Shenzhen Huatongwei International Inspection Co.,Ltd.
Huatongwei 101, No.006, Keji south 12th Road, High-tech zone community, Yuehai Street,
Nanshan District, Shenzhen, Guangdong, China
Phone:86-755-26715499 E-mail: cs@szhtw.com.cn Website:http://www.szhtw.com.cn

TEST REPORT

For FCC Part15B

Report No. .....:	**CHTW24060007**	Report verification:
Project No. ……..……..:	**SHT2404071815W**	
FCC ID..... :	**BBP-OTY0GV1**	
Applicant's name..... :	Ricoh Company Ltd	
Address.....:	2-7-1 Izumi Ebina Kanagawa, 243-0460 Japan	
Product Name ..... :	**PROJECTOR**	
Trade Mark .....:	RICOH	
Model No. .....:	RICOH PJ UHL3660	
Listed Model(s) .....:	-	
Standard ..... :	**FCC CFR Title 47 Part 15 Subpart B**	
Date of receipt of test sample……..:	May.08, 2024	
Date of testing……:	May.08, 2024 - Jun.03, 2024	
Date of issue……...:	Jun.04, 2024	
Result..... ……..:	**Pass**	

Compiled by (position+printed name+signature)...:	File administrators Kiki Kong
Supervised by (position+printed name+signature)...:	Project Engineer Kiki Kong
Approved by (position+printed name+signature)...:	RF Manager Hans Hu

Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**
Address.....:	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China

Contents

1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

FCC CFR Title 47 Part 15 Subpart B - Unintentional Radiators

ANSI C63.4: 2014 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

1.2. Report version information

Revision No.	Date of issue	Description
N/A	2024-06-04	Original

2. TEST DESCRIPTION

Section	Test Item	Section in CFR 47	Result #1	Test Engineer
5.1	Conducted Emissions	15.107(a)	PASS	JUNMAN.WANG
5.2	Radiated Emissions	15.109(a)	PASS	Yifan Wang

Note:
#1: The test result does not include measurement uncertainty value

3. SUMMARY

3.1. Client Information

Applicant:	Ricoh Company Ltd
Address:	2-7-1 Izumi Ebina Kanagawa, 243-0460 Japan
Manufacturer:	Ricoh Company Ltd
Address:	2-7-1 Izumi Ebina Kanagawa, 243-0460 Japan
Factory:	EFUN Display Technology (Shenzhen) Co.,Ltd
Address:	4-6 floor, Block 2, Huahong ICT Industrial Park, Genyu Road and Nanming Road Interchange, Guangming New District, 518052 Shenzhen, Guangdong, PEOPLE'S REPUBLIC OF CHINA.

3.2. Product Description

Main unit information:	
Product Name:	PROJECTOR
Trade Mark:	RICOH
Model No.:	RICOH PJ UHL3660
Listed Model(s):	-
Power supply:	AC100-240V
Hardware version:	381067903
Software version:	1507.0.24

3.3. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	Building 7, Baiwang Idea Factory, No.1051, Songbai Road, Yangguang Community, Xili Subdistrict, Nanshan District, Shenzhen, Guangdong, China	
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC Registration Number	762235
	FCC Designation Number	CN1181

4. TEST CONFIGURATION

4.1. Descriptions of test mode

Test mode O1	All functions full load(Playing 1KHz video signal Colour bars with moving picture element)HDMl 1 Input
Test mode O2	All functions full load(Playing 1KHz video signal Colour bars with moving picture element)HDMl 2 Input
Test mode O3	All functions full load(Playing 1KHz video signal Colour bars with moving picture element) PC Control Input
Test mode O4	All functions full load(Playing 1KHz video signal Colour bars with moving picture element) USB Input
Test mode O5	All functions full load(Playing 1KHz video signal Colour bars with moving picture element) HDBase-T Input
Test mode O6	All functions full load(Playing 1KHz video signal Colour bars with moving picture element) HDMl Input
Test mode O7	All functions full load(Playing 1KHz video signal Colour bars with moving picture element) Remote Input
Test mode O8	Standy

Pre-scan above all test mode, found below test mode which it was worse case mode, so only show the test data for worse case mode on the test report

Test Item	Test mode for worse case
Conducted Emissions	Test mode O1
Radiated Emissions	Test mode O1

4.2. Support unit used in test configuration

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

Whether support unit is used?			
✓ No			
Item	Equipment	Trade Name	Model No.
1			
2			

4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.4. Statement of the measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	AC Conducted Emission	3.21dB
2	Radiated Emission	4.54dB for 30MHz-1GHz 5.10dB for above 1GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

4.5. Equipments Used during the Test

● Conducted Emission

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2023/8/22	2024/8/21
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2023/8/18	2024/8/17
●	Protection Network	SCHWARZBECK	HTWE0567	VTSD9561FN	00899	2023/8/18	2024/8/17
●	ISN	FCC	HTWE0148	FCC-TLISN-T2-02	20371	2023/8/18	2024/8/17
●	ISN	FCC	HTWE0150	FCC-TLISN-T8-02	20375	2023/8/18	2024/8/17
●	Test Software	R&S	N/A	EMC32	N/A	N/A	N/A

