

FCC TEST REPORT

FCC ID: 2AN5C-CR01

Product : RFID qr reader
Model Name : CR01
Brand : POFT
Report No. : SZNTT26011158E1-1

Prepared for

SO Security System Co., Ltd

81 seri 2 road, Huamark, Bangkapi, Bangkok. Thailand. 10240

Prepared by

Shenzhen NTT Testing Technology Co.,Ltd.

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1 TEST RESULT CERTIFICATION

Applicant's name : SO Security System Co., Ltd.

Address : 81 seri 2 road, Huamark, Bangkapi, Bangkok. Thailand. 10240

Manufacture's name : Shenzhen pengguangfeng technology co.,Ltd

Address : R104,79Building ,baoshan 2nd industrial,pingshan ,shenzhen, China

Product name : RFID qr reader

Model number : CR01

Standards : FCC CFR47 Part 15 Section 15.225

Test procedure : ANSI C63.10-2020+Cor 1+2023

Date of test : Mar. 12, 2026-Mar. 22, 2026

Date of Issue : Mar. 23, 2026

This device described above has been tested by NTT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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2 Test Summary

FCC CFR47 Part 15 Section 15.225			
Standard Section	Test Item	Result	Remark
15.203	Antenna requirement	PASS	
15.207	Conducted Emission	N/A	
15.225(d) 15.209	Radiated Spurious Emission	PASS	
15.215	Bandwidth	PASS	
15.225(d) 15.209	Restricted Spurious Emission	PASS	
15.225(e)	Frequency Stability Tolerance	PASS	

Remark:

1. "N/A" denotes test is not applicable in this Test Report.

3 General Information

3.1 General Description of E.U.T.

Product Name	:	RFID qr reader
Model Name	:	CR01
Sample ID	:	SZNTT26011158E-001#
Sample(s) Status:	:	Engineer sample
Series Model	:	deadlock
Model Different.:	:	N/A
Operation Frequency	:	13.56 MHz
Number of Channel	:	1
Type of Modulation	:	ASK
Antenna installation	:	Loop Antenna
Antenna Gain	:	N/A
Power supply	:	DC 12V
Hardware Version	:	N/A
Software Version	:	N/A
Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.		

3.2 Test Setup Configuration

Radiated Emission



Conducted Spurious



3.3 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

3.4 Test Site

Site Description

EMC Lab. : Designation Number: CN3446
Test Firm Registration Number: 129414
Accredited by ANAB, Dec. 19, 2025
The Certificate Registration Number is AT-3446

Name of Firm : Shenzhen NTT Testing Technology Co.,Ltd.

Site Location : 1B, Building 2, Factory Building & 103, Building 3, Factory Building,
Dayang Industrial Park, No.4, Industrial Avenue, Tangwei Community,
Fuhai Sub-district, Bao 'an District, Shenzhen City, Guangdong, China

4 Equipment During Test

4.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	HSRCE944	/	HTEC	2025/4/30	2028/4/29
EMI Test Receiver	ESPI	/	RS	2025/9/8	2026/9/7
LISN	NNLK 8129	00603	Schwarzbeck	2025/9/8	2026/9/7
LISN	NNHV 8123-400	00694	Schwarzbeck	2025/9/8	2026/9/7
LISN	NNHV 8123-400	00680	Schwarzbeck	2025/9/8	2026/9/7
Cable	RG223-1500MM	NA	RG	2025/9/8	2026/9/7

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2025/7/24	2028/7/23
EMI Test Receiver	ESCI	101018	RS	2025/9/8	2026/9/7
Amplifier (30MHz-1GHz)	BBV 9718D	00042	SCHWARZBECK	2025/9/8	2026/9/7
Bilog Antenna (30MHz-1GHz)	VULB9168	1858	SCHWARZBECK	2025/9/9	2026/9/8
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHWARZBECK	2025/9/9	2026/9/8
Preamplifier (1GHz-18GHz)	BBV 9718D	0024	SCHWARZBECK	2025/9/8	2026/9/7
Spectrum Analyzer (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2025/9/8	2026/9/7
Preamplifier (18GHz-40GHz)	BBV 9721	0056	SCHWARZBECK	2025/9/8	2026/9/7

Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2025/9/8	2026/9/7
Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHWARZBECK	2025/9/8	2026/9/7
Amplifier (9KHz-30MHz)	CVP 9222 C	00109	SCHWARZBECK	2025/9/8	2026/9/7
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2025/9/8	2026/9/7
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2025/9/8	2026/9/7
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2025/9/8	2026/9/7
Power Sensor	TR1029-2	512364	Techoy	2025/9/8	2026/9/7
RF Switch	TR1029-1	512364	Techoy	2025/9/8	2026/9/7
Cable	DA800-4000MM	NA	DA	2025/9/8	2026/9/7
Cable	DA800-11000MM	NA	DA	2025/9/8	2026/9/7

