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IKeyless, LLC TEST REPORT

SCOPE OF WORK

EMC TESTING – KEY FOB REMOTE

REPORT NUMBER

106279645LEX-001

ISSUE DATE

11/18/2025

PAGES

37

DOCUMENT CONTROL NUMBER

Non-Specific EMC Report Shell Rev. December 2017
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EMC TEST REPORT (FULL COMPLIANCE)

Report Number: 106279645LEX-001

Project Number: G106279645

Report Issue Date: 11/18/2025

Model(s) Tested: Key Fob Remote

Standards: FCC Title 47 CFR Part 15.231
RSS-210 Issue 11
RSS-GEN Issue 5
FCC Title 47 CFR 15B
ICES-003

Tested by:
Intertek Testing Services NA, Inc.
731 Enterprise Dr.
Lexington, KY 40510
USA

Client:
IKeyless, LLC
12101 Sycamore Station Place
Suite 140
Louisville, KY 40299
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Report prepared by



David Perry,
EMC Engineer

Report reviewed by



Michael Carlson,
EMC Team Leader

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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	FCC Reference	IC Reference	Result
6	Transmission Timing	§ 15.231(a)	RSS-210 (A1.2)	Pass
7	Occupied Bandwidth	§ 15.231(c)	RSS-210 (A1.4)/RSS-Gen (6.7)	Pass
8	Radiated Spurious Emissions (Transmitter)	§ 15.231(b)	RSS-210 (A1.3)	Pass
9	Radiated Emissions, (Idle Mode)	§ 15.109	ICES-003/RSS-Gen (7.3)	Pass
10	Antenna Requirement per FCC Part 15.203	§ 15.203	RSS-Gen (7.1.2)	Pass



3 Client Information

This product was tested at the request of the following:

Client Information	
Client Name:	IKeyless, LLC
Address:	12101 Sycamore Station Place Suite 140 Louisville, KY 40299 USA
Contact:	Madison McClellan
Telephone:	+1 (877) 445-3953
Email:	mmcclellan@carkeysexpress.com
Manufacturer Information	
Manufacturer Name:	IKeyless, LLC
Manufacturer Address:	12101 Sycamore Station Place Suite 140 Louisville, KY 40299 USA



4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	Key Fob Remote
Model Number	NSSSL-G300
Serial Number	N/A
Receive Date	8/2/2025
Test Start Date	8/13/2025
Test End Date	8/18/2025
Device Received Condition	Good
Test Sample Type	Production
Rated Voltage	3VDC
Description of Equipment Under Test (provided by client)	
Key Fob where a user will hold device and push buttons to perform actions at a vehicle (locking/unlocking doors, remote start, panic, etc.) In addition, the user can use the device to start the car, with the device in the vehicle.	

4.1 Variant Models:

There were no variant models covered by this evaluation.



5 System Setup and Method

5.1 Method:

Configuration as required by ANSI C63.4:2014, and ANSI C63.10:2020.

Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
-	-	-	-	-	-

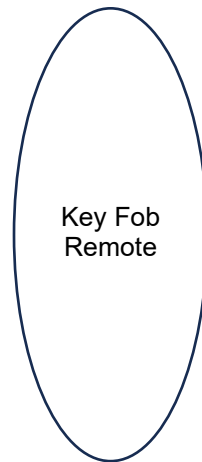
Support Equipment		
Description	Manufacturer	Model Number
-	-	-

5.2 Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	The device was on and operating normally, radio idle.
2	The device was on and operating normally, radio transmitting. 315MHz radio transmits at 314.89MHz. 434MHz radio transmits at 433.91Mhz



5.3 EUT Block Diagram:





5.4 EUT Photo (Front):





5.5 EUT Photo (Back):





6 Transmission Timing

§ 15.231(a):

The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

(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.

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

6.1 Test Procedure

The sample was set up in its normal operating mode. A small antenna connected to a spectrum analyzer was placed in close proximity to the sample. The scope was configured to trigger when the sample transmitted data. Conditions 1, 2, and 3 above were used to evaluate compliance.

6.2 Test Equipment Used:

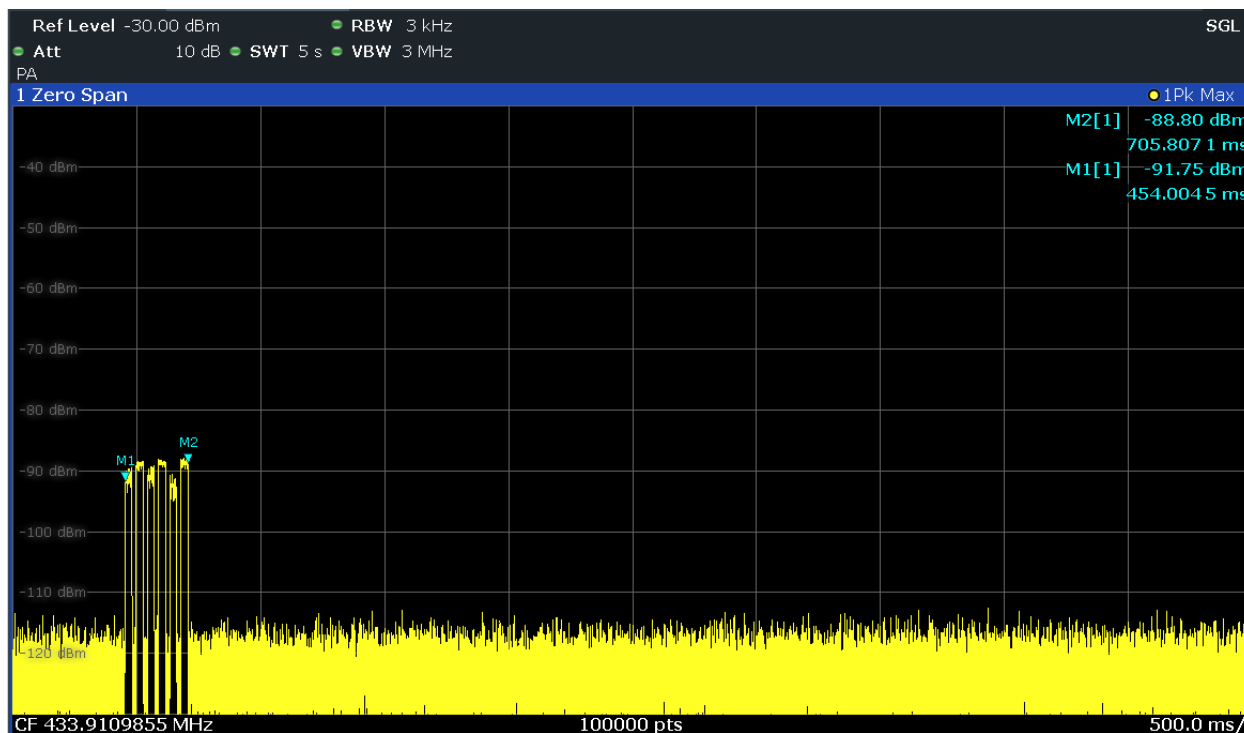
Description	Asset	Manufacturer	Model	Calibration Date	Calibration Due
Spectrum Analyzer	8305	Rohde & Schwarz	FSW26	9/20/2024	9/20/2025



