HUAK TESTING

FCC
TEST REPORT

Prepared for :

EDA Technology Shanghai Co., Ltd.

Building 29, No.1661 Jialuo Road, Jiading District, Shanghai, PRC

Product Name:	**ED-HMI2000**
Trade Mark:	**EDA TEC**
Product Model (S):	**ED-HMI2020-101C, ED-HMI2020-050C, ED-HMI2020-070C, ED-HMI2020-050R, ED-HMI2020-070R, ED-HMI2020-101R**
Date of Test:	**Dec. 07, 2023 – Dec. 22, 2023**
Date of Report:	**Dec. 22, 2023**
Report Number:	**HK2312075948-1ER**

Prepared By :

Shenzhen HUAK Testing Technology Co., Ltd.

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TEST REPORT VERIFICATION

Applicant	:	EDA Technology Shanghai Co., Ltd.
Address	:	Building 29, No.1661 Jialuo Road, Jiading District, Shanghai, PRC
Manufacturer	:	EDA Technology Shanghai Co., Ltd.
Address	:	Building 29, No.1661 Jialuo Road, Jiading District, Shanghai, PRC
Product Name	:	ED-HMI2000
(A) Product Model	:	ED-HMI2020-101C
(B) Series Model	:	ED-HMI2020-050C, ED-HMI2020-070C, ED-HMI2020-050R, ED-HMI2020-070R, ED-HMI2020-101R
(C) Power Supply	:	Input: 9-28VDC, 24W

Standards..... FCC Part 15 Subpart B
ANSI C63.4:2019

This device described above has been tested by HUAK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Test Result..... **Pass**

Date of Test: Dec. 07, 2023 – Dec. 22, 2023

Prepared by: Kevin Pan
Project Engineer

Reviewed by: Project Supervisor

Approved by: Technical Director

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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2023/12/22	Jason Zhou

1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part 15 Subpart B ANSI C63.4:2019	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report

(2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen HUAK Testing Technology Co., Ltd.
Add. : 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization：
A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %.

A. Conducted Measurement :

Measurement Frequency Range	Uncertainty	NOTE
150 KHz ~ 30MHz	±2.71dB	

B. Radiated Measurement :

Measurement Frequency Range	Uncertainty	NOTE
30MHz ~ 1000MHz	±3.90dB	
1GHz ~6GHz	±4.28dB	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	ED-HMI2000
Product Model	ED-HMI2020-101C
Series Model	ED-HMI2020-050C, ED-HMI2020-070C, ED-HMI2020-050R, ED-HMI2020-070R, ED-HMI2020-101R
Model Difference	The main difference between different models is that the size of the LCD screen is not the same, and the maximum size is tested. Test sample model: ED-HMI2020-101C.
Product Description	The EUT is a ED-HMI2000. Operating frequency: N/A Connecting I/O port: N/A Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	DC Voltage
Power Rating	Input: 9-28VDC, 24W

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

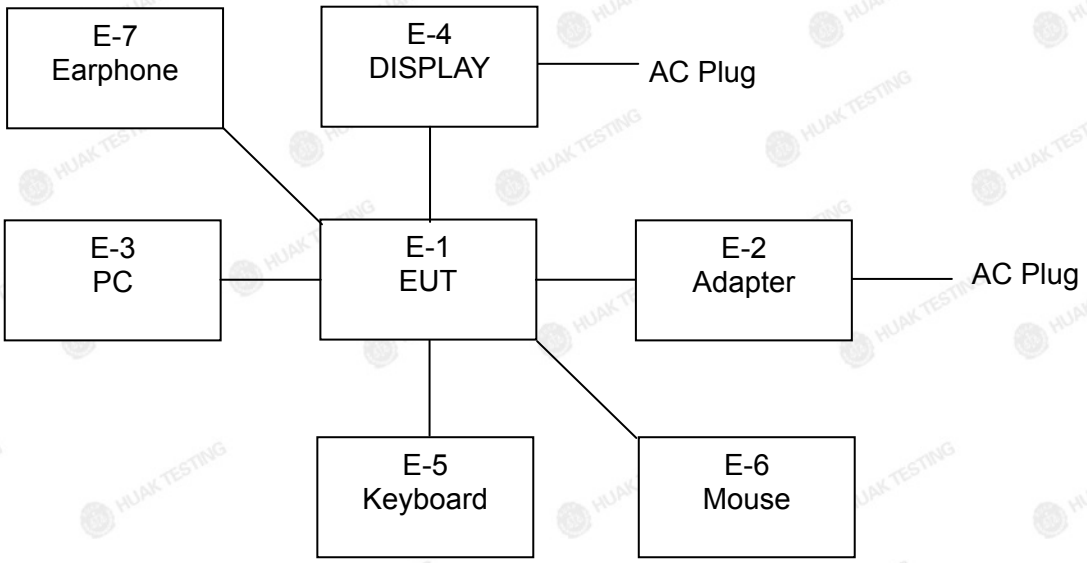
Pretest Mode	Description
Mode 1	Working

For Conducted Test	
Final Test Mode	Description
Mode 1	Working

For Radiated Test	
Final Test Mode	Description
Mode 1	Working

2.3 DESCRIPTION OF TEST SETUP

Mode 1:



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Series No.	Note
E-1	ED-HMI2000	EDA	ED-HMI2020-101C	N/A	EUT
E-2	Adapter	N/A	KSASB0241200200 D5	N/A	
E-3	PC	Lenovo	ThinkpadE450	N/A	
E-4	DISPLAY	AOC	280LM00004	N/A	
E-5	Keyboard	N/A	N/A	N/A	
E-6	Mouse	N/A	N/A	N/A	
E-7	Earphone	N/A	N/A	N/A	

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Feb. 17, 2023	1 Year
2.	Receiver	R&S	ESR-7	HKE-010	Feb. 17, 2023	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 17, 2023	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Feb. 17, 2023	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 17, 2023	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Feb. 17, 2023	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 17, 2023	1 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Feb. 17, 2023	1 Year
11.	Pre-amplifier	Schwarzbeck	EMC051845SE	HKE-015	Feb. 17, 2023	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Feb. 17, 2023	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	Feb. 17, 2023	1 Year
14.	Power Sensor	Agilent	E9300A	HKE-086	Feb. 17, 2023	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Feb. 17, 2023	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Feb. 17, 2023	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Feb. 17, 2023	1 Year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

