

Test Report No.:
FCC2022-0036-RF

RF Test Report

EUT : Monitor Light
MODEL : P3 Pro
BRAND NAME : N/A
CLIENT : Shenzhen Yuanrunxin Electronics Co.,Ltd
Classification Of Test : N/A

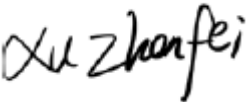
CVC Testing Technology Co., Ltd.



CVC Testing Technology Co., Ltd.

Test Report No.: FCC2022-0036-RF

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Client	Name :Shenzhen Yuanrunxin Electronics Co.,Ltd Address :Floor 3 Building B Yuan Dong Industrial Park Xue Xiang Bantian Longgang District Shenzhen China		
Manufacturer	Name :Shenzhen Yuanrunxin Electronics Co.,Ltd Address :Floor 3 Building B Yuan Dong Industrial Park Xue Xiang Bantian Longgang District Shenzhen China		
Equipment Under Test	Name : Monitor Light Model/Type:P3 Pro Additional Models/Types : See section 2.2 Trade mark : IPUDA Additional Trade mark : OOWOLF Serial NO.:N/A Sample NO.:3-1		
Date of Receipt.	2022.07.14	Date of Testing	2022.07.14~2022.09.01
Test Specification		Test Result	
FCC Part 15, Subpart C, Section 15.249		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: 2022.09.02		
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
FCC2022-0036-RF	Original release	2022.09.02



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	PASS	Compliant
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant



1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Test Equipment	Type/Mode	SERIAL NO.	Equipment No.	Manufacturer	Cal. Due
WIFI & Bluetooth Test System 1					/
Communication Shielded Room 1	4m*3m*3m	CRTDSWKS R 44301	VGDS-0699	CRT	2024/04/24
Spectrum Analyzer	FSV30	104337	DZ-000235	R&S	/
Comprehensive Test Instrument	CMW500	137779	DZ-000220	R&S	2023/06/05
Comprehensive Test Instrument	CMW500	169888	DZ-000342	R&S	2022/12/09
LTE Comprehensive Test Instrument	E7515A	MY58010639	DZ-000173	KEYSIGHT	2023/06/05
Analog Signal Generator	SMA100B	103663	DZ-000239-2	R&S	2023/06/05
Vector Signal Generator	SMBV100B	101757	DZ-000239-1	R&S	2023/06/06
Programmable DC Power Supply	E3642A	MY59108106	DZ-000242-2	KEYSIGHT	2023/04/21
Radiation Spurious Test System					/
3m Semi-Anechoic Chamber	FACT-4	ST08035	WKNA-0024	ETS	2024/12/12
Spectrum Analyzer	N9010B	MY57470323	DZ-000174	KEYSIGHT	2023/03/02
EMI Test Receiver	N9038A-508	MY532290079	EM-000397	Agilent	2023/03/02
Broadband Antenna	VULB 9163	9163-530	EM-000342	SCHWARZBECK	2023/06/25
Waveguide Horn Antenna	HF906	360306/008	WKNA-0024-8	R&S	2023/03/04
Waveguide Horn Antenna	BBHA9170	00949	DZ-000209-2	SCHWARZBECK	2023/07/31
Preamplifier	BBV 9721	9721-050	DZ-000209-1	SCHWARZBECK	2023/06/05
5G Bandstop Filters	WRCJV12-4900-5100-5900-6100-50EE	1	DZ-000186	WI	2022/12/20
Comprehensive tester	CMW500	159000	DZ-000240-2	R&S	2022/12/20
Conducted emission					/
EMI Test Receiver	ESCI	100857	WKNB-0081	R&S	2022-12-08
EMI Test Receiver	ESR3	102394	VG DY-0705	R&S	2023-03-04
LISN	NSLK 8127	8127644	VG DY-0150	SCHWARZBECK	2022-10-09
DC LISN	PVDC8301-017	PVDC8301#17	VG DY-0692	SCHWARZBECK	2022-10-09
LISN	NSLK 8129	8129-268	EM-000388	SCHWARZBECK	2023-03-03
Plus Limiter (#1)	VTSD 9561 F-N	00515	VG DY-0808	SCHWARZBECK	2023-03-04
Impedance Stabilization Network	ISN T800	27095	WKNE-0195	TESEQ	2022-09-01
Impedance Stabilization Network	NTFM8158	8158-0092	VG DY-0356	SCHWARZBECK	2023-06-07
Impedance Stabilization Network	NTFM8131	#184	EM-000498	SCHWARZBECK	2023-06-07
Voltage Probe	TK9420	9420-499	VG DY-0128	SCHWARZBECK	2023-03-04
Power Divider	4901.17.B	22643830	DB-0016	HUBER+SUHNER	2023-09-01
Video Signal Generator	GV-798+	151064920001	VGDS-0215	PROMAX	2023-05-30
Audio Signal Generator	GAG-810	EK871591	EM-000309	GW	2022-12-08
Shielding Room(#1)	GP1A	001	WKNF-0001	LEINING	2024-08-08



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 emissions	9KHz ~ 30MHz	±0.769dB
		30MHz ~ 1GMHz	±0.877dB
		1GHz ~ 18GHz	±0.777dB
		18GHz ~ 40GHz	±1.315dB

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

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



2 GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT	Monitor Light	
BRAND	IPUDA®	
ADDITIONAL BRAND	OOWOLF	
MODEL	P3 Pro	
ADDITIONAL MODEL	See section 2.2	
FCC ID	2A8SU-P3PRO	
POWER SUPPLY	REMOTE:	DC 3V(2*1.5V AA battery)
MODULATION TECHNOLOGY	GFSK	
OPERATING FREQUENCY	2419MHz ~ 2480MHz	
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. Please refer to the EUT photo document for detailed product photo. (Report NO.: FCC2022-0036)		



2.2 ADDITIONAL MODELS/TYPES

Models/Types		Trade mark
1	P3	IPUDA®
2	P3ES	IPUDA®
3	P3A	IPUDA®
4	TL03R	OOWOLF
Note: Series models differ from main model only in Trade mark and model no. (The above appearance is for color and silk-screen only.)		

