



Test Report No.:
FCC2023-0017-EMC

EMC Test Report

EUT : **ASSETS MONITORING A SERIES**
MODEL : **AL300**
BRAND NAME : **AOVX**
APPLICANT : **AOVX WIRELESS SOLUTIONS CO. LTD**
CLASSIFICATION OF TEST : **N/A**

CVC Testing Technology Co., Ltd.



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Applicant	Name: AOVX WIRELESS SOLUTIONS CO. LTD Address: Room 501, BlockA1, ZhongAn Valley, 900 Wangjiang West Road, High-tech Zone, HeFei, China 230088		
Manufacturer	Name: AOVX WIRELESS SOLUTIONS CO. LTD Address: Room 501, BlockA1, ZhongAn Valley, 900 Wangjiang West Road, High-tech Zone, HeFei, China 230088		
Equipment Under Test	Product Name: ASSETS MONITORING A SERIES Model/Type: AL300 Brand Name: AOVX Serial NO.: N/A Sample NO.:5-1		
Date of Receipt.	2023.03.30	Date of Testing	2022.03.30~2022.04.25
Test Specification		Test Result	
FCC Part 15, Subpart B, Class B (SDOC)		PASS	
Evaluation of Test Result	The equipment under test was found to comply with the requirements of the standards applied. Seal of CVC Issue Date: 2023.05.08		
Tested by:  Xu ZhenFei Name Signature	Reviewed by:  Liu YongHai Name Signature	Approved by:  Chen HuaWen Name Signature	
Other Aspects: NONE.			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2023-0017-EMC	Original release	2023.05.08

**1. SUMMARY OF TEST RESULTS**

EMISSION			
Standard	Test Item	Result	Remarks
FCC Part 15, Subpart B, Class B (SDOC)	Radiated Test (30MHz~ 1GHz)	PASS	Minimum passing margin is 7.75dB at 957.3157MHz
	Radiated Test (Above 1GHz)	PASS	Minimum passing margin is 16.20dB at 16759.0759MHz

1.1 List of Test and Measurement Instruments

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
Radiation emission					/
EMI Test Receiver (3M)	N9038A-508	MY532290079	EM-000397	Agilent	2024-02-22
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2024-02-22
Radio Communication Test	CMW500	156686	EM-000623	R&S	2023-12-06
Broadband Antenna(3m)	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2023-06-25
Loop Antenna	HLA 6121	540046	EM-000546	TESEQ	2023-06-06
Loop Antenna	FMZB1513	1513-170	EM-000384	SCHWARZBECK	2024-02-24
H-field antenna	FESP 5133-7/41	00458	EM-000674-4	SCHWARZBECK	2023-06-06
Monopole antenna	HFH2-Z6E	101317	EM-000613	R&S	2024-03-02
Waveguide Horn Antenna	BBHA9120B	602	EM-000383	SCHWARZBECK	2024-01-11
Waveguide Horn Antenna	HF906	360306/008	WKNA-0024-8	R&S	2024-02-24
Semi-Anechoic Chamber(3m)	FACT-4	ST08035	WKNA-0024	ETS	2024-12-11



1.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	Item	Measurement Uncertainty	No.
1	Radiated Spurious Emissions	9KHz ~ 30MHz	±0.769dB
		30MHz ~ 1GMHz	±0.877dB
		1GHz ~ 18GHz	±0.777dB
		18GHz ~ 40GHz	±1.315dB
Remark: 95% Confidence Levels, k=2.			

1.3 Test Location

The tests and measurements refer to this report were performed by EMC testing Lab. of CVC Testing Technology Co., Ltd.

