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iKeyless LLC TEST REPORT

SCOPE OF WORK

EMC TESTING – KEY FOB REMOTE

REPORT NUMBER

106071733LEX-002

ISSUE DATE

2/14/2025

PAGES

21

DOCUMENT CONTROL NUMBER

Non-Specific EMC Report Shell Rev. December 2017
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EMC TEST REPORT

(FULL COMPLIANCE)

Report Number: 106071733LEX-002**Project Number:** G106071733**Report Issue Date:** 2/14/2025**Model(s) Tested:** Key Fob Remote**Standards:** FCC Title 47 CFR Part 15.249

RSS-210 Issue 11

RSS-GEN Issue 5

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
USA

Report prepared by

Michael Carlson,
EMC Team Leader

Report reviewed by

Brian Lackey,
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Table of Contents

1	<i>Introduction and Conclusion</i>	4
2	<i>Test Summary</i>	4
3	<i>Client Information</i>	5
4	<i>Description of Equipment under Test and Variant Models</i>	6
5	<i>System Setup and Method</i>	7
6	<i>Occupied/DTS Bandwidth</i>	9
7	<i>Fundamental Emissions Output Power</i>	14
8	<i>Radiated Emissions</i>	16
9	<i>Antenna Requirement</i>	20
10	<i>Revision History</i>	21



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	Result
6	Occupied Bandwidth (ANSI C63.10 (2020) §6.9.2)	Pass
7	Fundamental Emission Output Power (ANSI C63.10 (2020) §11.9)	Pass
8	Radiated Emissions (ANSI C63.10 (2020) §6.3 §6.5 and §6.6)	Pass
9	Antenna Requirement (FCC Part 15.203, RSS-Gen Issue 5 § 6.8)	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:	Brian Corbett
Telephone:	502-791-3117
Email:	bcorbett@ikeyless.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	FDSSL-G140
Receive Date	2/3/2025
Test Start Date	2/12/2025
Test End Date	2/13/2025
Device Received Condition	Good
Test Sample Type	Production
Transmit Band	902MHz – 928MHz
Nominal DTS Bandwidth	25kHz
Antenna Type	Integral Antenna
Antenna Gain¹	-5.07 dBi
Rated Voltage	3VDC (Internal Battery)
Description of Equipment Under Test (provided by client)	
The Key Fob Remote is a key fob with wireless capabilities.	

4.1 Variant Models:

There were no variant models covered under this evaluation.

¹ This information was provided by the client and may affect compliance. Intertek does not make any claim of compliance for values other than those shown.



5 System Setup and Method

5.1 Method:

Configuration as required by ANSI C63.10 (2020)

No.	Descriptions of EUT Exercising
1	Battery Power: ON, transmitting continuously on alternating channels at 902.3815MHz and 903.432MHz
2	Battery Power: ON, not transmitting
3	Battery Power: ON, transmitting continuously on alternating channels at 902.3815MHz and 903.432MHz over a conducted path with a modified sample.

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

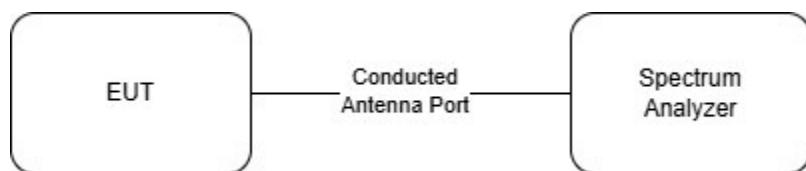
Support Equipment (Accessories)		
Description	Manufacturer	Model Number
-	-	-



5.2 EUT Block Diagram:



And





6 Occupied/DTS Bandwidth

6.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §6.9.2 and §6.9.3.

6.2 Test Limits:

Title 47 CFR 15.215(c)

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

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.



6.3 Test Equipment Used:

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

6.4 Test Software Used:

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

6.5 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Occupied Bandwidth	2.89dB

No measurement correction based on measurement uncertainty is performed.

