3		99.8777	48.92	11.58	30.89	1.08	30.69	40.00	-9.31	QP			
4	*	126.7723	51.43	8.85	30.75	1.27	30.80	40.00	-9.20	QP			
5		172.5987	47.87	9.55	30.51	1.56	28.47	40.00	-11.53	QP			
6		202.8103	42.36	11.68	30.35	1.72	25.41	40.00	-14.59	QP			

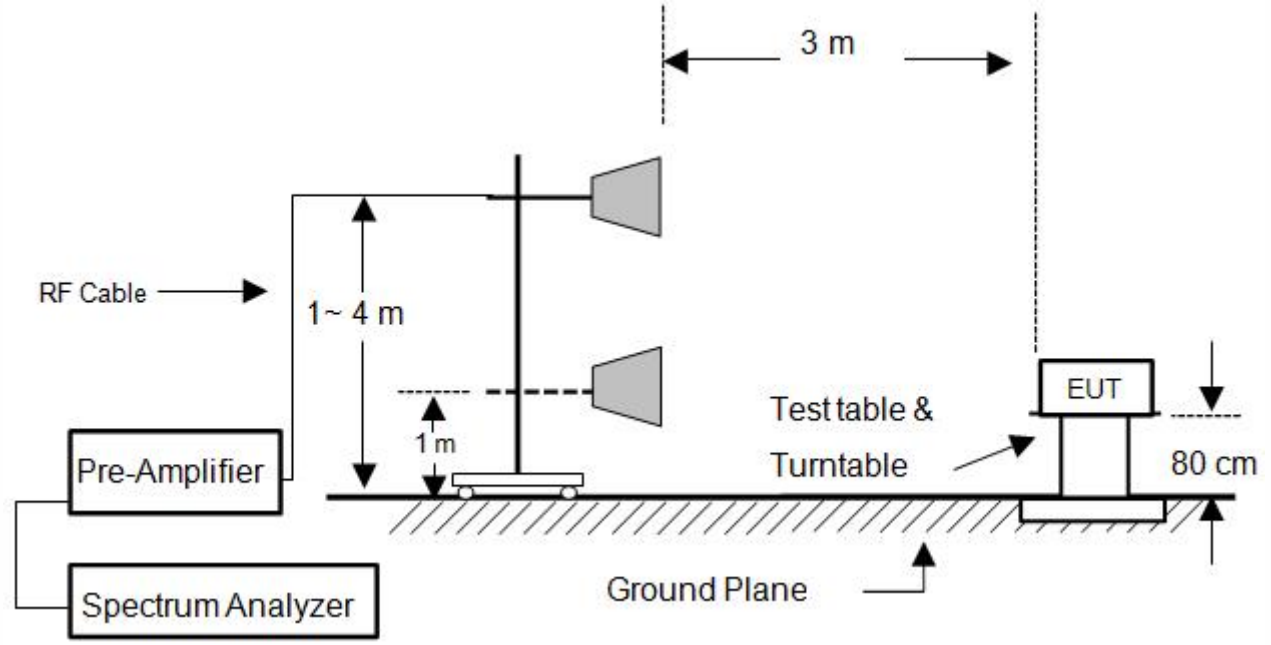
*:Maximum data x:Over limit !:over margin Operator: Ccyf

Remark:

1. Measurement (dB μ V/m) = Antenna Factor(dB) -Amp Factor(dB) +Cable Loss(dB) + Reading(dB μ V/m)
2. Over (dB) = Measurement (dB μ V/m) - Limit (dB μ V/m)

7. RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

7.1. Block Diagram of Test Setup



7.2. Radiated Limit

Table 11

Frequency range (MHz)	Measurement			Class B limits dB(μ V/m)
	Facility	Distance (m)	Detector type/ bandwidth	
1000 to 3000	FSOATS	3	Average / 1 MHz	50
3000 to 6000				54
1000 to 3000			Peak /1 MHz	70
3000 to 6000				74
Note: The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.				

7.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz.

Test results were obtained from the following equation:
Emission level (dBμV/m) = Antenna Factor -Amp Factor +Cable Loss + Reading
Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

7.4. Measuring Results

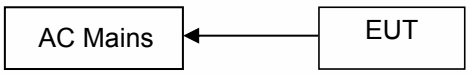
N/A.

The highest frequency of the internal sources of the EUT is less than 108 MHz

8. HARMONIC CURRENT MEASUREMENT

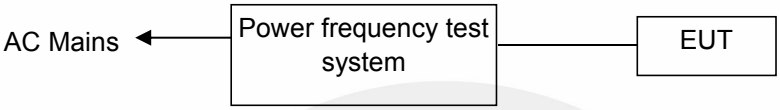
8.1. Block Diagram of Test Setup

8.1.1. Block Diagram of connection between the EUT and simulators



(EUT:Battery Charger)

8.1.2. Block Diagram of Test Setup



(EUT: Battery Charger)

8.2. Measuring Standard

EN IEC 61000-3-2: 2019+A1:2021 Class A Power>75W

8.3. Operating Condition of EUT

Same as Section 4.4 except that the test setup replaced by Section 8.1.

8.4. Test Results

Pass.

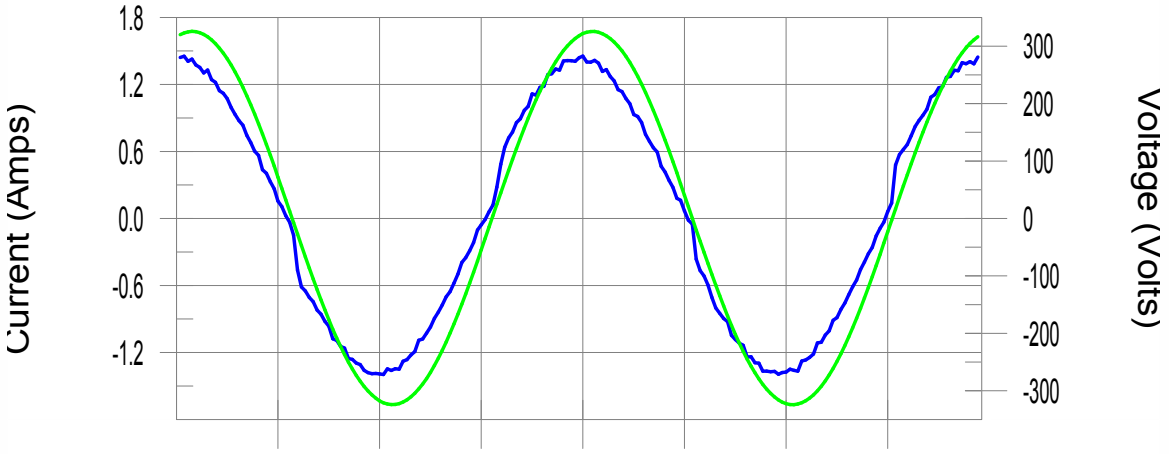
Please refer to the following page.