6.3 Transmission Timing Results

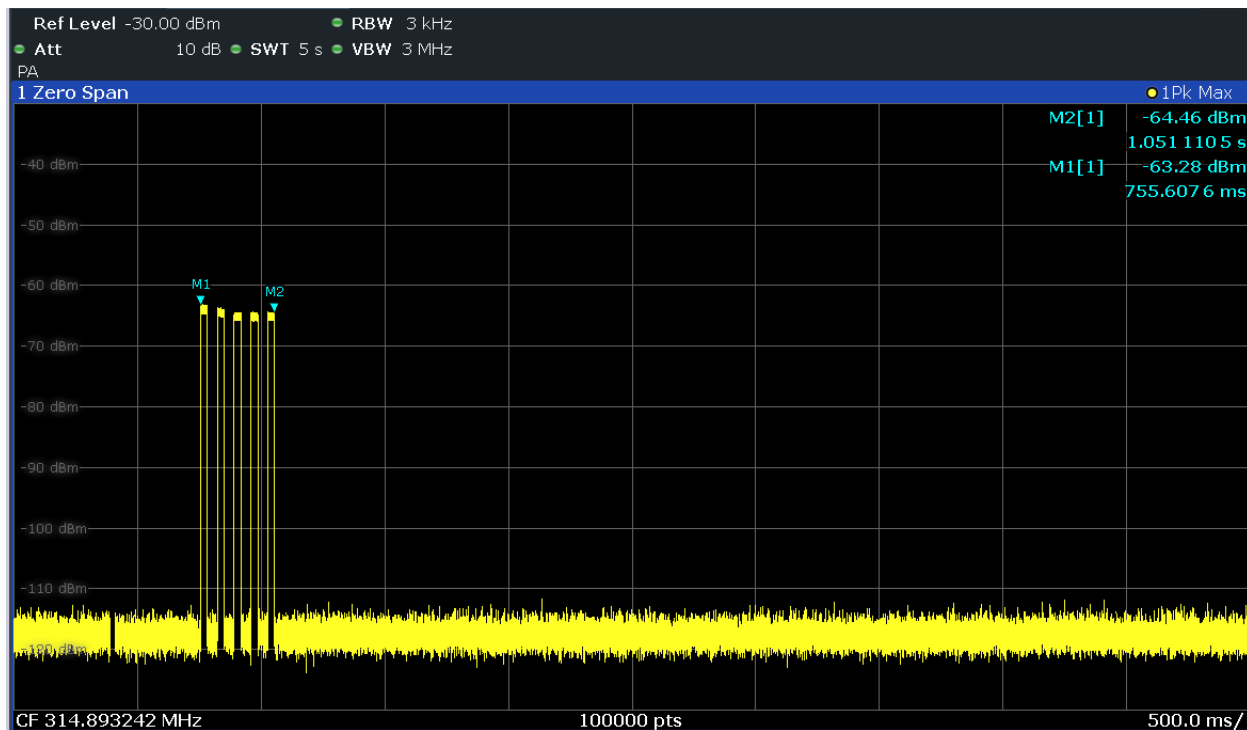
The device was activated once, with one button press. The transmitter automatically stops transmitting immediately after activation ended.

6.3.1.1 434MHz





6.3.1.2 315MHz





7 Occupied Bandwidth

7.1 Test Limits

§ 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.

RSS-GEN §6.7: The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

7.2 Test Procedure

Tests are performed in accordance with ANSI C63.10 §6.9.3

7.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Calibration Date	Calibration Due
Spectrum Analyzer	8305	Rohde & Schwarz	FSW26	9/20/2024	9/20/2025

7.4 Test Software Used:

Description	Manufacturer	Version
RSCCommander	Rohde & Schwarz	2.4.2 64 bit (2023)

7.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Signal Chain Calibration	1.2

No measurement correction based on measurement uncertainty is performed.

7.6 Test Conditions

Test Personnel	Test Date	Ambient Temperature	Relative Humidity	Pressure
David Perry	8/13/2025	27.1°C	55.2%	978.67mbar

7.7 Test Results:

The sample tested was found to Comply.



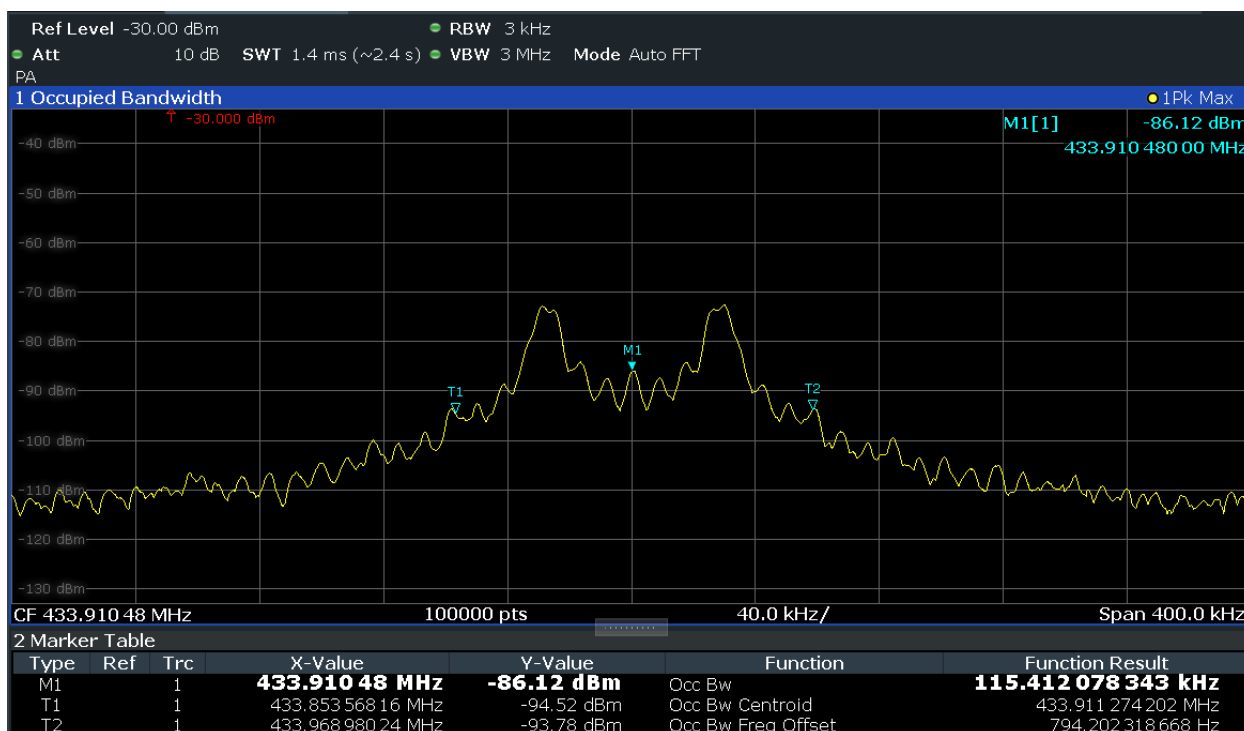
7.8 Test Data:

Frequency (MHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit (kHz)
314.89	44.38	103.54	787.5
433.91	101.42	115.41	1082.5