● Radiated Emission - 30MHz~1GHz

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2023/4/6	2026/4/5
●	EMI Test Receiver	R&S	HTWE0099	ESCI 7	100900	2023/8/22	2024/8/21
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2023/2/22	2026/2/21
●	Pre-Amplifer	SCHWARZBECK	HTWE0295	BBV 9742	/	2024/5/24	2025/5/23
●	Test Software	R&S	N/A	EMC32	N/A	N/A	N/A

● Radiated emission-Above 1GHz

Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	C11121	2023/4/17	2026/4/16
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2023/8/22	2024/8/21
●	Horn Antenna	SCHWARZBECK	HTWE0126	BBHA 9120D	1011	2023/2/14	2026/2/13
●	Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2023/2/20	2026/2/19
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0551	SCU18F	100855	2023/6/6	2024/6/5
●	Test Software	R&S	N/A	EMC32	N/A	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Conducted Emissions

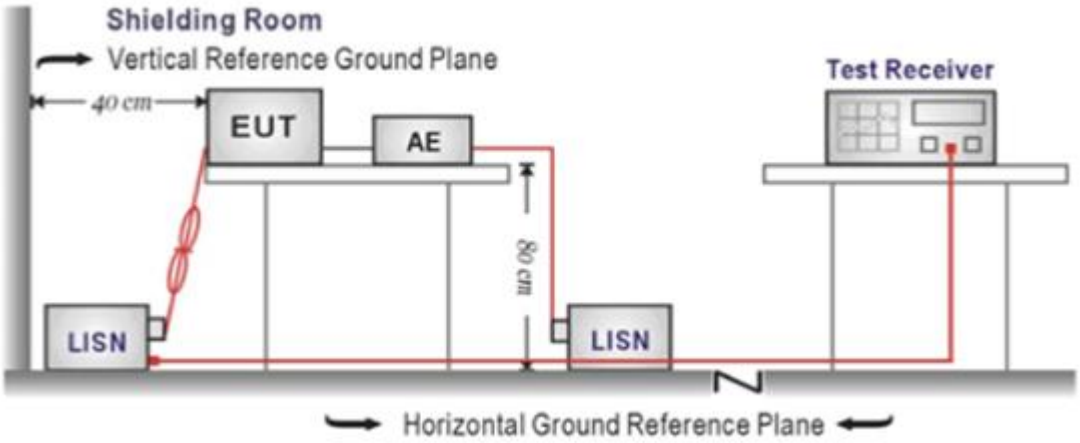
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.107:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.4:2014
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

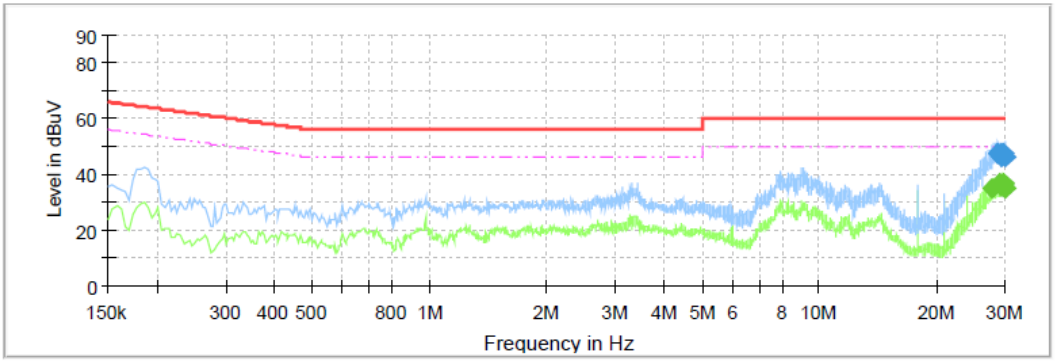
Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Test Voltage:120Va.c..60Hz

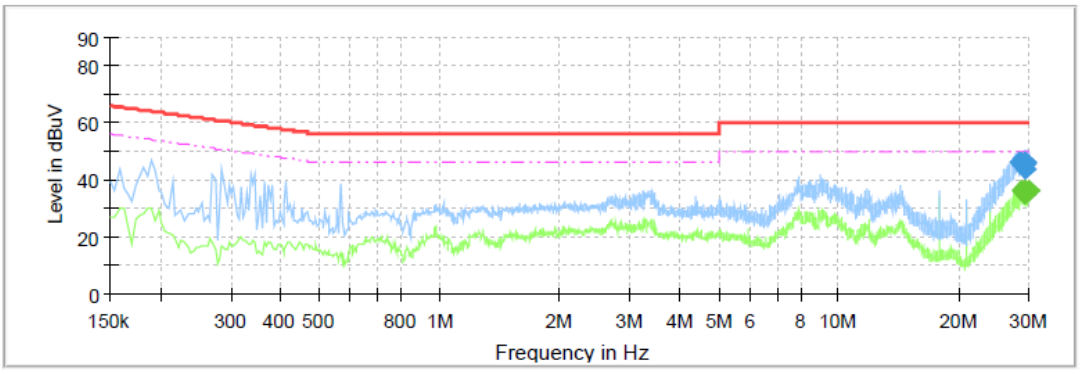
Test Line:	L



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
27.8835	---	35.20	50.00	14.80	L1	11.5
28.6195	47.37	---	60.00	12.63	L1	11.5
28.8075	47.78	---	60.00	12.22	L1	11.5
29.1475	---	36.64	50.00	13.36	L1	11.5
29.2155	47.26	---	60.00	12.74	L1	11.5
29.2835	46.36	---	60.00	13.64	L1	11.5
29.4565	---	35.60	50.00	14.40	L1	11.5
29.5395	47.57	---	60.00	12.43	L1	11.5
29.6115	---	36.88	50.00	13.12	L1	11.5
29.7925	---	36.56	50.00	13.44	L1	11.5
29.8795	46.48	---	60.00	13.52	L1	11.5
29.9885	---	35.23	50.00	14.77	L1	11.5