6.6 Test Conditions

Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Michael Carlson	N/A	2/13/2025	22.1°C	25.1%	992.2mbar

6.7 Test Results:

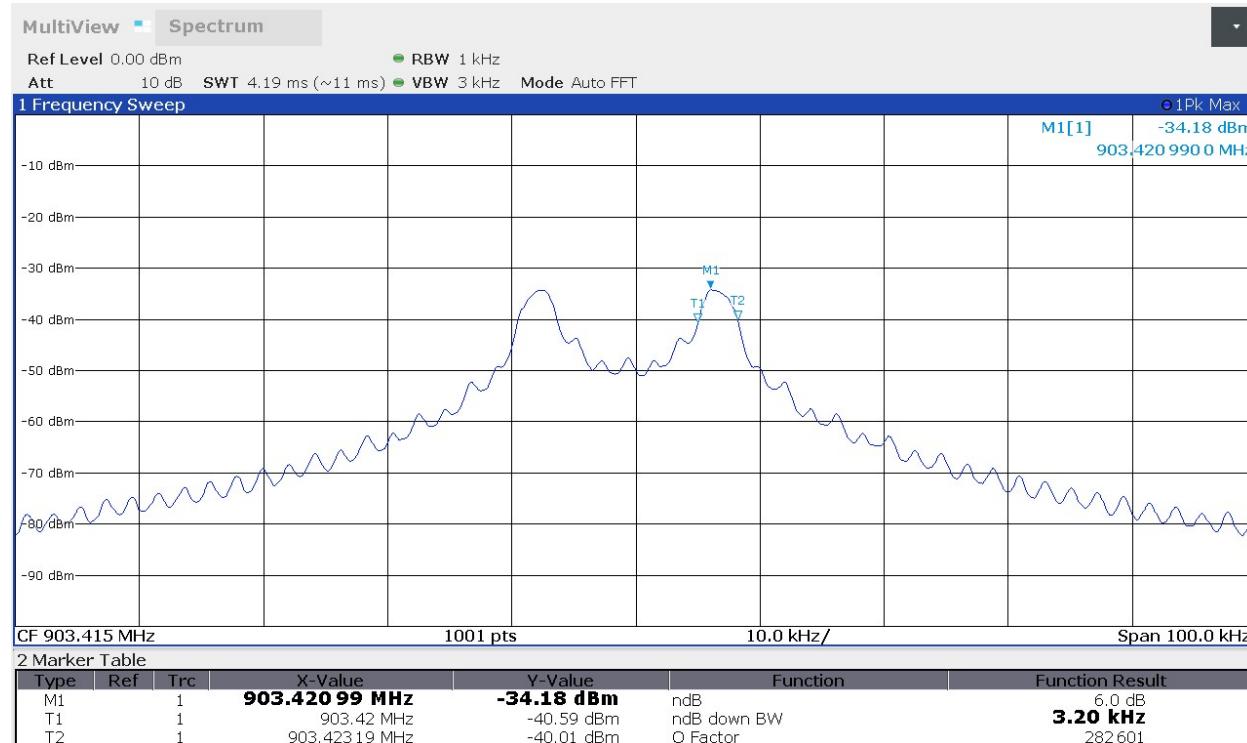
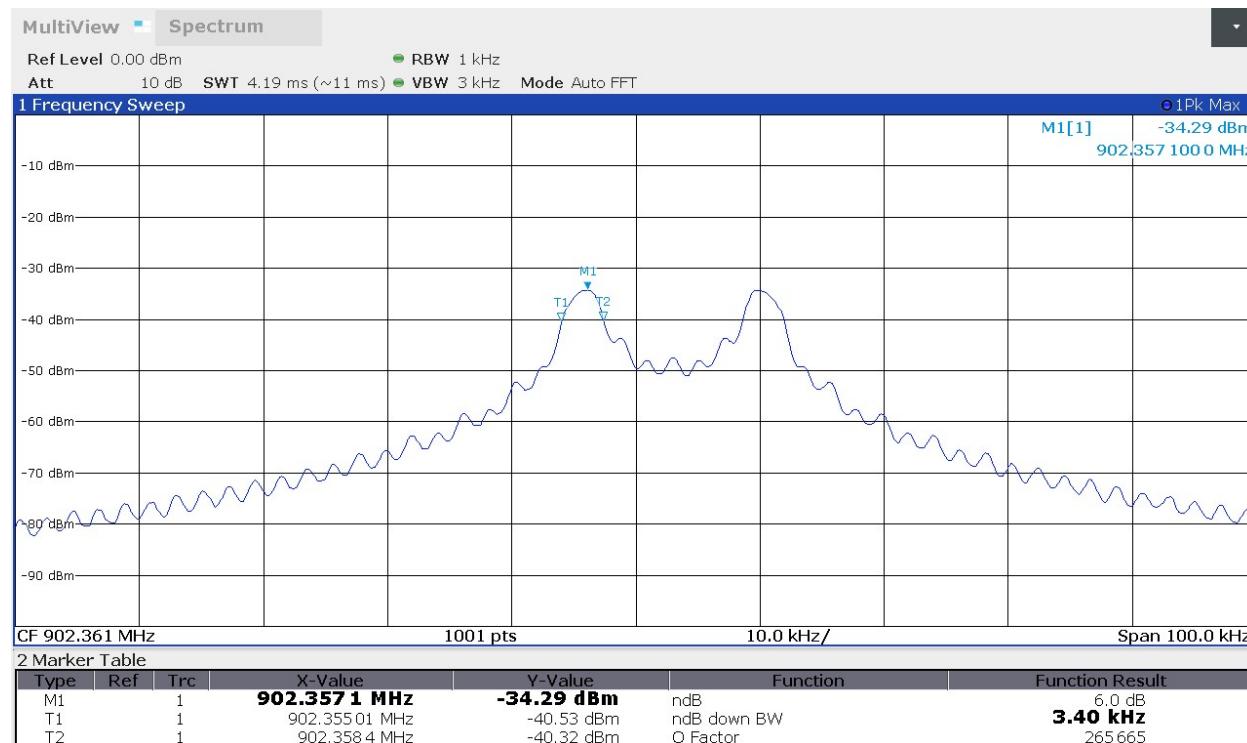
The sample tested was found to Comply. The bandwidth was contained in the bands of operation.

