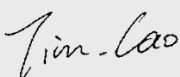
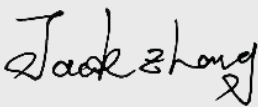


Test report No:
2290864R-RF-US-P06V03

FCC TEST REPORT

Product Name	Electronic fence transmitter
Trademark	CFMOTO
Model and /or type reference	CFEF-433AT
FCC ID	2A9ABCFEF-433AT
Applicant's name / address	ZHEJIANG CFMOTO POWER CO.,LTD. No.116,Wuzhou Road,Yuhang Economic Development Zone, Hangzhou City, Zhejiang
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.231 ANSI C63.10: 2013
Verdict Summary	IN COMPLIANCE
Testedby (name / position & signature)	Tim Cao/ Project Engineer 
Approved by (name / position & signature)	Jack Zhang/ Manager 
Date of issue	2023-01-04
Report Version	V2.2
Report template No	Template_FCC 15.231-RF-V1.0

INDEX

	page
General conditions	4
Environmental conditions	4
Possible test case verdicts	5
Abbreviations	5
Document History	6
Remarks and Comments.....	6
Used Equipment	7
Uncertainty	8
1 General Information.....	9
1.1 General Description of the Item(s)	9
1.2 Antenna Information	10
1.3 Channel List	11
2 Description of Test Setup	12
2.1 Operating mode(s) used for tests.....	12
2.2 Auxiliary equipment / Test software for the EUT.....	12
2.3 Test Configuration / Block diagram used for tests	13
2.4 Testing process	13
3 Verdict summary section	14
3.1 Standards.....	14
3.2 Deviation(s) from the Standard(s) / Test Specification(s).....	14
3.3 Overview of results.....	15
3.4 Test Facility.....	16
4 Test Results.....	17
4.1 Field strength of fundamental	17
4.1.1 Limit	17
4.1.2 Test Setup.....	18
4.1.3 Test Procedure.....	18
4.1.4 Test Data	19
4.2 Field strength of spurious emissions	20
4.2.1 Limit	20
4.2.2 Test Setup.....	22
4.2.3 Test Procedure.....	22
4.2.4 Test Data	23
4.3 DTS Bandwidth	27



4.3.1	Limit	27
4.3.2	Test Setup.....	27
4.3.3	Test Procedure.....	27
4.3.4	Test Data	28
4.4	Duration Time.....	29
4.4.1	Limit	29
4.4.2	Test Setup.....	29
4.4.3	Test Procedure.....	30
4.4.4	Test Data	31
5	Test setup photo and EUT Photo.....	32

COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

Test Location	No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China
Date(receive sample)	Aug. 27, 2022
Date (start test)	Aug. 30, 2022
Date (finish test)	Nov. 03, 2022

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report No.	Version	Description	Issued Date
2290864R-RF-US-P06V03	V1.0	Initial issue of report.	2022-12-02
2290864R-RF-US-P06V03	V2.0	Update the applicant address, V1.0 has expired.	2022-12-03
2290864R-RF-US-P06V03	V2.1	Modify the restrictions in Section 4.2, V2.0 has expired.	2022-12-28
2290864R-RF-US-P06V03	V2.2	Modify the test for duration time, V2.1 has expired.	2023-01-04

REMARKS AND COMMENTS

1. The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.231.
3. The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result.
4. The test results presented in this report relate only to the object tested.
5. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification (Suzhou) Co., Ltd.
6. This report will not be used for social proof function in China market.
7. DEKRA declines any responsibility with the following test data provided by customer that may affect the validity of result:
 - Chapter 1.1 General Description of the Item(s);
 - Chapter 1.2 Antenna Information
 - Chapter 1.3 Channel List.

USED EQUIPMENT

Radiated Emission(30MHz-1GHz) / AC3

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100573	2022.09.17	2023.09.16
Loop Antenna	R&S	HFH2-Z2	833799/003	2022.04.15	2023.04.14
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2021.12.03	2022.12.02
Temperature/Humidity Meter	RTS	RTS-8S	AC3-TH	2022.07.07	2023.07.06
Coaxial Cable	Huber+Suhner	RG 214	AC3-C	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-

Radiated Emission(1GHz-40GHz) / AC5

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
EXA Spectrum Analyzer	Keysight	N9010A	MY48030494	2021.12.15	2022.12.14
Pre-Amplifier	SKET	LNPA_0118G-45	SK2021090101	2021.12.13	2022.12.12
Preamplifier	CHENGYI	EMC184045SE	980263	2022.05.21	2023.05.20
DRG Horn	ETS-Lindgren	3117	00167055	2022.08.29	2023.08.28
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2022.05.19	2023.05.18
Loop Antenna	R&S	HFH2-Z2	833799/003	2022.04.15	2023.04.14
Temperature/Humidity Meter	RTS	RTS-8S	AC5-TH	2022.07.07	2023.07.06
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2022.03.21	2023.03.20
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2022.03.21	2023.03.20
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2022.03.21	2023.03.20
Dekra test software	Dekra	-	-	-	-

UNCERTAINTY

Uncertainties have been calculated according to the DEKRA internal document. The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The Uncertainties comply with standard required as below.

