



TEST REPORT

Applicant Name : Vanstone Electronic (Beijing) Co., Ltd.
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Haidian District, Beijing, China 100195
Report Number : SZXX1220215-04503-00D
FCC ID: OWLV73

Test Standard (s)
FCC PART 15C

Sample Description

Product: Wireless POS Terminal
Tested Model: V73
Trademark: Aisino
Date Received: 2022-02-15
Date of Test: 2022-02-18 to 2022-03-09
Report Date: 2022-03-22

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Black Ding

Black Ding
EMC Engineer

Approved By:

Candy Li

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

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TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
SYSTEM TEST CONFIGURATION.....	5
JUSTIFICATION	5
EUT EXERCISE SOFTWARE	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
TEST EQUIPMENT LIST	8
FCC§15.203 - ANTENNA REQUIREMENT.....	9
APPLICABLE STANDARD	9
ANTENNA CONNECTED CONSTRUCTION	9
FCC §15.207 – AC LINE CONDUCTED EMISSION	10
APPLICABLE STANDARD	10
EUT SETUP.....	10
EMI TEST RECEIVER SETUP.....	10
TEST PROCEDURE	11
CORRECTED FACTOR & MARGIN CALCULATION	11
TEST DATA	11
FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST	14
APPLICABLE STANDARD	14
EUT SETUP.....	14
EMI TEST RECEIVER SETUP.....	15
CORRECTED AMPLITUDE & MARGIN CALCULATION	15
TEST DATA	15
FCC§15.225(E) - FREQUENCY STABILITY.....	27
APPLICABLE STANDARD	27
TEST PROCEDURE	27
TEST DATA	27
FCC§15.215(C) - 20DB EMISSION BANDWIDTH	28
REQUIREMENT	28
TEST PROCEDURE	28
TEST DATA	28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Wireless POS Terminal
Trademark	Aisino
Tested Model	V73
Frequency Range	13.56 MHz
Modulation Technique	ASK
Voltage Range	DC3.6V by battery or DC 5V from adapter.
Sample serial number	SZXX1220215-04503E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter Information	Model: SW-0983 Input: 100-240V~, 50/60Hz, 0.5A Output: DC 5V, 2A

Objective

This Type approval report is in accordance with Part 2- Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The objective is to determine the compliance of the EUT with FCC rules, section 15.203, 15.205, 15.207, 15.209 and 15.225.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		0.082×10^{-7}
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
Temperature		1°C
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

No Exercise Software was used.

Equipment Modifications

No modification on the EUT.

Support Equipment List and Details

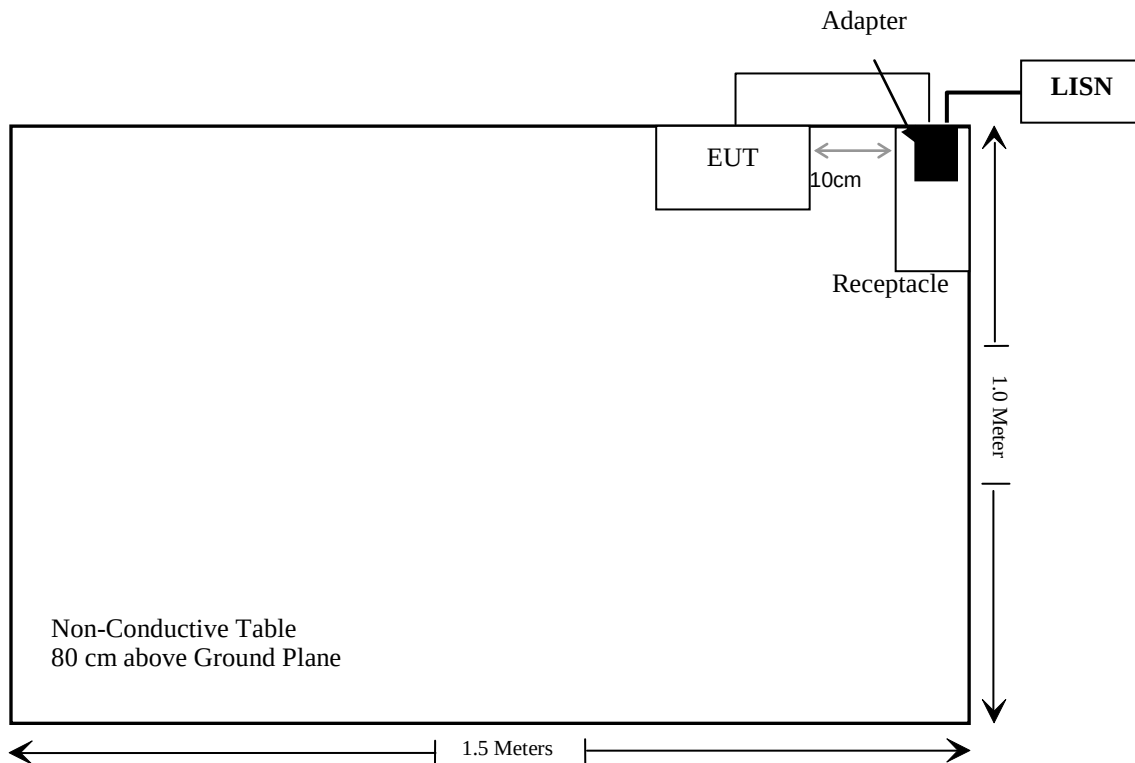
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

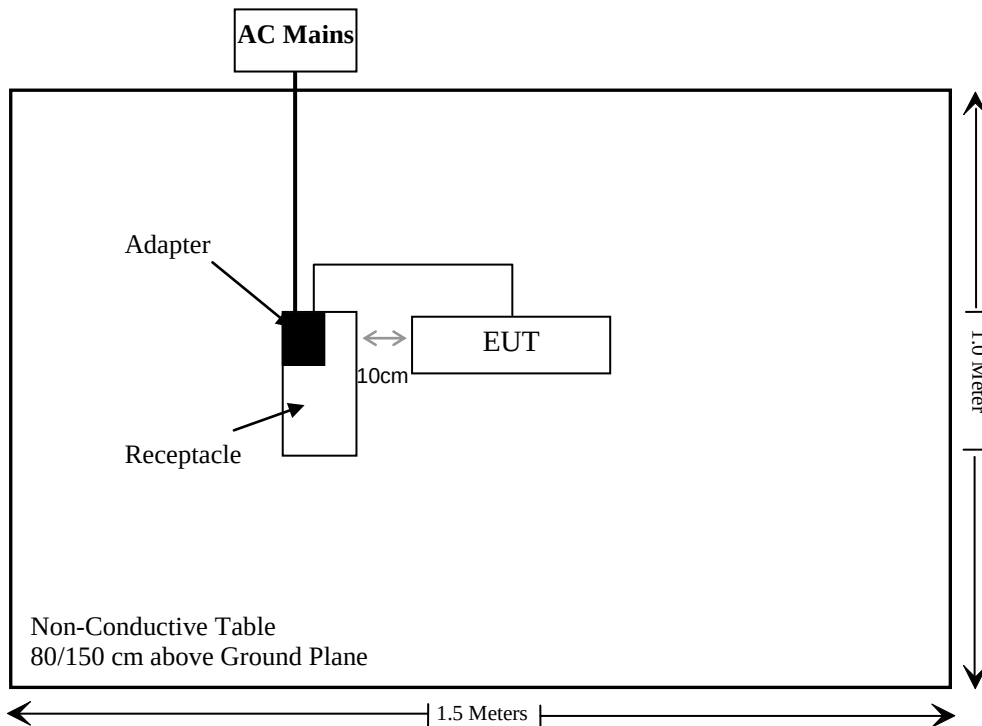
Cable Description	Length (m)	From Port	To
Unshielded Detachable USB Cable	1.2	Adapter	EUT

