



Prüfbericht-Nr.: <i>Test Report No.:</i>	CN22DPE6 001	Auftrags-Nr.: <i>Order No.:</i>	178164387	Seite 1 von 1 <i>Page 1 of 1</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	01.04.2022	
Auftraggeber: <i>Client:</i>	Hisense Visual Technology Co., Ltd. No. 218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, P.R. China			
Prüfgegenstand: <i>Test item:</i>	LASER CINEMA			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	PX1, PX1G, PX1-PRO, PX1G-PRO, PXx, PXxGx, PXx-PROx, PXxG-PROx, PXx-LITEx (x=0-9 or A-Z or Blank or -)			
Auftrags-Inhalt: <i>Order content:</i>	RED AK			
Prüfgrundlage: <i>Test specification:</i>	Refer to relevant reports			
Wareneingangsdatum: <i>Date of receipt:</i>	01.04.2022	<p>Dokumenten-Check (keine Fotodokumentation erforderlich)</p> <p>Document Check (no photo documentation required)</p>		
Prüfmuster-Nr.: <i>Test sample No.:</i>	178164387-001A			
Prüfzeitraum: <i>Testing period:</i>	Refer to test report			
Ort der Prüfung: <i>Place of testing:</i>	Refer to related reports			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland/CCIC (Qingdao) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	X 	genehmigt von: <i>authorized by:</i>	X 	
Datum: <i>Date:</i>	25.04.2022 <small>Signed by: Hunter Yu</small>	Ausstellungsdatum: <i>Issue date:</i>	25.04.2022 <small>Signed by: Ying Xie</small>	
Stellung / Position:	Project Engineer	Stellung / Position:	Technical Certifier	
Sonstiges / Other: <p><i>This test report is to combine test report regarding RF, EMC and health requirement according to client's requirements, with the following report number: TÜV Rheinland report: part III of CN22DPE6 001 (Health), TÜV Rheinland report: part I of CN22DPE6 001 and part II of CN22DPE6 001 (EMC), TÜV Rheinland report: part III of CN22DPE6 001 (Radio Spectrum), Refer to related test report for details.</i></p>				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar 4 = sufficient N/A = not applicable
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht-Nr.: <i>Test Report No.:</i>	part I of CN22DPE6 001	Auftrags-Nr.: <i>Order No.:</i>	178164387	Seite 1 von 40 <i>Page 1 of 40</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	01.04.2022	
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Auftrags-Inhalt: <i>Order content:</i>	RED AK			
Prüfgrundlage: <i>Test specification:</i>	EN 55032:2015+A11+A1 EN IEC 61000-3-2:2019+A1 EN 61000-3-3:2013+A1 EN 55035:2017+A11			
Wareneingangsdatum: <i>Date of receipt:</i>	01.04.2022	<p>Dokumenten-Check (keine Fotodokumentation erforderlich)</p> <p>Document Check (no photo documentation required)</p>		
Prüfmuster-Nr.: <i>Test sample No.:</i>	178164387-001A			
Prüfzeitraum: <i>Testing period:</i>	Refer to test report			
Ort der Prüfung: <i>Place of testing:</i>	Refer to Section 1.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland/CCIC (Qingdao) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i>	25.04.2022	Ausstellungsdatum: <i>Issue date:</i>	25.04.2022	
Stellung / Position:	Project Engineer	Stellung / Position:	Technical Certifier	
Sonstiges / Other:				
<i>In electrical characteristics, all models above are the same, the only difference among them is model name, therefore, all EMC tests were performed on the model PX1G.</i>				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar 4 = sufficient N/A = not applicable
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TEST SUMMARY

4.1 HARMONICS ON AC MAINS

Result:

Pass

4.2 VOLTAGE FLUCTUATIONS ON AC MAINS

Result:

Pass

4.3 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE

Result:

Pass

4.4 ASYMMETRIC MODE DISTURBANCE VOLTAGE

Result:

Pass

4.5 DISTURBANCE RADIATION BELOW 1GHz

Result:

Pass

4.6 DISTURBANCE RADIATION ABOVE 1GHz

Result:

Pass

5.1 ELECTROSTATIC DISCHARGE

Result:

Pass

5.2 RADIO FREQUENCY ELECTROMAGNETIC FIELD

Result:

Pass

5.3 POWER FREQUENCY MAGNETIC FIELD

Result:

n.a.

5.4 INJECTED CURRENT INTO AC POWER PORT

Result:

Pass

5.5 INJECTED CURRENT INTO ANALOGUE/DIGITAL DATA PORT

Result:

Pass

5.6 SURGES TO AC POWER PORT

Result:

Pass

5.7 SURGES TO ANALOGUE/DIGITAL DATA PORT

Result:

n.a.

5.8 VOLTAGE DIPS AND INTERRUPTIONS TO AC POWER PORT

Result:

Pass

5.9 ELECTRICAL FAST TRANSIENTS TO AC POWER PORT

Result:

Pass

5.10 ELECTRICAL FAST TRANSIENTS TO ANALOGUE/DIGITAL DATA PORT

Result:

Pass

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1 Test Sites

1.1 Test Facilities

Laboratory: CTC Laboratories, Inc.

Address: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building,
Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong,
China

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1 List of test and measurement equipment

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-759	Nov. 09, 2022
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 23, 2022
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 23, 2022
4	Broadband Prempplier	SCHWARZBECK	BBV9743B	259	Dec. 23, 2022
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 23, 2022
6	3m chamber 3	YIHENG	EE106	/	Sep. 09, 2023
Conducted emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 23, 2022
2	LISN	R&S	ENV216	101113	Dec. 23, 2022
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 23, 2022
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 23, 2022
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 23, 2022
6	Current Probe	CYBERTEK	EM5011	E165011025	Dec. 23, 2022
7	Power Dividers	Weinschel	1506A	KJ658	Dec. 23, 2022
Harmonic current emissions & Voltage fluctuations and flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Universal Power Analyzer	Voltech	PM6000	200006700723	Dec.23, 2022
2	Programmable AC Power Source	Mtoni	PHF1530	MTPS001	Dec.23, 2022
Electrostatic discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until

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1	ESD Simulator	EM TEST	DITO	V1113109156	Dec.23, 2022
Radio frequency electromagnetic field					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	High Gain Log-Periodic Antenna	R&S	HL046E	100037	Dec.23, 2022
2	Stacked Log.-Per. Antenna	Schwarzbeck	STLP 9149	9149-658	Dec.23, 2022
3	Power Amplifier	BONN ELEKTRONIK	BLWA0830-160/100/40D	76788	Dec.23, 2022
4	Power Amplifier	Micotop	MPA-3-6G-50	MPA1706258	Dec.23, 2022
5	PSG Analog Signal Generator	Agilent	E8257D	MY46521908	Dec.23, 2022
Electrical fast transient / burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Electrical fast transient generator	3ctest	EFT-4003G	EC0471140	Dec.23, 2022
2	Coupling/Decoupling Clamp	3ctest	EFTC	EC0441141	Dec.23, 2022
Surges					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Surge generator	3ctest	SG-5006G	EC5581149	Dec.23, 2022
2	Surge CDN	3ctest	SGN-20G	EC5551128	Dec.23, 2022
3	Network Surge Generator	3ctest	CWS 600T	ES0311603	Dec.23, 2022
4	Network Surge CDN	3ctest	CDN 405T8A1	ES2731605	Dec.23, 2022
Radio frequency continuous conducted					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	C/S Generator	SCHLODER	CDG 6000	126A1266	Dec.23, 2022
2	Coupling/Decoupling Network	SCHLODER	CDN M2+3	A2210258	Dec.23, 2022
3	Coupling/Decoupling Network	TESEQ GmbH	CDN T8-10	45011	Dec.23, 2022
4	6dB Attenuator	N/A	100W/6dB	N/A	Dec.23, 2022
Voltage dips, short interruptions and voltage variations					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Voltage dips and up generator	3ctest	VDG-1105G	EC0171116	Dec.23, 2022

2 General Product Information

2.1 Product Function and Intended Use

The EUT are Laser Cinemas. For further information, refer to the user's manual.

2.2 Ratings and System Details

System input voltage : AC 100-240V, 50/60Hz
Rated current : 1.54A
Protection class : II

2.3 Independent Operation Modes

The basic operation modes are Display with different signal input ports.

2.4 Noise Generating and Noise Suppressing Parts

Refer to the circuit diagram of the product for further information.

2.5 Submitted Documents

Rating label, component list and circuit diagram, etc.

Photo documentation, construction drawings etc. (Refer to relevant safety report CN22KFRJ001).

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible emission level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

A computer was used as signal generator during display mode test.

3.5 Countermeasures to achieve EMC Compliance

Refer to circuit diagram for details.

4 Test Results EMISSION

4.1 Harmonics on AC Mains

Result:	Pass
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Date of testing : 19.04.2022
Test procedure : EN IEC 61000-3-2:2019+A1
Harmonic order : 2 – 40th
Frequency range : 0 – 2kHz

The harmonics on AC Mains in the frequency from 0 to 2kHz were measured in accordance with EN IEC 61000-3-2:2019+A1.

The measurement was conducted with an automatic current harmonic analyzing system. This equipment is in compliance with the requirements of EN IEC 61000-3-2:2019+A1.

The results indicated in the following tables and figures were those measured and recorded by an automatic measuring system.

Table 2: Harmonic currents measurement result

Equipment category: Class D;

Test voltage: AC 230V, 50Hz

Fundamental current I₁: 0.606A; Power factor: 0.929; Active input power: 135.0W.

order	Current per watt (avg.) (mA/W)	100% Limit (mA/W)	Current per watt (max.) (mA/W)	150% Limit (mA/W)	Result (avg.) (A)	100% limits (A)	Result (max.) (A)	150% limits (A)	Result
3	0.465	3.4	0.469	5.1	0.063	2.30	0.063	3.45	Pass
5	0.083	1.9	0.085	2.85	0.011	1.14	0.012	1.71	Pass
7	0.095	1.0	0.098	1.5	0.013	0.77	0.013	1.15	Pass
9	0.072	0.5	0.075	0.75	0.010	0.4	0.010	0.6	Pass
11	0.062	0.35	0.064	0.525	0.008	0.33	0.009	0.495	Pass
13	0.044	0.296	0.047	0.444	0.006	0.21	0.006	0.315	Pass
15	0.039	0.257	0.041	0.386	0.005	0.15	0.006	0.225	Pass
17	0.028	0.226	0.030	0.339	0.004	0.132	0.004	0.198	Pass
19	0.023	0.203	0.025	0.305	0.003	0.118	0.003	0.177	Pass
21	0.019	0.183	0.021	0.275	0.003	0.161	0.003	0.161	Pass
23	0.013	0.167	0.015	0.251	0.002	0.147	0.002	0.147	Pass
25	0.015	0.154	0.016	0.231	0.002	0.135	0.002	0.135	Pass
27	0.016	0.143	0.018	0.215	0.002	0.125	0.002	0.125	Pass
29	0.017	0.133	0.019	0.199	0.002	0.116	0.003	0.116	Pass
31	0.014	0.124	0.015	0.186	0.002	0.109	0.002	0.109	Pass
33	0.019	0.117	0.021	0.176	0.003	0.102	0.003	0.102	Pass
35	0.015	0.110	0.017	0.165	0.002	0.096	0.002	0.096	Pass
37	0.013	0.104	0.015	0.156	0.002	0.091	0.002	0.091	Pass
39	0.012	0.099	0.014	0.149	0.002	0.086	0.002	0.086	Pass

4.2 Voltage Fluctuations on AC Mains

Result:**Pass**

Date of testing : 19.04.2022
Test procedure : EN 61000-3-3:2013+A1

According to the characteristics of the sample, as specified by clause 5 of the basic standard, following limits apply:

- the maximum relative voltage change d_{\max} , shall not exceed 4%.

