



RF Test Report

For

Applicant Name:

GOLDEN WATER HK LIMITED

Address:

Unit G 1F Mau Lam Commerical Centre, 16-18 Mau Lam Street, Jordan, Kowloon, Hong Kong

EUT Name:

Mobiletronix Wireless FM Transmitter - Car Charger

Brand Name:

N/A

Model Number:

192-54055

Series Model Number:

Refer to section 2

Issued By

Company Name:

BTF Testing Lab (Shenzhen) Co., Ltd.

Address:

F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

Report Number:

BTF240223R00102

Test Standards:

47 CFR Part 15 Subpart C Section 15.239

FCC ID:

2BE3Y-192-54055

Test Conclusion:

Pass

Test Date:

2024-02-28 to 2024-03-15

Date of Issue:

2024-03-15

Prepared By:

Gavin Cui

Gavin Cui / Project Engineer

2024-03-15



Ryan.CJ / EMC Manager

Date:

Approved By:

Date:

2024-03-15

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd. All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.



Revision History		
Version	Issue Date	Revisions Content
R_V0	2024-03-15	Original
<i>Note:</i>	<i>Once the revision has been made, then previous versions reports are invalid.</i>	

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1. Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Laboratory Condition

Ambient Temperature:	20°C to 25°C
Ambient Relative Humidity:	45% to 55%
Ambient Pressure:	100 kPa to 102 kPa

1.4 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Product Information

2.1 Application Information

Company Name:	GOLDEN WATER HK LIMITED
Address:	Unit G 1F Mau Lam Commerical Centre, 16-18 Mau Lam Street, Jordan, Kowloon, Hong Kong

2.2 Manufacturer Information

Company Name:	GOLDEN WATER HK LIMITED
Address:	Unit G 1F Mau Lam Commerical Centre, 16-18 Mau Lam Street, Jordan, Kowloon, Hong Kong

2.3 Factory Information

Company Name:	GOLDEN WATER HK LIMITED
Address:	Unit G 1F Mau Lam Commerical Centre, 16-18 Mau Lam Street, Jordan, Kowloon, Hong Kong

2.4 General Description of Equipment under Test (EUT)

EUT Name	Mobiletronix Wireless FM Transmitter - Car Charger
Under Test Model Name	192-54055
Hardware Version	N/A

2.5 Technical Information

Modulation Type	FM
Product Type	Low Power Communication Device Transmitter
Frequency Range	The frequency range used is 88.1 MHz – 107.9 MHz; The frequency block is 88 MHz to 108 MHz.
Number of Channel	199 (at intervals of 100 KHz)
Tested Channel	01 (88.1 MHz), 101 (98.1 MHz), 199 (107.9 MHz)
Antenna Type	Internal Antenna
Antenna Gain [#]	0 dBi

Note:

#: The antenna gain provided by the applicant, and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.

All channel was listed on the following table:

Channel	Frequency (MHz)
01	88.1
02	88.2
:	:
100	98.0
101	98.1
102	98.2
:	:
198	107.8
199	107.9

3. Summary of Test Results

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C Section 15.239	Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Summary of Test Result

No.	Description	IC Part No.	Test Result	Verdict
1	Antenna Requirement	Part 15.203	Section 5.1	Pass
2	20dB bandwidth & 99% bandwidth	Part 15.239(a)	ANNEX A.1	Pass
3	Field Strength of the Fundamental and Band Edge	Part 15.239(b)	ANNEX A.2	Pass
4	Radiated Spurious Emission	Part 15.209 Part 15.239(c)	ANNEX A.2	Pass

3.3 Uncertainty of Test

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2 and TR100 028-1/-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	69 KHz
All emissions, radiated(<1GHz)	4.12 dB
All emissions, radiated(>1GHz)	4.16 dB
Temperature	0.82 °C
Humidity	4.1 %

4. Test Configuration

4.1 Environment Condition

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	20°C to 25°C	DC 12V from battery	30% to 60%	100 kPa to 102 kPa

4.2 Test Equipment List

Conducted Method Test					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RFTest software	/	V1.00	/	/	/
RF Control Unit	Techy	TR1029-1	/	/	/
RF Sensor Unit	Techy	TR1029-2	/	/	/
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2023-11-16	2024-11-15
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	/	/
WIDEBAND RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2023-11-16	2024-11-15
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2023-11-16	2024-11-15

Radiated Method Test					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023-03-24	2024-03-23
Preamplifier	SCHWARZBEC K	BBV9744	00246	/	/
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	/	/
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	/	/
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	/	/
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	/	/
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Horn Antenna	SCHWARZBEC K	BBHA9170	01157	2023-11-13	2024-11-12

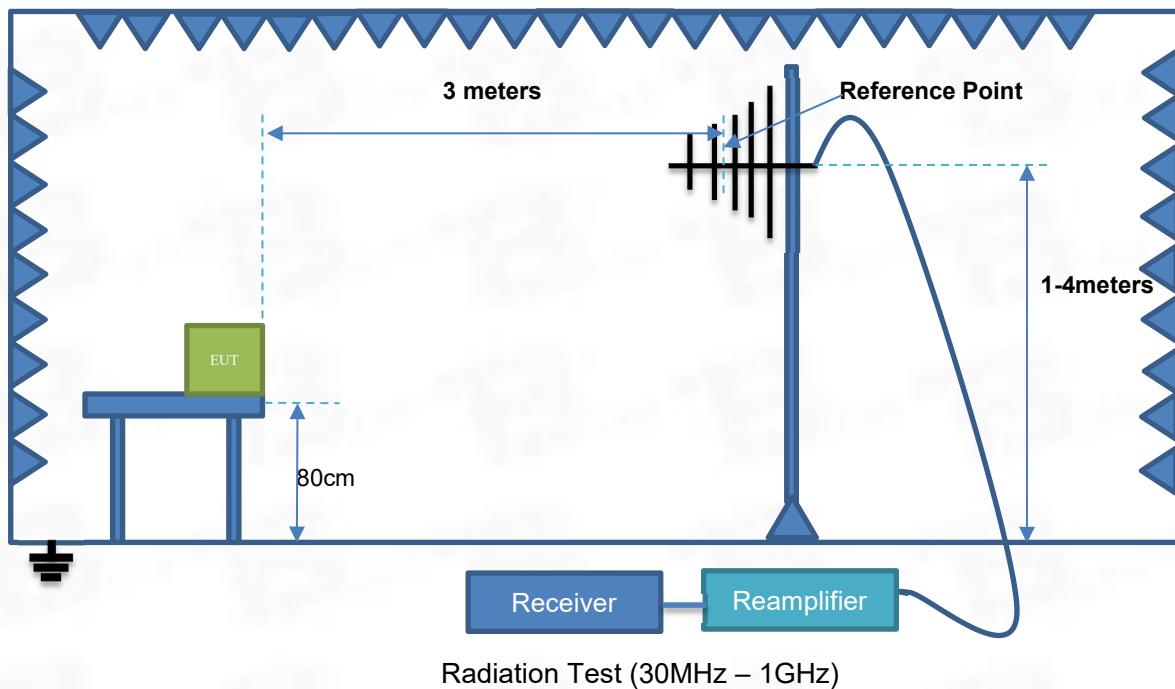
EMI TEST RECEIVER	ROHDE&SCHW ARZ	ESCI7	101032	2023-11-16	2024-11-15
SIGNAL ANALYZER	ROHDE&SCHW ARZ	FSQ40	100010	2023-11-16	2024-11-15
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Broadband Preamplifier	SCHWARZBEC K	BBV9718D	00008	/	/
Horn Antenna	SCHWARZBEC K	BBHA9120D	2597	2022-05-22	2024-05-21
EZ_EMC	Frad	FA-03A2 RE+	/	/	/
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/
Log periodic antenna	SCHWARZBEC K	VULB 9168	01328	2023-11-13	2024-11-12

