APPLICATION FOR EMC DIRECTIVE

On Behalf of

Shenzhen Limei Technology Co., Ltd

Head up Display

Trade Name: AWOLIMEI

Model: G2, M11, T10, XS, G12, G3, G16, Y03, C1, G15, C2, M1, P21

Prepared For : **Shenzhen Limei Technology Co., Ltd**

A13A01, Building 2, Yulongju, 26 Xixiang Avenue, Fuhua Community, Xi xiang Street, Bao'an District, Shenzhen

Prepared By : **BSL Testing Co.,Ltd.**

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Date of Test : October 30, 2023-November 7, 2023

Date of Report : November 8, 2023

Report Number : BSL23100158P02-R01

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TEST REPORT DECLARATION

Applicant	:	Shenzhen Limei Technology Co., Ltd
Address	:	A13A01, Building 2, Yulongju, 26 Xixiang Avenue, Fuhua Community, Xixiang Street, Bao'an District, Shenzhen
EUT Description	:	Head up Display
Manufacturer	:	Shenzhen Limei Technology Co., Ltd
Address	:	A13A01, Building 2, Yulongju, 26 Xixiang Avenue, Fuhua Community, Xixiang Street, Bao'an District, Shenzhen
Model Number	:	G2, M11, T10, XS, G12, G3, G16, Y03, C1, G15, C2, M1, P21
Remark	:	Vehicle product, Do not connect to the AC end
Frequency range	:	1.574GHz-1.577GHz
FCC ID	:	2BDEJ-G2

Test Standards:

FCC Part 15, Subpart B, ANSI C 63.4-2014

The EUT described above is tested by US to determine the maximum emission levels emanating from the EUT, the maximum emission levels are compared to the FCC Part 15 Subpart Class B limits.The measurement results are contained in this test report, and BSL Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT is to be technically compliant with the FCC requirements.
This report applies to above tested sample only and shall not be reproduced in part without written approval of BSL Testing Co., Ltd.

Judy chen

Prepared by : _____
Judy Chen/Assistant

Vivian Jiang

Approved & Authorized Signer : _____
Vivian Jiang / Manager

1. GENERAL INFORMATION

1.1. Report information

1.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BSL approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BSL in any way guarantees the later performance of the product/equipment.

1.1.2. The sample/s mentioned in this report is/are supplied by Applicant, BSL therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

1.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BSL, unless the applicant has authorized BSL in writing to do so.

1.2. Measurement Uncertainty

Available upon request.

1.3. Test Uncertainty

Conducted Emission Uncertainty	=	±2.66dB
Radiated Emission Uncertainty	=	±4.26dB

2. PRODUCT DESCRIPTION

2.1. EUT Description

Description	:	Head up Display
Applicant	:	Shenzhen Limei Technology Co., Ltd A13A01, Building 2, Yulongju, 26 Xixiang Avenue, Fuhua Commu nity, Xixiang Street, Bao'an District, Shenzhen
Manufacturer	:	Shenzhen Limei Technology Co., Ltd A13A01, Building 2, Yulongju, 26 Xixiang Avenue, Fuhua Commu nity, Xixiang Street, Bao'an District, Shenzhen
Model Number	:	G2

2.2. Test Conditions

Temperature: 23~25℃

Relative Humidity: 55~63 %

2.3. Support Equipment List

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	--	--	--	--	--	--	--

3. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Conducted disturbance	N/A
Radiated disturbance	Pass

4. TEST EQUIPMENT USED

4.1. For Conducted Emission Test

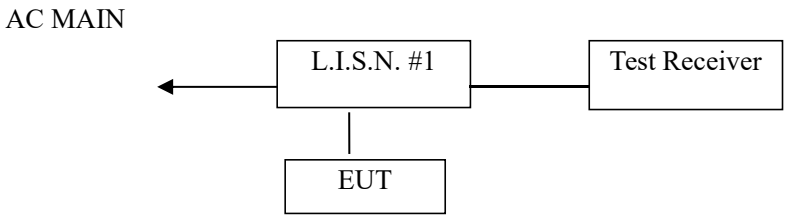
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration time	Recalibration time
1.	Test Receiver	Rohde & Schwarz	ESPI3	101396	Oct.28, 22	Nov.27, 23
2.	L.I.S.N.	Rohde & Schwarz	ENV216	102723	Oct.28, 22	Nov.27, 23
3.	loop antenna	DAZE	ZN30401	19036	Oct.28, 22	Nov.27, 23
4.	Wet and dry thermometer	M&G	ARC92569	N/A	Oct.28, 22	Nov.27, 23
5.	Shielding room	SKET	2021082301	N/A	Aug.23,21	Aug.22,24

