

EVER SPARKLE TECHNOLOGIES LTD. TEST REPORT

SCOPE OF WORK

FCC TESTING–BKDBCHIMEBLKUS, NESTDB3WCHIMEWHTUSA, NESTDB3CHIMEBLKUSA

REPORT NUMBER

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Intertek Report No.: 221222005SZN-001

EVER SPARKLE TECHNOLOGIES LTD.Application
For
Certification**FCC ID: SQOCHIMEBLK****Wasserstein Wireless Chime****Model: BKDBChimeBLKUS, NestDB3WChimeWhtUSA, NestDB3ChimeBLKUSA****Brand Name: Wasserstein****Transmitter**

Report No.: 221222005SZN-001

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 [10-1-21]

Prepared and Checked by:**Approved by:**

Draven Li
Project Engineer

Ryan Chen
Project Engineer
Date: 03 April 2023

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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 [10-01-21] Edition] provision.

Report prepared by:

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1.0 Summary of Test results

Applicant: EVER SPARKLE TECHNOLOGIES LTD.

Applicant Address: Unit 403, Nan Fung Commercial Centre, 19 Lam Lok St., Kowloon Bay, Kowloon, Hong Kong.

Manufacturer: EVER SPARKLE TECHNOLOGIES LTD.

Manufacturer Address: Unit 403, Nan Fung Commercial Centre, 19 Lam Lok St., Kowloon Bay, Kowloon, Hong Kong.

Wasserstein Wireless Chime

**Model: BKDBChimeBLKUS, NestDB3WChimeWhtUSA, NestDB3ChimeBLKUSA
FCC ID: SQOCHIMEBLK**

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
AC Conducted Emission	FCC 15.207	Pass

Note: 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 Wasserstein Wireless Chime operating at 433.92MHz. The EUT is powered by DC 3V (AAA battery*2) or 16-24VAC by adapter. For more detailed features description, please refer to the user's manual.

Antenna Type: Integral Antenna

Modulation: FSK

Antenna Gain: 0dBi Max.

The Model: NestDB3WChimeWhtUSA, NestDB3ChimeBLKUSA are the same as the Model: BKDBChimeBLKUS in hardware aspect. The differences in appearance and model number serve as marketing strategy.

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 Wasserstein Wireless Chime transmitter portion. Other digital functions were reported in the verification report: 221222006SZN-001.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. 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 and shielding room used to collect the radiated data is EMTEK (SHENZHEN) CO., LTD. and located at Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China. This test facility and site measurement data have been fully placed on file with File Number: CN1204.

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 new DC 3V (AAA battery*2) or 16-24VAC by adapter 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 Equipment Modification

Any modifications installed previous to testing by EVER SPARKLE TECHNOLOGIES LTD. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by EMTEK (SHENZHEN) CO., LTD.

3.5 Measurement Uncertainty

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

Measurement Uncertainty	Uncertainty
Channel Bandwidth	±2.3%
Spurious emission (Above 18GHz)	±1.42dB
Spurious emission (6GHz to 18GHz)	±5.34dB
Radiated emission (1GHz to 6GHz)	±4.94dB
Radiated emission (Up to 1GHz)	±4.4dB
AC Conducted emission	±2.4 dB
Temperature	±3.2°C
Humidity	±2.5%

3.6 Support Equipment List and Description

Description	Manufacturer	Remark
Adapter	DONGGUAN SHUNXIN ELECTRONICS CO., LTD. (Provided by EMTEK)	Model: SX48-1850750G Input: AC 230V~, 50Hz Output: AC 18.5V~, 0.75A

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 dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ 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.

$$RA = 62.0\text{dB}\mu\text{V}$$

$$AF = 7.4\text{ dB/m}$$

$$CF = 1.6\text{dB}$$

$$AG = 29.0\text{dB}$$

$$PD = 0\text{dB}$$

$$AV = -10\text{dB}$$

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

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

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 15.37dB margin

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

TEST PERSONNEL:

