



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2407-2
FCC ID : IHDT56AS3
STANDARD : FCC Part 15 Subpart C §15.209
CLASSIFICATION : (DCD) Part 15 Low Power Transmitter Below 1705 kHz
TEST DATE(S) : May 10, 2024 ~ May 22, 2024

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (ShenZhen)

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China



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History of this test report

Report No.	Version	Description	Issued Date
FR441212E	01	Initial issue of report	May 31, 2024



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	2.1049	20dB Bandwidth	Reporting Only	-
3.1	2.1049	99% Occupied Bandwidth	Reporting Only	-
3.2	15.209	Radiated Emission	Pass	Under limit 16.35 dB at 30.00 MHz
3.3	15.207	AC Conducted Emission	Pass	Under limit 12.35 dB at 0.15 MHz
3.4	15.203	Antenna Requirements	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Motorola Mobility LLC

222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC

222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2407-2
FCC ID	IHDT56AS3
IMEI Code	Conducted: 358858730015558-358858730015566 Conduction: 358858730015715/358858730015723 Radiation: 358858730015673/358858730015681
HW Version	DVT2
SW Version	U3UW34.46
WPT Frequency Range	115kHz~145kHz
WPT Type of Modulation	ASK
WPT Antenna Type	Loop Antenna
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.

1.5 Test Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-SZ TH01-SZ	CN1256	421272

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04SZ	CN1256	421272

1.6 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b



1.7 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.209, §15.207
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.
- ♦ ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

1.8 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola(chenyang)	Model Name	MC-681N
AC Adapter 1(EU)	Brand Name	Motorola(chenyang)	Model Name	MC-682N
AC Adapter 1(UK)	Brand Name	Motorola(chenyang)	Model Name	MC-683N
AC Adapter 1(AU)	Brand Name	Motorola(chenyang)	Model Name	MC-685N
AC Adapter 1(AR)	Brand Name	Motorola(chenyang)	Model Name	MC-686N
AC Adapter 1(Chile)	Brand Name	Motorola(chenyang)	Model Name	MC-689N
AC Adapter 2(US)	Brand Name	Motorola(Acbel)	Model Name	MC-681N
AC Adapter 2(EU)	Brand Name	Motorola(Acbel)	Model Name	MC-682N
AC Adapter 2(UK)	Brand Name	Motorola(Acbel)	Model Name	MC-683N
AC Adapter 2(AU)	Brand Name	Motorola(Acbel)	Model Name	MC-685N
AC Adapter 2(AR)	Brand Name	Motorola(Acbel)	Model Name	MC-686N
Battery 1	Brand Name	Motorola(SUNWODA)	Model Name	QR50
Battery 2	Brand Name	Motorola(ATL)	Model Name	QR50
USB Cable 1	Brand Name	Motorola (Luxshare)	Model Name	SC18E08104
USB Cable 2	Brand Name	Motorola (Saibao)	Model Name	SC18D71644



2 Test Configuration of Equipment Under Test

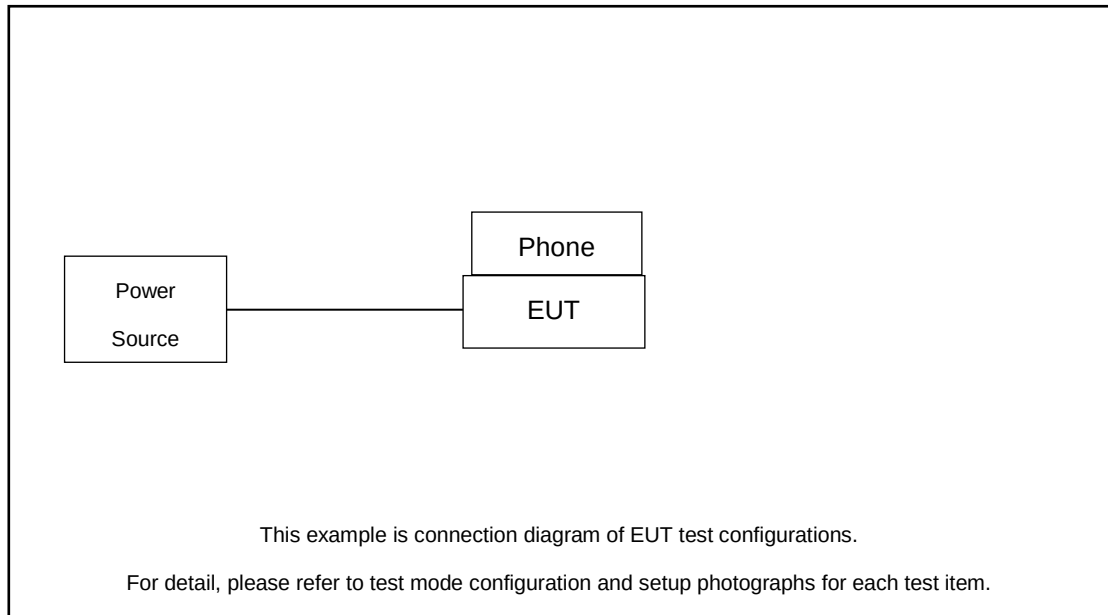
2.1 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 1000 MHz).
- b. AC power line Conducted Emission was tested under maximum output power.