7.9 Test Plots

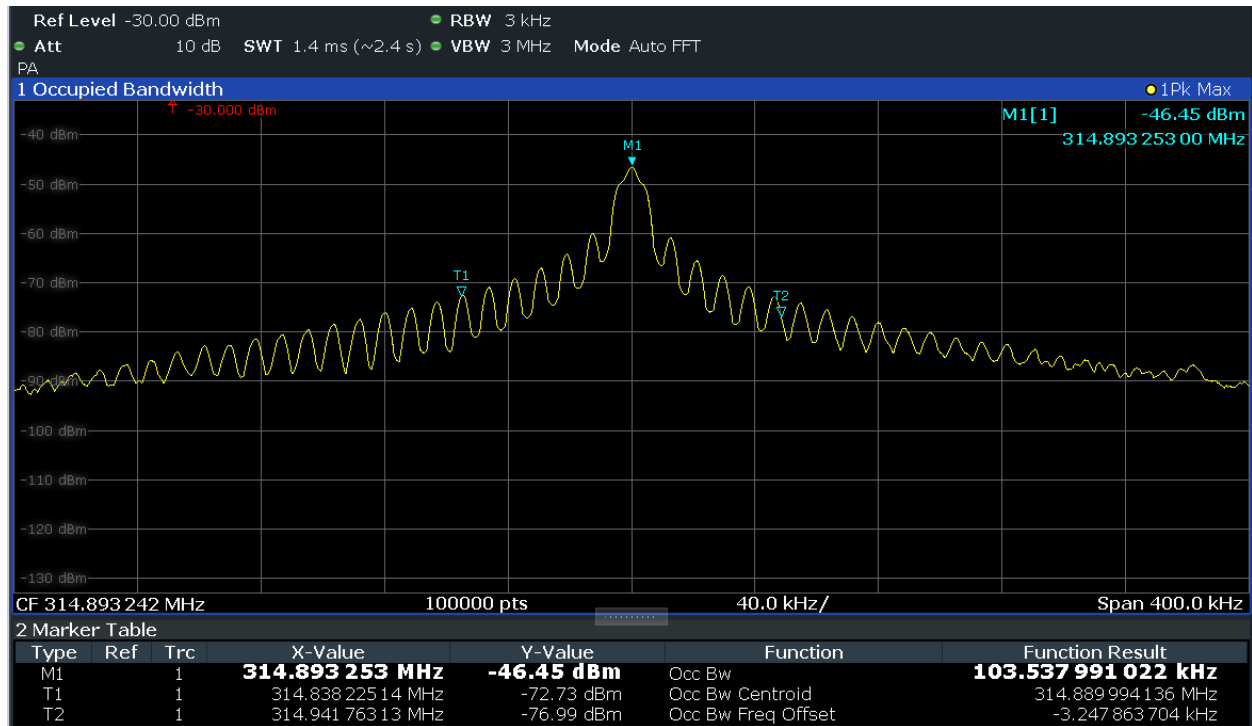
7.9.1 99% Bandwidth Measurement

7.9.1.1 434MHz





7.9.1.2 315MHz

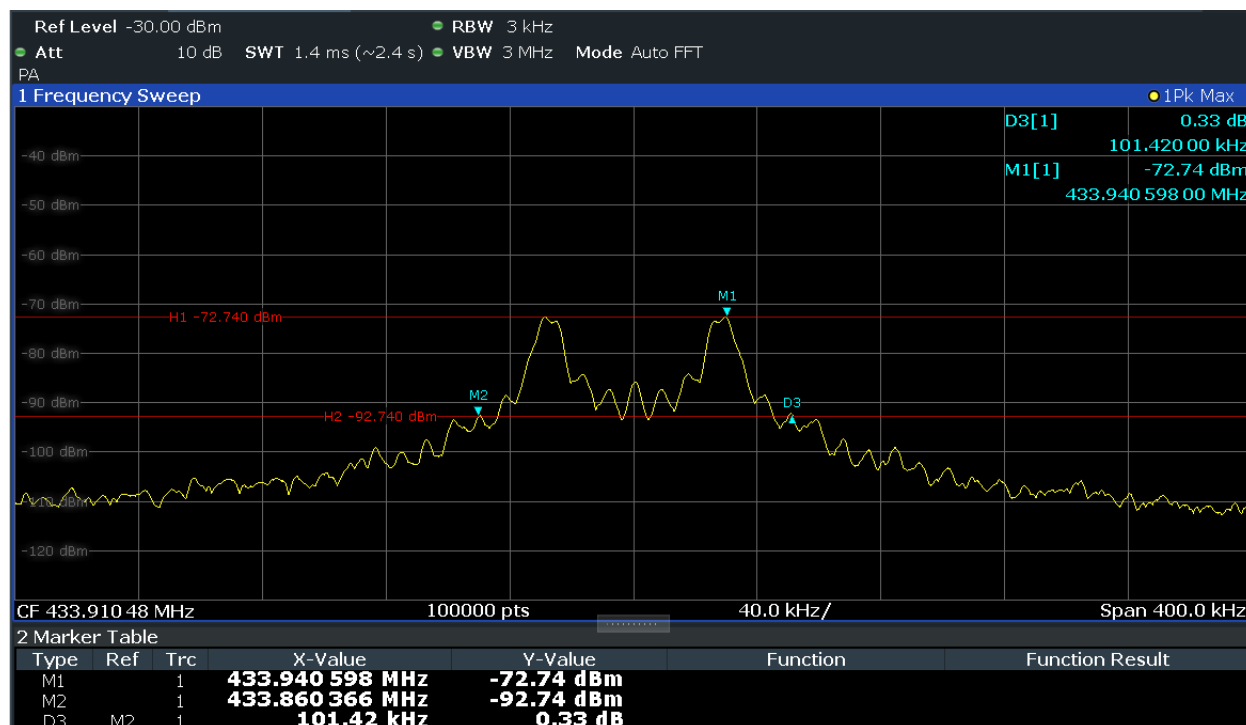




EMC Test Report

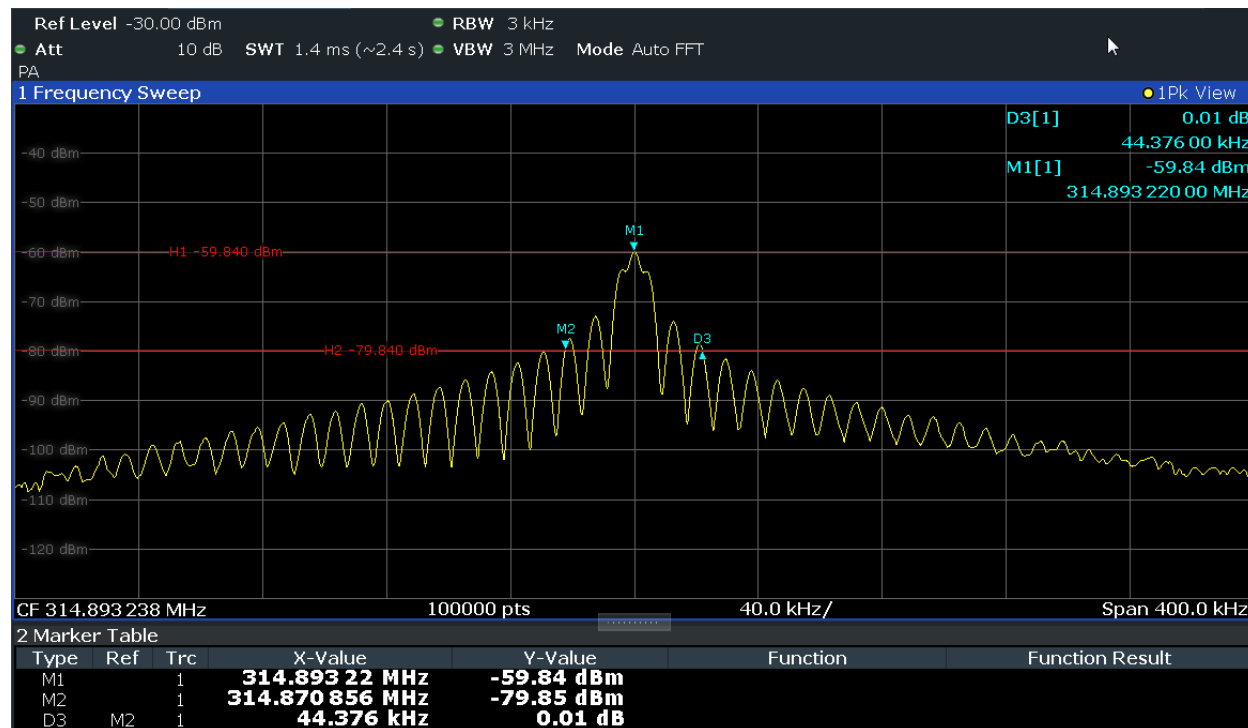
7.9.2 20dB Bandwidth Measurement

7.9.2.1 434MHz





7.9.2.2 315MHz





8 Radiated Spurious Emissions (Transmitter)

8.1 Test Limits

§ 15.231(a): The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

(b) In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

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

¹Linear interpolations.

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

(2) 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.

(3) 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.



RSS-210 §A.1.3(a): The field strength of emissions from momentarily operated intentional radiators shall not exceed the limits in table A1, based on the average value of the measured emissions. The requirements of the “Pulsed Operation” section of RSS-Gen apply for averaging pulsed emissions and limiting peak emissions.

Alternatively, compliance with the limits in table A1 may be based on the use of a CISPR quasi-peak detector.

RSS-210 §A.1.3(b): Unwanted emissions shall be 10 times below the fundamental emissions field strength limits in table A1 or comply with the limits specified in RSS-Gen, whichever is less stringent

Table A1: Permissible field strength limits for momentarily operated devices

Fundamental frequency (MHz), excluding restricted frequency bands specified in RSS-Gen	Field strength of the fundamental emissions ($\mu\text{V/m}$ at 3 m)
70-130	1,250
130-174	1,250 to 3,750*
174-260**	3,750
260-470**	3,750 to 12,500*
Above 470	12,500
*Linear interpolation with frequency, f, in MHz: - for 130-174 MHz: field strength ($\mu\text{V/m}$) = $(56.81818 \times f) - 6136.3636$ - for 260-470 MHz: field strength ($\mu\text{V/m}$) = $(41.6667 \times f) - 7083.3333$ **Frequency bands 225-328.6 MHz and 335.4-399.9 MHz are designated for use by the Government of Canada. Manufacturers should be aware of possible harmful interference and degradation of their licence-exempt radio equipment in these frequency bands.	

**Part 15.205(a): Restricted Bands of Operations**

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
¹ 0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	(²)
13.36–13.41.			

