FCC TEST REPORT

Client Name	:	ZeroLemon(HongKong)Limited
Address	:	817 New Tech Plaza, 34 Tai Yau St, KLN, HongKong China
Product Name	:	ToughJuice Pro 30000mAh Power Bank
Date	:	Mar. 09, 2022

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant	:	ZeroLemon(HongKong)Limited
Manufacturer	:	ZeroLemon
Product Name	:	ToughJuice Pro 30000mAh Power Bank
Model No.	:	Y1348
Trade Mark	:	ZEROLEMON
Rating(s)	:	Input: Typc-C 1 & Typc-C 2: DC 5V-9V/2A(MAX) QC 3.0 Output(the blue port): DC 5V-9V/2A(MAX) Typc-C Output: DC 5V/3A, 9V/2.5A(MAX) Wireless output: 5W/7.5W/10W Battery capacity: DC 3.8V, 30000mAh
Test Standard(s)	**:**	**FCC Part15 Subpart C, Paragraph 15.209**
Test Method(s)	**:**	**ANSI C63.10: 2013**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited 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 Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt	Feb. 21, 2022
Date of Test	Feb. 21~ Mar. 02, 2022

Prepared by

Nian xiu Chen

(Nianxiu Chen)

Approved & Authorized Signer

Kingkong Jin

(Kingkong Jin)

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1. General Information

1.1. Client Information

Applicant	:	ZeroLemon(HongKong)Limited
Address	:	817 New Tech Plaza, 34 Tai Yau St, KLN, HongKong China
Manufacturer	:	ZeroLemon
Address	:	817 New Tech Plaza, 34 Tai Yau St, KLN, HongKong China
Factory		ZeroLemon
Address		817 New Tech Plaza, 34 Tai Yau St, KLN, HongKong China

1.2. Description of Device (EUT)

Product Name	:	ToughJuice Pro 30000mAh Power Bank	
Model No.	:	Y1348	
Trade Mark	:	ZEROLEMON	
Test Power Supply	:	AC 120V, 60Hz for adapter/ AC 240V, 60Hz for adapter/ DC 3.8V battery inside	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	110.1-205KHz
		Modulation Type:	ASK
		Antenna Type:	Inductive loop coil Antenna
		Antenna Gain(Peak):	0 dBi(Provided by customer)
		Adapter	N/A
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

1.3. Auxiliary Equipment Used During Test

Adapter	:	Model: MDY-11-EX Input: 100-240V~50/60Hz, 07A Output: 5V⎓3A/ 9V⎓3A/ 12V⎓2.25A/ 20V⎓1.35A/ 11V⎓3A Max
Wireless charging load	:	Manufacturer: Shenzhen Ouju Technology Co., Ltd. M/N: CD2577 Power: 5W/7.5W/10W/15W Last Cal.: Oct. 26, 2021 Cal. Interval: 1 Year

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	WPT Mode
Mode 2	Battery Charging Mode

For Conducted Emission	
Final Test Mode	Description
Mode 2	Battery Charging Mode

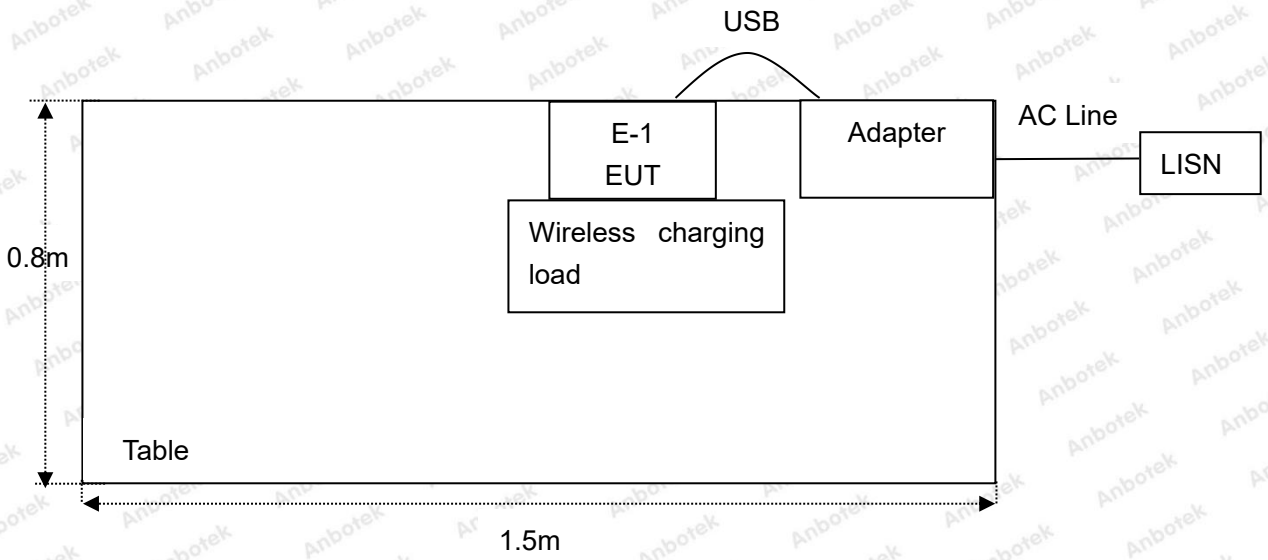
For Radiated Emission	
Final Test Mode	Description
Mode 1	WPT Mode
Mode 2	Battery Charging Mode

Note: (1)Test channel is 0.1285MHz.

(2) All the situation(full load, half load and empty load) has been tested,only the worst situation (full load 10W) was recorded in the report.

1.5. Description Of Test Setup

CE



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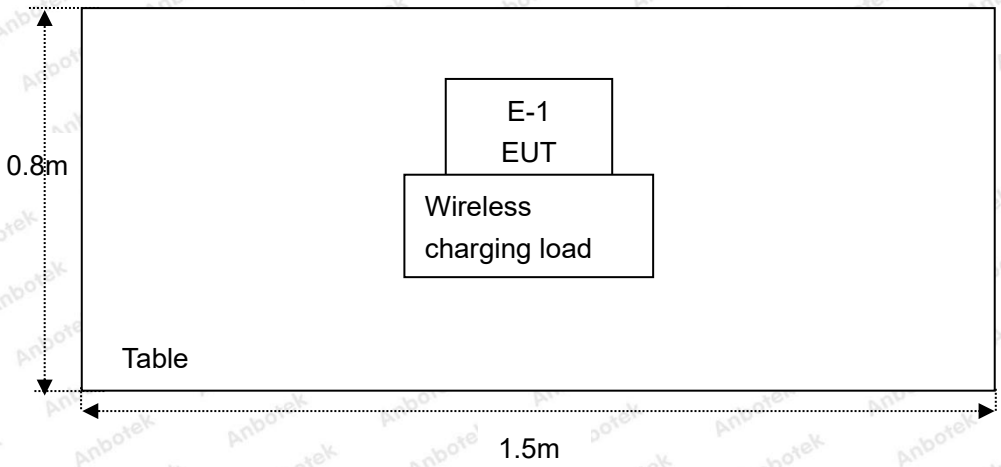

1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul 05, 2021	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 22, 2021	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 22, 2021	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Oct. 22, 2021	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 22, 2021	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 22, 2021	2 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 22, 2021	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 22, 2021	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 22, 2021	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 22, 2021	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 22, 2021	1 Year
16.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 22, 2021	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 22, 2021	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 22, 2021	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2021	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 22, 2021	1 Year

1.7. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

1.8. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
Part 15.203	Antenna Requirement	PASS