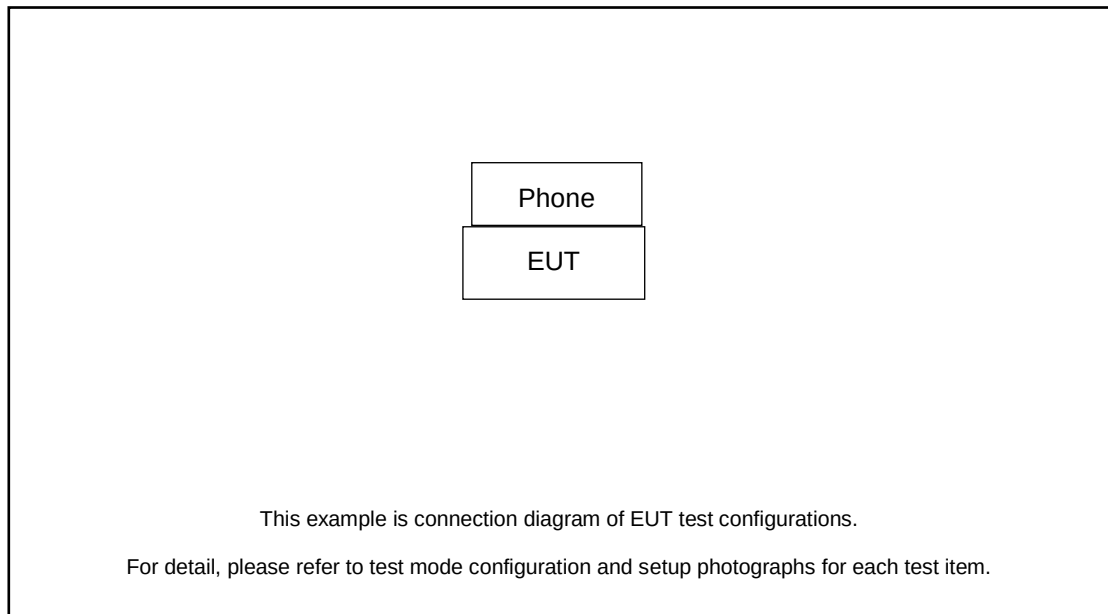
Test Items	Function Type
AC Conducted Emission	Mode 1: WPC + Reverse charge + USB Cable 1 (Charging from Adapter1)
Radiated Emission	Mode 1: WPC + Reverse charge

2.2 Connection Diagram of Test System

For Conducted Emission:



For Radiated Emission:



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Mobile Phone (WPT Client)	N/A	N/A	N/A	N/A	N/A

3 Test Result

3.1 20dB and 99% Occupied Bandwidth Measurement

3.1.1 Limit of 20dB and 99% Occupied Bandwidth

Reporting only, 99% OBW shall not located within 15.205 restricted bands.

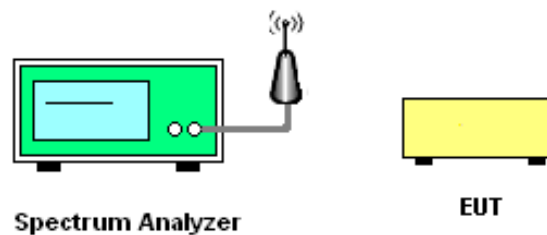
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The 20dB bandwidth is measured with a spectrum analyzer connected via a receiver antenna placed near the EUT while wirelessly charging a charging board.
2. Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
3. Measure and record the results in the test report.

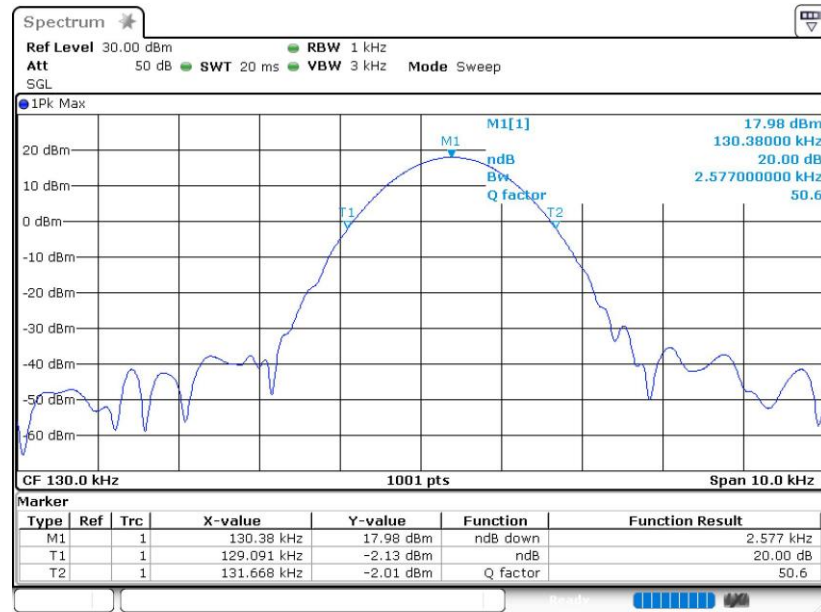
3.1.4 Test Setup





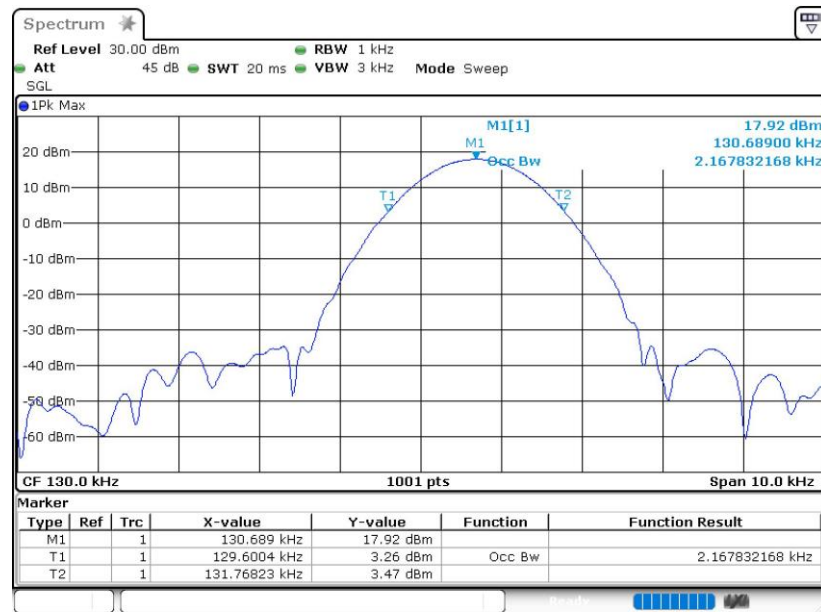
3.1.5 Test Result of 20dB and 99% Bandwidth