Address: No.3, TiantaiyiRoad, KaitaiAvenue, ScienceCity, Guangzhou, China

Post Code: 510663 Tel: 020-32293888

FAX: 020-32293889 E-mail: office@cvc.org.cn

Test Firm Registration Number: 937273



2. GENERAL INFORMATION

2.1 General Product Information

PRODUCT	ASSETS MONITORING A SERIES		
BRAND	AOVX		
TEST MODEL	AL300		
ADDITIONAL MODEL	N/A		
POWER SUPPLY (See section 2.2)	1. DC 3.6V from battery (non-rechargeable) 2. DC 3.0V from battery (non-rechargeable)		
FCC ID	2BAXKYX2304AL300		
OPERATING FREQUENCY	MODE	TX(MHz)	RX(MHz)
	GSM850	824 ~ 849	869 ~ 894
	GSM1900	1850 ~ 1910	1930 ~ 1990
	LTE B2	1850 ~ 1910	1930 ~ 1990
	LTE B4	1710 ~ 1755	2110 ~ 2155
	LTE B5	824 ~ 849	869 ~ 894
	LTE B7	2500 ~ 2570	2620 ~ 2690
I/O PORTS	Refer to user’s manual		
CABLE SUPPLIED	N/A		
Remark: 1. For more detailed features description, please refer to the manufacturer’s specifications or the User’s Manual. 2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report. 3. EUT photo refer to the report (Report NO.: FCC2023-0017-E).			

2.2 Description of Accessories

No.	Battery	
1	Model No.:	ER14505-3+HPC1550
	Voltage:	3.6V
2	Model No.:	CR17450-3
	Voltage:	3.0V
NOTE: Batteries are non-rechargeable		



2.3 Independent Operation Modes

The EUT were tested under the following modes, the final worst mode was marked in boldface and recorded in this report.

EMISSION Test Modes		
For Radiated Emission Tests		
Test Mode		Test Voltage
1	Normal Working + GNSS IDLE	DC 3.6V from battery (non-rechargeable)
2	Normal Working + GNSS IDLE	DC 3.0V from battery (non-rechargeable)



2.4 General Description of Applied Standards

According to the specifications of the manufacturers, the EUT must comply with the requirements of the following standards:

**FCC PART 15, SUBPART B, CLASS B (SDOC)
ANSI C63.4:2014**

All test items have been performed and recorded as per the above standards.

2.5 Description of Support Units

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.

Support Equipment					
NO	Description	Brand	Model No.	Serial Number	Supplied by
1	N/A	N/A	N/A	N/A	N/A



3. EMISSION

3.1 Radiated Emission

3.1.1 Limits Of Radiated Emission

TEST STANDARD:

FCC Part 15, Subpart B (Section: 15.109), for above 1GHz(section 3.2.2 Table 4)

FCC Part 15, Subpart B

Frequency (MHz)	Distance (m)	Class A (dBuV)	Class B (dBuV)
30 - 88	3	QP: 49.5	QP: 40
88 - 216	3	QP: 54	QP: 43.5
216 - 960	3	QP: 56.9	QP: 46
960-1000	3	QP: 60	QP: 54
Above 1000	3	Avg: 60 Peak: 80	Avg: 54 Peak: 74

NOTE: 1. The lower limit shall apply at the transition frequencies.

NOTE: 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

NOTE: 3. All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 Test Procedures

The basic test procedure was in accordance with ANSI C63.4:2014 (section 12).

1. From 30 MHz to 1GHz test procedure as below:

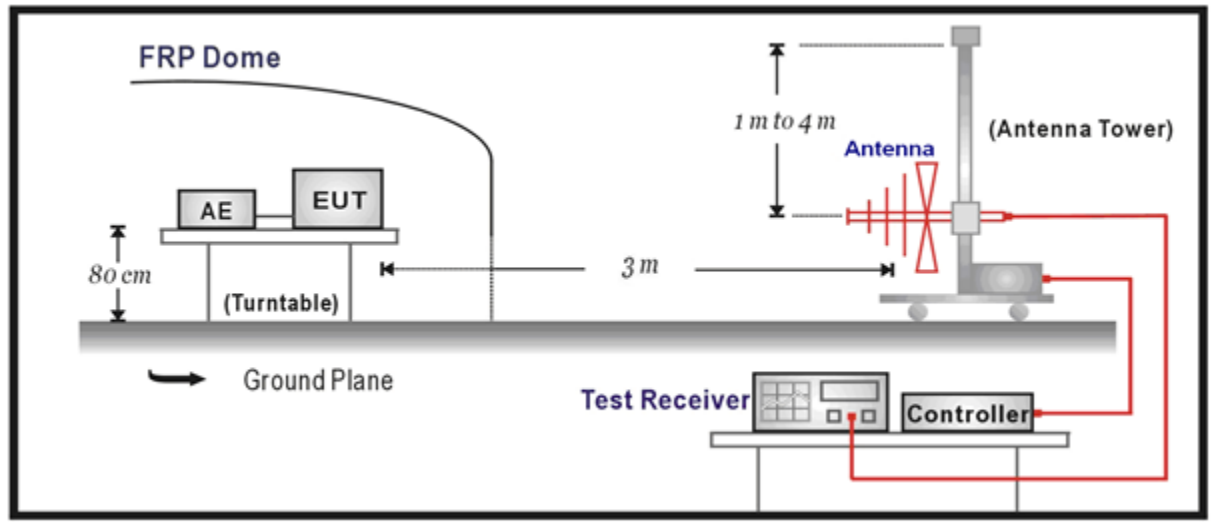
- 1) The radiated emissions were tested in a semi-anechoic chamber.
- 2) The Product was placed on the non-conductive turntable 0.1 m above the ground at a chamber.
- 3) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 4) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