Block Diagram of Test Setup

For conducted emission:



For radiated emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207	AC Line Conducted Emission	Compliant
§15.225 §15.209 §15.205	Radiated Emission Test	Compliant
§15.225(e)	Frequency Stability	Compliant
§15.215(c)	20dB Emission Bandwidth	Compliant

Note: Per FCC Part 15B, pre-test for resistive screen and capacitive screen, and the worst case about maximum emission is resistive screen, which was recorded in this report.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emission Test & Frequency Stability Test					
Rohde & Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
SCHWARZBECK	LOOP ANTENNA	FMZB1516	1516131	2021/12/22	2024/12/21
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Fluke	Desktop Multi Meter	45	7664009	2021/12/13	2022/12/12
UNI-T	DC Power Supply	UTP8305B	10584	NCR	NCR
Gongwen	Temp. & Humid. Chamber	HSD-500	109	2021/12/14	2022/12/13
Radiated Emission Test Software: e3 19821b (V9)					

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

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.

Antenna Connected Construction

The EUT has one internal antenna arrangement for NFC, which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

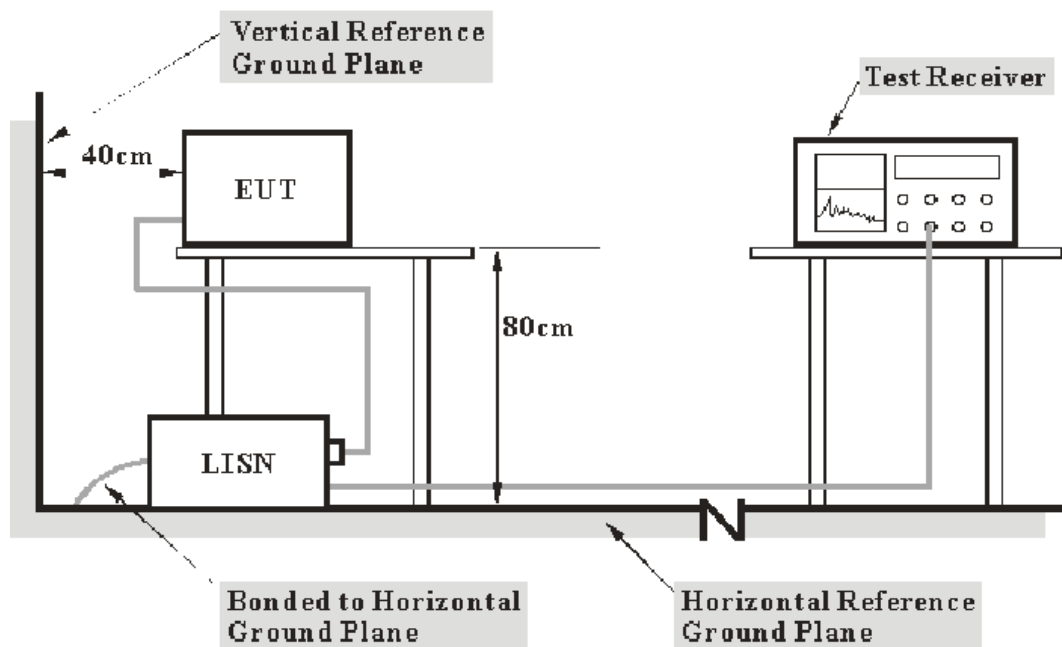
Result: Compliant.

FCC §15.207 – AC LINE CONDUCTED EMISSION

Applicable Standard

FCC§15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss}$$

The “**Over limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Read Level} + \text{Factor}\end{aligned}$$

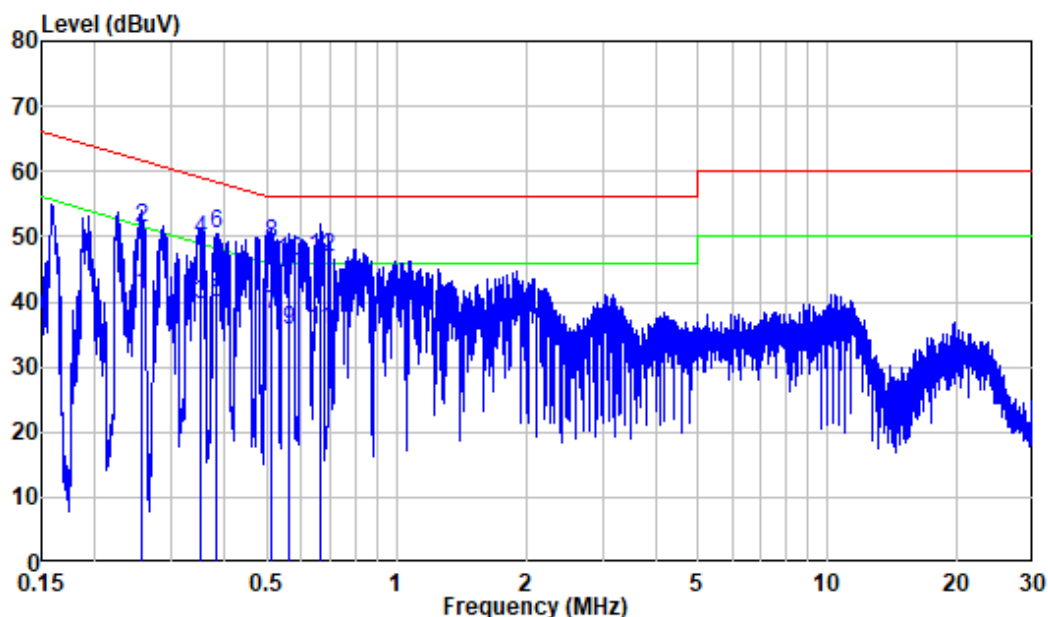
Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	53 %
ATM Pressure:	101.3 kPa