20 dB Bandwidth Plot



Date: 17.MAY.2024 10:18:44

99% Occupied Bandwidth Plot



Date: 17.MAY.2024 10:05:56

3.2 Radiated Emission Measurement

3.2.1 Limit of Radiated Emission

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (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

Receiver Parameter	Setting
Frequency Range: 9kHz~150kHz	RBW 200Hz for QP
Frequency Range: 150kHz~30MHz	RBW 9kHz for QP
Frequency Range: 30MHz~1000MHz	RBW 120kHz for Peak

Note: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For radiated emissions from 9kHz to 1GHz test distance is 3m

For 9kHz ~ 30MHz

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);
3. specific line (dB μ V/m) = $20 \log$ Emission level (μ V/m)
4. Limit line = specific limits (dB μ V/m) + distance extrapolation factor.

3.2.2 Measuring Instruments

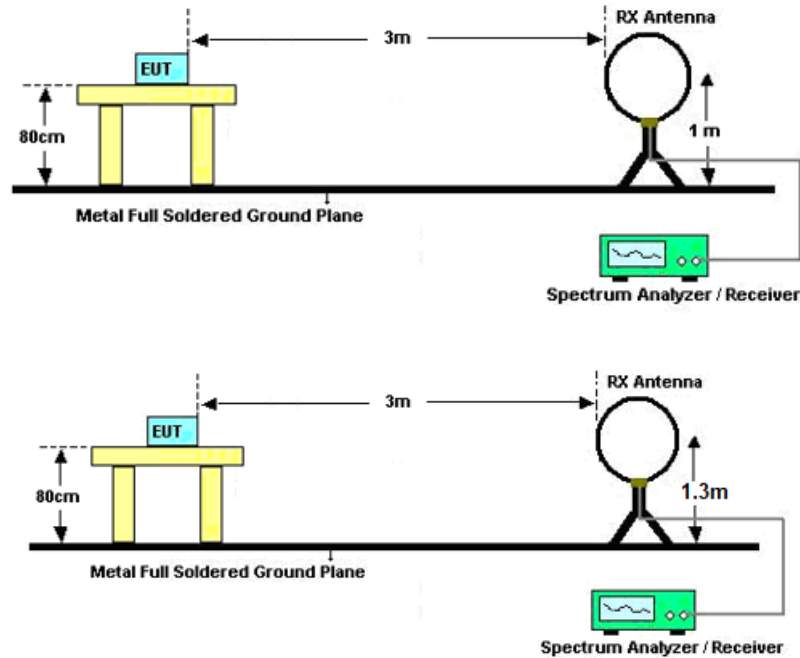
See list of measuring equipment of this test report.

3.2.3 Measuring Instrument Setting

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.2.4 Test Setup of Radiated Emission

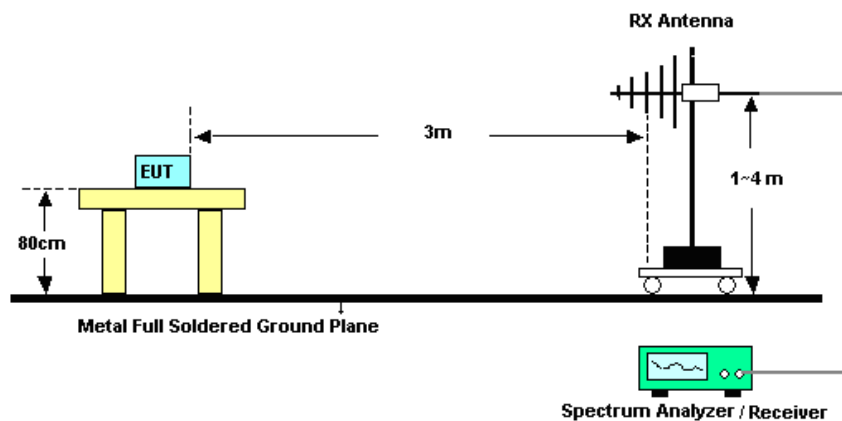
For radiated emissions below 30MHz



Note:

1. There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.
2. Tested for radiated below 30 MHz using a loop antenna in accordance with C63.10, the antenna was positioned in three antenna orientations: horizontal, vertical, and ground-parallel three polarization's, the worst case is horizontal & vertical polarization, test data of two mode was reported.

