



Shenzhen CTL Testing Technology Co., Ltd.
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FCC SDoC Test Report

FCC PART 15 Subpart B

Report Reference No.....: CTL2308102051-F

Compiled by

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the tests

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Date of issue.....: Aug. 29, 2023

Representative Laboratory Name.: Shenzhen CTL Testing Technology Co., Ltd.

Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road,
Nanshan District, Shenzhen, China 518055

Test Firm.....: Shenzhen CTL Testing Technology Co., Ltd.

Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road,
Nanshan District, Shenzhen, China 518055

Applicant's name.....: Shenzhen Prodo Technology Co., Ltd.

Address.....: 4th floor, J building, No 6 Zhongtai Road, Loucun community, Xihu
street, Guangming district, Shenzhen City, 518000

Test specification:

Standard.....: FCC PART 15 Subpart B

TRF Originator.....: Shenzhen CTL Testing Technology Co., Ltd.

Shenzhen CTL Testing Technology Co., Ltd.

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Test item description.....: Smart Radon Gas Detector

Trade Mark: N/A

Rating.....: AC 100-240V~50/60Hz

Result.....: Pass



FCC Test Report

Test Report No. : CTL2308102051-F	Aug. 29, 2023 Date of issue
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Equipment under Test : Smart Indoor Multiple Air Quality Monitor

Type / Model : PT07

Listed Models : N/A

Applicant : Shenzhen Prodo Technology Co., Ltd.

Address : 4th floor, J building, No 6 Zhongtai Road, Loucun community, Xihu street, Guangming district, Shenzhen City, 518000

Manufacturer : Shenzhen Prodo Technology Co., Ltd.

Address : 4th floor, J building, No 6 Zhongtai Road, Loucun community, Xihu street, Guangming district, Shenzhen City, 518000

Test Result	Pass
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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.

History of this test report

Report No.	Version	Description	Issued Date
CTL2308102051-F	V1.0	Initial Issued Report	Aug. 29, 2023

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1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart B - Unintentional Radiators](#)

[ANSI C63.4-2014](#)

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : Aug. 11, 2023

Testing commenced on : Aug. 11, 2023

Testing concluded on : Aug. 25, 2023

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☒ 120V / 60 Hz ☐ 115V / 60Hz
☐ 3.7 V DC ☐ 5 V DC
☐ Other (specified in blank below)

/

Description of test modes

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

EMISSION TEST:

Description of Test Mode	Test Voltage
WORKING	AC 120V/60Hz

Note:

For the test results, the EUT had been tested with all conditions. But only the worst case was showed in test report.

2.3. Short description of the Equipment under Test (EUT)

Smart Indoor Multiple Air Quality Monitor.

For more details, refer to the user's manual of the EUT.

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- o - supplied by the lab

2.6. Related Submittal(s) / Grant (s)

This test report is intended for Smart Radon Gas Detector filing to comply with the FCC Part 15, Subpart B Rules

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. Test Result Summary

Test Item	Test Requirement	Standard Paragraph	Result
Radiated Emission	FCC PART 15 Subpart B	Section 15.109	PASS
Conducted Emission	FCC PART 15 Subpart B	Section 15.107	PASS

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 399832

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

Certificated by A2LA, USA

Registration No.:4343.01

Date of registration: December 27, 2017

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

3.4. 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 Shenzhen CTL Testing Technology Co., Ltd 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.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission(chamber 1)	30~1000MHz	$\pm 4.10\text{dB}$	(1)
Radiated Emission(chamber 2)	30~1000MHz	$\pm 4.10\text{dB}$	(1)
Radiated Emission(chamber 2)	Above 1GHz	$\pm 4.32\text{dB}$	(1)
Conducted Emission	0.15~30MHz	$\pm 3.20\text{dB}$	(1)
Conducted Emission (signal terminal)	0.15~30MHz	$\pm 2.96\text{dB}$	(1)
Disturbance Power	30~300MHz	$\pm 2.90\text{dB}$	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Equipments Used during the Test

Radiated Emission(chamber 1)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Sunol Sciences Corp.	JB1 Antenna	A061713	2023/02/13	2026/02/12
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2023/05/04	2024/05/03
Software:						
Name of Software:				Version:		
EZ_EMG(Below 1GHz)				V1.1.4.2		

Radiated Emission(chamber 2)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Schwarzbeck	VULB 9168	824	2023/02/13	2026/02/12
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2023/05/04	2024/05/03
3	Horn Antenna	Sunol Sciences Corp	DRH-118	A062013	2021/12/23	2024/12/22
Software:						
Name of Software:				Version:		
EZ_EMG				V1.1.4.2		

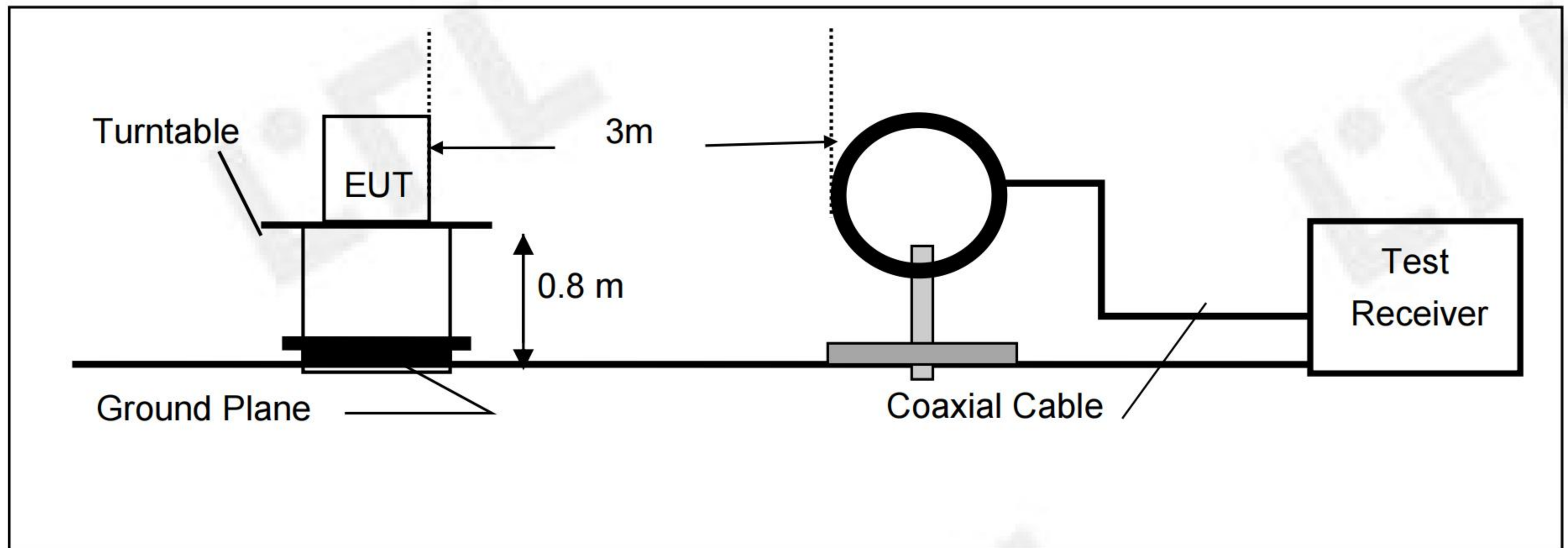
Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2023/05/04	2024/05/03
2	LISN	ROHDE & SCHWARZ	ESH2-Z5	860014/010	2023/05/04	2024/05/03
3	Limitator	ROHDE & SCHWARZ	ESH3-Z2	100408	2023/05/04	2024/05/03
4	The Impedance Stability Network ISN	FISCHER CUSTOM COMMUNICATIONS,INC.	F-071115-1057-1-09	112299	2023/05/05	2024/05/04
Software:						
Name of Software:				Version:		
ES-K1				V1.71		

