



HUAKE TESTING

IC TEST REPORT

Prepared for :

EDA Technology Shanghai Co., Ltd.

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

Product Name: CM4 Sensing

Trade Mark: 

Product Model (S): ED-CM4SEN, ED-CM4SEN-PJ,
ED-CM4SEN-PT

Date of Test: Mar. 18, 2024 – May 09, 2024

Date of Report: May 09, 2024

Report Number: HK2403181199-1ER

Prepared By :

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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 : CM4 Sensing
(A) Product Model : ED-CM4SEN
(B) Series Model : ED-CM4SEN-PJ, ED-CM4SEN-PT
(C) Power Supply : DC12V From Adapter or AC100-240V, 50/60Hz

Standards..... ICES-003 Issue 7 October 2020

This device described above has been tested by HUAKE, and the test results show that the equipment under test (EUT) is in compliance with ICES-003 of IC Rules. And it is applicable only to the tested sample identified in the report.

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

Date of Test: Mar. 18, 2024 – May 09, 2024

Prepared by:

Kevin Pan

Project Engineer

Reviewed by:

Steven Wom

Project Supervisor

Approved by:

Jason Zhou

Technical Director

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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2024/05/09	Jason Zhou



1. TEST SUMMARY

1.1 TEST FACILITY

Shenzhen HUAKE 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 Test procedures according to the technical standards:

Standard	Test Item	Limit	Judgment	Remark
ICES-003 Issue 7 October 2020	Conducted Emission	Class A	PASS	
	Radiated Emission	Class A	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.

(3) Equipment meeting Class A requirements may not offer adequate protection to broadcast services within a residential environment.

1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$ · 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	$\pm 2.71\text{dB}$	

B. Radiated Measurement :

Measurement Frequency Range	Uncertainty	NOTE
30MHz ~ 1000MHz	$\pm 3.90\text{dB}$	
1GHz ~6GHz	$\pm 4.28\text{dB}$	



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	CM4 Sensing	
Product Model	ED-CM4SEN	
Series Model	ED-CM4SEN-PJ, ED-CM4SEN-PT	
Model Difference	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: ED-CM4SEN.	
Product Description	The EUT is a CM4 Sensing.	
	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	DC12V From Adapter or AC100-240V, 50/60Hz	



2.2 DESCRIPTION OF TEST MODES

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Pretest Mode	Description
Mode 1	Working

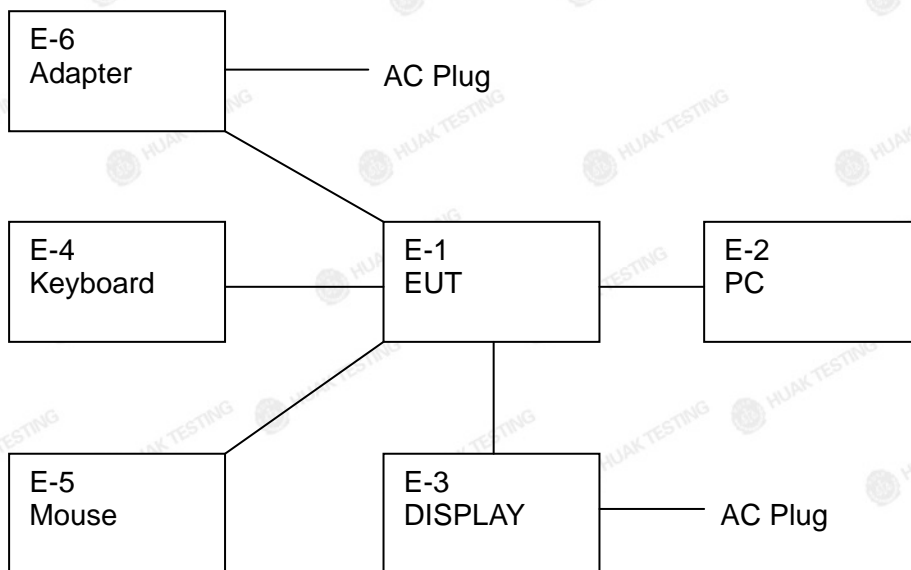
For Conducted Test	
Final Test Mode	Description
Mode 1	Working

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	CM4 Sensing		ED-CM4SEN	N/A	EUT
E-2	PC	Lenovo	ThinkpadE450	N/A	
E-3	DISPLAY	PHILIPS	279E1	N/A	
E-4	Keyboard	N/A	N/A	N/A	
E-5	Mouse	N/A	N/A	N/A	
E-6	Adapter	N/A	KSASB241200200D5	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".

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**2.5 MEASUREMENT INSTRUMENTS LIST**

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N.	R&S	ENV216	HKE-002	Feb. 20, 2024	1 Year
2.	L.I.S.N.	R&S	ENV216	HKE-059	Feb. 20, 2024	1 Year
3.	EMI Test Receiver	R&S	ESR	HKE-005	Feb. 20, 2024	1 Year
4.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
5.	Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 20, 2024	1 Year
6.	Preamplifier	EMCI	EMC05184 5S	HKE-006	Feb. 20, 2024	1 Year
7.	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	Feb. 20, 2024	1 Year
8.	Preamplifier	A.H. Systems	SAS-574	HKE-182	Feb. 20, 2024	1 Year
9.	6d Attenuator	Pasternack	6db	HKE-184	Feb. 20, 2024	1 Year
10.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 20, 2024	1 Year
11.	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 21, 2024	2 Year
12.	Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 21, 2024	2 Year
13.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 21, 2024	2 Year
14.	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15.	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/



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.

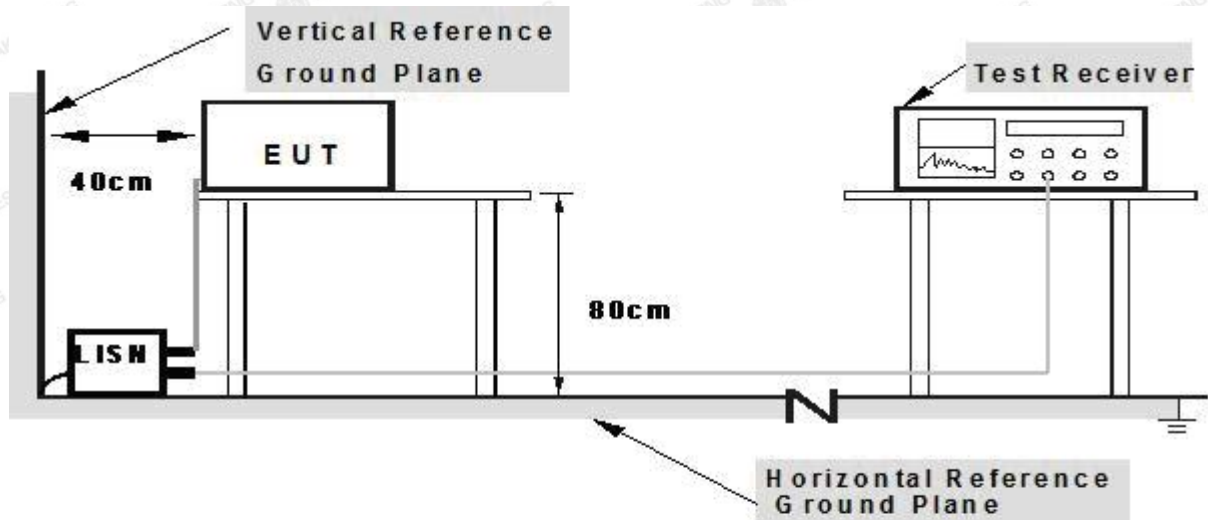
The following table is the setting of the receiver

