

# TEST REPORT

**Report No.** ..... : **KS2212S6231E**

**FCC ID**..... : 2A9V5-S600PRO

**Applicant**.....: **TIANJIN CETC NEW ENERGY RESEARCH INSTITUTE Co.,LTD**

**Address**.....: No.6, 7th HuaKe Road,Hi-Tech, Binhai New Technology Industrial Area, Tianjin

**Manufacturer**.....: TIANJIN CETC NEW ENERGY RESEARCH INSTITUTE Co.,LTD

**Address**.....: No.6, 7th HuaKe Road,Hi-Tech, Binhai New Technology Industrial Area, Tianjin

**Product Name**.....: **Portable Power Station**

**Trade Mark**.....: Lantian Intelligent Power

**Model/Type reference**.....: S600 Pro

**Standard**.....: **FCC Rules and Regulations Part 15 Subpart C (Section 15.209), ANSI C63.10: 2013**

**Date of receipt of test sample**.....: December 29, 2022

**Date of testing**.....: December 29, 2022 to February 09, 2023

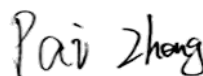
**Date of issue**.....: February 09, 2023

**Test Result**.....: **Pass**

Prepared by:

( Printed Name + Signature )

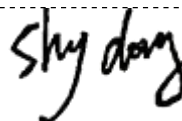
Pai Zheng



Approved by:

( Printed Name + Signature )

Sky Dong



**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	February 09, 2023	Original

### 1.3 Summary of measurement results

FCC Rules	Description of test	Result
§15.207	Conducted emissions test	Pass
§15.209	Radiated emission test	Pass
§15.203	Antenna requirement	Compliant

Note:

1. Pass: The EUT complies with the essential requirements in the standard

Fail: The EUT does not comply with the essential requirements in the standard

All indications of Pass/Fail in this report are opinions expressed by KSIGN(Guangdong) Testing Co., Ltd. based on interpretations and/or observations of test results Measurement Uncertainties were not taken into account and are published for informational purposes only.

2. N/A: means this test item is not applicable for this device according to the technology characteristic of device.

### 1.4 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.

### 1.5 Modifications

No modifications were implemented to meet testing criteria.

## 1.6 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

### **Laboratory accreditation**

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.

## 1.7 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

Conducted testing:

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

## 2 GENERAL INFORMATION

### 2.1 Product Description

<b>Product Name:</b>	Portable Power Station
<b>Trade Mark:</b>	Lantian Intelligent Power
<b>Model/Type reference:</b>	S600 Pro
<b>Model Different:</b>	N/A
<b>Hardware version:</b>	V1.0
<b>Software version:</b>	V1.0
<b>Test samples ID:</b>	KS2212S6231E-1# (Engineer sample), KS2212S6231E-2# (Normal sample)
<b>Power supply(Input ):</b>	Input: AC 100-240V~50/60Hz, 3A Output: DC 19.5V, 10.26A, 200.07W
<b>Wireless Charging(Output):</b>	Wireless Charging(*2): 15W (Max)
<b>Operation frequency:</b>	115KHz - 205KHz
<b>Modulation type:</b>	ASK
<b>Antenna type:</b>	Loop coil antenna
<b>Antenna Gain:</b>	0 dBi
Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.	

## 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	Two Coil wireless simultaneous charging mode (15W)	Recorded
Mode 2	Coil 1-Wireless charging mode (15W)	Recorded
Mode 3	Coil 2-Wireless charging mode (15W)	Recorded
Mode 4	Standby	Pre-tested
Note: All test modes were pre-tested, The Mode 1 was the worst case and only the data of the worst case record 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
Adapter	/	KT200A1951026B3	Input: AC 100-240V~50/60Hz,3A Output: DC 19.5V, 10.26A, 200.07W	FCC	manufacturer
Wireless charging load	/	EESON	15W	FCC	laboratory

## 2.4 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

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.

TRF No. FCC Part 15C\_R2

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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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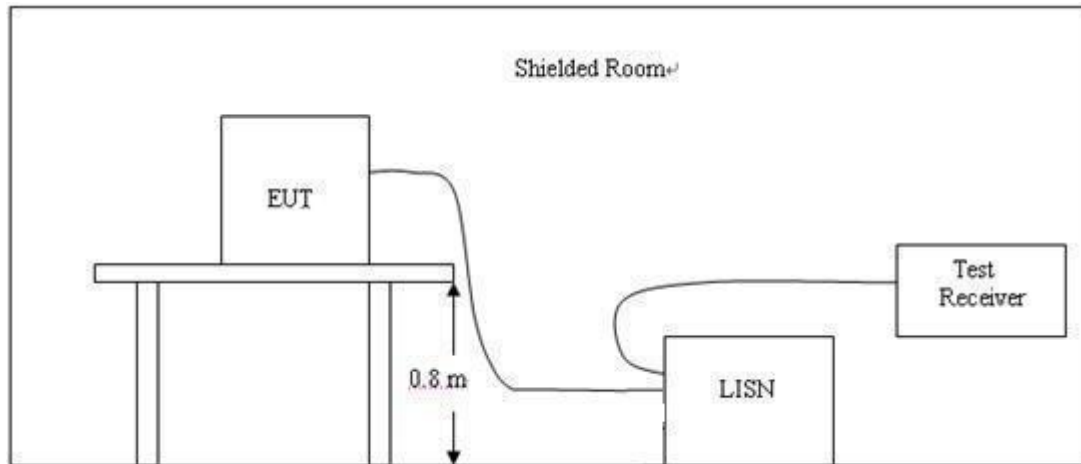
[www.gdkesign.com](http://www.gdkesign.com)



