

**APPLICATION FOR EMC DIRECTIVE****On Behalf of****Shenzhen Wins Novelty Co., Ltd****Head Up Display****Trade Name: N/A****Model: X3**

Prepared For : **Shenzhen Wins Novelty Co.,Ltd**
3F,Gushu No 1 road (NO. 171), Gushu community, Xixiang
Street,Bao an district,Shen zhen,China

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TABLE OF CONTENTS

TEST REPORT DECLARATION	4
1. TEST RESULTS SUMMARY	5
2. GENERAL INFORMATION	6
2.1. Report information	6
2.2. Measurement Uncertainty	6
3. PRODUCT DESCRIPTION	7
3.1. EUT Description.....	7
3.2. Block Diagram of EUT Configuration	7
3.3. Operating Condition of EUT	7
3.4. Support Equipment List.....	7
3.5. Test Conditions.....	7
3.6. Modifications.....	7
3.7. Abbreviations	8
3.8. Performance Criterion	8
4. TEST EQUIPMENT USED	9
4.1. For Radiated Emission Measurement.....	9
5. RADIATED EMISSION TEST	11
5.1. Open Site Setup Diagram	11
5.2. Test Standard.....	11
5.3. Radiated Emission Limit	11
5.4. EUT Configuration on Test.....	11
5.5. Operating Condition of EUT	11
5.6. Test Procedure	12
5.7. Test Results	12
6. ELECTROSTATIC DISCHARGE TEST	15
6.1. Block Diagram of ESD Test Setup.....	15
6.2. Test Standard.....	15
6.3. Severity Levels and Performance Criterion.....	15
6.4. EUT Configuration on Test.....	15
6.5. Operating Condition of EUT	15
6.6. Test Procedure	15
6.7. Test Results	16
7. RF FIELD STRENGTH SUSCEPTIBILITY TEST	18
7.1. R/S Test Setup	18
7.2. Test Standard.....	18
7.3. Severity Levels and Performance Criterion.....	18
7.4. EUT Configuration on Test.....	18
7.5. Operating Condition of EUT	19
7.6. Test Procedure	19
7.7. Test Results	19
8. MAGNETIC FIELD IMMUNITY TEST	21
8.1. Block Diagram of Test Setup	21
8.2. Test Standard.....	21
8.3. Severity Levels and Performance Criterion.....	21
8.4 EUT Configuration on Test.....	21
8.5 Operating Condition of EUT	22
8.6. Test Procedure	22
1.7. Test Results	22

APPENDIX I	24
APPENDIX II	26

TEST REPORT DECLARATION

Applicant	:	Shenzhen Wins Novelty Co.,Ltd
Address	:	3F,Gushu No 1 road (NO. 171), Gushu community, Xixiang Street,Bao an district,Shen zhen,China
EUT Description	:	Head Up Display
Model Number	:	X3

Test Standards:

EN 55022:2010+AC:2011

EN 55024:2010

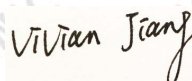
EN 61000-3-2:2014

EN 61000-3-3:2013

The EUT described above is tested by TMC International Inspection & Certification Group 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 International Inspection & Certification Group 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 2004/108/EC 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 :



Assistant

Reviewer :

Kevin Chen

Supervisor

Approved & Authorized Signer :


Lemon/ 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

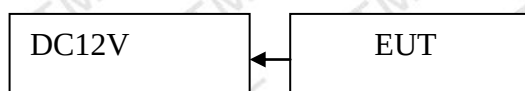
Available upon request.

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description	:	Head Up Display
Applicant	:	Shenzhen Wins Novelty Co.,Ltd 3F,Gushu No 1 road (NO. 171), Gushu community, Xixiang Street,Bao an district,Shen zhen,China
Manufacturer	:	Shenzhen Wins Novelty Co.,Ltd 3F,Gushu No 1 road (NO. 171), Gushu community, Xixiang Street,Bao an district,Shen zhen,China
Model Number	:	X3

3.2. Block Diagram of EUT Configuration



3.3. Operating Condition of EUT

Test mode: on

Note: Discharge is the worst mode

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 or 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