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

3.1.2 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- 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 cm from other units and other metal planes

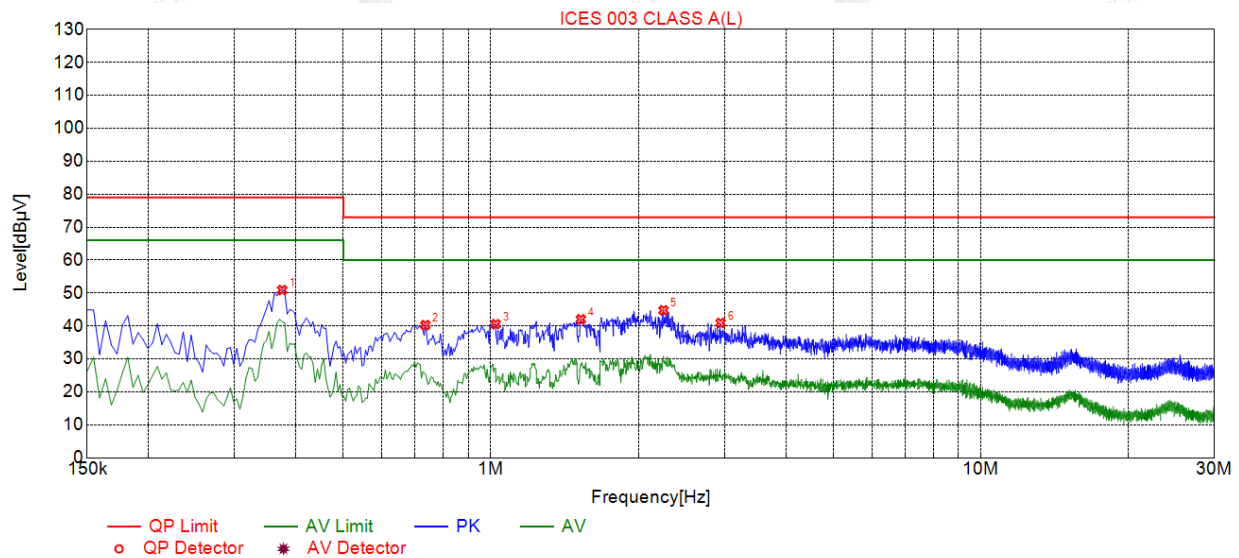
3.1.4 EUT OPERATING CONDITIONS

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 :	CM4 Sensing	Model Name. :	ED-CM4SEN
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2024-03-22
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	0.3750	50.91	20.05	79.00	28.09	30.86	PK	L
2	0.7350	40.28	20.06	73.00	32.72	20.22	PK	L
3	1.0230	40.56	20.07	73.00	32.44	20.49	PK	L
4	1.5270	42.04	20.11	73.00	30.96	21.93	PK	L
5	2.2515	44.78	20.18	73.00	28.24	24.58	PK	L
6	2.9445	40.93	20.21	73.00	32.07	20.72	PK	L

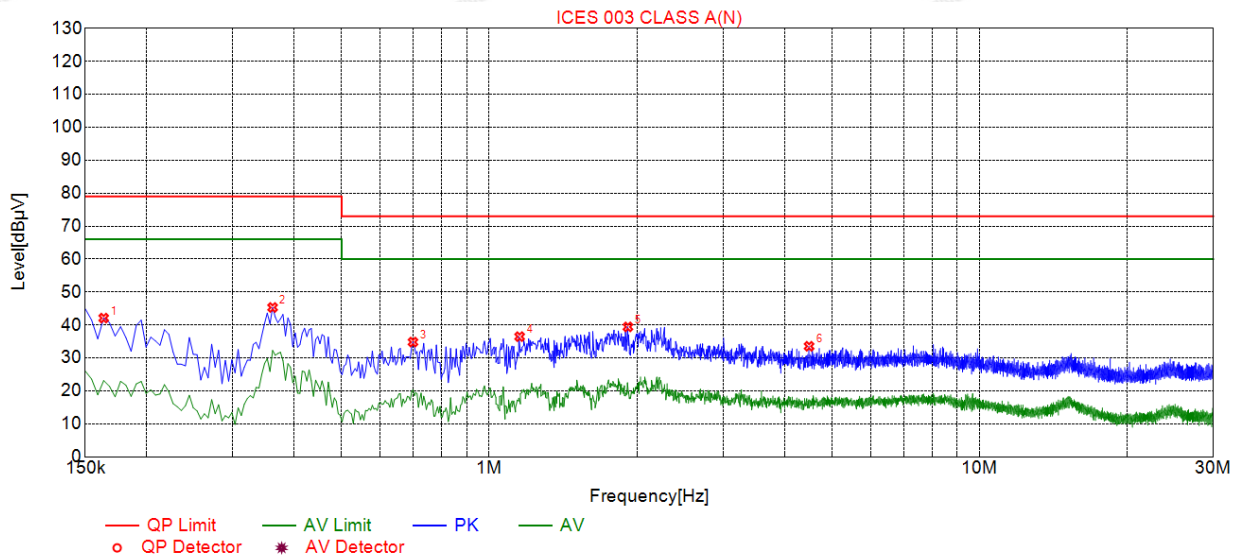
Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level=Test receiver reading + correction factor



EUT :	CM4 Sensing	Model Name. :	ED-CM4SEN
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2024-03-22
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	0.1635	42.09	19.98	79.00	36.91	22.11	PK	N
2	0.3615	45.31	20.04	79.00	33.69	25.27	PK	N
3	0.6990	34.81	20.05	73.00	38.19	14.76	PK	N
4	1.1535	36.47	20.09	73.00	36.53	16.38	PK	N
5	1.9185	39.42	20.14	73.00	33.58	19.28	PK	N
6	4.4925	33.54	20.25	73.00	39.46	13.29	PK	N

Remark: $\text{Margin} = \text{Limit} - \text{Level}$

Correction factor = Cable loss + 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:

