Verification of compliance Verification of compliance Verification of compliance

Verification of Compliance

Verification No.:	MK23110094P01-C01
Name and address of Applicant:	**Shenzhen Wins Novelty Co.,Ltd** 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Name and address of Manufacturer:	**Shenzhen Wins Novelty Co.,Ltd** 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Product name:	**Head Up Display**
Product model(s):	C7
Product trademark:	N/A

This verification confirms that the product meets the requirements of the following standard.
The conformity was demonstrated based on following standard(s) listed by European Commission as harmonized with Directive RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU

IEC 62321-1:2013	IEC 62321-3-1:2013
IEC 62321-4:2013/AMD1:2017	IEC 62321-5:2013
IEC 62321:6-2015	IEC 62321-7-1:2015
IEC 62321-7-2:2017	IEC 62321-8:2017

The verification has been carried out in accordance with individual rules and conditions agreed with the applicant. Evaluation has been carried out in accordance with:

Test report(s) No.:	MK23110094P01-C01
Test conducted by:	TMC Testing Services (Shenzhen) Co., Ltd.
Verification issue date:	November 25, 2023

Notes:

This verification refers to the above mentioned product and its conformity in regards of above mentioned standard(s) was proven on test sample.

This verification does not imply meeting all essential requirements, assessment of the series-production or any other restricted Notified Bodies conformity assessment procedure appropriate for the product.

This verification holder shall use this verification in connection to verification of conformity and technical data relevant for the product the verification was issued.

TMC Testing Services (Shenzhen) Co., Ltd.
t:86-755-86642861 cert@tmc-lab.com www.tmc-lab.com
1st Floor, Block A1, Zone A, Xinshidai Gongrong Industrial Park, No. 2, Shihuan Road, Shiyan Street, Baoan District, Shenzhen, China

Bauart geprüft TMC Product Safety We approved

Lab Director
Vivian Jiang

CE

Applicant	Shenzhen Wins Novelty Co.,Ltd
Address	2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Manufacturer	Shenzhen Wins Novelty Co.,Ltd
Address	2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China

The following sample(s) was /were submitted and identified on behalf of the clients as：

Sample Name：	Head Up Display
Model Name:	C7
Trade Name:	N/A
Sample Received Date：	November 21, 2023
Testing Period：	November 21, 2023- November 24, 2023
Report Date:	November 25, 2023
Test Requested：	Selected test (s) in the selected parts as requested by client with the RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU on the restriction of hazardous substances.
Test Method	Please refer to next page(s).
Test Result	Please refer to next page(s).
Test conclusion：	Based upon the performed tests by submitted samples, the test results comply with the limits of the RoHS 2.0 Directive (EU) 2015/863 and (EU)2017/2102 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of

Technical Director

1. Pb, Cd, Cr(VI), Hg, PBBs&PBDEs

Test Method:

A. Disassembly, disjointment and mechanical sample preparation

—Ref. to IEC 62321-2:2021, Disassembly, disjointment and mechanical sample preparation.

B. With reference to IEC 62321-1:2013, tests were performed for the samples indicated by the photos in this report.

(1) Screening – Lead, mercury, cadmium, total chromium and total bromine

—Ref. to IEC 62321-3-1:2013, Screening for Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry.

(2) Wet chemical test method

Test Item(s)	Test Method	Test Equipment	Unit	MDL	Limit
Pb	IEC62321-5:2013	ICP-OES	mg/kg	2	1000
Cd	IEC62321-5:2013	ICP-OES	mg/kg	2	100
Hg	IEC 62321-4:2013 /AMD1:2017	ICP-OES	mg/kg	2	1000
Cr(VI) (Metal)	IEC62321-7-1:2015	UV-Vis	μg/cm2	0.1	0.13
Cr(VI) (Nonmetal)	IEC62321-7-2:2017	UV-Vis	mg/kg	8	1000
PBBs	IEC62321-6:2015	GC-MS	mg/kg	5	100
PBDEs	IEC62321-6:2015	GC-MS	mg/kg	5	1000

Test result(s):

No.	Sample Description	Results of XRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	USB interface metal	BL	BL	BL	BL	---	---	PASS
2	LED	7.24	17.18	BL	BL	84.03	---	PASS
3	Buzzer	23.95	14.78	BL	BL	BL	---	PASS
4	Black plastic case	BL	BL	BL	BL	BL	---	PASS
5	Shield case	BL	BL	BL	68.54	---	---	PASS
6	Ceramic antenna	BL	2.48	BL	7.91	BL	---	PASS
7	Transparent plastic sheet	BL	BL	BL	BL	BL	---	PASS
8	Displayer	BL	BL	BL	BL	BL	---	PASS
9	Screw	BL	BL	BL	BL	---	---	PASS
10	Grey plastic	BL	BL	BL	BL	BL	---	PASS

Remark:

a. It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

b. The XRF screening test for RoHS elements-The reading may be different to the actual content in the sample be of non-uniformity composition.

c. Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS for Cr(VI) and GC/MSD (for PBBs/PBDEs) is recommended to be performed if the concentration exceeds the below warming value according to IEC 62321-3-1:2013.

Attached table 1, XRF screening limits in mg/kg for regulated elements in various matrices:

Element	Polymer Material	Metallic Material	Composite Material
Pb	BL≤700-3σ≤X<1300+3σ≤OL	BL≤700-3σ≤X<1300+3σ≤OL	BL≤500-3σ≤X<1500+3σ≤OL
Cd	BL≤70-3σ≤X<130+3σ≤OL	BL≤70-3σ≤X<130+3σ≤OL	LOD<X<150+3σ≤OL
Hg	BL≤700-3σ≤X<1300+3σ≤OL	BL≤700-3σ≤X<1300+3σ≤OL	BL≤500-3σ≤X<1500+3σ≤OL
Cr	BL≤700-3σ<X	BL≤700-3σ<X	BL≤500-3σ<X
Br	BL≤300-3σ<X	--	BL≤250-3σ<X

XRF detection limits in mg/kg for regulated elements in various material

Element	Polymer Material	Metallic Material	Composite Material
Pb	10	50	50
Cd	10	50	50
Hg	10	50	50
Cr	10	50	50
Br	10	50	50

Note：

-BL = Under the XRF screening limit

-OL = Furture chemical test will be conducted while result is above the screening limit

-X = inconclusive, the region where need further chemical testing by ICP-OES (for Pb, Cd, Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs).

-3σ=The reproducibility of analytical instruments

-LOD=Detection limit

"---" = Not Applicable

- mg/kg=0.0001%

- N.D.=Not Detected(<MDL)

- MDL = Method Detection Limit

-Negative = Absence of Cr(VI), the detected Cr(VI) concentration in the boiling water extraction solution is less than 0.02 mg/kg with 50cm2 sample surface area used.

-*=According to 2011/65/EU Annex,point 6-Lead as an alloying element is steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight and as a copper alloy, containing up to 4% lead by weight can be exempted.