The following tables are those measured by an automatic measuring system.

Table 3: Voltage fluctuations and flicker measurement results

	dc	dmax	Tmax	Pst	Plt
Limits	N/A	4%	N/A	N/A	N/A
Result	-	1.102%	-	-	-

4.3 Mains Terminal Continuous Disturbance Voltage

Result:	Pass
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Date of testing	: 20.04.2022
Test procedure	: EN 55032:2015+A11+A1 and CISPR 16-1 series standards
Limit	: Table A.10 of EN 55032:2015+A11+A1
Frequency range	: 0.15 – 30MHz
Bandwidth of EMI receiver	: 9kHz
Detector	: Quasi-peak, average
Kind of test site	: Shielded room
Input voltage	: AC 110V and AC 230V, 50Hz
Operation modes	: HDMI mode

The measurement setup was made according to EN 55032:2015+A11+A1 in a shielded room.

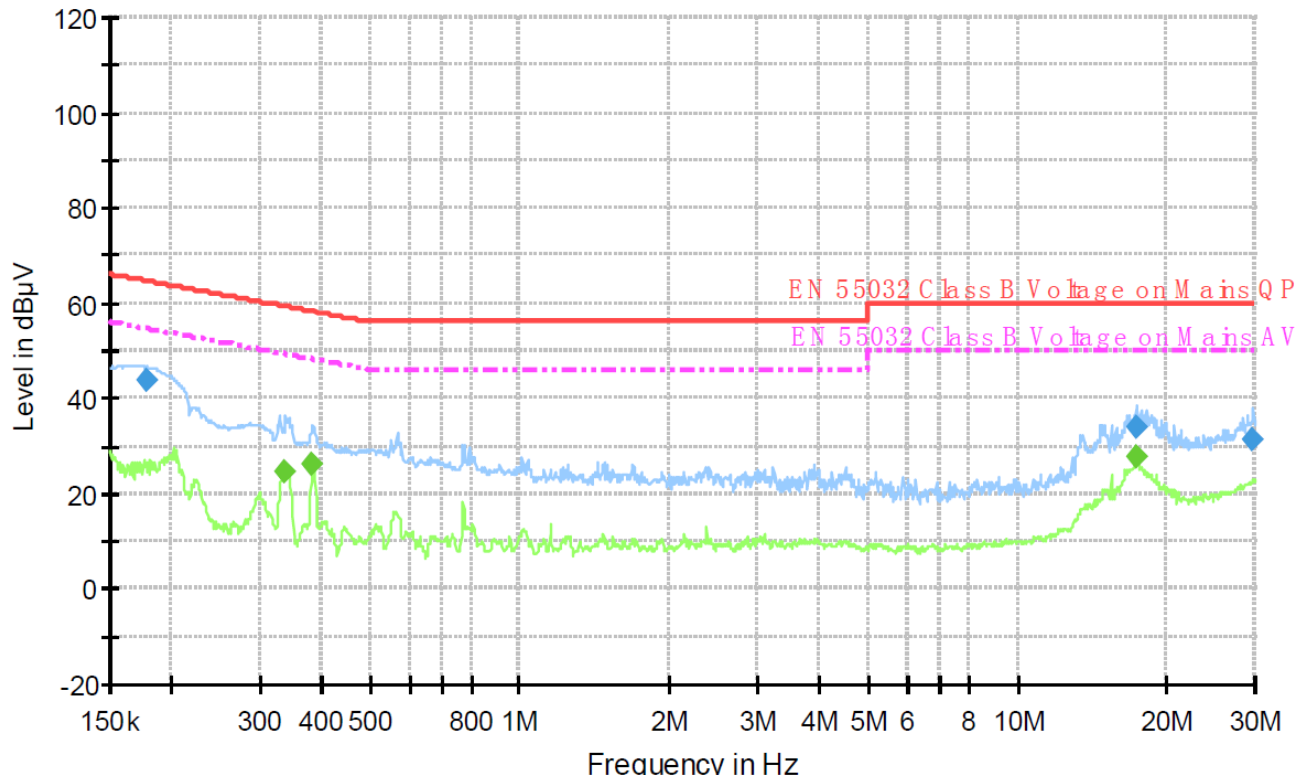
The measurement equipment like test receivers, quasi-peak detector and artificial mains network are in compliance with CISPR 16-1 series standards. The tested object was operated under its rated voltage and its rated frequency.

The tested object was set-up on a wooden table. The EUT was set 0.8m away from the artificial mains network. The cord longer than necessary to be connected to the AMN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m.

A pre-scan was performed on HDMI and USB mode before the final test, HDMI mode with AC 230V 50Hz mains input has the worst disturbance level. Therefore, the test was performed on HDMI mode with AC 230V 50Hz.

The following figures and tables were those measured by an automatic measuring system. The measurement was performed with quasi-peak and average detectors.

Figure 1: Spectral diagram and measurement results, Mains terminal disturbance voltage, 150kHz – 30MHz, line L

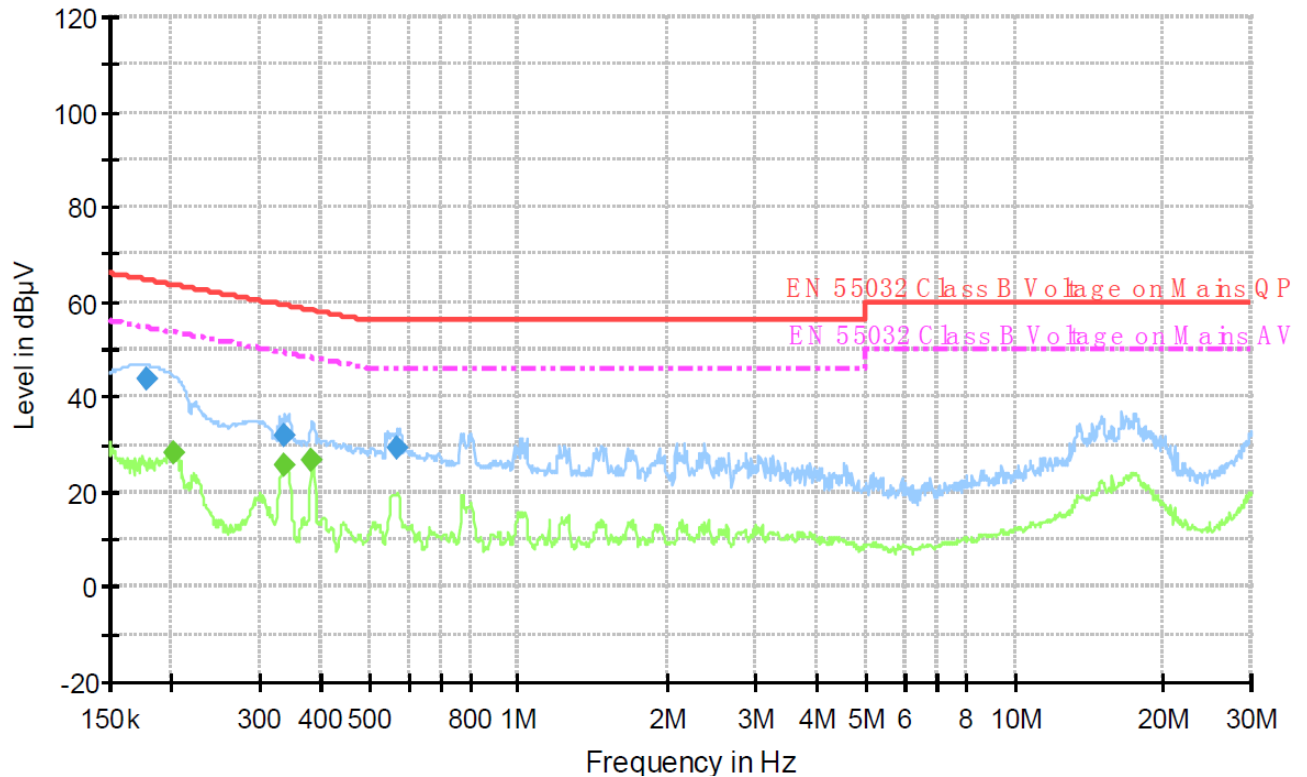


Final Quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.178090	43.6	1000.00	9.000	On	L1	9.7	21.0	64.6	
17.346420	34.1	1000.00	9.000	On	L1	9.9	25.9	60.0	
29.734530	31.4	1000.00	9.000	On	L1	9.8	28.6	60.0	

Final Average measurement results:

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.335970	24.7	1000.00	9.000	On	L1	9.7	24.6	49.3	
0.383280	26.2	1000.00	9.000	On	L1	9.7	22.0	48.2	
17.346420	27.8	1000.00	9.000	On	L1	9.9	22.2	50.0	

Figure 2: Spectral diagram and measurement results, Mains terminal disturbance voltage, 150kHz – 30MHz, line N

Final Quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.178090	43.7	1000.00	9.000	On	N	10.0	20.9	64.6	
0.338660	31.7	1000.00	9.000	On	N	10.0	27.5	59.2	
0.569050	29.1	1000.00	9.000	On	N	10.0	27.0	56.0	

Final Average measurement results:

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.202360	28.4	1000.00	9.000	On	N	10.0	25.1	53.5	
0.338660	25.7	1000.00	9.000	On	N	10.0	23.5	49.2	
0.383280	26.8	1000.00	9.000	On	N	10.0	21.4	48.2	

