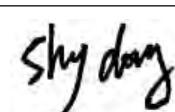
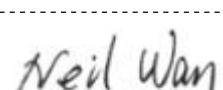


# TEST REPORT

<b>Report No.</b>	<b>KS2205S2221E</b>
<b>FCC ID:</b>	<b>2A6ZZ-EA500</b>
<b>Applicant</b>	<b>CEA ELECTRIC CO.,LTD</b>
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
<b>Product Name :</b>	<b>Portable Power Station</b>
Trade Mark	CEA
Model/Type reference	EA500-518WH-1YE
Listed Model(s)	EA500-518WH-1GN,EA500-518WH-1BK
<b>Standard</b>	<b>FCC Rules and Regulations Part 15 Subpart C (Section 15.209), ANSI C63.10: 2013</b>
Date of Receipt	May 27, 2022
Date of Test Date	May 27, 2022 ~ June 24,2022
Date of issue	June 24,2022
<b>Test result</b>	<b>Pass</b>
Prepared by: ( Printed Name + Signature )	Sky Dong 
Approved by: ( Printed Name + Signature )	Neil Wan 
<b>Testing Laboratory Name</b>	<b>KSIGN(Guangdong) Testing Co., Ltd.</b>
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
This test report may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by KSIGN. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to KSIGN within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.	

TRF No. RF exposure\_R1

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TRF No. FCC Part 15C\_R2

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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 24,2022	Original

TRF No. FCC Part 15C\_R2

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

<b>Product Name:</b>	Portable Power Station
<b>Trade Mark:</b>	CEA
<b>Model/Type reference:</b>	EA500-518WH-1YE
<b>Listed Model(s):</b>	EA500-518WH-1GN,EA500-518WH-1BK
<b>Model Different:</b>	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.
<b>Hardware version:</b>	V1.0
<b>Software version:</b>	V1.0.0
<b>Test samples ID:</b>	KS2205S2221E-1# (Engineer sample), KS2205S2221E-2# (Normal sample)
<b>Power supply:</b>	Input:AC 100-120V/60Hz USB Output*2: 5V/3A, 9V/2A, 12V/1.5A Output: Wireless Charging: 10W(Max) LED Light: 2W
<b>Power supply(Battery):</b>	19.2V
<b>Operation frequency:</b>	115KHz - 205KHz
<b>Modulation type:</b>	FSK
<b>Antenna type:</b>	coil antenna
<b>Antenna gain:</b>	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.

TRF No. FCC Part 15C\_R2

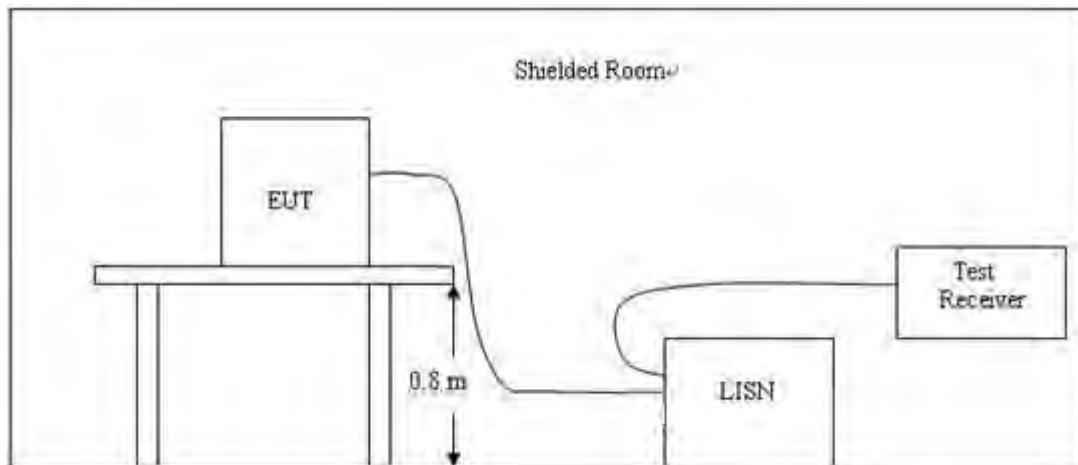
Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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## 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.

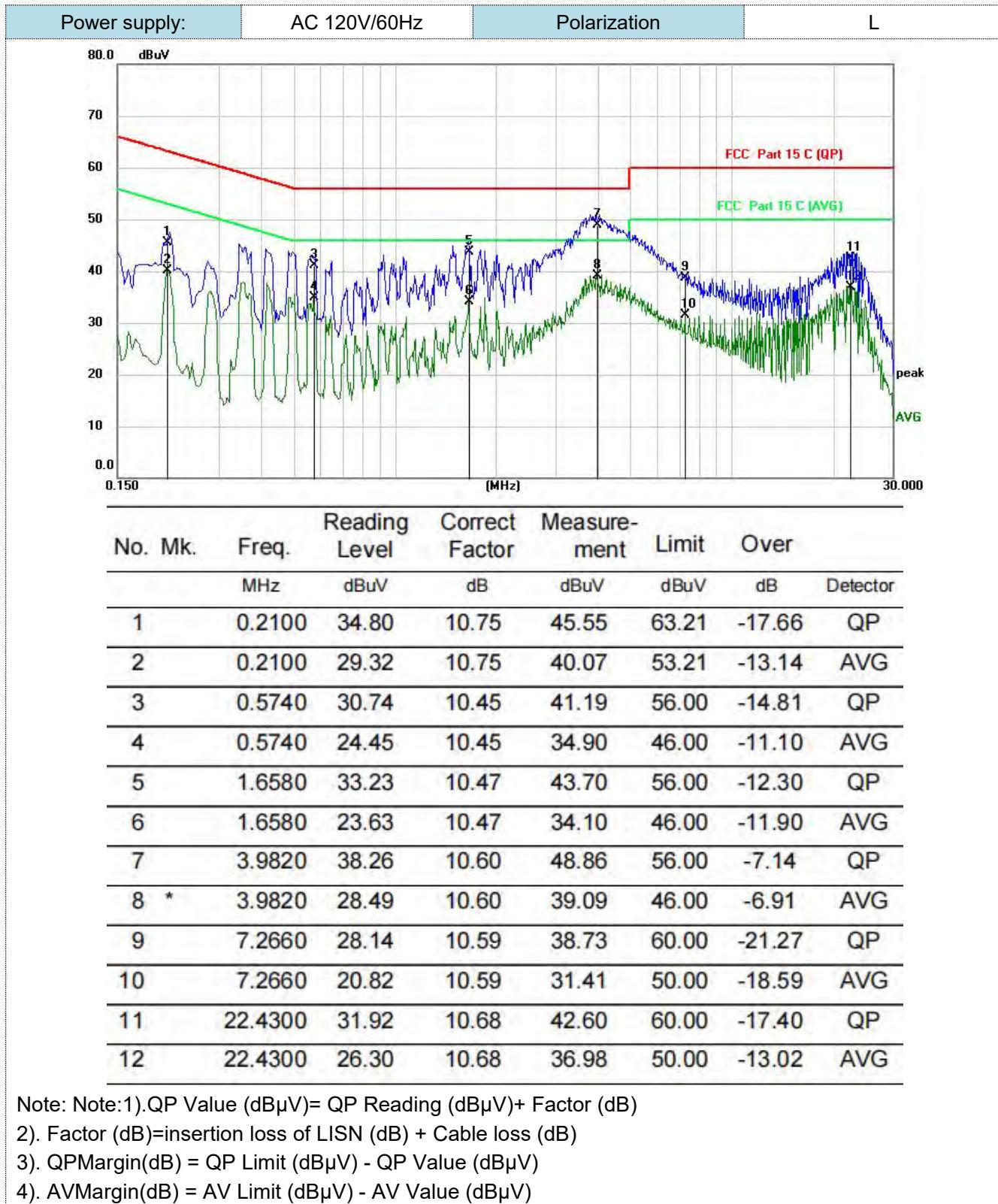
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**TEST RESULTS**

