

TEST REPORT

Report No.	CISRR26082744701
Project No.	CISR260827447
FCC ID	2A7KZ-R270
Applicant	Ningbo Sunfree Motor Technology Co., Ltd.
Address	202, No. 418, Qihang North Road, Yinzhou District, Ningbo, China
Manufacturer	Ningbo Sunfree Motor Technology Co., Ltd.
Address	202, No. 418, Qihang North Road, Yinzhou District, Ningbo, China
Product Name	Curtain motorR270 series
Trade mark	-
Model/Type reference	R270/A
Listed Model(s)	R2XX/*-* R2XX/*-** X=0~9 *=A~Z
Standard	47 CFR Part 15.231
Date of sample receipt	August 27, 2026
Test date	August 31, 2026 to September 6, 2026
Issue date	September 7, 2026
Test result	Complied

Lucas Huang

Reviewed by: Lucas Huang



Approved by: Hans Hu

The test results relate only to the tested samples.

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1. STANDARD AND APPLICABLE TEST METHODS

The tests were performed according to following standards:

47 CFR Part 15.231: Periodic operation in the band 40.66-40.70 MHz and above 70 MHz

ANSI C63.10-2020: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

2. REPORT VERSION

Version No.	Issue date	Description
00	September 7, 2026	Original

3. TEST DESCRIPTION

No.	Test Item	Standard Requirement	Result
1	Antenna requirement	47 CFR 15.203	Pass
2	Conducted Emission at AC power line	47 CFR 15.207(a)	Pass
3	20dB Bandwidth	47 CFR 15.231(c)	Pass
4	Transmit time	47 CFR 15.231(a)(1)	Pass
5	Duty Cycle	-	Pass
6	Field Strength of The Fundamental Signal	47 CFR 15.231(b)	Pass
7	Radiated Emission (below 1GHz)	47 CFR 15.231	Pass
8	Radiated Emission (above 1GHz)	47 CFR 15.231	Pass

Note:

- The measurement uncertainty is not included in the test result.

4. SUMMARY

4.1. Product Description *

Main unit information:	
Product Name:	Curtain motorR270 series
Trade mark:	-
Model No.:	R270/A
Listed Model(s):	R2XX/*-* R2XX/*-** X=0~9 *=A~Z
Model difference:	The difference between different models is that in this application, due to different sales channels and different model names, the differences in the same product model do not safety performance and electromagnetic affect the compatibility performance of the product.
Power supply:	DC 5V by USB-C port or DC 7.2V by Internal battery
Hardware version:	AC1371-ASM V1.0
Software version:	R270/A-1/30 5V A-00
Accessory unit (AU) information:	
Battery information:	2.0Ah, 7.2V

4.2. Radio Specification Description *

Modulation type:	FSK
Operation frequency:	433.92MHz
transmission mode:	Manual transmission
Antenna type:	PCB antenna
Antenna gain:	-10dBi

Note:

- 1) *: As the above information is provided by the applicant, all relevant results and conclusions of this report are based solely on such information. Bangce lab shall not be liable for the authenticity, integrity, and resulting outcomes of the information, and/or the validity of the conclusions herein.

4.3. Modification of EUT

No modifications are made to the EUT during all test items.

4.4. Deviation from standards

None

4.5. Testing Site

Laboratory Name	Shenzhen Bangce Testing Technology Co., Ltd.
Laboratory Location	101, building 10, Yunli Intelligent Park, Shutianpu community, Matian Street, Guangming District, Shenzhen, Guangdong, China
Contact information	Tel: 86-755-2319 6848, email: service@cis-cn.net

	Website: http://www.cis-cn.net/
FCC registration number	736346
FCC designation number	CN1372

5. TEST CONFIGURATION

5.1. Test frequency list

Channel	Frequency (MHz)
CH1	433.92

5.2. Descriptions of test mode

No	Test mode	Description
Mode1	Transmit mode	Keep the EUT in continuously transmit
Mode2	Normal Transmit	Keep the EUT in normal transmit

5.3. Test sample information

Type	Sample No.
Engineer sample	CISR260827447-S01
Normal sample	CISR260827447-S02

5.4. Environmental conditions

Type	Requirement
Temperature:	15~35°C
Relative Humidity:	25~75%
Air Pressure:	860~1060mbar

5.5. Statement of the measurement uncertainty

No.	Test Items	Measurement Uncertainty
1	Conducted Emission at AC power line (150kHz ~ 30MHz)	3.52dB
2	Bandwidth	0.19%
3	Time	2.3ns
4	Radiated Spurious Emission (30MHz ~ 1000MHz)	4.46dB
5	Radiated Spurious Emission (9kHz ~ 30MHz)	3.28dB
6	Radiated Spurious Emission (Above 1GHz)	4.60dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

5.6. Equipment Used during the Test

Conducted Emission at AC power line

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	8*4*3 Shielding room	SKET	8m*4m*3 m	CIS-EE012	2024-09-02	2027-09-01
2	EMI Test Receiver	ROHDE&SCHWARZ	ESPI7	CIS-EE043	2026-01-06	2027-01-05
3	LISN	SCHWARZBECK	NSLK 8127	CIS-EE044	2026-01-06	2027-01-05
4	LISN-AE	ETS	3810/2N M	CIS-EE075	2026-01-06	2027-01-05
5	RF Cable	SKET	-	CIS-EE071	2026-01-06	2027-01-05
6	Power Strip	BULL	GNIN-413	CIS-EE087	2026-01-06	2027-01-05
7	Test software	FARAD	EZ-CON	CIS-EE095	/	/
8	Thermohygrometer	DeLi	8866	CIS-EE069	2026-01-06	2027-01-05

20dB Bandwidth

Dwell Time

Duty Cycle

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	Spectrum analyzer	ROHDE&SCHWARZ	FSV-40N	CIS-EE076	2026-01-06	2027-01-05
2	Notch Filter Assembly	WCS	SMU-1003	CIS-EE093	2026-01-06	2027-01-05
3	Vector Signal Generator	Agilent	N5182A	CIS-RE012	2026-01-06	2027-01-05
4	Analog Signal Generator	Agilent	N5181A	CIS-RE013	2026-01-06	2027-01-05
5	Test software	WCS	WCN-Regulator y	CIS-EE103	/	/

Radiated Emission (below 1GHz)

Radiated Emission (above 1GHz)