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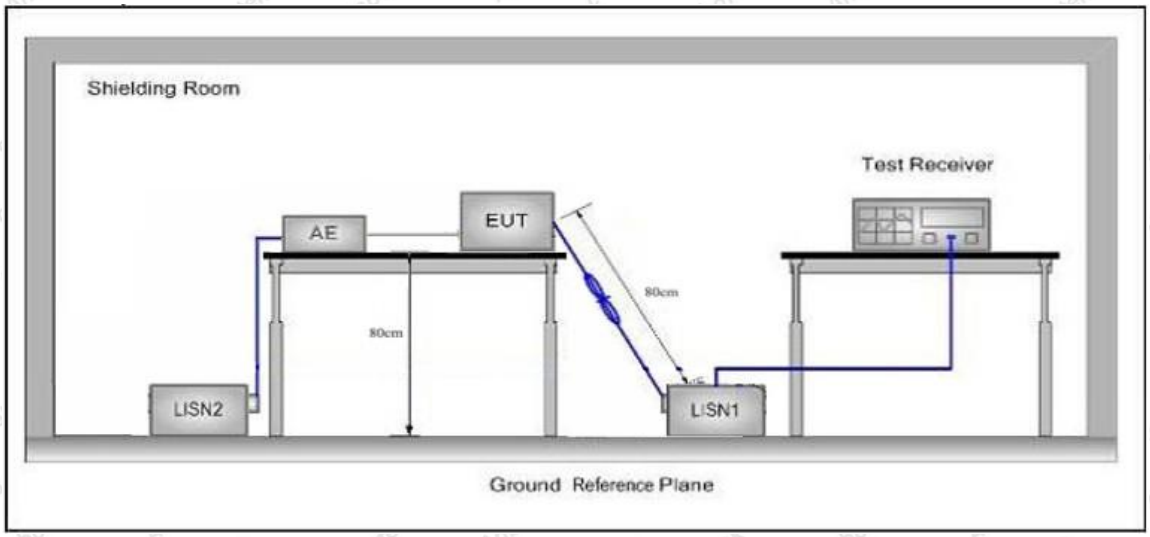
3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

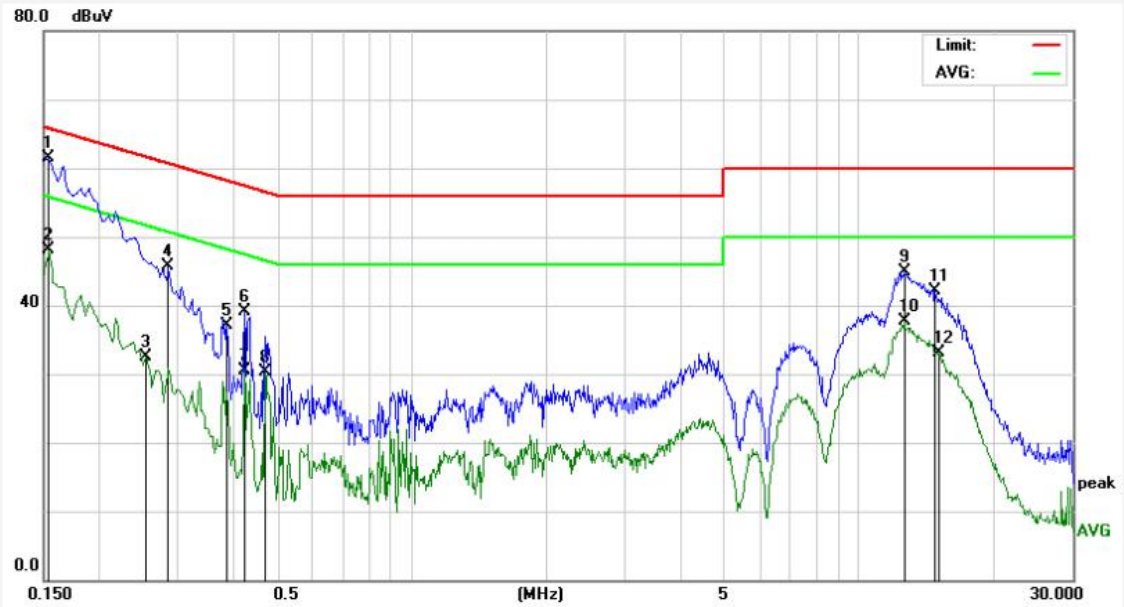
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

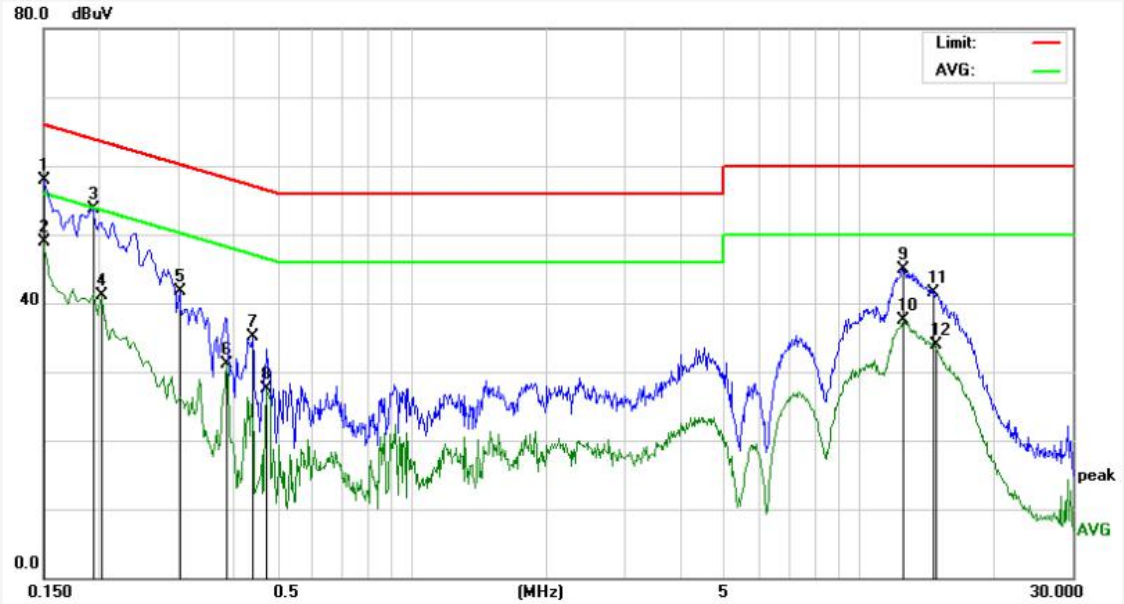
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1539	61.32	0.12	61.44	65.78	-4.34	QP	
2	0.1539	47.92	0.12	48.04	55.78	-7.74	AVG	
3	0.2540	32.41	0.13	32.54	51.62	-19.08	AVG	
4	0.2860	45.54	0.13	45.67	60.64	-14.97	QP	
5	0.3860	36.97	0.11	37.08	58.15	-21.07	QP	
6	0.4220	39.05	0.12	39.17	57.41	-18.24	QP	
7	0.4220	30.48	0.12	30.60	47.41	-16.81	AVG	
8	0.4700	30.17	0.14	30.31	46.51	-16.20	AVG	
9	12.5940	44.67	0.15	44.82	60.00	-15.18	QP	
10	12.5940	37.57	0.15	37.72	50.00	-12.28	AVG	
11	14.7500	41.95	0.17	42.12	60.00	-17.88	QP	
12	15.0460	33.02	0.17	33.19	50.00	-16.81	AVG	

