FCC Test Report

FCC Rule(s):	FCC Part 15 Subpart B
Applicant:	Shenzhen wanmai technology innovation Co.,LTD
Product Name:	Portable Power Station
Model:	Vickers 500
Report No.:	ZKS210200021-1
Tested Date:	2021-02-02
Issued Date:	2021-02-04
Tested By :	Lieber Ouyang (Engineer)
Approved By:	Lahm Peng (Manager)
Prepared By:	

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1. General Information

1.1 Product Information

Applicant and Manufacturer	
Applicant:	Shenzhen wanmai technology innovation Co.,LTD
Address of Applicant:	501,5th Fir.BLDG 4,Pingshan Minqi Technology Park,No.65 Lishan
	Road Pingshan Community,Taoyuan Street,Nanshan
Manufacturer:	Shenzhen wanmai technology innovation Co.,LTD
Address of Manufacturer:	501,5th Fir.BLDG 4,Pingshan Minqi Technology Park,No.65 Lishan
	Road Pingshan Community,Taoyuan Street,Nanshan

General Description of EUT	
Product Name:	Portable Power Station
Model No.:	Savior 500
Trade Name:	--
Adding Model(s):	--
Class of Equipment:	Class B
Rated Voltage:	DC Input: 18V/4.6A, DC Output: DC 12V/15A
	QC Output: 5V/3.1A, 9V/2A, 12V/1.5A
	PD Output: 5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/3A
	AC Output: 110V/60Hz
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	

1.2 Compliance Standards

Compliance Standards or Rules	
FCC Part 15 Subpart B	FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Unintentional Radiators
The objective of the manufacturer or applicant is to demonstrate compliance with the above standards.	
According to standards for test methodology	
ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.
All measurements contained in this report were conducted with all above standards	
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

1.3 Test Facilities

Global United Technology Services Co., Ltd.
All measurement facilities used to collect the measurement data are located at No.301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

1.4 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	Charging	--	
TM2	Discharging	--	
List and Details of Auxiliary Cable			
Description	Length (M)	Shielded/Unshielded	With/Without Ferrite
--	--	--	--
--	--	--	--
--	--	--	--
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
--	--	--	--
--	--	--	--
--	--	--	--
The equipment under test (EUT) was configured to measure its highest possible emission and immunity level. The test modes were adapted according to the operation manual for use.			

1.5 Measurement Uncertainty

Parameter	Conditions	Uncertainty
Conducted Disturbance	9kHz ~30MHz	±2.75 dB
Radiated Disturbance	30MHz ~ 1GHz	±4.89 dB
Radiated Disturbance	1Hz ~ 6GHz	±4.93 dB

1.6 List of Test and Measurement Instruments

Description	**Manufacturer**	**Model**	**Serial Number**	**Due. Date**
EMI Test Receiver	Rohde & Schwarz	ESCS30	830245/009	2021-04-21
AMN	Rohde & Schwarz	ESH2-Z5	100002	2021-04-21
EMI Test Receiver	Rohde & Schwarz	ESI26	838786/013	2021-04-21
Pre-amplifier	CD	PAP-0118	24004	2021-04-21
Bilog Antenna	Chase	CBL6112B	2591	2021-04-21
Horn Antenna	Rohde & Schwarz	HF906	100014	2021-04-21

2. Summary of Test Results

FCC Rules	Description of Test Items	Result
FCC Part 15.107	Conducted Emissions	Passed
FCC Part 15.109	Radiated Emissions	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: Not applicable		

3. Conducted Disturbance

3.1 Standard and Limit

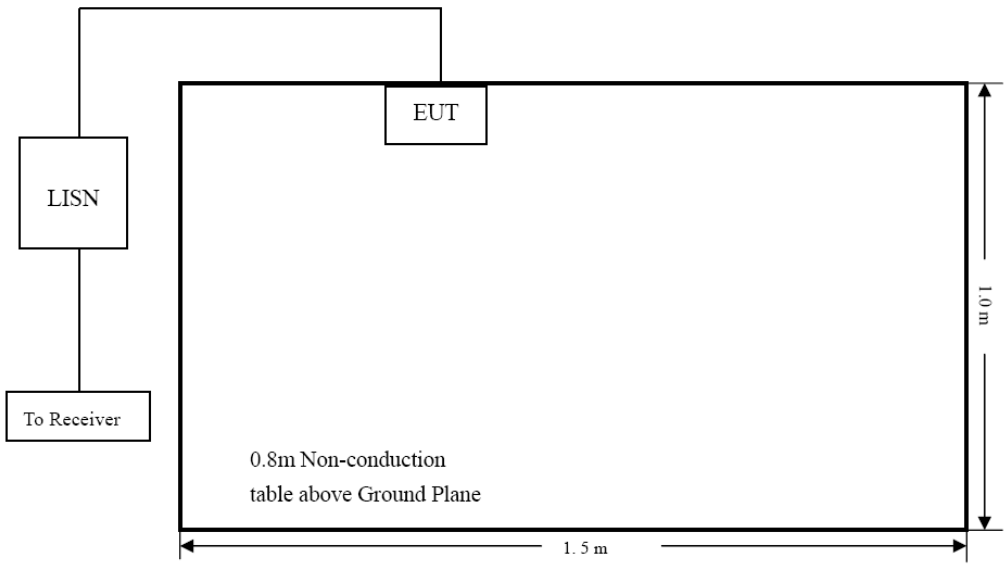
According to the rule FCC Part 15.107, Conducted limit, the limit for a class B device as below:

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Note 1: Decreases with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz Note 2: The lower limit applies at the band edges		

AC Power Line

3.2 Test Procedure

Test is conducting under the description of ANSI C63.4-2003 American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