4 TEST CONDITIONS AND RESULTS

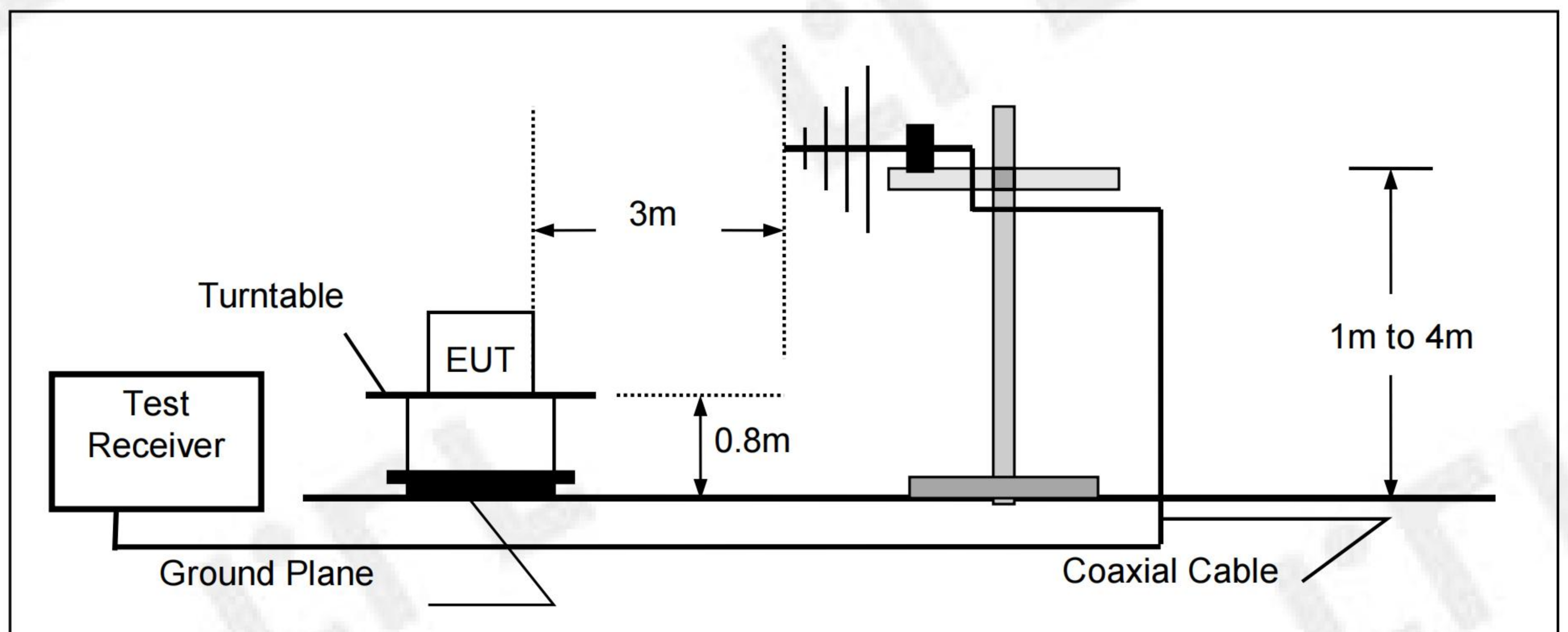
4.1. Radiated Emission Test

TEST CONFIGURATION

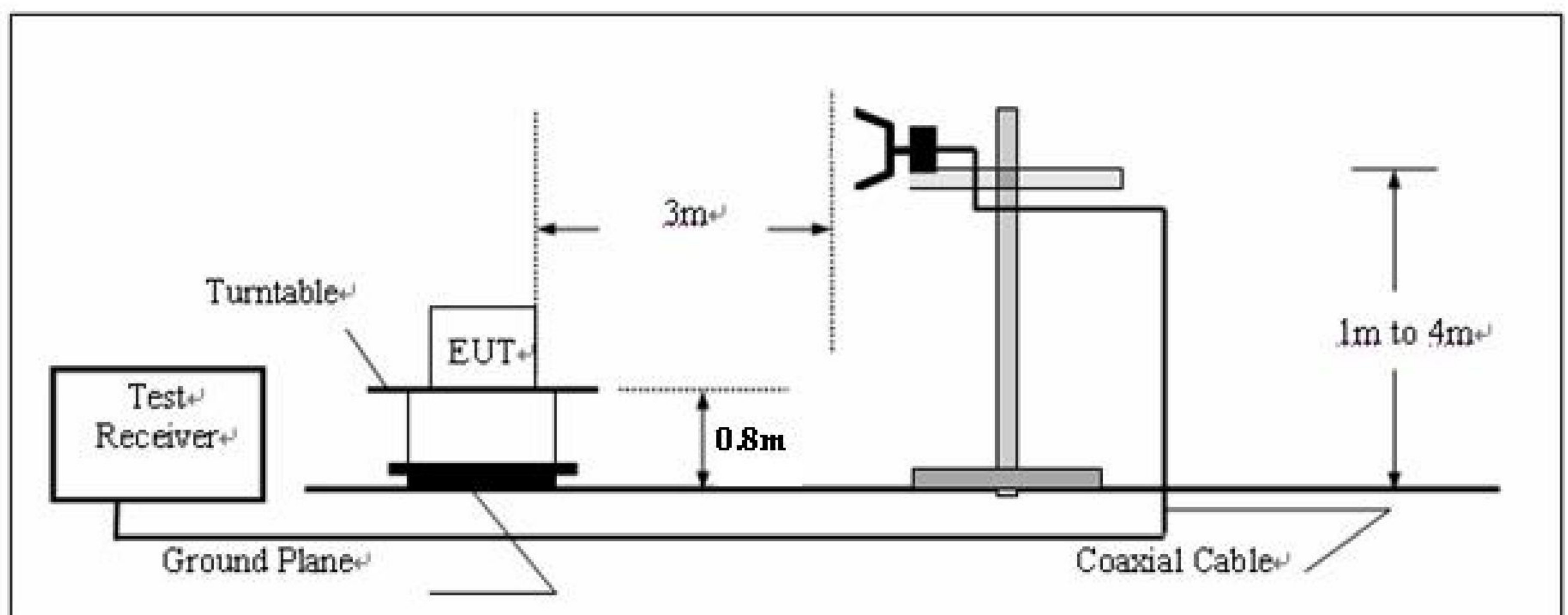
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	49	100
88-216	3	53.5	150
216-960	3	56	200
Above 960	3	60	500

