EMC TEST REPORT

For

Shenzhen LED Color Co., Ltd.

Holographic invisible Screen

Test Model: LC-XPA-P3.91

Additional Model No.: Please Refer To Page 9

Prepared for	:	Shenzhen LED Color Co., Ltd.
Address	:	1001, Building 1, 10th Industrial Zone, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Tel	:	+(86) 0755-82591330
Fax	:	+(86) 0755-82591332
Web	:	www.lcs-cert.com
Mail	:	webmaster@lcs-cert.com
Date of receipt of test sample	:	May 29, 2025
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	May 29, 2025 to June 25, 2025
Date of Report	:	July 09, 2025

CE

TEST REPORT

Report No.	:	**LCSA05215280E001**
Date of Issue	:	July 09, 2025
Testing Laboratory Name	:	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address	:	Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure	:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name	:	**Shenzhen LED Color Co., Ltd.**
Address	:	1001, Building 1, 10th Industrial Zone, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Test Specification		
Standard	:	EN 55032:2015/A1:2020 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021 EN 55035:2017/A11:2020
Test Report Form No	:	TRF-4-E-006 A/0
TRF Originator	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF	:	Dated 2011-03

Shenzhen LCS Compliance Testing Laboratory Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen LCS Compliance Testing Laboratory Ltd. is acknowledged as copyright owner and source of the material. Shenzhen LCS Compliance Testing Laboratory Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test Item Description	:	**Holographic invisible Screen**
Trade Mark	:	Color 色彩光电 LED Light
Test Model	:	LC-XPA-P3.91
Result	:	**Pass**

Compiled by:	**Supervised by:**	**Approved by:**
Emma wang / File Administrator	Jelly Li/ Technique principal	Gavin Liang / Manager

TEST REPORT

Test Report No.: LCSA05215280E001	July 09, 2025 Date of issue

Test Model	:	**LC-XPA-P3.91**
EUT	:	Holographic invisible Screen
Applicant	:	**Shenzhen LED Color Co., Ltd.**
Address	:	1001, Building 1, 10th Industrial Zone, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone	:	/
Fax	:	/
Manufacturer	:	**Shenzhen LED Color Co., Ltd.**
Address	:	1001, Building 1, 10th Industrial Zone, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone	:	/
Fax	:	/
Factory	:	**Shenzhen LED Color Co., Ltd.**
Address	:	1001, Building 1, 10th Industrial Zone, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone	:	/
Fax	:	/

Test Result	**Pass**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revision History

Report Version	Issue Date	Revision Content	Revised By
000	June 25, 2025	Initial Issue	/
001	July 09, 2025	This report replaces the report No. LCSA05215280E, and the original report is invalid.	Emma wang

TABLE OF CONTENTS

Test Report Description Page

1. TEST STANDARDS 6
2. SUMMARY OF STANDARDS AND RESULTS 7

2.1 Description of Standards and Results 7
2.2 Description of Test Modes 8
2.3 Description of Performance Criteria 8

3. GENERAL INFORMATION 9

3.1 Description of Device (EUT) 9
3.2 Support equipment List 9
3.3 Description of Test Facility 9
3.4 Measurement Uncertainty 9

4. MEASURING DEVICES AND TEST EQUIPMENT 10
5. EMISSION TEST RESULTS (EMI) 13

5.1 Conducted emissions from AC mains power ports (150kHz-30MHz) 13
5.2 Asymmetric mode conducted emissions (150kHz-30MHz) 16
5.3 Radiated emissions (30MHz-1GHz) 18
5.4 Harmonic current emission 21
5.5 Voltage fluctuations and flicker 25

6. IMMUNITY TEST RESULTS (EMS) 27

6.1 Electrostatic discharges 27
6.2 RF electromagnetic field disturbances 29
6.3 Electrical fast transients / burst for AC mains power ports 31
6.4 Electrical fast transients / burst for analogue/digital data ports 33
6.5 Surges for AC mains power ports 35
6.6 Surges for analogue/digital data ports 37
6.7 Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz) 39
6.8 Continuous induced RF disturbances for analogue/digital data ports (150kHz-80MHz) 41
6.9 Voltage dips and interruptions 43

7. TEST SETUP PHOTOS 45
8. EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS) 50

1. TEST STANDARDS

The tests were performed according to following standards:

EN 55032:2015/A1:2020: Electromagnetic compatibility of multimedia equipment - Emission requirements
EN IEC 61000-3-2:2019/A1:2021: Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16A per phase)
EN 61000-3-3:2013/A2:2021: Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16A per phase and not subject to conditional connection
EN 55035:2017/A11:2020: Electromagnetic compatibility of multimedia equipment - Immunity requirements.

2. SUMMARY OF STANDARDS AND RESULTS

2.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

Description of Test Item	Standard	Limits	Test Engineer	Result
Conducted emissions from AC mains power ports (150kHz-30MHz)	EN 55032:2015/A1:2020	Class B	KL Zheng	Pass
Asymmetric mode conducted emissions (150kHz-30MHz)	EN 55032:2015/A1:2020	Class B	KL Zheng	Pass
Radiated emissions (30MHz-1GHz)	EN 55032:2015/A1:2020	Class B	KL Zheng	Pass
Harmonic current emission	EN IEC 61000-3-2:2019/A1:2021	Class A	KL Zheng	Pass
Voltage fluctuations and flicker	EN 61000-3-3:2013/A2:2021	EN 61000-3-3, Clause 4	KL Zheng	Pass
Electrostatic discharges	EN 55035:2017/A11:2020	Contact Discharge: +/- 4kV Air Discharge: +/- 8kV	KL Zheng	Pass
RF electromagnetic field disturbances	EN 55035:2017/A11:2020	3V/m, 80%, 1kHz Amp. Mod.	KL Zheng	Pass
Electrical fast transients / burst for AC mains power ports	EN 55035:2017/A11:2020	1kV; 5/50ns Tr/Th; 5kHz Repetition Frequency	KL Zheng	Pass
Electrical fast transients / burst for analogue/digital data ports	EN 55035:2017/A11:2020	0.5kV; 5/50ns Tr/Th; 5kHz Repetition Frequency	KL Zheng	Pass
Surges for AC mains power ports	EN 55035:2017/A11:2020	1.2/50μs Tr/Td; 1kV Line to Line; 2kV Line to Ground	KL Zheng	Pass
Surges for analogue/digital data ports	EN 55035:2017/A11:2020	1.2/50μs Tr/Td; 1 and 4 kV Lines to Ground	KL Zheng	Pass
Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)	EN 55035:2017/A11:2020	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.	KL Zheng	Pass
Continuous induced RF disturbances for analogue/digital data ports (150kHz-80MHz)	EN 55035:2017/A11:2020	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.	KL Zheng	Pass
Voltage dips and interruptions	EN 55035:2017/A11:2020	<5% residual voltage for 0.5 periods: B, 70% residual voltage for 25 periods: C, <5% residual voltage for 250 periods: C	KL Zheng	Pass

2.2 Description of Test Modes

No	Title	Description
TM1	Working(AC 230V/50Hz)	Record

2.3 Description of Performance Criteria

General Performance Criteria

Performance Criteria A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criteria B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, 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.

The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criteria 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. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

3. GENERAL INFORMATION

3.1 Description of Device (EUT)

EUT	: Holographic invisible Screen
Test Model	: LC-XPA-P3.91
Additional Model	: LC-XPA-P2.5, LC-XPA-P6.25, LC-XPA-P10, LC-XPB-P2.5, LC-XPB-P3.91, LC-XPB-P6.25, LC-XPB-P10, LC-XPC-P5-10, LC-XPC-P10, LC-XPC-P20, LC-XPD-P2.5, LC-XPD-P3.91, LC-XPD-P6.25, LC-XPD-P10
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Power Supply	: Input: 100-240V, 50/60Hz,300W
Highest Internal Frequency	: f ≤ 108MHz
Classification of Equipment	: Class B

3.2 Support equipment List

Manufacturer	Description	Model	Serial Number	Certificate
/	/	/	/	/

3.3 Description of Test Facility

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

3.4 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emission (150kHz to 30MHz)	± 2.35 dB
Radiated Emission (30MHz to 1000MHz)	± 3.48 dB
Radiated Emission (above 1000MHz)	± 3.90 dB
Voltage Fluctuations & Flicker	± 0.510%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

4. MEASURING DEVICES AND TEST EQUIPMENT

Conducted emissions from AC mains power ports (150kHz-30MHz) Asymmetric mode conducted emissions (150kHz-30MHz)				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
EMI Test Software	Farad	EZ	/	N/A
EMI Test Receiver	R&S	ESR3	102312	2026-03-05
Artificial Mains	R&S	ENV216	101288	2026-05-22
Pulse Limiter	R&S	ESH3-Z2	102750-NB	2026-05-22
Impedance Stabilization Network	TESEQ	ISN T800	45130	2025-10-07

Radiated emissions (30MHz-1GHz)				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
EMI Test Software	AUDIX	E3	/	N/A
By-log Antenna	SCHWARZBECK	VULB9163	01143	2027-07-19
Horn Antenna	SCHWARZBECK	3115	EABF-018	2027-07-19
EMI Test Receiver	R&S	ESR3	102311	2026-05-22
Broadband Preamplifier	/	BBV9745	00317	2025-11-07
EMI Test Receiver	R&S	ESCI7	101173	2025-10-07
By-log Antenna	SchwarzZBECK	VULB9163	01565	2027-07-12
EMI Test Software	Farad	EZ	/	N/A
MXA Signal Analyzer	Agilent	N9020A	MY53290398	2026-05-22

Harmonic current emission Voltage fluctuations and flicker				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
HARMONICS&FLICKER MEASUREMENT SYSTEM	EVERFINE	HFM-3000	P630850CD1411116	2026-03-05
HARMONICS&FLICKER TESTING POWER SOURCE	EVERFINE	HFS-4000	P624486CD14111124	2026-03-05

Electrostatic discharges				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
ESD Simulator	emtest	ESD NX30.1	111969	2026-05-25

RF electromagnetic field disturbances				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2025-10-07
RF POWER AMPLIFIER	SKET	HAP_0306G-50W	/	2026-05-22
RF POWER AMPLIFIER	OPHIR	5225R	1052	2026-05-22
RF POWER AMPLIFIER	OPHIR	5273F	1019	2026-05-22
Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	NCR
Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-484	NCR
RS Electric field probe	narda	EP601	611WX80208	2026-05-22

Electrical fast transients / burst for AC mains power ports Electrical fast transients / burst for analogue/digital data ports				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2026-05-22
Capacitive coupling clamp	3CTEST	EFTC	EC0441098	2026-05-22

Surges for AC mains power ports Surges for analogue/digital data ports				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Immunity Simulative Generator	EM TEST	UCS500-M4	0101-34	2026-05-22
Communication wave lightning generator	HTEC	HTSG 70	181701	2025-10-07
Symmetrical data line coupling network	HTEC	HCN 8	182701	2025-10-07
Data line decoupling network	HTEC	HDEC 8	182702	2025-10-07

Voltage dips and interruptions				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Three phase power supply fault simulator	HTEC	HPFS 2003P	234711	2026-01-06
Programmable AC fault power supply	HTEC	HV3P200T	234710	2026-01-06

Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz) Continuous induced RF disturbances for analogue/digital data ports (150kHz-80MHz)				
Equipment	**Manufacturer**	**Model No**	**Serial No.**	**Due Date**
Simulator	FRANKONIA	CIT-10/75	A126A1195	2026-05-22
CDN	FRANKONIA	CDN-M2+M3	A2210177	2026-05-22
6dB Attenuator	FRANKONIA	DAM25W	1172040	2026-05-22
Electromagnetic coupling injection clamp	ZHINAN	ZN23203	14017	2026-05-22

5. EMISSION TEST RESULTS (EMI)

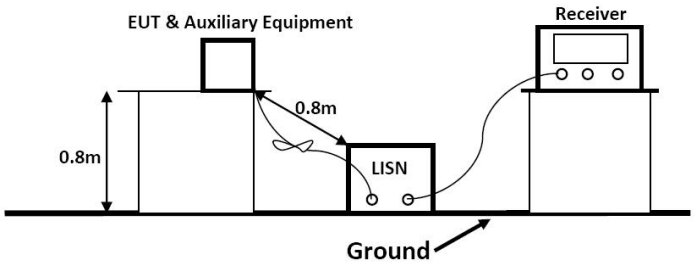
5.1 Conducted emissions from AC mains power ports (150kHz-30MHz)

Test Requirement:	Class B
Test Limit:	**Frequency Range** / **Limit (Quasi-Peak)** / **Limit (Average)** 0.15MHz to 0.5MHz / 66dB(μV) to 56dB(μV) / 56dB(μV) to 46dB(μV) 0.5MHz to 5MHz / 56dB(μV) / 46dB(μV) 5MHz to 30MHz / 60dB(μV) / 50dB(μV) Detector: / Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz
Test Method:	Clause 7 of CISPR 16-2-1:2014/AMD1:2017
Procedure:	An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor

5.1.1 E.U.T. Operation:

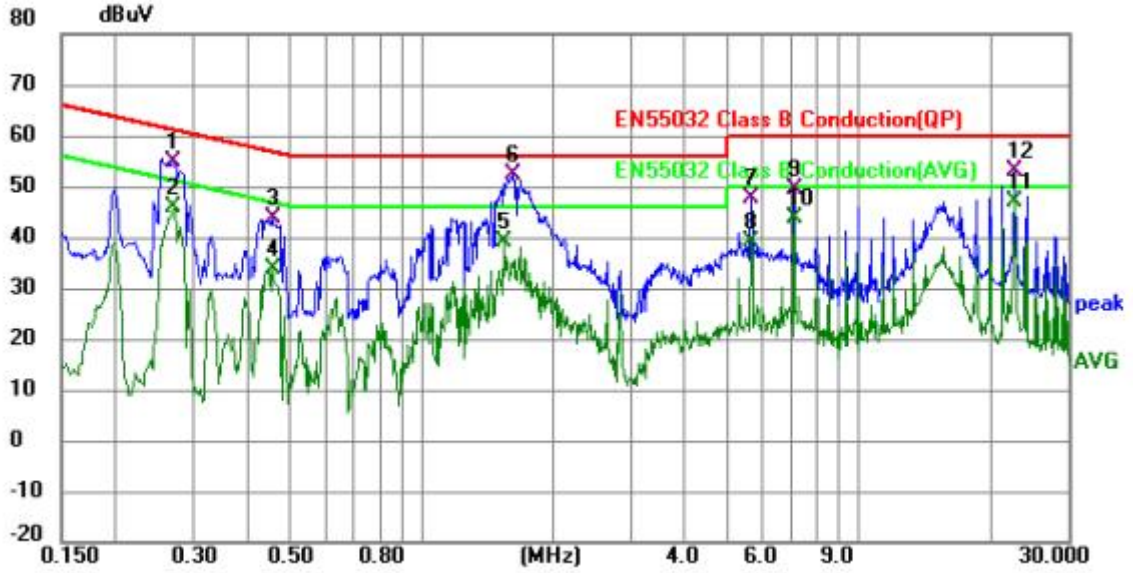
Operating Environment:			
Temperature:	22.7 °C	Humidity:	53.7 %
Pre test mode:	TM1		
Final test mode:	TM1		

5.1.2 Test Setup Diagram:



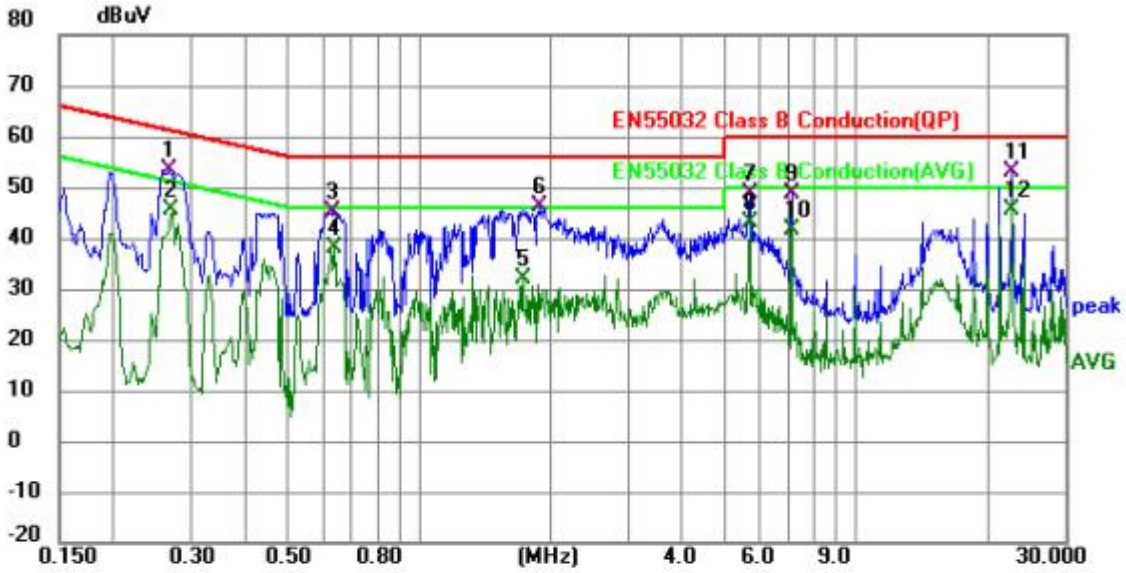
5.1.3 Test Data:

TM1 / Line: Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2714	34.62	20.35	54.97	61.07	-6.10	QP	
2		0.2714	25.55	20.35	45.90	51.07	-5.17	AVG	
3		0.4560	23.51	20.16	43.67	56.77	-13.10	QP	
4		0.4560	13.48	20.16	33.64	46.77	-13.13	AVG	
5		1.5403	18.67	20.47	39.14	46.00	-6.86	AVG	
6		1.6170	31.81	20.47	52.28	56.00	-3.72	QP	
7		5.6805	27.20	20.53	47.73	60.00	-12.27	QP	
8		5.6805	18.46	20.53	38.99	50.00	-11.01	AVG	
9		7.1025	28.90	20.48	49.38	60.00	-10.62	QP	
10		7.1025	23.28	20.48	43.76	50.00	-6.24	AVG	
11	*	22.6050	26.07	20.89	46.96	50.00	-3.04	AVG	
12		22.7265	32.09	20.88	52.97	60.00	-7.03	QP	

TM1 / Line: Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2670	32.92	20.35	53.27	61.21	-7.94	QP	
2		0.2714	25.19	20.35	45.54	51.07	-5.53	AVG	
3		0.6312	24.95	20.26	45.21	56.00	-10.79	QP	
4		0.6402	17.76	20.27	38.03	46.00	-7.97	AVG	
5		1.7295	11.35	20.51	31.86	46.00	-14.14	AVG	
6		1.8825	25.73	20.53	46.26	56.00	-9.74	QP	
7		5.6850	28.13	20.54	48.67	60.00	-11.33	QP	
8		5.6850	22.67	20.54	43.21	50.00	-6.79	AVG	
9		7.1025	28.12	20.60	48.72	60.00	-11.28	QP	
10		7.1025	20.94	20.60	41.54	50.00	-8.46	AVG	
11		22.7265	32.14	20.81	52.95	60.00	-7.05	QP	
12	*	22.7265	24.75	20.81	45.56	50.00	-4.44	AVG	

***Note: 1) Pre-scan all modes and recorded the worst case results in this report.

2) Margin= Reading level + Correct factor – Limit

Correct Factor=Lisn Factor+Cable Factor+Insertion loss of Pulse Limitter

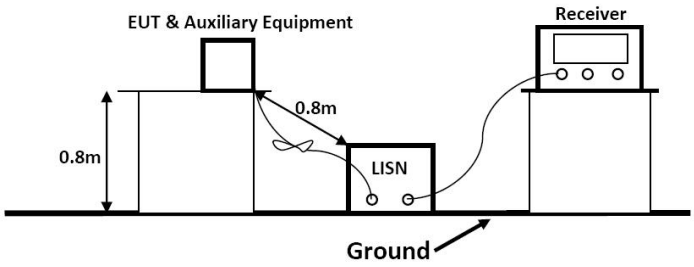
5.2 Asymmetric mode conducted emissions (150kHz-30MHz)

<table>
<tr><td>Test Requirement:</td><td>Class B</td></tr>
<tr><td>Test Limit:</td><td>ISN:
<table>
<tr><th>Frequency Range</th><th>Limit (Quasi-Peak)</th><th>Limit (Average)</th></tr>
<tr><td>0.15MHz to 0.5MHz</td><td>84dB(μV) to 74dB(μV)</td><td>74dB(μV) to 64dB(μV)</td></tr>
<tr><td>0.5MHz to 30MHz</td><td>74dB(μV)</td><td>64dB(μV)</td></tr>
<tr><td>Detector:</td><td colspan="2">Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz</td></tr>
</table></td></tr>
<tr><td>Test Method:</td><td>Clause 7 of CISPR 16-2-1:2014/AMD1:2017</td></tr>
<tr><td>Procedure:</td><td>An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.
Remark: Level= Read Level+ Cable Loss+ LISN Factor</td></tr>
</table>