Test Line:	N



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr. (dB)
28.5075	46.13	---	60.00	13.87	N	11.2
28.6475	46.41	---	60.00	13.59	N	11.2
28.7795	---	36.17	50.00	13.83	N	11.2
29.1195	---	35.56	50.00	14.44	N	11.2
29.2355	---	35.14	50.00	14.86	N	11.2
29.3035	45.87	---	60.00	14.13	N	11.2
29.3115	---	36.16	50.00	13.84	N	11.2
29.3715	46.39	---	60.00	13.61	N	11.2
29.3835	---	36.15	50.00	13.85	N	11.2
29.4475	46.15	---	60.00	13.85	N	11.2
29.4955	43.65	---	60.00	16.35	N	11.2
29.8475	---	36.11	50.00	13.89	N	11.2

5.2. Radiated Emissions

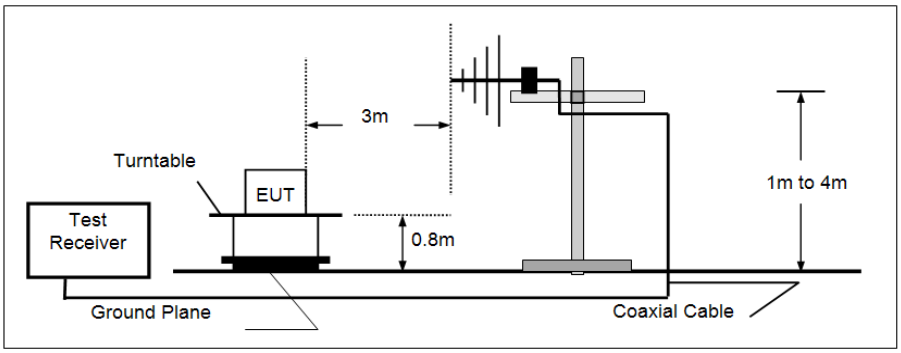
LIMIT

FCC CFR Title 47 Part 15 Subpart B Section 15.109

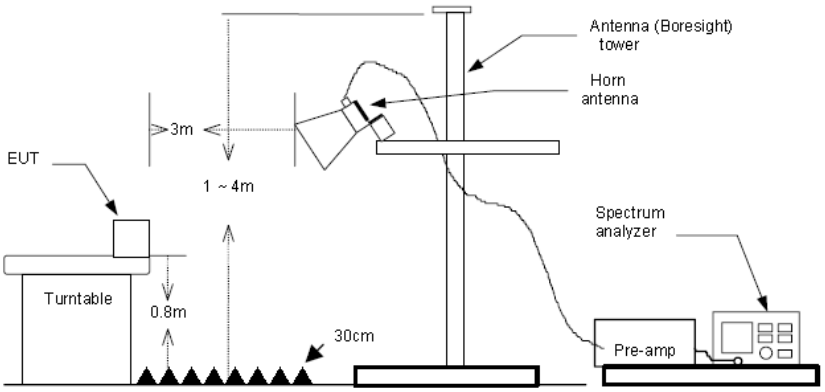
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

- 30MHz ~ 1GHz



- Above 1GHz



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.4:2014.
2. The EUT is placed on a turn table which is 0.8 meter above ground.
3. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
4. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
5. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna.
6. Use the following spectrum analyzer settings
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Below 1GHz,
   RBW=120KHz, VBW=300KHz, Sweep=auto, Detector function=peak, Trace=max hold;
   If the emission level of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, theemission measurement will be repeated using the quasi-peak detector and reported.
   (3) From 1GHz to 5th harmonic, RBW=1MHz, VBW=3MHz

TEST MODE:

Please refer to the clause 3.3

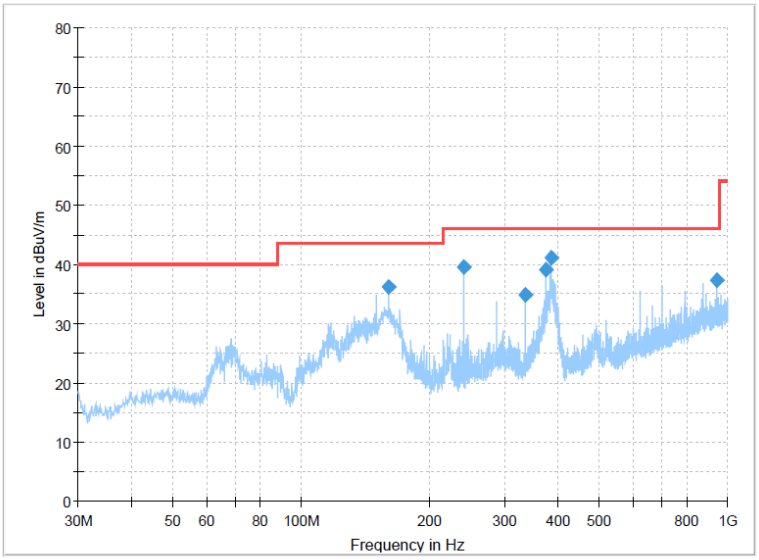
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Note: Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
The emission levels of frequency above 6GHz are very lower than limit and not show in test report.