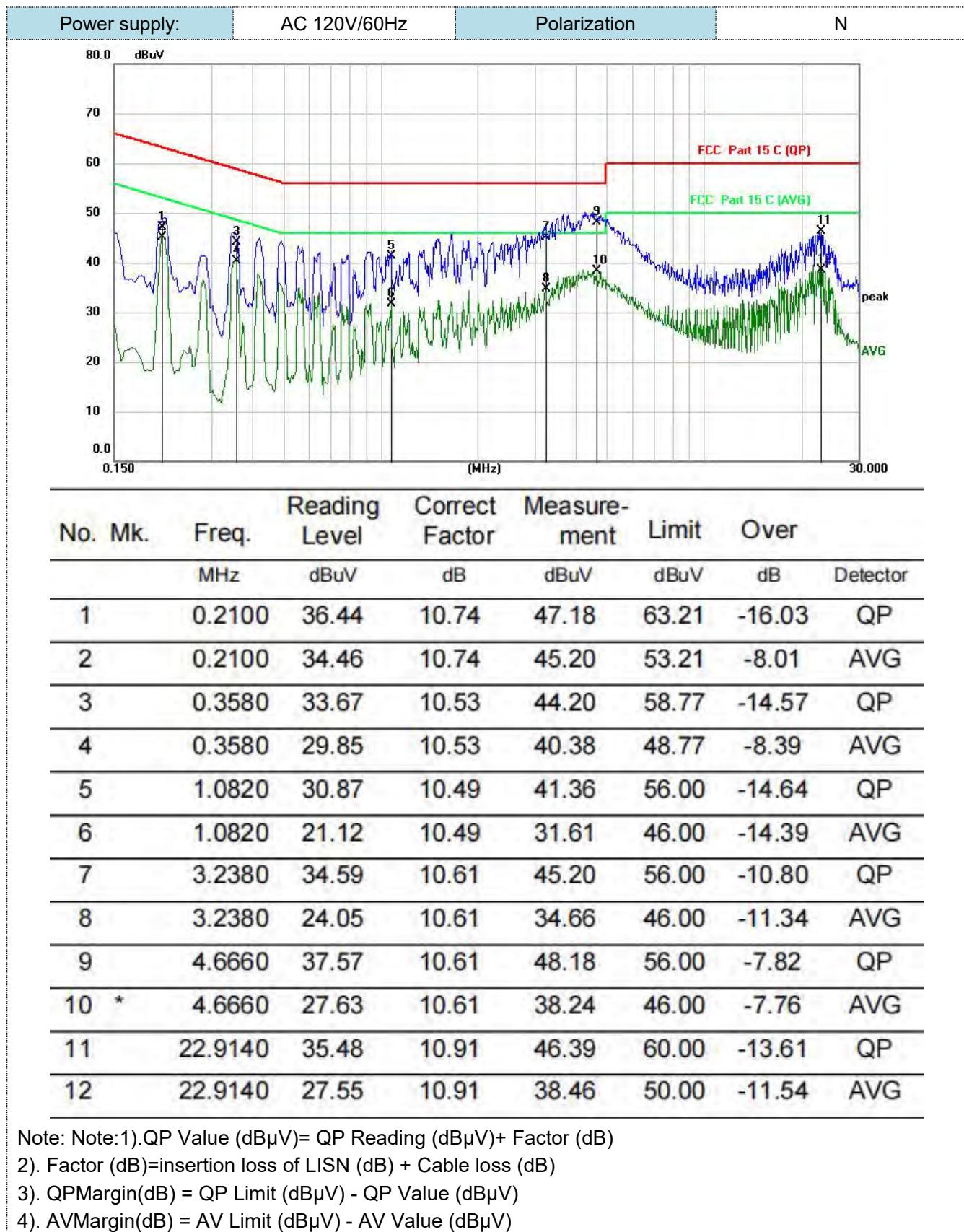
1. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:



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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.

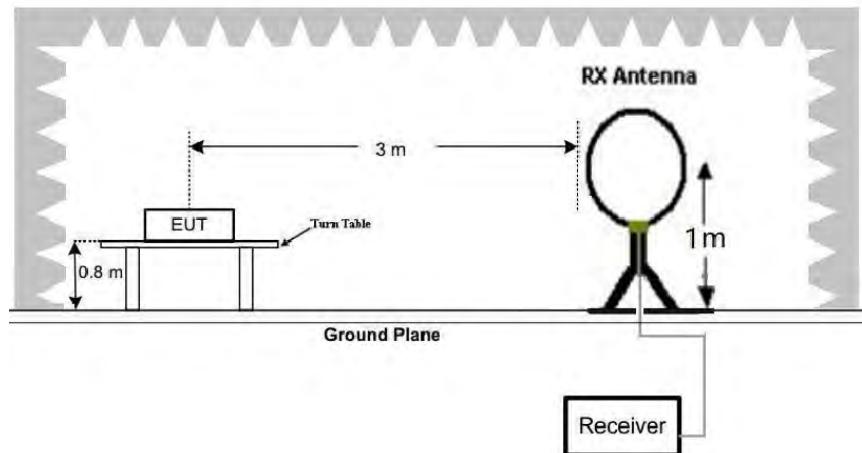
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/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

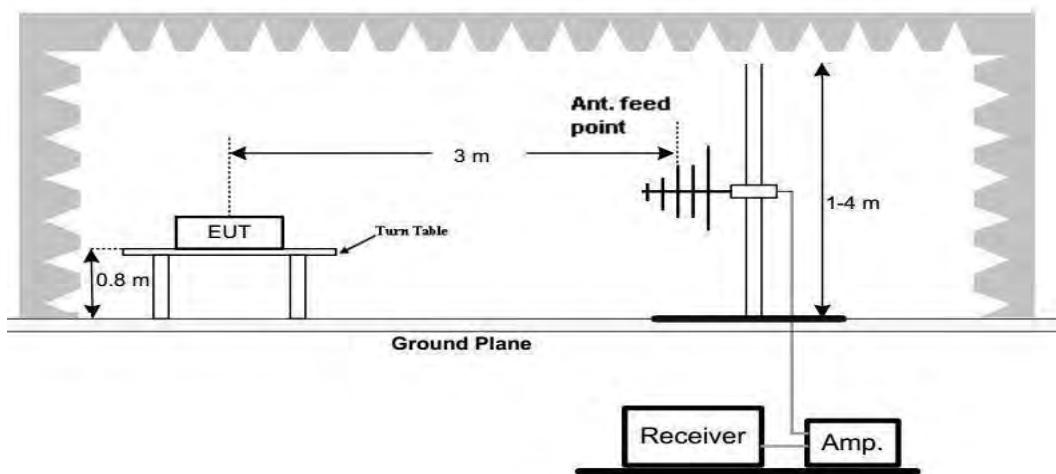


#### 2. Radiated Emission Test Set-Up, Frequency below 1000MHz

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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°C to 360°C 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