5.2.1 E.U.T. Operation:

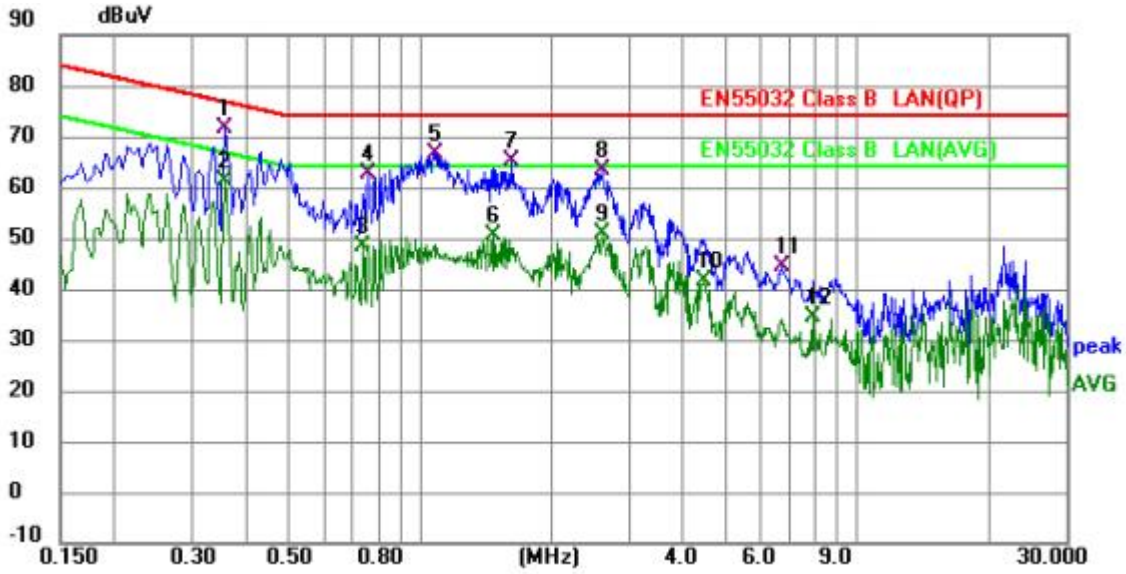
<table>
<tr><td colspan="4">Operating Environment:</td></tr>
<tr><td>Temperature:</td><td>22.7 °C</td><td>Humidity:</td><td>53.7 %</td></tr>
<tr><td colspan="2">Pre test mode:</td><td colspan="2">TM1</td></tr>
<tr><td colspan="2">Final test mode:</td><td colspan="2">TM1</td></tr>
</table>

5.2.2 Test Setup Diagram:



5.2.3 Test Data:

TM1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.3570	51.62	20.00	71.62	76.80	-5.18	QP	
2		0.3570	41.38	20.00	61.38	66.80	-5.42	AVG	
3		0.7395	28.30	20.06	48.36	64.00	-15.64	AVG	
4		0.7620	42.45	20.07	62.52	74.00	-11.48	QP	
5		1.0770	46.60	20.11	66.71	74.00	-7.29	QP	
6		1.4775	30.28	20.10	50.38	64.00	-13.62	AVG	
7		1.6215	44.91	20.12	65.03	74.00	-8.97	QP	
8		2.5980	43.15	20.12	63.27	74.00	-10.73	QP	
9		2.5980	30.79	20.12	50.91	64.00	-13.09	AVG	
10		4.4565	21.50	20.13	41.63	64.00	-22.37	AVG	
11		6.7020	24.14	20.17	44.31	74.00	-29.69	QP	
12		7.9215	14.16	20.22	34.38	64.00	-29.62	AVG	

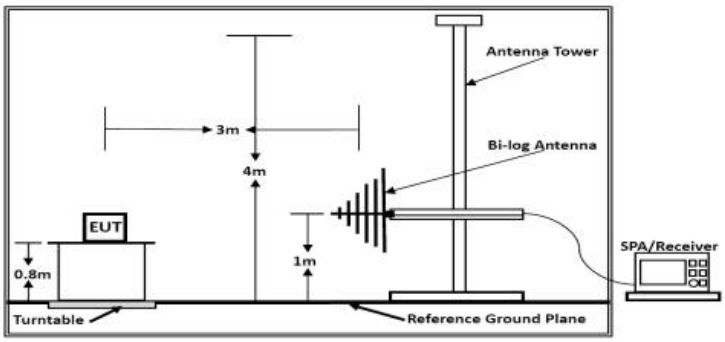
5.3 Radiated emissions (30MHz-1GHz)

Test Requirement:	Class B
Test Limit:	**Frequency (MHz)** / **Limit [dB(uV/m) at 10m]** / **Limit [dB(uV/m) at 3m]** 30 to 230 / 30 / 40 230 to 1000 / 37 / 47 Detector: / Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz
Test Method:	Clause 7.3 of CISPR 16-2-3:2016
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

5.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	26.4 °C	Humidity:	54.2 %
Pre test mode:	TM1		
Final test mode:	TM1		

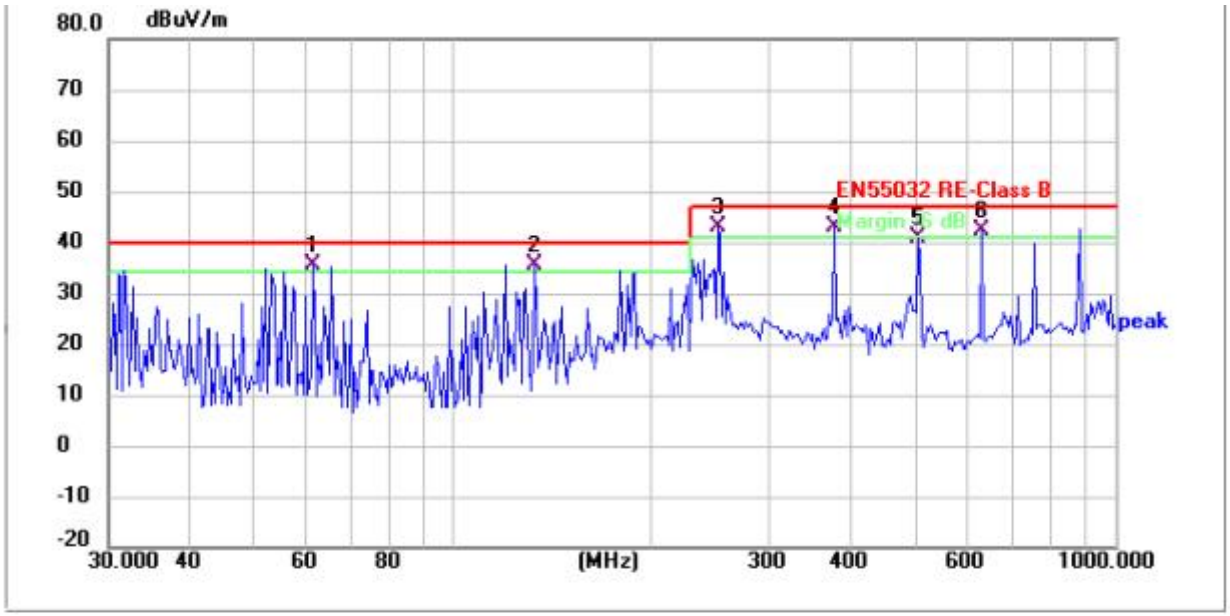
5.3.2 Test Setup Diagram:



Below 1GHz

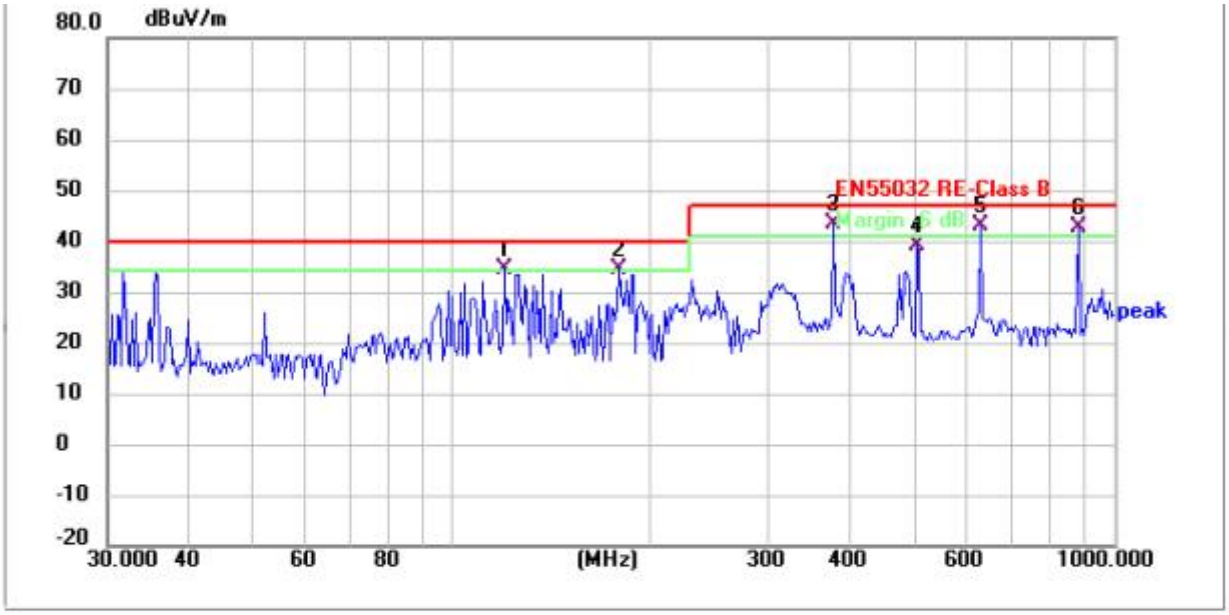
5.3.3 Test Data:

TM1 / Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 !	61.004	47.64	-11.94	35.70	40.00	-4.30	QP	P	
2 !	132.149	50.70	-15.25	35.45	40.00	-4.55	QP	P	
3 !	250.486	54.15	-11.24	42.91	47.00	-4.09	QP	P	
4 *	376.523	51.19	-8.06	43.13	47.00	-3.87	QP	P	
5	502.247	47.57	-6.83	40.74	47.00	-6.26	QP	P	
6 !	628.894	46.96	-4.58	42.38	47.00	-4.62	QP	P	

TM1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 !	119.767	48.00	-13.67	34.33	40.00	-5.67	QP	P	
2 !	178.770	49.41	-14.93	34.48	40.00	-5.52	QP	P	
3 *	376.523	51.35	-8.06	43.29	47.00	-3.71	QP	P	
4	502.247	46.09	-6.83	39.26	47.00	-7.74	QP	P	
5 !	628.894	47.64	-4.58	43.06	47.00	-3.94	QP	P	
6 !	881.184	44.55	-1.90	42.65	47.00	-4.35	QP	P	

Note:1).Pre-Scan all mode, Thus record worse case mode result in this report.