¹ Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.² Above 38.6**Part 15.209(a): Field Strength Limits for Restricted Bands of Operation**

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / 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



8.2 Test Procedure

ANSI C63.10: 2020 §6.3, §6.4, §6.5, §6.6

8.3 Example of Field Strength Calculation Method:

The measured field strength was calculated by summing the readings taken from the spectrum analyzer with the appropriate correction factors associated with the antenna losses and cable losses. The calculation formula and sample calculations are listed below:

Formula:

$$FS = RA + AF + CF$$

FS = Field Strength in dB μ V/m

RA = Receiver Amplitude in dB μ V

AF = Antenna Factor in dB

CF = Cable Attenuation Factor in dB (Including preamplifier and filter attenuation)

Example Calculation:

$$RA = 19.48 \text{ dB}\mu\text{V}$$

$$AF = 18.52 \text{ dB}$$

$$CF = 0.78 \text{ dB}$$

$$FS = 19.48 + 18.52 + 0.78 = 38.78 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(38.78 \text{ dB}\mu\text{V/m})/20] = 86.89 \mu\text{V/m}$$

**8.4 Test Equipment Used:**

Description	Asset	Manufacturer	Model	Calibration Date	Calibration Due
EMI Test Receiver	8258	Rohde & Schwarz	ESW44	5/25/2025	5/25/2026
Bilog Antenna (30MHz-1GHz)	7085	SunAR	JB6	3/14/2025	3/14/2026
Horn Antenna (1-18GHz)	4001	ETS	3117	3/4/2025	3/4/2026
System Controller	4096	ETS Lindgren	2090	Verify at Time of Use	Verify at Time of Use
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
30M-1G 3m Signal Path without Preamplifier	8311 2593 8188 8185	-	-	11/26/2024	11/26/2025
Preamplifier	3918	Rohde & Schwarz	TS-PR18	11/26/2024	11/26/2025
1-18GHz Signal Path with Preamplifier	3074 3918 8310 2593 8188 8185	-	-	11/26/2024	11/26/2025

8.5 Software Utilized:

Name	Manufacturer	Version
EMC32	Rohde & Schwarz	Version 10.60.20



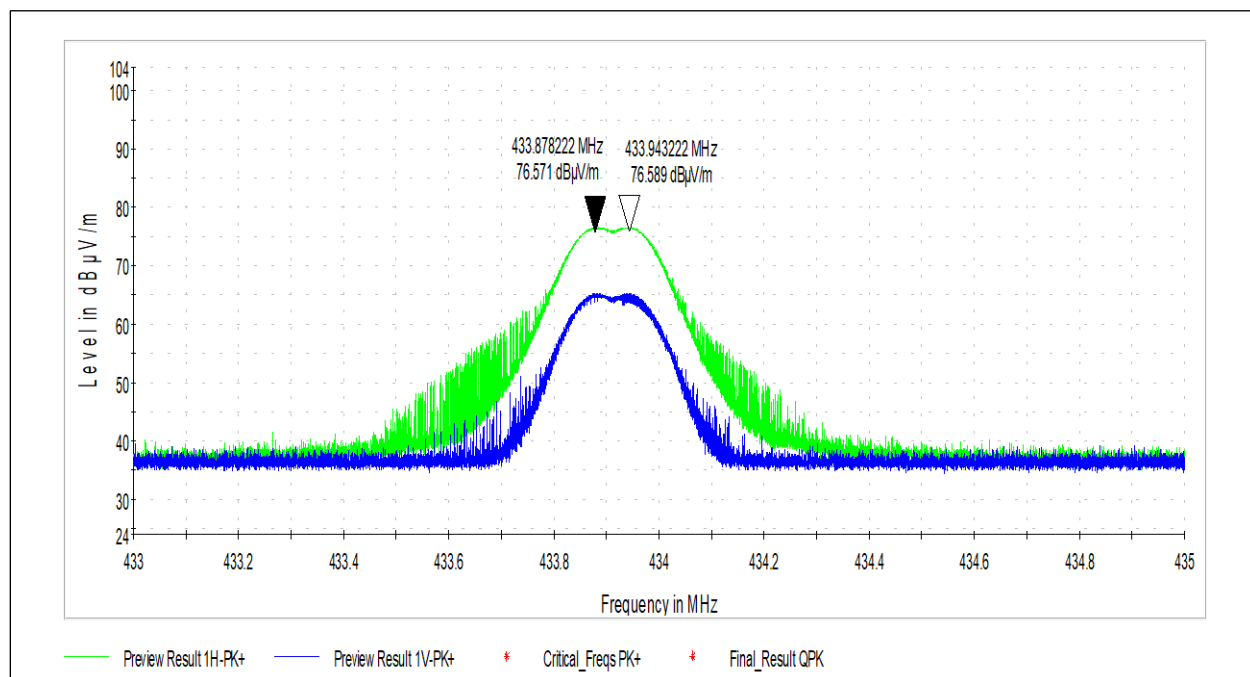
8.6 Test Results:

All fundamental and spurious emissions not falling into the restricted bands met the limits outlined in FCC Part 15.231(b). Additionally, all emissions falling within restricted bands of operation were found to be below the limit specified in Part 15.209(a). The emissions listed in the following tables are the worst case emissions and were investigated with the sample positioned in three orthogonal axis in order to report the highest possible field strength.