4.2. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration time	Recalibration time
1.	Test Receiver	Rohde&Schwarz	ESC17(9kHz-7GHz)	100336	Oct.28, 22	Nov.27, 23
2.	Broadband antenna	Schwarzbeck	VULB9168	01222	Oct.28, 22	Nov.27, 23
3.	Horn antenna	Schwarzbeck	BBHA9120D	02476	Oct.28, 22	Nov.27, 23
4.	Preamplifier	Schwarzbeck	BBV9745	00250	Oct.28, 22	Nov.27, 23
5.	Preamplifier	N/A	TRLA-01018G440B	21081001	Oct.28, 22	Nov.27, 23
6.	3M method semi anechoic chamber	SKET	9m*6m*6m	2021082304	Oct.14,21	Oct.13,24
7.	Pointer hygrometer	M&G	ARC92570	N/A	Oct.28, 22	Nov.27, 23

5. CONDUCTED EMISSION TEST

5.1. Block Diagram of Test Setup



(EUT: Head up Display)

5.2. Test Standard

FCC Part 15, Subpart B, Class B

5.3. Conducted Emission Limit (Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

5.4. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet Part 15 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

5.4.1.EUT Information

Model Number**:** G2

5.5. Operating Condition of EUT

5.5.1.Setup the EUT and simulators as shown in Section 5.1.

5.5.2.Turn on the power of all equipments.

5.5.3.Let the EUT work in test modes (EUT Working) and test it.

5.6. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

The bandwidth of the test receiver (R&S Test Receiver ESHS30) is set at 10KHz. All the test results are listed in Section 5.7

5.7. Test Result

N/A

6. RADIATED EMISSION MEASUREMENT

6.1. Block Diagram of EUT Configuration

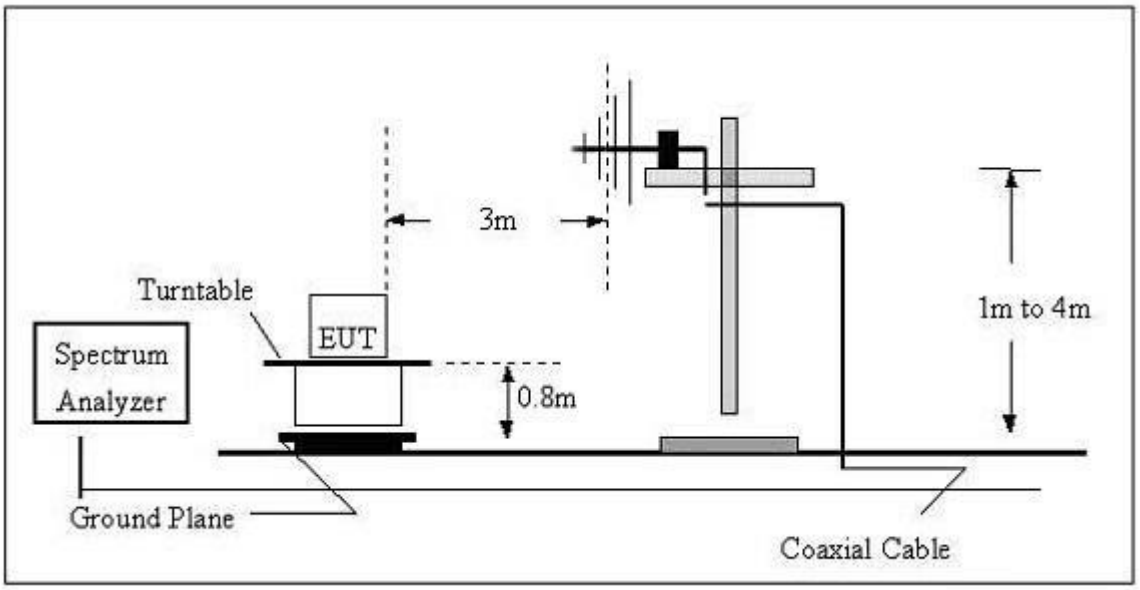
6.1.1.Block Diagram of connection between the EUT and the simulators

