

CTM Maison Elite Inc.

TEST REPORT

SCOPE OF WORK

FCC TESTING—CTMVCCI21

REPORT NUMBER

211208049SZN-002

ISSUE DATE

April 15, 2022

[REVISED DATE]

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CTM Maison Elite Inc.

Application
For
Certification

FCC ID: 2A3XWCTMVCCI21

Voice Control Centre (VCC I)

Model: CTMVCCI21

Brand Name: FORNO VOCE

Transmitter

Report No.: 211208049SZN-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-20]

Prepared and Checked by:

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Approved by:

Peter Kang
Senior Technical Supervisor
Date: April 15, 2022

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MEASUREMENT/TECHNICAL REPORT

This report concerns (check one) Original Grant Class II Change

Equipment Type: DSC - Part 15 Security Remote Control Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes No

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-20] Edition] provision.

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Table of Contents

1.0	<u>Summary of Test results</u>	4
2.0	<u>General Description</u>	5
2.1	Product Description	5
2.2	Related Submittal(s) Grants	5
2.3	Test Methodology	5
2.4	Test Facility	5
3.0	<u>System Test Configuration</u>	6
3.1	Justification	6
3.2	EUT Exercising Software	6
3.3	Special Accessories	6
3.4	Measurement Uncertainty	6
3.5	Equipment Modification	6
3.6	Support Equipment List and Description	7
4.0	<u>Measurement Results</u>	8
4.1	Field Strength Calculation	8
4.2	Radiated Emission Configuration Photograph	9
4.3	Radiated Spurious Emission	9
4.2	Conducted Emission Configuration Photograph	11
4.2.1	Conducted Emission	11
5.0	<u>Equipment Photographs</u>	14
6.0	<u>Product Labelling</u>	14
7.0	<u>Technical Specifications</u>	14
8.0	<u>Instruction Manual</u>	14
9.0	<u>Miscellaneous Information</u>	15
9.1	Timing Plot	15
9.2	Measured Bandwidth	16
9.3	Discussion of Pulse Desensitization	17
9.4	Emissions Test Procedures	19
10.0	<u>Test Equipment List</u>	20

1.0 Summary of Test results

Applicant: CTM Maison Elite Inc.

Applicant Address: 11420 Albert Hudon, Montreal, Quebec, H1G 3J6

Manufacturer: CTM Maison Elite Inc.

Manufacturer Address: 11420 Albert Hudon, Montreal, Quebec, H1G 3J6

Voice Control Centre (VCC I)

Model: CTMVCCI21
FCC ID: 2A3XWCTMVCCI21

TEST ITEM	REFERENCE	RESULTS
Transmitter Field Strength	15.231(b) &15.205	Pass
Bandwidth	15.231(c)	Pass
Timing Requirement	15.231(a)(1)	Pass

Notes: 1. The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a Voice Control Centre (VCC I) operating at 433.9MHz. The EUT is powered by DC 5V/500mA through an adapter, which has an USB type A port. For more detailed features description, please refer to the user's manual.

Antenna Type: Integral Antenna

Modulation: OOK

Antenna Gain: 0dBi Max.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of the Voice Control Centre (VCC I) transmitter portion. which has Bluetooth function and 433MHz Transceiver, and related report for FCC is subjected to report number: 211208049SZN-001.

2.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in Semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.4 Test Facility

The Semi-Anechoic chamber used to collect the radiated data is Intertek **Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

3.0 System Test Configuration

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10 (2013).

The EUT was powered by a new DC 5V/500mA through an adapter, which has an USB type A port during the test. Only the worst case data was shown in the report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the bottom of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data report in Exhibit 4.0.

The unit was operated standalone and placed in the center of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the styrene turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

3.2 EUT Exercising Software

There was no special software to exercise the device.