▲= According to the customer's statement, the sample involves EU RoHS Directive 2011/65/EU exemption Article 6(c)-I: The lead content in copper alloys does not exceed 4% by mass.

2. Phthalates—DBP, BBP, DEHP & DIBP

Test Item(s)	Test Method	Test Equipment	Unit	MDL	Limit
Dibutyl Phthalate(DBP)	IEC62321-8:2017	GC-MS	mg/kg	30	1000
Benzylbutyl Phthalate (BBP)	IEC62321-8:2017	GC-MS	mg/kg	30	1000
Di-(2-ethylhexyl) Phthalate(DEHP)	IEC62321-8:2017	GC-MS	mg/kg	30	1000
Diisobutyl phthalate (DIBP)	IEC62321-8:2017	GC-MS	mg/kg	30	1000

Test result(s):

No.	Test item (mg/kg)				Conclusion
	DBP	BBP	DEHP	DIBP	
2	N.D.	N.D.	N.D.	N.D.	PASS
3	N.D.	N.D.	N.D.	N.D.	PASS
4	N.D.	N.D.	N.D.	N.D.	PASS
6	N.D.	N.D.	N.D.	N.D.	PASS
7	N.D.	N.D.	N.D.	N.D.	PASS
8	N.D.	N.D.	N.D.	N.D.	PASS
10	N.D.	N.D.	N.D.	N.D.	PASS

Note：

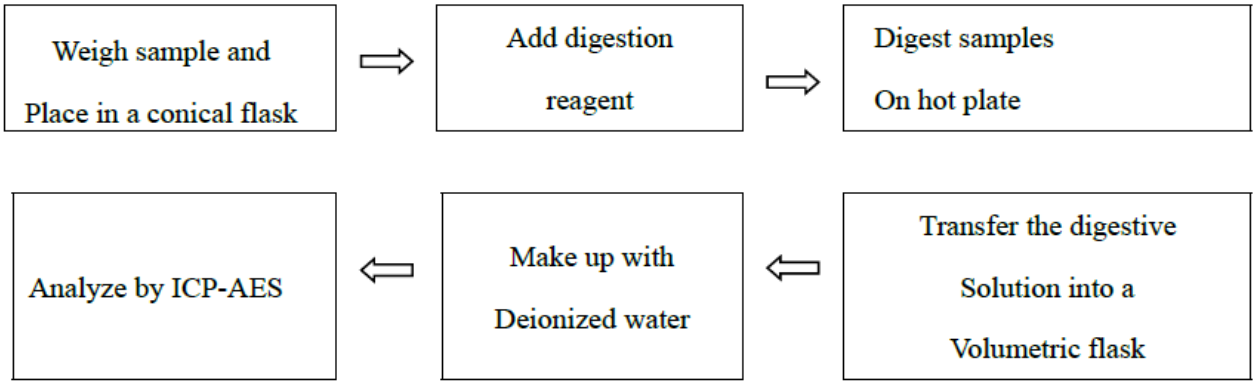
- mg/kg=0.0001%

-ND=Not Detected(<MDL)

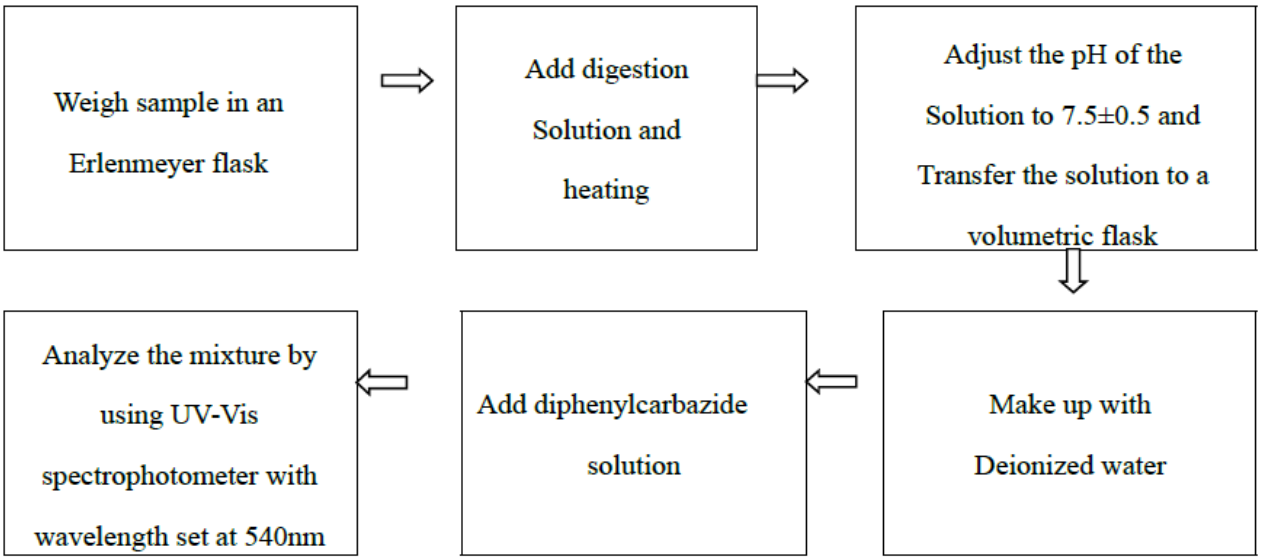
-*1 = The samples were resubmitted on

Test Process:

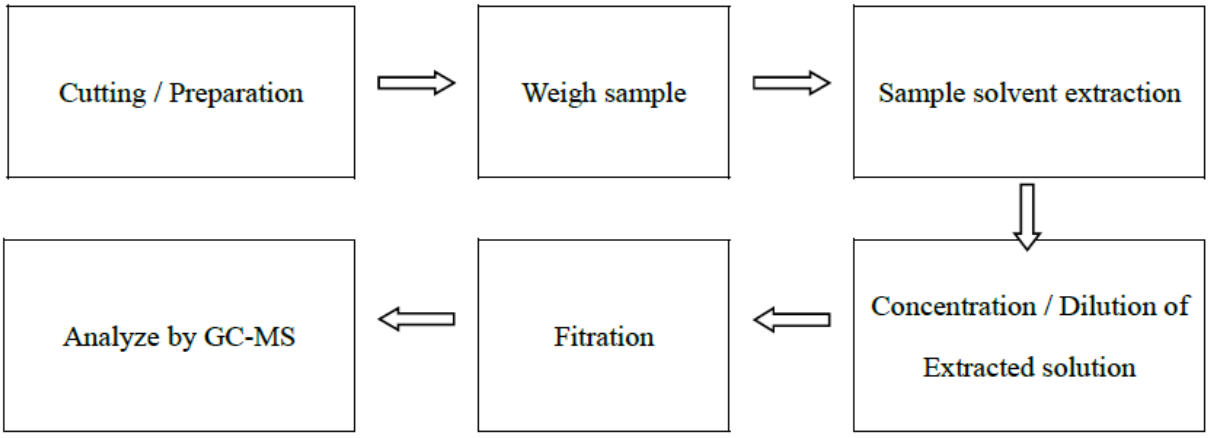
1. Test for Cd/Pb /Hg



2. Test for Chromium (VI) Content



3. Test for PBBs/PBDES/DIBP/DBP/BBP/DEHP Content



Sample photo:

END OF REPORT

BSL

SDoC's Compliance Information Statement

No.:	BSL23110094P01-E01
Name and address of Applicant:	**Shenzhen Wins Novelty Co.,Ltd** 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Name and address of Manufacturer	**Shenzhen Wins Novelty Co.,Ltd** 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Product name:	**Head Up Display**
Product model(s):	C7
Product trademark:	N/A

The submitted sample of the above equipment has been tested and found to comply with the following requirement of 47 CFR of PART 15.

