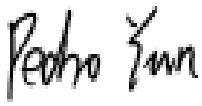
NVLAP TESTING
NVLAP LAB CODE 600341-0

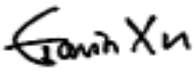
BACL Bay Area Compliance Labs Corp.

TEST REPORT

Applicant:	**AKUVOX (XIAMEN) NETWORKS CO., LTD.**
Address:	**10/F, No.56 Guanri Road，Software Park II , Xiamen 361009, China**
Product Name:	**Door Phone**
FCC ID:	**2AHCR-R25A**
Standard(s):	**47 CFR Part 15, Subpart C** **ANSI C63.10-2013**
Report Number:	**2402A108791E-RF-00C**
Report Date:	**2025/2/5**

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).





Reviewed By: **Pedro Yun** — Title: **Project Engineer**

Approved By: **Gavin Xu** — Title: **RF Supervisor**

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CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2402A108791E-RF-00C	Original Report	2025/2/5

1. GENERAL INFORMATION

1.1 General Description of Equipment under Test

EUT Name:	Door Phone
EUT Model:	R25A
Operation Frequency:	125kHz
Modulation Type:	ASK
Rated Input Voltage:	DC 12V From Adapter or DC 48V From POE
Serial Number:	2VON-1
EUT Received Date:	2024/12/12
EUT Received Status:	Good

1.2 Accessory Information

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

1.3 Antenna Information Detail▲

Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
Loop	Unknown	125kHz	Unknown
The design of compliance with §15.203:			
☒ Unit uses a permanently attached antenna.			
☐ Unit uses a unique coupling to the intentional radiator.			
☐ Unit was professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.			

1.4 Equipment Modifications

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

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.209; §15.205	Radiated Spurious Emissions	Compliant
§15.215(c)	20 dB Bandwidth	Compliant
FCC§15.203	Antenna Requirement	Compliant
Note 1: Per 15B report, Powered by Adapter was the worst for AC Line Conducted Emissions and Radiated Spurious Emissions Below 1GHz, so only performed it.		

3. DESCRIPTION OF TEST CONFIGURATION

3.1 EUT Operation Condition

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

3.2 EUT Exercise Software

No software was used in test.

3.3 Support Equipment List and Details

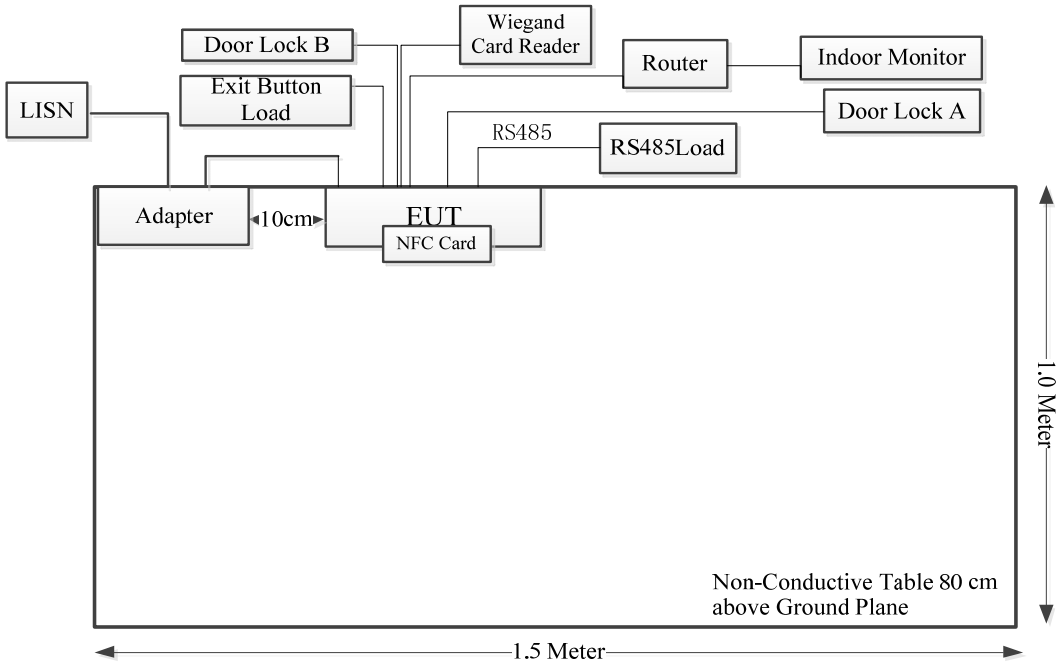
Manufacturer	Description	Model	Serial Number
HEWEISHUN	Adapter	BN073-A12012E	220617-27055ERFS1
TENDA	Router	F6	E6895010048000097
AKUVOX	Indoor Monitor	Unknown	Unknown
Unknown	Door Lock A	Unknown	Unknown
Unknown	Door Lock B	Unknown	Unknown
bacl	Exit Button Load	EX2500012678	EK5681358358486
Unknown	Wiegand card reader	Unknown	Unknown
Unknown	RS485 Load	Unknown	Unknown
Unknown	NFC Card	EINOLDA	EMZBNC21103001