2.3 DESCRIPTION OF ACCESSORIES

N/A



2.4 OTHER INFORMATION

Following channel(s) was (were) selected for the test as listed below.

TESTED CHANNEL	TESTED FREQUENCY
Low	2419 MHz
Middle	2453MHz
High	2480MHz

Channel List

CHANNEL	FREQUENCY
Low	2419 MHz
Middle	2453MHz
High	2480MHz

2.5 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, xyz axis and antenna ports

EUT CONFIGURE MODE	APPLICABLE TEST ITEMS				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	√	√	--	√	DC 3V(2*1.5V AA battery)

Where **RE<1G**: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission

BW:20db bandwidth

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE<1G	24deg. C, 55%RH	DC 3V(2*1.5V AA battery)	LiuShiWei
RE≥1G	24deg. C, 55%RH	DC 3V(2*1.5V AA battery)	LiuShiWei
PLC	24deg. C, 55%RH	DC 3V(2*1.5V AA battery)	LiuShiWei
APCM	25deg. C, 58%RH	DC 3V(2*1.5V AA battery)	LiuShiWei



2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.249
ANSI C63.10-2020

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

2.7 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 (cm)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A



3 TEST TYPES AND RESULTS

3.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

3.1.1 Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (Microvolts/Meter)	MEASUREMENT DISTANCE (Meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

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. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength offundamental (milli-volts/meter)	Field strength ofharmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

3.1.2 Measurement procedure

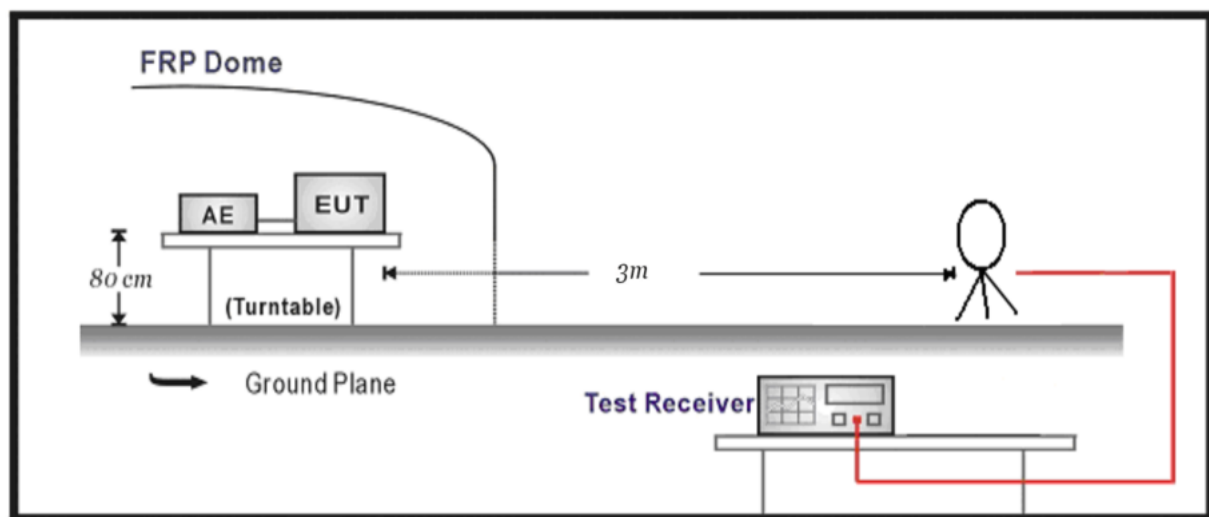
- The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- For below 1GHz was used bilog antenna, and above 1GHz was used horn antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables. For battery operated equipment, the equipment tests shall be performed using fresh batteries. The turntable was rotated to maximize the emission level.

NOTE:

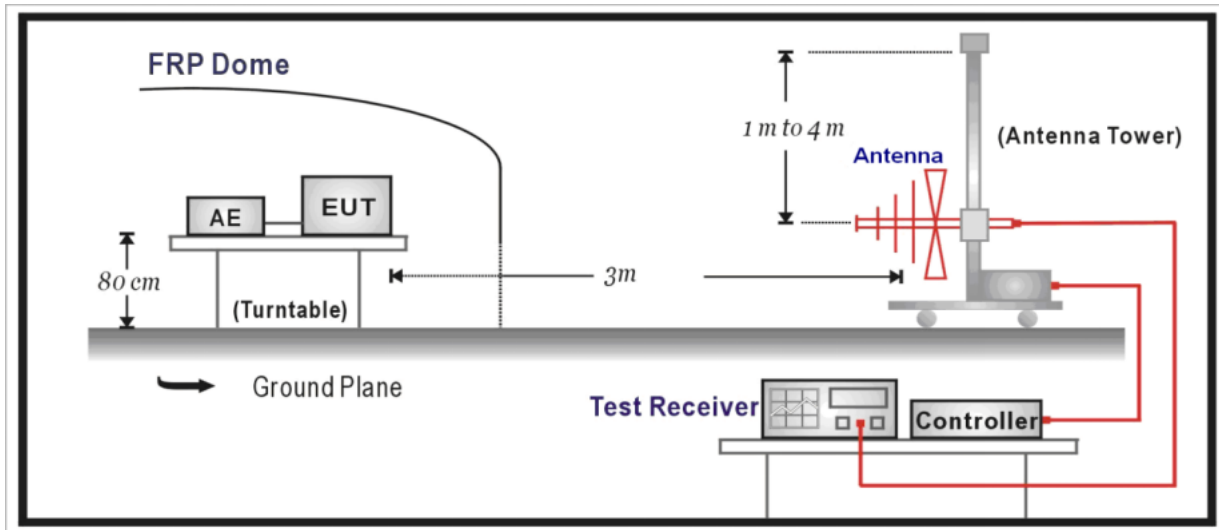
- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
- All modes of operation were investigated and the worst-case emissions are reported.
- The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