Sign on file

Moon Tan, Project Engineer
Typed/Printed Name

26 December 2022
Date

Applicant: EVER SPARKLE TECHNOLOGIES LTD.
Date of Test: 26 December 2022
Worst Case Operating Mode: Transmitting

Model: BKDBChimeBLKUS

Table 1
Radiated Emissions

Freq. (MHz)	Ant. Pol. H/V	Reading	Pre-amp. gain	antenna factor	Emission Level(dBuV/m)			Limit 3m(dBuV/m)		Margin(dB)	
		(dBμV)	(dB)	(dB/m)	PK	AV Factor(dB)	AV	PK	AV	PK	AV
433.92	H	57.21	/	25.19	82.40	-16.97	65.43	100.80	80.80	-18.40	-15.37
1301.76*	H	54.19	36.70	22.01	39.50	-16.97	22.53	74.00	54.00	-34.50	-31.47
2169.60	H	57.91	36.10	18.84	40.65	-16.97	23.68	80.80	60.80	-40.15	-37.12
2603.52	H	64.41	36.10	19.16	47.47	-16.97	30.50	80.80	60.80	-33.33	-30.30
433.92	V	51.46	/	25.19	76.65	-16.97	59.68	100.80	80.80	-24.15	-21.12
1301.76*	V	53.79	36.70	22.01	39.10	-16.97	22.13	74.00	54.00	-34.90	-31.87
2169.60	V	57.30	36.10	18.86	40.06	-16.97	23.09	80.80	60.80	-40.74	-37.71
2603.52	V	61.54	36.10	19.16	44.60	-16.97	27.63	80.80	60.80	-36.20	-33.17

- 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)
20log (Duty cycle) =20log (0.1417) = -16.97dB

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
0.4350MHz

Judgement: Passed by 7.82dB margin

TEST PERSONNEL:

Sign on file

Moon Tan, Project Engineer
Typed/Printed Name

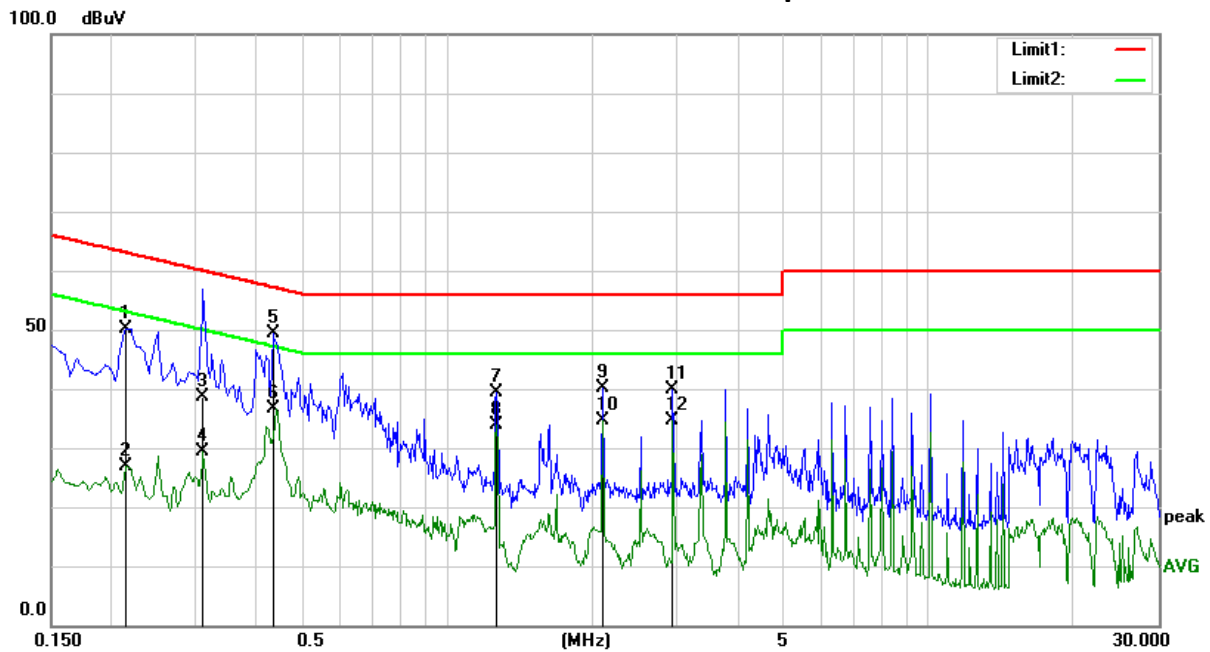
26 December 2022
Date

Applicant: EVER SPARKLE TECHNOLOGIES LTD.
Date of Test: 26 December 2022
Worst Case Operating Mode: Transmitting
Worst Case Test Voltage: AC 120V/60Hz
Phase: Live

Model: BKDBChimeBLKUS

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)
0.2150	50.15	9.000	L1	9.5	12.86	63.01
0.3100	38.70	9.000	L1	9.5	21.27	59.97
0.4350	49.34	9.000	L1	9.5	7.82	57.16
1.2650	39.40	9.000	L1	9.6	16.60	56.00
2.1050	40.04	9.000	L1	9.6	15.96	56.00
2.9450	39.77	9.000	L1	9.6	16.23	56.00

Limit and Margin AV

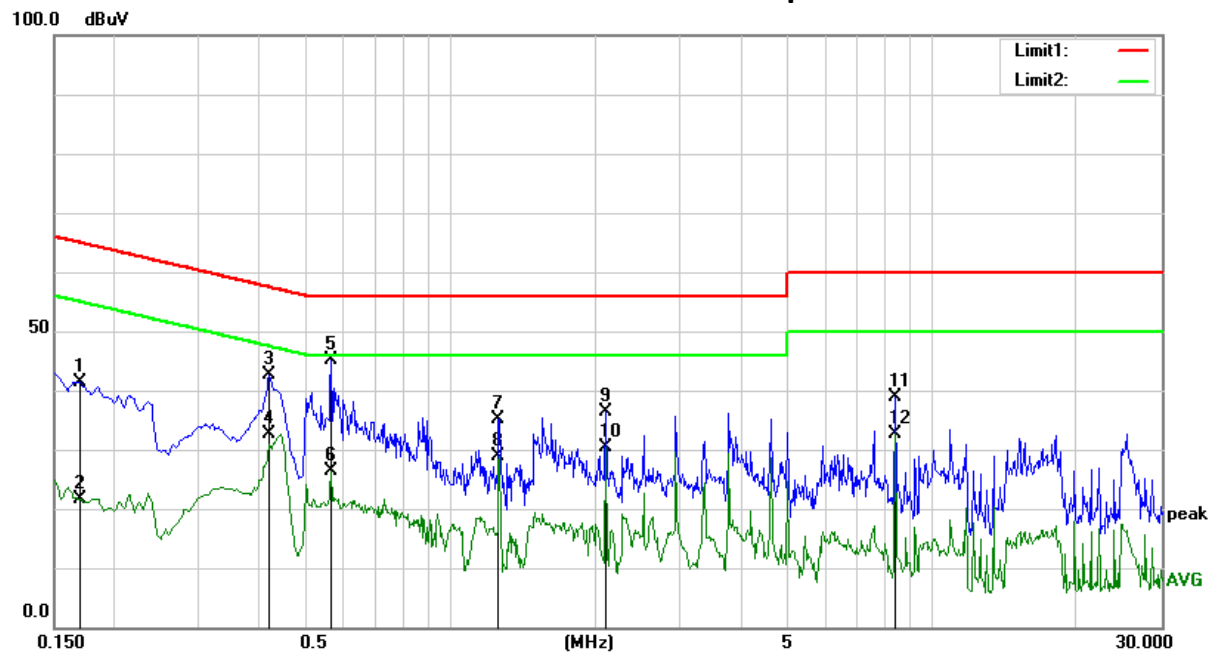
Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.2150	26.91	9.000	L1	9.5	26.10	53.01
0.3100	29.33	9.000	L1	9.5	20.64	49.97
0.4350	36.64	9.000	L1	9.5	10.52	47.16
1.2650	33.97	9.000	L1	9.6	12.03	46.00
2.1050	34.56	9.000	L1	9.6	11.44	46.00
2.9450	34.52	9.000	L1	9.6	11.48	46.00

