

FCC TEST REPORT

FCC ID: 2BYDD-CTS30

Product : Smart lock
Model Name : CTS30, CTS30-W, CTS30-B, CTS10, CTS40
Brand : N/A
Report No. : SZNTT26037108E1-1

Prepared for

Shenzhen Lockman Lock Co., Ltd.

201, Building 5, Yingtai Industrial Road, Langkou Community, Dalang Street, Longhua District, Shenzhen City, Guangdong Province, China

Prepared by

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1 TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Lockman Lock Co., Ltd.

Address : 201, Building 5, Yingtai Industrial Road, Langkou Community, Dalang Street, Longhua District, Shenzhen City, Guangdong Province, China

Manufacture's name : Shenzhen Lockman Lock Co., Ltd.

Address : 201, Building 5, Yingtai Industrial Road, Langkou Community, Dalang Street, Longhua District, Shenzhen City, Guangdong Province, China

Product name : Smart lock

Model number : CTS30, CTS30-W, CTS30-B, CTS10, CTS40

Standards : FCC CFR47 Part 15 Section 15.225

Test procedure : ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024

Date of test : Jul. 22, 2026 to Sep. 15, 2026

Date of Issue : Sep. 15, 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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Contents

	Page
1 TEST RESULT CERTIFICATION	2
2 TEST SUMMARY.....	5
3 GENERAL INFORMATION.....	6
3.1 GENERAL DESCRIPTION OF E.U.T.....	6
3.2 TEST SETUP CONFIGURATION.....	6
3.3 TEST MODE.....	7
3.4 TEST SITE.....	7
4 EQUIPMENT DURING TEST.....	8
4.1 EQUIPMENTS LIST	8
4.2 MEASUREMENT UNCERTAINTY	11
4.3 DESCRIPTION OF SUPPORT UNITS	11
5 CONDUCTED EMISSION	13
5.1 E.U.T. OPERATION	13
5.2 EUT SETUP.....	13
5.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	14
5.4 MEASUREMENT PROCEDURE	14
5.5 CONDUCTED EMISSION LIMIT	14
5.6 MEASUREMENT DESCRIPTION.....	14
5.7 CONDUCTED EMISSION TEST RESULT	14
6 RADIATED SPURIOUS EMISSIONS & RESTRICTED SPURIOUS EMISSION	15
6.1 EUT OPERATION	15
6.2 TEST SETUP.....	16
6.3 SPECTRUM ANALYZER SETUP.....	17
6.4 TEST PROCEDURE	18
6.5 SUMMARY OF TEST RESULTS.....	19
7 6DB&99% BANDWIDTH MEASUREMENT	23
7.1 TEST PROCEDURE	23
7.2 TEST RESULT	23

8 FREQUENCY STABILITY	24
8.1 TEST PROCEDURE	24
8.2 TEST RESULT	25
9 ANTENNA APPLICATION	26
9.1 ANTENNA REQUIREMENT	26
9.2 RESULT	26
10 TEST SETUP &EUT PHOTOS	27

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.

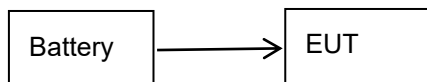
3 General Information

3.1 General Description of E.U.T.

Product Name	:	Smart lock
Model Name	:	CTS30
Sample ID	:	SZNTT26037108E1
Sample(s) Status:	:	N/A
Series Model	:	CTS30-W, CTS30-B, CTS10, CTS40
Model Different.:	:	All the model are the same circuit and RF module, only the names and appearance colors are different. Test sample model: CTS30
Operation Frequency	:	13.56 MHz
Number of Channel	:	1
Type of Modulation	:	ASK
Antenna installation	:	PCB antenna
Antenna Gain	:	1.0dBi
Power supply	:	DC 4.5V by battery
Hardware Version	:	V1.0
Software Version	:	V1.0
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

Accredited by ANAB, Dec. 19, 2025

The Certificate Registration Number is AT-3446

FCC Designation Number: CN3446

EMC Lab.

:

FCC Test Firm Registration Number: 129414

ISED CAB identifier: CN0199

ISED Company Number: 35943

Name of Firm

:

Shenzhen NTT Testing Technology Co., Ltd.