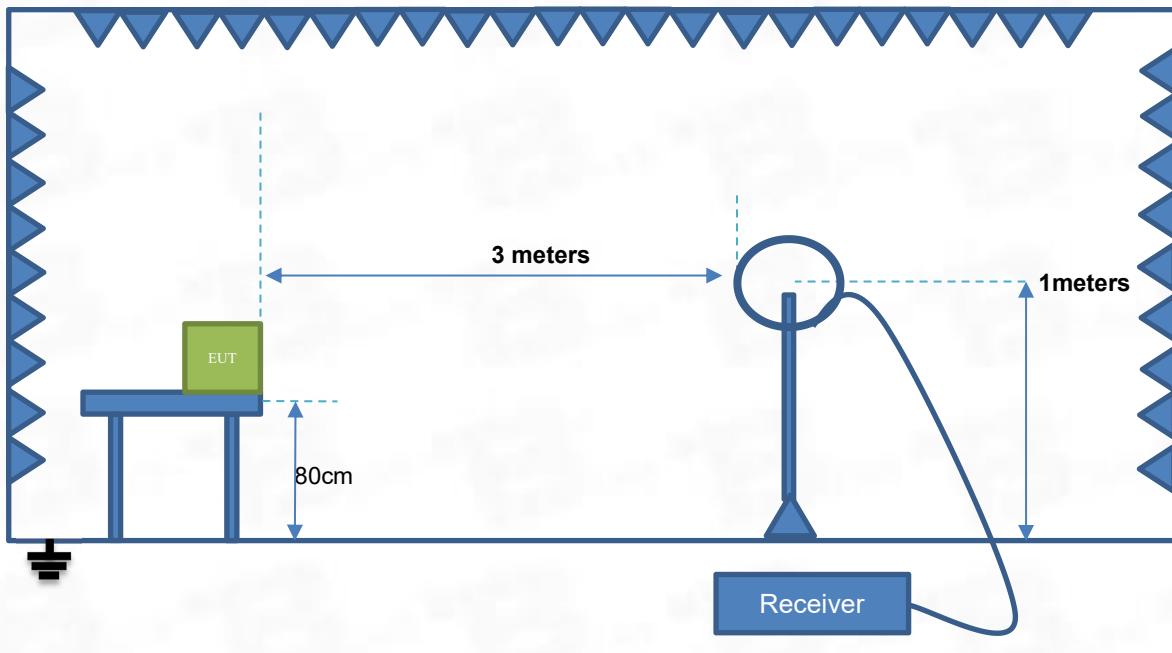
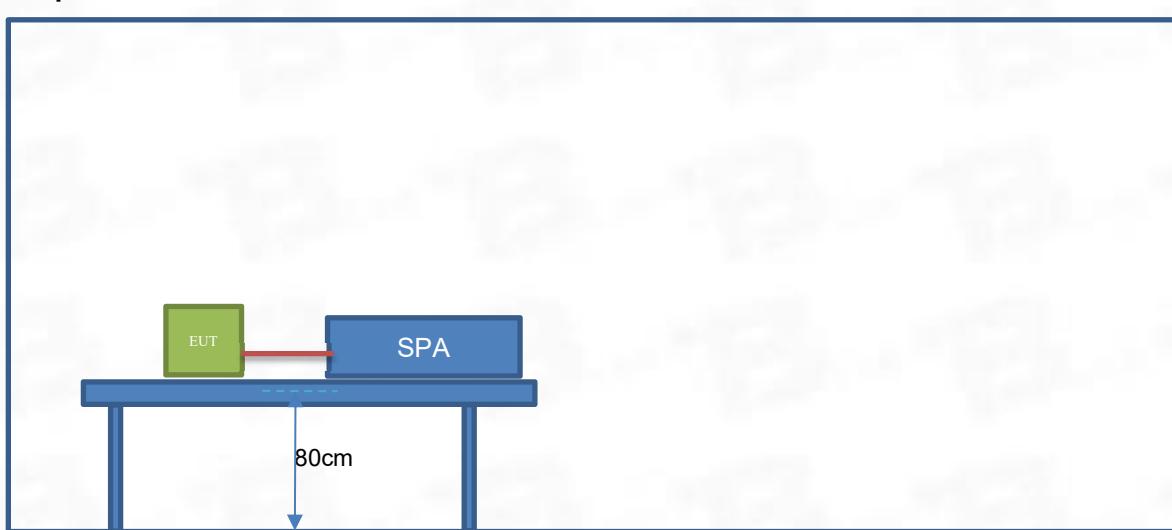
4.3 Test Auxiliary Equipment

Title	Manufacturer	Model No.	Serial No.
DC power supply	ITECH	IT6721	800104030767710436

4.4 Test Setup

Test Setup 1



Test Setup 2**Test Setup 43**

5. Test Items

5.1 Antenna Requirements

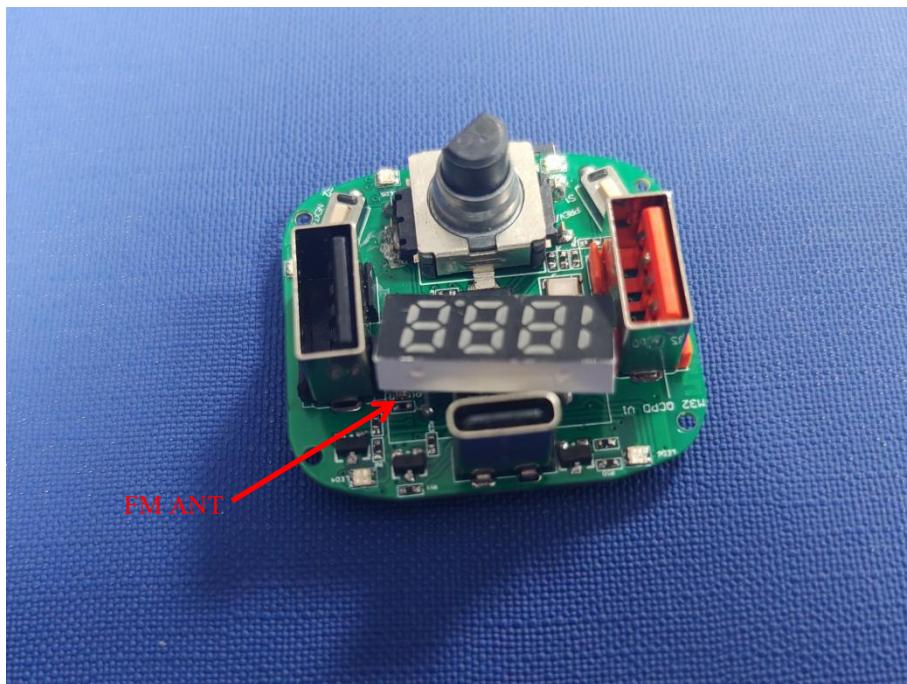
5.1.1 Relevant Standards

Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of 15.211, 15.213, 15.217, 15.219, 15.221, or 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.1.2 Antenna Anti-Replacement Construction

Protected Method	Description
The antenna is embedded in the product.	An embedded in antenna design is used.
Reference Documents	Item
Photo	Please refer to the EUT Photo documents.



5.2 20dB bandwidth & 99% bandwidth

5.2.1 Limit

Part 15.239(a)

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

5.2.2 Test Setup

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the EUT bandwidth.

Set the RBW = 1%~5%OBW. Set VBW \geq 3 x RBW.

Set span \geq 3 x RBW, Sweep time = auto couple. Detector = peak.

Trace mode = max hold.

Allow trace to fully stabilize, view the transmitter waveform on the spectrum analyzer.

5.2.3 Test Result

Please refer to ANNEX A.1

5.3 Field Strength of the Fundamental and Band Edge

5.3.1 Limit

Part 15.239(b)

The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.