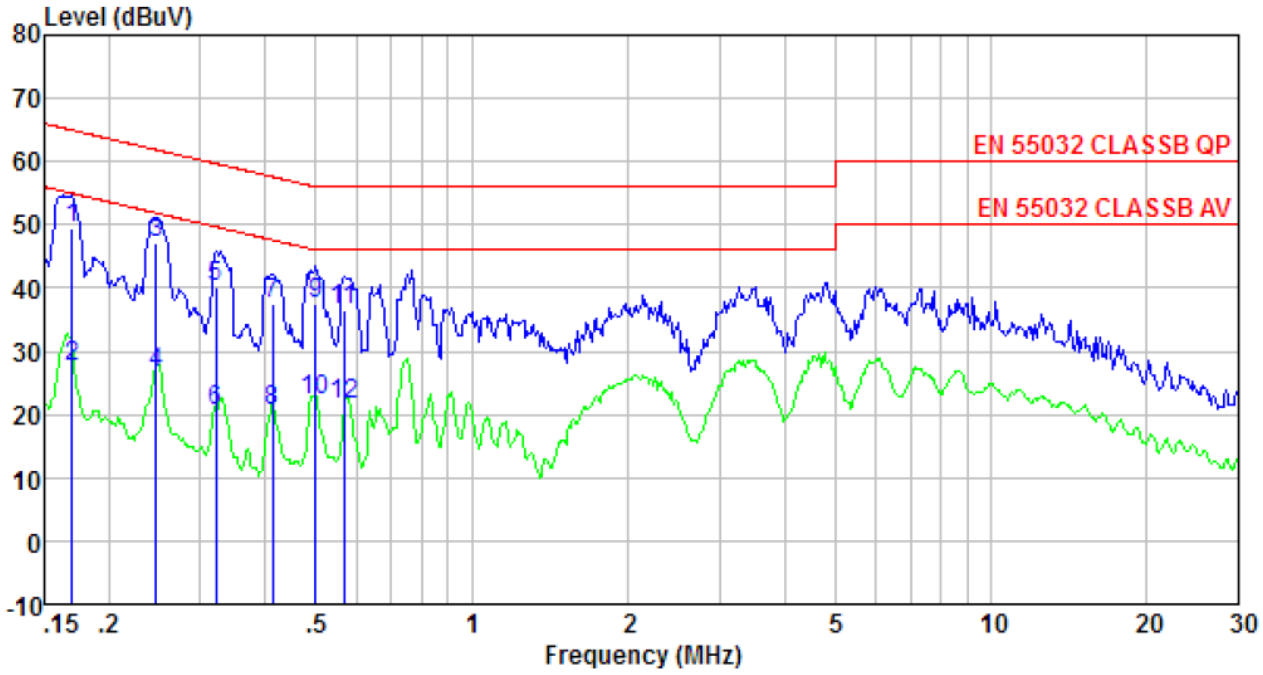


Test Setup Block Diagram

3.3 Test Data and Results

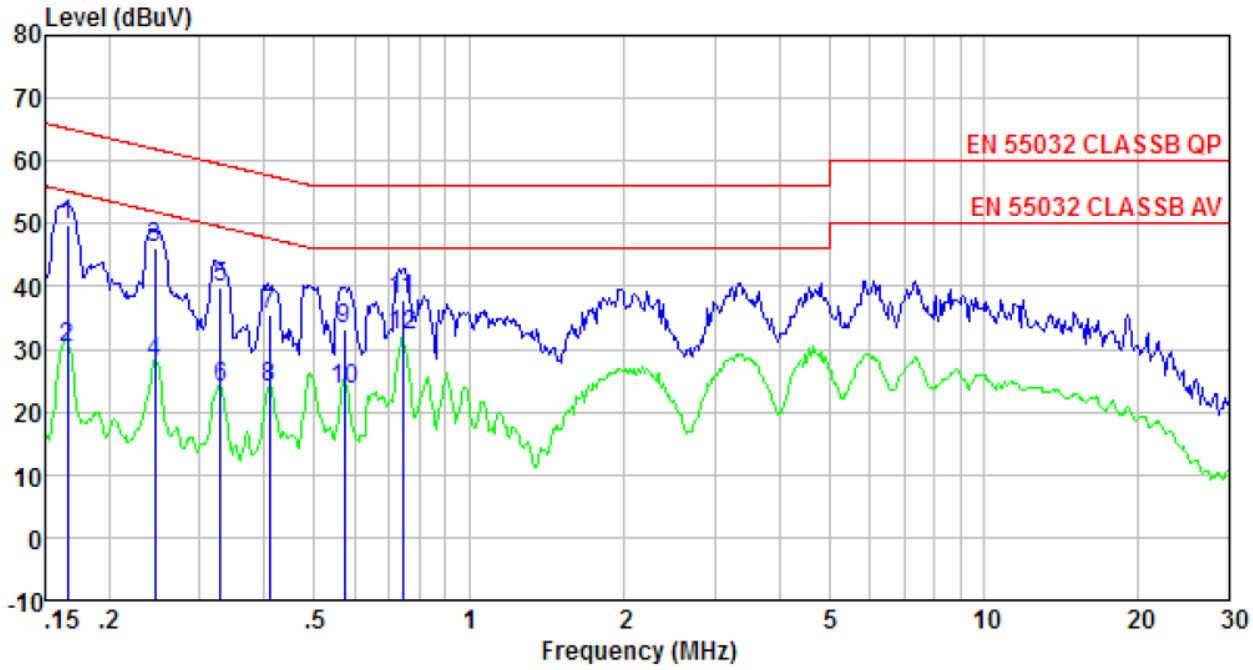
Based on all tested data, the EUT complied with the FCC Part 15.107 standard limit for a Class B device, and with the worst case as below:

Test Plots and Data of Conducted Emissions	
Tested Model:	Vickers 500
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Power Line:	Live
Remark:	



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.169	48.85	0.40	0.09	49.34	64.99	-15.65	QP
2	0.169	27.01	0.40	0.09	27.50	54.99	-27.49	Average
3	0.247	46.74	0.40	0.10	47.24	61.86	-14.62	QP
4	0.247	25.95	0.40	0.10	26.45	51.86	-25.41	Average
5	0.322	39.72	0.39	0.10	40.21	59.66	-19.45	QP
6	0.322	20.21	0.39	0.10	20.70	49.66	-28.96	Average
7	0.413	36.89	0.35	0.11	37.35	57.59	-20.24	QP
8	0.413	20.15	0.35	0.11	20.61	47.59	-26.98	Average
9	0.499	36.91	0.32	0.11	37.34	56.01	-18.67	QP
10	0.499	21.68	0.32	0.11	22.11	46.01	-23.90	Average
11	0.567	36.09	0.29	0.12	36.50	56.00	-19.50	QP
12	0.567	21.05	0.29	0.12	21.46	46.00	-24.54	Average

Test Plots and Data of Conducted Emissions	
Tested Model:	Vickers 500
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Power Line:	Neutral
Remark:	



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	49.39	0.40	0.08	49.87	65.16	-15.29	QP
2	0.166	29.87	0.40	0.08	30.35	55.16	-24.81	Average
3	0.246	45.48	0.40	0.10	45.98	61.91	-15.93	QP
4	0.246	27.43	0.40	0.10	27.93	51.91	-23.98	Average
5	0.329	39.43	0.38	0.10	39.91	59.49	-19.58	QP
6	0.329	23.45	0.38	0.10	23.93	49.49	-25.56	Average
7	0.408	34.89	0.35	0.11	35.35	57.68	-22.33	QP
8	0.408	23.35	0.35	0.11	23.81	47.68	-23.87	Average
9	0.573	32.88	0.29	0.12	33.29	56.00	-22.71	QP
10	0.573	23.28	0.29	0.12	23.69	46.00	-22.31	Average
11	0.743	37.38	0.25	0.13	37.76	56.00	-18.24	QP
12	0.743	31.89	0.25	0.13	32.27	46.00	-13.73	Average