Applicant: EVER SPARKLE TECHNOLOGIES LTD.
Date of Test: 12 December 2022
Worst Case Operating Mode: transmitting
Worst Case Test Voltage: AC 120V/60Hz
Phase: Neutral

BKDBChimeBLKUS

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)
0.1700	41.38	9.000	N	9.5	23.58	64.96
0.4200	42.55	9.000	N	9.5	14.90	57.45
0.5650	45.21	9.000	N	9.5	10.79	56.00
1.2600	35.15	9.000	N	9.6	20.85	56.00
2.1050	36.37	9.000	N	9.6	19.63	56.00
8.4050	38.83	9.000	N	9.6	21.17	60.00

Limit and Margin AV

Frequency (MHz)	Average (dBµV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.1700	21.72	9.000	N	9.5	33.24	54.96
0.4200	32.56	9.000	N	9.5	14.89	47.45
0.5650	26.46	9.000	N	9.5	19.54	46.00
1.2600	28.76	9.000	N	9.6	17.24	46.00
2.1050	30.45	9.000	N	9.6	15.55	46.00
8.4050	32.57	9.000	N	9.6	17.43	50.00

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

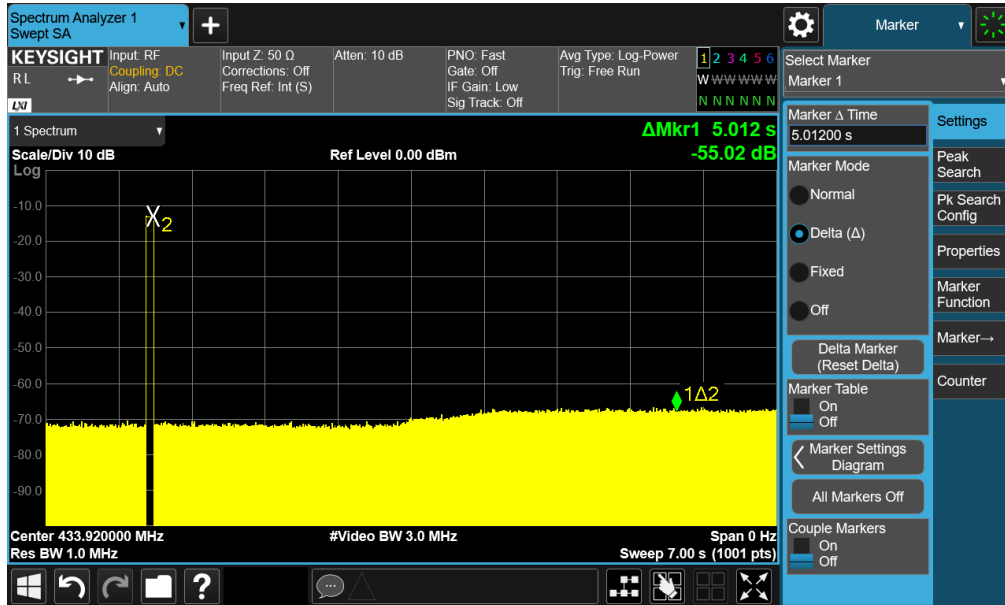
For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

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)