The field strength of emissions from the intentional radiators operated under these frequency bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBuV/m@3m)	
	Peak	Average
88 to 108	67.96	47.96

Field strength of outside of the frequency bands limit show in below table.

Outside Frequency Band Edge	Distance Meters(dBuV/m@3m)
Below 88 MHz	40.0 (QP)
Above 108 MHz	43.5 (QP)

5.3.2 Test Setup

See section 4.4 for test setup description for setup 1. The photo of test setup please refer to ANNEX B

5.3.3 Test Procedure

(1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. The EUT was placed on a rotating 0.8m high above the ground, the table was rotated 360 degrees to determine the position of the highest radiation.

(2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

(3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

(4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

(5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Below 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

(6) Testing frequency range below 1GHz the measuring instrument use RBW=100 kHz, VBW=300 kHz with Quasi-peak detection.

(7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Average Detector for Average Values.

(8) For the actual test configuration, please see the test setup photo.

5.3.4 Test Result

Please refer to ANNEX A.2

5.4 Radiated Spurious Emission

5.4.1 Limit

Part 15.209

Frequency	Limit (dBuV/m)	Value
0.009 MHz ~0.49 MHz	2400/F(kHz) @300m	Quasi-peak
0.49 MHz ~ 1.705 MHz	24000/F(kHz) @30m	Quasi-peak
1.705 MHz ~30 MHz	30 @30m	Quasi-peak

Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 40*log(300/3)= Limit dBuV/m @300m +80,

Limit dBuV/m @3m = Limit dBuV/m @30m +40*log(30/3)= Limit dBuV/m @30m + 40.

Frequency	Limit (dBuV/m @3m)	Value
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz~1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

Part 15.239(c)

The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in § 15.209.

5.4.2 Test Setup

See section 4 for test setup description for setup 1. The photo of test setup please refer to ANNEX B

5.4.3 Test Procedure

(1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz. The EUT was placed on a rotating 0.8m high above the ground, the table was rotated 360 degrees to determine the position of the highest radiation.

(2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.

(3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.

(4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning

the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

(5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Below 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.

(6) Testing frequency range below 1GHz the measuring instrument use RBW=100 kHz, VBW=300 kHz with Quasi-peak detection.

(7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Average Detector for Average Values.

(8) For the actual test configuration, please see the test setup photo.

5.4.4 Test Result

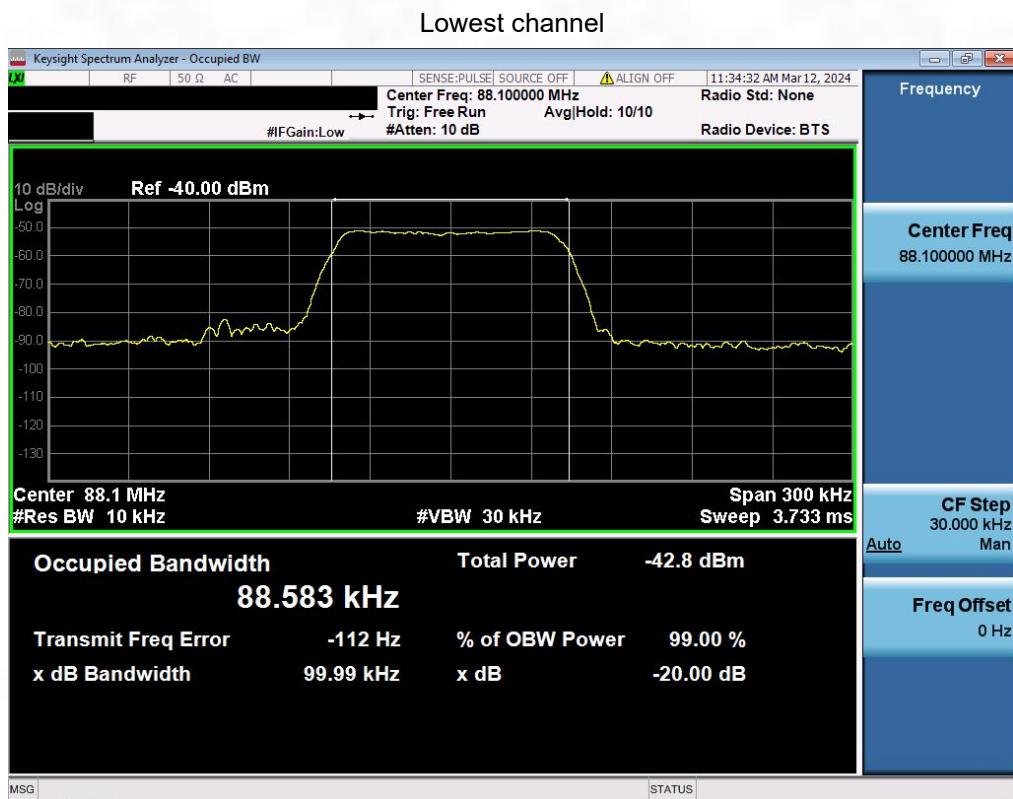
Please refer to ANNEX A.2

ANNEX A Test Results

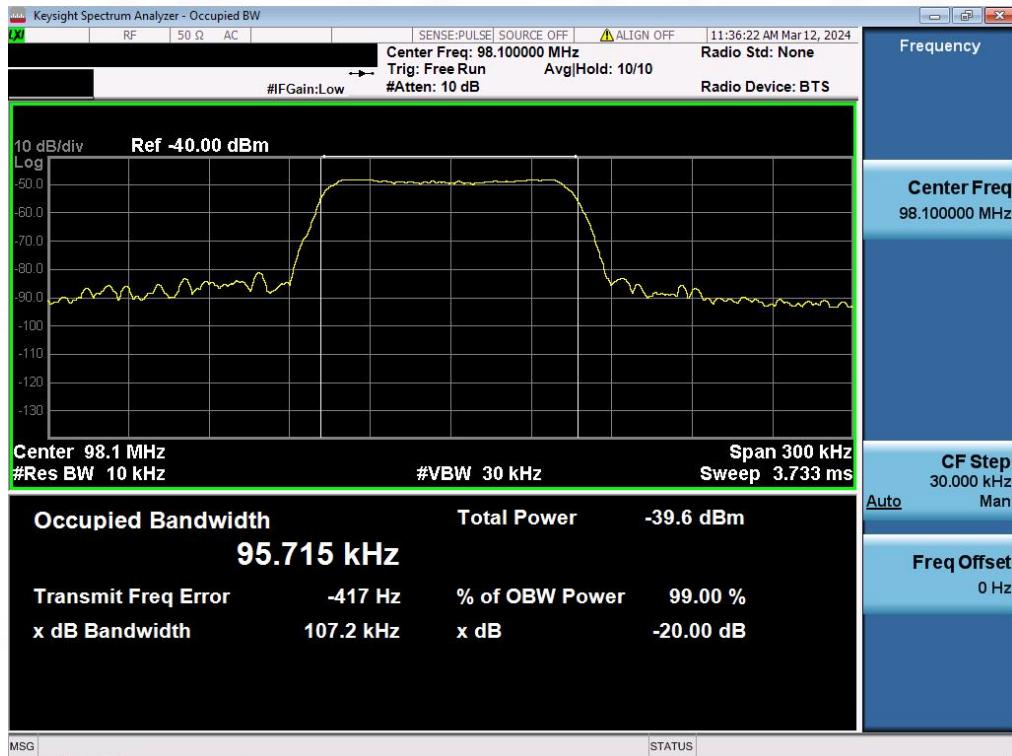
A.1 20dB bandwidth & 99% bandwidth

Test Channel	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
Lowest	88.583	200	PASS
Middle	95.715	200	PASS
Highest	104.42	200	PASS