4.4 Asymmetric Mode Disturbance Voltage

Result:**Pass**

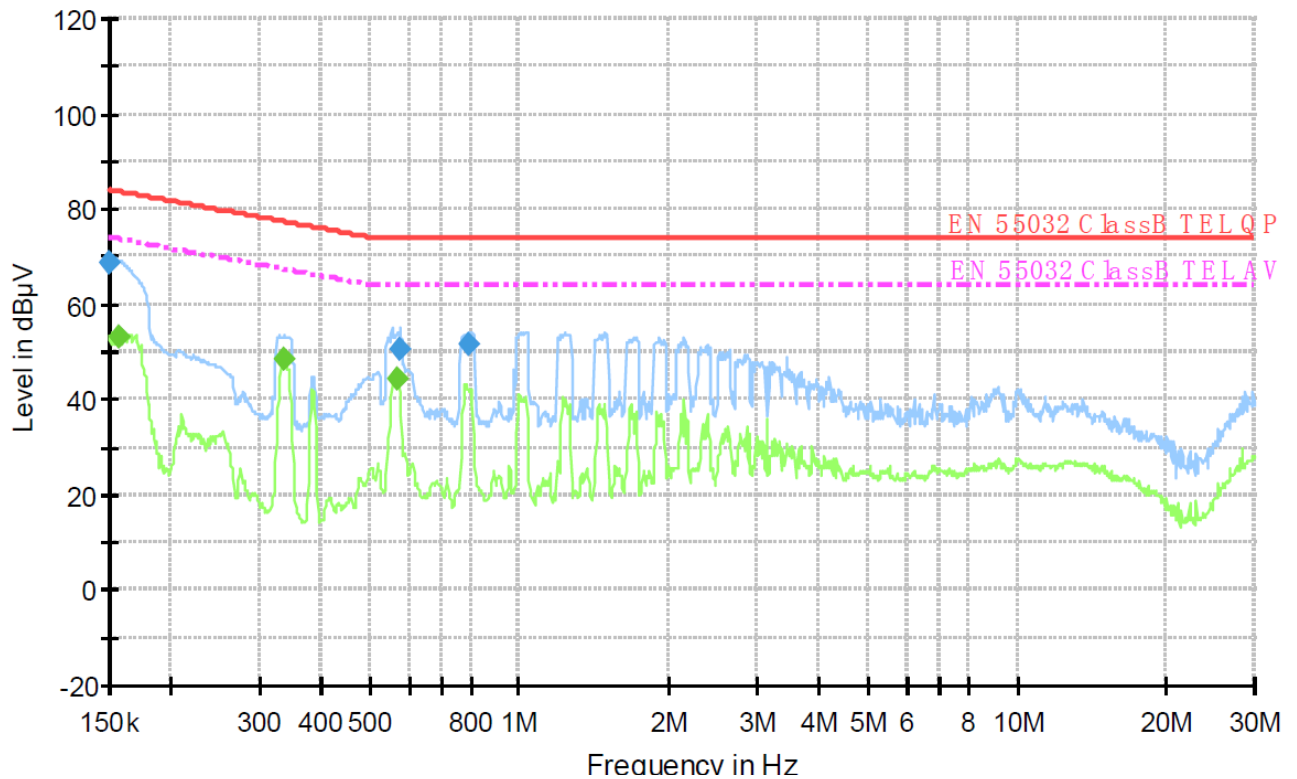
Date of testing : 18.04.2022
Test procedure : EN 55032:2015+A11+A1 and CISPR 16-1 series standards
Limit : Table A.12 of EN 55032:2015+A11+A1
Frequency range : 0.15 – 30MHz
Bandwidth of EMI receiver : 9kHz
Detector : Quasi-peak, average
Kind of test site : Shielded room
Input voltage : AC 230V, 50Hz
Operation modes : LAN mode

The measurement setup was made according to EN 55032:2015+A11+A1 in a shielded room.

The measurement equipment like test receivers, quasi-peak detector and networks are in compliance with CISPR 16-1 series standards. The tested object was operated under its rated voltage and its rated frequency.

The following figures and tables were those measured by an automatic measuring system. The measurement was performed with quasi-peak and average detectors.

Figure 3: Spectral diagram and measurement results, asymmetric mode disturbance voltage, 150kHz – 30MHz, wired network port



Final Quasi-peak measurement results:

Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.150000	68.5	1000.00	9.000	On	LAN	10.0	15.5	84.0	
0.575910	50.7	1000.00	9.000	On	LAN	10.0	23.3	74.0	
0.795760	51.8	1000.00	9.000	On	LAN	10.0	22.2	74.0	

Final Average measurement results:

Frequency (MHz)	Average (dBµ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)	Comment
0.156110	53.3	1000.00	9.000	On	LAN	10.0	20.4	73.7	
0.337310	48.3	1000.00	9.000	On	LAN	10.0	19.0	67.3	
0.566780	44.2	1000.00	9.000	On	LAN	10.0	19.8	64.0	

4.5 Disturbance radiation below 1GHz

Result:	Pass
----------------	-------------

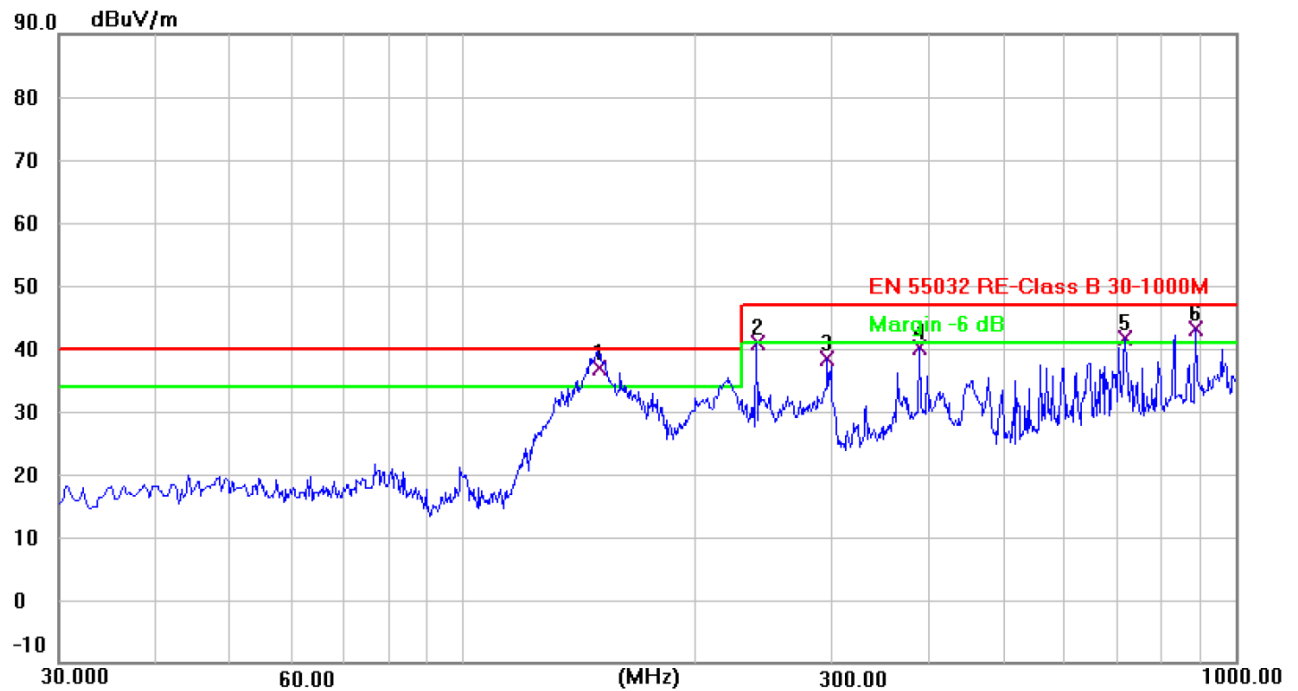
Date of testing	: 09.04.2022
Test procedure	: EN 55032:2015+A11+A1 and CISPR 16-1 series standards
Limit	: Table A.4 of EN 55032:2015+A11+A1 for Class B equipment
Frequency range	: 30-1000MHz
Detector	: Quasi-peak
Kind of test site	: Semi-anechoic chamber
Input voltage	: AC 230V, 50Hz
Operation modes	: HDMI mode

The measurement setup was in accordance with EN 55032:2015+A11+A1. During the test, the sample was placed on a wooden table of 0.8m high. The wooden table was placed on a turntable, which during the test can rotate 360° around. The center of the measuring antenna and the center of the equipment under test was in the same vertical plane. The mains cable was placed in the same plane with the excess length folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 30cm and 40cm at the mains-plug end.

A pre-scan was performed on HDMI and USB mode before the final test, HDMI has the worst disturbance level. Therefore, the test was performed on HDMI mode.

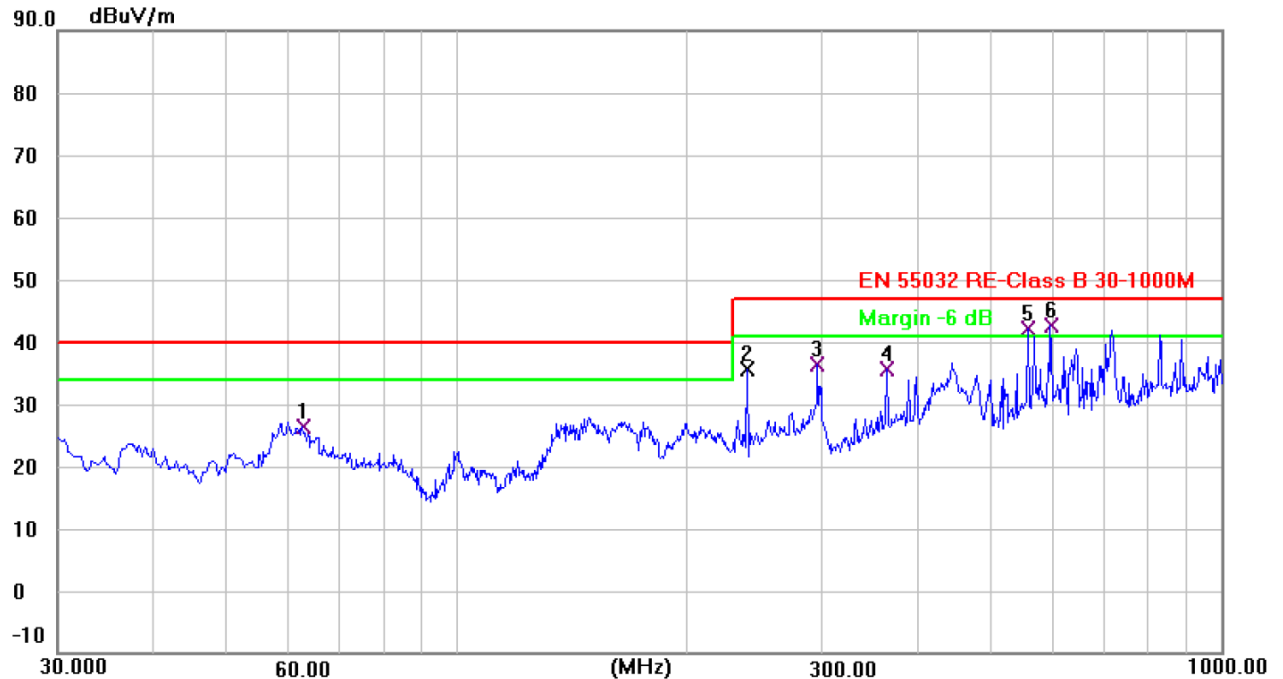
The height of the receiving antenna was adjusted from 1m-4m and the turntable was rotated 360° around to detect the maximum emission. Both horizontal- and vertical-polarizations were measured. The measured results were those maximum emissions detected.

The following results were those measured accordingly.

