FCC PART 15.231

TEST REPORT

For

olibra llc

45 legion dr, CRESSKILL, New Jersey, 07626, United States

FCC ID: 2AME8BD1K

Report Type:	**Product Name:**
Class II Permissive Change Report	WhisperTech connect

Report Number:	RSHA240227001-00B
Report Date:	2024-09-26
Reviewed By:	Bard Liu
Approved By:	Kyle Xu
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu Province, China Tel: +86-512-86175000 Fax: +86-512-88934268 www.baclcorp.com.cn

TABLE OF CONTENT

REPORT REVISION HISTORY

Number of Revisions	Version	Release Date	Report Number	Information about Changes
0	R1V1	2021-01-11	RSHD201021003-00B	First release
1	R1V2	2024-09-26	RSHA240227001-00B	Model; POE power supply; Product Name; Adapter; USB Cable, Appearance

Note:

This is a Class II Permissive Change Report based on RSHD201021003-00B, the details are as below:

1. Change the model from “BD-1750-PRO” to “BD-1720-TWUS”.
2. The POE power supply mode is disabled.
3. Change the name to “WhisperTech connect”.
4. Change adapter and USB Cable.
5. Appearance changes, which does not affect RF performance

The above changes will affect test data, we retested the “Conducted Emissions” and “Radiated Emissions below 1GHz”.We also updated related photos, other data and photos were referred to the original report RSHD201021003-00B that issued on 2021-01-11 by BACL (Kunshan).

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	olibra llc
Tested Model:	BD-1720-TWUS
Product Name:	WhisperTech connect
Power Supply:	DC 5V from adapter
RF Function:	SRD
Operating Band/Frequency:	285.5-321.5 MHz 336-364.99 MHz 365-399.5 MHz 410.5-505.5 MHz
Modulation Type:	OOK, GFSK
Antenna Type:	Chip Antenna
★Maximum Antenna Gain:	7.0 dBi

Adapter Information:
Model: MKD-0501000DEXU
Input: AC100-240V 50/60Hz 0.5A
Output:5V, 1.0A 5.0W

Note: The maximum antenna gain is provided by the applicant.

All measurement and test data in this report was gathered from production sample serial number: RSHA240227001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2024-02-27.)

Objective

This test report is prepared for *olibra llc* all the test measurements were performed according to the measurement procedure described in ANSI C63.10 - 2013.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209, 15.35(c) and 15.231 rules.

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.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
Radiated emission	9 kHz~150 kHz	3.8dB
	150 kHz~30 MHz	3.4dB
	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz ~18GHz	5.23dB
Occupied Bandwidth		0.5kHz
Temperature		1.0℃
Humidity		6%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu Province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) is accredited in accordance with ISO/IEC 17025:2017 by NVLAP (Lab code: 600338-0), and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No. : CN5055.

SYSTEM TEST CONFIGURATION

Justification

Channel List:

For 300MHz Band:

The frequencies is F(MHz)=285.5+0.0001*n (0<=n<=360000). The lowest, middle, highest channel numbers of the EUT used and tested in this report are below.

Channel	Frequency (MHz)
Low	285.5
Middle	303.5
High	321.5

For 350MHz Band:

The frequencies is F(MHz)=336+0.0001*n (0<=n<=289900). The lowest, middle, highest channel numbers of the EUT used and tested in this report are below.

Channel	Frequency (MHz)
Low	336.00
Middle	350.50
High	364.99

For 375MHz Band:

The frequencies is F(MHz)=365+0.0001*n (0<=n<=345000). The lowest, middle, highest channel numbers of the EUT used and tested in this report are below.

Channel	Frequency (MHz)
Low	365.0
Middle	380.0
High	399.5

For 434MHz Band:

The frequencies is F(MHz)=410.5+0.0001*n (0<=n<=950000). The lowest, middle, highest channel numbers of the EUT used and tested in this report are below.

Channel	Frequency (MHz)
Low	410.5
Middle	458.0
High	505.5

EUT Exercise Software

RF test tool: SecureCRT
(The software was used to control the channel switching.)

Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

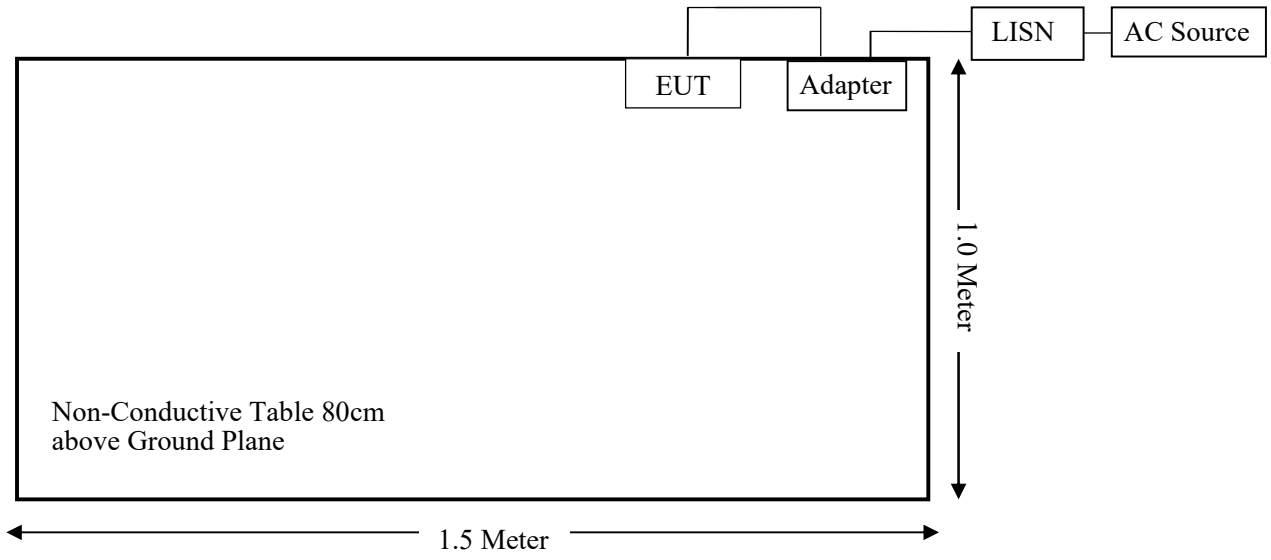
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

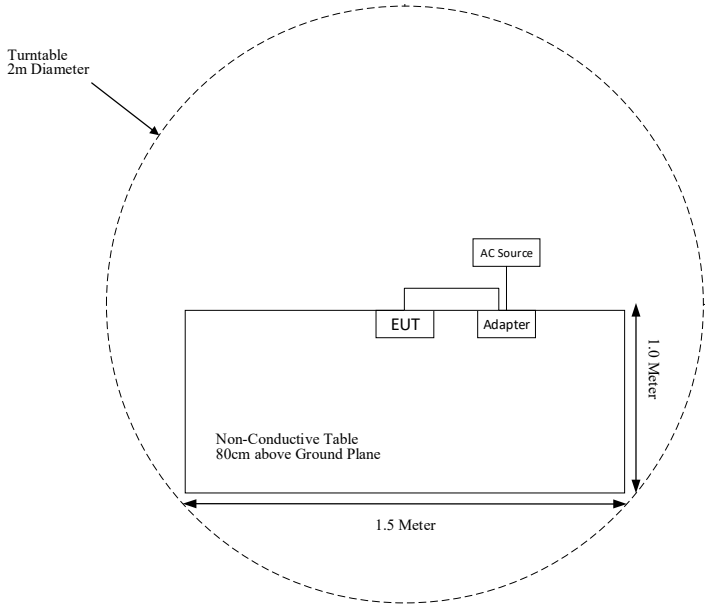
Cable Description	Length (m)	From Port	To Port
Power Cable 1	1.5	EUT	Adapter
Power Cable 2	1.0	Adapter	LISN/AC Source

Block Diagram of Test Setup

For Conducted Emissions:



For Radiated Emissions (Below 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.207(a)	Conducted Emissions	Compliant
§15.205, §15.209, §15.231(b)	Radiated Emissions	Compliant
§1.1310 & §2.1091	Maximum Permissible Exposure (MPE)	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test(Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2024-04-23	2025-04-22
Sunol Sciences	Hybrid Antenna	JB3	A090314-1	2023-11-11	2024-11-10
Narda	6dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Sonoma Instrument	Amplifier	310N	171205	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-8	008	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2024-04-23	2025-04-22
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	101746	2023-05-23	2024-05-22
ROHDE&SCHWARZ	LISN	ENV216	101115	2023-05-23	2024-05-22
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	0357.8810.54	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-15	015	2023-05-23	2024-05-22
Audix	Test Software	e3	V9	N/A	N/A

