APPLICATION FOR EMC DIRECTIVE

On Behalf of

Shenzhen Wins Novelty Co.,Ltd

Head Up Display

Trade Name: N/A

Model: T5

Prepared For : **Shenzhen Wins Novelty Co.,Ltd**
2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China

Prepared By : **TMC Testing Services (Shenzhen) Co., Ltd.**
1/F., Block A, Xinshidai Gongrong Industrial Park, No. 2, Shihuan Road, Shilong Community, Shiyan Street, Baoan District, Shenzhen, China
Tel: +86-755- 86642861
Web: www.tmc-lab.com
E-mail: Cert@tmc-lab.com

Date of Test : November 11, 2022-November 16, 2022
Date of Report : November 17, 2022
Report Number : MK22080024-P01E02

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TEST REPORT DECLARATION

Applicant	:	Shenzhen Wins Novelty Co.,Ltd
Address	:	2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
EUT Description	:	Head Up Display
Manufacturer	:	Shenzhen Wins Novelty Co.,Ltd
Address	:	2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Model Number	:	T5

Test Standards:

FCC Part 15, Subpart B, Class B(sDoC), 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 TMC Testing Services (Shenzhen) 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 TMC Testing Services (Shenzhen) Co., Ltd

Prepared by : Peishuang Wu / Assistant

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 TMC approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that TMC 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, TMC 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 TMC, unless the applicant has authorized TMC 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 Wins Novelty Co.,Ltd 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Manufacturer	:	Shenzhen Wins Novelty Co.,Ltd 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Model Number	:	T5

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

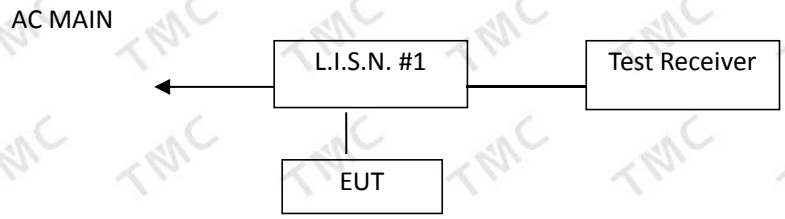
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration time	Recalibration time
1.	Test Receiver	Rohde & Schwarz	ESPI3	101396	Nov.08,22	Nov.07,23
2.	L.I.S.N.	Rohde & Schwarz	ENV216	102723	Nov.22,21	Nov.21,22
3	absorbing clamp	ZHINAN	ZN23201	15037	Nov.08,22	Nov.07,23
4.	Wet and dry thermometer	M&G	ARC92569	N/A	Oct.28,22	Oct.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-7 GHz)	100336	Nov.09,22	Nov.08,23
2.	Broadband antenna	Schwarzbeck	VULB9168	01222	Nov.06,22	Nov.05,23
3.	Horn antenna	Schwarzbeck	BBHA9120D	02476	Nov.13,22	Nov.12,23
4.	Preamplifier	Schwarzbeck	BBV9745	00250	Nov.08,22	Nov.07,23
5.	Preamplifier	N/A	TRLA-01018G 440B	21081001	Nov.08,22	Nov.07,23
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	Oct.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**:** T5