Test item	Uncertainty
Radiated Emission(30MHz~1GHz)	Horizontal: 30MHz~200MHz: 3.50 dB 300MHz~1GHz: 3.60 dB Vertical: 30MHz~200MHz: 3.60 dB 300MHz~1GHz: 3.50 dB
Radiated Emission(1GHz~26.5GHz)	Horizontal: 1GHz~18GHz: 5.00 dB Vertical: 1GHz~18GHz: 4.80 dB
Occupied Bandwidth	$\pm 1\text{kHz}$
Time	

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Product Name..... :	Electronic fence transmitter
Model No. :	CFEF-433AT
FCC ID :	2A9ABCFEF-433AT
Manufacturer..... :	Shenzhen Yuanlai Intelligent Equipment Co., Ltd
Manufacturer Address..... :	103, building 27, Yingshui villa, Minle community, Minzhi street, Longhua District, Shenzhen
Model Difference(s)..... :	N/A

Wireless specification..... :	N/A
Operating frequency range(s)..... :	433MHz
Type of Modulation..... :	FSK
Number of channel..... :	1

Rated power supply	Voltage and Frequency	
	☐	AC: 220 – 240 V, 50/60 Hz
	☒	AC: 12V
	☐	DC: 24V
	☐	Battery: ...3V...
Mounting position..... :	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Head-mounted equipment
	☒	Other:

1.2 Antenna Information

Antenna model / type number.....:	N/A		
Antenna serial number	N/A		
Antenna Delivery	☒	1TX + 1RX	
	☐	2TX + 2RX	
	☐	Others:.....	
Antenna technology.....:	☒	SISO	
	☐	MIMO	☐ CDD
			☐ Beam-forming
Antenna Type.....:	☒	External	☒ Dipole
			☐ Sectorized
	☐	Internal	☐ FPC
			☒ PCB
			☐ Metal Monopole Antenna
			☐ Ceramic chip
			☐ Others:.....

1.3 Channel List

SRD Working Frequency							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	433 MHz	--	--	--	--	--	--

Note: The general description of the Item(s) and channel list in clause 1 are provided and confirmed by the client.

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

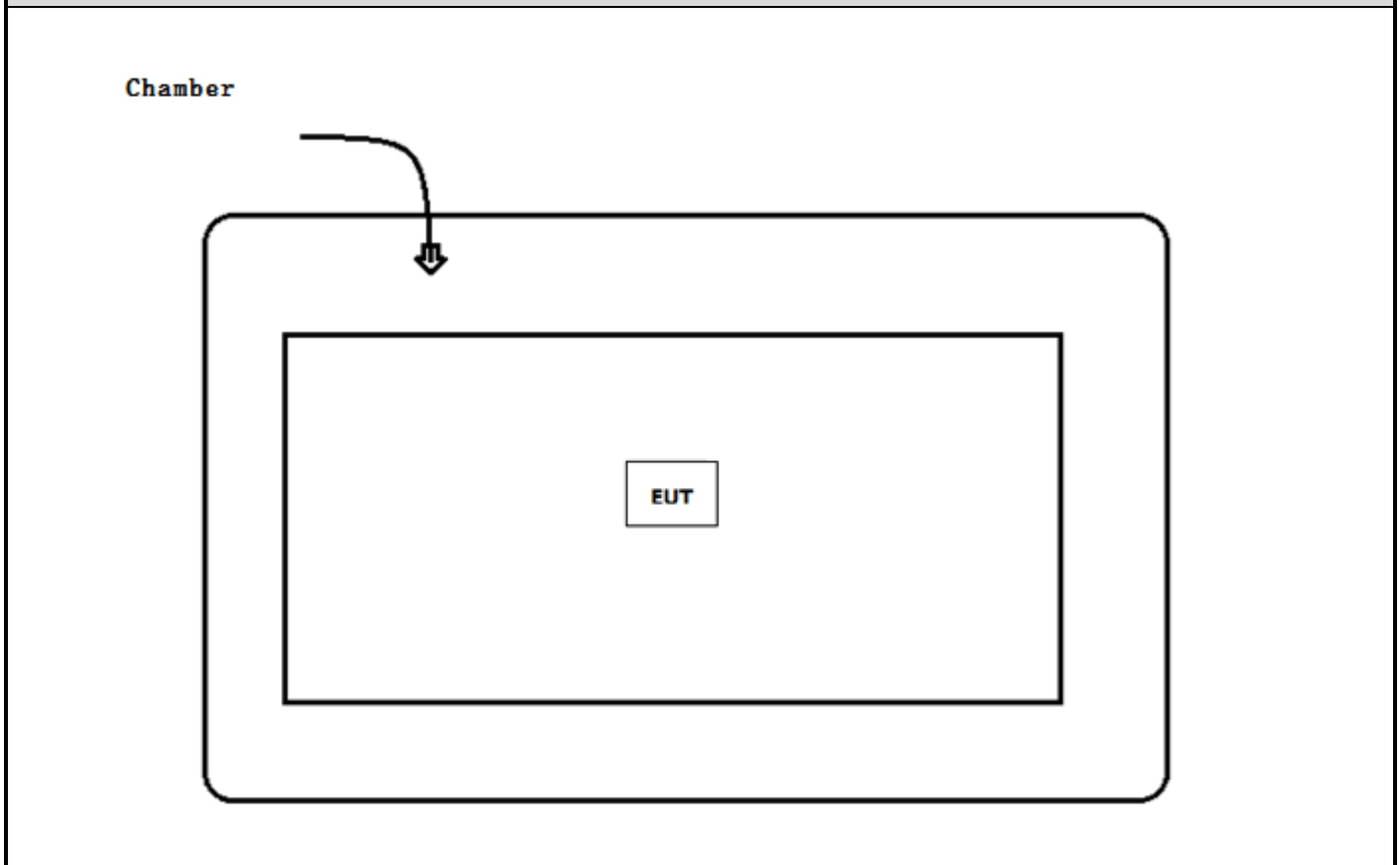
Test Mode	Mode1: Transmit
-----------	-----------------

2.2 Auxiliary equipment / Test software for the EUT

Auxiliary equipment	Type / Version	Manufacturer	Supplied by
N/A	N/A	N/A	N/A
Software	Type / Version	Manufacturer	Supplied by
N/A	N/A	N/A	N/A

2.3 Test Configuration / Block diagram used for tests

Test setup Diagram- Radiated Emission



2.4 Testing process

1	Setup the EUT as shown in Section 2.3.
2	Press the transmit button.
3	Configure the test mode, the test channel, and the data rate.
4	Verify that the EUT works properly.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C Section 15.231	2021	Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