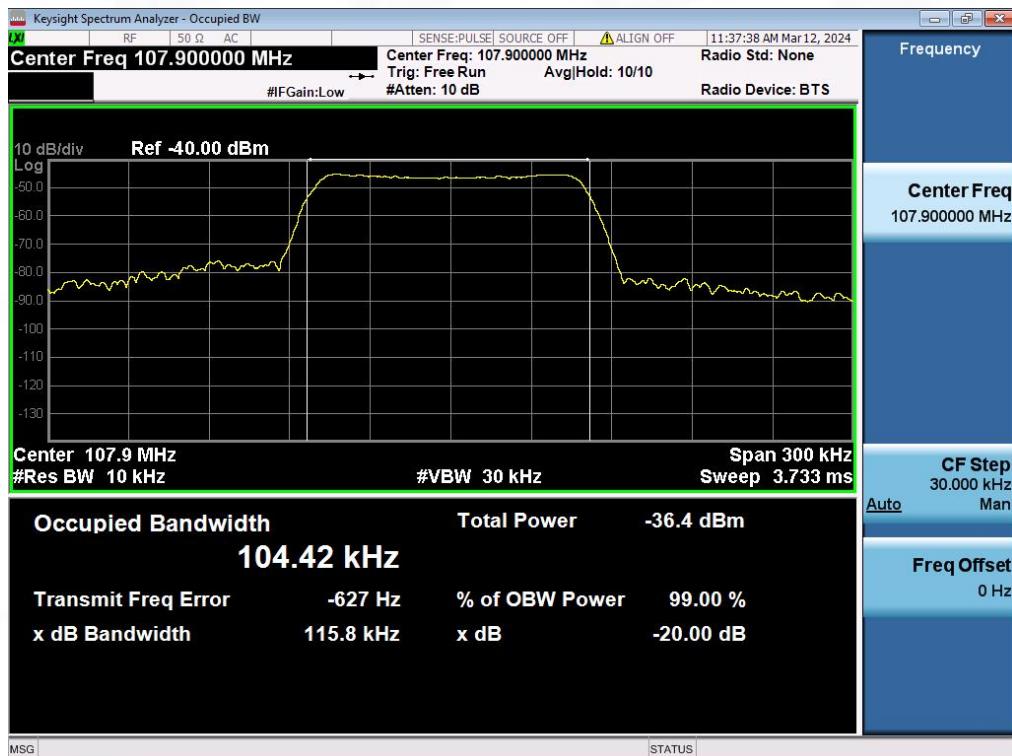
Test plots as follows:



Middle channel

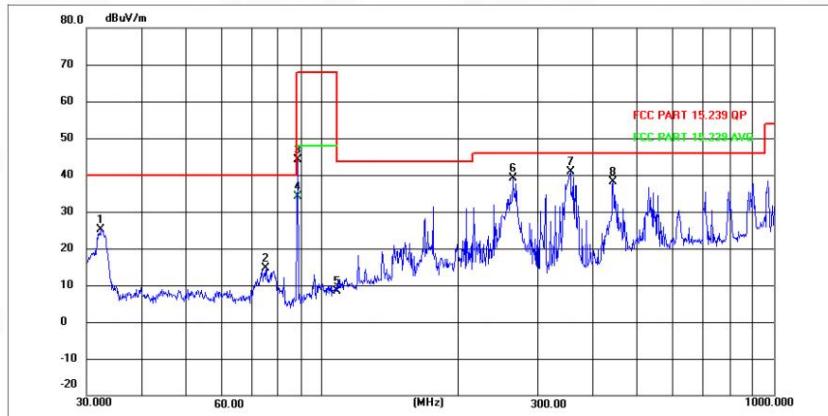


Highest channel



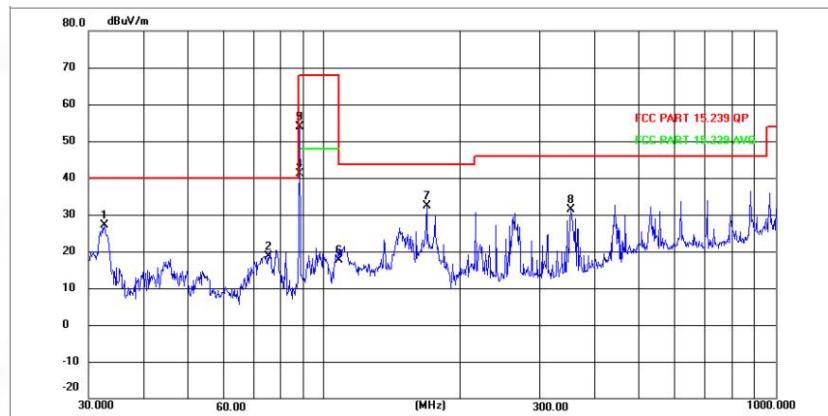
A.2 Field Strength of the Fundamental and Band Edge Radiated Spurious Emission

Test Mode 88.1MHz ANT Horizontal

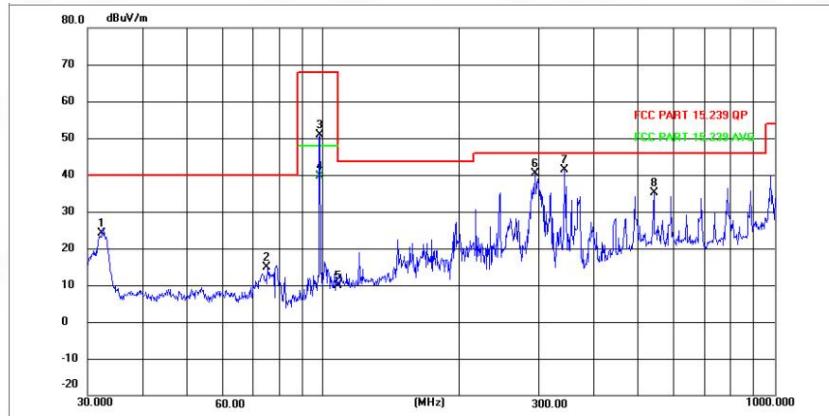


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	32.4060	43.62	-18.50	25.12	40.00	-14.88	peak	P
2	75.2000	32.62	-18.06	14.56	40.00	-25.44	peak	P
3	88.0330	74.38	-30.19	44.19	68.00	-23.81	peak	P
4	88.0330	64.29	-30.19	34.10	48.00	-13.90	AVG	P
5	108.0000	36.44	-28.15	8.29	43.60	-35.31	peak	P
6	264.7456	64.80	-25.73	39.07	46.00	-6.93	peak	P
7 *	355.4272	65.77	-24.98	40.79	46.00	-5.21	peak	P
8	440.9687	60.89	-22.71	38.18	46.00	-7.82	peak	P