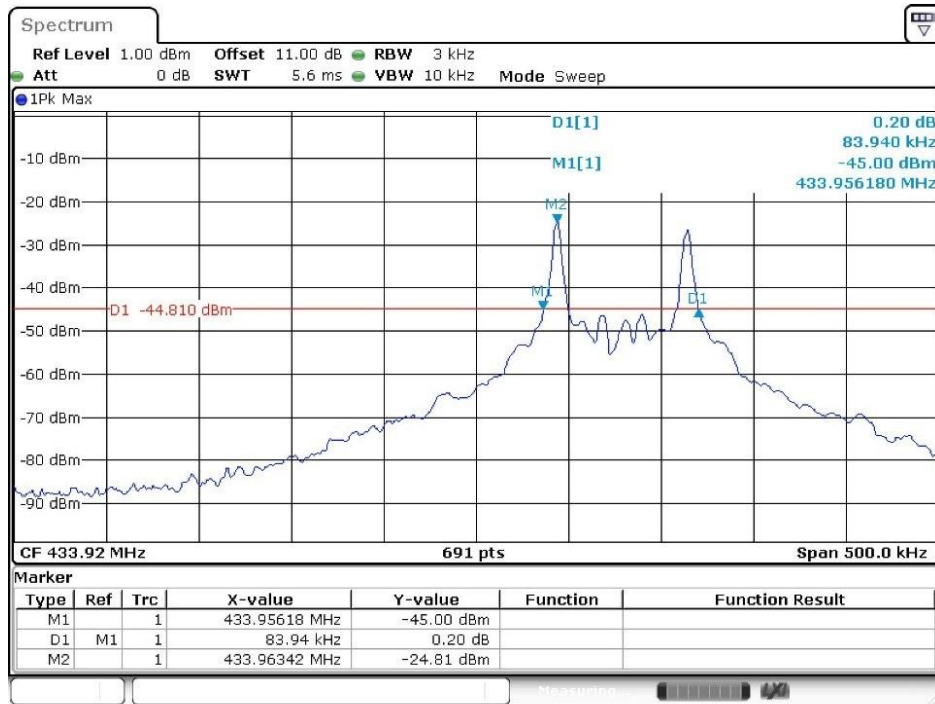


Note: The emission was found to cease within 5 seconds after button release.

Result: Pass.