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

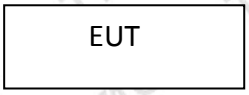
5.7. Test Result

N/A

6. RADIATED EMISSION MEASUREMENT

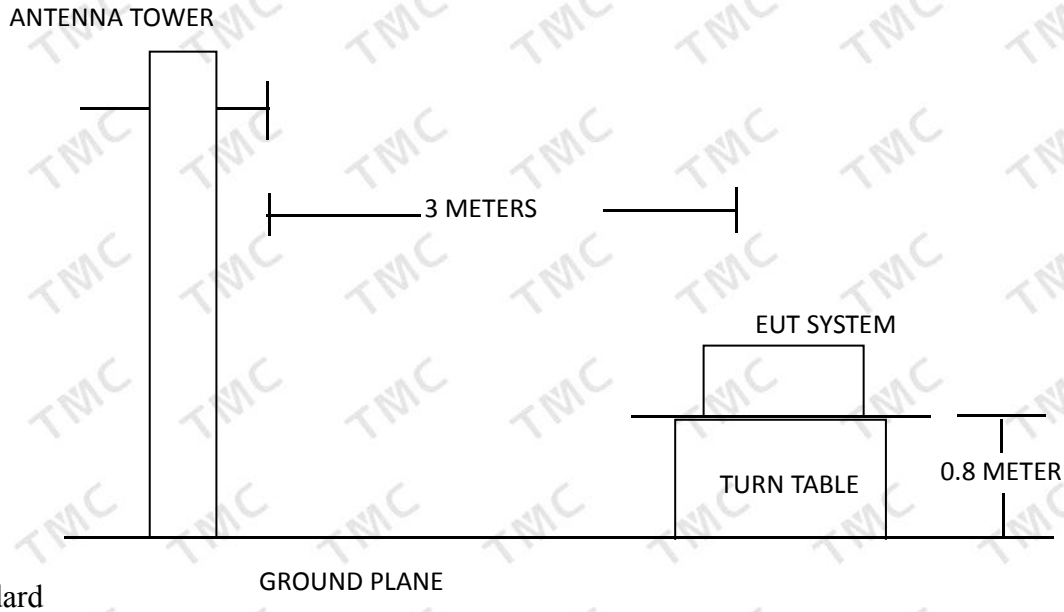
6.1. Block Diagram of EUT Configuration

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



(EUT: Head Up Display)

6.1.2.Anechoic Chamber Test Setup Diagram



6.2. Test Standard

FCC Part 15, Subpart B, Class B

6.3. Radiated Emission Limit (Class B)

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dBμV/m)
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
960 ~ 1000	3	54.0

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

The EUT is placed on a turn table which is 0.8 meter above ground. 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 move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

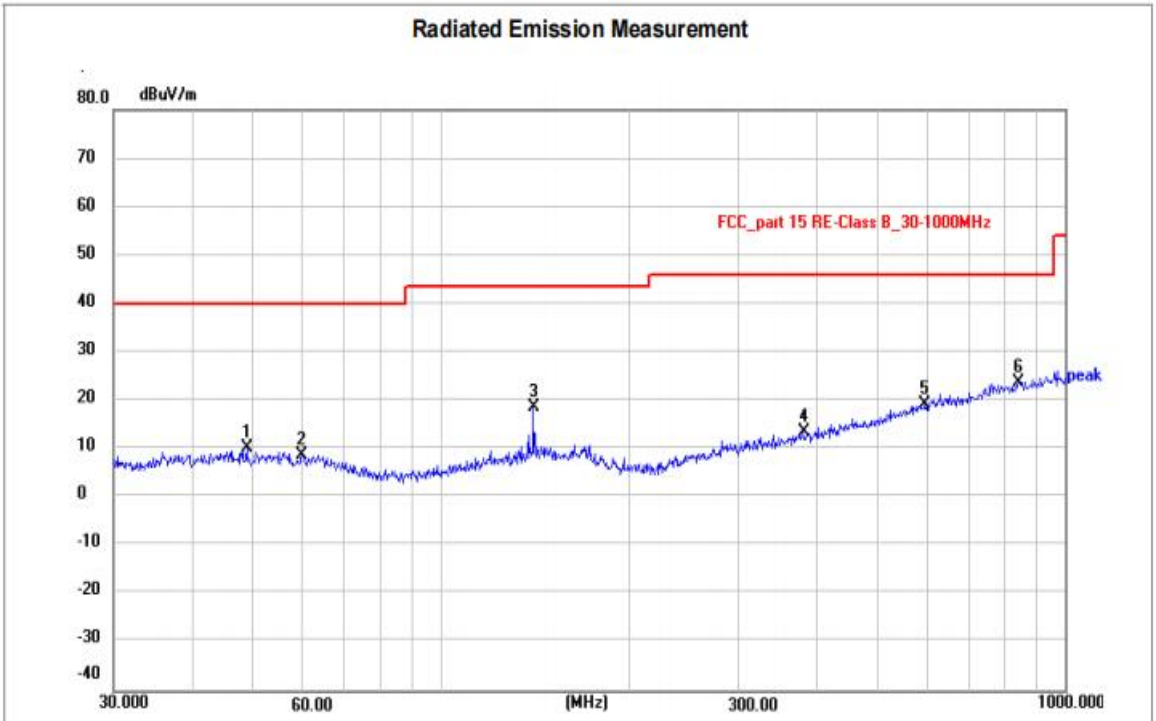
The bandwidth setting on the test receiver (R&S TEST RECEIVER ESCIS28A) is 120 KHz. The EUT is tested in Anechoic Chamber. The frequency range from 30MHz to 1000 MHz is checked. All the test results are listed in Section 6.7. and all the scanning waveform are attached within **Appendix I**