Figure 4: Measurement results of disturbance radiation horizontal polarizations, 30-1000MHz


Final quasi-peak measurement results:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	149.6333	55.23	-18.41	36.82	40.00	-3.18	QP
2	240.1667	54.55	-13.69	40.86	47.00	-6.14	QP
3	296.7500	50.69	-12.32	38.37	47.00	-8.63	QP
4	389.8700	50.14	-10.01	40.13	47.00	-6.87	QP
5 !	719.9932	45.91	-4.37	41.54	47.00	-5.46	QP
6 !	890.0665	45.19	-2.06	43.13	47.00	-3.87	QP

Figure 5: Measurement results of disturbance radiation vertical polarizations, 30-1000MHz


Final quasi-peak measurement results:

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	62.6566	41.82	-15.44	26.38	40.00	-13.62	QP
2	239.8433	49.31	-13.69	35.62	47.00	-11.38	QP
3	296.7500	48.69	-12.32	36.37	47.00	-10.63	QP
4	366.5900	46.19	-10.59	35.60	47.00	-11.40	QP
5 !	559.9433	48.65	-6.57	42.08	47.00	-4.92	QP
6 *	598.0967	48.43	-5.73	42.70	47.00	-4.30	QP

4.6 Disturbance radiation above 1GHz

Result:**Pass**

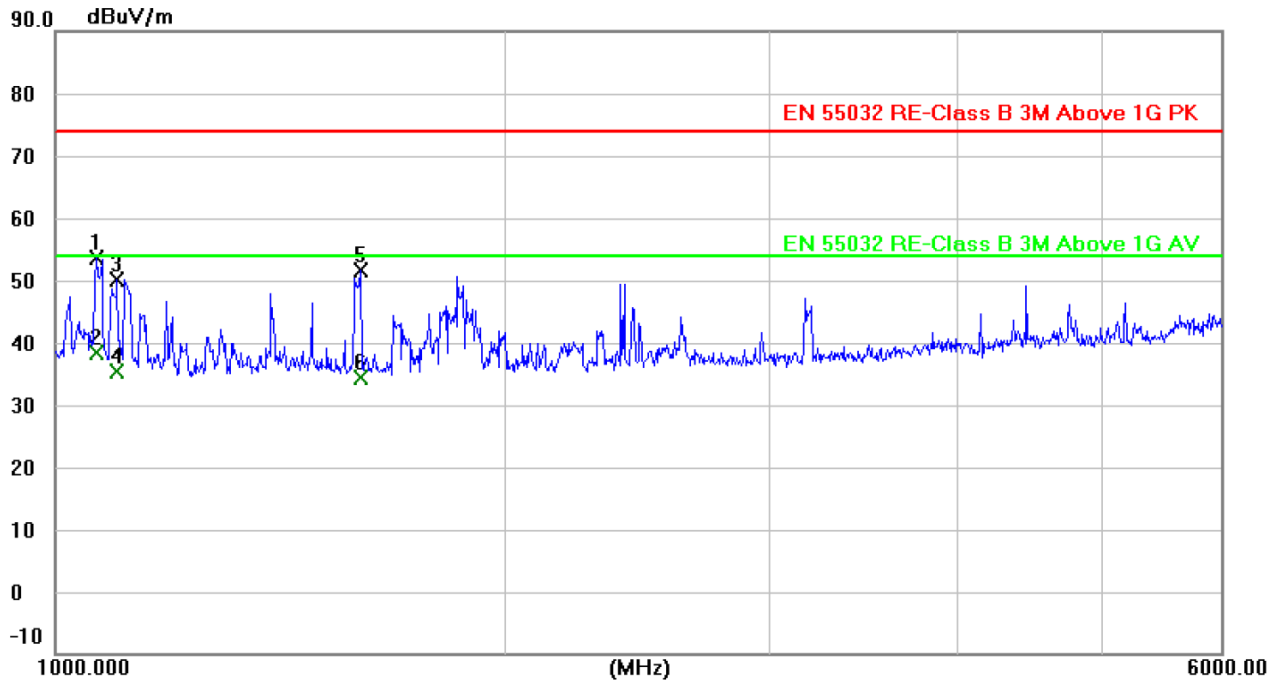
Date of testing	: 09.04.2022
Test procedure	: EN 55032:2015+A11+A1 and CISPR 16-1 series standards
Limit	: Table A.5 of EN 55032:2015+A11+A1 for Class B
Frequency range	: 1-6GHz
Detector	: Peak, Average
Kind of test site	: Anechoic chamber
Input voltage	: AC 230V, 50Hz
Operation modes	: HDMI mode

The measurement setup was in accordance with clause 7.6 of CISPR 16-2-3. During the test, the sample was placed on a wooden table of 0.8m high. The wooden table was placed on a turntable, which during the test can rotate 360° around. The center of the measuring antenna and the center of the equipment under test was in the same vertical plane.

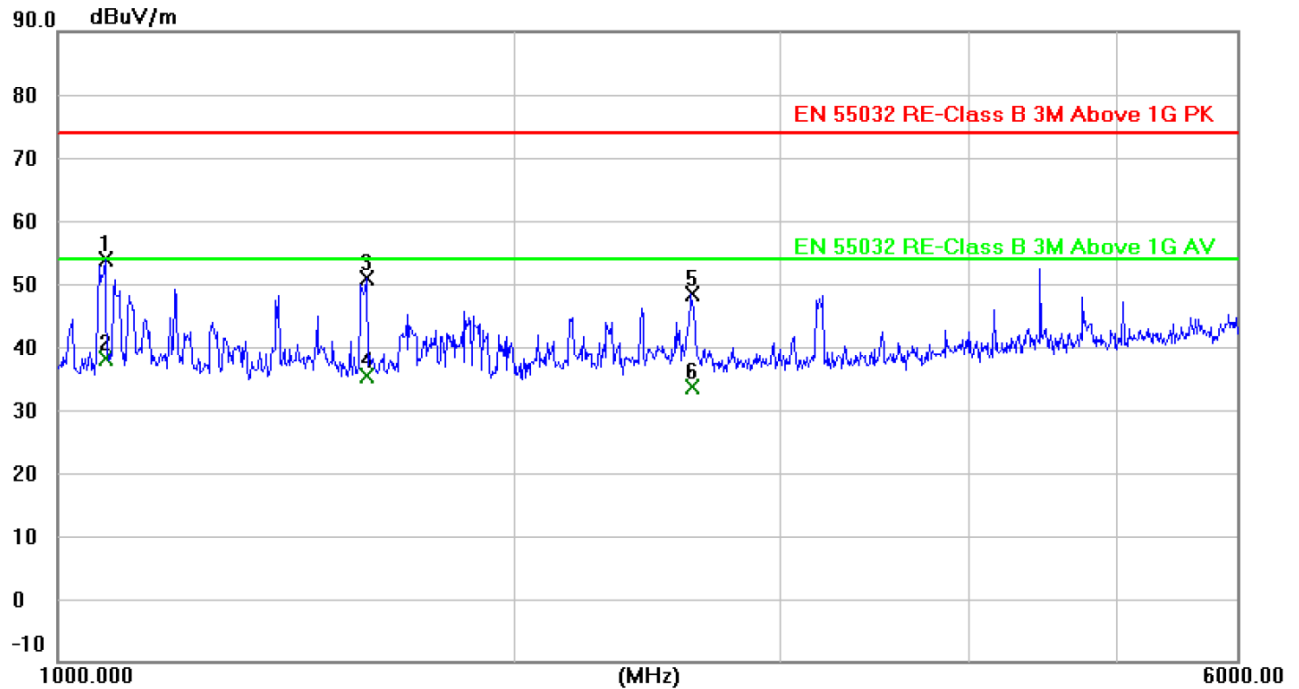
A pre-scan was performed on HDMI and USB mode before the final test, HDMI has the worst disturbance level. Therefore, the test was performed on HDMI mode.

The EUT should be rotated 360° in azimuth for both polarizations to determine the maximum emissions at each frequency of interest. Both horizontal- and vertical-polarizations were measured. The measured results were those maximum emissions detected.

The following results were those measured accordingly.

Figure 6: Measurement results of disturbance radiation above 1GHz horizontal-polarizations


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1065.000	61.71	-8.06	53.65	74.00	-20.35	peak
2 *	1065.000	46.53	-8.06	38.47	54.00	-15.53	AVG
3	1100.000	58.18	-7.99	50.19	74.00	-23.81	peak
4	1100.000	43.25	-7.99	35.26	54.00	-18.74	AVG
5	1600.000	58.42	-6.83	51.59	74.00	-22.41	peak
6	1600.000	41.09	-6.83	34.26	54.00	-19.74	AVG

Figure 7: Measurement results of disturbance radiation above 1GHz vertical-polarizations


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1075.000	61.91	-8.03	53.88	74.00	-20.12	peak
2 *	1075.000	46.18	-8.03	38.15	54.00	-15.85	AVG
3	1600.000	57.76	-6.83	50.93	74.00	-23.07	peak
4	1600.000	42.09	-6.83	35.26	54.00	-18.74	AVG
5	2621.667	51.47	-2.99	48.48	74.00	-25.52	peak
6	2621.667	36.58	-2.99	33.59	54.00	-20.41	AVG

5 Test Results IMMUNITY

During the immunity tests, the EUT was operated under conditions specified by clause 3.1 of this report.

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

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

Date of testing: 19.04.2022-22.04.2022

Room temperature: 20°C

Relative Humidity: 50%

5.1 Electrostatic Discharge

Result:**Pass**

The immunity against electrostatic discharge was tested in accordance with Table 1 of EN 55035:2017+A11. Test setup, test method and ESD generator are in accordance with IEC 61000-4-2.

The EUT was placed on a 0.8m wood table above the ground plane. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m.

Test voltage : $\pm 4.0\text{kV}$ (Contact Discharge), $\pm 8.0\text{kV}$ (Air Discharge)
Polarity : Positive / negative
Number of discharges : 10 for each polarity at each discharge point
Performance criteria : B
Operation mode : HDMI and USB mode

Table 4: Electrostatic discharge immunity test results

Position	Kind of discharge	Result	Remarks
All accessible metallic part around the enclosure	Contact discharge	Pass	During the test, the sample can operate as intended
Slots, seams, non-metallic part of the enclosure	Air discharge	Pass	Ditto
HCP, VCP	Contact discharge	Pass	Ditto

5.2 Radio frequency electromagnetic field

Result:	Pass
----------------	-------------

This immunity test was performed in accordance with Table 1 of EN 55035:2017+A11. Test setup and test method are in accordance with IEC 61000-4-3.

The test was performed inside an anechoic chamber. The field uniformity of the volume where the sample was placed meet the field uniformity requirements specified by IEC 61000-4-3.

Test specifications : Swept test: 80-1000MHz, 3V/m, 80% AM, 1kHz, step 1%/2s
Spot test: 1800, 2600, 3500, 5000MHz, 3V/m, 80% AM, 1kHz

Performance criterion : A

Operation mode : HDMI and USB mode

Table 5: RF electromagnetic field immunity test results

Frequency range	Test level	Polarization	Result	Remarks
80-1000MHz	3V/m	Horizontal Vertical	Pass	During the test, the sample can operate as intended
			Pass	Ditto
1800MHz, 2600MHz, 3500MHz, 5000MHz	3V/m		Pass	Ditto

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5.3 Power frequency magnetic field

Result:**n.a.**

5.4 Injected Current into AC Power Port

Result:
Pass

The immunity against injected current into AC power port was tested according to Table 4 of EN 55035:2017+A11 in a shielded room. The Test setup and the test generator was according to IEC 61000-4-6.

The EUT is placed on a ground reference plane and shall be insulated from it by an insulating support 0.1m thick. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m.

Voltage Level	: 0.15-10MHz: 3V 10-30MHz: 3 to 1V 30-80MHz: 1V
Environmental phenomena	: r.f. current, common mode, 1kHz, 80%AM
Source impedance	: 150 Ω
Step size/dwell time	: 1%/2s
Performance criteria	: A
Operation mode	: HDMI and USB mode

Table 6: Injected current, AC power port

Line	Result	Remarks
AC Input port	Pass	During the test, the sample can operate as intended

5.5 Injected Current into Analogue/Digital Data Port

Result:
Pass

The immunity against injected current into tuner port was tested according to Table 2 of EN 55035:2017+A11 in a shielded room. The Test setup and the test generator was according to IEC 61000-4-6.

The EUT is placed on a ground reference plane and shall be insulated from it by an insulating support 0.1m thick. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m.

Voltage Level	: 0.15-10MHz: 3V 10-30MHz: 3 to 1V 30-80MHz: 1V
Environmental phenomena	: r.f. current, common mode, 1kHz, 80%AM
Source impedance	: 150 Ω
Step size/dwell time	: 1%/2s
Performance criteria	: A
Operation mode	: HDMI and USB mode

Table 7: Injected current, analogue/digital data port

Line	Result	Remarks
Signal input ports	Pass	During the test, the sample can operate as intended
LAN port	Pass	Ditto

5.6 Surges to AC Power Port

Result:
Pass

The immunity against surges to AC power port was tested in accordance with Table 4 of EN 55035:2017+A11. Test setup and the Combination Wave Generator (CWG) were according to IEC 61000-4-5.