2) Margin= Reading level + Correct factor – Limit

Correct Factor=Antenna Factor+Cable Factor- Pre-amplifier Factor

5.4 Harmonic current emission

Test Requirement:	Class A
Test Limit:	

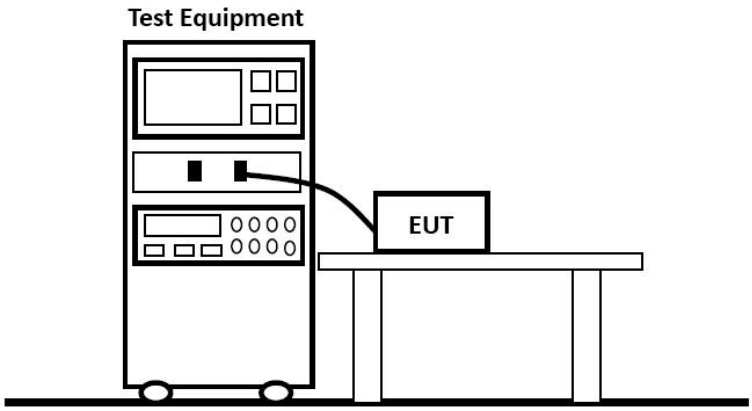
Harmonic order h	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \le h \le 39$	$0{,}15\frac{15}{h}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \le h \le 40$	$0{,}23\frac{8}{h}$

Test Method:	EN IEC 61000-3-2:2019/A1:2021

5.4.1 E.U.T. Operation:

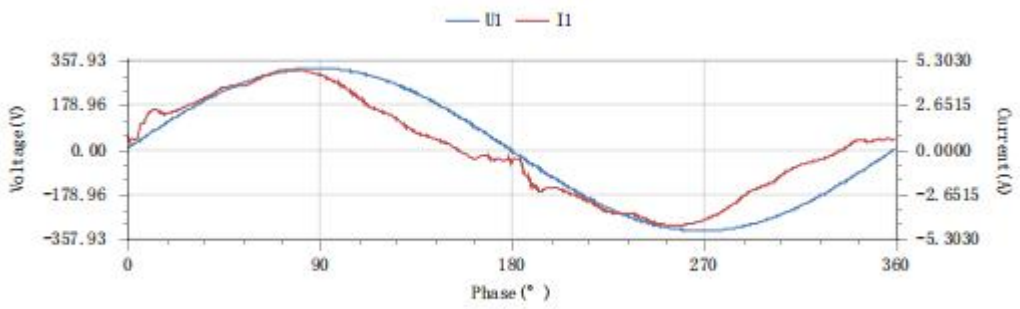
Operating Environment:			
Temperature:	24.3 °C	Humidity:	55.6 %
Pre test mode:	TM1		
Final test mode:	TM1		

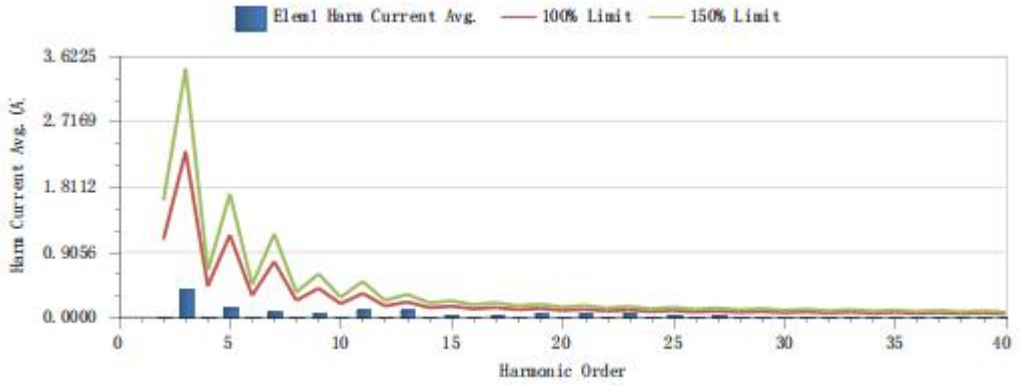
5.4.2 Test Setup Diagram:



5.4.3 Test Data:

Customer : Result : Pass





Customer : Result : Pass

Total Current Harmonic and Some Odd Harmonic Parameters

THC(A)	0.4308	THD(%)	15.09	POHC(A)	0.0640	POHC Limit(A)	0.2514

Maximum Value of Relevant Parameter During Test Period

Urms(V)	229.97	Freq(Hz)	49.999
Irms(A)	2.8893	Ipeak(A)	4.8235
I1(A)	2.8559	ICF	1.6756
P(W)	616.58	λ	0.9278

Individual Harmonics and Limit Judgment

Order(n)	Harmonics Current Avg.(A)	100% Limit(A)	Limit Percent(%)	Harmonics Current Max.(A)	150% Limit(A)	Limit Percent(%)	Result
2	0.0005	1.0800	N/A	0.0008	1.6200	N/A	Pass
3	0.3781	2.3000	16.44	0.3785	3.4500	10.97	Pass
4	0.0079	0.4300	N/A	0.0081	0.6450	N/A	Pass
5	0.1066	1.1400	9.35	0.1069	1.7100	6.25	Pass
6	0.0067	0.3000	N/A	0.0069	0.4500	N/A	Pass
7	0.0652	0.7700	8.47	0.0657	1.1550	5.69	Pass
8	0.0060	0.2300	N/A	0.0061	0.3450	N/A	Pass
9	0.0558	0.4000	13.94	0.0559	0.6000	9.32	Pass
10	0.0059	0.1840	N/A	0.0060	0.2760	N/A	Pass
11	0.0839	0.3300	25.42	0.0841	0.4950	16.98	Pass
12	0.0069	0.1533	N/A	0.0070	0.2300	N/A	Pass
13	0.0957	0.2100	45.56	0.0958	0.3150	30.40	Pass
14	0.0050	0.1314	N/A	0.0051	0.1971	N/A	Pass
15	0.0210	0.1500	13.98	0.0210	0.2250	9.34	Pass
16	0.0084	0.1150	N/A	0.0084	0.1725	N/A	Pass
17	0.0228	0.1324	17.25	0.0229	0.1985	11.53	Pass
18	0.0077	0.1022	N/A	0.0077	0.1533	N/A	Pass
19	0.0438	0.1184	36.98	0.0439	0.1776	24.69	Pass
20	0.0043	0.0920	N/A	0.0044	0.1380	N/A	Pass
21	0.0372	0.1071	34.72	0.0373	0.1607	23.18	Pass
22	0.0020	0.0836	N/A	0.0021	0.1255	N/A	Pass
23	0.0387	0.0978	39.56	0.0387	0.1467	26.40	Pass
24	0.0019	0.0767	N/A	0.0020	0.1150	N/A	Pass
25	0.0259	0.0900	28.76	0.0260	0.1350	19.24	Pass
26	0.0026	0.0708	N/A	0.0026	0.1062	N/A	Pass
27	0.0183	0.0833	21.98	0.0185	0.1250	14.77	Pass
28	0.0027	0.0657	N/A	0.0028	0.0986	N/A	Pass
29	0.0108	0.0776	N/A	0.0109	0.1164	N/A	Pass
30	0.0024	0.0613	N/A	0.0024	0.0920	N/A	Pass
31	0.0011	0.0726	N/A	0.0012	0.1089	N/A	Pass
32	0.0025	0.0575	N/A	0.0026	0.0863	N/A	Pass
33	0.0035	0.0682	N/A	0.0036	0.1023	N/A	Pass
34	0.0021	0.0541	N/A	0.0021	0.0812	N/A	Pass
35	0.0051	0.0643	N/A	0.0052	0.0964	N/A	Pass
36	0.0010	0.0511	N/A	0.0010	0.0767	N/A	Pass
37	0.0055	0.0608	N/A	0.0056	0.0912	N/A	Pass
38	0.0005	0.0484	N/A	0.0005	0.0726	N/A	Pass
39	0.0046	0.0577	N/A	0.0047	0.0865	N/A	Pass
40	0.0010	0.0460	N/A	0.0010	0.0690	N/A	Pass

Customer : Result : Pass

Voltage Relevant Parameter During Test Period and Judgment

Item	Nominal Value	Measured Value	Error Value	Allowable Error Value	Result
Urms(V)	230.00	229.97	0.03	±2.0%	Pass
Frequency(Hz)	50.000	49.998	0.002	±0.5%	Pass

Individual Harmonics Voltage and Limit Judgment

Order(n)	U[k](V)	Uhdf(%)	Limit(%)	Result
1	229.968	99.999	---	Pass
2	0.026	0.011	0.200	Pass
3	0.034	0.015	0.900	Pass
4	0.003	0.001	0.200	Pass
5	0.006	0.003	0.400	Pass
6	0.005	0.002	0.200	Pass
7	0.006	0.002	0.300	Pass
8	0.004	0.002	0.200	Pass
9	0.008	0.003	0.200	Pass
10	0.008	0.004	0.200	Pass
11	0.009	0.004	0.100	Pass
12	0.009	0.004	0.100	Pass
13	0.007	0.003	0.100	Pass
14	0.005	0.002	0.100	Pass
15	0.007	0.003	0.100	Pass
16	0.003	0.001	0.100	Pass
17	0.005	0.002	0.100	Pass
18	0.003	0.001	0.100	Pass
19	0.011	0.005	0.100	Pass
20	0.002	0.001	0.100	Pass
21	0.020	0.009	0.100	Pass
22	0.002	0.001	0.100	Pass
23	0.021	0.009	0.100	Pass
24	0.002	0.001	0.100	Pass
25	0.016	0.007	0.100	Pass
26	0.002	0.001	0.100	Pass
27	0.019	0.008	0.100	Pass
28	0.003	0.001	0.100	Pass
29	0.018	0.008	0.100	Pass
30	0.002	0.001	0.100	Pass
31	0.015	0.007	0.100	Pass
32	0.002	0.001	0.100	Pass
33	0.016	0.007	0.100	Pass
34	0.003	0.001	0.100	Pass
35	0.013	0.005	0.100	Pass
36	0.003	0.001	0.100	Pass
37	0.012	0.005	0.100	Pass
38	0.002	0.001	0.100	Pass
39	0.015	0.006	0.100	Pass
40	0.003	0.001	0.100	Pass

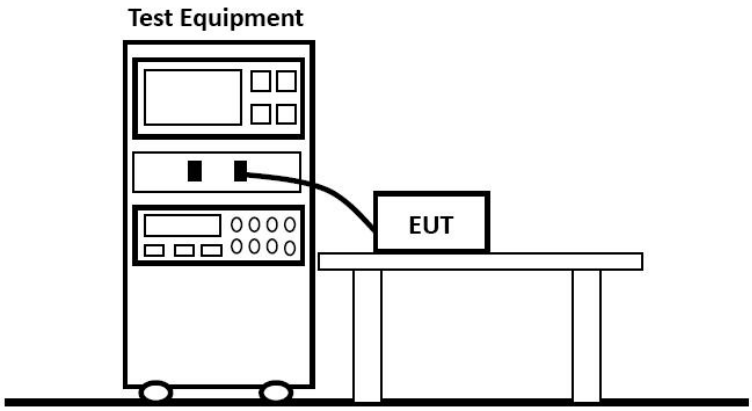
5.5 Voltage fluctuations and flicker

Test Requirement:	EN 61000-3-3, Clause 4
Test Limit:	EN 61000-3-3, Clause 5
Test Method:	EN 61000-3-3:2013+A2:2021

5.5.1 E.U.T. Operation:

Operating Environment:			
Temperature:	26.6 °C	Humidity:	55.3 %
Pre test mode:	TM1		
Final test mode:	TM1		

