TEST REPORT

Report No. :	**KS2205S1940E**
FCC ID:	**2A6ZZ-EA1000**
Applicant :	**CEA ELECTRIC CO.,LTD**
Address :	No.55 Dingda Road, Yingquan Economic Development Zone, Fuyang Anhui, China
Manufacturer.....:	CEA ELECTRIC CO.,LTD
Address.....:	No.55 Dingda Road, Yingquan Economic Development Zone, Fuyang Anhui, China
Product Name :	**Portable Power Station**
Trade Mark :	CEA
Model/Type reference :	EA1000-1280WH-1YE
Listed Model(s) :	EA1000-1280WH-1GN,EA1000-1280WH-1BK
Standard :	**FCC Rules and Regulations Part 15 Subpart C (Section 15.209), ANSI C63.10: 2013**
Date of Receipt :	May 27, 2022
Date of Test Date :	May 27, 2022 ~ June 22,2022
Date of issue :	June 22,2022
Test result :	**Pass**

Prepared by: (Printed Name + Signature)	Sky Dong	Sky dong
Approved by: (Printed Name + Signature)	Neil Wan	Neil Wan

Testing Laboratory Name :	**KSIGN(Guangdong) Testing Co., Ltd.**
Address :	West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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1. TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart C (Section 15.207): Conducted limits.
FCC Rules and Regulations Part 15 Subpart C (Section 15.209): Radiated emission limits; general requirements.
ANSI C63.10: 2013: American National Standard for Testing Unlicensed Wireless Devices

1.2 Report Version

Revised No.	Date of issue	Description
01	June 22,2022	Original

Add：West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China
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2. SUMMARY

2.1 Product Description

Product Name:	Portable Power Station
Trade Mark:	CEA
Model/Type reference:	EA1000-1280WH-1YE
Listed Model(s):	EA1000-1280WH-1GN,EA1000-1280WH-1BK
Model Different:	The difference between product models is only color, other power supply mode, internal structure, circuit and key components are the same, does not affect safety and electromagnetic compatibility performance.
Hardware version:	V1.0
Software version:	V1.0.0
Test samples ID:	KS2205S1940E-1# (Engineer sample), KS2205S1940E6-2# (Normal sample)
Power supply:	Input:AC 100-120V/60Hz USB Output*2: 5V/3A, 9V/2A, 12V/1.5A Output: Wireless Charging: 10W(Max) LED Light: 2W
Power supply(Battery):	25.6V
Operation frequency:	115KHz - 205KHz
Modulation type:	FSK
Antenna type:	coil antenna
Antenna gain:	0 dBi

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2.2 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:
☒ Charging and communication mode

Test Modes:		
Mode 1	Wireless Charging（10W）	Recorded
Mode 2	Wireless Charging（7.5W）	Recorded
Mode 3	Wireless Charging（5W）	Recorded
Mode 4	Standby	Pre-tested
Note: All test modes were pre-tested, but we only recorded the worst case in this report.		

2.3 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
Wireless charging load	/	EESON	5W/7.5W/10W	FCC	laboratory

2.4 Modifications

No modifications were implemented to meet testing criteria.

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3. TEST ENVIRONMENT

3.1 Address of the test laboratory

KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

CNAS-Lab Code: L13261
KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5457.01
KSIGN(Guangdong) Testing Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED#: 25693 CAB identifier.: CN0096
KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

FCC-Registration No.: 294912 Designation Number: CN1328
KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:
Radiated Emission:

Temperature:	24 ° C
Humidity:	45 %
Atmospheric pressure:	950-1050mbar

AC Power Conducted Emission:

Temperature:	25 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

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Conducted testing:

Temperature:	25 ° C
Humidity:	44 %
Atmospheric pressure:	950-1050mbar

3.4 Summary of measurement results

Description of test	Result
Conducted emissions test	Compliant
Radiated emission test	Compliant
Antenna requirement	Compliant

3.5 Statement of the measurement uncertainty

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.06 dB	(1)
Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)
Radiated Emission	9~30MHz	2.20dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6 Equipments Used during the Test

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	Spectrum Analyzer	R&S	FSV40-N	101798	03/04/2023
2	Vector Signal Generator	Agilent	N5182A	MY50142520	03/04/2023
3	Analog Signal Generator	HP	83752A	3344A00337	03/04/2023
4	Power Sensor	Agilent	E9304A	MY50390009	03/04/2023
5	Power Sensor	Agilent	E9300A	MY41498315	03/04/2023
6	Wideband Radio Communication Tester	R&S	CMW500	157282	03/04/2023
7	Climate Chamber	Angul	AGNH80L	1903042120	03/04/2023
8	Dual Output DC Power Supply	Agilent	E3646A	MY40009992	03/04/2023
9	RF Control Unit	Tonscend	JS0806-2	/	03/04/2023

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Transmitter spurious emissions & Receiver spurious emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	EMI Test Receiver	R&S	ESR	102525	03/04/2023
2	High Pass Filter	Chengdu E-Microwave	OHF-3-18-S	0E01901038	03/04/2023
3	High Pass Filter	Chengdu E-Microwave	OHF-6.5-18-S	0E01901039	03/04/2023
4	Spectrum Analyzer	HP	8593E	3831U02087	03/04/2023
5	Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	01230	12/04/2023
6	Loop Antenna	Beijin ZHINAN	ZN30900C	18050	03/04/2023
7	Spectrum Analyzer	R&S	FSV40-N	101798	03/04/2023
8	Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	03/29/2023
9	Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	03/04/2023
10	Pre-Amplifier	EMCI	EMC051835SE	980662	03/04/2023

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	LISN	R&S	ENV432	1326.6105.02	03/04/2023
2	EMI Test Receiver	R&S	ESR	102524	03/04/2023
3	Manual RF Switch	JS TOYO	/	MSW-01/002	03/04/2023

Note: 1)The Cal.Interval was one year.
2)The cable loss has calculated in test result which connection between each test instruments.

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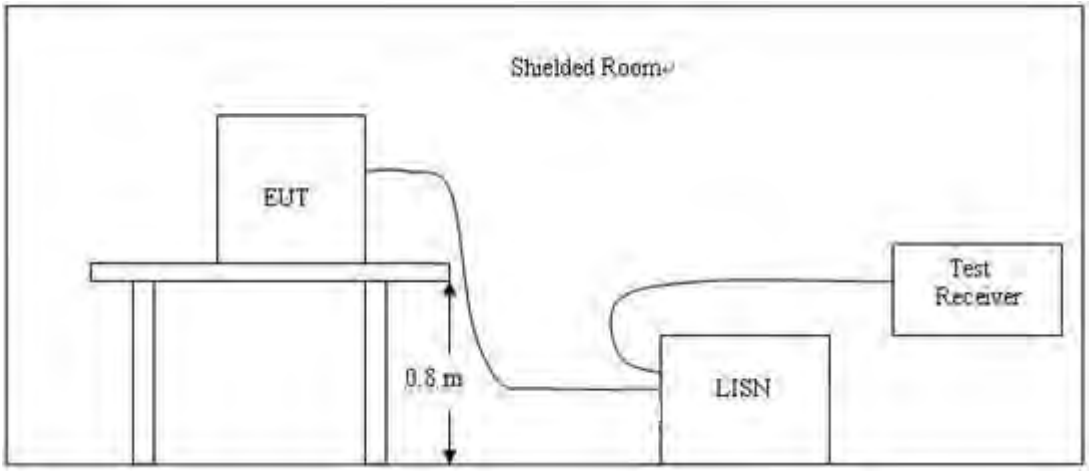
4. TEST CONDITIONS AND RESULTS

4.1 AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2, Support equipment, if needed, was placed as per ANSI C63.10.
3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5, All support equipments received AC power from a second LISN, if any.
6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following:

Frequency range (MHz)	Limit (dBuV)	
	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.		

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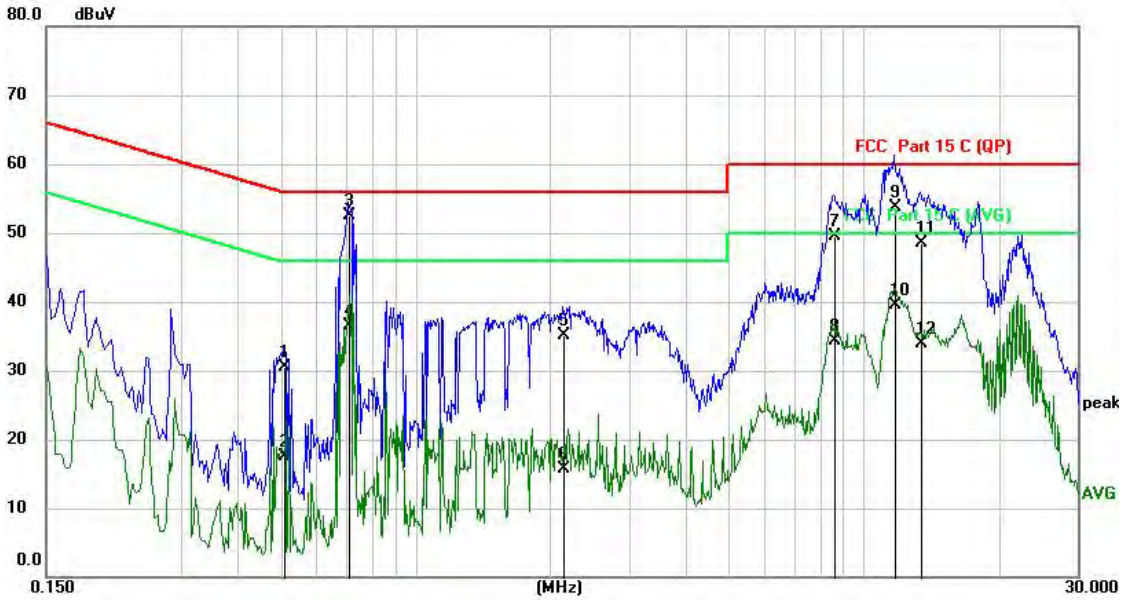
TEST RESULTS

1. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

Power supply:	AC 120V/60Hz	Polarization	L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.5100	20.18	10.39	30.57	56.00	-25.43	QP
2		0.5100	7.12	10.39	17.51	46.00	-28.49	AVG
3	*	0.7100	42.10	10.44	52.54	56.00	-3.46	QP
4		0.7100	26.16	10.44	36.60	46.00	-9.40	AVG
5		2.1340	24.44	10.57	35.01	56.00	-20.99	QP
6		2.1340	5.22	10.57	15.79	46.00	-30.21	AVG
7		8.5620	38.96	10.60	49.56	60.00	-10.44	QP
8		8.5620	23.68	10.60	34.28	50.00	-15.72	AVG
9		11.6940	43.06	10.67	53.73	60.00	-6.27	QP
10		11.6940	28.75	10.67	39.42	50.00	-10.58	AVG
11		13.3580	37.83	10.73	48.56	60.00	-11.44	QP
12		13.3580	23.10	10.73	33.83	50.00	-16.17	AVG

Note: Note:1).QP Value (dBμV)= QP Reading (dBμV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBμV) - QP Value (dBμV)
4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV)

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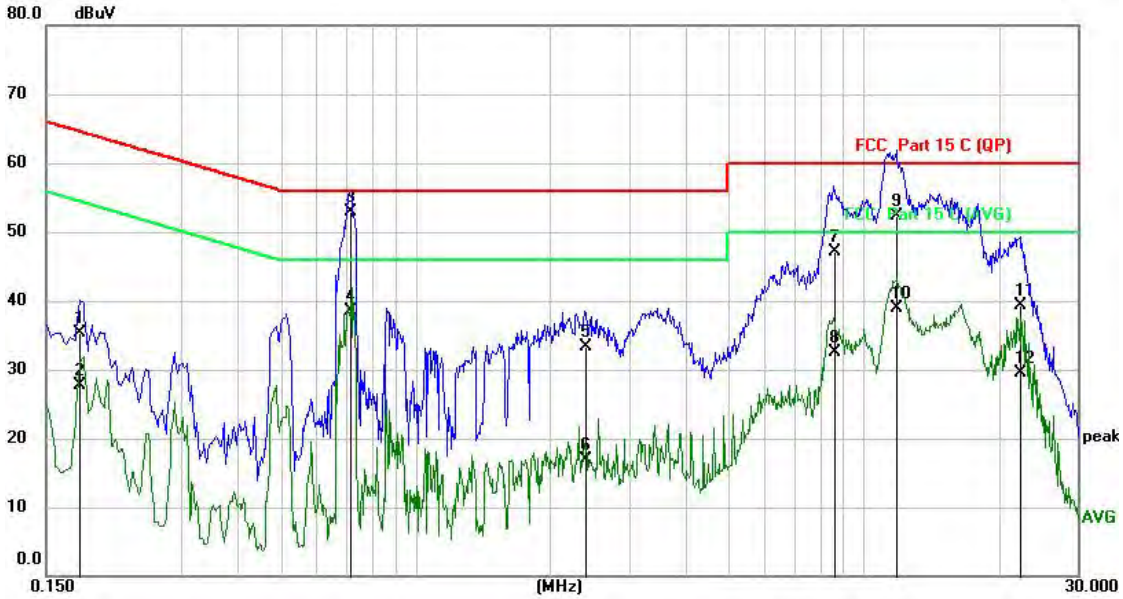
Power supply:	AC 120V/60Hz	Polarization	N



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1780	24.49	10.74	35.23	64.58	-29.35	QP
2		0.1780	16.94	10.74	27.68	54.58	-26.90	AVG
3	*	0.7140	42.43	10.43	52.86	56.00	-3.14	QP
4		0.7140	28.13	10.43	38.56	46.00	-7.44	AVG
5		2.3860	22.75	10.54	33.29	56.00	-22.71	QP
6		2.3860	6.40	10.54	16.94	46.00	-29.06	AVG
7		8.5620	36.51	10.58	47.09	60.00	-12.91	QP
8		8.5620	21.99	10.58	32.57	50.00	-17.43	AVG
9		11.8540	41.57	10.66	52.23	60.00	-7.77	QP
10		11.8540	28.26	10.66	38.92	50.00	-11.08	AVG
11		22.3260	28.47	10.90	39.37	60.00	-20.63	QP
12		22.3260	18.53	10.90	29.43	50.00	-20.57	AVG

Note: Note:1).QP Value (dBμV)= QP Reading (dBμV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBμV) - QP Value (dBμV)
4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV)

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4.2 Radiated Emission

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

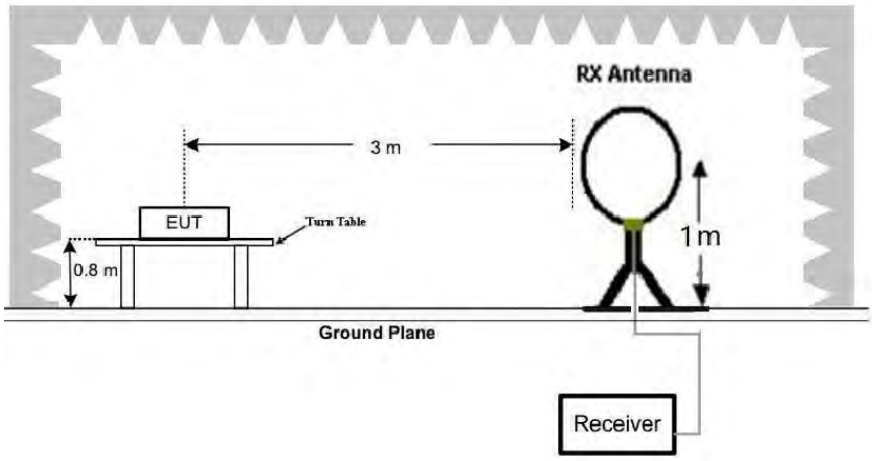
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

1. Radiated Emission Test Set-Up, Frequency Below 30MHz



2. Radiated Emission Test Set-Up, Frequency below 1000MHz

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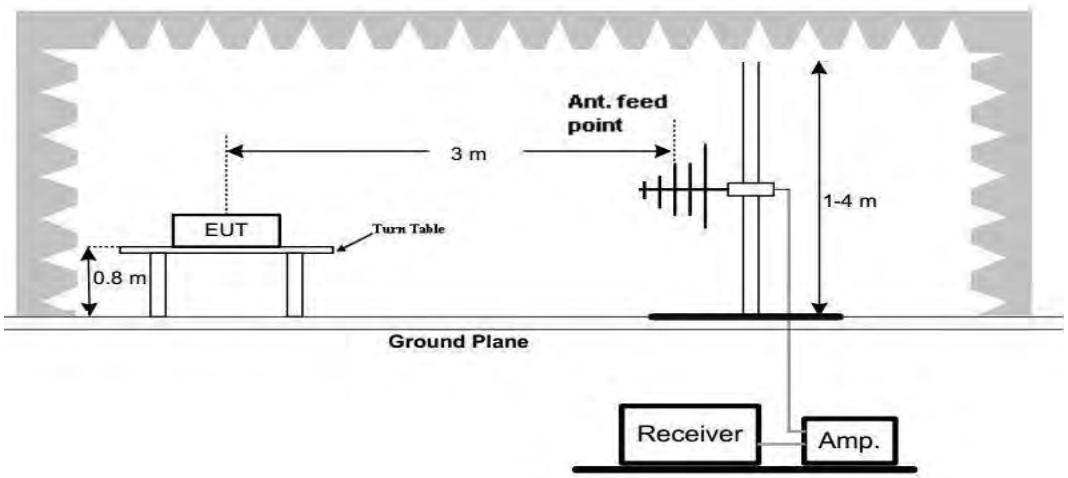

Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 1000MHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP

TEST RESULTS

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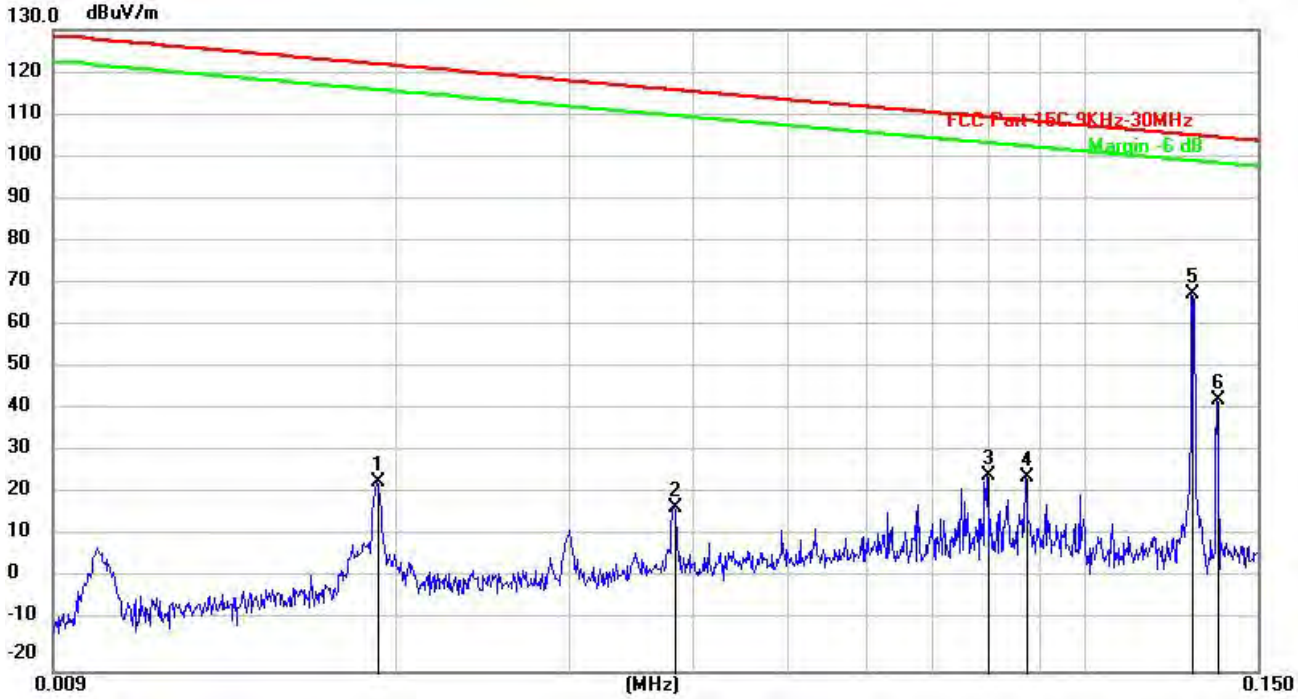
For 9 KHz-30MHz

Face



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.0192	33.43	-9.05	24.38	121.94	-97.56	peak
2		0.0384	27.48	-8.91	18.57	115.92	-97.35	peak
3		0.0798	35.15	-9.15	26.00	109.56	-83.56	peak
4		0.0872	34.64	-8.97	25.67	108.79	-83.12	peak
5	*	0.1287	77.90	-9.67	68.23	105.41	-37.18	peak
6		0.1365	53.04	-9.59	43.45	104.90	-61.45	peak

Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

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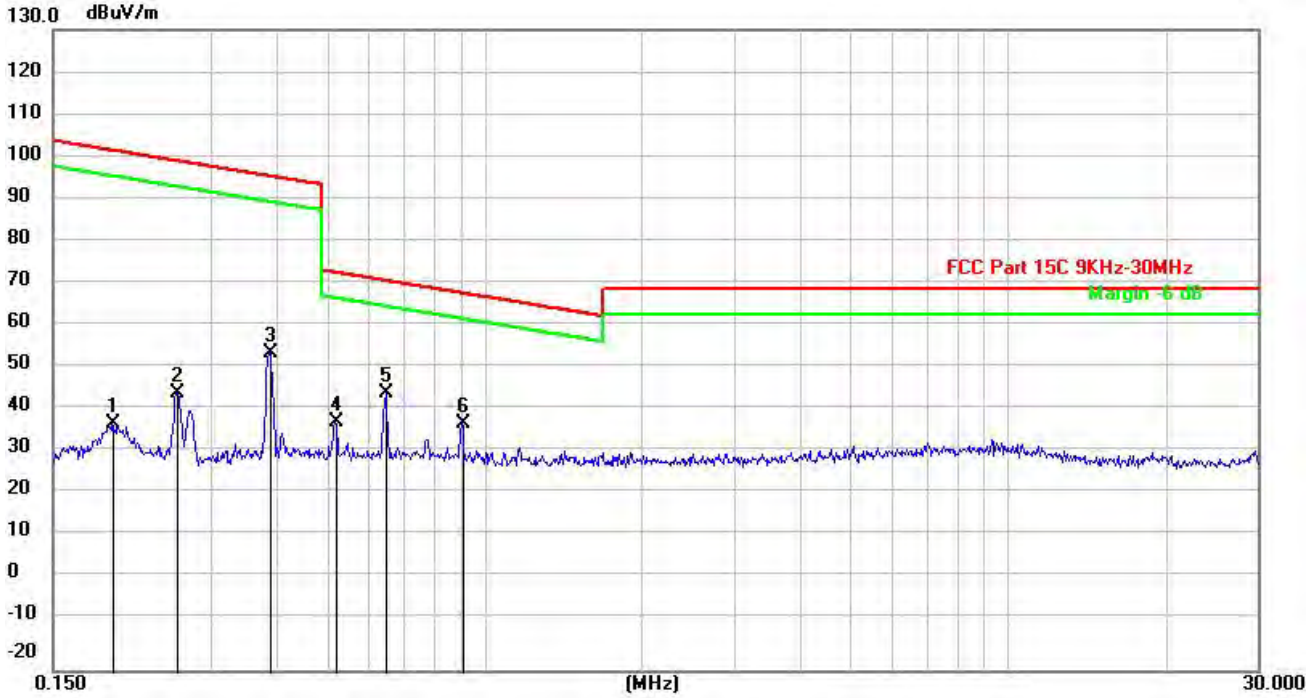
Face



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.1948	47.31	-9.31	38.00	101.81	-63.81	peak
2		0.2587	54.42	-9.30	45.12	99.35	-54.23	peak
3		0.3895	63.86	-9.25	54.61	95.79	-41.18	peak
4		0.5188	47.41	-9.22	38.19	73.30	-35.11	peak
5	*	0.6491	54.20	-9.18	45.02	71.36	-26.34	peak
6		0.9073	46.93	-9.13	37.80	68.45	-30.65	peak

Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

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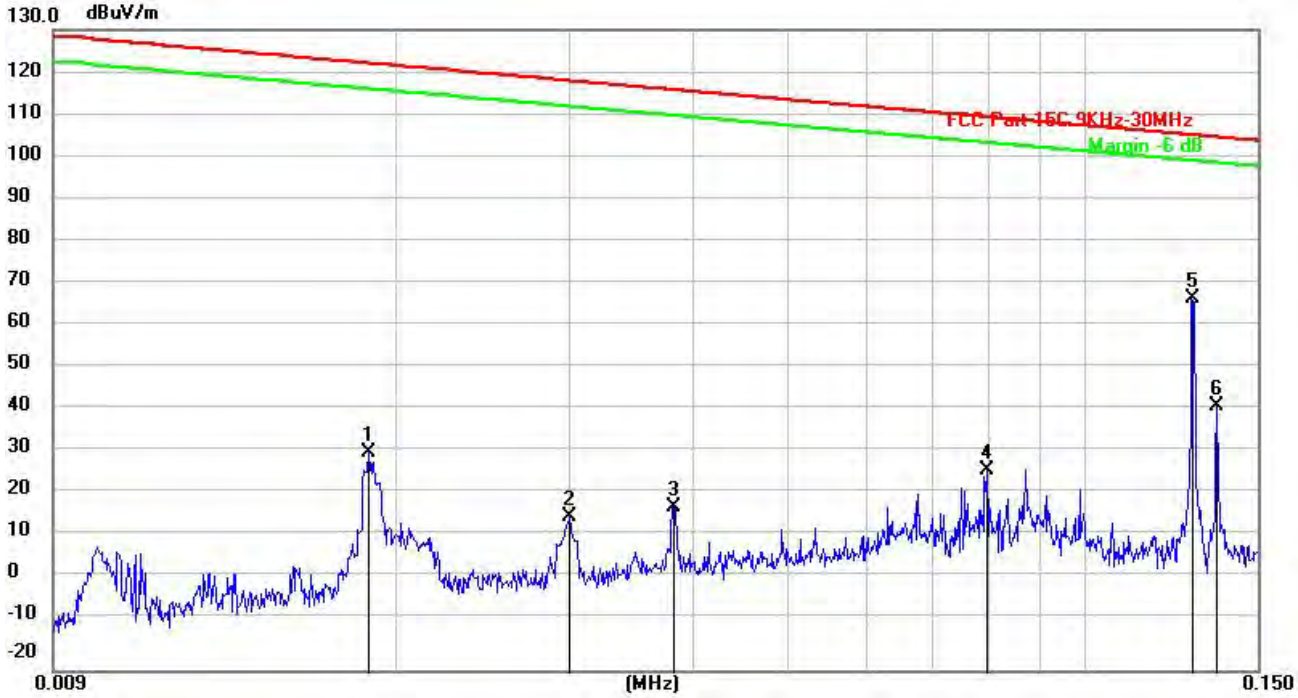
Side



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.0188	40.14	-9.06	31.08	122.12	-91.04	peak
2		0.0300	25.05	-9.00	16.05	118.06	-102.01	peak
3		0.0383	27.49	-8.92	18.57	115.94	-97.37	peak
4		0.0796	36.16	-9.16	27.00	109.59	-82.59	peak
5	*	0.1287	76.90	-9.67	67.23	105.41	-38.18	peak
6		0.1363	51.54	-9.59	41.95	104.91	-62.96	peak

Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

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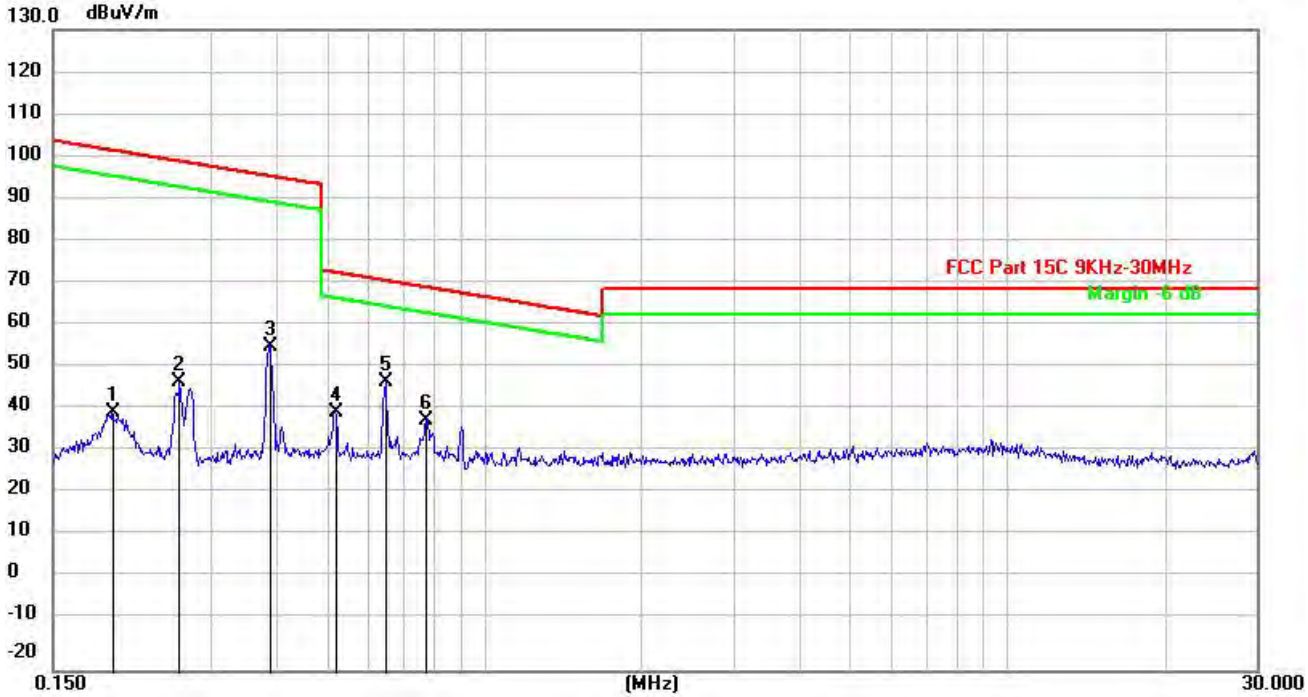
Side



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.1947	49.81	-9.31	40.50	101.82	-61.32	peak
2		0.2615	56.93	-9.29	47.64	99.25	-51.61	peak
3		0.3894	65.36	-9.25	56.11	95.80	-39.69	peak
4		0.5187	49.91	-9.22	40.69	73.31	-32.62	peak
5	*	0.6491	56.70	-9.18	47.52	71.36	-23.84	peak
6		0.7751	48.02	-9.15	38.87	69.82	-30.95	peak

Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

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For 30MHz-1GHz

Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		63.5133	35.53	-18.32	17.21	40.00	-22.79	QP
2		126.7278	42.21	-20.42	21.79	43.50	-21.71	QP
3	*	144.2332	51.95	-21.32	30.63	43.50	-12.87	QP
4		196.6476	42.18	-18.15	24.03	43.50	-19.47	QP
5		211.7487	47.77	-17.48	30.29	43.50	-13.21	QP
6		248.2905	47.56	-15.81	31.75	46.00	-14.25	QP

Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

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Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		41.9035	38.08	-16.72	21.36	40.00	-18.64	QP
2	*	63.6694	43.33	-18.36	24.97	40.00	-15.03	QP
3		125.2698	43.46	-20.17	23.29	43.50	-20.21	QP
4		144.1827	49.28	-21.33	27.95	43.50	-15.55	QP
5		207.1947	37.16	-17.69	19.47	43.50	-24.03	QP
6		247.5081	36.28	-15.84	20.44	46.00	-25.56	QP

Note:1).Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

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4.3 Antenna Requirement

Standard Applicable

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Information

The antenna used in this product is a Coil Antenna, The directional gains of antenna used for transmitting is 0dBi.

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5. Test Setup Photos of the EUT

Radiated Measurement (Below 30MHz)

Radiated Measurement (Above 30MHz)

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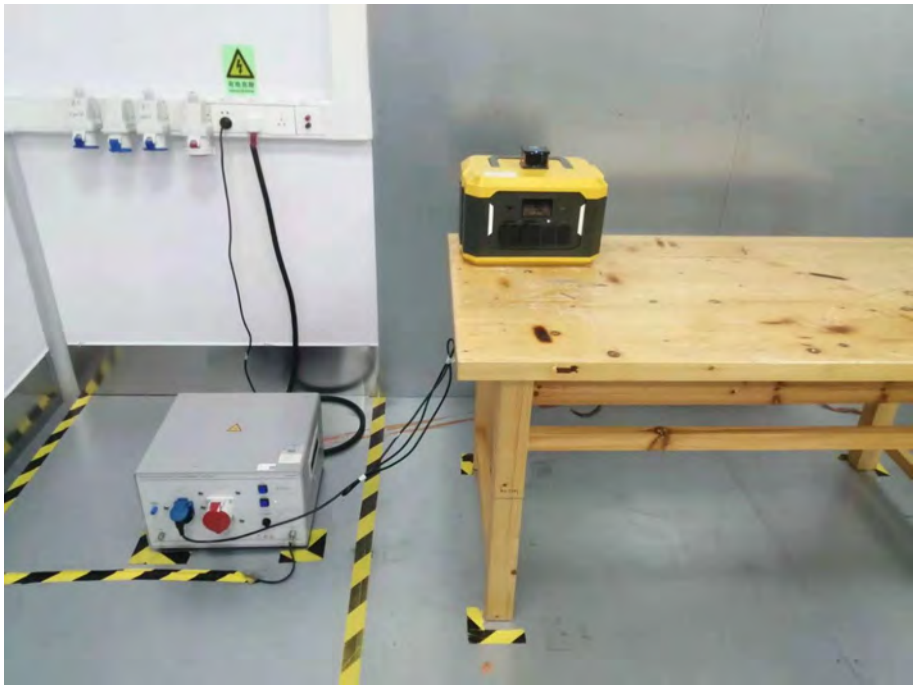
Conducted Emission



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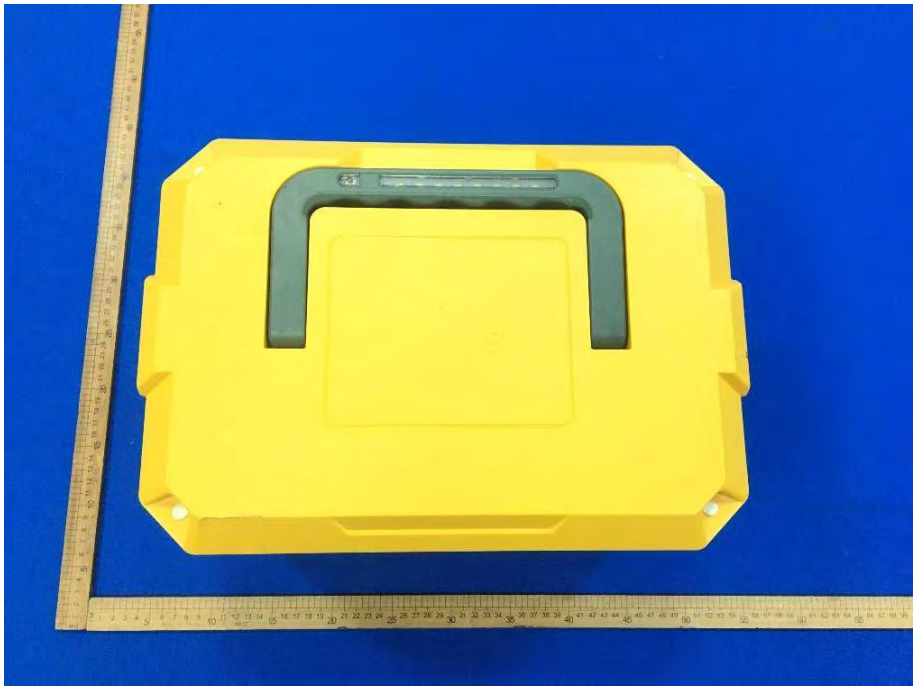
6. PHOTOS OF THE EUT



