FCC Test Report

Client Name	:	Zoleo Incorporated
Address	:	7A Taymall Avenue, Toronto M8Z 3Y8 Canada
Product Name	:	Car charger
Date	:	Dec. 03, 2019

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	Zoleo Incorporated
Manufacturer	:	Fab-Chain Service Co.,Ltd.
Product Name	:	Car charger
Model No.	:	36W-PD, BCVCP36, SPSVCP36, ZLVCP36, IRVCP36
Trade Mark	:	BEAM SatPhone Shop ZOLEO iridium
Rating(s)	:	Input: 12V-24V⎓ 4A Max Output: USB: 5V⎓ 3A, 9V⎓ 2A, 12V⎓ 1.5A Type-C: 5V⎓ 3A, 9V⎓ 2A, 12V⎓ 1.5A Total output: 36W MAX

Test Standard(s) : FCC Rules and Regulations Part 15 Subpart B: 2018

Test Method(s) : ANSI C63.4-2014

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these measurements.

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

Date of Receipt Oct. 30, 2019

Date of Test Oct. 30~Nov. 19, 2019

Prepared By

(Engineer / Dolly Mo)

Reviewer

(Supervisor / Bibo Zhang)

Approved & Authorized Signer

(Manager / Sally Zhang)

1. General Information

1.1. Client Information

Applicant	:	Zoleo Incorporated
Address	:	7A Taymall Avenue, Toronto M8Z 3Y8 Canada
Manufacturer	:	Fab-Chain Service Co.,Ltd.
Address	:	5th Floor, Building A, and 4th Floor, Building B, ChuangJian industrial Park, ShiYan Yingrenshi, BaoAn District, Shenzhen, China
Factory	:	Fab-Chain Service Co.,Ltd.
Address	:	5th Floor, Building A, and 4th Floor, Building B, ChuangJian industrial Park, ShiYan Yingrenshi, BaoAn District, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	Car charger	
Model No.	:	36W-PD, BCVCP36, SPSVCP36, ZLVCP36, IRVCP36 (Note: All samples are the same except the model name, so we prepare "36W-PD" for test only.)	
Trade Mark	:	BEAM SatPhone Shop zoleo iridium	
Test Power Supply	:	DC 12V / DC 24V	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Adapter:	N/A
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

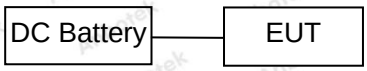
1.3. Auxiliary Equipment Used During Test

N/A		

1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	NO Mode

Mode 1 Block Diagram of Test Setup



1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (150KHz To 30MHz)	/	N
Radiated Emission Test (30MHz To 1000MHz) & (Above 1 GHz)	Mode 1	P
P) Indicates “PASS”. N) Indicates “Not applicable”.		

1.6. Test Equipment List

Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Nov. 04, 2019	1 Year
2.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 01, 2019	1 Year
3.	Pre-amplifier	SONOMA	310N	186860	Nov. 04, 2019	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A
5.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Nov. 04, 2019	1 Year
6.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 01, 2019	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 registed 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, September 27, 2019.

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, March 07, 2019.

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. Radiated Emission Test

2.1. Test Standard and Limit

Test Standard	FCC Part 15 B Subpart 15.109

Radiated Emission Test Limit (Subpart B Class B)

	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
Test Limit	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.