Harmonics – Class-A per Ed. Ed. 5.0 (2018)(Run time)

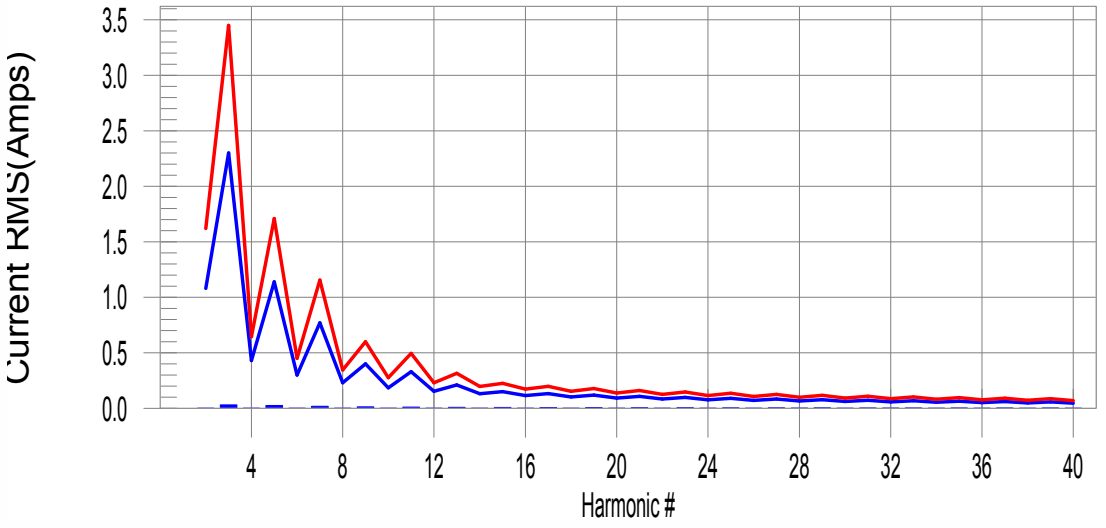
EUT: NBW54D601D3D01 **Tested by: Chenli**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2024/1/18 **Start time: 15:05:03** **End time: 15:07:44**
Test duration (min): 2.5 **Data file name: H-000073.cts_data**
Comment: Full load
Customer: Customer information

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

Current & voltage waveforms



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



Test result: Pass **Worst harmonics H17-3.3% of 150% limit, H15-4.9% of 100% limit**

Current Test Result Summary (Run time)

EUT: NBW54D601D3D01 **Tested by: Chenli**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2024/1/18 **Start time: 15:05:03** **End time: 15:07:44**
Test duration (min): 2.5 **Data file name: H-000073.cts_data**
Comment: Full load
Customer: Customer information

Test Result: Pass **Source qualification: Normal**
THC(A): 0.051 **I-THD(%): 5.0** **POHC(A): 0.011** **POHC Limit(A): 0.251**

Highest parameter values during test:

V_RMS (Volts):	229.85	Frequency(Hz):	50.00
I_Peak (Amps):	1.554	I_RMS (Amps):	1.009
I_Fund (Amps):	1.006	Crest Factor:	1.542
Power (Watts):	227.5	Power Factor:	0.982

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.031	2.300	1.3	0.032	3.450	0.9	Pass
4	0.000	0.430	N/A	0.001	0.645	N/A	Pass
5	0.026	1.140	2.2	0.026	1.710	1.5	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.018	0.770	2.3	0.018	1.155	1.6	Pass
8	0.000	0.230	N/A	0.001	0.345	N/A	Pass
9	0.013	0.400	3.3	0.014	0.600	2.3	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.011	0.330	3.2	0.011	0.495	2.2	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.009	0.210	4.2	0.009	0.315	2.9	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.007	0.150	4.9	0.008	0.225	3.3	Pass
16	0.000	0.115	N/A	0.001	0.173	N/A	Pass
17	0.006	0.132	4.8	0.007	0.198	3.3	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.006	0.118	N/A	0.006	0.178	N/A	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.005	0.107	N/A	0.005	0.161	N/A	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.004	0.098	N/A	0.005	0.147	N/A	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.004	0.090	N/A	0.004	0.135	N/A	Pass
26	0.001	0.071	N/A	0.001	0.107	N/A	Pass
27	0.004	0.083	N/A	0.004	0.125	N/A	Pass
28	0.002	0.066	N/A	0.002	0.099	N/A	Pass
29	0.003	0.078	N/A	0.003	0.116	N/A	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.003	0.073	N/A	0.003	0.109	N/A	Pass
32	0.002	0.058	N/A	0.002	0.086	N/A	Pass
33	0.003	0.068	N/A	0.003	0.102	N/A	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.002	0.064	N/A	0.003	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.002	0.061	N/A	0.002	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.002	0.058	N/A	0.002	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass

Voltage Source Verification Data (Run time)

EUT: NBW54D601D3D01 **Tested by: Chenli**
Test category: Class-A per Ed. 5.0 (2018) (European limits) **Test Margin: 100**
Test date: 2024/1/18 **Start time: 15:05:03** **End time: 15:07:44**
Test duration (min): 2.5 **Data file name: H-000073.cts_data**
Comment: Full load
Customer: Customer information

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

Highest parameter values during test:

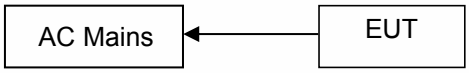
Voltage (Vrms):	229.85	Frequency(Hz):	50.00
I_Peak (Amps):	1.554	I_RMS (Amps):	1.009
I_Fund (Amps):	1.006	Crest Factor:	1.542
Power (Watts):	227.5	Power Factor:	0.982

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.017	0.460	3.66	OK
3	0.385	2.069	18.61	OK
4	0.014	0.460	3.01	OK
5	0.016	0.919	1.79	OK
6	0.013	0.460	2.94	OK
7	0.021	0.689	3.03	OK
8	0.013	0.460	2.82	OK
9	0.013	0.460	2.82	OK
10	0.011	0.460	2.33	OK
11	0.006	0.230	2.51	OK
12	0.014	0.230	5.89	OK
13	0.008	0.230	3.34	OK
14	0.004	0.230	1.95	OK
15	0.009	0.230	3.81	OK
16	0.005	0.230	2.25	OK
17	0.006	0.230	2.51	OK
18	0.007	0.230	3.19	OK
19	0.009	0.230	3.75	OK
20	0.014	0.230	6.29	OK
21	0.006	0.230	2.65	OK
22	0.005	0.230	2.24	OK
23	0.006	0.230	2.65	OK
24	0.004	0.230	1.90	OK
25	0.007	0.230	2.84	OK
26	0.003	0.230	1.09	OK
27	0.006	0.230	2.45	OK
28	0.002	0.230	1.07	OK
29	0.003	0.230	1.40	OK
30	0.003	0.230	1.30	OK
31	0.005	0.230	2.17	OK
32	0.003	0.230	1.23	OK
33	0.003	0.230	1.16	OK
34	0.002	0.230	1.03	OK
35	0.005	0.230	2.33	OK
36	0.003	0.230	1.22	OK
37	0.003	0.230	1.10	OK
38	0.004	0.230	1.70	OK
39	0.007	0.230	2.88	OK
40	0.012	0.230	5.18	OK

9. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

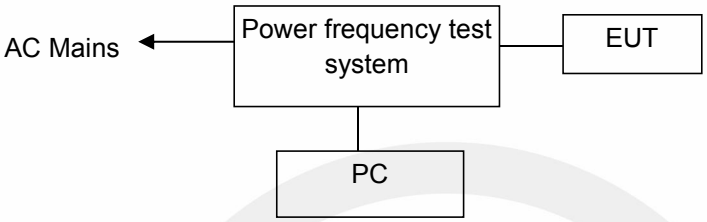
9.1. Block Diagram of Test Setup

9.1.1. Block Diagram of connection between the EUT and simulators



(EUT:Battery Charger)

9.1.2. Block Diagram of Test Setup



(EUT: Battery Charger)

9.2. Measuring Standard

EN 61000-3-3:2013+A2:2021

9.3. Operating Condition of EUT

Step 1: Setup the EUT as shown Section 9.1.

Step 2: Turn on the power of all equipments.

Step 3: Let EUT work in test mode (Full load) and measure it.

9.4. Test Results

PASS.