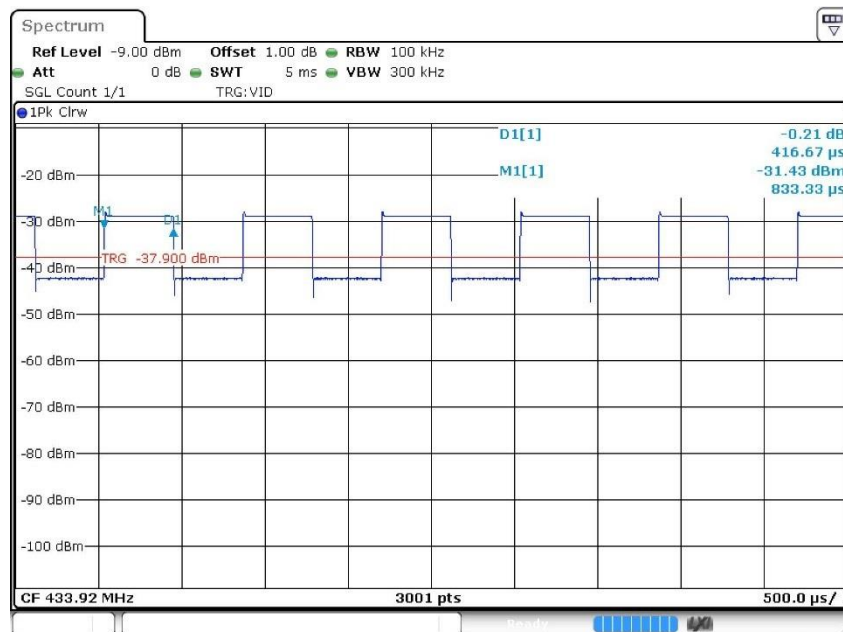
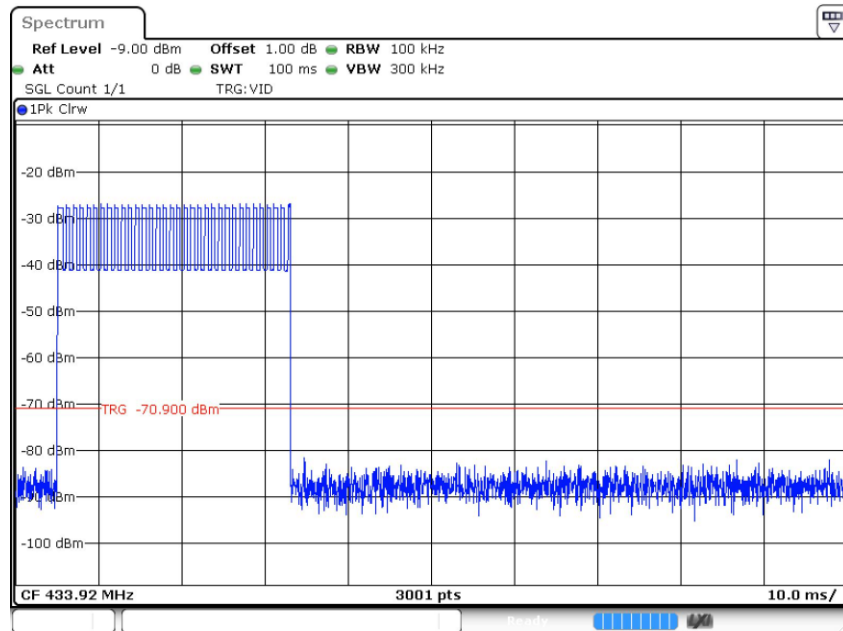
9.2 Measured Bandwidth

From the plot, the 20dB bandwidth is 83.94 kHz and less than the limit of 1.08MHz. It fulfils the requirement of 15.231(c).



9.3 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (T_{eff}) is approximately 0.417ms for a digital "1" bit which illustrated on technical specification. With a resolution bandwidth (3 dB) of 100 kHz, the pulse desensitivity factor was 0 dB.



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

The duration of one cycle = 100ms

Effective period of the cycle = $0.41667 \times 34 = 14.17\text{ms}$

DC = $14.17\text{ms} / 100\text{ms} = 0.1417$ or 14.17%

Therefore, the averaging factor is found by $20 \log_{10} (0.1417) = -16.97\text{dB}$

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

Equip No.	Description	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EE-040	Pre-Amplifier	HP	8447F	2944A07999	2022/5/14	2023/5/13
EE-343	EMI Test Receiver	Rohde & Schwarz	ESCI	101414	2022/5/14	2023/5/13
EE-371	Bilog Antenna	Schwarzbeck	VULB9163	712	2021/7/5	2023/7/4
EE-247	Horn antenna	Schwarzbeck	BBHA9120D	9120D-1178	2021/8/22	2023/8/21
ENSE7260	Pre-Amplifie	CDSI	PAP-1.0G18	23589	2021/5/15	2023/5/14
EE-230	Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	2022/5/14	2023/5/13
EE-095	Horn antenna	Schwarzbeck	BBHA9170	9170-399	2021/6/12	2023/6/11
EE-157	Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2021/6/12	2023/6/11
EE-174	3m Anechoic Chamber(1#)	TDK	9m*6m*6m(NSA)	/	2022/05/19	2024/05/18
EE-229	EMI Test Receiver	Rohde & Schwarz	ESCI	101384	2022/5/14	2023/5/13
EE-145	AMN	Rohde & Schwarz	ENV216	101161	2022/5/14	2023/5/13
EE-022	AMN	Kyoritsu	KNW-407	8-1492-9	2022/5/14	2023/5/13