For radiated emissions above 30MHz

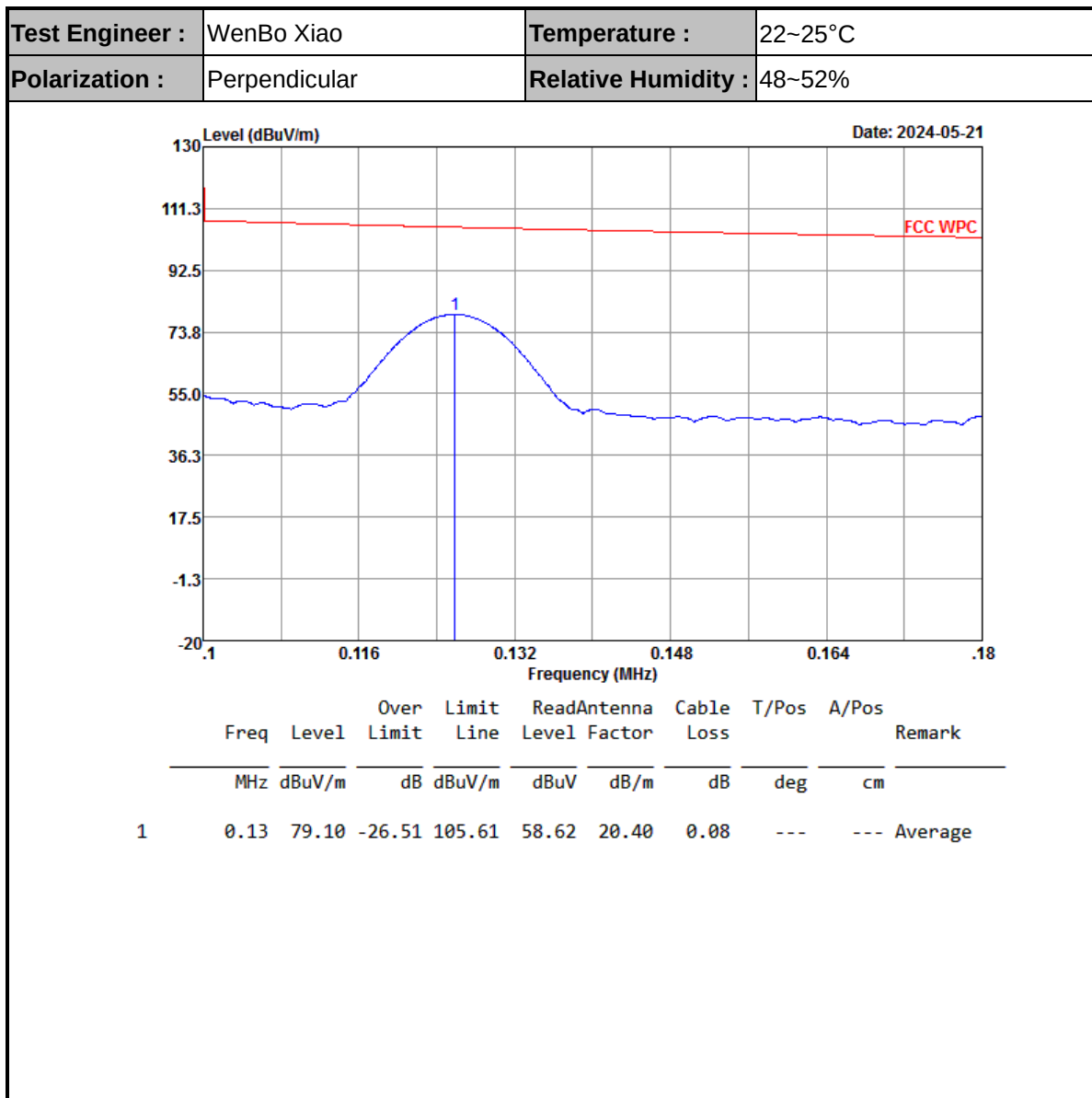




3.2.5 Test Result of Fundamental Emission

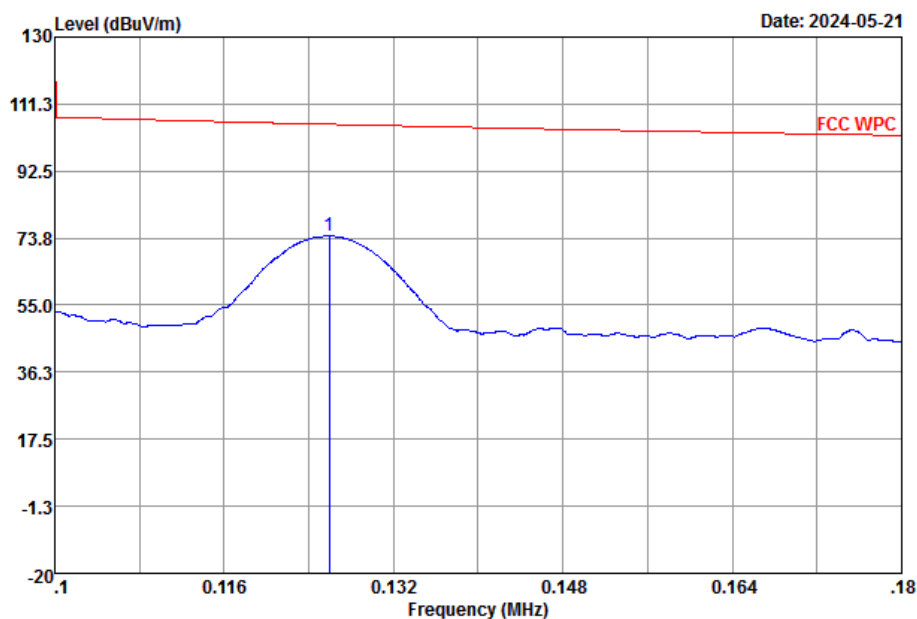
Frequency (MHz)	Level @3m (dBuV/m)	Distance Factor (dB)	Corrected Level @300m (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Remark	Pol/Phase
0.12584	79.1	-80	-0.9	25.61	-26.51	58.62	20.4	0.08	Average	Perpendicular
0.12592	74.3	-80	-5.7	25.61	-31.30	53.82	20.4	0.08	Average	Parallel

Note: The field strength is tested at 3m distance then convert to 300m by adding distance factor $40 \cdot \log(d1/d2)$.