4. Radiated Disturbance

4.1 Standard and Limit

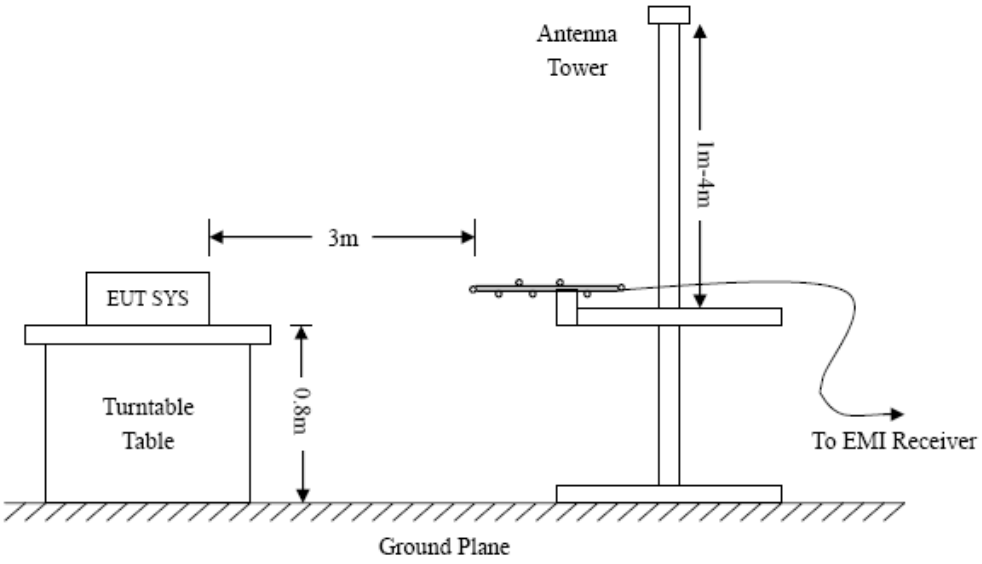
According to the rule FCC Part 15.109, Radiated emission limit, the limit for a class B device as below:

Frequency of Emission (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	
	QP	QP	AV
30-88	100	40	--
88-216	150	43.5	--
216-960	200	46	--
Above 960	500	54	74

Limits at a measurement distance of 3 m

4.2 Test Procedure

Test is conducting under the description of ANSI C63.4-2003 American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

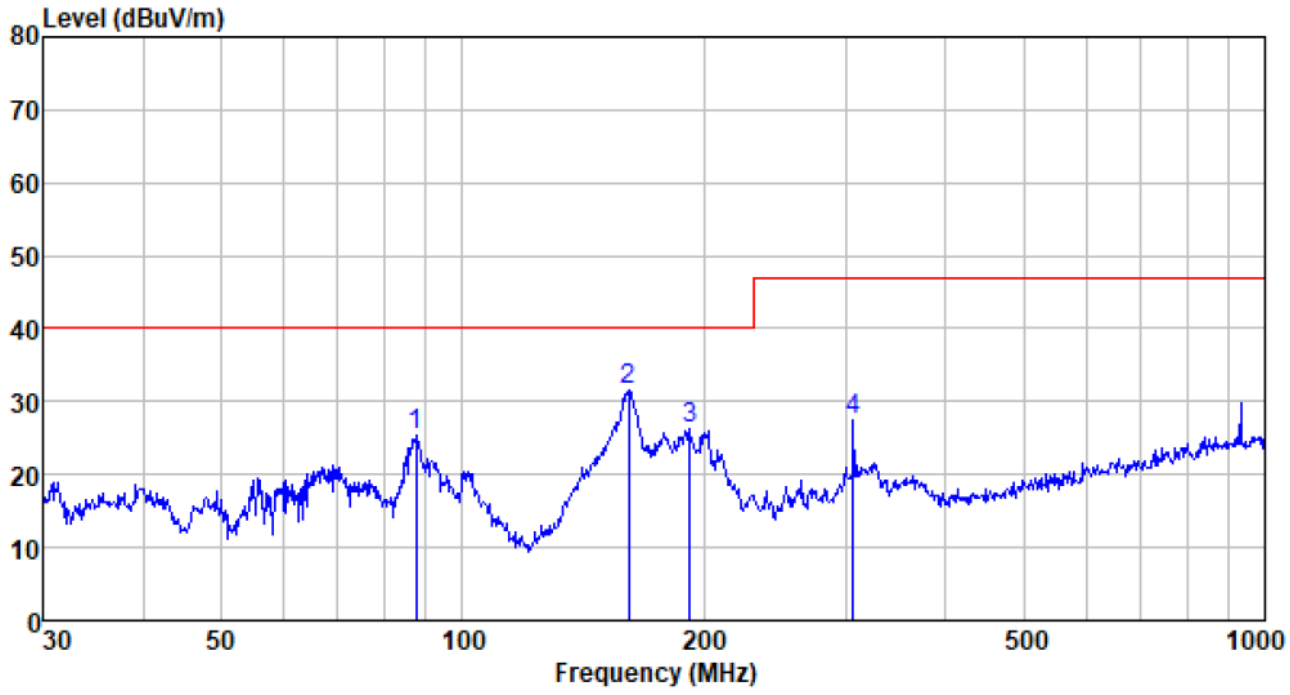


Test Setup Block Diagram

4.3 Test Data and Results

Based on all tested data, the EUT complied with the FCC Part 15.109 standard limit for a Class B device, and with the worst case as below:

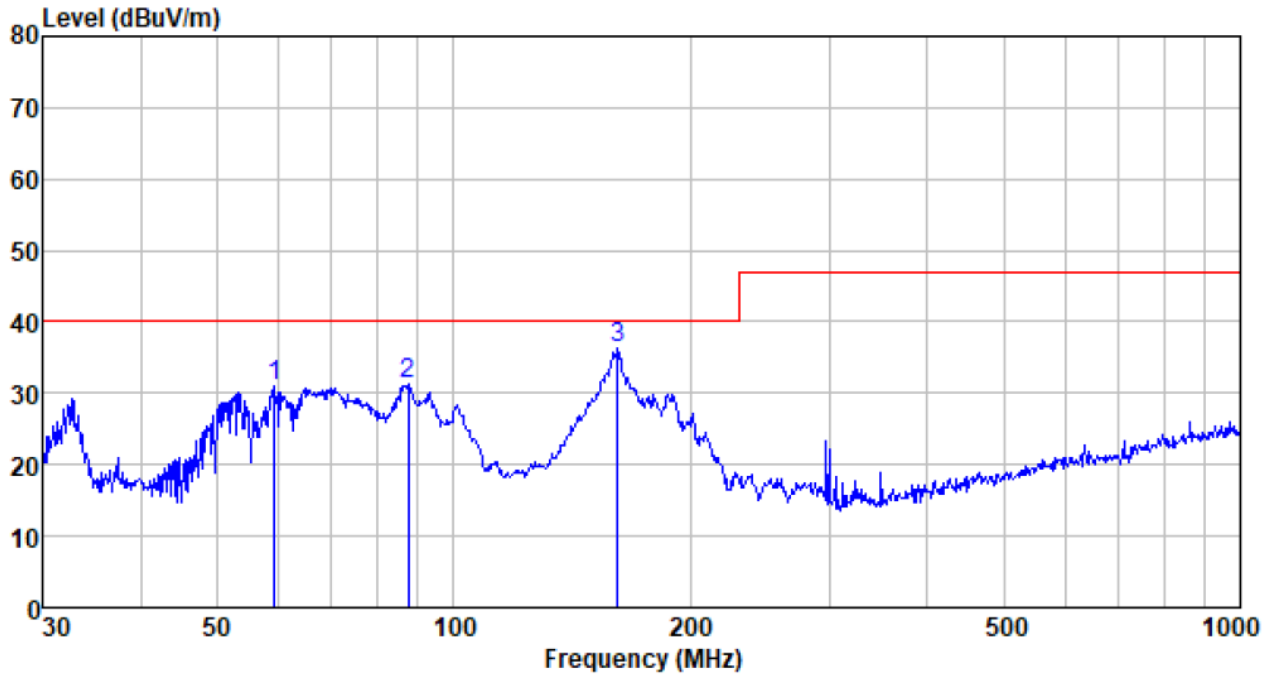
Test Plots and Data of Radiated Emissions	
Tested Model:	Vickers 500
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Horizontal
Remark:	