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ-EMC	Ver.EMC-CON 3A1.1+
2	EMC radiation test system	FALA	EZ-EMC	Ver.FA-03A2 RE+
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9KHz~30MHz)	±4.51dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Radiated Emission(25GHz~40GHz)	±3.38dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	RFID qr reader		CR01	N/A	EUT
E-2	Battery	N/A	N/A	N/A	Auxiliary

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

5 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method	: ANSI C63.10: 2013
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

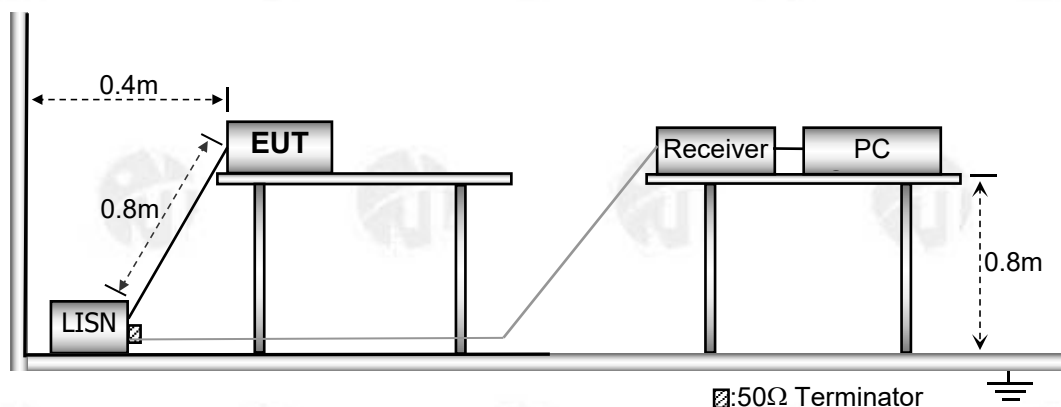
5.1 E.U.T. Operation

Operating Environment :

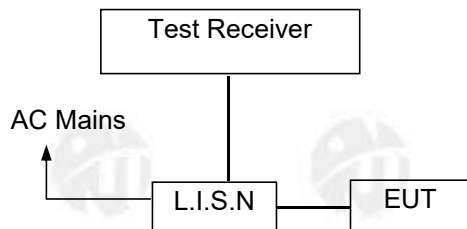
Temperature	: 24.5 °C
Humidity	: 52% RH
Atmospheric Pressure	: 101.11kPa

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10-2020+Cor 1+2023.



5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

N/A

Note: The EUT is powered by the DC supply. This test item is not applicable.

6 Radiated Spurious Emissions & Restricted Spurious Emission

Test Requirement : FCC CFR 47 Part 15 Section 15.225(d)&15.209
 Test Method : ANSI C63.10-2020+Cor 1+2023
 Test Result : PASS
 Measurement Distance : 3m
 Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

According to FCC CFR 47 Part 15 Section 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.

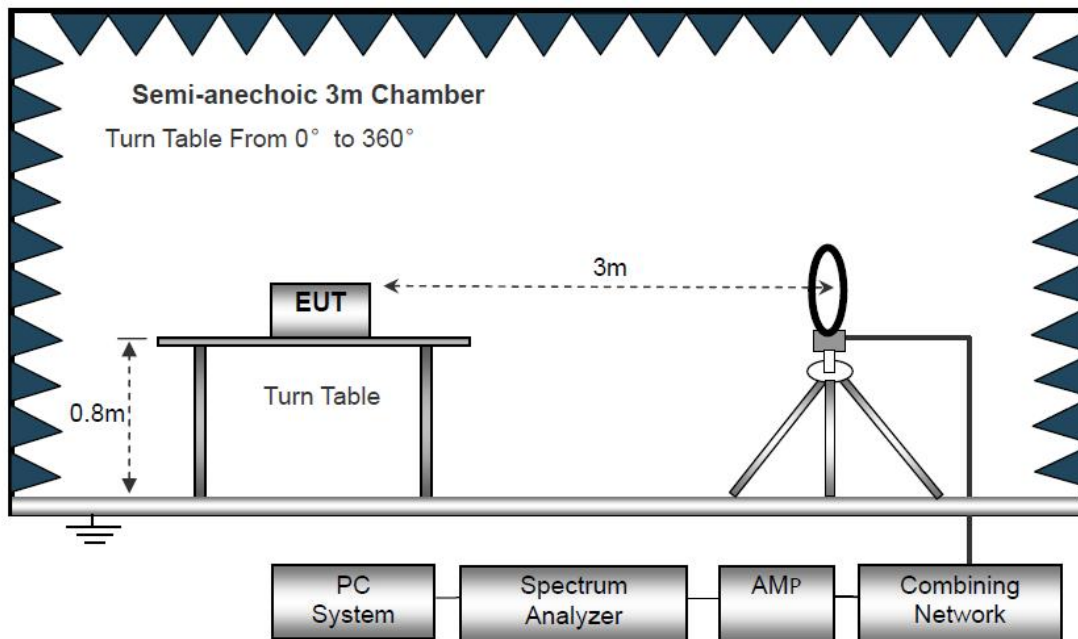
6.1 EUT Operation

Operating Environment :
 Temperature: : 24.5°C
 Humidity: : 52 % RH
 Atmospheric Pressure: : 101.11kPa
 Test Voltage : DC 12V