3.3 Special Accessories

No special accessories used.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

3.5 Equipment Modification

Any modifications installed previous to testing by CTM Maison Elite Inc. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

Description	Manufacturer	Remark
Adapter (Provided by Intertek)	XIAOMI	MDY-08-EO

4.0 System Test Configuration

4.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in $\text{dB}\mu\text{V}/\text{m}$

RA = Receiver Amplitude (including preamplifier) in $\text{dB}\mu\text{V}$

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB/m

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Example

Assume a receiver reading of 62.0dB μ V is obtained. The antenna factor of 7.4dB and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is 32dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

RA = 62.0dB μ V

AF = 7.4 dB/m

CF = 1.6dB

AG = 29.0dB

PD = 0dB

AV = -10dB

$$FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32\text{dB}\mu\text{V}/\text{m}$$

$$\text{Level in } \mu\text{V}/\text{m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V}/\text{m})/20] = 39.8\mu\text{V}/\text{m}$$

4.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

4.3 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at
433.92MHz

Judgement: Passed by 2.369dB margin

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: CTM Maison Elite Inc.
Date of Test: April 14, 2022
Model: CTMVCCI21
Worst Case Operating Mode: Transmitting

Table 1
Radiated Emissions (30M-12.75G)

Freq. (MHz)	Ant. Pol. H/V	Emission Level(dBuV/m)				Limit 3m(dBuV/m)		Margin(dB)	
		PK	Corr (dB)	AV Factor(dB)	AV	PK	AV	PK	AV
433.92	H	87.24	26.1	8.809	78.431	100.8	80.8	13.56	2.369
867.800	H	34.30	31.9	8.809	25.491	80.8	60.8	46.50	35.309
1301.700*	H	49.60	-5.3	8.809	40.791	74	54	24.40	13.209
1735.55	H	51.80	-1.3	8.809	42.991	80.8	60.8	29.00	17.809
2169.71	H	65.00	1.4	8.809	56.191	80.8	60.8	15.80	4.609
3037.300	H	48.24	4.5	8.809	39.431	80.8	60.8	32.56	21.369
433.92	V	86.32	26.1	8.809	77.511	100.8	80.8	14.48	3.289
867.800	V	34.30	31.9	8.809	25.491	80.8	60.8	46.50	35.309
1301.700*	V	46.20	-5.3	8.809	37.391	74	54	27.80	16.609
1735.55	V	37.85	-1.3	8.809	29.041	80.8	60.8	42.95	31.759
2169.71	V	55.20	1.4	8.809	46.391	80.8	60.8	25.60	14.409
3037.300	V	47.40	4.5	8.809	38.591	80.8	60.8	33.40	22.209

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3-meter. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions below the Average limit.
5. “**” Emission within restricted band fulfils the requirement of section 15.205.
6. Averaging factor in dB=20log (duty cycle)
 $20\log (\text{Duty cycle}) = 20\log (0.3627) = -8.809\text{dB}$.
7. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)

4.4 Conducted Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

4.4.1 Conducted Emission

Worst Case Conducted Configuration
at
0.306MHz

Judgement: Passed by 16.2dB margin

TEST PERSONNEL:

Sign on file

Rode Liu, Project Engineer

Typed/Printed Name

10 March 2022

Date

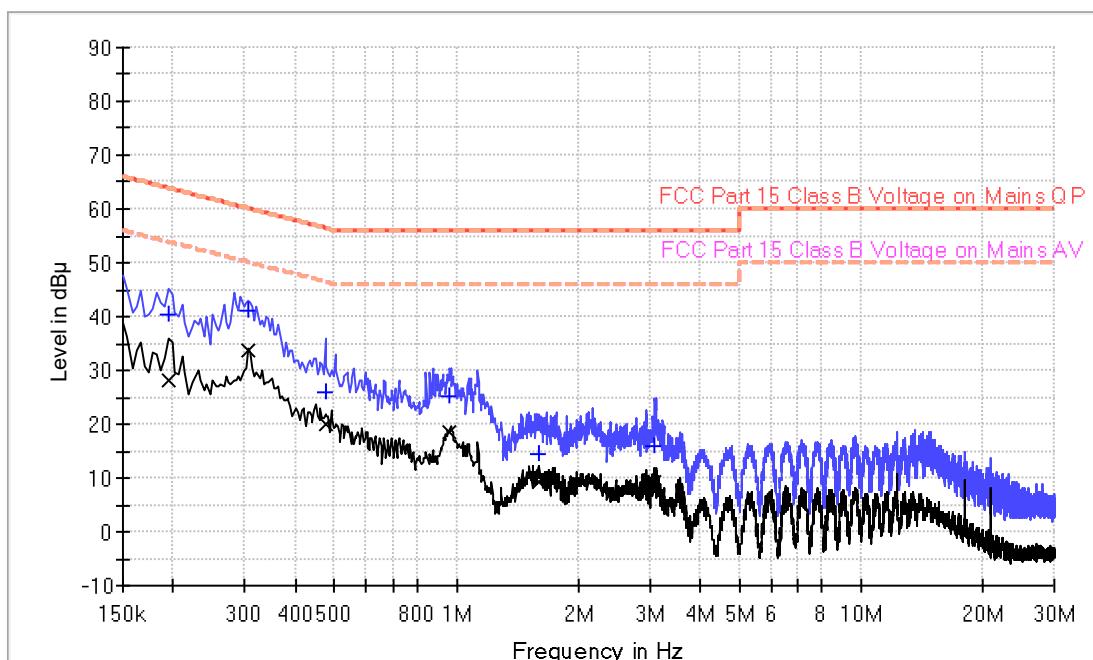
Applicant: CTM Maison Elite Inc.