1B, Building 2, Factory Building & 103, Building 3, Factory Building,

Site Location

:

Dayang Industrial Park No.4, Industrial Avenue, Tangwei Community,
Fuhai Sub-district, Bao'an District, Shenzhen City, China

4 Equipment During Test

4.1 Equipments List

1Conducted Test Site

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 Test Site(Below 1G and Above 1G)&RF Test Site

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
Amplifi (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
Pream plifier (1GHz-18GHz)	BBV 9718D	0024	SCHWARZBECK	2025/9/8	2026/9/7
Spectrum Analyze (10Hz-40GHz)	FSV 40	100952	Rohde & Schwarz	2025/9/8	2026/9/7

Pream plifier (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	MY505102 02	Agilent	2025/9/8	2026/9/7
MXG Vector Signal Generator	N5182A	MY501400 20	Agilent	2025/9/8	2026/9/7
MXG Analog Signal Generator	N5181A	MY474209 19	Agilent	2025/9/8	2026/9/7
Power Sensor	TR1029-2	512364	Techoy	2025/9/8	2026/9/7
RF Swith	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

Test software

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

Conducted Test Site

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	HSRCE944	/	HTEC	2025/04/30	2028/04/29
EMI Test Receiver	ESCI	100881/003	ROHDE&SCHW ARZ	2026/09/04	2027/09/03
LISN	AMN6500	101185	ROHDE&SCHW ARZ	2026/09/04	2027/09/03
LISN	NNLK 8129	00603	SCHWARZBECK	2026/09/04	2027/09/03
Cable	RG223-2M	/	RG	2026/09/04	2027/09/03

Radiated Test Site(Below 1G and Above 1G)&RF Test Site

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2025/07/24	2028/07/23
EMI Test Receiver	ESPI	101018	ROHDE&SCHW ARZ	2026/09/04	2027/09/03
Amplifi (30MHz-1GHz)	BBV 9745	00431	SCHWARZBECK	2026/09/04	2027/09/03
Bilog Antenna (30MHz-1GHz)	VULB9168	1858	SCHWARZBECK	2026/09/05	2027/09/04
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHWARZBECK	2026/09/05	2027/09/04
Pream plifier (1GHz- 18GHz)	BBV 9718D	0024	SCHWARZBECK	2026/09/04	2027/09/03
Spectrum Analyze (10Hz-40GHz)	FSV 40	100952	ROHDE&SCHW ARZ	2026/09/04	2027/09/03
Pream plifier (18GHz-40GHz)	BBV 9721	0056	SCHWARZBECK	2026/09/04	2027/09/03

Double Ridge Guide Horn Antenna (18GHz-40GHz)	SAS-574	588	A.H.System	2026/09/05	2027/09/04
Loop Antenna (9KHz-30MHz)	FMZB 1513-60	00115	SCHWARZBECK	2026/09/04	2027/09/03
MXG Signal Analyzer	N9020A	MY49100730	Agilent	2026/09/04	2027/09/03
MXG Vector Signal Generator	N5182A	MY50144920	Agilent	2026/09/04	2027/09/03
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	/	ROHDE&SCHW ARZ	2026/09/07	2027/09/06
Power Sensor	MW100- RFCB-2	MW260105N TT-64	MWRFTtest	2026/09/04	2027/09/03
RF Swith	MW100- RFCB-1	MW260105N TT-64	MWRFTtest	2026/09/04	2027/09/03
Cable	RG223-3M	/	DA	2026/09/04	2027/09/03
Cable	RG223-12M	/	DA	2026/09/04	2027/09/03
Cable	SFT205- NMNMSW- 2.5M	/	DA	2026/09/04	2027/09/03
Cable	SFT205- NMNM-12M	/	DA	2026/09/04	2027/09/03
Cable	UCA500- NJWSM- 1.5M	017	MWRFTtest	2026/09/04	2027/09/03

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$

Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1\text{ }^{\circ}\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(9kHz~30MHz)	$\pm 4.51\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$
Remark:When making a conformity declaration based on test results for regulations/standards or specifications,the default is to use Clause 4.2.1of ILAC-G8:09/2019 and the guidelines on decision rules and conformity declaration in IEC Guide 115:2023.	