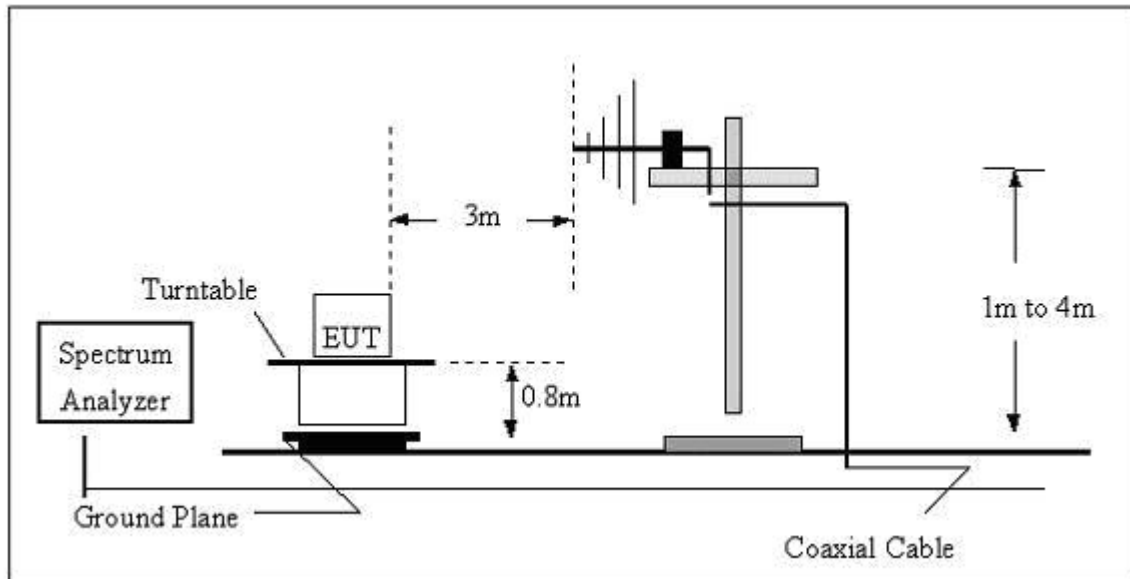
- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

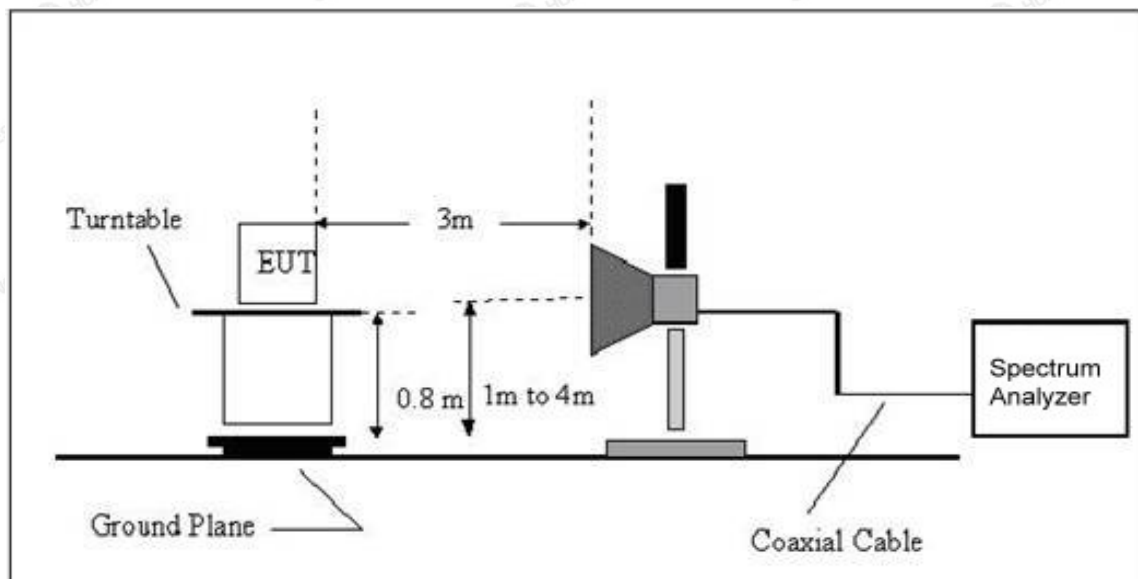
- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 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



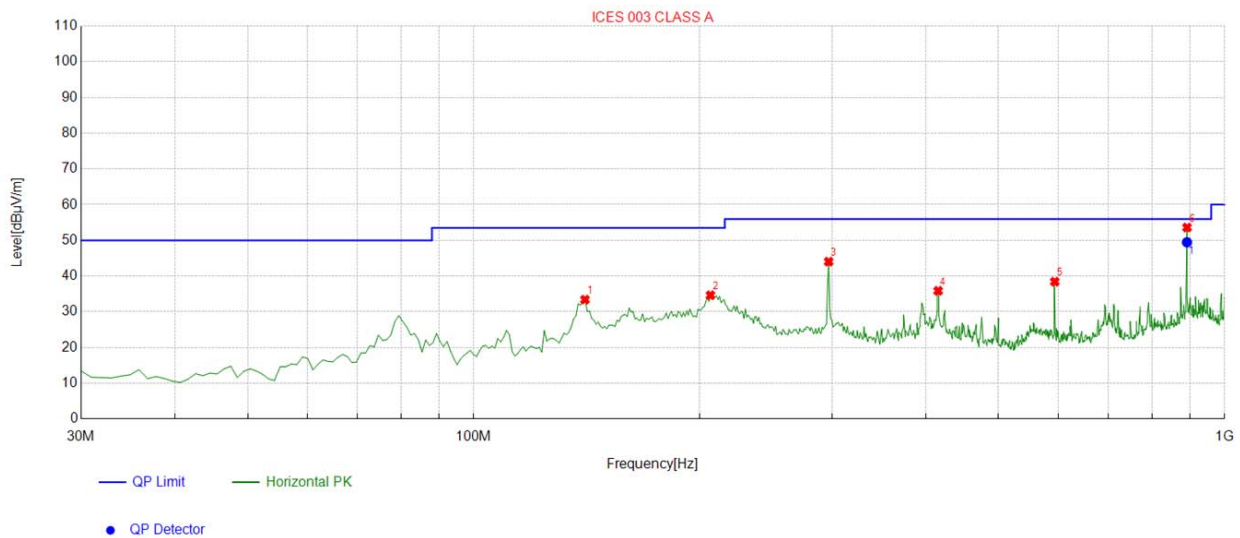
3.2.4 EUT OPERATING CONDITIONS

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 :	CM4 Sensing	Model Name :	ED-CM4SEN
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2024-03-22
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	140.69069	-18.07	51.47	33.40	53.50	20.10	100	206	Horizontal
2	206.71671	-14.61	49.24	34.63	53.50	18.87	100	225	Horizontal
3	297.01701	-12.04	56.08	44.04	56.00	11.96	100	41	Horizontal
4	415.47547	-8.88	44.75	35.87	56.00	20.13	100	151	Horizontal
5	594.13413	-5.30	43.73	38.43	56.00	17.57	100	269	Horizontal
6	891.25125	-0.67	54.26	53.59	56.00	2.41	100	341	Horizontal