3.4 Support Cable List and Details

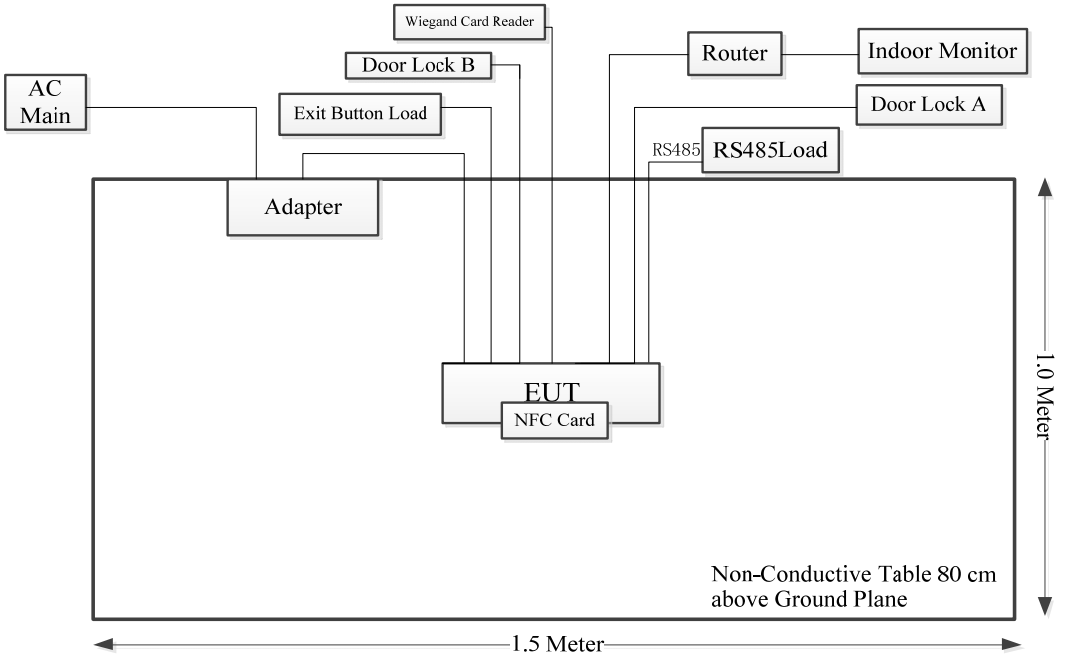
Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
2Pin DC Cable	No	No	1.2	Adapter	EUT
RJ45 Cable	No	Yes	10	Router	EUT
RJ45 Cable	No	No	3	Router	Indoor Monitor
2Pin RS485 Cable	No	No	2	RS485 Load	EUT
3Pin Wiegand card reader Cable	No	No	3	Wiegand card reader	EUT
3Pin Door Cable #1	No	No	3	Door Lock A	EUT
3Pin Door Cable #2	No	No	3	Door Lock B	EUT
3Pin Exit Button Cable	No	No	3	Exit Button Load	EUT

3.5 Block Diagram of Test Setup

AC Line Conducted Emissions:



Radiated Spurious Emissions:



3.6 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 829273, the FCC Designation No. : CN5044.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

3.7 Measurement Uncertainty

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

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	9kHz~30MHz: 3.3dB, 30MHz~200MHz: 4.55 dB, 200MHz~1GHz: 5.92 dB, 1GHz~6GHz: 4.98 dB, 6GHz~18GHz: 5.89 dB, 18GHz~26.5GHz:5.47 dB, 26.5GHz~40GHz:5.63 dB
Unwanted Emissions, conducted	±2.47 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.11 dB (150 kHz to 30 MHz)

4. REQUIREMENTS AND TEST RESULTS

4.1 AC Line Conducted Emissions

4.1.1 Applicable Standard

FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

	Conducted limit (dBμV)	
Frequency of emission (MHz)	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.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

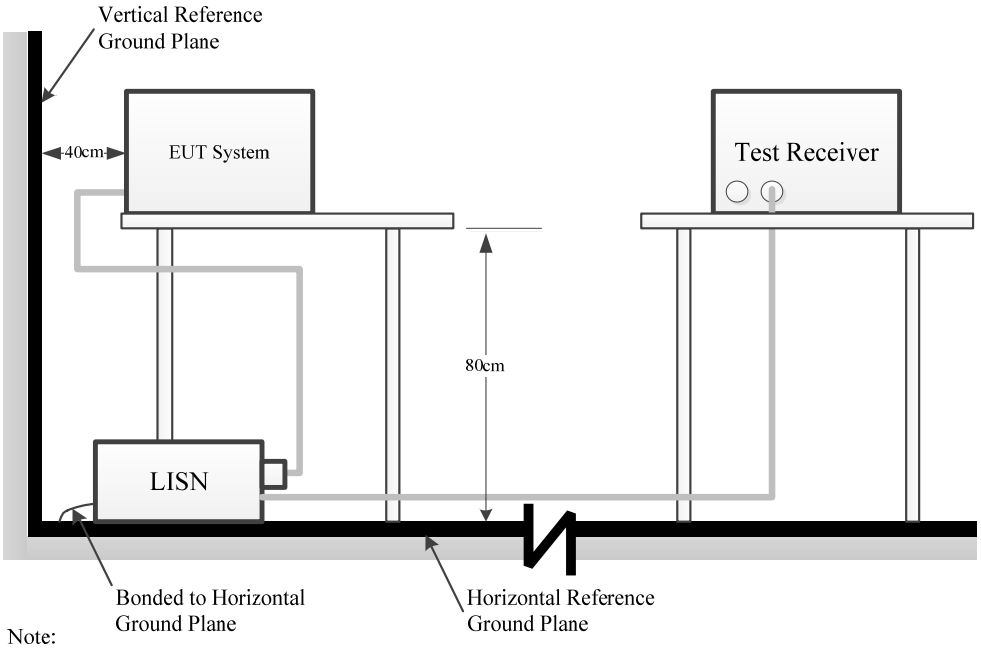
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μV within the frequency band 535-1705 kHz, as measured using a 50 μH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtainig their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

4.1.2 EUT Setup



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

The spacing between the peripherals was 10 cm.

The adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

4.1.3 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

4.1.4 Test Procedure

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

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

According FCC publication number 174176,for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

4.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = attenuation caused by cable loss + voltage division factor of AMN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

4.1.6 Test Data

Serial Number:	2VON-1	Test Date:	2024/12/20
Test Site:	CE	Test Mode:	Transmitting
Tester:	Yukin Qiu	Test Result:	Pass

Environmental Conditions:

Temperature: (℃)	20.8	Relative Humidity: (%)	29	ATM Pressure: (kPa)	102.3

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101614	2024/9/5	2025/9/4
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2024/9/5	2025/9/4
R&S	EMI Test Receiver	ESCI	100035	2024/8/26	2025/8/25
Audix	Test Software	E3	191218 V9	N/A	N/A