3.1.3 Test setup

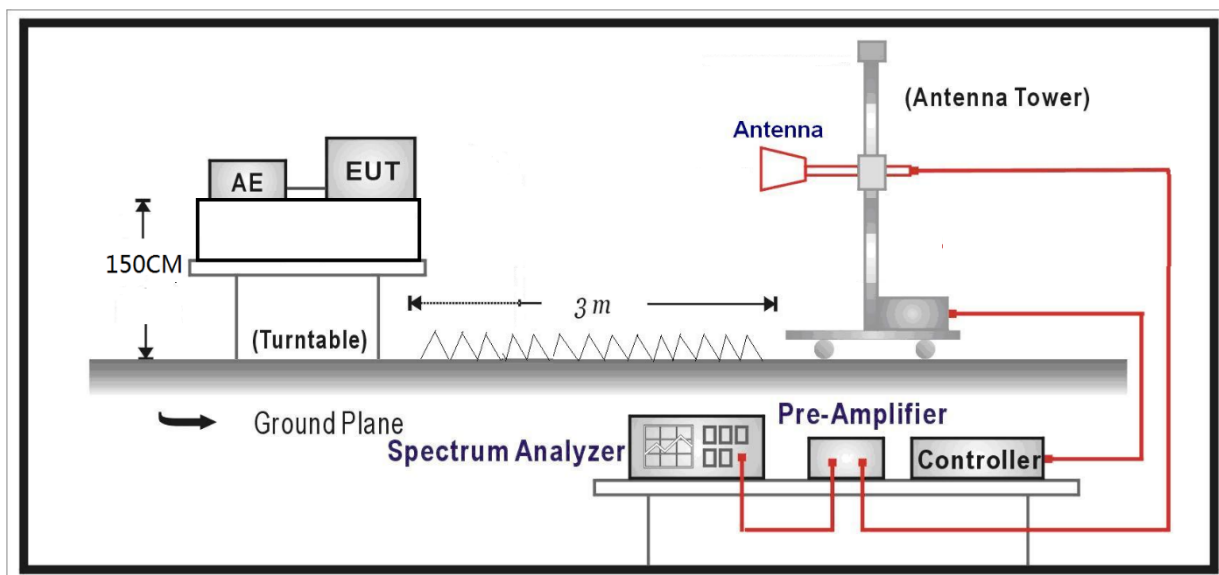
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



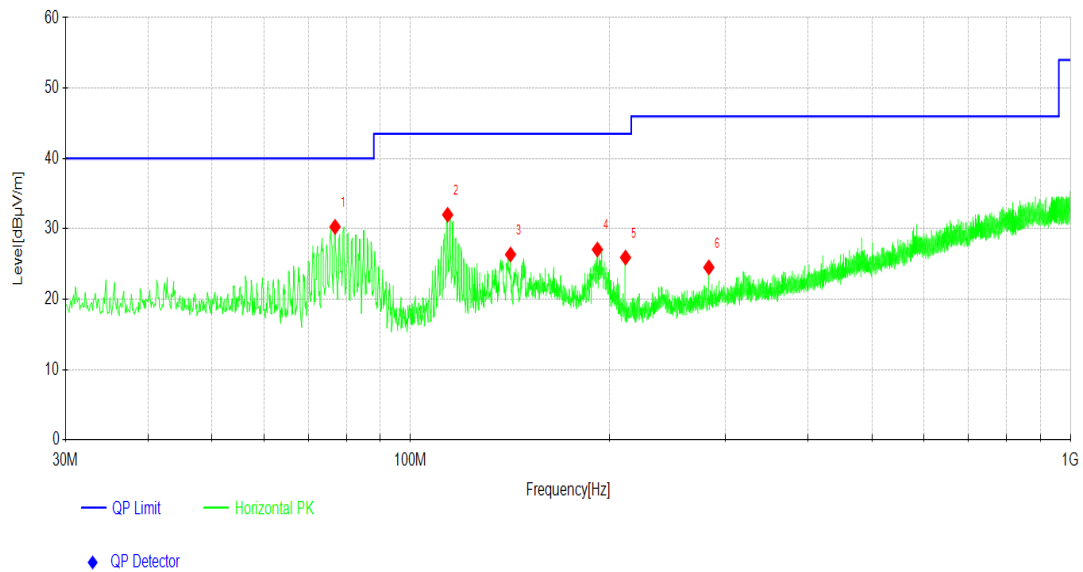


3.1.4 Test results

BELOW 1GHz WORST-CASE DATA:

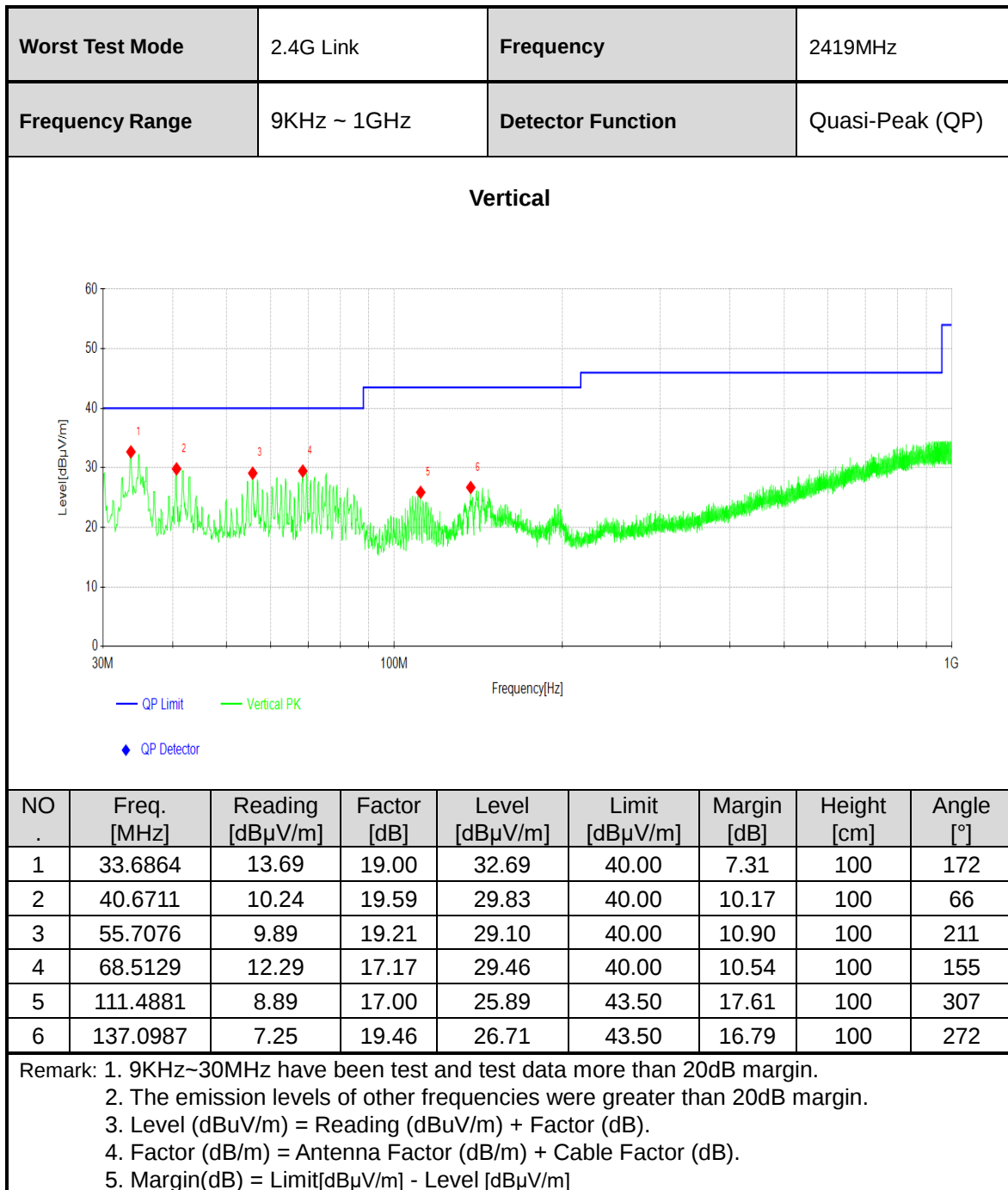
Worst Test Mode	2.4G Link	Frequency	2419MHz
Frequency Range	9KHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Horizontal



NO	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]
1	44.2604	4.49	19.49	23.98	40.00	16.02	200	155
2	75.6916	9.50	15.96	25.46	40.00	14.54	200	354
3	112.9433	9.89	17.11	27.00	43.50	16.50	200	216
4	140.9791	8.52	19.81	28.33	43.50	15.17	200	176
5	196.8567	8.12	17.10	25.22	43.50	18.28	200	289
6	322.6783	5.08	20.23	25.31	46.00	20.69	100	0

Remark: 1. 9KHz~30MHz have been test and test data more than 20dB margin.
2. The emission levels of other frequencies were greater than 20dB margin.
3. Level (dBμV/m) = Reading (dBμV/m) + Factor (dB).
4. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
5. Margin(dB) = Limit[dBμV/m] - Level [dBμV/m]