Conducted Susceptibility (CS) :					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Conducted Disturbances test system	SCHLODER	CDG 6000	N/A	2015/05/20
2	Amplifier	SCHLODER	4N100W-6DB	N/A	2015/05/20
3	Dual Directional Coupler	AR	DC2600	302389	2015/05/13
4	6db Attenuator	EMTEST	ATT6/75	0010230A	2015/05/20
5	EM CLAMP	LÜTHI	EM101	335625	2015/05/20
6	CDN	SCHLODER	CDN M2+M3	A2210225/2013	2015/05/20

Harmonic Current/ Voltage Fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Purified Power Source	MToni	PHF 5010	N/A	2015/05/20
2	Harmonic And Flicker Analyzer	Voltech	PM6000	N/A	2015/05/20

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2015/05/22
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESPI	1164.6407.07	2015/05/22
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2015/05/19
4	Controller	EM Electronics	Controller EM 1000	N/A	2015/05/19
5	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2015/05/22

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2015/05/20
2	LISN	ROHDE & SCHWARZ	ENV216	101034	2015/05/19
3	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2015/05/19

RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERATOR	IFR	2032	203002/100	2015/05/22
2	AMPLIFIER	AR	150W1000	301584	2015/05/20
3	DUAL DIRECTIONAL COUPLER	AR	DC6080	301508	2015/05/20
4	POWER HEAD	AR	PH2000	301193	2015/05/20
5	POWER METER	AR	PM2002	302799	2015/05/20

Electrical Fast Transient/Surge/Dips					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.

1	Ultra Compact Simulator	HAEFELY	ECOMPACT4	174887	2015/05/20
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Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	SKYLARK	ESD-2000	0220K10251	2015/05/13

Magnetic Field Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2015/05/20
2	Triple-Loop Antenna	EVERFINE	LLA-2	1008002	2015/05/20
3	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2015/05/20

Disturbance Power					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2015/05/20
2	Absorbing Clamp	EVERFINE	MDS-21	4035	2015/05/22
3	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2015/05/20

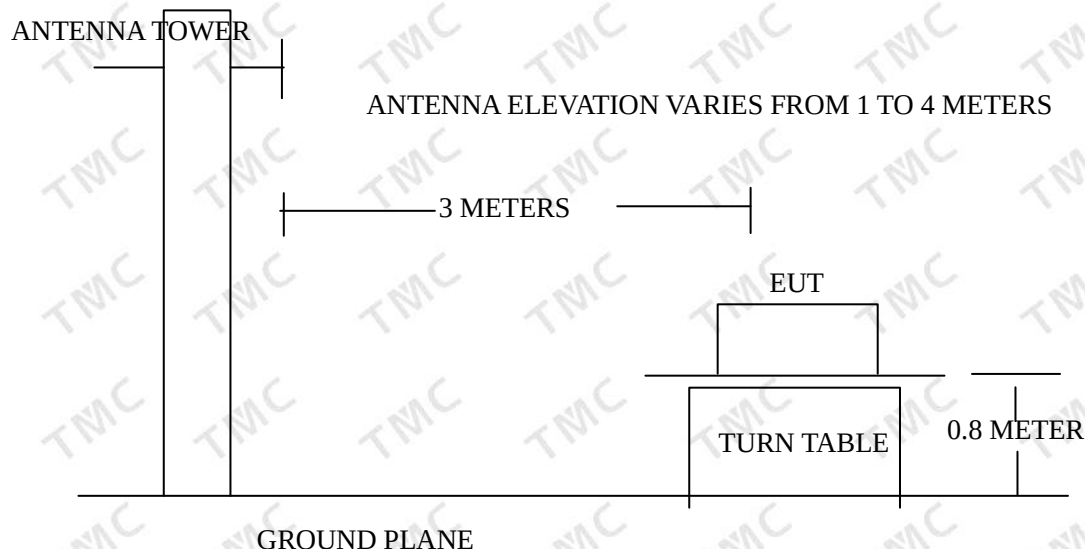
Antenna Terminal					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2015/05/20
2	RF TEST PANNEL	EVERFINE	TS / RSP	335015/ 0017	2015/05/20
3	SIGNAL	BARCO	COSMS	50041	2015/05/20
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2015/05/20

Power Frequency Magnetic Field Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA COMPACT SIMULATOR	EM TEST	UCS500M6	202304/060	2015/05/20
2	MOTOR DRIVEN VOLTAGE TRANSFORMER	EM TEST	MV2616	302205	2015/05/20
3	CURRENT TRANSFORMER	EM TEST	MC2630	302389	2015/05/20
4	MAGNETIC COIL	EM TEST	MS100	0010230A	2015/05/20

Mark: The Cal. Due is 1 year.