6.7. Test Result

PASS

Test Mode: operating

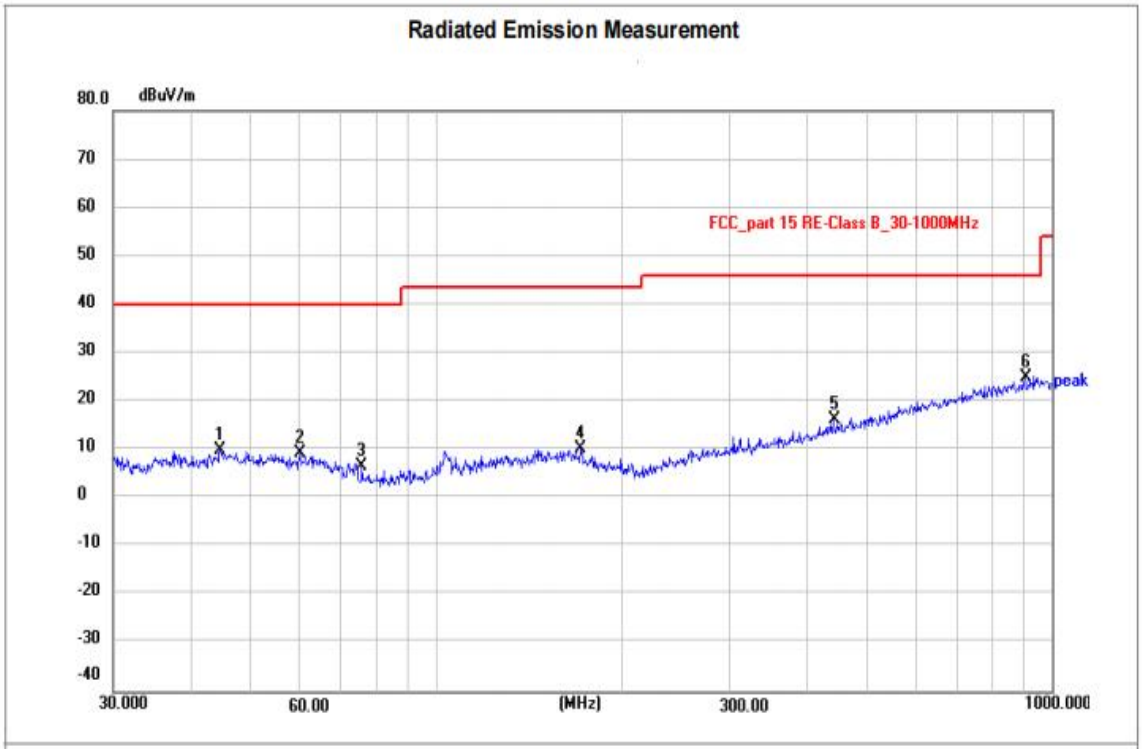
APPENDIX I



Site LAB Polarization: *Horizontal* Temperature: 26(C)