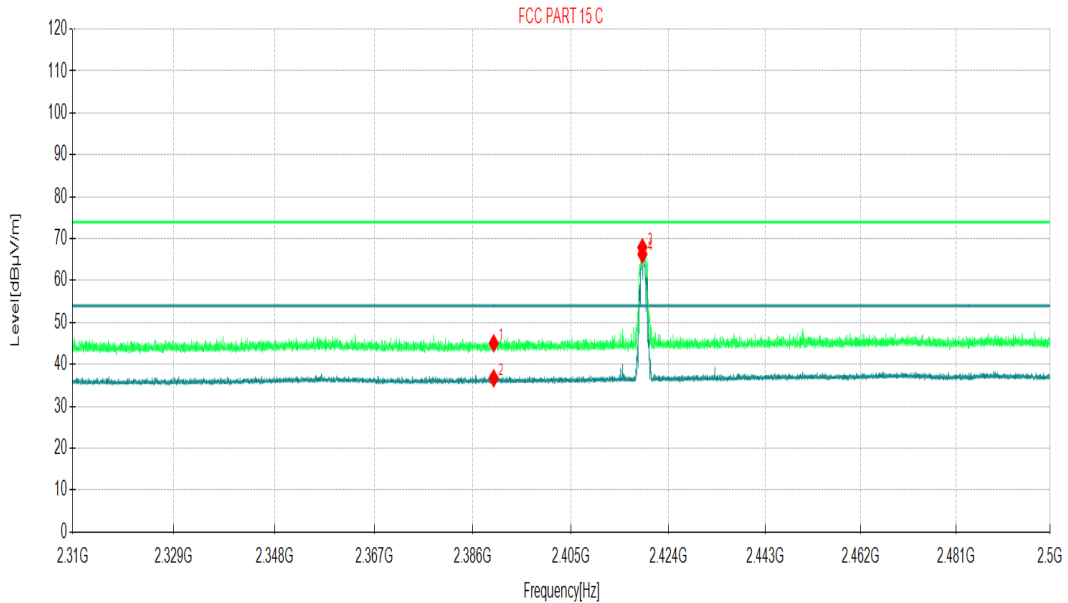




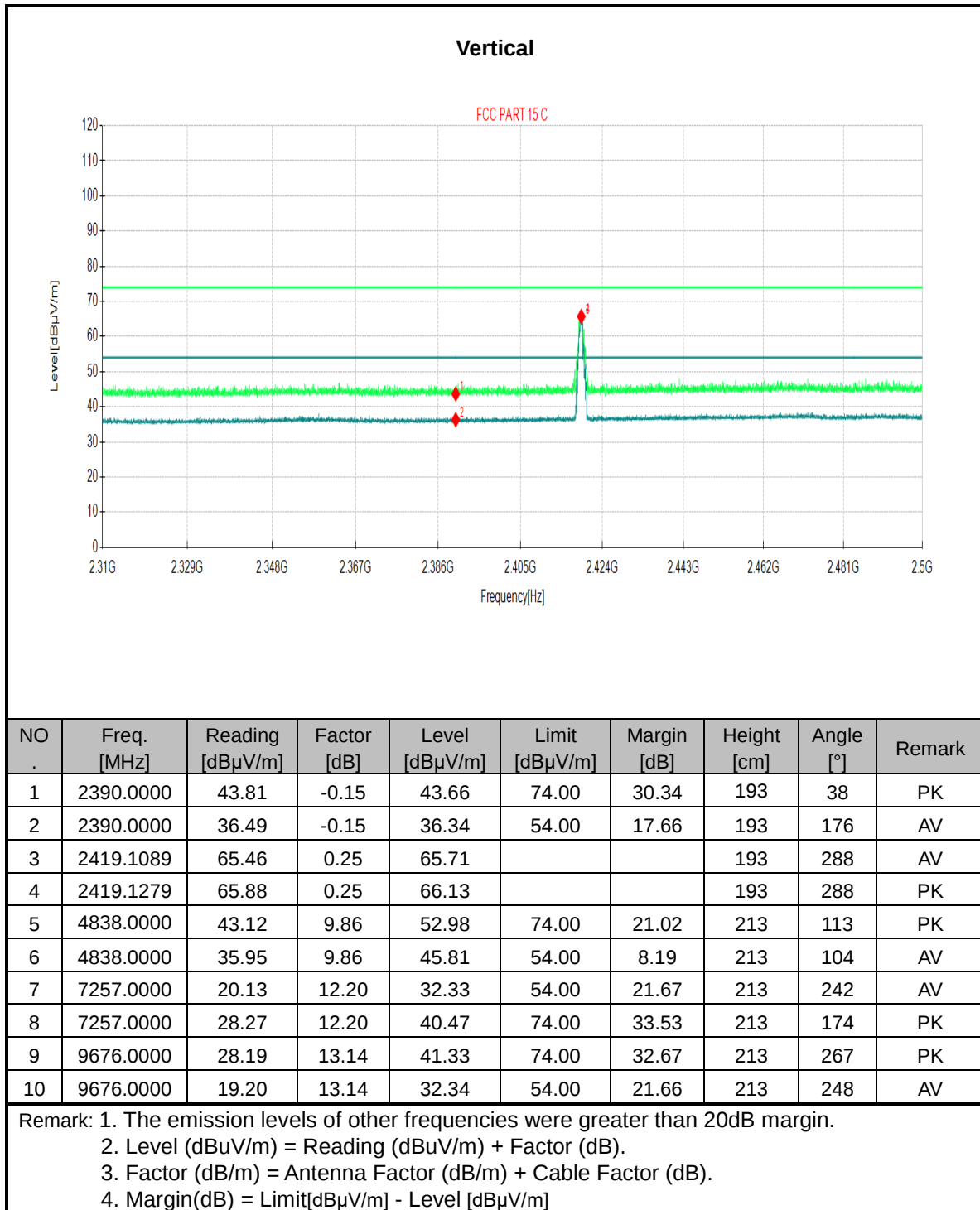
ABOVE 1GHz DATA

Test Mode	2.4G Link	Frequency	2419MHz
Frequency Range	Above 1G	Detector Function	PK/AV