(Please define the deviations from the standard(s) if applicable)

3.3 Overview of results

Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	FCC 15.207	PASS	---
Field strength of fundamental	FCC 15.231(e)	PASS	---
Field strength of spurious emissions	FCC 15.231(e), FCC 15.209	PASS	---
20dB Bandwidth	FCC 15.231(c)	PASS	---
Duration Time	FCC 15.231(a)(1)	PASS	---

3.4 Test Facility

USA : FCC Designation Number: CN1199

4 TEST RESULTS

4.1 Field strength of fundamental

VERDICT: PASS

4.1.1 Limit

Standard	FCC Part 15 Subpart C Paragraph 15.231
-----------------	--

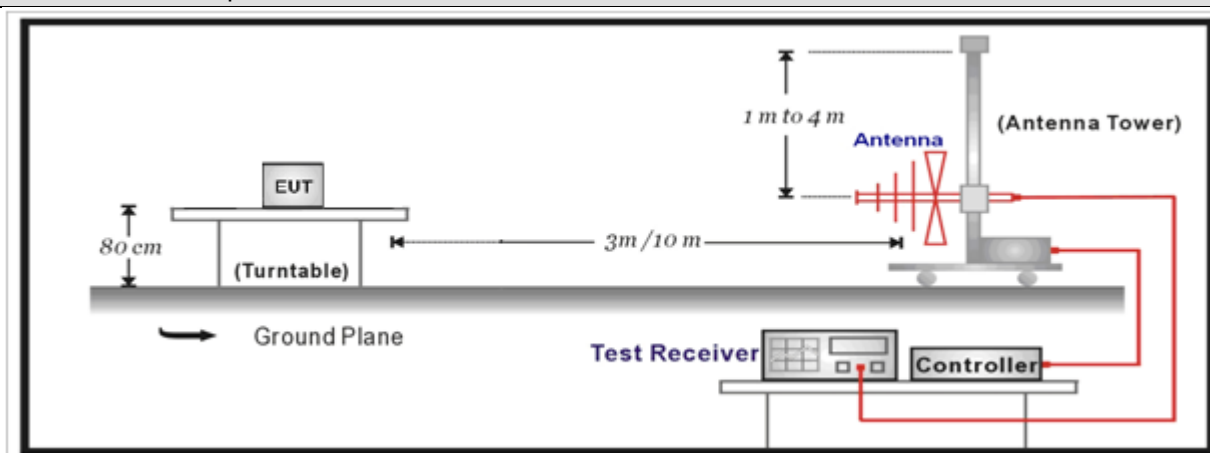
Restricted Bands of operation for FCC

Fundamental frequency (MHz)	Field strength of fundamental (μ V/m)	Field strength of fundamental (dB μ V/m)
40.66-40.70	1000	60
70-130	500	54
130-174	500-1500	54-63.5 ¹
174-260	1500	63.5
260-470	1500-5000	63.5-74 ¹
Above 470	5000	74

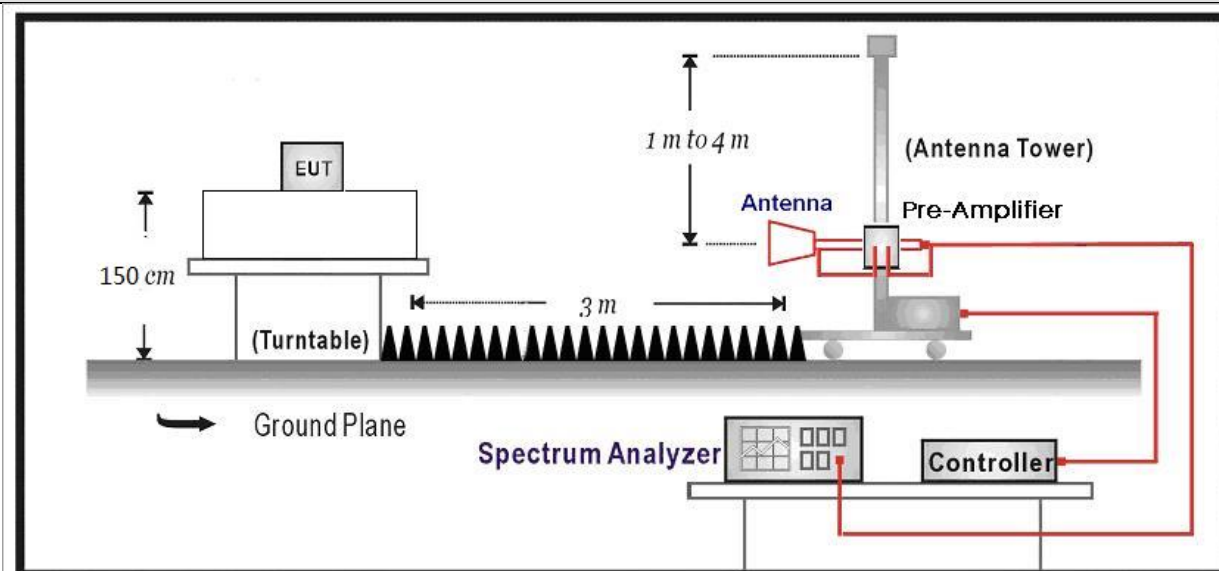
Note ¹⁾ : Linear interpolations

4.1.2 Test Setup

30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.1.3 Test Procedure

	References Rule		Chapter	Description
☒	ANSI C63.10		11.12	Emissions in restricted frequency bands
	☒	ANSI C63.10	11.12.1	Radiated emission measurements
	☒	ANSI C63.10	11.12.2.7	Radiated spurious emission test
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

4.1.4 Test Data

Frequency (MHz)	Measure Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Type
433(X Axis)	99.60	100.83	-1.23	Horizontal	PK
433(X Axis)	83.64	100.83	-17.19	Vertical	PK

Frequency (MHz)	Measure Level (dBuV/m)	Duty cycle Factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433(X Axis)	100.19	-25.85	74.34	92.87	-18.53	Horizontal
433(X Axis)	83.53	-25.85	57.68	72.87	-15.19	Vertical

Note 1:

Average value=Peak value + Duty Cycle Factor

Duty cycle factor = $20\log(\text{Duty cycle})$

Duty cycle = on time/100 milliseconds or period, whichever is less

T on time = $1.7 \times 3 = 5.1(\text{ms})$

T on time+T off time=100ms

Duty cycle = 5.1%

Duty cycle factor = $20\log(\text{Duty cycle}) = -25.85$

Note 2:

We have evaluated three orthogonal positions (X , Y , Z) and the position with the highest emission level(X Axis) was recorded and shown in the report.