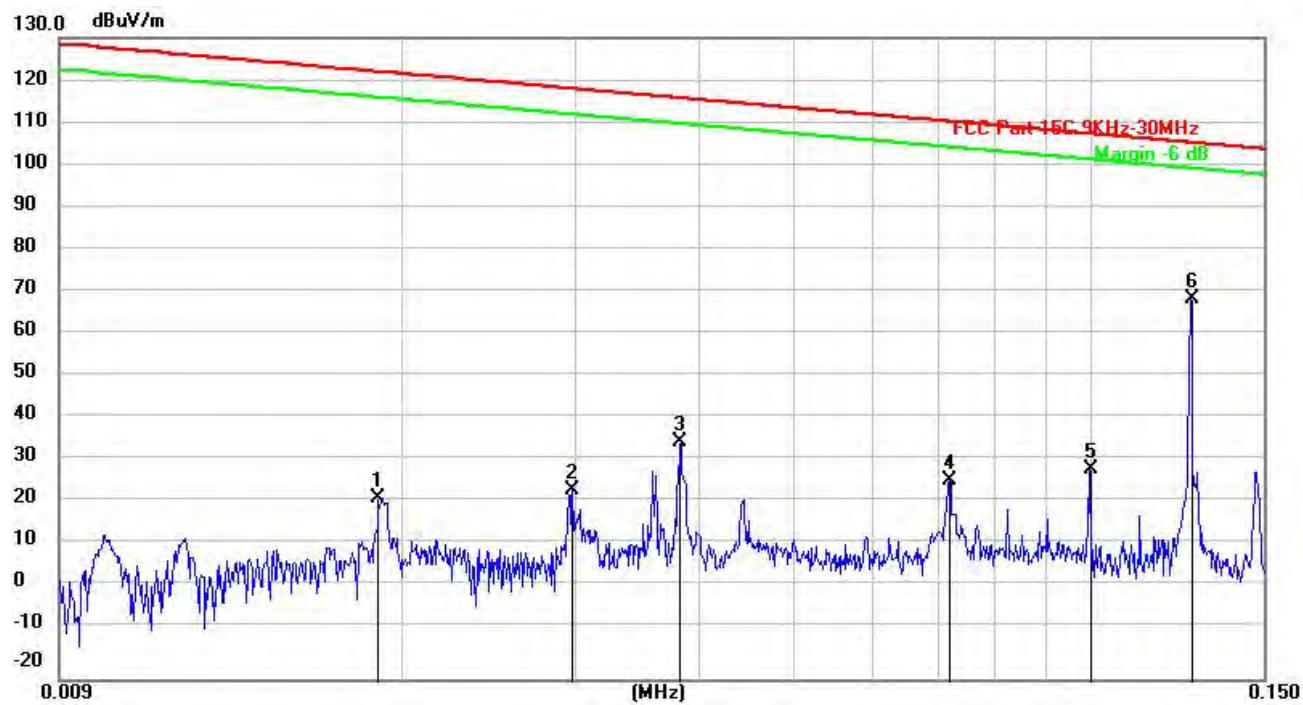
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For 9 KHz-30MHz

Face



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector
			Level	Factor	ment			
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		0.0189	31.78	-9.06	22.72	122.08	-99.36	peak
2		0.0298	33.33	-9.00	24.33	118.12	-93.79	peak
3		0.0383	44.46	-8.92	35.54	115.94	-80.40	peak
4		0.0719	36.21	-9.35	26.86	110.47	-83.61	peak
5		0.1000	38.07	-8.90	29.17	107.60	-78.43	peak
6	*	0.1265	78.74	-9.57	69.17	105.56	-36.39	peak

Remark:

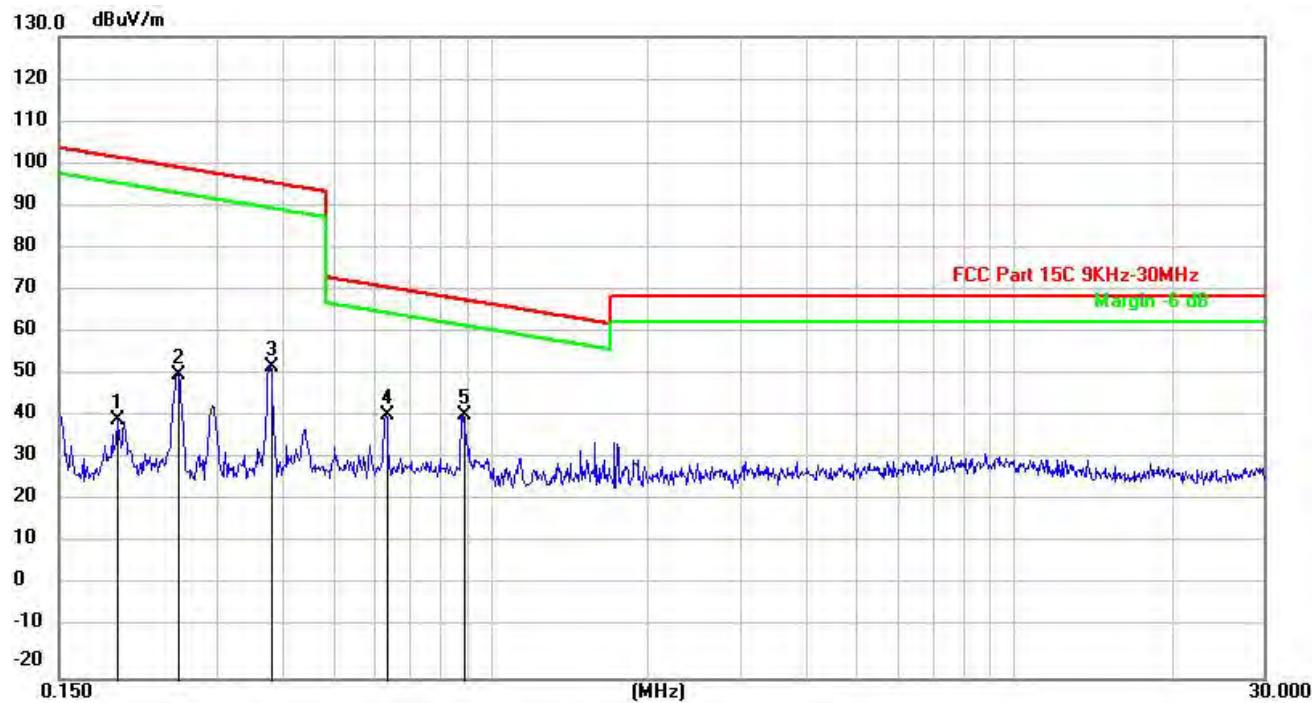
Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

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## Face



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.1943	49.76	-9.31	40.45	101.83	-61.38	peak
2		0.2533	60.39	-9.29	51.10	99.53	-48.43	peak
3		0.3793	62.34	-9.25	53.09	96.02	-42.93	peak
4		0.6322	50.86	-9.19	41.67	71.59	-29.92	peak
5	*	0.8868	50.72	-9.13	41.59	68.65	-27.06	peak