5.5.2 Test Setup Diagram:

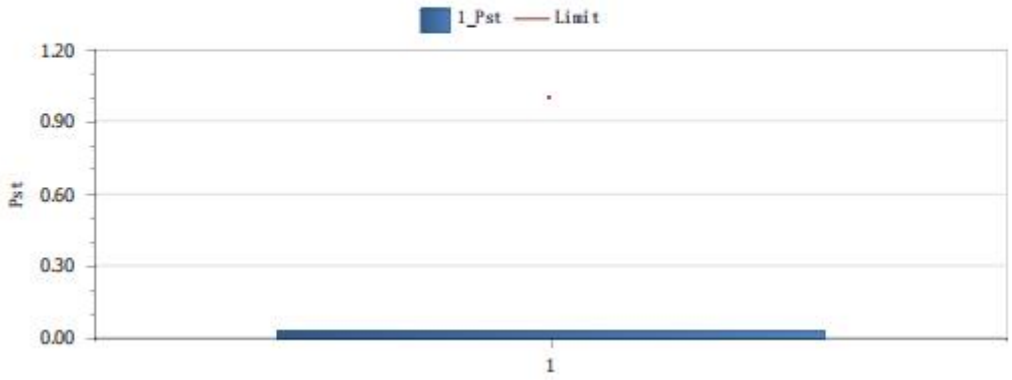


5.5.3 Test Data:

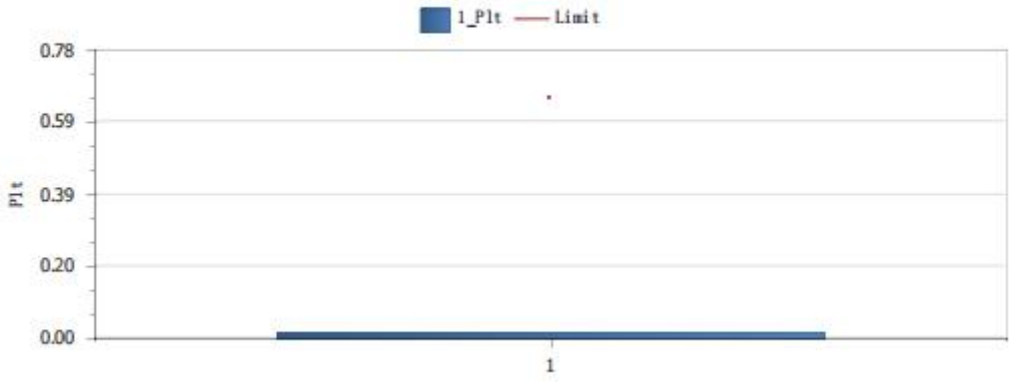
TM1

Customer : Result : Pass

Pst and Limit



Plt and Limit



Relevant Parameter and Judgment During Test Period

Voltage at end of test	229.090V		
Voltage Fluctuation and Flicker	Test Value	Test Limit	Result
Tmax	0ms	500ms	Pass
dc	0.00%	3.30%	Pass
dmax	0.00%	4.00%	Pass
Pst	0.028	1.000	Pass
Plt	0.012	0.650	Pass

Eleml Test Parameters

Count	dc(%)	dmax(%)	Tmax(ms)	Pst	Plt
1	0.00	0.00	0.00	0.028	0.012

6. IMMUNITY TEST RESULTS (EMS)

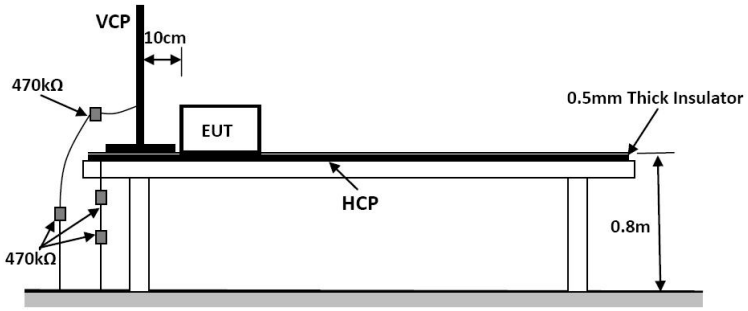
6.1 Electrostatic discharges

Test Requirement:	Contact Discharge: +/- 4kV Air Discharge: +/- 8kV
Test Method:	EN 61000-4-2: 2009
Procedure:	Discharge Impedance: 330Ω/150pF Number of Discharge: Minimum 10 times at each test point Discharge Mode: Single Discharge Discharge Period: 1 second minimum
Performance Criteria:	B

6.1.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

Discharge type	Volt (kV)	Polarity	Test Point	Result/ Observations
Air discharge	2,4,8	+	10	B
Air discharge	2,4,8	-	10	B
Contact discharge	4	+	10	B
Contact discharge	4	-	10	B
Horizontal Coupling	4	+	10	B
Horizontal Coupling	4	-	10	B
Vertical Coupling	4	+	10	B
Vertical Coupling	4	-	10	B

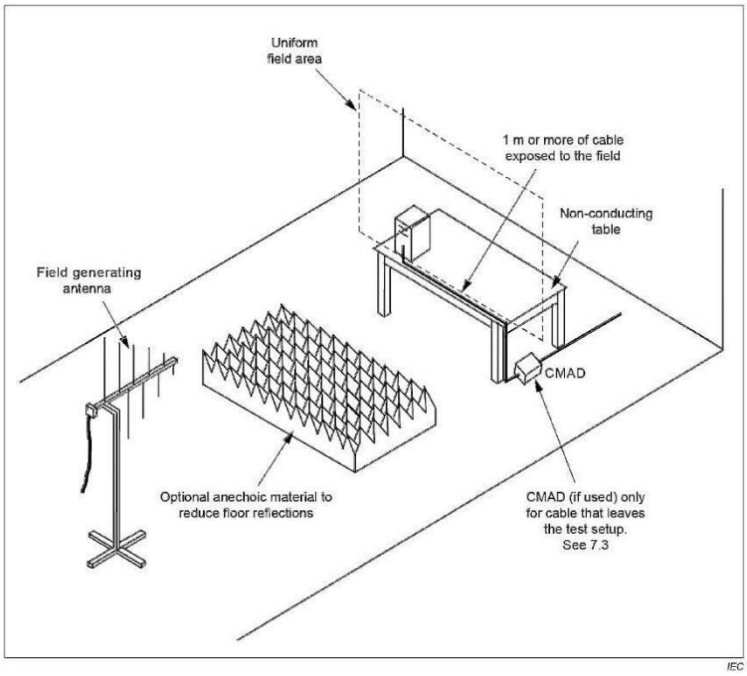
6.2 RF electromagnetic field disturbances

Test Requirement:	3V/m, 80%, 1kHz Amp. Mod.
Test Method:	EN IEC 61000-4-3: 2020
Procedure:	Frequency Range: 80MHz to 1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz Antenna Polarisation: Vertical and Horizontal Modulation: 1kHz,80% Amp. Mod,1% increment
Performance Criteria:	A

6.2.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Frequency	Field Strength (V/m)	EUT face	Dwell time	Result/ Observations
80MHz-1GHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
1800MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
2600MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
3500MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A
5000MHz	3	Front, Back, Left, Right, Top, Bottom	3s	A

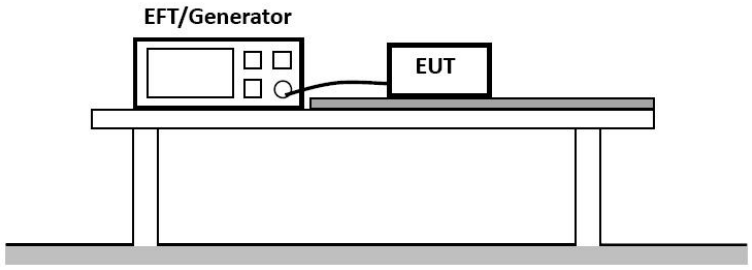
6.3 Electrical fast transients / burst for AC mains power ports

Test Requirement:	1kV; 5/50ns Tr/Th; 5kHz Repetition Frequency
Test Method:	EN 61000-4-4: 2012
Procedure:	Repetition Frequency: 5kHz Burst Period: 300ms Test Duration: 2 minute per level & polarity
Performance Criteria:	B

6.3.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.3.2 Test Setup Diagram:



6.3.3 Test Data:

Port	Volt (kV)	Polarity	CDN/ Clamp	Result/ Observations
AC power port	1	+	CDN	B
AC power port	1	-	CDN	B

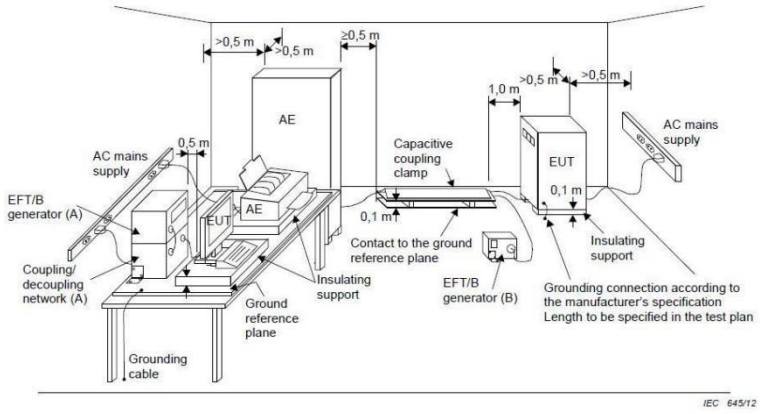
6.4 Electrical fast transients / burst for analogue/digital data ports

Test Requirement:	0.5kV; 5/50ns Tr/Th; 5kHz Repetition Frequency
Test Method:	EN 61000-4-4: 2012
Procedure:	Repetition Frequency: 5kHz Burst Period: 300ms Test Duration: 2 minute per level & polarity
Performance Criteria:	B

6.4.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Port	Volt (kV)	Polarity	CDN/ Clamp	Result/ Observations
Signal port	0.5	+	Clamp	B
Signal port	0.5	-	Clamp	B

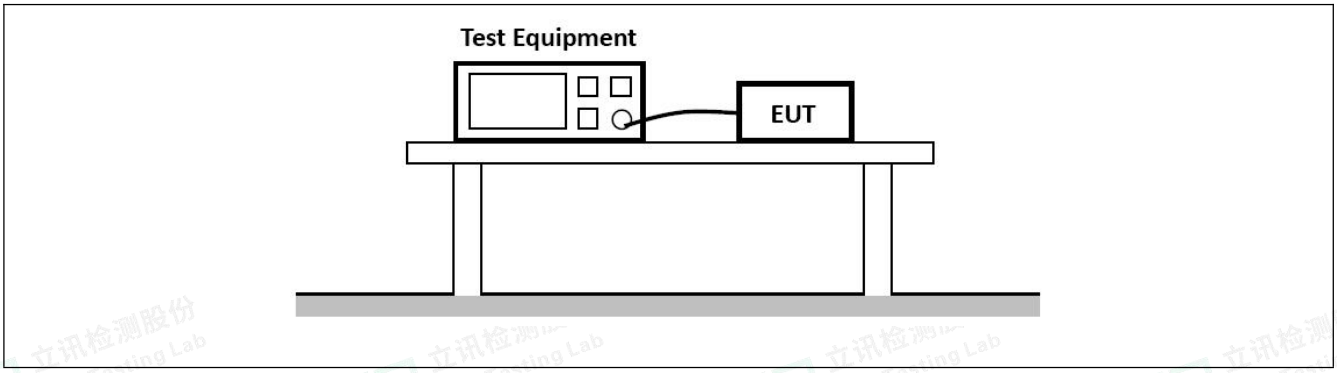
6.5 Surges for AC mains power ports

Test Requirement:	1.2/50μs Tr/Td; 1kV Line to Line; 2kV Line to Ground
Test Method:	EN 61000-4-5: 2014 +A1: 2017
Procedure:	Interval: 60s between each surge No. of surges: 5 positive, 5 negative at 90°, 270°
Performance Criteria:	B