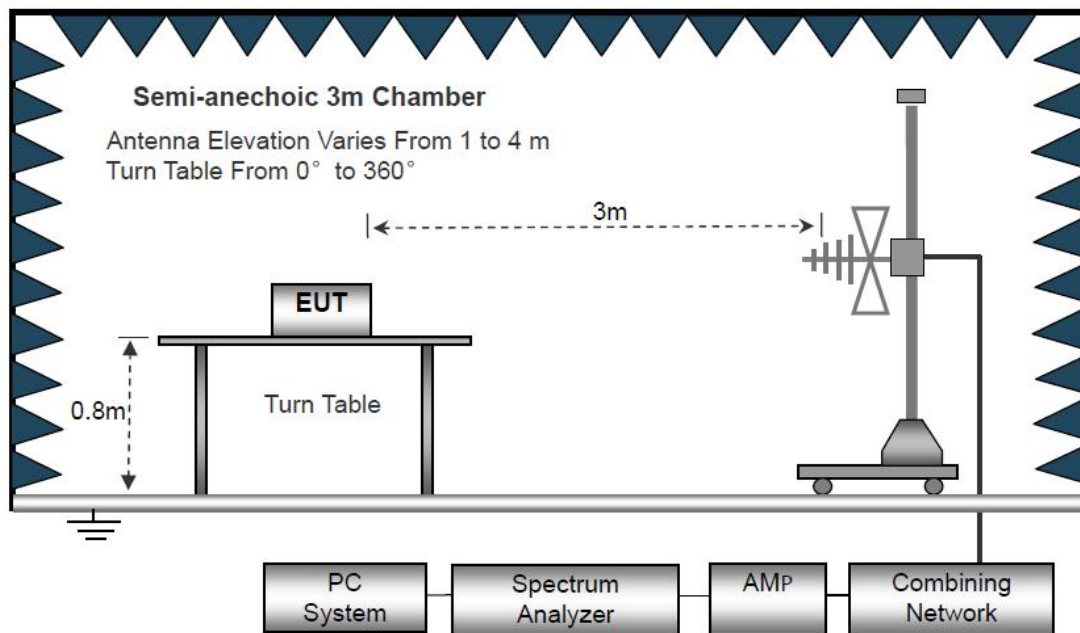
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

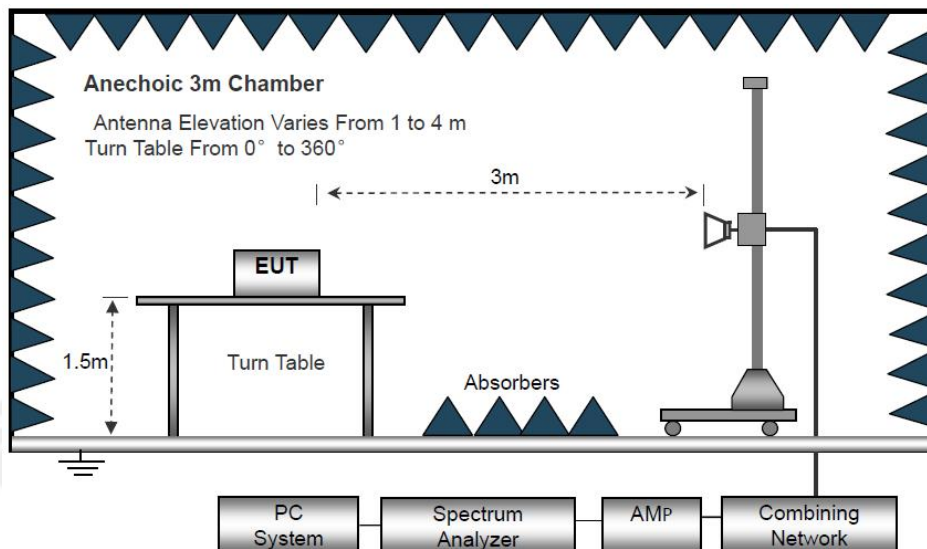
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

Below 30MHz			
IF Bandwidth	:	10kHz	
Resolution Bandwidth	:	10kHz	
Video Bandwidth	:	10kHz	
30MHz ~ 1GHz			
Detector	:	PK	QP
Resolution Bandwidth	:	100kHz	120kHz
Video Bandwidth	:	300kHz	300kHz
Above 1GHz			
Detector	:	PK	AV
Resolution Bandwidth	:	1MHz	1MHz
Video Bandwidth	:	3MHz	10Hz

