



FCC SDoC TEST REPORT
KHADAS TECHNOLOGY CO., LTD
Edge2 ARM PC
Test Model: K1011

Prepared for : KHADAS TECHNOLOGY CO., LTD
Address : 2709 QIANCHENG CENTER, HAICHENG ROAD,
XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN,
CHINA. 518101

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : Room 101, 201, Building A and Room 301, Building C,
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Date of receipt of test sample : February 17, 2023
Number of tested samples : 1
Sample No. : A010523104
Date of Test : February 17, 2023 ~ February 21, 2023
Date of Report : February 21, 2023





FCC SDoC TEST REPORT
FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014

Report Reference No. : LCSA010523104E

Date Of Issue : February 21, 2023

Testing Laboratory Name : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Testing Location/ Procedure... : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's Name..... : KHADAS TECHNOLOGY CO., LTD

Address : 2709 QIANCHENG CENTER, HAICHENG ROAD, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN, CHINA. 518101

Test Specification

Standard..... : FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014

Test Report Form No..... : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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Test Item Description..... : Edge2 ARM PC

Trade Mark..... : Khadas

Test Model..... : K1011

Ratings : Please Refer To Page 7

Result : Positive

Compiled by:

Emma Wang/ File administrators

Supervised by:

Baron Wen/Technique principal

Approved by:

Gavin Liang/ Manager





FCC -- TEST REPORT

Test Report No. : LCSEA010523104E	<u>February 21, 2023</u> Date of issue
--	---

Test Model	: K1011
EUT.....	: Edge2 ARM PC
Applicant.....	: KHADAS TECHNOLOGY CO., LTD
Address.....	: 2709 QIANCHENG CENTER, HAICHENG ROAD, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN, CHINA. 518101
Telephone.....	: /
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Manufacturer.....	: KHADAS TECHNOLOGY CO., LTD
Address.....	: 2709 QIANCHENG CENTER, HAICHENG ROAD, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN, CHINA. 518101
Telephone.....	: /
Fax.....	: /
Factory.....	: KHADAS TECHNOLOGY CO., LTD
Address.....	: 2709 QIANCHENG CENTER, HAICHENG ROAD, XIXIANG STREET, BAO'AN DISTRICT, SHENZHEN, CHINA. 518101
Telephone.....	: /
Fax.....	: /

Test Result according to the standards on page 6: **Positive**

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





Revision History

Revision	Issue Date	Revisions Content	Revised By
000	February 21, 2023	Initial Issue	/





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1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

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

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014	--	PASS
Radiated disturbance	FCC 47 CFR Part 15 Subpart B, Class B(SDoC), ANSI C63.4 -2014	--	PASS

N/A is an abbreviation for Not Applicable.

Test mode:		
Mode	Working	Record





2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	: Edge2 ARM PC
Trade Mark	: Khadas
Test Model	: K1011
Power Supply	: Type-C Input: 5V=3A 9V=2.67A 12V=2A Output: USB 1: 5V=1300mA USB 2: 5V=1500mA
Highest internal freq.	: Fx>108MHz

Highest internal frequency (Fx)	Highest measured frequency
Fx ≤ 1.705 MHz	30 MHz
1.705 MHz < Fx ≤ 108 MHz	1 GHz
108 MHz < Fx ≤ 500 MHz	2 GHz
500 MHz < Fx ≤ 1000 MHz	5 GHz
Fx > 1 GHz	5 × Fx up to a maximum of 40 GHz

2.2. Support equipment List

Name	Manufacturers	M/N	S/N
Adapter	OPPO	OP52KAUH	--
TV	PHILIPS	32PHF6395/T3	XM1A2119003731





2.3. Description of Test Facility

Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0.
 FCC Designation Number is CN5024.
 CAB identifier is CN0071.
 CNAS Registration Number is L4595.

2.4. Statement of the Measurement Uncertainty

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

2.5. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (U _{lab})	Expanded Uncertainty (U _{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.



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3. TEST RESULTS

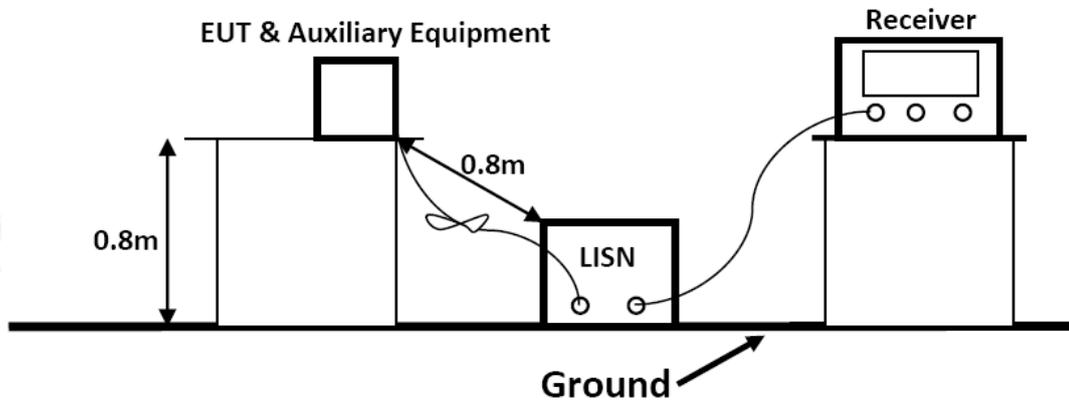
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2023-02-17	2024-02-16
3	Artificial Mains	R&S	ENV216	101288	2022-06-16	2023-06-15
4	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2022-08-17	2023-08-16

3.1.2. Block Diagram of Test Setup



3.1.3. Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dB μ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.1.4. EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.





3.1.5. Operating Condition of EUT

3.1.5.1. Setup the EUT as shown on Section 3.1.2

3.1.5.2. Turn on the power of all equipments.

3.1.5.3. Let the EUT work in measuring test Mode (Working) and measure it.

3.1.6. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

PASS.

The test result please refer to the next page.



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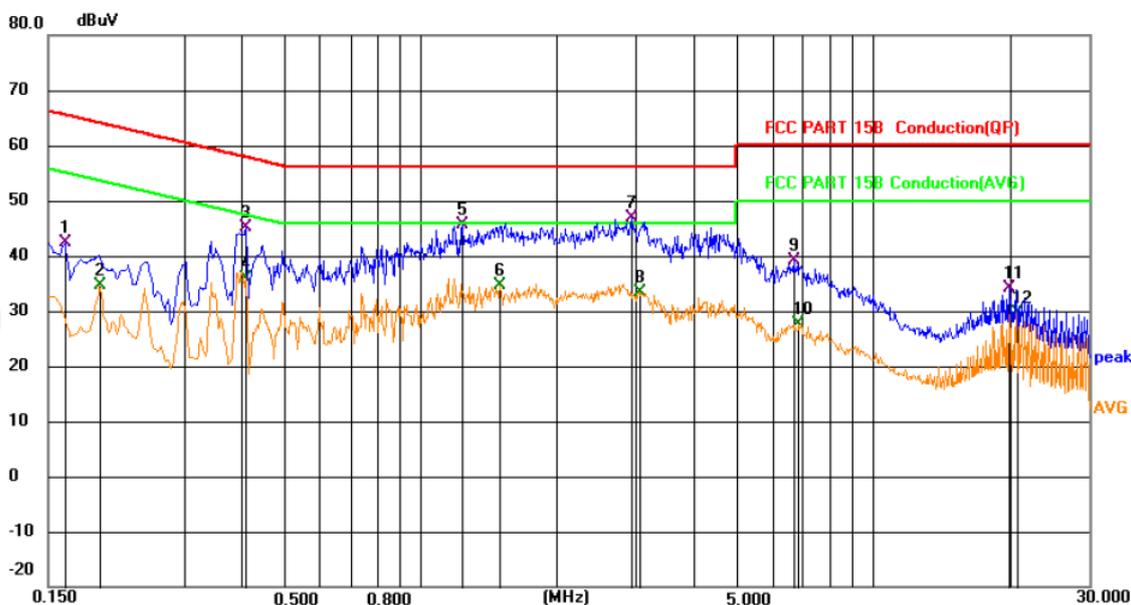
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Test Model	K1011	Test Mode	Working
Environmental Conditions	22.5°C, 53.7% RH	Test Engineer	Paul Xie
Pol	Line	Test Voltage	AC 120V/60Hz