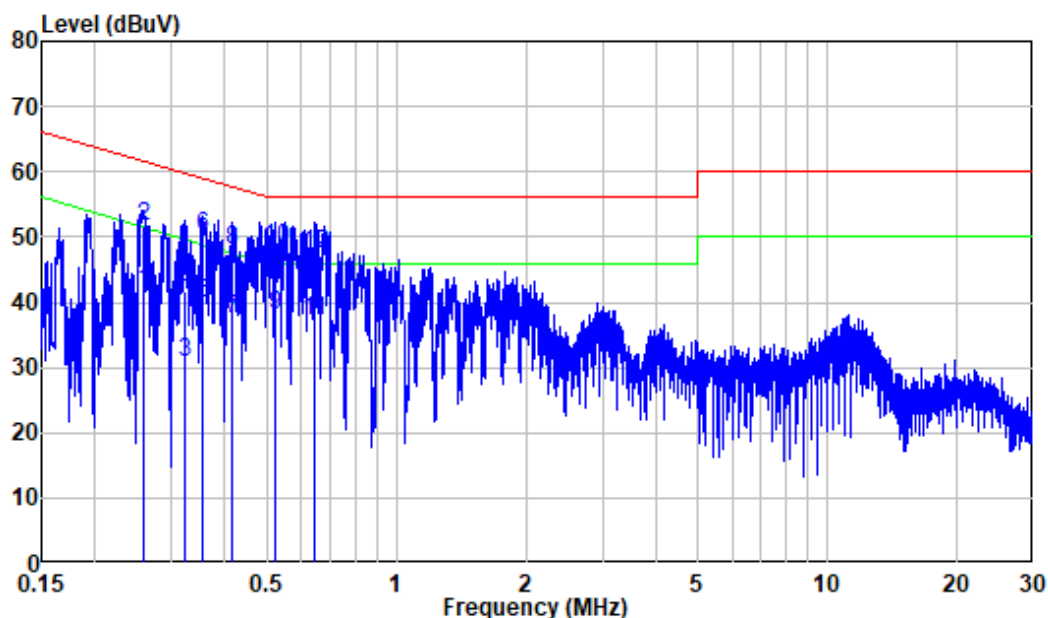
The testing was performed by Caro Hu on 2022-03-09.

Test mode: Charging+NFC Transimitting

AC 120 V/60 Hz, Line:

Site : Shielding Room
 Condition: Line
 Mode : NFC Transmitting
 Model : V73
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.255	9.80	31.25	41.05	51.58	-10.53	Average
2	0.255	9.80	41.60	51.40	61.58	-10.18	QP
3	0.353	9.80	29.73	39.53	48.90	-9.37	Average
4	0.353	9.80	39.58	49.38	58.90	-9.52	QP
5	0.381	9.80	30.00	39.80	48.27	-8.47	Average
6	0.381	9.80	40.52	50.32	58.27	-7.95	QP
7	0.511	9.81	28.18	37.99	46.00	-8.01	Average
8	0.511	9.81	39.11	48.92	56.00	-7.08	QP
9	0.565	9.81	25.67	35.48	46.00	-10.52	Average
10	0.565	9.81	36.48	46.29	56.00	-9.71	QP
11	0.665	9.81	25.73	35.54	46.00	-10.46	Average
12	0.665	9.81	36.91	46.72	56.00	-9.28	QP

AC 120V/ 60 Hz, Neutral:

Site : Shielding Room
 Condition: Neutral
 Mode : NFC Transmitting
 Model : V73
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.260	9.80	31.80	41.60	51.44	-9.84	Average
2	0.260	9.80	41.72	51.52	61.44	-9.92	QP
3	0.323	9.80	20.92	30.72	49.63	-18.91	Average
4	0.323	9.80	31.84	41.64	59.63	-17.99	QP
5	0.353	9.80	30.06	39.86	48.89	-9.03	Average
6	0.353	9.80	40.34	50.14	58.89	-8.75	QP
7	0.416	9.80	27.57	37.37	47.53	-10.16	Average
8	0.416	9.80	38.30	48.10	57.53	-9.43	QP
9	0.523	9.81	28.28	38.09	46.00	-7.91	Average
10	0.523	9.81	38.44	48.25	56.00	-7.75	QP
11	0.644	9.81	27.17	36.98	46.00	-9.02	Average
12	0.644	9.81	37.73	47.54	56.00	-8.46	QP

FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

As per FCC Part 15.225

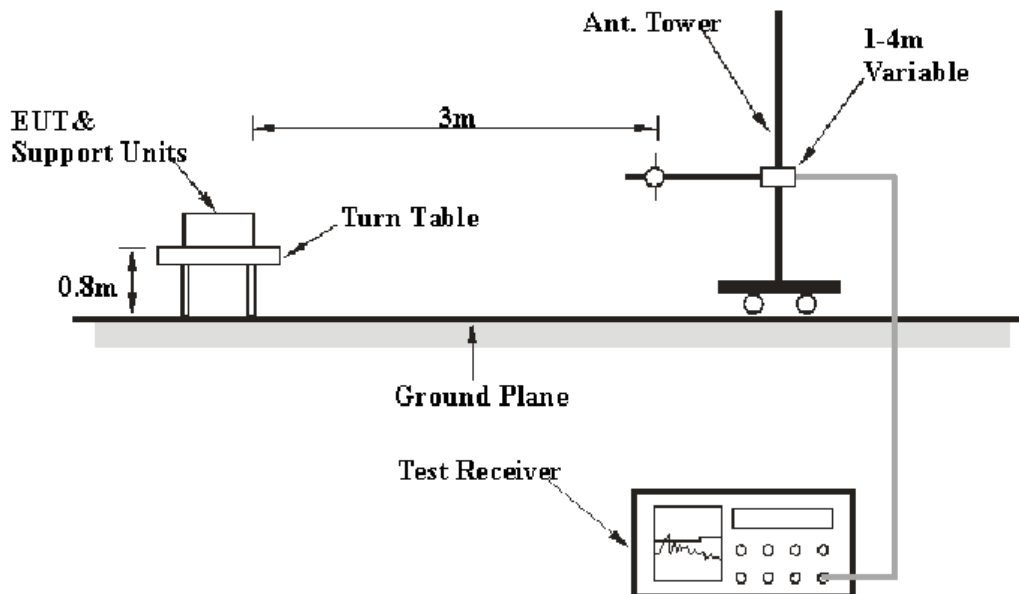
(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

EUT Setup



Note: Antenna is set up at 1m during test for below 30MHz.