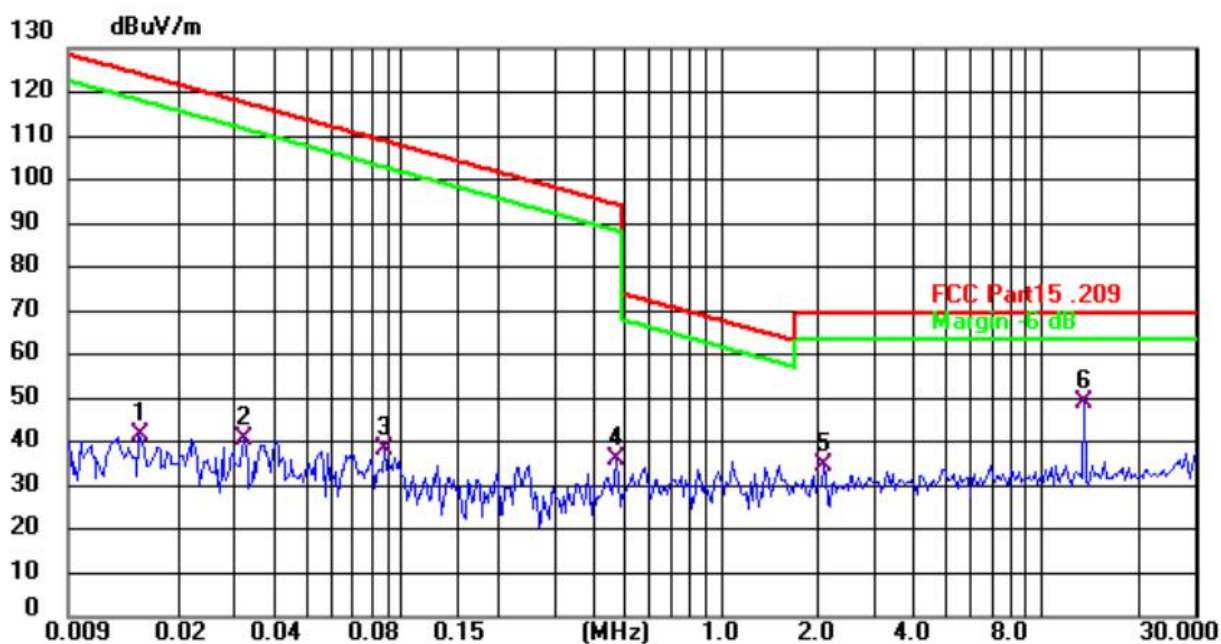
6.4 Test Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

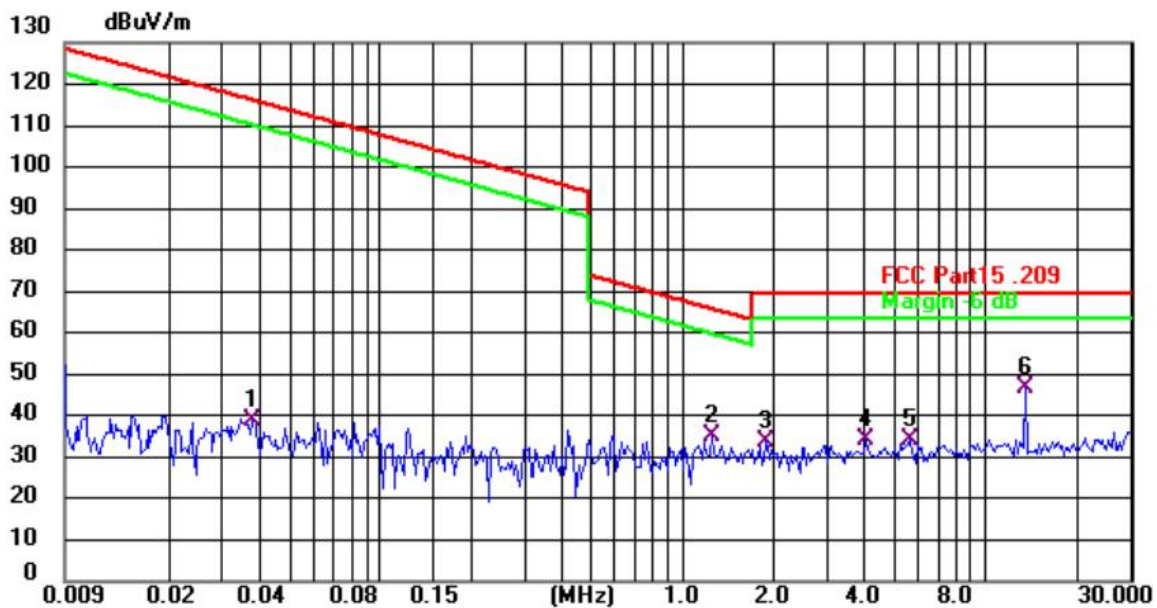
Temperature:	24.5℃	Relative Humidity:	52%
Pressure:	101.11kPa	Pol.	Coplanar
Test Voltage :	DC 12V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.0153	40.64	0.79	41.43	123.91	-82.48	QP
2	0.0324	40.04	0.56	40.60	117.39	-76.79	QP
3	0.0872	37.85	0.28	38.13	108.79	-70.66	QP
4	0.4638	35.70	0.17	35.87	94.28	-58.41	QP
5	2.0633	34.26	0.18	34.44	69.54	-35.10	QP
6 *	13.5600	48.21	0.68	48.89	69.54	-20.65	QP