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 1.1310, 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/		f/1500	30
1500-100,000	/		1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\Pi r^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data (worst case):

Mode	Frequency Range (MHz)	Maximum Antenna Gain*		Tune-up conducted Power*		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
802.11b	2412~2462	3.40	2.19	27.00	501.19	20	0.2183	1.0	0.2183
802.11g		3.40	2.19	26.00	398.11	20	0.1734	1.0	0.1734
802.11 n-HT20		3.40	2.19	26.00	398.11	20	0.1734	1.0	0.1734
802.11 n-HT40	2422~2452	3.40	2.19	27.00	501.19	20	0.2183	1.0	0.2183
BLE	2402~2480	3.40	2.19	7.00	5.01	20	0.0022	1.0	0.0022
BT	2402~2480	3.40	2.19	9.00	7.94	20	0.0035	1.0	0.0035

Mode	Frequency Range (MHz)	Maximum Antenna Gain*		Tune-up EIRP*		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)	MPE ratio
		(dBi)	(numeric)	(dBm)	(mW)				
SRD	285.5-505.5	/	/	-2.5	0.56	20	0.0001	0.2	0.0005

Note:
(1) The EUT Contains FCC ID: 2AC7Z-ESP32WROVERE (Grant on:04/13/2020)
(2) The SRD EIRP = 92.62 dBμV/m -95.2 = -2.58dBm.
(3) The worst condition of transmit simultaneously (WiFi&SRD) is as below:

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.2183+0.0005=0.2188 < 1.0$$

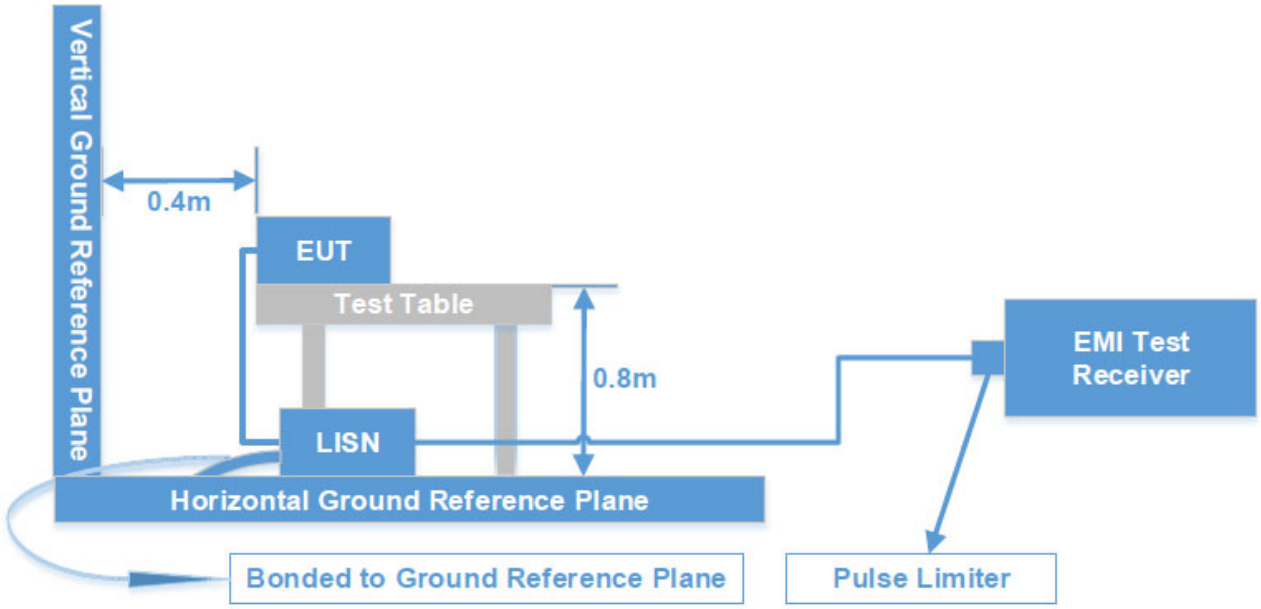
Conclusion: The device meets MPE at distance 20cm.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

Test System Setup



The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

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	RBW	VBW
150 kHz - 30 MHz	9 kHz	30 kHz

Test Procedure

ANSI C63.10-2013 clause 6.2

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

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

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Level & Over Limit Calculation

The Level is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
Level (dBμV) = Read level (dBμV) + Factor (dB)

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 above the limit. The equation for Over Limit calculation is as follows:

Over Limit (dB) = Level (dBμV) - Limit (dBμV)

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, FCC Part 15.207.