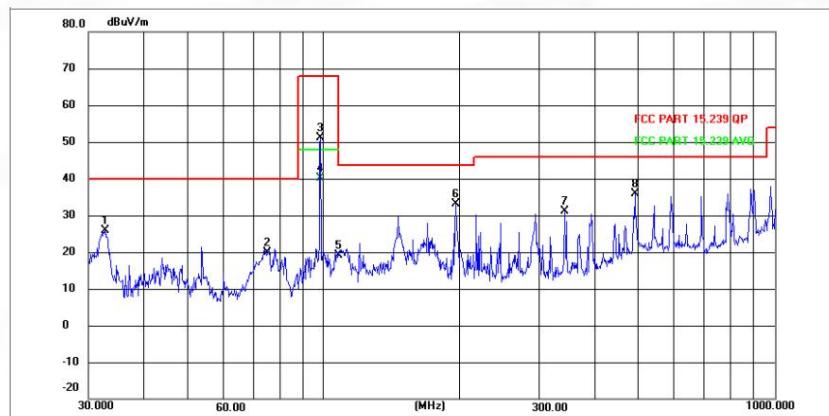
Test Mode 88.1MHz ANT Vertical



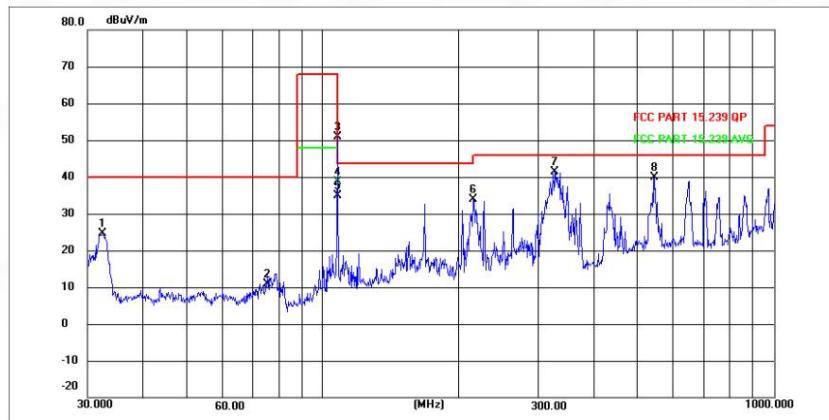
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	32.5197	47.74	-20.69	27.05	40.00	-12.95	peak	P
2	75.2000	38.45	-19.90	18.55	40.00	-21.45	peak	P
3	88.0330	84.07	-30.19	53.88	68.00	-14.12	peak	P
4 *	88.0330	71.39	-30.19	41.20	48.00	-6.80	AVG	P
5	88.0330	84.07	-30.19	53.88	68.00	-14.12	peak	P
6	108.0000	45.84	-28.15	17.69	43.60	-25.91	peak	P
7	168.4137	60.00	-27.61	32.39	43.60	-11.21	peak	P
8	352.3250	56.37	-25.01	31.36	46.00	-14.64	peak	P

Test Mode 98.1MHz ANT Horizontal


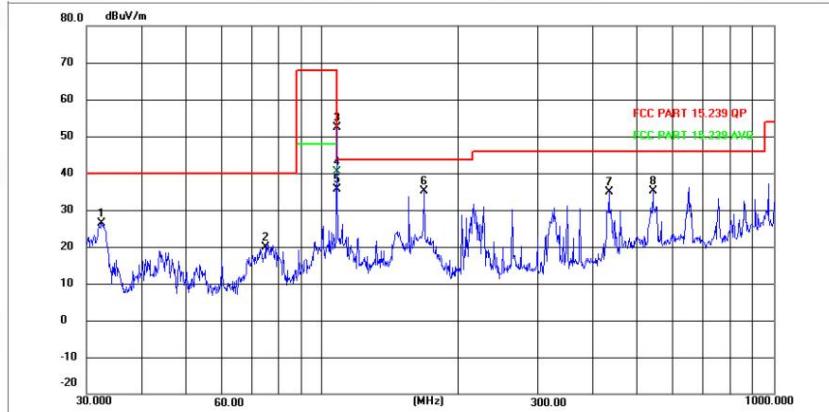
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	32.4060	42.67	-18.50	24.17	40.00	-15.83	peak	P
2	75.2000	32.97	-18.06	14.91	40.00	-25.09	peak	P
3	98.1418	79.42	-28.54	50.88	68.00	-17.12	peak	P
4	98.1418	68.24	-28.54	39.70	48.00	-8.30	AVG	P
5	108.0000	37.95	-28.15	9.80	43.60	-33.80	peak	P
6	294.6297	65.85	-25.48	40.37	46.00	-5.63	peak	P
7 *	342.5788	66.43	-25.09	41.34	46.00	-4.66	peak	P
8	541.3724	56.59	-21.57	35.02	46.00	-10.98	peak	P

Test Mode 98.1MHz ANT Vertical


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	32.8061	46.61	-20.68	25.93	40.00	-14.07	peak	P
2	75.2000	39.85	-19.90	19.95	40.00	-20.05	peak	P
3	98.1418	79.78	-28.54	51.24	68.00	-16.76	peak	P
4 *	98.1418	68.64	-28.54	40.10	48.00	-7.90	AVG	P
5	108.0000	47.21	-28.15	19.06	43.60	-24.54	peak	P
6	196.1655	60.42	-27.37	33.05	43.60	-10.55	peak	P
7	342.5788	56.31	-25.09	31.22	46.00	-14.78	peak	P
8	490.7445	57.24	-21.35	35.89	46.00	-10.11	peak	P

Test Mode 107.9MHz ANT Horizontal


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	32.4628	43.05	-18.50	24.55	40.00	-15.45	peak	P
2	75.2000	29.03	-18.06	10.97	40.00	-29.03	peak	P
3	107.8876	78.91	-28.15	50.76	68.00	-17.24	peak	P
4	107.8876	66.75	-28.15	38.60	48.00	-9.40	AVG	P
5	108.0000	62.92	-28.15	34.77	43.60	-8.83	peak	P
6	215.6454	60.55	-26.65	33.90	43.60	-9.70	peak	P
7 *	326.7395	66.60	-25.21	41.39	46.00	-4.61	peak	P
8	543.2741	61.54	-21.59	39.95	46.00	-6.05	peak	P

Test Mode 107.9MHz ANT Vertical


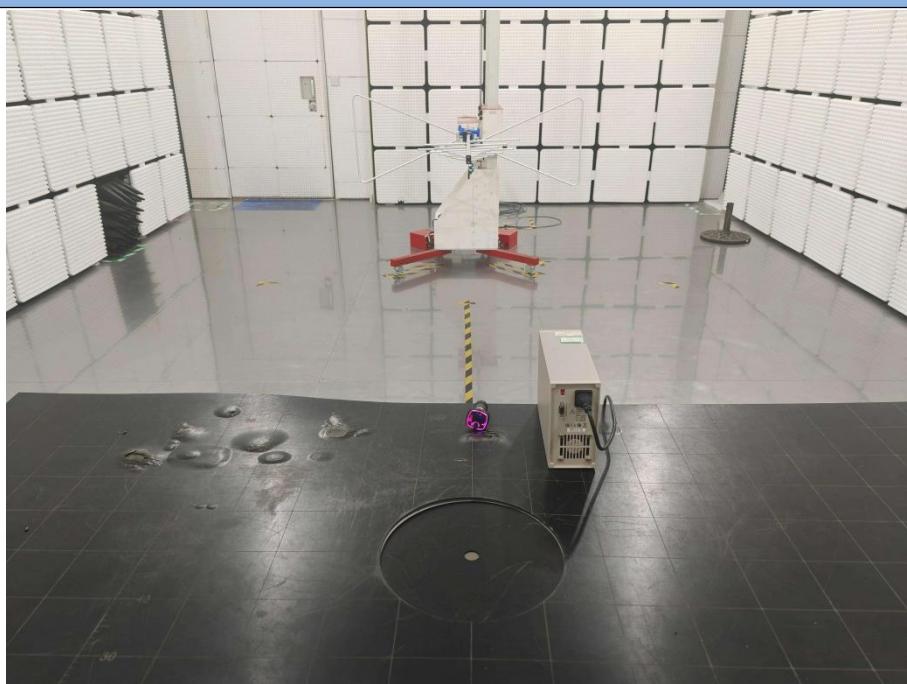
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	32.4628	47.18	-20.69	26.49	40.00	-13.51	peak	P
2	75.2000	39.90	-19.90	20.00	40.00	-20.00	peak	P
3	107.8877	80.58	-28.15	52.43	68.00	-15.57	peak	P
4 *	107.8877	68.45	-28.15	40.30	48.00	-7.70	AVG	P
5	108.0000	63.90	-28.15	35.75	43.60	-7.85	peak	P
6	167.8242	62.69	-27.62	35.07	43.60	-8.53	peak	P
7	431.7880	58.14	-23.14	35.00	46.00	-11.00	peak	P
8	539.4775	56.59	-21.55	35.04	46.00	-10.96	peak	P