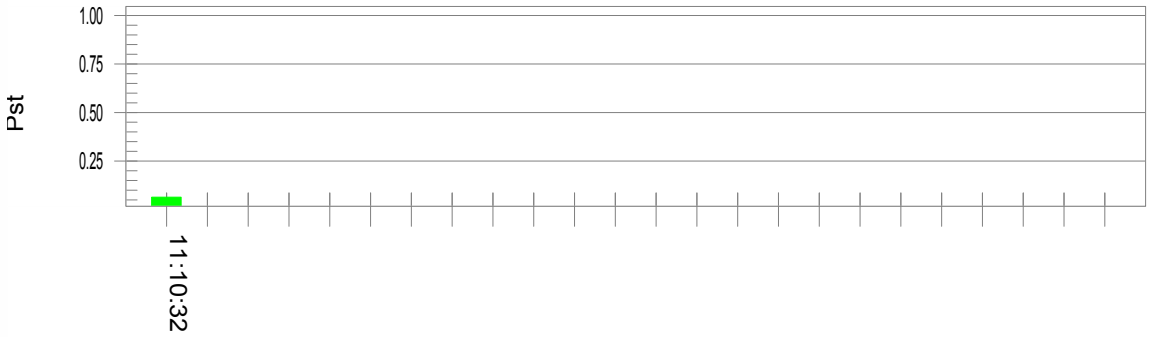
Please refer to the following page.

Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

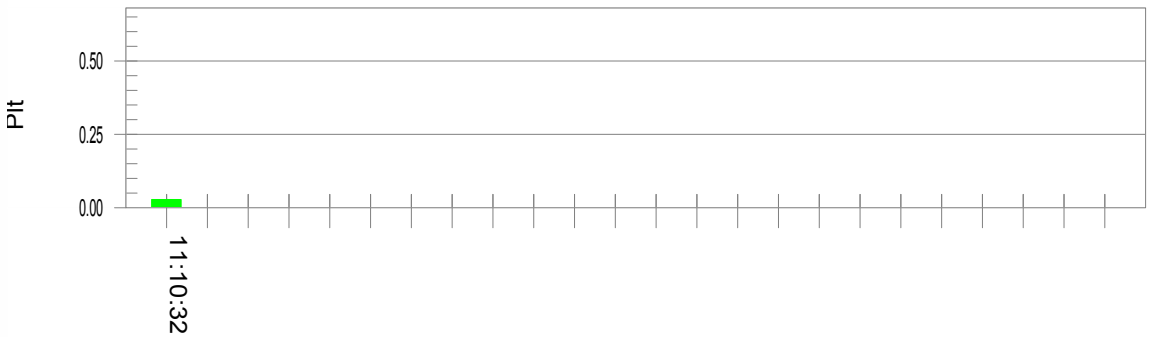
EUT: NBW54D604D0D **Tested by: chenli**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2023-12-29 **Start time: 11:00:11** **End time: 11:10:38**
Test duration (min): 10 **Data file name: F-001572.cts_data**
Comment: Full load
Customer: Customer information

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):	**229.47**			
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**

10. IMMUNITY GENERAL PERFORMANCE CRITERIA DESCRIPTION

General performance criteria are defined in EN IEC 55014-2 clause 6. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

EN IEC 55014-2:
Performance criterion A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.

Performance 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 (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual 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 from what the user may reasonably expect from the apparatus if used as intended.

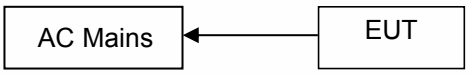
Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

The selection, the specification of functions, and the permissible degradation is left to the responsibility of the manufacturer.

11. ELECTROSTATIC DISCHARGE TEST

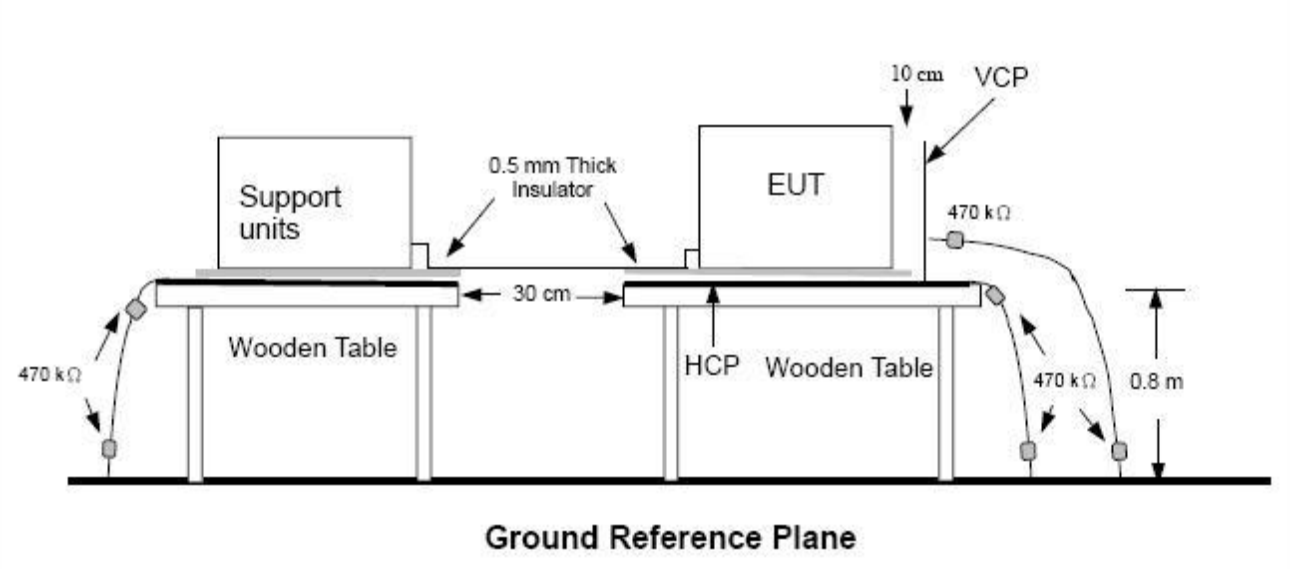
11.1.Block Diagram of Test Setup

11.1.1.Block Diagram of connection between the EUT and simulators



(EUT:Battery Charger)

11.1.2.Block Diagram of ESD Test Setup



(EUT:Battery Charger)

11.2.Test Standard

EN IEC 55014-2: 2021
(IEC 61000-4-2:2008 (Severity Level: 2 / Contact Discharge: ±4KV; Severity Level: 3 / Air Discharge: ±8KV))

11.3.Severity Levels and Performance Criterion

11.3.1.Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

Performance criterion: B

11.4.EUT Configuration

The configuration of EUT is listed in Section 11.1

11.5.Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 11.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, Half load, No load) and measure them.

11.6.Test Procedure

11.6.1.Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

11.6.2.Contact Discharge

All the procedure shall be same as Section 10.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

11.6.3.Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be 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.

11.6.4.Indirect discharge for vertical coupling plane

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

11.7.Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant	:	Shenzhen AMC Technology Co., Ltd.	Test Date	:	December 25, 2023
EUT	:	Battery Charger	Temperature	:	19.8 ℃
M/N	:	NBW54D601D3D01	Humidity	:	52.7%
Power Supply	:	AC 230V 50Hz, AC 120V 60Hz	Test Engineer:		Chen Li
Test Mode	:	Full load, Half load, No load	Criterion	:	B
			Atmospheric Pressure: 101kpa		

Air Discharge: ±2,4,8KV

Contact Discharge: ±4KV # For each point positive 10 times and negative 10 times

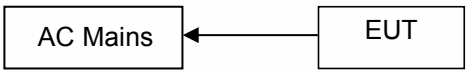
Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
HCP	Contact Discharge	PASS
VCP	Contact Discharge	PASS
Conductive parts	Contact Discharge	PASS
Non-conductive enclosure & Gap	Air Discharge	PASS
Note : No observable change.		