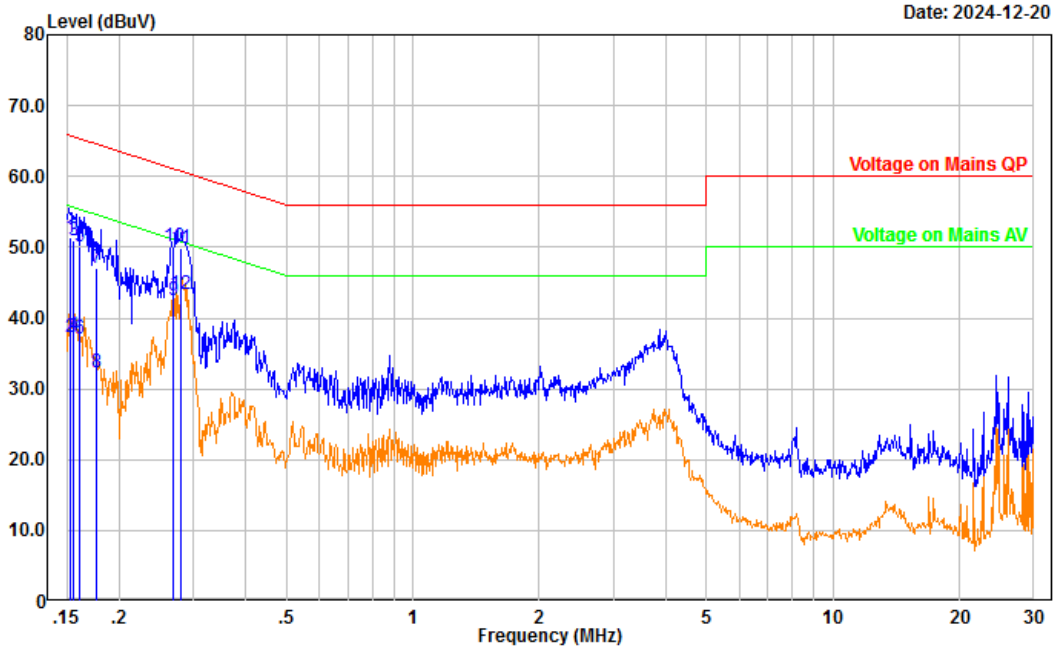
** Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Note:
Without tag(NFC Card) to test was the worst.

Project No.: 2402A108791E-RF
Port: Line
Test Mode: Transmitting
Note:
IF B/W 9kHz PK/AV

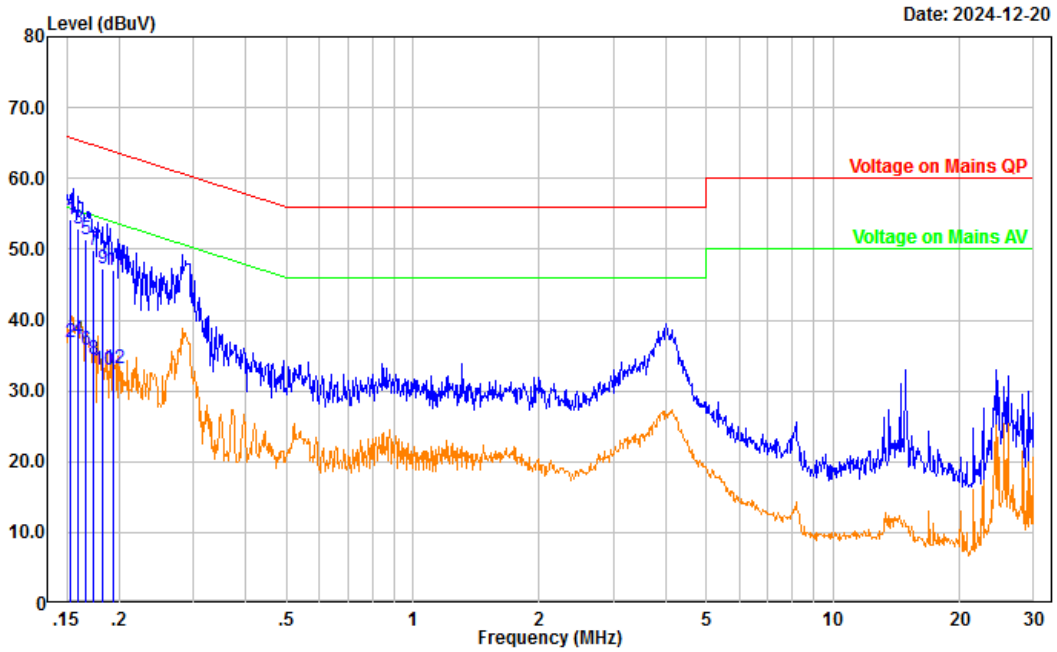
Serial No.: 2VON-1
Tester: Yukin Qiu



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.153	40.53	10.76	51.29	65.84	14.55	QP
2	0.153	26.50	10.76	37.26	55.84	18.58	Average
3	0.155	40.19	10.76	50.95	65.72	14.77	QP
4	0.155	26.74	10.76	37.50	55.72	18.22	Average
5	0.161	39.39	10.77	50.16	65.41	15.25	QP
6	0.161	26.29	10.77	37.06	55.41	18.35	Average
7	0.176	36.31	10.80	47.11	64.66	17.55	QP
8	0.176	21.51	10.80	32.31	54.66	22.35	Average
9	0.269	31.75	10.83	42.58	51.16	8.58	Average
10	0.269	39.16	10.83	49.99	61.14	11.15	QP
11	0.279	39.14	10.83	49.97	60.83	10.86	QP
12	0.279	32.53	10.83	43.36	50.83	7.47	Average

Project No.: 2402A108791E-RF
Port: neutral
Test Mode: Transmitting
Note:
IF B/W 9kHz PK/AV

Serial No.: 2VON-1
Tester: Yukin Qiu



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.153	43.33	10.85	54.18	65.83	11.65	QP
2	0.153	25.96	10.85	36.81	55.83	19.02	Average
3	0.160	41.98	10.85	52.83	65.46	12.63	QP
4	0.160	26.34	10.85	37.19	55.46	18.27	Average
5	0.166	40.50	10.85	51.35	65.14	13.79	QP
6	0.166	24.82	10.85	35.67	55.14	19.47	Average
7	0.173	38.92	10.85	49.77	64.80	15.03	QP
8	0.173	23.65	10.85	34.50	54.80	20.30	Average
9	0.183	36.40	10.85	47.25	64.34	17.09	QP
10	0.183	22.10	10.85	32.95	54.34	21.39	Average
11	0.194	36.30	10.85	47.15	63.85	16.70	QP
12	0.194	22.27	10.85	33.12	53.85	20.73	Average