Conducted Emission Test Data

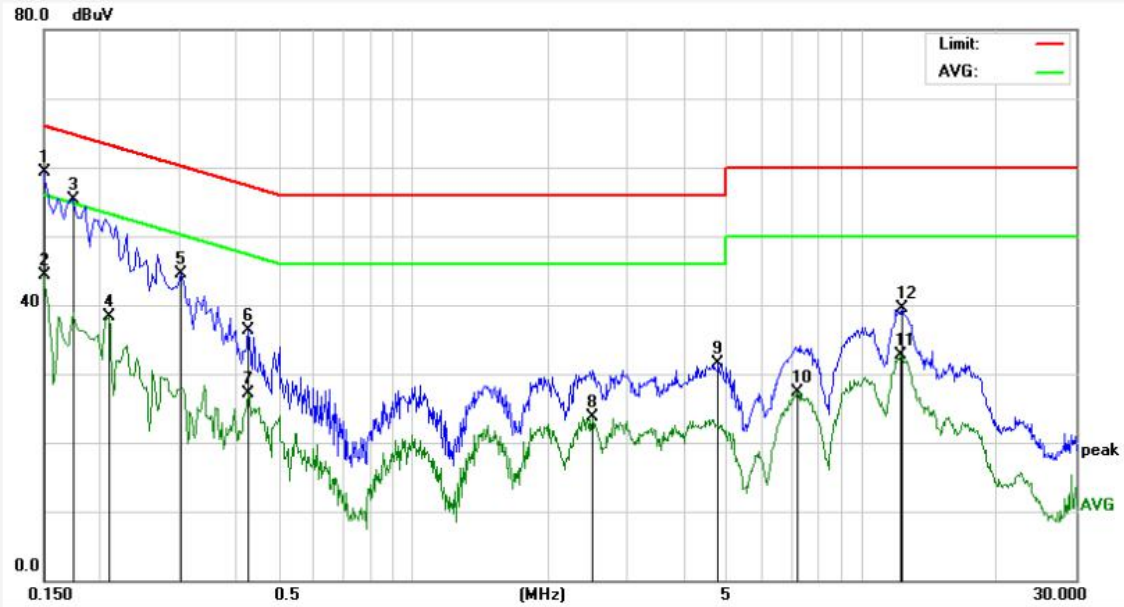
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	57.86	0.11	57.97	65.99	-8.02	QP	
2	0.1500	48.82	0.11	48.93	55.99	-7.06	AVG	
3	0.1940	53.49	0.12	53.61	63.86	-10.25	QP	
4	0.2020	41.01	0.12	41.13	53.52	-12.39	AVG	
5	0.3020	41.58	0.13	41.71	60.19	-18.48	QP	
6	0.3860	31.00	0.11	31.11	48.15	-17.04	AVG	
7	0.4420	34.88	0.13	35.01	57.02	-22.01	QP	
8	0.4740	27.43	0.14	27.57	46.44	-18.87	AVG	
9	12.5659	44.71	0.15	44.86	60.00	-15.14	QP	
10	12.5659	37.36	0.15	37.51	50.00	-12.49	AVG	
11	14.6940	41.30	0.17	41.47	60.00	-18.53	QP	
12	14.8180	33.70	0.17	33.87	50.00	-16.13	AVG	

Conducted Emission Test Data

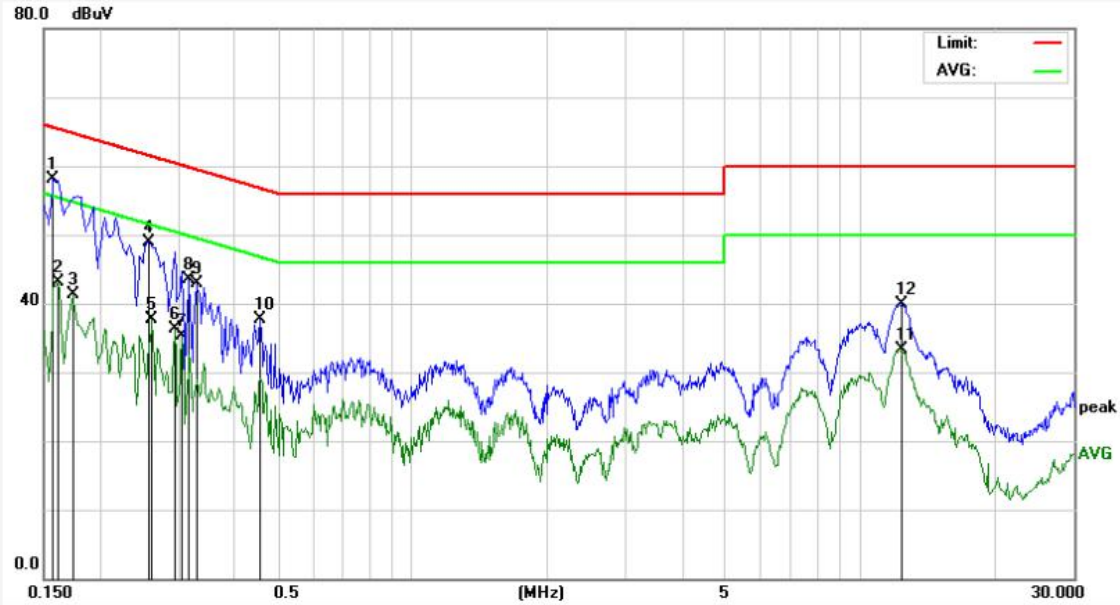
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	59.18	0.11	59.29	66.00	-6.71	QP	
2	0.1500	44.13	0.11	44.24	56.00	-11.76	AVG	
3	0.1740	55.22	0.12	55.34	64.76	-9.42	QP	
4	0.2100	38.12	0.12	38.24	53.20	-14.96	AVG	
5	0.3020	44.28	0.13	44.41	60.19	-15.78	QP	
6	0.4300	36.22	0.12	36.34	57.25	-20.91	QP	
7	0.4300	26.89	0.12	27.01	47.25	-20.24	AVG	
8	2.5100	23.64	0.12	23.76	46.00	-22.24	AVG	
9	4.7779	31.39	0.11	31.50	56.00	-24.50	QP	
10	7.1899	27.27	0.11	27.38	50.00	-22.62	AVG	
11	12.1979	32.49	0.14	32.63	50.00	-17.37	AVG	
12	12.2539	39.38	0.14	39.52	60.00	-20.48	QP	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1580	57.91	0.12	58.03	65.56	-7.53	QP	
2	0.1620	43.01	0.12	43.13	55.36	-12.23	AVG	
3	0.1740	41.11	0.12	41.23	54.76	-13.53	AVG	
4	0.2580	48.82	0.13	48.95	61.49	-12.54	QP	
5	0.2620	37.52	0.13	37.65	51.36	-13.71	AVG	
6	0.2940	36.21	0.13	36.34	50.41	-14.07	AVG	
7	0.3060	35.10	0.13	35.23	50.08	-14.85	AVG	
8	0.3180	43.31	0.13	43.44	59.76	-16.32	QP	
9	0.3300	42.69	0.12	42.81	59.45	-16.64	QP	
10	0.4580	37.56	0.13	37.69	56.73	-19.04	QP	
11	12.3420	33.25	0.14	33.39	50.00	-16.61	AVG	
12	12.4379	39.79	0.14	39.93	60.00	-20.07	QP	