The EUT is placed on a 0.1m wood table above the ground plane.

Open-circuit Test Voltage : 1kV (phase to neutral)
 2kV (phase to PE)
 Tr/Tn : 1.2/50µs (open-circuit voltage)
 8/20µs (short-circuit current)
 Test numbers : 5 positive and 5 negative pulses
 Repetition rate : 1 surge/min
 Performance criteria : B
 Operation mode : HDMI and USB mode

Table 8: Surges to AC Power port, positive/negative

Line	Result	Remarks
Phase to neutral 1kV	Pass	During the test, the sample can operate as intended
Phase to PE 2kV	n.a.	n.a.
Neutral to PE 2kV	n.a.	n.a.

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5.7 Surges to Analogue/Digital Data Port

Result:**n.a.**

5.8 Voltage Dips and Interruptions to AC Power Port

Result:
Pass

The immunity against voltage dips and interruptions to AC power port was tested in accordance to Table 4 of EN 55035:2017+A11. Test setup and the test generator were according to IEC 61000-4-11.

Basic standard : IEC 61000-4-11
 Test level : <5% residual, 0.5T;
 70% residual, 25T;
 <5% residual, 250T.
 Performance criteria : B (<5% residual, 0.5T) ;
 C (70% residual, 25T and <5% residual, 250T)
 Operation mode : HDMI and USB mode

Table 9: Test condition and Test Result for Voltage interruptions

Environmental Phenomena	Test level (in % U_T)	Duration (in period of the rated frequency)	Remarks
Interruptions	0	250T	During the test, the EUT stopped temporarily
Dips	0	0.5T	During the test, the sample can operate as intended
Dips	70	25T	Ditto

5.9 Electrical fast transients to AC Power Port

Result:	Pass
----------------	-------------

The immunity against electrical fast transients/burst was tested in accordance to Table 4 of EN 55035:2017+A11. Test setup, test method and EFT/B generator are in accordance with IEC 61000-4-4.

The EUT is placed on a 0.1m wood table above the ground plane. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m. The length between the coupling device and the EUT is less than 1m.

The reference ground plane is an aluminum sheet of 0.25mm minimum thickness. The reference ground plane is connected to the protective earth. The size of the ground plane is more than 2m x 2m.

Test voltage	: 1kV
Repetition frequency	: 5kHz
T _r /T _d	: 5/50ns
Polarity	: Positive/negative
Test duration	: 1min for each polarity
Performance criteria	: B
Operation mode	: HDMI and USB mode

Table 10: Electrical fast transients/burst immunity test on AC power port

Coupling port	Result	Remarks
L+N -GRD	Pass	During the test, the sample can operate as intended.

5.10Electrical fast transients to Analogue/Digital Data Port

Result:	Pass
----------------	-------------

The immunity against electrical fast transients/burst was tested in accordance to Table 2 of EN 55035:2017+A11. Test setup, test method and EFT/B generator are in accordance with IEC 61000-4-4.

The EUT is placed on a 0.1m wood table above the ground plane. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m. The length between the coupling device and the EUT is less than 1m.

The reference ground plane is an aluminum sheet of 0.25mm minimum thickness. The reference ground plane is connected to the protective earth. The size of the ground plane is more than 2m x 2m.

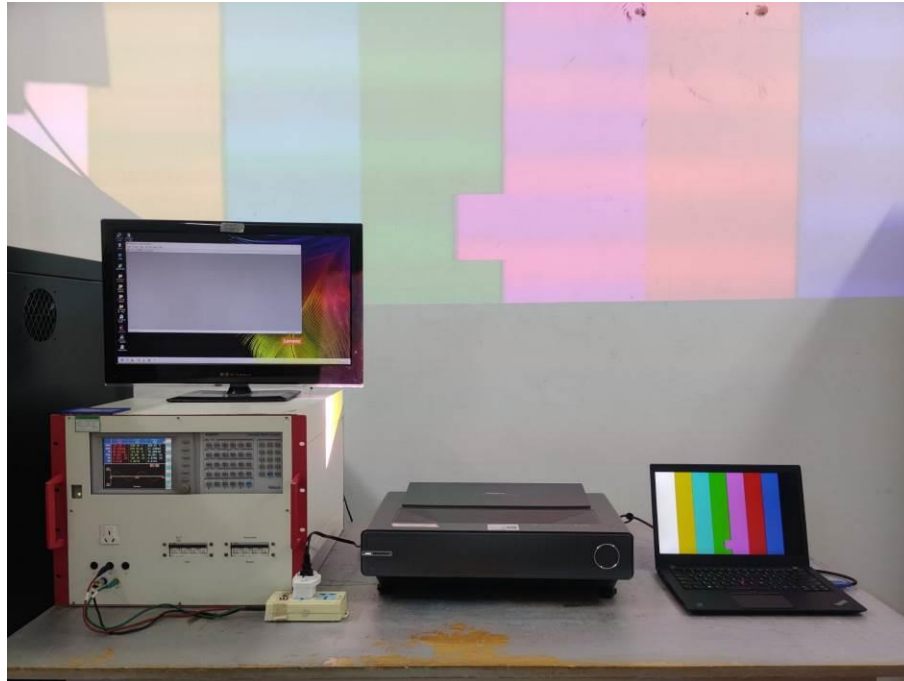
Test voltage	: 0.5kV
Repetition frequency	: 5kHz
T _r /T _d	: 5/50ns
Polarity	: Positive/negative
Test duration	: 1min for each polarity
Performance criteria	: B
Operation mode	: HDMI and USB mode

Table 11: Electrical fast transients/burst immunity test on analogue/digital data port

Coupling port	Result	Remarks
Signal input ports	Pass	During the test, the sample can operate as intended
LAN port	Pass	Ditto

6 Photographs of the Test Set-Up

Photograph 1: Harmonics and voltage fluctuations



Photograph 2: Mains terminal continuous disturbance voltage



Photograph 3: Asymmetric mode disturbance voltage



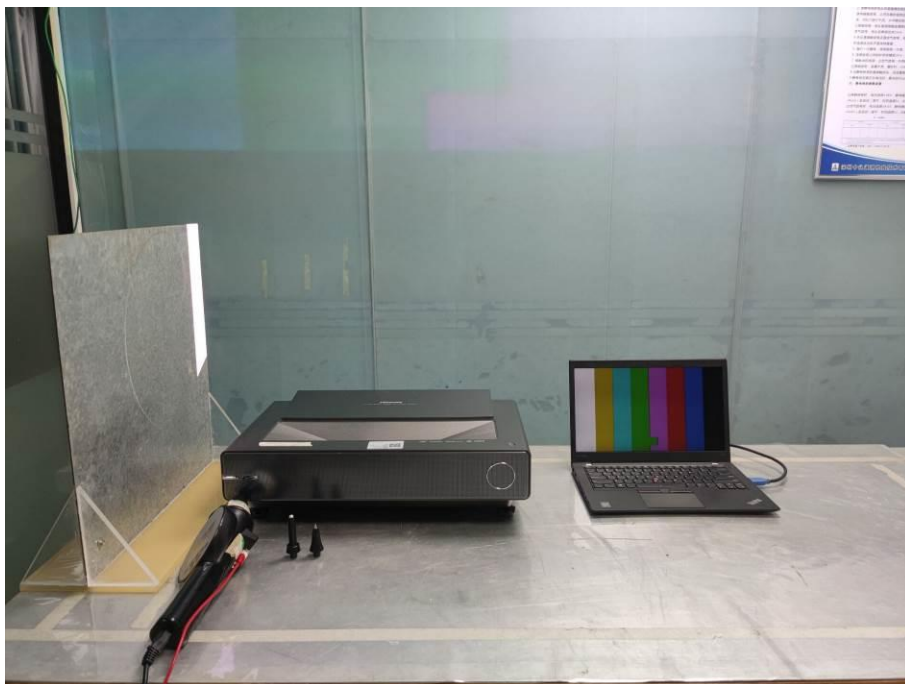
Photograph 4: Disturbance radiation below 1GHz



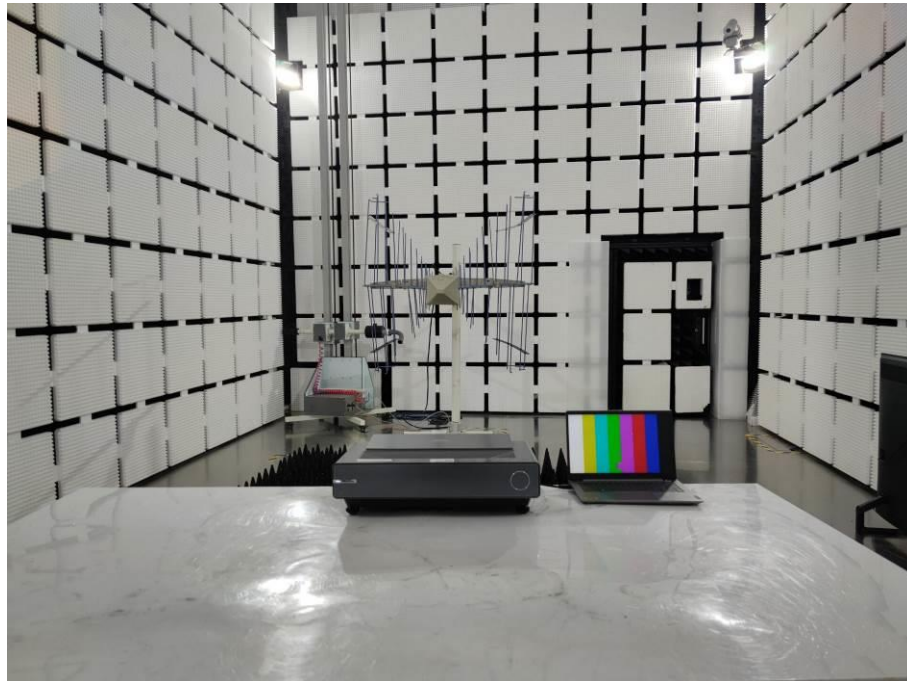
Photograph 5: Disturbance radiation above 1GHz