5. RADIATED EMISSION TEST

5.1. Open Site Setup Diagram



5.2. Test Standard

EN 55022:2010+AC: 2011

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 (dB μ V/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 (dB μ V/m)	Peak limit (dB μ V/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 EN55022 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.

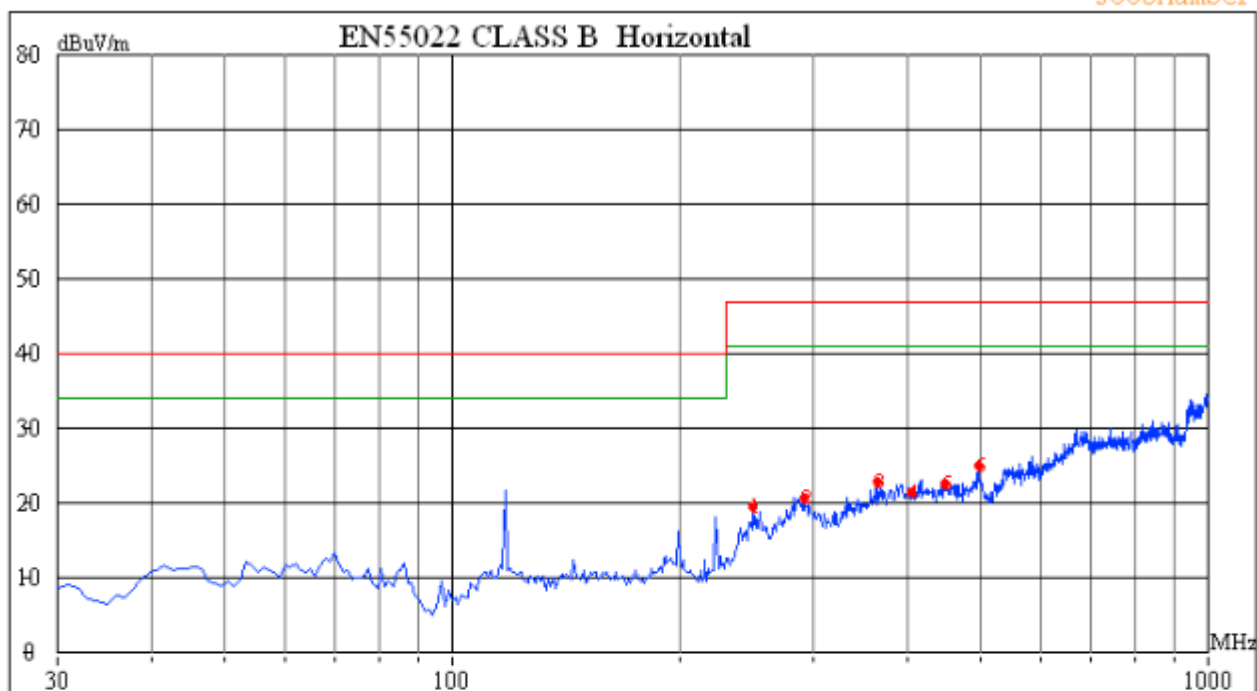
5.6. Test Procedure