The radiated emission tests were performed in the 3-meter chamber a test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

EMI Test Receiver Setup

According to FCC Rules, 47 CFR 15.33, the EUT emissions were investigated up to 1000 MHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
9 kHz – 150 kHz	300 Hz	1 kHz	/	QP
150 kHz –30 MHz	10 kHz	30 kHz	/	QP
30 MHz – 1000 MHz	100 kHz	300 kHz	/	QP

Corrected Amplitude & Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Over Limit/Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

$$\text{Over Limit/Margin} = \text{Level} / \text{Corrected Amplitude} - \text{Limit}$$

$$\text{Level} / \text{Corrected Amplitude} = \text{Read Level} + \text{Factor}$$

Test Data

Environmental Conditions

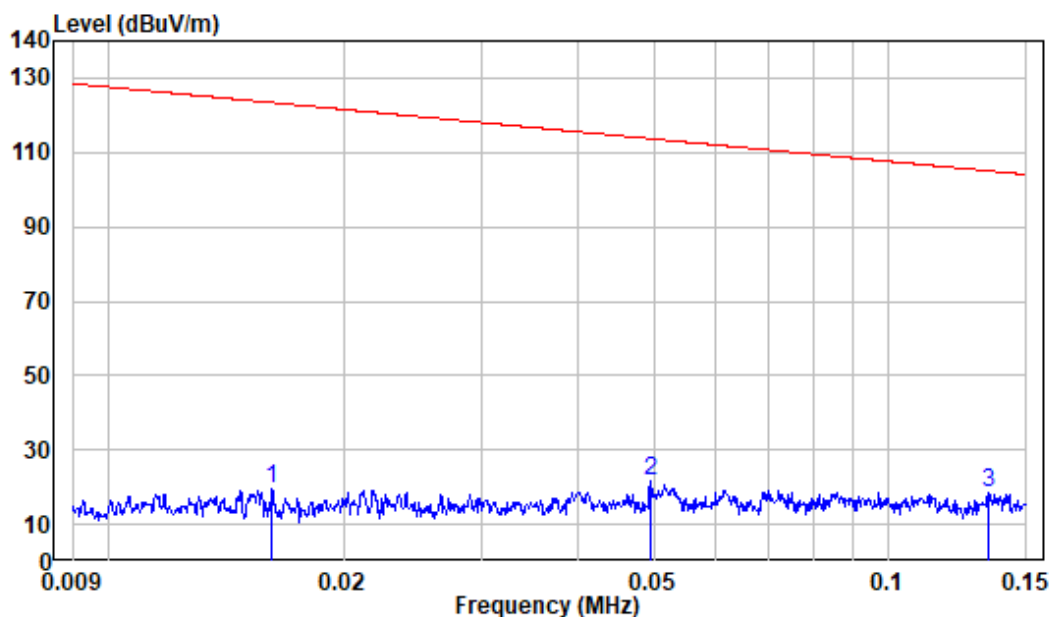
Temperature:	19 °C
Relative Humidity:	58 %
ATM Pressure:	101.1 kPa

The testing was performed by Chao Mo on 2022-2-28.

Test mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case X-axis of orientation was recorded)

1) Spurious Emissions (9 kHz~30 MHz):

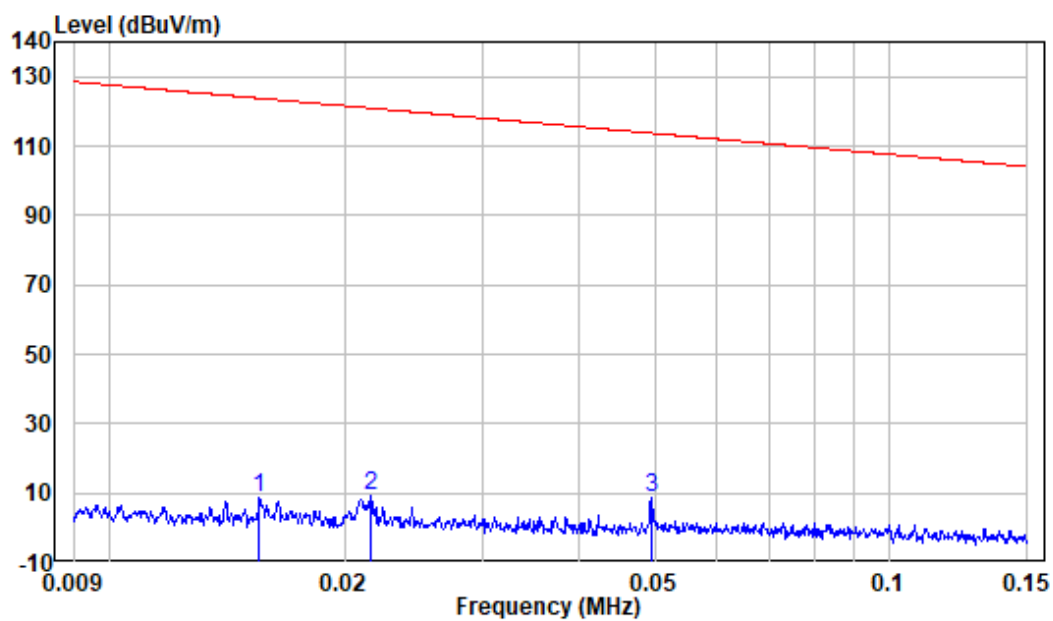
9 kHz~150 kHz
Parallel



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.016	-11.57	30.90	19.33	123.41	-104.08	Peak
2	0.050	-11.53	33.38	21.85	113.71	-91.86	Peak
3	0.134	-11.94	30.60	18.66	105.04	-86.38	Peak