2.2. Test Setup

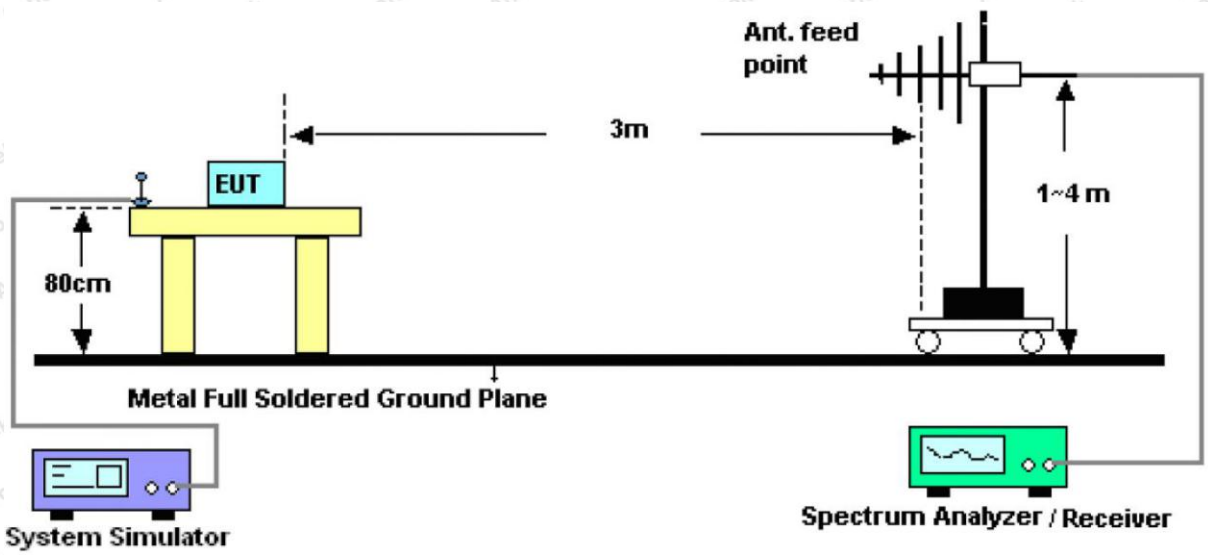


Figure 1. 30MHz to 1GHz

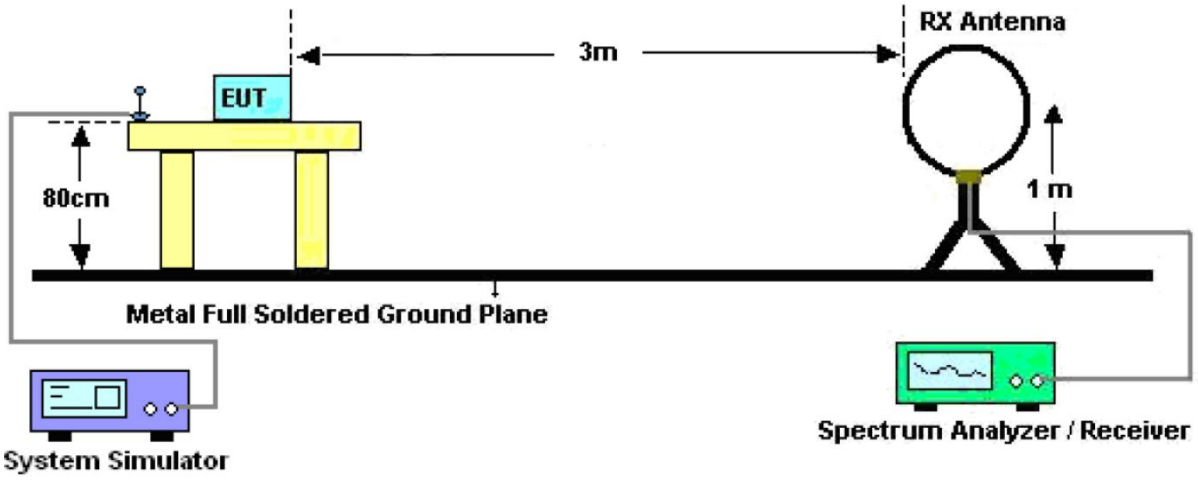


Figure 2. Below 30MHz

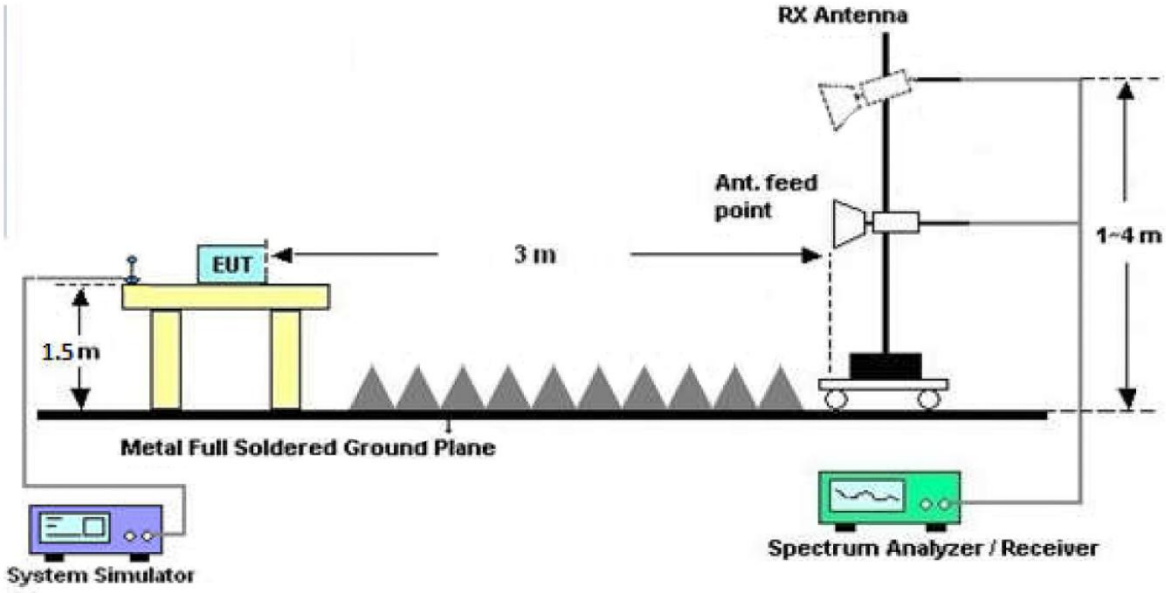


Figure 3. Above 1 GHz

2.3. EUT Configuration on Measurement

The following equipments are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

2.4. Operating Condition of EUT

2.4.1. Setup the EUT as shown in Section 2.2.

2.4.2. Turn on the power of all equipments.

2.4.3. Let the EUT work in test mode and measure it.

2.5. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m 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 the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed

at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

The bandwidth of the EMI test receiver (ESCI) is set at 120kHz.

The frequency range from 30MHz to 1000MHz is checked.

For above 1GHz,Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

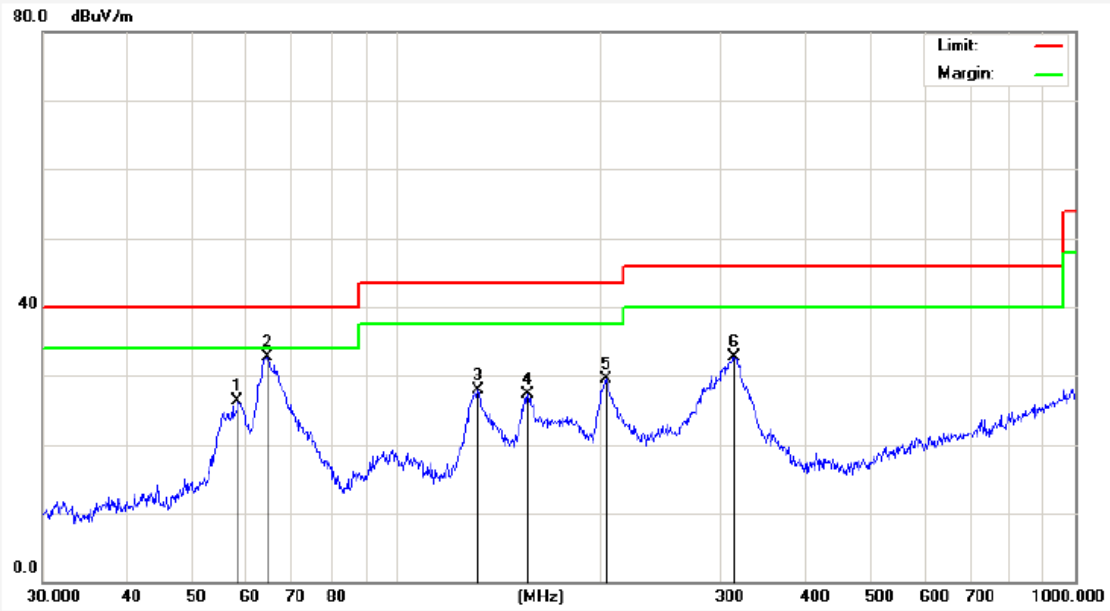
The test results are listed in Section 2.6.