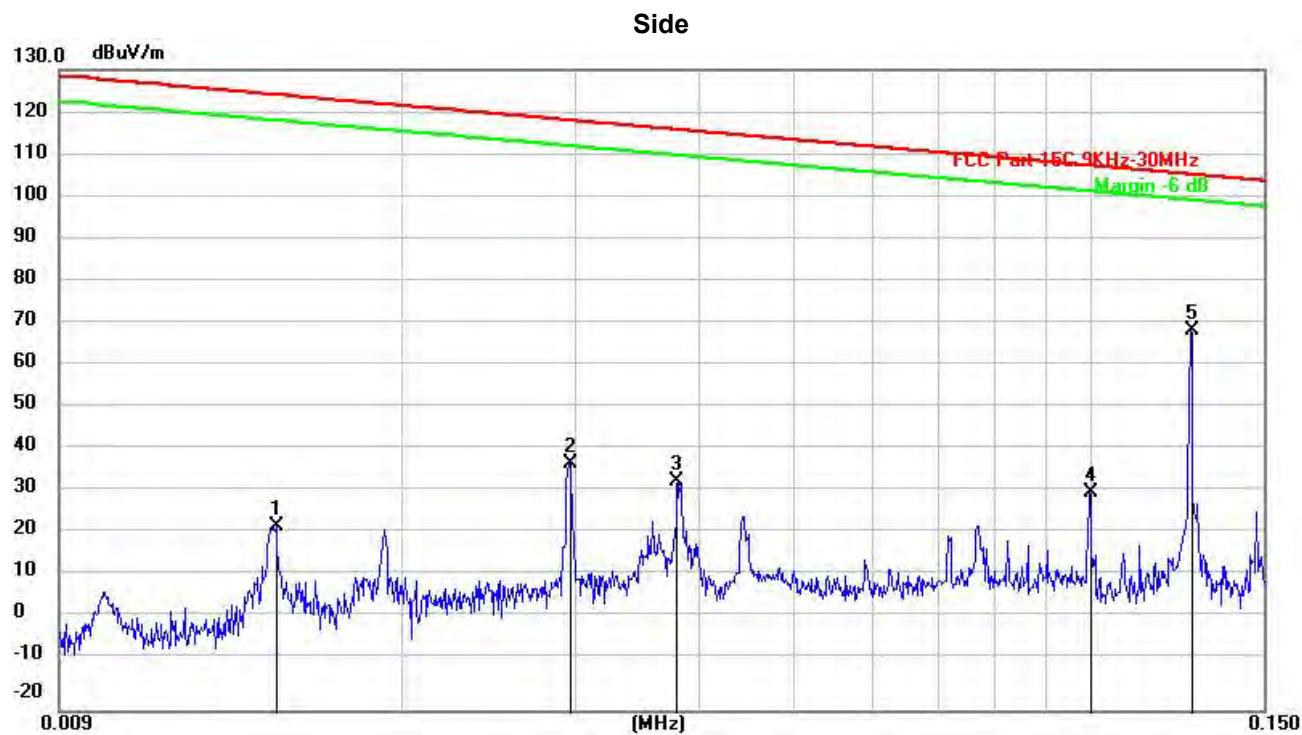
Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

TRF No. FCC Part 15C\_R2

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No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector
			Level	Factor	ment			
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		0.0149	32.30	-9.08	23.22	124.14	-100.92	peak
2		0.0296	46.81	-9.00	37.81	118.18	-80.37	peak
3		0.0381	42.89	-8.92	33.97	115.99	-82.02	peak
4		0.1000	40.07	-8.90	31.17	107.60	-76.43	peak
5	*	0.1265	78.74	-9.57	69.17	105.56	-36.39	peak

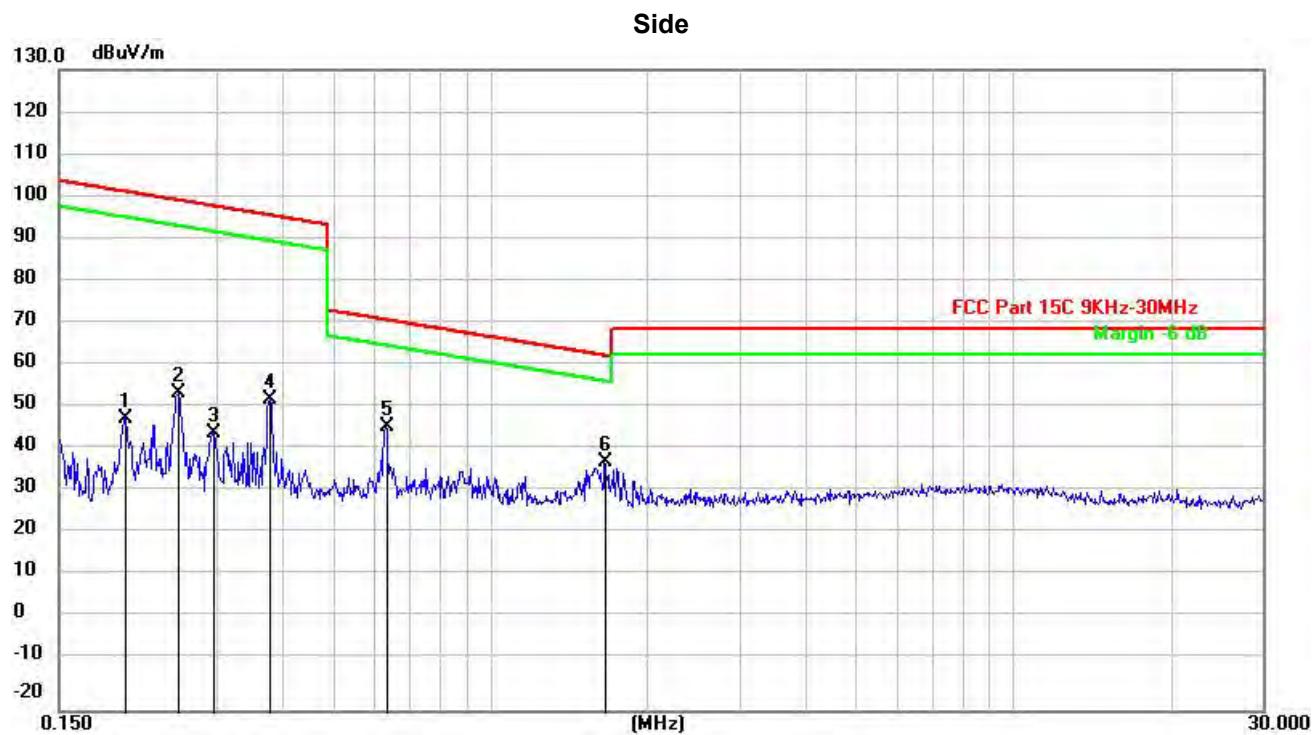
Remark:

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

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No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		0.2006	57.86	-9.32	48.54	101.56	-53.02	peak
2		0.2534	63.56	-9.29	54.27	99.53	-45.26	peak
3		0.2958	54.45	-9.28	45.17	98.18	-53.01	peak
4		0.3790	62.04	-9.25	52.79	96.03	-43.24	peak
5		0.6323	55.72	-9.19	46.53	71.59	-25.06	peak
6	*	1.6579	47.69	-9.19	38.50	63.21	-24.71	peak

Remark:

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For 30MHz-1GHz

Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
			Level	Factor	ment			
		MHz	(dB $\mu$ V)	(dB/m)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	Detector
1		73.4108	30.46	-20.05	10.41	40.00	-29.59	QP
2		102.2520	35.37	-17.81	17.56	43.50	-25.94	QP
3		122.6618	38.69	-19.75	18.94	43.50	-24.56	QP
4	*	294.0106	37.64	-14.80	22.84	46.00	-23.16	QP
5		330.3107	36.04	-13.36	22.68	46.00	-23.32	QP
6		378.0537	31.37	-11.62	19.75	46.00	-26.25	QP

Note:1).Level (dB $\mu$ V/m)= Reading (dB $\mu$ V)+ Factor (dB/m)