Final Data List

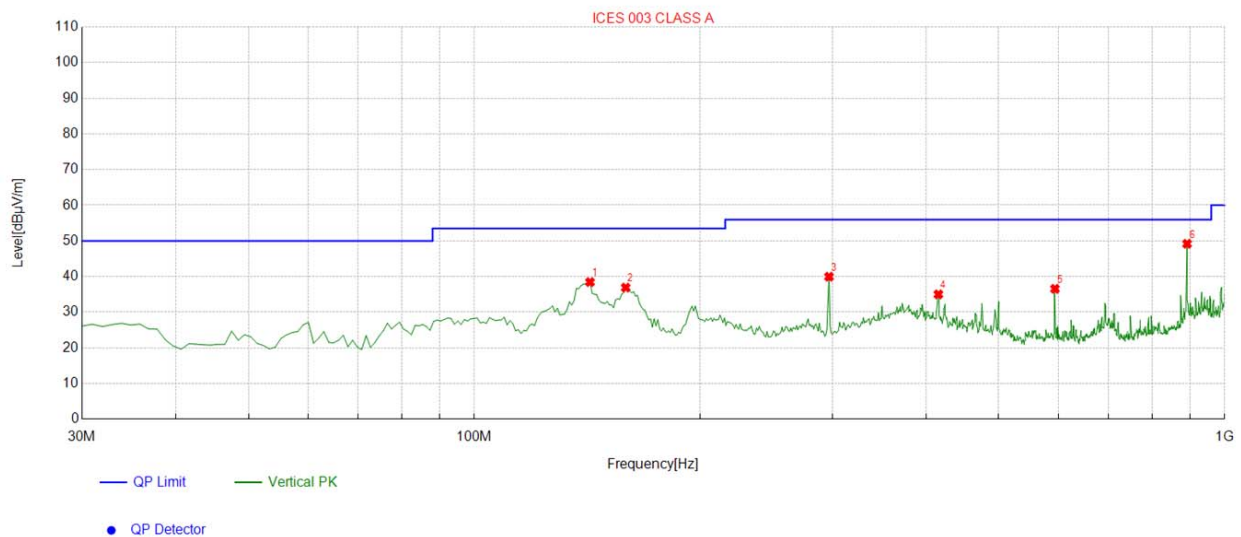
NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBμV/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	890.9671	-0.67	50.14	49.47	56.00	6.53	100	341	Horizontal

Final Data List

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



EUT :	CM4 Sensing	Model Name :	ED-CM4SEN
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2024-03-22
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	142.63263	-18.24	56.69	38.45	53.50	15.05	100	163	Vertical
2	159.13913	-17.21	54.12	36.91	53.50	16.59	100	158	Vertical
3	297.01701	-12.04	52.00	39.96	56.00	16.04	100	324	Vertical
4	415.47547	-8.88	43.89	35.01	56.00	20.99	100	6	Vertical
5	594.13413	-5.30	41.86	36.56	56.00	19.44	100	142	Vertical
6	891.25125	-0.67	49.87	49.20	56.00	6.80	100	216	Vertical

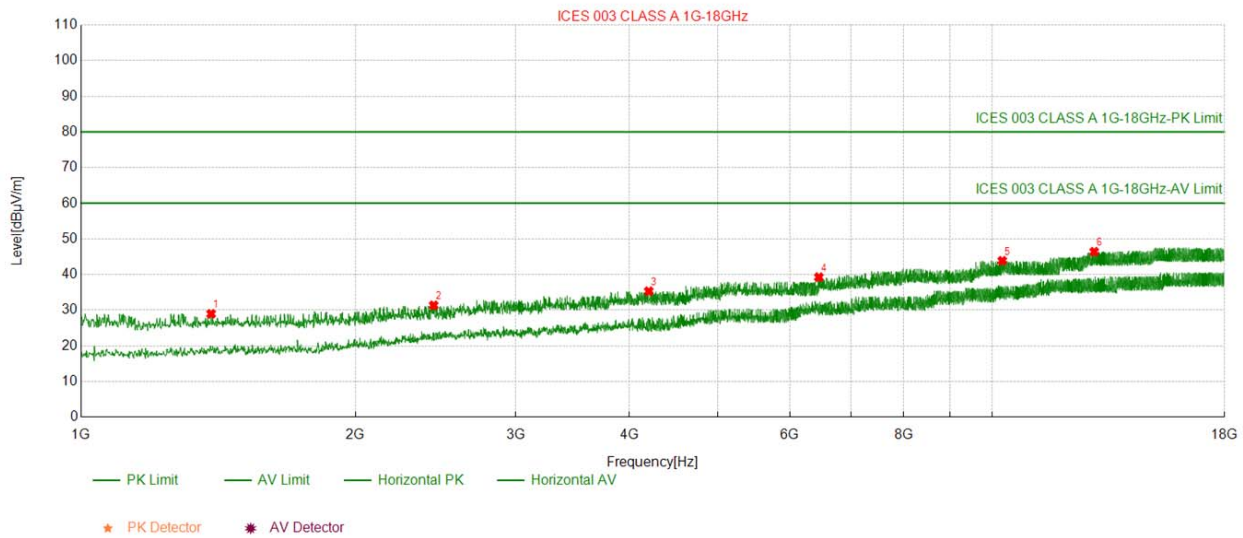
Final Data List

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



3.2.6 TEST RESULTS(Above 1GHz)

EUT :	CM4 Sensing	Model Name :	ED-CM4SEN
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2024-03-22
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC12V From Adapter		