### 3.TEST CONDITIONS AND RESULTS

#### 3.1 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

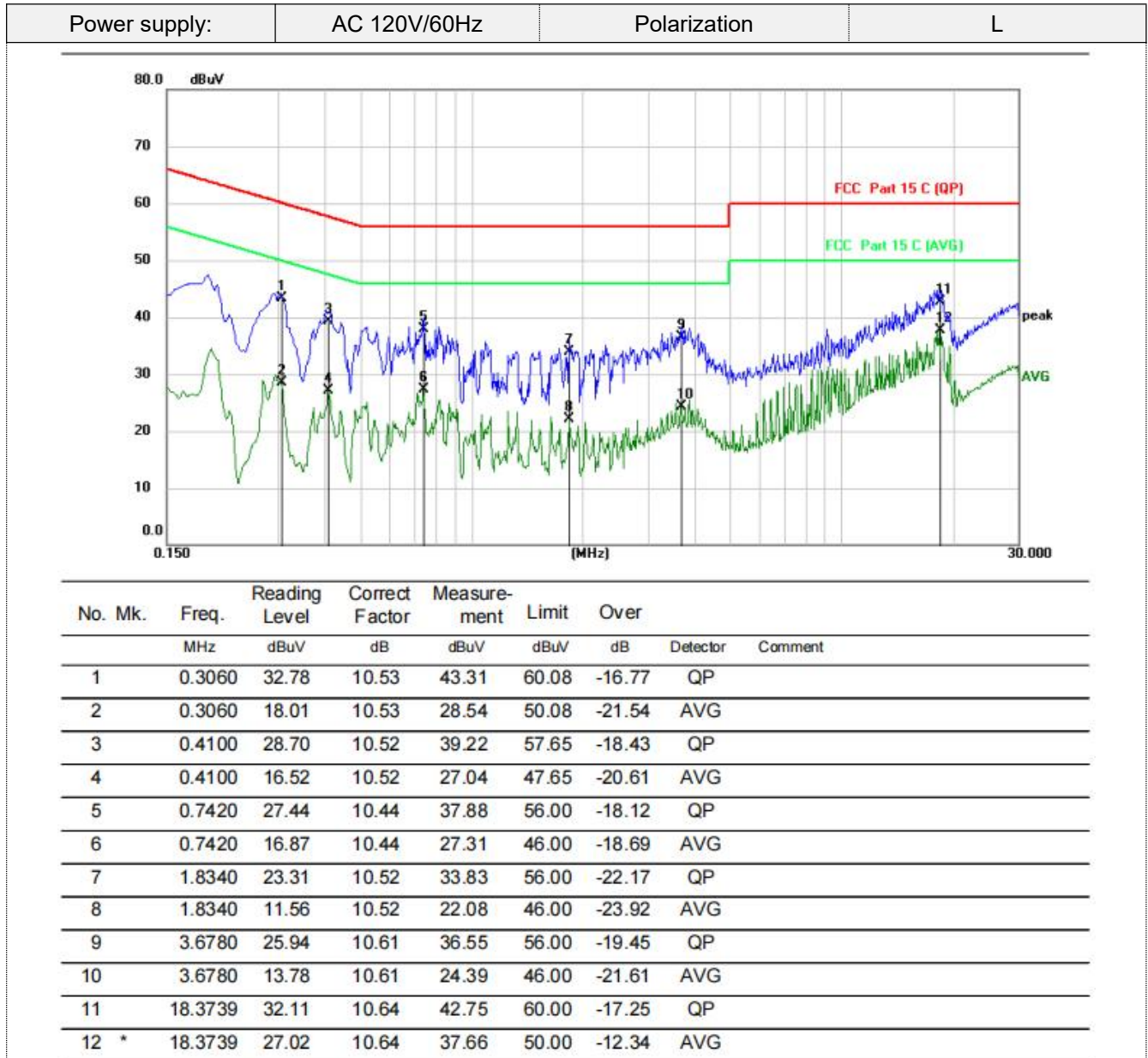
For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following:

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.

## TEST RESULTS

- 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:



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)

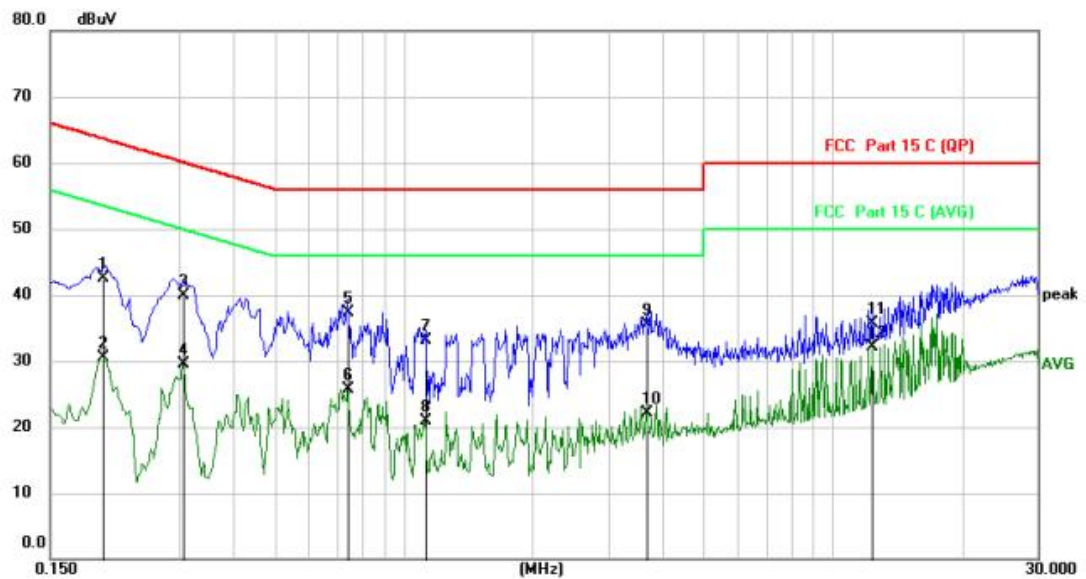
4). AVMargin(dB) = AV Limit (dBμV) - AV Value (dBμV)

Power supply:

AC 120V/60Hz

Polarization

N



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
	MHz	dBμV	dB	dBμV	dBμV	dB	Detector	Comment
1	0.1996	31.73	10.75	42.48	63.63	-21.15	QP	
2	0.1996	19.82	10.75	30.57	53.63	-23.06	AVG	
3	0.3060	29.36	10.51	39.87	60.08	-20.21	QP	
4	0.3060	18.94	10.51	29.45	50.08	-20.63	AVG	
5	0.7420	26.94	10.43	37.37	56.00	-18.63	QP	
6	0.7420	15.26	10.43	25.69	46.00	-20.31	AVG	
7	1.1220	22.56	10.48	33.04	56.00	-22.96	QP	
8	1.1220	10.37	10.48	20.85	46.00	-25.15	AVG	
9	3.6860	24.94	10.61	35.55	56.00	-20.45	QP	
10	3.6860	11.57	10.61	22.18	46.00	-23.82	AVG	
11	12.3500	25.08	10.67	35.75	60.00	-24.25	QP	
12 *	12.3500	21.49	10.67	32.16	50.00	-17.84	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)

### 3.2 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.

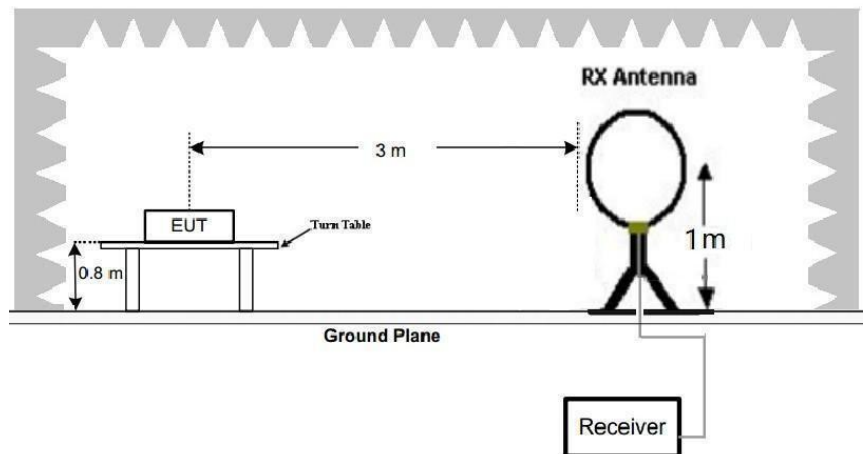
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