Date of Test: 10 March 2022

Model: CTMVCCI21

Worst Case Operating Mode: Simultaneous transmitting

Phase: Live

Graphic / Data Table**Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement****Limit and Margin QP**

Frequency (MHz)	Quasi Peak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.194000	40.3	9.000	L1	9.6	23.6	63.9
0.306000	41.0	9.000	L1	9.6	19.1	60.1
0.474000	25.8	9.000	L1	9.6	30.6	56.4
0.962000	25.1	9.000	L1	9.6	30.9	56.0
1.606000	14.6	9.000	L1	9.6	41.4	56.0
3.094000	15.9	9.000	L1	9.7	40.1	56.0

Limit and Margin AV

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.194000	28.3	9.000	L1	9.6	25.6	53.9
0.306000	33.9	9.000	L1	9.6	16.2	50.1
0.474000	20.1	9.000	L1	9.6	26.3	46.4
0.962000	18.6	9.000	L1	9.6	27.4	46.0
1.606000	9.2	9.000	L1	9.6	36.8	46.0
3.094000	9.2	9.000	L1	9.7	36.8	46.0

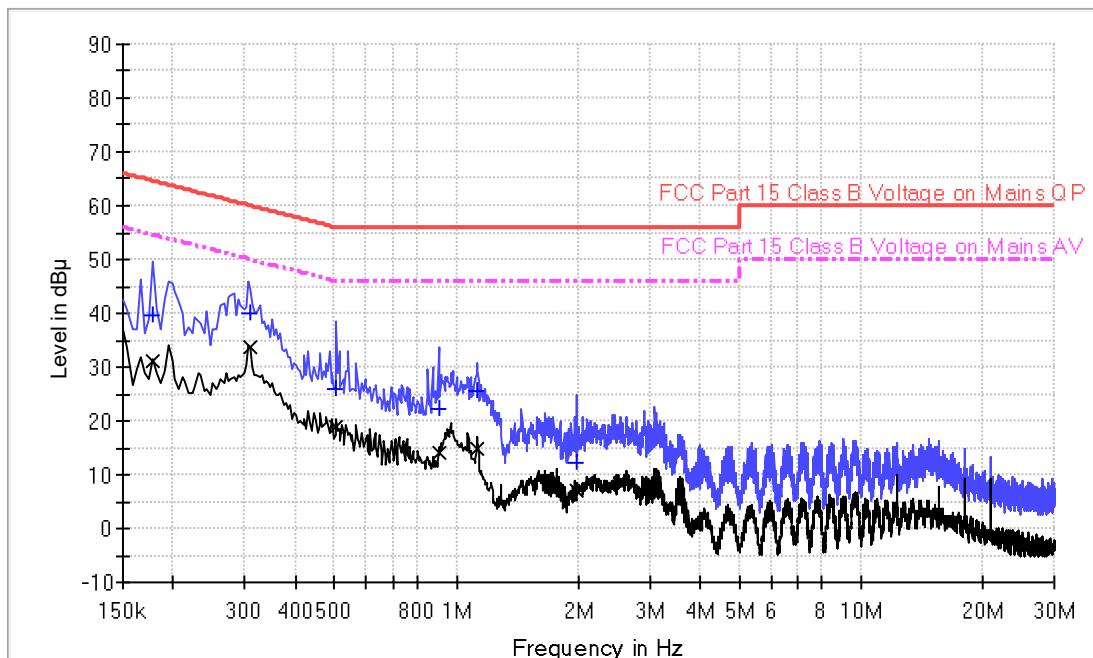
Applicant: CTM Maison Elite Inc.