Frequency (MHz)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dB)
314.891	74.757	75.623	0.87
433.943	76.589	80.795	4.21

8.7 Plots/Data: Radiated Emissions, Fundamental Transmission

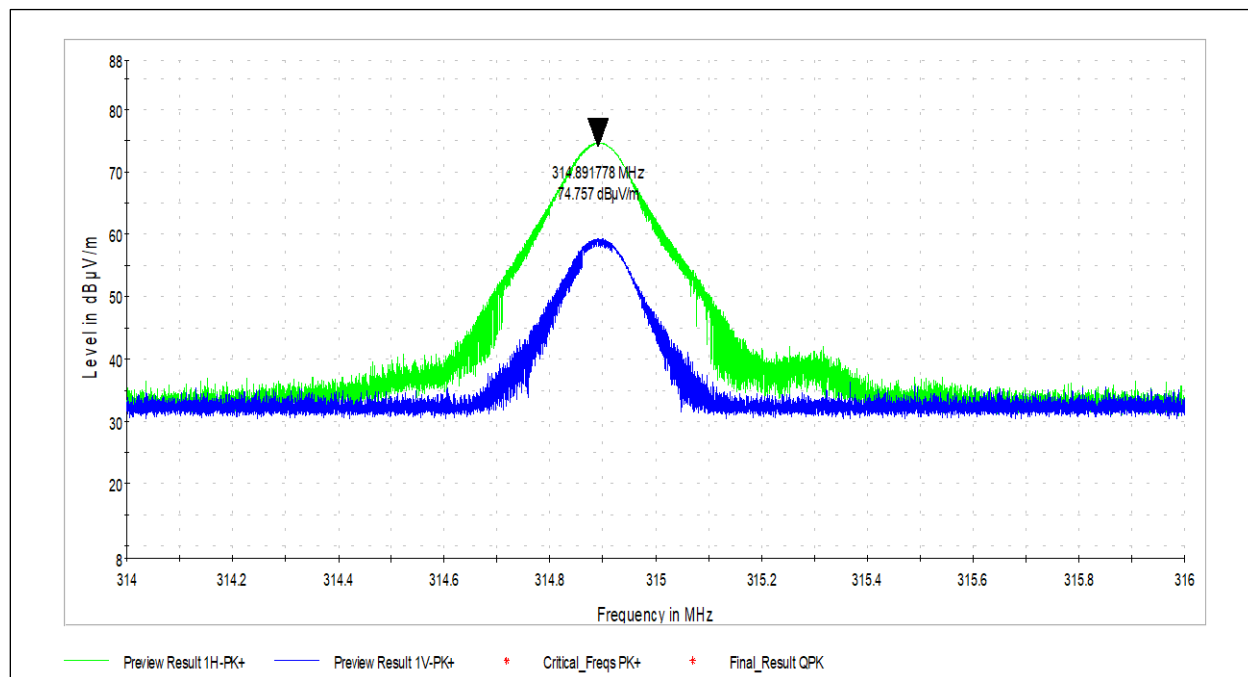
8.7.1 433MHz, (120kHz RBW)



Test Personnel: David Perry
Supervising/Reviewing Engineer: N/A
(Where Applicable) FCC 15.231
Product Standard: RSS-210
Input Voltage: 3VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 8/18/2025
Limit Applied: FCC 15.231
Ambient Temperature: 25.0°C
Relative Humidity: 53.1%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None

**8.7.2 315MHz, (120kHz RBW)**

Test Personnel: David Perry
Supervising/Reviewing Engineer:
(Where Applicable) N/A
FCC 15.231
Product Standard: RSS-210
Input Voltage: 3VDC
Pretest Verification w / Ambient
Signals or BB Source: Yes

Test Date: 8/18/2025
Limit Applied: FCC 15.231
Ambient Temperature: 25.0°C
Relative Humidity: 53.1%
Atmospheric Pressure: 985.4mbar

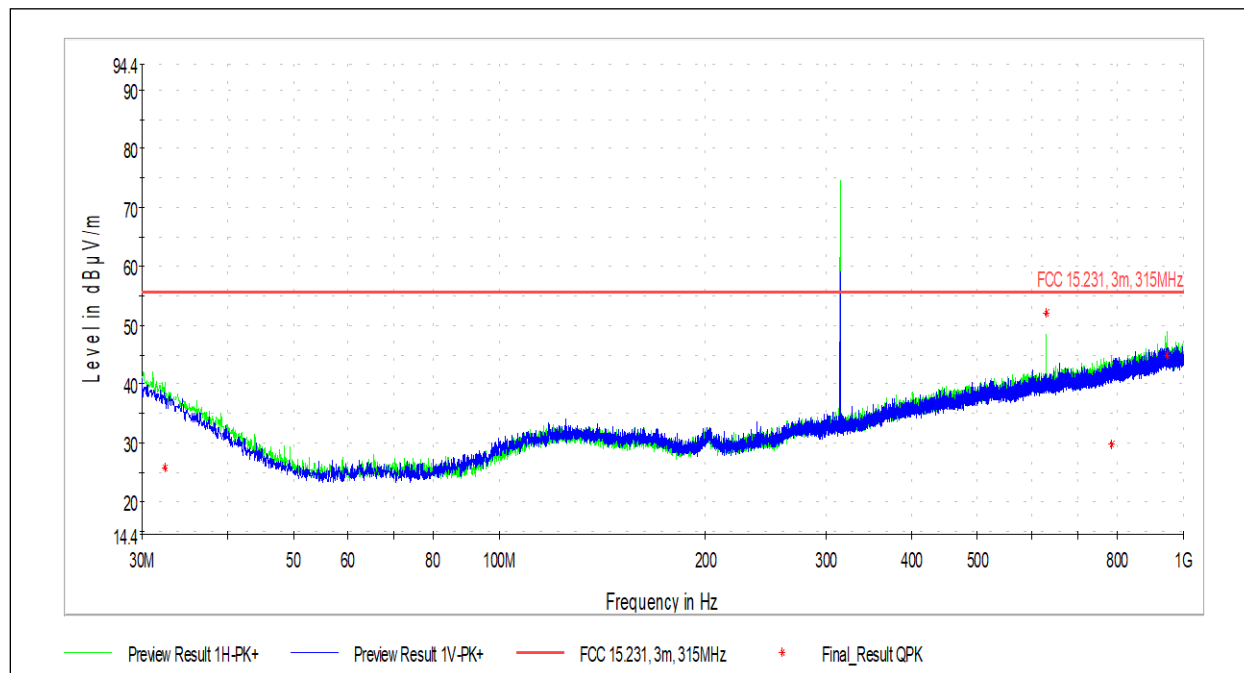
Deviations, Additions, or Exclusions: None



