



Test Report No.:
FCC2023-0015-EMC

RF Test Report

EUT	:	GOODS MONITORING G SERIES
MODEL	:	GL100
BRAND NAME	:	AOVX
APPLICANT	:	YUNXION WIRELESS SOLUTION CO.,LTD
Classification Of Test	:	N/A

CVC Testing Technology Co., Ltd.



CVC Testing Technology Co., Ltd.

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Applicant	Name: YUNXION WIRELESS SOLUTION CO.,LTD Address: Room 501, BlockA1, ZhongAn Valley, 900 Wangjiang West Road, High-tech Zone, HeFei, China 230088		
Manufacturer	Name: YUNXION WIRELESS SOLUTION CO.,LTD Address: Room 501, BlockA1, ZhongAn Valley, 900 Wangjiang West Road, High-tech Zone, HeFei, China 230088		
Equipment Under Test	Product Name: GOODS MONITORING G SERIES Model/Type: GL100 Brand Name: AOVX Serial NO.: N/A Sample NO.:5-1		
Date of Receipt.	2022.03.10	Date of Testing	2022.03.10~2022.04.13
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: 2023.04.14		
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
FCC2023-0015-EMC	Original release	2023.04.14



1. SUMMARY OF TEST RESULTS

EMISSION			
Standard	Test Item	Result	Remarks
FCC Part 15, Subpart B, Class B (sDoC)	Conducted test	PASS	Minimum passing margin is 23.7dB at 1.996MHz
	Radiated Test (30MHz~ 1GHz)	PASS	Minimum passing margin is 5.01dB at 947.6148MHz
	Radiated Test (Above 1GHz)	PASS	Minimum passing margin is 8.21 at 1535.2535MHz



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
Conducted emission					/
EMI Test Receiver	ESW44	103123	EM-000698	R&S	2023-06-17
EMI Test Receiver	ESR3	102394	VG DY-0705	R&S	2024-02-22
LISN	NSLK 8127	8127644	VG DY-0150	SCHWARZBECK	2023-09-03
LISN	NSLK 8128	8128-316	VG DY-0149	SCHWARZBECK	2023-09-03
DC LISN	PVDC8301-017	PVDC8301#17	VG DY-0692	SCHWARZBECK	2023-10-07
LISN	NSLK 8129	8129-268	EM-000388	SCHWARZBECK	2024-02-22
Plus Limiter (#1)	VTSD 9561 F-N	00515	VG DY-0808	SCHWARZBECK	2024-03-03
Plus Limiter (#2)	VTSD 9561	9561-F017	VG DY-0152	SCHWARZBECK	2024-09-03
Impedance Stabilization Network	ISN T800	27095	WKNE-0195	TESEQ	2023-09-03
Impedance Stabilization Network	NTFM8158	8158-0092	VG DY-0356	SCHWARZBECK	2023-06-06
Impedance Stabilization Network	NTFM8131	#184	EM-000498	SCHWARZBECK	2023-06-06
Voltage Probe	TK9420	9420-499	VG DY-0128	SCHWARZBECK	2024-02-22
Power Divider	4901.17.B	22643830	DB-0016	HUBER+SUHNER	2023-08-31
Video Signal Generator	GV-798+	151064920001	VGDS-0215	PROMAX	2023-05-29
Audio Signal Generator	GAG-810	EK871591	EM-000309	GW	2023-12-06
Shielding Room(#1)	GP1A	001	WKNF-0001	LEINING	2024-08-07
Shielding Room(#2)	GP1A	002	WKNF-0006	LEINING	2024-08-07
Current probe	EZ-17	0816.2063.02	EM-000567	R&S	2024-01-07
LISN	NNHV8123-200	8123200-020	EM-000385	SCHWARZBECK	2024-02-22
LISN	NNHV8123-200	8123200-021	EM-000386	SCHWARZBECK	2024-02-22