Date of Test: 10 March 2022

Model: CTMVCCI21

Worst Case Operating Mode: Simultaneous transmitting

Phase: Neutral

Graphic / Data Table**Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement****Limit and Margin QP**

Frequency (MHz)	Quasi Peak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.178000	39.7	9.000	N	9.5	24.9	64.6
0.310000	40.2	9.000	N	9.5	19.8	60.0
0.506000	26.0	9.000	N	9.5	30.0	56.0
0.906000	22.3	9.000	N	9.5	33.7	56.0
1.130000	25.6	9.000	N	9.5	30.4	56.0
1.982000	12.4	9.000	N	9.5	43.6	56.0

Limit and Margin AV

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.178000	31.2	9.000	N	9.5	23.4	54.6
0.310000	33.6	9.000	N	9.5	16.4	50.0
0.506000	19.0	9.000	N	9.5	27.0	46.0
0.906000	14.0	9.000	N	9.5	32.0	46.0
1.130000	14.8	9.000	N	9.5	31.2	46.0
1.982000	7.1	9.000	N	9.5	38.9	46.0

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

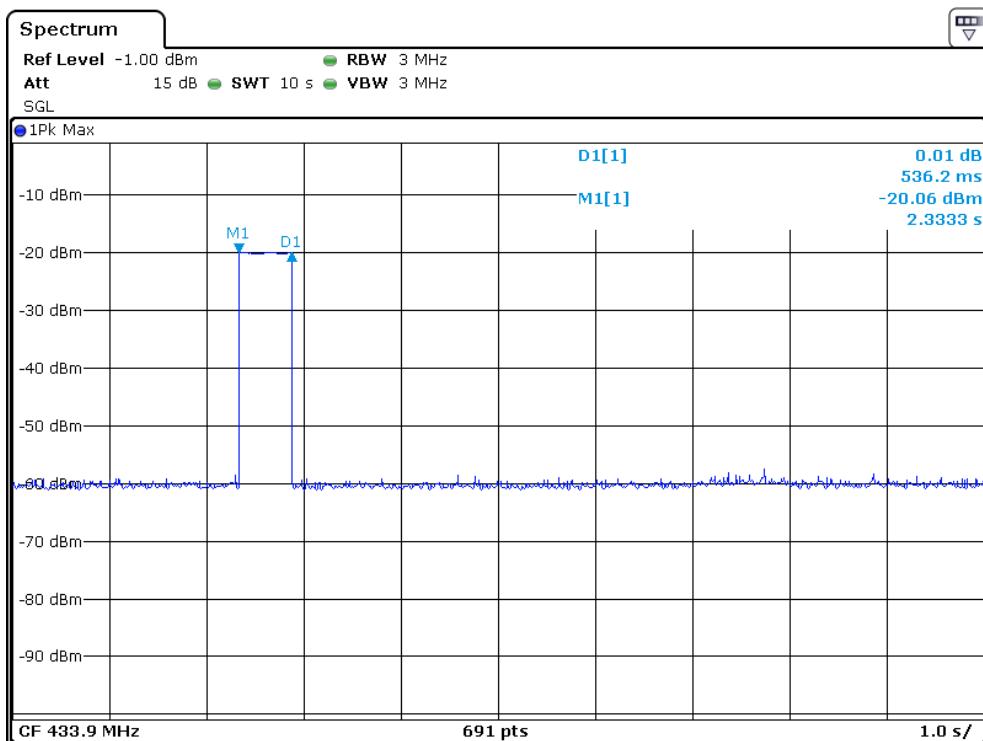
This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Miscellaneous Information

This miscellaneous information includes details of the measured bandwidth, the test procedure, calculation of timing requirements and pulse desensitization.