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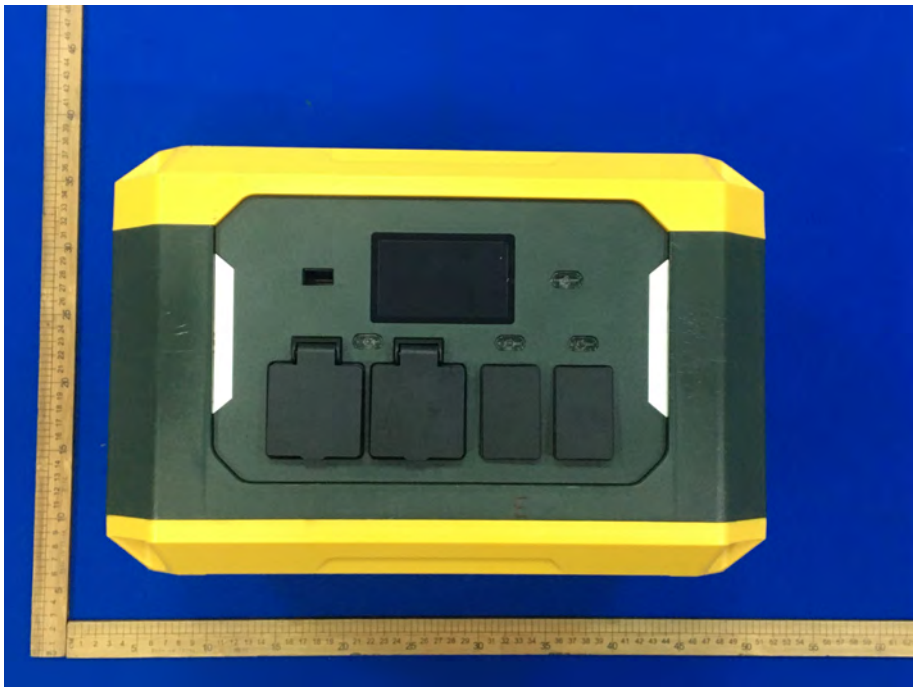

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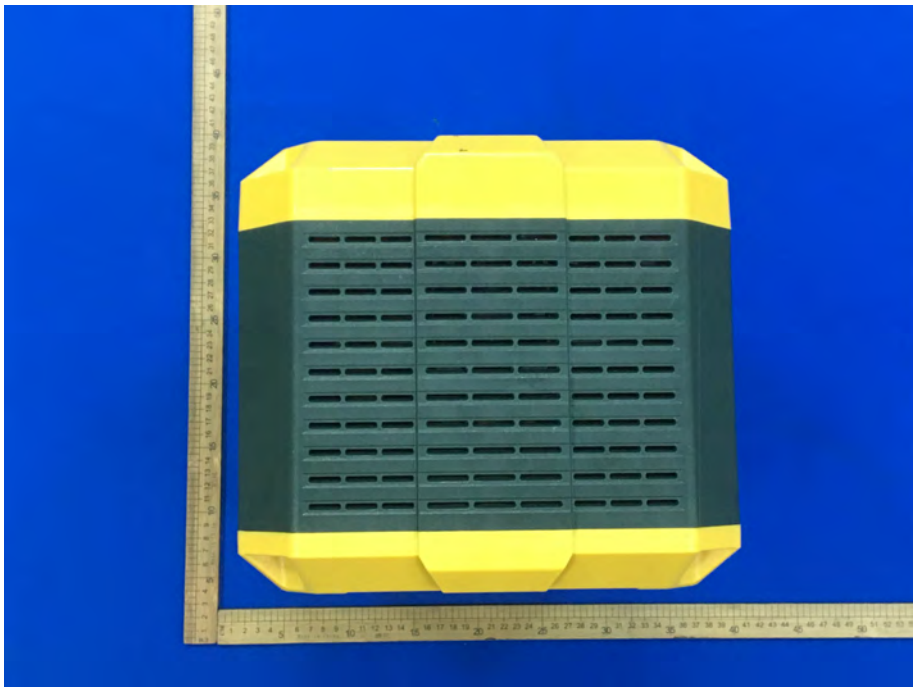

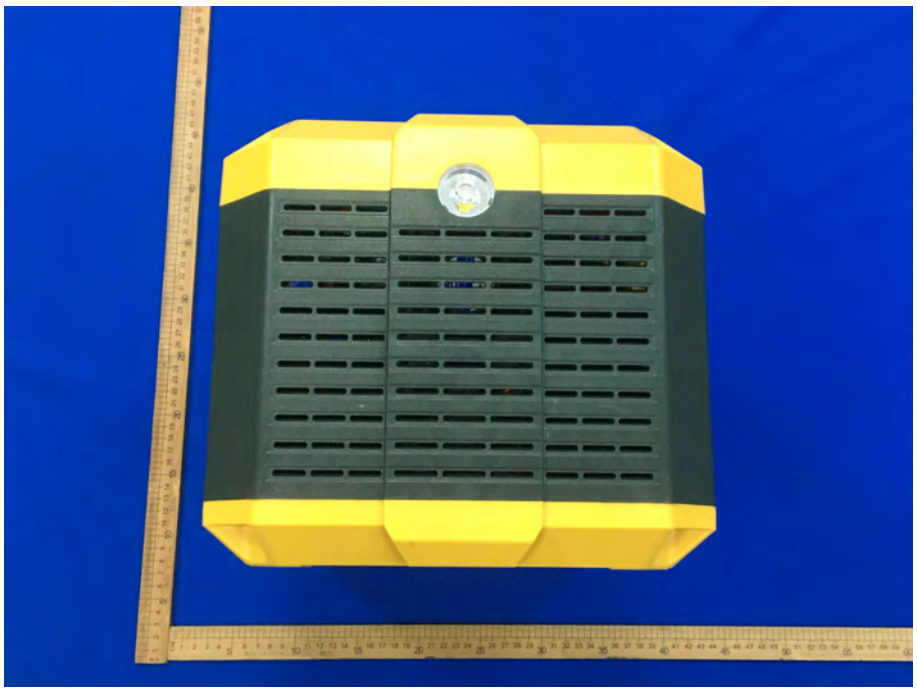

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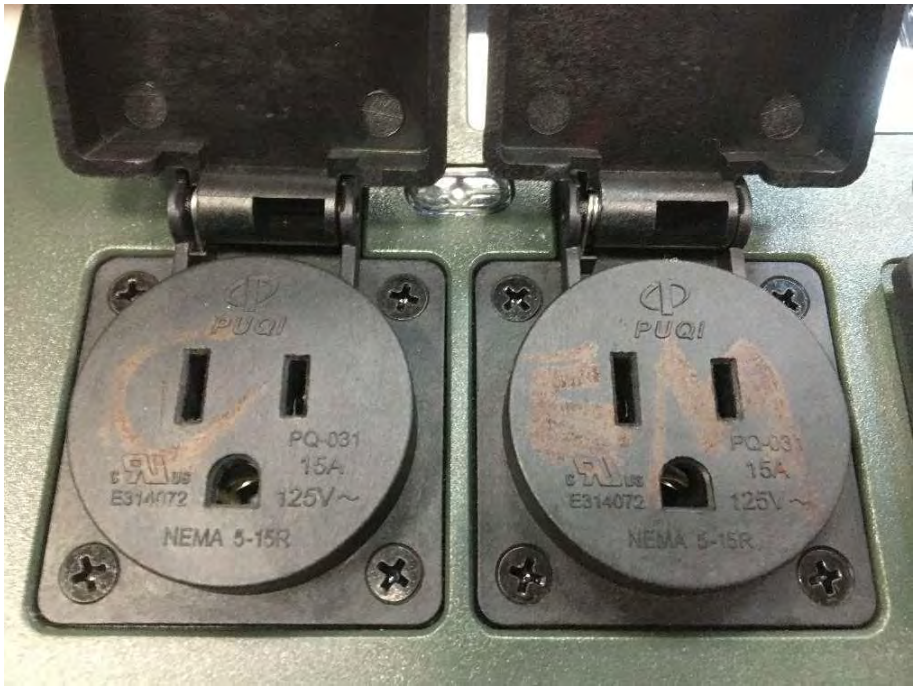

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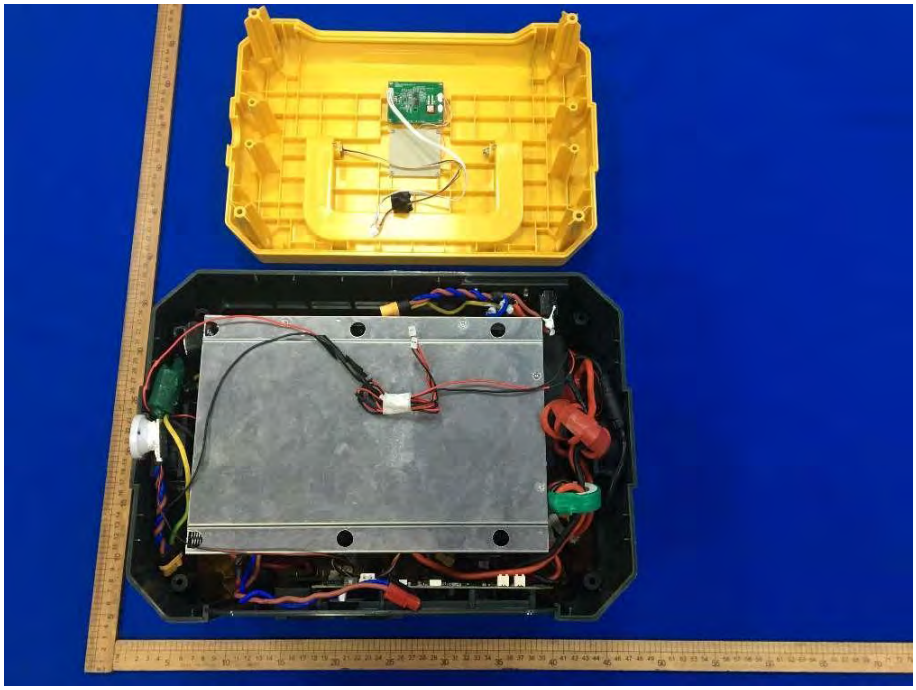