EUT

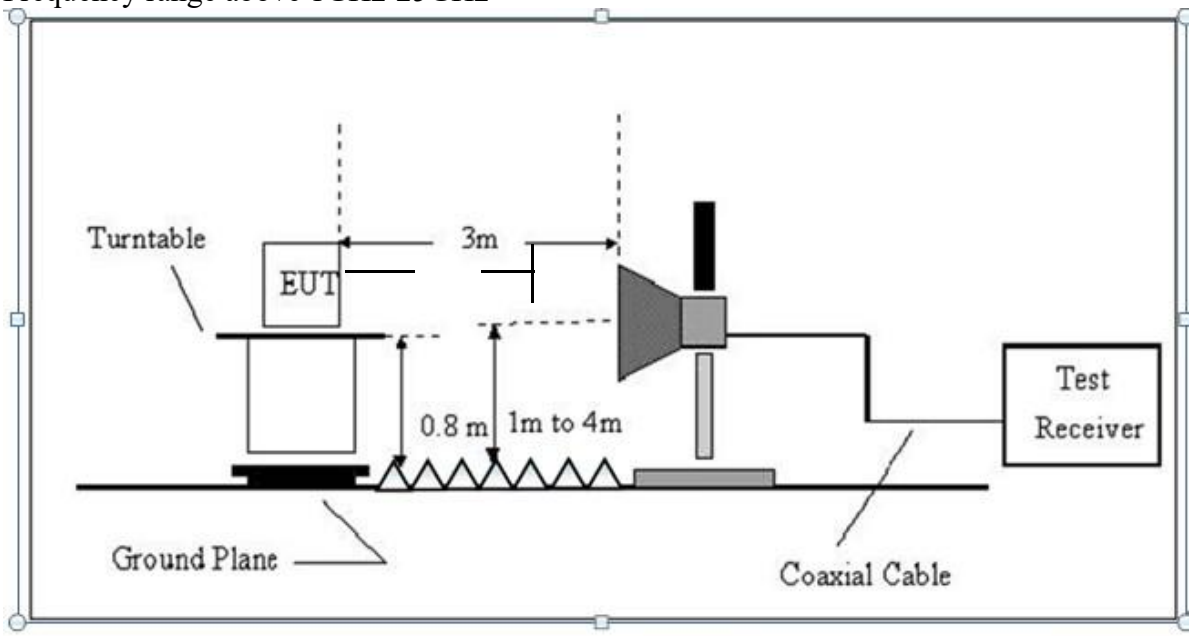
(EUT: Head up Display)

6.1.2.Anechoic Chamber Test Setup Diagram

Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



6.2. Test Standard

FCC Part 15, Subpart B, Class B

6.3. Radiated Emission Limit (Class B)

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(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

Note**:**(1) The smaller limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT or system.

6.4. EUT Configuration on Test

The following equipment 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.

6.5. Operating Condition of EUT

6.5.1.Setup the EUT as shown on Section 6.1.2

6.5.2.Turn on the power of all equipments.

6.5.3.Let the EUT work in test mode (EUT working) and measure it.

6.6. Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. 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.
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 25GHz.
The bandwidth setting on the test receiver is 120 KHz.
The EUT is tested in Anechoic Chamber. The frequency range from 30MHz to 6000 MHz is checked. All the test results are listed in Section 6.7. and all the scanning waveform are attached within **Appendix I**