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

12. FAST TRANSIENTS TEST

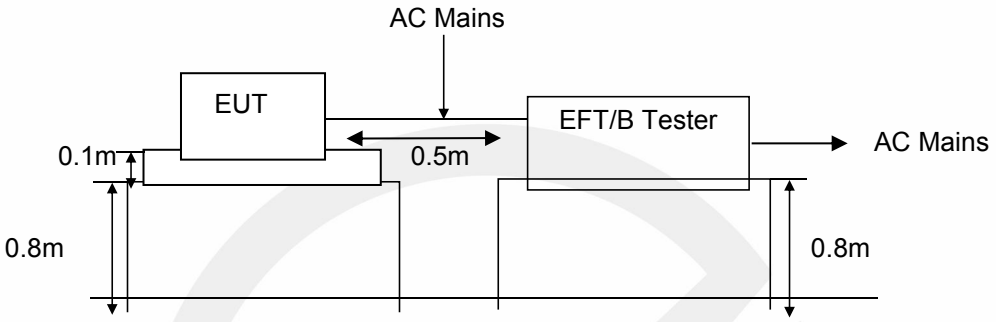
12.1.Block Diagram of Test Setup

12.1.1.Block Diagram of connection between the EUT and simulators



(EUT:Battery Charger)

12.1.2.Block Diagram of EFT Test Setup



(EUT:Battery Charger)

12.2.Test Standard

EN IEC 55014-2: 2021
(IEC 61000-4-4:2012, Severity Level, Level 2: 1KV)

12.3.Severity Levels and Performance Criterion

12.3.1.Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5 KV	5 or 100	0.25 KV	5 or 100
2.	1 KV	5 or 100	0.5 KV	5 or 100
3.	2 KV	5 or 100	1 KV	5 or 100
4.	4 KV	5 or 100	2 KV	5 or 100
X	Special	Special	Special	Special
NOTE 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. NOTE 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.				
"X" is an open level. The level has to be specified in the dedicated equipment specification.				

Performance criterion: B

12.4.EUT Configuration

The configurations of EUT are listed in Section 12.1.

12.5.Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 12.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, Half load, No load) and measure them.

12.6.Test Procedure

The EUT is put on the table which is 0.1 meter high above the ground. This reference ground plane shall 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 beneath the EUT, shall be more than 0.5m.

For input and output AC power ports:
The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

For signal lines and control lines ports:
No I/O ports. It's unnecessary to test.

For DC output line ports:
No DC ports. It's unnecessary to test.

12.7.Test Results

PASS.

Please refer to the following page.

Fast Transients Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant : Shenzhen AMC Technology Co., Ltd.

EUT : Battery Charger

M/N : NBW54D601D3D01

Power Supply: AC 230V 50Hz, AC 120V 60Hz

Criterion : B

Ambient Condition : 19.8 ℃ 51.8% RH

Operation Mode : Full load, Half load, No load

Line : ☒ AC Mains	Line : ☐ Signal ☐ I/O Cable
Coupling : ☒ Direct	Coupling : ☐ Capacitive
Test Time : *120s*	

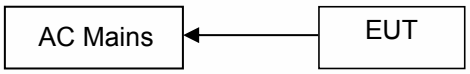
Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
L、N	1KV	PASS	PASS

Note : No observable change.

13. SURGE TEST

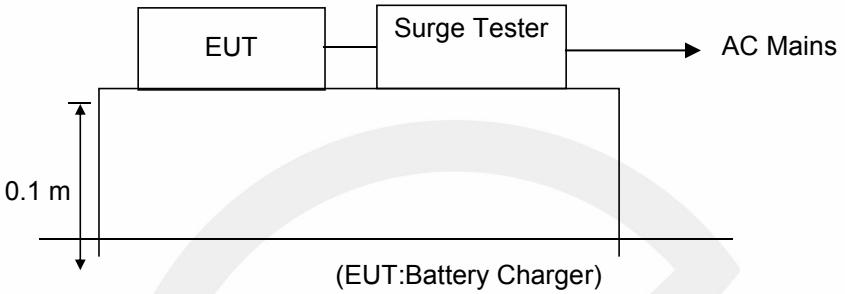
13.1.Block Diagram of Test Setup

13.1.1.Block Diagram of connection between the EUT and simulators



(EUT: Battery Charger)

13.1.2.Surge Test Setup



(EUT:Battery Charger)

13.2.Test Standard

EN IEC 55014-2: 2021
(IEC 61000-4-5: 2014+AMD1:2017, Severity Level: Line to Line: Level 2, 1.0KV, Line to Ground: Level 3, 2.0KV)

13.3.Severity Levels and Performance Criterion

13.3.1.Severity level

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

Performance criterion: B

13.4.EUT Configuration

The configurations of EUT are listed in Section 12.1.

13.5.Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 13.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, Half load, No load) and measure them.

13.6.Test Procedure

1) Set up the EUT and test generator as shown on Section 13.1.2.

2) For line to line and line to ground coupling mode, respectively provide a 1.0KV and 2.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

4) Different phase angles are done individually.

5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

13.7.Test Results

PASS.

Please refer to the following page.

Surge Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant : Shenzhen AMC Technology Co., Ltd. EUT : Battery Charger M/N : NBW54D601D3D01 Power Supply : AC 230V 50Hz, AC 120V 60Hz Test Mode : Full load, Half load, No load	Test Date : December 27, 2022 Temperature : 19.8 ℃ Humidity : 51.8% Test Engineer : Chen Li Criterion : B

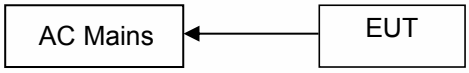
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Result
L-N	+	90^0	5	1.0	PASS
	-	270^0	5	1.0	PASS

Note : No observable change.

14. INJECTED CURRENTS TEST

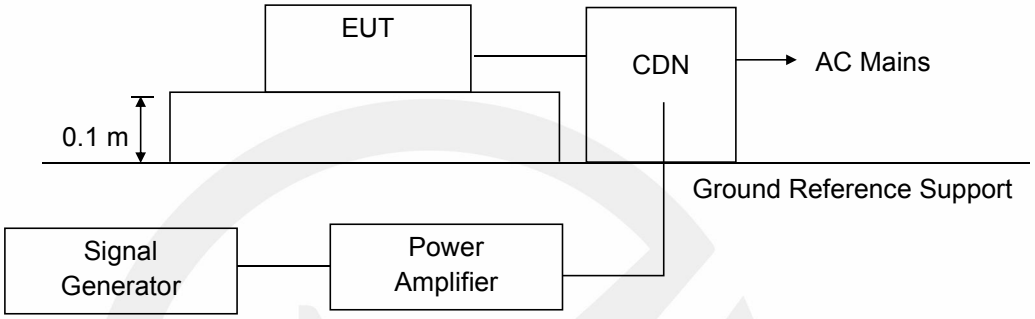
14.1.Block Diagram of Test Setup

14.1.1.Block Diagram of connection between the EUT and simulators



(EUT:Battery Charger)

14.1.2.Block Diagram of Test Setup



(EUT:Battery Charger)

14.2.Test Standard

EN IEC 55014-2: 2021
(IEC 61000-4-6:2013/COR1:2015, Severity Level: 3V (rms), 0.15MHz ~ 80MHz)

14.3.Severity Levels and Performance Criterion

14.3.1.Severity level

Level	Field Strength V
1.	1
2.	3
3.	10
X	Special

Performance criterion: A

14.4.EUT Configuration

The configurations of EUT are listed in Section 14.1.

14.5.Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 14.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mod (Full load, Half load, No load) and measure them.

14.6.Test Procedure

1) Set up the EUT, CDN and test generators as shown on Section 14.1.2.

2) Let the EUT work in test mode and measure it.

3) 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).

4) The disturbance signal described below is injected to EUT through CDN.

5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.

6) The frequency range is swept from 150KHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

7) 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.