Field Strength of The Fundamental Signal

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	9*6*6 Chamber	SKET	9m*6m*6 m	CIS-EE011	2024-09-02	2027-09-01
2	EMI Test Receiver	ROHDE&SCHWARZ	ESCI	CIS-EE016	2026-01-06	2027-01-05
3	Broadband Antenna	SCHWARZBECK	VULB 9163	CIS-EE018	2026-01-06	2029-01-05
4	Double Ridged Broadband Horn Antennas	SCHWARZBECK	BBHA 9120D	CIS-EE019	2026-01-06	2029-01-05

5	Preamplifier	Tonscend	TAP9K3G 40	CIS-EE021	2026-01-06	2027-01-05
6	Preamplifier	Tonscend	TAP0101 8050	CIS-EE022	2026-01-06	2027-01-05
7	Preamplifier	WCS	DLNA-1- 18G-40	CIS-EE081	2026-01-06	2027-01-05
8	RF Cable	Tonscend	-	CIS-EE024	2026-01-06	2027-01-05
9	RF Cable	Tonscend	-	CIS-EE025	2026-01-06	2027-01-05
10	Test software	FARAD	EZ-EMC RE	CIS-EE097	/	/
11	Thermohygrometer	DeLi	8866	CIS-EE067	2026-01-06	2027-01-05
12	Loop Antenna	SCHWARZBECK	FMZB 1513-60 B	CIS-EE060	2026-01-06	2029-01-05
13	Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	CIS-EE020	2025-01-09	2028-01-08
14	Preamplifier	Tonscend	TAP1804 0048	CIS-EE023	2026-01-06	2027-01-05
15	1GHz Highpass	COM-MW	ZHPF6- M1000- 18000- 3910	CIS-EEA043	2026-01-06	2027-01-05
16	3GHz Highpass	COM-MW	ZHPF6- M3000- 18000- 5254	CIS-EEA044	2026-01-06	2027-01-05
17	6GHz Highpass	COM-MW	ZHPF6- M6500- 18000- 547	CIS-EEA045	2026-01-06	2027-01-05
18	Notch Filter Assembly	Tonscend	TS@JS08 06-F	CIS-EE026	2026-01-06	2027-01-05
19	Spectrum analyzer	Agilent	N9020A	CIS-RE001	2026-01-06	2027-01-05

6. TEST RESULTS

6.1. Evaluation Results (Evaluation)

6.1.1. Antenna requirement

Test Requirement:

Refer to 47 CFR Part 15.203, 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 shall be considered sufficient to comply with the provisions of this section.

6.1.1.1. Test Result

Pass

6.1.1.2. Conclusion:

The EUT antenna is PCB antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used. Antenna structure please refer to the EUT internal photographs antenna photo.

6.2. Radio Spectrum Matter Test Results (RF)

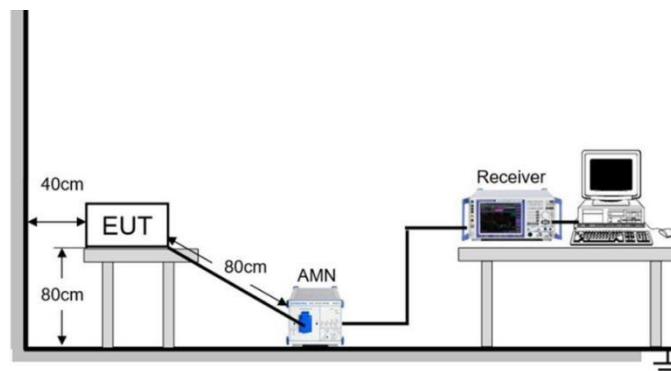
6.2.1. Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN).		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	*Decreases with the logarithm of the frequency.		
Test Method:	ANSI C63.10-2020 section 6.2		
Procedure:	1>. The EUT was setup according to ANSI C63.10 requirements. 2>. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. 3>. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. 4>. The peripheral devices are also connected to the main power through a LISN. (Refer to the block diagram of the test setup and photographs) 5>. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source. 6>. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. 7>. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz. 8>. During the above scans, the emissions were maximized by cable manipulation.		

6.2.1.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 $^{\circ}$ C	Humidity:	55 %	Atmospheric Pressure:	102.6 kPa
Pre test mode:	Mode2				
Final test mode:	Mode2				