6.7. Test Result

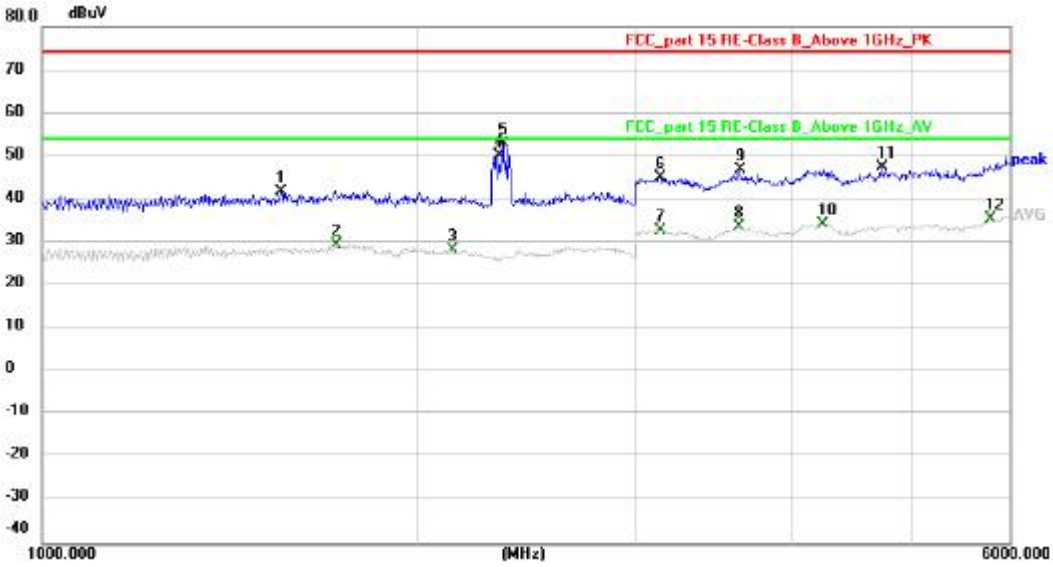
PASS

Test Mode: operating

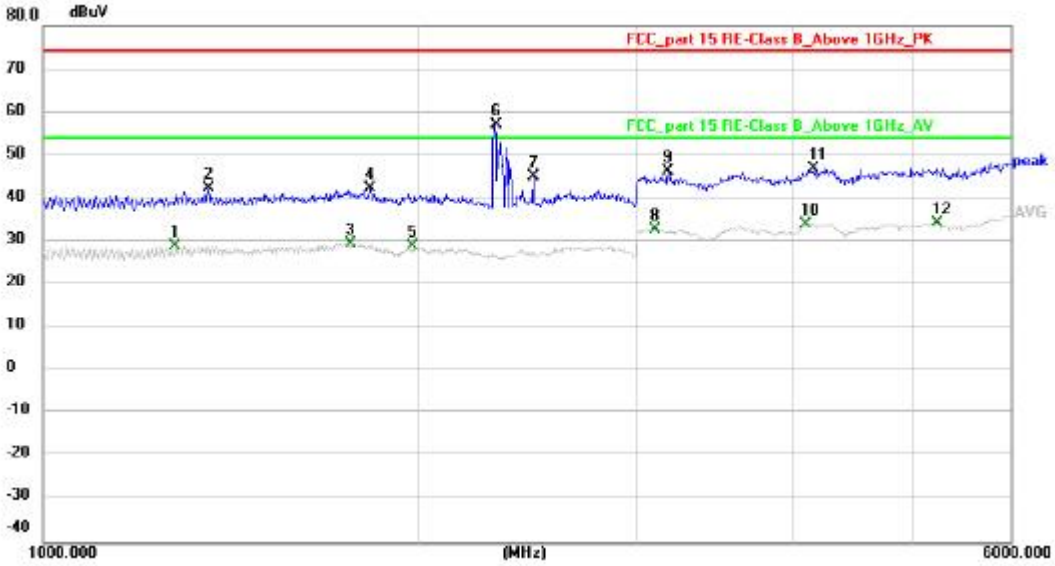
APPENDIX I

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	55.4147	33.59	-16.86	16.73	40.00	-23.27	peak
2	137.9028	34.59	-16.87	17.72	43.50	-25.78	peak
3	214.5143	35.40	-19.34	16.06	43.50	-27.44	peak
4	257.4222	37.50	-17.08	20.42	46.00	-25.58	peak
5	379.9141	36.37	-13.60	22.77	46.00	-23.23	peak
6 *	827.4934	36.28	-4.38	31.90	46.00	-14.10	peak

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	55.8047	46.24	-16.87	29.37	40.00	-10.63	peak
2	94.0979	39.92	-20.34	19.58	43.50	-23.92	peak
3	104.1701	40.78	-19.51	21.27	43.50	-22.23	peak
4	214.5143	37.63	-19.34	18.29	43.50	-25.21	peak
5	452.7197	31.60	-11.60	20.00	46.00	-26.00	peak
6	774.1584	33.52	-4.98	28.54	46.00	-17.46	peak



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	1556.694	57.51	-15.79	41.72	74.00	-32.28	peak
2	1724.082	44.66	-15.21	29.45	54.00	-24.55	AVG
3	2133.821	42.16	-13.79	28.37	54.00	-25.63	AVG
4	2325.462	63.28	-13.15	50.13	74.00	-23.87	peak
5	2346.389	65.83	-13.08	52.75	74.00	-21.25	peak
6	3136.610	55.04	-10.08	44.96	74.00	-29.04	peak
7	3136.610	42.97	-10.08	32.89	54.00	-21.11	AVG
8	3633.029	42.76	-9.07	33.69	54.00	-20.31	AVG
9	3639.545	55.81	-9.05	46.76	74.00	-27.24	peak
10	4245.883	41.31	-6.95	34.36	54.00	-19.64	AVG
11	4727.779	52.75	-5.43	47.32	74.00	-26.68	peak
12 *	5788.796	38.24	-2.92	35.32	54.00	-18.68	AVG