6.8 Test Data:

Frequency (MHz)	6dB Bandwidth (kHz)	20dB Bandwidth (kHz)	26dB Bandwidth (kHz)	99% Bandwidth (kHz)
902.382	3.4	26.27	30.72	25.865
903.432	3.2	26.07	30.67	25.766

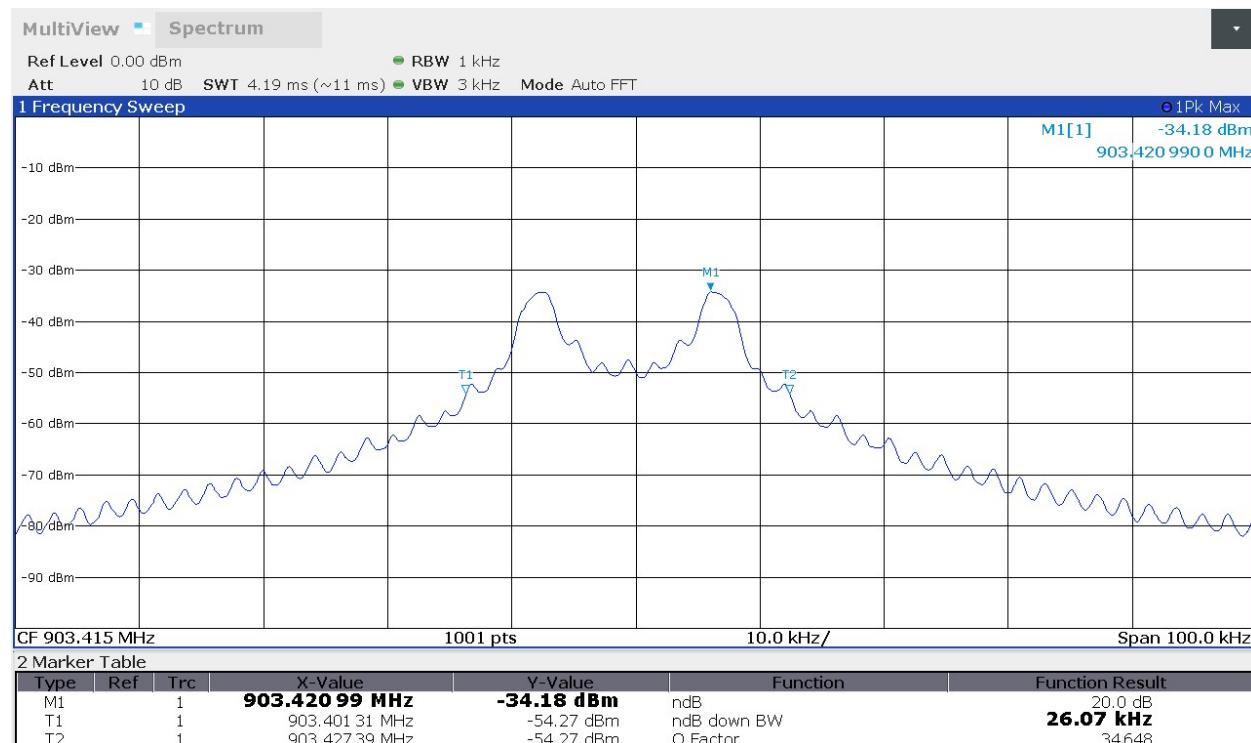
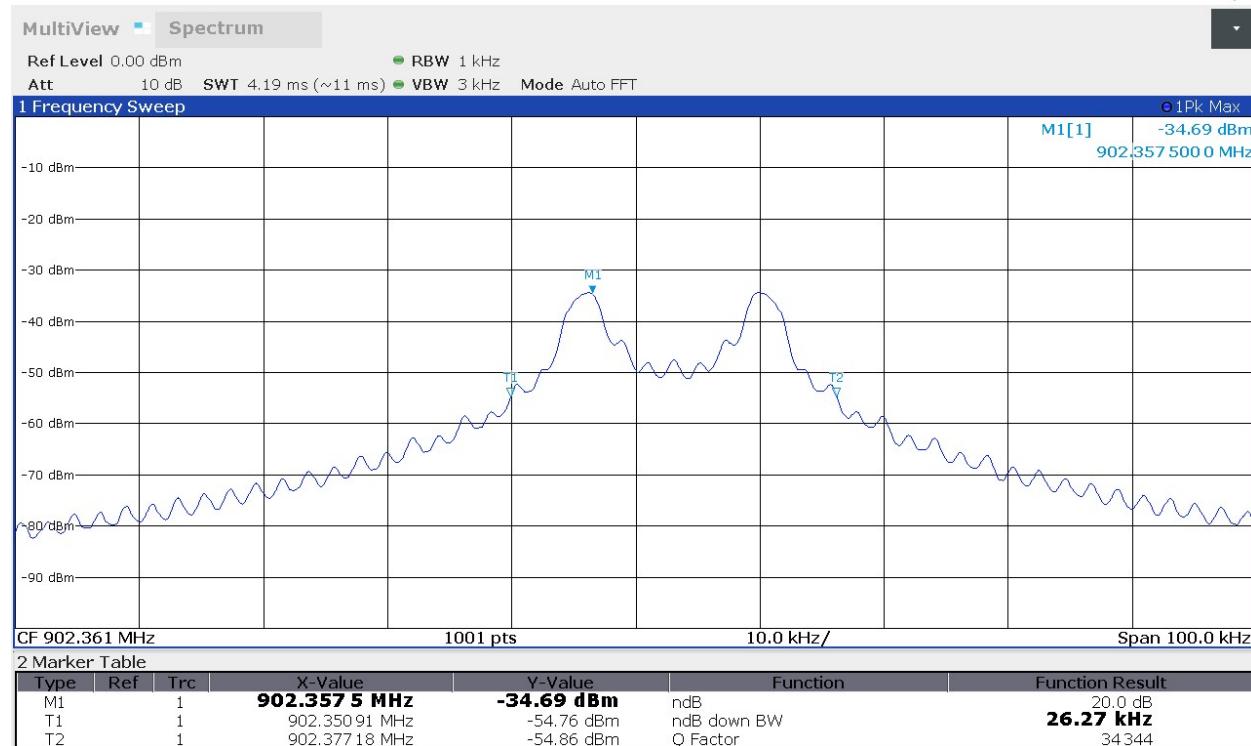