Test Data

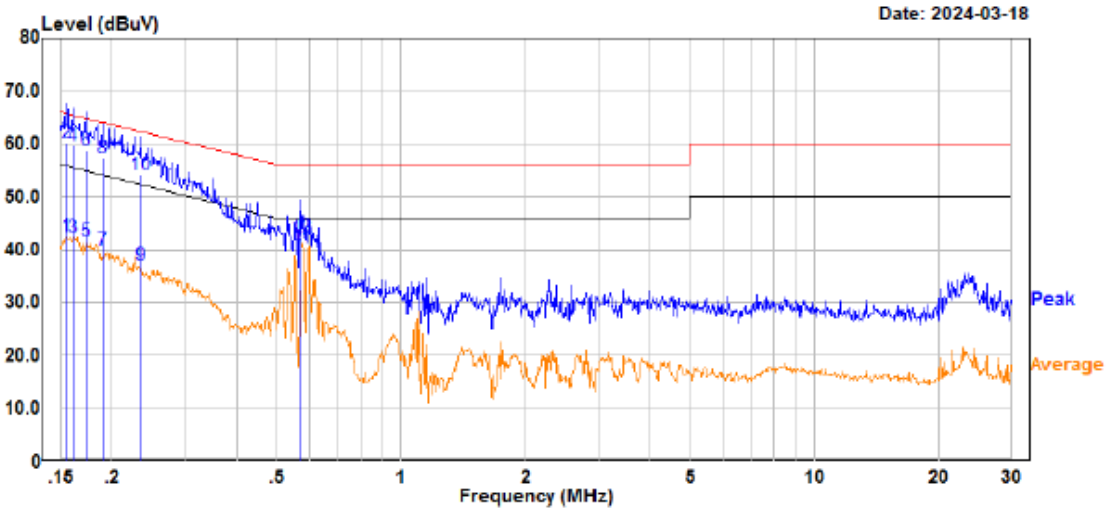
Environmental Conditions & Test Information

Temperature:	16.1 ℃
Relative Humidity:	47 %
ATM Pressure:	102.5 kPa
Test Date:	2024-03-18
Test Engineer:	Joe Zhang

Test Result: Compliant.

EUT operation mode: Transmitting in Low channel of ANT1 (GFSK 434MHz Band) was the worst

