

Test Report

Version
Issued

2026-024

A
19 May 2026

Applicant

Garmin International
1200 E 151st St.
Olathe Kansas USA

Client-supplied information:

Model Identifier

A05147

FCC ID

IPH-05147

ISED ID

1792A-05147

Equipment Type

Portable Digital Transceiver

Types of Radio Tested

13.56 MHz Near Field Communication (NFC)

Radio Classification

License-Exempt, Category 1

Primary Test Standards

CFR 47, FCC Part 15, Subpart C (15.225)

RSS-GEN Issue 5 Amd 2

RSS-210 Issue 11

ANSI C63.10: 2020 and ANSI C63.10: 2020 +Cor 1: 2023

Test Lab

Garmin Compliance Lab
1200 E 151st St.
Olathe Kansas 66062 USA

Project Tracking Identifier

GCL-1030



See [section 5.5](#) of this report regarding the presence or absence of accreditation logos or marks on this cover page.

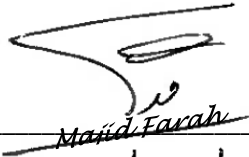
Report History and Approval

Version	Date	Author	Reason for change and/or summary of changes
A	19 May 2026	Andy Heier	Original issuance

Table 0.1: Revision history

Report Technical Review:

Majid Farah
Senior EMC Engineer



GCL only

Report Approval:

Shruti Kohli
Senior Manager Operations



GCL only

TABLE OF CONTENTS

1.	Test Result Summary.....	4
2.	Test Background.....	6
2.1	The Test Lab	6
2.2	The Applicant	6
2.3	Other Information	6
3.	Test Sample Modifications and Special Conditions.....	7
4.	Description of the Equipment Tested	8
4.1	Unique Identification	8
4.2	Key Parameters.....	8
4.3	Operating modes	8
4.4	EUT Arrangement	8
4.1	Associated Equipment (AE) used	9
4.2	Cables used	9
5.	Test Standards and Accreditation.....	10
5.1	Accredited Standards.....	10
5.2	Non-accredited Standards	10
5.3	Sampling and Decision Rule	10
5.4	Variances.....	10
5.5	Laboratory Accreditation	11
6.	Measurement Instrumentation Uncertainty	12
7.	Selected Example Calculations	13
8.	Environmental Conditions During Test	13
9.	3m RF Chamber Block Diagrams	14
10.	Test Results	16
10.1	Radiated Emission Test Results.....	17
10.1.1	Radiated Emissions, Wanted and Unwanted, 0.009 – 30 MHz	17
10.1.2	Radiated Emissions, Unwanted, Above 30 MHz.....	22
10.2	Other Data.....	31
10.2.1	AC Powerline Conducted Emissions	31
10.2.2	Occupied Bandwidth, 99% Method.....	35
10.2.3	Necessary Bandwidth	38
10.2.4	Frequency Stability	39
11.	Concluding Notes	42

1. TEST RESULT SUMMARY

The equipment or product described in section 5 of this report was tested at the Garmin Compliance Lab according to standards listed in section 6. This report focuses on the 13.56 MHz NFC transceiver. The results are as follows.

FCC	ISED	Requirements	Key Results	Judgment	Data
2.202a	RSS-GEN: 6.7	Occupied bandwidth on a 99% basis must be reported has no limits.	The 99% Occupied bandwidth is 1.5600 MHz or less.	Reported	Link Other
2.202c, g	RSS-GEN: 9	Necessary bandwidth is a property of radio protocols that is used under the regulations but has no limits.	The necessary bandwidth is calculated for each protocol.	Reported	Link Other
15.225a-d, 15.209	RSS-210: B.6a RSS-GEN: 8.9	Emissions in and near the 13.56 MHz band must meet an emission mask. Unwanted emissions outside the frequency band must be reduced to the general radiated emission limit.	Emissions had 36 dB of margin to the 13.110 to 14.010 MHz emission mask. The margin to the general radiated emission limit was 9 dB or greater.	PASS	Link1 Link2 Field
15.205	RSS-GEN: 8.9 and 8.10	Restricted band emissions must be below the general radiated emission limit.	The transmitter is exempt from compliance in the 13.36-13.41 MHz restricted band. For other restricted bands of operation, the margin to the general radiated emission limit was 9 dB or greater.	PASS	Link1 Link2 Field
15.225e	RSS-210: B.6b	Transmitter frequency stability looks at carrier drift over a range of temperatures and supply voltages. In addition, the 20 dB occupied bandwidth must remain within the 13.110 – 14.01 MHz allocated band over the range of temperatures and voltages.	The Carrier frequency was stable within 0.0024% of the target frequency, meeting the 0.01% requirement.	PASS	Link Other
15.207	RSS-GEN: 8.8	AC powerline conducted emissions must be below the limits provided in these sections of the regulations.	The measured emissions had at least 27 dB of margin to the limits.	PASS	Link Other