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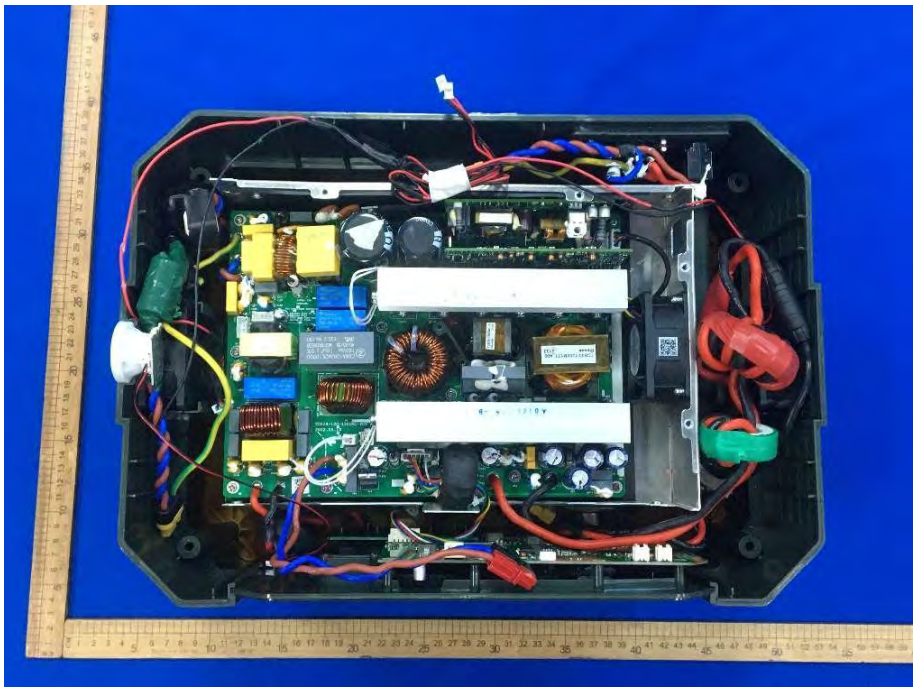

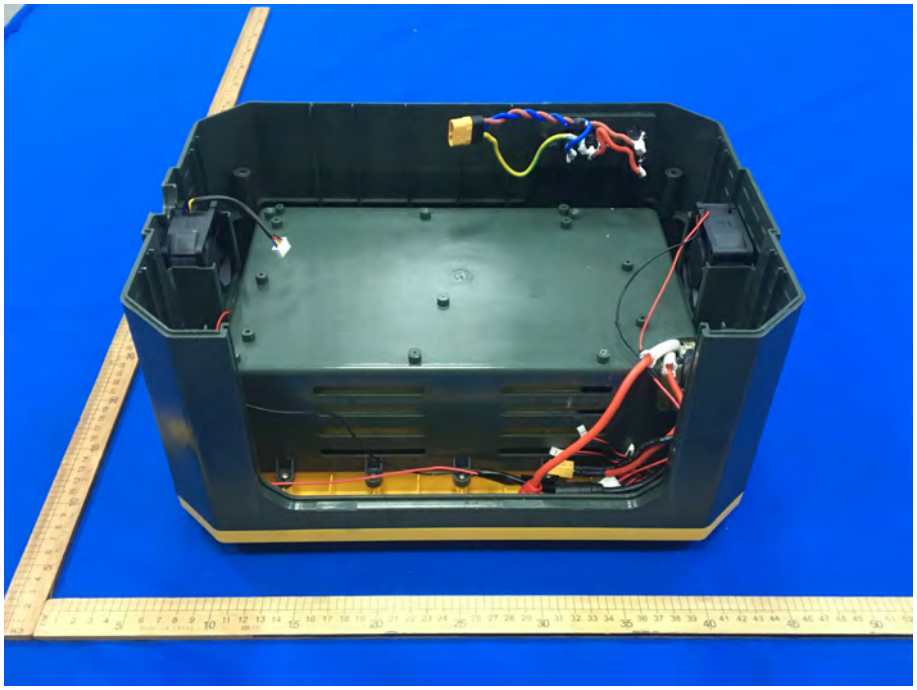

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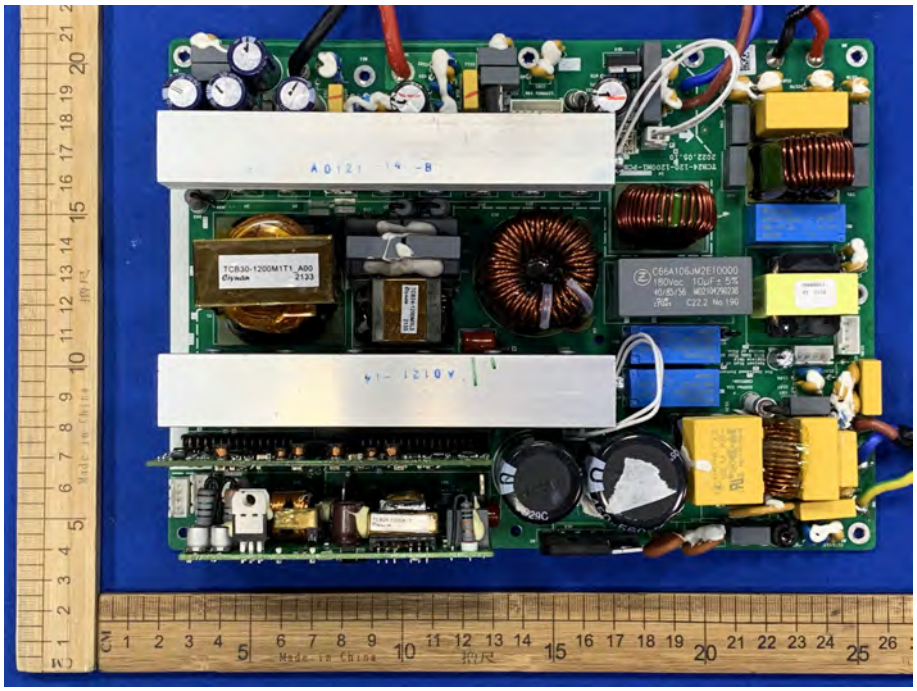

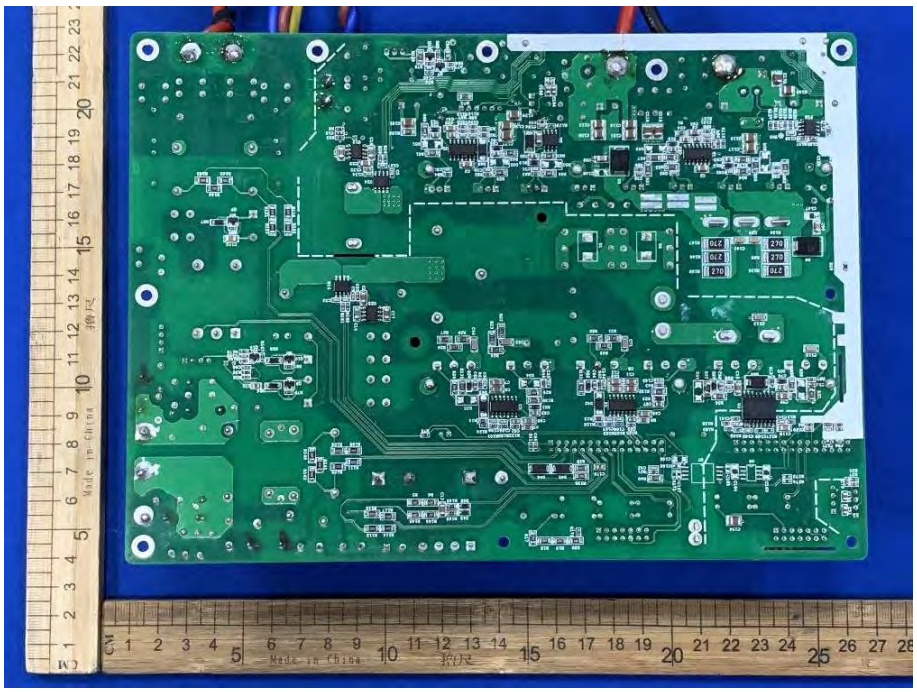

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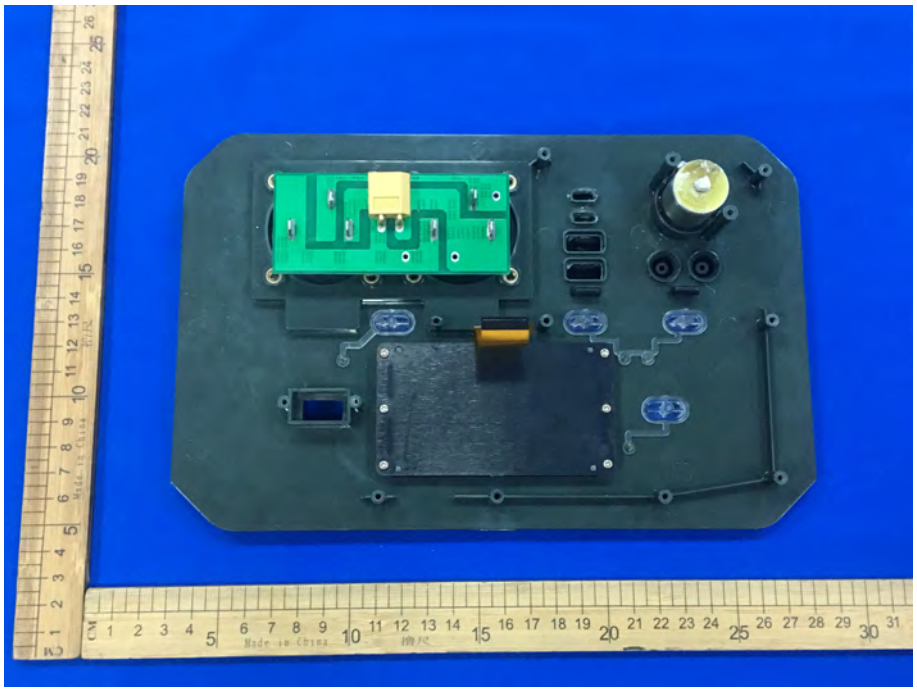