6.5.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Port	Volt (kV)	Polarity	Phase(degree)	Result/ Observations
L-N	1	+	90°	B
L-N	1	-	270°	B
L-PE	2	+	90°	B
L-PE	2	-	270°	B
N-PE	2	-	90°	B
N-PE	2	+	270°	B

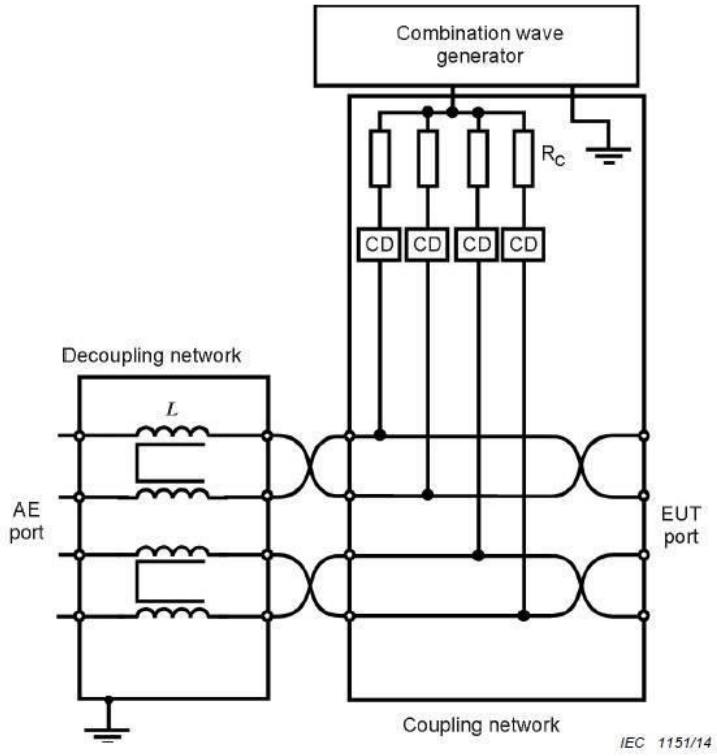
6.6 Surges for analogue/digital data ports

Test Requirement:	1.2/50μs Tr/Td; 1 and 4 kV Lines to Ground
Test Method:	EN 61000-4-5: 2014 +A1: 2017
Procedure:	Interval: 60s between each surge
Performance Criteria:	B

6.6.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.6.2 Test Setup Diagram:



6.6.3 Test Data:

Port	Line	Waveform(μs)	Volt (kV)	Polarity	Result/ Observations
Signal port	Line-Ground	10/700 (5/320)	0.5	+	B
Signal port	Line-Ground	10/700 (5/320)	0.5	-	B

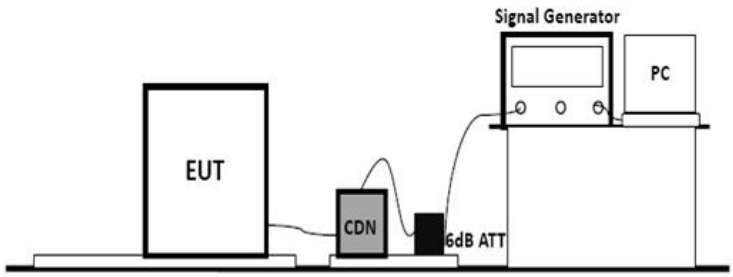
6.7 Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)

Test Requirement:	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.
Test Method:	EN 61000-4-6: 2014
Procedure:	Frequency Range: 0.15MHz to 80MHz Modulation: 80%, 1kHz Amplitude Modulation Step Size: 1%
Performance Criteria:	A

6.7.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.7.2 Test Setup Diagram:



6.7.3 Test Data:

Port	Strength (Vrms)	CDN/Clamp	Dwell time	Result/ Observations
AC power port	3(0.15MHz-10MHz)	CDN	3s	B
AC power port	3 to 1(10MHz-30MHz, Lines)	CDN	3s	B
AC power port	1(30MHz-80MHz)	CDN	3s	B

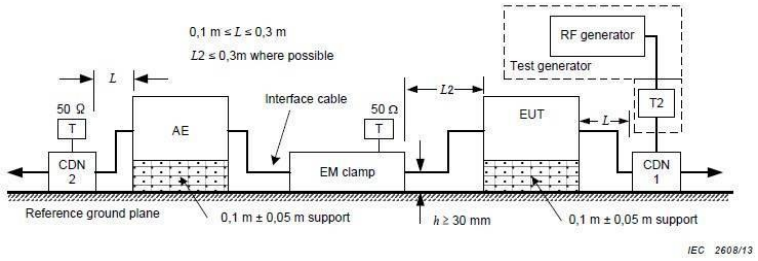
6.8 Continuous induced RF disturbances for analogue/digital data ports (150kHz-80MHz)

Test Requirement:	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%,1kHz Amp. Mod.
Test Method:	EN 61000-4-6: 2014
Procedure:	Frequency Range: 0.15MHz to 80MHz Modulation: 80%, 1kHz Amplitude Modulation Step Size: 1%
Performance Criteria:	A

6.8.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.8.2 Test Setup Diagram:



6.8.3 Test Data:

Port	Strength (Vrms)	CDN/ Clamp	Dwell time	Result/ Observations
Signal port	3(0.15MHz-10MHz)	Clamp	3s	A
Signal port	3 to 1(10MHz-30MHz, Lines)	Clamp	3s	A
Signal port	1(30MHz-80MHz)	Clamp	3s	A

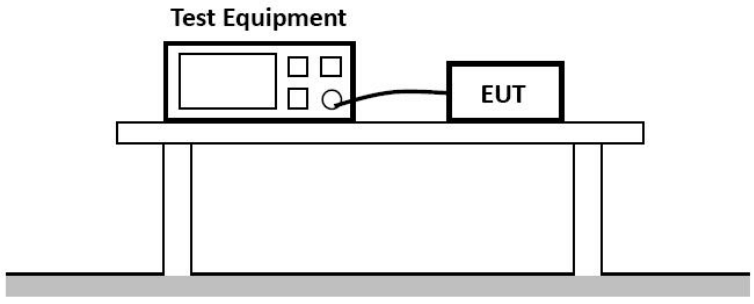
6.9 Voltage dips and interruptions

Test Requirement:	<5% residual voltage for 0.5 periods 70% residual voltage for 25 periods <5% residual voltage for 250 periods
Test Method:	EN IEC 61000-4-11:2020
Procedure:	<5% residual voltage for 0.5 period 70% residual voltage for 25 period <5% residual voltage for 250 period No. of Dips / Interruptions: 3 per Level Time between dropout: 10s
Performance Criteria:	B, C

6.9.1 E.U.T. Operation:

Operating Environment:			
Temperature:	22.6 °C	Humidity:	52.4 %
Pre test mode:	TM1		
Final test mode:	TM1		

6.9.2 Test Setup Diagram:

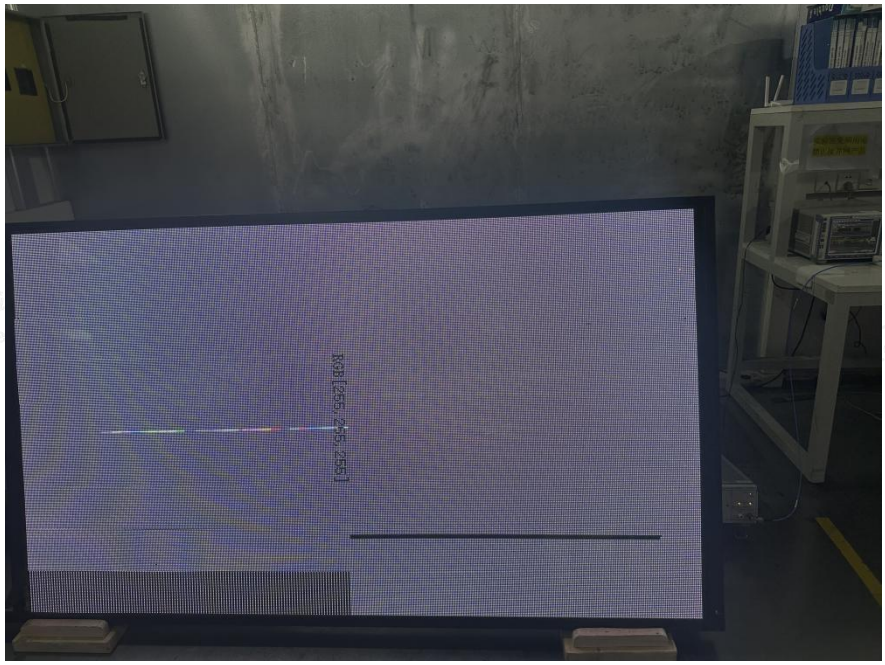


6.9.3 Test Data:

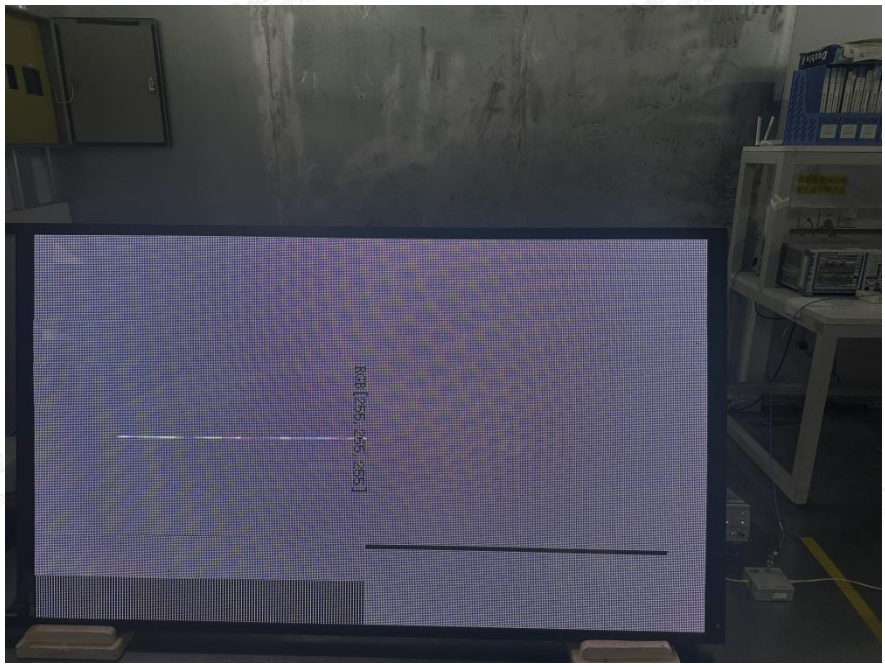
Level %UT	Phase (degree)	Duration	No. of Dips/ Interruptions	Result/ Observations
0	0°	0.5 Cycles	3	B
0	0°	250 Cycles	3	C
70	0°	25 Cycles	3	C