Limit: FCC_part 15 RE-Class B_30-1000MHz Power: Humidity: 54 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	49.0145	26.60	-16.42	10.18	40.00	-29.82	peak	100	25	P	
2	60.0691	25.77	-17.04	8.73	40.00	-31.27	peak	100	25	P	
3	140.8351	35.32	-16.70	18.62	43.50	-24.88	peak	100	25	P	
4	381.2487	27.10	-13.56	13.54	46.00	-32.46	peak	100	25	P	
5	597.2234	27.31	-7.93	19.38	46.00	-26.62	peak	100	25	P	
6 *	842.1296	28.17	-4.27	23.90	46.00	-22.10	peak	100	25	P	



Site LAB Polarization: *Vertical* Temperature: 26(C)

Limit: FCC_part 15 RE-Class B_30-1000MHz Power: Humidity: 54 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	44.7433	26.61	-16.51	10.10	40.00	-29.90	peak	100	0	P	
2	60.2801	26.31	-17.08	9.23	40.00	-30.77	peak	100	0	P	
3	75.9773	26.57	-19.85	6.72	40.00	-33.28	peak	100	0	P	
4	171.9946	26.61	-16.50	10.11	43.50	-33.39	peak	100	0	P	
5	441.7426	28.19	-11.90	16.29	46.00	-29.71	peak	100	0	P	
6 *	903.3094	28.58	-3.72	24.86	46.00	-21.14	peak	100	0	P	