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

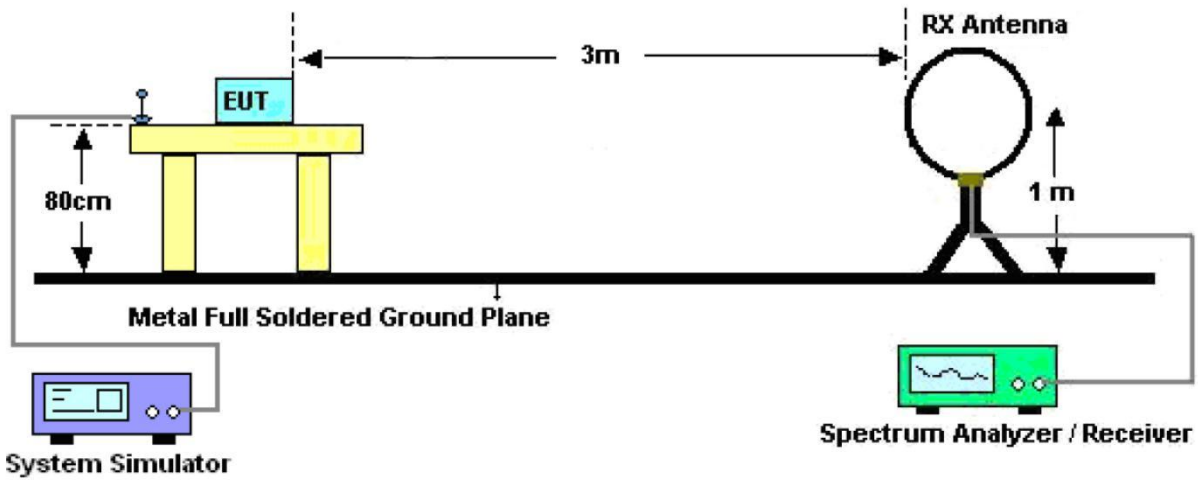


Figure 1. Below 30MHz

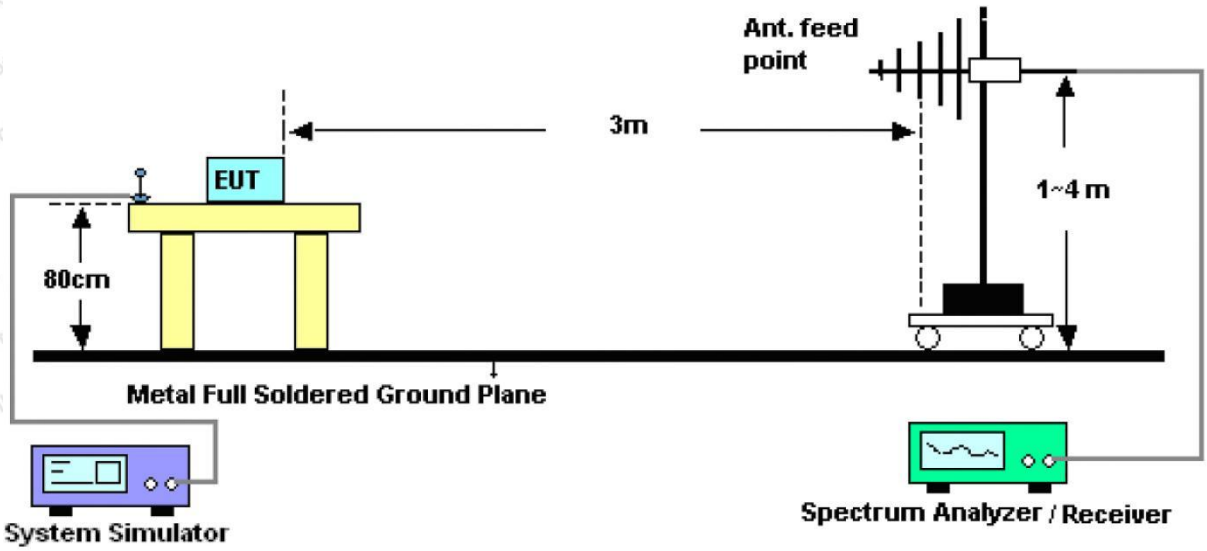


Figure 2. 30MHz to 1GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
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 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

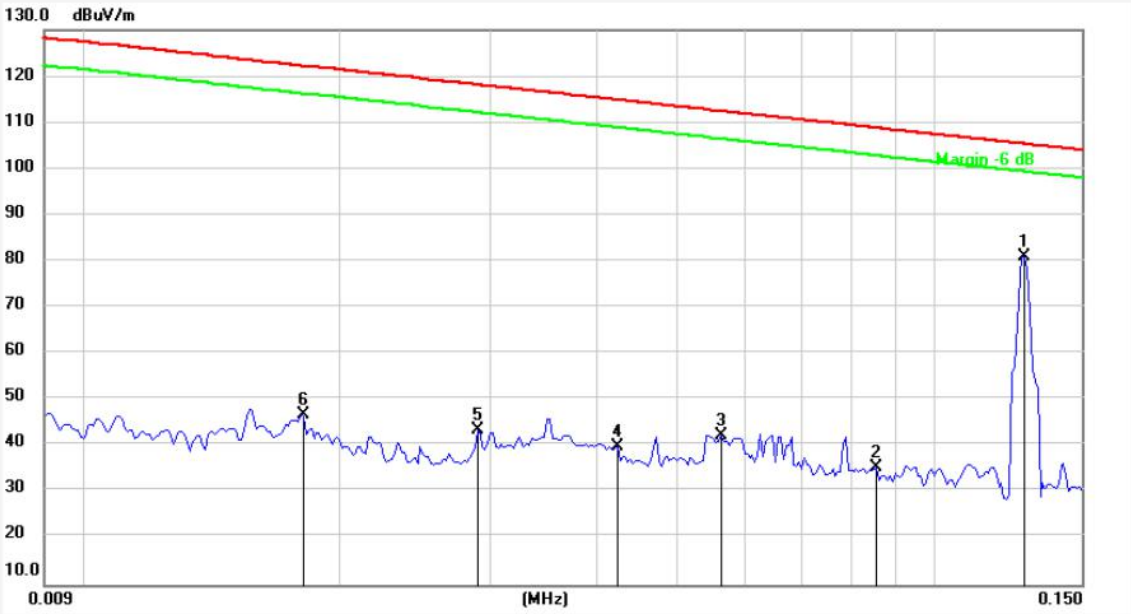
PASS

Note: The data is in TX mode, and this is the worst mode.

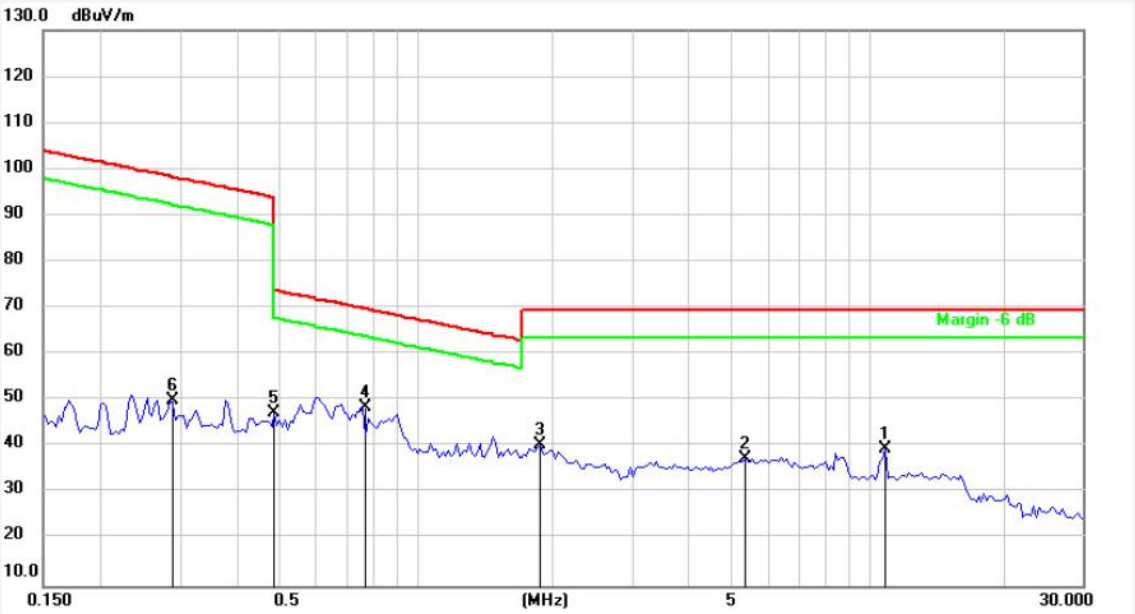
Test Results

(Between 9KHz – 30MHz)

Standard:	**FCC PART15 C _3m**	**Power Source:**	**DC 3.8V battery inside**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**22.7℃/49%RH**
Test Mode:	**Mode 1**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.1285	60.75	20.34	81.09	105.35	-24.26	AV			
2	0.0859	14.92	20.38	35.30	108.83	-73.53	AV			
3	0.0563	21.96	20.36	42.32	112.48	-70.16	AV			
4	0.0425	19.42	20.44	39.86	114.91	-75.05	AV			
5	0.0291	23.15	20.43	43.58	118.18	-74.60	AV			
6	0.0181	26.60	20.20	46.80	122.27	-75.47	AV			