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	FREQUENCY	UNCERTAINTY
1	Conducted Emissions	9kHz~30MHz	±2.66dB
2	Radiated Spurious Emissions	9KHz ~ 30MHz	±0.769dB
		30MHz ~ 1GMHz	±0.877dB
		1GHz ~ 18GHz	±0.777dB
		18GHz ~ 40GHz	±1.315dB

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	GOODS MONITORING G SERIES		
BRAND	AOVX		
TEST MODEL	GL100		
ADDITIONAL MODEL	N/A		
POWER SUPPLY	DC 5V From USB host unit or DC 4.2V from Li-ion battery		
FCC ID	2BAXKYX2304GL100		
OPERATING FREQUENCY	Mode	TX(MHz)	RX(MHz)
	GSM900	824 ~ 849M	869 ~ 894M
	GSM1800	1850 ~ 1910	1930 ~ 1990M
	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	USB line, 1 Meter, Unshielded without ferrite		
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.: FCC2023-0015-E).			

2.2 DESCRIPTION OF ACCESSORIES

N/A



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 Conducted Emission Tests		
Test Mode		Test Voltage
1	Normal working + GNSS IDLE	DC 5V From Adapter input AC 120V/50Hz
For Radiated Emission Tests		
Test Mode		Test Voltage
1	Charging + Normal working + GNSS IDLE	DC 5V From Adapter input AC 120V/50Hz
2	Normal working + GNSS IDLE	DC 4.2V from Li-ion battery

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		
Support Cable							
NO	Description	Quantity (Number)	Length (m)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	USB CABLE	1	1.0	YES	YES	N/A	Lab

3. EMISSION

3.1 CONDUCTED EMISSION

3.1.1 Limits Of Conducted Emission

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.
 NOTE: 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 NOTE: 3. All emanations 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 7).

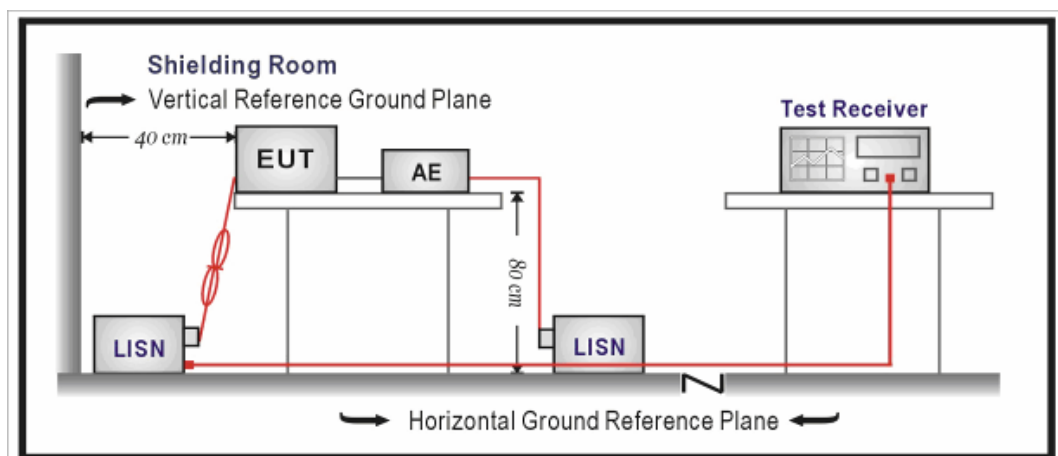
The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