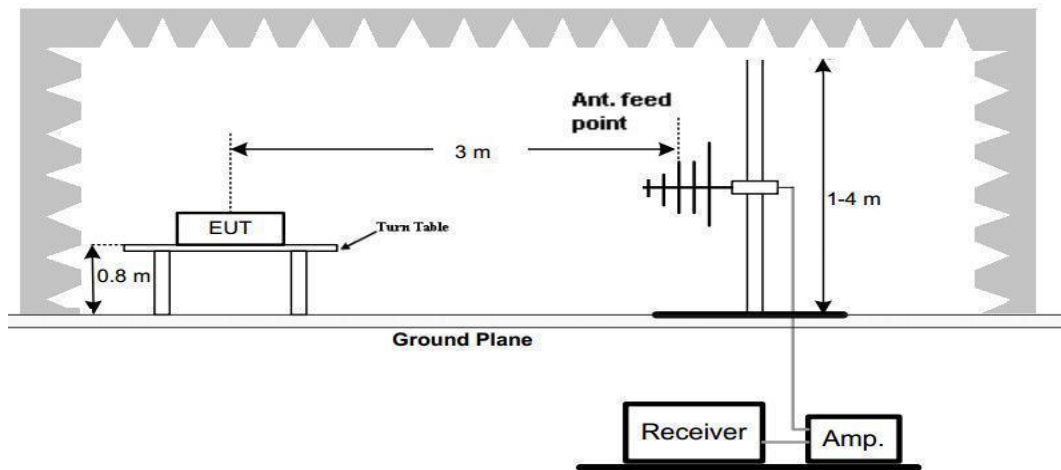
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	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



### Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane.
- 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
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 1000MHz.
- 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

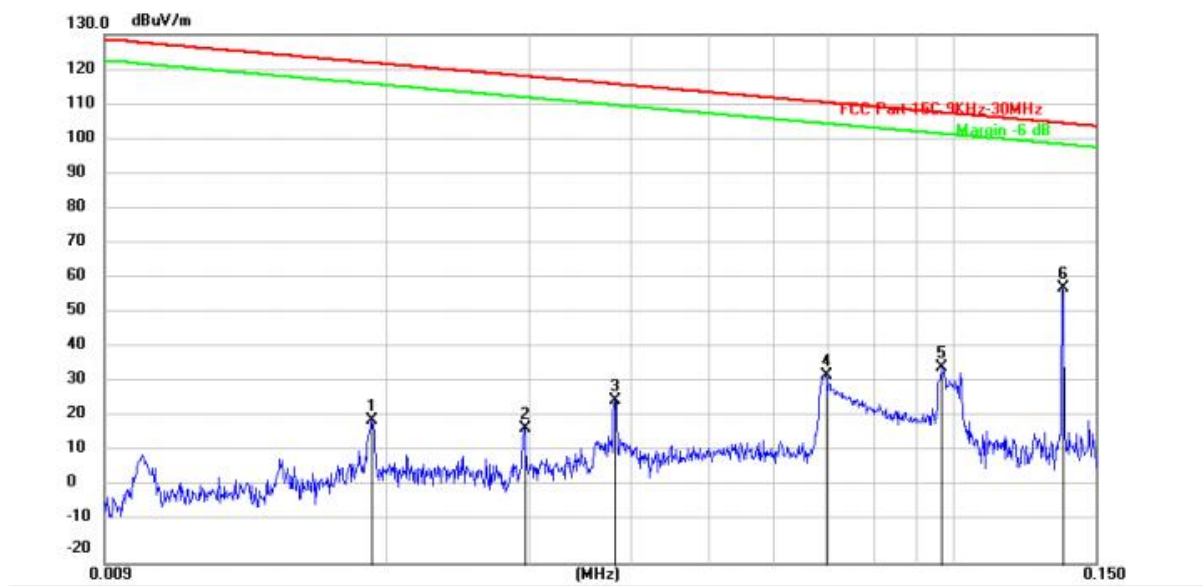
- Setting test receiver/spectrum as following table states:

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

# For 9 KHz-30MHz

## Face



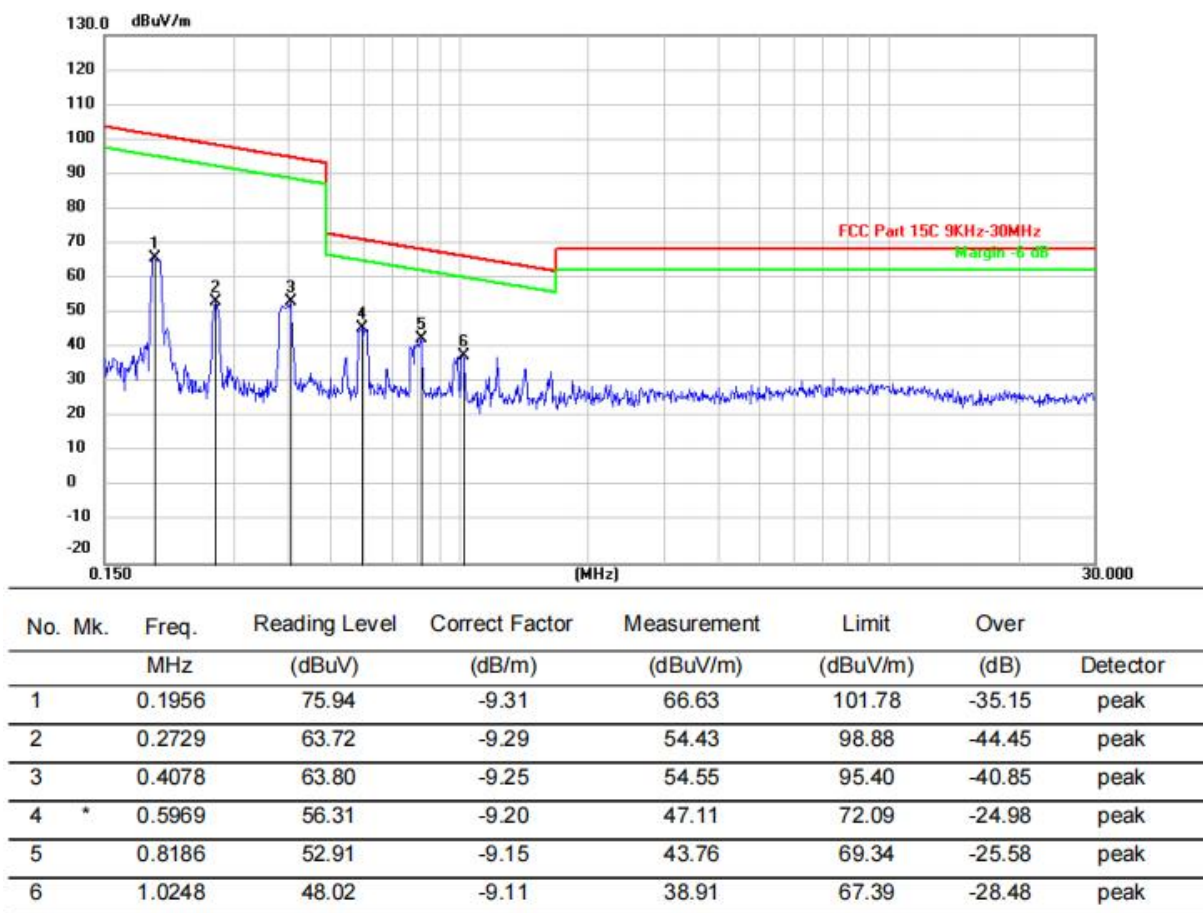
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.0192	29.82	-9.05	20.77	121.94	-101.17	peak
2		0.0296	27.57	-9.00	18.57	118.18	-99.61	peak
3		0.0383	35.42	-8.92	26.50	115.94	-89.44	peak
4		0.0696	42.88	-9.39	33.49	110.75	-77.26	peak
5		0.0969	44.49	-8.90	35.59	107.88	-72.29	peak
6	*	0.1365	67.61	-9.59	58.02	104.90	-46.88	peak

### Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor



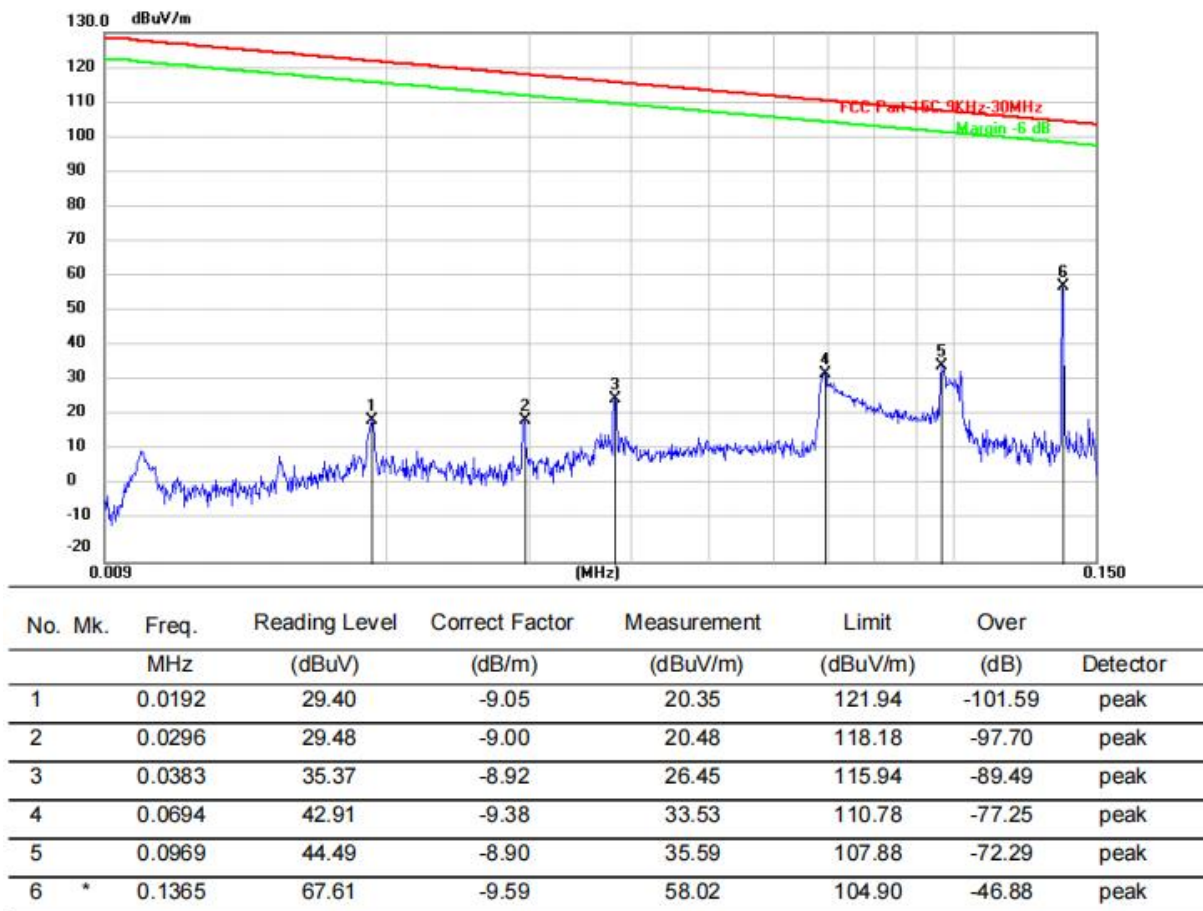
### Face



Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

### Side

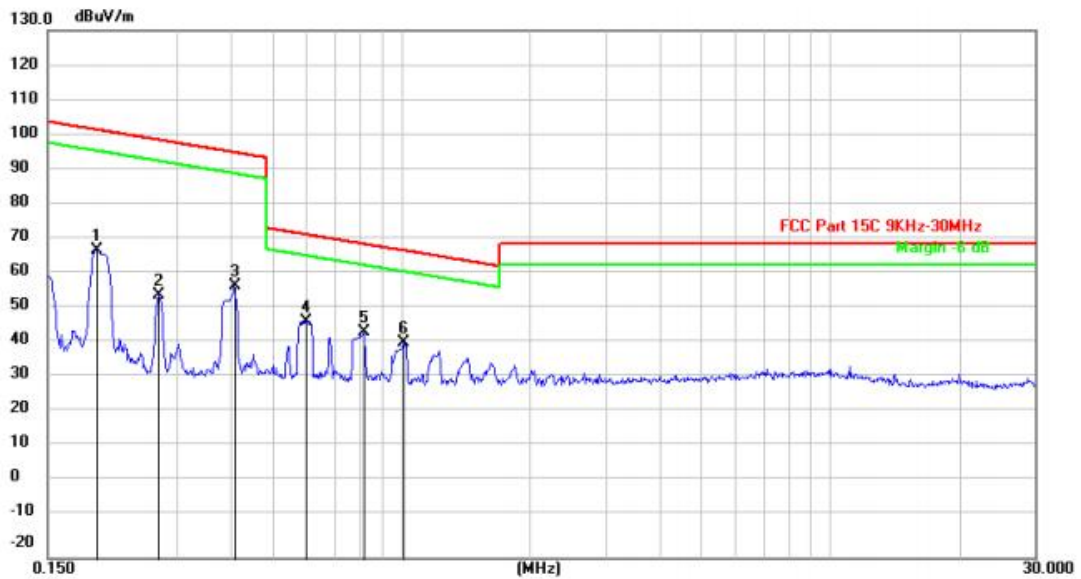


#### Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor



### Side



No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measurement (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector
1		0.1949	77.02	-9.31	67.71	101.81	-34.10	peak
2		0.2728	63.98	-9.29	54.69	98.89	-44.20	peak
3		0.4087	66.53	-9.25	57.28	95.38	-38.10	peak
4	*	0.5998	56.64	-9.20	47.44	72.04	-24.60	peak
5		0.8195	53.33	-9.15	44.18	69.33	-25.15	peak
6		1.0135	50.36	-9.10	41.26	67.49	-26.23	peak

Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

# For 30MHz-1GHz

## Horizontal



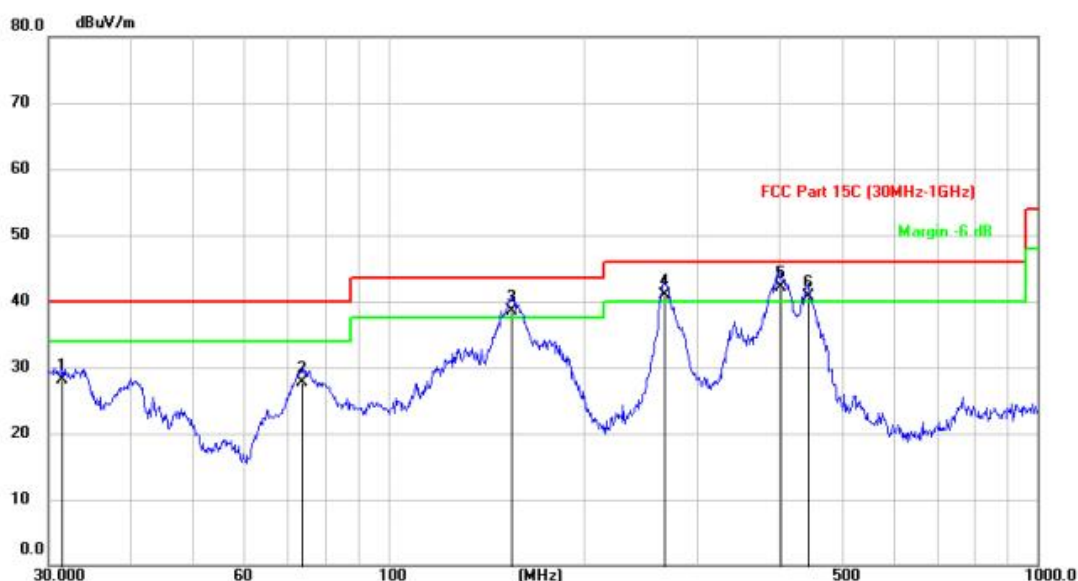
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		117.0315	43.03	-19.11	23.92	43.50	-19.58	QP
2		153.6308	53.45	-21.31	32.14	43.50	-11.36	QP
3		188.1484	51.43	-18.55	32.88	43.50	-10.62	QP
4	*	267.3579	56.39	-15.41	40.98	46.00	-5.02	QP
5		400.9939	45.15	-10.89	34.26	46.00	-11.74	QP
6		438.0406	42.63	-10.46	32.17	46.00	-13.83	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)

# Vertical



No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measurement (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector
1		31.4874	47.05	-18.95	28.10	40.00	-11.90	QP
2		73.8496	47.76	-20.09	27.67	40.00	-12.33	QP
3	!	154.8204	59.84	-21.27	38.57	43.50	-4.93	QP
4	!	266.5155	56.39	-15.42	40.97	46.00	-5.03	QP
5	*	401.5568	53.04	-10.89	42.15	46.00	-3.85	QP
6	!	444.8514	51.11	-10.38	40.73	46.00	-5.27	QP

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

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

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

### 3.3 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.

#### 4. Test Setup Photos of the EUT

Radiated Measurement (Below 30MHz)

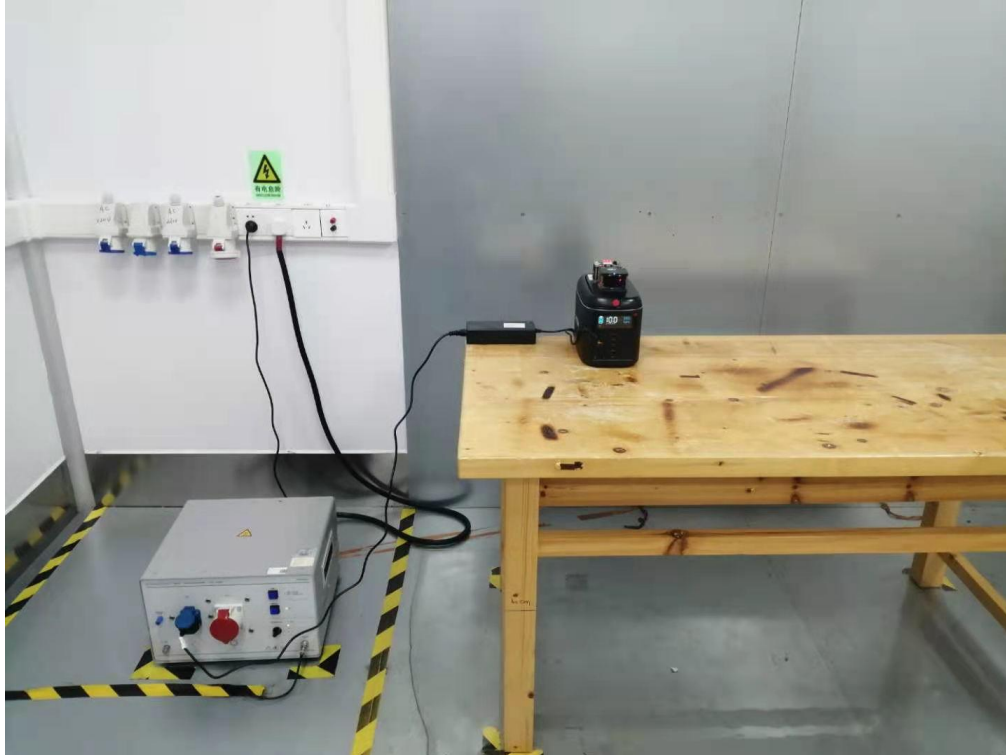


Radiated Measurement (Above 30MHz)





## Conducted Emission



## 5. PHOTOS OF THE EUT

### External





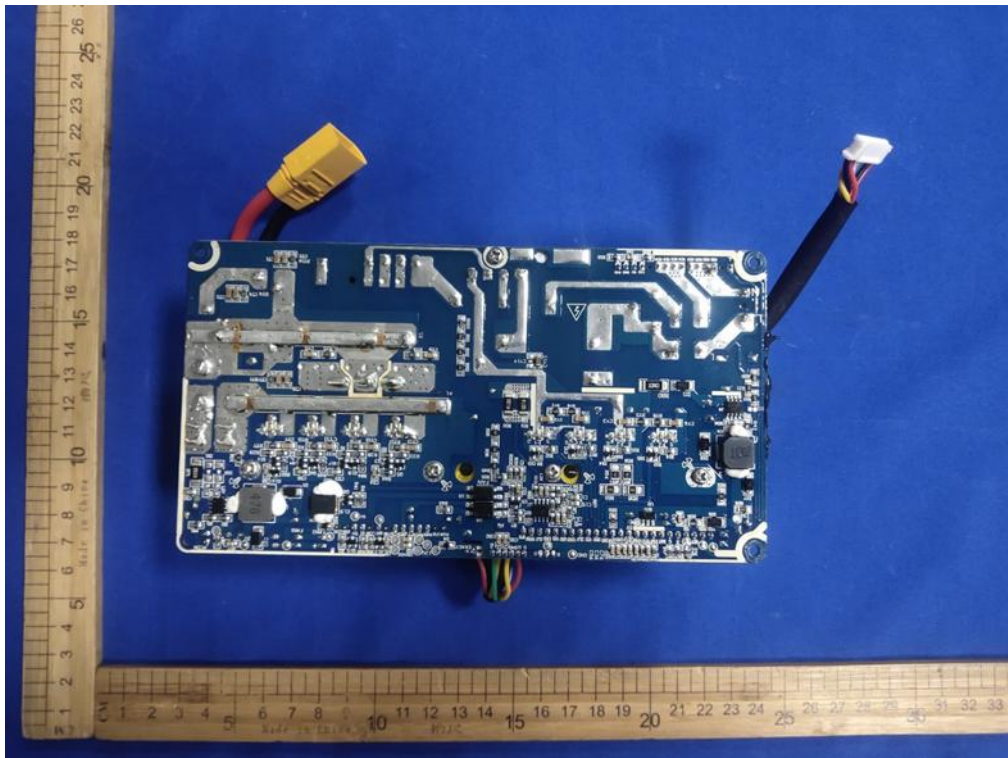
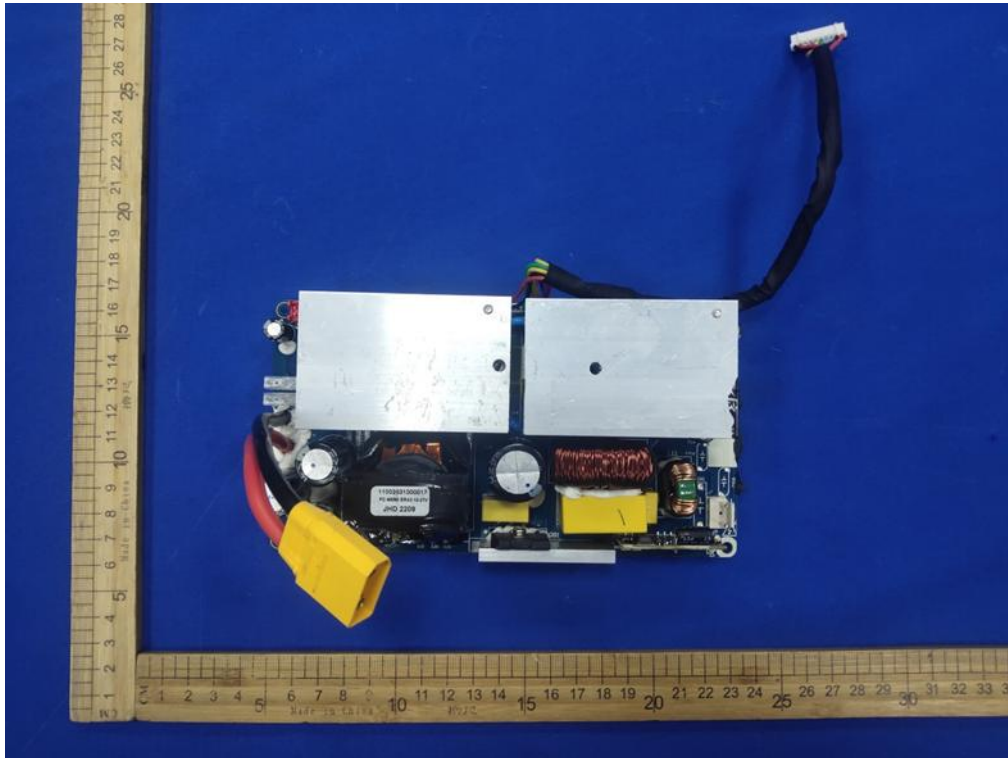