2.6. Test Results

PASS

The test curves are shown in the following pages.

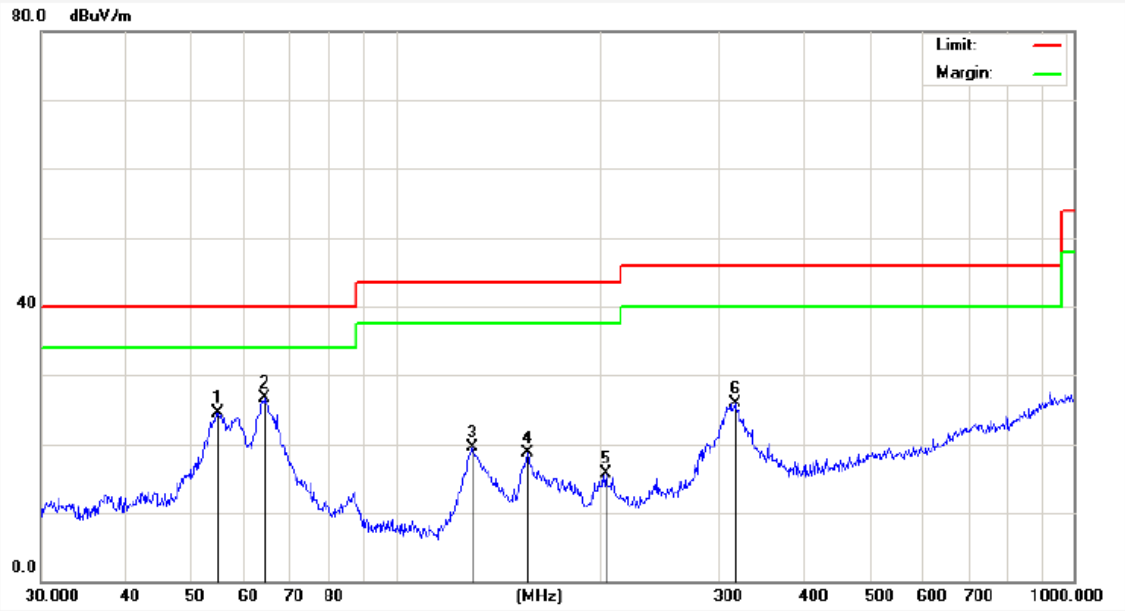
Test item:	**Radiation Test**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC Part 15 Subpart B**	**Power Source:**	**DC 12V**
Distance:	**3m**	**Temp.(℃)/Hum.(%RH):**	**21.2℃/49%RH**



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	58.2030	44.66	-18.35	26.31	40.00	-13.69	peak			
2	64.4331	52.78	-20.17	32.61	40.00	-7.39	peak			
3	131.7577	53.25	-25.29	27.96	43.50	-15.54	peak			
4	155.9101	51.85	-24.60	27.25	43.50	-16.25	peak			
5	203.5228	51.67	-22.09	29.58	43.50	-13.92	peak			
6	314.3765	50.69	-18.01	32.68	46.00	-13.32	peak			

Note: **Result=Reading+Factor Over Limit=Result-Limit**

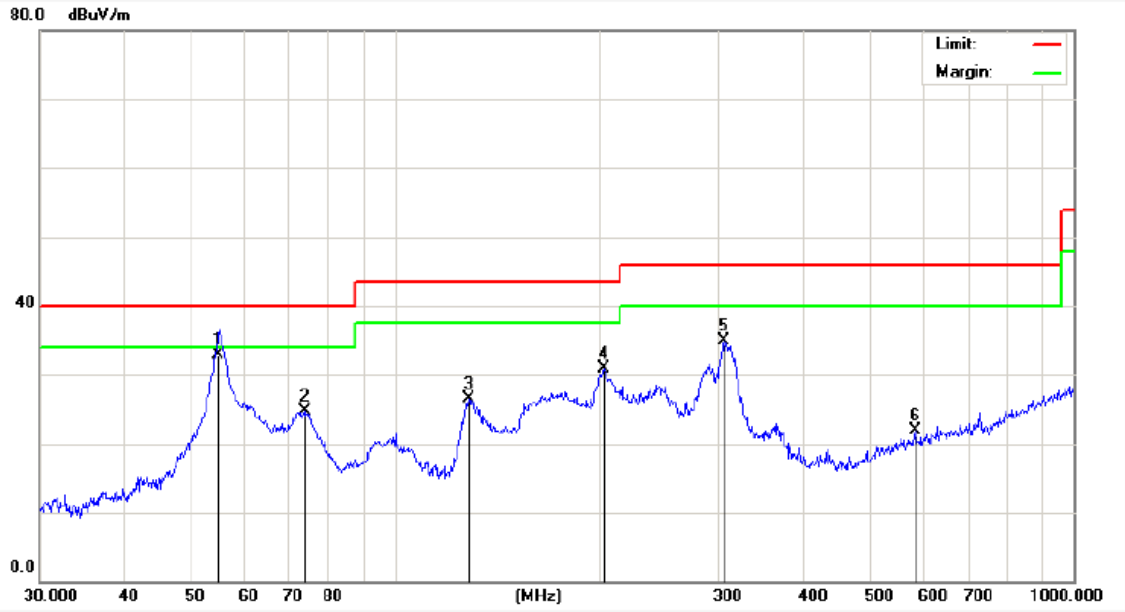
Test item:	**Radiation Test**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC Part 15 Subpart B**	**Power Source:**	**DC 12V**
Distance:	**3m**	**Temp.(℃)/Hum.(%RH):**	**21.2℃/49%RH**