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
87.418	50.98	9.81	1.09	36.62	25.26	40.00	-14.74	Peak
160.909	58.80	8.33	1.63	37.14	31.62	40.00	-8.38	Peak
191.745	51.68	9.99	1.80	37.29	26.18	40.00	-13.82	Peak
306.754	48.70	13.74	2.39	37.43	27.40	47.00	-19.60	Peak

Remarks: level = Reading level + Antenna factor + Cable loss - Preamp Factor

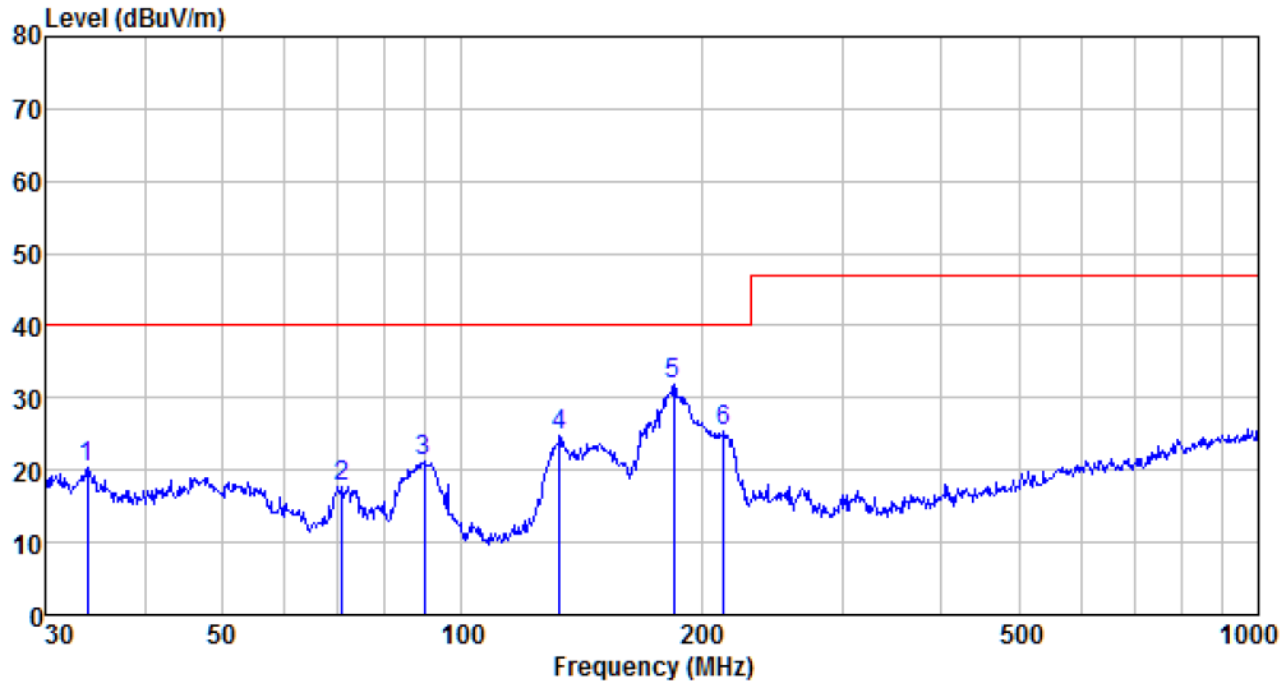
Test Plots and Data of Radiated Emissions	
Tested Model:	Vickers 500
Tested Mode:	TM1
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Vertical
Remark:	



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
59.232	55.09	11.38	0.85	36.31	31.01	40.00	-8.99	Peak
87.418	57.15	9.81	1.09	36.62	31.43	40.00	-8.57	Peak
161.474	63.39	8.33	1.64	37.14	36.22	40.00	-3.78	Peak

Remarks: level = Reading level + Antenna factor + Cable loss - Preamp Factor

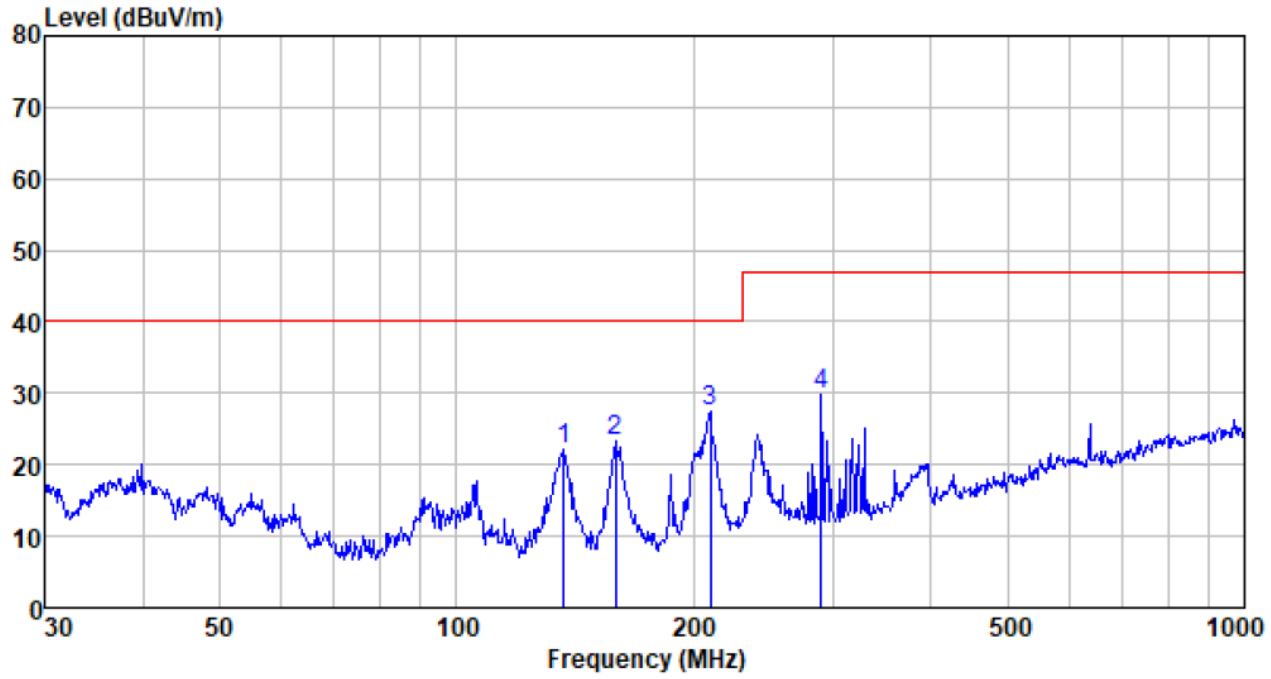
Test Plots and Data of Radiated Emissions	
Tested Model:	Vickers 500
Tested Mode:	TM2
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Horizontal
Remark:	