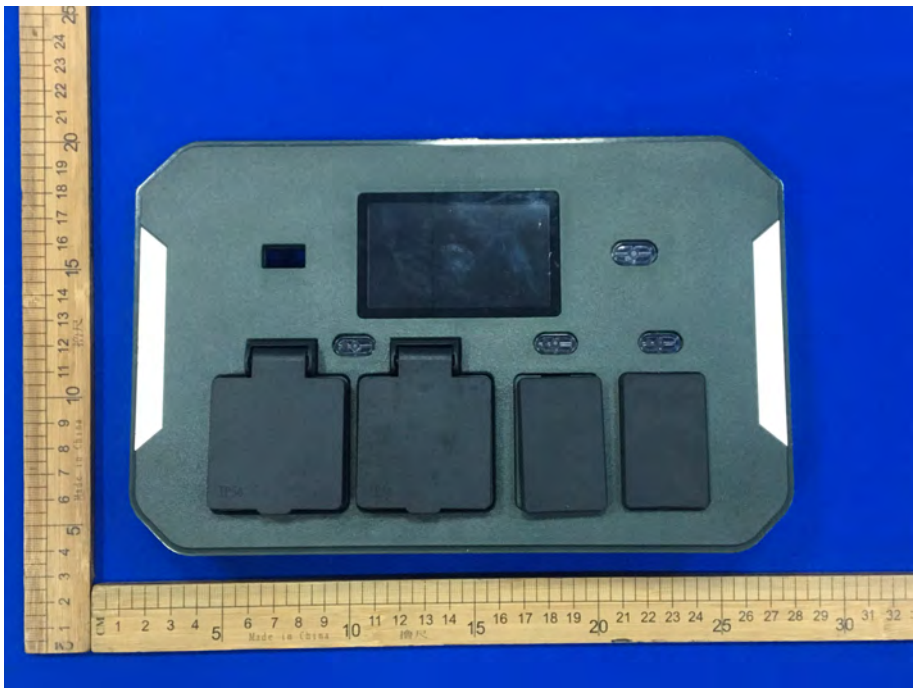

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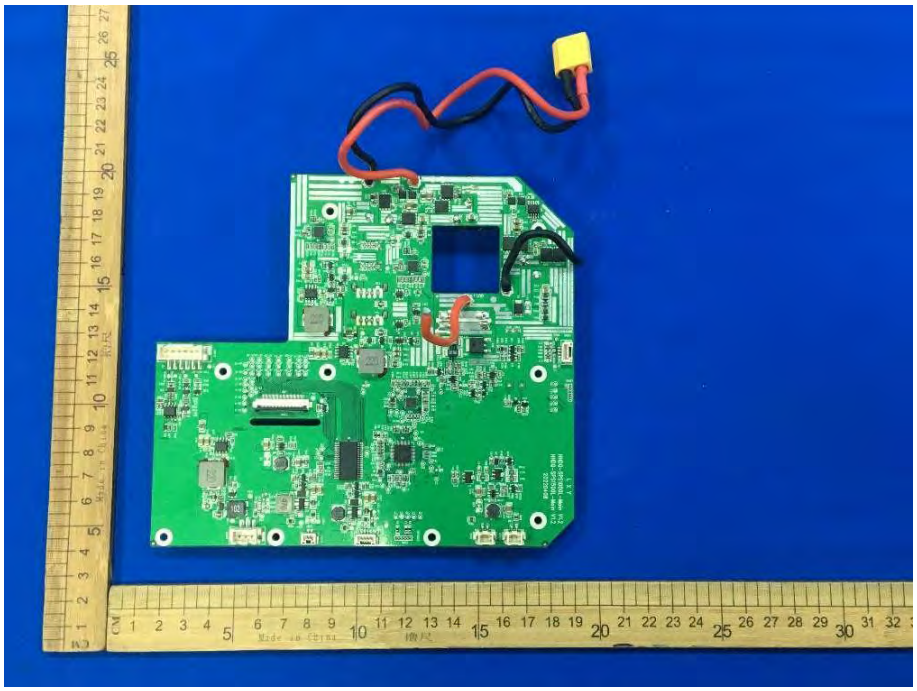

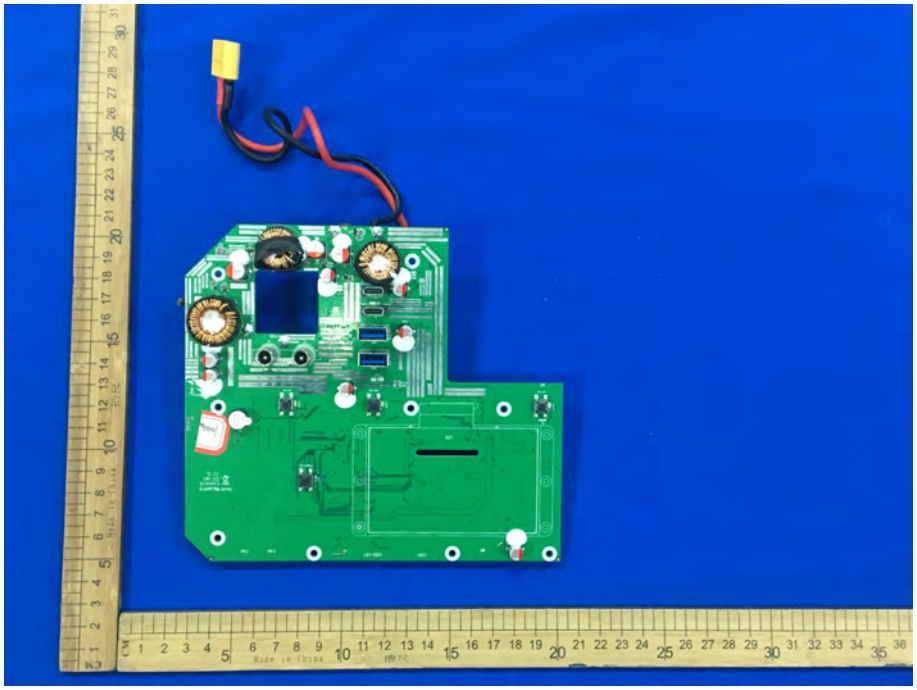

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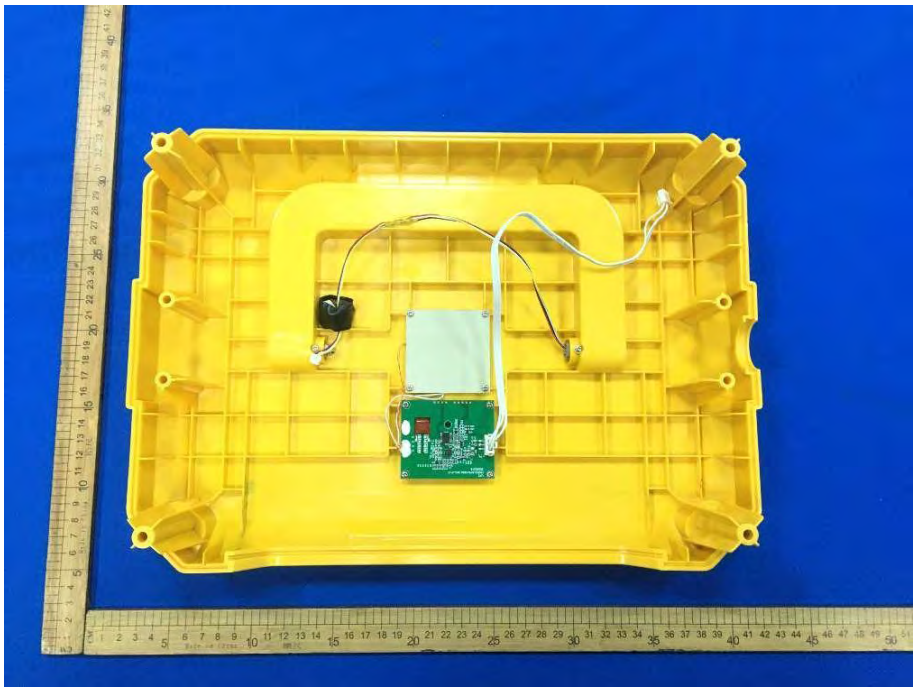