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	1278.223	45.31	-16.33	28.98	54.00	-25.02	AVG
2	1358.513	58.53	-16.20	42.33	74.00	-31.67	peak
3	1767.877	44.41	-15.05	29.36	54.00	-24.64	AVG
4	1832.378	57.13	-14.83	42.30	74.00	-31.70	peak
5	1979.136	43.05	-14.33	28.72	54.00	-25.28	AVG
6 *	2308.855	70.34	-13.21	57.13	74.00	-16.87	peak
7	2480.405	57.68	-12.62	45.06	74.00	-28.94	peak
8	3103.070	42.87	-10.13	32.74	54.00	-21.26	AVG
9	3181.894	56.37	-10.02	46.35	74.00	-27.65	peak
10	4103.772	41.19	-7.32	33.87	54.00	-20.13	AVG
11	4163.019	54.11	-7.16	46.95	74.00	-27.05	peak
12	5236.146	38.45	-4.14	34.31	54.00	-19.69	AVG

APPENDIX II

Photo 1 Radiated Emission Test

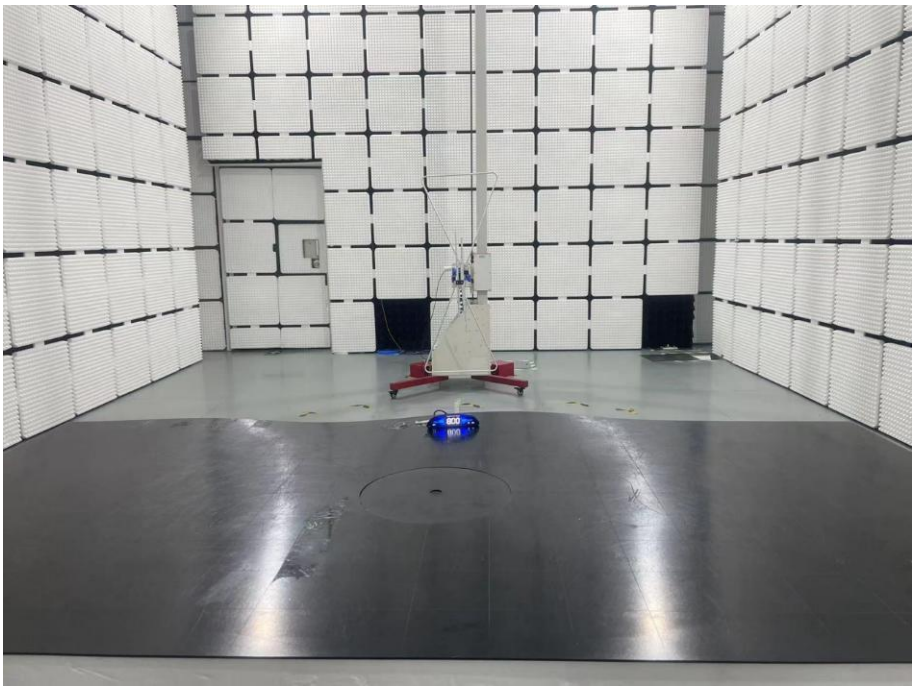


Photo 2 Radiated Emission Test (Above 1G)