8.8 Plots/Data: Radiated Emissions, Spurious Emissions

8.8.1 30MHz-1GHz

8.8.1.1 315MHz



*Large peak shown is fundamental operating frequency and is not subject to the limit

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.425000	25.70	55.62	29.92	400.0	H	322.0	26.7
629.783333	52.07	55.62	3.55	150.0	H	150.0	28.7
785.468333	29.74	55.62	25.88	143.0	H	102.0	31.1
944.656111	44.98	55.62	10.64	149.0	H	98.0	32.9

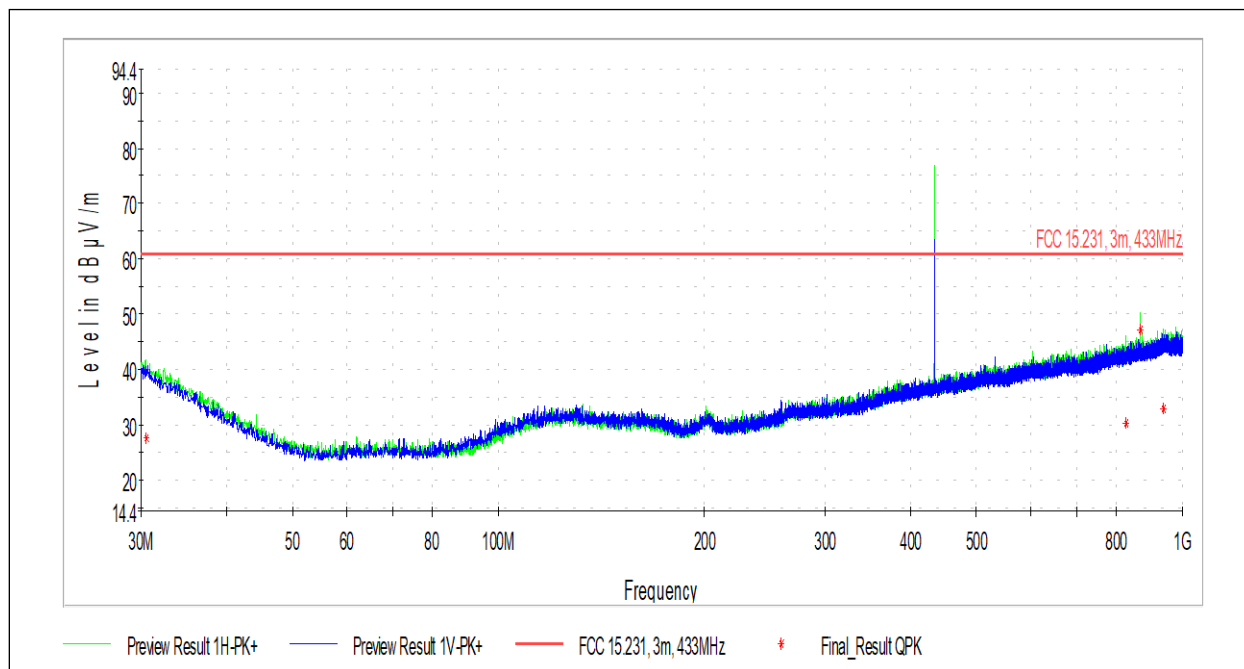
Test Personnel: David Perry
Supervising/Reviewing Engineer: N/A
(Where Applicable)
Product Standard: FCC 15.231
Input Voltage: RSS-210
Pretest Verification w / Ambient Signals or BB Source: 3VDC
Yes

Test Date: 8/15/2025
Limit Applied: FCC 15.231
Ambient Temperature: 24.7°C
Relative Humidity: 50.5%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None



8.8.1.2 433MHz



*Large peak shown is fundamental operating frequency and is not subject to the limit

Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.538889	27.65	40.00	12.35	250.0	H	270.0	28.1
826.423889	30.37	46.02	15.65	338.0	H	288.0	31.6
867.756667	47.12	46.02	-1.10	96.0	H	95.0	32.0
937.704444	32.77	46.02	13.25	360.0	H	80.0	32.8

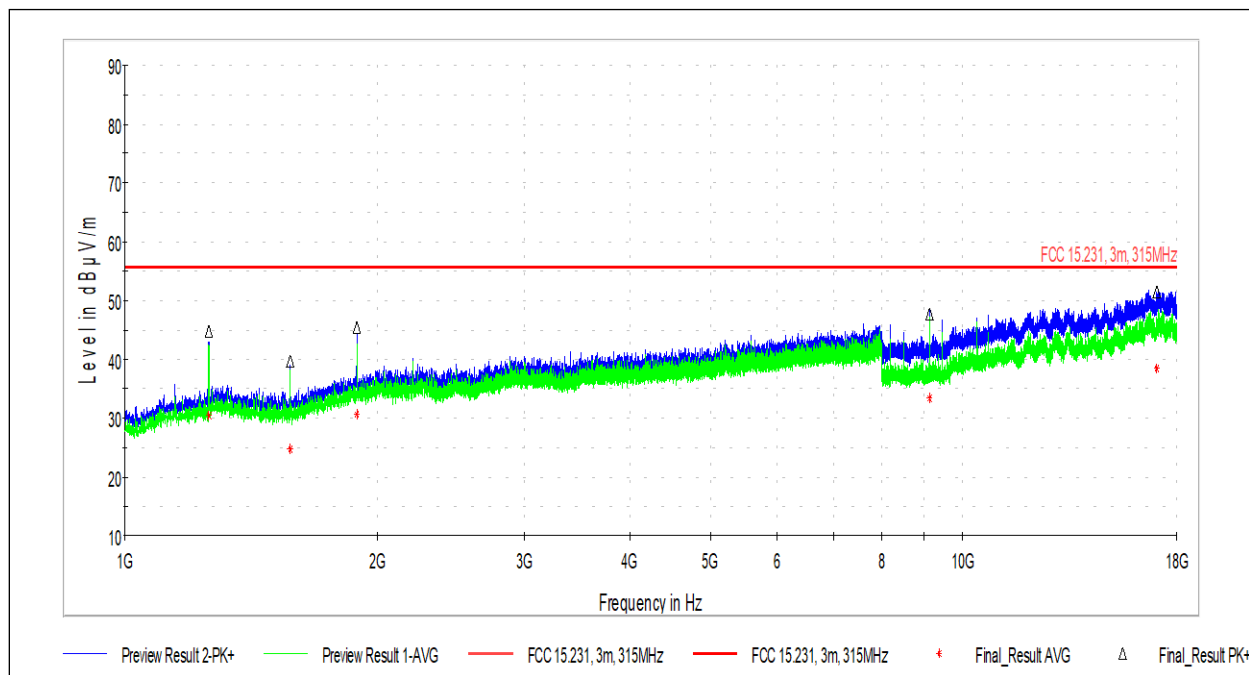
Test Personnel: David Perry
Supervising/Reviewing Engineer: N/A
(Where Applicable) FCC 15.231
Product Standard: RSS-210
Input Voltage: 3VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 8/15/2025
Limit Applied: FCC 15.231
Ambient Temperature: 24.7°C
Relative Humidity: 50.5%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None



8.8.1.3 315MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1259.388889	44.79	75.62	30.83	198.0	H	268.0	0.3
1574.000000	39.59	75.62	36.03	209.0	H	79.0	-0.3
1889.000000	45.27	75.62	30.35	255.0	H	247.0	3.4
9131.875000	47.69	75.62	27.93	100.0	V	330.0	15.7
17052.500000	51.51	75.62	24.11	100.0	H	0.0	26.5