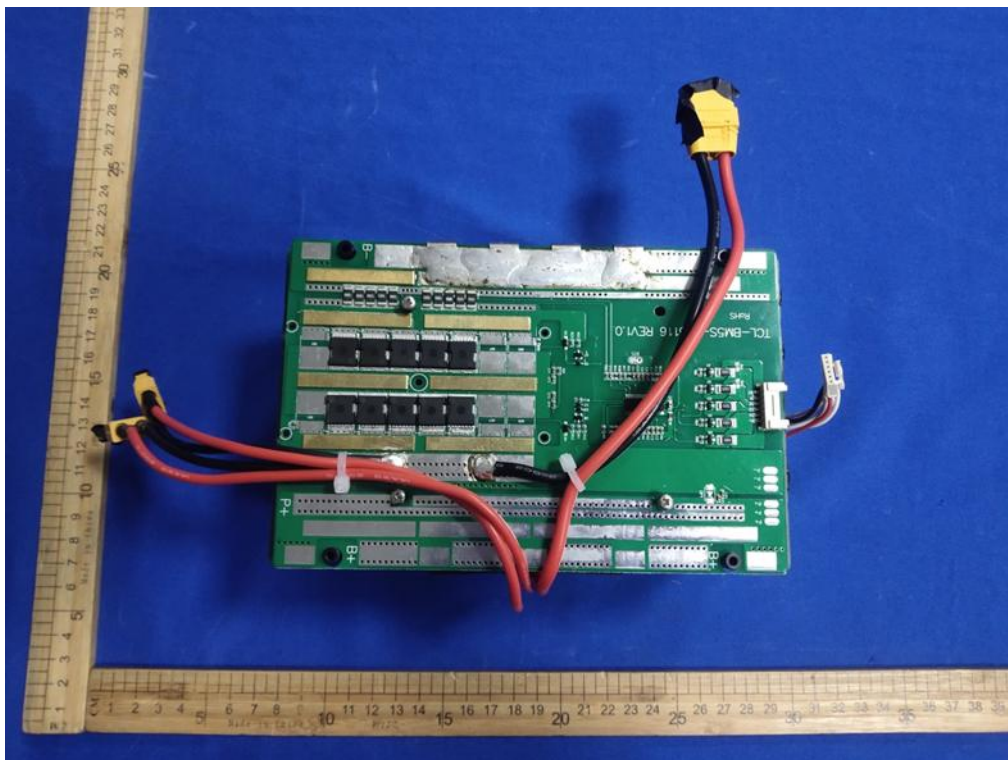
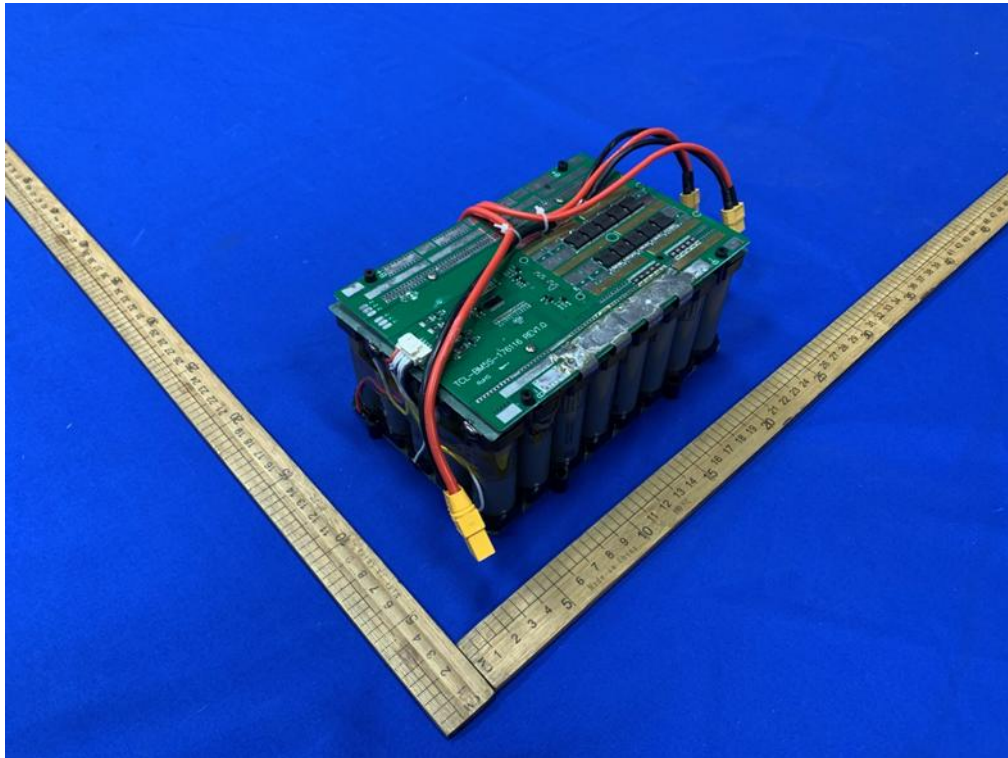