4.2 Radiated Spurious Emissions

4.2.1 Applicable Standard

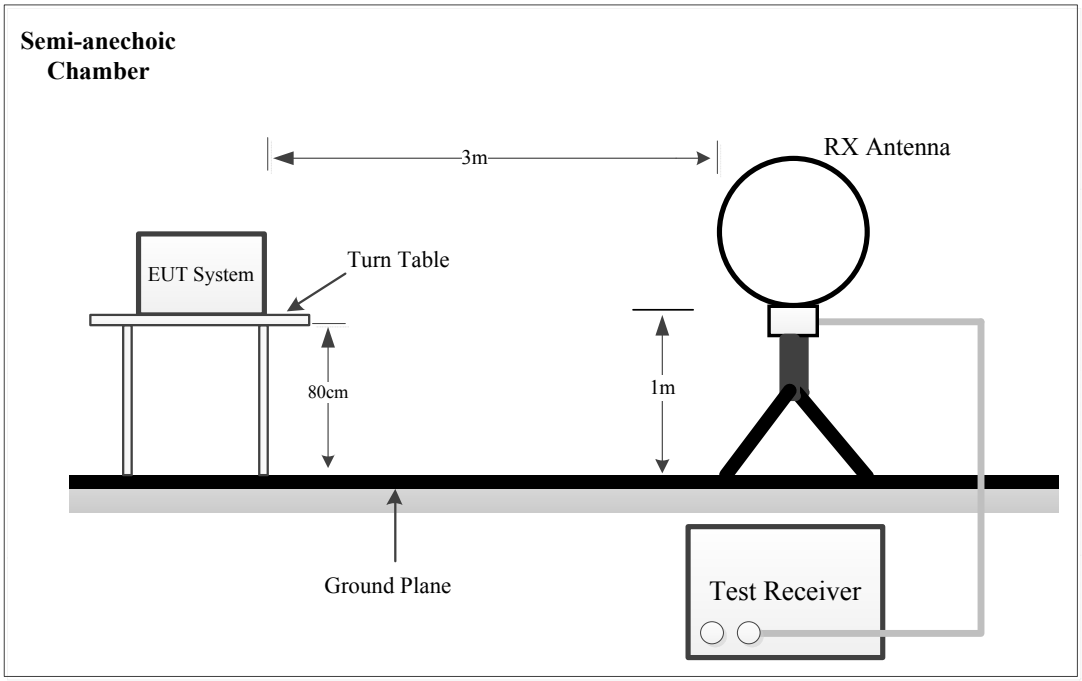
FCC Part 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

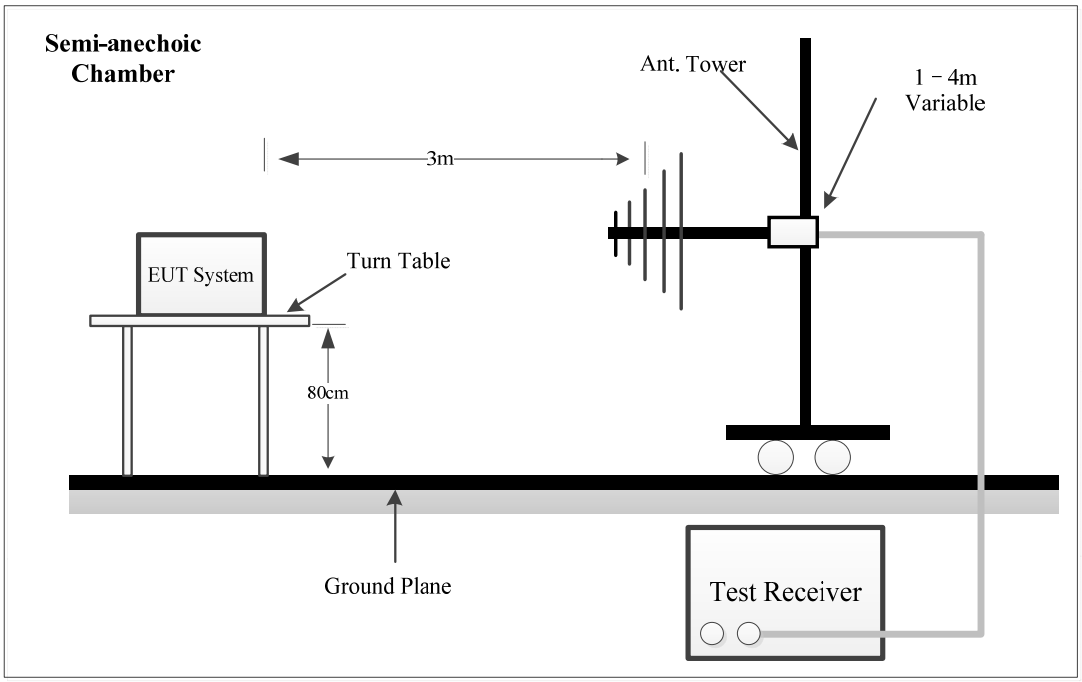
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

4.2.2 EUT Setup

9kHz~30MHz:



30MHz~1GHz:



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013.

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.

For 9kHz-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.

4.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 1 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	300 Hz	1 kHz	200 Hz	QP/AV
150 kHz – 30 MHz	10 kHz	30 kHz	9 kHz	QP/AV
30 MHz – 1000 MHz	100 kHz	300 kHz	/	PK
	/	/	120 kHz	QP

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP measurement

4.2.4 Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz-1 GHz except 9-90 kHz, 110-490 kHz, employing an average detector.

All emissions under the average limit and under the noise floor have not recorded in the report.