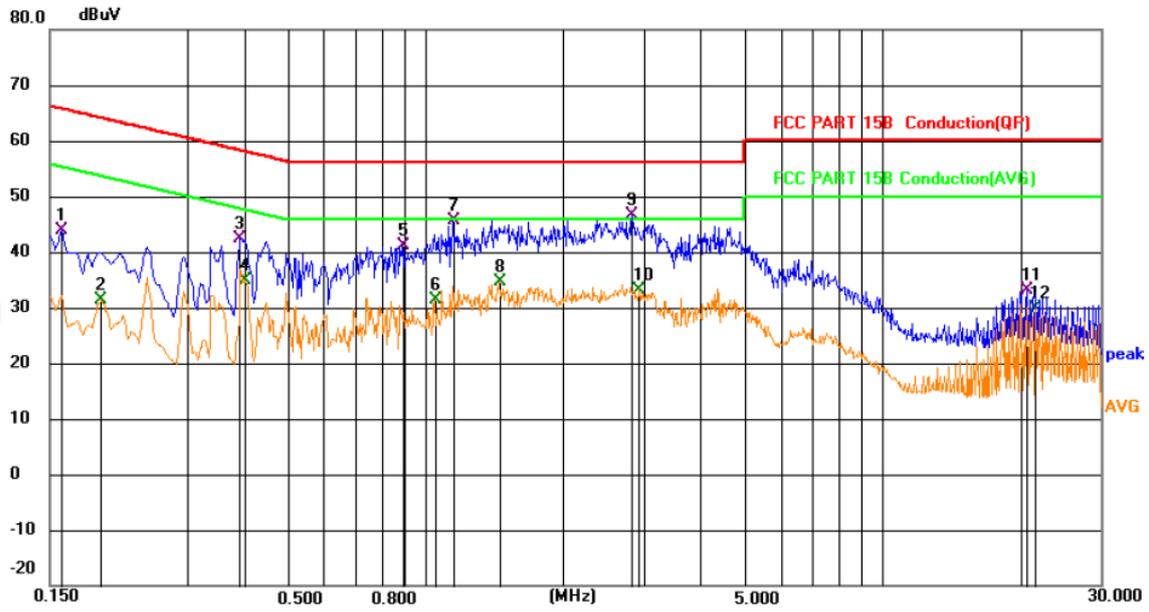


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1635	22.86	19.63	42.49	65.28	-22.79	QP	
2		0.1951	14.95	19.63	34.58	53.82	-19.24	AVG	
3		0.4111	25.48	19.63	45.11	57.63	-12.52	QP	
4		0.4111	16.15	19.63	35.78	47.63	-11.85	AVG	
5		1.2390	25.89	19.66	45.55	56.00	-10.45	QP	
6		1.5000	14.88	19.66	34.54	46.00	-11.46	AVG	
7	*	2.9310	27.31	19.68	46.99	56.00	-9.01	QP	
8		3.0391	13.77	19.70	33.47	46.00	-12.53	AVG	
9		6.6706	19.35	19.72	39.07	60.00	-20.93	QP	
10		6.8551	7.99	19.72	27.71	50.00	-22.29	AVG	
11		19.9771	13.84	20.21	34.05	60.00	-25.95	QP	
12		20.7961	9.53	20.16	29.69	50.00	-20.31	AVG	





Test Model	K1011	Test Mode	Working
Environmental Conditions	22.5°C, 53.7% RH	Test Engineer	Paul Xie
Pol	Neutral	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1590	24.28	19.63	43.91	65.52	-21.61	QP	
2		0.1951	11.64	19.63	31.27	53.82	-22.55	AVG	
3		0.3930	22.73	19.63	42.36	58.00	-15.64	QP	
4		0.4021	15.14	19.63	34.77	47.81	-13.04	AVG	
5		0.8881	21.57	19.64	41.21	56.00	-14.79	QP	
6		1.0456	11.73	19.65	31.38	46.00	-14.62	AVG	
7		1.1446	26.01	19.65	45.66	56.00	-10.34	QP	
8		1.4461	14.96	19.66	34.62	46.00	-11.38	AVG	
9	*	2.8276	26.91	19.72	46.63	56.00	-9.37	QP	
10		2.9310	13.52	19.73	33.25	46.00	-12.75	AVG	
11		20.7916	12.91	20.16	33.07	60.00	-26.93	QP	
12		21.6106	9.81	20.12	29.93	50.00	-20.07	AVG	

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



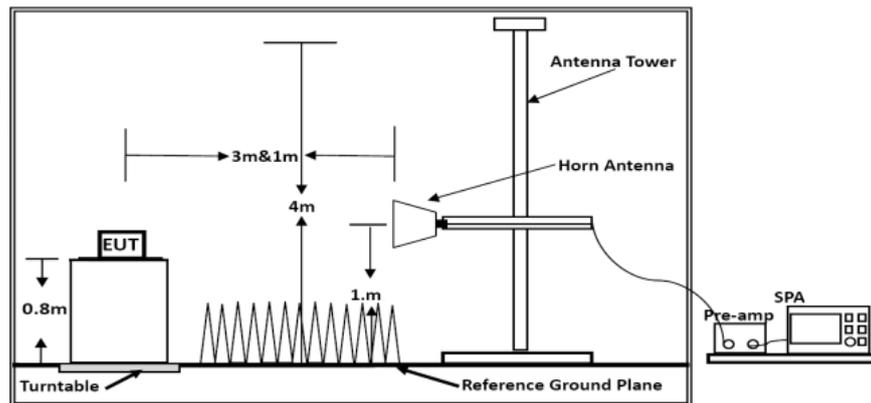
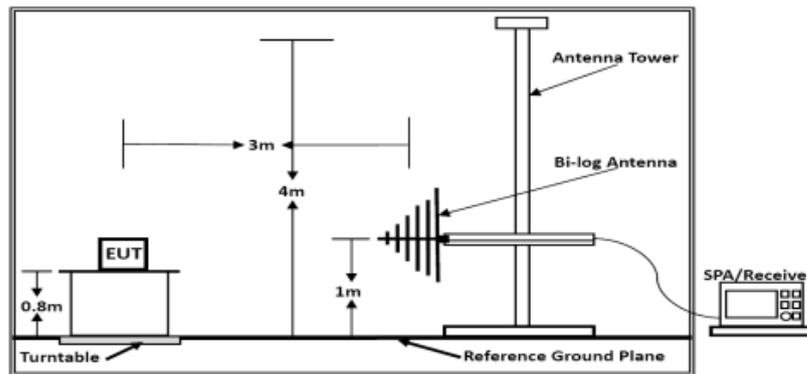
3.2. Radiated emission Measurement

3.2.1. Test Equipment

The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
4	EMI Test Receiver	R&S	ESR3	102311	2022-08-17	2023-08-16
5	Broadband Preamplifier	/	BP-01M18G	P190501	2022-06-16	2023-06-15
6	EMI Test Software	Farad	EZ	/	N/A	N/A
7	MXA Signal Analyzer	Agilent	N9020A	MY53290398	2022-06-16	2023-06-15

3.2.2. Block Diagram of Test Setup





3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54
Remark : (1) Emission level $(\text{dB})\mu\text{V} = 20 \log$ Emission level $\mu\text{V}/\text{m}$ (2) The smaller limit shall apply at the cross point between two frequency bands. (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.			
Limits for Radiated Emission Above 1GHz			
Frequency (MHz)	Distance (Meters)	Peak Limit ($\text{dB}\mu\text{V}/\text{m}$)	Average Limit ($\text{dB}\mu\text{V}/\text{m}$)
Above 1000	3	74	54
***Note: The lower limit applies at the transition frequency.			

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

3.2.5.1. Setup the EUT as shown in Section 3.2.2.

3.2.5.2. Let the EUT work in test Mode (Working) and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.



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3.2.7. Measuring Instruments and Setting

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10 th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

The frequency range from 30MHz to 1000MHz and above 1000MHz is checked.

3.2.8. Radiated Emission Noise Measurement Result

PASS.

The scanning waveforms please refer to the next page.



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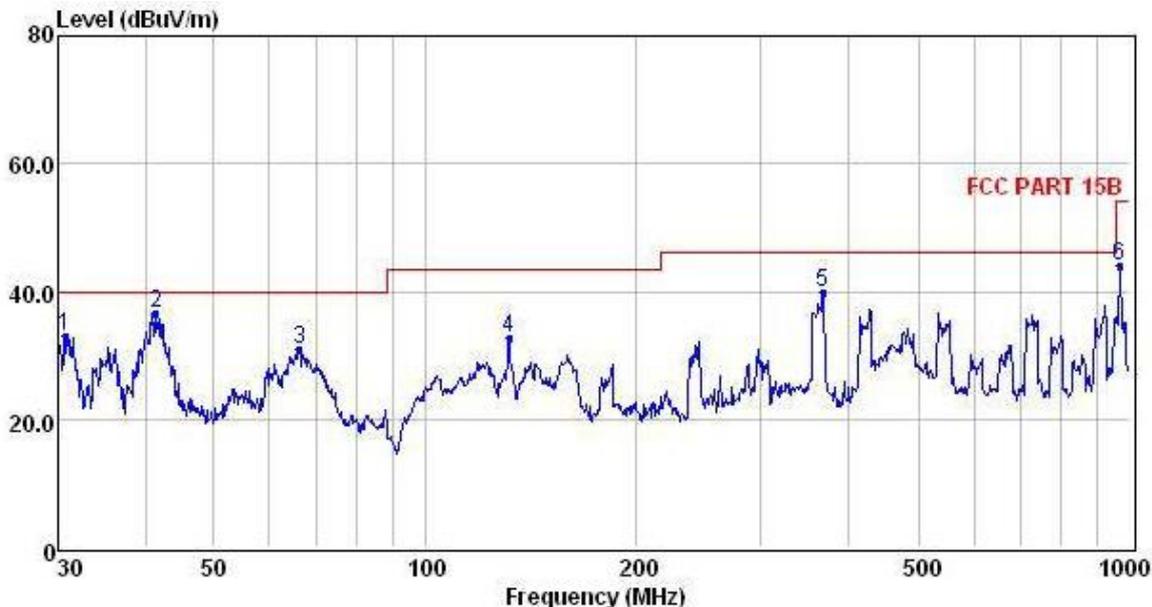
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Test Model	K1011	Test Mode	Working
Environmental Conditions	22.3°C, 53% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	XF Peng	Test Voltage	AC 120V/60Hz