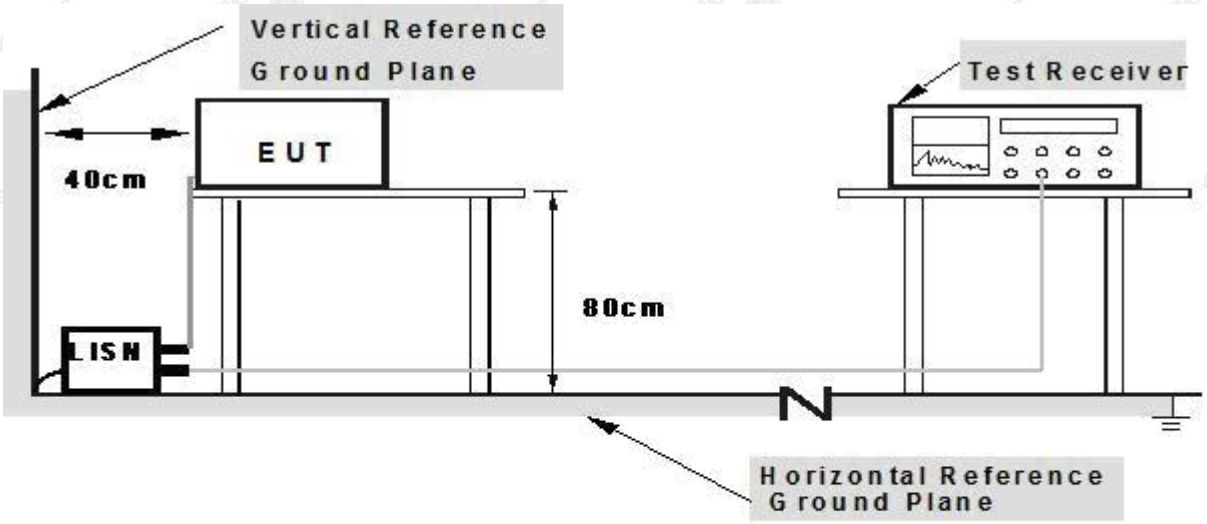
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



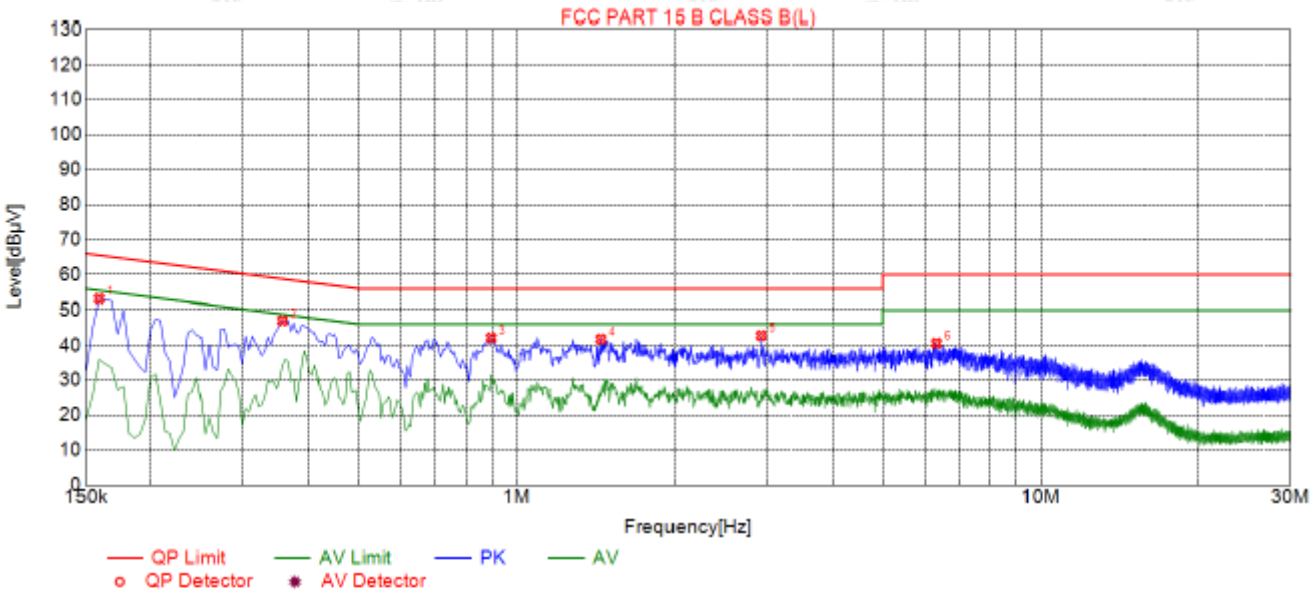
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5 TEST RESULTS

EUT：	ED-HMI2000	Model Name. ：	ED-HMI2020-101C
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2023-12-20
Test Mode：	Mode 1	Phase：	L
Test Voltage ：	DC12V From Adapter		



Suspected List

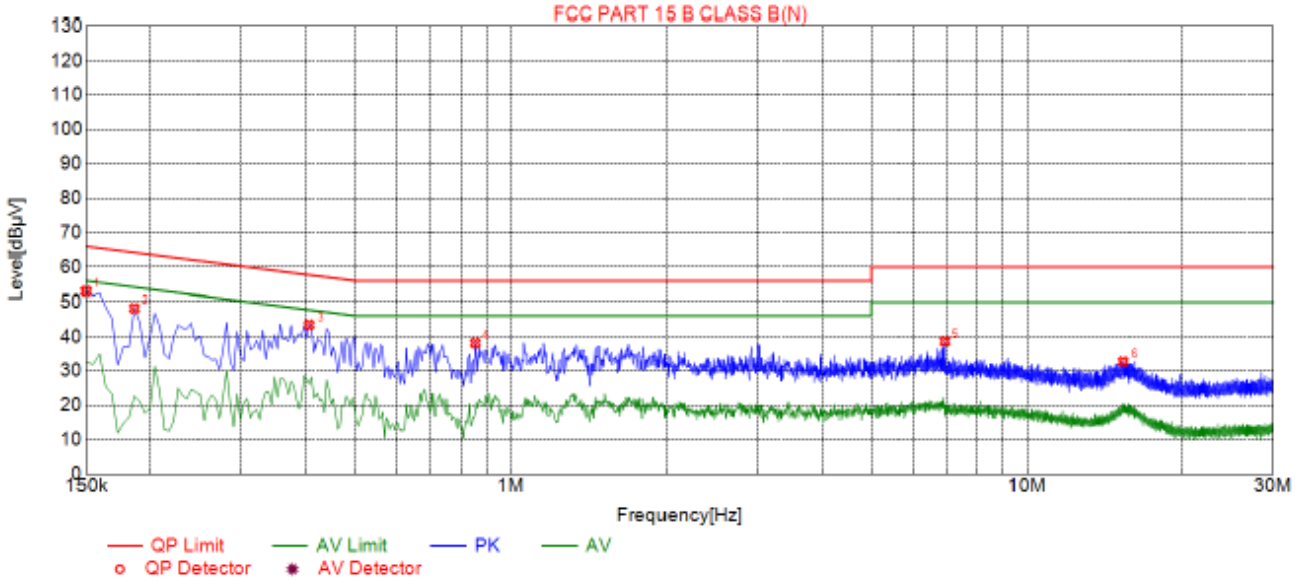
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1590	53.19	20.01	65.52	12.33	33.18	PK	L
2	0.3570	46.99	20.03	58.80	11.81	26.96	PK	L
3	0.8925	42.11	20.06	56.00	13.89	22.05	PK	L
4	1.4460	41.76	20.10	56.00	14.24	21.66	PK	L
5	2.9310	42.76	20.21	56.00	13.24	22.55	PK	L
6	6.3195	40.60	20.22	60.00	19.40	20.38	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

EUT：	ED-HMI2000	Model Name. ：	ED-HMI2020-101C
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2023-12-20
Test Mode：	Mode 1	Phase：	N
Test Voltage ：	DC12V From Adapter		



Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1500	53.08	20.03	66.00	12.92	33.05	PK	N
2	0.1860	48.16	20.05	64.21	16.05	28.11	PK	N
3	0.4065	43.40	20.03	57.72	14.32	23.37	PK	N
4	0.8520	38.13	20.06	56.00	17.87	18.07	PK	N
5	6.9315	38.62	20.20	60.00	21.38	18.42	PK	N
6	15.3960	32.73	19.96	60.00	27.27	12.77	PK	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

(1) The limit for radiated test was performed according to as following: FCC PART 15B /ICES-003.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

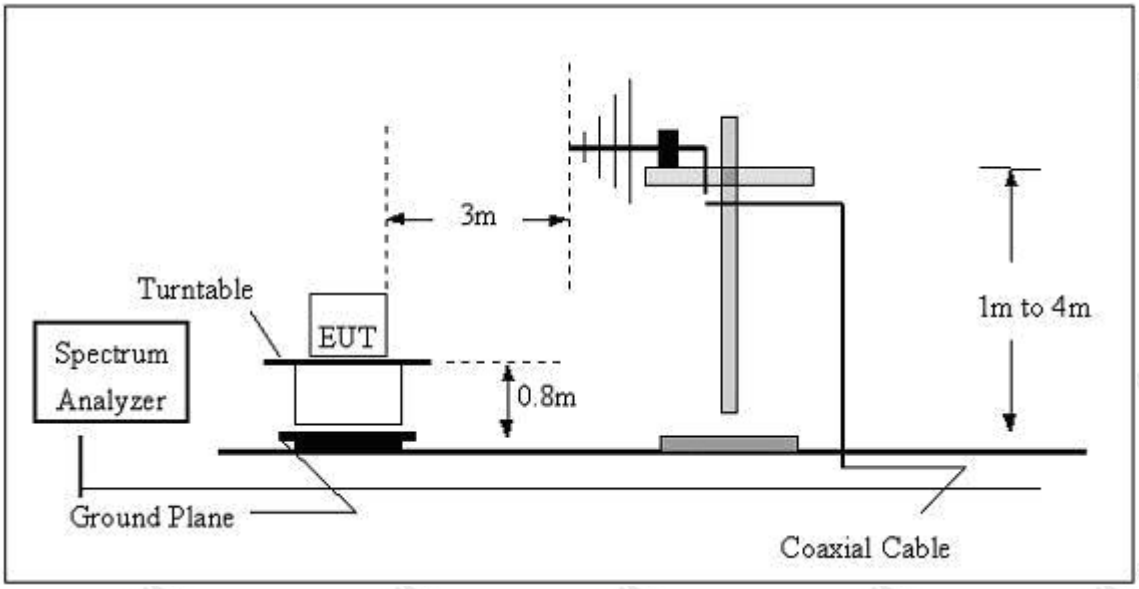
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

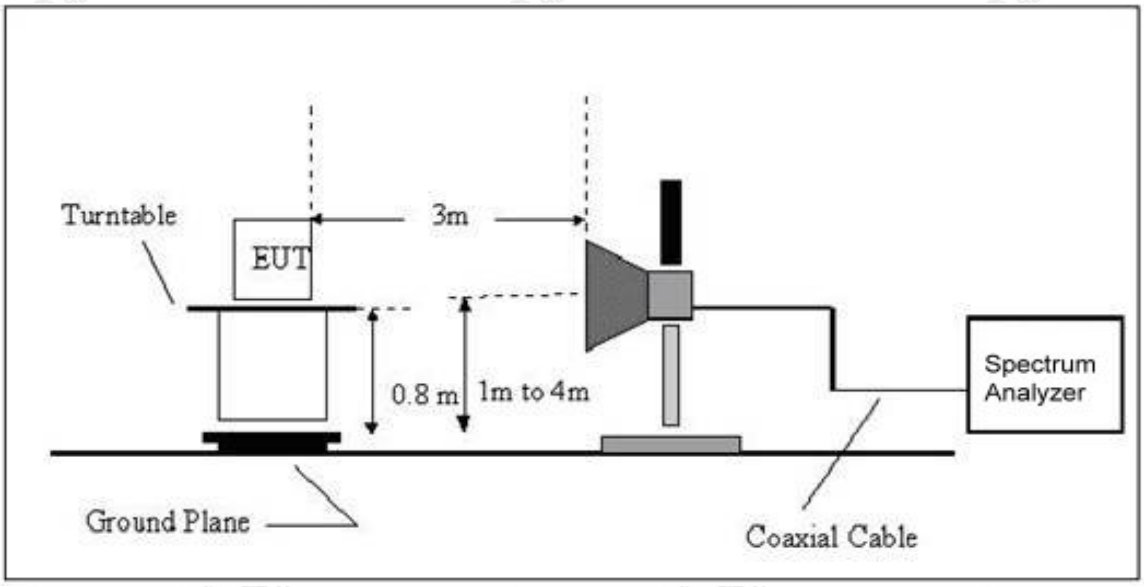
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz

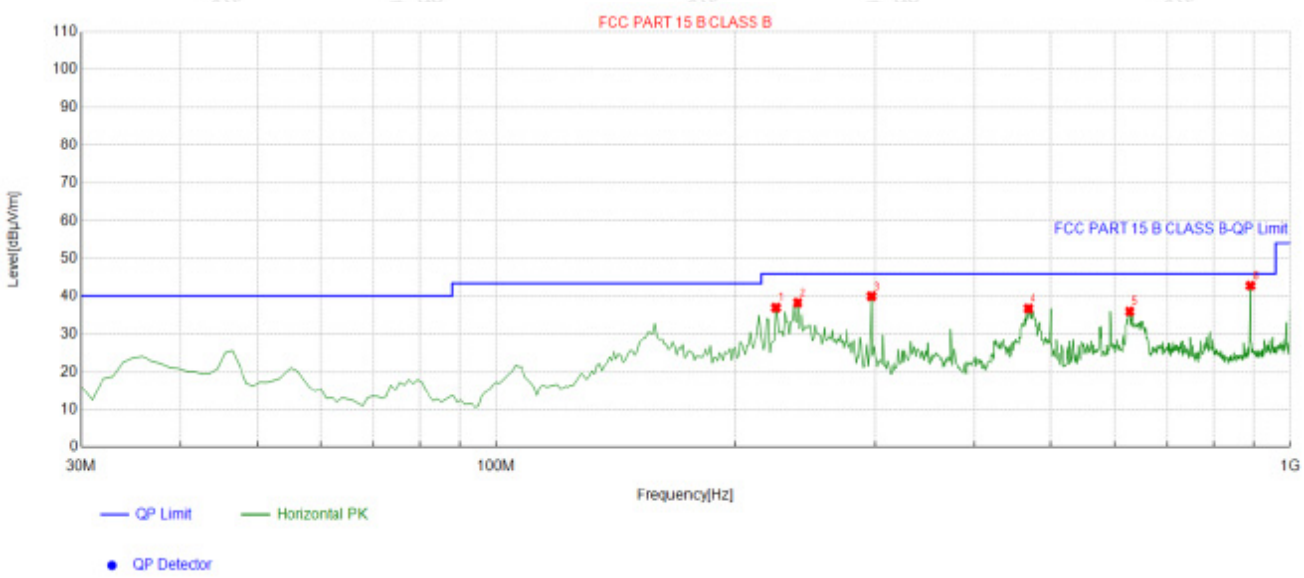


3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

EUT：	ED-HMI2000	Model Name ：	ED-HMI2020-101C
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2023-12-20
Test Mode ：	Mode 1	Polarization：	Horizontal
Test Power ：	DC12V From Adapter		