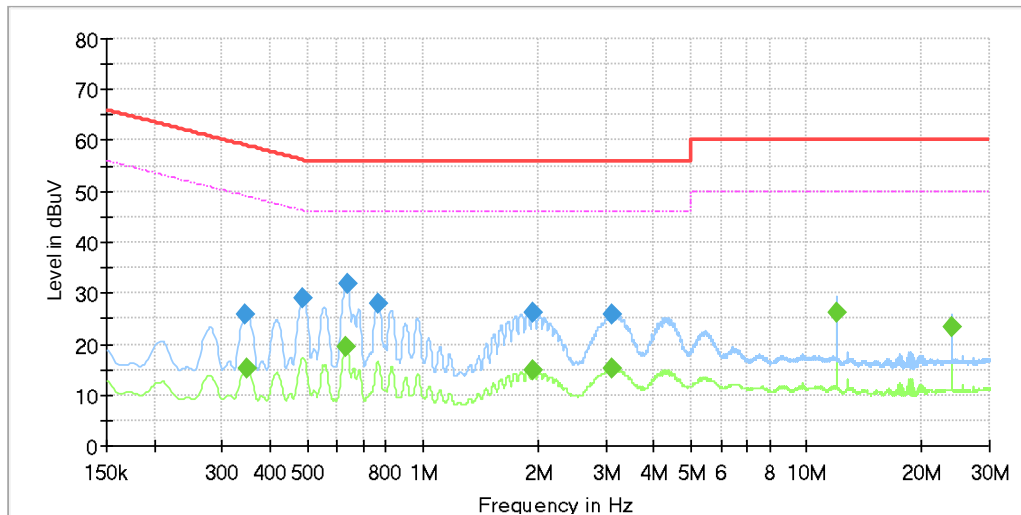
3.1.3 Test setup





3.1.4 Test Results

Test Mode	See section 2.3	Frequency Range	150KHz ~ 30MHz
Test Voltage	See section 2.3	PHASE	Line (L)
Environmental Conditions	23deg. C,55% RH	Tested By	Liu shiwei

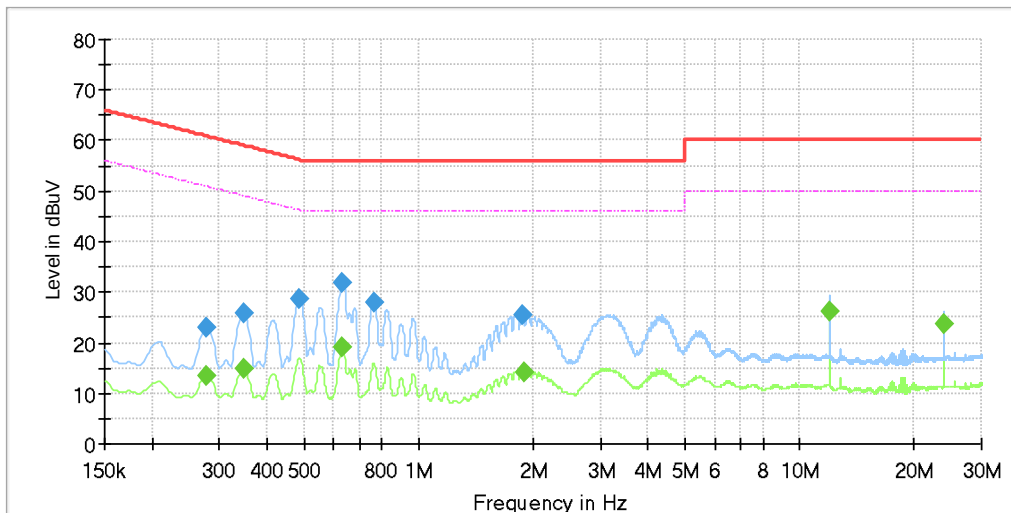


NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.344	25.7	---	59.1	33.4	L1	19.4
2	0.348	---	15.2	49.0	33.9	L1	19.4
3	0.488	28.9	---	56.2	27.3	L1	19.4
4	0.632	---	19.6	46.0	26.4	L1	19.5
5	0.634	31.9	---	56.0	24.1	L1	19.5
6	0.762	28.1	---	56.0	27.9	L1	19.5
7	1.930	---	14.7	46.0	31.3	L1	19.5
8	1.932	26.1	---	56.0	29.9	L1	19.5
9	3.122	---	15.3	46.0	30.7	L1	19.5
10	3.127	25.7	---	56.0	30.3	L1	19.5
11	11.996	---	26.2	50.0	23.8	L1	19.8
12	23.993	---	23.5	50.0	26.5	L1	19.9

Remark: The emission levels of other frequencies were very low against the limit.