7. TEST SETUP PHOTOS

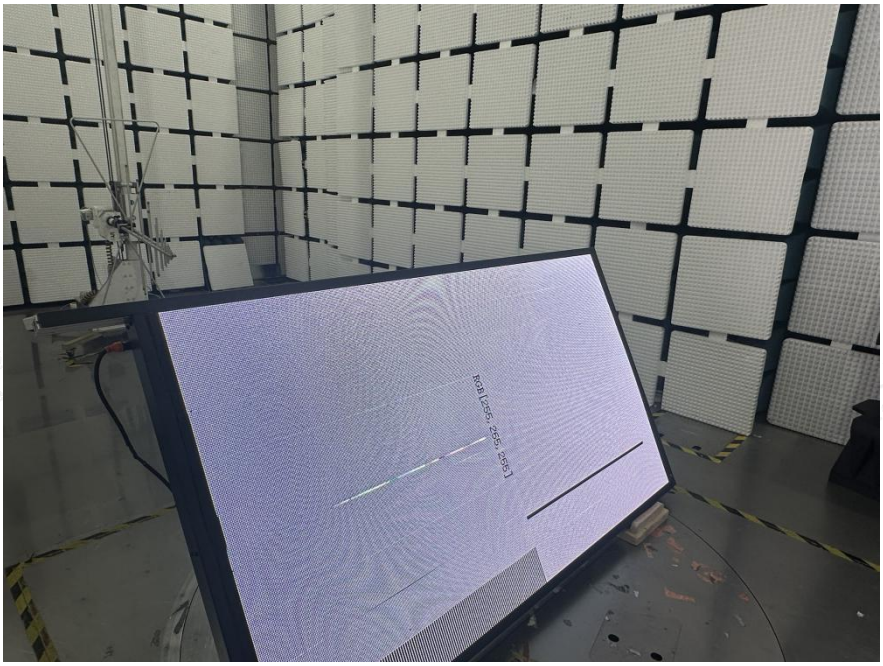
Conducted emissions from AC mains power ports (150kHz-30MHz)



Asymmetric mode conducted emissions (150kHz-30MHz)



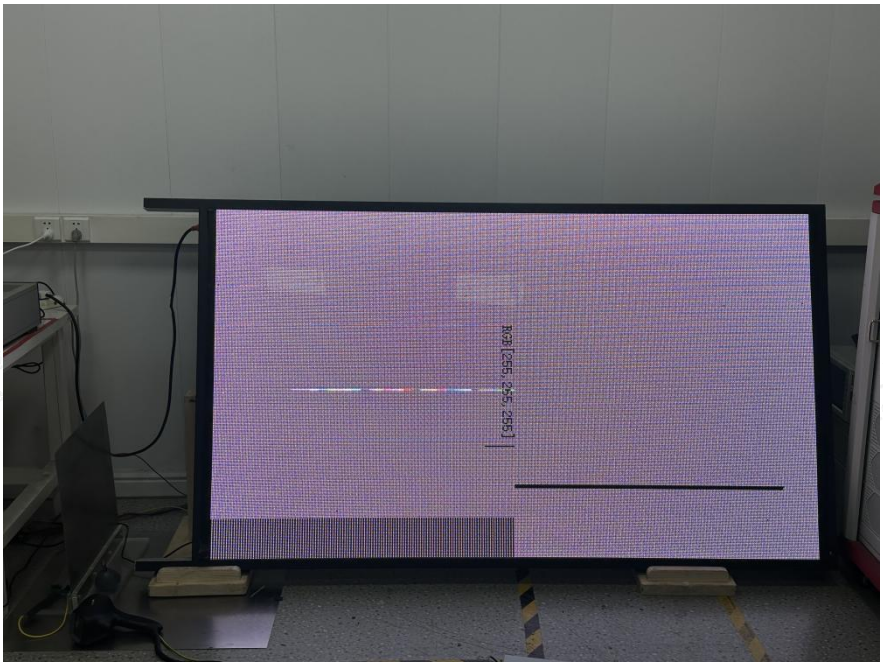
Radiated emissions (30MHz-1GHz)



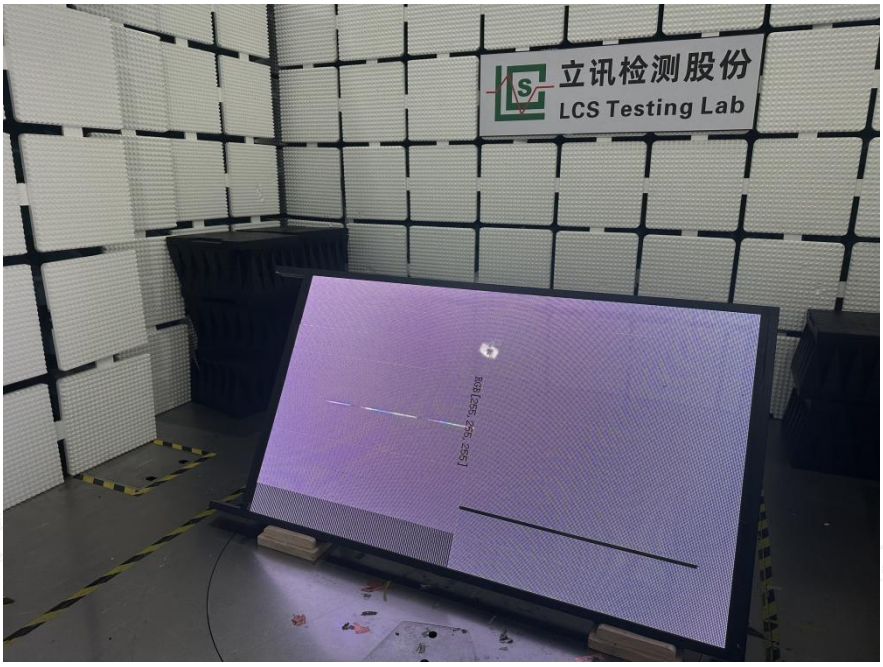
Harmonic current emission
Voltage fluctuations and flicker



Electrostatic discharges



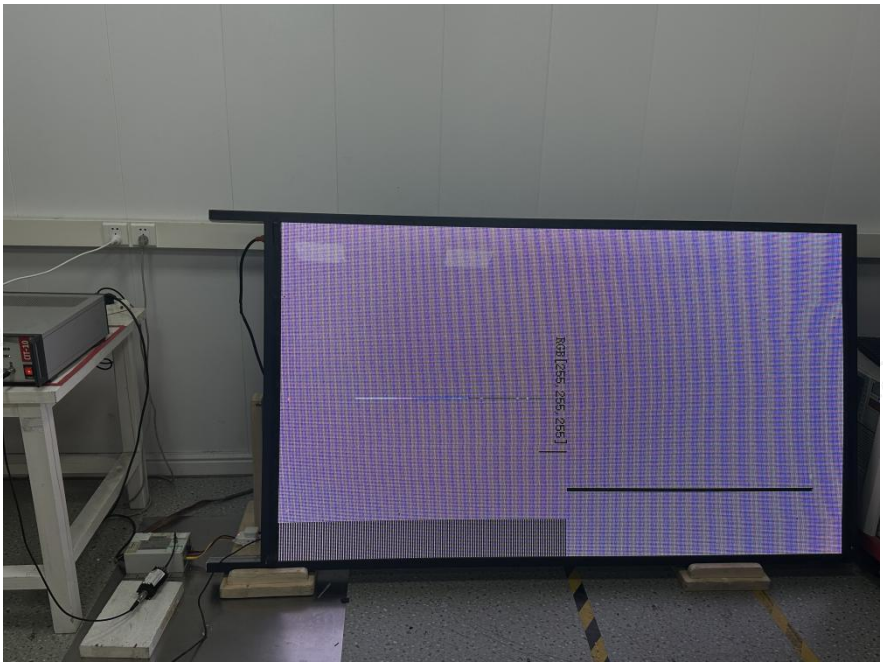
RF electromagnetic field disturbances



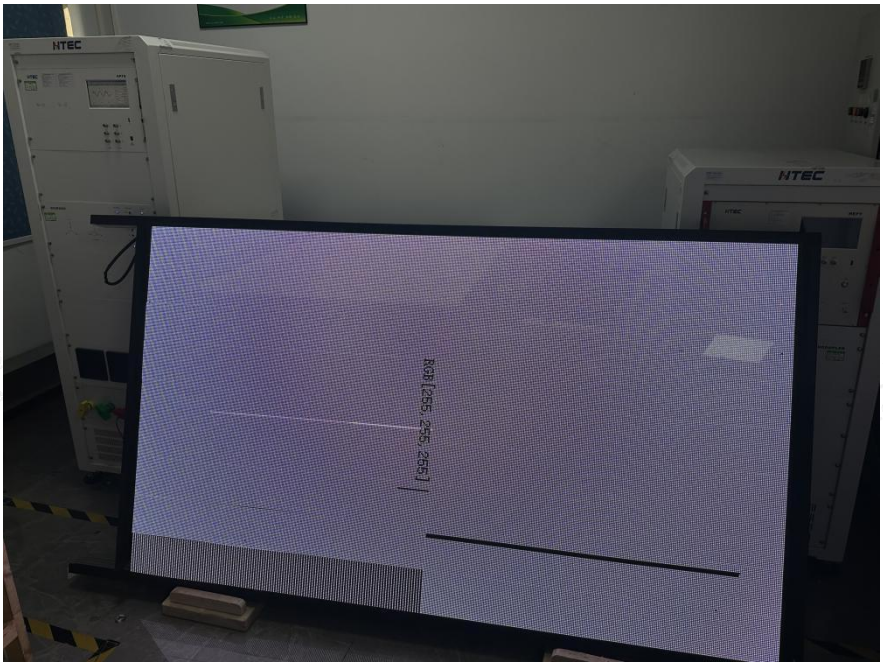
Electrical fast transients / burst for AC mains power ports
Electrical fast transients / burst for analogue/digital data ports
Surges for AC mains power ports
Surges for analogue/digital data ports



Continuous induced RF disturbances for AC mains power ports (150kHz-80MHz)
Continuous induced RF disturbances for analogue/digital data ports (150kHz-80MHz)