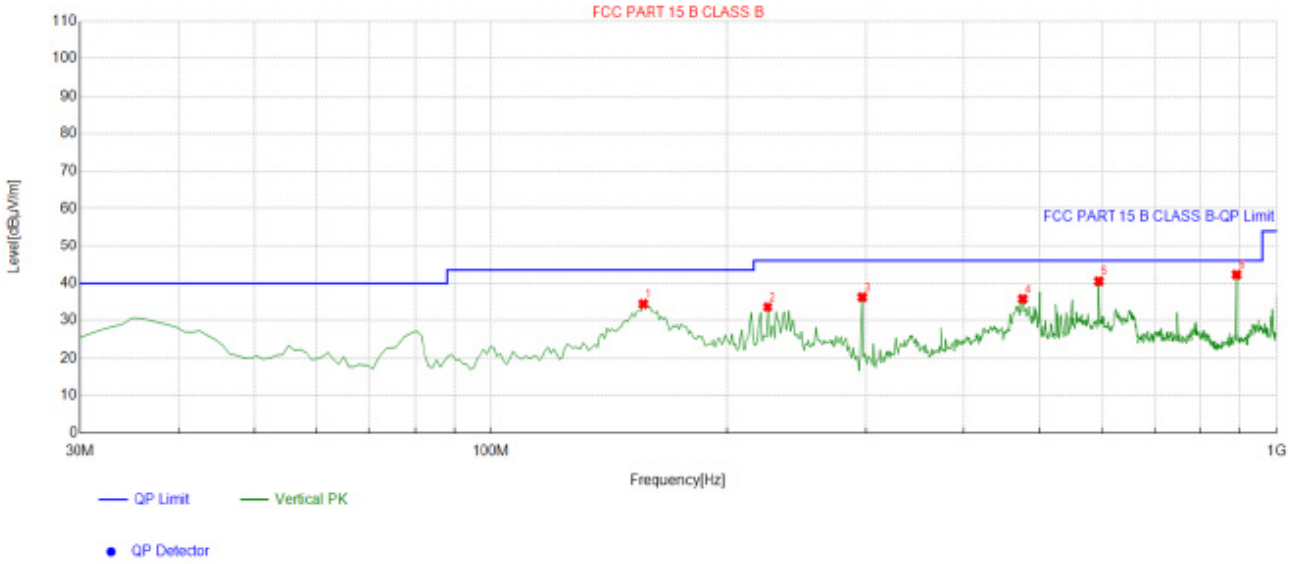
Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	225.16516	-14.01	50.96	36.95	46.00	9.05	100	13	Horizontal
2	239.72973	-13.31	51.54	38.23	46.00	7.77	100	37	Horizontal
3	297.01701	-12.04	51.96	39.92	46.00	6.08	100	82	Horizontal
4	467.90790	-8.11	44.82	36.71	46.00	9.29	100	124	Horizontal
5	628.11811	-4.36	40.33	35.97	46.00	10.03	100	159	Horizontal
6	891.25125	-0.67	43.54	42.87	46.00	3.13	100	248	Horizontal

Final Data List

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

EUT：	ED-HMI2000	Model Name ：	ED-HMI2020-101C
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2023-12-20
Test Mode ：	Mode 1	Polarization：	Vertical
Test Power ：	DC12V From Adapter		



Suspected List

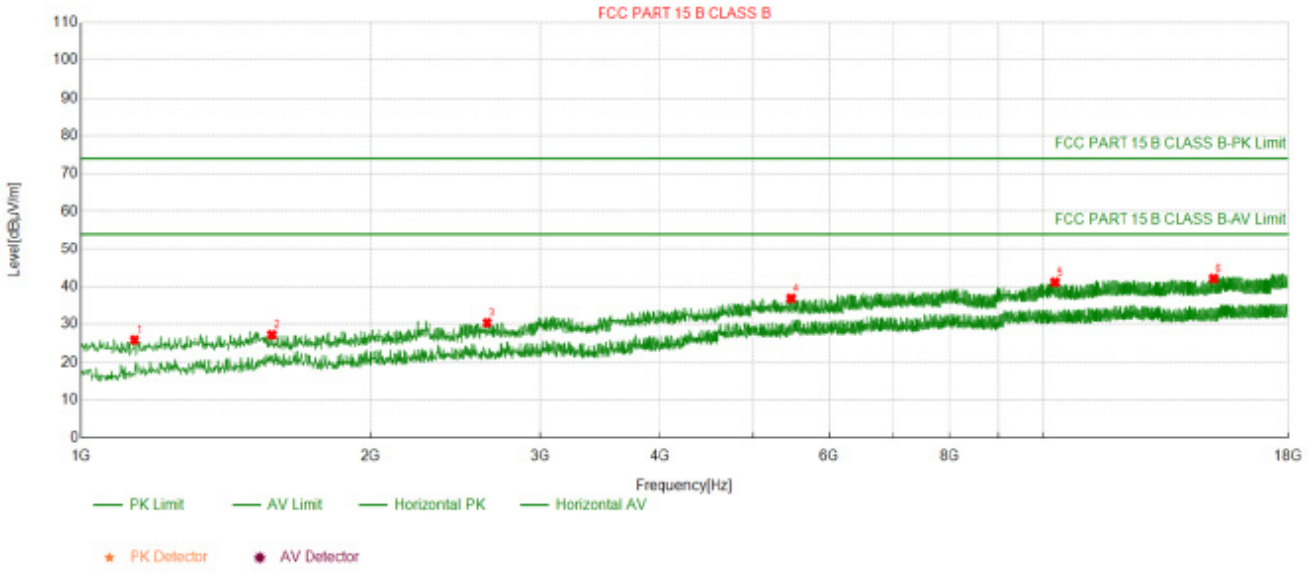
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	156.22622	-18.26	52.83	34.57	43.50	8.93	100	212	Vertical
2	225.16516	-14.01	47.70	33.69	46.00	12.31	100	80	Vertical
3	297.01701	-12.04	48.41	36.37	46.00	9.63	100	62	Vertical
4	475.67567	-7.90	43.81	35.91	46.00	10.09	100	153	Vertical
5	594.13413	-5.30	45.86	40.56	46.00	5.44	100	306	Vertical
6	891.25125	-0.67	42.97	42.30	46.00	3.70	100	215	Vertical

Final Data List

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

3.2.6 TEST RESULTS(Above 1GHz)

EUT：	ED-HMI2000	Model Name ：	ED-HMI2020-101C
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2023-12-20
Test Mode ：	Mode 1	Polarization：	Horizontal
Test Power ：	DC12V From Adapter		