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1259.388889	30.33	55.62	25.29	198.0	H	268.0	0.3
1574.000000	24.75	55.62	30.87	209.0	H	79.0	-0.3
1889.000000	30.66	55.62	24.96	255.0	H	247.0	3.4
9131.875000	33.34	55.62	22.28	100.0	V	330.0	15.7
17052.500000	38.37	55.62	17.25	100.0	H	0.0	26.5

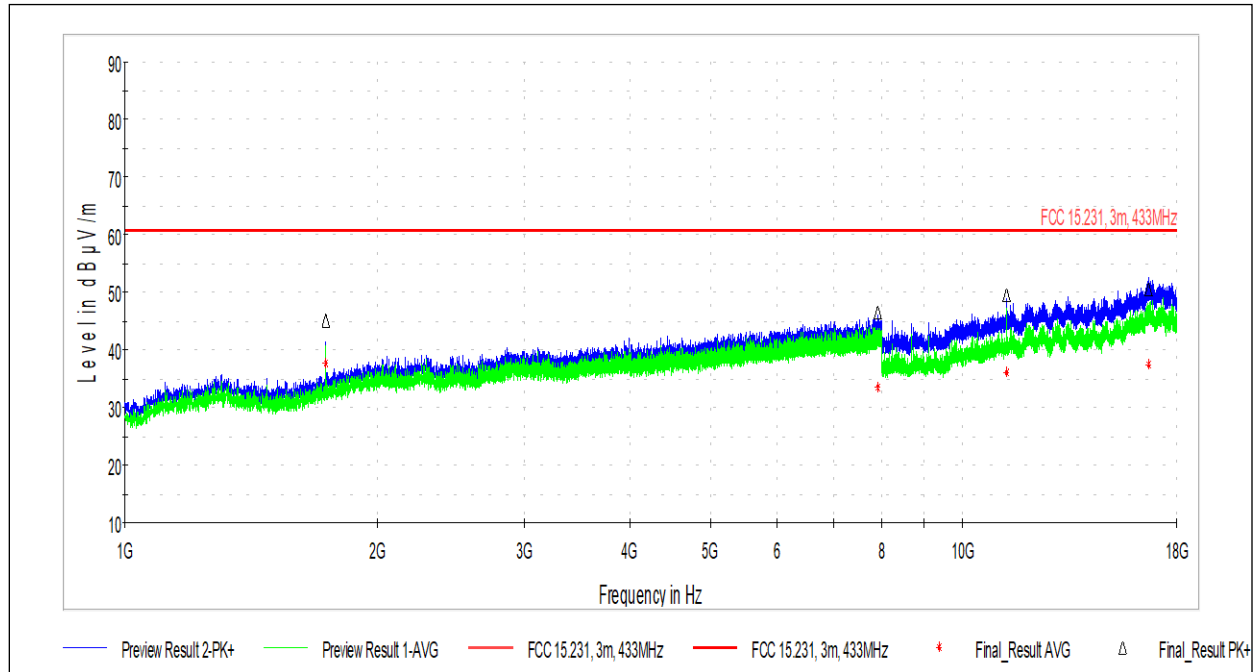
Test Personnel: David Perry
Supervising/Reviewing Engineer: (Where Applicable) N/A
Product Standard: FCC 15.231
Input Voltage: RSS-210
Pretest Verification w / Ambient Signals or BB Source: 3VDC Yes

Test Date: 8/15/2025
Limit Applied: FCC 15.231
Ambient Temperature: 24.7°C
Relative Humidity: 50.5%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None



8.8.1.4 433MHz



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1735.777778	45.18	80.8	35.62	230.0	H	248.0	1.7
7912.111111	46.58	80.8	34.22	410.0	V	0.0	14.1
11282.500000	49.61	80.8	31.19	146.0	V	245.0	19.3
16646.875000	50.54	80.8	30.26	109.0	H	311.0	26.2

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1735.777778	37.62	60.80	23.18	230.0	H	248.0	1.7
7912.111111	33.48	60.80	27.32	410.0	V	0.0	14.1
11282.500000	36.11	60.80	24.69	146.0	V	245.0	19.3
16646.875000	37.46	60.80	23.34	109.0	H	311.0	26.2

Test Personnel: David Perry
Supervising/Reviewing Engineer: _____
(Where Applicable) N/A
FCC 15.231
Product Standard: RSS-210
Input Voltage: 3VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 8/15/2025
Limit Applied: FCC 15.231
Ambient Temperature: 24.7°C
Relative Humidity: 50.5%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None



9 Radiated Emissions, (Idle Mode)

9.1 Method

Tests are performed in accordance with ANSI C63.4:2014.

TEST SITE: 10m ALSE

Site Designation: 10m Chamber

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U_{CISPR}
Radiated Emissions, 10m	30-1000 MHz	3.9dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	4.0dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.7dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	4.7dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	4.7dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	4.7dB	5.5 dB

As shown in the table above our radiated emissions U_{Lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.



9.2 Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

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

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
- AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}$$

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

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

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

$$FS = 32 \text{ dB}\mu\text{V/m}$$

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$
$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

**9.1 Test Equipment Used:**

Description	Asset	Manufacturer	Model	Calibration Date	Calibration Due
EMI Test Receiver	8258	Rohde & Schwarz	ESW44	5/25/2025	5/25/2026
Bilog Antenna (30MHz-1GHz)	7085	SunAR	JB6	3/14/2025	3/14/2026
Horn Antenna (1-18GHz)	3780	ETS	3117	3/4/2025	3/4/2026
System Controller	4096	ETS Lindgren	2090	Verify at Time of Use	Verify at Time of Use
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
Preamplifier (30MHz-1GHz)	3919	Rohde & Schwarz	TS-PR3	11/26/2024	11/26/2025
30M-1G 10m Signal Path with Preamplifier	8311 3919 3172 2590 8187 8186	-	-	11/26/2024	11/26/2025
Preamplifier	3918	Rohde & Schwarz	TS-PR18	11/26/2024	11/26/2025
1-18GHz Signal Path with Preamplifier	3074 3918 8310 2593 8188 8185	-	-	11/26/2024	11/26/2025