6.9 Test Plots: Occupied Channel Bandwidth (6dB Bandwidth)



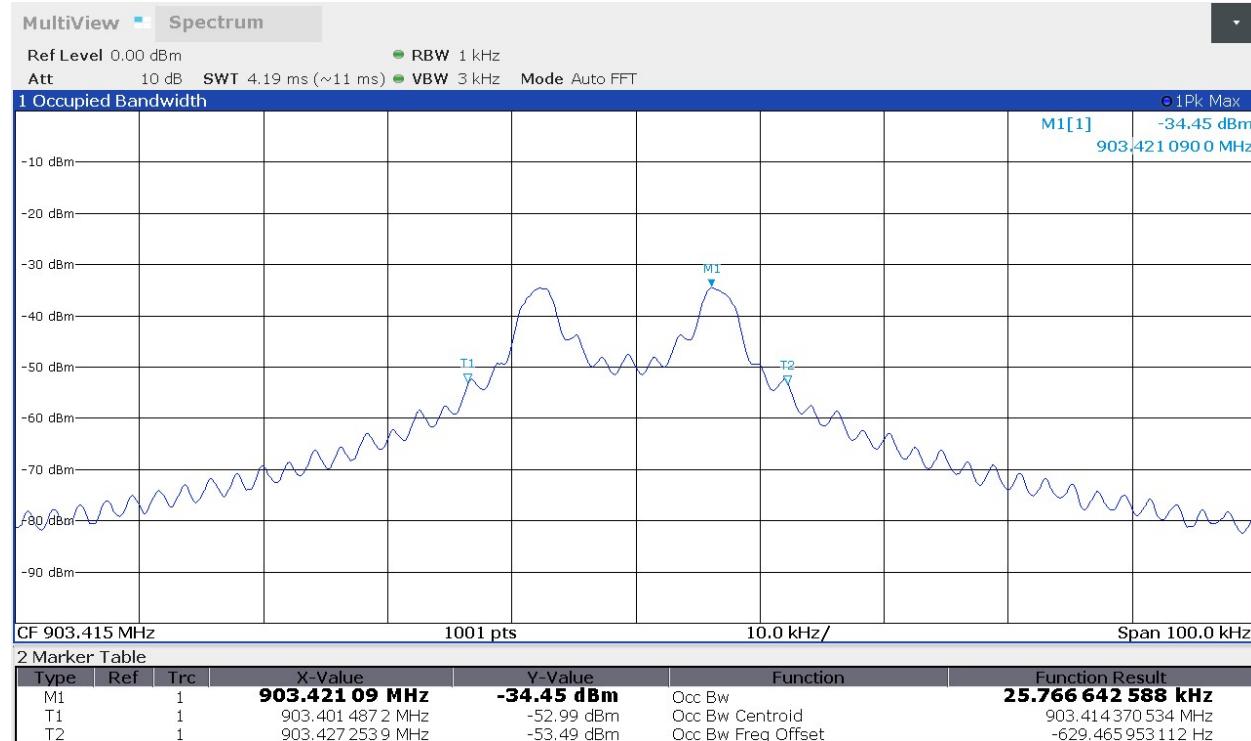
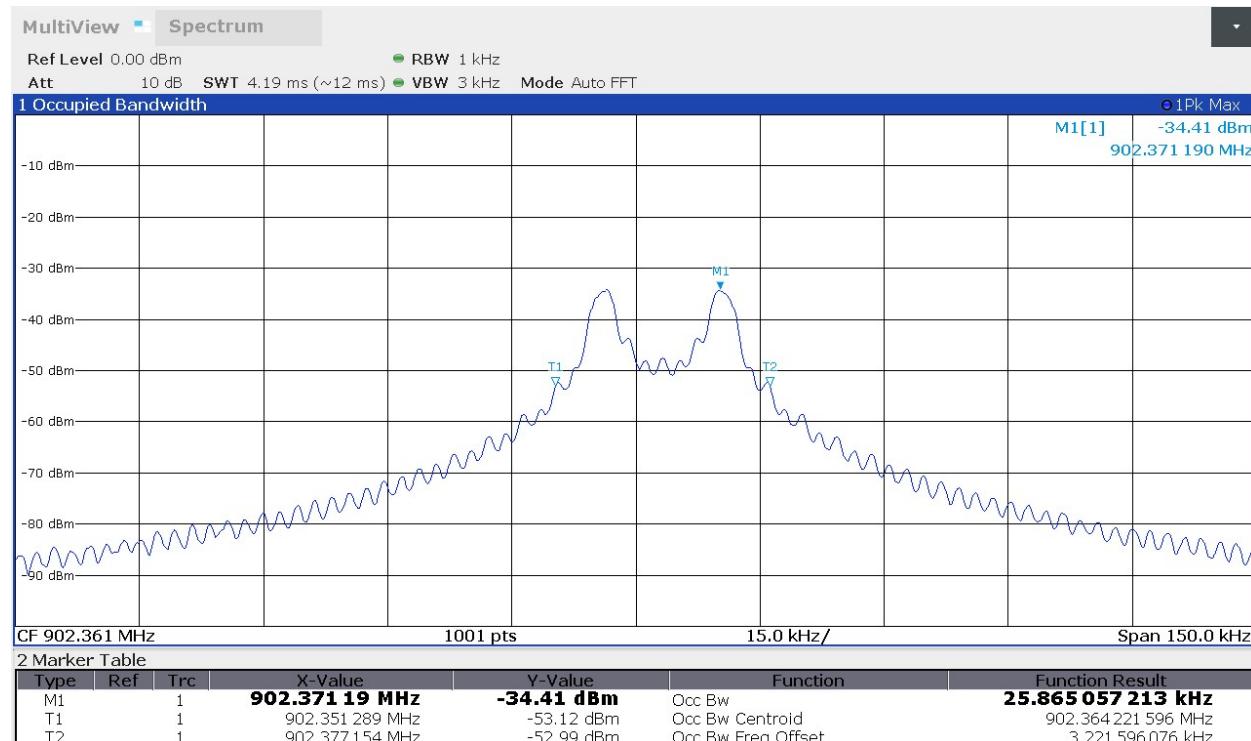


6.11 Test Plots: Occupied Channel Bandwidth (20dB Bandwidth)





6.12 Test Plots: Occupied Channel Bandwidth (99% Bandwidth)





7 Fundamental Emissions Output Power

7.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §11.9.