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

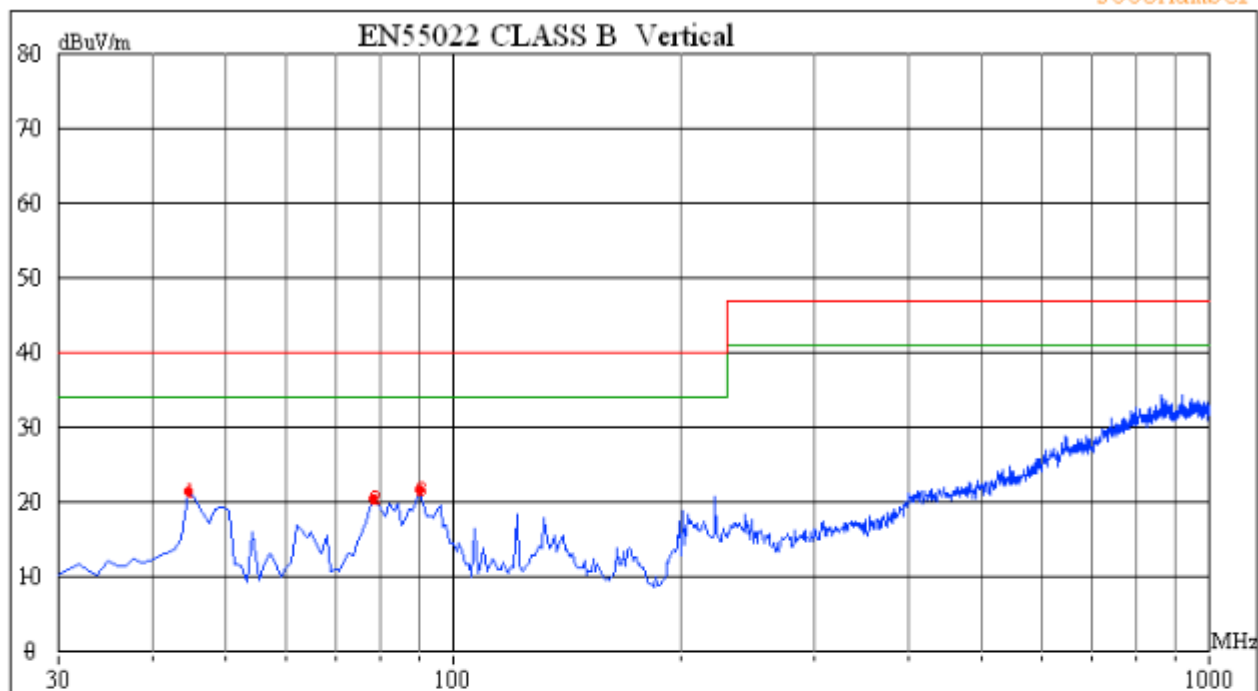
5.7. Test Results

PASS.

Test Mode: operating

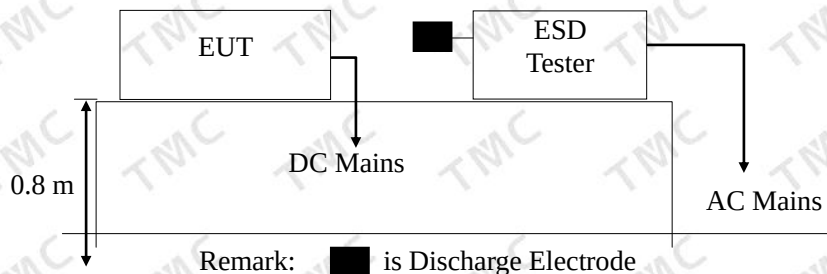
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966Chamber

[illegible]

6. ELECTROSTATIC DISCHARGE TEST

6.1. Block Diagram of ESD Test Setup



6.2. Test Standard

EN 55024:2010

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 International Inspection & Certification Group LTD