2. Above 1GHz test procedure as below:

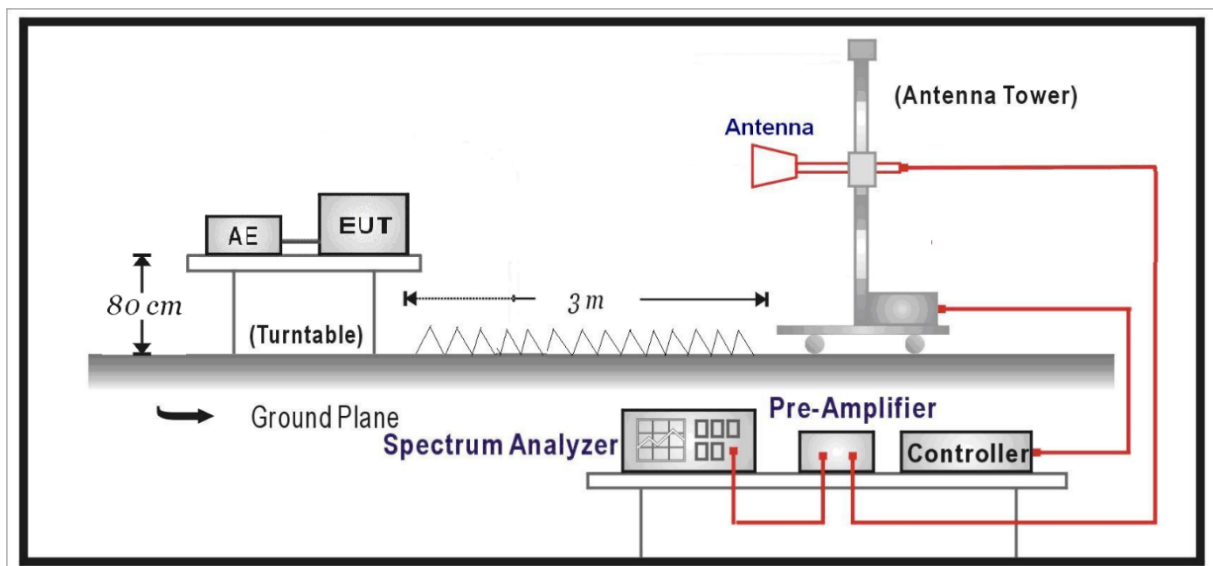
- 1) The radiated emissions were tested in a fully Anechoic Chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

3.1.3 Test Setup

Below 1GHz Test Setup:



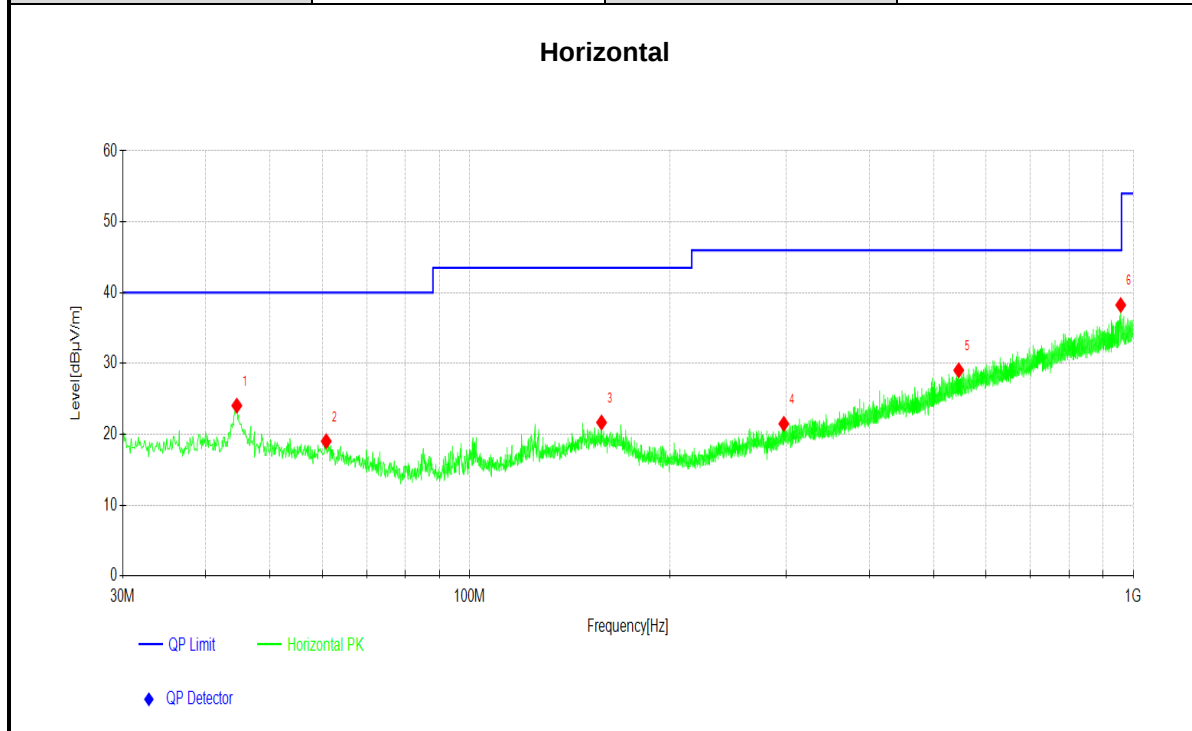
Above 1GHz Test Setup:





3.1.4 Test Results (Below 1GHz)

Test Mode	See section 2.3	Frequency Range	30-1000MHz
Test Voltage	See section 2.3	Detector Function	Quasi-Peak(QP)
Environmental Conditions	24.2deg. C,55% RH	Tested By	Liu Shiwei



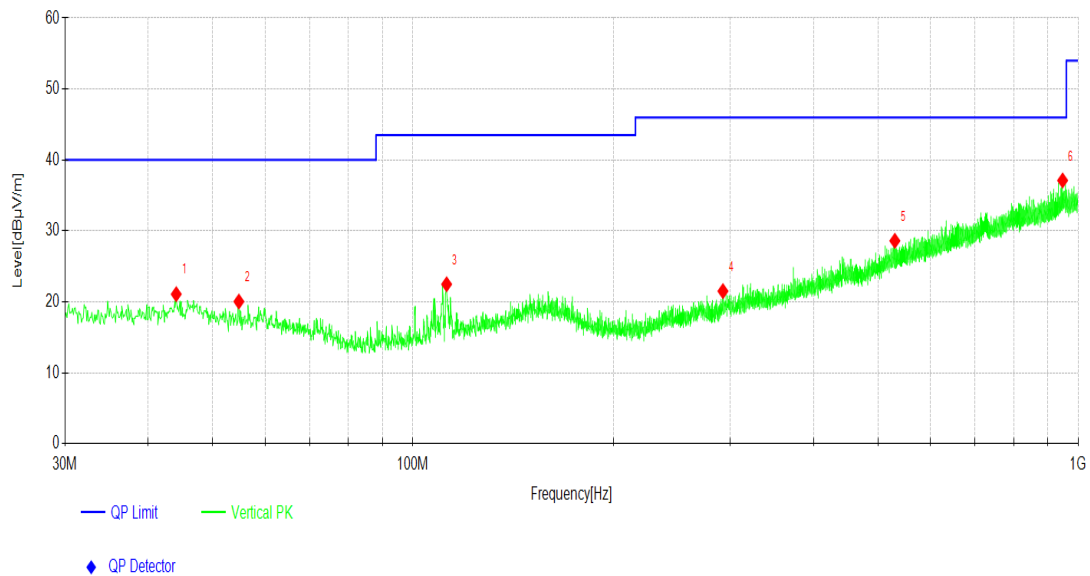
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	44.5515	5.14	18.91	24.05	40.00	15.95	300	10
2	60.7521	1.42	17.60	19.02	40.00	20.98	200	84
3	157.9558	2.47	19.20	21.67	43.50	21.83	100	60
4	297.3587	2.35	19.13	21.48	46.00	24.52	200	188
5	545.6066	3.59	25.45	29.04	46.00	16.96	200	122
6	957.3157	5.91	32.34	38.25	46.00	7.75	200	130