7.2 Test Equipment Used:

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

7.3 Test Software Used:

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

7.4 Measurement Uncertainty

Description	Expanded Uncertainty (k=2)
Fundamental Emissions Output Power	1.2dB

No measurement correction based on measurement uncertainty is performed.

7.5 Test Conditions

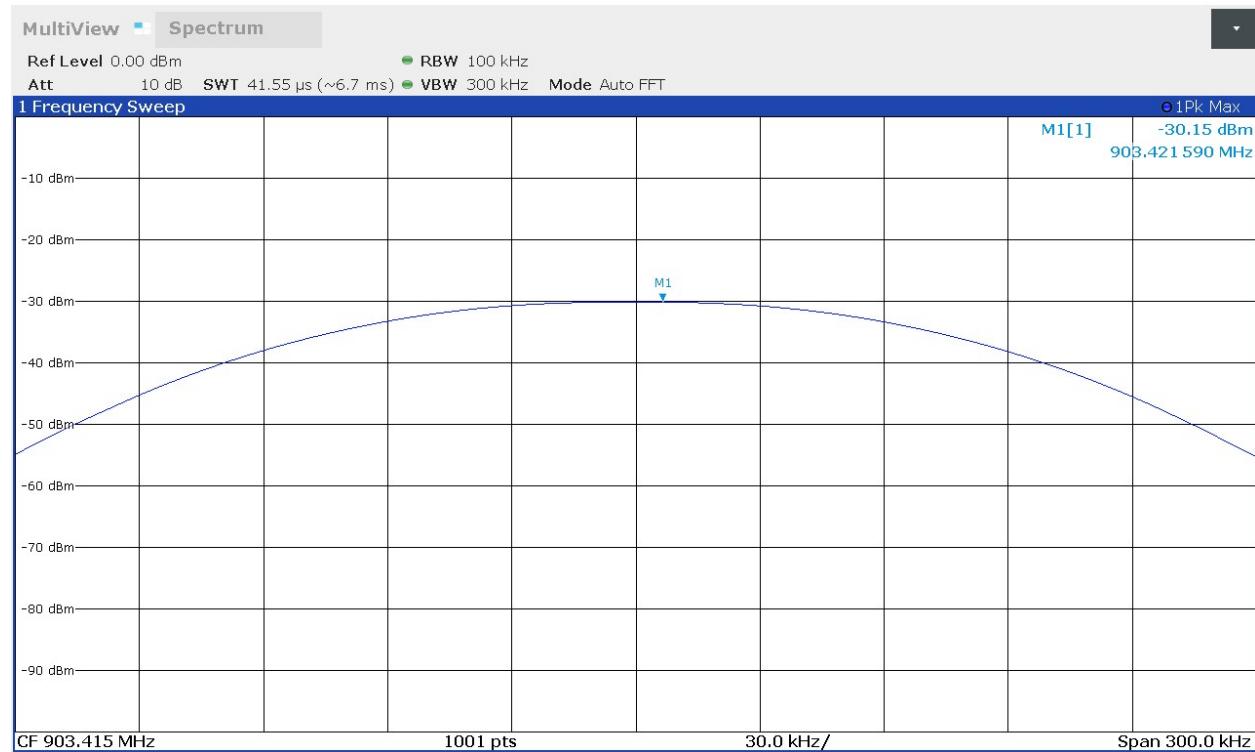
Test Personnel	Supervising / Reviewing Engineer	Test Date	Ambient Temperature	Relative Humidity	Pressure
Michael Carlson	N/A	2/13/2025	22.1°C	25.1%	992.2mbar

7.6 Test Data:

Frequency (MHz)	Output Power (dBm)	Output Power (W)
903.421	-9.704	0.000107



7.7 Test Plots: Output Power



Note: A 20.4426dB correction factor was applied to account for cables and a 20dB inline attenuator.



8 Radiated Emissions

8.1 Test Method:

Tests are performed in accordance with ANSI C63.10 §6.3 §6.5 and §6.6.

8.2 Test Limits:

47 CFR 15.249(a)

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

RSS-210 §B.10(a)

The field strength of fundamental and harmonic emissions measured at the distance of 3m shall not exceed the limits in table B2.