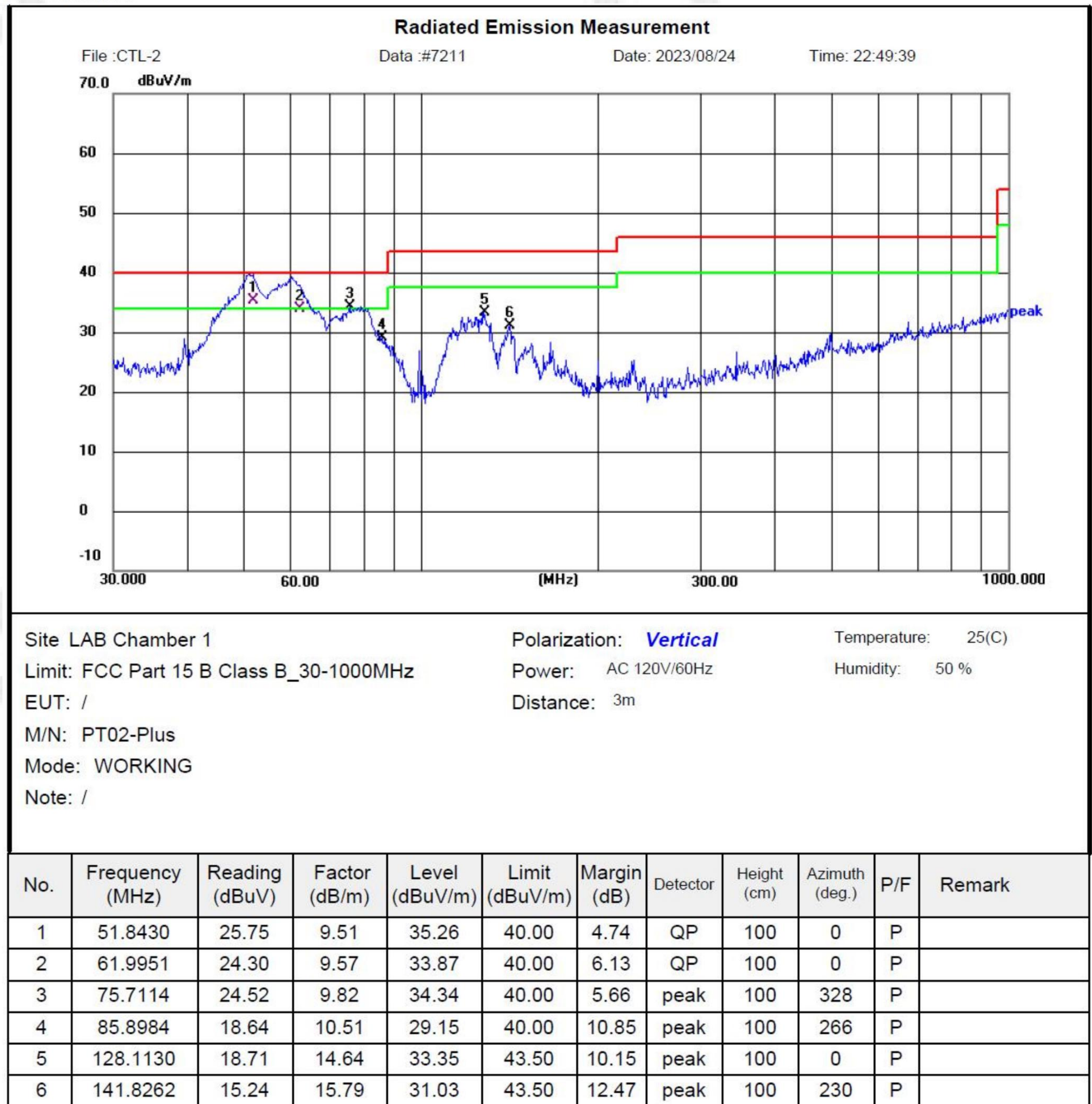
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

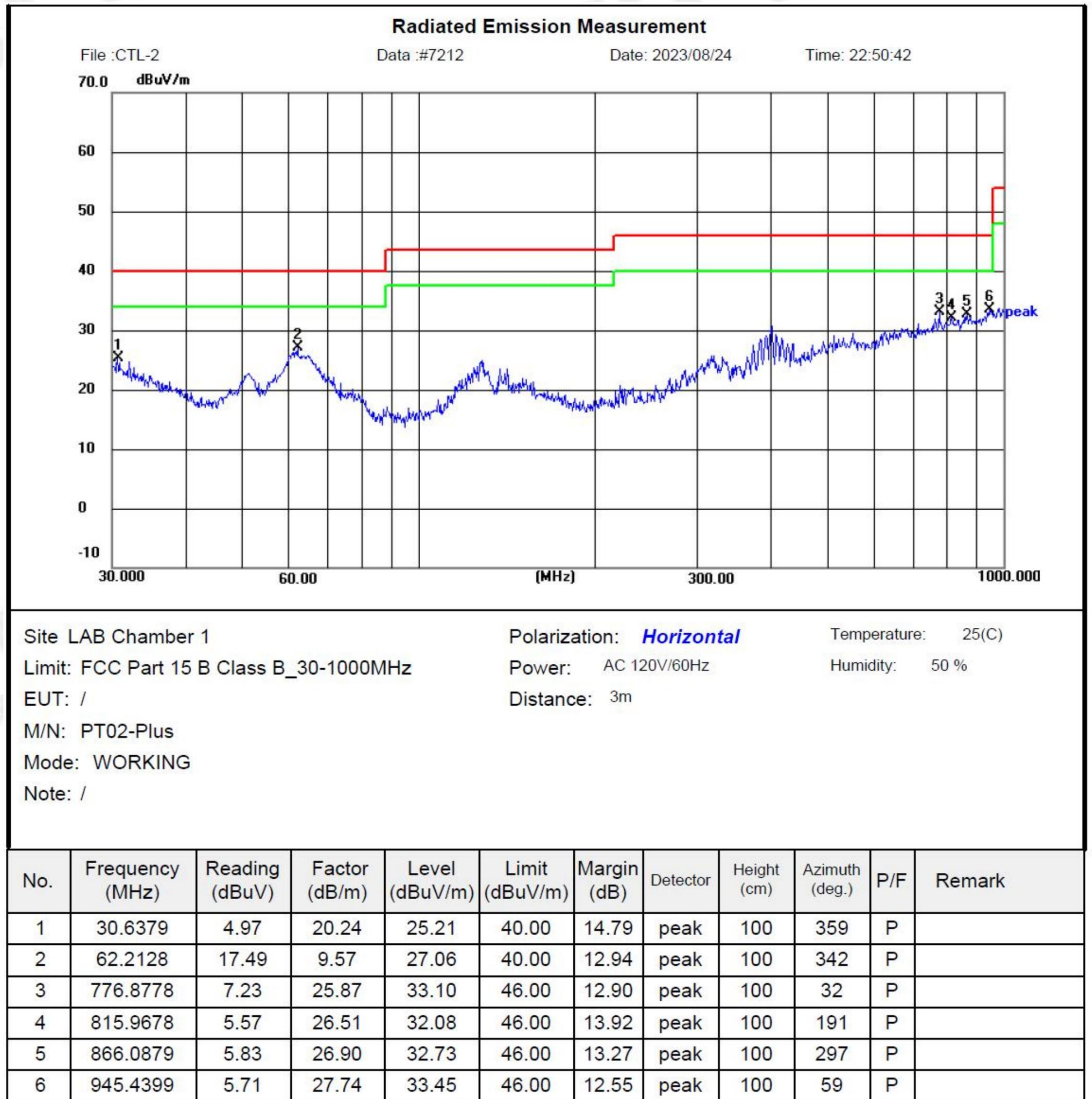
Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