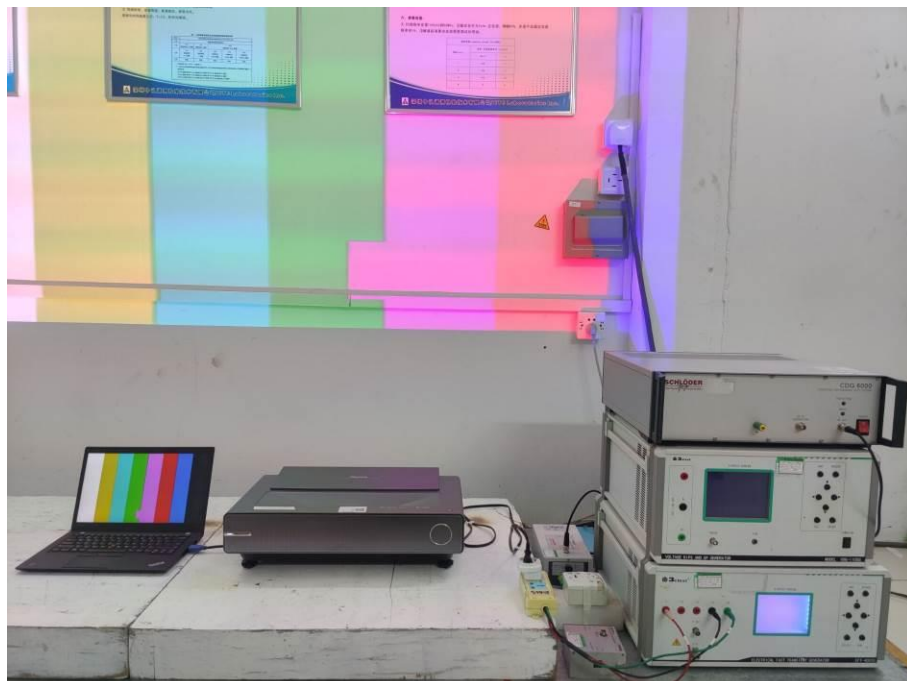
Photograph 6: Electrostatic discharge



Photograph 7: Radio frequency electromagnetic field



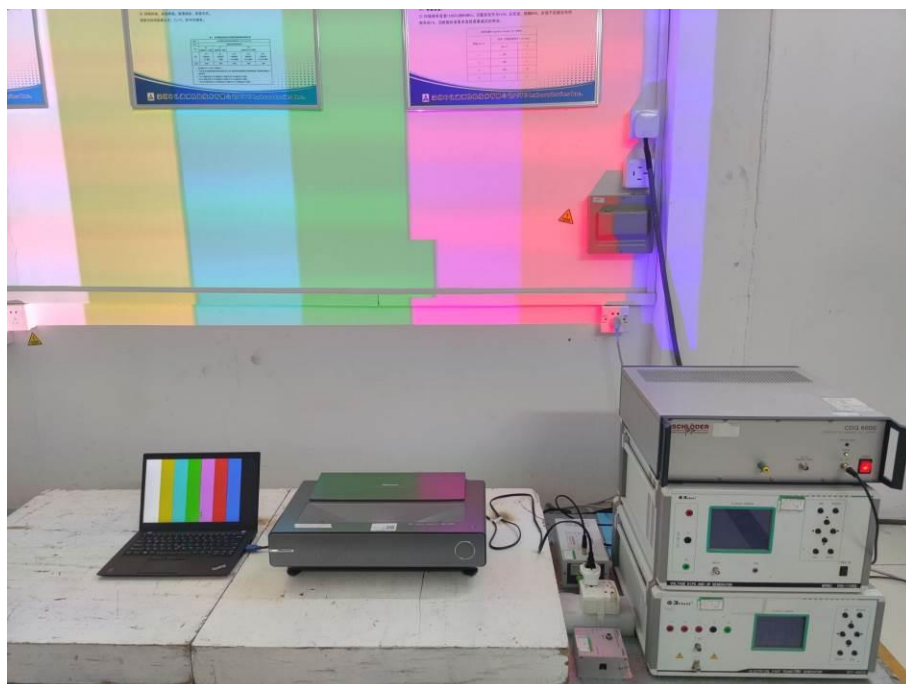
Photograph 8: Burst on AC mains



Photograph 9: Burst on analogue/digital data ports



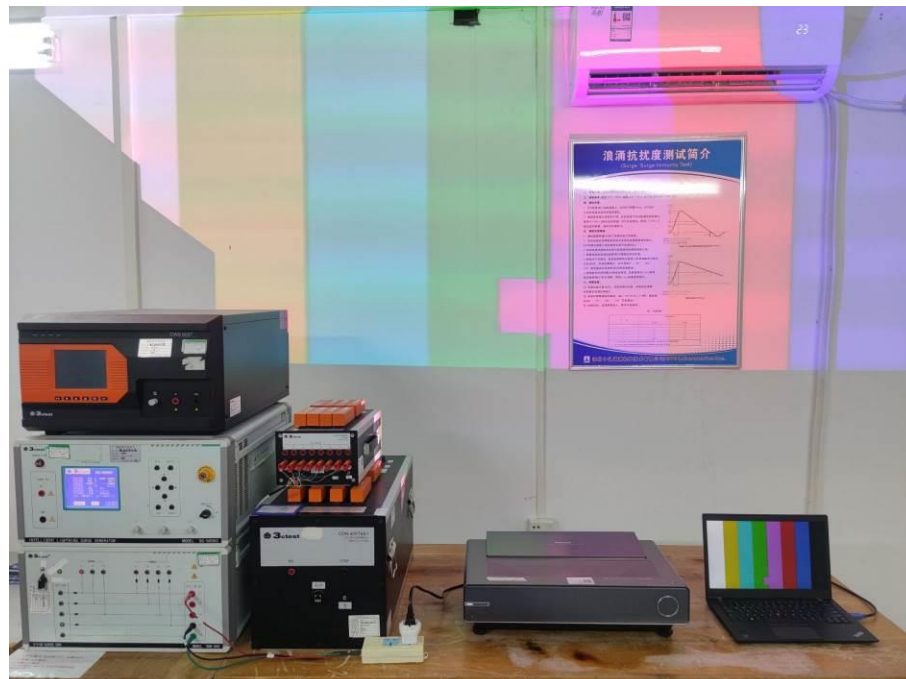
Photograph 10: Injected Current on AC mains



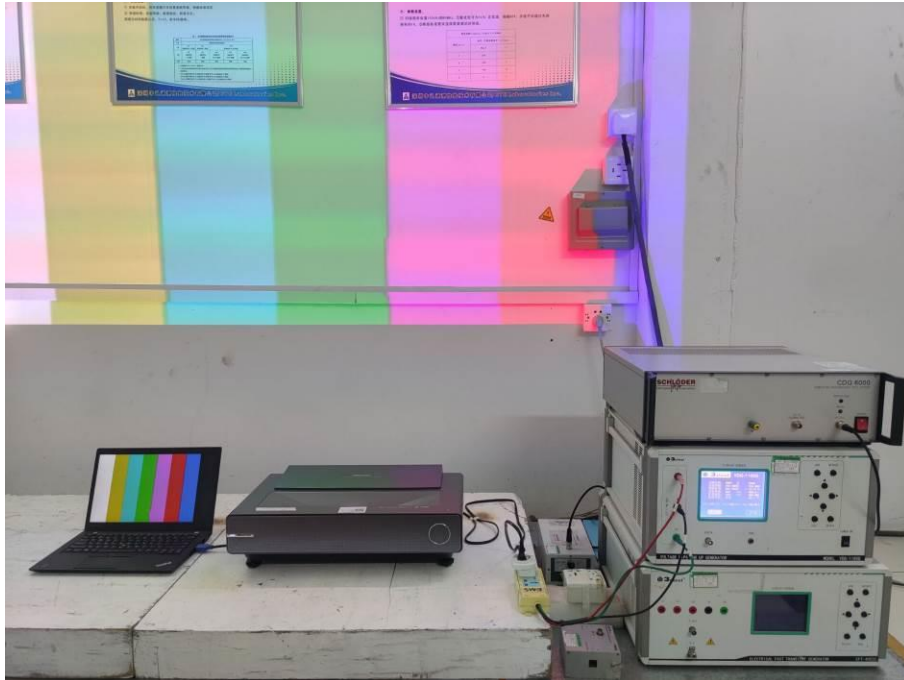
Photograph 11: Injected Current on analogue/digital data ports



Photograph 12: Surge on AC mains



Photograph 13: Voltage dips and interruptions to AC mains



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Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	01.04.2022	
Auftraggeber: <i>Client:</i>	Hisense Visual Technology Co., Ltd. No. 218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, P.R. China			
Prüfgegenstand: <i>Test item:</i>	LASER CINEMA			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	PX1, PX1G, PX1-PRO, PX1G-PRO, PXx, PXxGx, PXx-PROx, PXxG-PROx, PXx-LITEx (x=0-9 or A-Z or Blank or -)			
Auftrags-Inhalt: <i>Order content:</i>	RED AK			
Prüfgrundlage: <i>Test specification:</i>	EN 301 489-1 V2.2.3:2019 EN 301 489-17 V3.2.4:2020			
Wareneingangsdatum: <i>Date of receipt:</i>	01.04.2022	<p>Dokumenten-Check (keine Fotodokumentation erforderlich)</p> <p>Document Check (no photo documentation required)</p>		
Prüfmuster-Nr.: <i>Test sample No.:</i>	178164387-001A			
Prüfzeitraum: <i>Testing period:</i>	Refer to test report			
Ort der Prüfung: <i>Place of testing:</i>	Refer to Section 1.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland/CCIC (Qingdao) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	X 	genehmigt von: <i>authorized by:</i>	X 	
Datum: <i>Date:</i>	25.04.2022 <small>Signed by: Hunter Yu</small>	Ausstellungsdatum: <i>Issue date:</i>	25.04.2022 <small>Signed by: Ying Xie</small>	
Stellung / Position:	Project Engineer	Stellung / Position:	Technical Certifier	
Sonstiges / Other: <i>In electrical characteristics, all models above are the same, the only difference among them is model name, therefore, all EMC tests were performed on the model PX1G.</i>				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar 4 = sufficient N/A = not applicable
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

3.1.1 EN 301 489-01 –8.2 RADIATED EMISSION ENCLOSURE OF ANCILLARY EQUIPMENT

Result:

n.a.

3.1.2 EN 301 489-01 –8.3 CONDUCTED EMISSION –DC POWER INPUT/OUTPUT PORTS

Result:

n.a.

3.1.3 EN 301 489-01 –8.4 CONDUCTED EMISSION –AC MAINS INPUT/OUTPUT PORTS

Result:

Pass

3.1.4 EN 301 489-01 –8.5 HARMONIC CURRENT EMISSIONS (AC MAINS INPUT PORT)

Result:

Pass

3.1.5 EN 301 489-01 –8.6 VOLTAGE FLUCTUATIONS AND FLICKER (AC MAINS INPUT PORT)

Result:

Pass

3.1.6 EN 301 489-01 –8.4 CONDUCTED EMISSION –WIRED NETWORK PORTS

Result:

Pass

3.2.1 EN 301 489-01 –9.2 RF ELECTROMAGNETIC FIELD (80MHZ TO 6000MHZ)

Result:

Pass

3.2.2 EN 301 489-01 –9.3 ELECTROSTATIC DISCHARGE

Result:

Pass

3.2.3 EN 301 489-01 –9.4 FAST TRANSIENTS, COMMON MODE

Result:

Pass

3.2.4 EN 301 489-01 –9.5 RADIO FREQUENCY, COMMON MODE

Result:

Pass

3.2.5 EN 301 489-01 –9.6 TRANSIENTS AND SURGES IN THE VEHICULAR ENVIRONMENTS

Result:

n.a.

3.2.6 EN 301 489-01 –9.7 VOLTAGE DIPS AND INTERRUPTIONS

Result:

Pass

3.2.7 EN 301 489-01 –9.8 SURGES

Result:

Pass

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1 Test Sites

1.1 Test Facilities

Laboratory: CTC Laboratories, Inc.

Address: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building,
Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong,
China

The used test equipment is in accordance with CISPR 16.