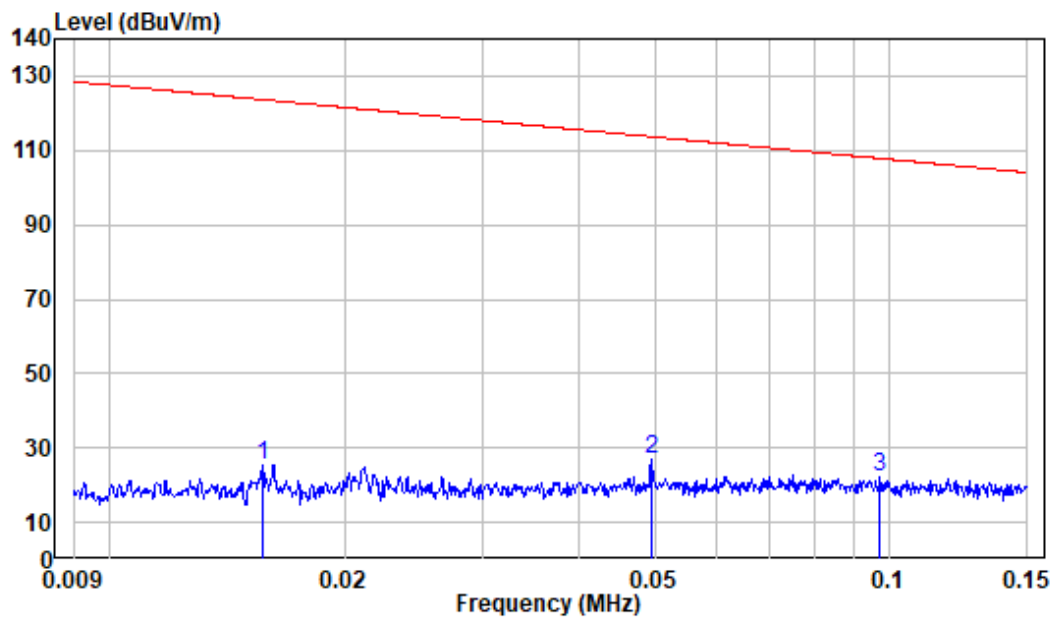
Perpendicular



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Perpendicular

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.016	-11.54	20.17	8.63	123.75-115.12		Peak
2	0.022	-11.68	20.65	8.97	120.92-111.95		Peak
3	0.050	-11.53	20.37	8.84	113.71-104.87		Peak

Ground-parallel

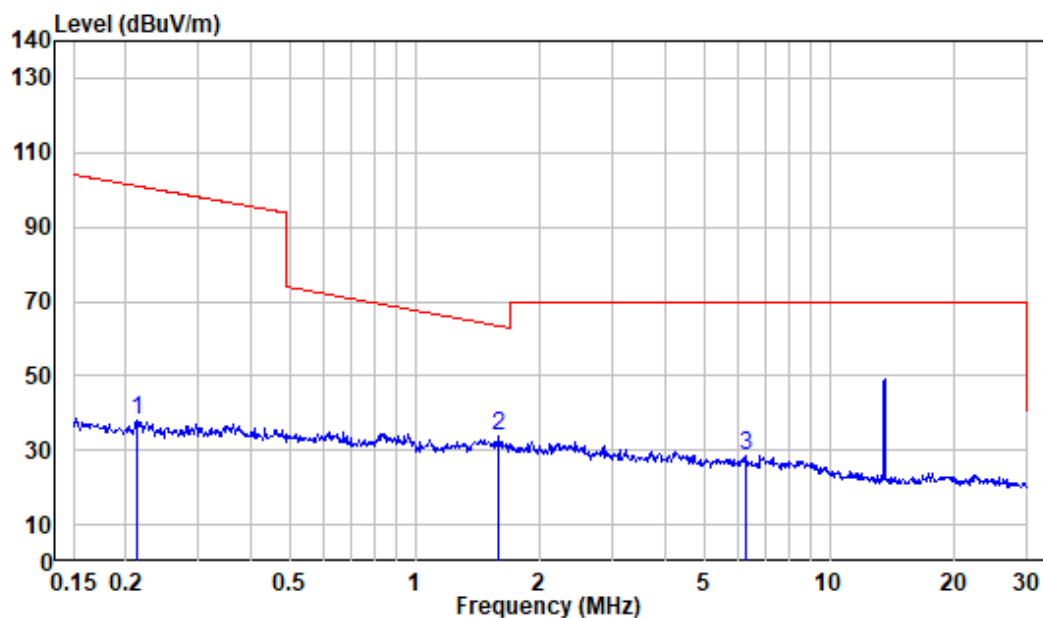


Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Ground-parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.016	-11.54	36.98	25.44	123.66	-98.22	Peak
2	0.050	-11.53	38.38	26.85	113.71	-86.86	Peak
3	0.097	-11.55	33.83	22.28	107.87	-85.59	Peak

150 kHz~30 MHz

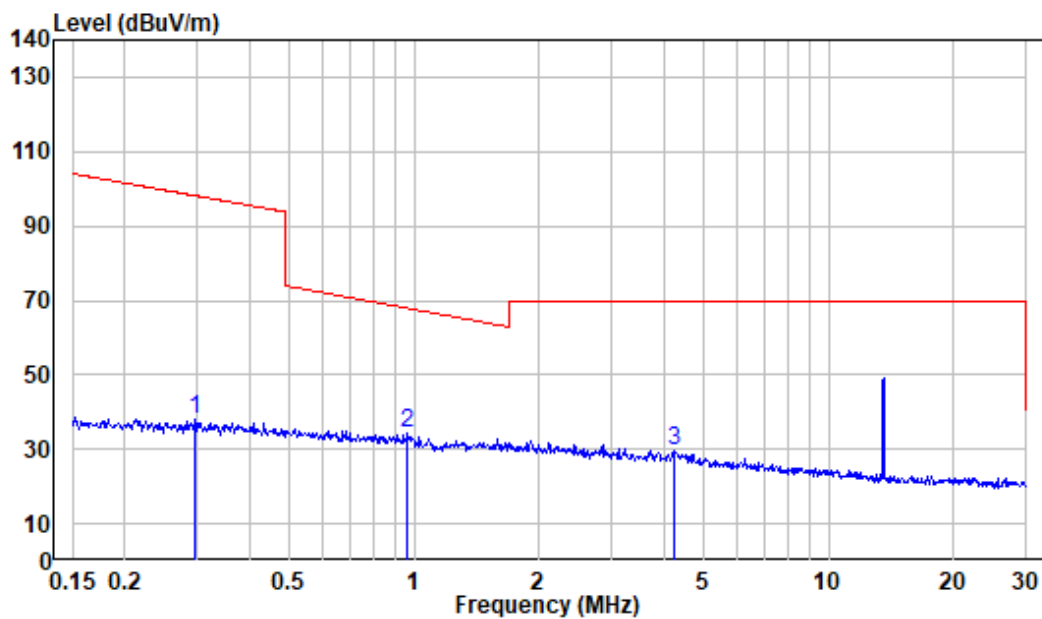
Parallel



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.213	-11.97	49.99	38.02	101.04	-63.02	Peak
2	1.593	-11.43	45.29	33.86	63.34	-29.48	Peak
3	6.285	-11.56	40.22	28.66	69.54	-40.88	Peak