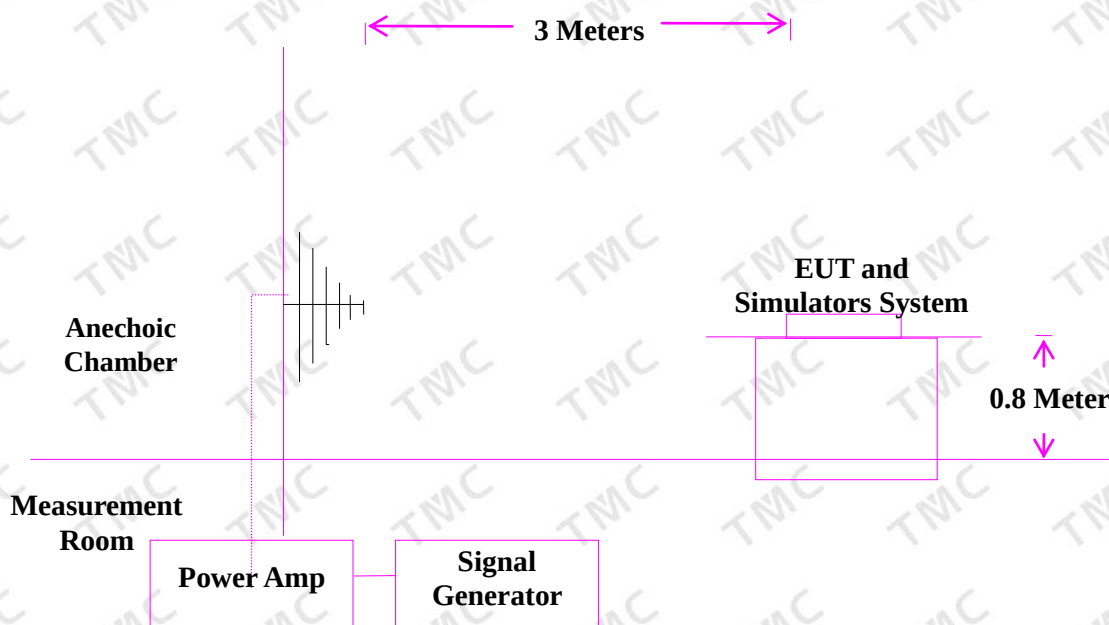
Date: January 28, 2016

Applicant	Shenzhen Wins Novelty Co.,Ltd	Test Date :	January 26, 2016
EUT	Head Up Display	Temperature :	22 °C
M/N	X3	Humidity :	50 %
Power Supply	DC12V	Test Mode :	Operating
Test Engineer			
Air Discharge: $\pm 8KV$ For each point positive 10 times and negative 10 times discharge. Contact Discharge: $\pm 4KV$			
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 55024:2010
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 International Inspection & Certification Group LTD

Date: January 28, 2016

Applicant	Shenzhen Wins Novelty Co.,Ltd	Test Date	January 26, 2016
EUT	Head Up Display	Temperature	22 °C
M/N	X3	Humidity	50 %
Power Supply	DC12V	Test Mode	Operating
Test Engineer		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

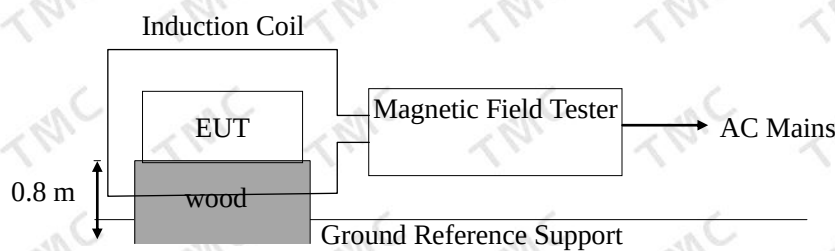
8.1. Block Diagram of Test Setup

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 55024:2010
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