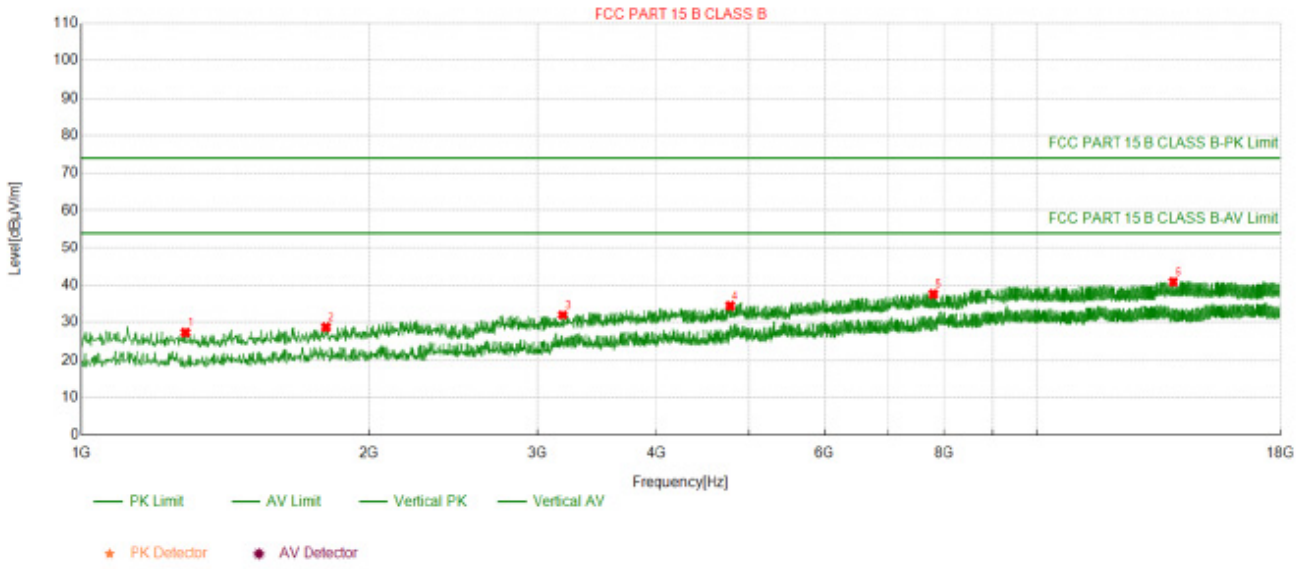
Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1136.0136	-21.63	47.52	25.89	74.00	48.11	100	70	Horizontal
2	1579.7579	-20.48	47.69	27.21	74.00	46.79	100	290	Horizontal
3	2644.0644	-16.10	46.46	30.36	74.00	43.64	100	260	Horizontal
4	5479.9479	-9.22	46.21	36.99	74.00	37.01	100	270	Horizontal
5	10296.529	-0.36	41.56	41.20	74.00	32.80	100	230	Horizontal
6	15065.506	5.97	36.19	42.16	74.00	31.84	100	150	Horizontal

Final Data List

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

EUT：	ED-HMI2000	Model Name ：	ED-HMI2020-101C
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2023-12-20
Test Mode ：	Mode 1	Polarization：	Vertical
Test Power ：	DC12V From Adapter		



Suspected List

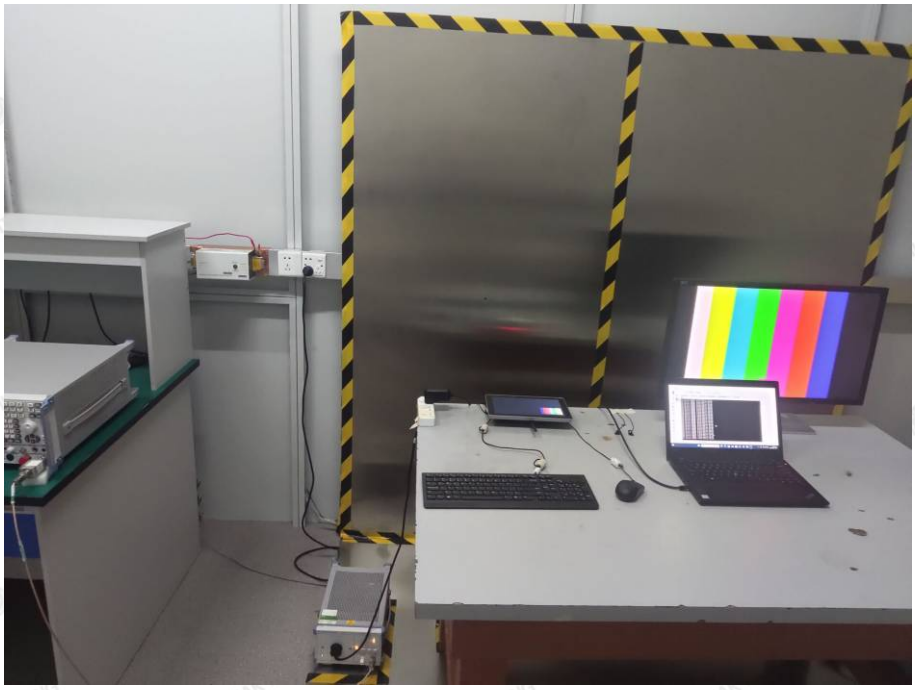
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1283.9283	-21.07	48.38	27.31	74.00	46.69	100	20	Vertical
2	1804.1804	-20.07	48.78	28.71	74.00	45.29	100	310	Vertical
3	3191.5191	-14.91	46.99	32.08	74.00	41.92	100	180	Vertical
4	4781.1781	-9.74	44.35	34.61	74.00	39.39	100	130	Vertical
5	7793.8793	-3.69	41.39	37.70	74.00	36.30	100	80	Vertical
6	13905.990	5.52	35.38	40.90	74.00	33.10	100	150	Vertical

Final Data List

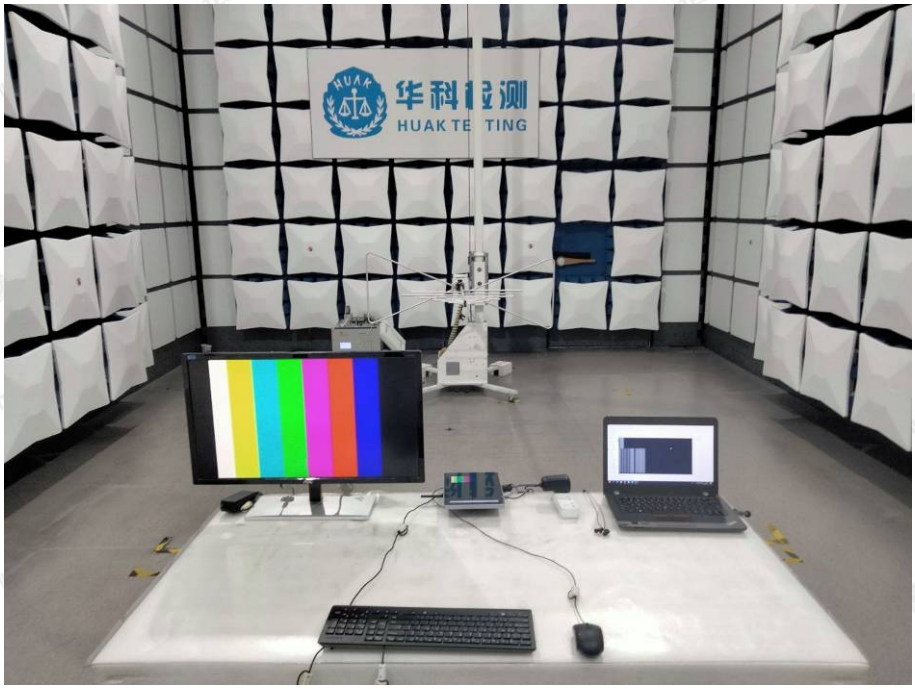
Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