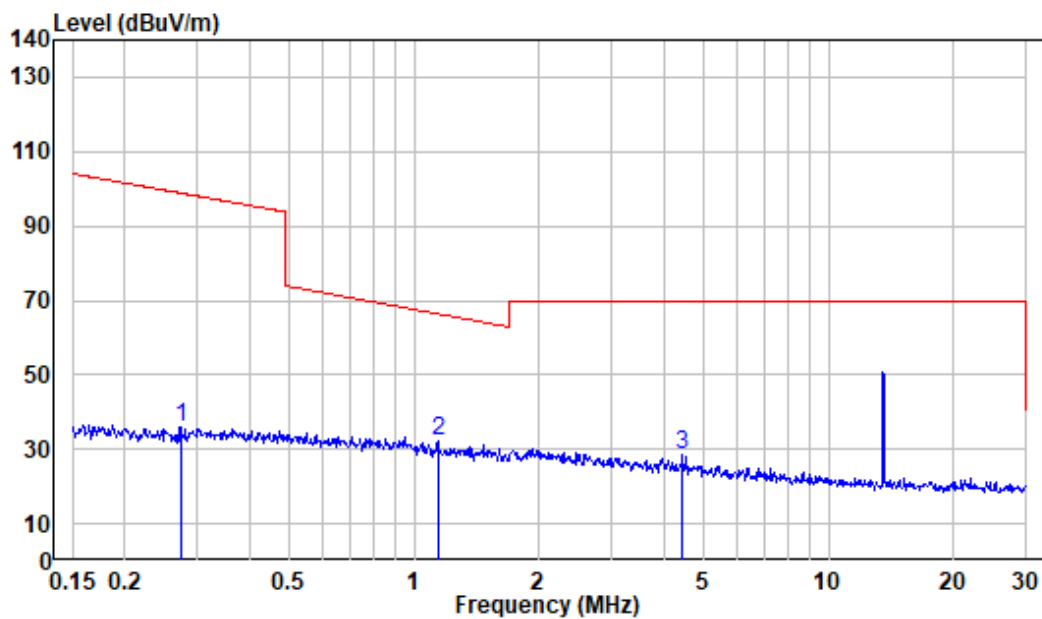
Perpendicular



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Perpendicular

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.297	-11.82	49.60	37.78	98.15	-60.37	Peak
2	0.963	-11.62	46.05	34.43	67.80	-33.37	Peak
3	4.247	-11.68	41.24	29.56	69.54	-39.98	Peak

Ground-parallel



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Ground-parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.273	-11.86	47.88	36.02	98.88	-62.86	Peak
2	1.141	-11.55	44.02	32.47	66.30	-33.83	Peak
3	4.430	-11.69	40.29	28.60	69.54	-40.94	Peak

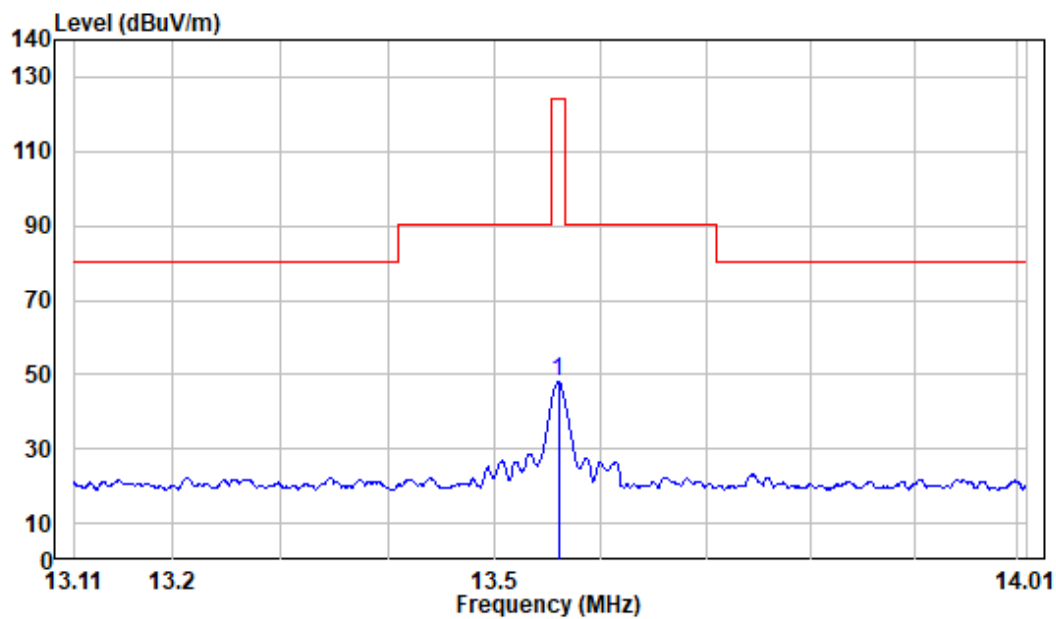
Part 15 Section 15.31(f)(2) (9kHz-30MHz)

Limit @ 3m=Limit @ 300m-40*log(3(m)/300(m))

Limit @ 3m=Limit @ 30m-40*log(3(m)/30(m))

2) Emission Mask & Fundamental:

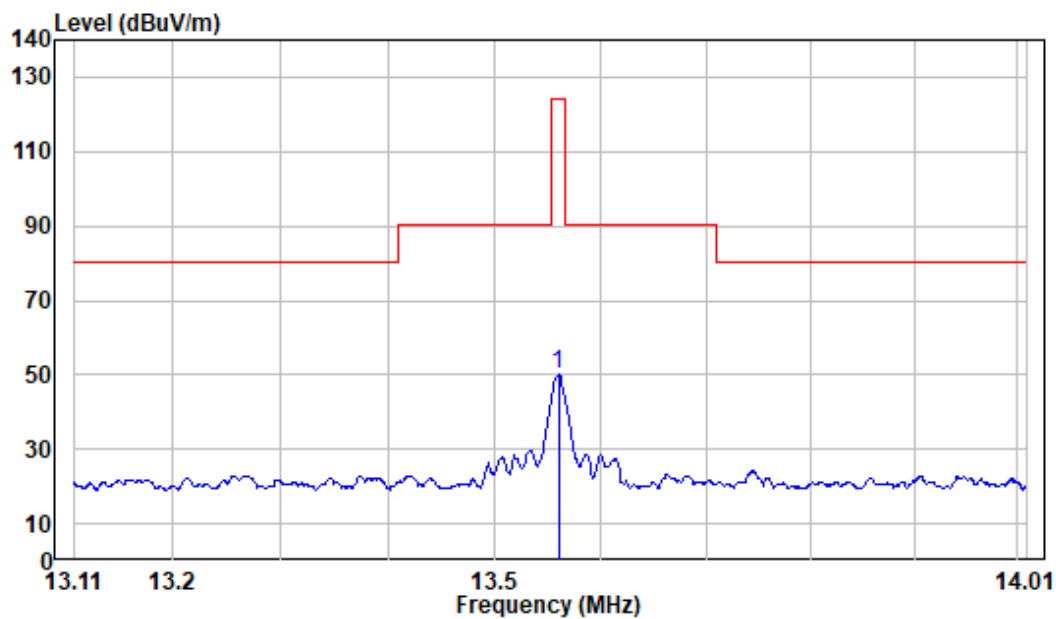
Parallel



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	13.560	-10.92	58.94	48.02	124.00	-75.98	Peak