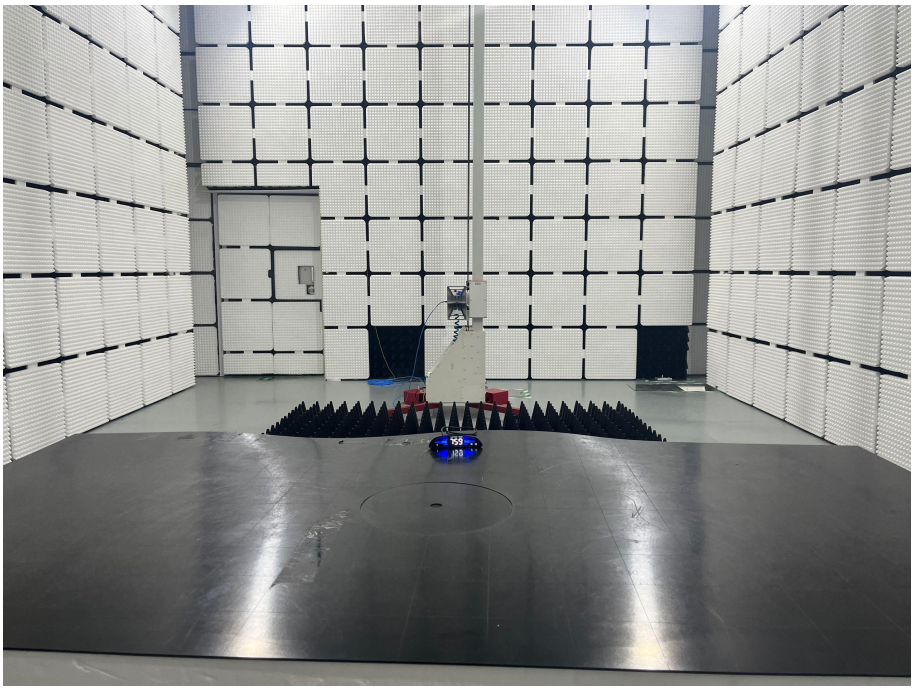


Photo 3 General Appearance of the EUT

Photo 4 General Appearance of the EUT

Photo 5 General Appearance of the EUT

Photo 6 General Appearance of the EUT

Photo 7 General Appearance of the EUT