ANNEX B TEST SETUP PHOTOS

above 1GHz



below 1GHz

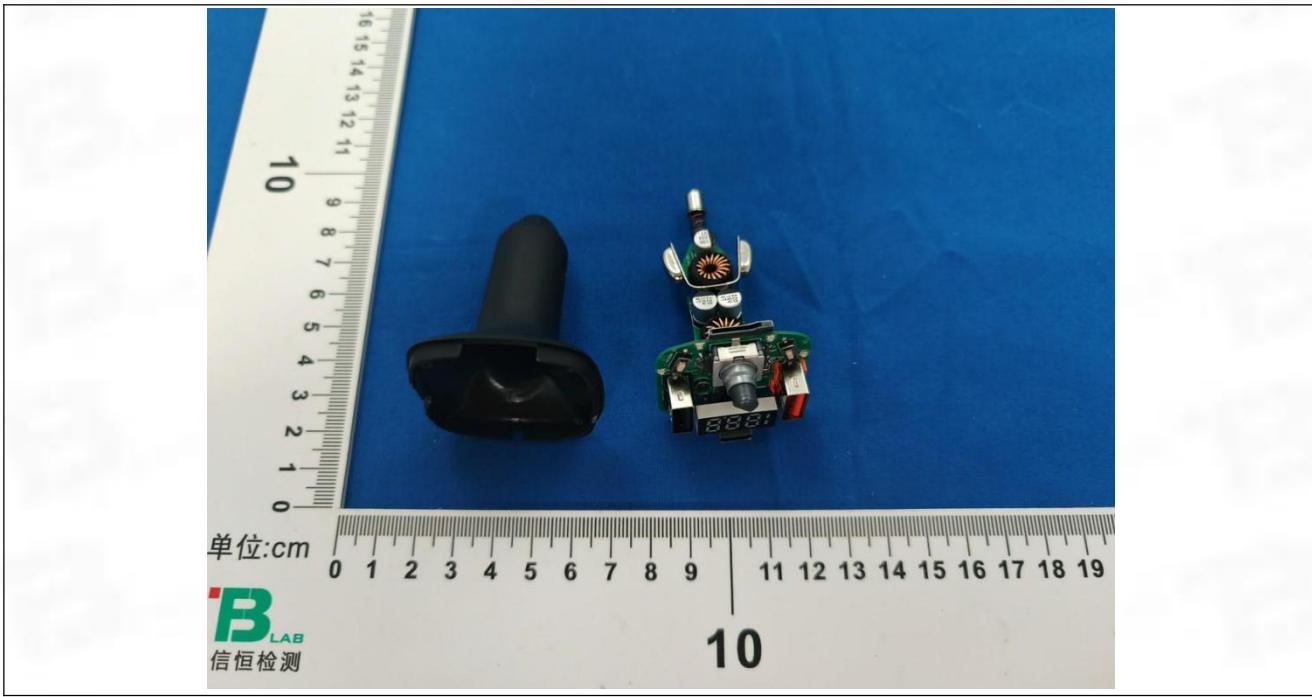


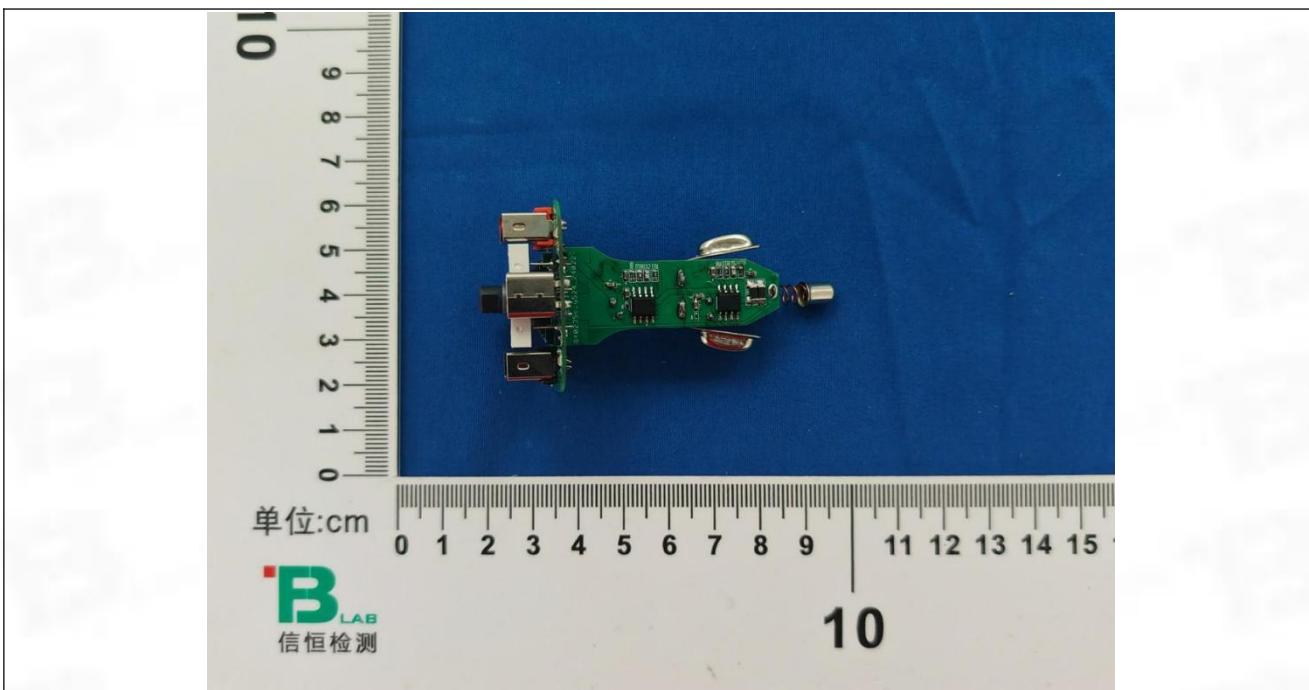
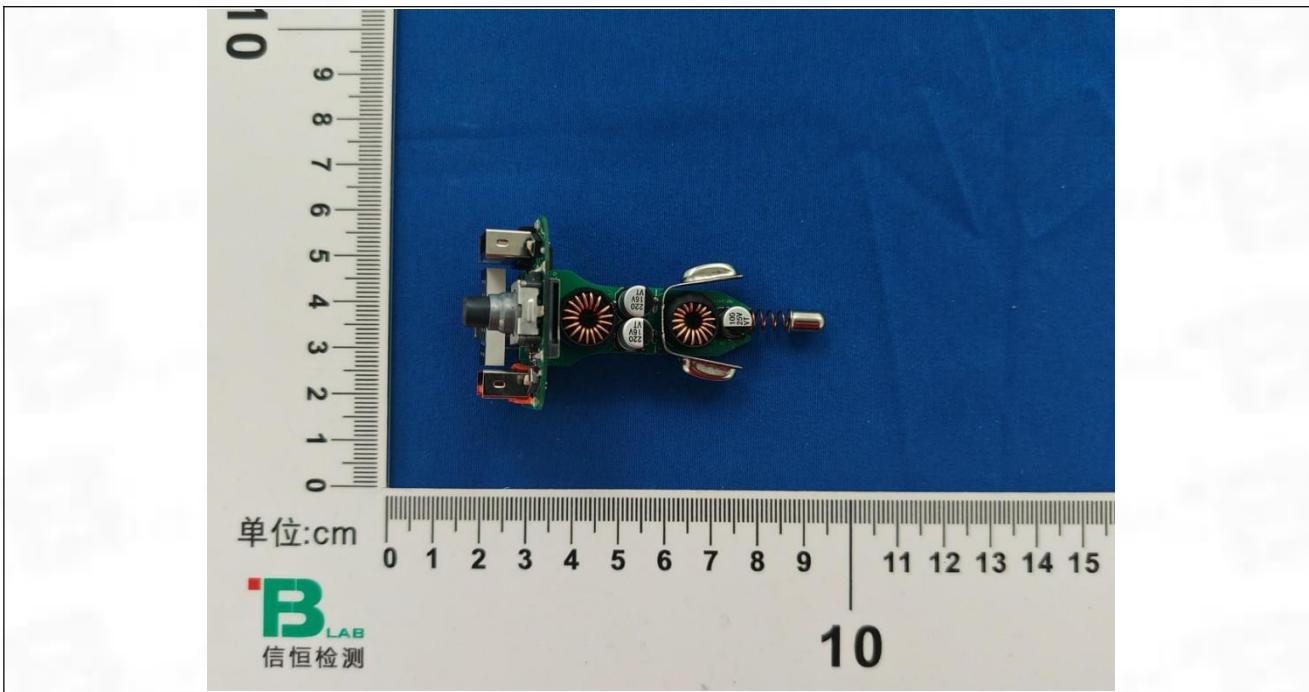
ANNEX C EUT EXTERNAL PHOTOS