APPENDIX II

Photo 1 Radiated Emission Test

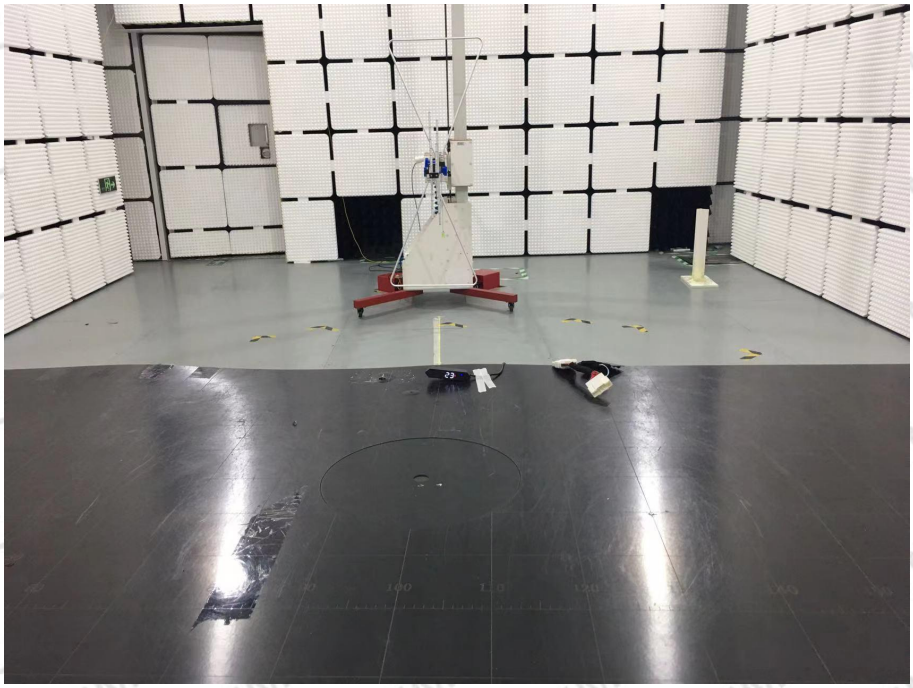


Photo 2 General Appearance of the EUT

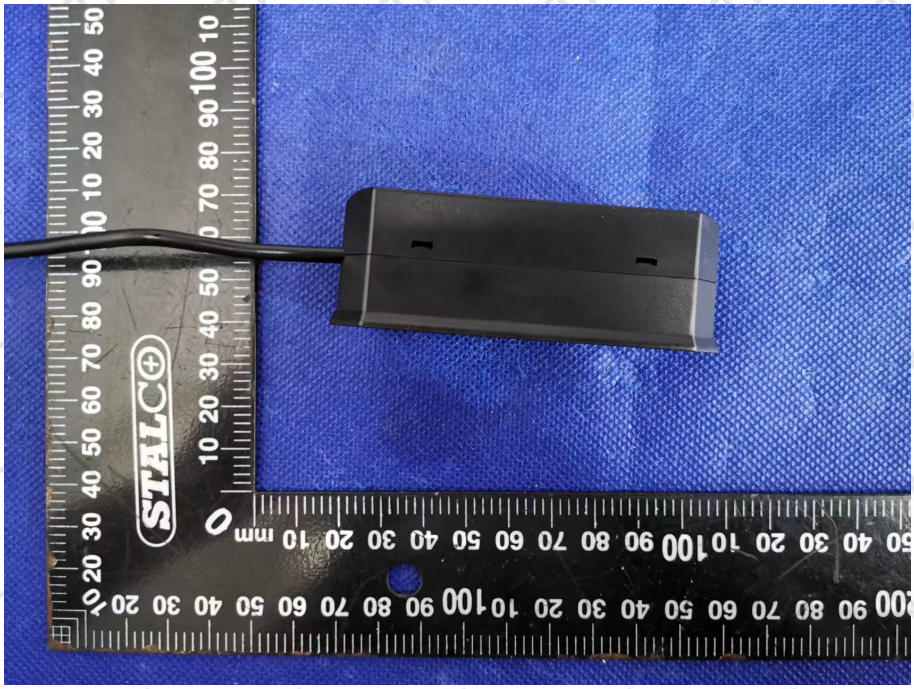


Photo 3 General Appearance of the EUT

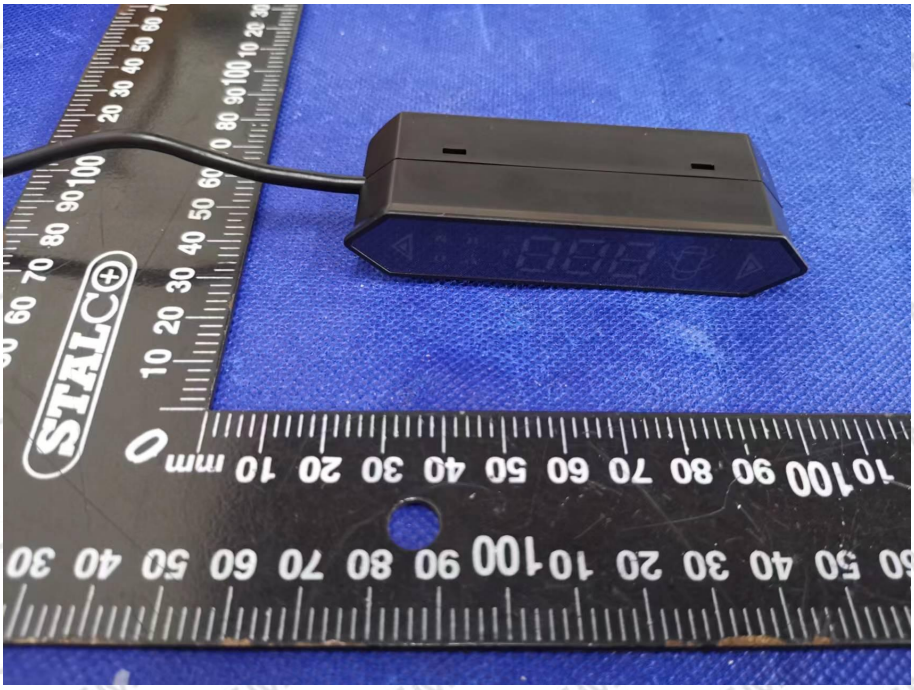