4.2 Field strength of spurious emissions**VERDICT: PASS****4.2.1 Limit**

Standard	FCC 15.231(e),FCC 15.209		
FCC 15.231			
Fundamental frequency (MHz)		Field strength of spurious emission (μ V/m)	Field strength of spurious emission (dB μ V/m)
40.66-40.70		100	40
70-130		50	34
130-174		50-150	34-43.5 ^(Note 1)
174-260		150	43.5
260-470		150-500	43.5-54 ^(Note 1)
Above 470		500	54

Note 1: Linear interpolations

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

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.

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.

FCC 15.209

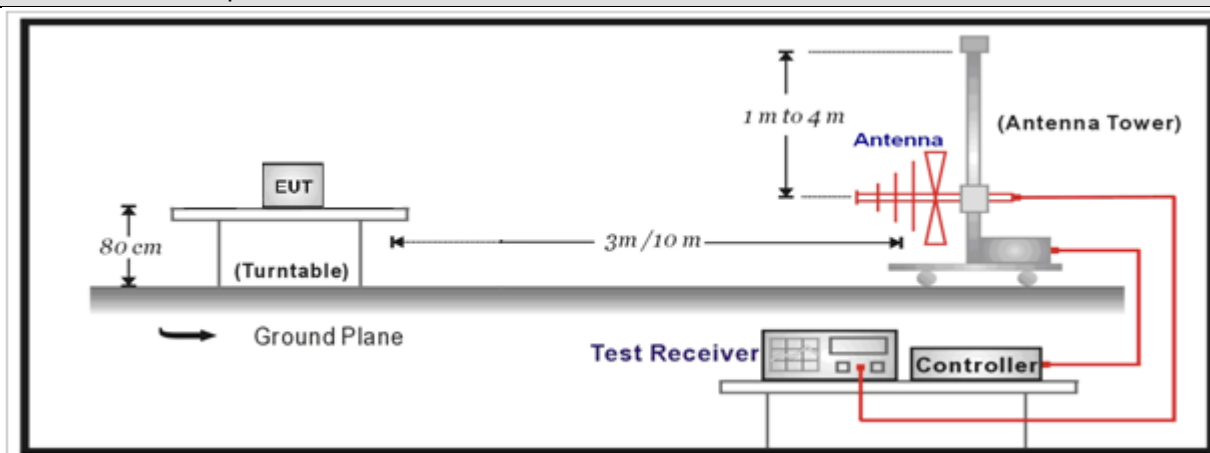
Frequency (MHz)	Field strength (μ V/m)	Field strength (dB μ V/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 ^(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 ^(Note 1)
1.705 - 30	30	29.5	30 ^(Note 1)
30 - 88	100	40	3 ^(Note 2)
88-216	150	43.5	3 ^(Note 2)
216 - 960	200	46	3 ^(Note 2)
Above 960	500	54	3 ^(Note 2)

Note 2: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

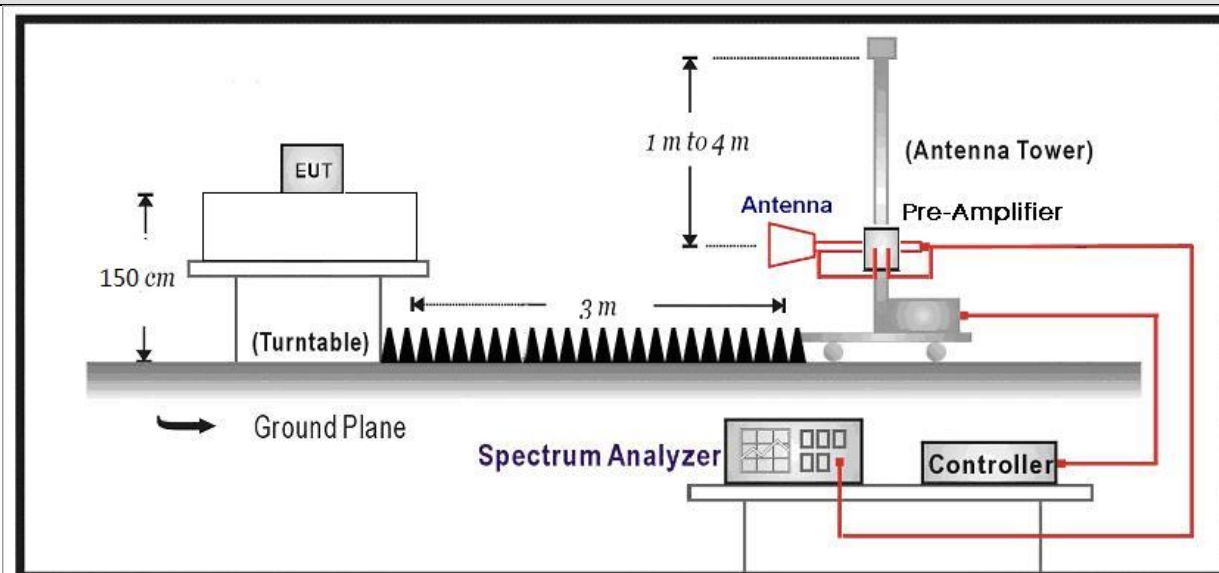
Note 3: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.2.2 Test Setup