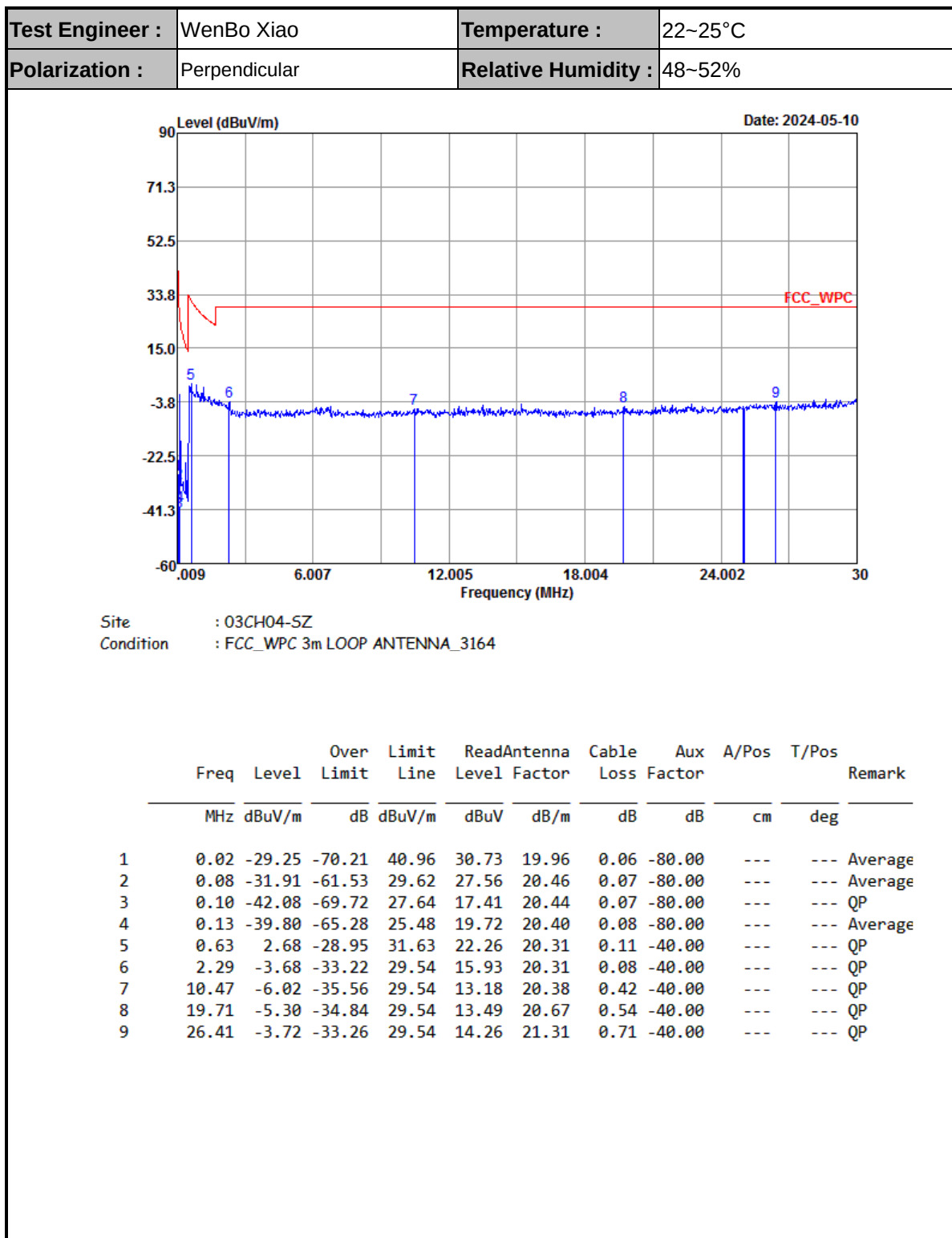
Test Engineer :	WenBo Xiao	Temperature :	22~25°C
Polarization :	Parallel	Relative Humidity :	48~52%



	Freq	Level	Over	Limit	ReadAntenna	Cable	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	deg	cm
1	0.13	74.30	-31.30	105.60	53.82	20.40	0.08	---	---

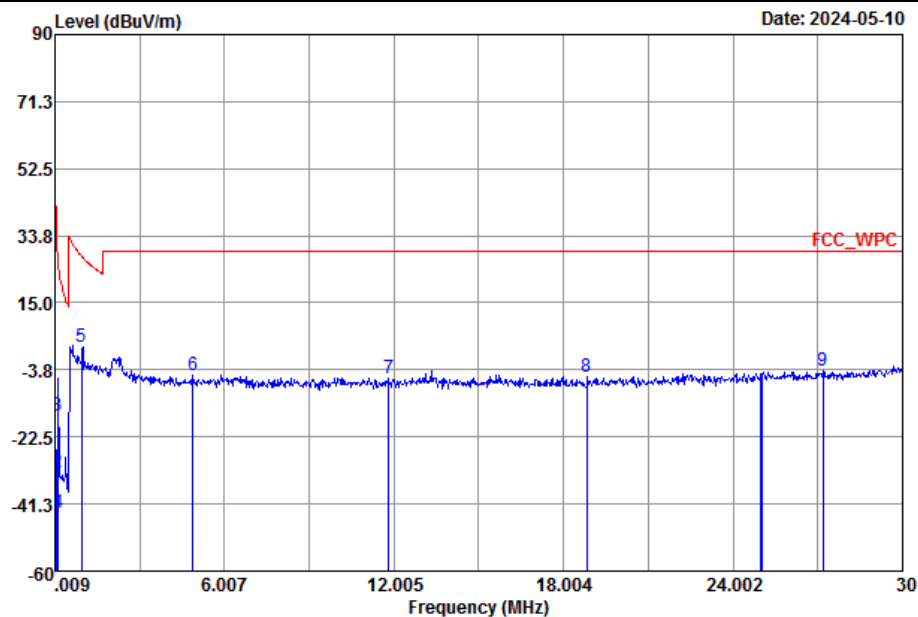


3.2.6 Test Result of Radiated Emission (9kHz ~ 30MHz)





Test Engineer :	WenBo Xiao	Temperature :	22~25°C
Polarization :	Parallel	Relative Humidity :	48~52%