The assessment of compliance of the product with the requirements relating to FCC rules was based on the following standards and procedure:.

Applicable Standard(s)	Test Report(s) Number
FCC Part 15, Subpart B ANSI C63.4:2014	BSL23110094P01-E01

This statement is part of the full test report(s) and should be read in conjunction with it. This statement is based on an evaluation of one sample of above mentioned product. It does not imply assessment of the production of the product. Without the written approval of BSL Testing Co., Ltd., this statement is not permitted to be reproduced, except in full. It is not permitted to use the test lab's logo

BSL Testing Co., Ltd.
1/F, Building B, Xinshidai GR Park,Shiyan Street, Bao'an District, Shenzhen,Guangdong, 518052, People's Republic of China

Lab Director
Vivian Jiang
November 25, 2023

APPLICATION FOR EMC DIRECTIVE

On Behalf of

Shenzhen Wins Novelty Co.,Ltd

Head Up Display

Trade Name: N/A

Model: C7

Prepared For : **Shenzhen Wins Novelty Co.,Ltd**

2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China

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

1/F, Building B, Xinshidai GR Park,Shiyan Street, Bao'an District, Shenzhen,Guangdong, 518052, People’s Republic of China

Tel: +86-755- 26649703

Date of Test	:	November 21, 2023- November 24, 2023
Date of Report	:	November 25, 2023
Report Number	:	BSL23110094P01-E01

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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	:	C7

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 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

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 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	:	C7

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

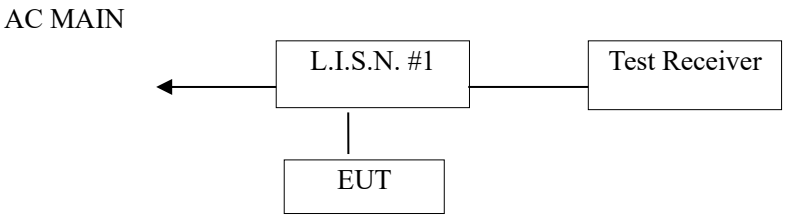
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration time	Recalibration time
1.	Test Receiver	Rohde & Schwarz	ESPI3	101396	Oct.27, 23	Oct.26, 24
2.	L.I.S.N.	Rohde & Schwarz	ENV216	102723	Oct.27, 23	Oct.26, 24
3.	loop antenna	DAZE	ZN30401	19036	Oct.27, 23	Oct.26, 24
4.	Wet and dry thermometer	M&G	ARC92569	N/A	Oct.27, 23	Oct.26, 24
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.27, 23	Oct.26, 24
2.	Broadband antenna	Schwarzbeck	VULB9168	01222	Oct.27, 23	Oct.26, 24
3.	Horn antenna	Schwarzbeck	BBHA9120D	02476	Oct.27, 23	Oct.26, 24
4.	Preamplifier	Schwarzbeck	BBV9745	00250	Oct.27, 23	Oct.26, 24
5.	Preamplifier	N/A	TRLA-01018G440B	21081001	Oct.27, 23	Oct.26, 24
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.27, 23	Oct.26, 24

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**:** C7

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

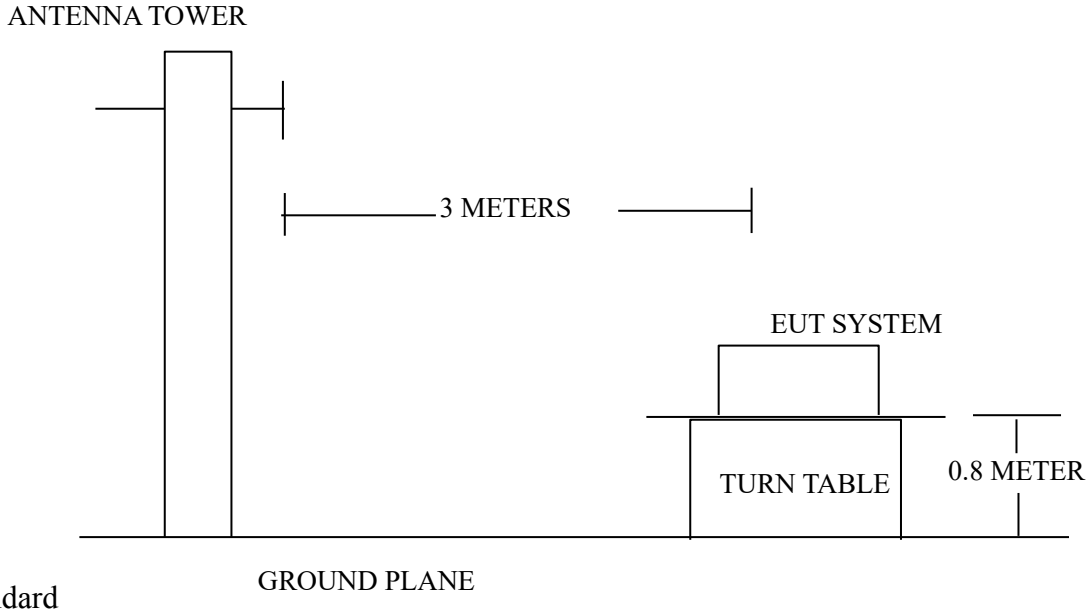
6. RADIATED EMISSION MEASUREMENT

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.