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	54.6429	41.69	-17.20	24.49	40.00	-15.51	peak			
2	63.9828	45.71	-19.00	26.71	40.00	-13.29	peak			
3	129.9226	39.85	-20.44	19.41	43.50	-24.09	peak			
4	156.4578	39.23	-20.58	18.65	43.50	-24.85	peak			
5	204.2377	33.58	-17.89	15.69	43.50	-27.81	peak			
6	316.5890	42.24	-16.41	25.83	46.00	-20.17	peak			

Note: **Result=Reading+Factor** **Over Limit=Result-Limit**

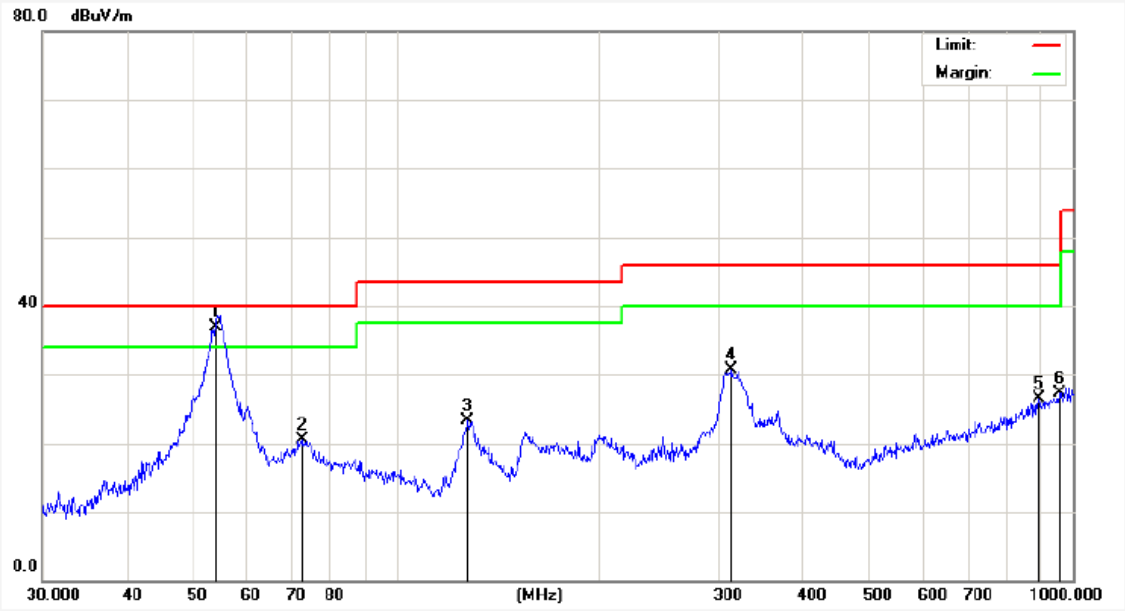
Test item:	**Radiation Test**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC Part 15 Subpart B**	**Power Source:**	**DC 24V**
Distance:	**3m**	**Temp.(℃)/Hum.(%RH):**	**21.2℃/49%RH**



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	54.6717	51.04	-18.21	32.83	40.00	-7.17	QP	100	55	
2	73.6170	47.62	-22.99	24.63	40.00	-15.37	peak			
3	128.5630	51.76	-25.30	26.46	43.50	-17.04	peak			
4	203.5228	52.91	-22.09	30.82	43.50	-12.68	peak			
5	305.6800	53.84	-19.03	34.81	46.00	-11.19	peak			
6	584.7895	34.77	-12.89	21.88	46.00	-24.12	peak			

Note: **Result=Reading+Factor** **Over Limit=Result-Limit**

Test item:	**Radiation Test**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC Part 15 Subpart B**	**Power Source:**	**DC 24V**
Distance:	**3m**	**Temp.(℃)/Hum.(%RH):**	**21.2℃/49%RH**



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	54.0658	54.18	-17.19	36.99	40.00	-3.01	QP	100	0	
2	72.8466	42.43	-21.87	20.56	40.00	-19.44	peak			
3	127.6645	43.45	-20.11	23.34	43.50	-20.16	peak			
4	313.2760	47.24	-16.47	30.77	46.00	-15.23	peak			
5	890.7278	32.12	-5.59	26.53	46.00	-19.47	peak			
6	955.4381	31.63	-4.41	27.22	46.00	-18.78	peak			

Note: **Result=Reading+Factor Over Limit=Result-Limit**

Test Results (1GHz~6GHz)