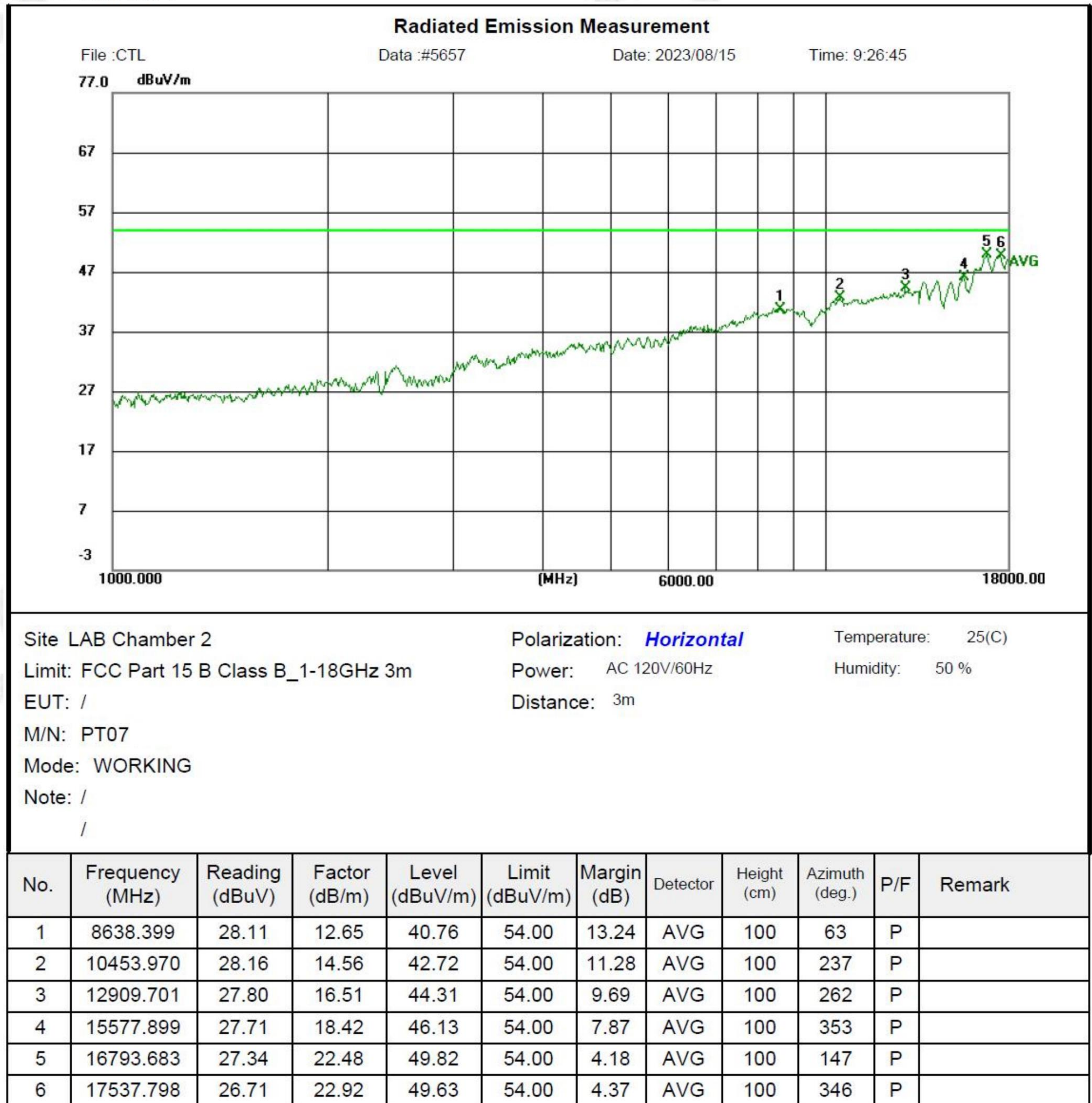
Radiation Test Results

30-1000MHz:





Above 1000MHz:



Radiated Emission Measurement

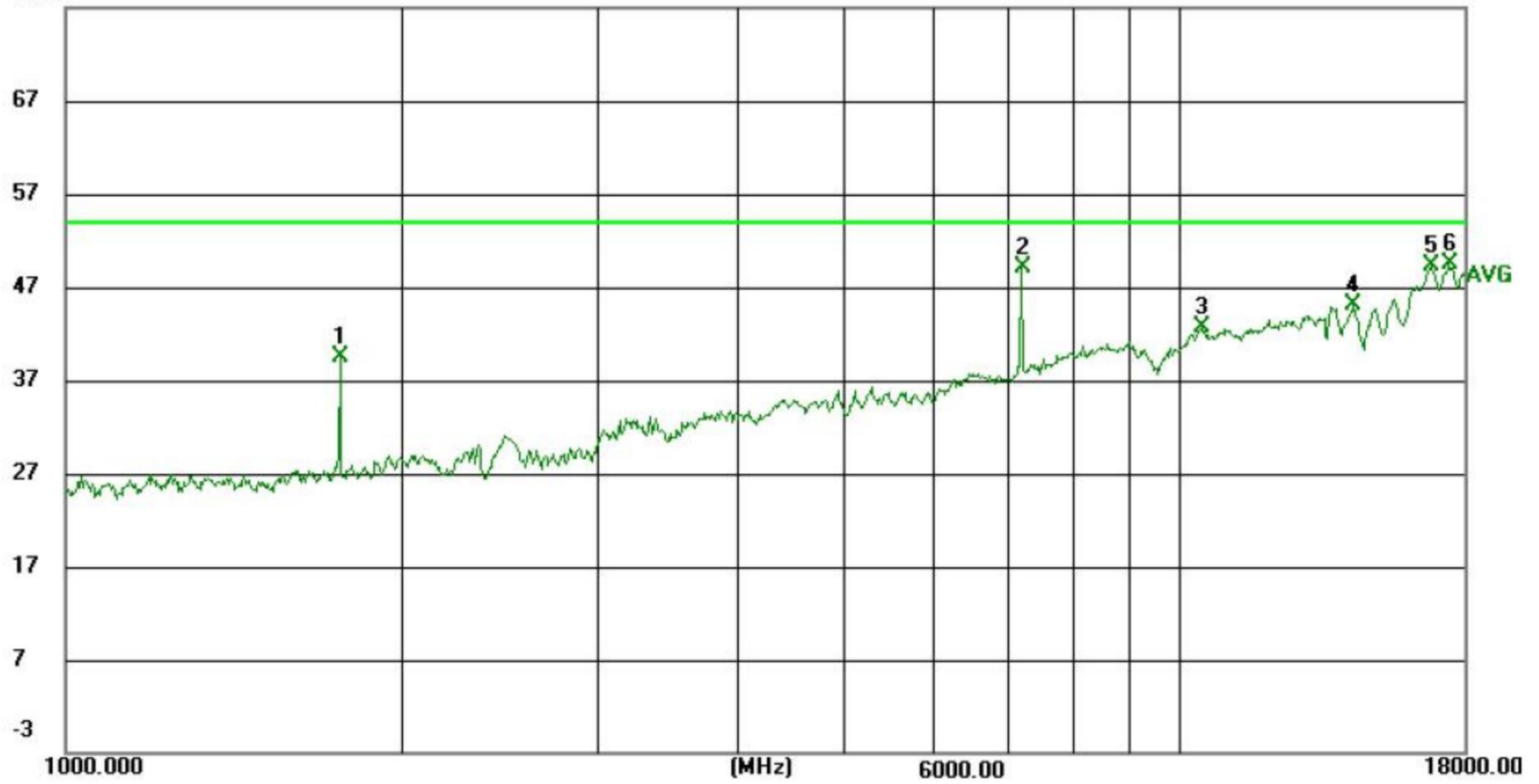
File :CTL

Data :#5658

Date: 2023/08/15

Time: 9:28:00

77.0 dBuV/m



Site LAB Chamber 2

Polarization: **Vertical**

Temperature: 25(C)