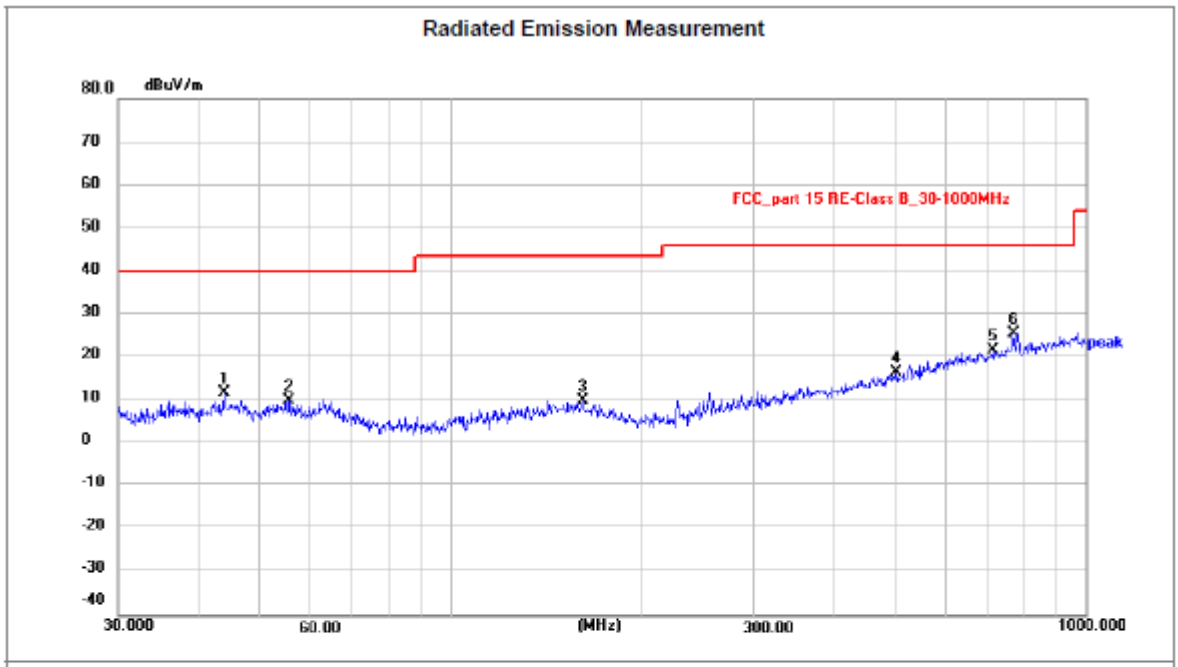
The bandwidth setting on the test receiver (R&S TEST RECEIVER ESCIS28A) is 120 KHz. The EUT is tested in Anechoic Chamber. The frequency range from 30MHz to 1000 MHz is checked. All the test results are listed in Section 6.7. and all the scanning waveform are attached within **Appendix I**

6.7. Test Result

PASS

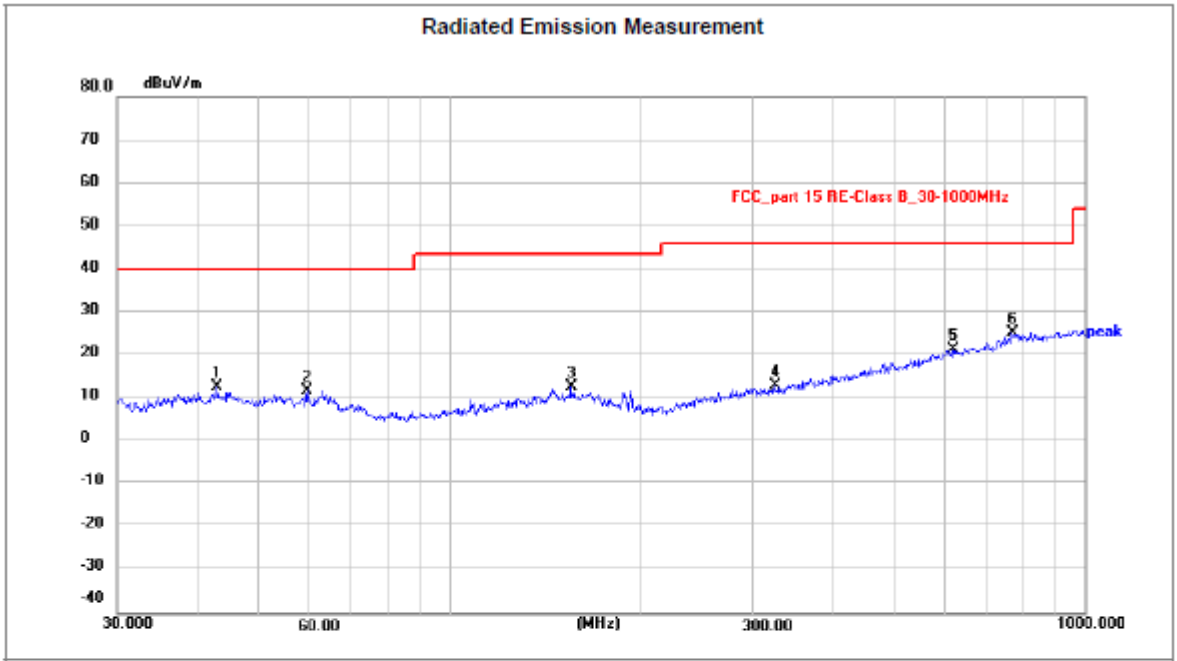
Test Mode: operating

APPENDIX I



Site LAB
Limit: FCC_part 15 RE-Class B_30-1000MHz
Polarization: *Horizontal*
Power: DC5V
Temperature: 26(C)
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	44.1202	28.10	-16.48	11.62	40.00	-28.38	peak	100	360	P	
2	55.8047	26.88	-16.87	10.01	40.00	-29.99	peak	100	360	P	
3	161.4742	25.96	-15.98	9.98	43.50	-33.52	peak	100	360	P	
4	504.7062	27.25	-10.56	16.69	46.00	-29.31	peak	100	360	P	
5	714.1734	27.90	-6.16	21.74	46.00	-24.26	peak	100	360	P	
6 *	768.7482	30.73	-5.05	25.68	46.00	-20.32	peak	100	360	P	



Site LAB
Limit: FCC_part 15 RE-Class B_30-1000MHz
Polarization: *Vertical*
Power: DC5V
Temperature: 26(C)
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	42.8998	29.12	-16.41	12.71	40.00	-27.29	peak	100	360	P	
2	59.6493	28.92	-17.02	11.90	40.00	-28.10	peak	100	360	P	
3	155.3644	28.53	-15.93	12.60	43.50	-30.90	peak	100	360	P	
4	324.4561	27.84	-14.97	12.87	46.00	-33.13	peak	100	360	P	
5	618.5369	28.92	-7.56	21.36	46.00	-24.64	peak	100	360	P	
6 *	768.7482	30.41	-5.05	25.36	46.00	-20.64	peak	100	360	P	