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
Laptop	DELL	Vostro 5490	/	/	

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 C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024
Test Result	: PASS
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

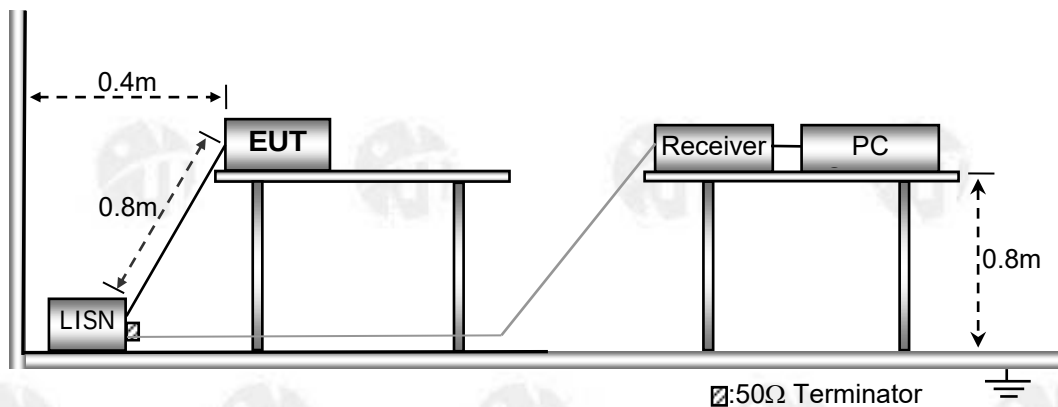
5.1 E.U.T. Operation

Operating Environment :

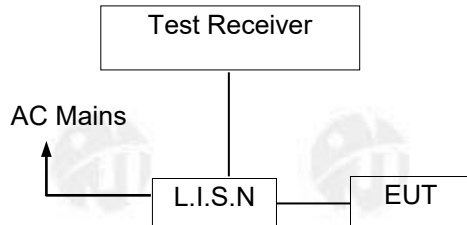
Temperature	: 24.5 °C
Humidity	: 52% RH
Atmospheric Pressure	: 101.11kPa

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 + C63.10a-2024 + Errata to C63.10a-2024
 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(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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

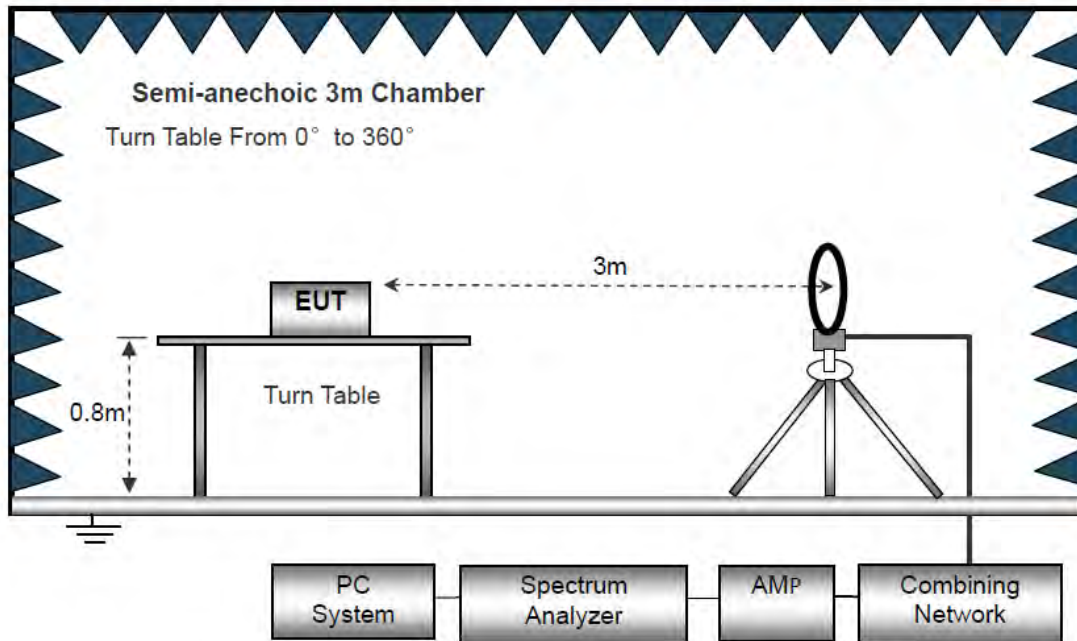
Operating Environment :

Temperature: : 24.5°C
 Humidity: : 52 % RH
 Atmospheric Pressure: : 101.11kPa
 Test Voltage : DC 4.5V