Line

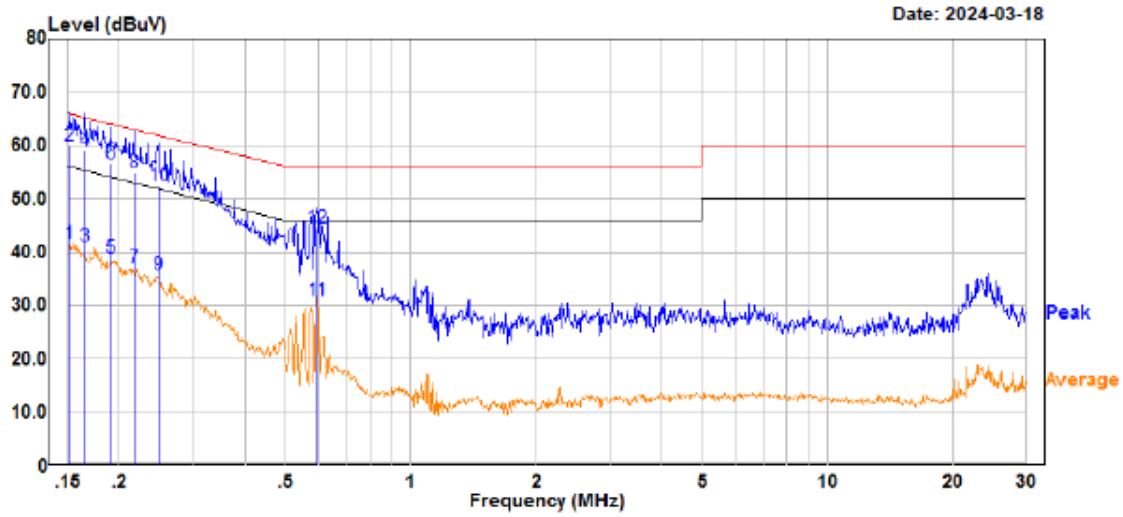


Trace: 1

Site : CE
Condition : limit\FCC Part 15.207\Class B QP.csv Line
: DET:Peak
Project No. : RSHA240227001
Model : BD-1720-TWUS
Phase : L
Voltage : 120V/60Hz
Mode : Work on
Test Equipment : ENV216,ESR
Temperature : 16.1℃
Humidity : 47%
Atmospheric pressure: 102.5kPa
Test Engineer : Joe Zhang

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.155	22.60	19.99	42.59	55.75	-13.16	Average
2	0.155	40.20	19.99	60.19	65.75	-5.56	QP
3	0.161	22.30	20.00	42.30	55.42	-13.12	Average
4	0.161	39.80	20.00	59.80	65.42	-5.62	QP
5	0.172	21.50	20.01	41.51	54.84	-13.33	Average
6	0.172	38.80	20.01	58.81	64.84	-6.03	QP
7	0.190	19.90	20.03	39.93	54.05	-14.12	Average
8	0.190	37.30	20.03	57.33	64.05	-6.72	QP
9	0.234	17.00	20.04	37.04	52.32	-15.28	Average
10	0.234	34.00	20.04	54.04	62.32	-8.28	QP
11	0.573	20.40	19.96	40.36	46.00	-5.64	Average
12	0.573	22.40	19.96	42.36	56.00	-13.64	QP

Neutral



Trace: 1

Site : CE
Condition : limit\FCC Part 15.207\Class B QP.csv Line
: DET:Peak
Project No. : RSHA240227001
Model : BD-1720-TWUS
Phase : N
Voltage : 120V/60Hz
Mode : Work on
Test Equipment : ENV216,ESR
Temperature : 16.1℃
Humidity : 47%
Atmospheric pressure: 102.5kPa
Test Engineer : Joe Zhang

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	21.60	19.99	41.59	55.92	-14.33	Average
2	0.152	40.00	19.99	59.99	65.92	-5.93	QP
3	0.165	21.10	20.00	41.10	55.21	-14.11	Average
4	0.165	38.90	20.00	58.90	65.21	-6.31	QP
5	0.191	19.00	20.03	39.03	54.01	-14.98	Average
6	0.191	36.60	20.03	56.63	64.01	-7.38	QP
7	0.217	16.90	20.04	36.94	52.94	-16.00	Average
8	0.217	34.80	20.04	54.84	62.94	-8.10	QP
9	0.248	15.81	20.03	35.84	51.82	-15.98	Average
10	0.248	32.51	20.03	52.54	61.82	-9.28	QP
11	0.594	11.00	19.95	30.95	46.00	-15.05	Average
12	0.594	24.60	19.95	44.55	56.00	-11.45	QP

FCC §15.205, §15.209, §15.231 (b) - RADIATED EMISSIONS

Applicable Standard

FCC §15.205, §15.209, §15.231 (b)

According to FCC §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750 ★	125 to 375 ★
174-260	3750	375
260-470	3750 to 12500 ★	375 to 1250 ★
Above 470	12500	1250