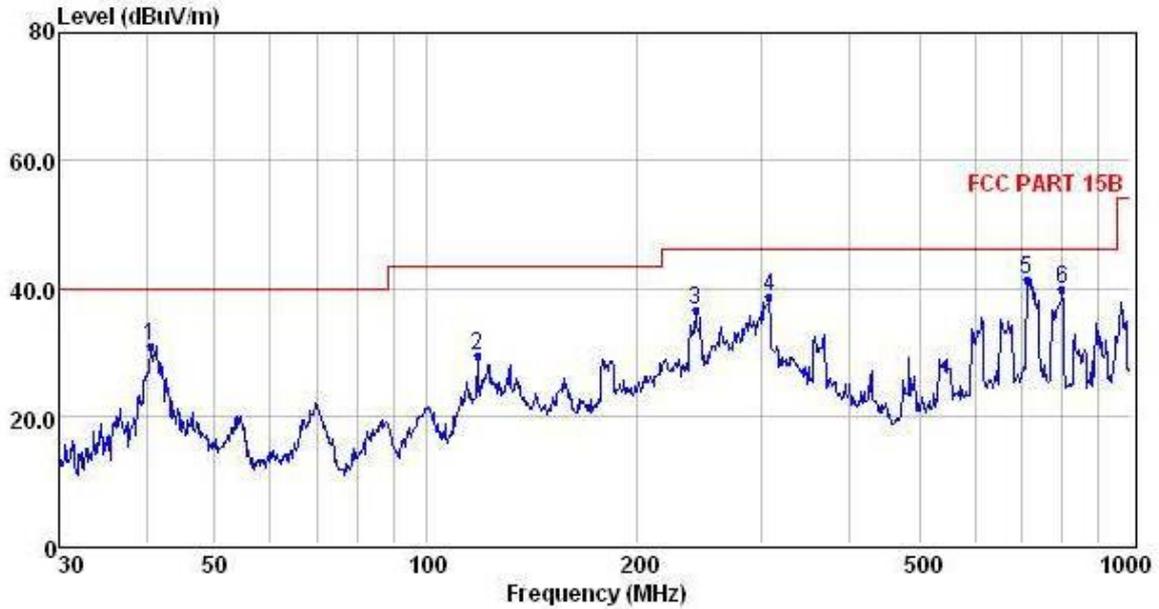
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	30.75	22.01	0.41	10.65	33.07	40.00	-6.93	QP
2	41.42	24.43	0.53	11.47	36.43	40.00	-3.57	QP
3	66.27	19.16	0.68	11.02	30.86	40.00	-9.14	QP
4	131.76	22.40	0.96	9.24	32.60	43.50	-10.90	QP
5	368.11	23.94	1.38	14.61	39.93	46.00	-6.07	QP
6	968.93	20.16	2.17	21.58	43.91	54.00	-10.09	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20db below the official limit are not reported





Test Model	K1011	Test Mode	Working
Environmental Conditions	22.3°C, 53% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	XF Peng	Test Voltage	AC 120V/60Hz



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	40.42	18.96	0.52	11.49	30.97	40.00	-9.03	QP
2	118.19	17.93	0.90	10.74	29.57	43.50	-13.93	QP
3	241.68	23.10	1.25	12.24	36.59	46.00	-9.41	QP
4	307.83	23.58	1.32	13.64	38.54	46.00	-7.46	QP
5	711.67	20.71	1.82	18.94	41.47	46.00	-4.53	QP
6	798.98	18.05	2.00	19.80	39.85	46.00	-6.15	QP

- Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20db below the official limit are not reported

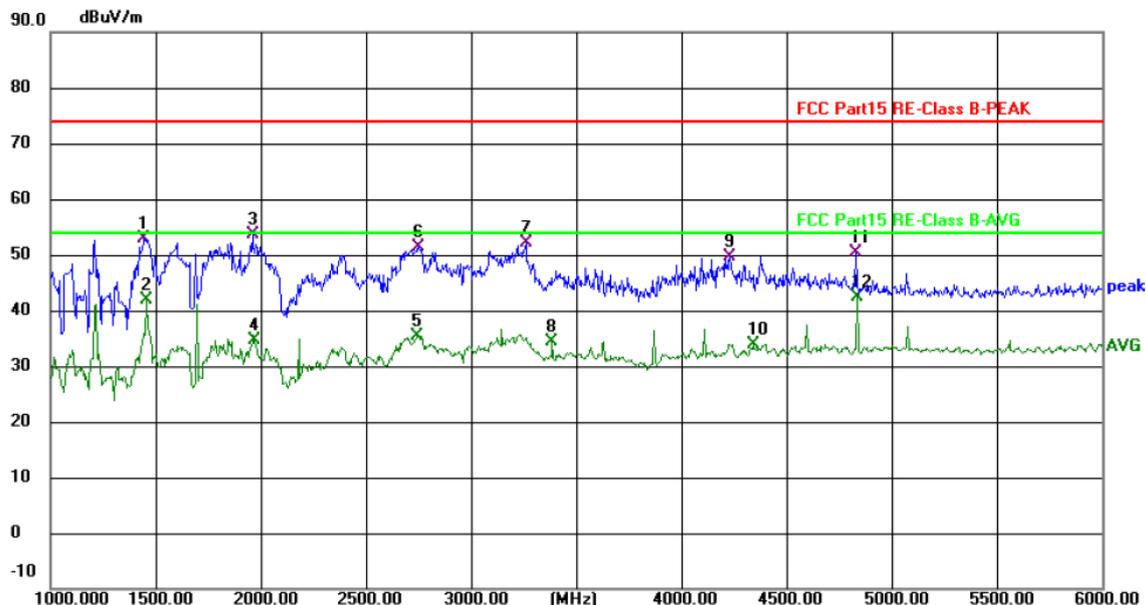
Note: Pre-Scan all mode, Thus record worse case mode result in this report.

Remark: For above 1000MHz, Because the emission it too low to be reported.





Test Model	K1011	Test Mode	Working
Environmental Conditions	23.9°C, 52.0% RH	Detector Function	Peak+AVG
Pol	Vertical	Distance	3m
Test Engineer	XF Peng	Test Voltage	AC 120V/60Hz

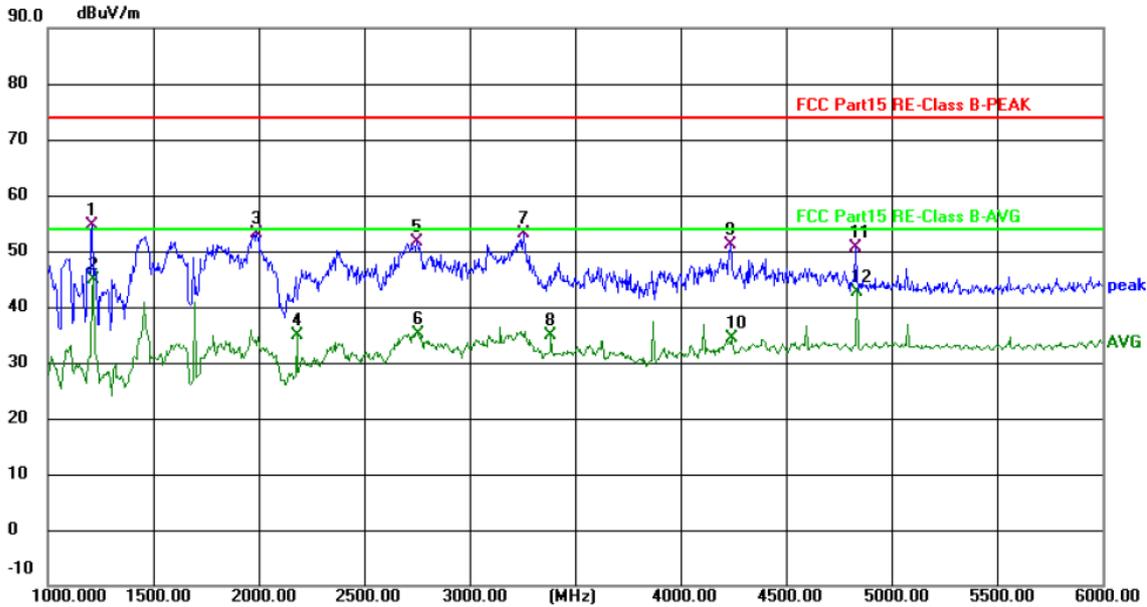


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1445.000	68.04	-15.12	52.92	74.00	-21.08	peak	P
2	1455.000	56.91	-15.08	41.83	54.00	-12.17	AVG	P
3	1960.000	66.89	-13.31	53.58	74.00	-20.42	peak	P
4	1970.000	48.01	-13.26	34.75	54.00	-19.25	AVG	P
5	2745.000	45.97	-10.48	35.49	54.00	-18.51	AVG	P
6	2750.000	61.90	-10.47	51.43	74.00	-22.57	peak	P
7	3260.000	61.75	-9.50	52.25	74.00	-21.75	peak	P
8	3385.000	43.87	-9.45	34.42	54.00	-19.58	AVG	P
9	4230.000	57.17	-7.64	49.53	74.00	-24.47	peak	P
10	4340.000	41.11	-7.21	33.90	54.00	-20.10	AVG	P
11	4830.000	55.37	-4.96	50.41	74.00	-23.59	peak	P
12	4835.000	47.37	-4.94	42.43	54.00	-11.57	AVG	P





Test Model	K1011	Test Mode	Working
Environmental Conditions	23.9°C, 52.0% RH	Detector Function	Peak+AV
Pol	Horizontal	Distance	3m
Test Engineer	XF Peng	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	1210.000	69.82	-15.21	54.61	74.00	-19.39	peak	P
2	1215.000	60.14	-15.22	44.92	54.00	-9.08	AVG	P
3	1990.000	66.33	-13.16	53.17	74.00	-20.83	peak	P
4	2180.000	47.43	-12.47	34.96	54.00	-19.04	AVG	P
5	2750.000	62.01	-10.47	51.54	74.00	-22.46	peak	P
6	2755.000	45.69	-10.45	35.24	54.00	-18.76	AVG	P
7	3255.000	62.52	-9.50	53.02	74.00	-20.98	peak	P
8	3385.000	44.28	-9.45	34.83	54.00	-19.17	AVG	P
9	4235.000	58.66	-7.62	51.04	74.00	-22.96	peak	P
10	4240.000	42.06	-7.60	34.46	54.00	-19.54	AVG	P
11	4830.000	55.68	-4.96	50.72	74.00	-23.28	peak	P
12	4835.000	47.53	-4.94	42.59	54.00	-11.41	AVG	P

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

Remark: For above 1000MHz, Because the emission it too low to be reported.