Site : 03CH04-SZ
Condition : FCC_WPC 3m LOOP ANTENNA_3164

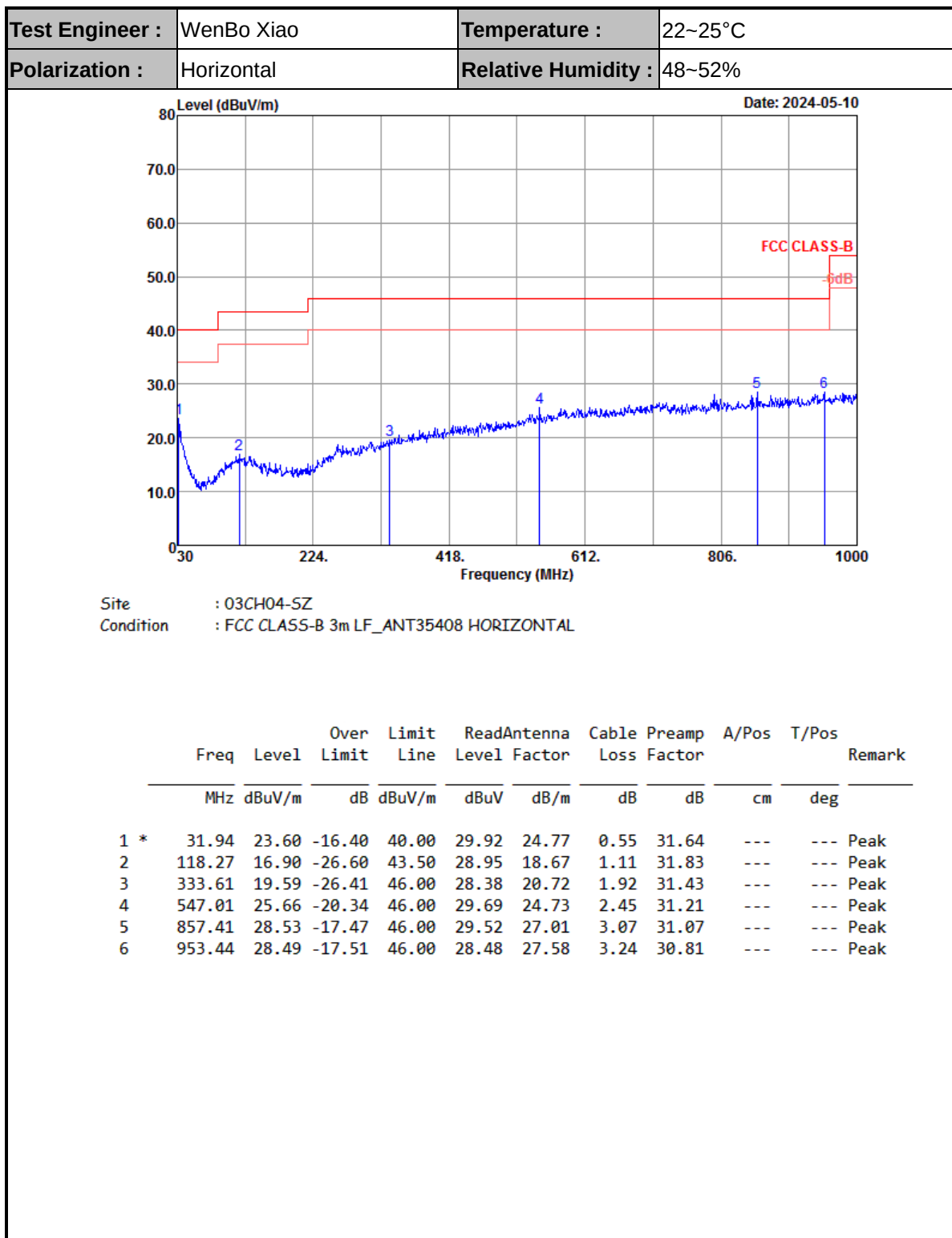
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Aux Loss	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	0.01	-31.20	-77.44	46.24	28.78	19.96	0.06	-80.00	---	--- Average
2	0.08	-32.57	-62.18	29.61	26.90	20.46	0.07	-80.00	---	--- Average
3	0.09	-16.71	-44.91	28.20	42.78	20.44	0.07	-80.00	---	--- QP
4	0.13	-43.58	-69.06	25.48	15.94	20.40	0.08	-80.00	---	--- Average
5	0.95	2.55	-25.46	28.01	22.12	20.31	0.12	-40.00	---	--- QP
6	4.89	-5.30	-34.84	29.54	14.31	20.30	0.09	-40.00	---	--- QP
7	11.81	-6.15	-35.69	29.54	13.00	20.42	0.43	-40.00	---	--- QP
8	18.84	-5.62	-35.16	29.54	13.20	20.66	0.52	-40.00	---	--- QP
9	27.18	-4.07	-33.61	29.54	13.81	21.40	0.72	-40.00	---	--- QP

Note:

1. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

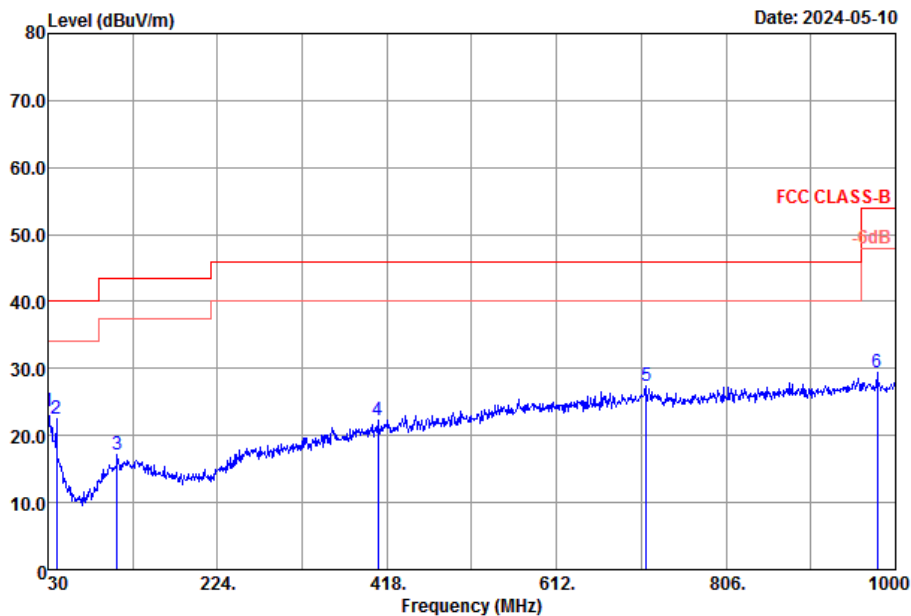


3.2.7 Test Result of Radiated Emission (30MHz ~ 1000MHz)





Test Engineer :	WenBo Xiao	Temperature :	22~25°C
Polarization :	Vertical	Relative Humidity :	48~52%