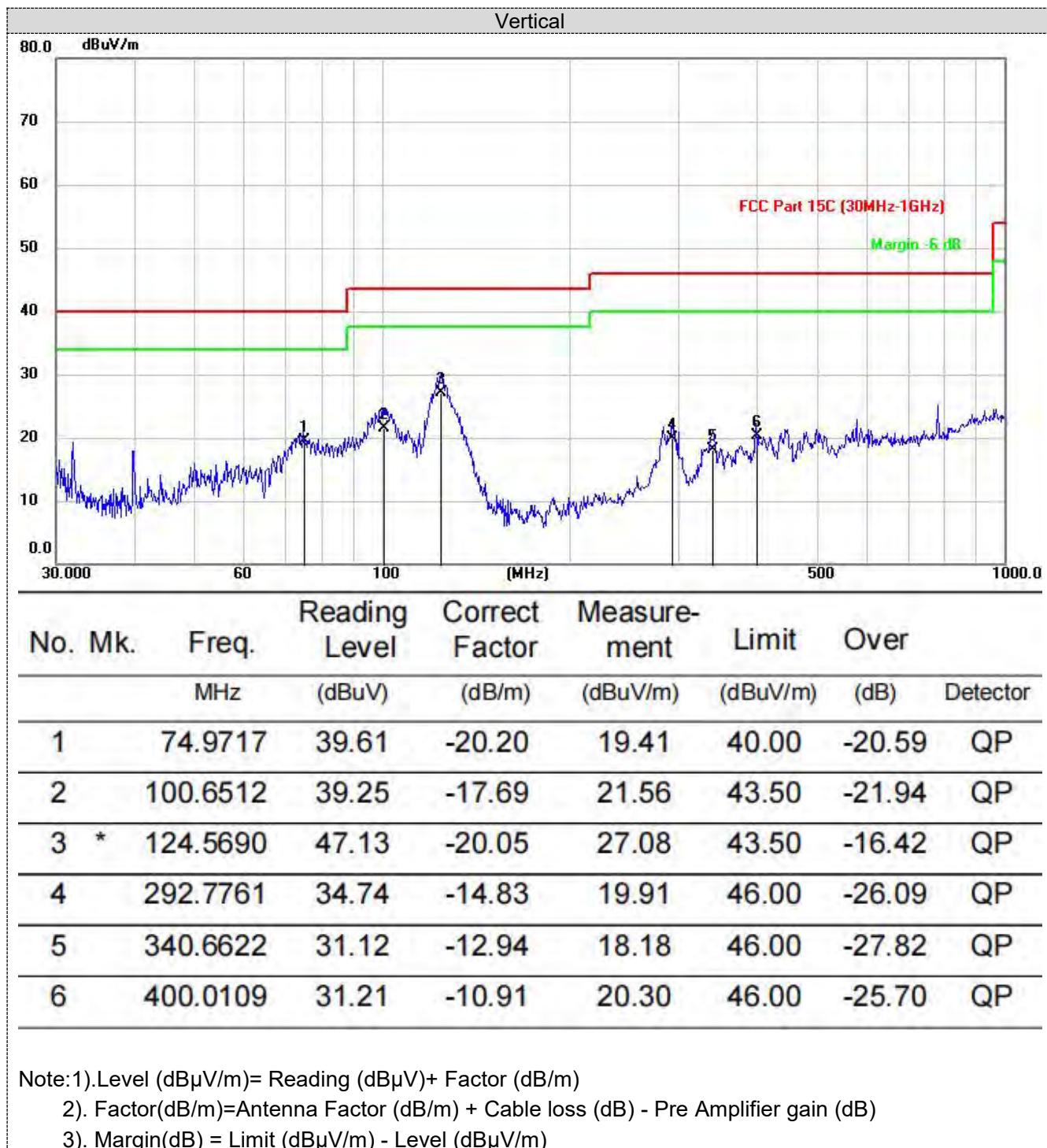
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dB $\mu$ V/m) - Level (dB $\mu$ V/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