Table continues on next page

(None)	RSS Gen Annex A item 10a	Rated transmitter power is not regulated for this service under RSS-210.	N/A	N/A	(None)
(None)	RSS Gen Annex A item 10b	Modulation characteristics (as stated by client)	Digitally modulated signaling at rates as high as 424 kbps.	Reported	(None)
(None)	RSS Gen Annex A item 10c	Frequency bands of operation	13.110 – 14.010 MHz	Reported	(None)
(None)	RSS Gen Annex A item 10d	Channel Bandwidths (Emission designators were not provided by the client and will be stated separately.)	N/A: NFC is not a channelized service. (See also the bandwidths provided at the start of this table.)	N/A	(None)
(None)	RSS Gen Annex A item 10g	Antenna characteristics (as stated by client)	A model-unique antenna is embedded in the product by design and cannot be changed by the user. Type: Planar Gain: none Impedance: 50 Ω	Reported	(None)
(None)	RSS Gen Annex A item 14b	Identification of the test sample firmware version	Version 22.25	Reported	(None)

NT (Not Tested) means the requirement may or may not be applicable, but the relevant measurement or test was not performed as part of this test project.

N/A (Not Applicable) means the lab judged that the test sample is exempt from the requirement.

RF Port in the Data column means testing was performed on a benchtop measuring radio performance characteristics at a coaxial cable port that replaced the antenna.

Field in the Data column means testing was performed in a validated radiated emission test site.

Other in the Data column means testing was performed in a different way than RF Port or Radiated.

Table 1.1: Summary of results

2. TEST BACKGROUND

2.1 The Test Lab

The testing reported here was performed at the Garmin Compliance Lab, an organization within Garmin International but distinct from the applicant/client, located at 1200 E 151st St, Olathe Kansas, USA. The contact telephone number is +1.913.397.8200. Lab accreditation and recognition are discussed at [section 5.5](#) of this report.

2.2 The Applicant

The testing was performed on behalf of the Garmin design group, a separate organization located at 1200 E 151st St, Olathe Kansas, USA. Witnesses from the business group included: None.

2.3 Other Information

Test Sample received: 11 Feb 2026
Test Start Date: 27 Feb 2026
Test End Date: 24 Apr 2026

The data in this test report apply only to the specific samples tested.

Upon receipt all test samples were believed to be properly assembled and ready for testing.

Due to confidentiality, certain material (such as test setup photographs) has been removed from this report and placed in GCL Test Report 2026-028. That report is treated as a part of this document by way of this reference.

3. TEST SAMPLE MODIFICATIONS AND SPECIAL CONDITIONS

The following special conditions or usage attributes were judged during test to be necessary to achieve compliance with one or more of the standards listed in section 6 of this report:

ID	Description of the special conditions or usage attributes	Tests most likely to be affected
None	None	None

Table 3.1: List of special conditions or usage attributes

The following modifications to the test sample(s) were made, and are judged necessary to achieve compliance with one or more of the standards listed in section 6 of this report:

ID	Detailed description of the change	Date Applied	Samples Modified	Reason for the change	List of tests performed without using the change *	Relevant to these stds?
CH1	Updated firmware from ver. 22.08 to 22.20. Changed BLE/ANT RF output filter.	08-Apr-2026	All	To meet radiated emissions requirements for North America	• RE82 Radiated Emissions • TR31 Tx Bandwidth	No
CH2	Reduced power, IEEE 802.11b, Ch 6.	13-Apr-2026	All	To meet radiated emissions requirements for North America	• RE82 Radiated Emissions • TR31 Tx Bandwidth	No
CH3	Updated firmware from ver. 22.20 to 22.25. Reduced power, IEEE 802.11b, All channels.	22-Apr-2026	All	To meet radiated emissions requirements for North America	• RE35 Radiated Emissions • RE82 Radiated Emissions • TR31 Tx Bandwidth	No

Table 3.2: List of changes made to the test sample(s)

* Any tests listed in this right-most column were performed without this modification being present, and the presence or absence of the modification is judged by the lab and client to have no significant effect on these specific tests.

Identifiers (ID) are provided for each special condition / usage attribute (SC#) or modification / change (CH#) for ease in referencing these details elsewhere in the test report.

4. DESCRIPTION OF THE EQUIPMENT TESTED

4.1 Unique Identification

Product Model	A05147
Serial Numbers Tested	8WP000264, 8WP000266, 8WP000271, 8WP000276

This product tested is a mobile device for collecting and sharing data with the user and nearby electronic devices.

The client affirmed that the test samples will be representative of production in all relevant aspects.