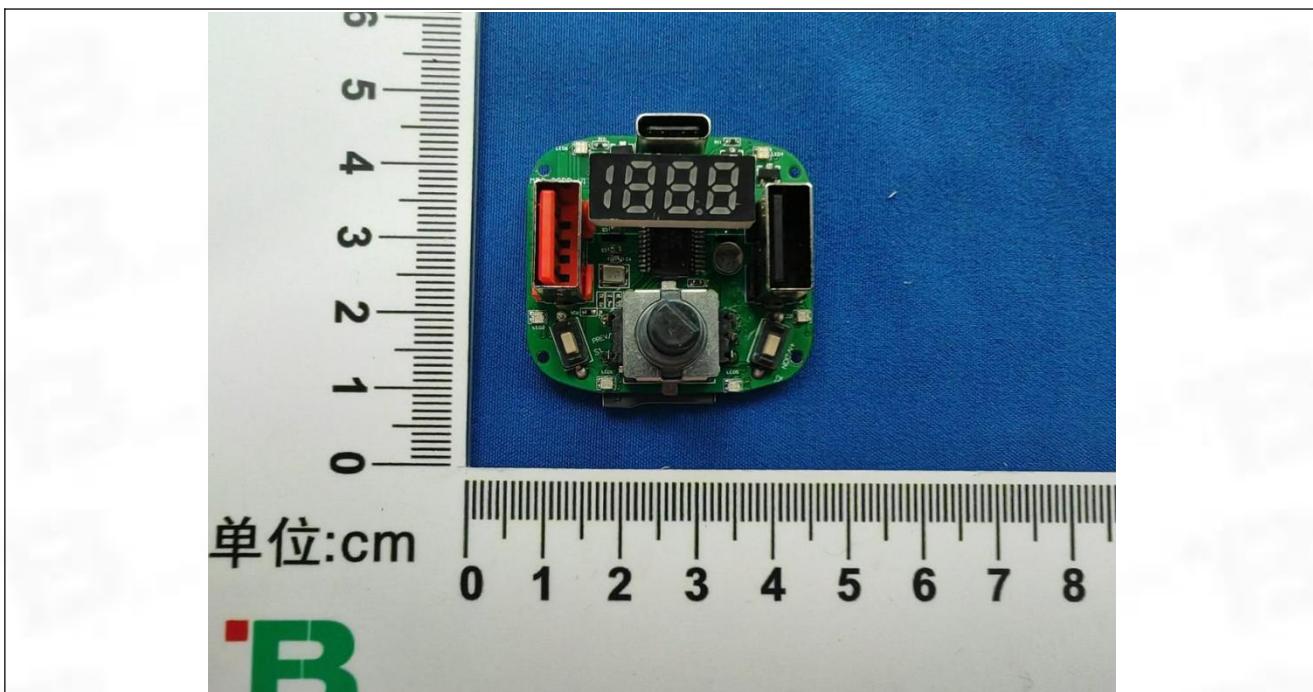
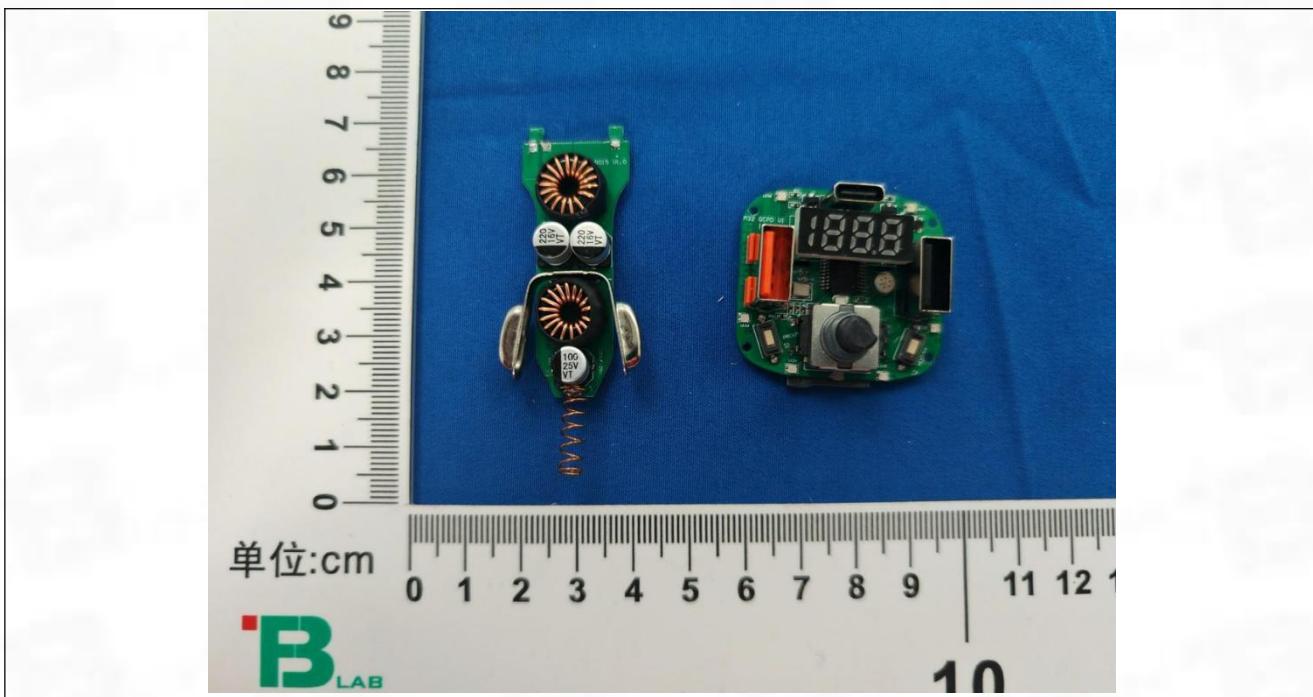