6.2.1.2. Test Setup Diagram

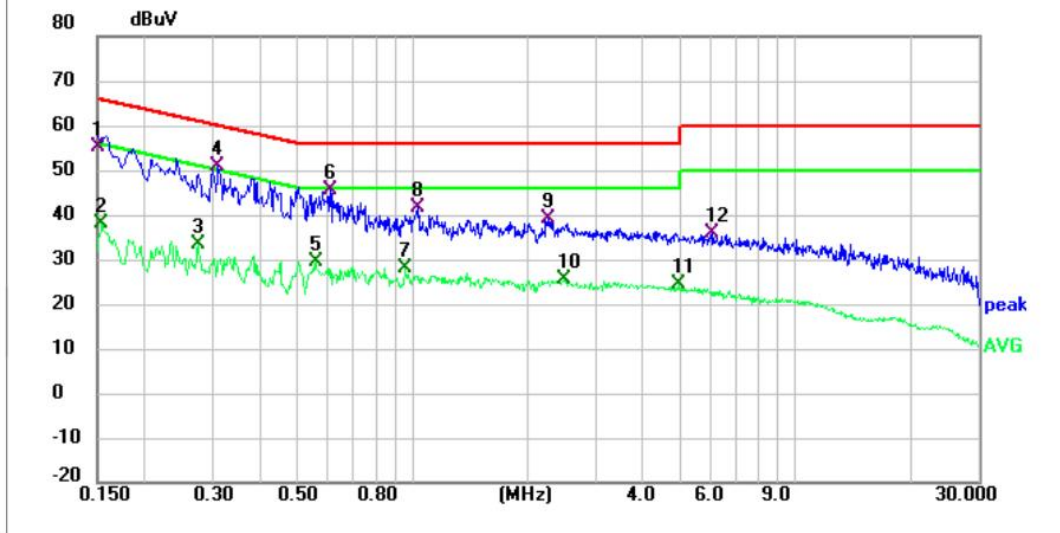


6.2.1.3. Test Result

Pass

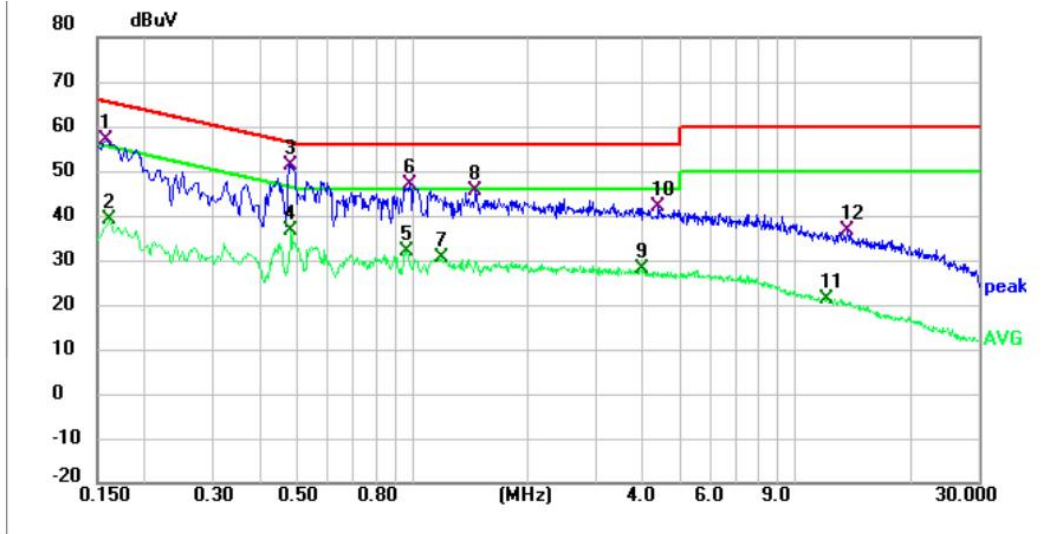
6.2.1.4. Test Data

Mode2 / Line: Line



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1504	45.03	10.20	55.23	65.98	10.75	QP
2	0.1539	27.72	10.20	37.92	55.79	17.87	AVG
3	0.2740	23.39	10.15	33.54	51.00	17.46	AVG
4 *	0.3100	40.72	10.14	50.86	59.97	9.11	QP
5	0.5580	19.28	10.17	29.45	46.00	16.55	AVG
6	0.6100	35.41	10.17	45.58	56.00	10.42	QP
7	0.9620	17.77	10.19	27.96	46.00	18.04	AVG
8	1.0300	31.48	10.19	41.67	56.00	14.33	QP
9	2.2540	28.71	10.27	38.98	56.00	17.02	QP
10	2.4900	15.22	10.28	25.50	46.00	20.50	AVG
11	4.9380	14.06	10.38	24.44	46.00	21.56	AVG
12	6.0260	25.43	10.36	35.79	60.00	24.21	QP

Mode2 / Line: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	46.81	10.16	56.97	65.57	8.60	QP
2	0.1620	28.94	10.15	39.09	55.36	16.27	AVG
3 *	0.4780	41.16	10.12	51.28	56.37	5.09	QP
4	0.4820	26.39	10.12	36.51	46.30	9.79	AVG
5	0.9660	21.73	10.16	31.89	46.00	14.11	AVG
6	0.9820	36.69	10.16	46.85	56.00	9.15	QP
7	1.1860	20.48	10.17	30.65	46.00	15.35	AVG
8	1.4620	35.21	10.19	45.40	56.00	10.60	QP
9	3.9820	17.80	10.32	28.12	46.00	17.88	AVG
10	4.4060	31.62	10.35	41.97	56.00	14.03	QP
11	12.0900	10.84	10.44	21.28	50.00	28.72	AVG
12	13.6660	26.05	10.47	36.52	60.00	23.48	QP

Note:

1>. Level = Reading +Factor (Voltage Division Coefficient + Cable Loss + Attenuator Factor)

2>. Margin = Limit - Level

6.2.2. 20dB Bandwidth

Test Requirement:	47 CFR 15.231(c)
Test Limit:	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.
Test Method:	ANSI C63.10-2020, section 6.9.2
Procedure:	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the “-xx dB down amplitude” using $[(\text{reference value}) - xx]$. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “ixx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “ixx dB down

	amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth. k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).
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6.2.2.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.4 °C	Humidity:	55.7 %	Atmospheric Pressure:	103.1 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.2.2.2. Test Setup Diagram