Limit: FCC Part 15 B Class B_1-18GHz 3m

Power: AC 120V/60Hz

Humidity: 50 %

EUT: /

Distance: 3m

M/N: PT07

Mode: WORKING

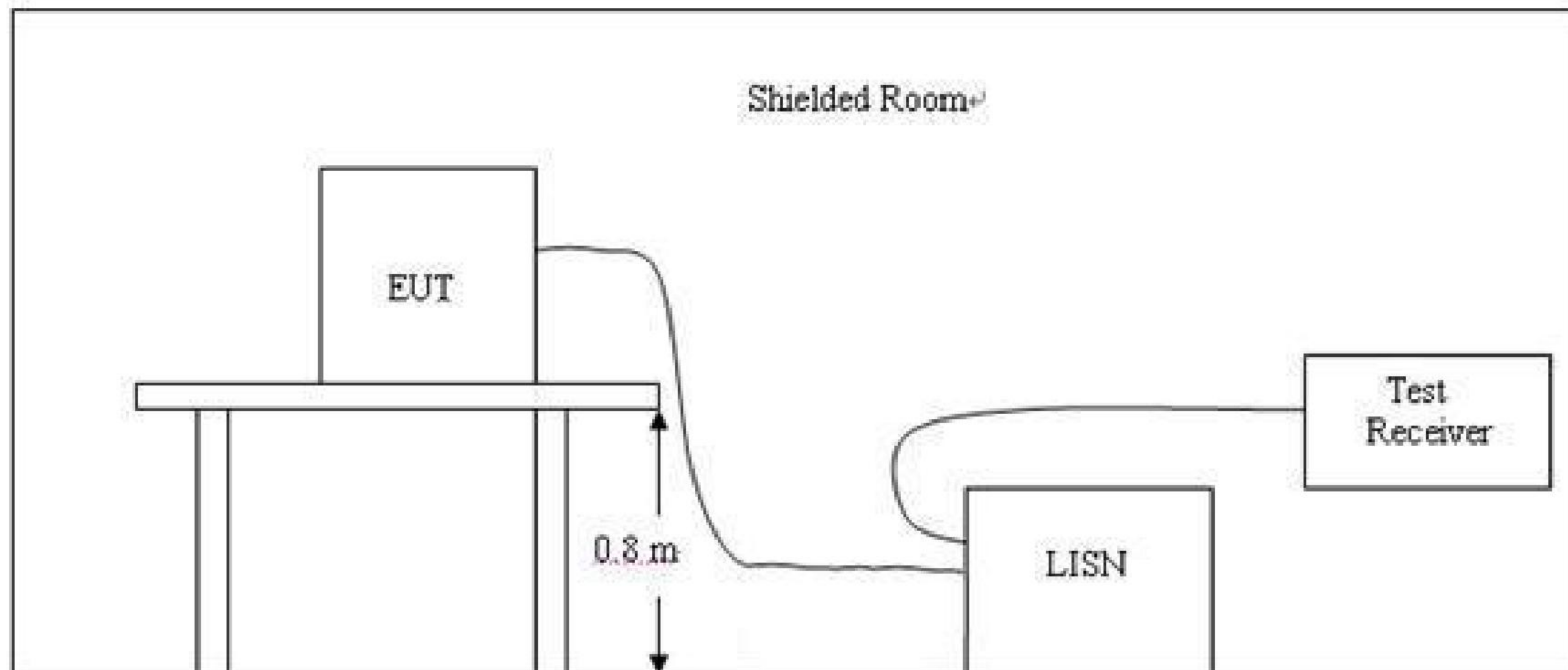
Note: /

/

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1762.112	44.89	-5.33	39.56	54.00	14.44	AVG	100	58	P	
2	7200.309	39.17	9.87	49.04	54.00	4.96	AVG	100	315	P	
3	10453.971	28.12	14.56	42.68	54.00	11.32	AVG	100	148	P	
4	14325.374	28.19	16.87	45.06	54.00	8.94	AVG	100	122	P	
5	16793.684	26.89	22.48	49.37	54.00	4.63	AVG	100	193	P	
6	17436.709	26.50	22.97	49.47	54.00	4.53	AVG	100	46	P	

4.2. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
- 2 Support equipment, if needed, was placed as per ANSI C63.4.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4 The EUT received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

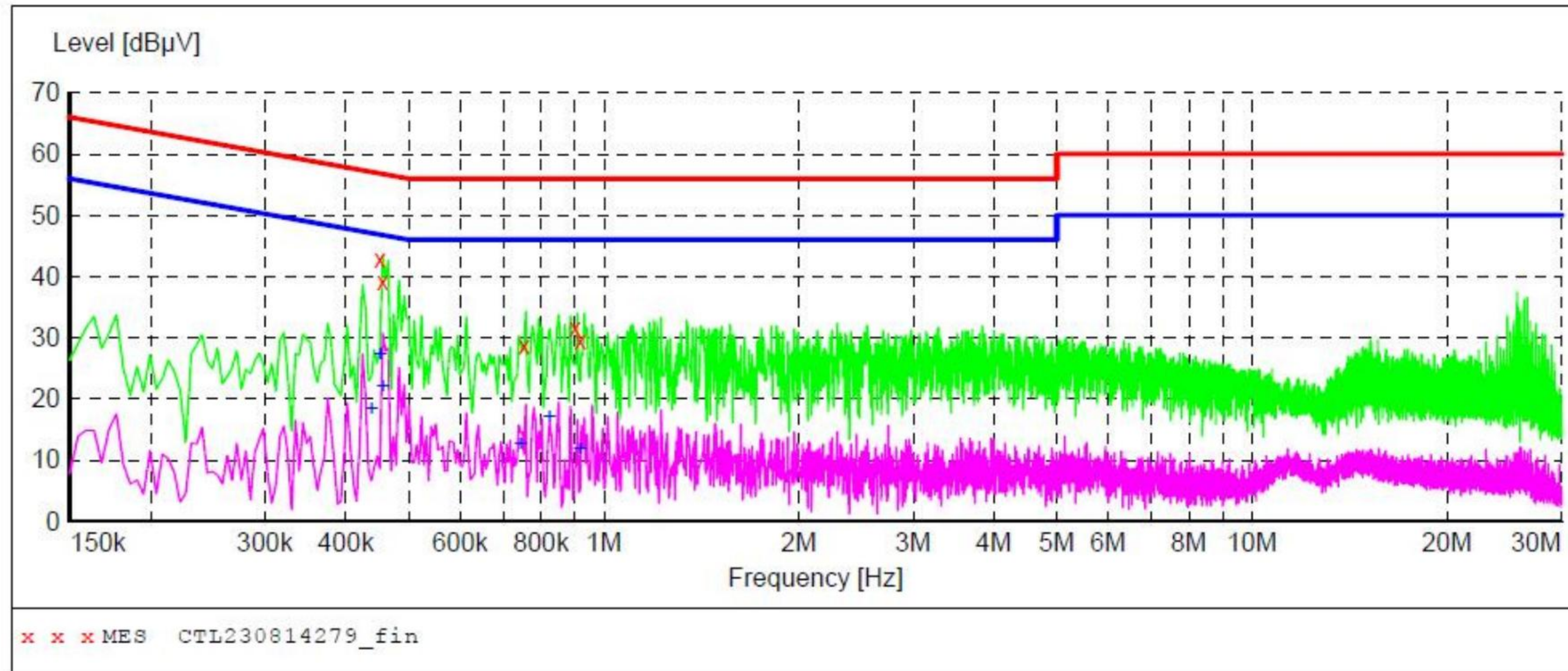
Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test FCC PART 15 B