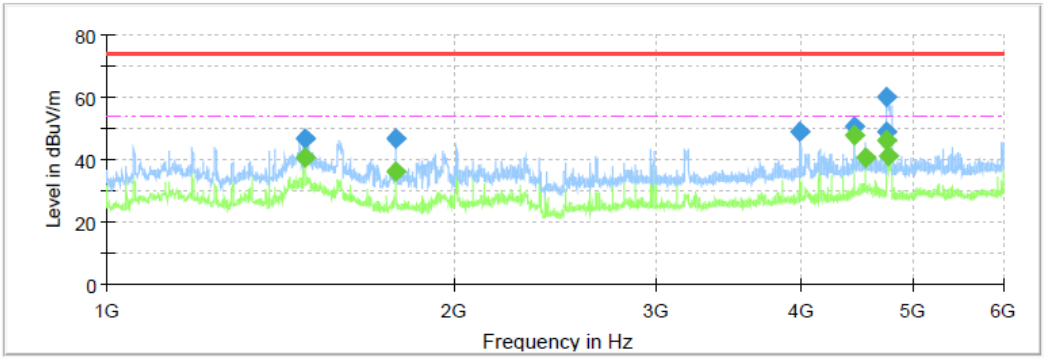
Test Voltage:120Va.c..60Hz

Polarization:	Horizontal



Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
160.4650	36.10	43.50	7.40	100.0	H	304.0	-13.1
240.0050	39.58	46.00	6.42	100.0	H	66.0	-8.7
335.9138	34.97	46.00	11.03	100.0	H	324.0	-5.6
374.9563	39.00	46.00	7.00	100.0	H	214.0	-4.8
385.5050	41.06	46.00	4.94	100.0	H	304.0	-4.5
945.3163	37.43	46.00	8.57	100.0	H	86.0	7.5



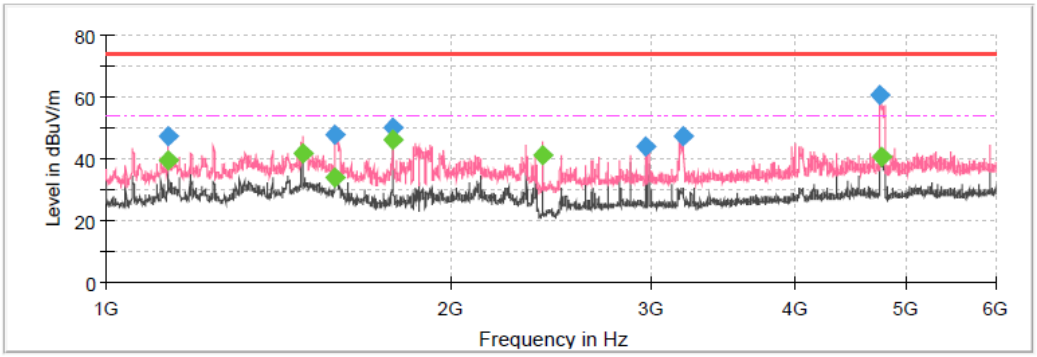
Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1485.0000	---	40.54	54.00	13.46	150.0	H	32.0	-13.2
1485.6250	46.93	---	74.00	27.07	150.0	H	32.0	-13.2
1780.0000	---	35.94	54.00	18.06	150.0	H	179.0	-13.3
1780.0000	46.84	---	74.00	27.16	150.0	H	179.0	-13.3
3992.5000	48.66	---	74.00	25.34	150.0	H	206.0	-6.1
4450.6250	---	47.75	54.00	6.25	150.0	H	32.0	-5.2
4450.6250	50.32	---	74.00	23.68	150.0	H	32.0	-5.2
4550.0000	---	40.51	54.00	13.49	150.0	H	269.0	-4.4
4746.8750	48.95	---	74.00	25.05	150.0	H	32.0	-4.1
4747.5000	---	46.01	54.00	7.99	150.0	H	315.0	-4.1
4753.7500	60.03	---	74.00	13.97	150.0	H	306.0	-4.1
4764.3750	---	40.88	54.00	13.12	150.0	H	306.0	-4.0

Polarization:	Vertical

Final_Result

Frequency (MHz)	MaxPeak (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.0000	34.68	40.00	5.32	100.0	V	144.0	-12.5
388.5363	42.97	46.00	3.03	100.0	V	100.0	-4.4
624.9738	39.89	46.00	6.11	100.0	V	341.0	1.6
868.4438	37.33	46.00	8.67	100.0	V	215.0	6.3
875.1125	39.33	46.00	6.67	100.0	V	215.0	6.4
890.9963	36.77	46.00	9.23	100.0	V	144.0	7.0