4.2 Key Parameters

EUT Input Power:	5 Vdc
I/O Ports:	USB
Radio Transceivers:	IEEE 802.11 b/g/n, Bluetooth, Bluetooth Low Energy, ANT, NFC
Radio Receivers:	GPS L1, GPS L5, Galileo E1, Galileo E5a/b, BeiDou, GLONASS
Typical use:	Portable in multiple orientations
Highest internal frequency:	2.484 GHz
Firmware Revision:	22.25 (See section 3)
Number of Tx chains:	1

4.3 Operating modes

During test, the EUT was operated in one or more of the following modes.

Mode 1 NFCRead:	Mode = Reader Periodic, Tech = A. RF ID Tag present and monitoring for connectivity during testing
-----------------	--

4.4 EUT Arrangement

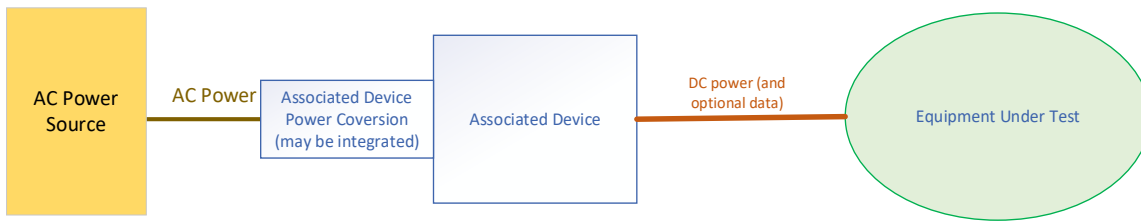
During test, the EUT components and associated support equipment were selected including the following arrangement sets.

Arrangement 1: A1 (Solo). The test sample operates from its battery and no external physical connections. No block diagram is needed for this arrangement.

Arrangement 2: A2 (Upwr). The test sample is connected to a Mains-powered device that provides dc power to the sample over a cable but no user data. See the block diagram in Figure 1.

Arrangement 3: A3 (Udata). The test sample is connected to a Mains-powered device that provides dc power to the sample and user data over a cable. See the block diagram in Figure 1.

Arrangement 4: A4 (Udc). The test sample is connected to a Mains-powered device that provides dc power to the sample and may or may not provide user data. This arrangement is specified in the test plan to provide staff flexibility when the presence or absence of data on the cable is not pertinent. See the block diagram in Figure 1.



*This interconnect drawing is not to scale.
It does not indicate the placement of devices.*

Figure 1: Block diagram of equipment arrangements A2, A3, A4

4.5 Associated Equipment (AE) used

Description	Manufacturer	Model	Serial Number
USB C power adaptor	Phihong (Garmin)	AQ27A-59CFA	362-00118-00
Laptop	Dell	Precision 5540	3JYG33
Power Supply	Dell	HA130PM130	CN-0V363H-CH200-78G-0DC1-A01

Table 4.5.1: List of associated equipment that may have been used during test

4.6 Cables used

Description	From	To	Length	EMC Treatment
USB-C Charging/Data	Laptop/Wall Charger	EUT	0.5m	none

Table 4.6.1: List of cables that may have been used during test

5. TEST STANDARDS AND ACCREDITATION

5.1 Accredited Standards

The following test or measurement standards were applied and are within the scope of the lab's accreditation. All results in this report that cite these standards are presented as Accredited results consistent with ISO/IEC 17025.

CFR 47, FCC Part 15, Subpart C (15.225)
RSS-GEN Issue 5 Amd 2
RSS-210 Issue 11
ANSI C63.10: 2020 and ANSI C63.10: 2020 +Cor 1: 2023

5.2 Non-accredited Standards

The following test or measurement standards were applied and are either outside the scope of the lab's accreditation, or were performed in such a way that results are not presented as being fully accredited.

FCC Part 2.202
TRC-43 Issue 3

5.3 Sampling and Decision Rule

The client typically provides two forms of test sample: modified to have an RF-cabled output instead of an antenna, and unmodified. The form of sample is matched to each kind of test based on whether the individual test method is done best with a modified or unmodified sample. When multiple samples of either form are provided, the sample to use is selected randomly from the eligible samples. Any diversions from this general rule will be identified in this section of the report or in the relevant test data records.

The baseline pass/fail decision rule used in GCL is that uncertainty is not used in determining the test result: the measurand is compared directly to the limit to judge whether the test has a passing or failing result. Some EMC or radio test standards require an alternate decision rule. Their alternate rule is that any MIU (uncertainty) above the benchmark uncertainty must be added to (or subtracted from, as appropriate) the measurand before comparison to the relevant limit. Except for Radio Signal Frequency Accuracy under some conditions and standards, all GCL uncertainties are below the benchmark level. Thus it is rare that this alternate decision rule would need to be applied at GCL. If the alternate rule must be applied as a requirement under one or more standards, that case will be plainly identified in this section or in the relevant test data records.