EUT: PT07
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: YCJ
Test Specification: AC 120V/60Hz
Comment: /
Start of Test: 8/14/2023 / 7:22:05PM

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL230814279_fin"

8/14/2023 7:24PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.451500	42.90	10.0	57	13.9	QP	N	GND
0.456000	39.10	10.0	57	17.7	QP	N	GND
0.753000	28.60	10.1	56	27.4	QP	N	GND
0.901500	31.50	10.1	56	24.5	QP	N	GND
0.919500	29.40	10.1	56	26.6	QP	N	GND

MEASUREMENT RESULT: "CTL230814279_fin2"

8/14/2023 7:24PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.438000	18.50	10.0	47	28.6	AV	N	GND
0.451500	27.30	10.0	47	19.5	AV	N	GND
0.456000	22.20	10.0	47	24.6	AV	N	GND
0.744000	12.70	10.1	46	33.3	AV	N	GND
0.825000	17.20	10.1	46	28.8	AV	N	GND
0.919500	11.90	10.1	46	34.1	AV	N	GND

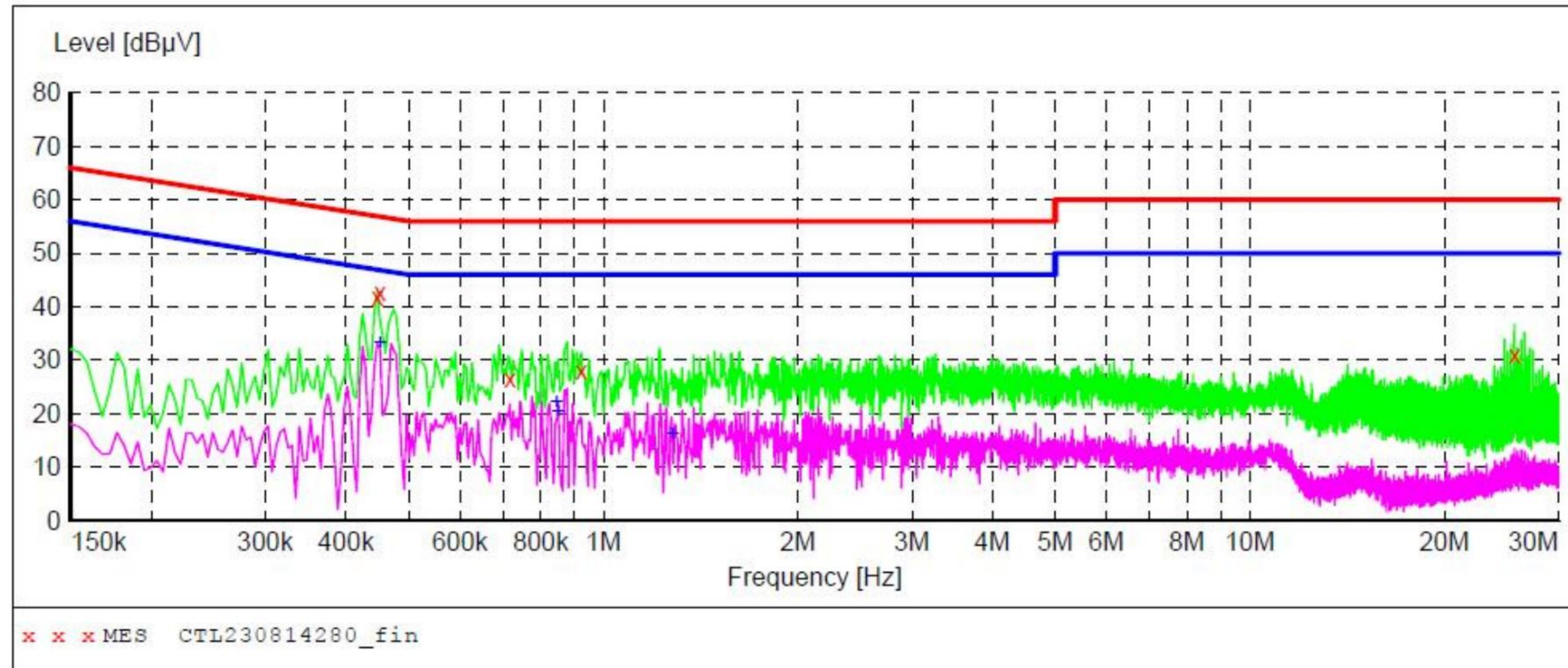
Shenzhen CTL Testing Technology Co., Ltd.

Voltage Mains Test FCC PART 15 B

EUT: PT07
Manufacturer: /
Operating Condition: WORKING
Test Site: /
Operator: YCJ
Test Specification: AC 120V/60Hz
Comment: /
Start of Test: 8/14/2023 / 7:25:11PM

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL230814280_fin"

8/14/2023 7:27PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.447000	41.80	10.0	57	15.1	QP	L1	GND
0.451500	42.80	10.0	57	14.0	QP	L1	GND
0.717000	26.60	10.1	56	29.4	QP	L1	GND
0.924000	27.90	10.1	56	28.1	QP	L1	GND
25.669500	30.90	11.5	60	29.1	QP	L1	GND

MEASUREMENT RESULT: "CTL230814280_fin2"

8/14/2023 7:27PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.451500	33.30	10.0	47	13.5	AV	L1	GND
0.847500	22.20	10.1	46	23.8	AV	L1	GND
0.852000	20.60	10.1	46	25.4	AV	L1	GND
1.279500	16.30	10.2	46	29.7	AV	L1	GND

5. Test Setup Photos of the EUT

Radiated Emission (30-1000MHz)