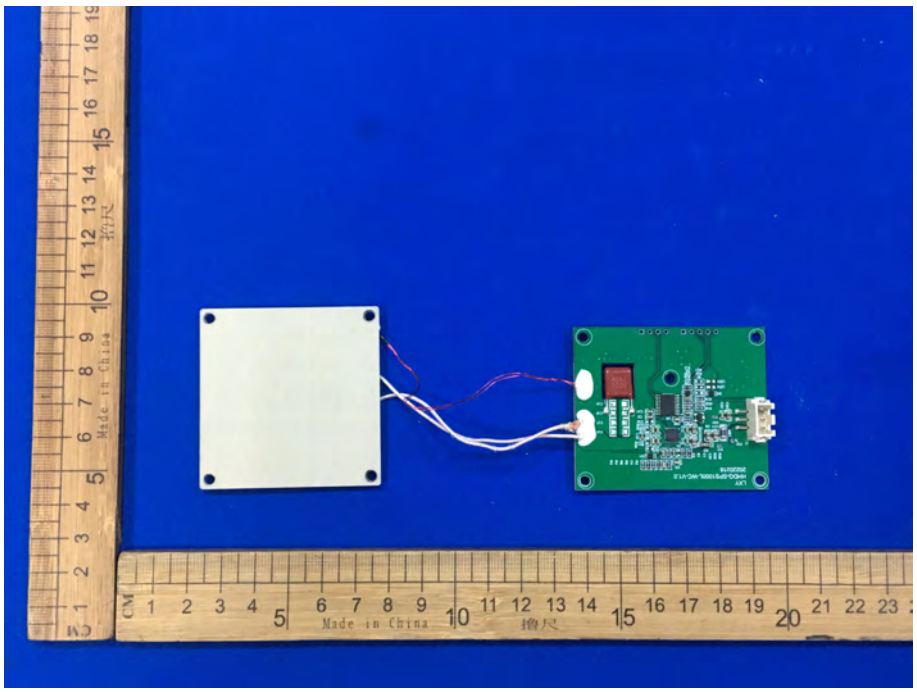

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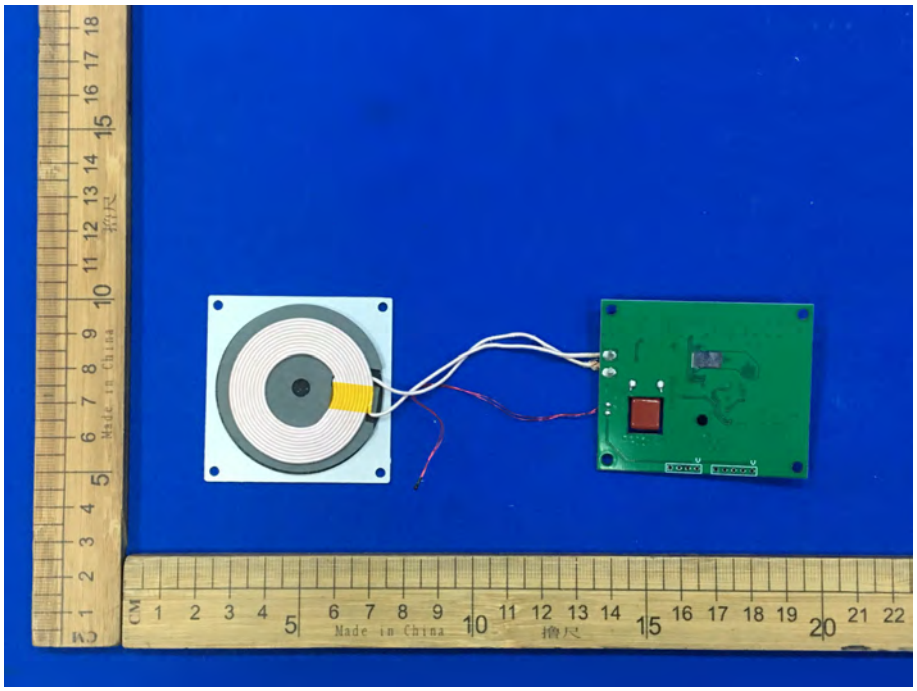

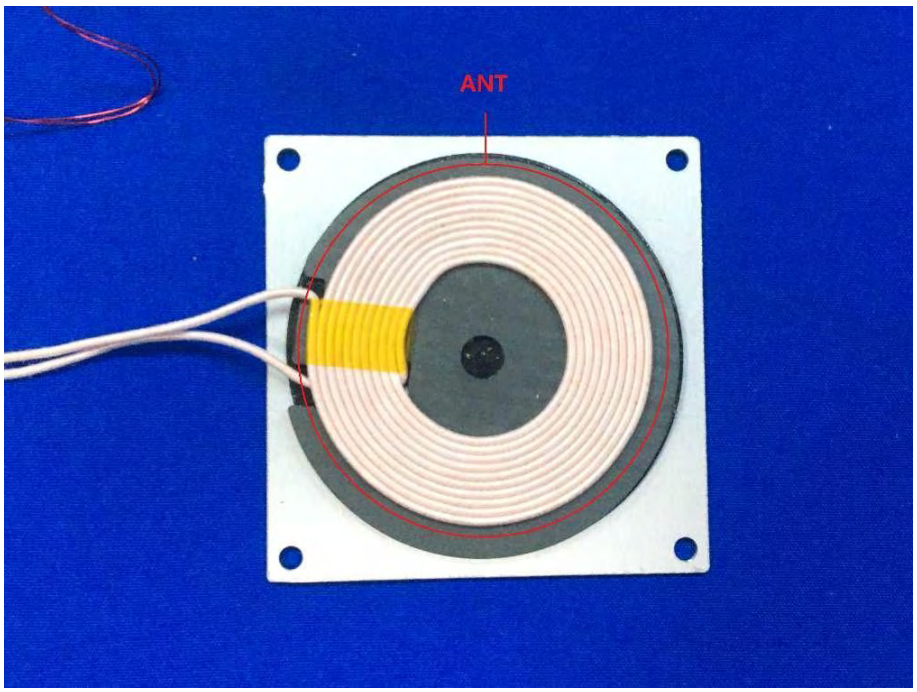

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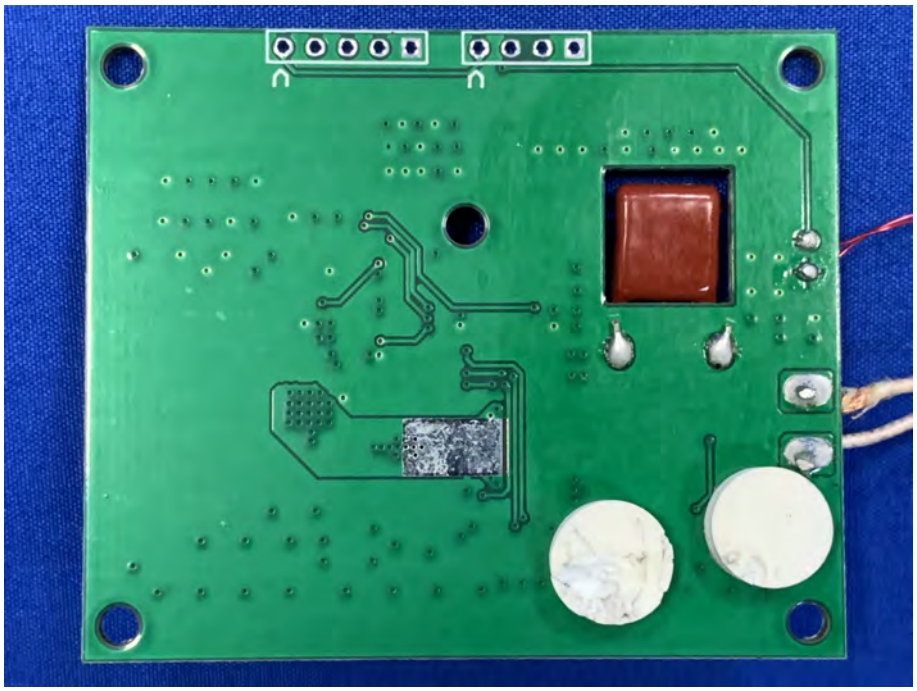

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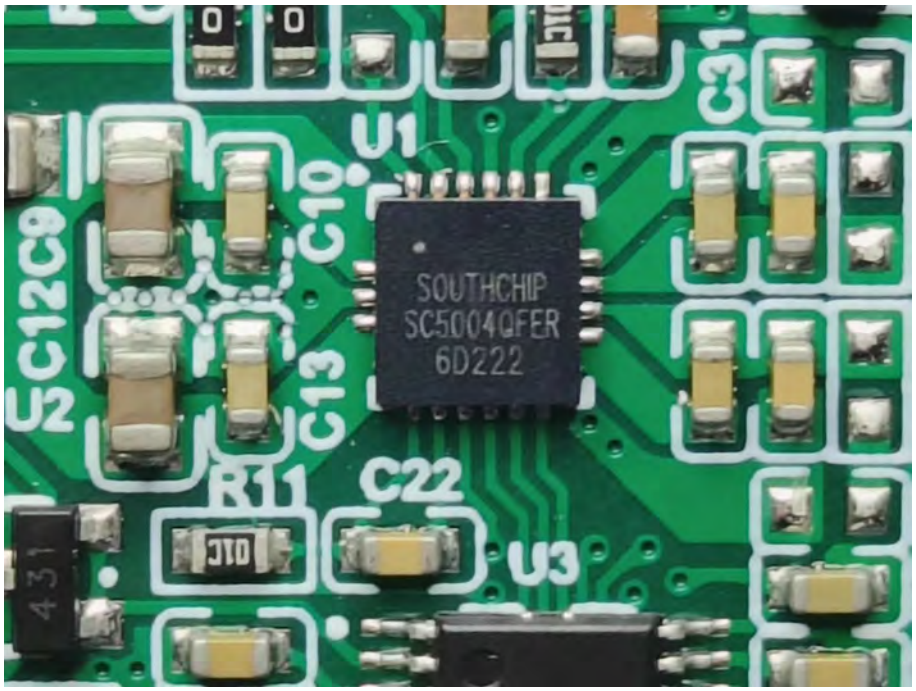

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