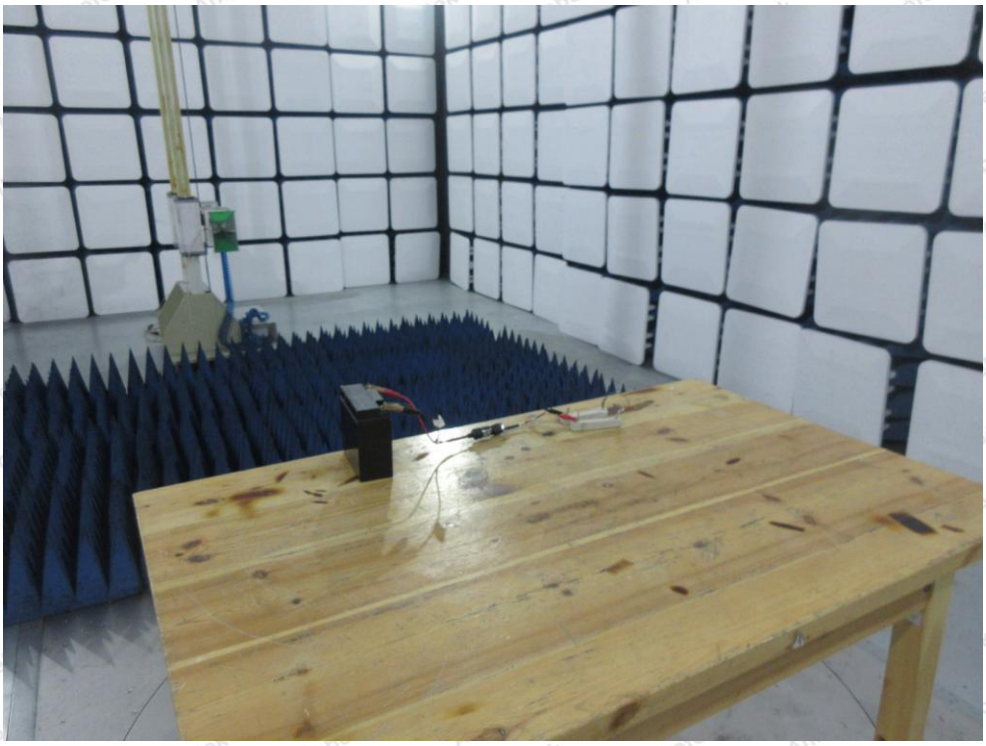
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
1547.41	54.09	-2.93	51.16	74.00	-22.84	H	PEAK
1856.69	45.01	-2.71	42.30	74.00	-31.70	H	PEAK
2014.65	53.31	-4.55	48.76	74.00	-25.24	H	PEAK
3948.83	52.46	-5.29	47.16	74.00	-26.84	H	PEAK
4494.15	49.26	-5.36	43.90	74.00	-30.10	H	PEAK
5134.64	50.51	-5.27	45.24	74.00	-28.76	H	PEAK
1547.41	38.28	-2.93	35.35	54.00	-18.65	H	AVG
1856.69	44.71	-2.71	42.01	54.00	-11.99	H	AVG
2014.65	40.39	-4.55	35.84	54.00	-18.16	H	AVG
3948.83	41.32	-5.29	36.03	54.00	-17.97	H	AVG
4494.15	43.29	-5.36	37.94	54.00	-16.06	H	AVG
5134.64	37.48	-5.27	32.21	54.00	-21.79	H	AVG
1312.38	50.40	-2.64	47.76	74.00	-26.24	V	PEAK
2184.93	49.31	-2.88	46.43	74.00	-27.57	V	PEAK
1902.49	48.19	-4.26	43.93	74.00	-30.07	V	PEAK
4126.38	50.54	-4.62	45.92	74.00	-28.08	V	PEAK
4438.76	55.41	-4.97	50.44	74.00	-23.56	V	PEAK
4856.45	52.74	-5.88	46.86	74.00	-27.14	V	PEAK
1312.38	39.54	-2.64	36.90	54.00	-17.10	V	AVG
2184.93	44.16	-2.88	41.27	54.00	-12.73	V	AVG
1902.49	38.24	-4.26	33.99	54.00	-20.01	V	AVG
4126.38	43.48	-4.62	38.86	54.00	-15.14	V	AVG
4438.76	38.06	-4.97	33.09	54.00	-20.91	V	AVG
4856.45	41.97	-5.88	36.09	54.00	-17.91	V	AVG

Remark:

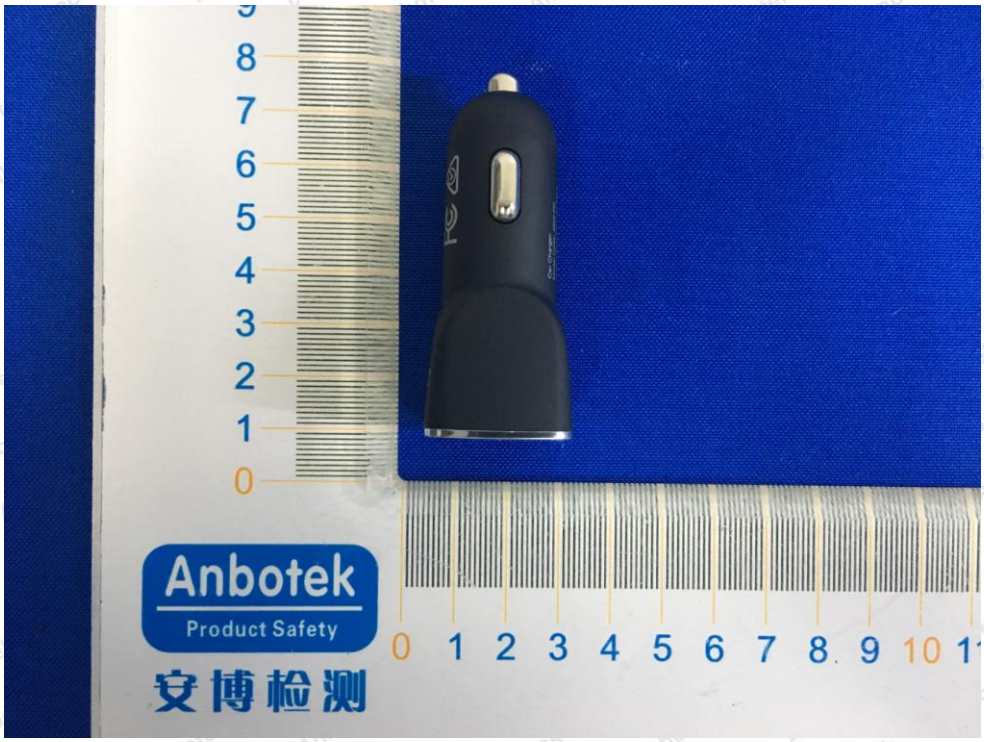
1. Level =Receiver Read level + Antenna Factor