Test Mode	See section 2.3	Frequency Range	150KHz ~ 30MHz
Test Voltage	See section 2.3	PHASE	Line (N)
Environmental Conditions	23deg. C,55% RH	Tested By	Liu shiwei



NO	Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Corr.Factor (dB)
1	0.278	---	13.6	50.9	37.3	N	19.4
2	0.278	23.0	---	60.9	37.8	N	19.4
3	0.348	---	15.0	49.0	34.0	N	19.4
4	0.348	25.7	---	59.0	33.3	N	19.4
5	0.488	28.7	---	56.2	27.5	N	19.5
6	0.632	31.8	---	56.0	24.2	N	19.5
7	0.632	---	19.1	46.0	26.9	N	19.5
8	0.762	27.8	---	56.0	28.2	N	19.5
9	1.883	25.6	---	56.0	30.4	N	19.5
10	1.887	---	14.2	46.0	31.8	N	19.5
11	11.996	---	26.3	50.0	23.7	N	20.0
12	23.993	---	23.8	50.0	26.2	N	20.2

Remark: The emission levels of other frequencies were very low against the limit.



3.2 RADIATED EMISSION

3.2.1 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.

3.2.2 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:

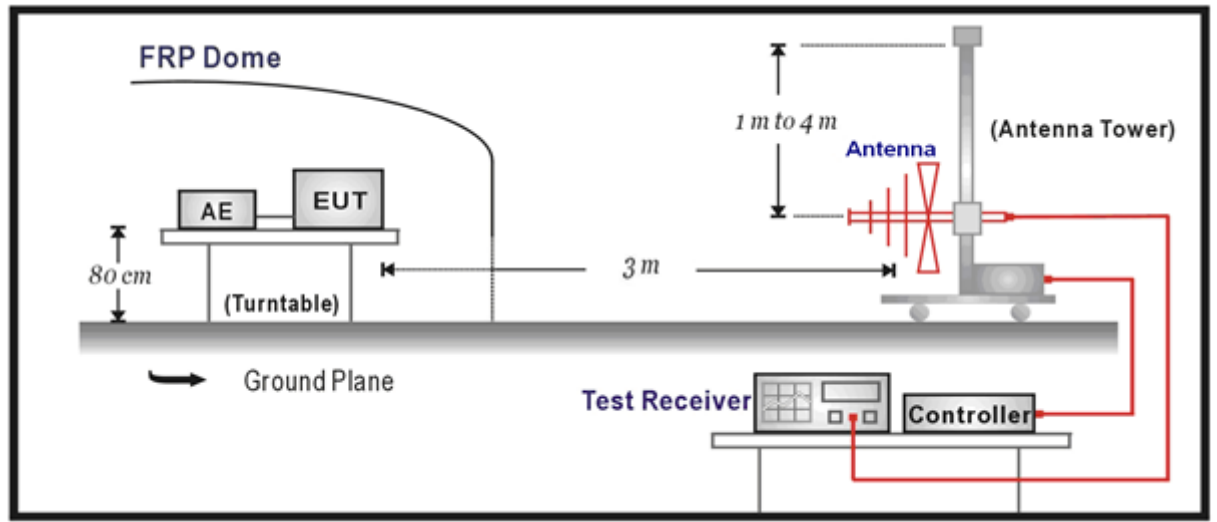
- 1) The radiated emissions were tested in a semi-anechoic chamber.
- 2) The Product was placed on the non-conductive turntable 0.1 m above the ground at a chamber.
- 3) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan 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:

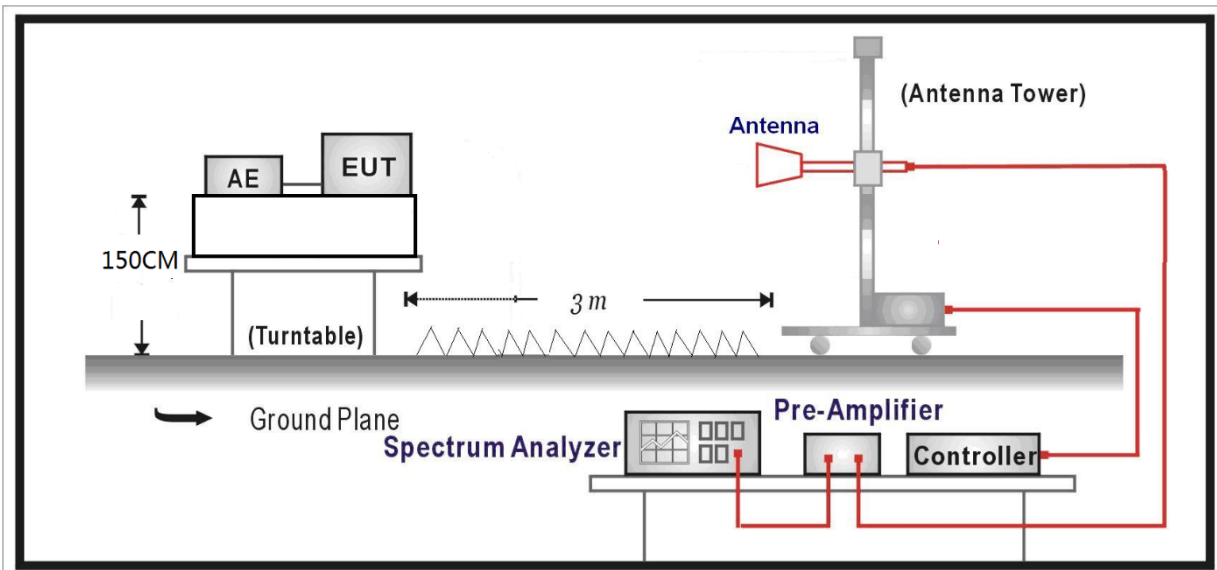
- 1) The radiated emissions were tested in a fully Anechoic Chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the 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.

3.2.3 Test Setup

Below 1GHz Test Setup:



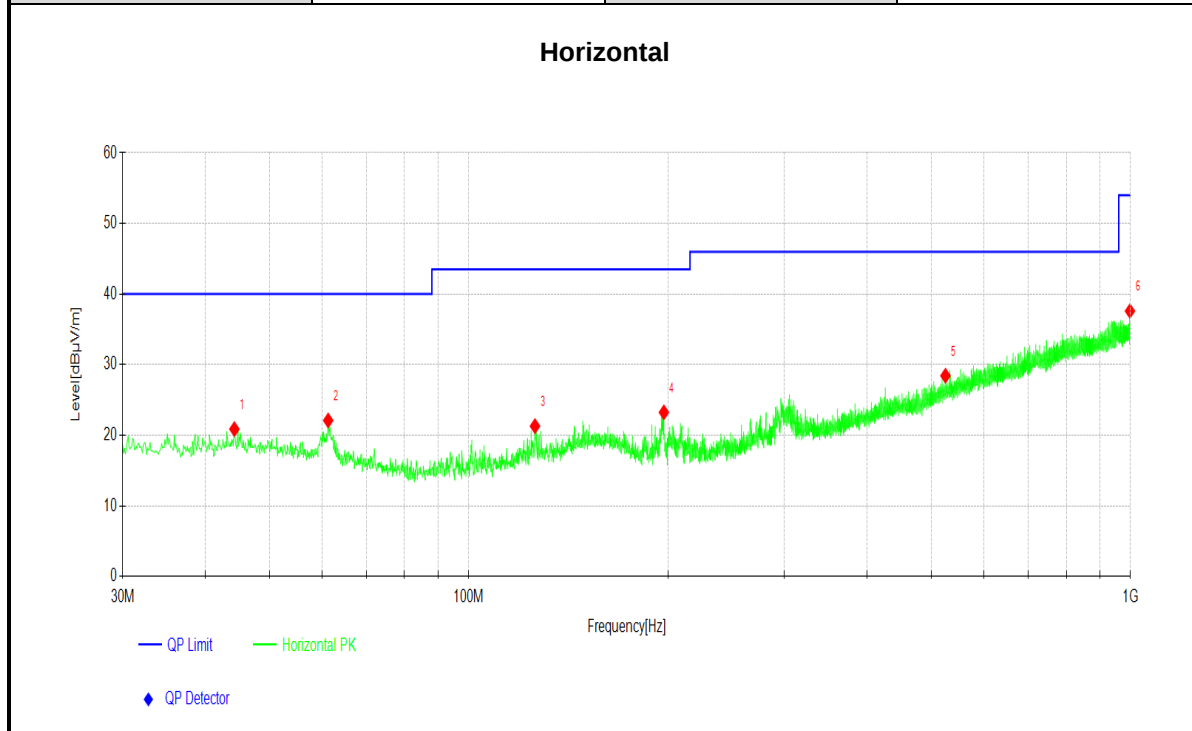
Above 1GHz Test Setup:





3.2.4 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	24.5deg. C,55% RH	Tested By	Liu shiwei



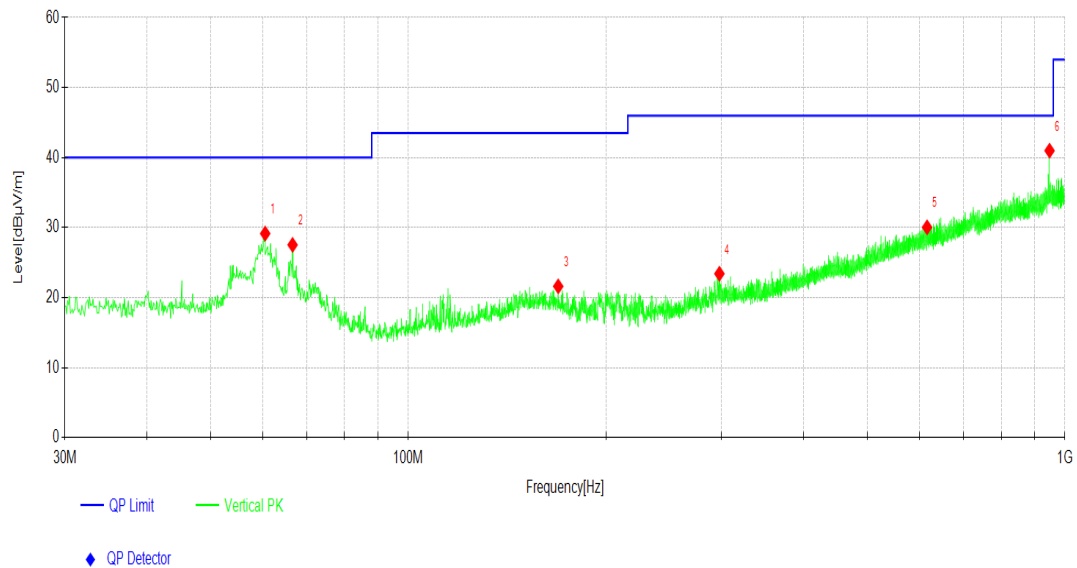
NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	44.2604	1.97	18.90	20.87	40.00	19.13	100	145
2	61.3341	4.57	17.52	22.09	40.00	17.91	100	6
3	125.9426	4.18	17.11	21.29	43.50	22.21	200	266
4	197.2447	7.17	16.07	23.24	43.50	20.26	100	106
5	525.3315	3.38	25.05	28.43	46.00	17.57	100	187
6	998.1568	5.19	32.41	37.60	54.00	16.40	100	131

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[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	24.5deg. C,55% RH	Tested By	Liu shiwei