5.4 Variances

The following variances were applied to standards cited in this section.

Where different test standards cover the same test parameter or phenomenon, and the standards have compatible differences, the stricter of the requirements is typically applied. For example, a consolidated limit may be applied to emission tests selecting the strictest of the limits at each frequency. Likewise, if one standard requires a vertical antenna sweep with boresighting and another does not, swept motion with boresighting will typically be used as it is the more stringent requirement.

Some standards that apply an Average detector provide a variety of methods to handle time-averaging, especially where the transmission is not continuous and the Duty Cycle (DC) is below a value such as 98%. The basic GCL process is to begin by applying an Average detector to the emission with the receiver in Max-Hold data mode. This Max Average method is worst-case compared to any of the methods of time-averaging provided. If the Max Average result complies with the limit, that result is provided in the test record and the emission judged to be compliant without additional detail. If the Max Average result is near or above the limit at one or more emission frequencies, then one of the appropriate time-averaging methods is applied to determine final compliance. When time-averaging is used, the test record will indicate which method of time-averaging was used.

DISCLAIMER: In some test activities, the operation of a test or the result of a test depends on data provided by the client. The Garmin Compliance Lab disclaims responsibility for any error in the processes, results, or judgments in this report arising from incorrect client-provided data.

5.5 Laboratory Accreditation

FCC Designation Number	US1311
FCC Test Firm Registration Number	273575
ISED CAB Identifier	US0233
ISED Company Number	1792A
A2LA Accreditation Certificate	6162.01

The Garmin Compliance Lab, an organization within Garmin International distinct from the applicant, is registered with the US Federal Communication Commission and recognized by the Canada Department of Innovation, Science, and Economic Development (ISED). The lab is accredited by A2LA, the American Association for Laboratory Accreditation. The presence of the A2LA logo on the cover of this report indicates this is an accredited ISO/IEC 17025 test report. If the logo is absent, this report is not issued as an accredited report. Other marks and symbols adjacent to the A2LA logo are accreditation co-operations of which A2LA is a member under a mutual recognition agreement, and to which the Garmin Compliance Lab has been sublicensed.

6. MEASUREMENT INSTRUMENTATION UNCERTAINTY

The lab has analyzed the sources of measurement instrumentation uncertainty (MIU). The analysis concludes that the actual measurement values cited in this report are accurate within the U_{LAB} intervals shown below. MIU is based on two standard deviations which is approximately 95% statistical confidence for an upper- and lower-bounded limit. MIU is one component of over-all measurement uncertainty, and other uncertainty components are not considered as part of this analysis.

The primary benchmark for MIU in an electromagnetic compatibility (EMC) test lab is the set of U_{CISPR} values published in CISPR 16-4-2. In all cases where a U_{CISPR} value is published by CISPR, the analysis shows that U_{LAB} – this lab’s estimated MIU – is better than the U_{CISPR} benchmark.

The secondary benchmark for MIU in a lab performing radio transceiver tests is a set of uncertainty limit values published in various ETSI standards. In this report, U_{ETSI} is the most restrictive of the values found in the ETSI EN standards in this lab’s scope of accreditation. The analysis principles are described in the ETSI TR documents listed there. In most cases U_{LAB} is better than the U_{ETSI} benchmark. Where U_{LAB} exceeds the U_{ETSI} benchmark cited here, that entry is preceded by an asterisk. In an individual test report, staff may re-evaluate that excess uncertainty based on the uncertainty of the method used and the uncertainty limits of the actual ETSI EN standard being applied, and the revised uncertainty values will be shown in the test report.

Some measurement uncertainties analyzed and reported here are not addressed in CISPR 16-4-2 or the ETSI standards, as indicated by the entry ‘None.’