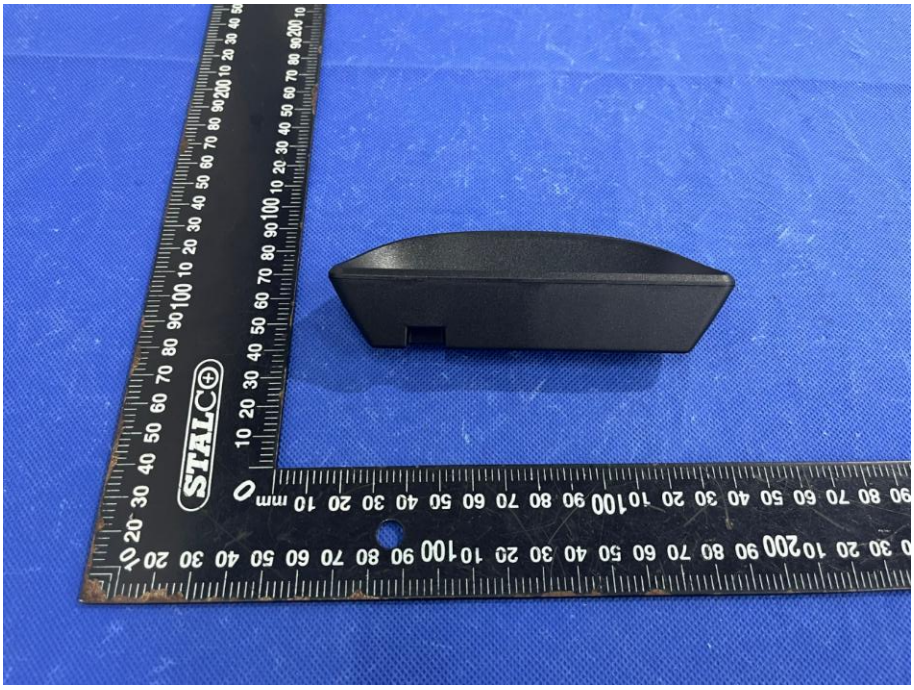


Photo 8 General Appearance of the EUT

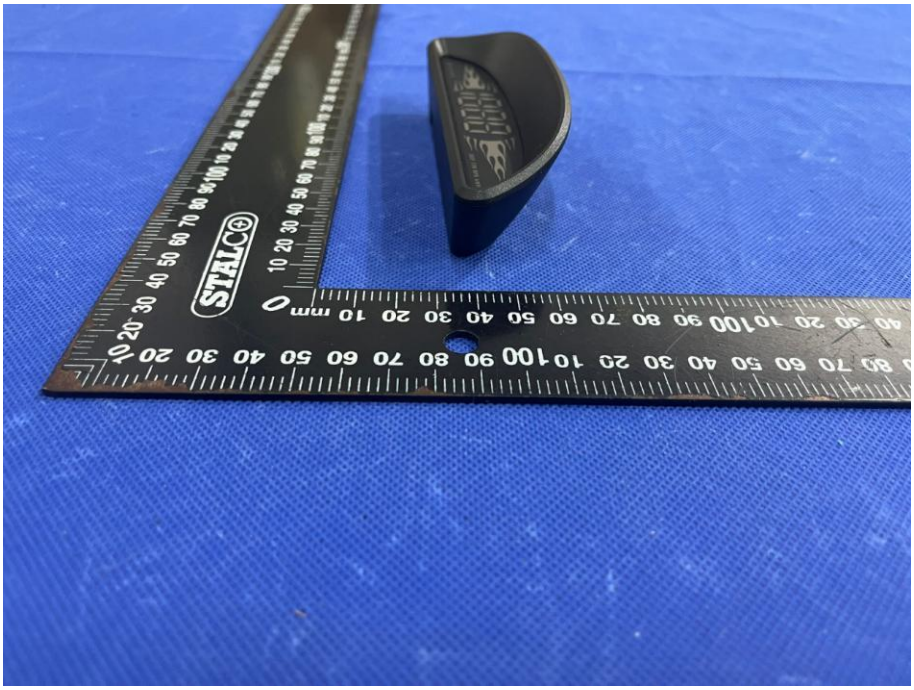


Photo 9 General Appearance of the EUT

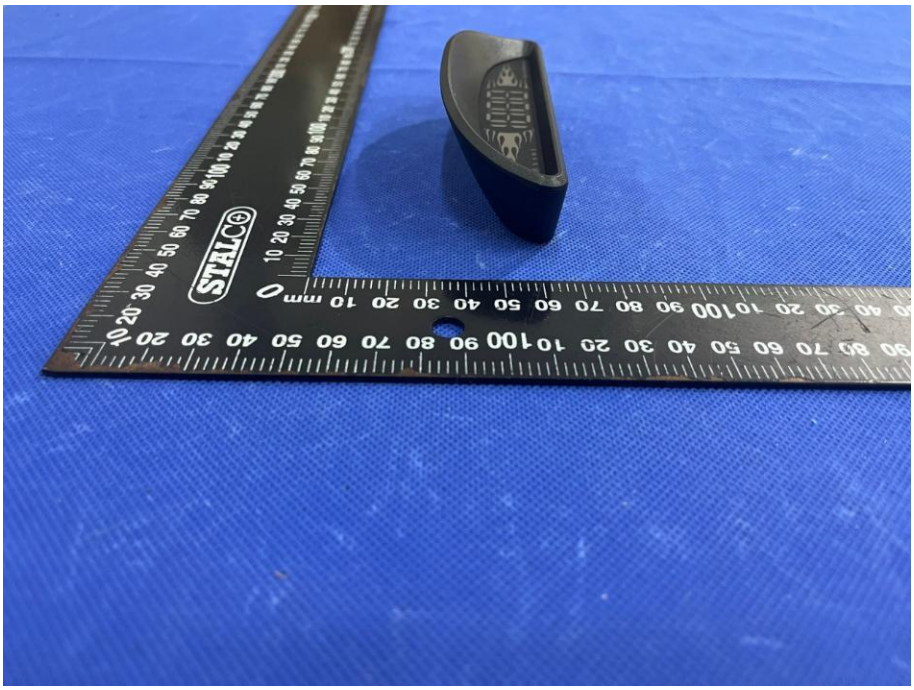


Photo 10 General Appearance of the EUT

Photo 11 General Appearance of the EUT