APPENDIX II

Photo 1 Radiated Emission Test

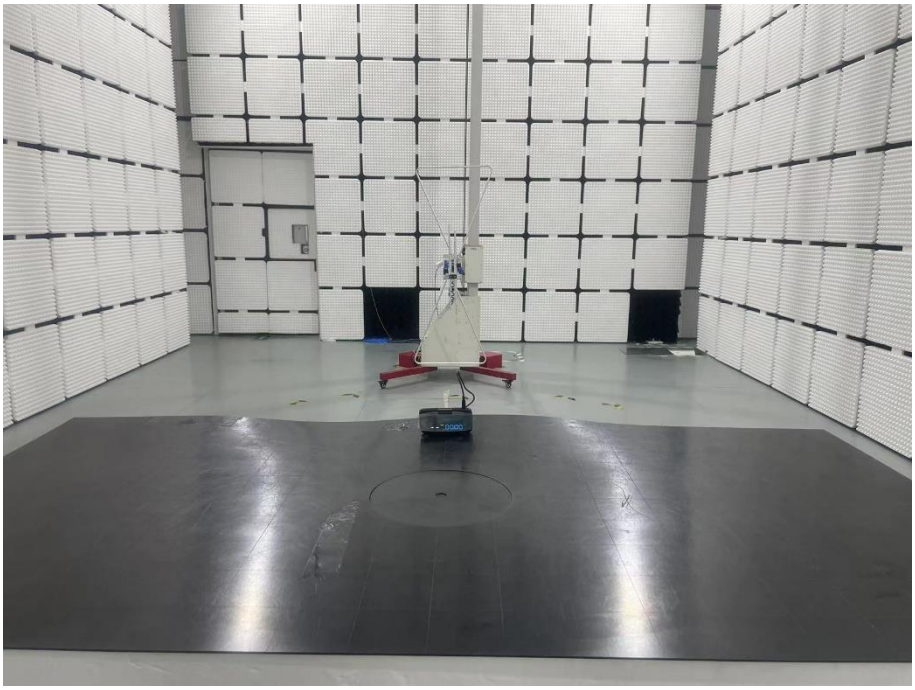


Photo 2 General Appearance of the EUT

Photo 3 General Appearance of the EUT

Photo 4 General Appearance of the EUT

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

Verification of compliance Verification of compliance Verification of compliance

Verification of Compliance

Verification No.:	MK23110094P01-E01
Name and address of Applicant:	**Shenzhen Wins Novelty Co.,Ltd** 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Name and address of Manufacturer:	**Shenzhen Wins Novelty Co.,Ltd** 2F, NO.30 Building, Chentian Industrial Area, Xixiang Street, Bao an district, Shenzhen, China
Product name:	**Head Up Display**
Rated:	5V⎓, 200mA, 1W
Product model(s):	C7
Product trademark:	N/A

This verification confirms that the product meets the requirements of the following standard.
The conformity was demonstrated based on following standard(s) listed by European Commission as harmonized with EMC Directive 2014/30/EU

EN 55032:2015+A11:2020
EN 55035:2017+A11:2020

The verification has been carried out in accordance with individual rules and conditions agreed with the applicant. Evaluation has been carried out in accordance with:

Test report(s) No.:	MK23110094P01-E01
Test conducted by:	TMC Testing Services (Shenzhen) Co., Ltd.
Verification issue date:	November 25, 2023

Notes:

This verification refers to the above mentioned product and its conformity in regards of above mentioned standard(s) was proven on test sample.

This verification does not imply meeting all essential requirements, assessment of the series-production or any other restricted Notified Bodies conformity assessment procedure appropriate for the product.

This verification holder shall use this verification in connection to verification of conformity and technical data relevant for the product the verification was issued.

TMC Testing Services (Shenzhen) Co., Ltd.
t:86-755-86642861 cert@tmc-lab.com www.tmc-lab.com
1st Floor, Block A1, Zone A, Xinshidai Gongrong Industrial Park, No. 2, Shihuan Road, Shiyan Street, Baoan District, Shenzhen, China

Bauart geprüft TMC Product Safety Type approved

Vivian Jiang

CE

APPLICATION FOR EMC DIRECTIVE

On Behalf of

Shenzhen Wins Novelty Co.,Ltd

Head Up Display

Trade Name: N/A

Model: C7

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 21, 2023- November 24, 2023
Date of Report:	November 25, 2023
Report Number:	MK23110094P01-E01

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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
Model Number	:	C7

Test Standards:

EN 55032:2015+A11:2020
EN 55035:2017 +A11:2020

The EUT described above is tested by TMC Testing Services (Shenzhen) Co., Ltd EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. TMC Testing Services (Shenzhen) Co., Ltd EMC Laboratory is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the 2014/30/EU directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Prepared by : Judy chen

Judy Chen/Assistant

Approved & Authorized Signer :

Vivian Jiang / Manager

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Radiated Emission	PASS
Electrostatic Discharge Immunity	PASS
Radiated Electromagnetic Fields Immunity	PASS
Magnetic Field Immunity	PASS

2. GENERAL INFORMATION

2.1. Report information

2.1.1. 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.

2.1.2. 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.

2.1.3. 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.

2.2. Measurement Uncertainty

Available upon request.

3. PRODUCT DESCRIPTION

3.1. 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	:	C7

3.2. Block Diagram of EUT Configuration

3.3. Operating Condition of EUT

Test mode : operating

3.4. Support Equipment List

N/A

3.5. Test Conditions

Temperature: 23-26℃
Relative Humidity: 55-68 %

3.6. Modifications

No modification was made.

3.7. Abbreviations

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
EM	ElectroMagnetic
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
IF	Intermediate Frequency
RF	Radio Frequency
rms	root mean square
EMI	Electromagnetic Interference
EMS	Electromagnetic Susceptibility

3.8. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

4. TEST EQUIPMENT USED

4.1. 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.27, 23	Oct.26, 24
2.	Broadband antenna	Schwarzbeck	VULB9168	01222	Oct.27, 23	Oct.26, 24
3.	Horn antenna	Schwarzbeck	BBHA9120D	02476	Oct.27, 23	Oct.26, 24
4.	Preamplifier	Schwarzbeck	BBV9745	00250	Oct.27, 23	Oct.26, 24
5.	Preamplifier	N/A	TRLA-01018G440B	21081001	Oct.27, 23	Oct.26, 24
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.27, 23	Oct.26, 24

4.2. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Recalibration time
1.	Electrostatic analog generator	LIONCEL	ESD-203B	0210502	Oct.27, 23	Oct.26, 24