Test Type	U_{LAB}	U_{CISPR}	U_{ETSI}
Conducted DC voltage	0.09% + 2 x LSDPV	None	1%
Conducted AC voltage below 500 Hz	1.0% + 3 x LSDPV	None	2%
Conducted Emissions, Mains Voltage	0.10% + 10 mV	None	None
Conducted Emissions, Mains Current	0.10% + 3 mA	None	None
Conducted Emissions, Mains Power	0.15% + 100 mW	None	None
Conducted Emissions, Power Mains, 9 kHz to 150 kHz	1.70 dB	3.8 dB	None
Conducted Emissions, Power Mains, 150 kHz to 30 MHz	1.48 dB	3.4 dB	None
Conducted Emissions, Cat 6 LCL, 150 kHz to 30 MHz	1.57 dB	5 dB	None
Conducted Emissions, Cat 5 LCL, 150 kHz to 30 MHz	3.06 dB	5 dB	None
Conducted Emissions, Cat 3 LCL, 150 kHz to 30 MHz	4.27 dB	5 dB	None
Radiated Emissions, below 30 MHz	0.88 dB	None	6 dB
Radiated Emissions, 30 MHz to 1000 MHz	2.79 dB	6.3 dB	6 dB
Radiated Emissions, 1 GHz to 18 GHz	2.54 dB	5.2 & 5.5 dB	6 dB
Radiated Emissions, 18 GHz to 26.5 GHz	2.68 dB	None	6 dB
Radiated Emissions, 26.5 GHz to 40 GHz	3.17 dB	None	6 dB
*Radio Signal Frequency Accuracy	1.55×10^{-7}	None	1.0×10^{-7}
Radio Signal Occupied Bandwidth	0.95%	None	5%
Radio Power or Power Spectral Density	0.98 dB	None	1 dB
Temperature	0.38 °C	None	1 °C
Barometric Pressure	0.38 kPa	None	None
Relative Humidity	2.85% RH	None	±5% RH
Signal Timing	The greater of these three...	None	None
	0.63 µsec		
	0.01% of value		
	0.5 x LSDPV		

Table 6.1: Measurement Instrumentation Uncertainty

Note: LSDPV stands for the Least Significant Digit Place Value reported. In the value 1470 msec, the least significant digit is the 7. It has a 10 msec place value. The LSDPV is thus 10 msec and the maximum error due to roundoff would be 5 msec. If the time value were reported as 1470 msec, the underscore indicates that the 0 is a significant figure and the error due to roundoff would be 0.5 msec. All digits provided to the right of a decimal point radix are significant.

7. SELECTED EXAMPLE CALCULATIONS

Certain regulators require samples of the calculations that lead from the raw measurement to the final result for AC Mains conducted and unintended radiated emissions. The assumption is that the lab performs raw measurements, then adds, subtracts, multiplies, or divides based on transducer factors, amplifier gains, and losses in the signal transmission path. In this lab, our CISPR 16 Receiver does not work that way. The calibration factors and losses and gains are provided to the receiver as detailed data files. These factors are applied in the RF measurement path prior to the detector. But the math is the same.

The transmission loss is measured including the combined losses and gains of preamplifiers, cables, and any band-selective filters. In many cases above 1 GHz it is a negative value, indicating that the preamplifier gain is greater than these other losses.

Here are examples of these calculations. The data in these examples was not taken as part of this project:

AC Mains conducted emissions at 22 MHz

(Raw measurement) + (AMN factor) + (transmission loss) = Result
 (7.145 dBμV) + (9.812 dB) + (0.216 dB) = 17.173 dBμV

Radiated Emissions at 630 MHz

(Raw measurement) + (Antenna factor) + (transmission loss) = Result
 (2.25 dBμV) + (27.80 dB/m) + (2.89 dB) = 32.94 dBμV/m

Radiated Emissions at 2.7 GHz

(Raw measurement) + (Antenna factor) + (transmission loss) = Result
 (43.72 dBμV) + (32.22 dB/m) + (-36.09 dB) = 39.85 dBμV/m

8. ENVIRONMENTAL CONDITIONS DURING TEST

Environmental conditions in the test lab were monitored during the test period. Temperature and humidity are controlled by an air handling system. As information to the reader, the conditions were observed at the values or within the ranges noted below. For any tests where environmental conditions are critical to test results and require further constraints or details, the test records in the annex may provide more specific information.

Temperature:	20.9 to 22.5 °C
Relative Humidity:	41.4% to 56.4% (non-condensing)
Barometric Pressure	95.3 to 99.8 kPa

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
Barometer	Traceable	6453	240300703	9-Apr-2024	9-Apr-2027

Table 8.1: Environmental monitoring device.

9. 3M RF CHAMBER BLOCK DIAGRAMS

The 3m chamber has three basic configurations which are shown in the figures below. These figures are not to scale.

Figure 1 shows a semi anechoic setup which is typically used for frequencies below 1 GHz. In this example, the antenna is mounted on a mast capable of 1-4 m elevation changes. If a preamplifier or RF filter is used, they are located at or just below floor level. The receiver is outside the chamber, typically in an adjacent separate shielded room.