30MHz-1GHz Test Setup:



Above 1GHz Test Setup:

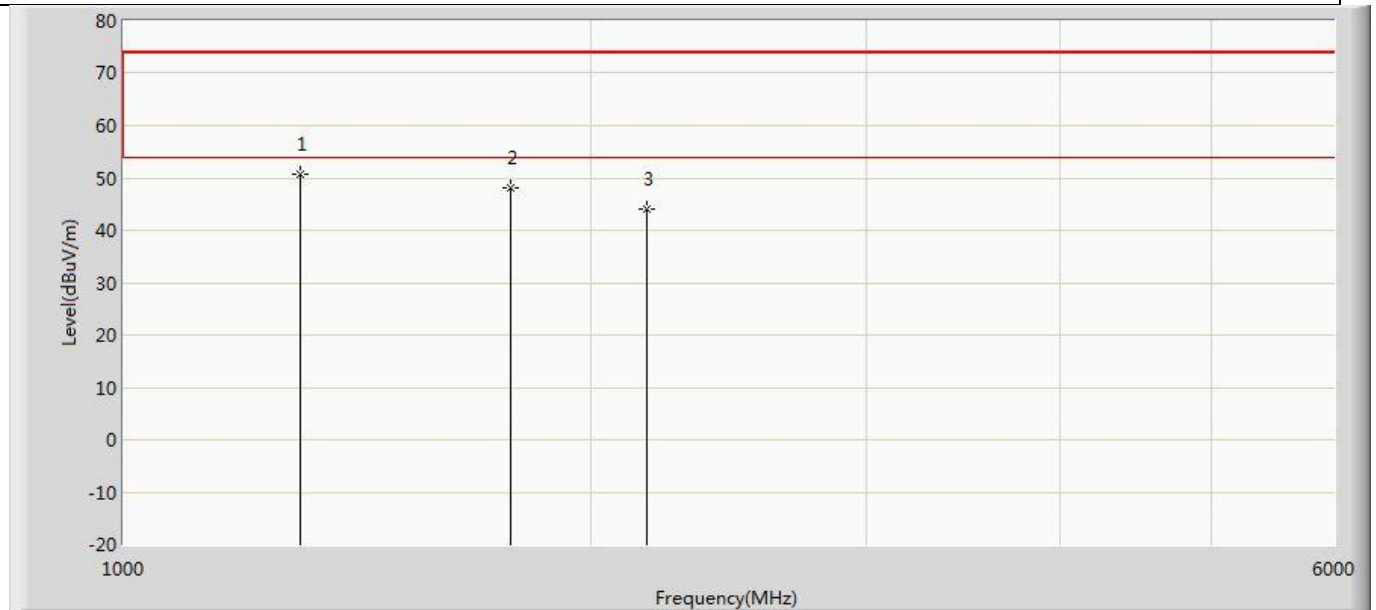


4.2.3 Test Procedure

	References Rule	Chapter	Description
☒	ANSI C63.10	11.12	Emissions in restricted frequency bands
☒	ANSI C63.10	11.12.1	Radiated emission measurements
☒	ANSI C63.10	11.12.2.7	Radiated spurious emission test
☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

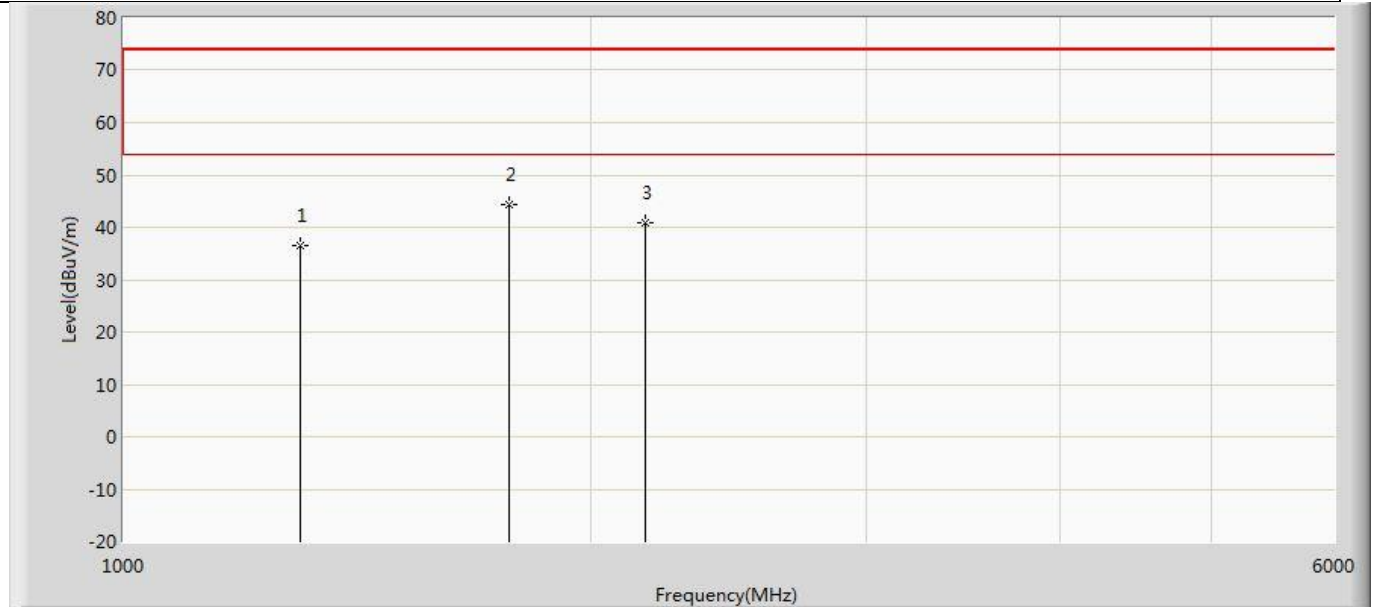
4.2.4 Test Data

Profile: 2290864R	Page No.: 5
Engineer: Noah	
Site: AC5	Time: 2022/11/03 - 22:26
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Vertical
EUT:Electronic fence transmitter	Power: DC 12V
Note: Mode1	