4. PHOTOGRAPH



Photo of Power Line Conducted Measurement

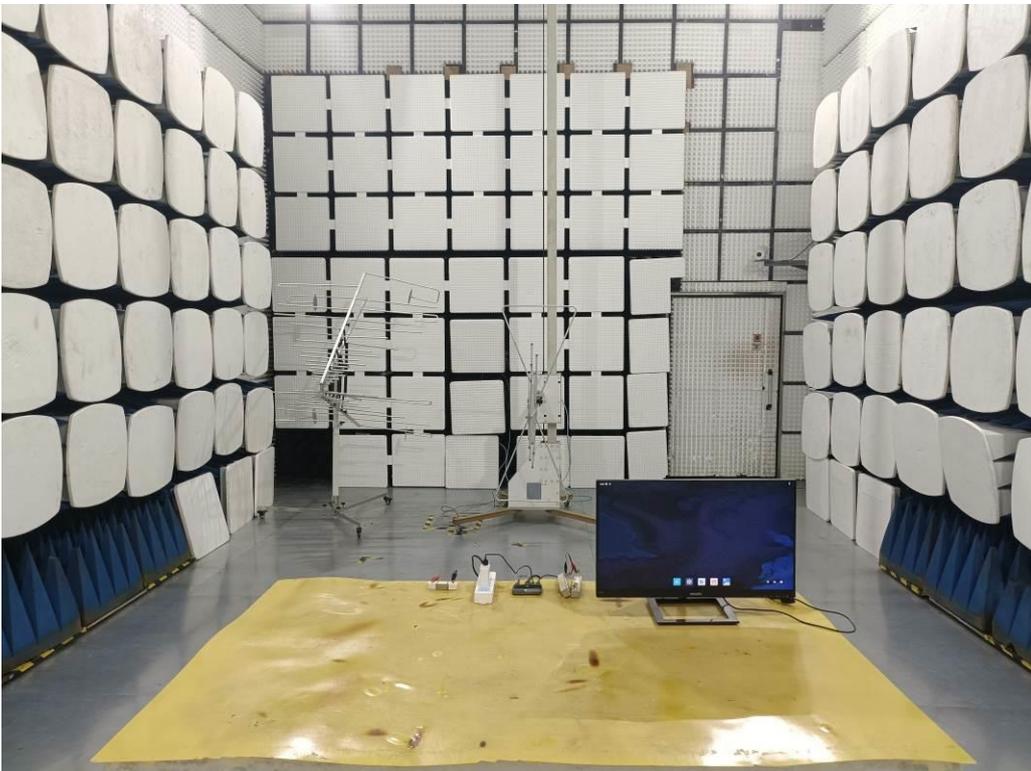


Photo of Radiated emission Measurement (30MHz-1G)



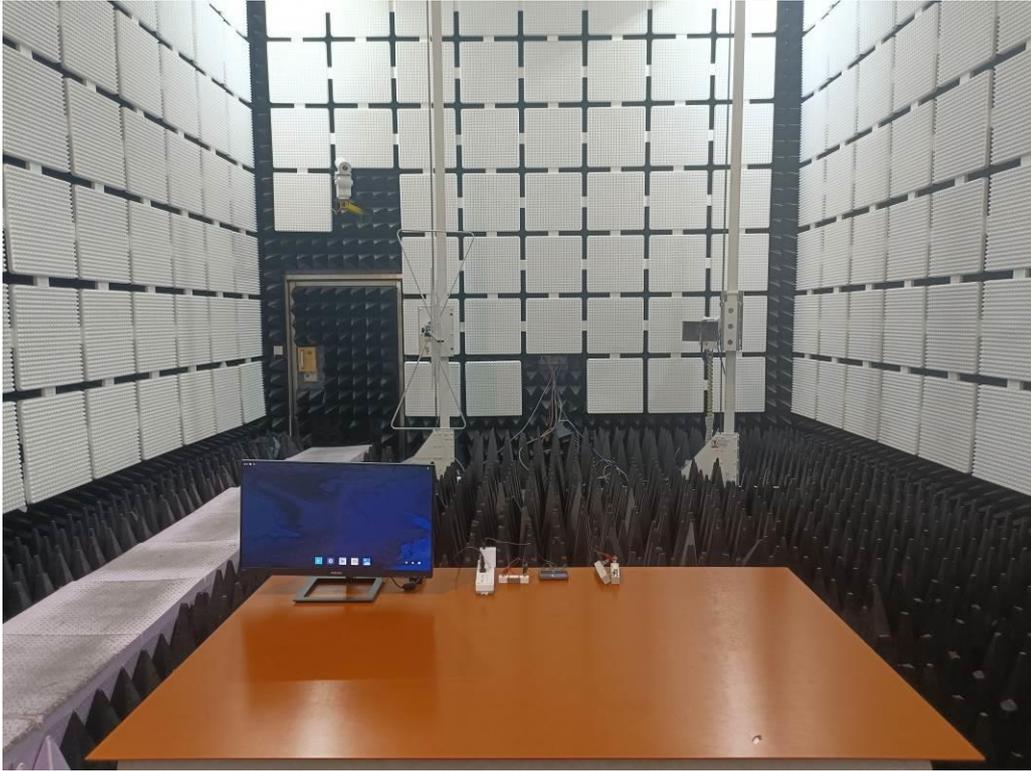


Photo of Radiated emission Measurement (1G-6G)