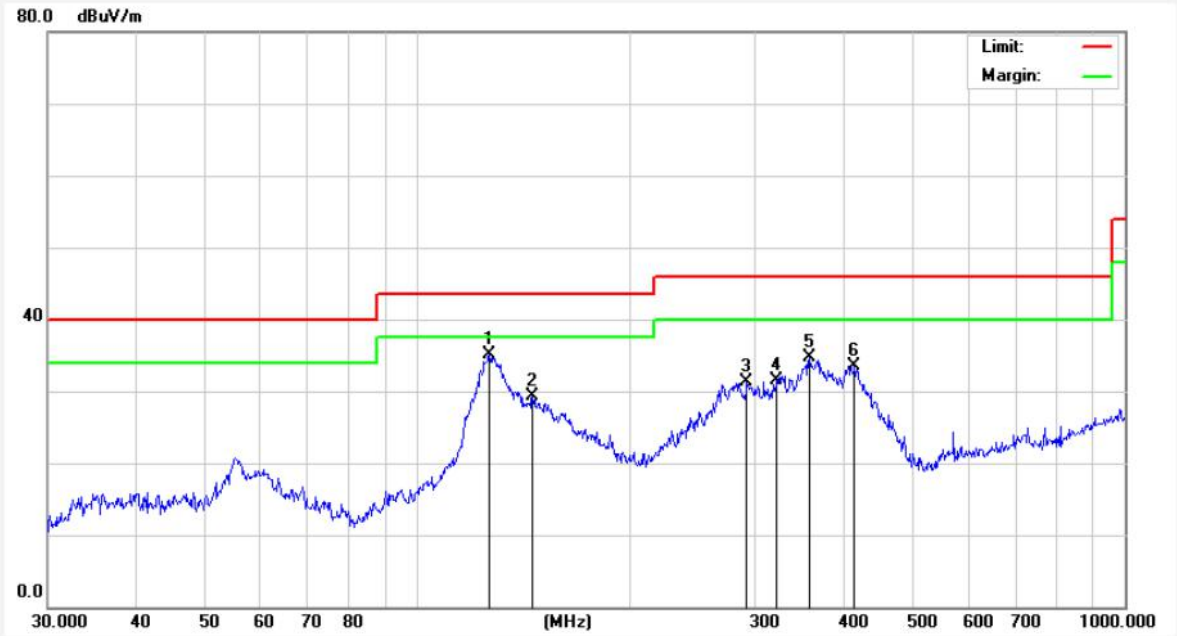


No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	10.9626	19.10	20.52	39.62	69.50	-29.88	QP			
2	5.3615	17.11	20.39	37.50	69.50	-32.00	QP			
3	1.8829	20.11	20.28	40.39	69.50	-29.11	QP			
4	0.7650	28.18	20.25	48.43	69.94	-21.51	QP			
5	0.4873	27.08	20.27	47.35	93.85	-46.50	AV			
6	0.2871	29.67	20.30	49.97	98.41	-48.44	AV			

Remark: According to FCC PART 15.209 (d), the emission limits for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, Radiated emission limits in these three bands are based on measurements employing an average detector.

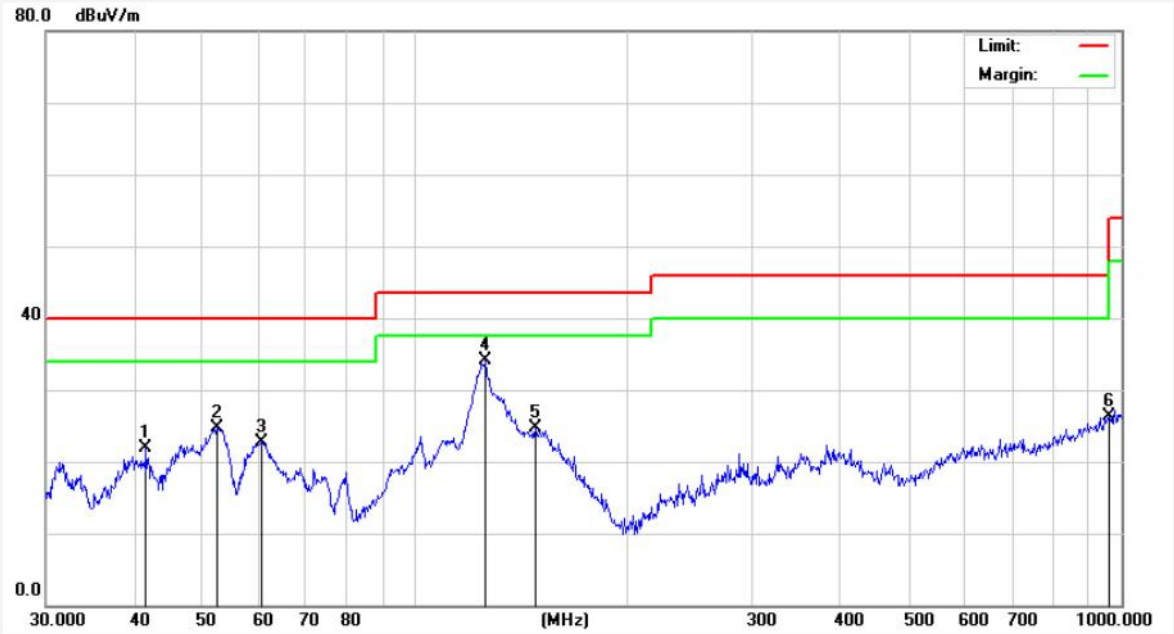
(Between 30MHz –1000 MHz)

Standard:	**FCC PART15 C _3m**	**Polarization:**	**Horizontal**
Test item:	**Radiation Test**	**Power Source:**	**DC 3.8V battery inside**
Test Mode:	**Mode 1**	**Temp.(C)/Hum.(%RH):**	**21.5℃/49%RH**
Distance:	**3m**		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	126.3286	58.18	-23.04	35.14	43.50	-8.36	QP			
2	145.3506	52.33	-22.95	29.38	43.50	-14.12	QP			
3	292.0583	49.23	-17.85	31.38	46.00	-14.62	QP			
4	322.1886	48.09	-16.64	31.45	46.00	-14.55	QP			
5	357.9287	50.63	-16.02	34.61	46.00	-11.39	QP			
6	414.7223	49.50	-15.95	33.55	46.00	-12.45	QP			

Standard:	**FCC PART15 C _3m**	**Polarization:**	**Vertical**
Test item:	**Radiation Test**	**Power Source:**	**DC 3.8V battery inside**
Test Mode:	**Mode 1**	**Temp.(C)/Hum.(%RH):**	**21.5℃/49%RH**
Distance:	**3m**		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	41.5670	36.57	-14.72	21.85	40.00	-18.15	QP			
2	52.3912	41.45	-16.66	24.79	40.00	-15.21	QP			
3	60.4919	40.32	-17.67	22.65	40.00	-17.35	QP			
4	125.8864	54.89	-20.84	34.05	43.50	-9.45	QP			
5	147.9214	46.71	-22.10	24.61	43.50	-18.89	QP			
6	962.1623	31.65	-5.44	26.21	54.00	-27.79	QP			

5. Antenna Requirement

5.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

5.2. Antenna Connected Construction

The antenna is a Inductive loop coil Antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com
Hotline 400-003-0500
www.anbotek.com