4.2.5 Corrected Result & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = Antenna Factor + Cable Loss- Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

4.2.6 Test Data

Serial Number:	2VON-1	Test Date:	2025/1/2
Test Site:	Chamber10m	Test Mode:	Transmitting
Tester:	Leesin Xiang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	21.5	Relative Humidity: (%)	44	ATM Pressure: (kPa)	101.2

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMCO	Passive Loop Antenna	6512	9706-1206	2023/10/25	2026/10/24
Sunol Sciences	Hybrid Antenna	JB3	A060611-1	2023/9/6	2026/9/5
Narda	Coaxial Attenuator	779-6dB	04269	2023/9/6	2026/9/5
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-04	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2024/7/1	2025/6/30
Sonoma	Amplifier	310N	185914	2024/8/26	2025/8/25
R&S	EMI Test Receiver	ESCI	100224	2024/8/26	2025/8/25
Audix	Test Software	E3	191218 V9	N/A	N/A

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

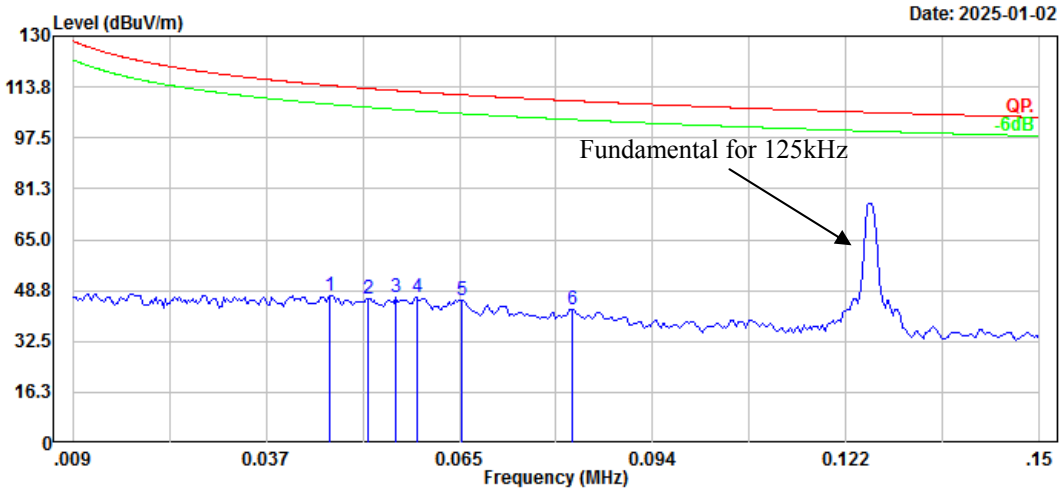
Test Data:

Please refer to the below table and plots.
With a representative tag(NFC Card) to test was the worst.

1) 9kHz~30MHz
Parallel

Project No.: 2402A108791E-RF
Polarization: Parallel
Test Mode: Transmitting
RBW:300Hz VBW:1kHz

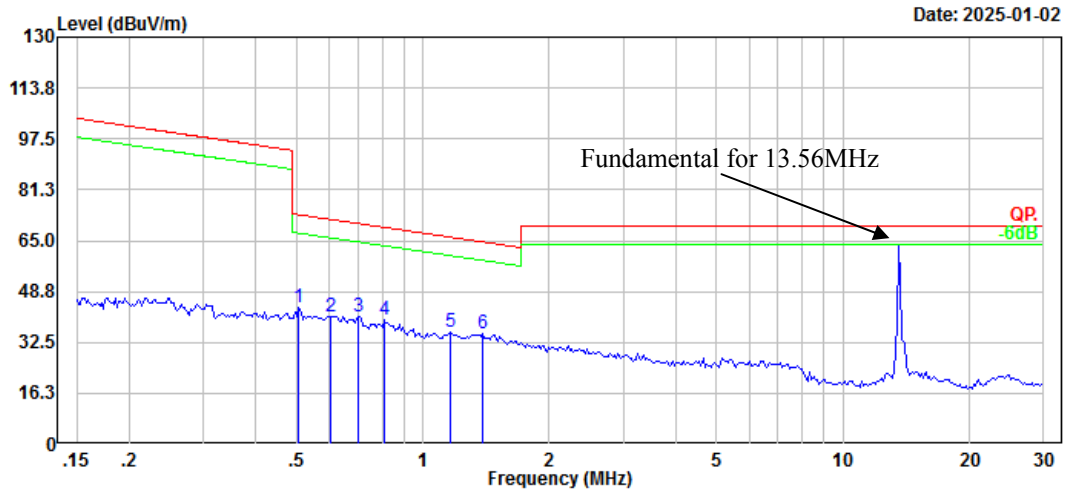
Serial No.: 2VON-1
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.047	2.41	44.64	47.05	114.25	67.20	Peak
2	0.052	2.66	43.69	46.35	113.26	66.91	Peak
3	0.056	3.60	43.00	46.60	112.63	66.03	Peak
4	0.059	4.14	42.48	46.62	112.16	65.54	Peak
5	0.066	4.28	41.34	45.62	111.26	65.64	Peak
6	0.082	4.14	38.61	42.75	109.35	66.60	Peak

Project No.: 2402A108791E-RF
Polarization: Parallel
Test Mode: Transmitting
RBW:10kHz VBW:30kHz