Voltage dips and interruptions



8. EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)



Fig. 1



Fig. 2



Fig. 3



Fig. 4

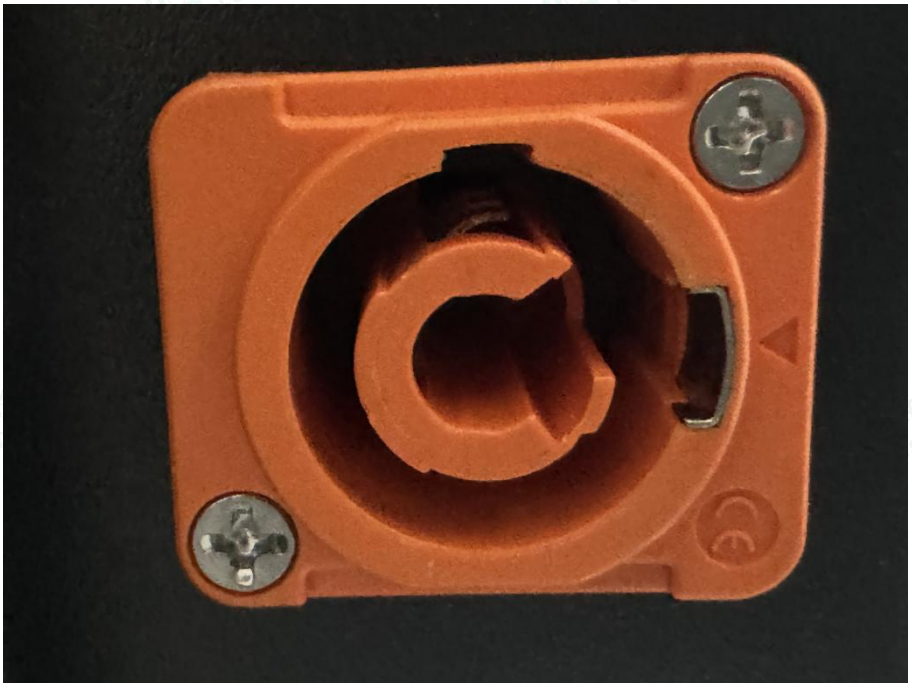


Fig. 5

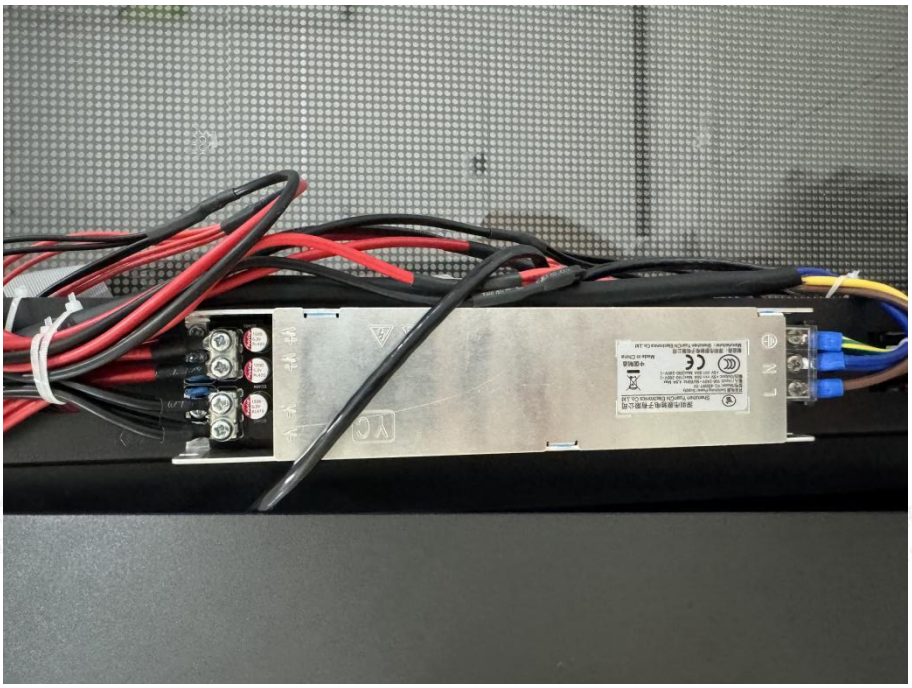


Fig. 6



Fig. 7

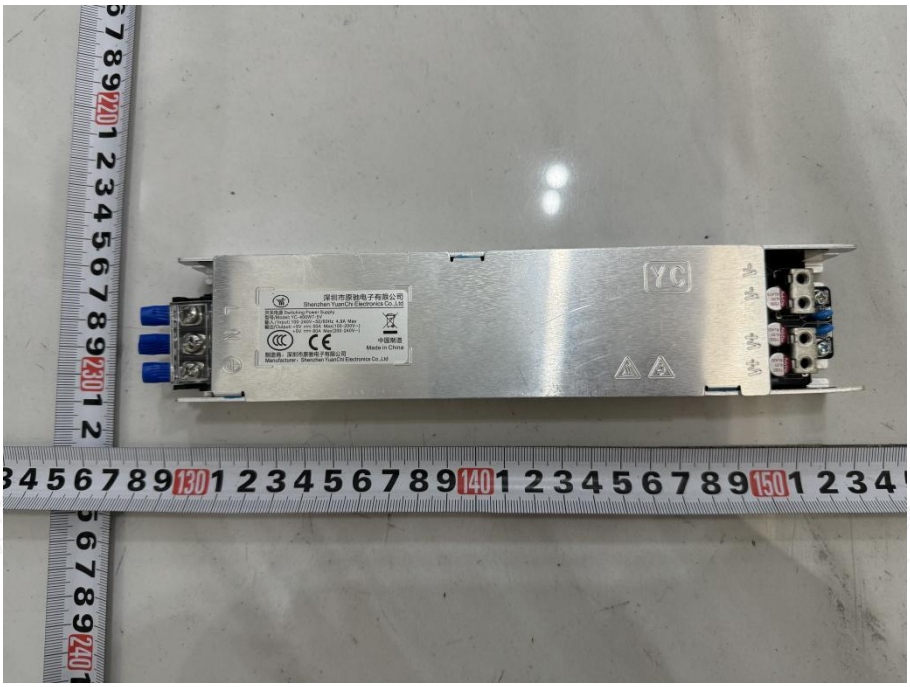


Fig. 8

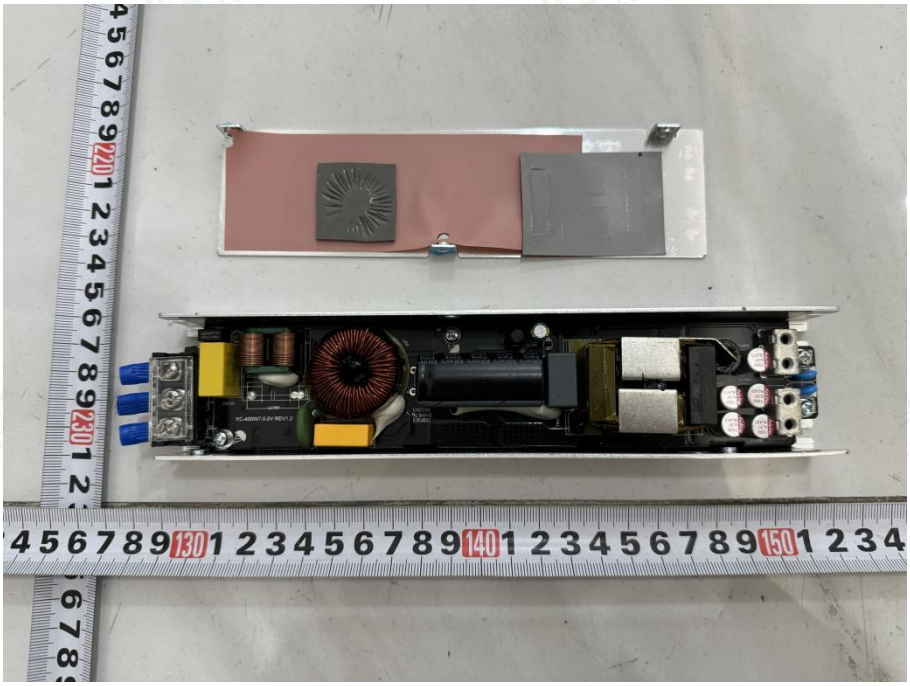


Fig. 9

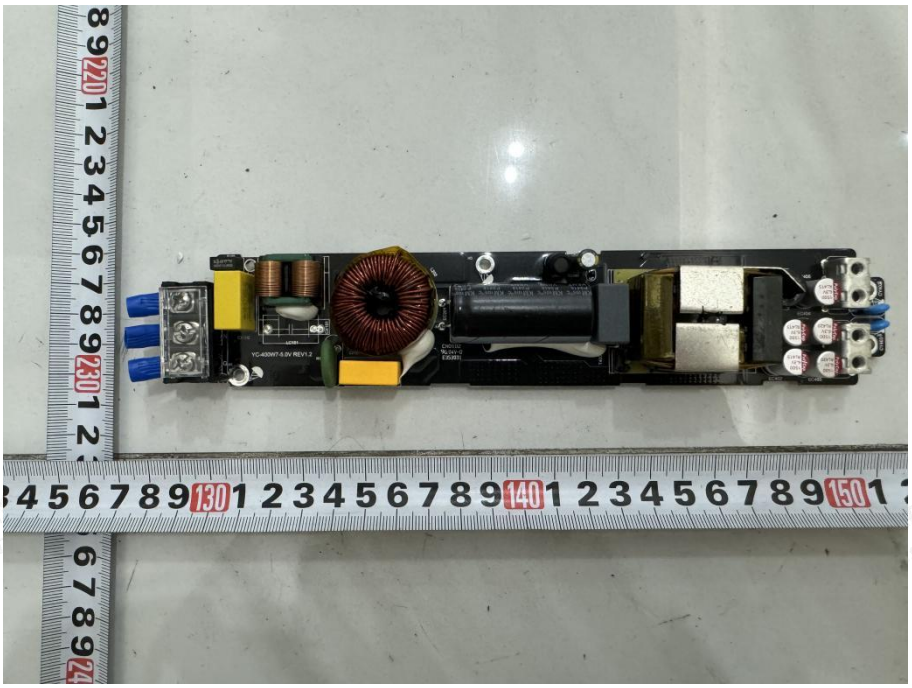


Fig. 10

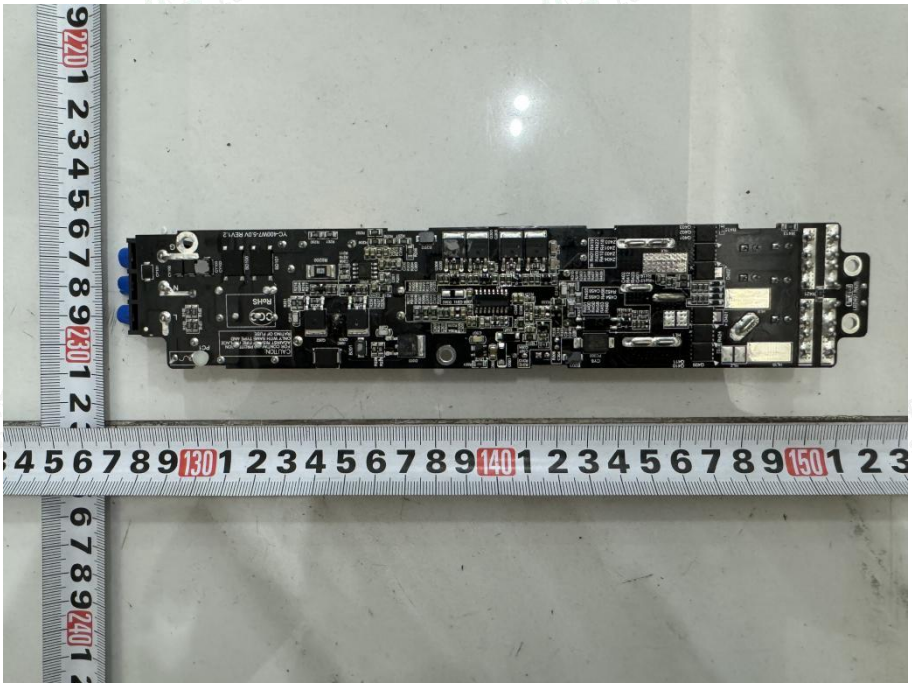


Fig. 11

LCS TESTING LABORATORY APPROVED

--- End of Report ---