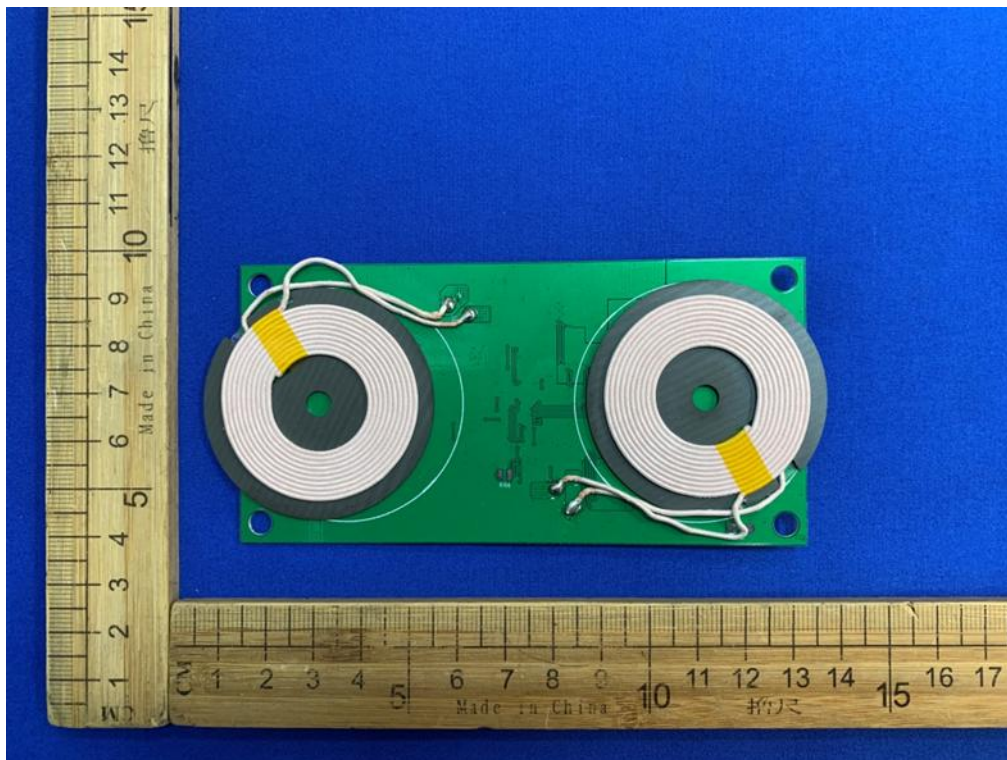


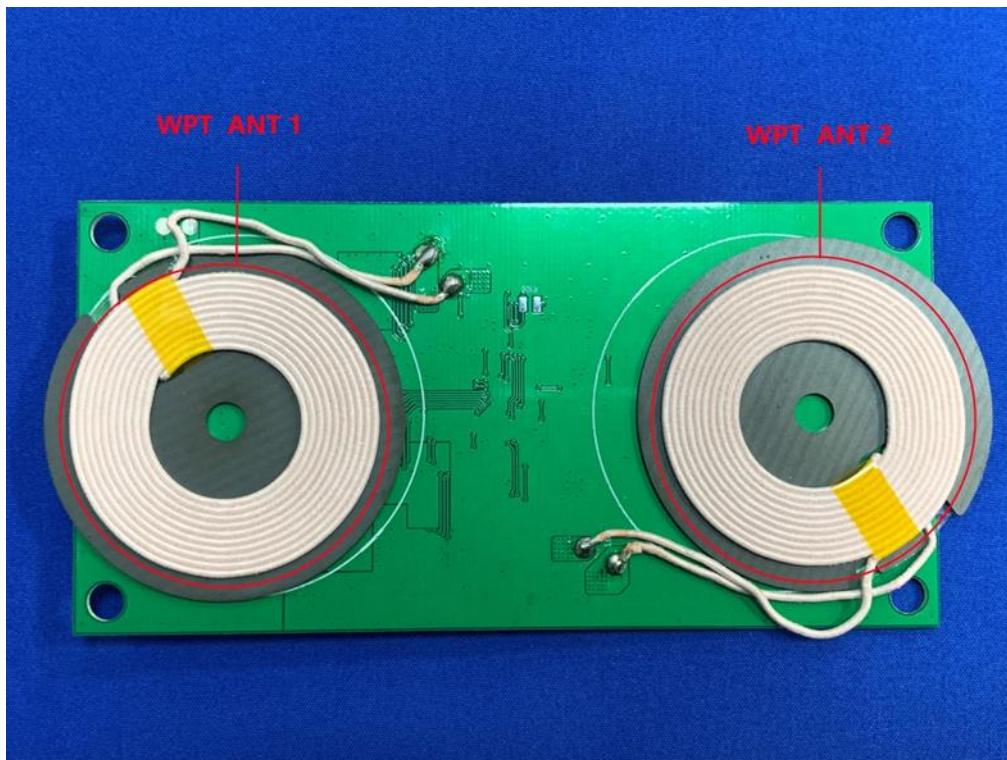
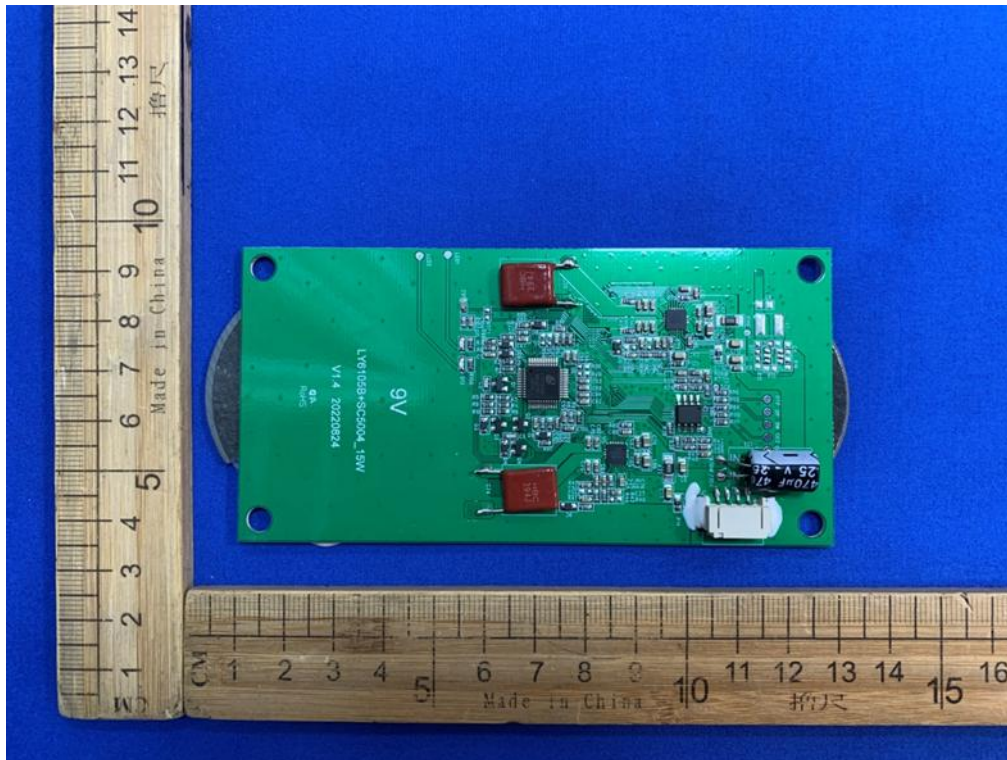
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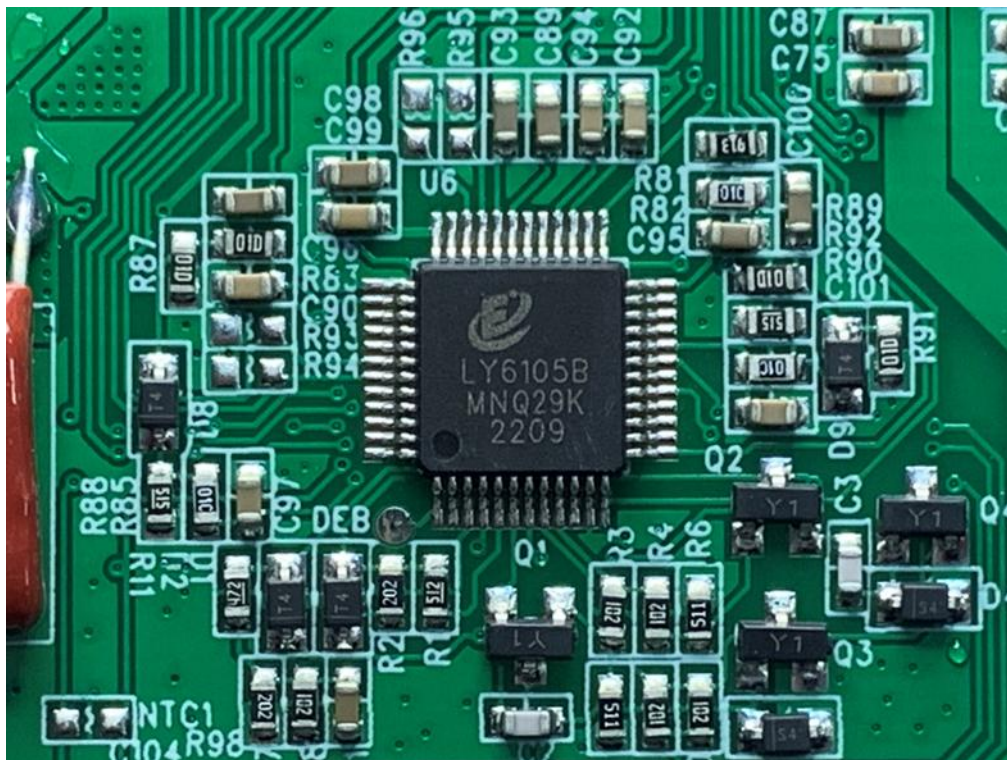
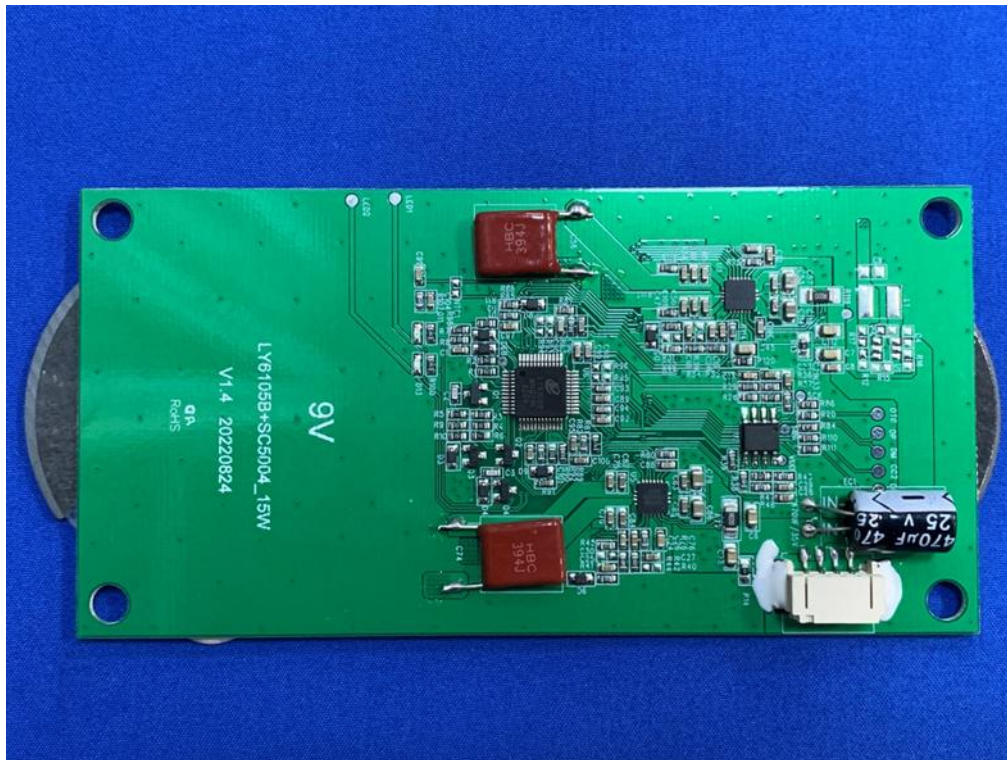