4.3. For RF Strength Susceptibility Test

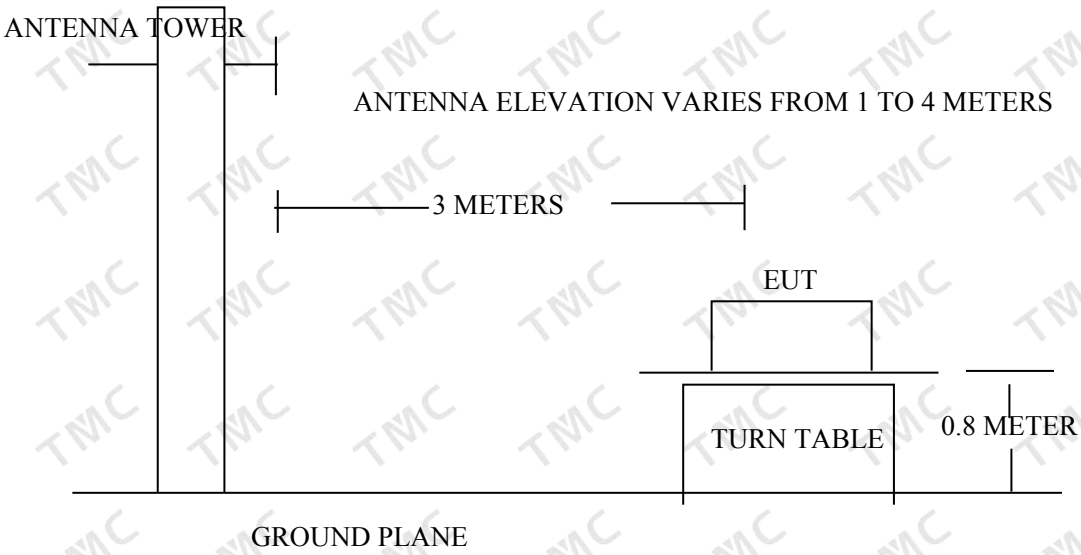
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Recalibration time
1.	Signal Generator	HP	8648A	3633A02081	Oct.27, 23	Oct.26, 24
2.	Amplifier	A&R	500A100	17034	NCR	NCR
3.	Amplifier	A&R	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	A&R	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	A&R	FLW220100	16755	Oct.27, 23	Oct.26, 24
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	A&R	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

4.4. For Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESPI3	101396	Oct.27, 23	Oct.26, 24
2.	loop antenna	ZHINAN	ZN30401	19036	Oct.27, 23	Oct.26, 24
3.	Shielding room	SKET	2021082301	N/A	Aug.23,21	Aug.22,24

5. RADIATED EMISSION TEST

5.1. Open Site Setup Diagram



5.2. Test Standard

EN 55032:2015+A11:2020

5.3. Radiated Emission Limit

All emanations from a Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

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

FREQUENCY (GHz)	DISTANCE (Meters)	Average limit (dBμV/m)	Peak limit (dBμV/m)
1 ~ 3	3	50	70
3 ~ 6	3	54	74

Note :The lower limit applies at the transition frequency.

5.4. EUT Configuration on Test

The EN55032 Class B regulations test method must be used to find the maximum emission during radiated emission test.

5.5. Operating Condition of EUT

5.5.1. Setup the EUT as shown on Section 5.1.

5.5.2. Turn on the power of all equipments.

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

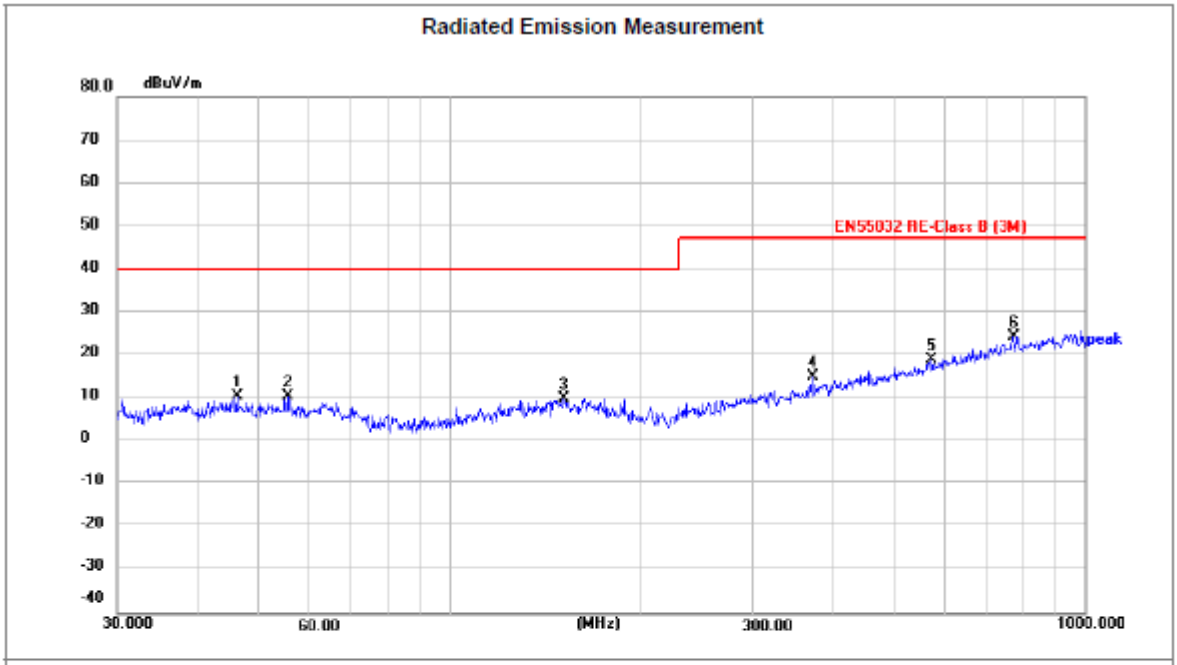
5.6. Test Procedure

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 test.
The bandwidth setting on the test receiver (R&S TEST RECEIVER ESCS20) is 120 KHz.
The EUT is tested in Anechoic Chamber

5.7. Test Results

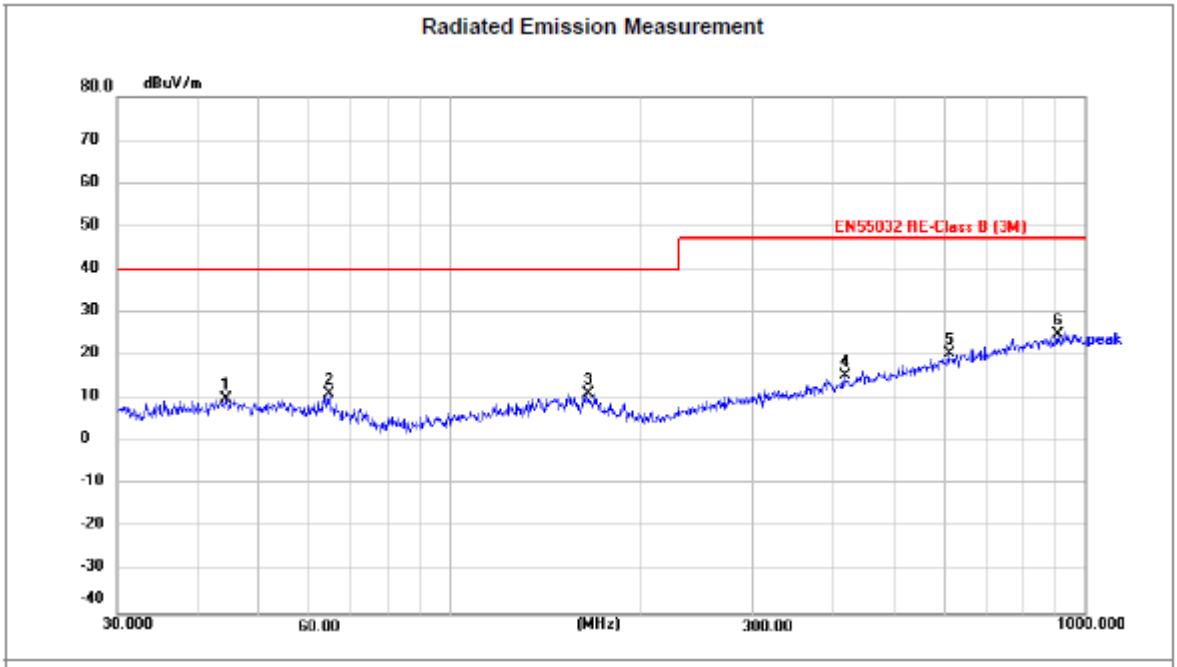
PASS.