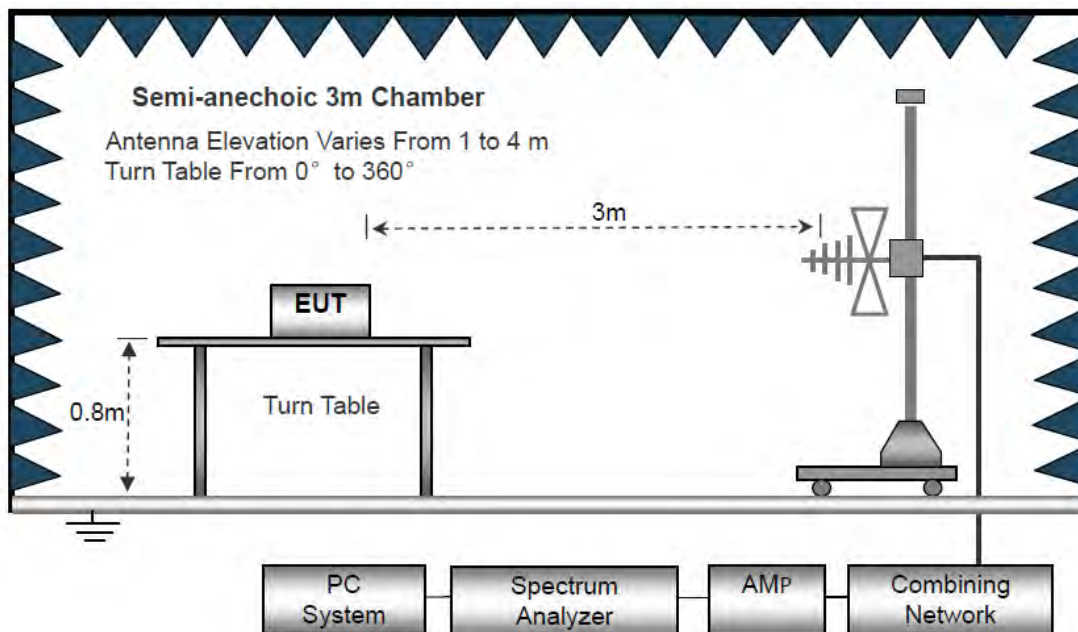
6.2 Test Setup

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

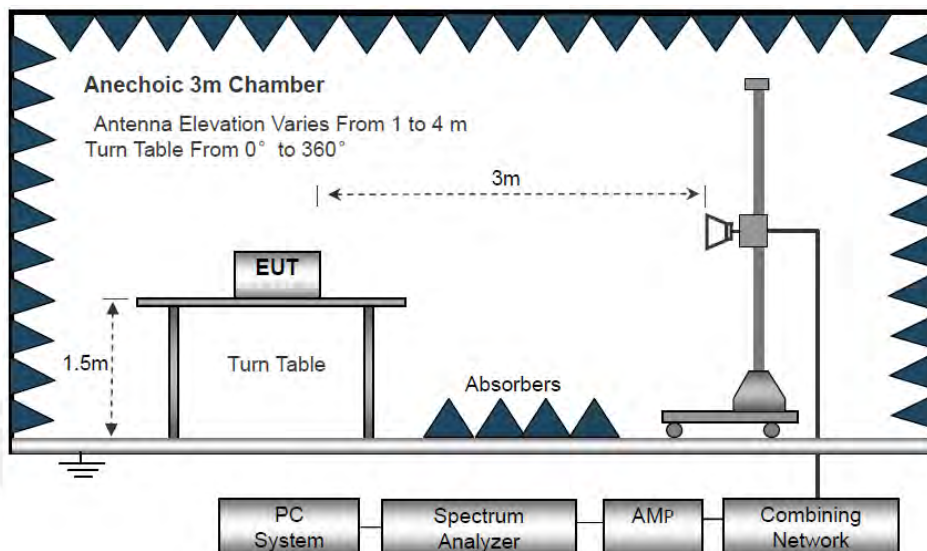
The test setup for emission measurement below 30MHz



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°C	Relative Humidity:	52%
Pressure:	101.11kPa	Pol.	Coplanar
Test Voltage :	DC 4.5V		

Azimuth: 0 deg

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
0.35	62.03	14.21	76.24	88.92	-12.68	QP
13.56	90.27	12.33	102.60	124	-21.40	peak
13.56	86.41	12.3	98.71	124	-25.29	AVG
27.12	57.18	12.41	69.59	79.03	-9.44	peak
27.12	56.69	12.41	69.10	79.03	-9.93	AVG
28.88	50.90	12.41	63.31	79.03	-15.72	QP