The performed tests have been conducted by the above mentioned lab under supervision of TÜV Rheinland's engineer.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radiated emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-759	Nov. 09, 2022
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 23, 2022
3	Test Receiver	Keysight	N9038A	MY56400071	Dec. 23, 2022
4	Broadband Premplifier	SCHWARZBECK	BBV9743B	259	Dec. 23, 2022
5	Mirowave Broadband Amplifier	SCHWARZBECK	BBV9718C	111	Dec. 23, 2022
6	3m chamber 3	YIHENG	EE106	/	Sep. 09, 2023
Conducted emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 23, 2022
2	LISN	R&S	ENV216	101113	Dec. 23, 2022
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 23, 2022
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 23, 2022
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 23, 2022
6	Current Probe	CYBERTEK	EM5011	E165011025	Dec. 23, 2022
7	Power Dividers	Weinschel	1506A	KJ658	Dec. 23, 2022
Harmonic current emissions & Voltage fluctuations and flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Universal Power Analyzer	Voltech	PM6000	200006700723	Dec.23, 2022
2	Programmable AC Power Source	Mtoni	PHF1530	MTPS001	Dec.23, 2022
Electrostatic discharge					

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Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	ESD Simulator	EM TEST	DITO	V1113109156	Dec.23, 2022
Radio frequency electromagnetic field					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	High Gain Log-Periodic Antenna	R&S	HL046E	100037	Dec.23, 2022
2	Stacked Log.-Per. Antenna	Schwarzbeck	STLP 9149	9149-658	Dec.23, 2022
3	Power Amplifier	BONN ELEKTRONIK	BLWA0830-160/100/40D	76788	Dec.23, 2022
4	Power Amplifier	Micotop	MPA-3-6G-50	MPA1706258	Dec.23, 2022
5	PSG Analog Signal Generator	Agilent	E8257D	MY46521908	Dec.23, 2022
Electrical fast transient / burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Electrical fast transient generator	3ctest	EFT-4003G	EC0471140	Dec.23, 2022
2	Coupling/Decoupling Clamp	3ctest	EFTC	EC0441141	Dec.23, 2022
Surges					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Surge generator	3ctest	SG-5006G	EC5581149	Dec.23, 2022
2	Surge CDN	3ctest	SGN-20G	EC5551128	Dec.23, 2022
3	Network Surge Generator	3ctest	CWS 600T	ES0311603	Dec.23, 2022
4	Network Surge CDN	3ctest	CDN 405T8A1	ES2731605	Dec.23, 2022
Radio frequency continuous conducted					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	C/S Generator	SCHLODER	CDG 6000	126A1266	Dec.23, 2022
2	Coupling/Decoupling Network	SCHLODER	CDN M2+3	A2210258	Dec.23, 2022
3	Coupling/Decoupling Network	TESEQ GmbH	CDN T8-10	45011	Dec.23, 2022
4	6dB Attenuator	N/A	100W/6dB	N/A	Dec.23, 2022
Voltage dips, short interruptions and voltage variations					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	Voltage dips and up generator	3ctest	VDG-1105G	EC0171116	Dec.23, 2022

2 General Product Information

2.1 Product Function and Intended Use

The EUTs (equipment under test) are laser projectors with WiFi/BT module for household use. For the further information, refer to the user's manual.

2.2 Ratings and System Details

Frequency range	2.400-2.4835GHz 5.150-5.350GHz 5.470-5.725GHz
System input voltage	AC 100-240V, 50/60Hz
System current	0.8A
Protection class	II

2.3 Description of the Samples

The EUT (equipment under test) is Non-radio products (laser projector) with a plug-in WiFi/BT radio module.

2.4 Independent Operation Modes

The basic operation modes are: "On" and "Off" modes for both transmitter and receiver.

2.5 Noise Generating and Noise Suppressing Parts

Refer to the circuit diagram for further information.

2.6 Submitted Documents

Circuit diagram, component list and rating label, etc.

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3 Test Results EN 301 489-17 V3.2.4:2020

3.1 EN 301 489-01 –7.1 EMC Emission

3.1.1 EN 301 489-01 –8.2 Radiated Emission enclosure of ancillary equipment

Result:	n.a.
----------------	-------------

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3.1.3 EN 301 489-01 –8.4 Conducted emission –AC mains input/output ports

Result:	Pass
----------------	-------------

Test procedure : EN 55032:2015+A11+A1 and CISPR 16-1 series standards
 Frequency range : 0.15 – 30MHz
 Limits : Quasi-peak: 0.15-0.5MHz, 66-56dB μ V (The limits decrease linearly with the logarithm of frequency);
 0.5-5MHz, 56dB μ V; 5-30MHz, 60dB μ V
 Average:0.15-0.5MHz, 56-46dB μ V (The limits decrease linearly with the logarithm of frequency);
 0.5-5MHz, 46dB μ V; 5-30MHz, 50dB μ V

Kind of test site : Shielded room

Ambient conditions : Temperature: 20°C, relative humidity: 60%

Test Setup

Input Voltage : AC 230V, 50Hz
 Artificial hand : N/A
 Earthing : No Earthed
 Operating condition : Transmitting and receiving

The measurement set-up was made according to EN 55032:2015+A11+A1 in a shielded room.

The measurement equipment like test receivers, quasi-peak detector and artificial mains network (AMN) are in compliance with CISPR 16-1 series standards.

The EUT was placed 0.8m away from the AMN and 0.4m from the metallic wall of the shielded enclosure. The part of the cord longer than necessary to be connected to the AMN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m.

The following figures and tables were those measured by an automatic measurement system. A preview test was firstly performed with peak detector. The final test was performed with quasi-peak and average detectors respectively at those critical frequencies during the preview test.

Test figures and data, refer to part I of CN22DPE6 001.

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Result:	Pass
----------------	-------------

Test procedure : EN IEC 61000-3-2:2019+A1

Test duration : 2.5min

Harmonic order : 2 – 40th

Following are the measurement results, which were obtained via an automatic measurement system.

Test data, refer to part I of CN22DPE6 001.

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3.1.5 EN 301 489-01 –8.6 Voltage fluctuations and flicker (AC mains input port)**Result:****Pass**

Test procedure : EN 61000-3-3:2013+A1

According to the characteristics of the sample, as specified by clause 5 of the basic standard, following limits apply:

- the maximum relative voltage change d_{max} , shall not exceed 4%.

Following are the measurement results obtained via an automatic testing system.

Test data, refer to part I of CN22DPE6 001.

3.1.6 EN 301 489-01 –8.4 Conducted emission –Wired Network ports**Result:****Pass**

Test procedure : EN 55032:2015+A11+A1

The measurement setup was made according to EN 55032:2015+A11+A1 in a shielded room.

The measurement equipment like test receivers, quasi-peak detector and artificial mains network are in compliance with CISPR 16-1 series standards. The tested object was operated under its rated voltage and its rated frequency.

Test data, refer to part I of CN22DPE6 001.

3.2 EN 301 489-01 –7.2 EMC Immunity

During the immunity tests, the EUT was operated under normal conditions specified by the manufacture.

According to EN 301 489-1 V2.2.3:

Performance criteria for continuous phenomena:

During the test, the equipment shall:

- continue to operate as intended;
- not unintentionally transmit;
- not unintentionally change its operating state;
- not unintentionally change critical stored data.

Performance criteria for transient phenomena:

For all ports and transient phenomena with the exception described below, the following applies:

- The application of the transient phenomena shall not result in a change of the mode of operation(e.g. unintended transmission) or the loss of critical stored data.
- After application of the transient phenomena, the equipment shall operate as intended.

For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies:

- For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be otherwise restored. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

According to EN 301 489-17 V3.2.4:

Criteria	During test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.

NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

3.2.1 EN 301 489-01 –9.2 RF electromagnetic field (80MHz to 6000MHz)

Result:
Pass

The test was performed inside an anechoic chamber with a test disturbance of 3m. The field uniformity of the chamber is regularly calibrated to ensure the 0-6dB field uniformity criterion as specified by EN 61000-4-3 is met.

Date of testing : 20.04.2022
 Basic standard : EN61000-4-3
 Test level : 3V/m
 Frequency range : 80-6000MHz with the exception of the exclusion band for transmitters
 Modulation : 80% 1kHz AM
 Frequency scan speed : Frequency step: 1%; Dwell time: 2s
 Performance criteria : A, performance criteria for continuous phenomena for both transmitter and receiver
 Ambient condition : Temperature: 20°C, Relative humidity: 55%

Table 2: RF electromagnetic field immunity test results

Polarization	Result	Remarks
Horizontal	Pass	During the test, the EUT and communication link can operate as intended, PER<10%.
Vertical	Pass	Ditto

3.2.2 EN 301 489-01 –9.3 Electrostatic discharge

Result:	Pass
----------------	-------------

Test setup, test method and ESD generator are in accordance with IEC 61000-4-2.

The EUT was placed on a 0.8m wood table above the ground plane. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m.

Date of testing : 20.04.2022
 Test voltage : $\pm 4.0\text{kV}$ (Contact Discharge), $\pm 8.0\text{kV}$ (Air Discharge)
 Polarity : Positive / negative
 Number of discharges : 10 for each polarity at each discharge point
 Performance criteria : B, performance criteria for transient phenomena for both transmitter and receiver
 Ambient condition : Temperature: 20°C, Relative humidity: 55%

Table 3: Electrostatic discharge immunity test results

Position	Kind of discharge	Result	Remarks
All accessible metallic part around the enclosure	Contact discharge	Pass	During the test, the EUT and communication link can operate as intended, PER<10%.
Slots, seams, non-metallic part of the enclosure	Air discharge	Pass	Ditto
HCP, VCP	Contact discharge	Pass	Ditto

3.2.3 EN 301 489-01 –9.4 Fast transients, common mode

Result:	Pass
----------------	-------------

Test setup, test method and EFT/B generator are in accordance with IEC 61000-4-4.

The EUT is placed on a 0.1m wood table above the ground plane. And the minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m. The length between the coupling device and the EUT is less than 1m.

The reference ground plane is an aluminum sheet of 0.25mm minimum thickness. The reference ground plane is connected to the protective earth. The size of the ground plane is more than 2m x 2m.

Date of testing	: 20.04.2022
Test voltage	: 1kV
Repetition frequency	: 5kHz
T_r/T_d	: 5/50ns
Polarity	: Positive/negative
Test duration	: 1min for each polarity
Test ports	: AC mains, signal ports, wired network port
Performance criteria	: B, performance criteria for transient phenomena for both transmitter and receiver
Ambient condition	: Temperature: 20°C, Relative humidity: 55%

Table 4: Electrical fast transients/burst immunity test

Coupling port	Result	Remarks
L+N -GRD	Pass	During the test, the EUT and communication link can operate as intended, PER<10%.
Signal ports	Pass	Ditto
Wired network port	Pass	Ditto

3.2.4 EN 301 489-01 –9.5 Radio frequency, common mode

Result:	Pass
----------------	-------------

During the test, the sample was placed on a 0.1m wooden support above the reference ground plane. The minimum distance between the sample and all other conductive structures except the reference ground plane beneath the EUT is more than 0.5m.

A CDN was used to couple the disturbing signal onto the power input port of the sample. The distance between the EUT and the CDN is within 0.1-0.3m. The cable between the EUT and CDN is placed about 50mm above the reference ground plane.