Serial No.: 2VON-1
Tester: Leesin Xiang

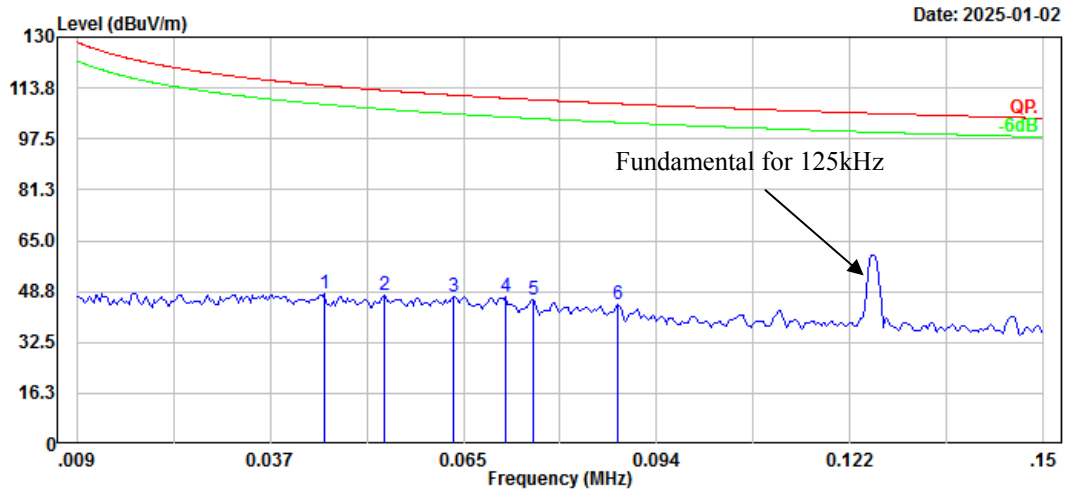


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.507	20.18	23.45	43.63	73.49	29.86	Peak
2	0.601	18.39	22.45	40.84	71.99	31.15	Peak
3	0.705	19.18	21.42	40.60	70.58	29.98	Peak
4	0.809	19.39	20.38	39.77	69.36	29.59	Peak
5	1.160	19.86	15.85	35.71	66.16	30.45	Peak
6	1.388	20.63	14.83	35.46	64.56	29.10	Peak

Perpendicular

Project No.: 2402A108791E-RF
Polarization: Perpendicular
Test Mode: Transmitting
RBW:300Hz VBW:1kHz

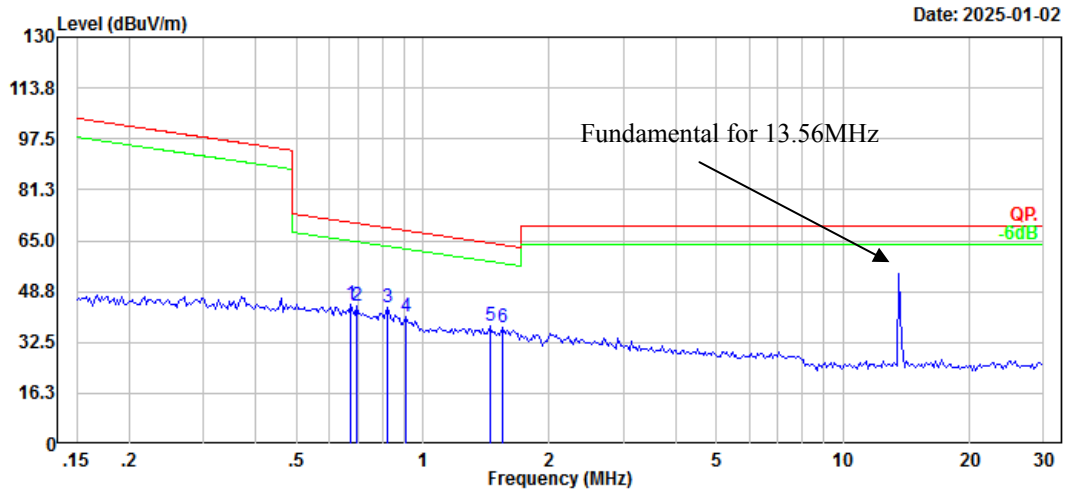
Serial No.: 2VON-1
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.045	2.97	44.89	47.86	114.52	66.66	Peak
2	0.054	3.99	43.40	47.39	112.98	65.59	Peak
3	0.064	5.50	41.64	47.14	111.48	64.34	Peak
4	0.072	6.93	40.32	47.25	110.51	63.26	Peak
5	0.076	6.41	39.67	46.08	110.04	63.96	Peak
6	0.088	6.94	37.50	44.44	108.72	64.28	Peak

Project No.: 2402A108791E-RF
Polarization: Perpendicular
Test Mode: Transmitting
RBW:10kHz VBW:30kHz

Serial No.: 2VON-1
Tester: Leesin Xiang

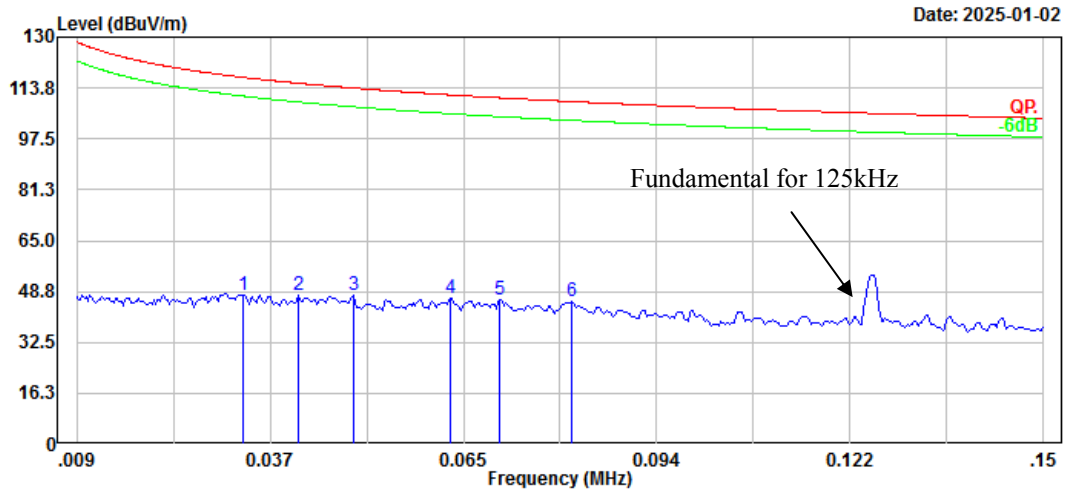


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.675	22.86	21.71	44.57	70.95	26.38	Peak
2	0.697	22.86	21.49	44.35	70.67	26.32	Peak
3	0.826	23.52	20.04	43.56	69.17	25.61	Peak
4	0.909	22.57	18.39	40.96	68.32	27.36	Peak
5	1.449	23.45	14.57	38.02	64.19	26.17	Peak
6	1.544	23.00	14.14	37.14	63.62	26.48	Peak

Ground Parallel

Project No.: 2402A108791E-RF
Polarization: Ground-parallel
Test Mode: Transmitting
RBW:300Hz VBW:1kHz