Test Mode: operating



Site LAB
Limit: EN55032 RE-Class B (3M)
Polarization: *Horizontal*
Power: DC5V
Temperature: 26(C)
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	46.3402	26.90	-16.49	10.41	40.00	-29.59	peak	100	360	P	
2	55.8047	27.32	-16.87	10.45	40.00	-29.55	peak	100	360	P	
3	151.0666	25.96	-15.93	10.03	40.00	-29.97	peak	100	360	P	
4	373.3112	28.76	-13.76	15.00	47.00	-32.00	peak	100	360	P	
5	574.6258	27.65	-8.58	19.07	47.00	-27.93	peak	100	360	P	
6 *	771.4486	29.27	-5.00	24.27	47.00	-22.73	peak	100	360	P	

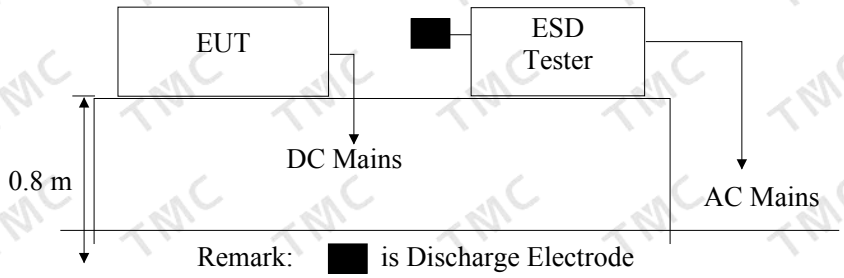


Site LAB
Limit: EN55032 RE-Class B (3M)
Polarization: *Vertical*
Power: DC5V
Temperature: 26(C)
Humidity: 54 %

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	44.4308	26.39	-16.50	9.89	40.00	-30.11	peak	100	360	P	
2	64.6594	28.98	-17.80	11.18	40.00	-28.82	peak	100	360	P	
3	164.9075	27.18	-16.06	11.12	40.00	-28.88	peak	100	360	P	
4	417.6411	27.82	-12.59	15.23	47.00	-31.77	peak	100	360	P	
5	612.0642	27.99	-7.66	20.33	47.00	-26.67	peak	100	360	P	
6 *	906.4824	28.53	-3.69	24.84	47.00	-22.16	peak	100	360	P	

6. ELECTROSTATIC DISCHARGE TEST

6.1. Block Diagram of ESD Test Setup



6.2. Test Standard

EN 55035:2017 +A11:2020
Severity Level 3 for Air Discharge at 8KV
Severity Level 2 for Contact Discharge at 4KV

6.3. Severity Levels and Performance Criterion

6.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

6.3.2. Performance criterion: B

6.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.2.

6.5. Operating Condition of EUT

6.5.1. Setup the EUT as shown in Section 9.1.

6.5.2. Turn on the power of all equipments.

6.5.3. Let the EUT work in test mode (full load) and test it.

6.6. Test Procedure

6.6.1. Air Discharge:

This test is done on a non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT.
After each discharge, the discharge electrode shall be removed from the EUT.
The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

6.6.2. Contact Discharge:

All the procedure shall be same as Section 9.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

6.6.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

6.6.4. Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

6.7. Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

TMC Testing Services (Shenzhen) Co., Ltd

Date: November 25, 2023

Applicant :	Shenzhen Wins Novelty Co.,Ltd	Test Date :	November 23, 2023
EUT :	Head Up Display	Temperature :	22 ℃
M/N :	C7	Humidity :	50 %
Power Supply :	DC5V	Test Mode :	Operating
Test Engineer :	Simon		

Air Discharge: ±8KV For each point positive 10 times and negative 10 times discharge.

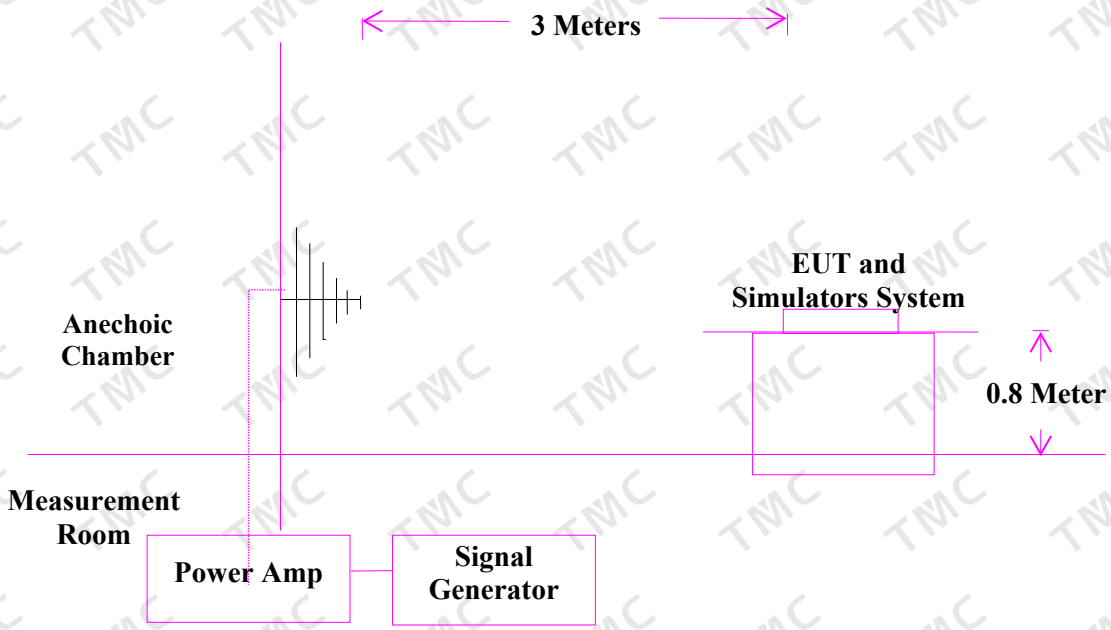
Contact Discharge: ±4KV

Location		**Kind** (A-Air Discharge C-Contact Discharge)	**Result** (PASS)
surface Slots	15 points	Air Discharge	A
interface Slots	6 points	Air Discharge	A
surface	10 points	Air Discharge	A
HCP	8 points	Contact Discharge	A
VCP	8 points	Contact Discharge	A