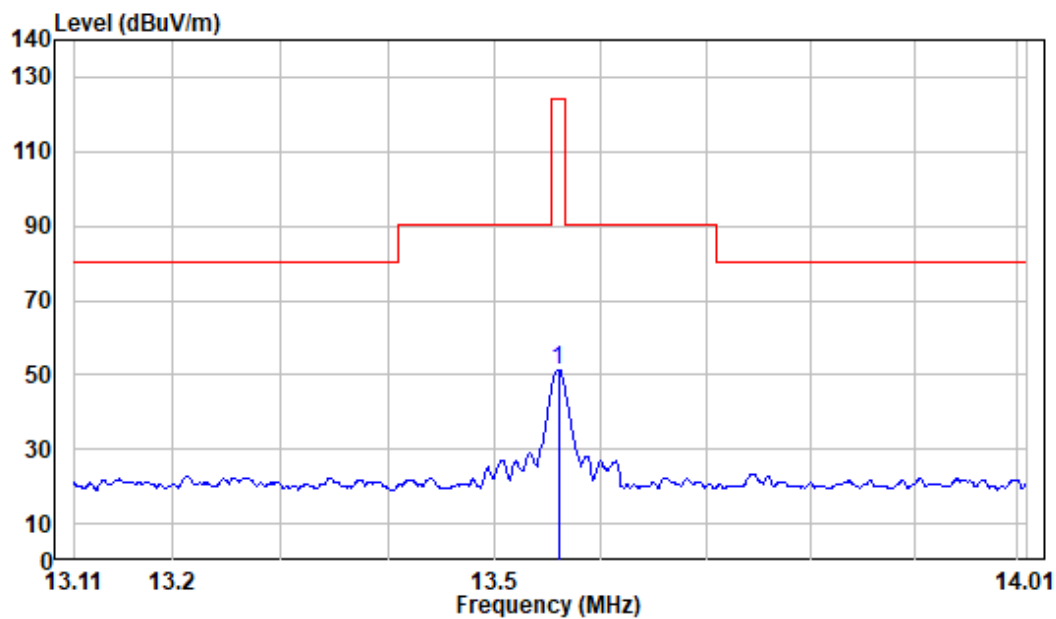
Perpendicular



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Perpendicular

	Freq	Factor	Read	Limit	Over	Remark
			Level	Line	Limit	
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB
1	13.560	-10.92	60.94	50.02	124.00	-73.98 Peak

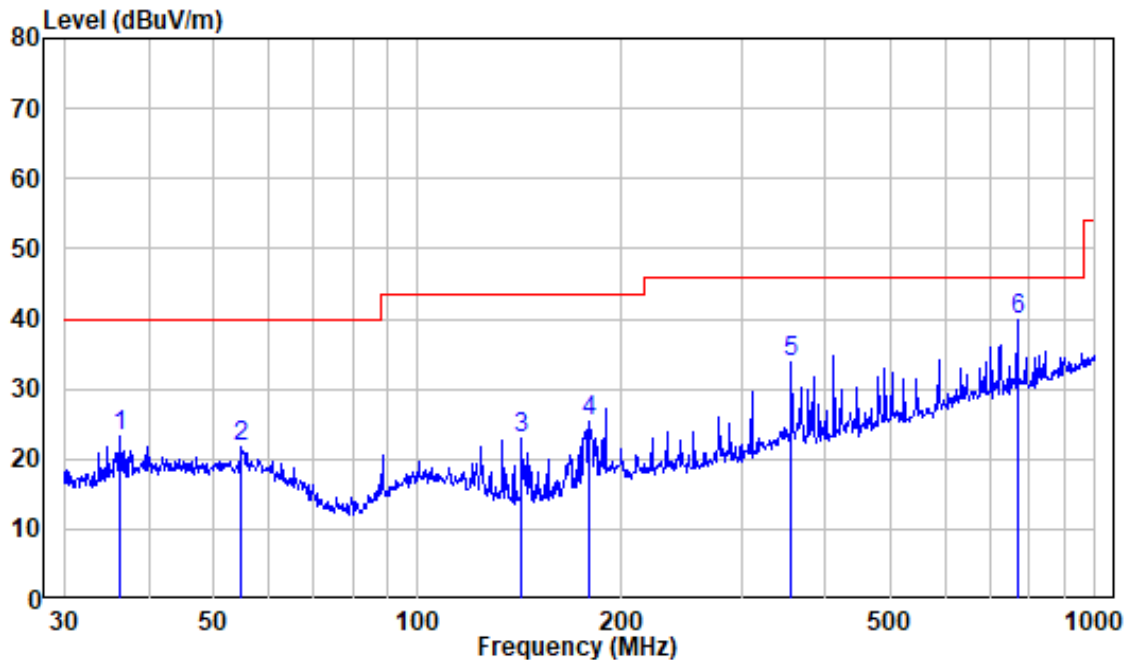
Ground-parallel



Site : chamber
Condition: 3m
Model : V73
Test Mode: NFC Transmitting
Pol : Ground-parallel

	Freq	Factor	Read	Limit	Over	Remark
			Level	Line	Limit	
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB
1	13.560	-10.92	62.34	51.42	124.00	-72.58 Peak