Horizontal

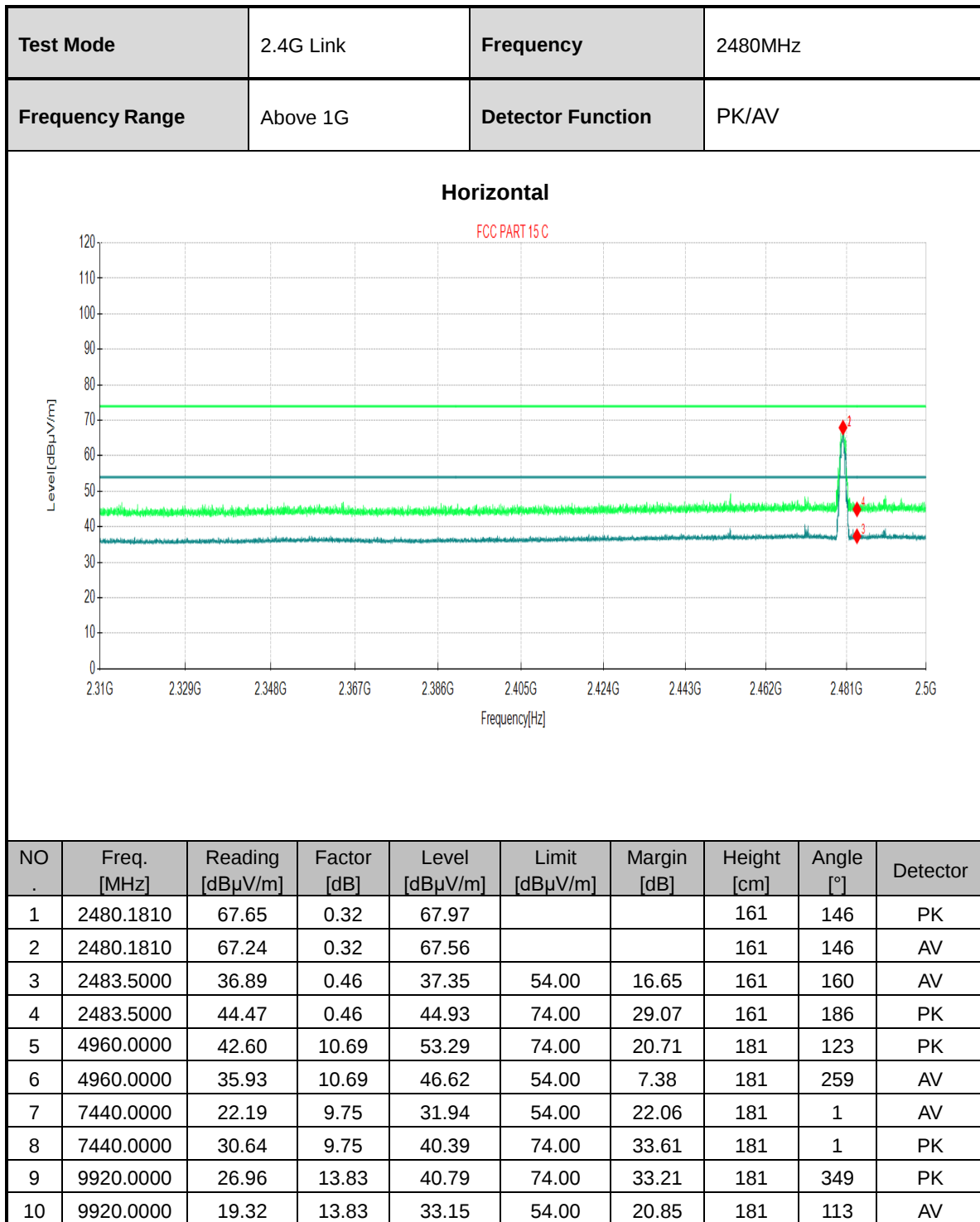


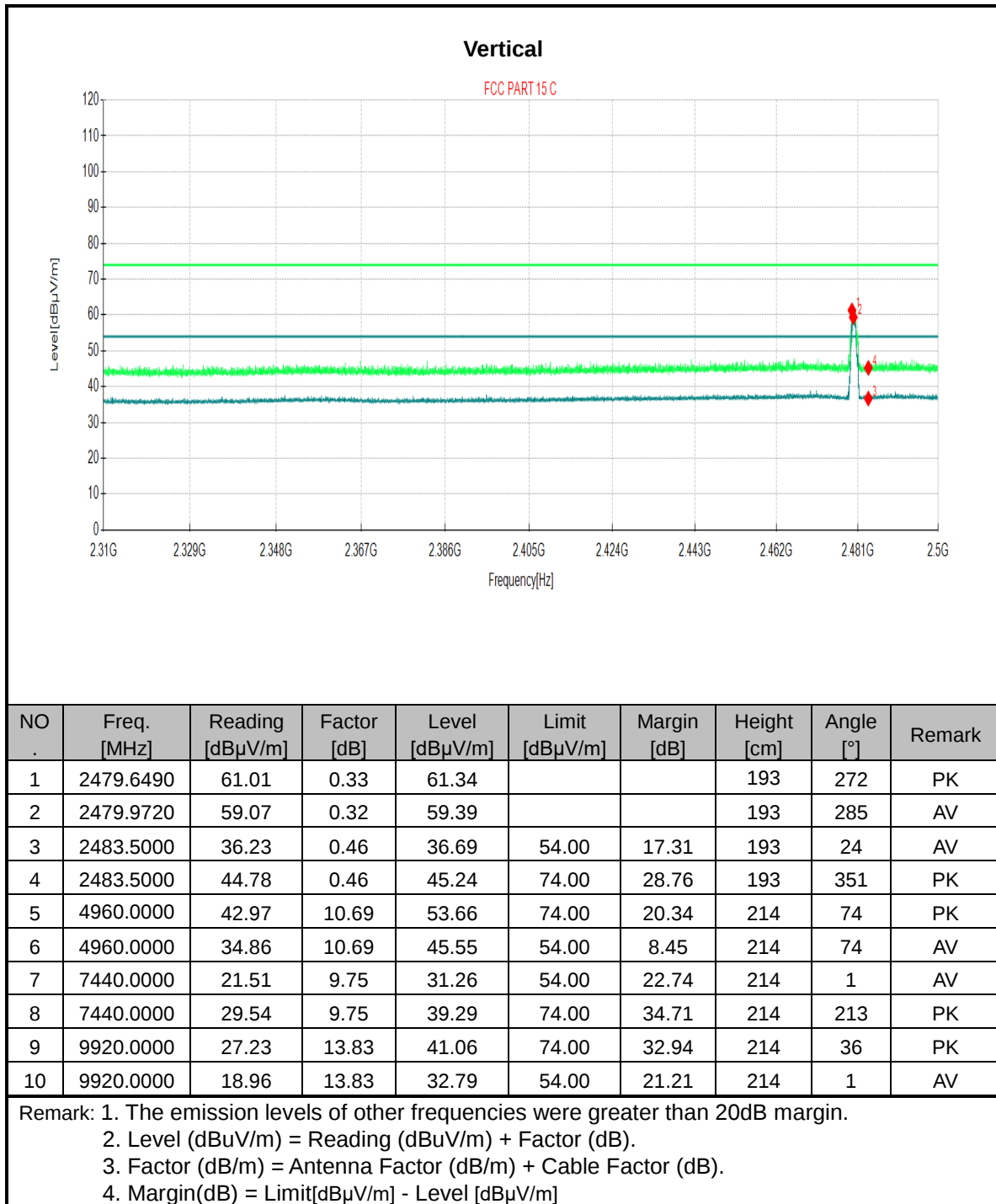
NO	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2390.0000	45.20	-0.15	45.05	74.00	28.95	158	0	PK
2	2390.0000	36.84	-0.15	36.69	54.00	17.31	158	230	AV
3	2418.8999	67.70	0.25	67.95			158	125	PK
4	2418.9189	66.03	0.25	66.28			158	125	AV
5	4838.0000	43.87	9.86	53.73	74.00	20.27	179	324	PK
6	4838.0000	36.87	9.86	46.73	54.00	7.27	179	109	AV
7	7257.0000	20.04	12.20	32.24	54.00	21.76	179	241	AV
8	7257.0000	28.94	12.20	41.14	74.00	32.86	179	230	PK
9	9676.0000	28.17	13.14	41.31	74.00	32.69	179	44	PK
10	9676.0000	19.67	13.14	32.81	54.00	21.19	179	161	AV





Test Mode		2.4G Link			Frequency		2453MHz		
Frequency Range		Above 1G			Detector Function		PK/AV		
Horizontal									
NO	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4906.0000	42.36	10.10	52.46	74.00	21.54	179	326	PK
2	4906.0000	33.91	10.10	44.01	54.00	9.99	179	335	AV
3	7359.0000	20.50	10.31	30.81	54.00	23.19	179	34	AV
4	7359.0000	28.49	10.31	38.80	74.00	35.20	179	142	PK
5	9812.0000	27.32	13.20	40.52	74.00	33.48	179	151	PK
6	9812.0000	19.34	13.20	32.54	54.00	21.46	179	191	AV
Vertical									
NO	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
1	4906.0000	41.63	10.10	51.73	74.00	22.27	213	319	PK
2	4906.0000	34.43	10.10	44.53	54.00	9.47	213	334	AV
3	7359.0000	20.67	10.31	30.98	54.00	23.02	213	101	AV
4	7359.0000	29.38	10.31	39.69	74.00	34.31	213	264	PK
5	9812.0000	27.12	13.20	40.32	74.00	33.68	213	264	PK
6	9812.0000	19.75	13.20	32.95	54.00	21.05	213	31	AV
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 20dB BANDWIDTH MEASUREMENT