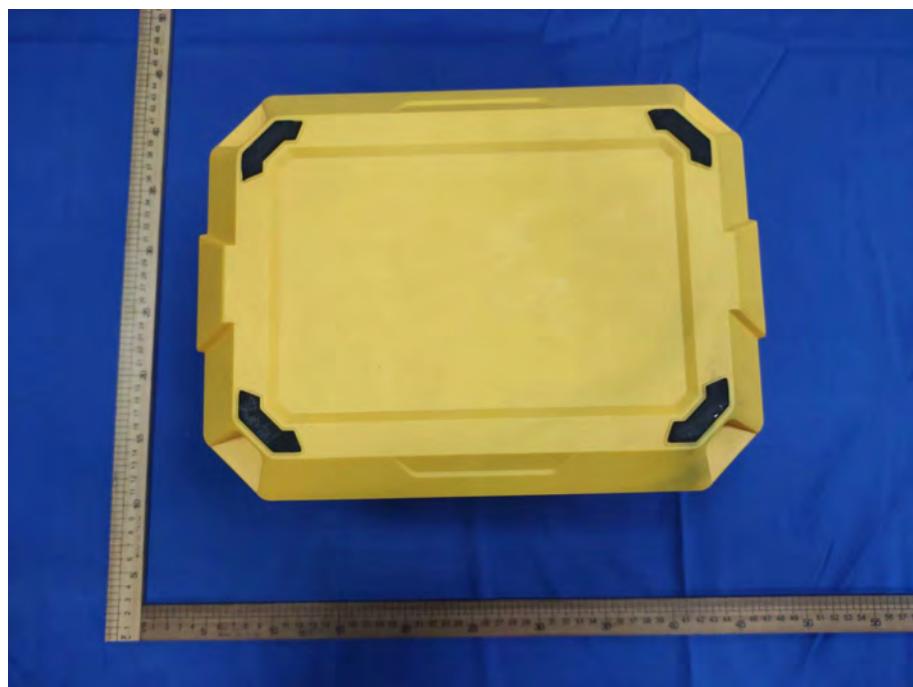


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## 6. PHOTOS OF THE EUT



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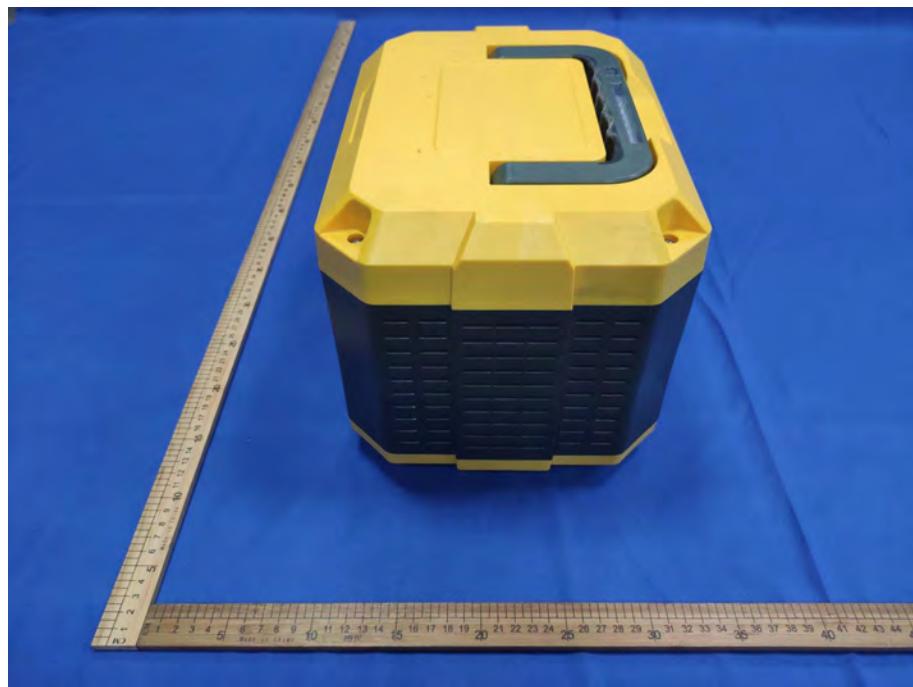
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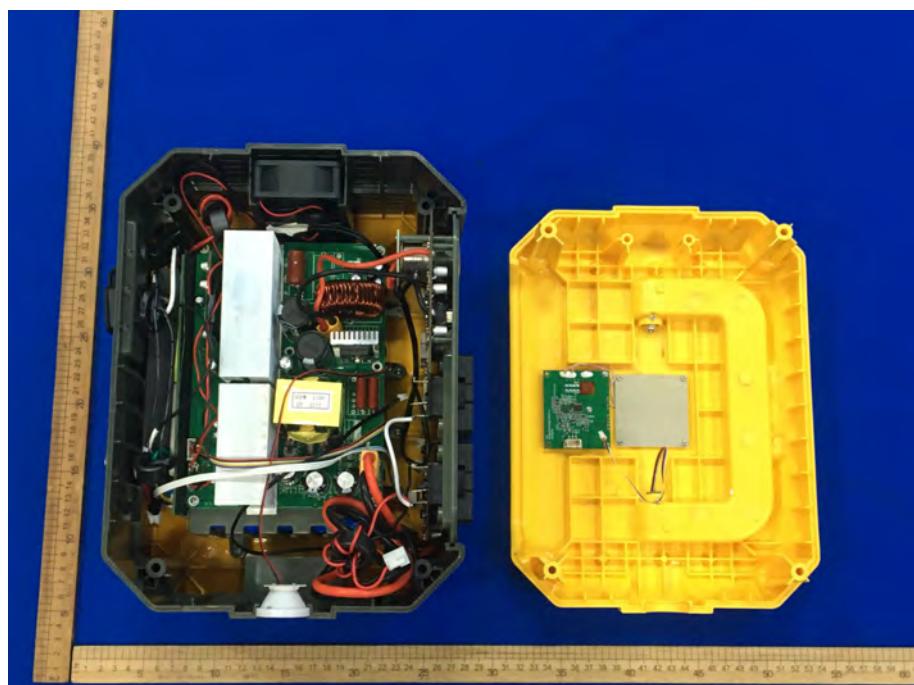