Site : 03CH04-SZ
Condition : FCC CLASS-B 3m LF_ANT35408 VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 *	30.00	23.65	-16.35	40.00	28.84	25.88	0.53	31.60	---	Peak
2	39.70	22.52	-17.48	40.00	33.35	20.35	0.61	31.79	---	Peak
3	109.54	17.16	-26.34	43.50	29.58	18.37	1.07	31.86	---	Peak
4	407.33	22.39	-23.61	46.00	29.24	22.53	2.12	31.50	---	Peak
5	714.82	27.41	-18.59	46.00	29.79	26.03	2.79	31.20	---	Peak
6	978.66	29.44	-24.56	54.00	29.24	27.78	3.28	30.86	---	Peak

3.3 AC Conducted Emission Measurement

3.3.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

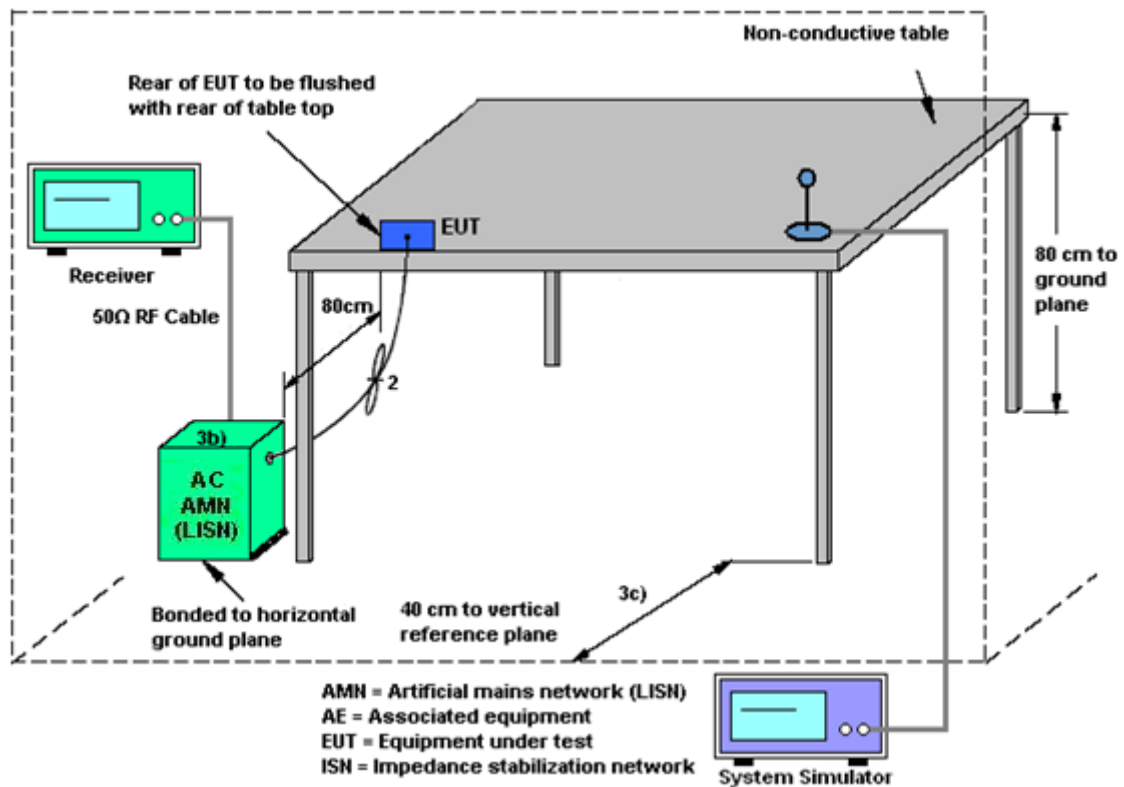
3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

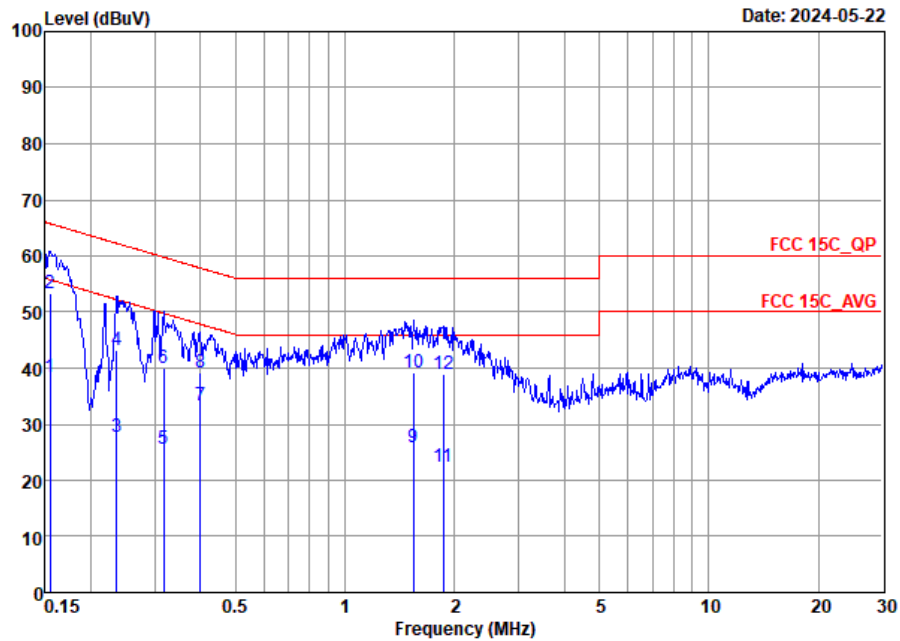
3.3.4 Test Setup





3.3.5 Test Result of AC Conducted Emission

Test Engineer :	Yuki Tang	Temperature :	22~24°C
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