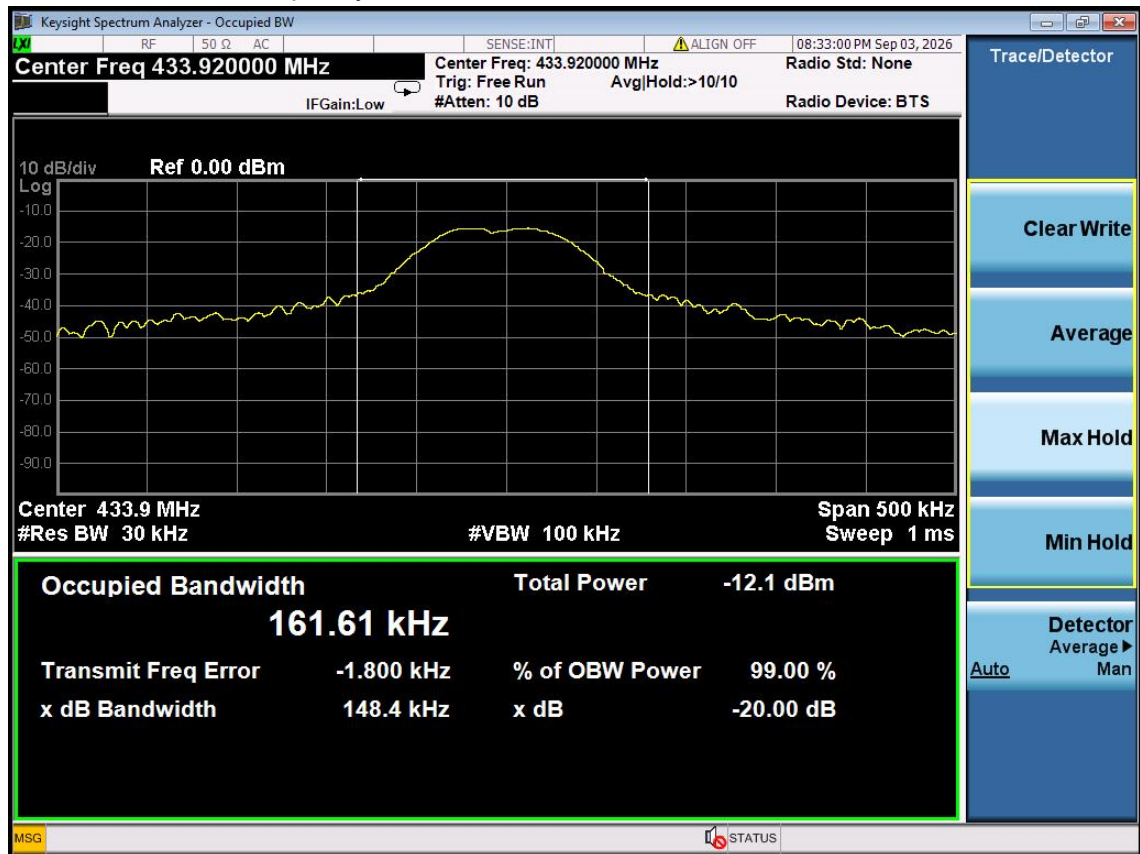
6.2.2.3. Test Result

Pass

6.2.2.4. Test Data

Test Channel	20dB Bandwidth	Limit	Result
	(kHz)	(kHz)	
CH1	148.4	1084.8	Pass

Note: Limit=0.25%*Center Frequency=1084.8 kHz



6.2.3. Transmit time

Test Requirement:	47 CFR 15.231(a)(1) & (a)(2)
Test Limit:	(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
Test Method:	ANSI C63.10-2020, Section 7.4
Procedure:	For evaluation of periodic operation characteristics, the following procedure may be used: a) Trigger the spectrum analyzer sweep on the RF waveform of the unlicensed wireless device. b) Set the spectrum analyzer sweep time greater than the specified time for periodic operation. c) Manually activate and deactivate the unlicensed wireless device and confirm that it ceases transmission within the specified time of deactivation. d) Document the test results. e) Verify and document that periodic transmissions at regular predetermined intervals do not exist, except where regulatory requirements allow polling or supervision transmissions, including data, to determine system integrity. Compliance is addressed by an attestation supported by the equipment theory of operation.

6.2.3.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.5 °C	Humidity:	55.9 %	Atmospheric Pressure:	103.1 kPa
Pre test mode:	Mode2				
Final test mode:	Mode2				