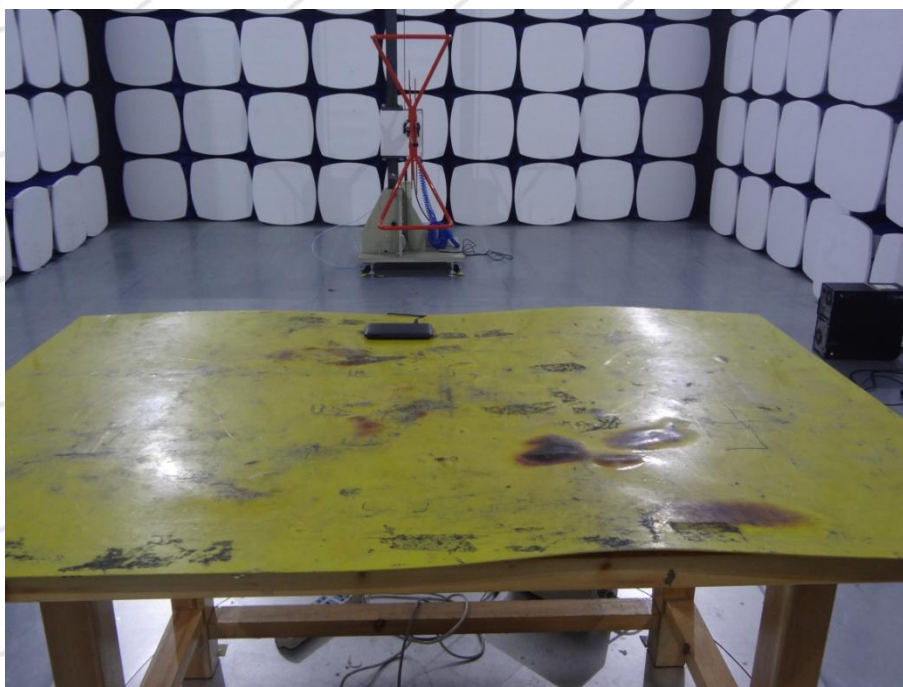
TMC International Inspection & Certification Group LTD

Applicant: Shenzhen Wins Novelty Co.,Ltd EUT : Head Up Display M/N : X3 Power Supply : DC12V			Test Date : January 26, 2016 Temperature : 26 °C Humidity : 60 % Test Engineer : Kelly	
Test Model: <u>ON</u>				
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



ESD TEST



APPENDIX II

(Photos of the EUT)

Photo 1 General Appearance of the EUT(Front)



Photo 2 General Appearance of the EUT(back)

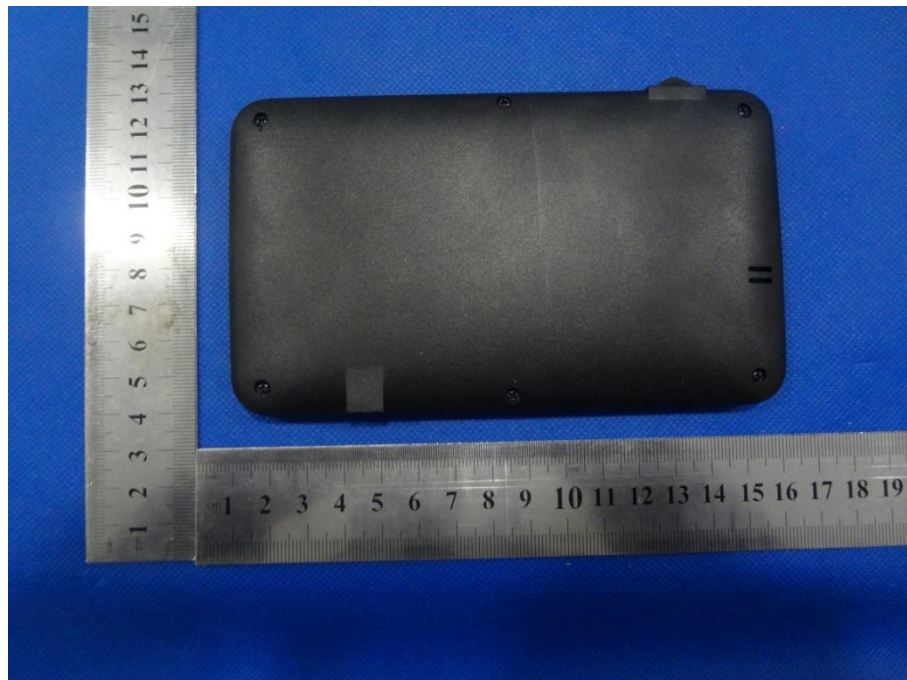


Photo 3 General Appearance of the EUT (side)



Photo 4 General Appearance of the EUT (side)



Photo 5 General Appearance of the EUT (inside)