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement

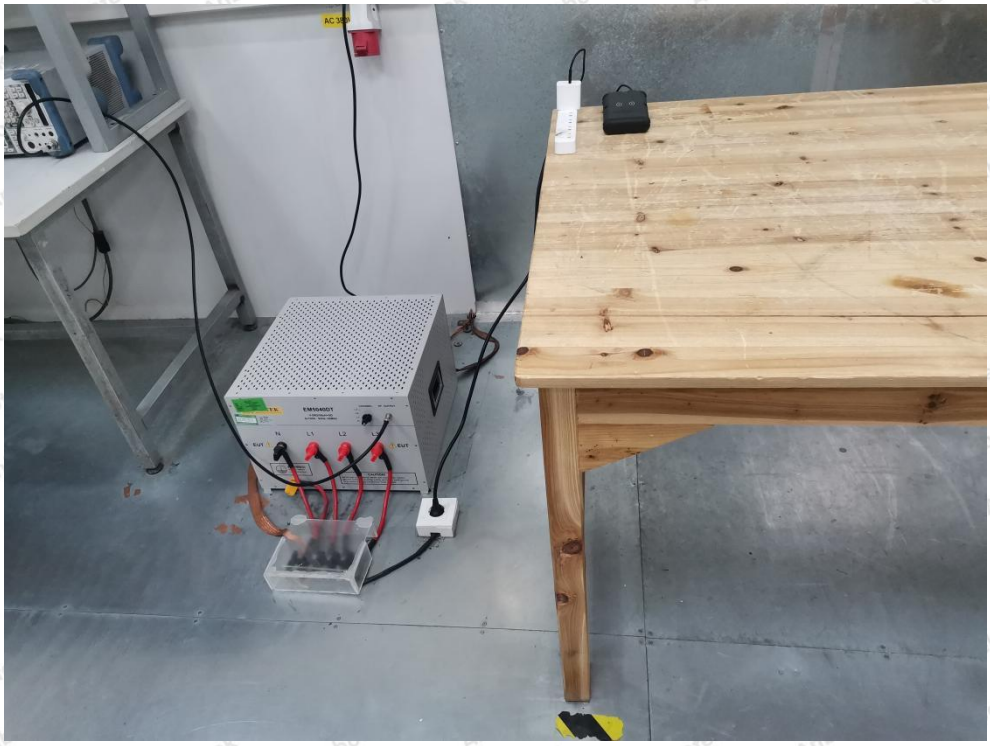


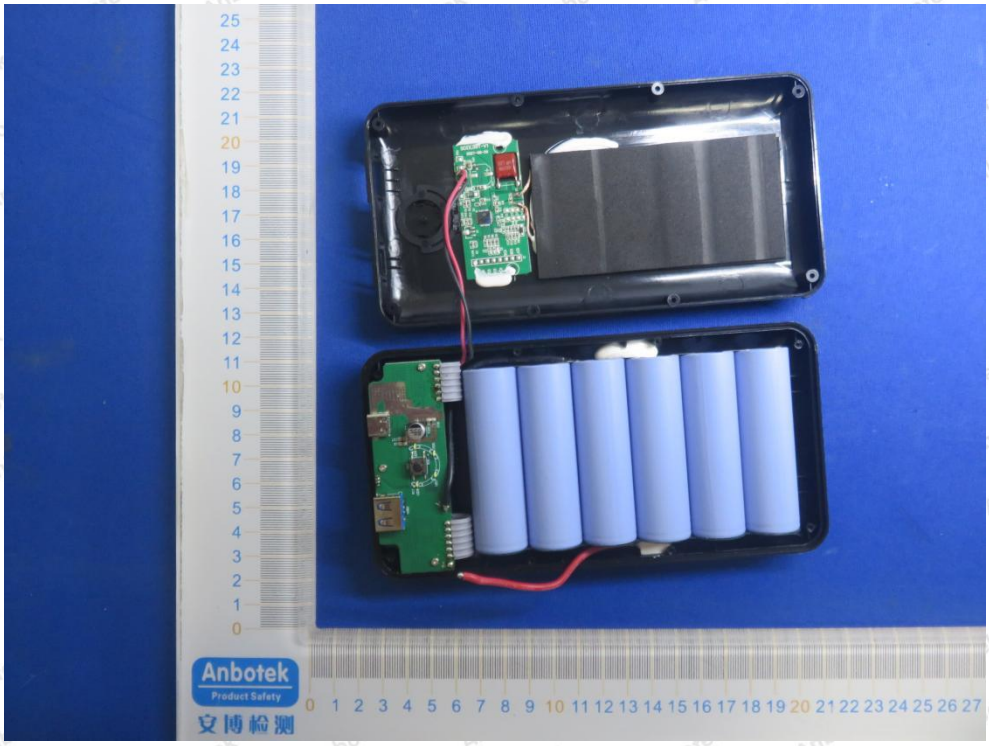
Photo of Radiation Emission Test

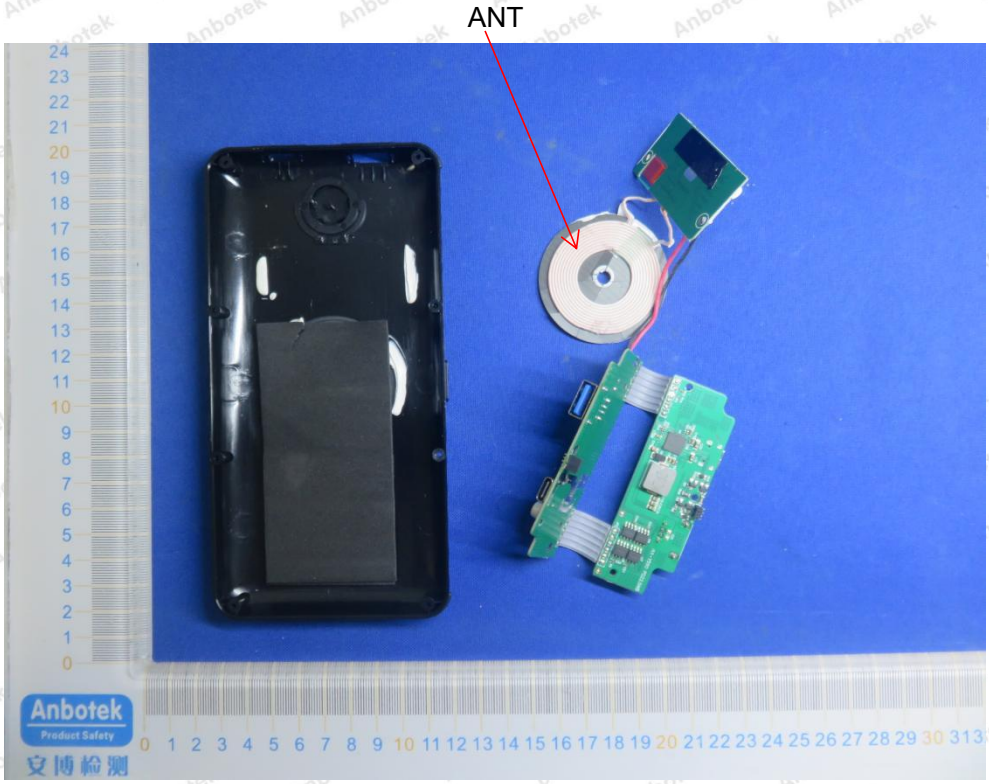
APPENDIX II -- EXTERNAL PHOTOGRAPH

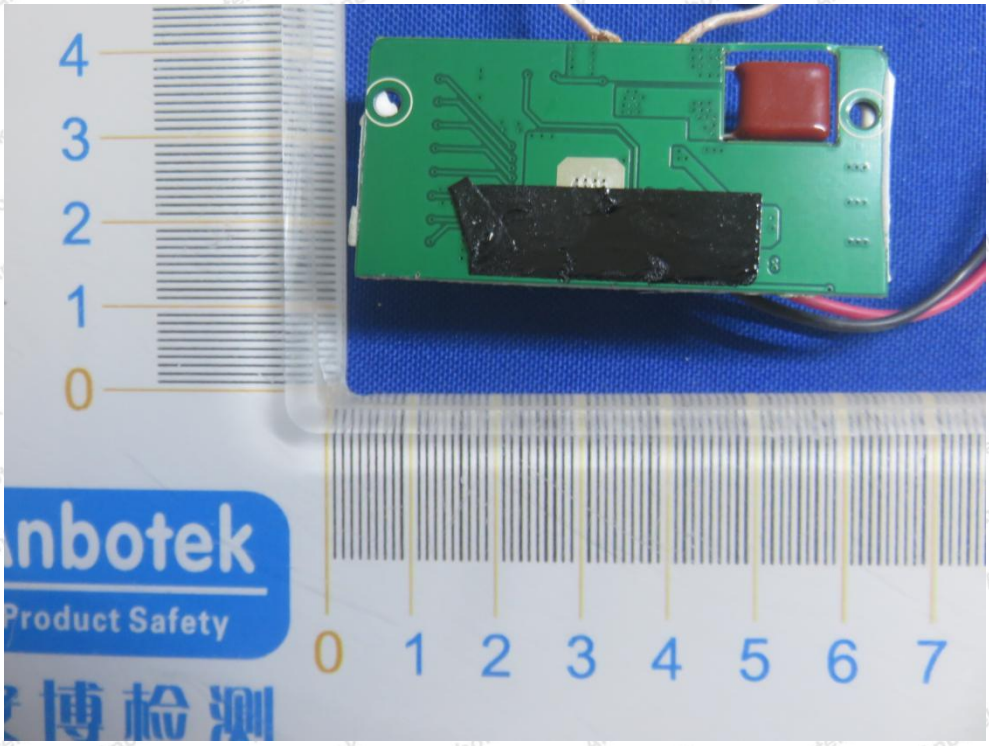
ZEROLEMON

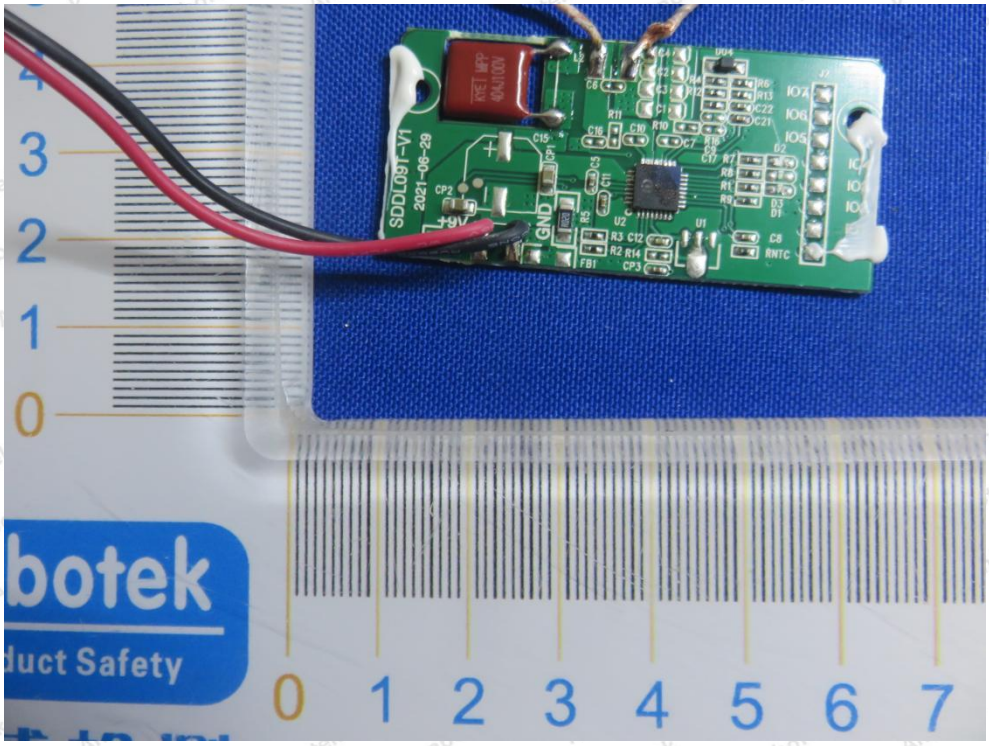
PD 22.5W