Photo 4 General Appearance of the EUT

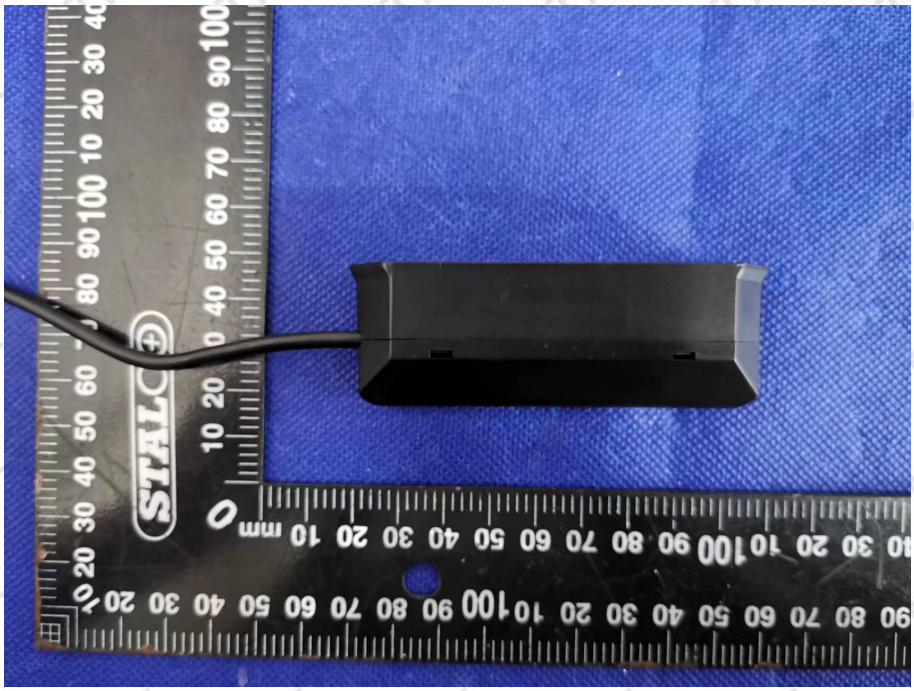
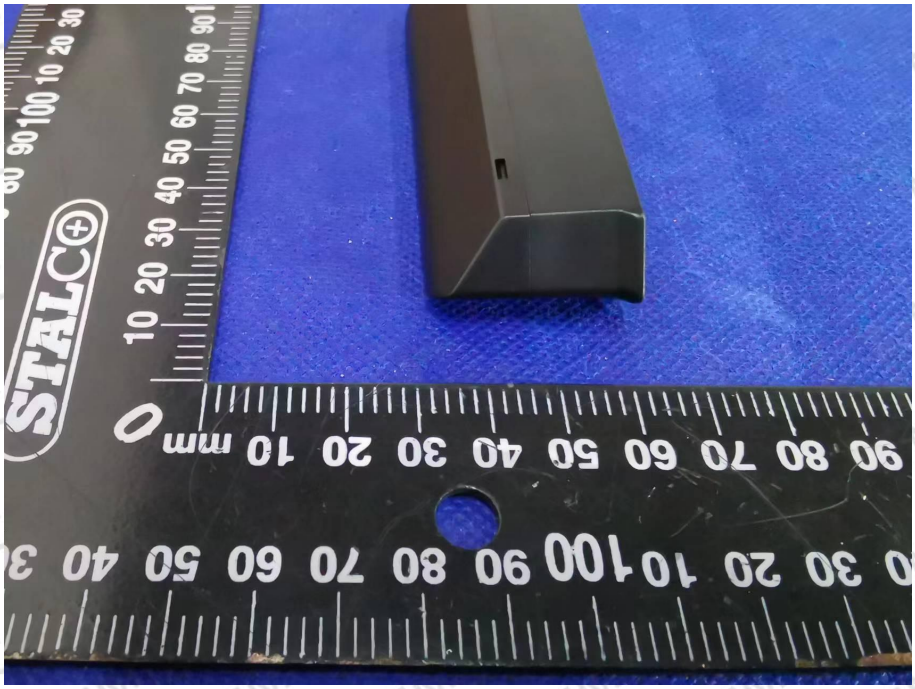


Photo 5 General Appearance of the EUT



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