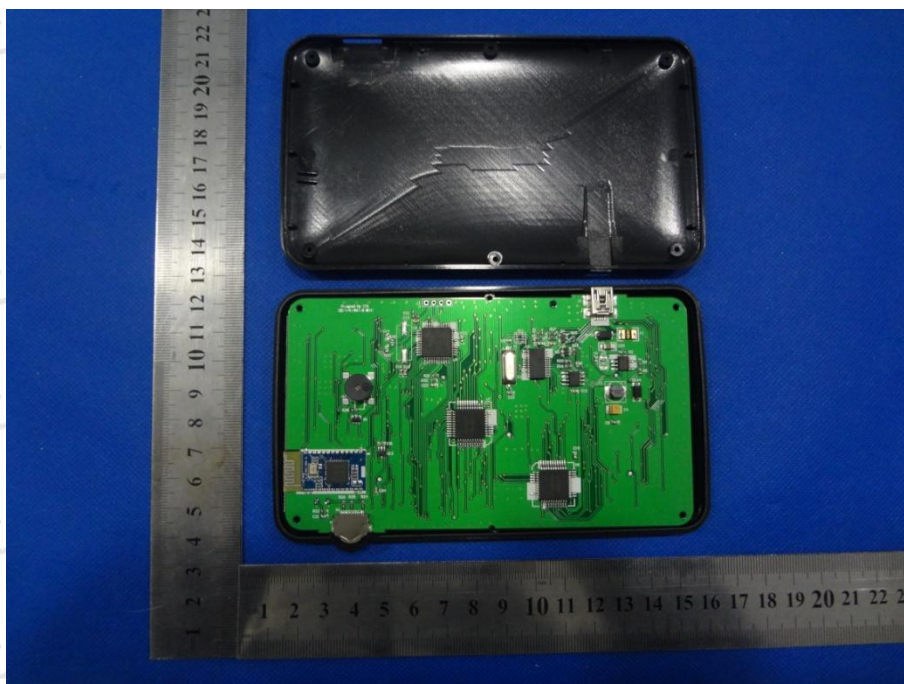


Photo 6 General Appearance of the EUT(inside)

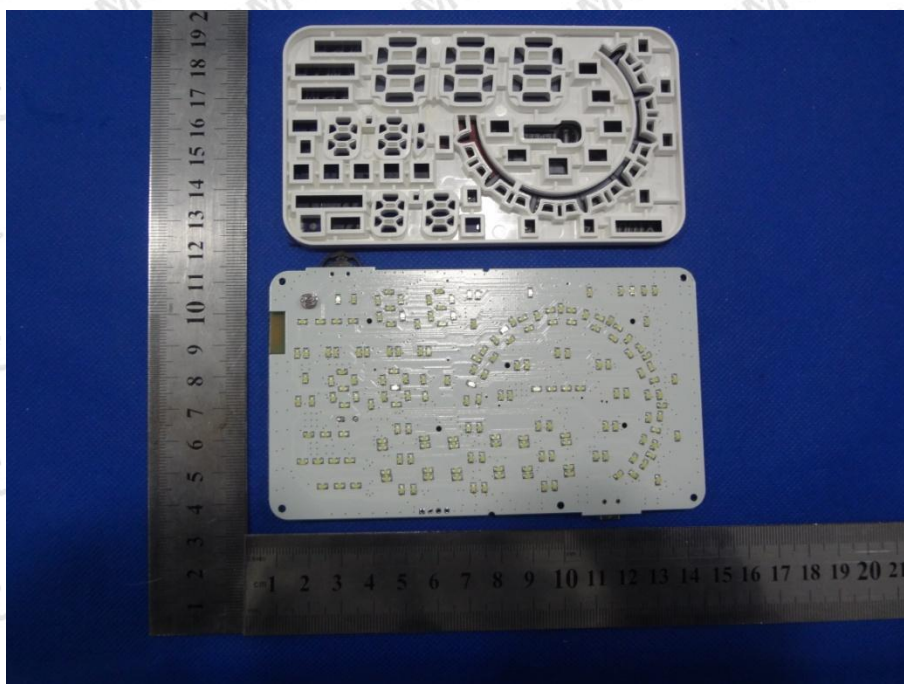


Photo 7 General Appearance of the EUT (PCB)