Table B2: Field strength limits for fundamental and harmonic emissions

Fundamental frequency (MHz)	Field strength (mV/m) of fundamental emissions	Field strength (mV/m) of harmonic emissions
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5
24000-24250	250	2.5



8.3 Test Equipment Used:

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8258	Rohde & Schwarz	ESW44	10/10/2024	10/10/2025
Bilog Antenna (30MHz-1GHz)	7085	SunAR	JB6	3/18/2024	3/18/2025
Horn Antenna (1-18GHz)	3780	ETS	3117	7/18/2024	7/18/2025
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

8.4 Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
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

No measurement correction based on measurement uncertainty is performed.

8.5 Test Software Used:

Description	Manufacturer	Version
EMC32	Rohde & Schwarz	10.60.20

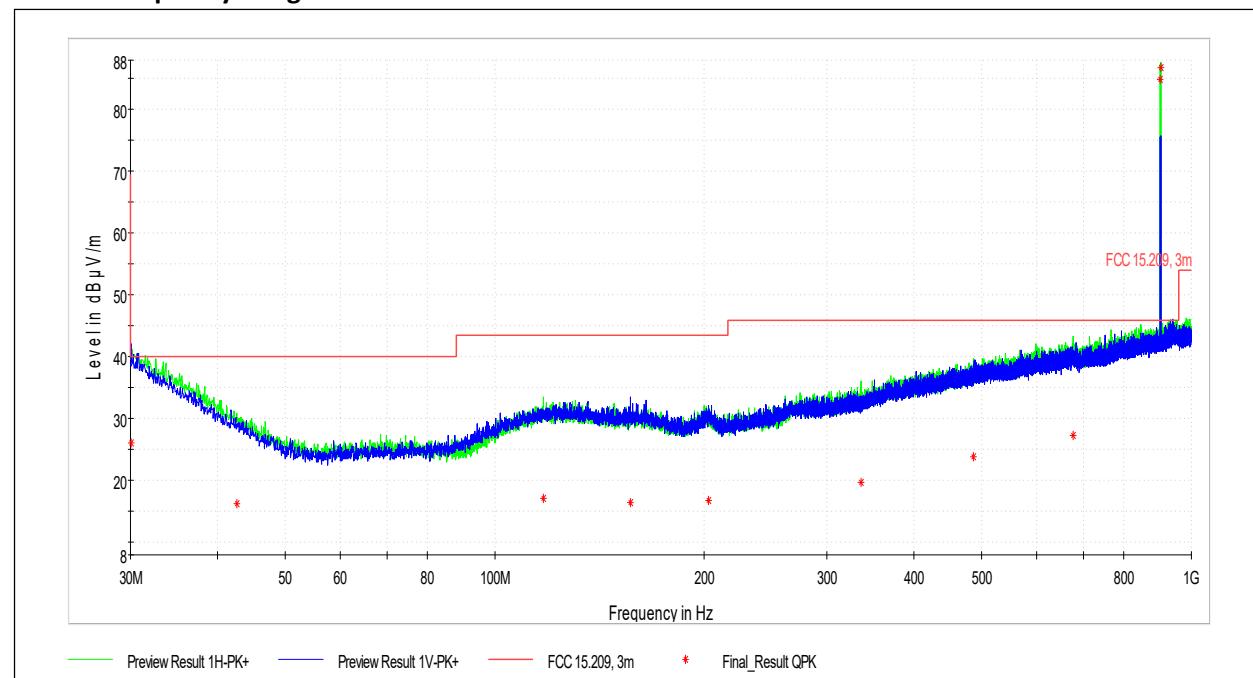
8.6 Test Results:

The sample tested was found to Comply. The device was investigated in three orthogonal axes.



8.7 Test Data: Radiated Emissions

8.7.1 Frequency Range 30MHz – 1GHz



Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.107778	26.03	40.00	13.97	252.0	V	88.0	27.2
42.610000	16.26	40.00	23.74	274.0	H	90.0	19.4
117.515556	17.11	43.50	26.39	376.0	H	0.0	20.4
156.477222	16.43	43.50	27.07	152.0	V	346.0	20.3
202.498333	16.82	43.50	26.68	254.0	V	256.0	20.2
335.603889	19.74	46.00	26.26	328.0	H	183.0	22.6
486.816111	23.89	46.00	22.11	320.0	H	103.0	26.3
675.696667	27.24	46.00	18.76	329.0	H	0.0	29.3
*902.407222	84.96	93.98	9.02	154.0	H	79.0	32.1
*903.431111	86.84	93.98	7.14	100.0	H	72.0	32.1

*This is the fundamental emission frequency.