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Radiation Emission Test



APPENDIX II -- EXTERNAL PHOTOGRAPH

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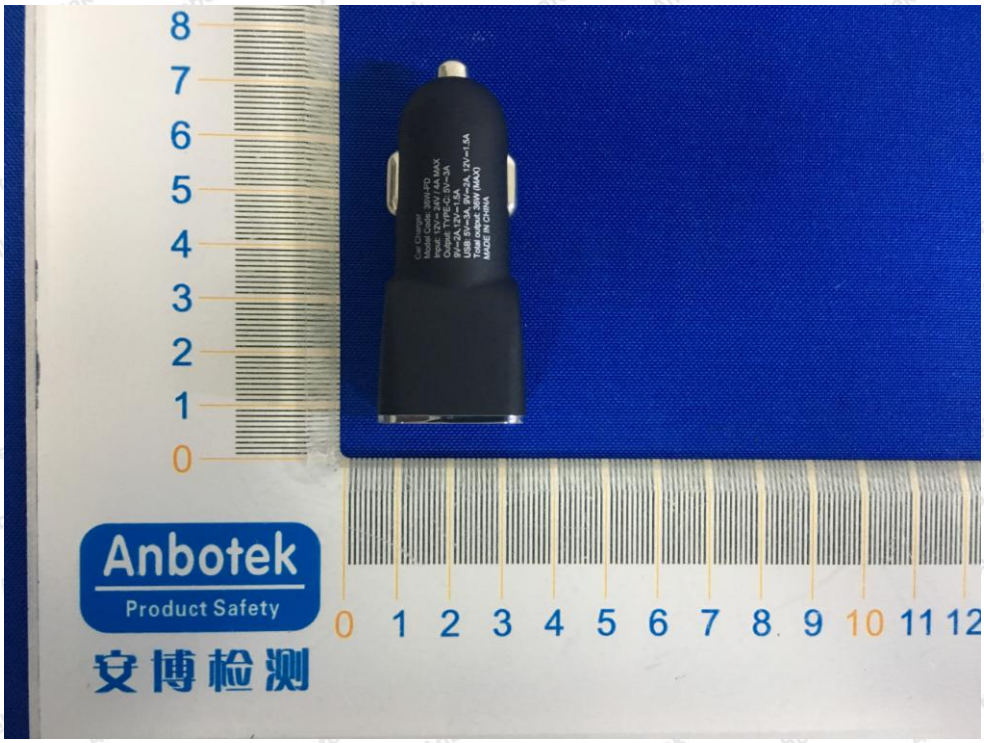
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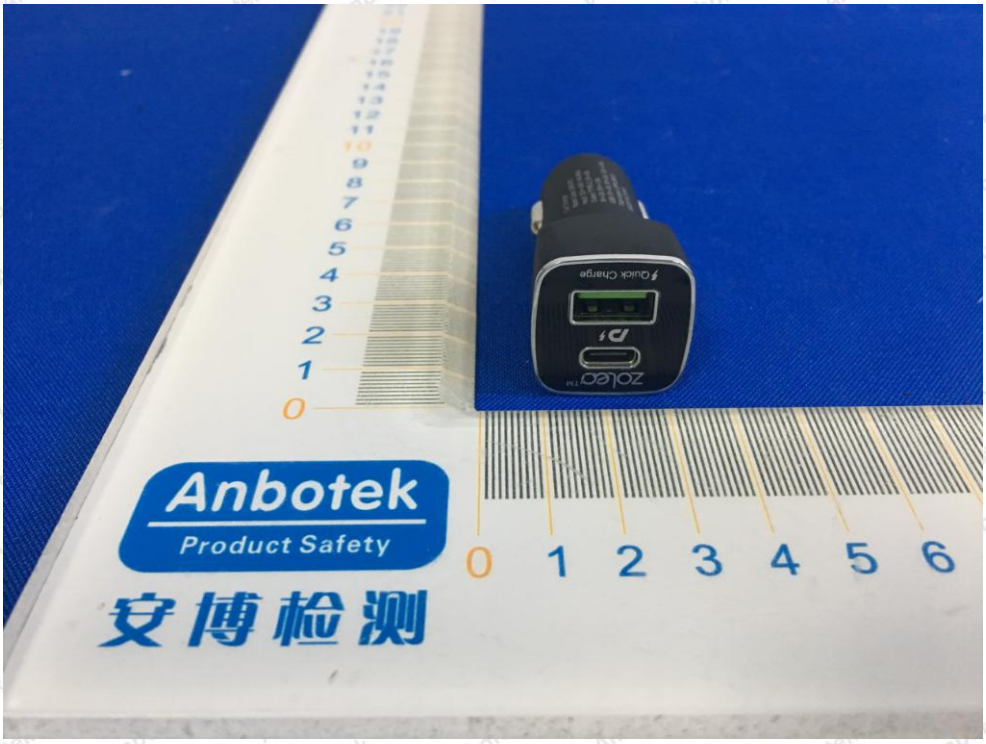