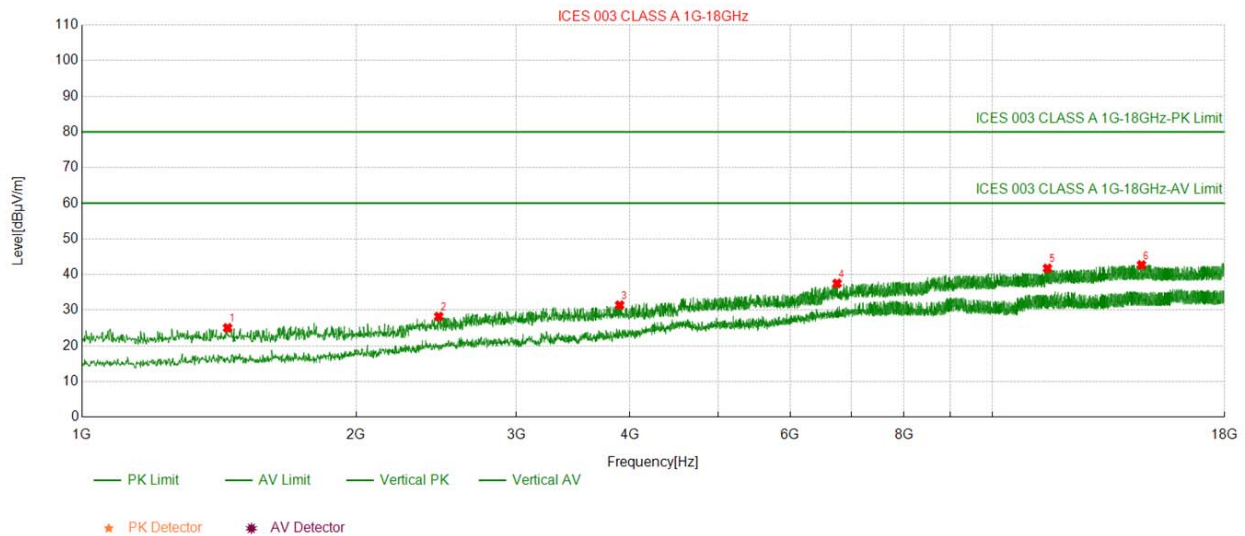
Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1389.3389	-20.53	49.52	28.99	80.00	51.01	100	10	Horizontal
2	2438.3438	-16.77	48.13	31.36	80.00	48.64	100	50	Horizontal
3	4199.7199	-11.14	46.45	35.31	80.00	44.69	100	210	Horizontal
4	6455.8455	-7.01	46.27	39.26	80.00	40.74	100	70	Horizontal
5	10262.526	-0.45	44.31	43.86	80.00	36.14	100	300	Horizontal
6	12947.094	2.16	44.24	46.40	80.00	33.60	100	180	Horizontal

Final Data List

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



EUT :	CM4 Sensing	Model Name :	ED-CM4SEN
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2024-03-22
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	1445.4445	-20.47	45.51	25.04	80.00	54.96	100	310	Vertical
2	2465.5465	-16.75	44.97	28.22	80.00	51.78	100	30	Vertical
3	3897.0897	-12.51	43.91	31.40	80.00	48.60	100	100	Vertical
4	6753.3753	-6.14	43.65	37.51	80.00	42.49	100	10	Vertical
5	11498.549	1.30	40.44	41.74	80.00	38.26	100	180	Vertical
6	14586.058	6.06	36.62	42.68	80.00	37.32	100	260	Vertical