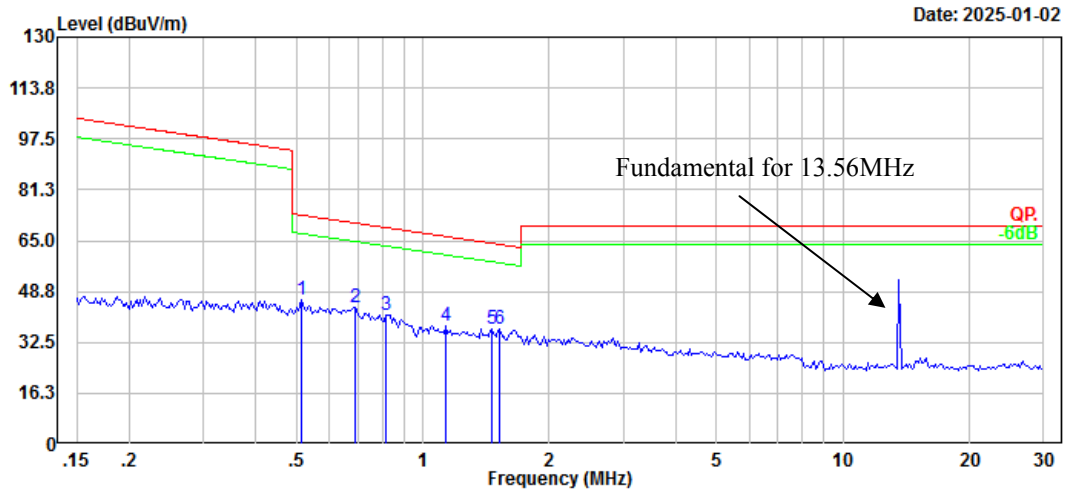
Serial No.: 2VON-1
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.033	0.68	46.97	47.65	117.17	69.52	Peak
2	0.041	2.00	45.52	47.52	115.26	67.74	Peak
3	0.049	3.43	44.16	47.59	113.74	66.15	Peak
4	0.063	4.68	41.74	46.42	111.56	65.14	Peak
5	0.071	5.50	40.46	45.96	110.61	64.65	Peak
6	0.081	6.68	38.71	45.39	109.41	64.02	Peak

Project No.: 2402A108791E-RF
Polarization: Ground-parallel
Test Mode: Transmitting
RBW:10kHz VBW:30kHz

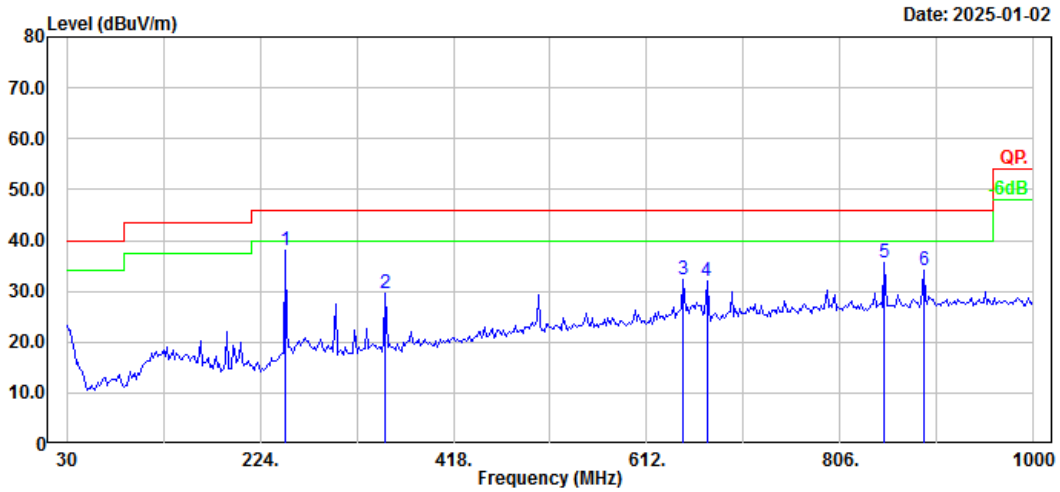
Serial No.: 2VON-1
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.513	22.50	23.40	45.90	73.40	27.50	Peak
2	0.690	22.21	21.57	43.78	70.77	26.99	Peak
3	0.817	21.18	20.21	41.39	69.26	27.87	Peak
4	1.135	21.98	15.96	37.94	66.35	28.41	Peak
5	1.464	22.51	14.50	37.01	64.09	27.08	Peak
6	1.527	22.42	14.22	36.64	63.72	27.08	Peak

2) 30MHz-1GHz

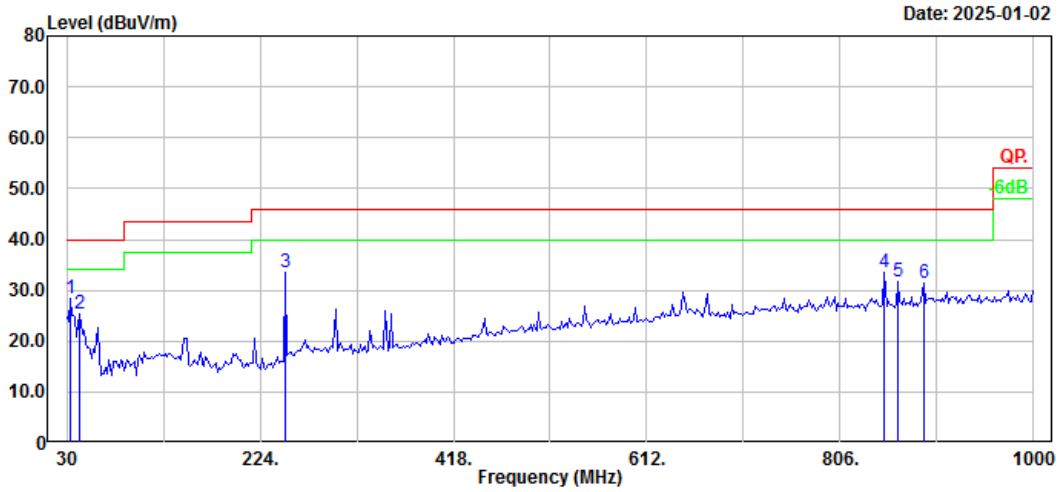
Project No.: 2402A108791E-RF Serial No.: 2VON-1
Polarization: Horizontal Tester: Leesin Xiang
Test Mode: Transmitting
RBW:100kHz VBW:300kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	249.22	49.59	-11.46	38.13	46.00	7.87	Peak
2	350.10	38.19	-8.61	29.58	46.00	16.42	Peak
3	648.86	34.15	-1.90	32.25	46.00	13.75	Peak
4	672.14	33.56	-1.61	31.95	46.00	14.05	Peak
5	850.62	34.75	0.89	35.64	46.00	10.36	Peak
6	889.42	32.94	1.30	34.24	46.00	11.76	Peak