9.1 Timing Plot – Pursuant to FCC Part 15 Section 15.231(a)(1)

Mode	Time seconds	Limit seconds	Verdict
Transmission	0.5362	<5	PASS

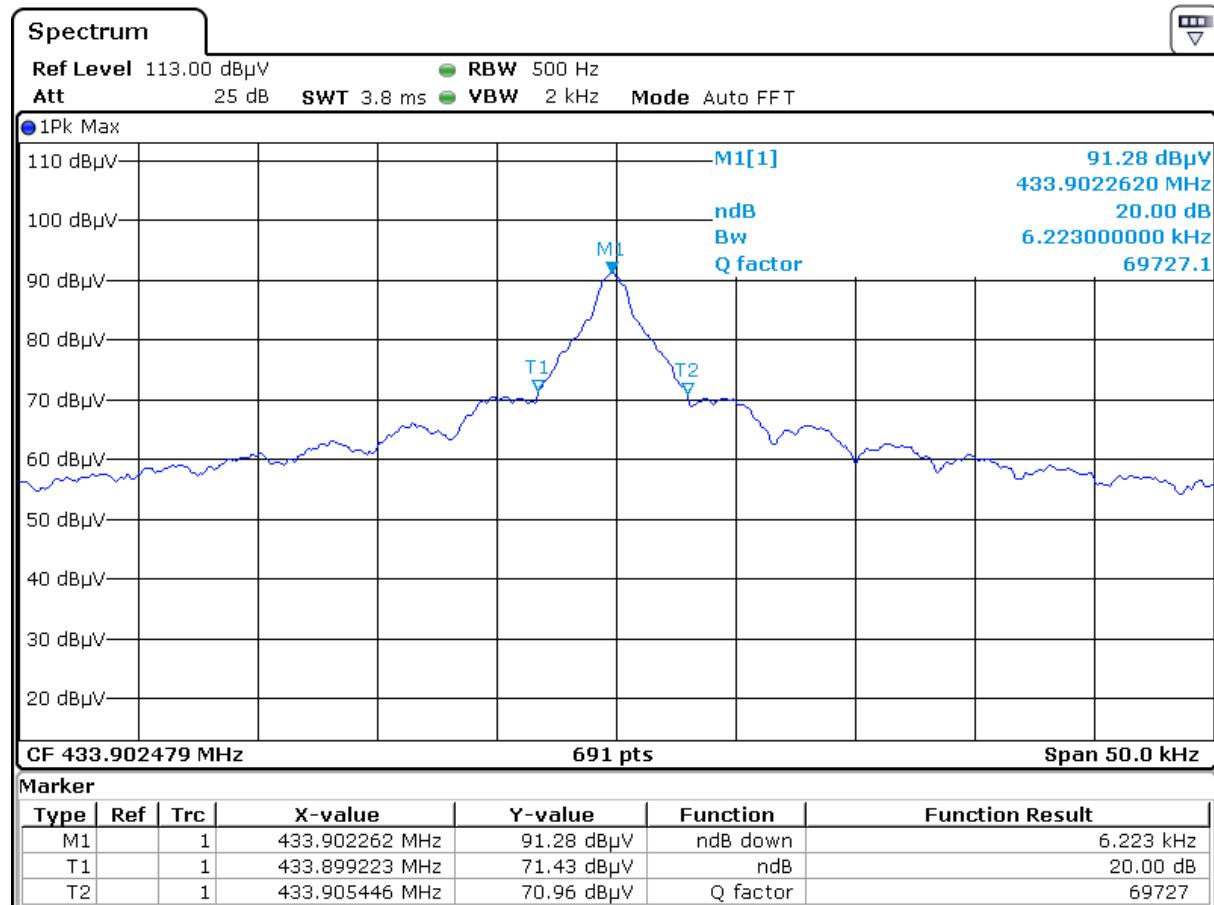


Note: The emission was found to cease within 5 seconds after button release.

Result: Pass.