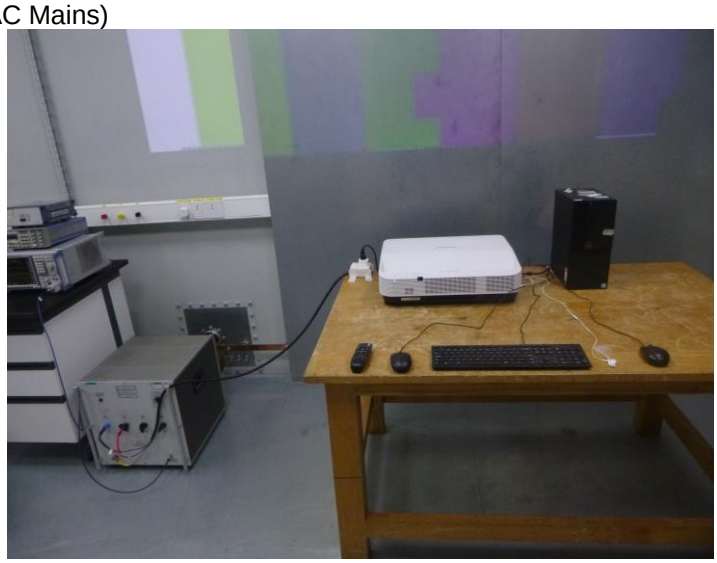


Final_Result

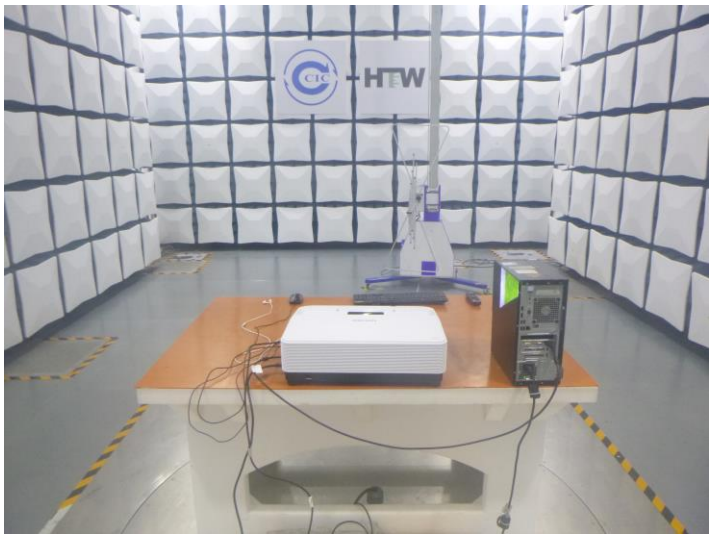
Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1133.1250	---	39.49	54.00	14.51	150.0	V	0.0	-14.3
1133.1250	47.03	---	74.00	26.97	150.0	V	0.0	-14.3
1485.0000	---	41.54	54.00	12.46	150.0	V	154.0	-13.2
1584.3750	47.84	---	74.00	26.16	150.0	V	26.0	-13.6
1585.0000	---	34.01	54.00	19.99	150.0	V	35.0	-13.6
1780.0000	49.99	---	74.00	24.01	150.0	V	271.0	-13.3
1780.0000	---	46.39	54.00	7.61	150.0	V	271.0	-13.3
2410.6250	---	41.00	54.00	13.00	150.0	V	163.0	-10.1
2967.5000	44.16	---	74.00	29.84	150.0	V	181.0	-8.5
3200.0000	47.38	---	74.00	26.62	150.0	V	359.0	-7.9
4753.7500	60.34	---	74.00	13.66	150.0	V	297.0	-4.1
4762.5000	---	40.53	54.00	13.47	150.0	V	297.0	-4.1

6. TEST SETUP PHOTOS OF THE EUT

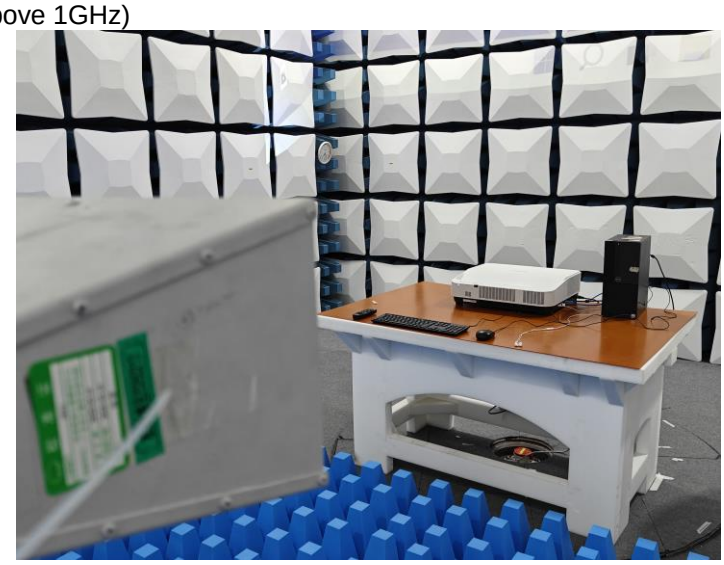
Conducted Emissions (AC Mains)



Radiated Emissions (30MHz-1GHz)