5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

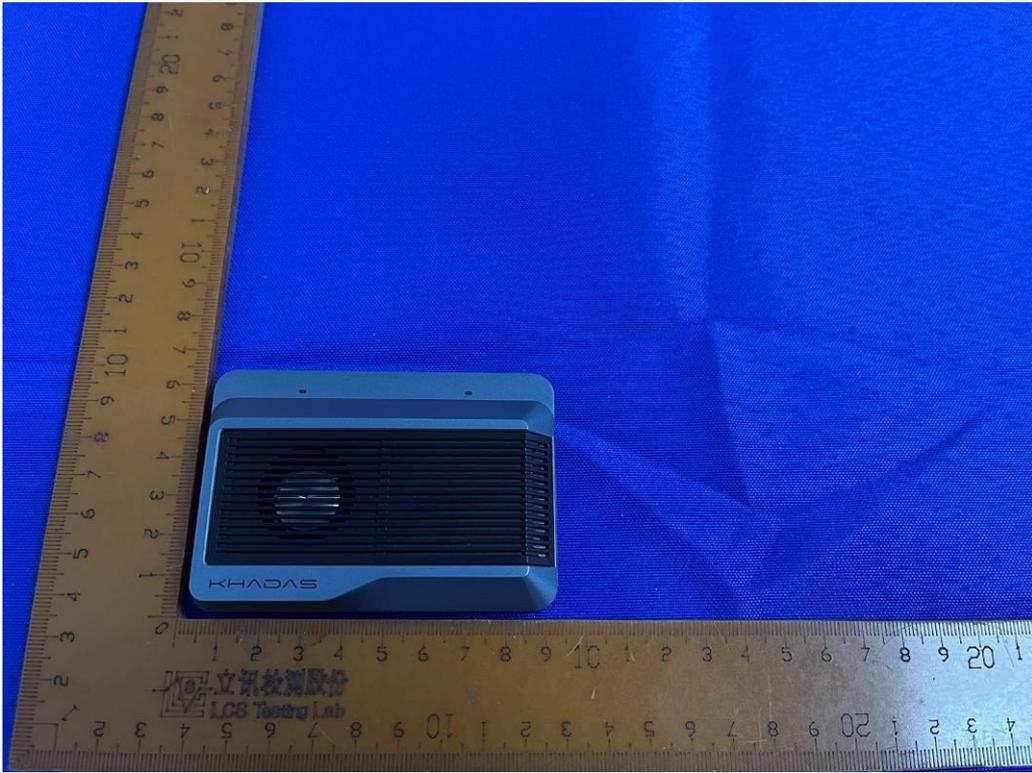


Fig. 1

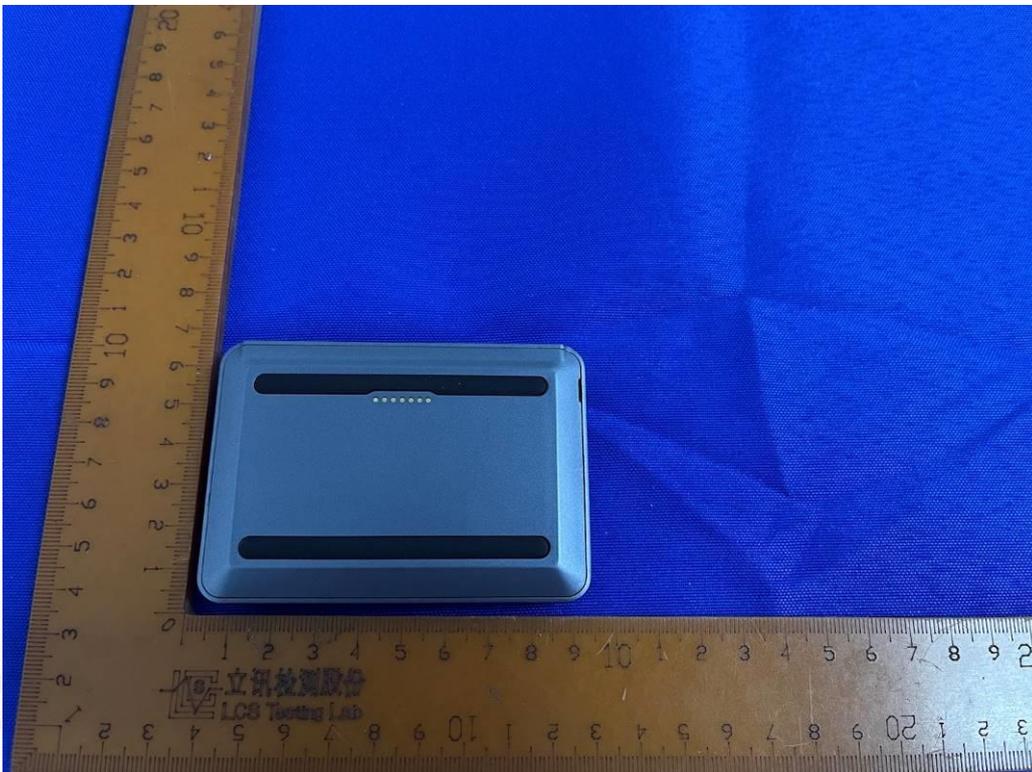


Fig. 2



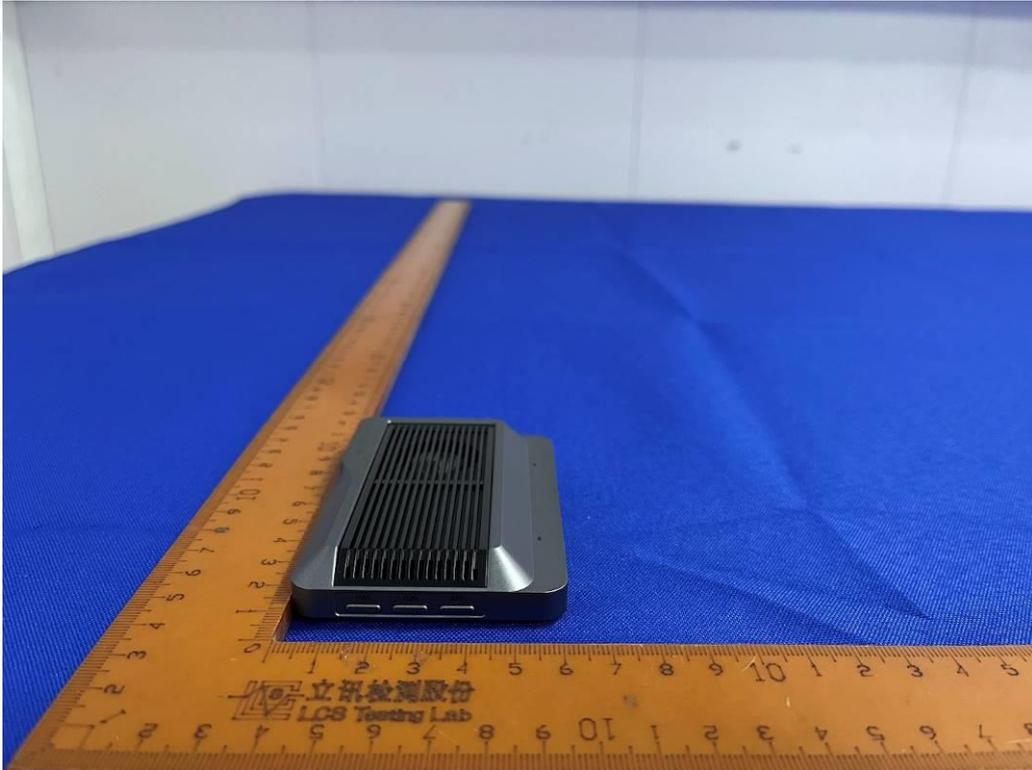


Fig. 3

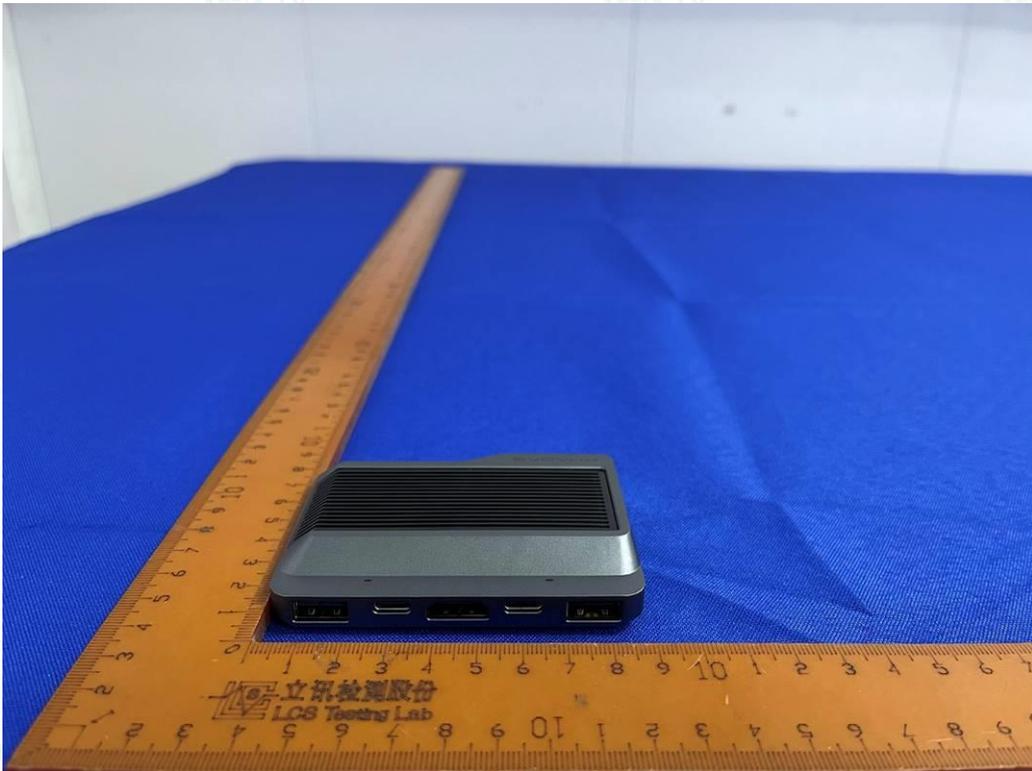