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBμV/m) = Reading (dBμV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]



Test Mode	See section 2.3	Frequency Range	30-1000MHz
Test Voltage	See section 2.3	Detector Function	Quasi-Peak(QP)
Environmental Conditions	24.2deg. C,55% RH	Tested By	Liu Shiwei

Vertical

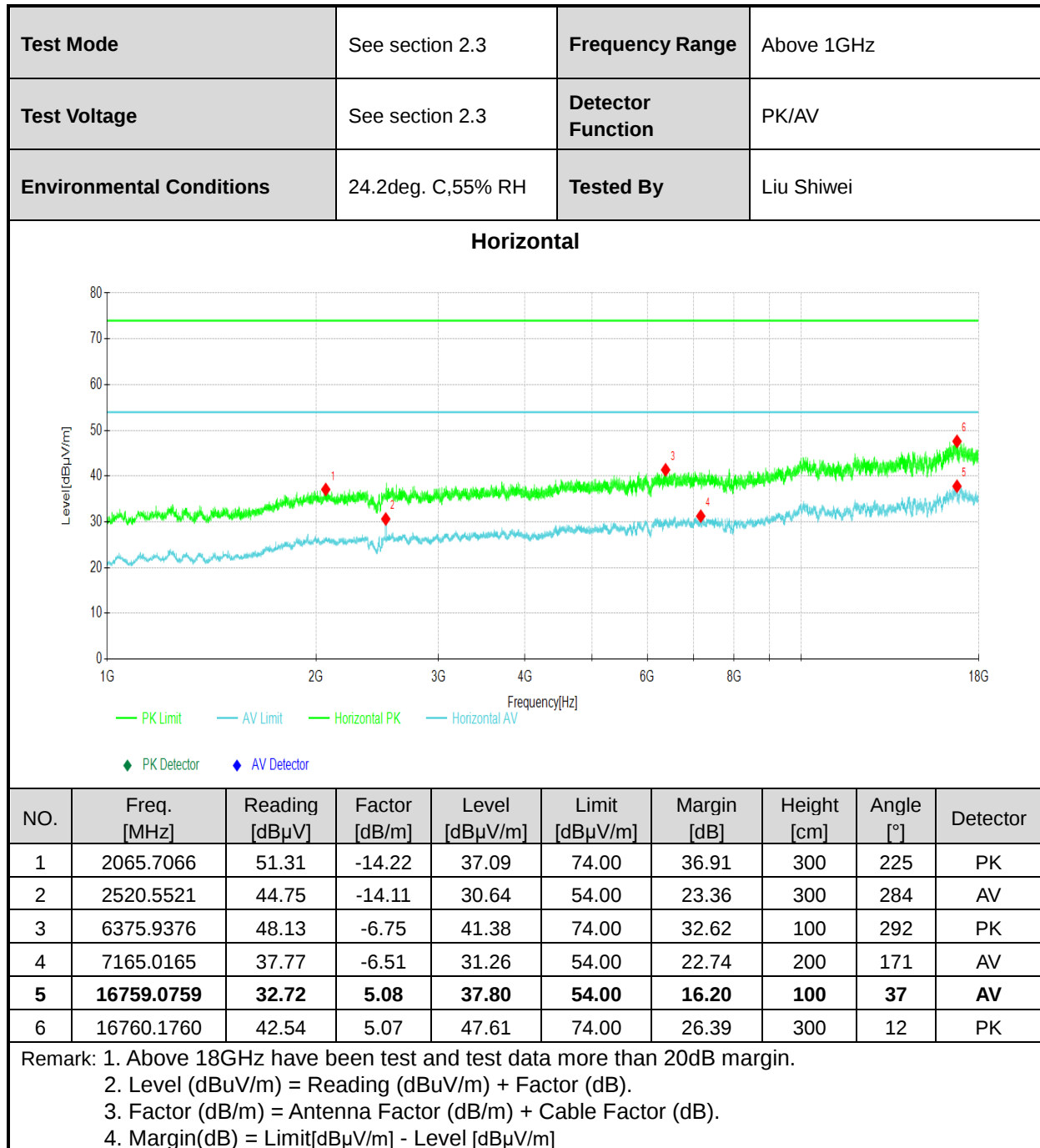


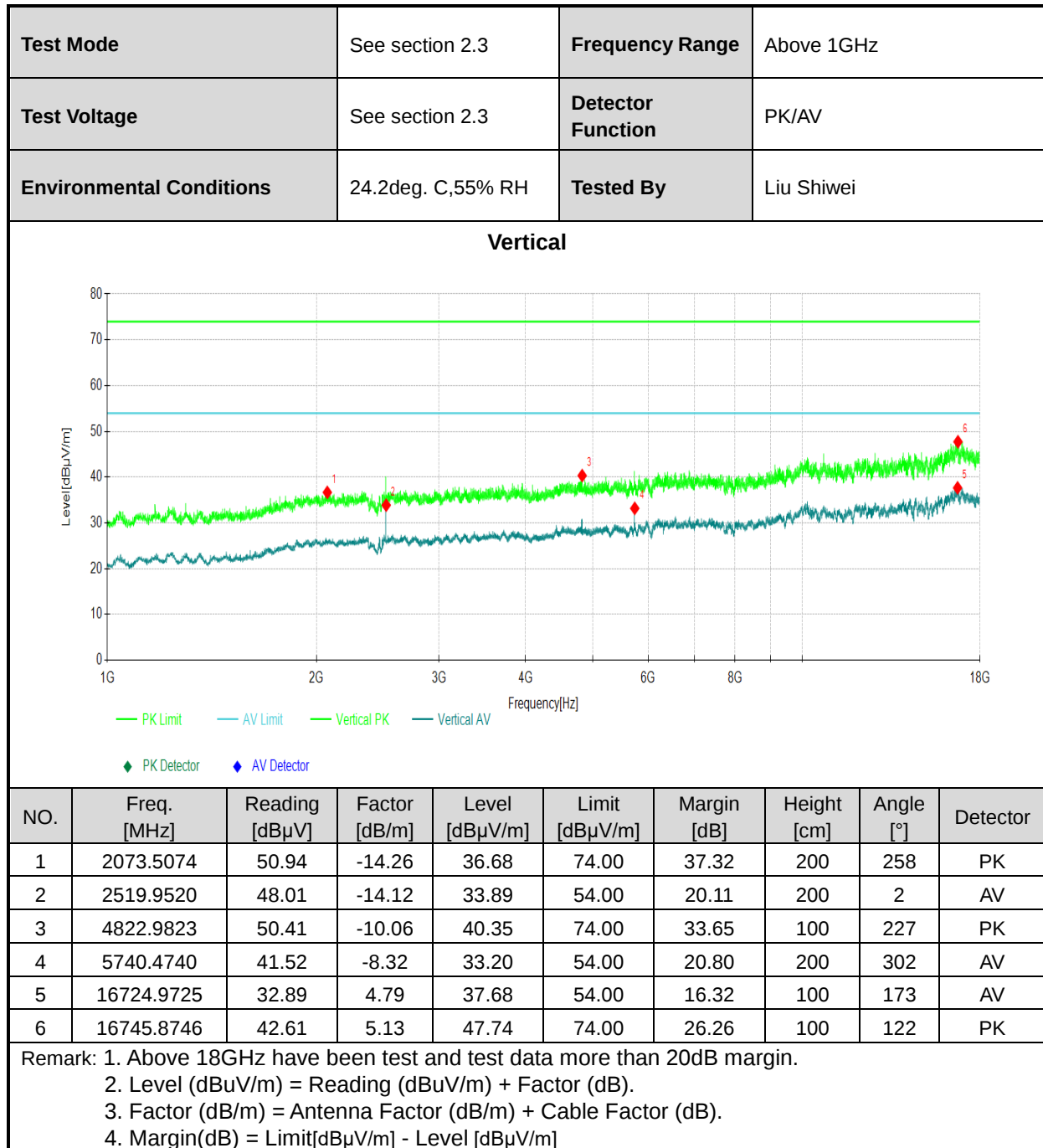
NO.	Freq. [MHz]	Reading [dBuV]	Factor [dB/m]	Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]
1	44.0664	2.19	18.89	21.08	40.00	18.92	100	18
2	54.7375	1.88	18.16	20.04	40.00	19.96	200	346
3	112.3612	6.43	16.05	22.48	43.50	21.02	200	230
4	292.4112	2.89	18.61	21.50	46.00	24.50	200	46
5	530.1820	3.47	25.13	28.60	46.00	17.40	200	204
6	947.6148	4.77	32.34	37.11	46.00	8.89	200	137