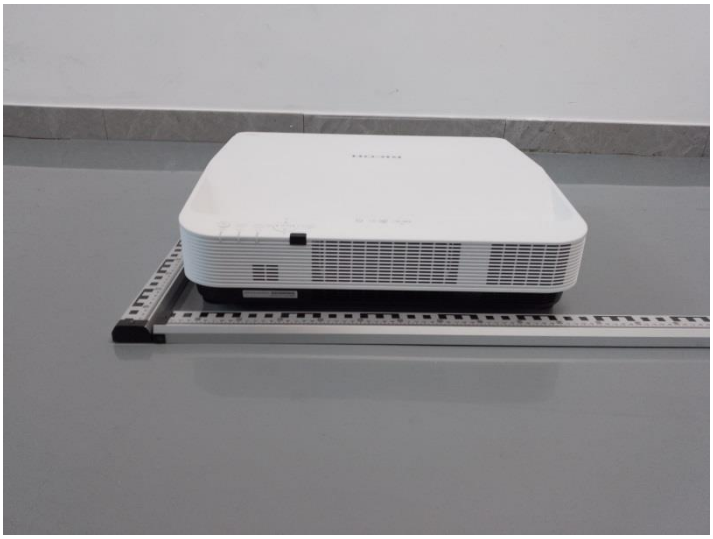


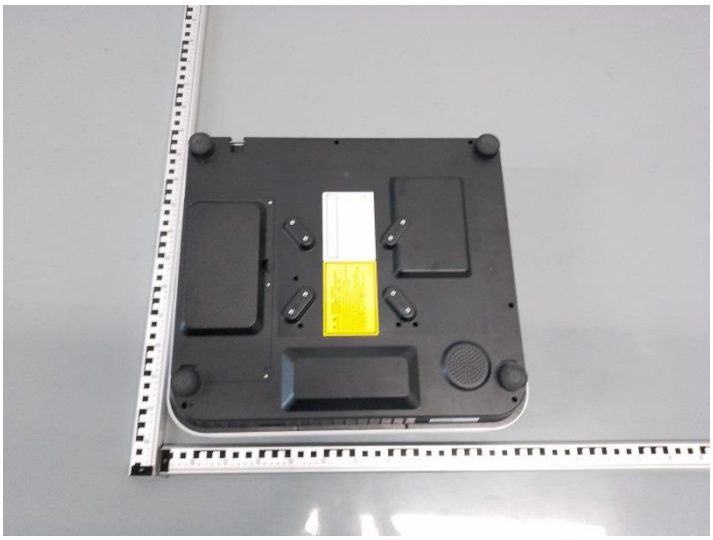
Radiated Emissions (Above 1GHz)



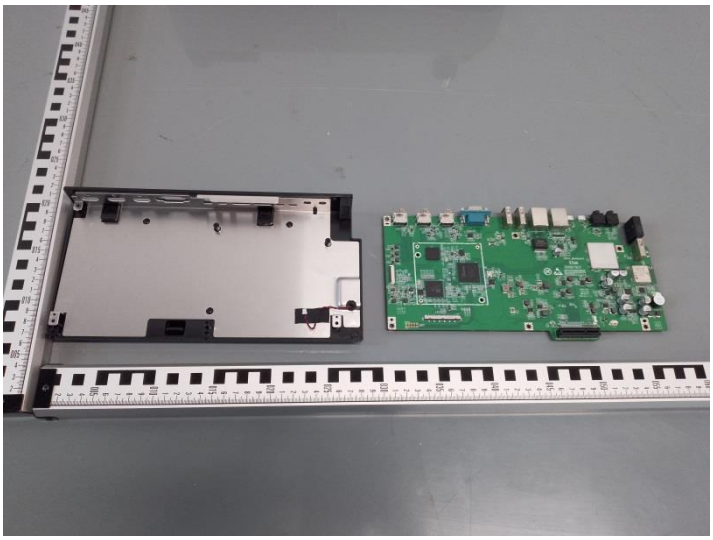
7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