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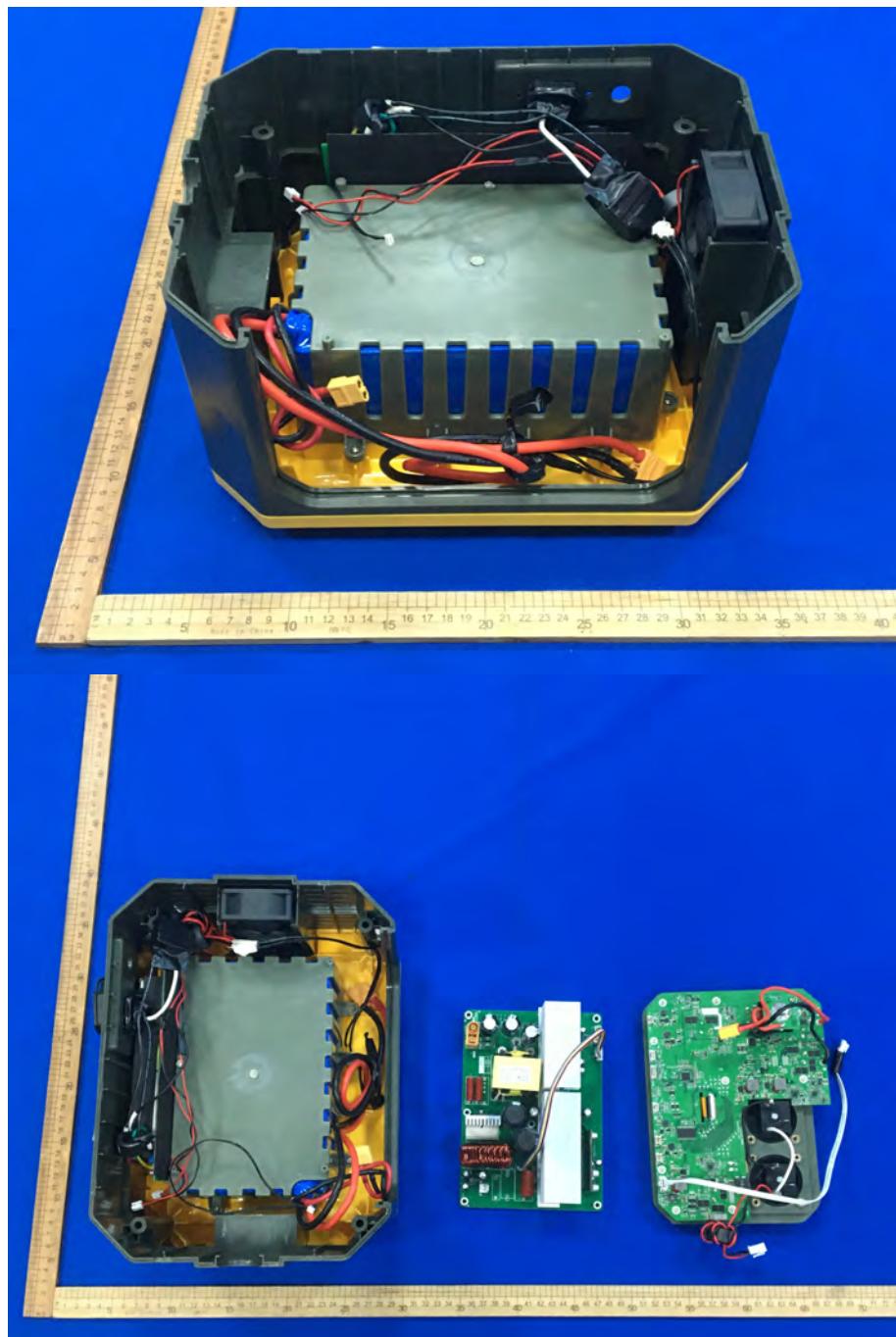
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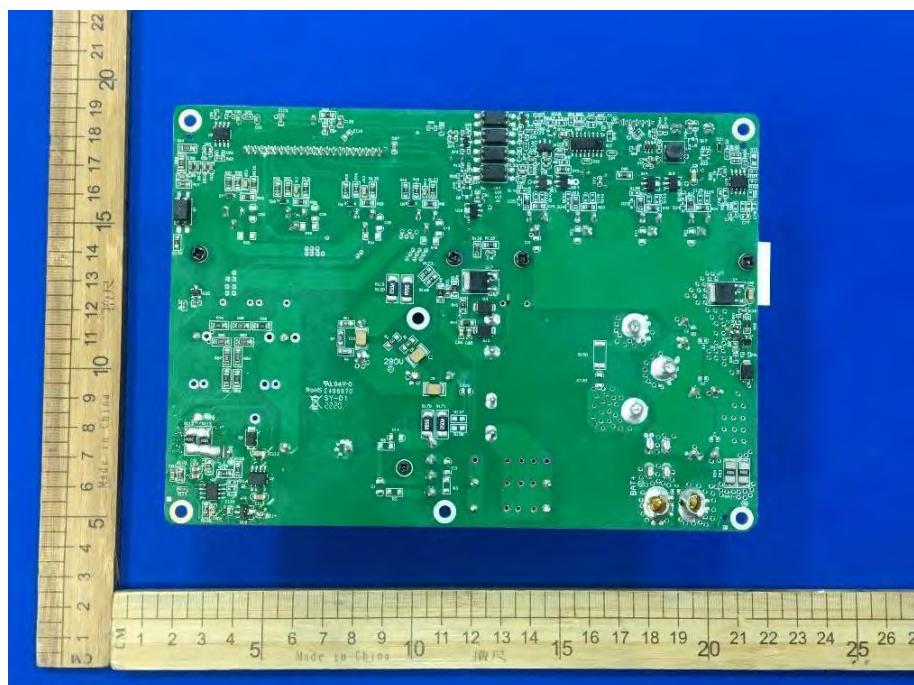
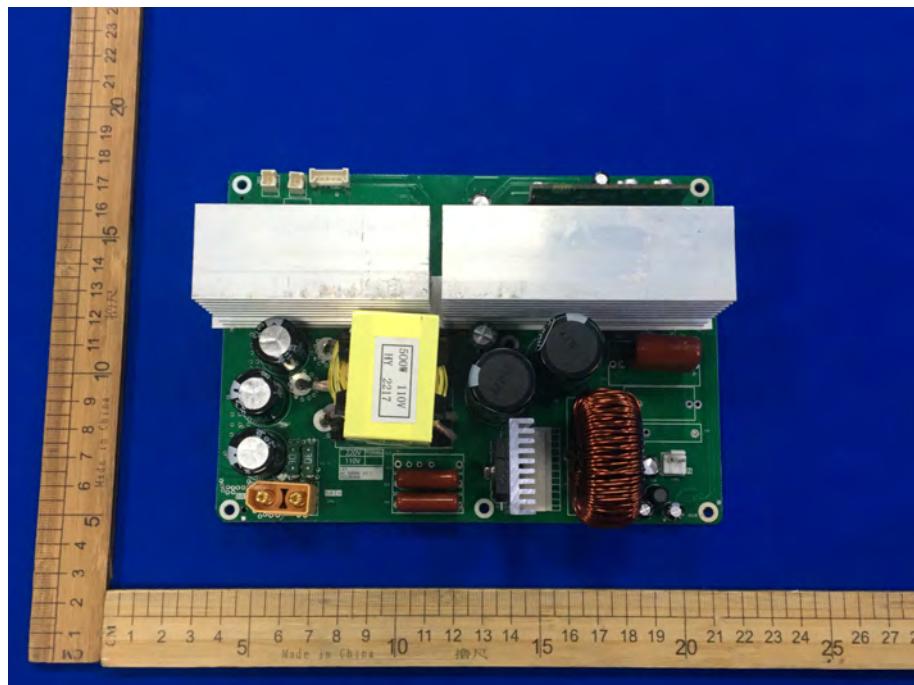
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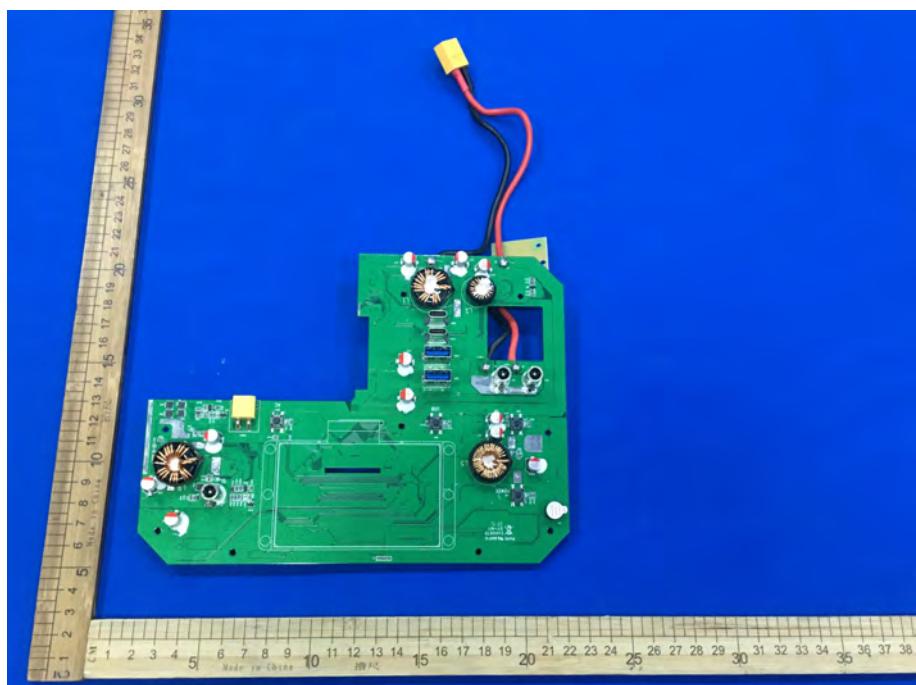
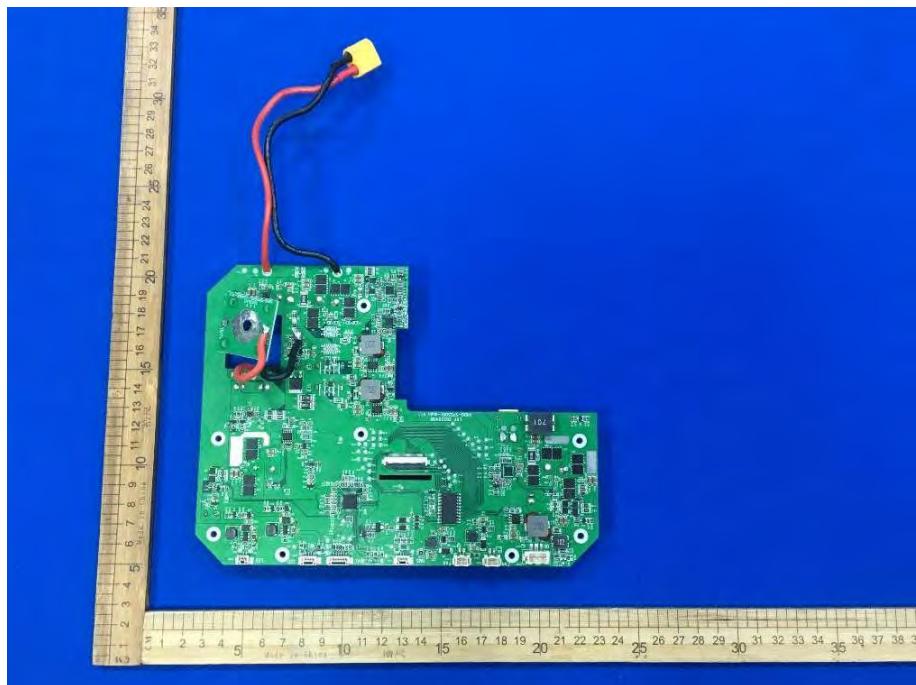