Temperature:	24.5℃	Relative Humidity:	52%
Pressure:	101.11kPa	Pol.	Coaxial
Test Voltage :	DC 12V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.0381	38.42	0.48	38.90	115.98	-77.08	QP
2	1.2478	35.12	0.11	35.23	65.68	-30.45	QP
3	1.8720	33.30	0.16	33.46	69.54	-36.08	QP
4	4.0128	33.74	0.34	34.08	69.54	-35.46	QP
5	5.6417	33.88	0.45	34.33	69.54	-35.21	QP
6 *	13.5481	46.01	0.68	46.69	69.54	-22.85	QP

Note:

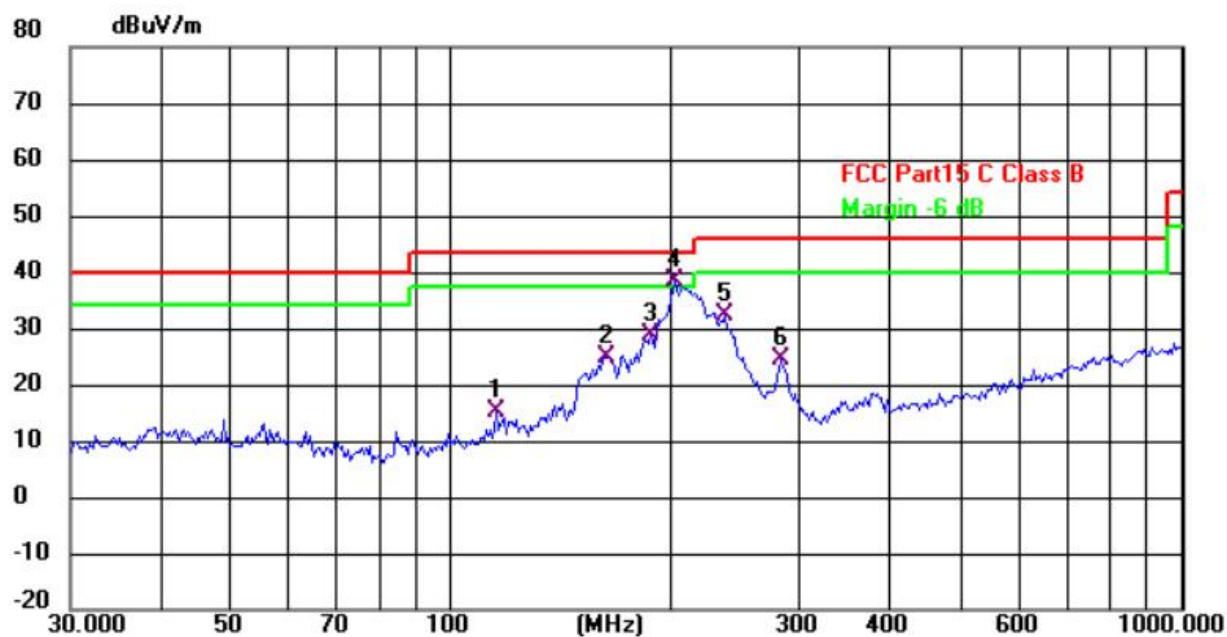
Pre-scan in the all of mode, the worst case in of was recorded.

Factor = antenna factor + cable loss – pre-amplifier. Emission Level=Reading+Factor

Margin = Emission Level- Limit.