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

7. RF FIELD STRENGTH SUSCEPTIBILITY TEST

7.1. R/S Test Setup



7.2. Test Standard

EN 55035:2017 +A11:2020
Severity Level 2 at 3V / m

7.3. Severity Levels and Performance Criterion

7.3.1. Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

7.3.2. Performance criterion : A

7.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.2

7.5. Operating Condition of EUT

Setup the EUT as shown in Section 10.1.. The operating condition of EUT are listed in section 3.3.

7.6. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.
In order to judge the EUT performance, a CCD camera is used to monitor the EUT.
All the scanning conditions are as follows **:**

Condition of Test	Remarks
1.Fielded Strength	3 V/m (Severity Level 2)
2.Radiated Signal	Modulated
3.Scanning Frequency	80 - 1000 MHz
4.Sweeping time of radiated	0.0015 decade/s
5.Dwell Time	1 Sec.

7.7. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

TMC Testing Services (Shenzhen) Co., Ltd

Date: November 25, 2023

Applicant :	Shenzhen Wins Novelty Co.,Ltd	Test Date :	November 23, 2023
EUT :	Head Up Display	Temperature :	22 ℃
M/N :	C7	Humidity :	50 %
Power Supply :	DC5V	Test Mode :	Operating
Test Engineer :	Simon	Frequency Range :	80 MHz to 1000 MHz
Modulation:	☑AM ☐Pulse ☐none 1 KHz 80%		
Criterion : A			

	Frequency Rang : 80-1000	
Steps	1%	1%
	Horizontal	Vertical
Front	A(pass)	A(pass)
Right	A(pass)	A(pass)
Rear	A(pass)	A(pass)
Left	A(pass)	A(pass)

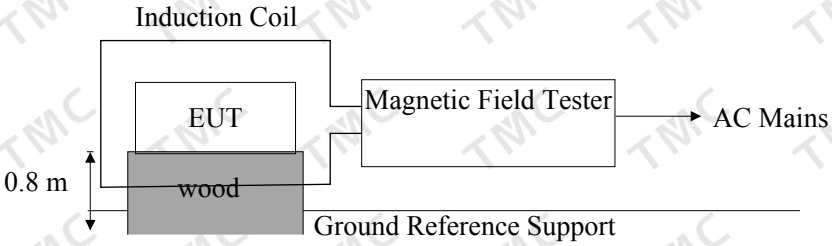
8. MAGNETIC FIELD IMMUNITY TEST

8.1. Block Diagram of Test Setup

8.1.1. Block Diagram of the EUT

(EUT: Head Up Display)

8.1.2. Block Diagram of Test Setup



8.2. Test Standard

EN 55035:2017 +A11:2020
Severity Level 2 at 3V / m

8.3. Severity Levels and Performance Criterion

8.3.1. Severity level

Level	Magnetic Field Strength A/m
1.	1
9.	3
10.	10
11.	30
12.	100
X.	Special

8.3.2 Performance criterion : A

8.4 EUT Configuration on Test

The configuration of EUT are listed in Section 3.2.

8.5 Operating Condition of EUT

8.5.1 Setup the EUT as shown in Section 14.1

8.5.2 Turn on the power of all equipments.

8.5.3 Let the EUT work in test mode (ON) and test it.

8.6. Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 14.1. The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

1.7. Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Results

TMC Testing Services (Shenzhen) Co., Ltd

Applicant: Shenzhen Wins Novelty Co.,Ltd	Test Date : November 23, 2023
EUT : Head Up Display	Temperature :26℃
M/N : C7	Humidity : 60%
Power Supply : DC5V	Test Engineer :Davis

Test Model: ON

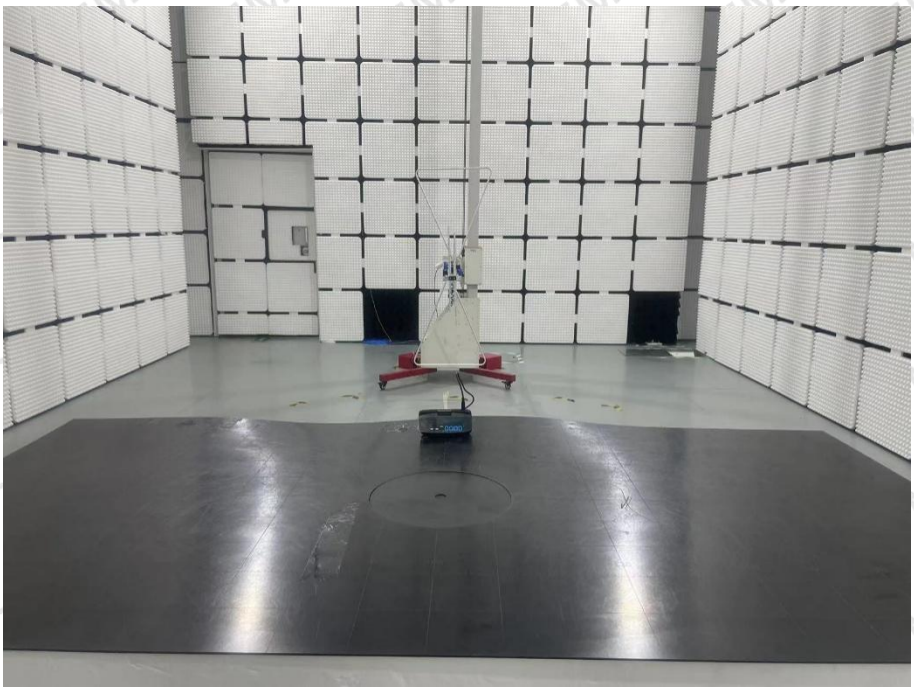
Test Level	Testing Duration	Coil Orientation	Criterion	Result
3A/M	5 mins	Horizontal	A	PASS
3A/M	5 mins	Vertical	A	PASS

Remark:	Test Equipment : Magnetic Field Tester MAG100

APPENDIX I

(TEST SETUP PHOTOGRAPHS)

RADIATED EMISSION MEASUREMENT



ELECTROSTATIC DISCHARGE IMMUNITY

APPENDIX Ⅱ

(Photos of the EUT)

Photo 1 General Appearance of the EUT

Photo 2 General Appearance of the EUT

Photo 3 General Appearance of the EUT

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