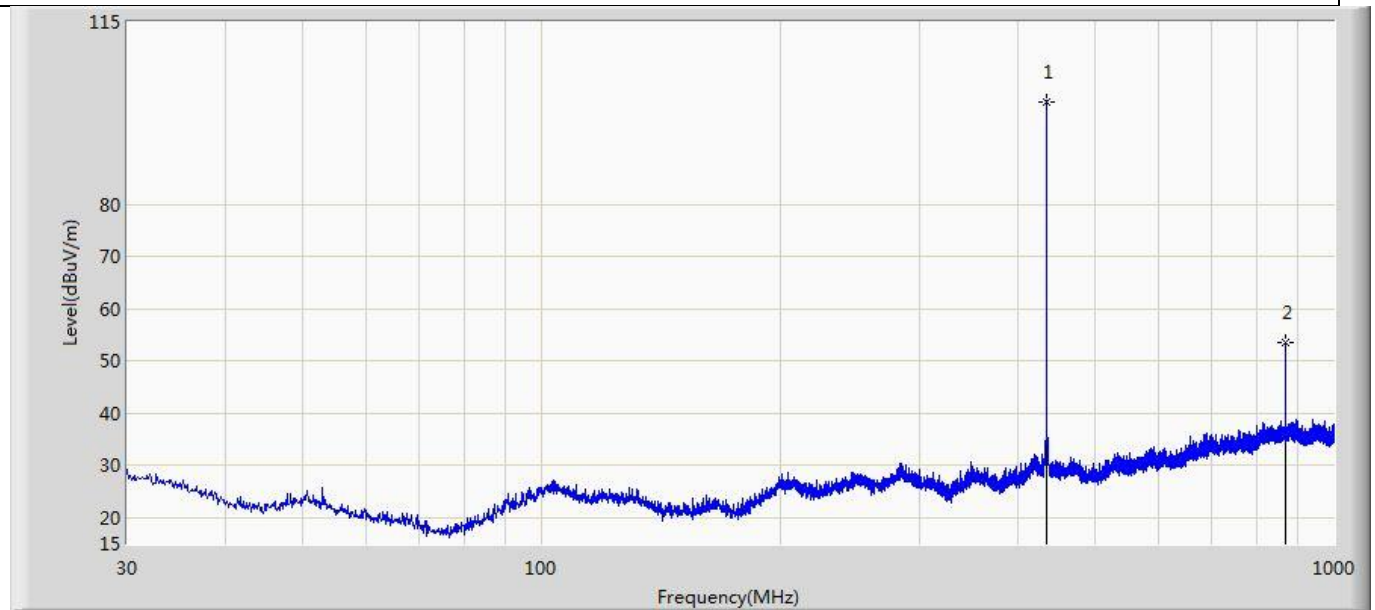
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	1300.000	50.718	71.869	-23.282	74.000	-21.151	PK
2		1775.000	47.982	67.661	-26.018	74.000	-19.679	PK
3		2170.000	43.998	62.539	-30.002	74.000	-18.540	PK

Profile: 2290864R	Page No.: 6
Engineer: Noah	
Site: AC5	Time: 2022/11/03 - 22:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)2022	Polarity: Horizontal
EUT:Electronic fence transmitter	Power: DC 12V
Note: Mode1	



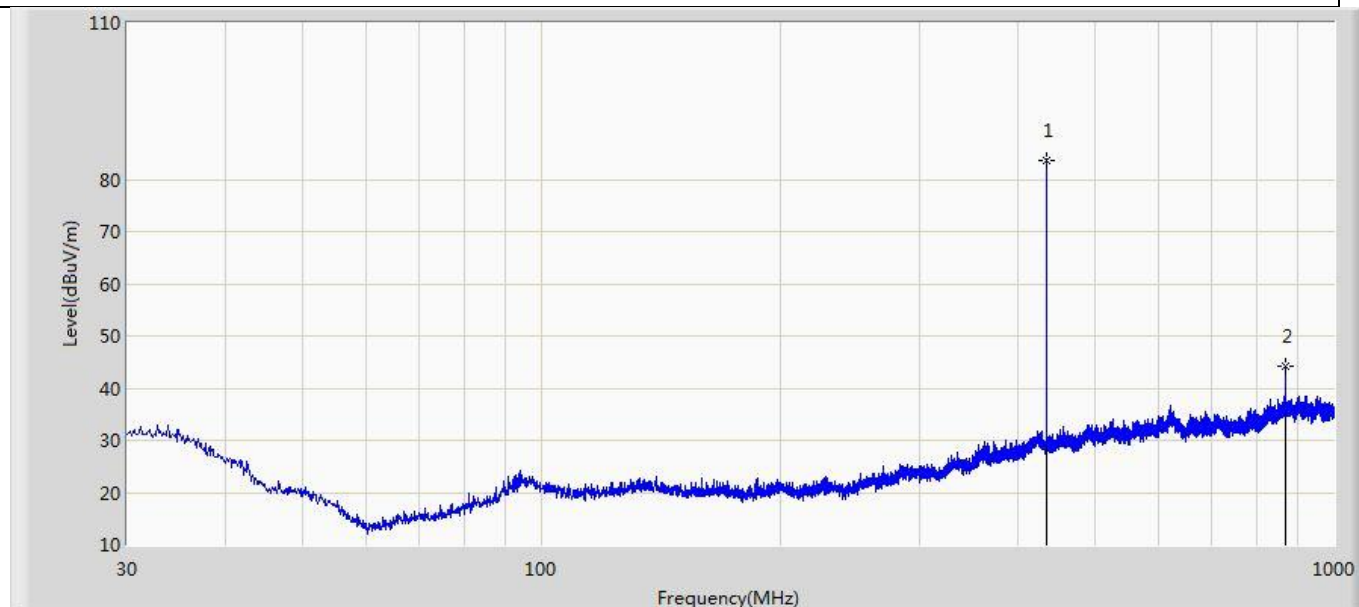
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1300.000	36.415	57.602	-37.585	74.000	-21.187	PK
2	*	1770.000	44.474	64.251	-29.526	74.000	-19.777	PK
3		2165.000	40.785	59.337	-33.215	74.000	-18.552	PK