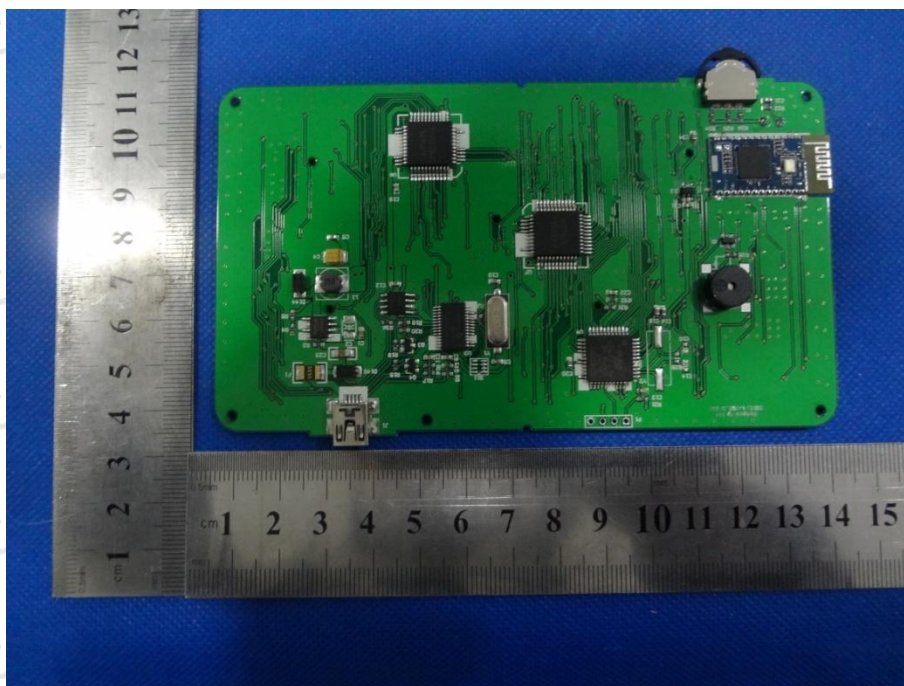
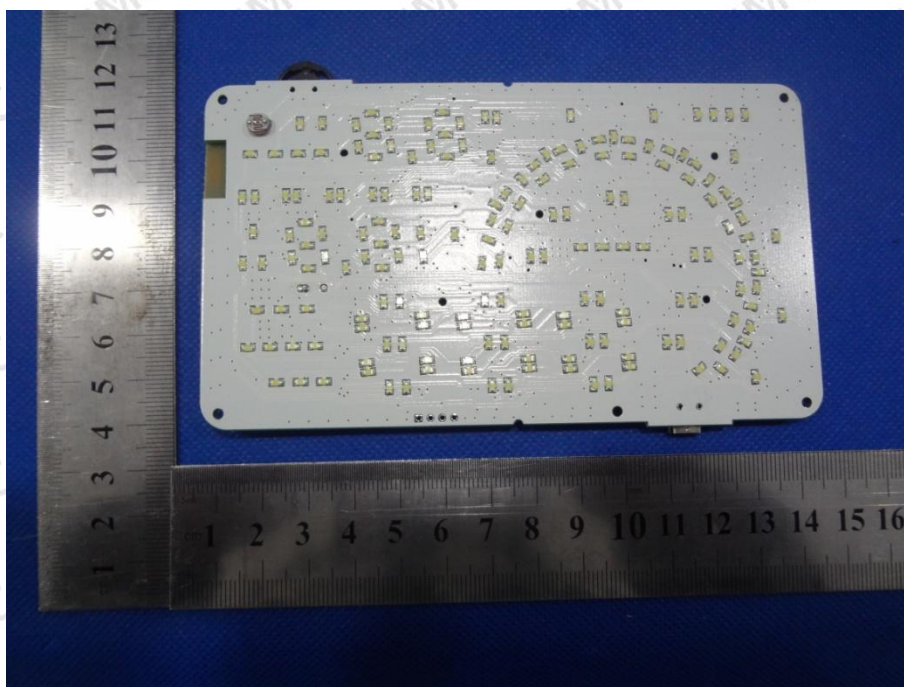


Photo 8 General Appearance of the EUT(PCB)



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