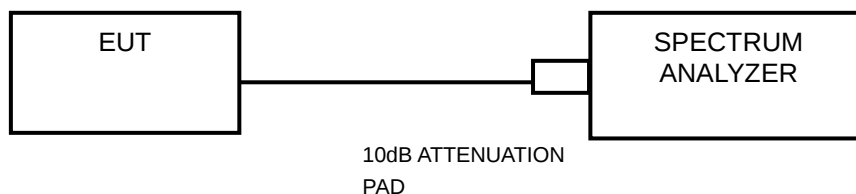
3.2.1 Limits

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

3.2.2 Measurement procedure

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.

3.2.3 Test setup

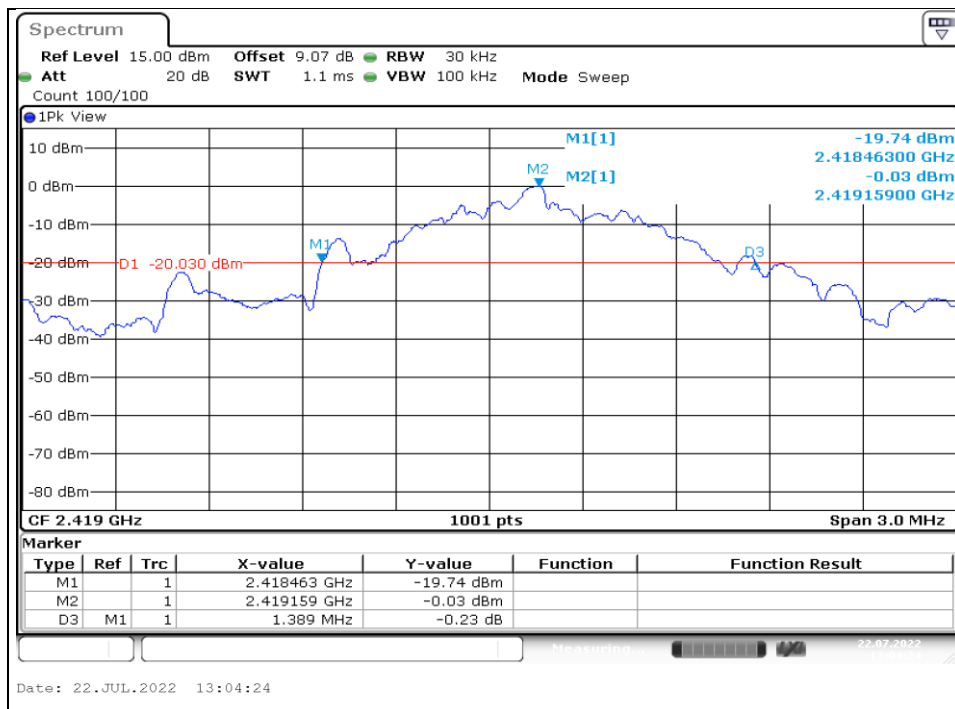




3.2.4 Test result

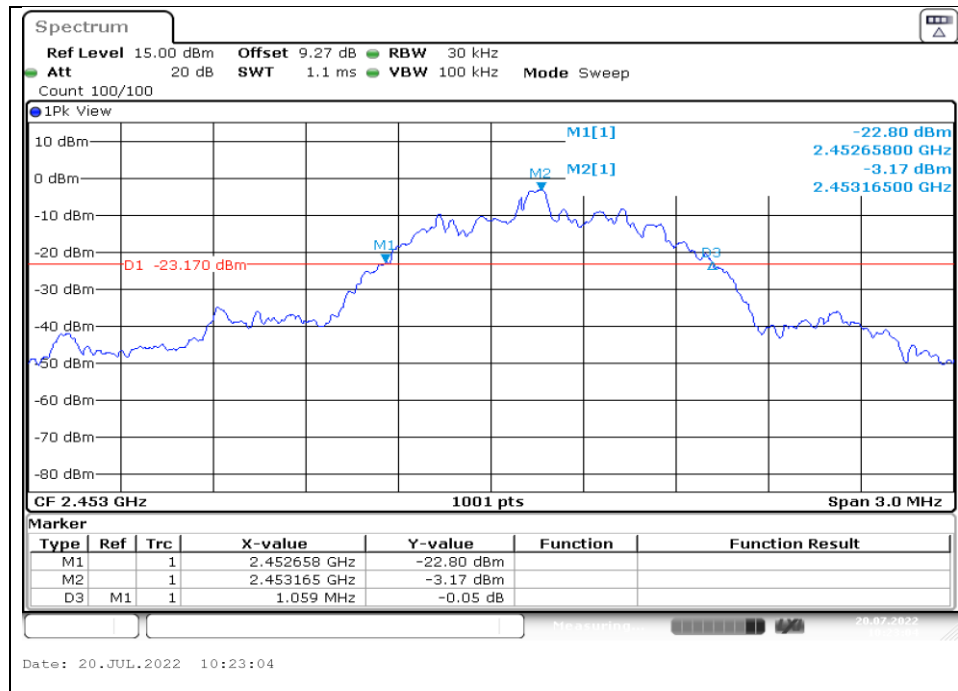
CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH(MHz)
Low	2408	1.389
Middle	2442	1.059
High	2472	1.104