Final Data List

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

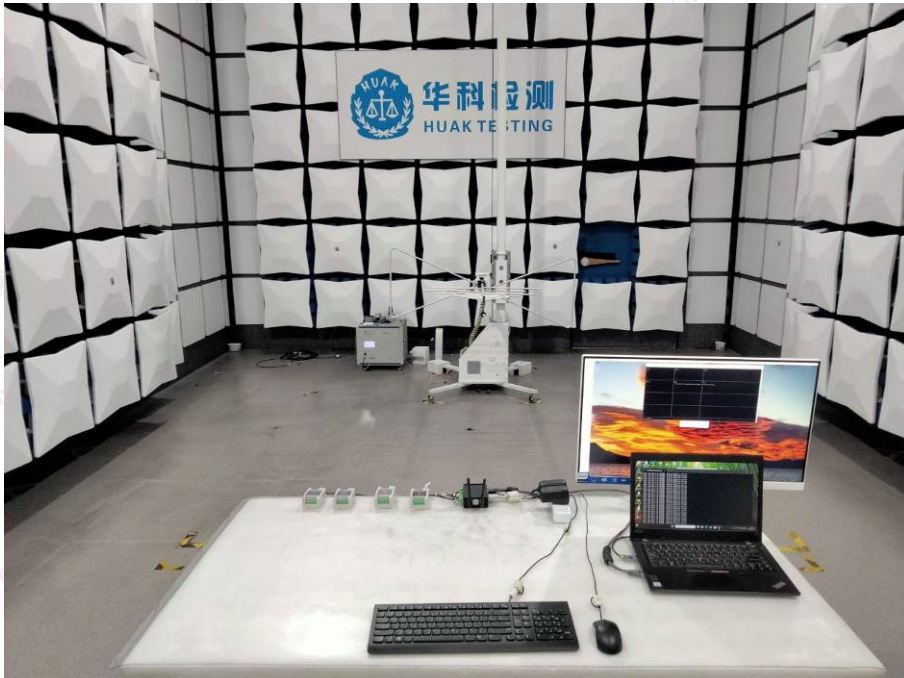


4. EUT TEST PHOTO

Conducted Emission



Radiated Emission





ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1



Photo 2

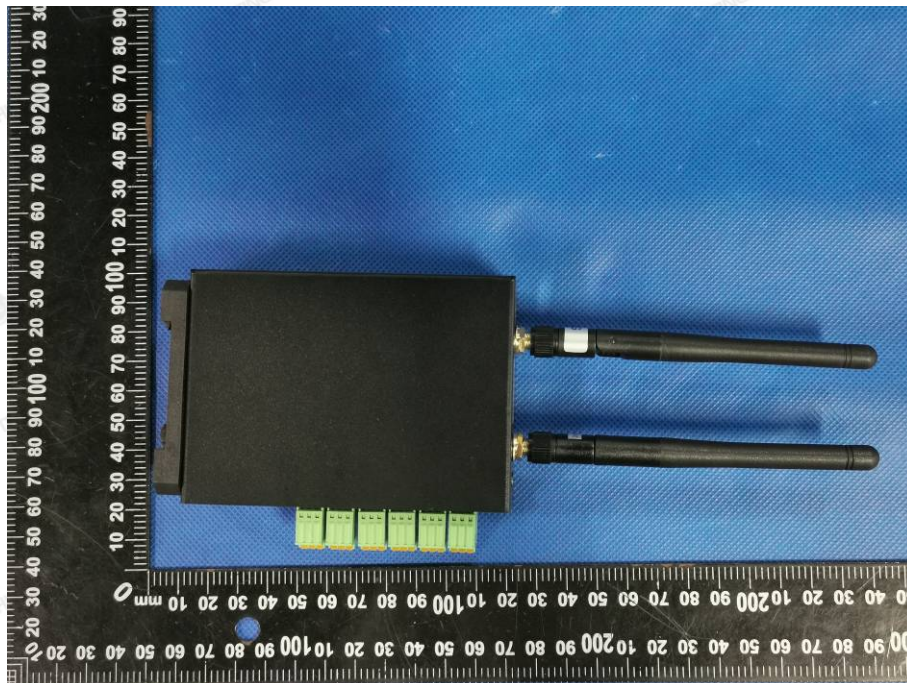




Photo 3