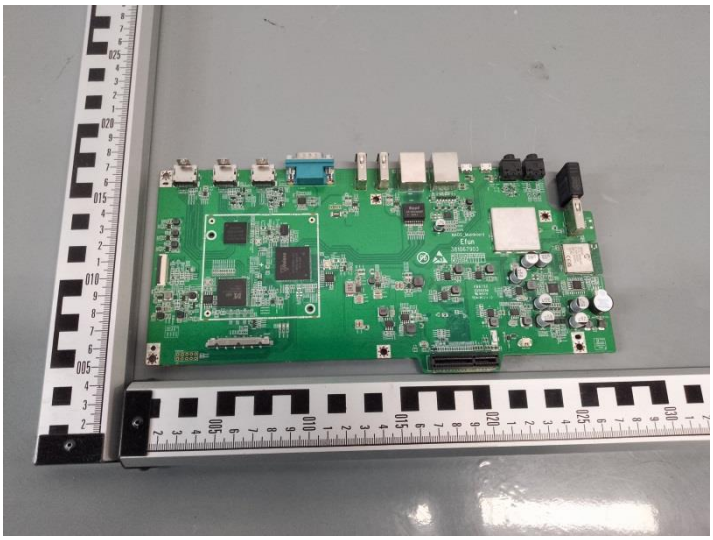
7.1. External Photos

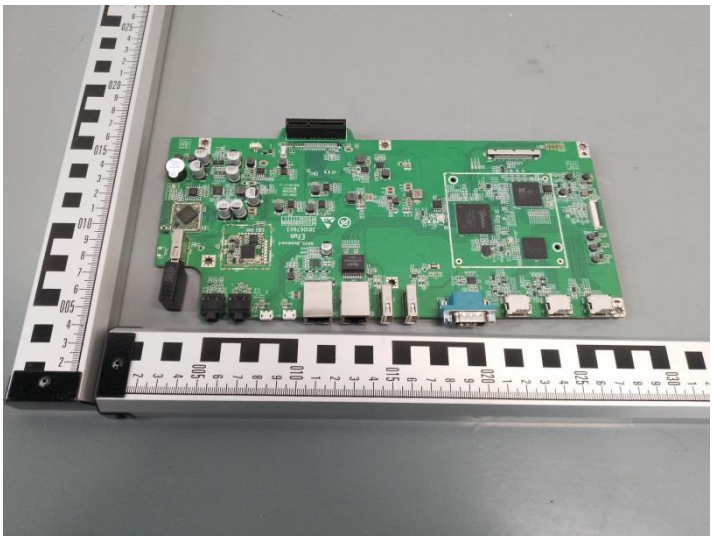


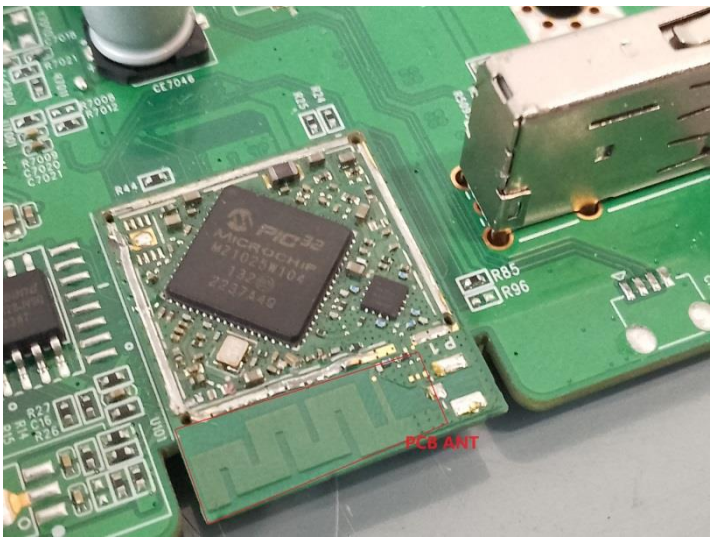


7.2. Internal Photos








CE7046
R7021
R7008
R7012
R7009
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C7031
R46
R85
R96