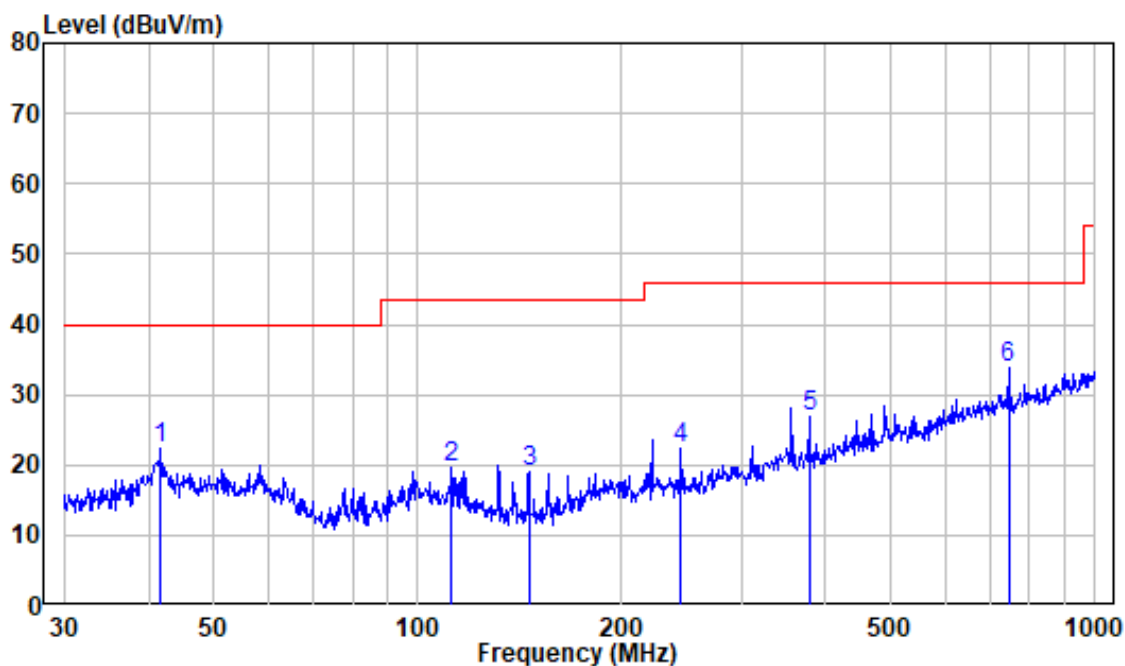
3) Spurious Emissions (30 MHz~1GHz):

Horizontal:

Site : chamber
Condition: 3m HORIZONTAL
Model : V73
Test Mode: NFC

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.254	-11.15	34.34	23.19	40.00	-16.81	Peak
2	54.835	-10.29	32.02	21.73	40.00	-18.27	Peak
3	142.324	-15.54	38.56	23.02	43.50	-20.48	Peak
4	179.386	-12.83	38.27	25.44	43.50	-18.06	Peak
5	355.427	-7.51	41.23	33.72	46.00	-12.28	Peak
6	768.748	-0.25	39.96	39.71	46.00	-6.29	Peak

Vertical:



Site : chamber
Condition: 3m VERTICAL
Model : V73
Test Mode: NFC

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	41.713	-10.07	32.35	22.28	40.00	-17.72	Peak
2	112.131	-12.26	31.84	19.58	43.50	-23.92	Peak
3	145.861	-15.50	34.45	18.95	43.50	-24.55	Peak
4	244.232	-10.63	32.95	22.32	46.00	-23.68	Peak
5	378.584	-7.18	33.96	26.78	46.00	-19.22	Peak
6	744.866	-0.88	34.77	33.89	46.00	-12.11	Peak

FCC§15.225(e) - FREQUENCY STABILITY

Applicable Standard

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and inductive antenna was connected to a Spectrum Analyzer. The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.

Test Data

Environmental Conditions

Temperature:	19 °C
Relative Humidity:	58 %
ATM Pressure:	101.1 kPa

The testing was performed by Paul Liu on 2022-2-28

Test Mode: Transmitting

Test Result: Pass

Voltage Supply (V _{DC})	Temperature (°C)	Measured Frequency (MHz)	Frequency Error (%)	Limit (%)
3.6	-20	13.560634	0.00468	± 0.01
	-10	13.560627	0.00462	± 0.01
	0	13.560653	0.00482	± 0.01
	10	13.560659	0.00486	± 0.01
	20	13.560662	0.00488	± 0.01
	30	13.560640	0.00472	± 0.01
	40	13.560652	0.00481	± 0.01
	50	13.560657	0.00485	± 0.01
3.2	20	13.560616	0.00454	± 0.01
4.0	20	13.560645	0.00476	± 0.01

Note: the extreme voltage was declared by the applicant.

FCC§15.215(c) - 20dB EMISSION BANDWIDTH

Requirement

Per 15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, 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. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Procedure

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test Data

Environmental Conditions

Temperature:	19 °C
Relative Humidity:	58 %
ATM Pressure:	101.3 kPa

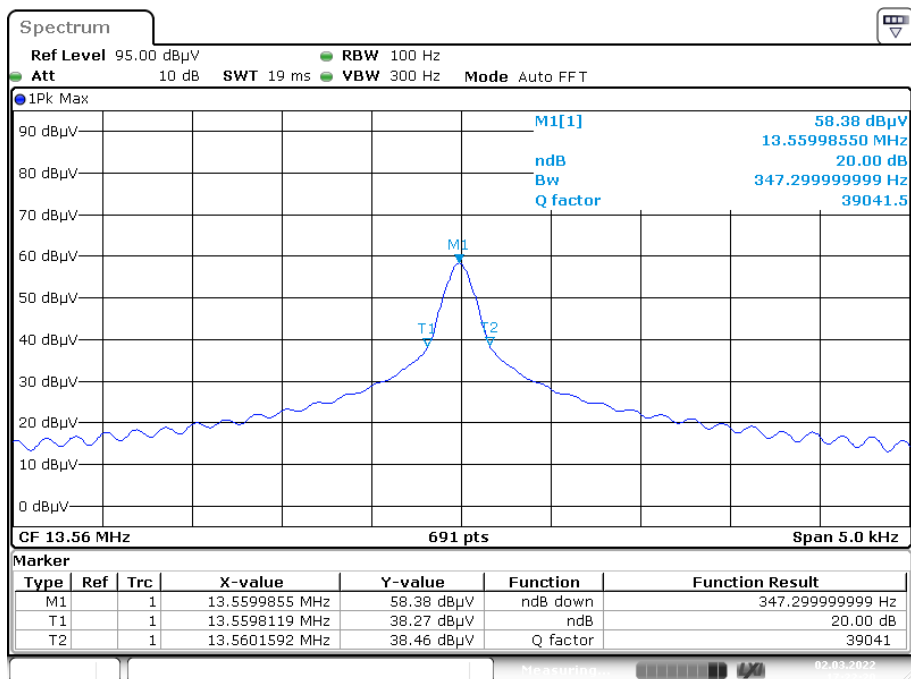
The testing was performed by Paul Liu on 2022-3-2.

Test Mode: Transmitting

Test Result: Pass

Test Frequency (MHz)	20dB Bandwidth (kHz)
13.56	0.347

20 dB Emission Bandwidth



Date: 2.MAR.2022 17:22:20

***** END OF REPORT *****