Profile: 2290864R	Page No.: 3
Engineer: YuLiu	
Site: AC3	Time: 2022/11/01 - 22:11
Limit: FCC_Part15.231_RE(3m)	Margin: 0
Probe: AC3_3M(30-1000M)	Polarity: Vertical
EUT:Electronic fence transmitter	Power: DC 12V
Note: Mode1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		433.884	99.599	73.489	NaN	NaN	26.109	PK
2		867.959	53.552	20.576	NaN	NaN	32.976	PK

Profile: 2290864R	Page No.: 4
Engineer: YuLiu	
Site: AC3	Time: 2022/11/01 - 22:14
Limit: FCC_Part15.231_RE(3m)	Margin: 0
Probe: AC3_3M(30-1000M)	Polarity: Horizontal
EUT:Electronic fence transmitter	Power: DC 12V
Note: Mode1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		433.884	83.637	57.326	NaN	NaN	26.310	PK
2		868.080	44.231	11.278	NaN	NaN	32.953	PK

Note:

1. Measured Level = Reading Level + Factor.
2. The test frequency range, 9kHz~30MHz, both of the worst case are at least 20dB below the limits, therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4. As the radiated emission was performed, so conducted emission was not tested.
5. We have evaluated three orthogonal positions (X, Y, Z) and the position with the highest emission level(X Axis) was recorded and shown in the report.