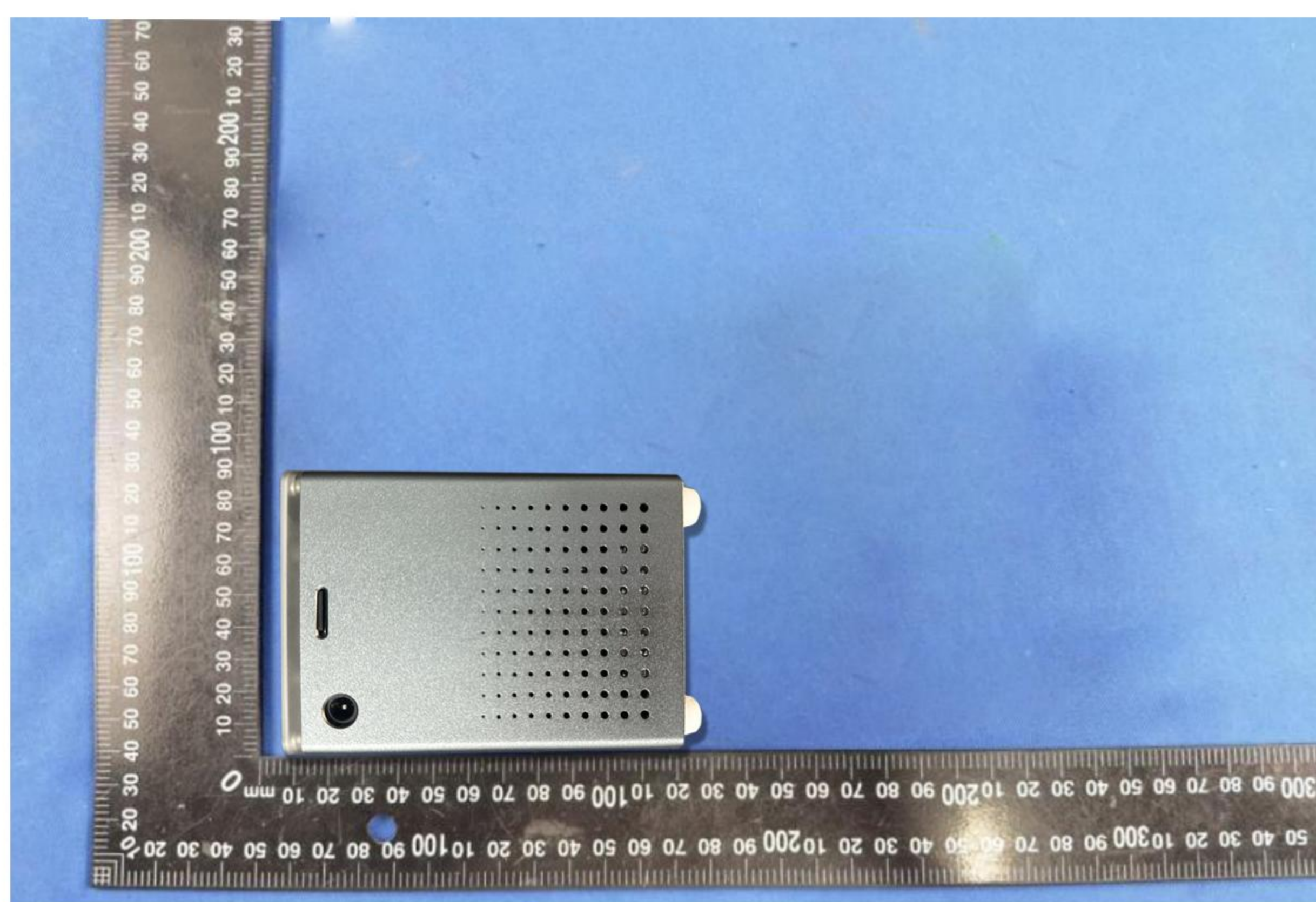
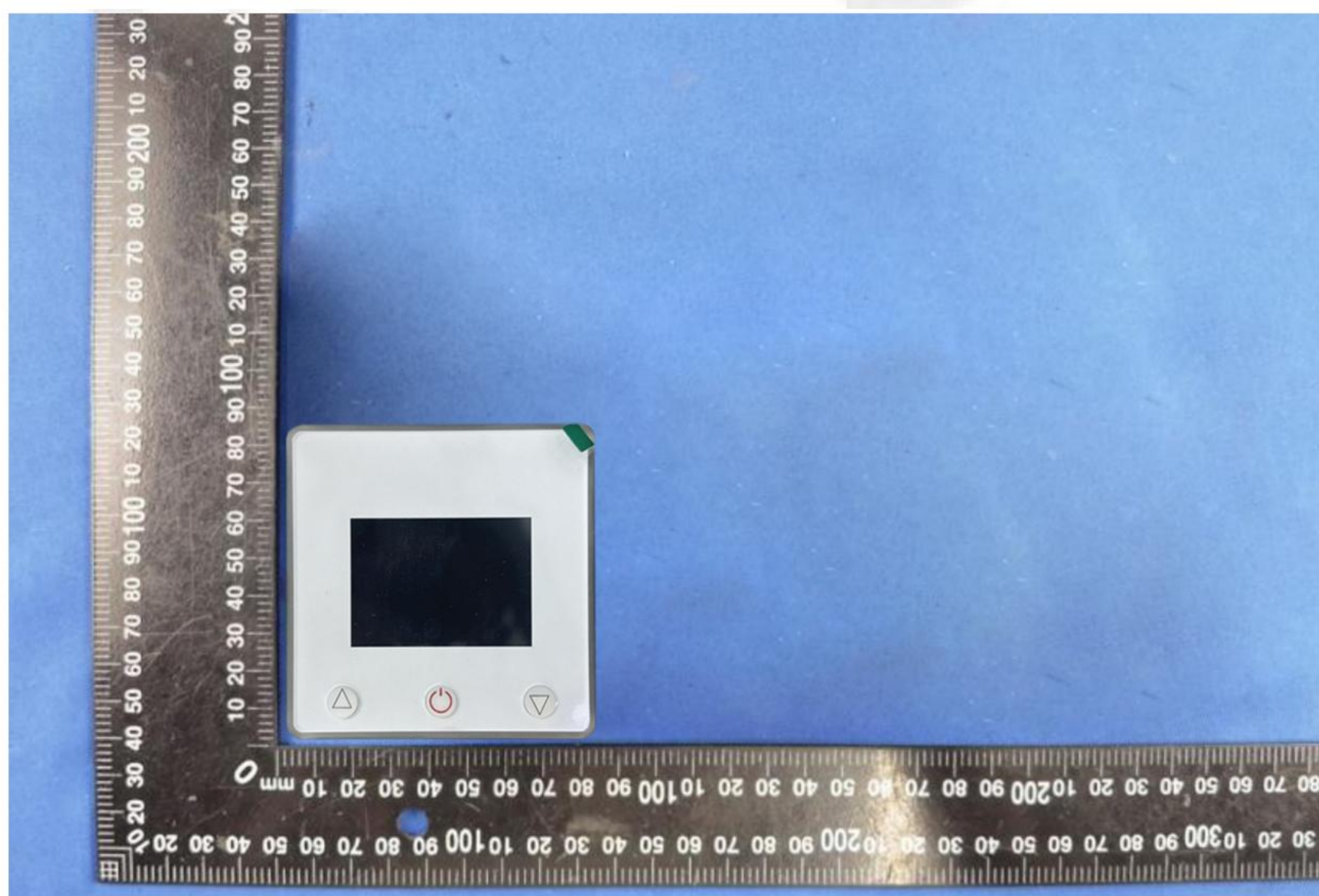
Radiated Emission (Above 1000MHz)