8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

14.7.Test Results

PASS.

Please refer to the following page.

Injected Currents Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant : Shenzhen AMC Technology Co., Ltd.	Test Date : December 27, 2022
EUT : Battery Charger	Temperature : 19.8 ℃
M/N : NBW54D601D3D01	Humidity : 51.8%
Power Supply : AC 230V 50Hz, AC 120V 60Hz	Test Engineer : Chen Li

Test Mode : Full load, Half load, No load

Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15 ~230	AC Mains	3V(rms)	A	PASS

Test Mode :

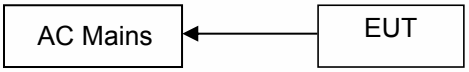
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result

Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : CDN : ☑CDN-M2 ☐CDN-M3	Note : No observable change.

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

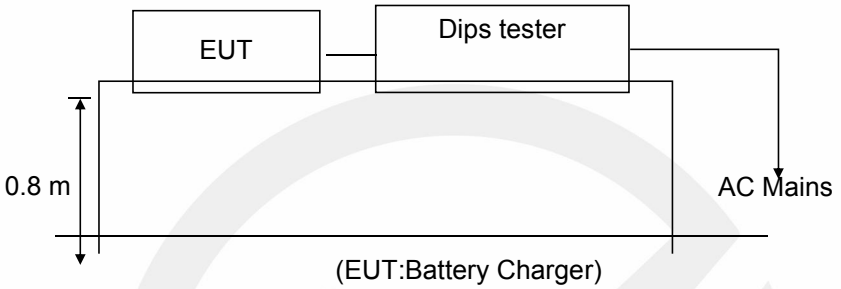
15.1.Block Diagram of Test Setup

15.1.1.Block Diagram of connection between the EUT and simulators



(EUT:Battery Charger)

15.1.2.Dips Test Setup



(EUT:Battery Charger)

15.2.Test Standard

EN IEC 55014-2: 2021
(IEC 61000-4-11: 2020)

15.3.Severity Levels and Performance Criterion

15.3.1.Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1 5 10 25 50 *
40	60	
70	30	

Performance criterion: C

15.4.EUT Configuration

The configurations of EUT are listed in Section 15.1.

15.5.Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 15.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, Half load, No load) and measure it.

15.6.Test Procedure

1) Set up the EUT and test generator as shown on Section 15.1.2.

2) The interruptions are introduced at selected phase angles with specified duration.

3) Record any degradation of performance.

15.7.Test Results

PASS.

Please refer to the following page.

Voltage Dips And Interruptions Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant : Shenzhen AMC Technology Co., Ltd.	Test Date : December 27, 2023
EUT : Battery Charger	Temperature : 19.8 ℃
M/N : NBW54D601D3D01	Humidity : 51.8%
Power Supply : AC 230V/120V 50/60Hz	Test Engineer : Chen Li

Test Mode : Full load(50Hz)

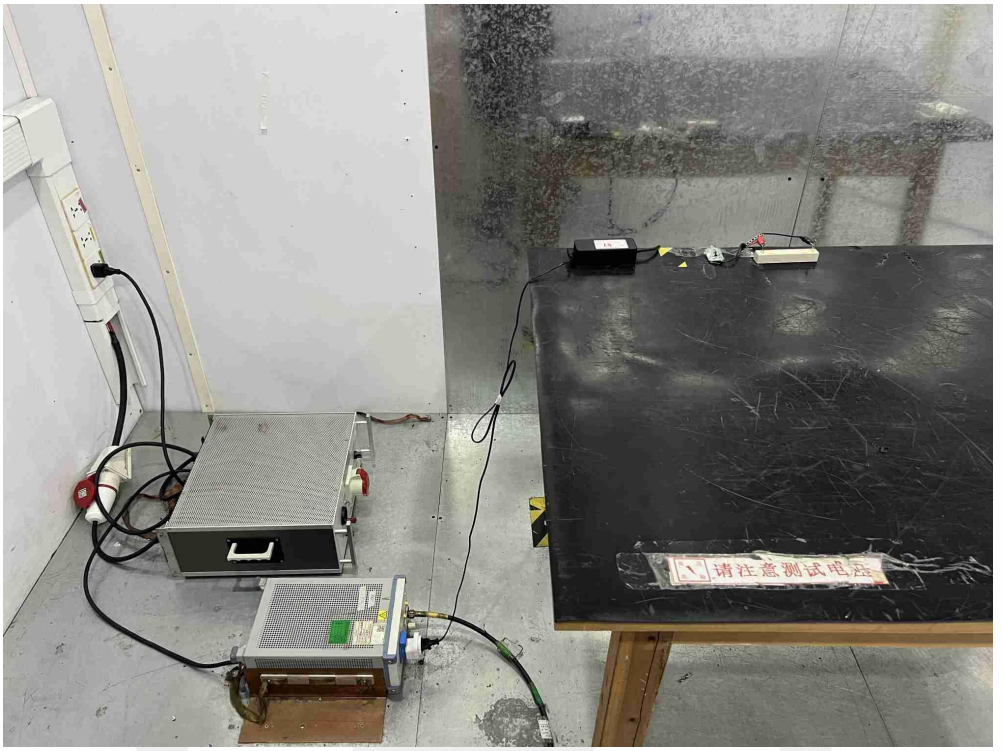
Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period) 50 Hz	Criterion ☐A ☐B ☒C ☐D	Result
0	100	0.5 P	C	PASS
40	60	10 P	C	PASS
70	30	25 P	C	PASS

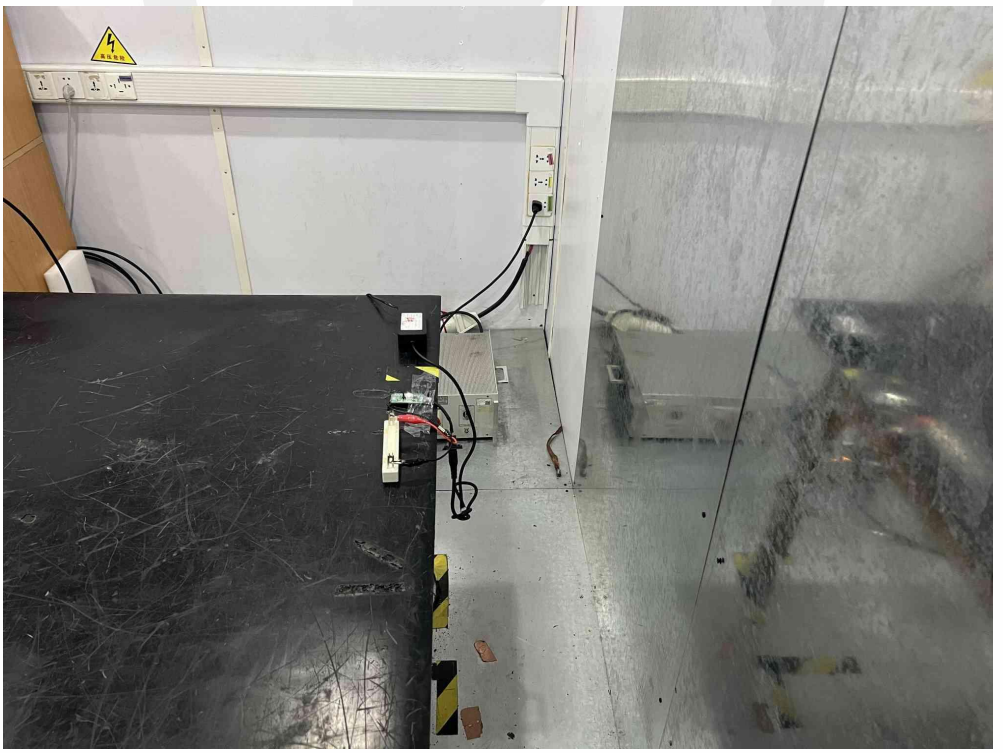
Test Mode : Full load(60Hz)