4.3 DTS Bandwidth

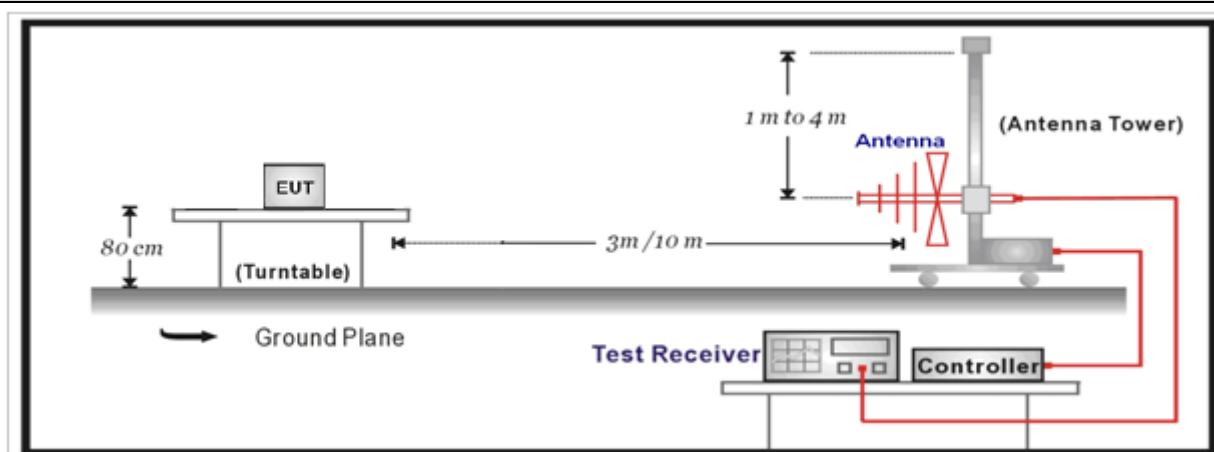
VERDICT: PASS

4.3.1 Limit

Standard	FCC 15.231(c)
----------	---------------

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

4.3.2 Test Setup

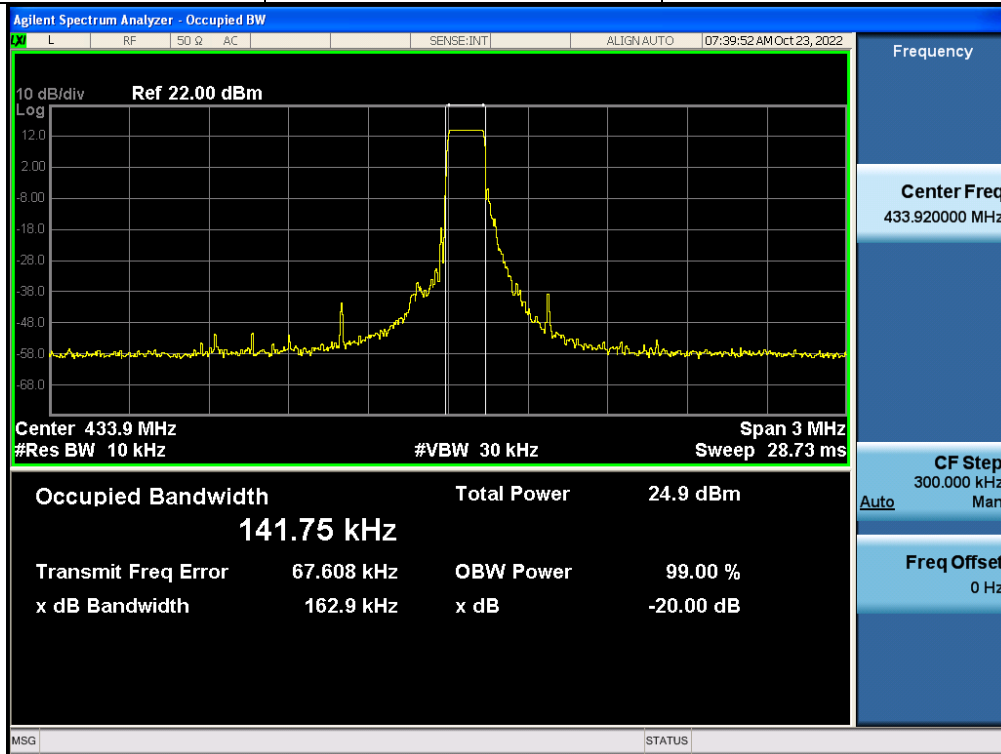


4.3.3 Test Procedure

	Reference Rule	Chapter	Description
☒	ANSI C63.10	6.9	Occupied bandwidth tests
☒	ANSI C63.10	6.9.2	Occupied bandwidth—relative measurement procedure
☐	ANSI C63.10	6.9.3	Occupied bandwidth—power bandwidth (99%) measurement procedure

4.3.4 Test Data

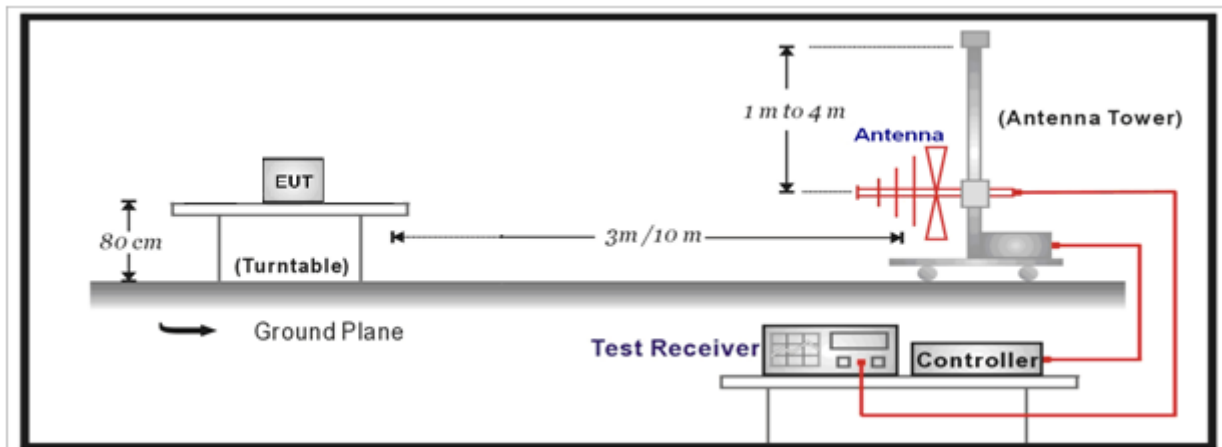
Mode	CH.	Test Freq. (MHz)	20dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
1	00	433.9	162.9	Within band	Pass



4.4 Duration Time**VERDICT: PASS****4.4.1 Limit****Standard**

FCC Part 15 Subpart C Paragraph 15.247 (b)(3)

(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

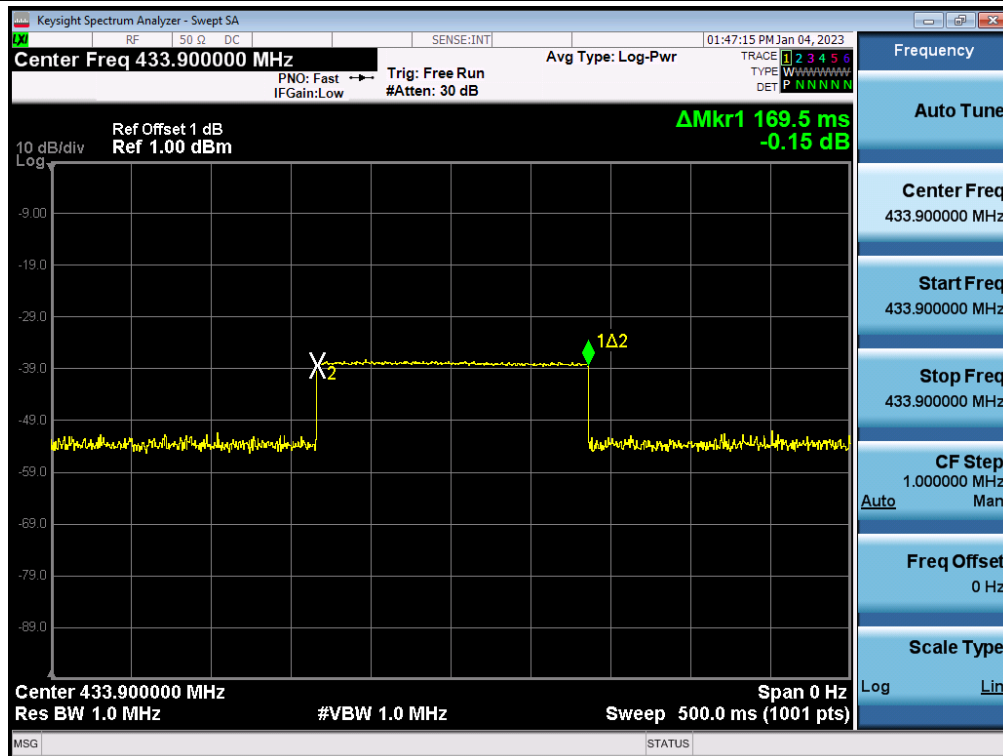
4.4.2 Test Setup

4.4.3 Test Procedure

1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.
2. Set the EUT to proper test channel.
3. Single scan the transmission, and read the transmission time.

4.4.4 Test Data

Frequency (MHz)	Duration Time (S)	Limit (S)	Result
433.9	0.17	<5.0	Pass



5 TEST SETUP PHOTO AND EUT PHOTO

Remark: The test setup photo and EUT Photo please see appendix.

_____ The End _____