QC 3.0

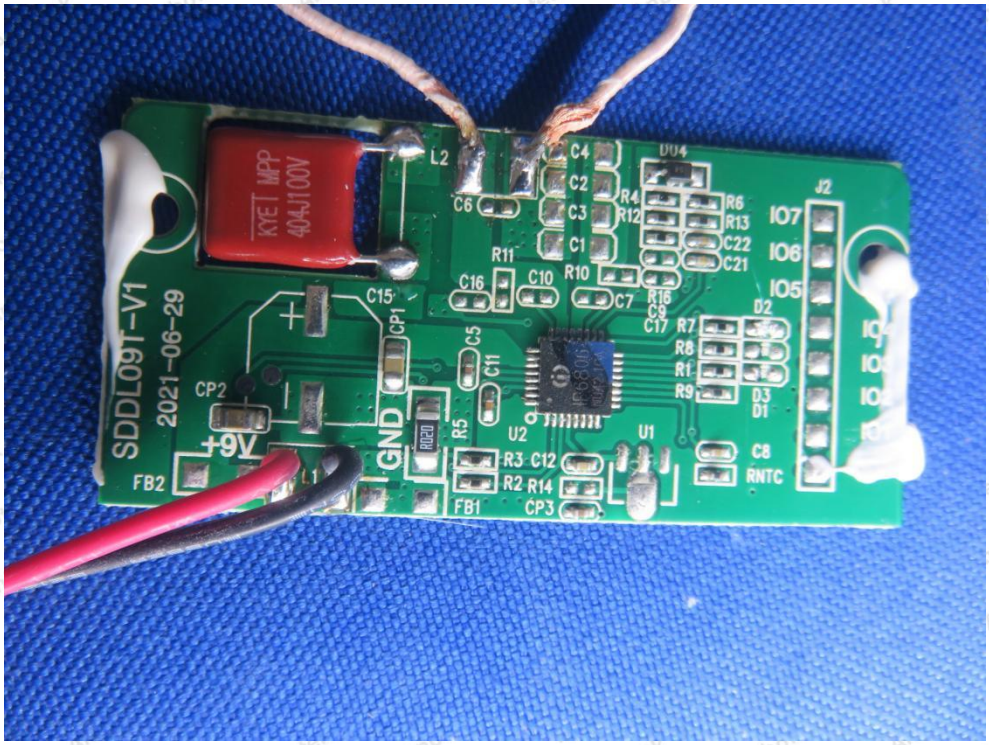
APPENDIX III -- INTERNAL PHOTOGRAPH







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SDDL09T-V1
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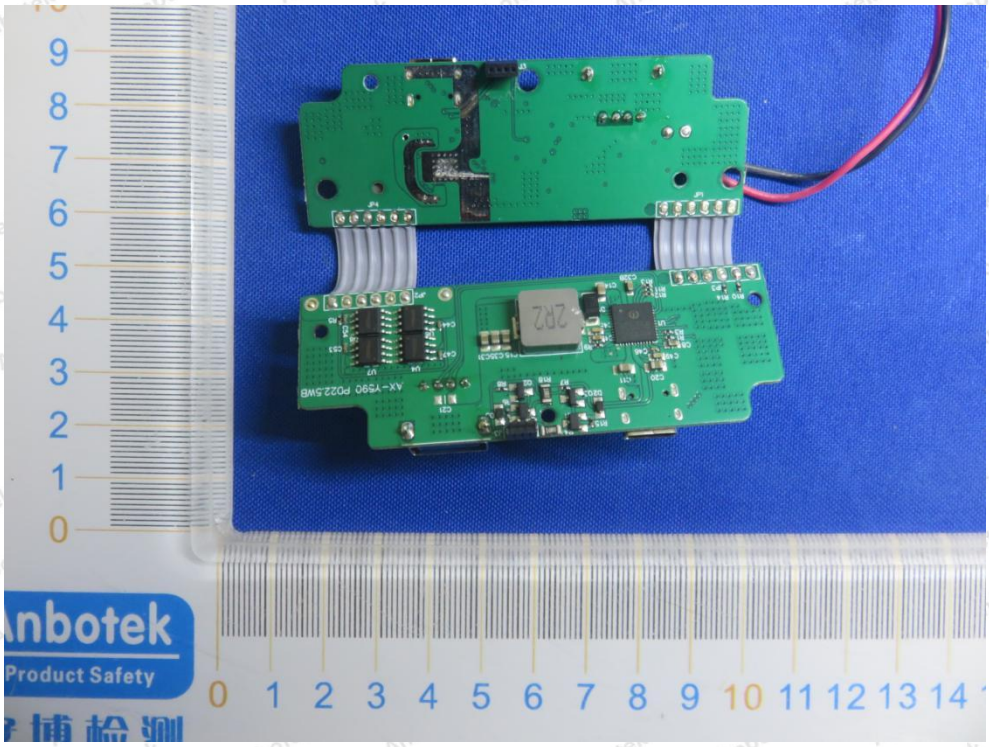
FB2
L1
L2
CP1
CP2
CP3
C15
C16
C10
C7
C5
C11
R5
R11
R10
R16
C9
C17
R7
R8
R1
R9
D2
D3
D1
U1
U2
R3
C12
R2
R14
FB1
C8