6.2.3.2. Test Setup Diagram

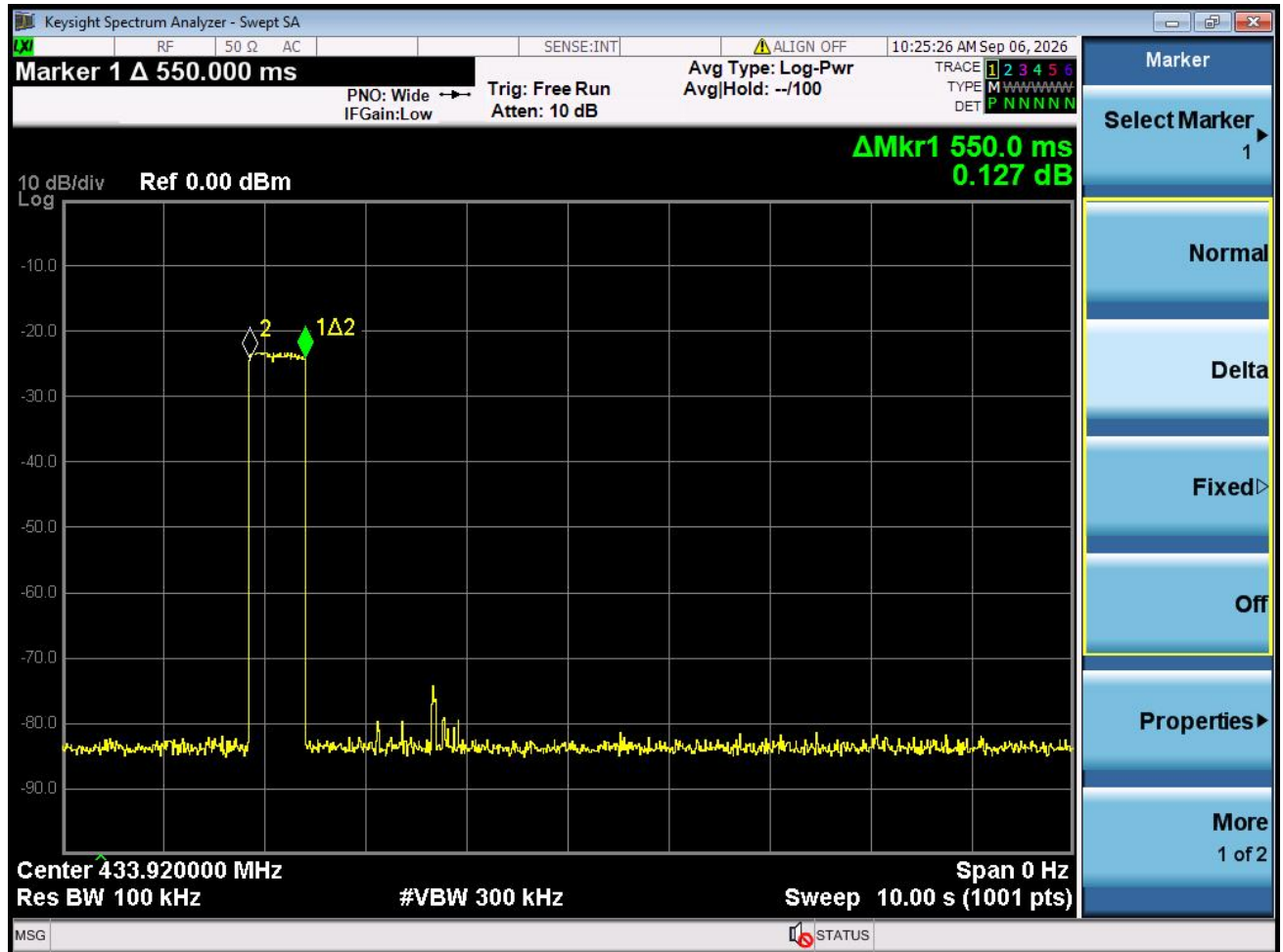


6.2.3.3. Test Result

Pass

6.2.3.4. Test Data

Transmission time (second)	Limit (second)	Result
0.55	5	Pass



6.2.4. Duty Cycle

Test Requirement:	-
Test Limit:	No limit, only for Report Use.
Test Method:	ANSI C63.10-2020, Section 7.5
Procedure:	a) Adjust and configure any EUT switches, controls, or input data streams to ensure that the EUT is transmitting or encoded to obtain the “worst-case” pulse ON time. b) Couple the final radio frequency output signal to the input of a spectrum analyzer. This may be performed by a radiated, direct connection (i.e., conducted) or by a “near-field” coupling method. The signal received shall be of sufficient level to trigger adequately the spectrum analyzer sweep display. NOTE—If the bandwidth of the pulse is greater than the RBW of the spectrum analyzer, then a similar measurement may be performed using a wideband digital storage oscilloscope (DSO). c) Adjust the center frequency of the spectrum analyzer to the center of the RF signal. d) Set the spectrum analyzer for ZERO span. e) Adjust the sweep time to obtain at least a 100 ms period of time on the horizontal display axis of the spectrum analyzer. f) If the pulse train is periodic (i.e., consists of a series of pulses that repeat in a characteristic pattern over a constant time period), and the period (T) is less than or equal to 100 ms, then: 1) Set the TRIGGER on the spectrum analyzer to capture at least one period of the pulse train, including any blanking intervals. 2) Determine the total maximum pulse “ON time” (t_{ON}) over one period of the pulse train. An example of a periodic pulse train and the associated period is shown in Figure 14. If the pulse train contains pulses of different widths, then t_{ON} is determined by summing the duration of all of the pulses within the pulse train [i.e., $t_{ON} = \Sigma(t_1 + t_2 + \dots t_n)$]. 3) The duty cycle is then determined by dividing the total maximum “ON time” by the period of the pulse train (t_{ON}/T). g) If the pulse train is nonperiodic or is periodic with a period that exceeds 100 ms, or as an alternative to step f), then: 1) Set the TRIGGER on the spectrum analyzer to capture the greatest amount of pulse “ON time” over 100 ms. 2) Find the 100 ms period that contains the maximum “on time”; this may require summing the duration of multiple pulses as described in step f2). 3) Determine the duty cycle by dividing the total maximum “ON time” by 100 ms ($t_{ON}/100\text{ ms}$).

6.2.4.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.4 °C	Humidity:	56.9 %	Atmospheric Pressure:	103.1 kPa
Pre test mode:	Mode2				
Final test mode:	Mode2				

6.2.4.2. Test Setup Diagram



6.2.4.3. Test Result

Pass

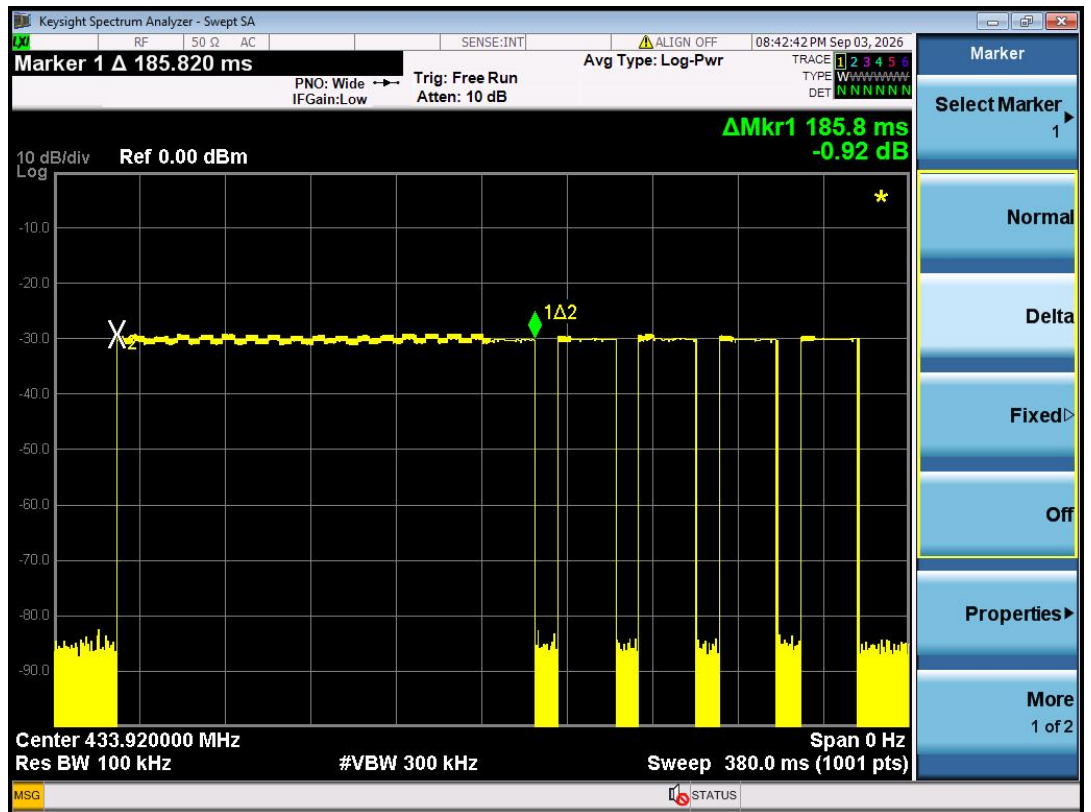
6.2.4.4. Test Data

T _{ON1} (ms) :	185.8
T _{ON1} number	1
T _{ON2} (ms) :	25.84
T _{ON2} number	2
Period (ms) :	330
Duty Cycle :	0.7196
Duty Cycle Corrected Factor:	-2.86

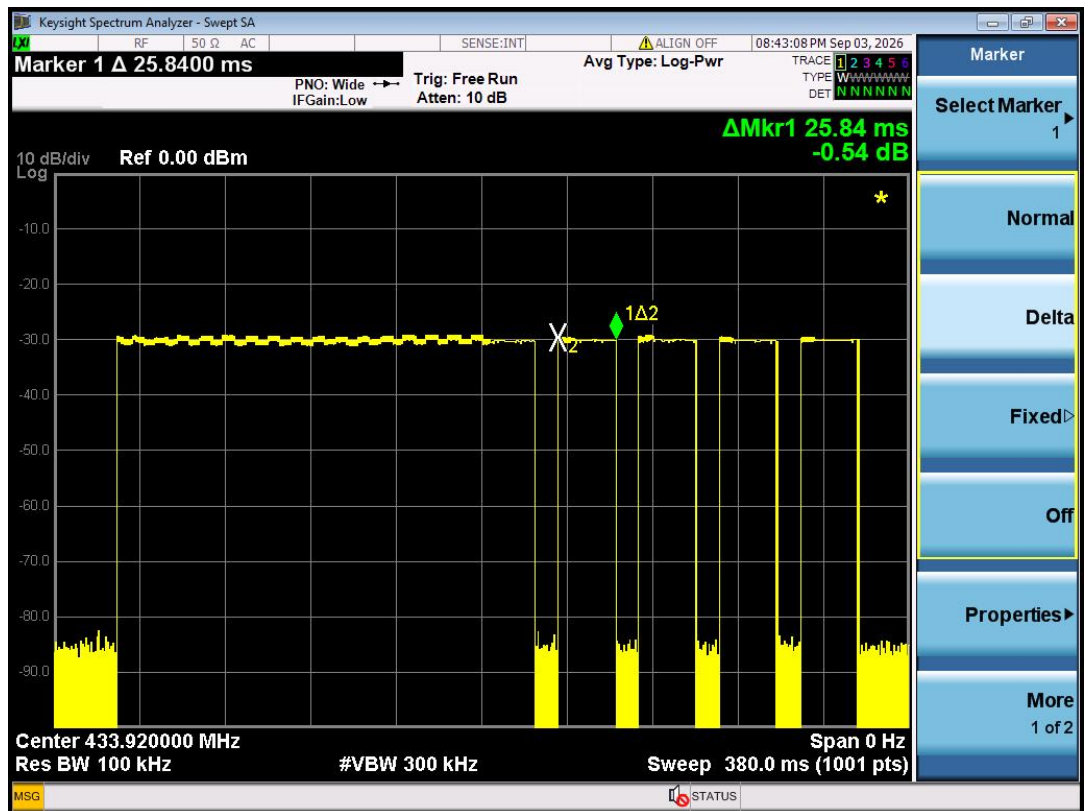
Note:

- 1) Duty cycle= $T_{ON1} \times T_{ON1 \text{ number}} + T_{ON2} \times T_{ON2 \text{ number}} / T \text{ period}$
Duty Cycle Corrected Factor/DCCF= $20 \times \log (\text{Duty Cycle})$

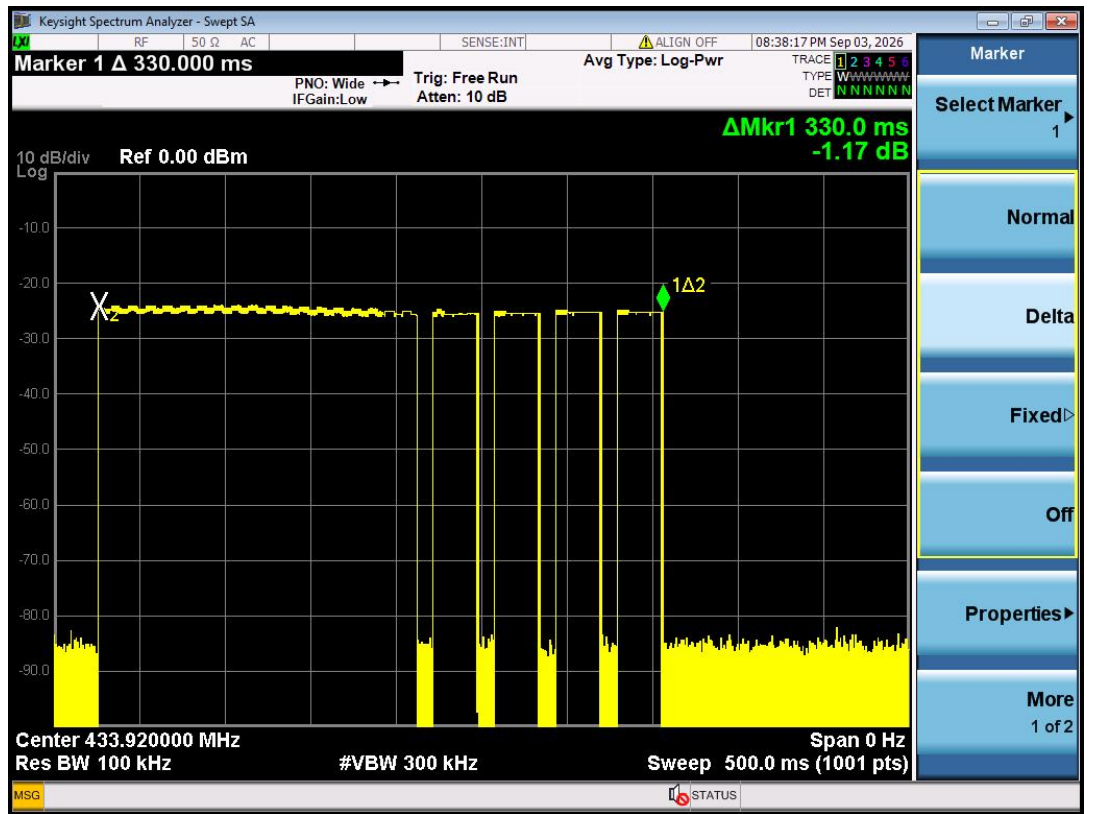
T_{ON1}(ms) :



T_{ON2} (ms)



Period (ms) :



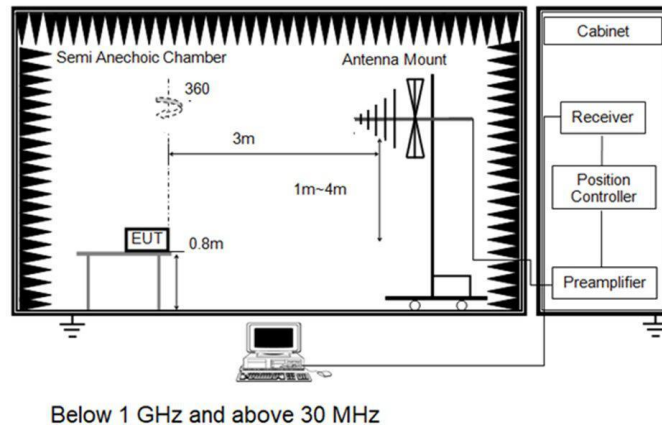
6.2.5. Field Strength of The Fundamental Signal

Test Requirement:	47 CFR 15.231(b)		
Test Limit:	Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
	40.66-40.70	2,250	225
	70-130	1,250	125
	130-174	¹ 1,250 to 3,750	¹ 125 to 375
	174-260	3,750	375
	260-470	¹ 3,750 to 12,500	¹ 375 to 1,250
	Above 470	12,500	1,250
	¹ Linear interpolations. (1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.		
Test Method:	ANSI C63.10-2020, Section 6.5		
Procedure:	1>. The EUT was setup and tested according to ANSI C63.10. 2>. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. 3>. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower. 4>. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines. 5>. Set to the maximum power setting and enable the EUT transmit continuously. 6>. Use the following spectrum analyzer settings a) Span shall wide enough to fully capture the emission being measured; b) RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.		