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
33.917	43.78	11.28	0.60	35.28	20.38	40.00	-19.62	Peak
70.832	45.83	7.49	0.95	36.45	17.82	40.00	-22.18	Peak
89.590	46.10	10.57	1.11	36.63	21.15	40.00	-18.85	Peak
132.685	52.23	7.96	1.45	36.97	24.67	40.00	-15.33	Peak
184.490	57.98	9.32	1.76	37.26	31.80	40.00	-8.20	Peak
213.015	49.83	10.91	1.92	37.34	25.32	40.00	-14.68	Peak

Remarks:level = Reading level + Antenna factor + Cable loss - Preamp Factor

Test Plots and Data of Radiated Emissions	
Tested Model:	Vickers 500
Tested Mode:	TM2
Test Power Specification:	AC 120V/60Hz
Test Antenna Polarization:	Vertical
Remark:	



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
136.939	50.10	7.64	1.48	37.00	22.22	40.00	-17.78	Peak
159.225	50.69	8.25	1.62	37.13	23.43	40.00	-16.57	Peak
210.048	52.04	10.80	1.90	37.34	27.40	40.00	-12.60	Peak
290.017	51.64	13.35	2.31	37.41	29.89	47.00	-17.11	Peak

Remarks: level = Reading level + Antenna factor + Cable loss - Preamp Factor

Annex A. EUT Photos

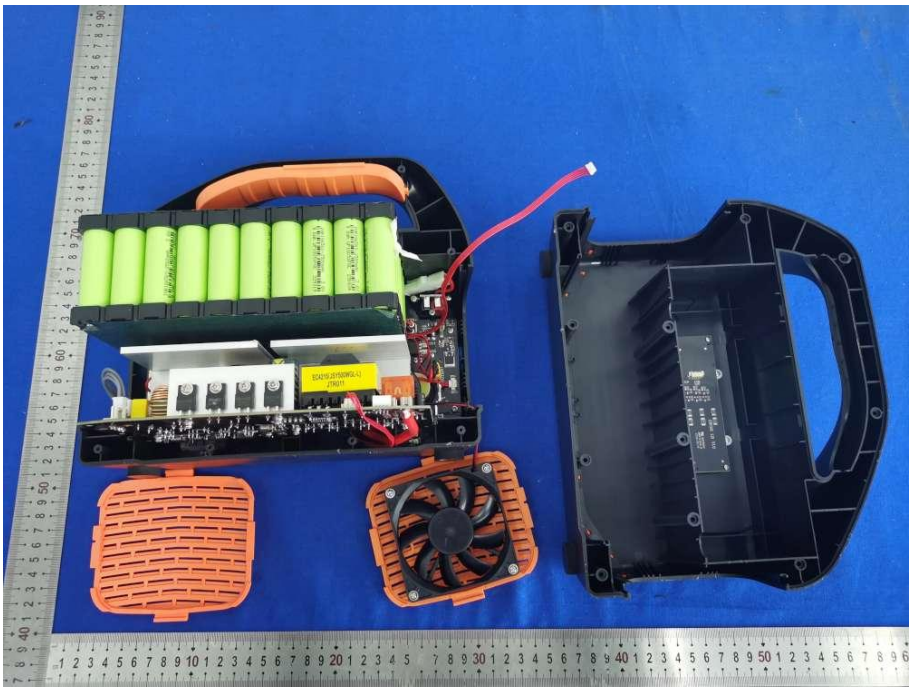
EUT View 1

EUT View 2

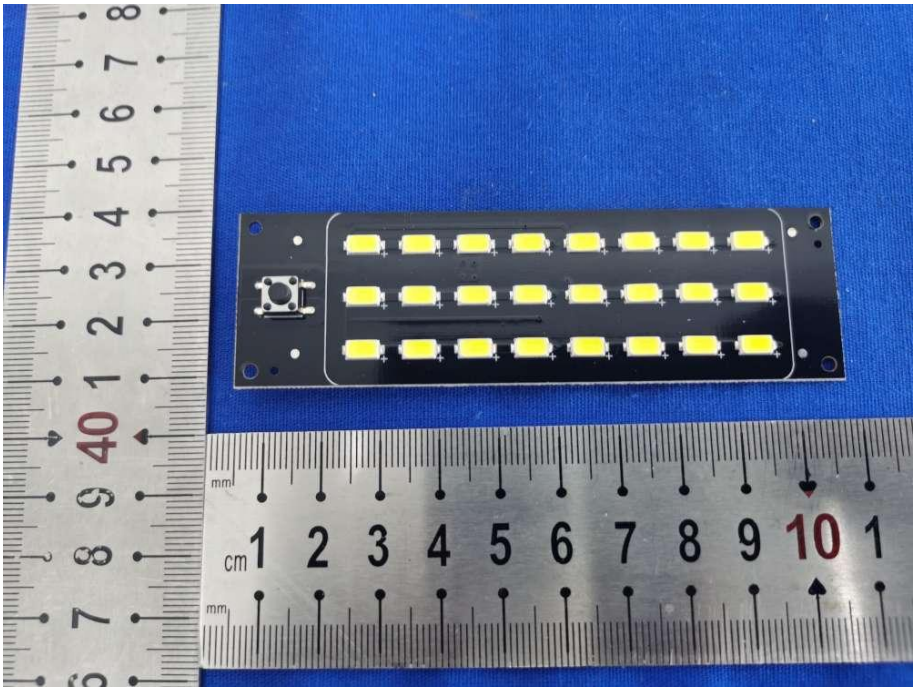
EUT View 3

EUT View 4

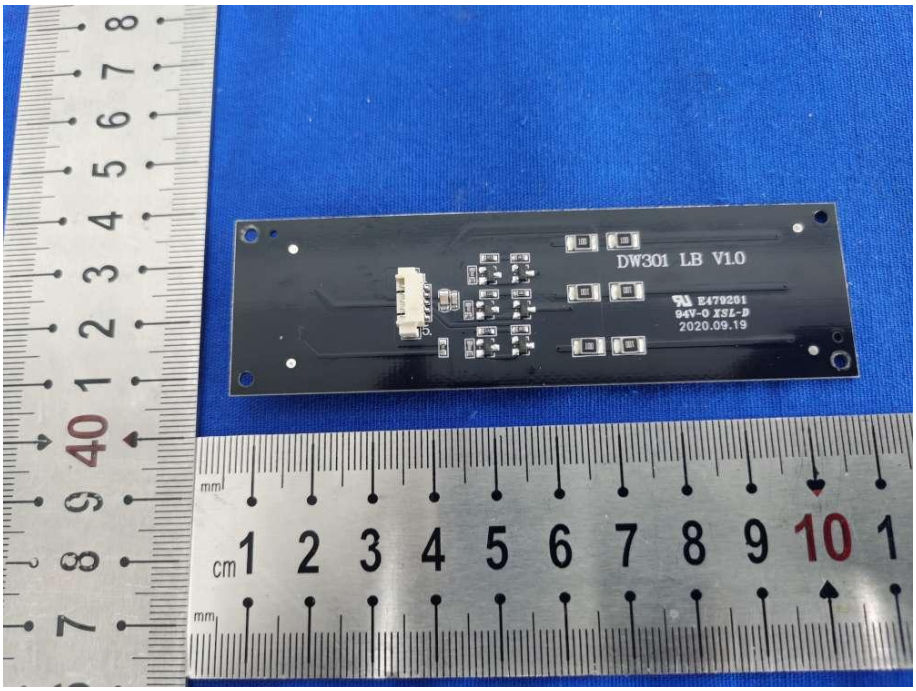
EUT View 5