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits

Temperature:	24.5°C	Relative Humidity:	52%
Pressure:	101.11kPa	Pol.	Coaxial
Test Voltage :	DC 4.5V		

Azimuth: 90 deg

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
0.35	60.41	14.21	74.62	88.92	-14.30	QP
13.56	88.90	12.33	101.23	124	-22.77	peak
13.56	88.32	12.3	100.62	124	-23.38	AVG
27.12	57.16	12.41	69.57	79.03	-9.46	peak
27.12	57.90	12.41	70.31	79.03	-8.72	AVG
28.88	49.30	12.41	61.71	79.03	-17.32	QP
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. Emission level = Reading Result + Factor, Margin = Emission level - Limits						

Note:

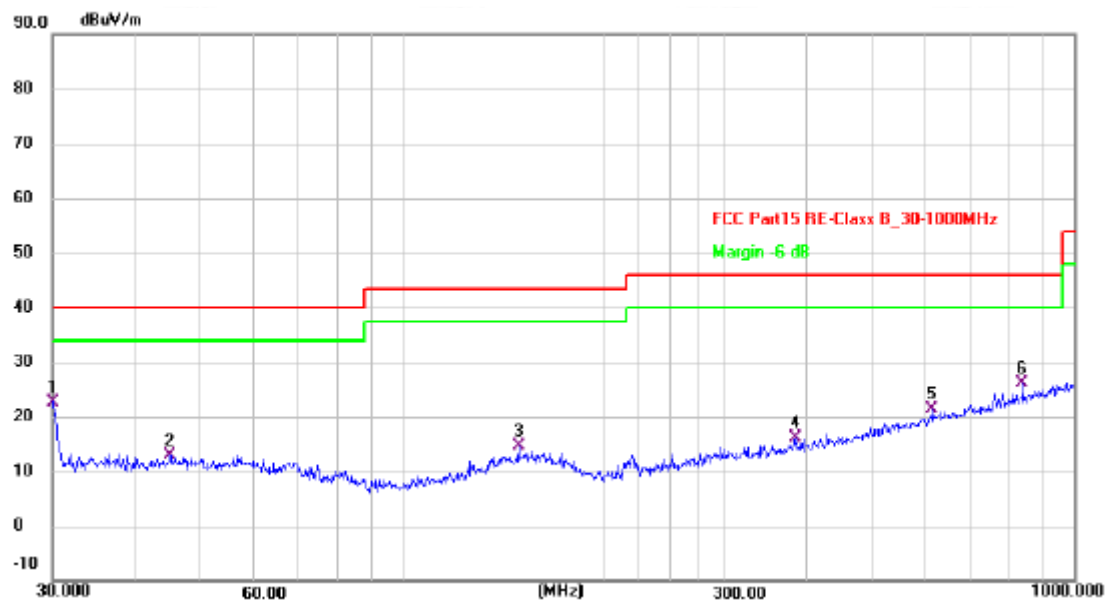
Pre-scan in the all of mode, the worst case in of was recorded.

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

Margin = Emission Level- Limit.