4. EUT TEST PHOTO

Conducted Emission



Radiated Emission



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1

Photo 2

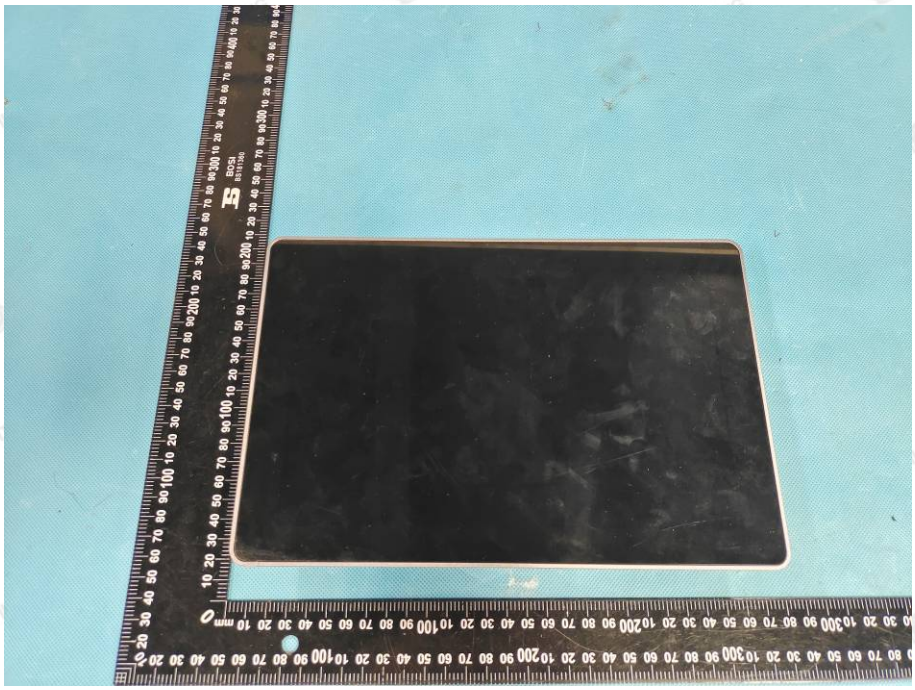


Photo 3

Photo 4

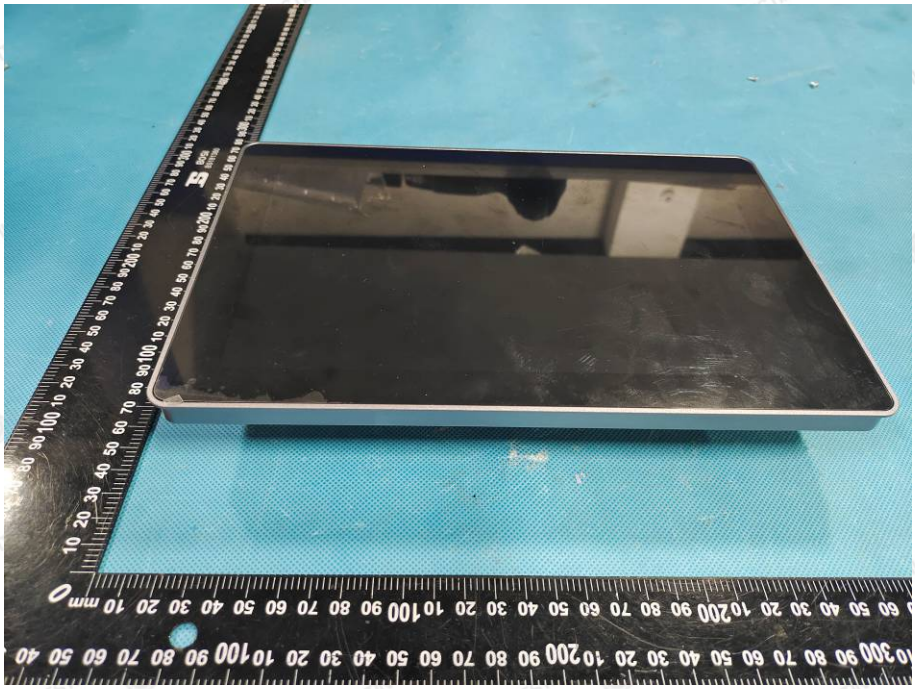