Project No.: 2402A108791E-RF
Polarization: Vertical
Test Mode: Transmitting
RBW:100kHz VBW:300kHz

Serial No.: 2VON-1
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	33.88	34.98	-6.62	28.36	40.00	11.64	Peak
2	43.58	38.19	-12.88	25.31	40.00	14.69	Peak
3	249.22	45.01	-11.46	33.55	46.00	12.45	Peak
4	850.62	32.69	0.89	33.58	46.00	12.42	Peak
5	864.20	30.65	1.03	31.68	46.00	14.32	Peak
6	889.42	30.20	1.30	31.50	46.00	14.50	Peak

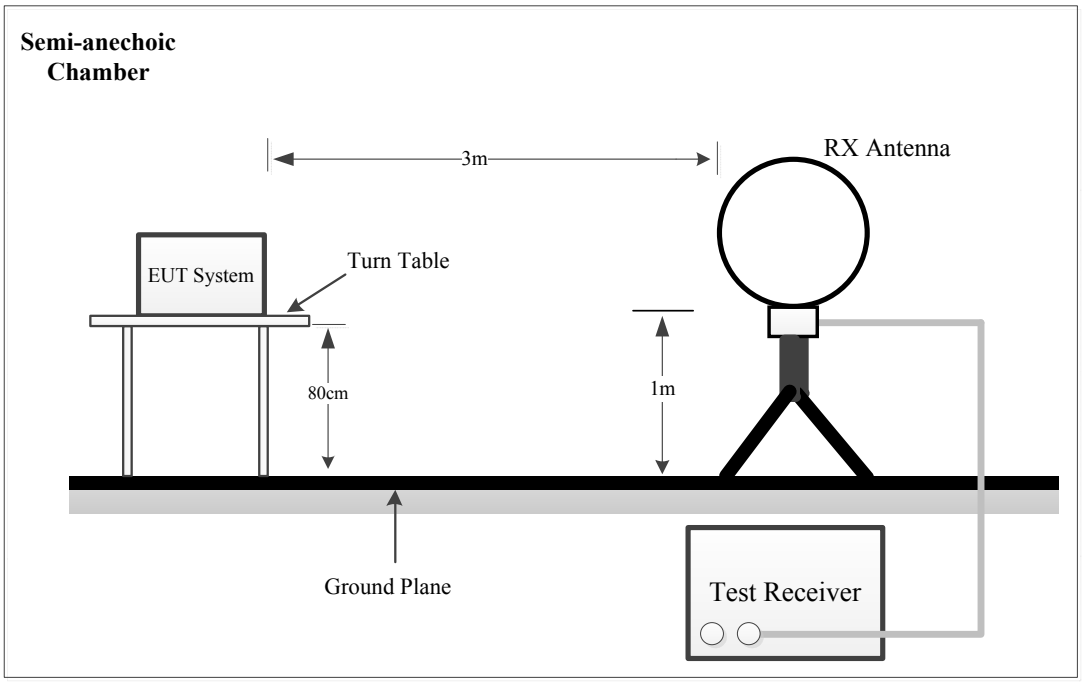
4.3 20 dB Emission Bandwidth

4.3.1 Applicable Standard

FCC §15.215

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.

4.3.2 EUT Setup



4.3.3 Test Procedure

According to ANSI C63.10-2013 Section 6.9.2

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2
d) Steps a) through c) might require iteration to adjust within the specified tolerances.
e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target

"−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
f) Set detection mode to peak and trace mode to max hold.
g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

h) Determine the "−xx dB down amplitude" using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).

j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "−xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

4.3.4 Test Data

Serial Number:	2VON-1	Test Date:	2025/1/2
Test Site:	Chamber10m	Test Mode:	Transmitting
Tester:	Leesin Xiang	Test Result:	Pass

Environmental Conditions:

Temperature: (℃)	21.5	Relative Humidity: (%)	44	ATM Pressure: (kPa)	101.2

Test Equipment List and Details:

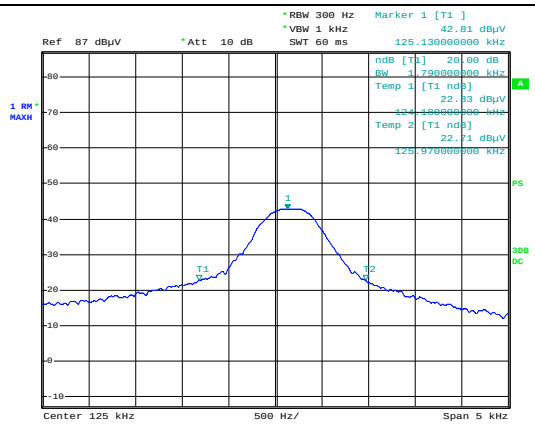
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
EMCO	Passive Loop Antenna	6512	9706-1206	2023/10/25	2026/10/24
Narda	Coaxial Attenuator	779-6dB	04269	2023/9/6	2026/9/5
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-04	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2024/7/1	2025/6/30
Sonoma	Amplifier	310N	185914	2024/8/26	2025/8/25
R&S	EMI Test Receiver	ESCI	100224	2024/8/26	2025/8/25

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

Test Data:

Test Frequency (kHz)	20 dB Emission Bandwidth (kHz)
125	1.79

20dB Emission Bandwidth



4.5 Antenna Requirement

4.5.1 Applicable Standard

FCC §15.203

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 a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

4.5.2 Judgment

Please refer to the Antenna Information detail in Section 1.3.

EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the attachment 2402A108791E-RF-EXP EUT external photographs and 2402A108791E-RF-INP EUT internal photographs.

EXHIBIT B - TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2402A108791E-RF-00C-TSP test setup photographs.

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