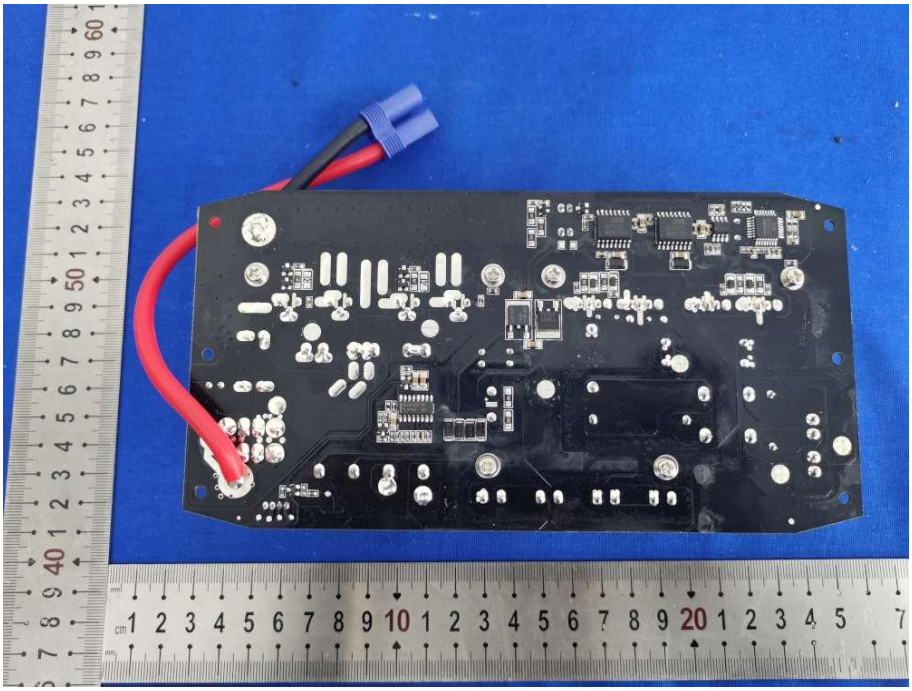
EUT View 6



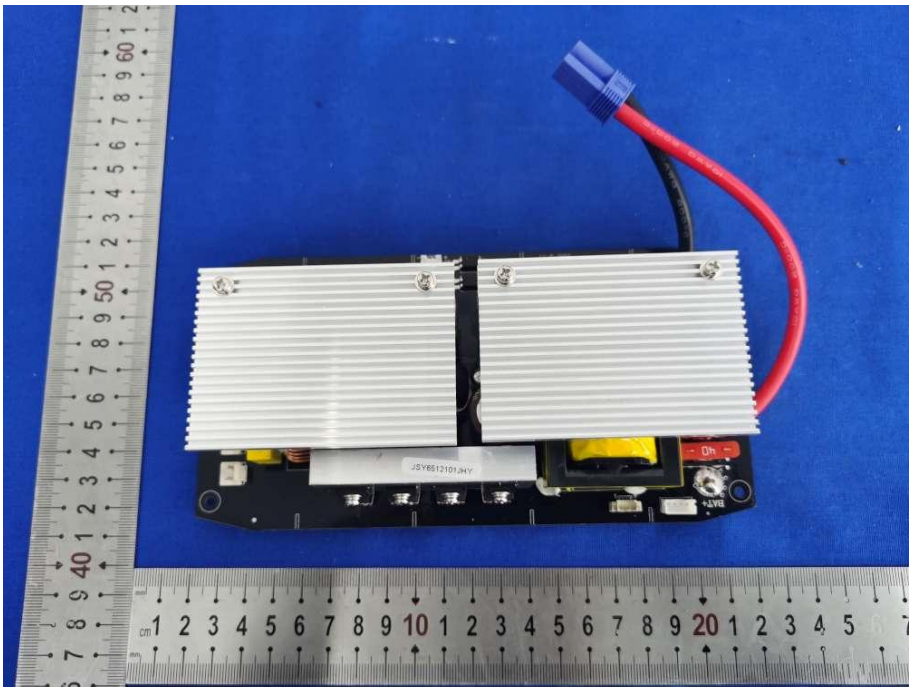
EUT View 7



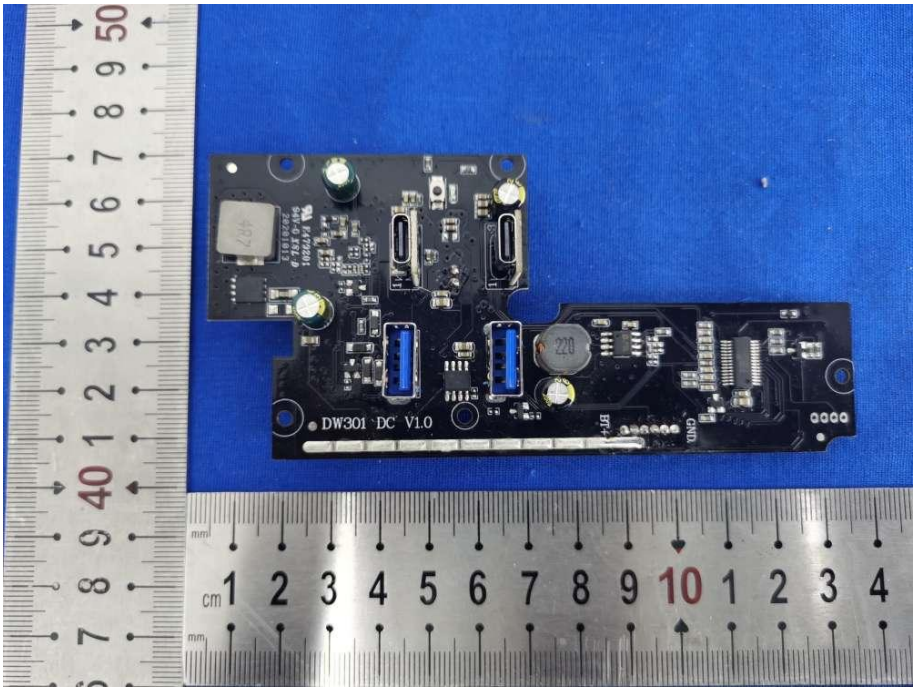
EUT View 8



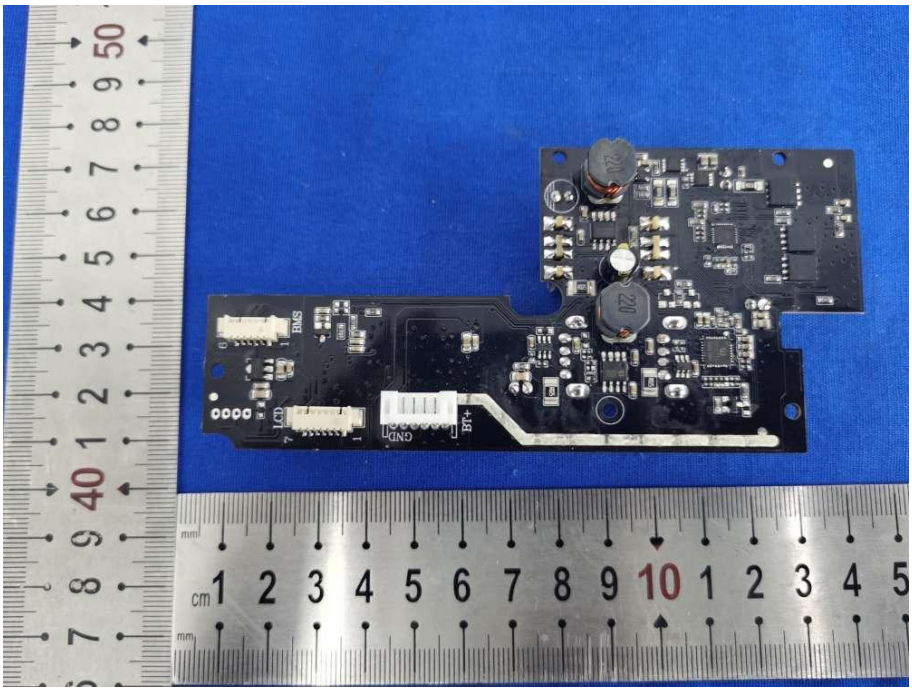
EUT View 9



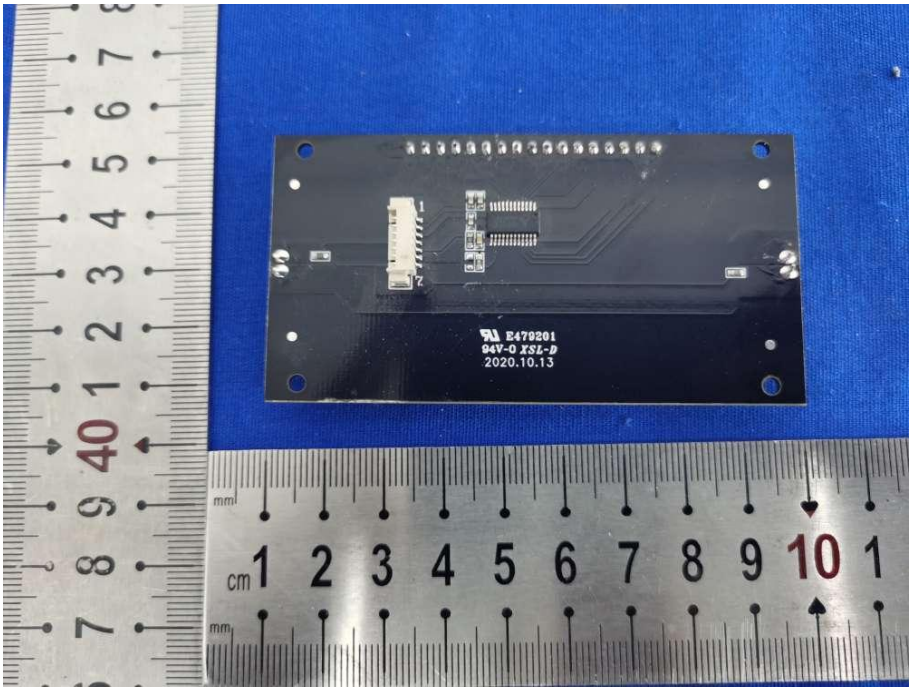
EUT View 10



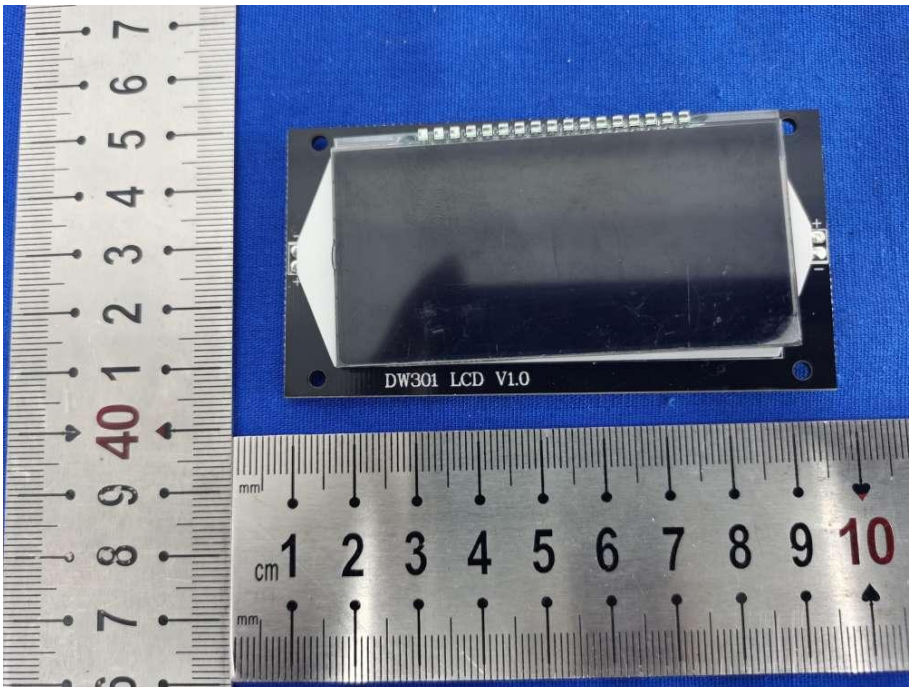
EUT View 11



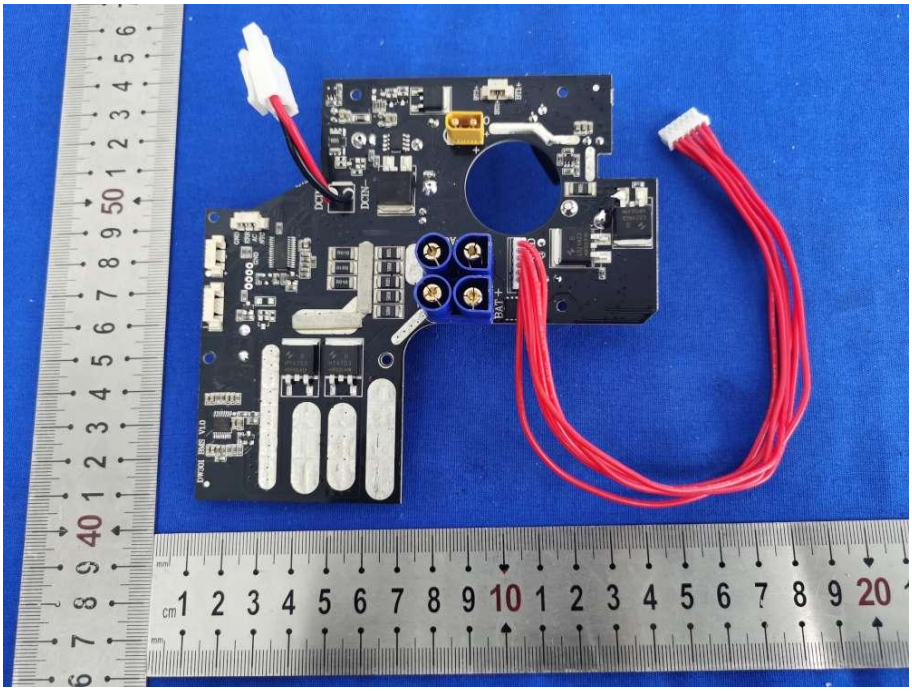
EUT View 12



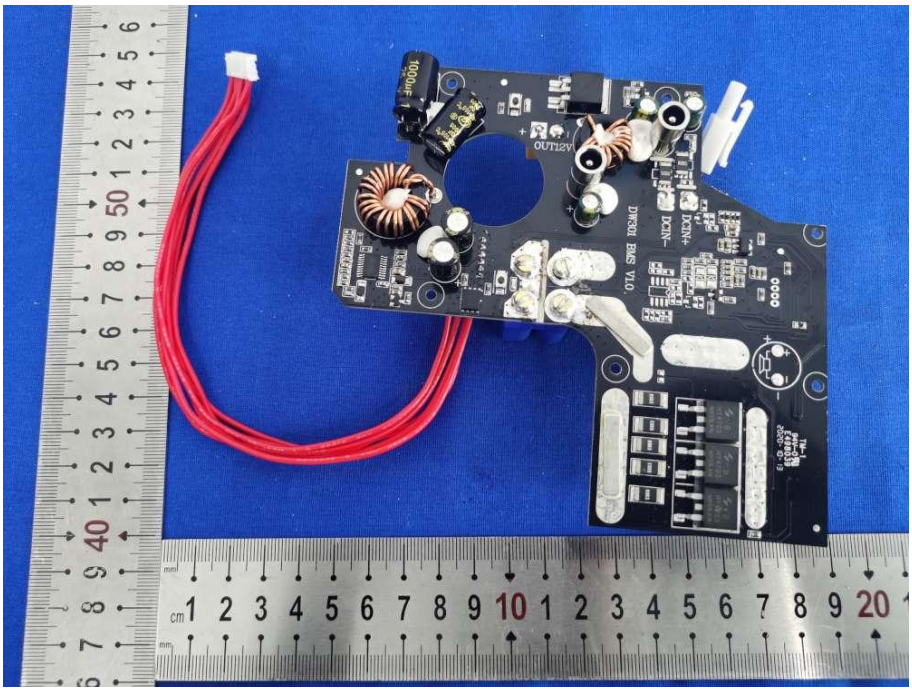
EUT View 13



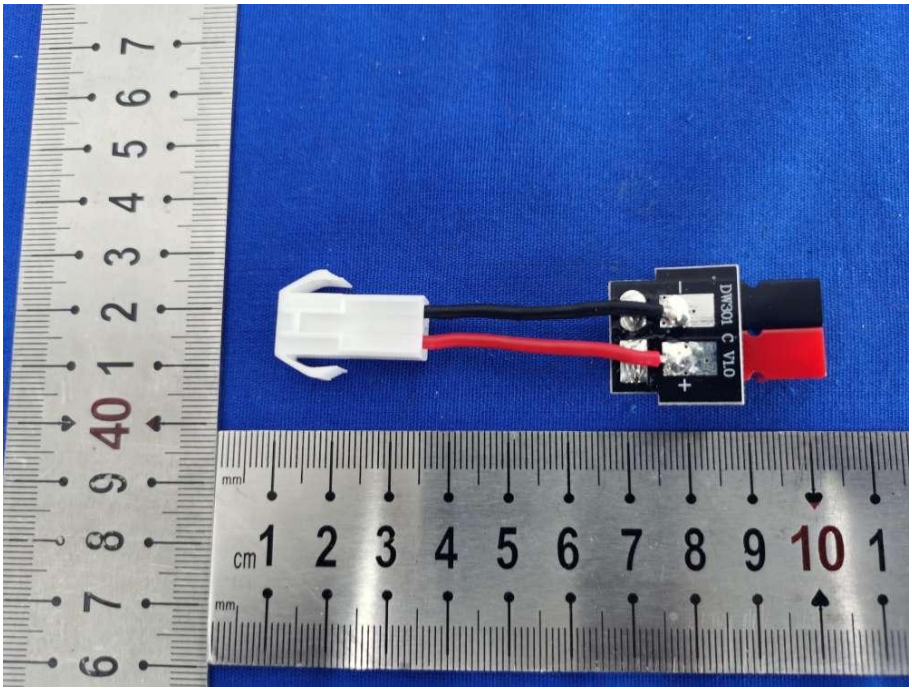
EUT View 14



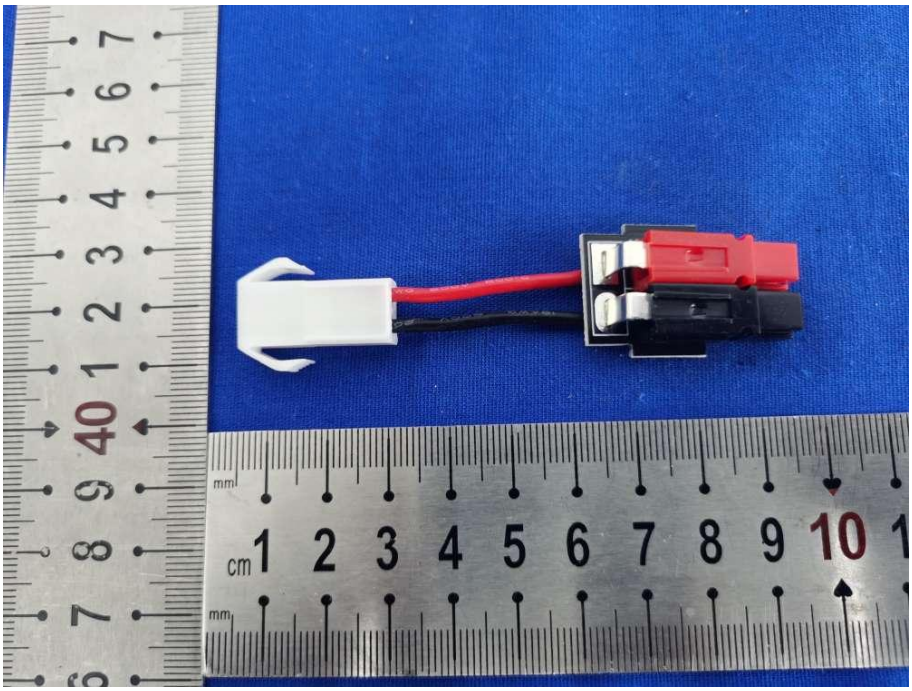
EUT View 15



EUT View 16



EUT View 17



Annex B. Label and Information

FCC Label Sample

FCC Label Specifications

Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. Where the EUT is constructed in two or more sections connected by wires and marketed together, the above statement is required to be affixed only to the main control unit. When the EUT is so small or for such use that it is not practicable to place the statement on it, the above information shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

Information to User

FCC Caution

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

******* END OF REPORT *******