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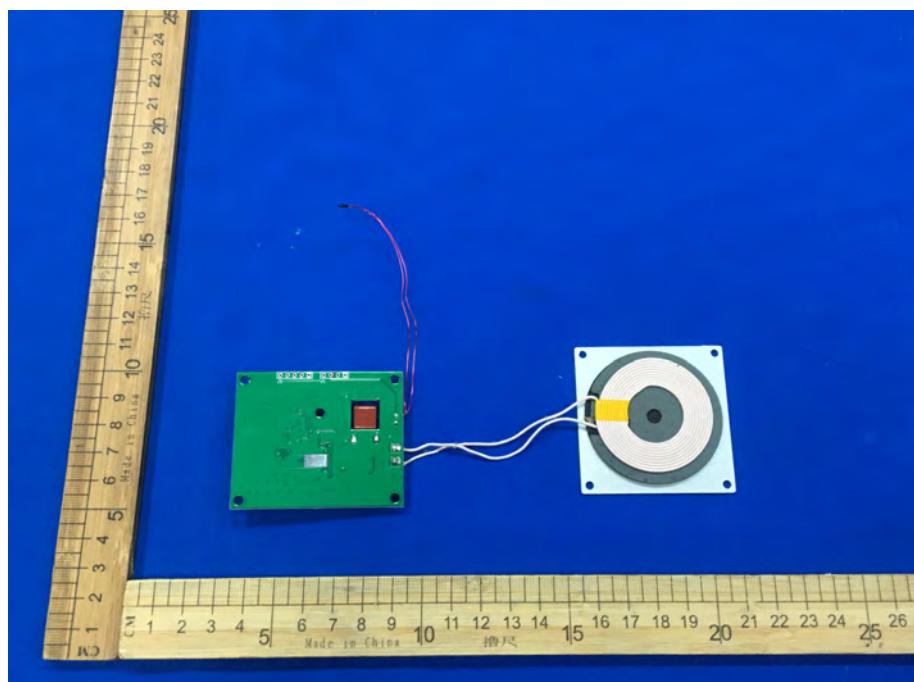
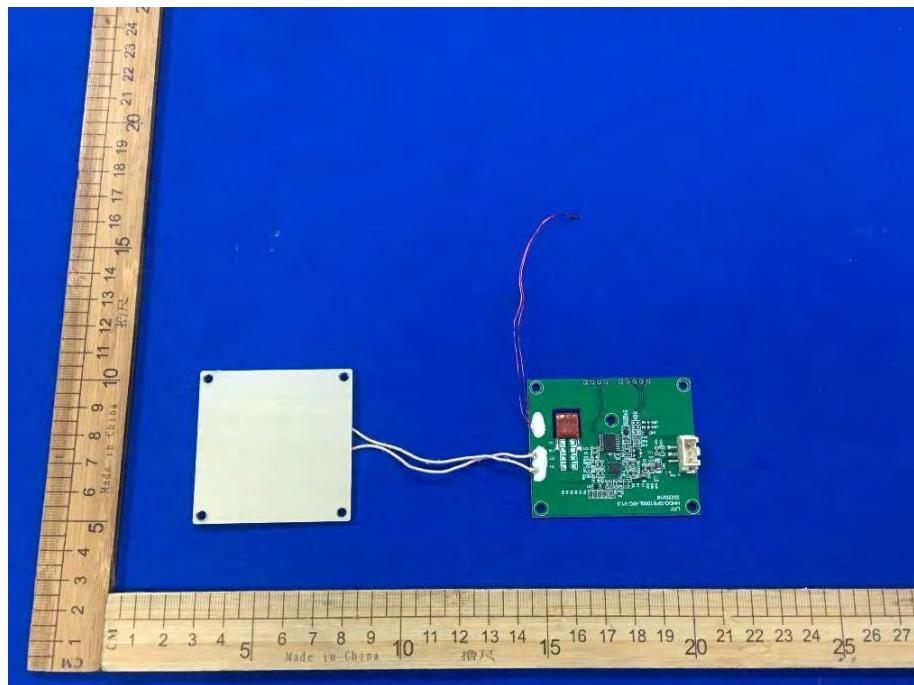
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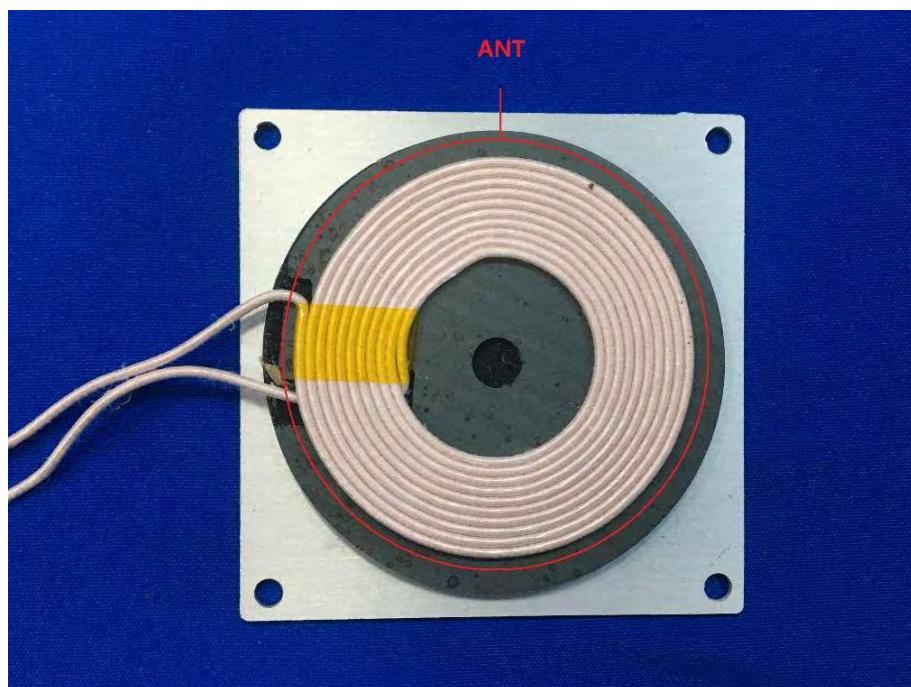
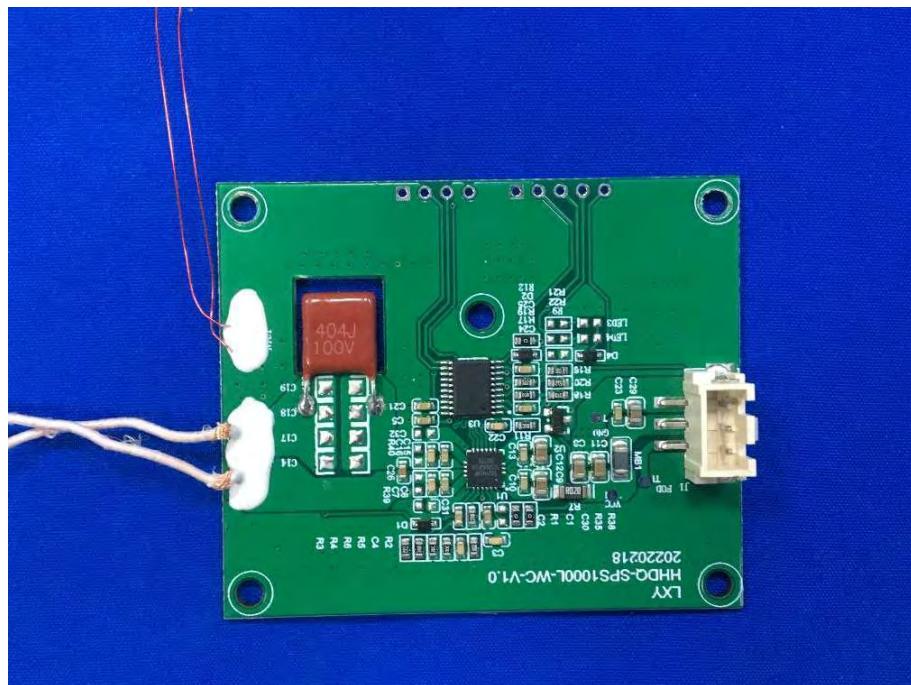
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