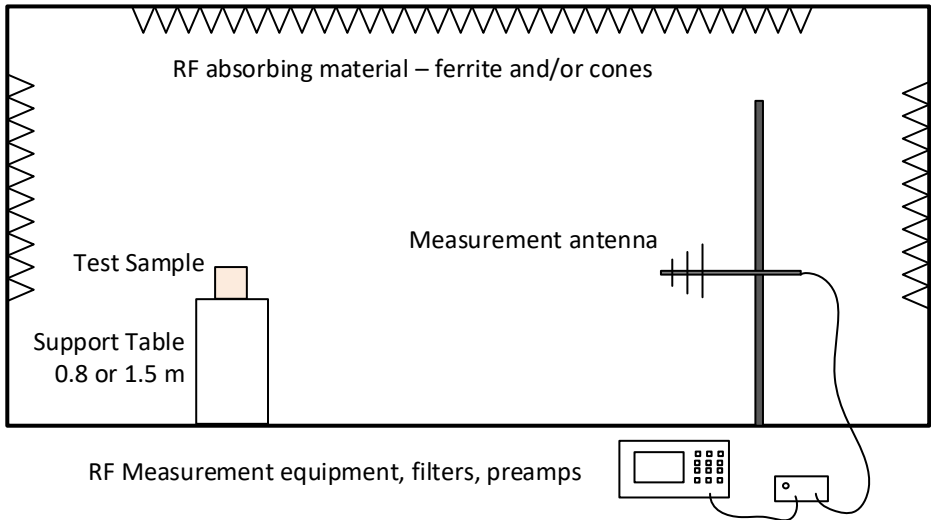


Figure 1: Typical configuration for measurements below 1 GHz

Figure 2 shows an FSOATS setup which is typically used for frequencies above 1 GHz but below an upper limit such as 14 or 18 GHz. In this example, the antenna is mounted on a mast capable of 1-4 m elevation changes and bore sighting. If a preamplifier or RF filter is used, they are located at or just below floor level. The receiver is outside the chamber, typically in an adjacent separate shielded room.

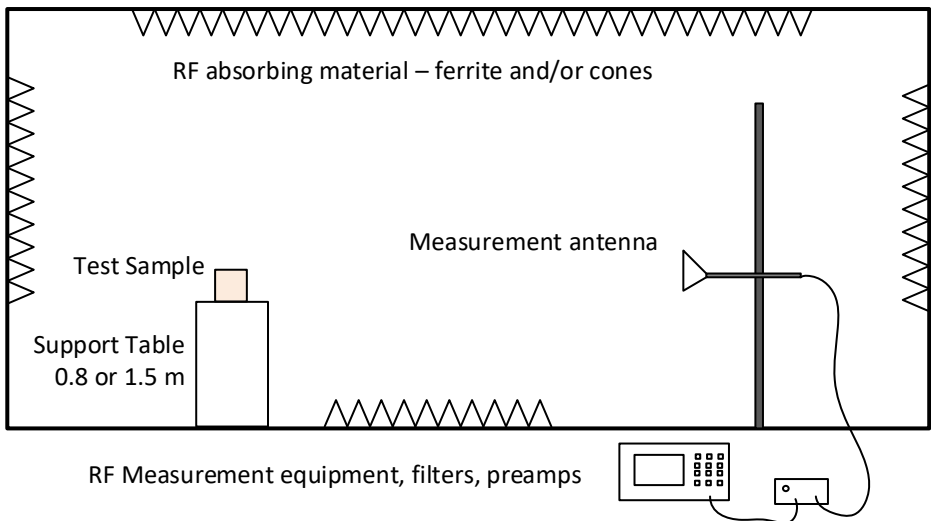


Figure 2: Typical configuration for measurements between 1 GHz and 14 GHz

Figure 3 shows an alternate FSOATS setup which is typically used for frequencies above 14 GHz. In this example, the antenna is mounted on a mast capable of 1-4 m elevation changes and bore sighting. A preamplifier is located on the mast just behind the antenna. The receiver is located in the chamber near floor level but outside the antenna beam. The receiver may be operated manually by an operator in the chamber and or remotely via an Ethernet connection.

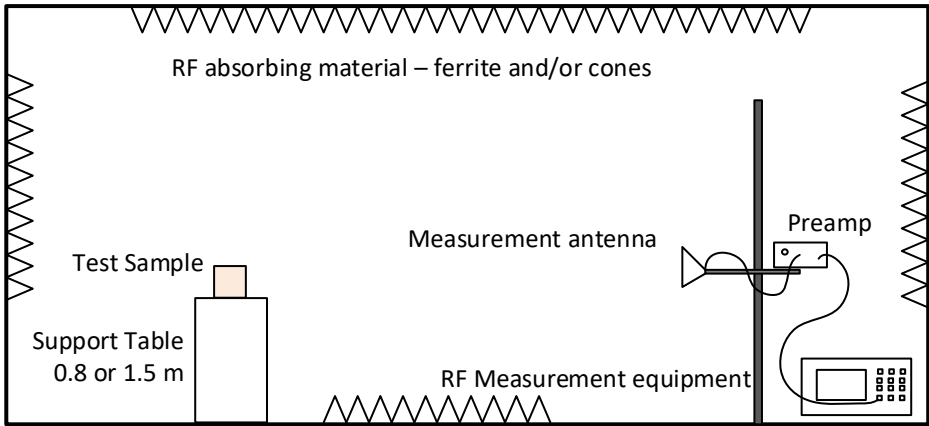


Figure 3: Typical configuration for measurements above 14 GHz

10. TEST RESULTS

This section of the report contains the detailed test data. The test data are organized as follows:

Radiated Emission Data. This testing was performed in a validated radiated emission test site. It generally uses unmodified test samples so that intended and unintended emissions from antennas embedded within the system, and stray emissions from various circuits (including circuits feeding those antennas), will be representative of the units to be sold into the market.