Photo 5

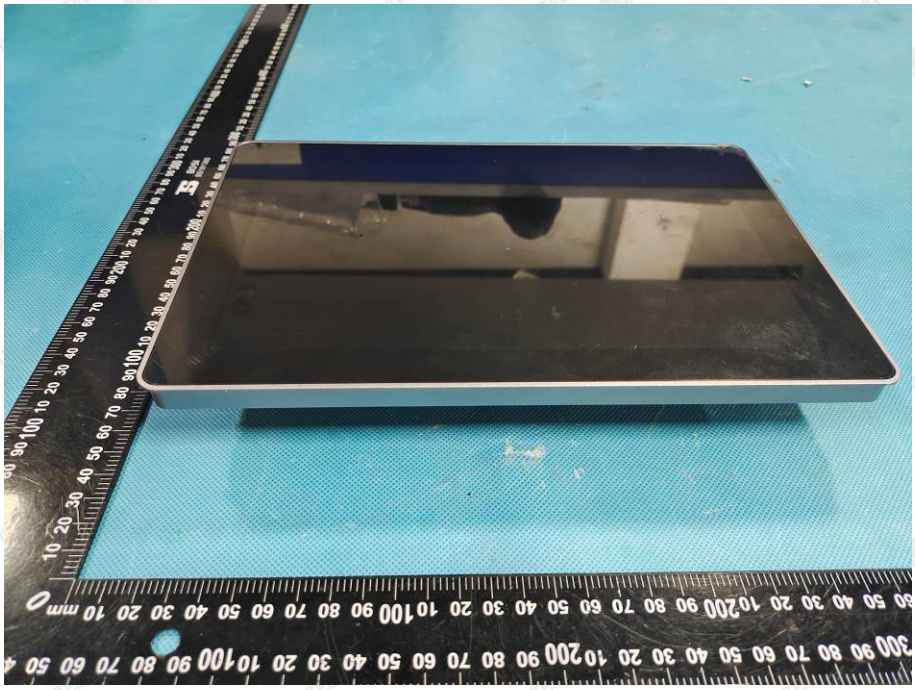


Photo 6

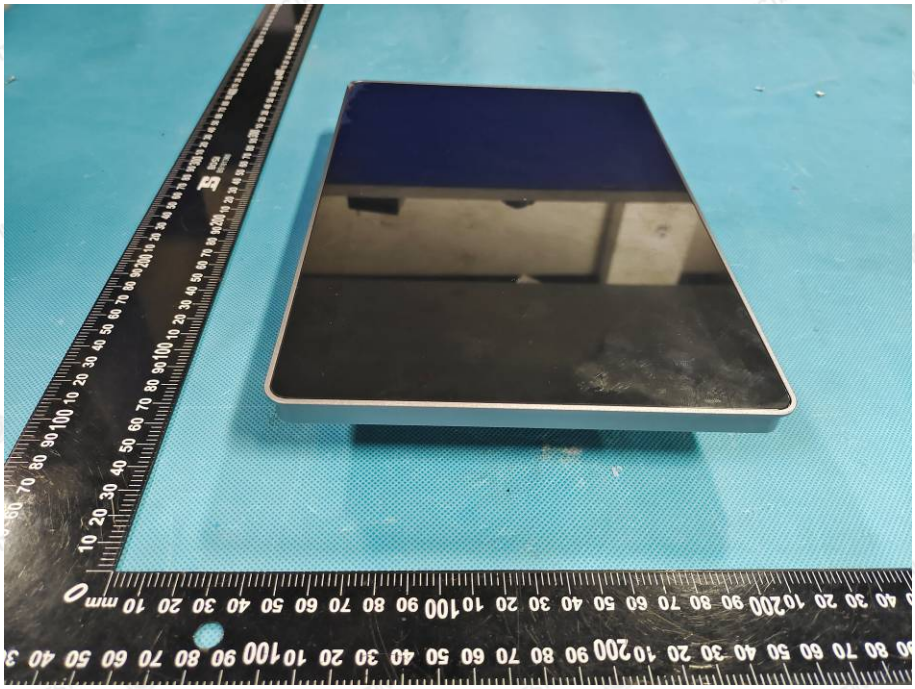


Photo 7

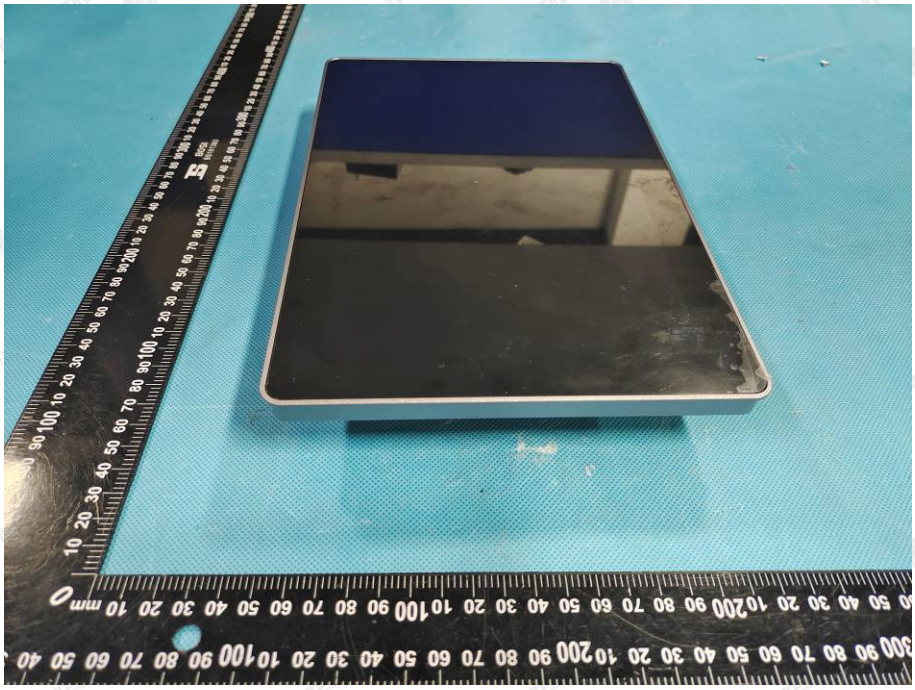


Photo 8

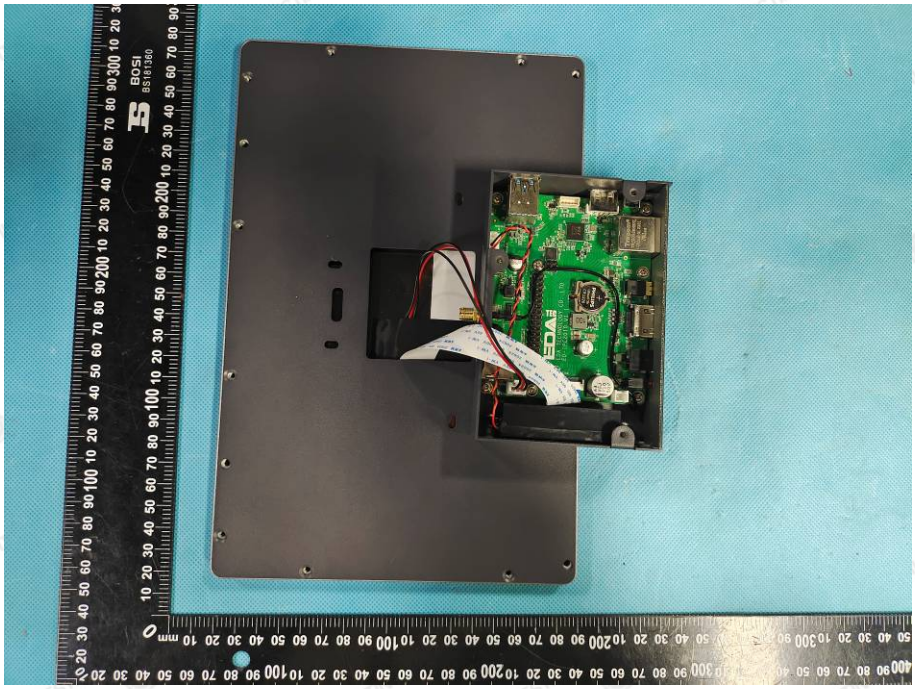


Photo 9