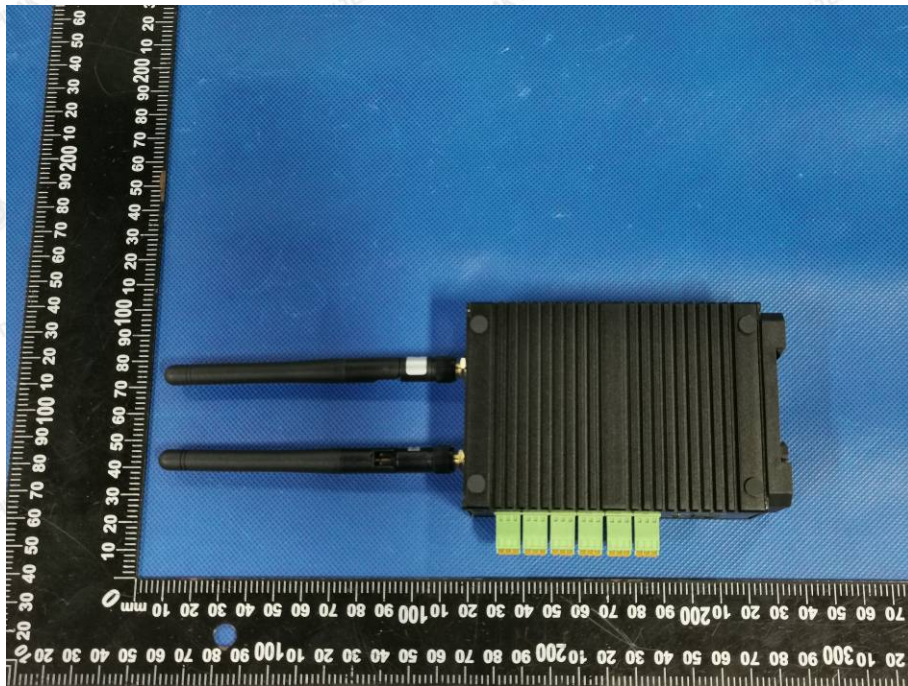


Photo 4

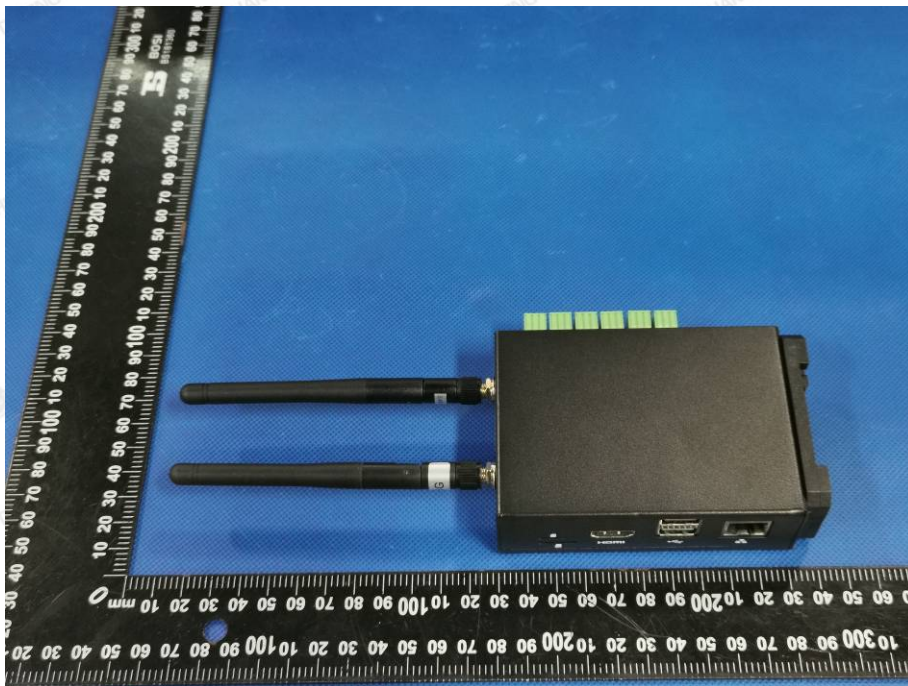




Photo 5

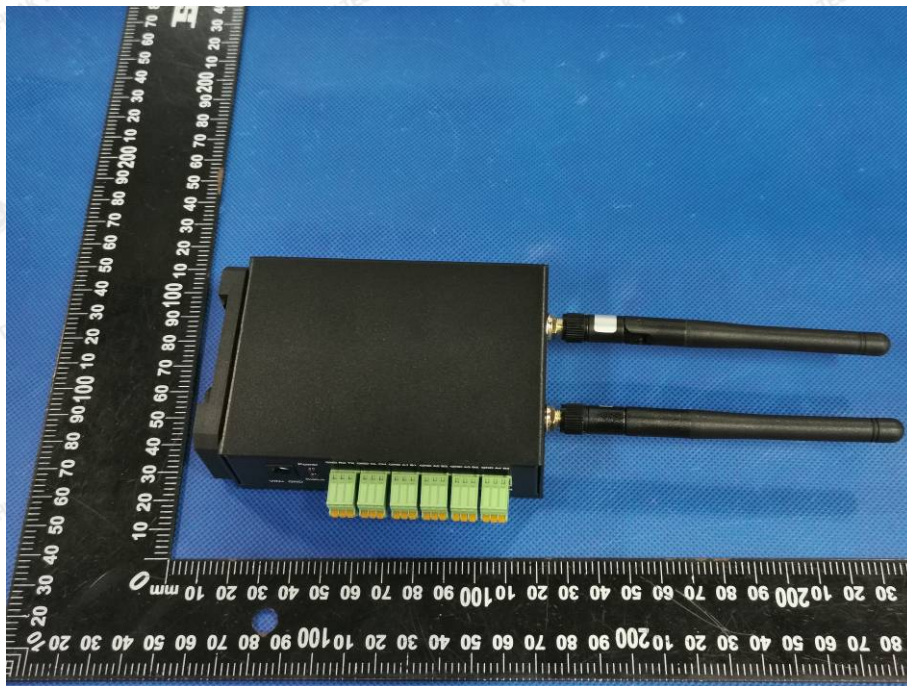


Photo 6





Photo 7



Photo 8

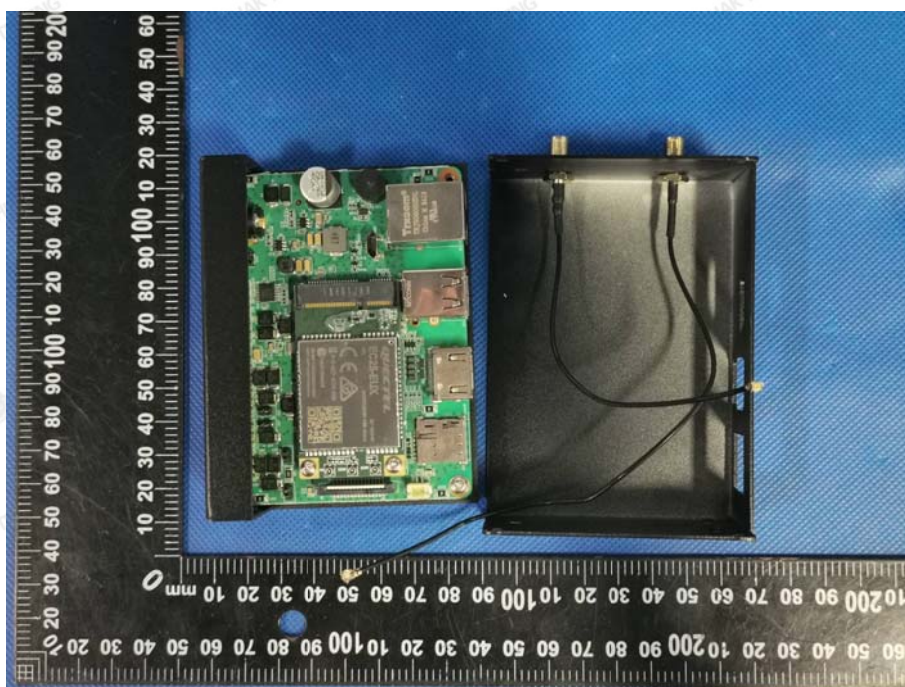




Photo 9

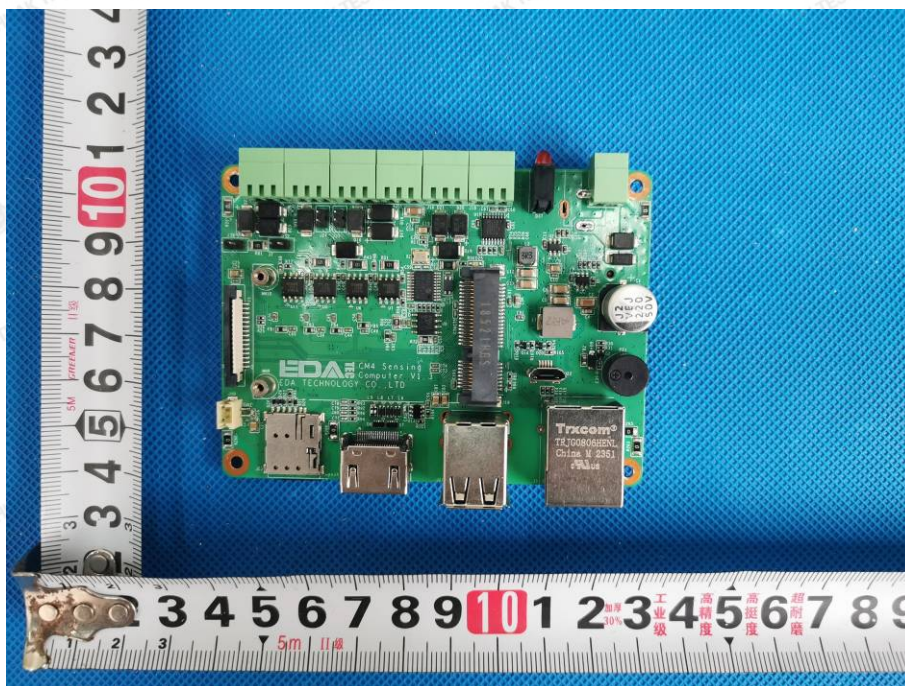


Photo 10