Other Data. This section includes testing performed in a different way than the Radiated Emission data described above. The most common example here is AC mains conducted emission data which was measured in a defined site configuration using a Line Impedance Stabilization Network. Another example would be measurements made with a near field probe

10.1 Radiated Emission Test Results

10.1.1 Radiated Emissions, Wanted and Unwanted, 0.009 – 30 MHz

Relevant standards include:

CFR47 Parts 15.225(a) through (d), 15.209

RSS-210 B.6(b)

RSS-GEN 8.9, 8.10

ANSI C63.10 sections 6.3, 6.4

Test and Data Overview

The US and Canadian standards provide relaxed limits for emissions within the frequency band allocated for radio operation. One must demonstrate compliance for wanted signals inside this allocated band, and unwanted signals that arise outside the band.

Inside the 13.110 – 14.010 MHz allocated band, the rules specify a stair-stepped limit often called an emission envelope.

The limits outside the allocated band are a combination of stepped and sloped limits. These are the general limits found in FCC Part 15.209 and RSS-GEN table 5 and 6 (which are essentially an extension of the Class B limits in FCC Part 15.109 and ICES-003 tables 2 and 3). These radiated emission test data are evidence of compliance for any emission, whether inside or outside the restricted bands of operation.

The data shown in this section will demonstrate compliance for both the wanted and unwanted signals.

We note that both the US and Canadian standards provide an emission mask for 13.56 MHz near-field devices that overlaps the 13.36 – 13.41 MHz Restricted Band of Operation. The following statement is from the section on Restricted Bands of Operation found at 15.205(d)(7): “Devices operated pursuant to § 15.225 are exempt from complying with this section for the 13.36–13.41 MHz band only.”

The test method followed ANSI C63.10 sections 6.3, and 6.4 was also applied in this frequency range. Sections 6.5 or 6.6 were applied in other frequency ranges.

Test Record**Radiated Emission Test****Test ID RE35****Project GCL1030**

Test Date(s):	24 Apr 2026
Test Personnel:	Vladimir Tolstik
Product Model:	A05147
Serial Number tested:	8WP000276
Operating Mode:	NFC Read
Arrangement:	A1 (Solo)
Input Power:	Battery
Test Standards:	FCC Part 15.225; RSS-210; RSS-GEN; ANSI-C63.10 (as noted in Section 5 of the report).
Frequency Range:	9 kHz to 30 MHz
Pass/Fail Judgment:	PASS
Test record created by:	Vladimir Tolstik
Date of this record:	28 Apr 2026

Original record, Version A.

Test Equipment

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
PXE Receiver 26 GHz	Keysight	N9048B	MY59290135	9-Dec-2025	9-Dec-2026
Antenna, Loop w/amp, 8k - 30 MHz	Schwarzbeck	FMZB 1519C	00071	11-Nov-2025	11-Nov-2027
SAC 3m, below 1 GHz	Frankonia	SAC3	F199004	11-Dec-2024	11-Dec-2027

Table RE35.1: Test Equipment Used

Software Used:	Keysight PXE software A.32.06, RE 150k to 30M Signal Maximization Tool V1 2021Mar17.xlsx, RE 9k30m FccCanada Analysis5 NS.xlsx
-----------------------	--

Test Data

For test standards that require reorienting the test sample, preliminary scans were taken in those alternate orientations to find the orientation that produced that largest field at the receive antenna. With intentional radiators, that highest field is usually found at the carrier frequency. The alternate orientations are typically described as X, Y, and Z and explained with a photograph. Subsequent testing was done using on the orientation identified in this way.

The radiated emission test process continued with a preliminary scan at multiple turntable angles, and in the three loop antenna polarizations. The loop antenna was positioned at a 1.5 m height. Where the test standard requires cable manipulation, this was done at one of more likely worst case frequencies selected by the test personnel while observing the receiver display. At each of the frequencies selected for final measurements, the loop was set to the worst case orientation for that frequency and the turntable angle was explored to find the worst-case settings. Final field strength measurements were taken in that set of positions. Full maximization was not performed at frequencies that are noise floor measurements included per the test standard requirements.