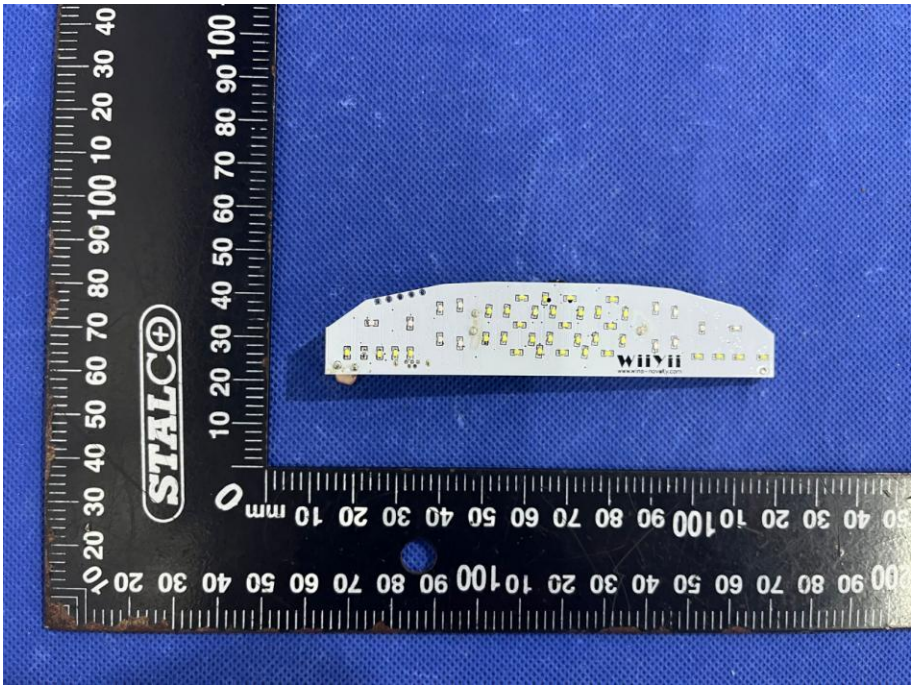


Photo 12 General Appearance of the EUT

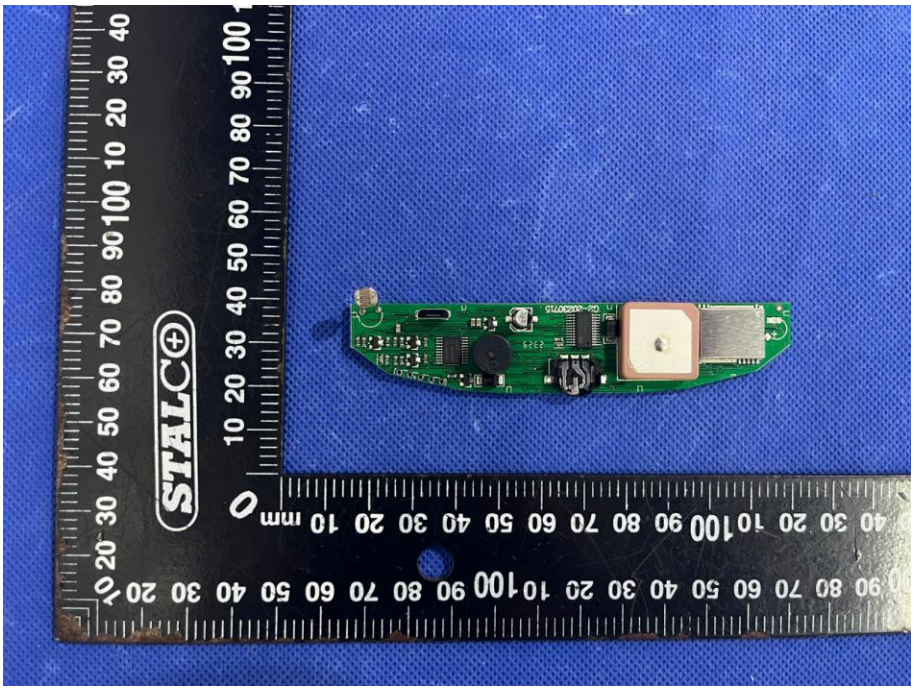
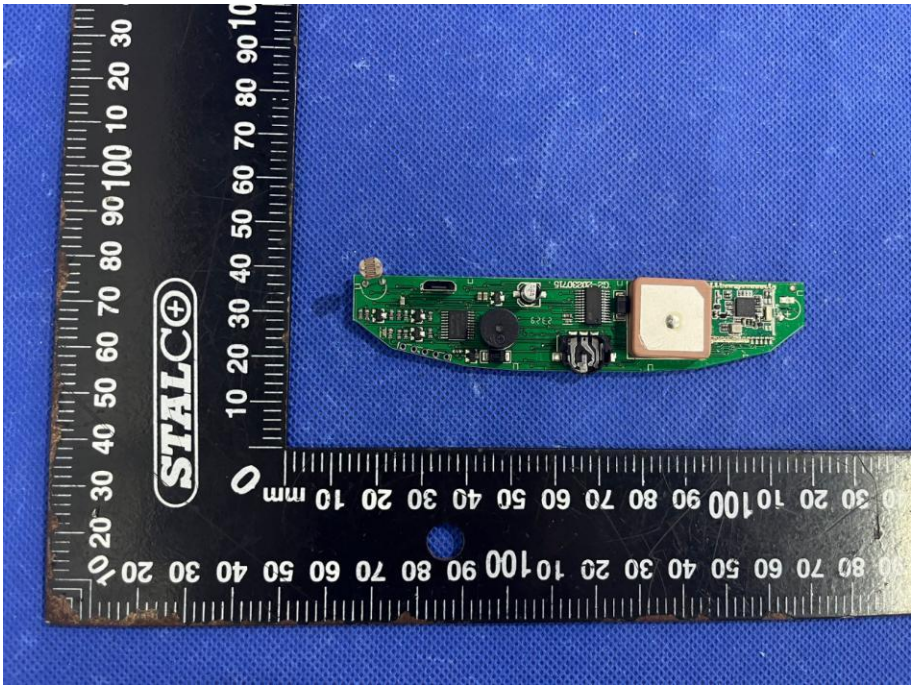


Photo 13 General Appearance of the EUT



******END OF REPORT******