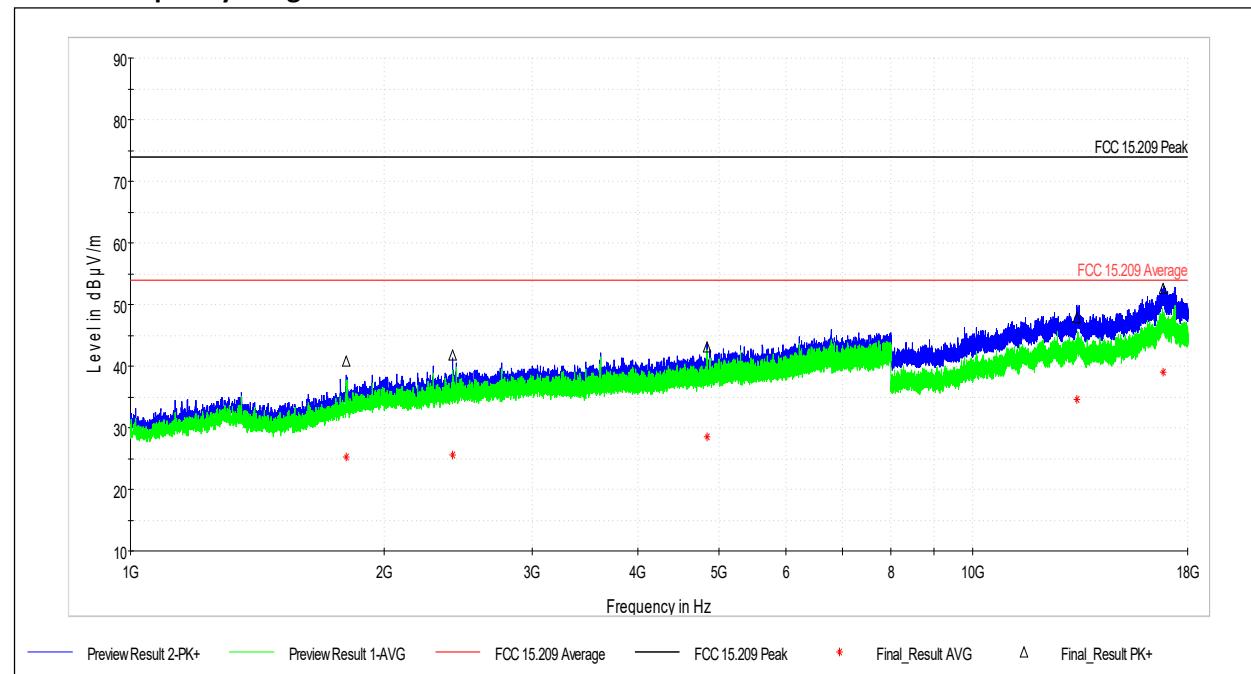
Test Personnel: Michael Carlson
Supervising/Reviewing Engineer: _____
(Where Applicable) NA
Product Standard: FCC 15.249
Input Voltage: RSS-210

Test Date: 2/12/2025
Limit Applied: See Section 8.2
Ambient Temperature: 15.4°C
Relative Humidity: 38.8%
Atmospheric Pressure: 978.6mbar

Deviations, Additions, or Exclusions: None



8.7.2 Frequency Range 1GHz – 18GHz



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1804.611111	40.85	74.00	33.15	296.0	H	148.0	2.5
2411.666667	41.83	74.00	32.17	303.0	V	0.0	5.3
4839.500000	43.15	74.00	30.85	100.0	H	66.0	9.8
13295.000000	47.85	74.00	26.15	100.0	V	302.0	21.4
16819.375000	52.63	74.00	21.37	100.0	V	254.0	26.4

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1804.611111	25.22	54.00	28.78	296.0	H	148.0	2.5
2411.666667	25.53	54.00	28.47	303.0	V	0.0	5.3
4839.500000	28.49	54.00	25.51	100.0	H	66.0	9.8
13295.000000	34.60	54.00	19.40	100.0	V	302.0	21.4
16819.375000	39.00	54.00	15.00	100.0	V	254.0	26.4

Test Personnel:	Michael Carlson	Test Date:	2/12/2025
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	See Section 8.2
Product Standard:	FCC 15.249	Ambient Temperature:	15.4°C
Input Voltage:	RSS-210	Relative Humidity:	38.8%
		Atmospheric Pressure:	978.6mbar

Deviations, Additions, or Exclusions: None



9 Antenna Requirement

9.1 Test Limits

FCC 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. 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, 15.221, or §15.236. 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 Issue 5 § 6.8:

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dB_i) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dB_i).

9.2 Test Results

The device was found to be **compliant**. The device has an internal, permanently affixed antenna.



10 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	2/14/2025	106071733LEX-002	MC	BL	Original Issue