Vertical



NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	60.5581	11.51	17.64	29.15	40.00	10.85	100	4
2	66.6697	10.87	16.66	27.53	40.00	12.47	100	151
3	169.2089	2.82	18.79	21.61	43.50	21.89	100	318
4	297.7468	4.25	19.16	23.41	46.00	22.59	100	146
5	616.8117	3.27	26.77	30.04	46.00	15.96	200	134
6	947.6148	8.65	32.34	40.99	46.00	5.01	100	338

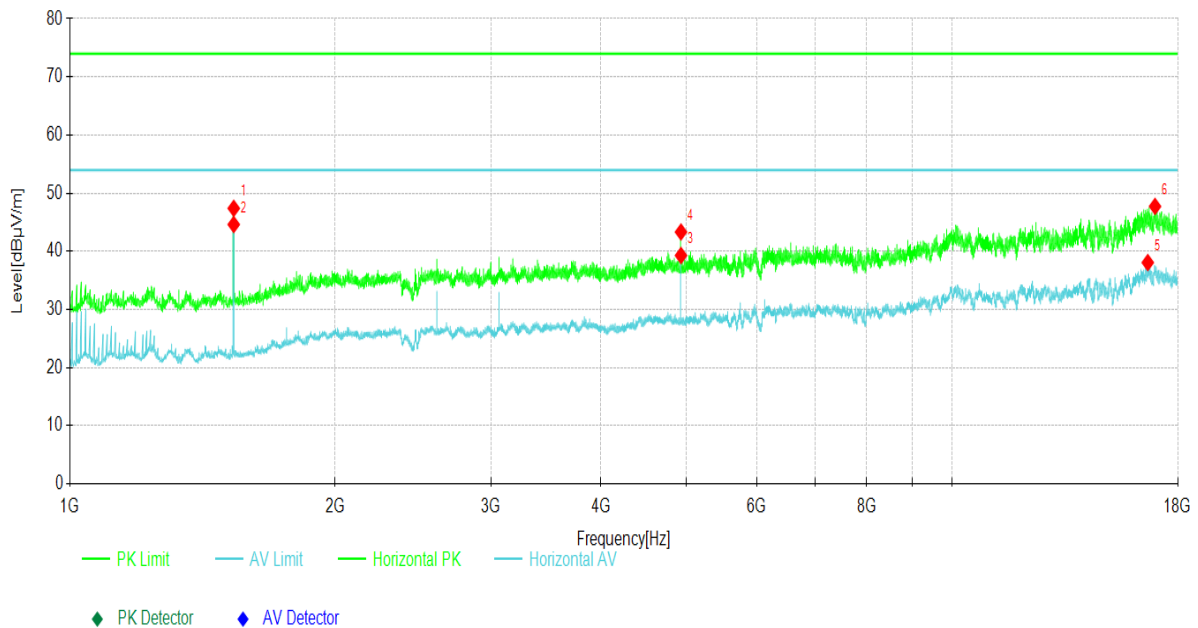
Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Level (dBuV/m) = Reading (dBuV/m) + Factor (dB).
3. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
4. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]



3.2.5 Test Results (Above 1GHz)

Test Mode:	See section 2.3	Frequency Range	Above 1GHz
Test Voltage	See section 2.3	Detector Function	PK/AV
Environmental Conditions	24.5deg. C,55% RH	Tested By	Liu shiwei