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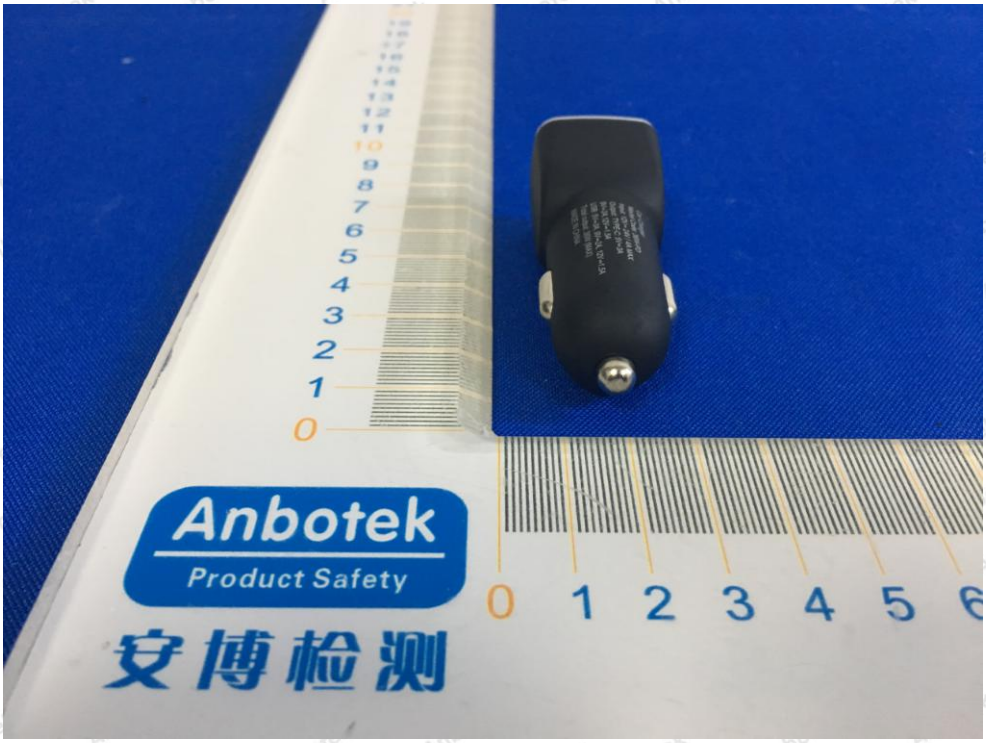
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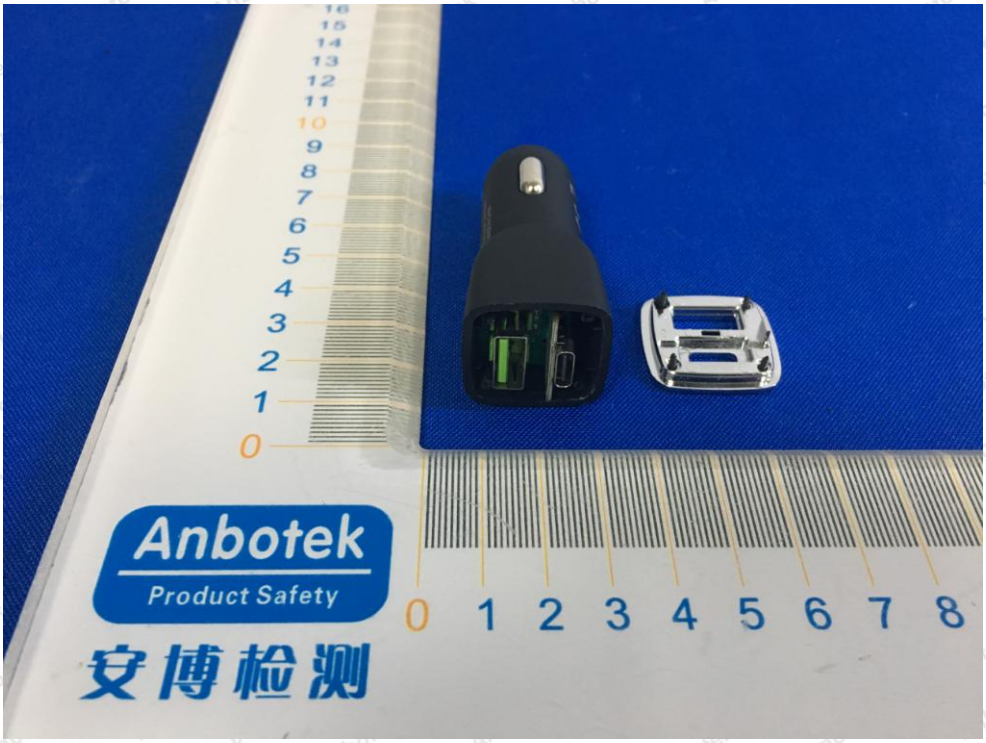
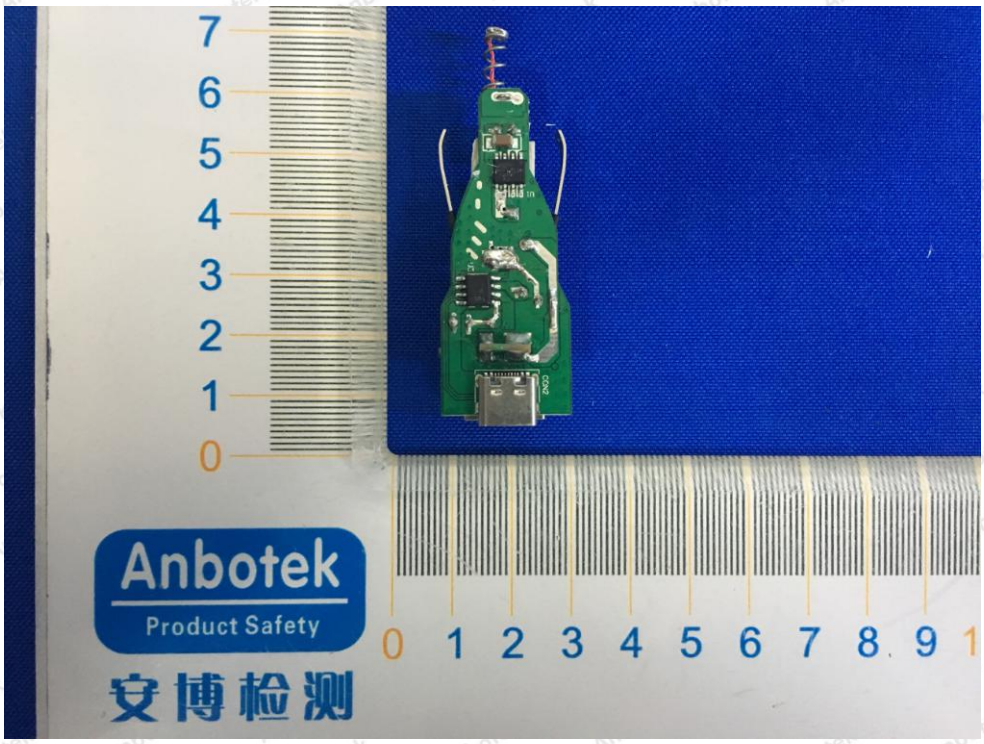
APPENDIX III -- INTERNAL PHOTOGRAPH