Fig. 4



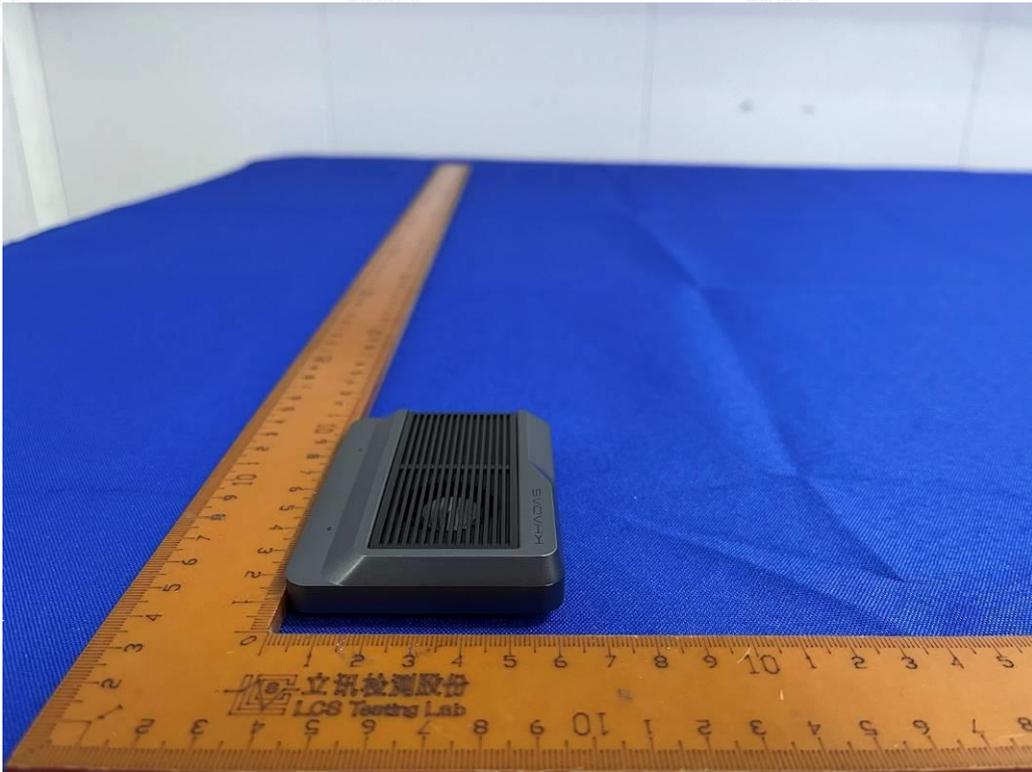


Fig. 5

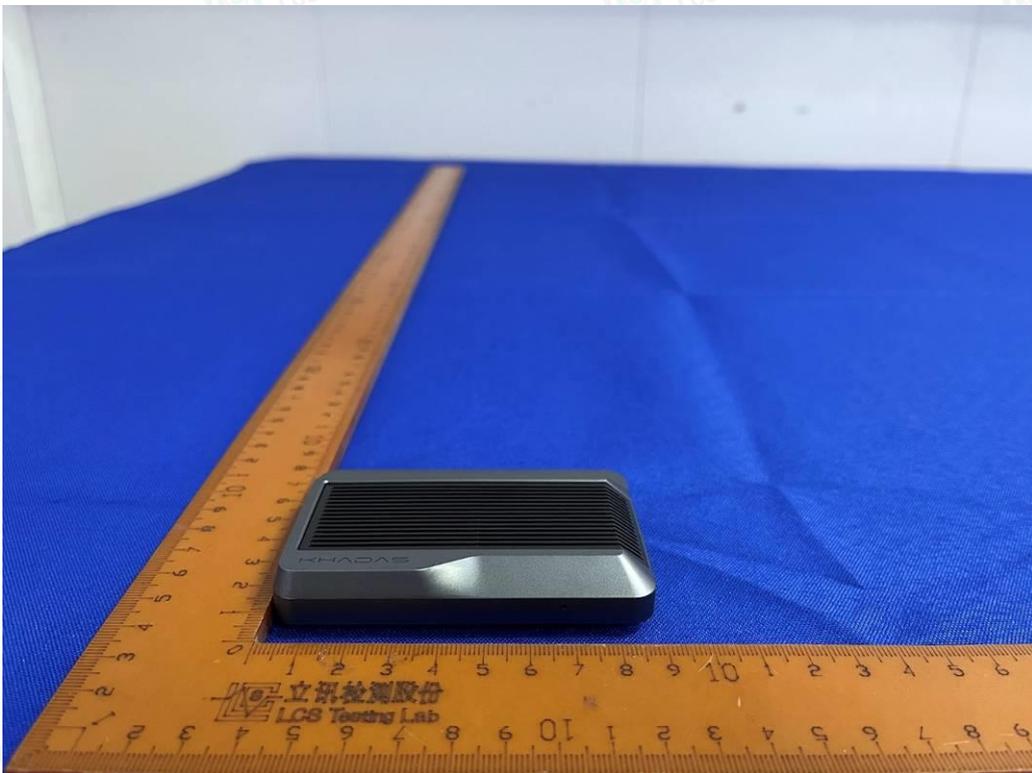


Fig. 6





Fig. 7

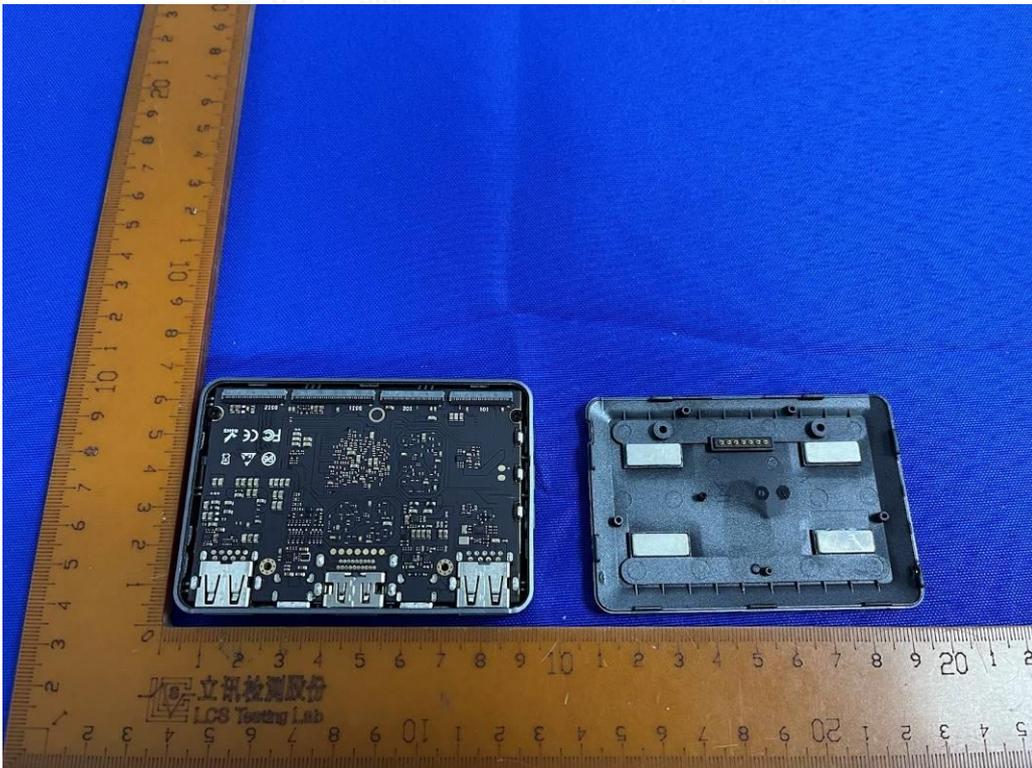


Fig. 8





Fig. 9

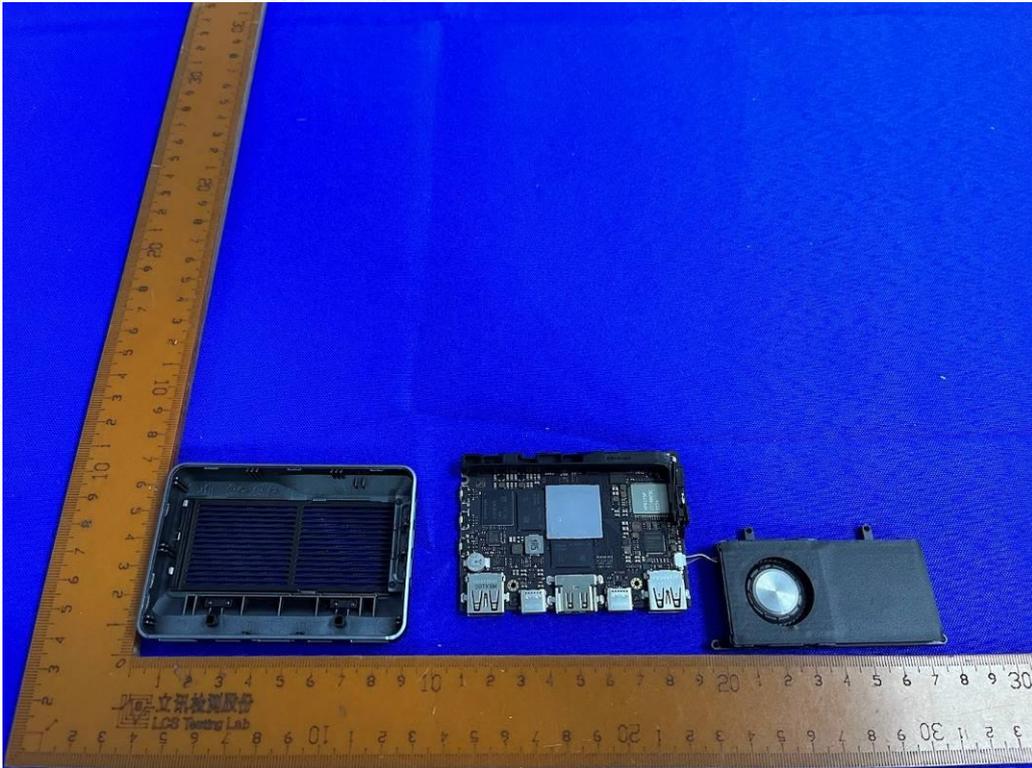


Fig. 10