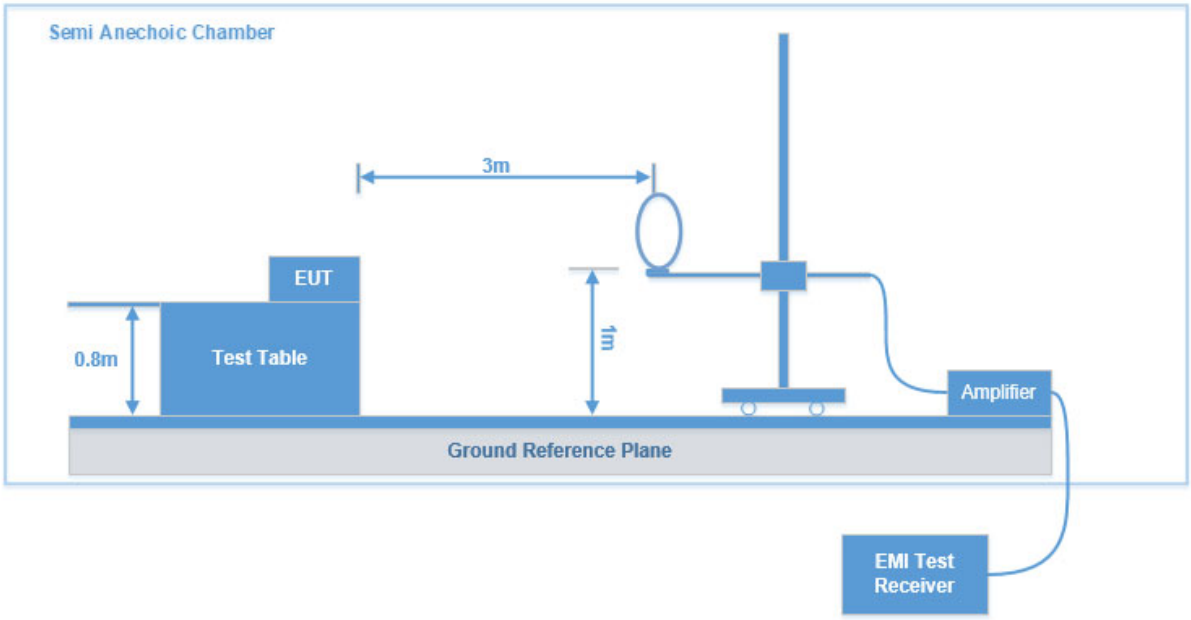
(1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

(2) Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

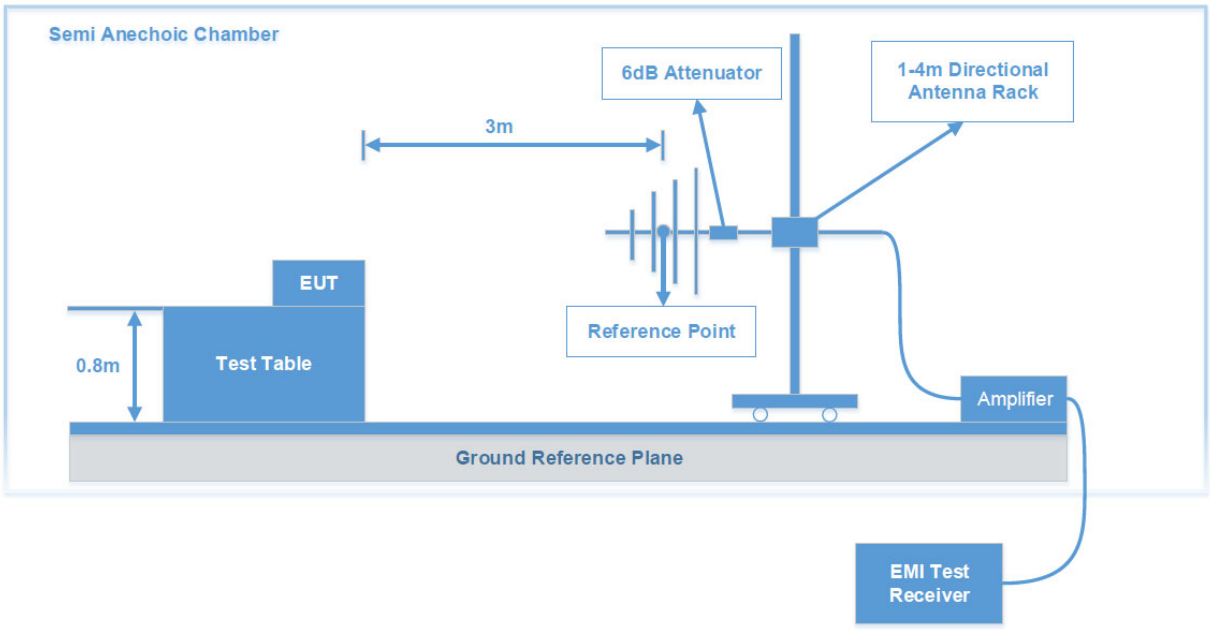
(3) The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