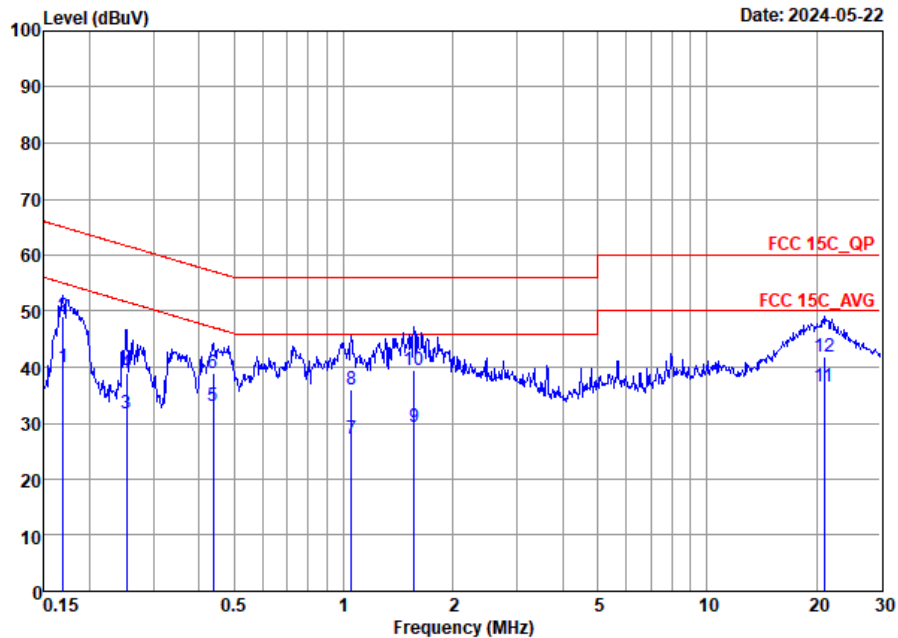


Site : CO01-SZ
Condition: FCC 15C_QP AC LISN 100063_L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	38.49	-17.25	55.74	18.00	10.35	10.14	Average
2 *	0.15	53.39	-12.35	65.74	32.90	10.35	10.14	QP
3	0.24	27.78	-24.48	52.26	7.41	10.22	10.15	Average
4	0.24	43.18	-19.08	62.26	22.81	10.22	10.15	QP
5	0.32	25.56	-24.24	49.80	5.29	10.11	10.16	Average
6	0.32	40.06	-19.74	59.80	19.79	10.11	10.16	QP
7	0.40	33.31	-14.55	47.86	12.70	10.45	10.16	Average
8	0.40	39.21	-18.65	57.86	18.60	10.45	10.16	QP
9	1.54	25.88	-20.12	46.00	5.00	10.68	10.20	Average
10	1.54	39.18	-16.82	56.00	18.30	10.68	10.20	QP
11	1.86	22.38	-23.62	46.00	1.50	10.66	10.22	Average
12	1.86	38.88	-17.12	56.00	18.00	10.66	10.22	QP



Test Engineer :	Yuki Tang	Temperature :	22~24°C
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15C_QP AC LISN 100063_N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	40.03	-14.96	54.99	19.40	10.49	10.14	Average
2	0.17	49.13	-15.86	64.99	28.50	10.49	10.14	QP
3	0.25	31.83	-19.81	51.64	11.50	10.18	10.15	Average
4	0.25	39.03	-22.61	61.64	18.70	10.18	10.15	QP
5	0.44	32.96	-14.15	47.11	12.79	10.01	10.16	Average
6	0.44	38.86	-18.25	57.11	18.69	10.01	10.16	QP
7	1.05	27.28	-18.72	46.00	6.91	10.21	10.16	Average
8	1.05	35.88	-20.12	56.00	15.51	10.21	10.16	QP
9	1.56	29.26	-16.74	46.00	8.59	10.46	10.21	Average
10	1.56	39.36	-16.64	56.00	18.69	10.46	10.21	QP
11 *	21.04	36.51	-13.49	50.00	15.80	10.11	10.60	Average
12	21.04	41.91	-18.09	60.00	21.20	10.11	10.60	QP

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



3.4 Antenna Requirements

3.4.1 Standard Applicable

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 18, 2023	May 10, 2024~ May 21, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY551502 13	10Hz~44GHz	Jul. 07, 2023	May 10, 2024~ May 21, 2024	Jul. 06, 2024	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 28, 2022	May 10, 2024~ May 21, 2024	Jun. 27, 2024	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May. 09, 2024	May 10, 2024~ May 21, 2024	May. 08, 2025	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2023	May 10, 2024~ May 21, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F11905001 9	N/A	Oct. 18, 2023	May 10, 2024~ May 21, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	May 10, 2024~ May 21, 2024	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	May 10, 2024~ May 21, 2024	NCR	Radiation (03CH04-SZ)
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 09, 2024	May 17, 2024	Apr. 08, 2025	Conducted (TH01-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 06, 2023	May 22, 2024	Jul. 05, 2024	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Aug. 21, 2023	May 22, 2024	Aug. 20, 2024	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 16, 2023	May 22, 2024	Oct. 15, 2024	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Jul. 07, 2023	May 22, 2024	Jul. 06, 2024	Conduction (CO01-SZ)

NCR: No Calibration Required



5 Measurement Uncertainty

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Occupied Channel Bandwidth	± 0.012 MHz

Uncertainty of AC Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.5dB
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Uncertainty of Radiated Emission Measurement (9 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.1 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.1 dB
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