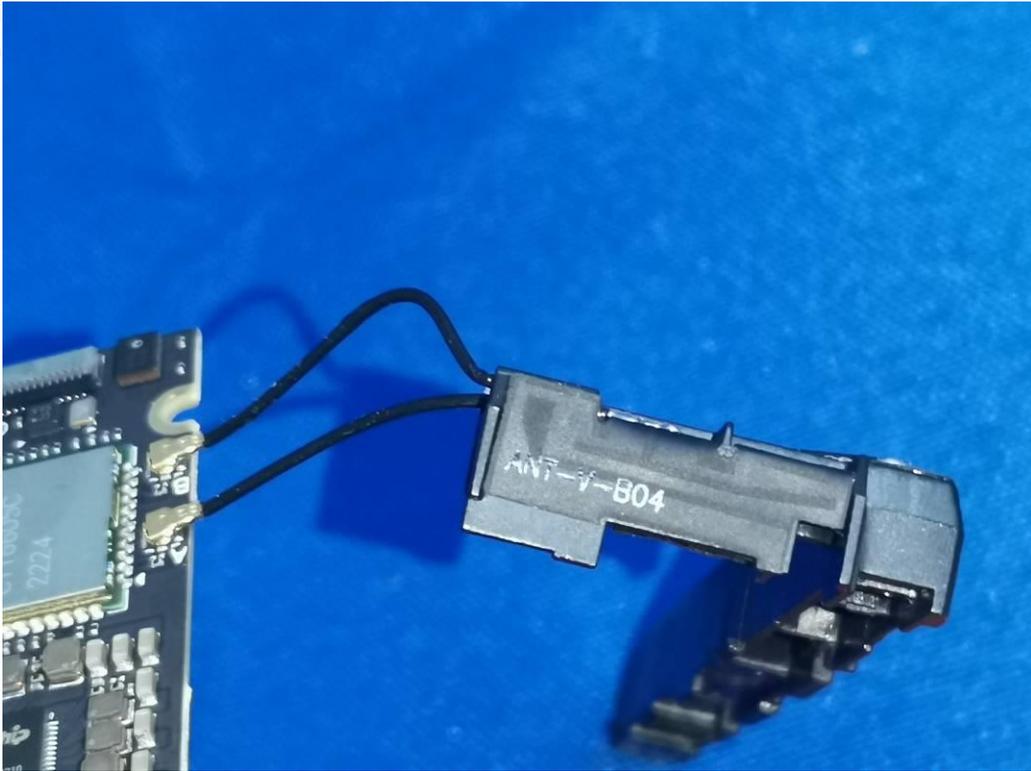


Fig. 11

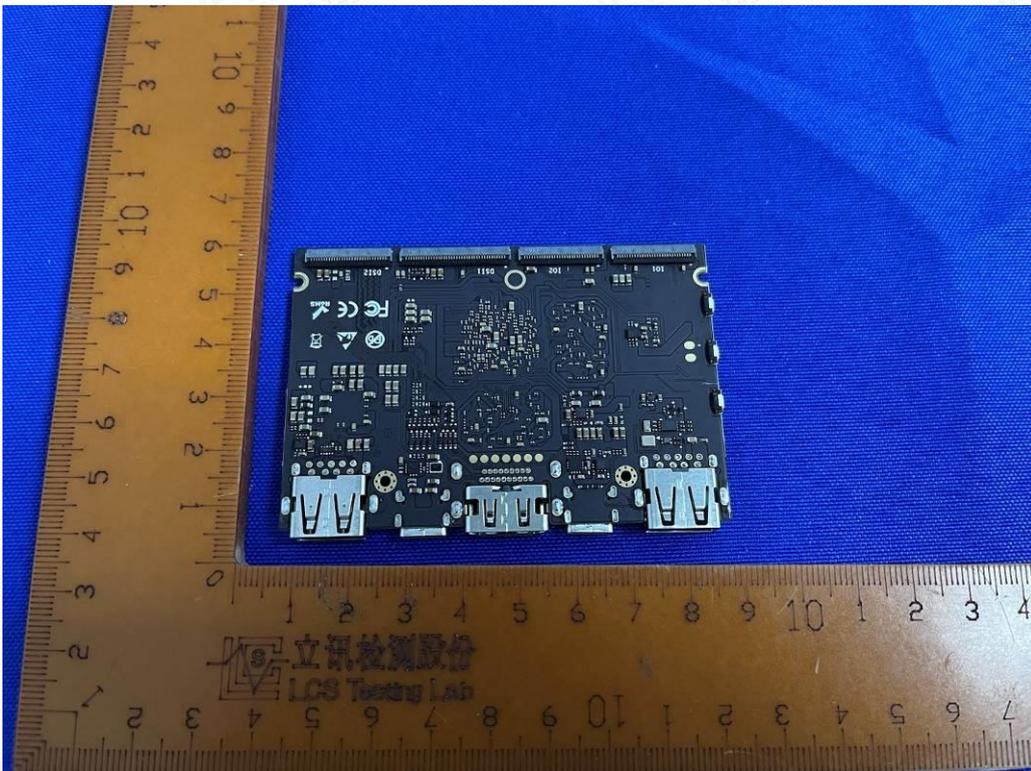


Fig. 12



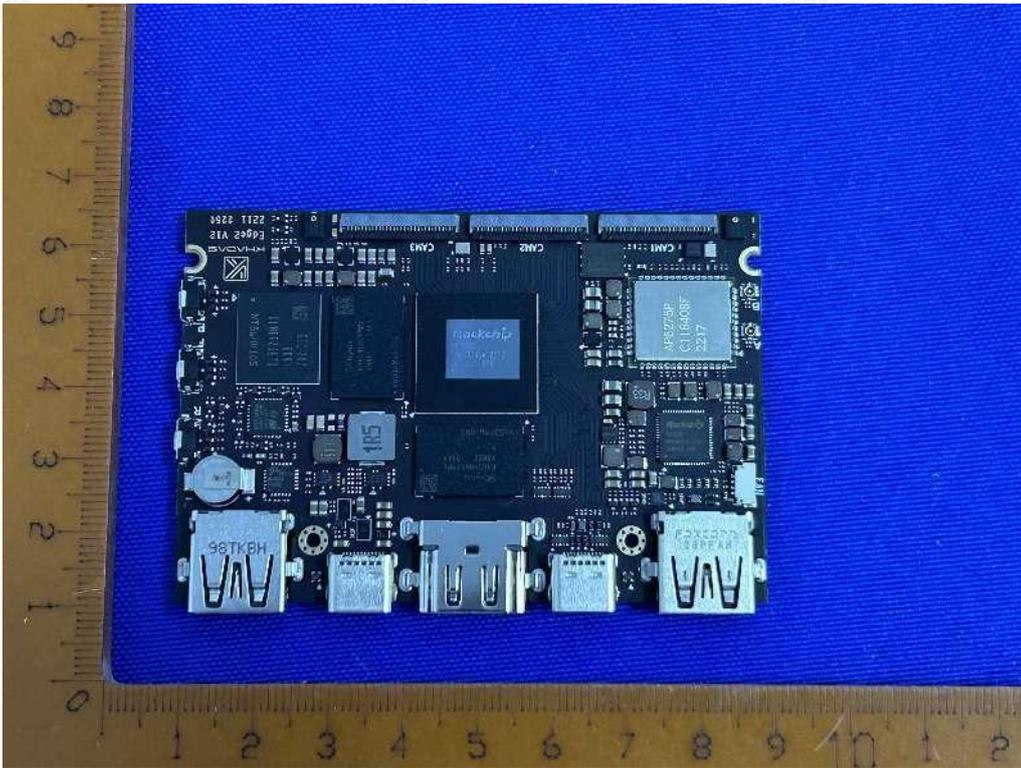


Fig. 13

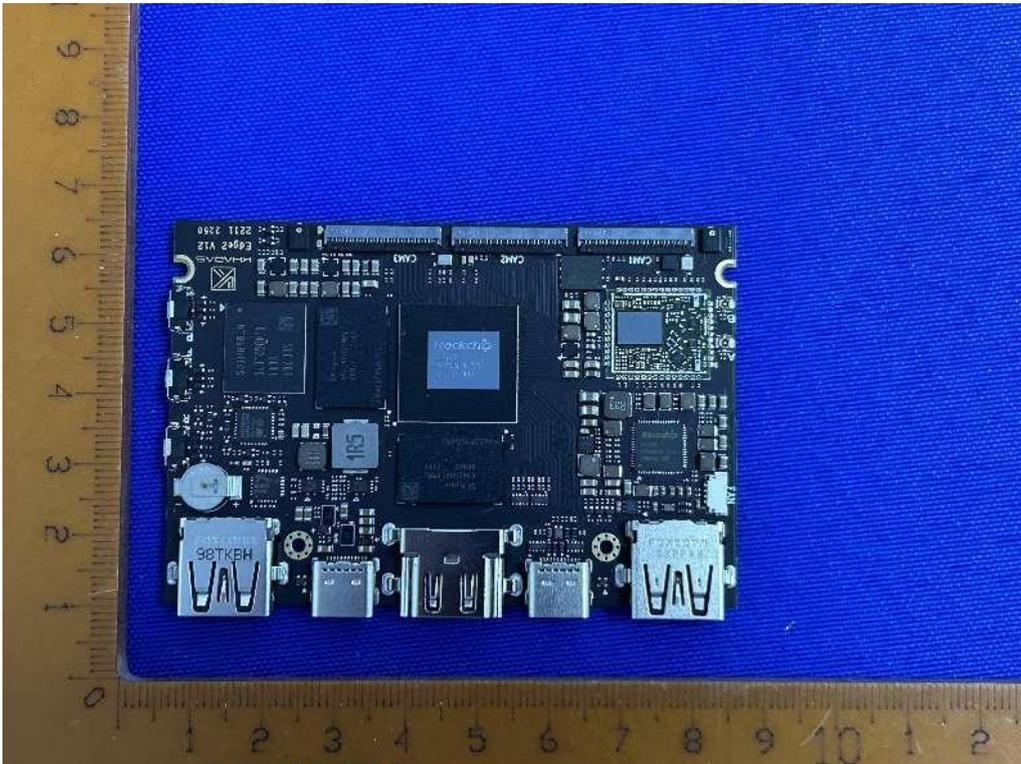


Fig. 14



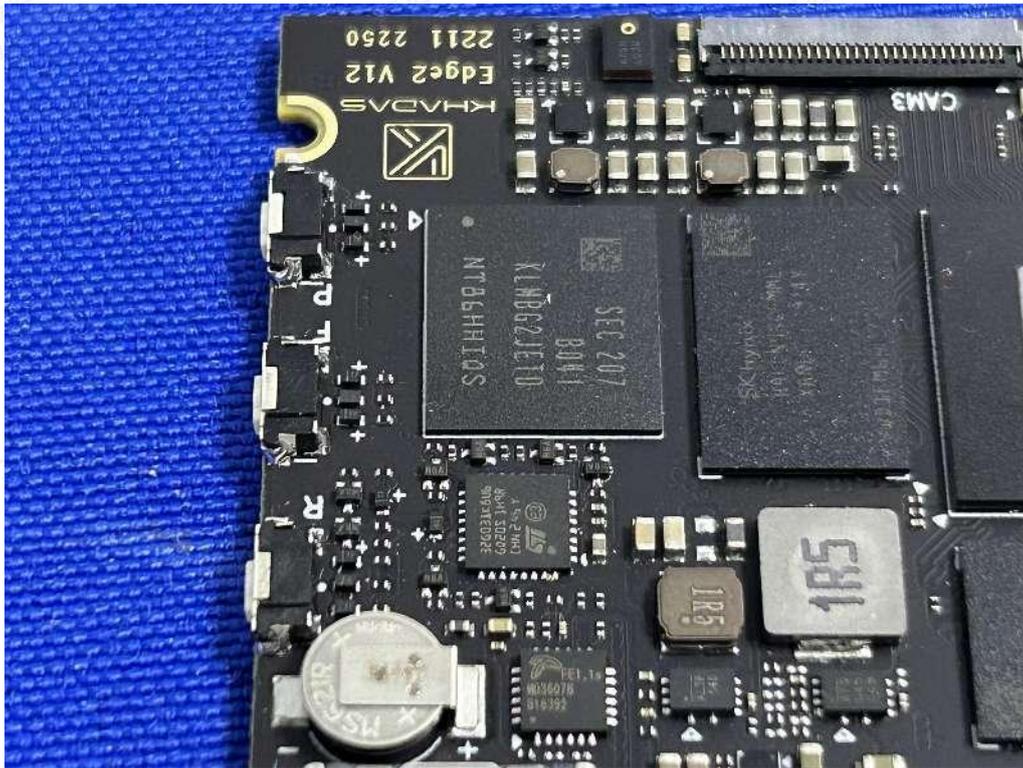


Fig. 15