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period) 60 Hz	Criterion ☐A ☐B ☒C ☐D	Result
0	100	0.5 P	C	PASS
40	60	12 P	C	PASS
70	30	30 P	C	PASS

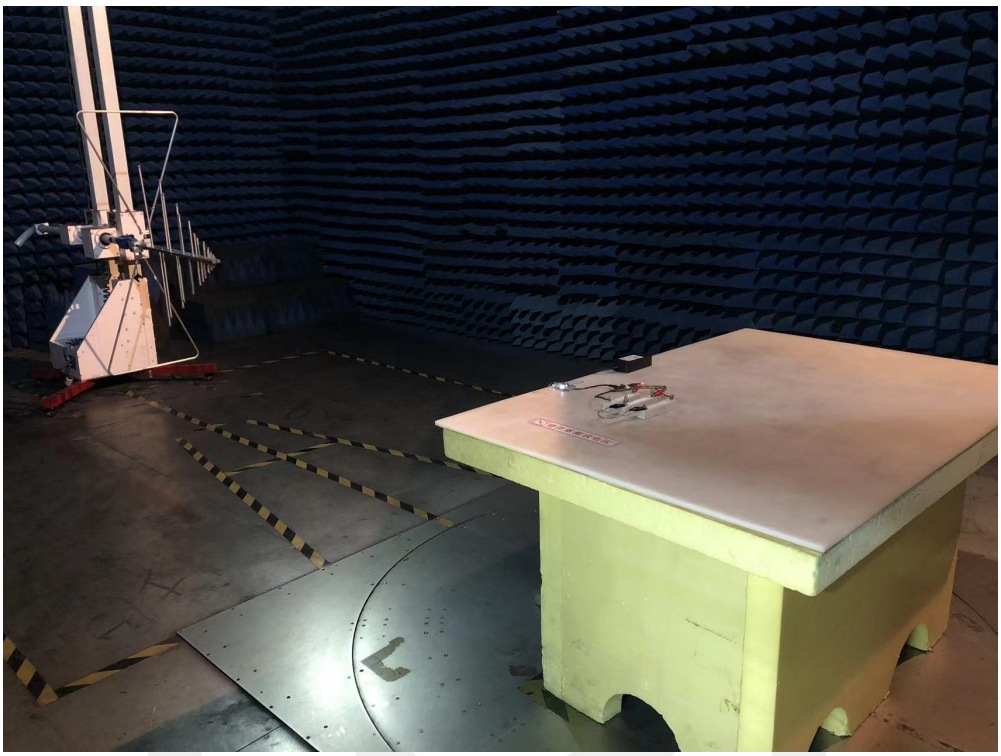
16. PHOTOGRAPH

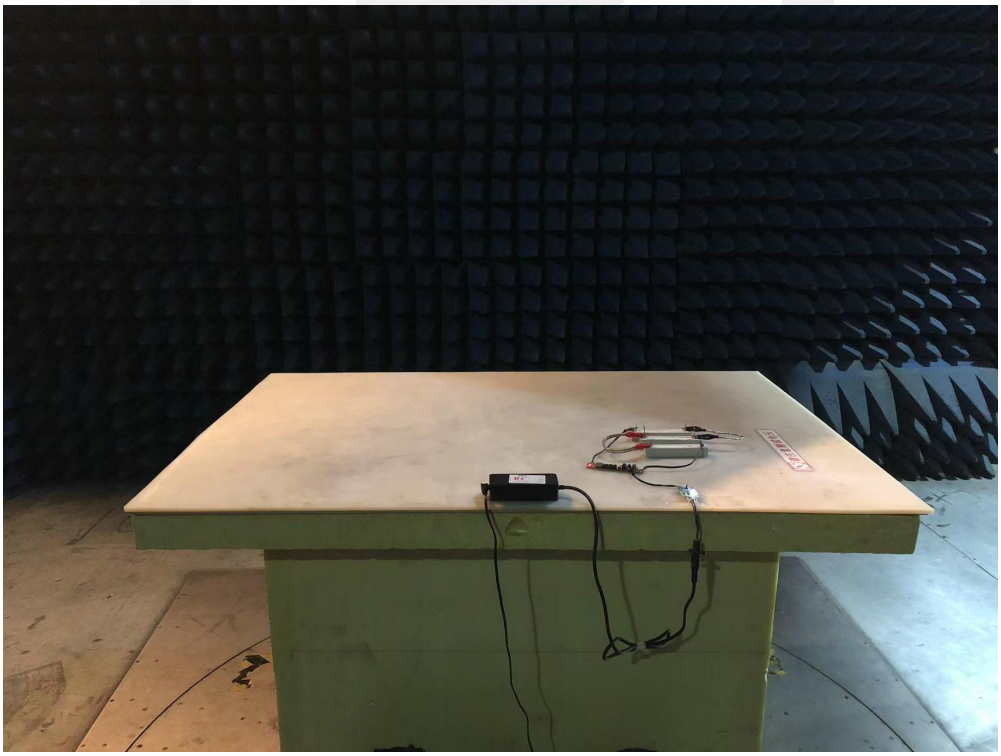
16.1.Photo of Conducted Emission





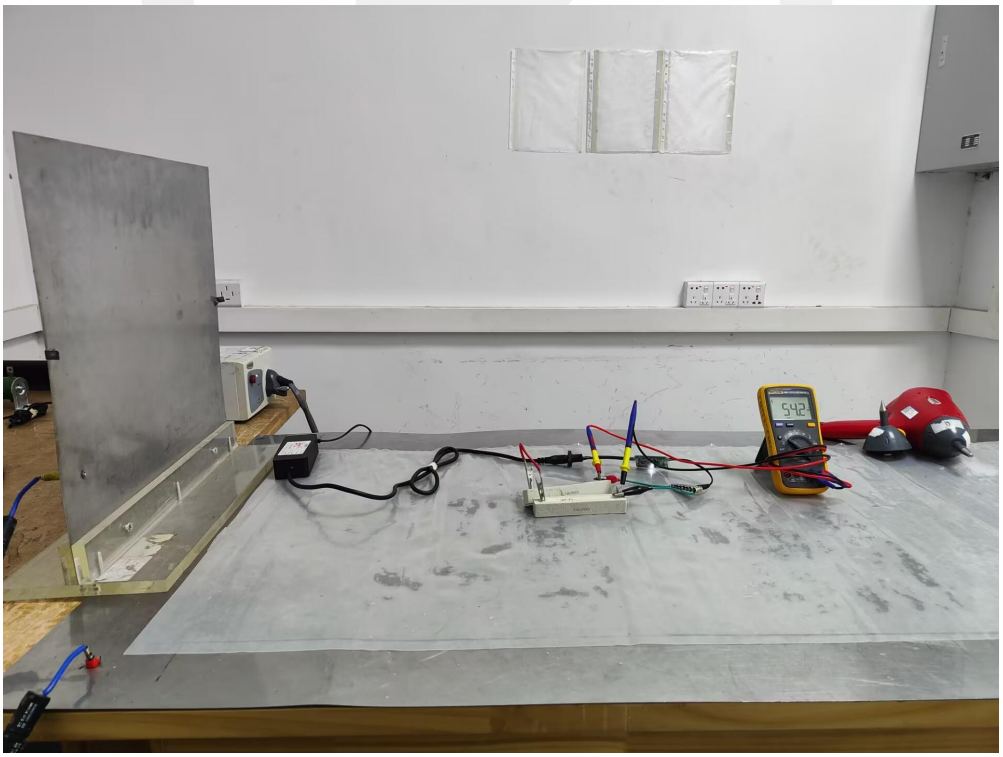
16.2.Photo of Radiated Emission





16.3.Photo of Harmonic/Flicker

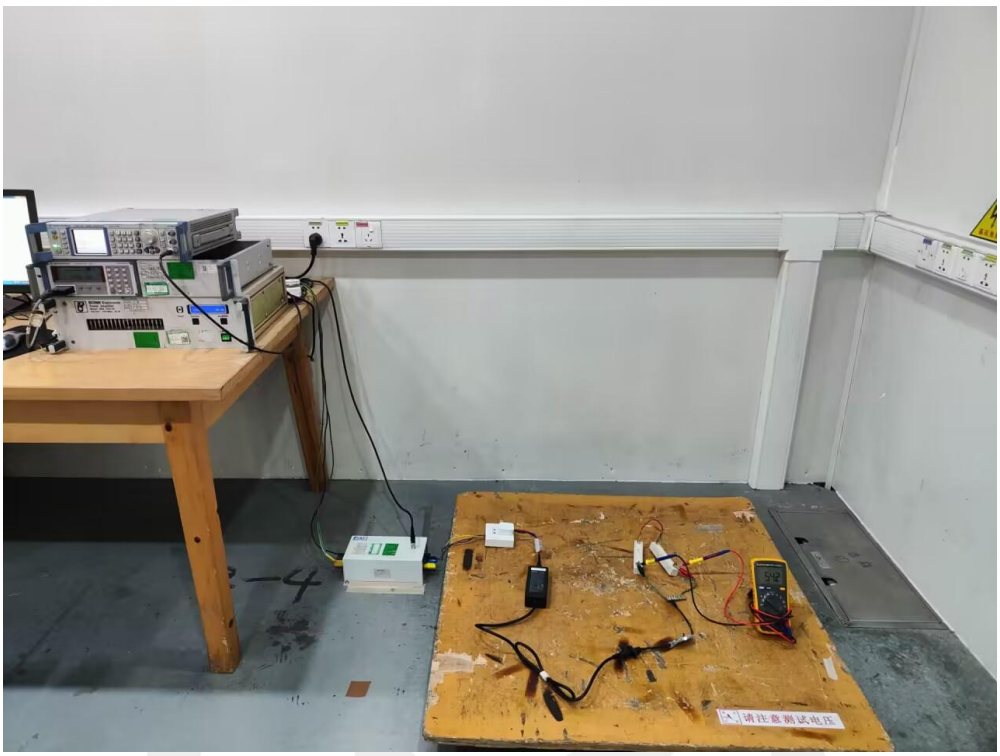
16.4.Photo of Electrostatic Discharge Test