Horizontal



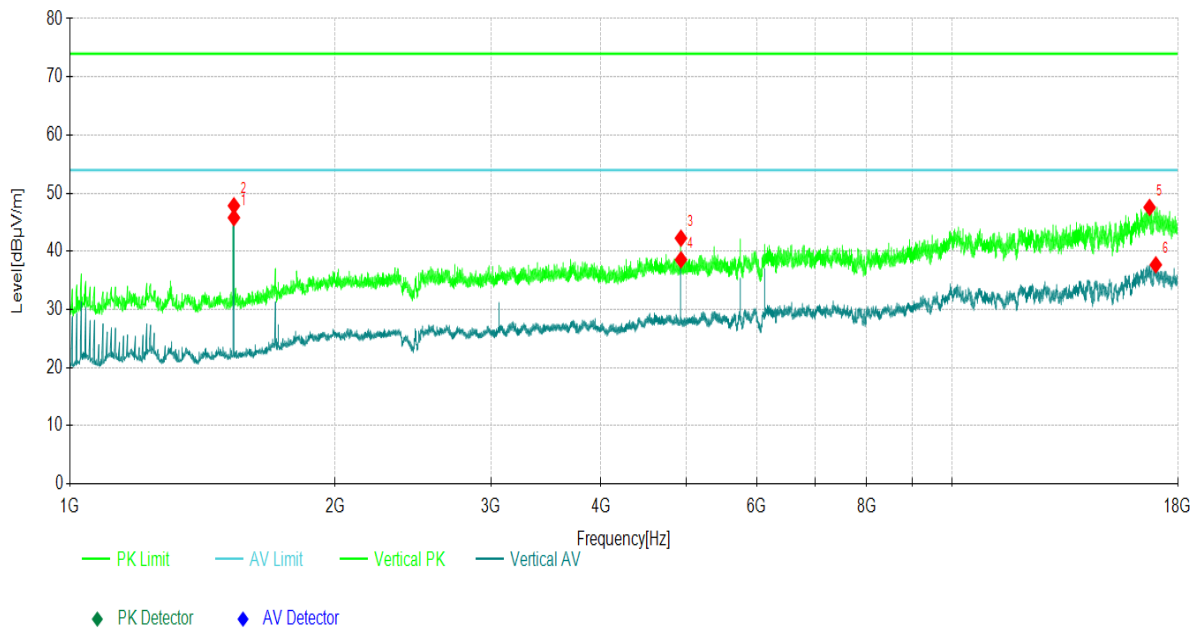
NO.	Freq. [MHz]	Reading [dBuV/m]	Factor [dB]	Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Detect or
1	1534.6535	66.44	-19.04	47.40	74.00	26.60	100	142	PK
2	1534.6535	63.67	-19.04	44.63	54.00	9.37	100	136	AV
3	4927.9928	49.31	-10.01	39.30	54.00	14.70	100	33	AV
4	4927.9928	53.35	-10.01	43.34	74.00	30.66	100	20	PK
5	16651.2651	33.13	4.95	38.08	54.00	15.92	100	12	AV
6	16971.3971	42.50	5.24	47.74	74.00	26.26	300	160	PK

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]



Test Mode:	See section 2.3	Frequency Range	Above 1GHz
Test Voltage	See section 2.3	Detector Function	PK/AV
Environmental Conditions	24.5deg. C,55% RH	Tested By	Liu shiwei

Vertical



NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detect or
1	1535.2535	64.82	-19.03	45.79	54.00	8.21	100	152	AV
2	1535.2535	66.88	-19.03	47.85	74.00	26.15	100	159	PK
3	4927.9928	52.28	-10.01	42.27	74.00	31.73	100	287	PK
4	4927.9928	48.58	-10.01	38.57	54.00	15.43	100	287	AV
5	16730.4730	42.69	4.88	47.57	74.00	26.43	100	2	PK
6	17005.5006	32.61	5.08	37.69	54.00	16.31	100	357	AV

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]

4. PHOTOGRAPHS OF TEST SETUP



Conducted Emission Test



Conducted Emission Test



RADIATED EMISSION TEST (Below 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 with the official seal of the laboratory and the signatures of Test engineer, Author and Reviewer simultaneously.
- (2) The test report is invalid if altered.
- (3) Any photocopies or part photocopies in the test report are forbidden without the written permission from the laboratory.
- (4) Objections to the test report must be submitted to the laboratory within 15 days.
- (5) Generally, commission test is responsible for the tested samples only.
- (6) Any photocopies or part photocopies of the test report are forbidden without the written permission from CVC;

Address of the laboratory:

CVC Testing Technology Co., Ltd.

Address: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, China

Post Code: 510663

Tel: 020-32293888

FAX: 020-32293889

E-mail: office@cvc.org.cn