Test Frequency: 30MHz ~ 1GHz

Test plot for Horizontal

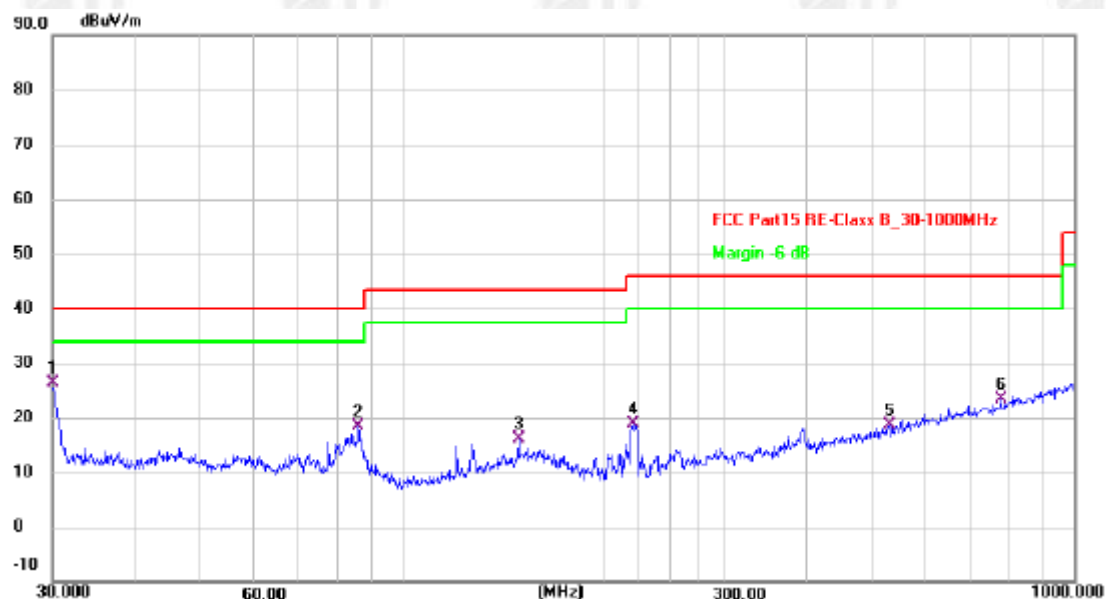


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	30.1053	36.36	-13.64	22.72	40.00	-17.28	QP
2	44.9006	26.06	-13.12	12.94	40.00	-27.06	QP
3	148.4410	27.04	-12.41	14.63	43.50	-28.87	QP
4	383.9318	26.81	-10.62	16.19	46.00	-29.81	QP
5	614.2142	26.59	-5.24	21.35	46.00	-24.65	QP
6	836.2443	27.91	-1.68	26.23	46.00	-19.77	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 *	30.0000	39.99	-13.65	26.34	40.00	-13.66	QP
2	85.5976	35.59	-17.32	18.27	40.00	-21.73	QP
3	148.4410	28.47	-12.41	16.06	43.50	-27.44	QP
4	220.6171	33.96	-15.02	18.94	46.00	-27.06	QP
5	530.1013	25.87	-7.22	18.65	46.00	-27.35	QP
6	776.8778	25.78	-2.52	23.26	46.00	-22.74	QP

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

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

7 6dB&99% Bandwidth Measurement

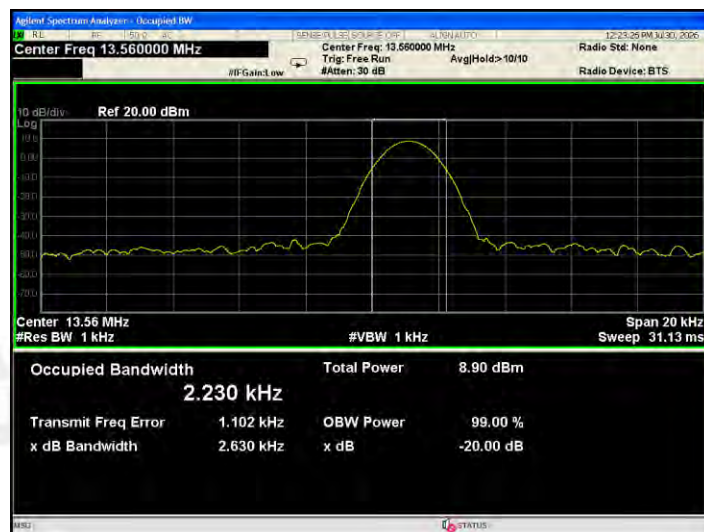
Test Requirement : FCC CFR47 Part 15 Section 15.215
 Test Method : ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024
 Test Limit : /

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	2.630	1.102	Pass



8 FREQUENCY STABILITY

Test Requirement	: FCC CFR47 Part 15 Section 15.225(e)
Test Method	: ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024
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)	13.5603	0.0020	7.60	± 100
	-20	13.5604	0.0028	4.65	± 100
	-10	13.5602	0.0014	13.79	± 100
	0	13.5606	0.0042	9.59	± 100
	+10	13.5603	0.0019	7.96	± 100
	+20	13.5604	0.0032	6.64	± 100
	+25	13.5602	0.0018	10.32	± 100
	+30	13.5604	0.0032	11.14	± 100
	+40	13.5603	0.0020	13.05	± 100
	+50	13.5604	0.0028	4.57	± 100
13.8	+20	13.5603	0.0020	2.21	± 100
10.2	+20	13.5604	0.0028	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 PCB antenna. It comply with the standard requirement.

10 Test Setup &EUT Photos

Reference to EUT photo attachment for details.

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