Test Frequency: 30MHz ~ 1GHz

Test plot for Horizontal

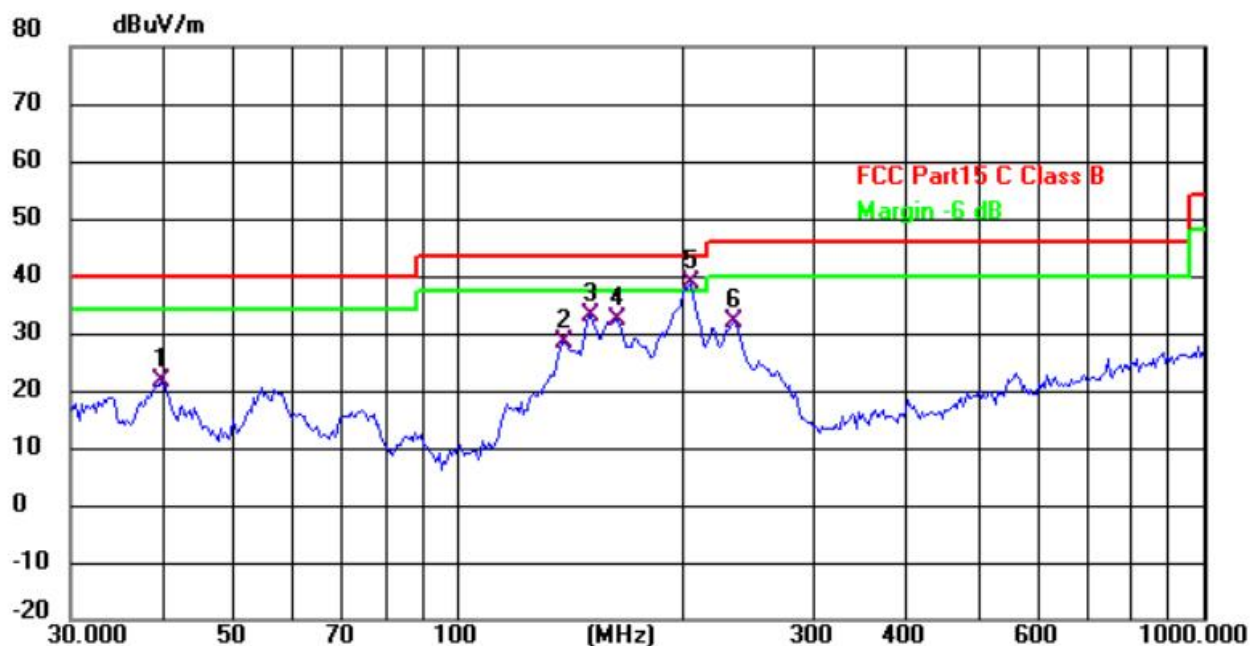


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	115.3204	29.62	-14.36	15.26	43.50	-28.24	QP
2	162.6105	37.21	-12.27	24.94	43.50	-18.56	QP
3	187.0956	43.89	-15.01	28.88	43.50	-14.62	QP
4 *	202.1004	53.81	-15.49	38.32	43.50	-5.18	QP
5	237.4760	46.74	-14.38	32.36	46.00	-13.64	QP
6	282.9849	37.49	-12.90	24.59	46.00	-21.41	QP

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier

Emission Level = Reading + Factor Margin = Emission Level – Limit

Test plot for Vertical



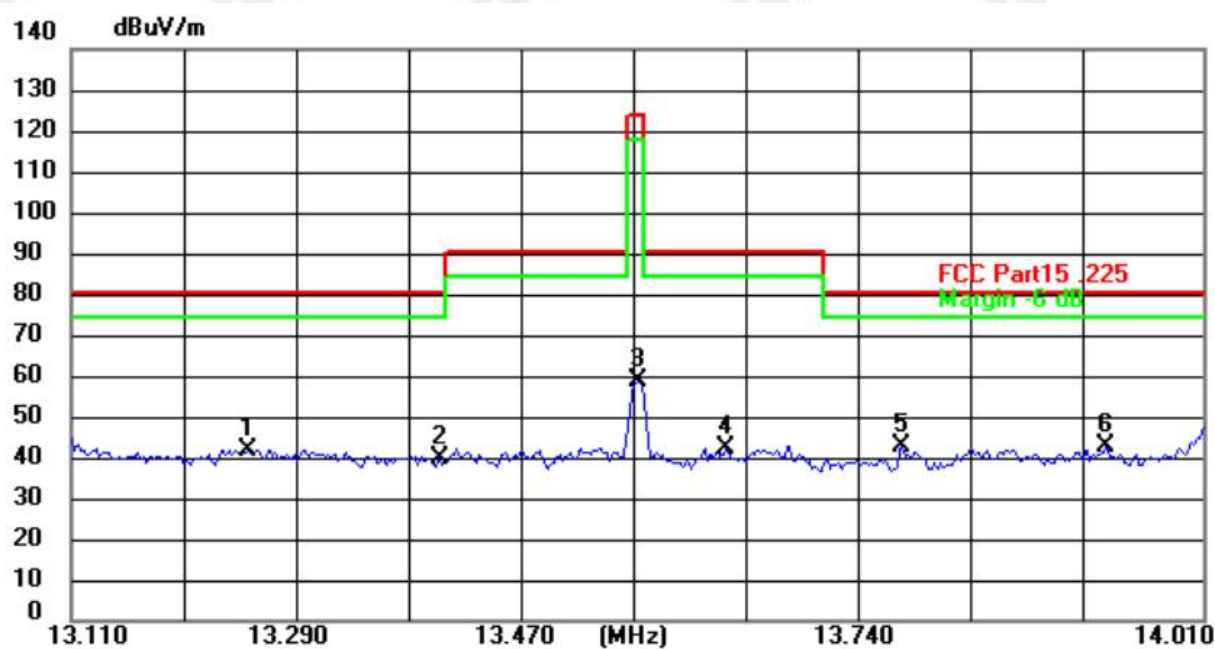
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.7146	34.71	-13.14	21.57	40.00	-18.43	QP
2	138.3873	41.42	-13.01	28.41	43.50	-15.09	QP
3	150.5377	45.54	-12.43	33.11	43.50	-10.39	QP
4	162.6105	44.49	-12.27	32.22	43.50	-11.28	QP
5 *	204.9550	54.04	-15.42	38.62	43.50	-4.88	QP
6	234.1682	46.61	-14.50	32.11	46.00	-13.89	QP