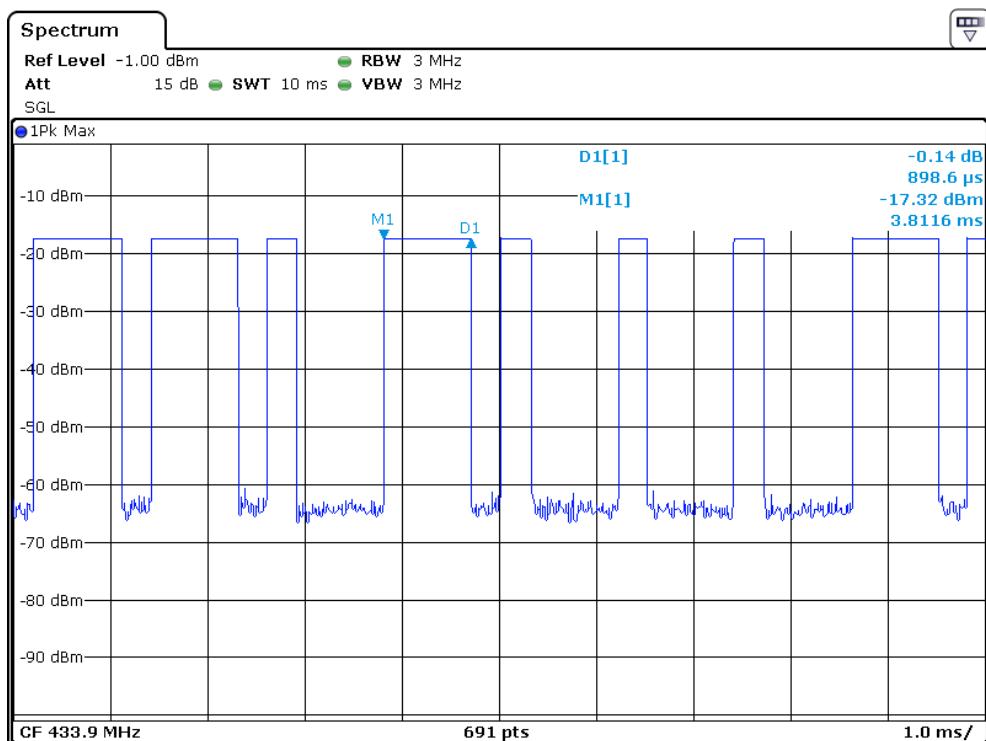
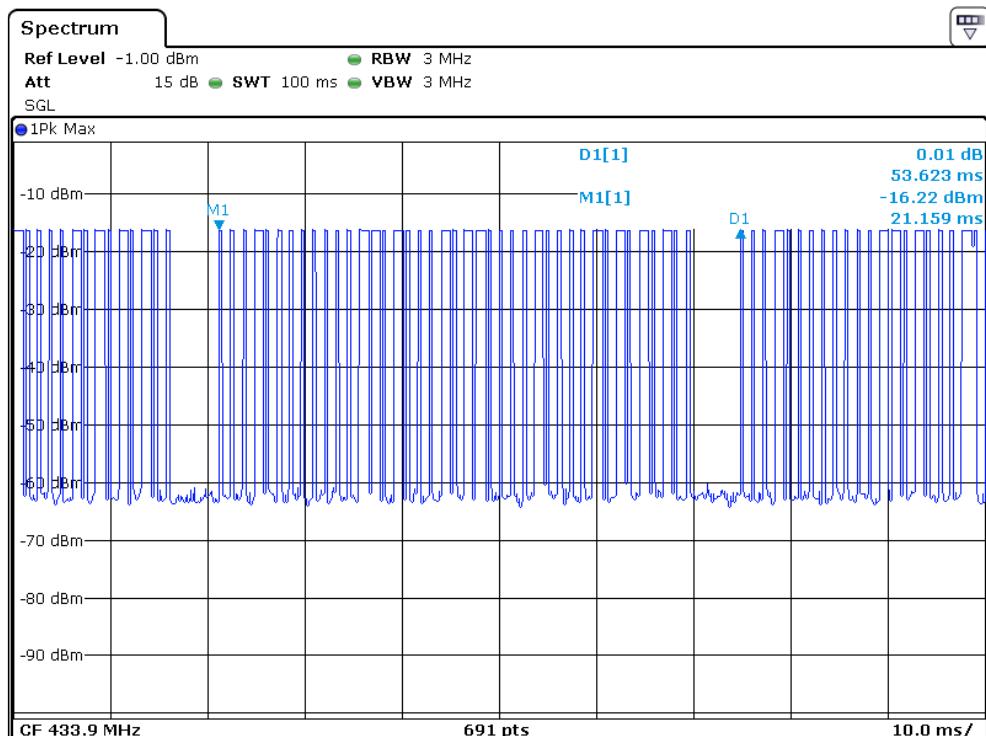
9.2 Measured Bandwidth