16.5.Photo of Fast Transients Test

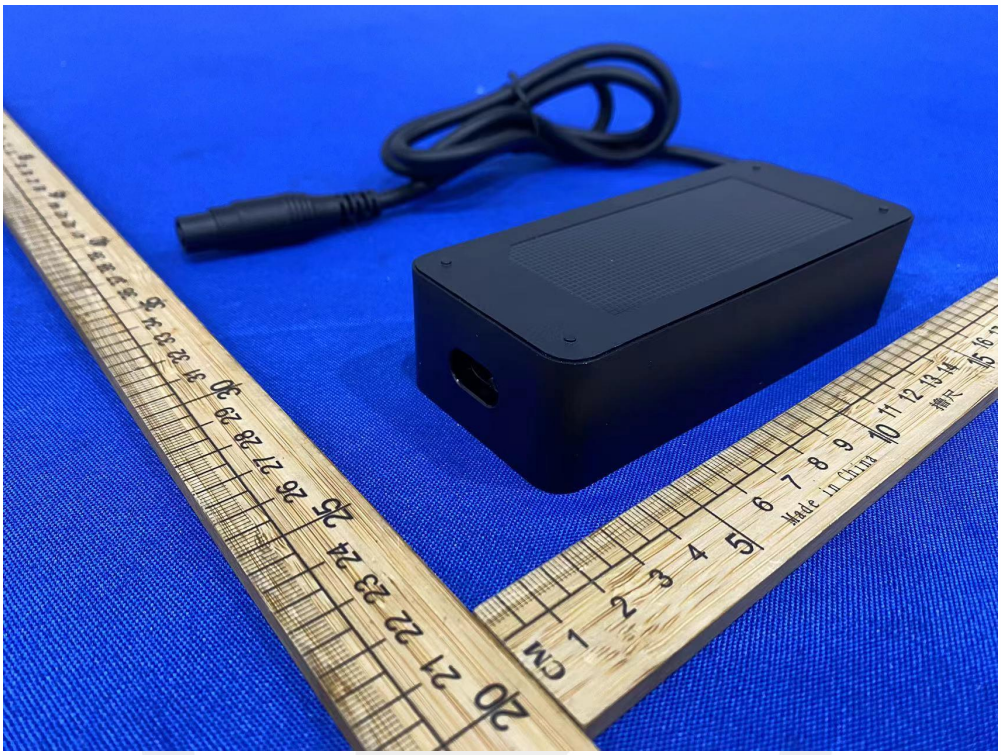
16.6.Photo of Surge Test

16.7.Photo of Injected Currents Test

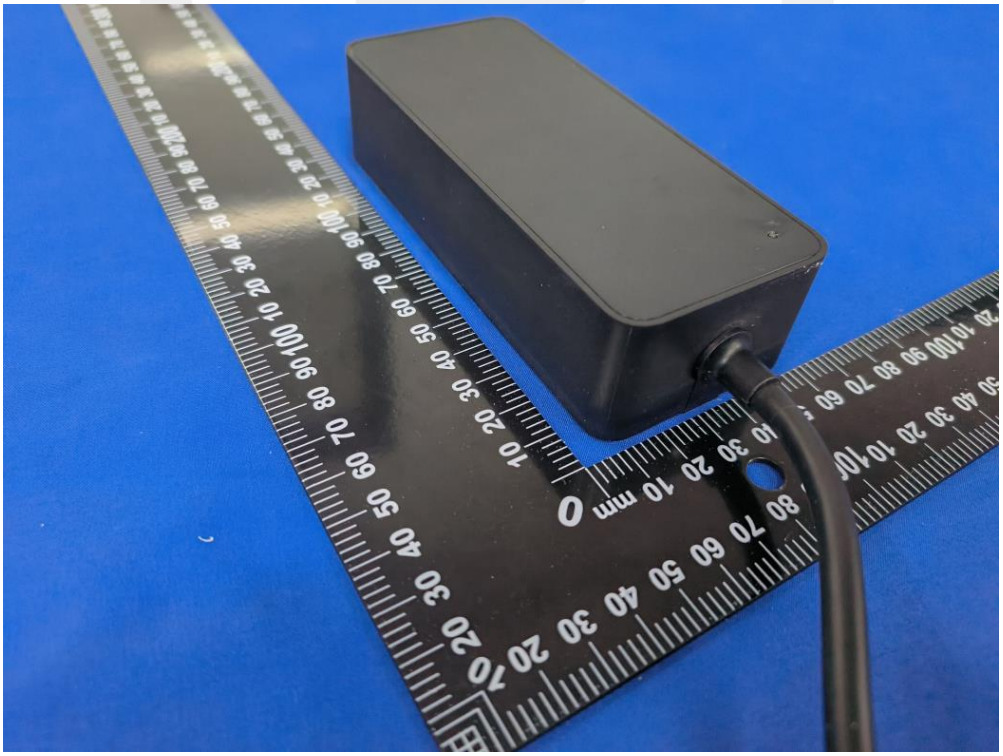


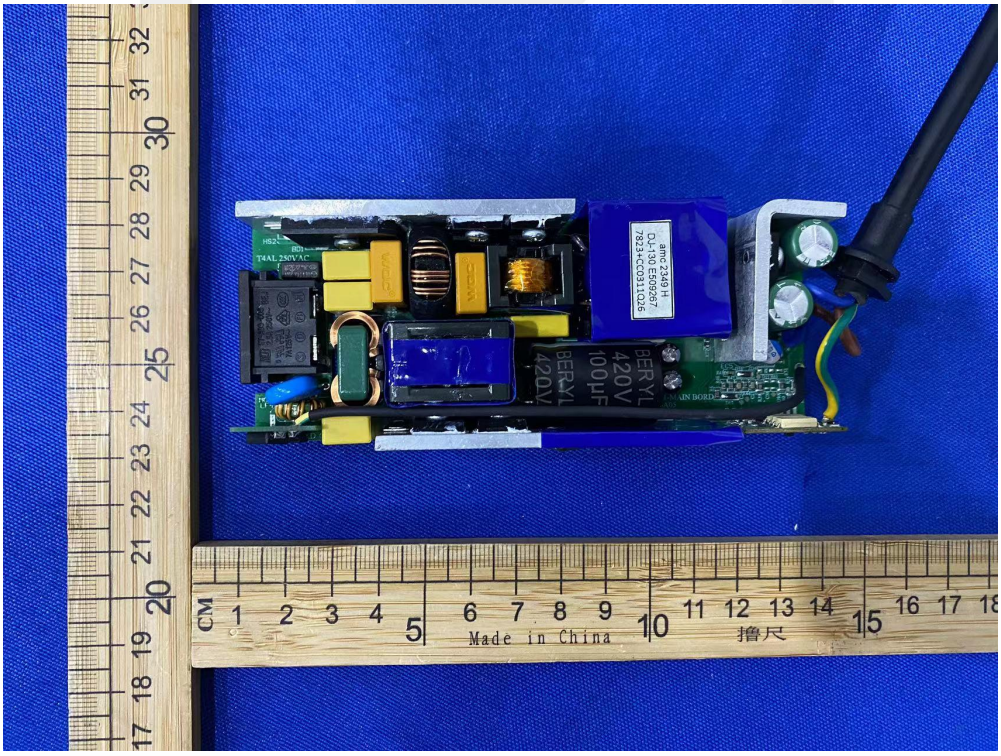
16.8.Photo of Voltage Dips And Interruptions Test

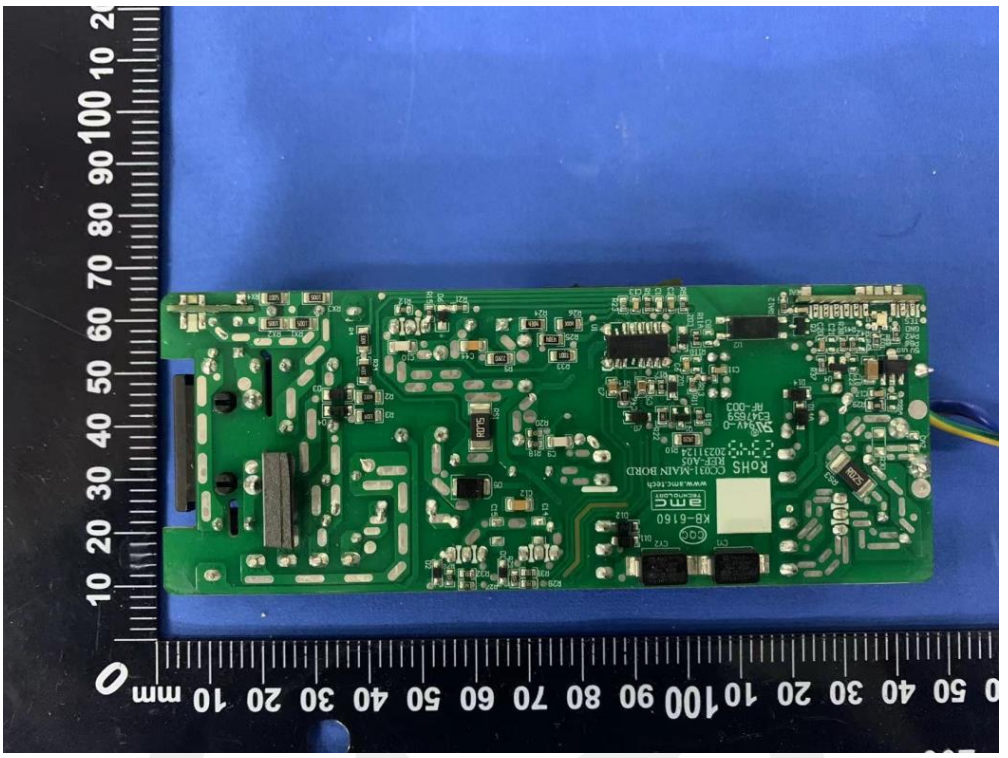
APPENDIX
(Photos of EUT)

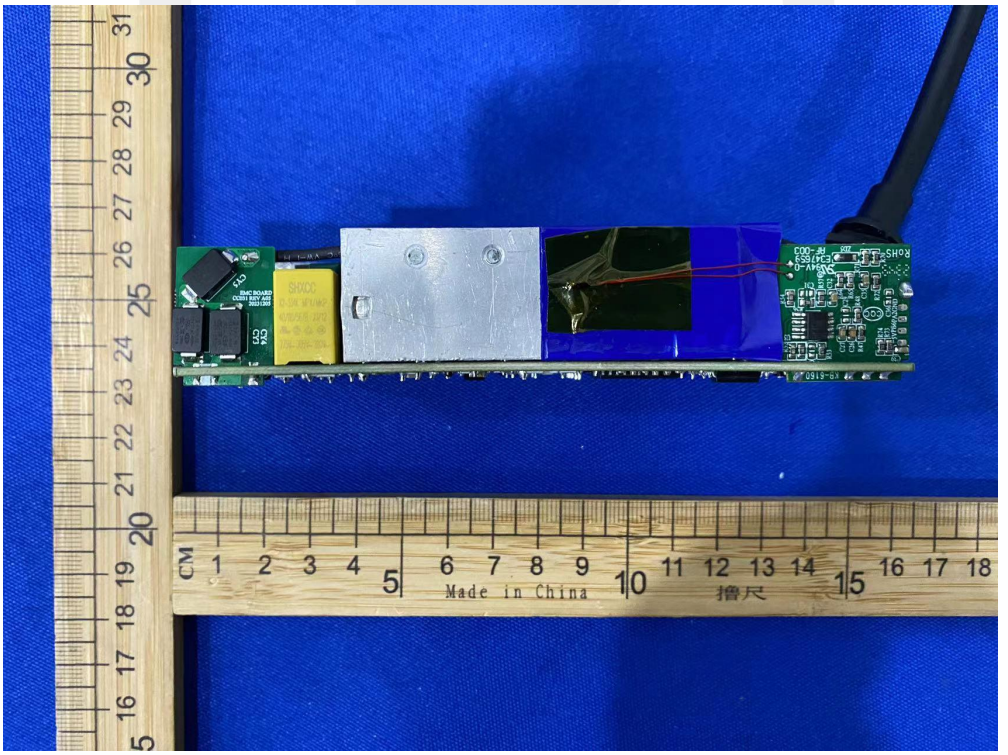

Made in China
CM


Made in China
CM




amc 2349 H
DJ-130 E509287
7823+CC0311Q16
BERYL
420V
100μF
T4AL 250VAC
Made in China





------The end----

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   The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.

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   The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

5. 本检测报告以实测值进行符合性判定，未考虑不确定度所带来的风险，本实验室不承担相关责任，特别约定、标准或规范中有明确规定的除外；
   The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6. 对本检测报告若有异议，请于收到报告之日起 20 日内提出；
   Objections shall be raised within 20 days from the date receiving the report.