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier

Emission Level = Reading + Factor Margin = Emission Level – Limit

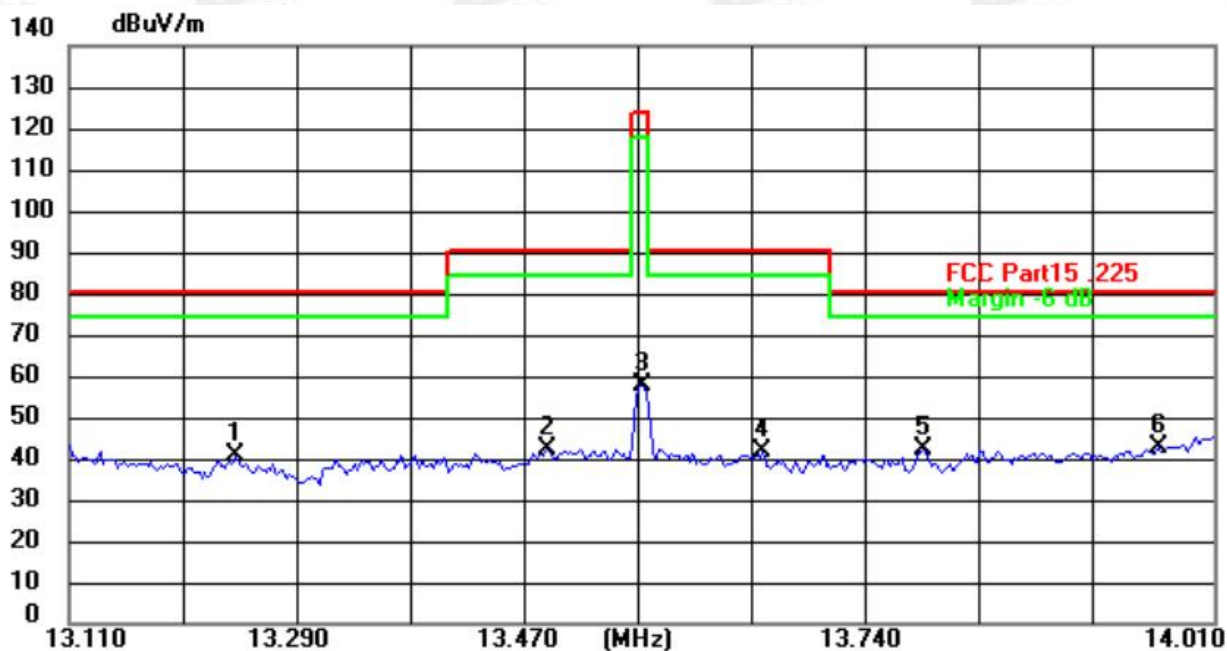
Restricted Spurious Emission

Temperature:	24.5℃	Relative Humidity:	52%
Pressure:	101.11kPa	Pol.	Coplanar
Test Voltage :	DC 12V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	13.2504	1.09	40.83	41.92	80.50	-38.58	peak
2	13.4034	-1.03	40.84	39.81	80.50	-40.69	peak
3	13.5600	17.89	40.85	58.74	124.00	-65.26	peak
4	13.6302	1.63	40.85	42.48	90.50	-48.02	peak
5	13.7706	1.75	40.85	42.60	80.50	-37.90	peak
6 *	13.9326	2.00	40.86	42.86	80.50	-37.64	peak

Temperature:	24.5℃	Relative Humidity:	52%
Pressure:	101.11kPa	Pol.	Coaxial
Test Voltage :	DC 12V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	13.2414	-0.28	40.83	40.55	80.50	-39.95	peak
2	13.4862	1.63	40.85	42.48	90.50	-48.02	peak
3	13.5600	16.97	40.85	57.82	124.00	-66.18	peak
4	13.6554	0.79	40.85	41.64	90.50	-48.86	peak
5	13.7814	1.22	40.85	42.07	80.50	-38.43	peak
6 *	13.9668	2.14	40.86	43.00	80.50	-37.50	peak