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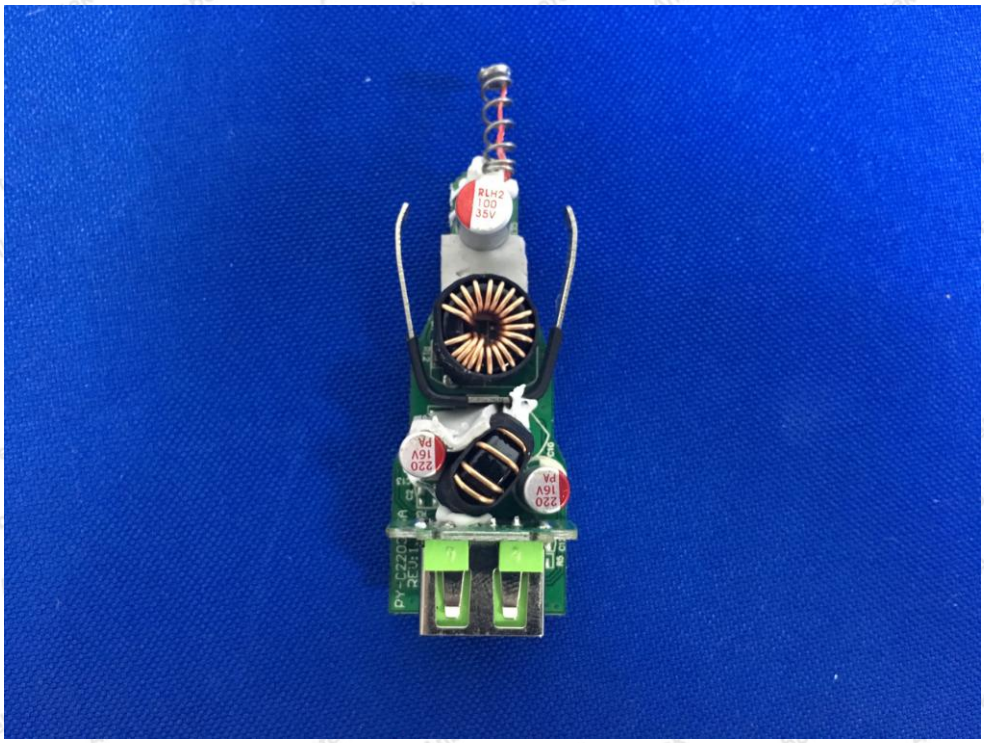

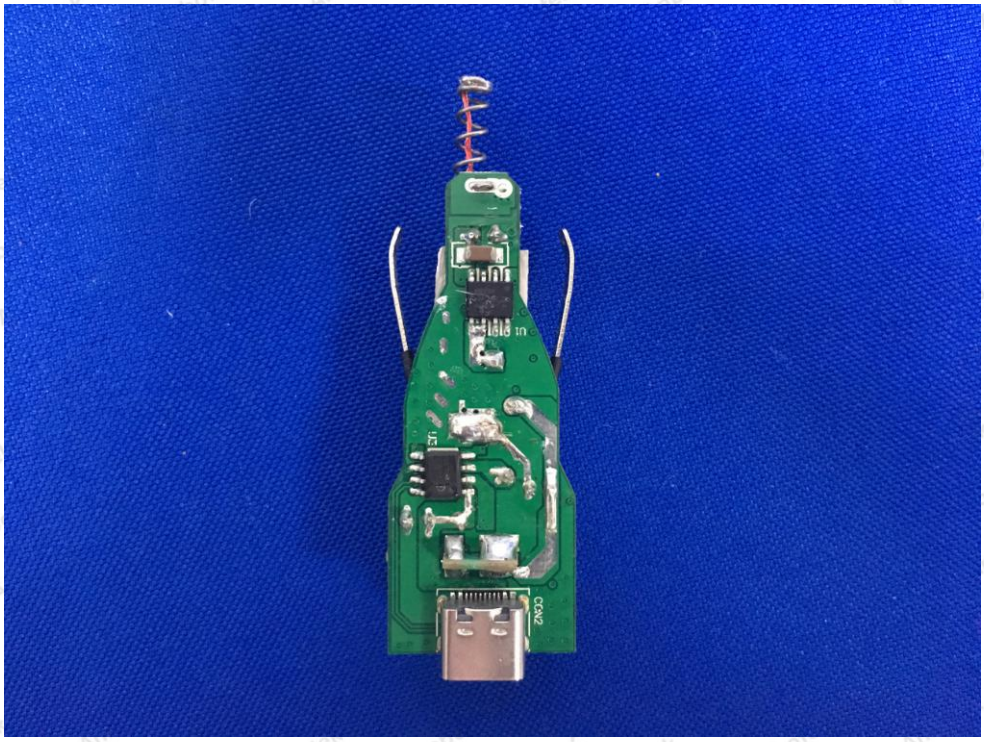

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