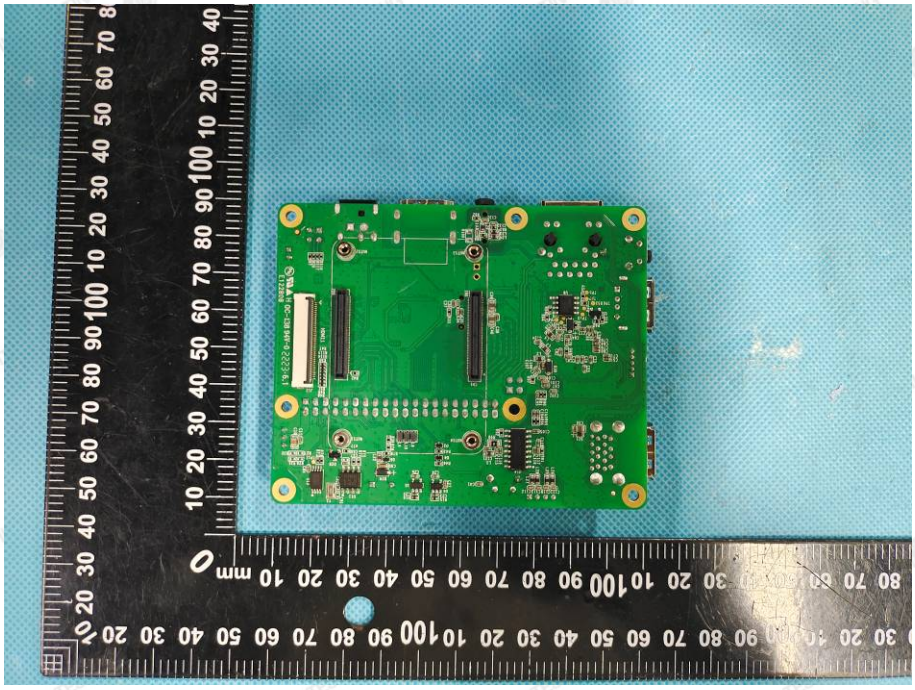


Photo 10

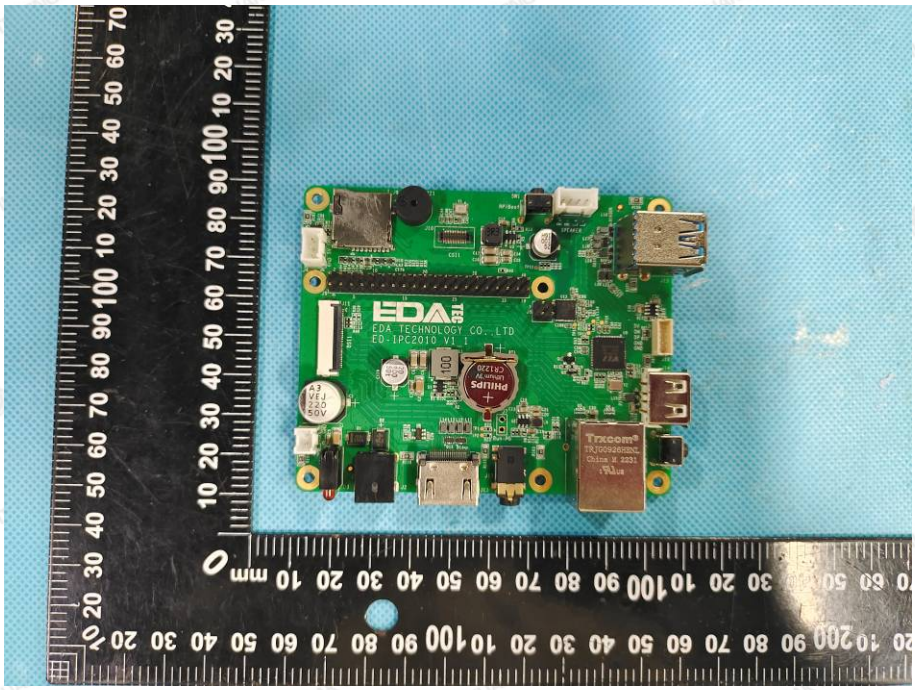


Photo 11

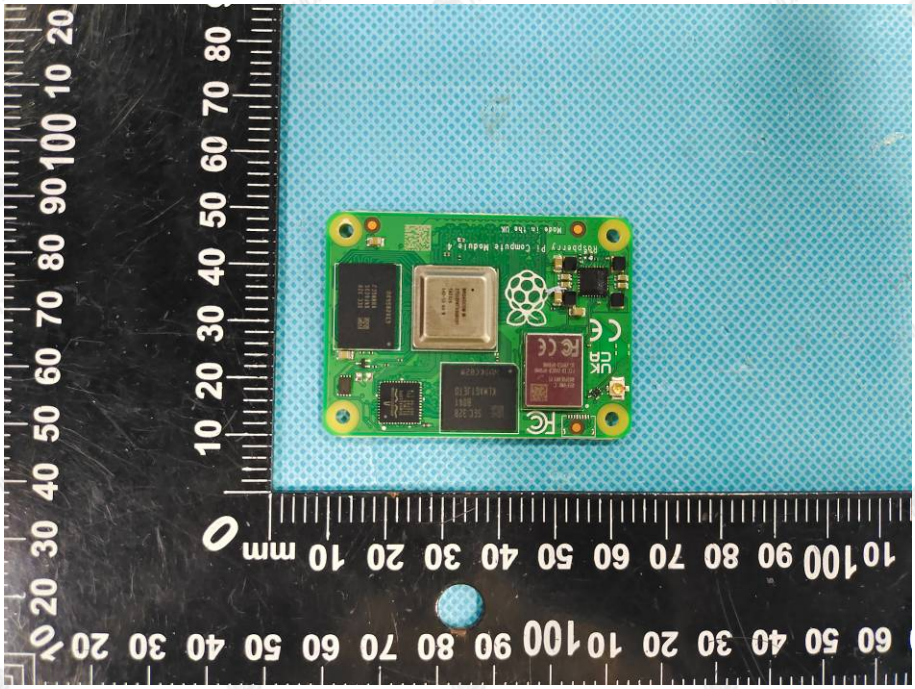
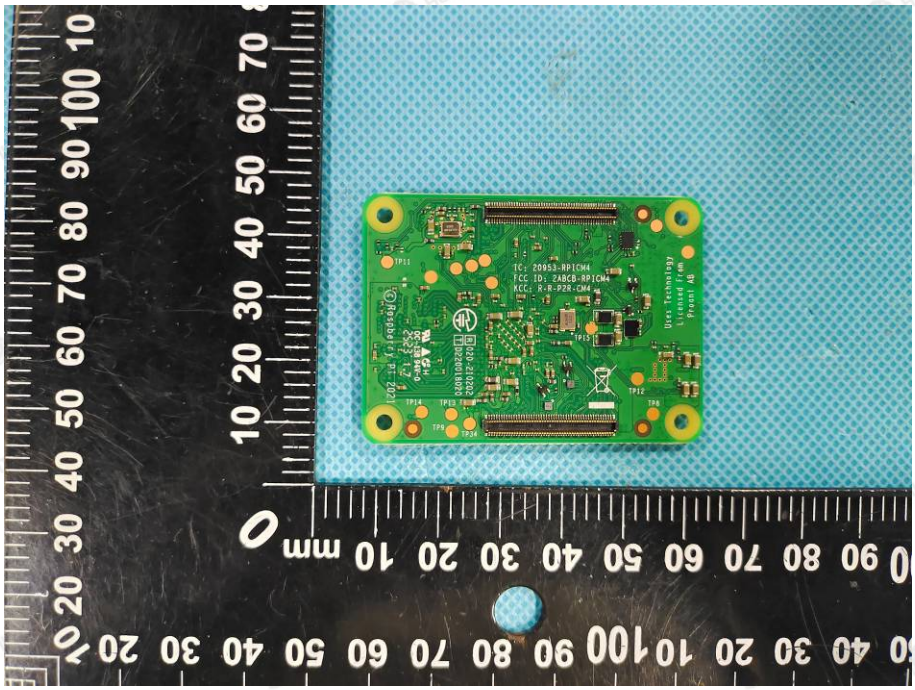


Photo 12



.....End of Report.....