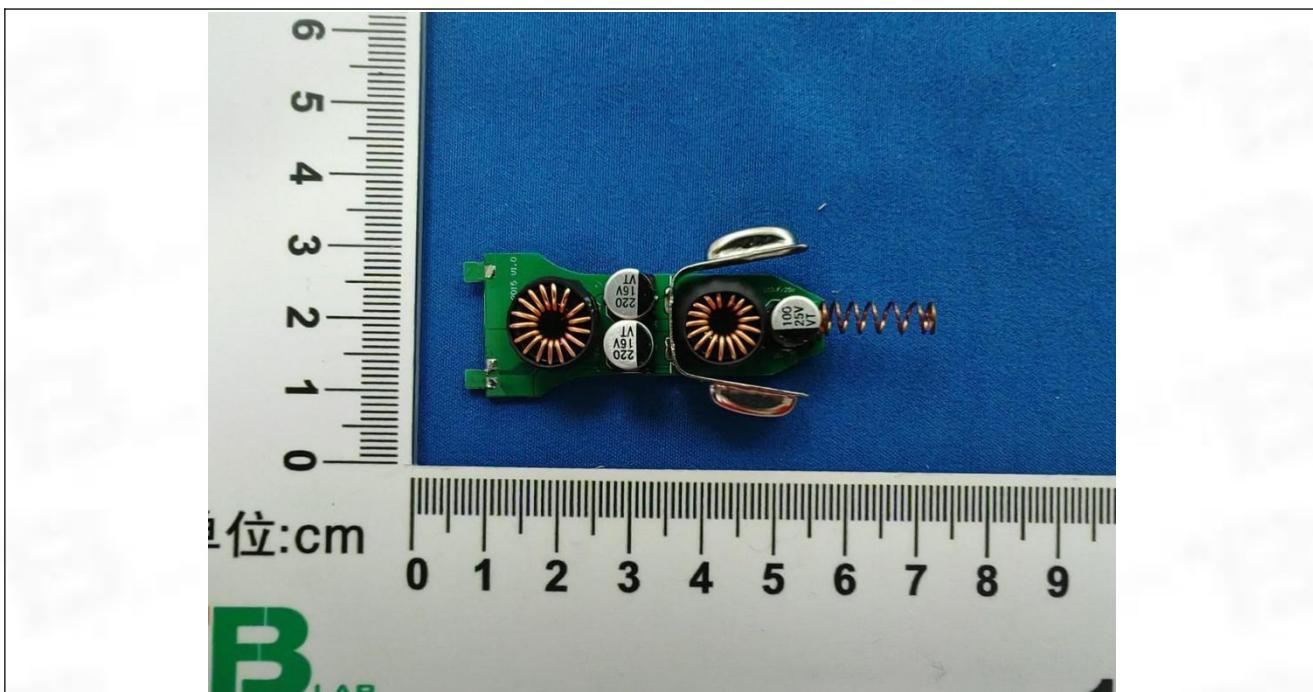
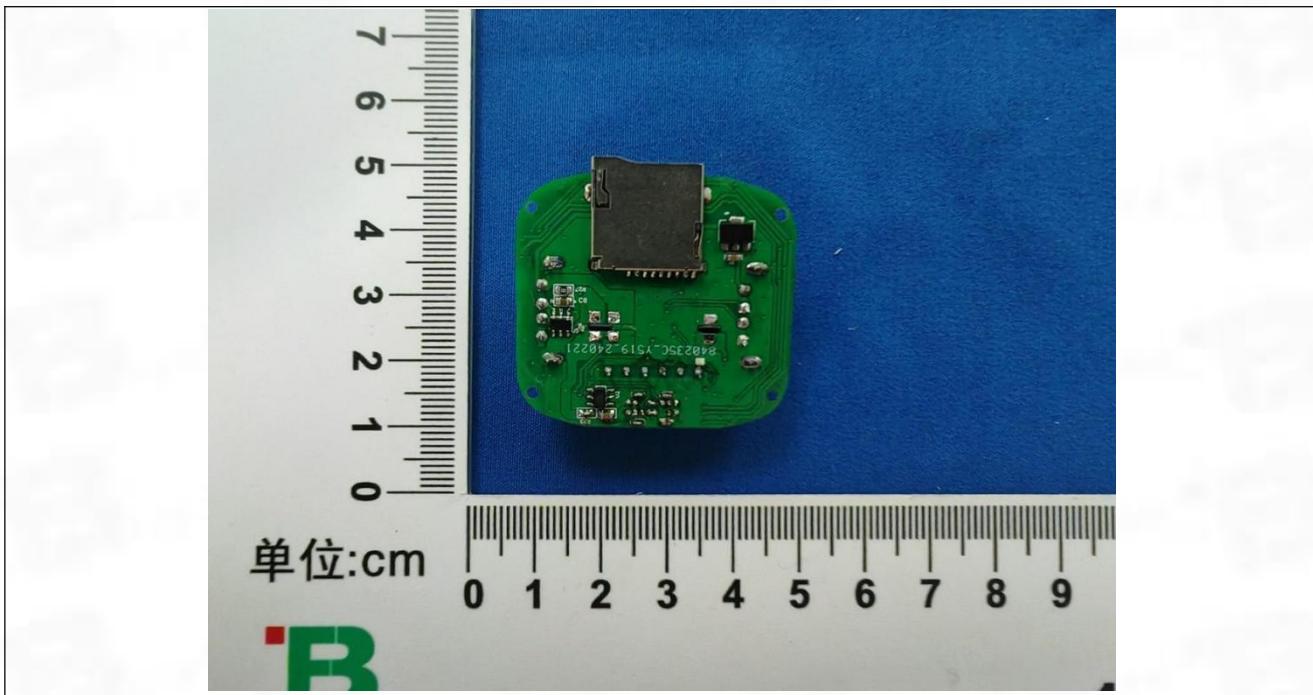


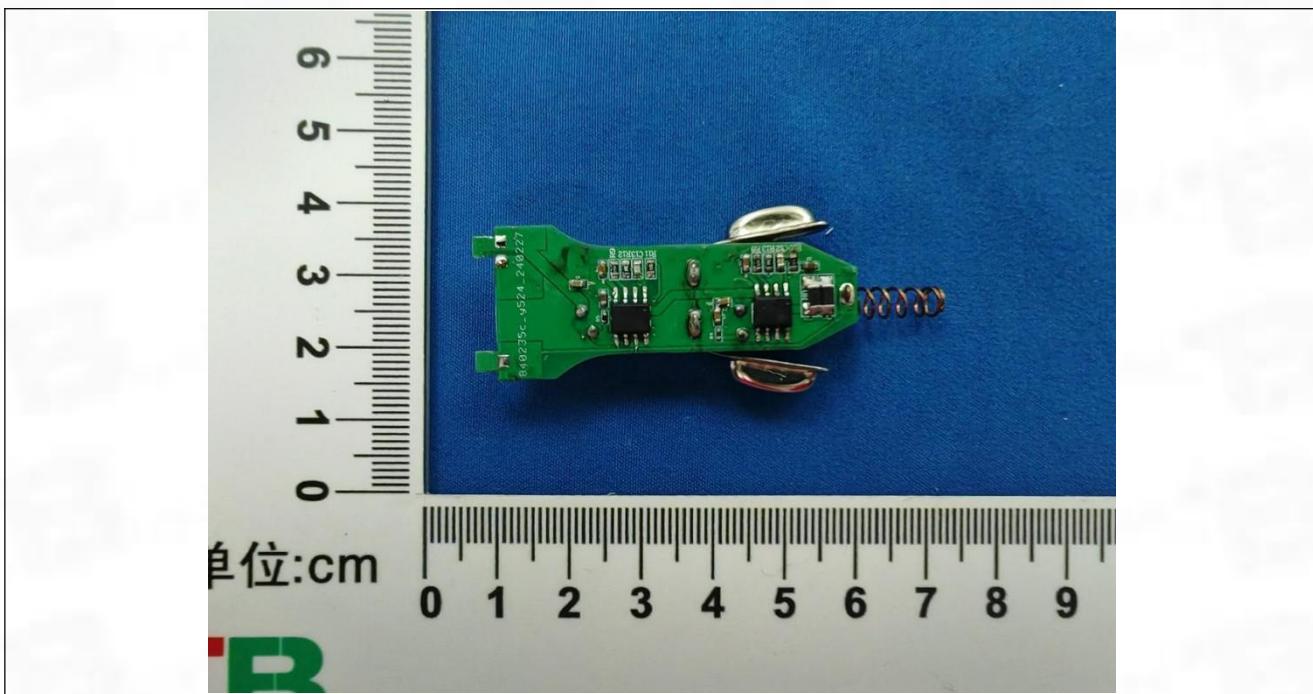


ANNEX D EUT INTERNAL PHOTOS











Test Report Number: BTF240223R00102



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