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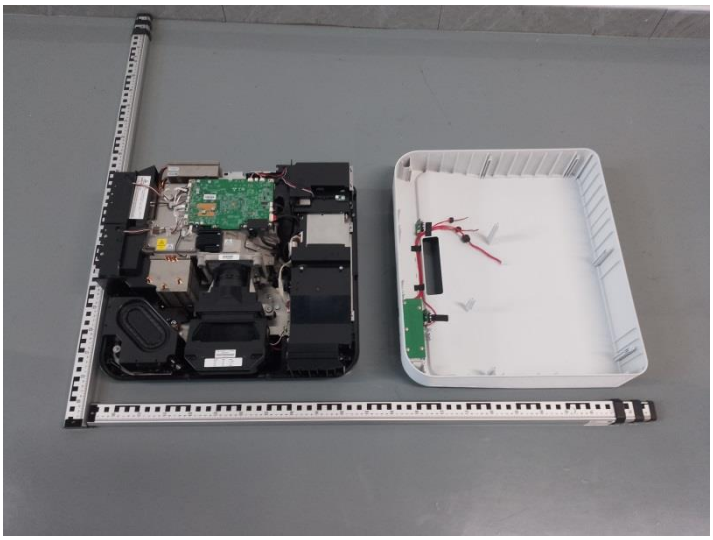
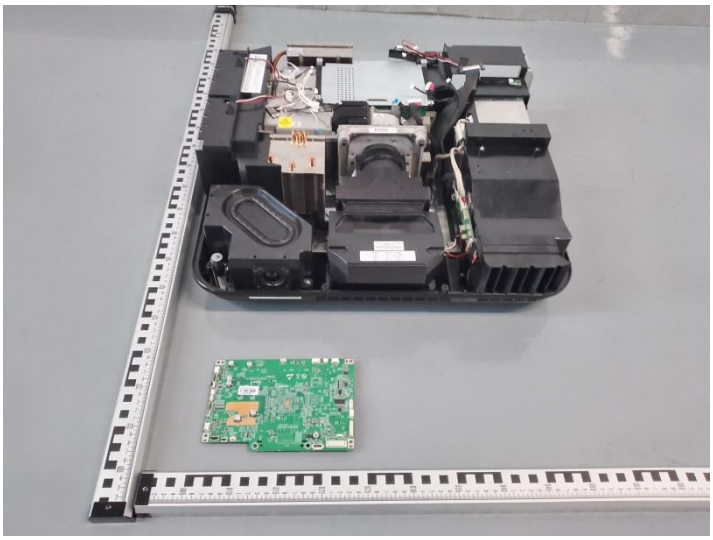
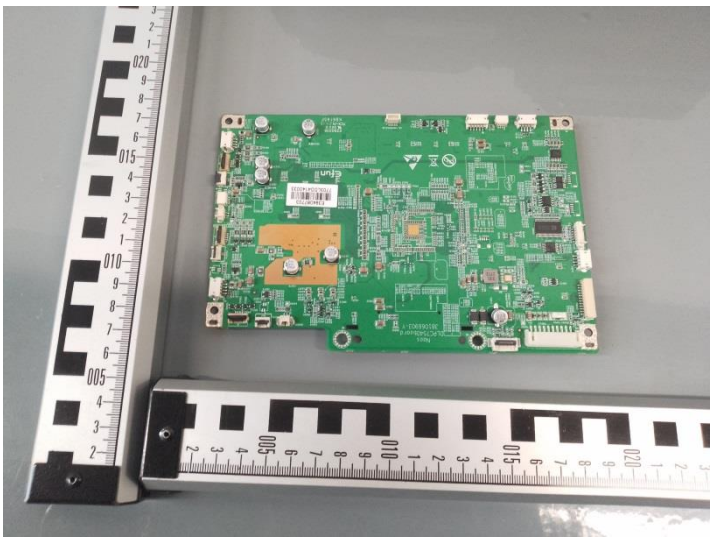
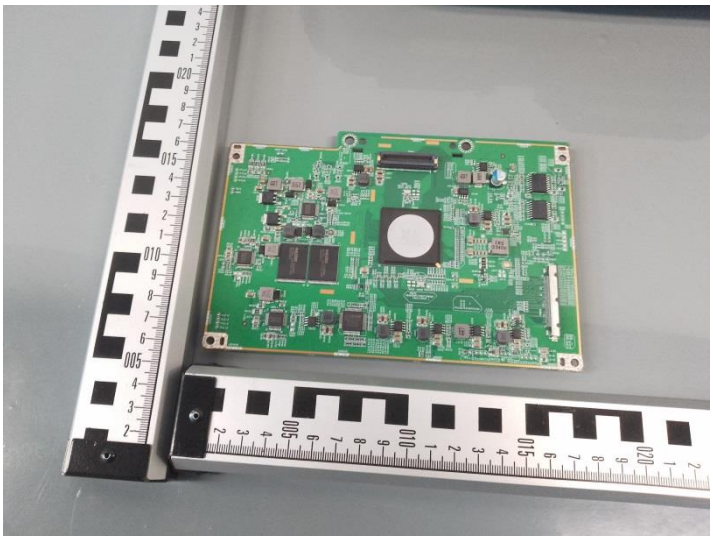
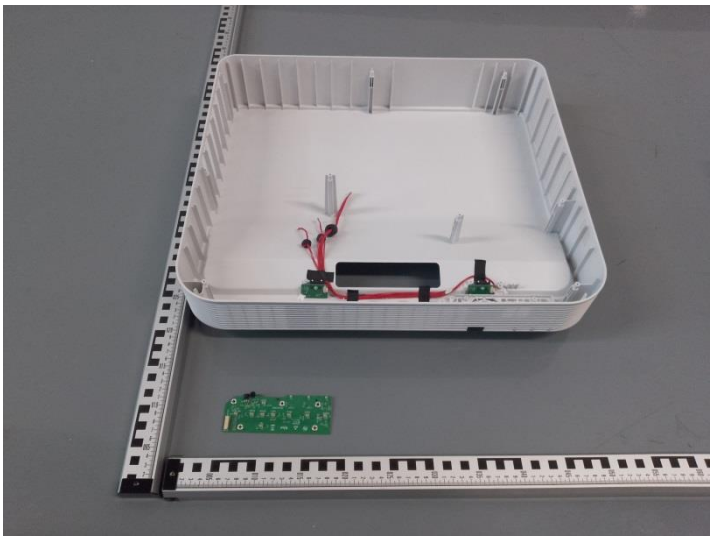
C16
R26
PCB ANT

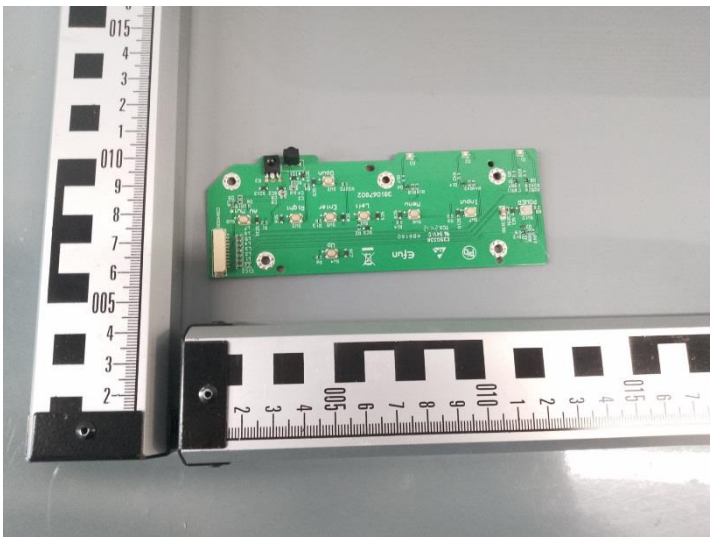












--------End of Report--------