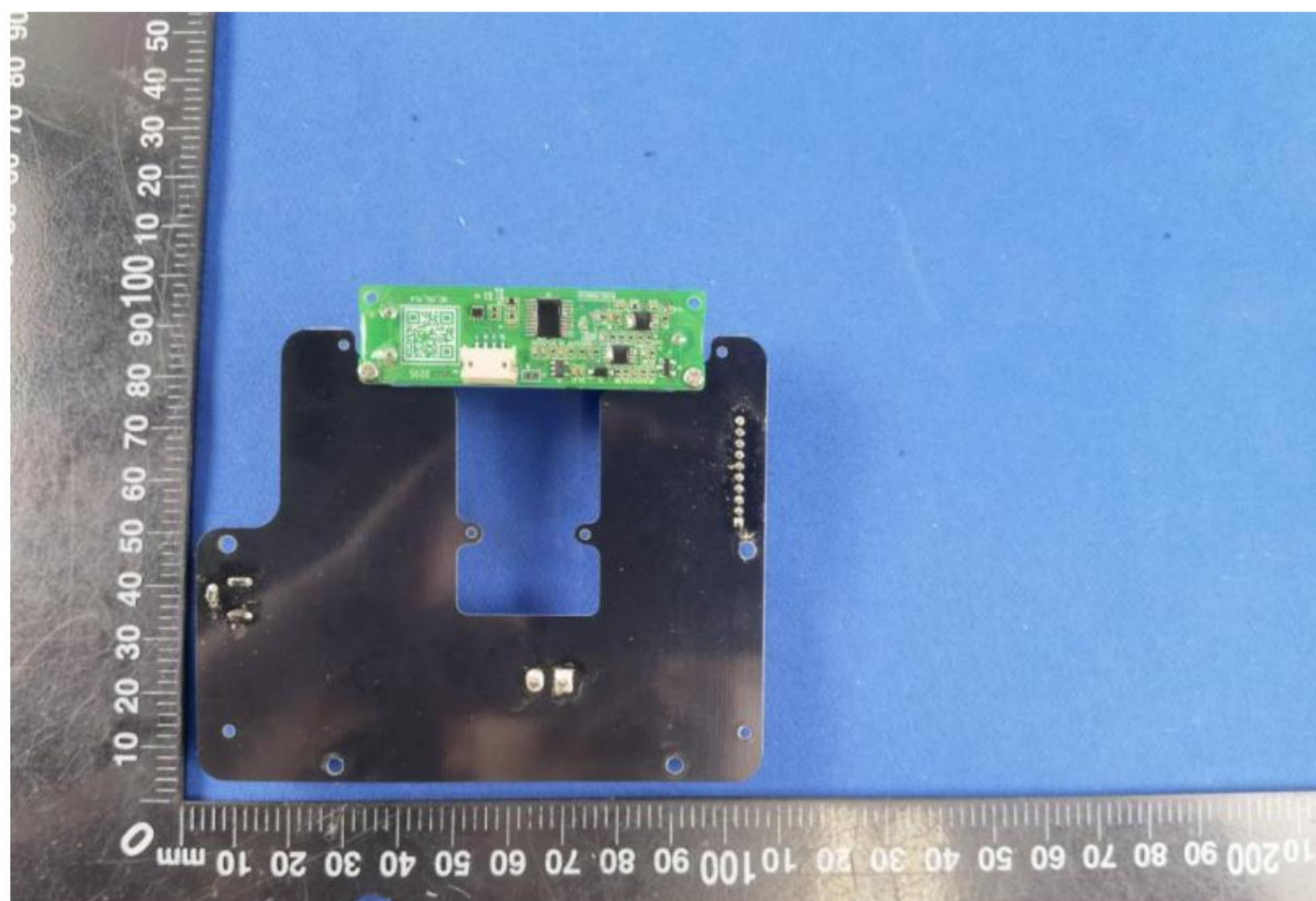
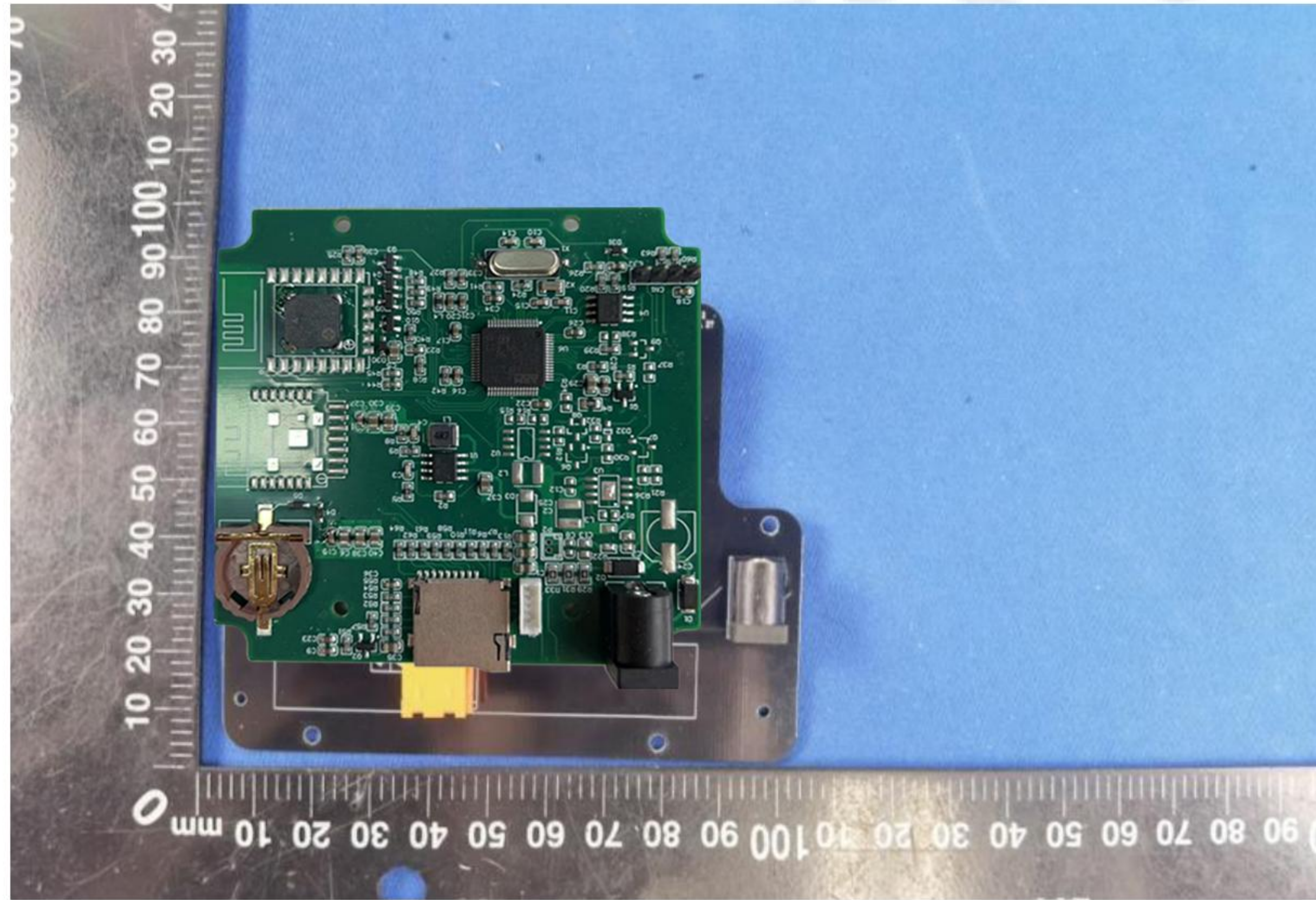


Conducted Emission



6. Photos of the EUT





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