Date of testing : 20.04.2022
 Basic standard : EN 61000-4-6
 Test level : 3V
 Frequency range : 0.15 – 80 MHz
 Modulation : 80% AM, 1kHz
 Frequency scan speed : Frequency step: 1%; Dwell time: 2s
 Test ports : AC mains, signal ports, wired network port
 Performance criteria : A, performance criteria for continuous phenomena for both transmitter and receiver
 Ambient condition : Temperature: 20°C, Relative humidity: 55%

Table 5: Injected current

Port	Result	Remarks
AC Input port	Pass	During the test, the EUT and communication link can operate as intended, PER<10%.
Signal ports	Pass	Ditto
Wired network port	Pass	Ditto

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3.2.6 EN 301 489-01 –9.7 Voltage dips and interruptions

Result:	Pass
----------------	-------------

Date of testing	: 20.04.2022
Basic standard	: EN 61000-4-11
Test level	: Voltage dip: 0 % residual voltage for 0,5 cycle; Voltage dip: 0 % residual voltage for 1 cycle; Voltage dip: 70 % residual voltage for 25 cycles (at 50 Hz); Voltage interruption: 0 % residual voltage for 250 cycles (at 50 Hz).
Performance criteria	: Voltage Dip: B, performance criteria for transient phenomena for both transmitter and receiver(for 70% dips, C is applied) Voltage interruption: C, volatile user data may have been lost and if applicable the communication link need not to be maintained and lost functions should be recoverable by user or operator
Ambient condition	: Temperature: 20°C, Relative humidity: 55%

Table 6: Voltage dips and interruptions

Environmental Phenomena	Test level (in % UT)	Duration (in period of the rated frequency)	Remarks
Interruptions	0	250 (5s)	During the test, the EUT and communication link stop working. After the test, EUT and communication link need operator to reset.
Dips	0	0.5 (10ms)	During the test, the EUT and communication link can operate as intended, PER<10%.
Dips	0	1 (20ms)	Ditto
Dips	70	25(500ms)	Ditto

3.2.7 EN 301 489-01 –9.8 Surges

Result:	Pass
----------------	-------------

Test setup and the Combination Wave Generator (CWG) were according to IEC 61000-4-5.

The EUT is placed on a 0.1m wood table above the ground plane.

Date of testing	: 20.04.2022
Open-circuit Test Voltage	: 1kV (phase to neutral) 2kV (phase to PE)
Tr/Tn	: 1.2/50µs (open-circuit voltage) 8/20µs (short-circuit current)
Test numbers	: 5 positive and 5 negative pulses
Repetition rate	: 1 surge/min
Test Ports	: AC mains
Performance criteria	: B, performance criteria for transient phenomena for both transmitter and receiver
Ambient condition	: Temperature: 20°C, Relative humidity: 55%

Table 7: Surges, positive/negative

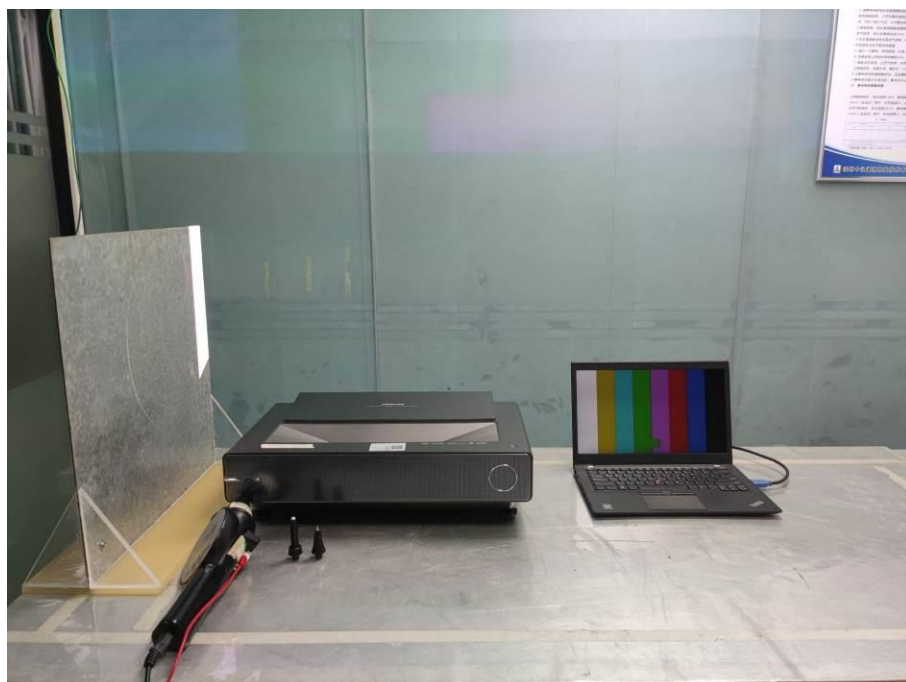
Line	Result	Remarks
Phase to neutral 1kV	Pass	During the test, the EUT and communication link can operate as intended, PER<10%
Phase to PE 2kV	n.a.	n.a.
Neutral to PE 2kV	n.a.	n.a.

4 Photographs of the Test Set-up

Photograph 1: RF electromagnetic field



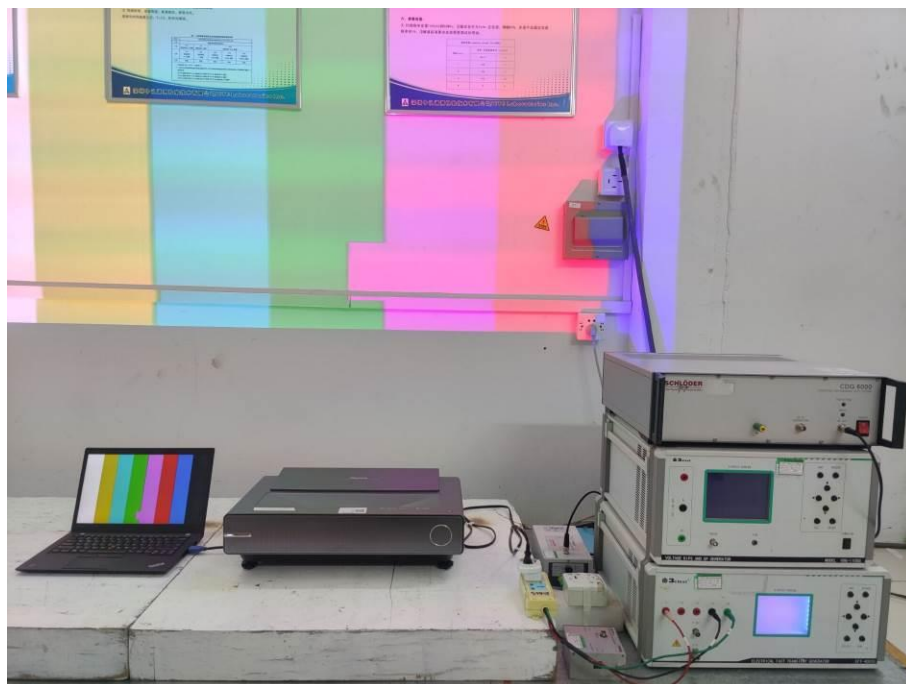
Photograph 2: ESD



Photograph 3: Radio frequency, common mode



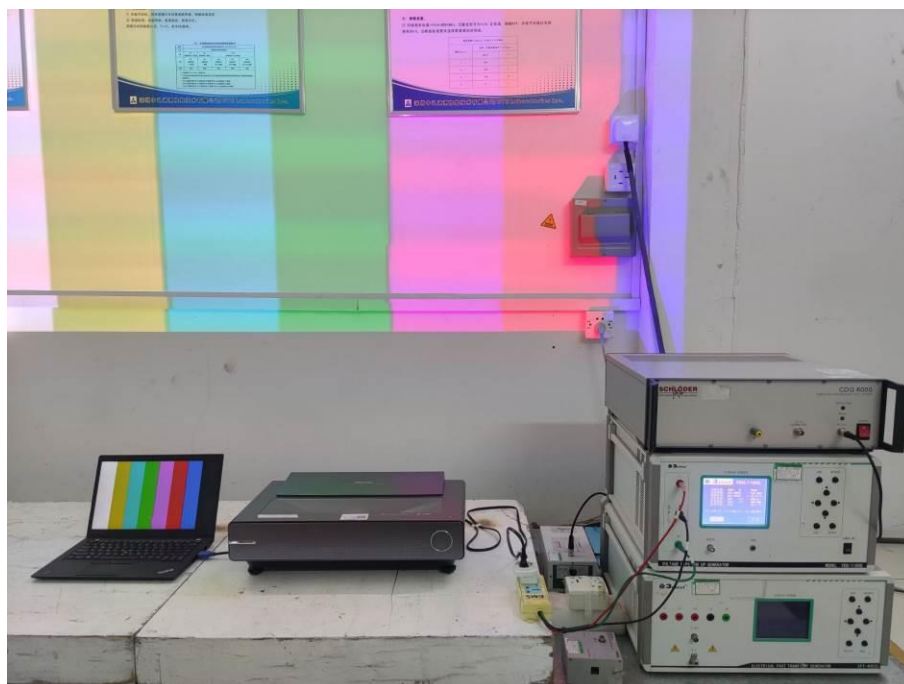
Photograph 4: Burst, common mode



Photograph 5: Surges



Photograph 6: Voltage dips and interruptions





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Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	01.04.2022	
Auftraggeber: <i>Client:</i>	Hisense Visual Technology Co., Ltd. No. 218 Qianwangang Road, Economy & Technology Development Zone, Qingdao, P.R. China			
Prüfgegenstand: <i>Test item:</i>	LASER CINEMA			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	PX1, PX1G, PX1-PRO, PX1G-PRO, PXx, PXxGx, PXx-PROx, PXxG-PROx, PXx-LITEx (x=0-9 or A-Z or Blank or -)			
Auftrags-Inhalt: <i>Order content:</i>	RED AK			
Prüfgrundlage: <i>Test specification:</i>	[Radio] EN 300 328 V2.2.2, EN 301 893 V2.1.1 [Health Protection] EN IEC 62311:2020			
Wareneingangsdatum: <i>Date of receipt:</i>	01.04.2022	<p>Dokumenten-Check (keine Fotodokumentation erforderlich)</p> <p>Document Check (no photo documentation required)</p>		
Prüfmuster-Nr.: <i>Test sample No.:</i>	178164387-001A			
Prüfzeitraum: <i>Testing period:</i>	Refer to test report			
Ort der Prüfung: <i>Place of testing:</i>	Refer to Section 2.1			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland/CCIC (Qingdao) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 25.04.2022	 X _____ Signed by: Hunter Yu		 X _____ Signed by: Ying Xie	
Stellung / Position:	Project Engineer	Ausstellungsdatum: <i>Issue date:</i> 25.04.2022	Technical Certifier	
Sonstiges / Other:				
In electrical characteristics, all models above are the same, the only difference among them is model name, therefore, all tests were performed on the model PX1G.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report.

1.2 Test Specifications

The following standards were applied.

Table 1: Applied Standard

Radio
EN 300 328 V2.2.2; EN 301 893 V2.1.1
Health Protection
EN IEC 62311: 2020

Other aspects:

1. The WiFi/Bluetooth module which model is MW510-1 manufactured and DOC declared by Qingdao Hisense Communication Co., Ltd. was integrated into the TV as an assessed module. The RF reports are SRTC2021-9004(R)-21090302(D) to SRTC2021-9004(R)-21090302(G). Assessed radio modules installed in equipment in conformance with the manufacturer's installation instructions.
2. According to ETSI EG 203 367, If the manufacturer of the combined equipment installs the radio product in a host non-radio product in equivalent assessment conditions (i.e. host equivalent to the one used for the assessment of the radio product) and according to the installation instructions for the radio product, then no additional assessment of the combined equipment against article 3.2 of the RED [i.1] is required. Therefore, the EUT is deemed to meet the requirements of EN 300 328 V2.2.2 and EN 301 893 V2.1.1 without further testing.

2. Evaluation of Human Exposure to EM Fields

Evaluation procedure : EN IEC 62311:2020

For test data, refer to report SRTC2021-9004(R)-21090302(I) issued by The State Radio_monitoring_center Testing Center (SRTC).

Conclusion: This device complies with requirements of 2014/53/EU (Article 3.1a, human exposure to Electromagnetic Fields).

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