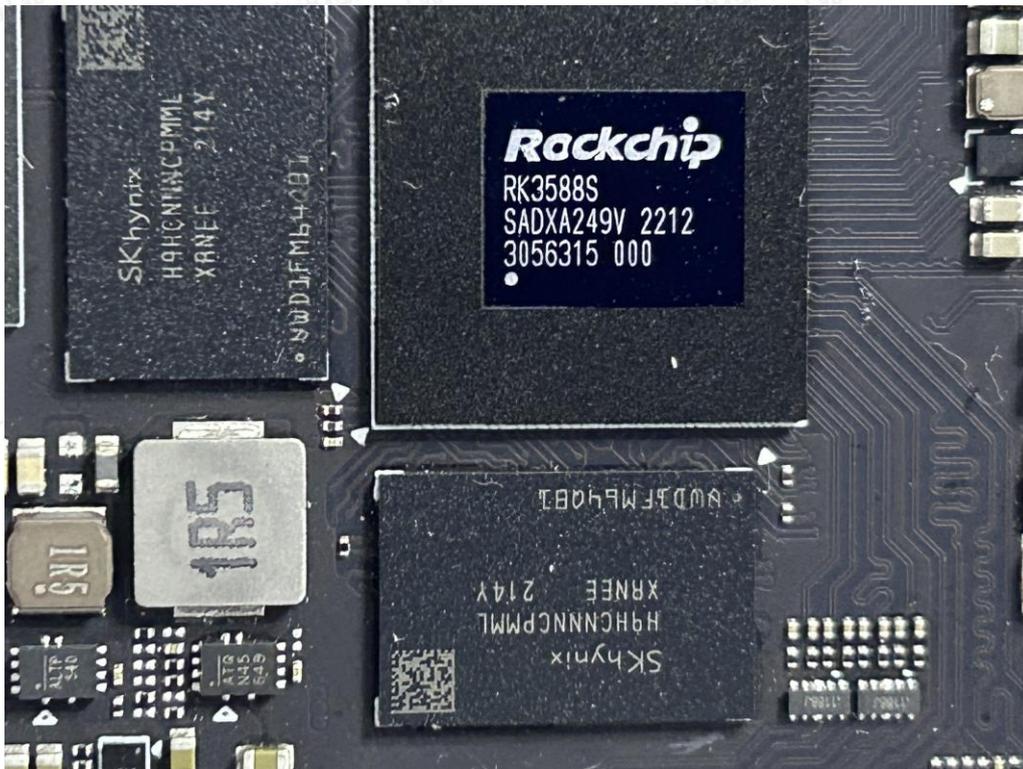


Fig. 16



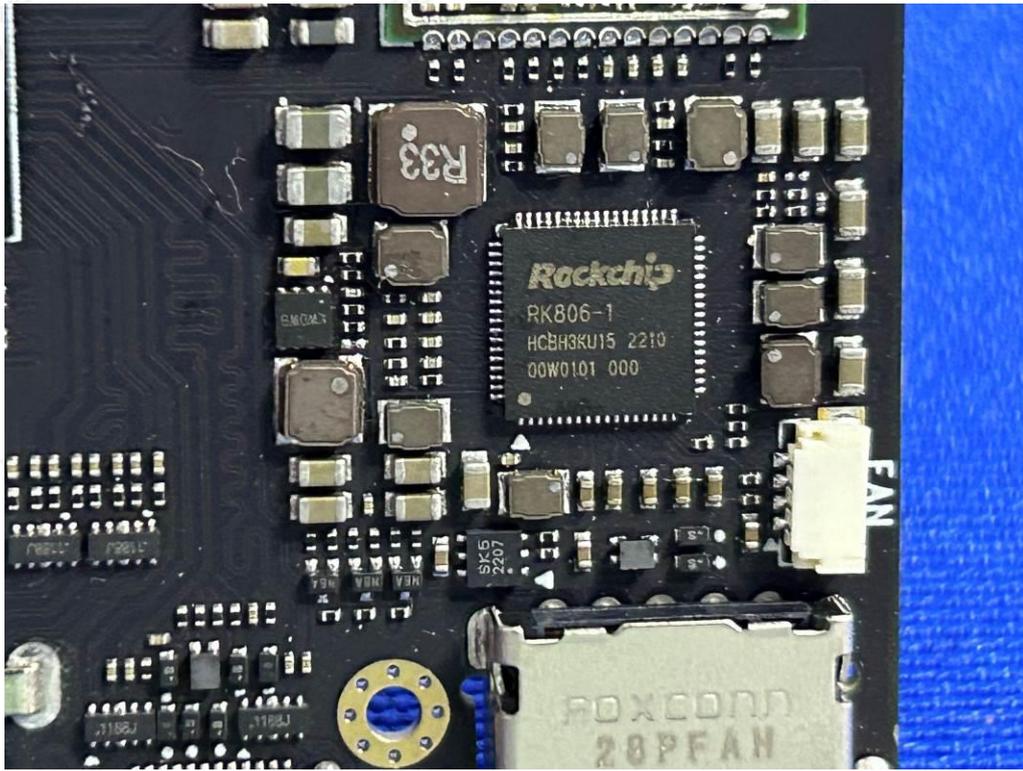


Fig. 17

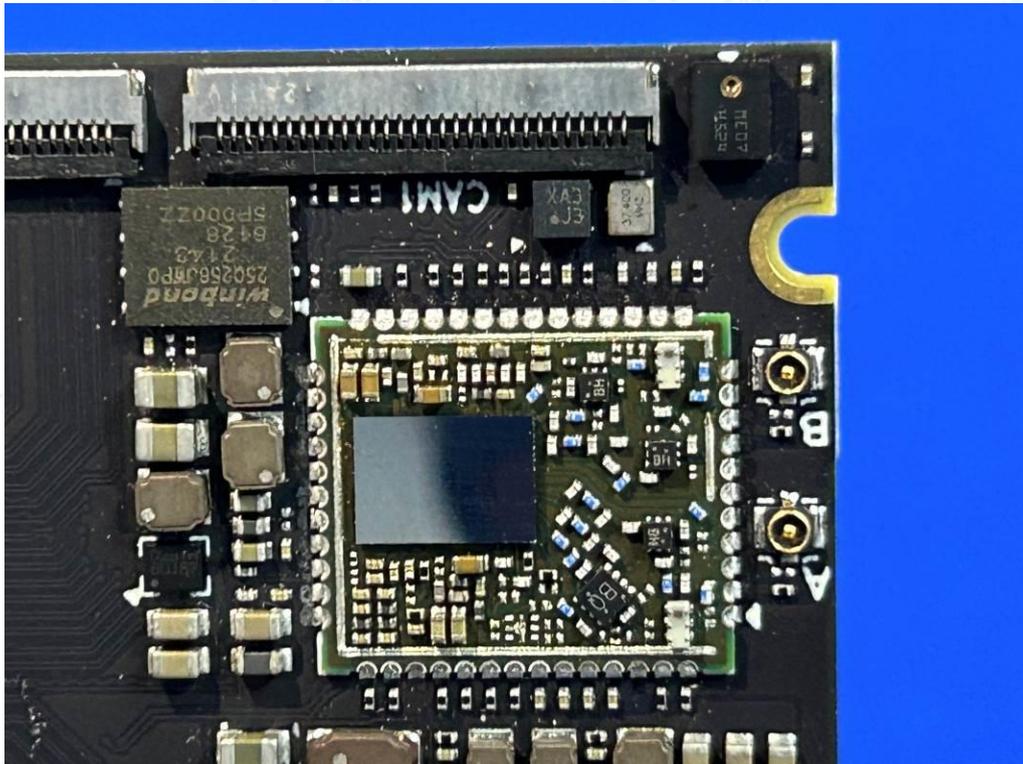


Fig. 18



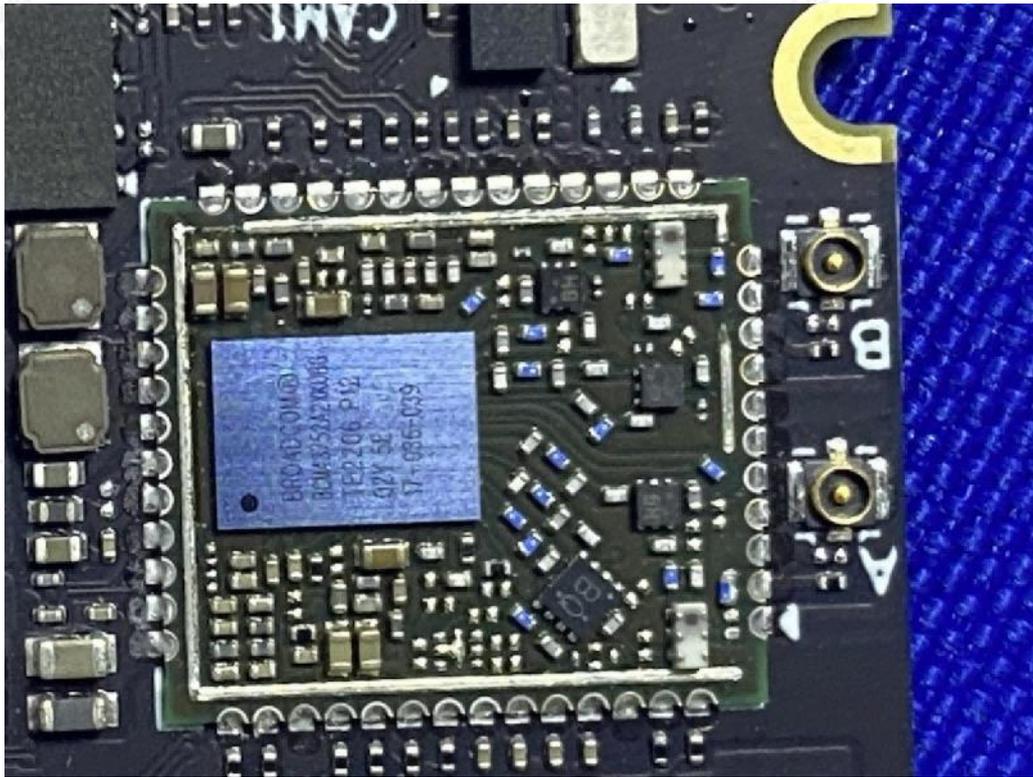


Fig. 19



-----THE END OF TEST REPORT-----