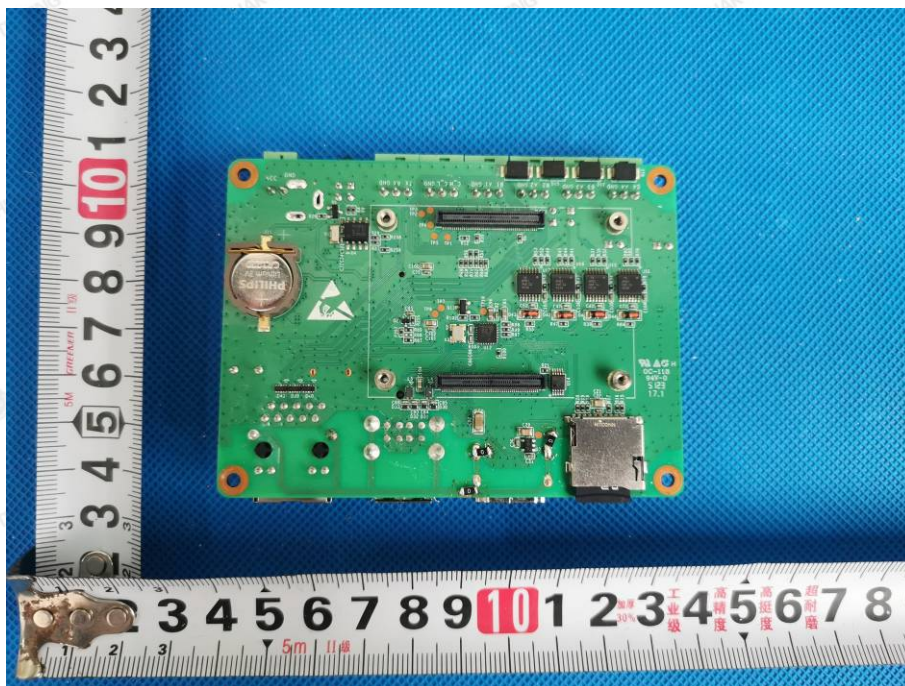




Photo 11

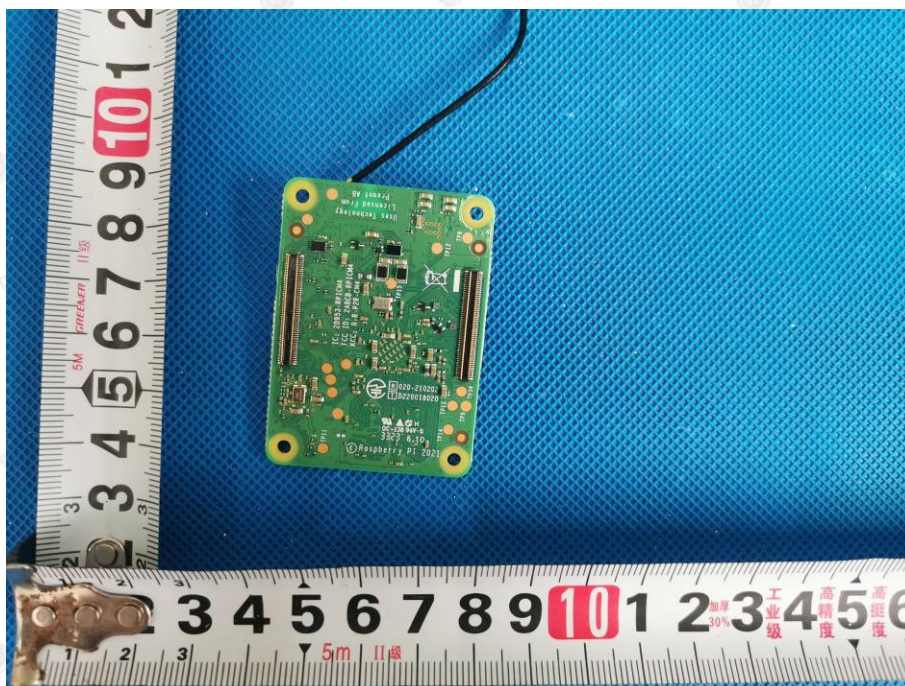


Photo 12

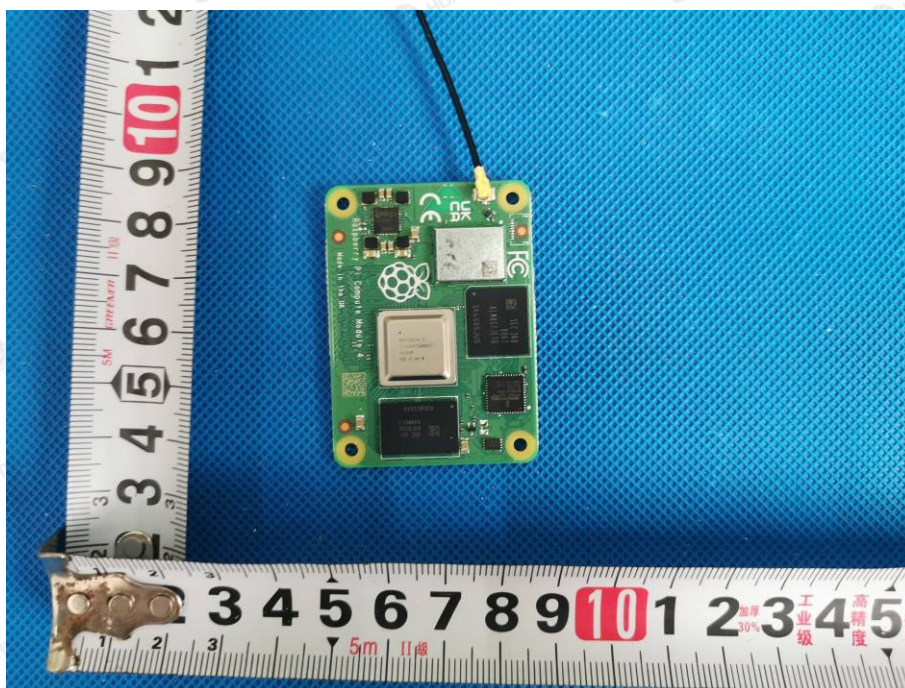




Photo 13

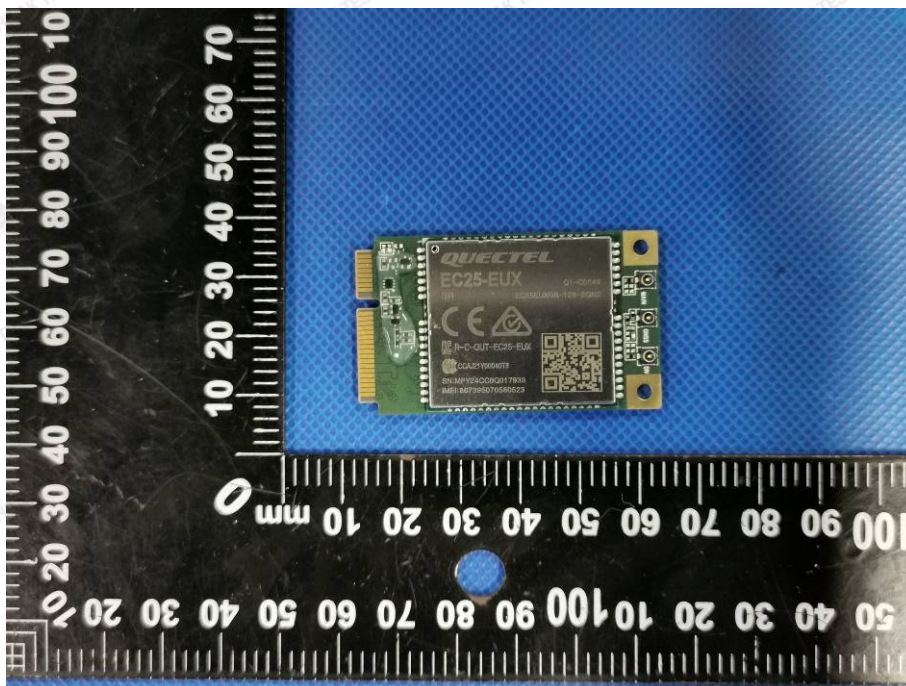
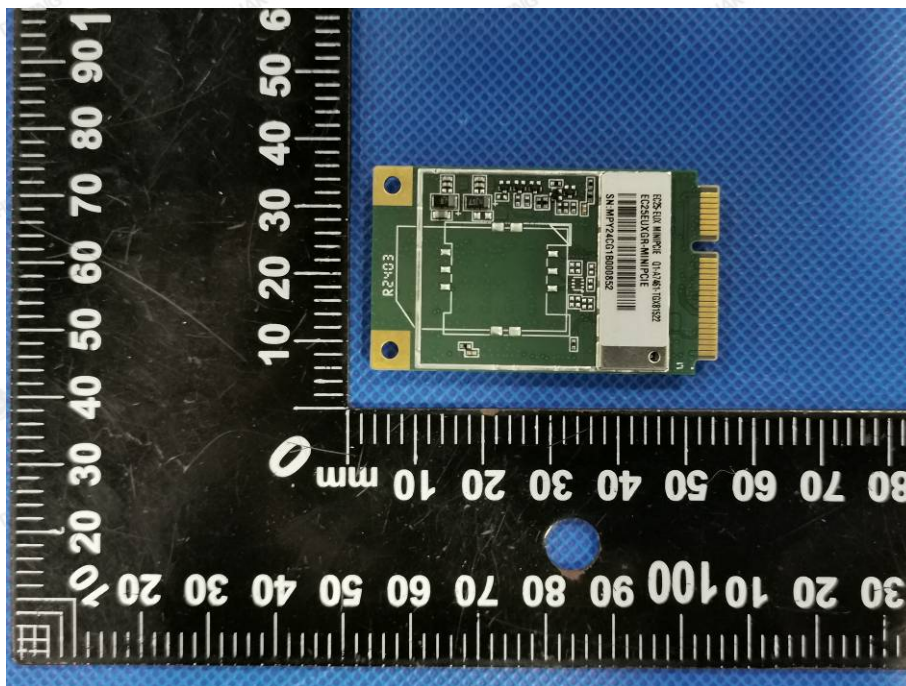


Photo 14



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