6.2.5.1. E.U.T. Operation

Operating Environment:					
Temperature:	23.3 °C	Humidity:	56.8 %	Atmospheric Pressure:	103.1 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.2.5.2. Test Setup Diagram



6.2.5.3. Test Result

Pass

6.2.5.4. Test Data

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Polarity
433.92	68.03	100.83	32.8	Peak	Horizontal
433.92	65.17	80.83	15.66	Average	Horizontal
433.92	67.10	100.83	33.73	Peak	Vertical
433.92	64.24	80.83	16.59	Average	Vertical

Note:

- 1) Level= Reading + Factor/Transd; Factor/Transd =Antenna Factor+ Cable Loss- Preamp Factor
- 2) Margin = Limit – Level
- 3) Average Level = Peak Level+Duty cycle corrected factor

This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in Y position.

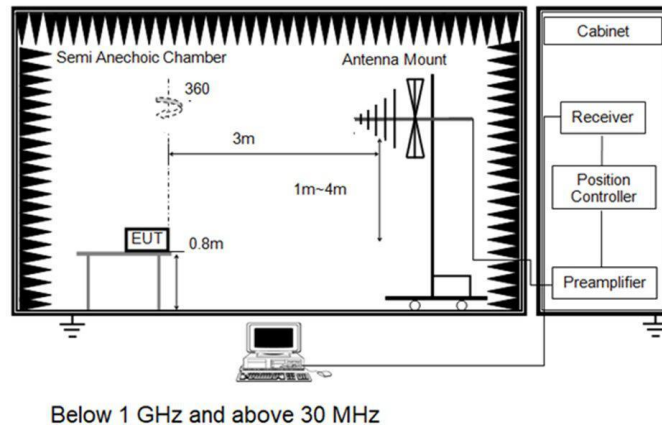
6.2.6. Radiated Emission (below 1GHz)

Test Requirement:	47 CFR 15.231		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.			
Test Method:	ANSI C63.10-2020, Section 6.5		
Procedure:	1>. The EUT was setup and tested according to ANSI C63.10. 2>. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. 3>. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower. 4>. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines. 5>. Set to the maximum power setting and enable the EUT transmit continuously. 6>. Use the following spectrum analyzer settings a) Span shall wide enough to fully capture the emission being measured; b) RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.		

6.2.6.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.1 °C	Humidity:	55.1 %	Atmospheric Pressure:	103.1 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.2.6.2. Test Setup Diagram



6.2.6.3. Test Result

Pass

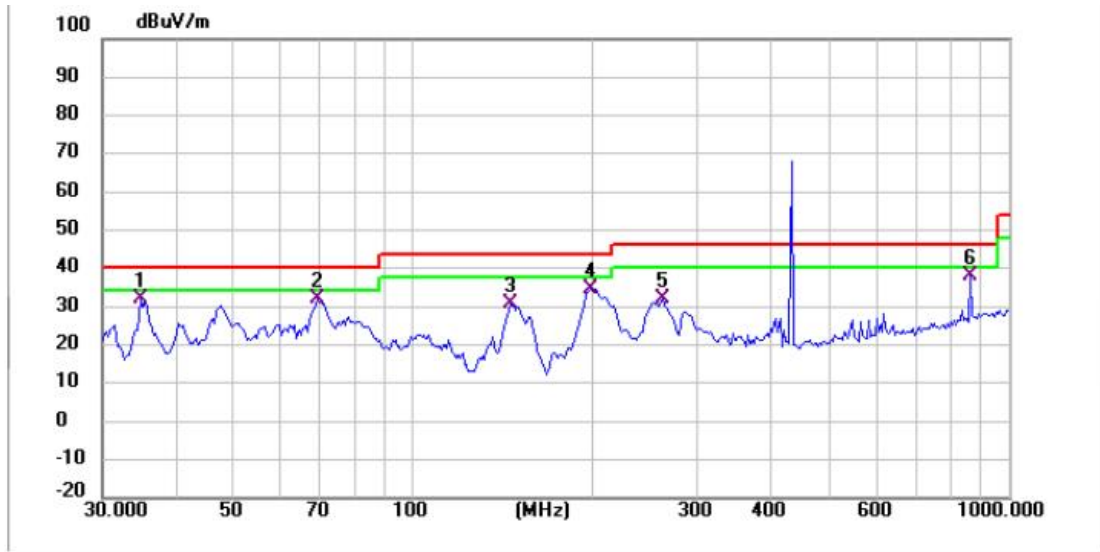
6.2.6.4. Test Data

Mode1 / Polarization: Horizontal / CH: 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.1613	45.73	-29.90	15.83	40.00	24.17	QP
2	69.6003	52.90	-32.65	20.25	40.00	19.75	QP
3	138.3873	55.97	-33.99	21.98	43.50	21.52	QP
4	252.9481	65.19	-28.78	36.41	46.00	9.59	QP
5	502.9395	54.22	-22.99	31.23	46.00	14.77	QP
6 *	863.0561	55.21	-16.94	38.27	46.00	7.73	QP

Mode1 / Polarization: Vertical / CH: 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	34.7601	63.39	-31.40	31.99	40.00	8.01	QP
2	69.1140	64.43	-32.47	31.96	40.00	8.04	QP
3	145.3505	65.01	-34.16	30.85	43.50	12.65	QP
4	197.8925	65.02	-30.40	34.62	43.50	8.88	QP
5	261.9750	60.58	-28.62	31.96	46.00	14.04	QP
6 *	863.0561	55.14	-16.94	38.20	46.00	7.80	QP

Note:

1>. For 9 kHz ~ 30 MHz Measurement

The EUT was pre-scanned this frequency band, found the radiated level 20dB lower than the limit, so don't show data on this report.