Remark: Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Emission Level=Reading+Factor Margin = Measurement Level - Limit

7 6dB&99% Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.215

Test Method : ANSI C63.10-2020+Cor 1+2023

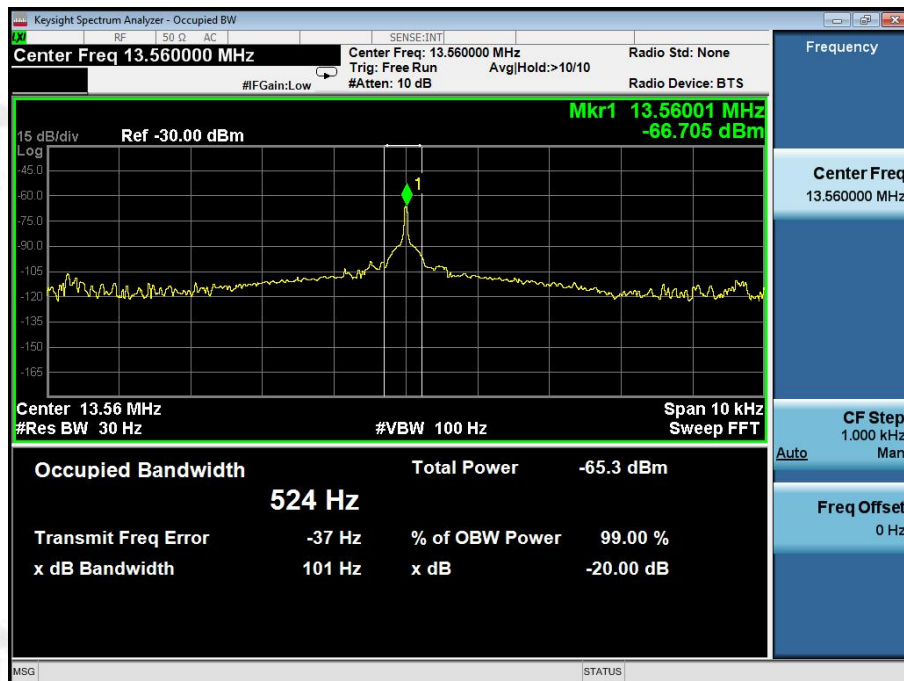
Test Limit /

7.1 Test Procedure

1. Set RBW = 1% to 5% of the OBW
2. Set VBW ≥ 3 RBW
3. Detector = Peak.
4. Trace mode = max hold
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20dB relative to the maximum level measured in the fundamental emission.

7.2 Test Result

Modulation	Frequency (MHz)	20dB bandwidth (Hz)	99%dB bandwidth (Hz)	Result
ASK	13.56	101	524	Pass



8 FREQUENCY STABILITY

Test Requirement : FCC CFR47 Part 15 Section 15.225(e)
Test Method : ANSI C63.10-2020+Cor 1+2023
Test Limit : the carrier frequency stability shall not exceed ± 100 ppm

8.1 Test Procedure

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency.

Turn EUT off and set the chamber temperature to -20°C . After the temperature stabilized for approximately 30 minutes recorded the frequency.

Repeat step measure with 10°C increased per stage until the highest temperature of $+50^{\circ}\text{C}$ reached.

Reduce the input voltage to specified extreme voltage variation ($\pm 15\%$) or endpoint, record the maximum frequency change.

8.2 Test Result

Reference Frequency: 13.56MHz					
Voltage (V)	Temperature (°C)	Frequency (KHz)	Frequency Deviation (Hz)	Deviation (ppm)	Limit (ppm)
12	+20(Ref)	13.560103	0.000103	7.60	± 100
	-20	13.560063	0.000063	4.65	± 100
	-10	13.560187	0.000187	13.79	± 100
	0	13.560130	0.00013	9.59	± 100
	+10	13.560108	0.000108	7.96	± 100
	+20	13.560090	0.00009	6.64	± 100
	+25	13.560140	0.00014	10.32	± 100
	+30	13.560151	0.000151	11.14	± 100
	+40	13.560177	0.000177	13.05	± 100
	+50	13.560062	0.000062	4.57	± 100
13.8	+20	13.560030	0.000030	2.21	± 100
10.2	+20	13.560101	0.000101	7.45	± 100



9 Antenna Application

9.1 Antenna Requirement

15.203 requirement:

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, 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.

9.2 Result

The EUT antenna is Loop Antenna. It comply with the standard requirement.

10 Test Setup &EUT Photos

Reference to the attachment for details.

*******THE END REPORT*******