TestGraphs:Low channel

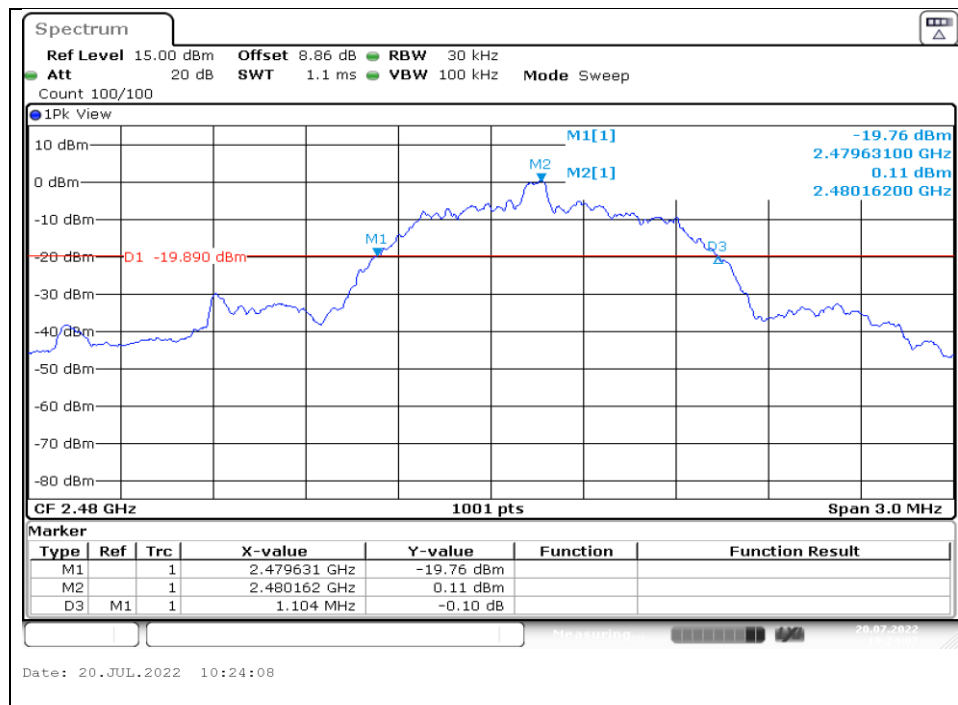




TestGraphs:Middle channel



TestGraphs:High channel



4 PHOTOGRAPHS OF TEST SETUP



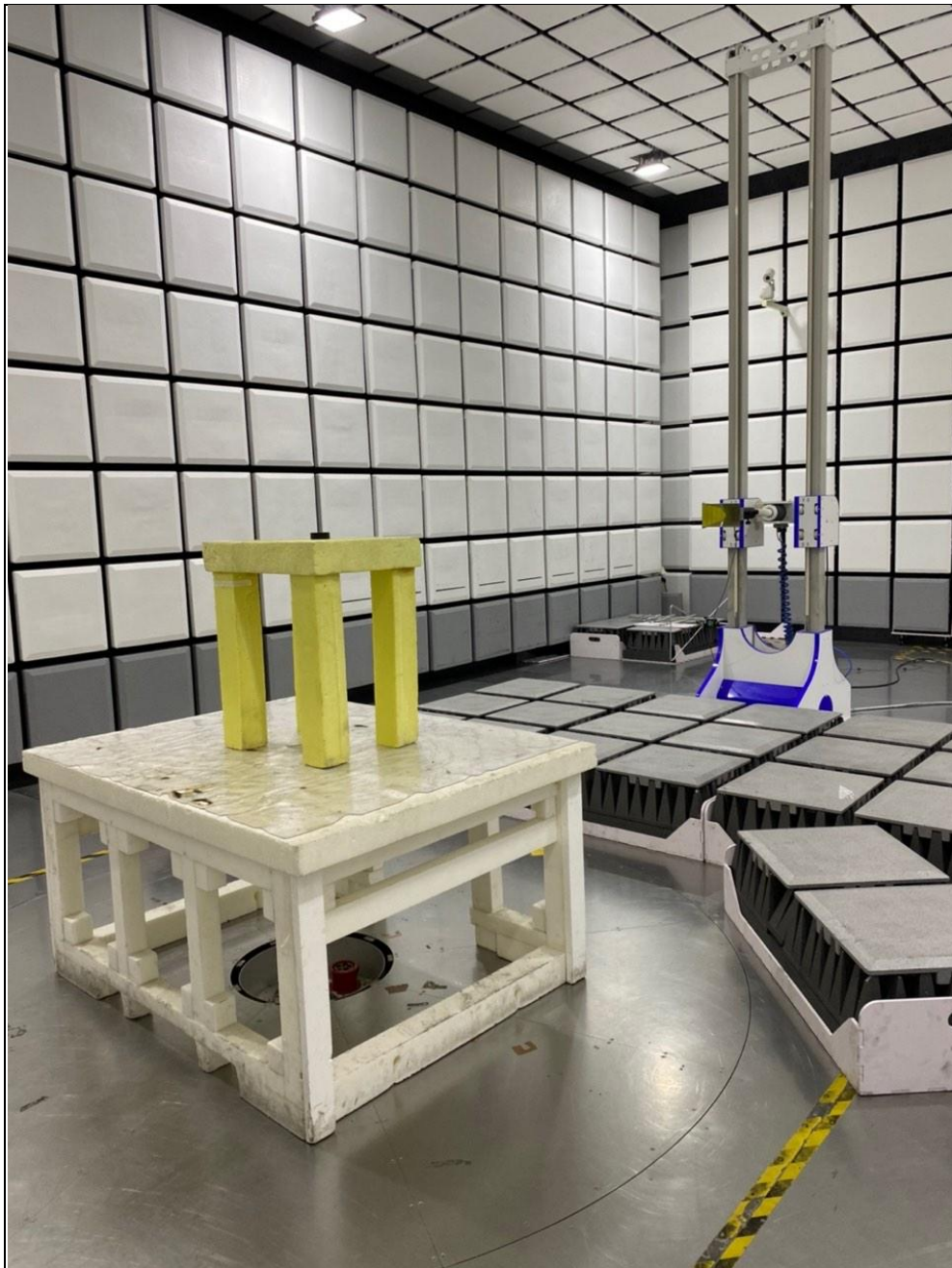
RADIATED EMISSION TEST (Below 1GHz)



RADIATED EMISSION TEST (Below 1GHz)



RADIATED EMISSION AND BANDEDGE TEST (Above 1GHz)



RADIATED EMISSION AND BAND EDGE TEST (Above 1GHz)



5 PHOTOGRAPHS OF THE EUT

Please refer to the attached file (External Photos report 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.

CVC Testing Technology Co., Ltd.

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