2>. Level= Reading + Factor (Antenna Factor+ Cable Loss- Preamplifier Factor)

3>. Margin = Limit – Level

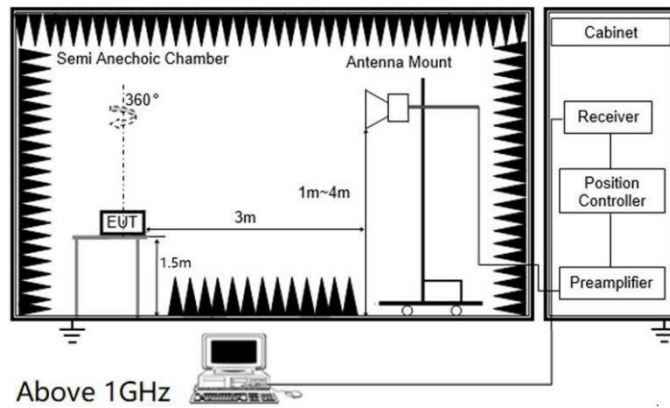
6.2.7. Radiated Emission (above 1GHz)

Test Requirement:	47 CFR 15.231		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. In the emission table above, the tighter limit applies at the band edges. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.			
Test Method:	ANSI C63.10-2020, Section 6.6		
Procedure:	1>. The EUT was setup and tested according to ANSI C63.10. 2>. The EUT is placed on a turn table which is 0.8 meter above ground for 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level. 3>. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower. 4>. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines. 5>. Set to the maximum power setting and enable the EUT transmit continuously. 6>. Use the following spectrum analyzer settings a) Span shall wide enough to fully capture the emission being measured; b) Set RBW=1MHz, VBW=3MHz, Sweep time=auto, Detector=peak, Trace=max hold for Peak measurement For average measurement: use duty cycle correction factor method (DCCF) Average level = Peak level + DCCF		

6.2.7.1. E.U.T. Operation

Operating Environment:					
Temperature:	22.2 °C	Humidity:	55.1 %	Atmospheric Pressure:	103.1 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.2.7.2. Test Setup Diagram

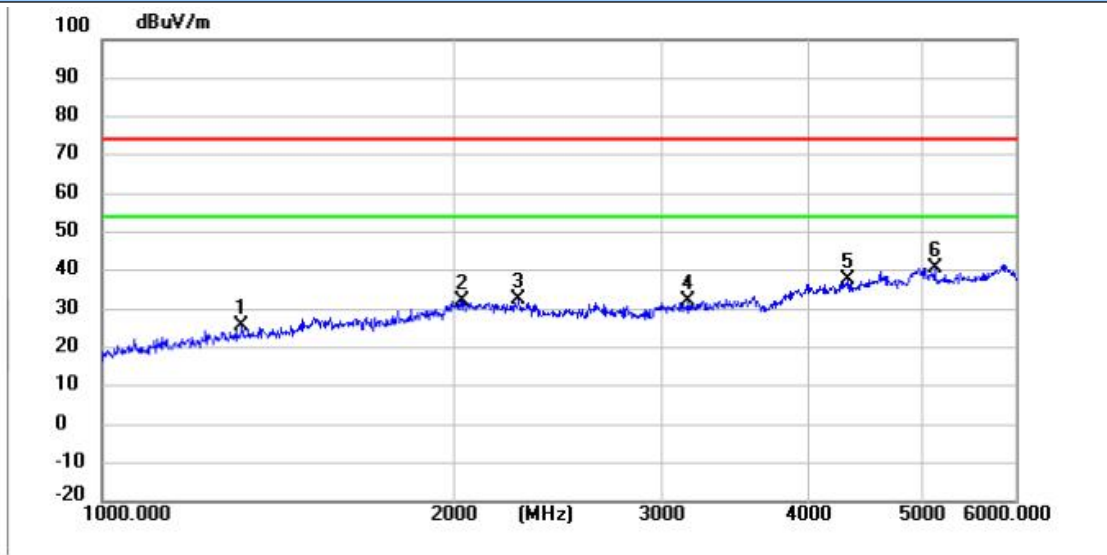


6.2.7.3. Test Result

Pass

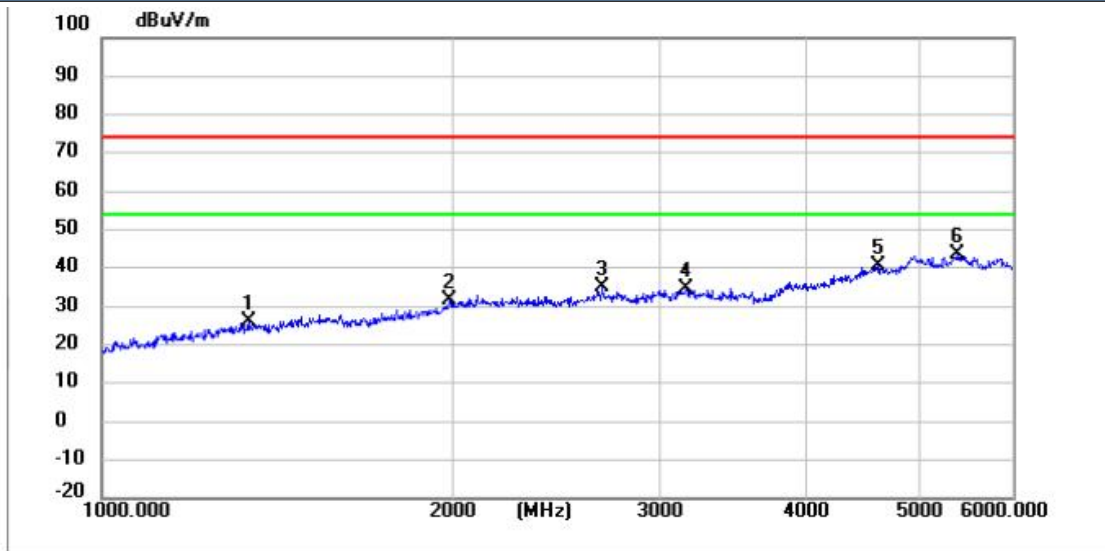
6.2.7.4. Test Data

Mode1 / Polarization: Horizontal / CH: 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1315.5000	46.25	-20.70	25.55	74.00	48.45	peak
2	2031.5000	46.66	-14.39	32.27	74.00	41.73	peak
3	2264.0000	47.66	-15.27	32.39	74.00	41.61	peak
4	3161.0000	49.35	-17.17	32.18	74.00	41.82	peak
5	4324.0000	51.58	-14.07	37.51	74.00	36.49	peak
6 *	5125.5000	52.69	-11.85	40.84	74.00	33.16	peak

Mode1 / Polarization: Vertical / CH: 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1335.0000	46.47	-20.55	25.92	74.00	48.08	peak
2	1981.0000	46.37	-14.73	31.64	74.00	42.36	peak
3	2681.0000	52.15	-16.87	35.28	74.00	38.72	peak
4	3161.0000	51.85	-17.17	34.68	74.00	39.32	peak
5	4605.0000	54.39	-13.66	40.73	74.00	33.27	peak
6 *	5383.5000	55.09	-11.62	43.47	74.00	30.53	peak

Note:

1>. Level= Reading + Factor (Antenna Factor+ Cable Loss- Preamp Factor)

2>. Margin = Limit – Level

3>. Average measurement was not performed if peak level is lower than average limit (54dBuV/m) above 1GHz.

-----End of the report-----