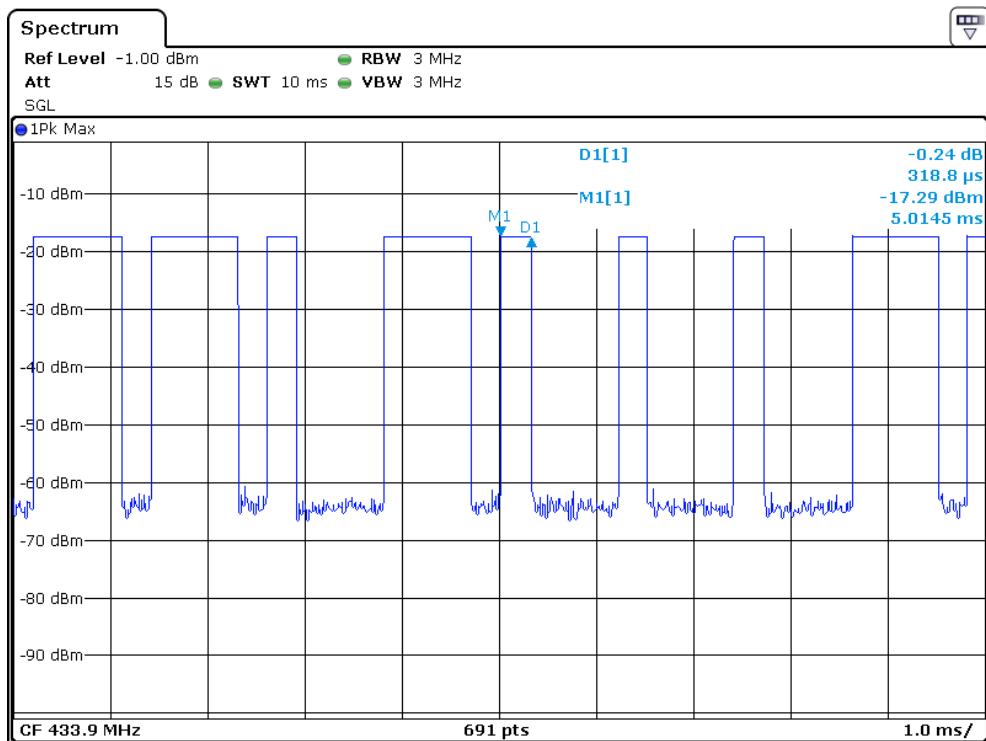
From the plot, the 20dB bandwidth is 6.223 kHz and less than the limit of 1.08MHz. It fulfils the requirement of 15.231(c).



9.3 Discussion of Pulse Desensitization

Pulse desensitization is not applicable for this device. The effective period (T_{eff}) is approximately 19.45ms for a digital "1" bit which illustrated on technical specification. With a resolution bandwidth (3 dB) of 100 kHz, the pulse desensitization factor was 0 dB.





The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 53.623ms

Effective period of the cycle = 19448.6μs

DC = 19.4486ms / 53.623ms = 0.3627 or 36.27%

Therefore, the averaging factor is found by $20 \log_{10} (0.3627) = -8.809 \text{dB}$

9.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.10 - 2013.

The transmitting equipment under test (EUT) is placed on a styrene turntable which is four feet in diameter, up to 1GHz 0.8m and above 1GHz 1.5m in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjust through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is based on the use of measurement instrumentation with a CISPR quasi-peak detector.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-12	Biconilog Antenna	ETS	3142E	00166158	2021-08-04	2024-08-04
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2021-05-18	2023-05-18
SZ061-08	Horn Antenna	ETS	3115	00092346	2021-09-05	2024-09-05
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	2019-08-13	2022-08-13
SZ056-03	Spectrum Analyzer	R&S	FSP30	101148	2021-05-10	2022-05-10
SZ185-03	EMI Receiver	R & S	ESCI	100547	2021-12-20	2022-12-20
SZ181-04	Preamplifier	Agilent	8449B	3008A024 74	2021-05-10	2022-05-10
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	2021-12-12	2024-12-12
SZ062-02	RF Cable	RADIALL	RG 213U	--	2021-11-20	2022-05-20
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	2021-11-20	2022-05-20
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	2021-11-20	2022-05-20
SZ067-04	Notch Filter	Micro-Tronics	BRM5070 2-02	--	2021-05-11	2022-05-11
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2021-07-12	2022-07-12
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	2021-05-12	2022-05-12
SZ188-03	Shielding Room	ETS	RFD-100	4100	2020-01-07	2023-01-07
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	2021-10-26	2022-10-26