Test System Setup

9 kHz-30MHz:



30MHz-1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10 - 2013. The specification used was the FCC § 15.209, 15.205 and 15.231.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

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

Frequency Range	RBW	VBW	IF B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	200 Hz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	9 kHz	QP/ Average
30 MHz – 1000 MHz	100 kHz	300 kHz	/	Peak
	/	/	120 kHz	QP

Test Procedure

According to ANSI C63.10-2013 clause 6.5, 6.6 and 6.7.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

For 9 kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude (dBμV/m) = Meter Reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

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

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.205, §15.209, §15.231 (b).

Test Data

Environmental Conditions & Test Information

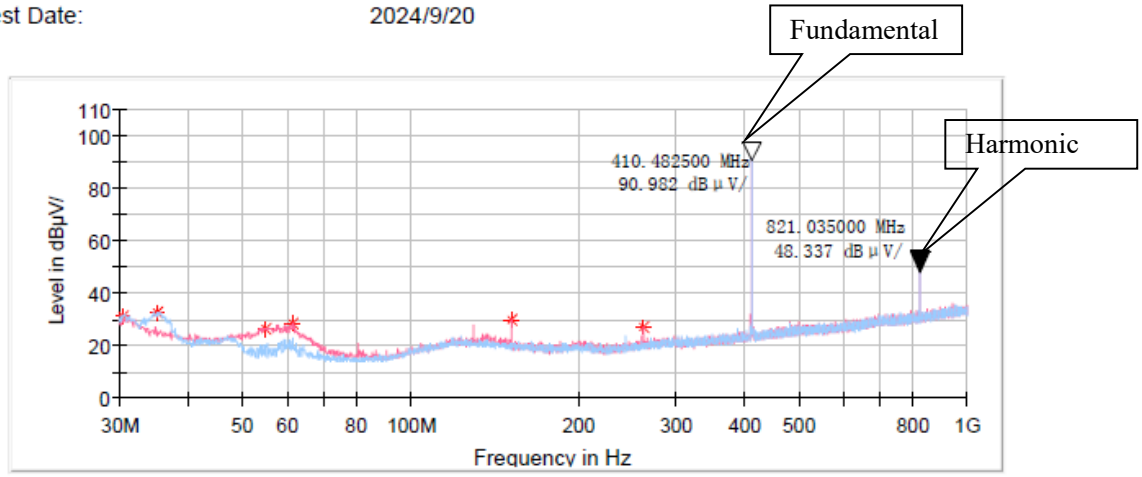
Frequency Range:	Below 1 GHz
Temperature:	26.2 ℃
Relative Humidity:	55 %
ATM Pressure:	100.5 kPa
Test Date:	2024-09-20
Test Engineer:	Richard Wen

9 kHz-30MHz: *Transmitting in low channel of ANT1 (GFSK 434MHz Band)*
The amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

30MHz-1GHz
Test mode: Transmitting in low channel of ANT1 (GFSK 434MHz Band) was the worst

Common Information

Project No:	RSHA240227001
EUT Model:	BD-1720-TWUS
Test Mode:	TX
Standard:	FCC part 15.205& Part 15.209&part 15.231
Test Equipment:	ESCI, JB3, 310N
Temperature:	26.2℃
Humidity:	55%
Barometric Pressure:	100.5kPa
Test Engineer:	Richard Wen
Test Date:	2024/9/20



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
30.485000	31.26	40.00	8.74	H	-5.1
35.092500	32.57	40.00	7.43	H	-8.2
55.098750	26.05	40.00	13.95	V	-17.2
61.646250	28.24	40.00	11.76	V	-17.5
151.735000	29.70	43.50	13.80	V	-11.8
261.830000	27.31	46.00	18.69	V	-11.8

EUT PHOTOGRAPHS

Please refer to the attachment EXHIBIT A - EUT EXTERNAL PHOTOGRAPHS and EXHIBIT B - EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment EXHIBIT C - TEST SETUP PHOTOGRAPHS.

Declarations

1. The laboratory is not responsible for the authenticity of any information provided by the applicant. Information from the applicant that may affect test results is marked with "★".

2. The test data was only valid for the test sample(s).

3. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor k=2 with the 95.45% confidence interval.

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