RNTC
J2
IO7
IO6
IO5
C4
C2
C3
C1
C6
R4
R12
R6
R13
C22
C21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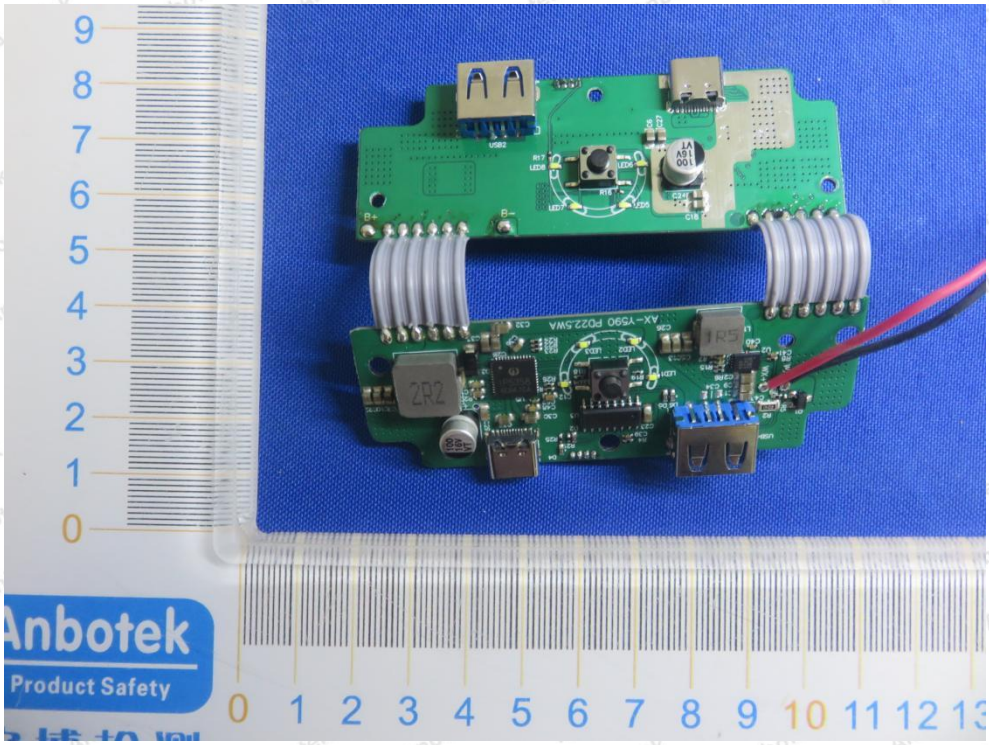
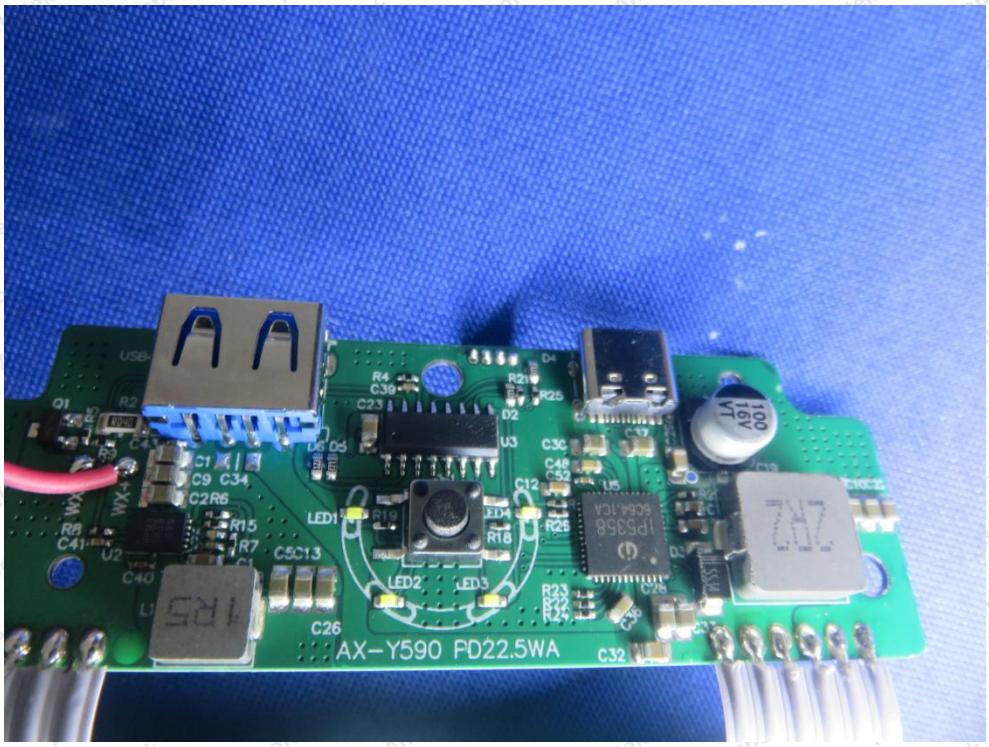
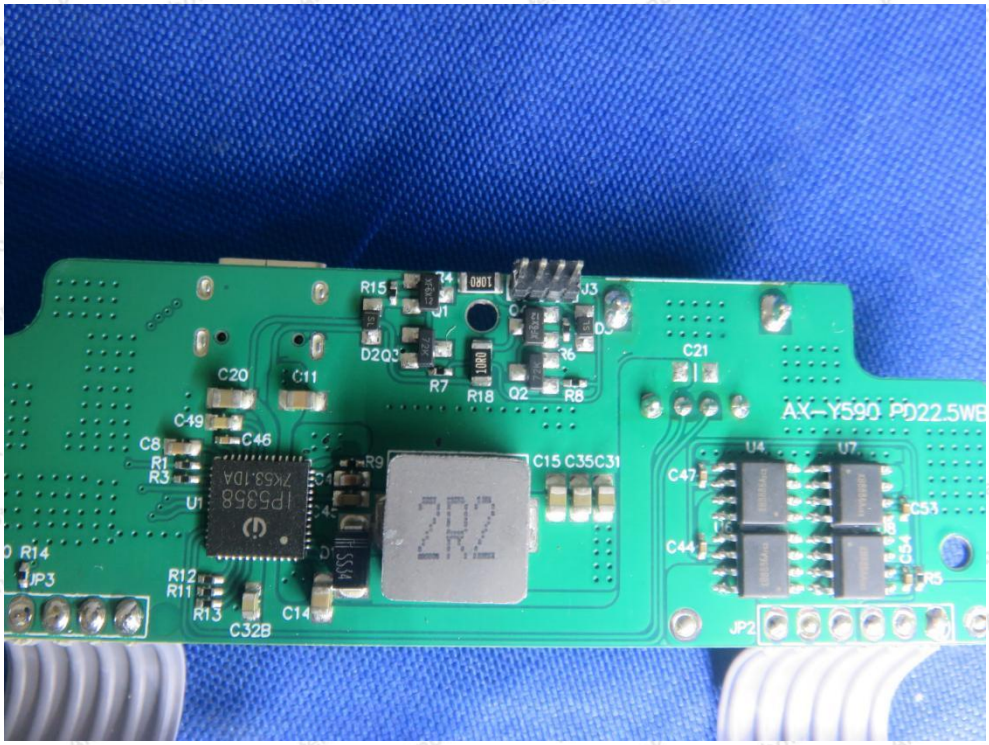
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
Product Safety




AX-Y590 PD22.5WA



---------- End of Report ----------