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBuV/m] - Level [dBuV/m]



3.1.5 Test Results (Above 1GHz)





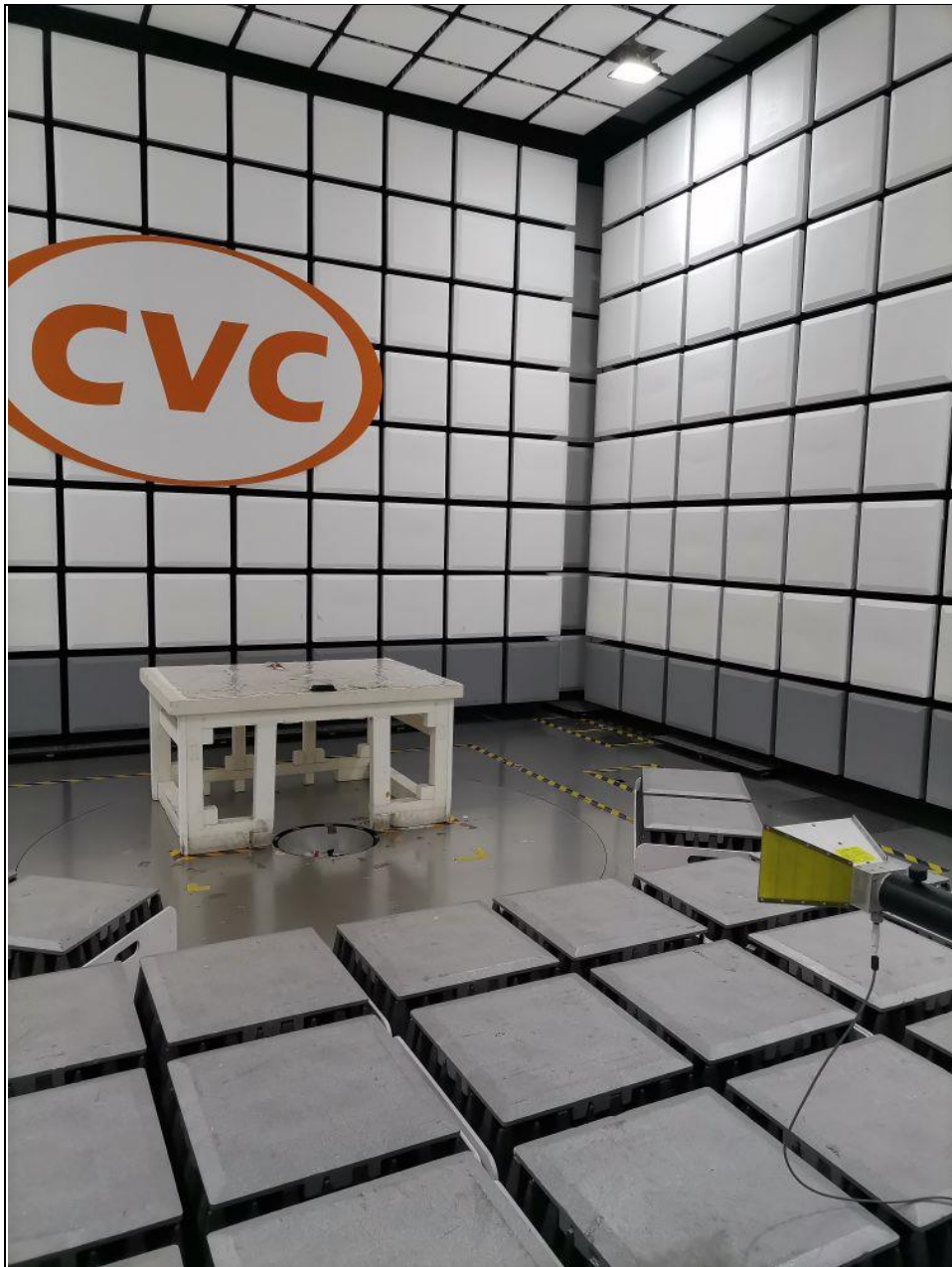
4. PHOTOGRAPHS OF TEST SETUP



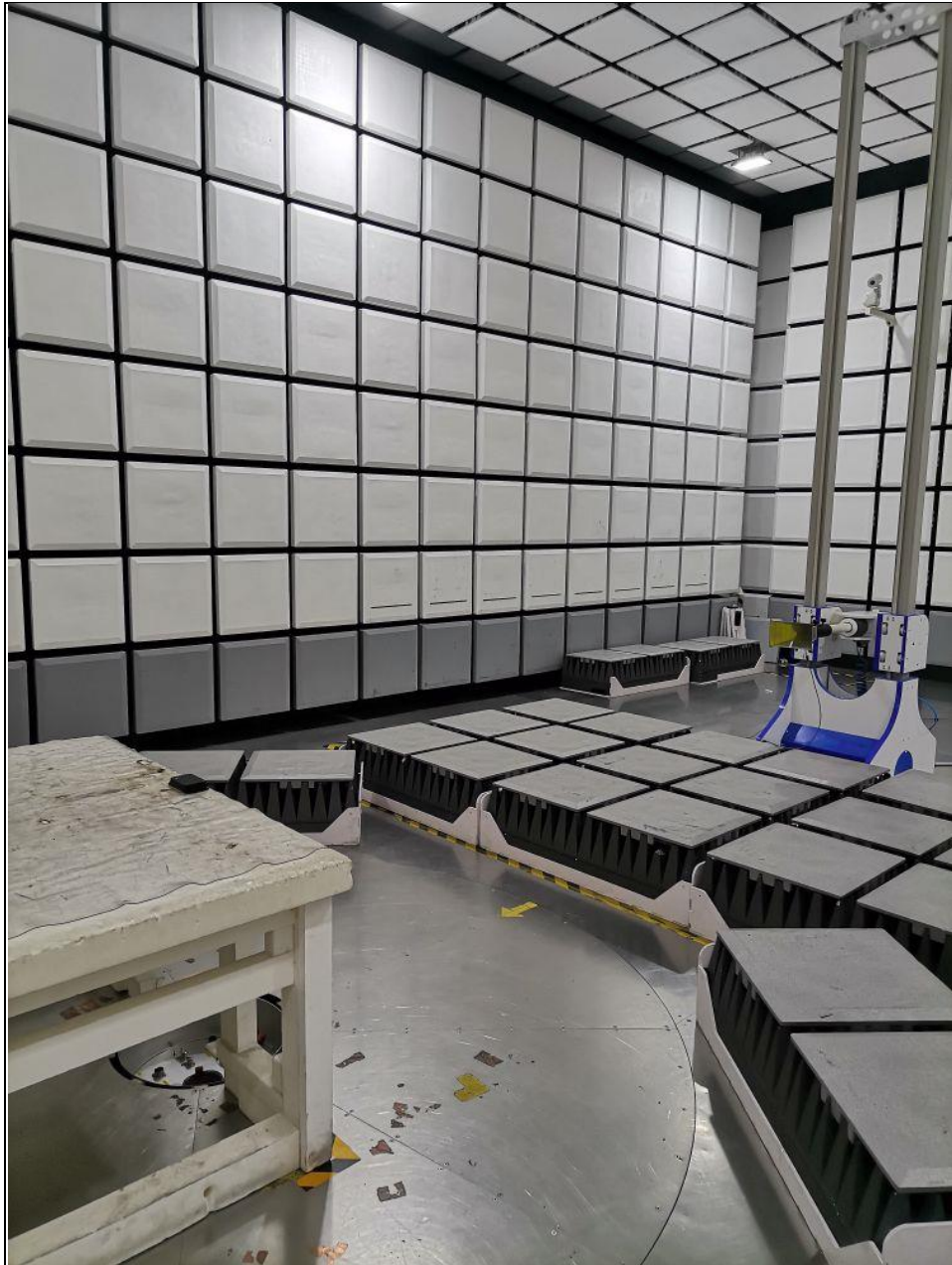
RADIATED EMISSION TEST (Below 1GHz)



RADIATED EMISSION TEST (Below 1GHz)



RADIATED EMISSION TEST (Above 1GHz)



RADIATED EMISSION TEST (Above 1GHz)



5. PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos and Internal Photos).



Important

- (1) The test report is valid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of Approval and Reviewer;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days.
- (6) Generally, commission test is responsible for the tested samples only.
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

The test data and test results given in this test report should only be used for purposes of scientific research, teaching and internal quality control when the CMA symbol is not presented.

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