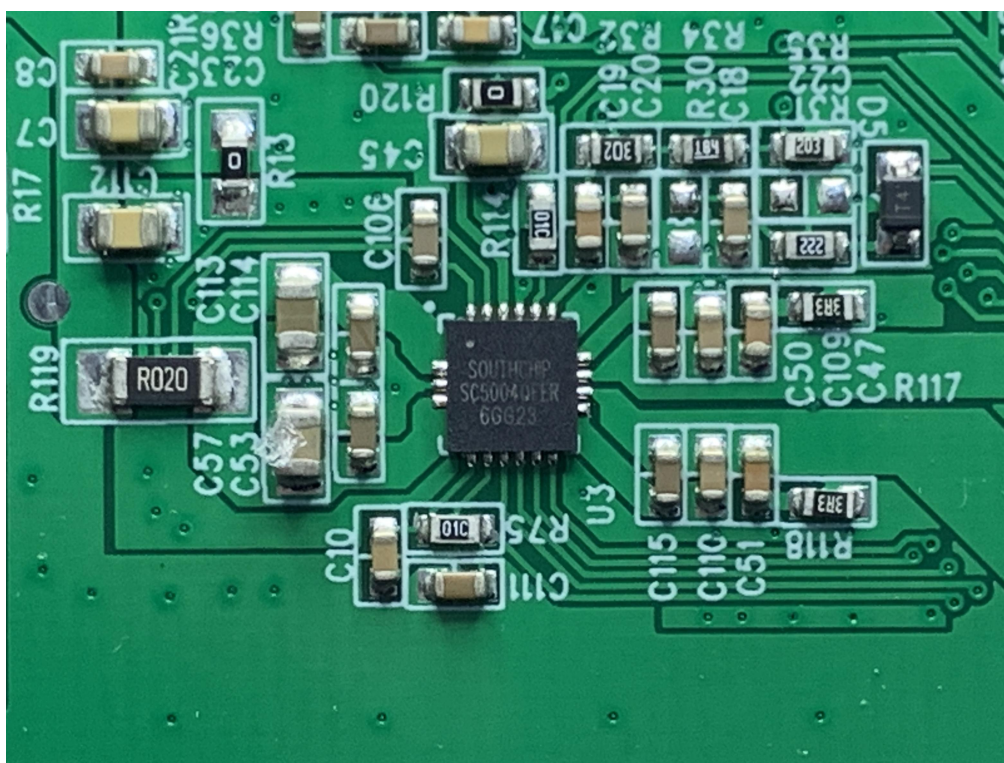












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