9.2 Software Utilized:

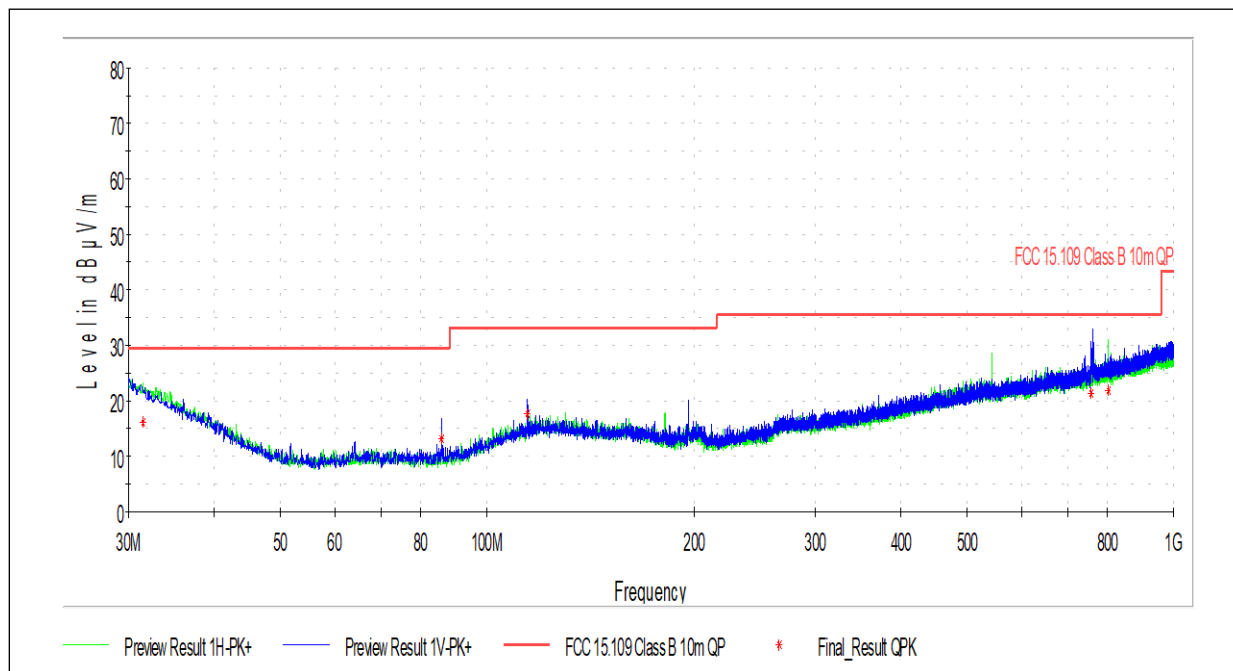
Name	Manufacturer	Version
EMC32	Rohde & Schwarz	Version 10.60.20

9.3 Results:

The sample tested was found to Comply.



9.4 Plots/Data: Radiated Emissions, 30MHz – 1GHz (Transmitters Idle)



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.508889	16.04	29.55	13.51	307.0	H	0.0	-3.3
85.882778	13.13	29.55	16.42	394.0	V	29.0	-14.7
114.551667	17.67	33.10	15.43	391.0	V	144.0	-9.5
758.577778	21.38	35.55	14.17	239.0	V	90.0	1.0
801.796667	21.90	35.55	13.65	189.0	H	322.0	1.8

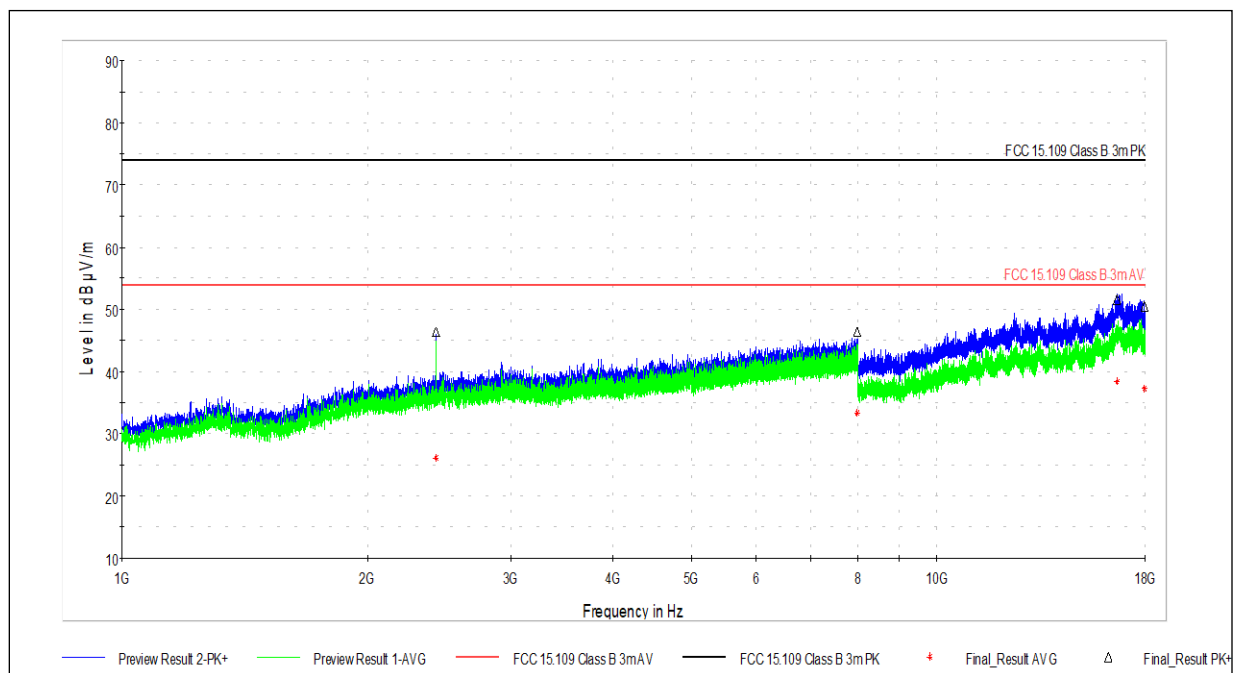
Test Personnel: David Perry
Supervising/Reviewing Engineer: _____
(Where Applicable) N/A
Product Standard: FCC Part 15B
Input Voltage: ICES-003
Pretest Verification w / Ambient: 3VDC
Signals or BB Source: Yes

Test Date: 8/15/2025
Limit Applied: Class B
Ambient Temperature: 24.7°C
Relative Humidity: 50.5%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None



9.5 Plots/Data: Radiated Emissions, 1GHz – 18GHz (Transmitters Idle)



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2426.055556	46.42	73.98	27.56	109.0	V	298.0	5.3
7982.111111	46.43	73.98	27.55	410.0	V	287.0	14.2
16610.625000	51.56	73.98	22.42	410.0	H	272.0	26.0
17958.125000	50.46	73.98	23.52	410.0	H	78.0	26.1

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2426.055556	26.02	53.98	27.96	109.0	V	298.0	5.3
7982.111111	33.27	53.98	20.71	410.0	V	287.0	14.2
16610.625000	38.27	53.98	15.71	410.0	H	272.0	26.0
17958.125000	37.23	53.98	16.75	410.0	H	78.0	26.1

Test Personnel: David Perry
Supervising/Reviewing Engineer: N/A
(Where Applicable) FCC Part 15B
Product Standard: ICES-003
Input Voltage: 3VDC
Pretest Verification w / Ambient Signals or BB Source: Yes

Test Date: 8/15/2025
Limit Applied: Class B
Ambient Temperature: 24.7°C
Relative Humidity: 50.5%
Atmospheric Pressure: 985.4mbar

Deviations, Additions, or Exclusions: None



10 Antenna Requirement per FCC Part 15.203

10.1 Test Limits

§ 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

RSS-Gen §6.8: The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

10.2 Results:

The sample tested met the antenna requirement. The antenna used was permanently attached to the PCB.



11 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of $k = 2$, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

Parameter	Uncertainty	Notes
Radiated emissions, 30 to 1000 MHz	$\pm 3.9\text{dB}$	None
Radiated emissions, 1 to 18 GHz	$\pm 4.2\text{dB}$	None
Radiated emissions, 18 to 40 GHz	$\pm 4.3\text{dB}$	None
Power Port Conducted emissions, 150kHz to 30 MHz	$\pm 2.8\text{dB}$	None
Signal Chain Calibration	$\pm 1.2\text{dB}$	None

**12 Revision History**

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	11/18/2025	106279645LEX-001	JP	MC	Original Issue