At azimuth angle 0° the 'front' reference mark of the turntable is pointed Southward. At 90° the reference mark points West. At -90° it points East. At -7° the turntable reference mark is pointed directly at the antenna mast for tests that involve changes in antenna elevation. At 0° the turntable reference mark is pointed directly at the loop antenna location. The designation of the X, Y, and Z orientations of the test sample are sample dependent, so these are reported by use of photographs.

The table shows the selected final measurement data between 9 kHz and 30 MHz. It includes at least the six strongest emissions observed relative to the test limit, along with other data points of interest. Where a data point is highlighted in yellow, this is an aid to indicate the data point(s) with the least margin to the test limit. A positive margin value indicates that the emission was below the test limit. The test limit is the FCC Class B Limit at 3m. Any unintentional radio emission limits are not applied to intentional radio signals.

For FCC and ISSED testing, the 3 m data is adjusted to an equivalent value at the 30 m or 300 m reference distance. Extrapolation of each data result uses the conservative method of ANSI C63.10 clause 6.4.4.1: 40 dB per decade for the part of the distance within the boundary (wavelength / 2 Pi), and 20 dB per decade for any part of the distance beyond that boundary.

Freq.	3 m Level	Detector	Distance	Dist Adj	Final Level	Limit	Margin	Peak 3 m	Peak Final	Pk Limit	Pk Margin	Antenna	Table
MHz	dBuV/m	Type	m	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dBuV/m	dB	Orientation	Azimuth, deg
0.0492	37.29	Avg	300	80.00	-42.71	33.77	76.48	44.95	-35.05	53.77	88.82	X	-28
0.0493	39.91	Avg	300	80.00	-40.09	33.76	73.84	47.83	-32.17	53.76	85.93	X	180
0.15	16.45	Avg	300	80.00	-63.55	24.08	87.63	26.20	-53.80	44.08	97.88	Z	36
1.3088	28.44	QP	30	40.00	-11.56	25.27	36.83	34.08	-5.92	None	None	X	180
1.6823	24.40	QP	30	39.52	-15.12	23.09	38.20	31.40	-8.12	None	None	Z	72
13.56	29.11	QP	30	21.40	7.71	84.00	76.29	39.86	18.46	None	None	X	-6

Table RE35.2: Emission summary (NFC Type A)

The graph below shows the background spectrum observed during pre-scan, as well as the final data points from the table above.

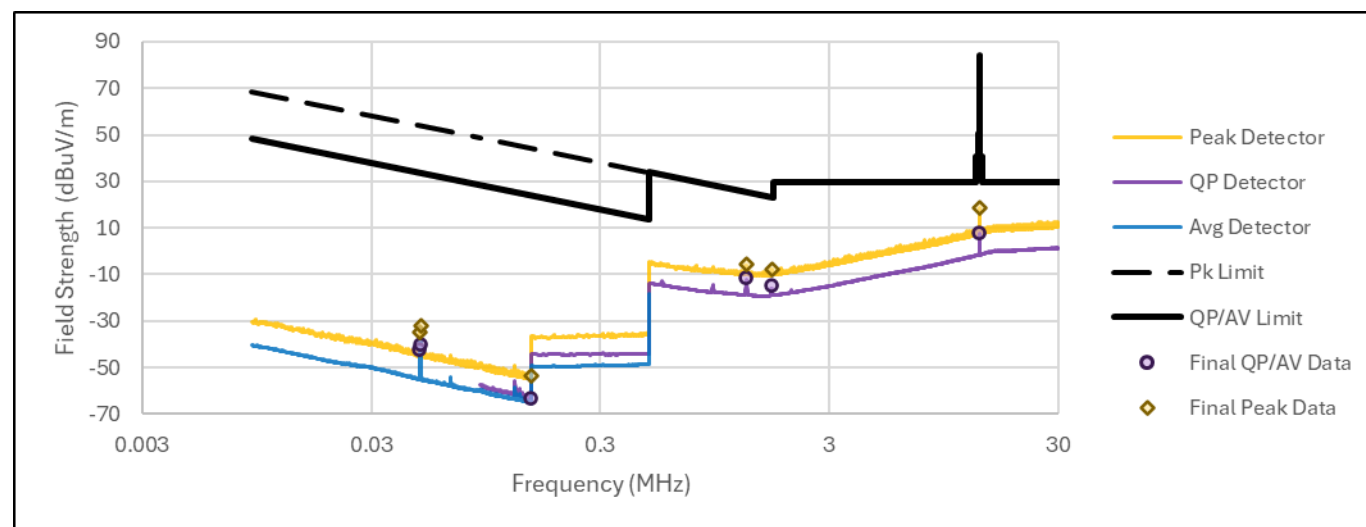


Figure RE35.1: Spectral data (NFC Type A)

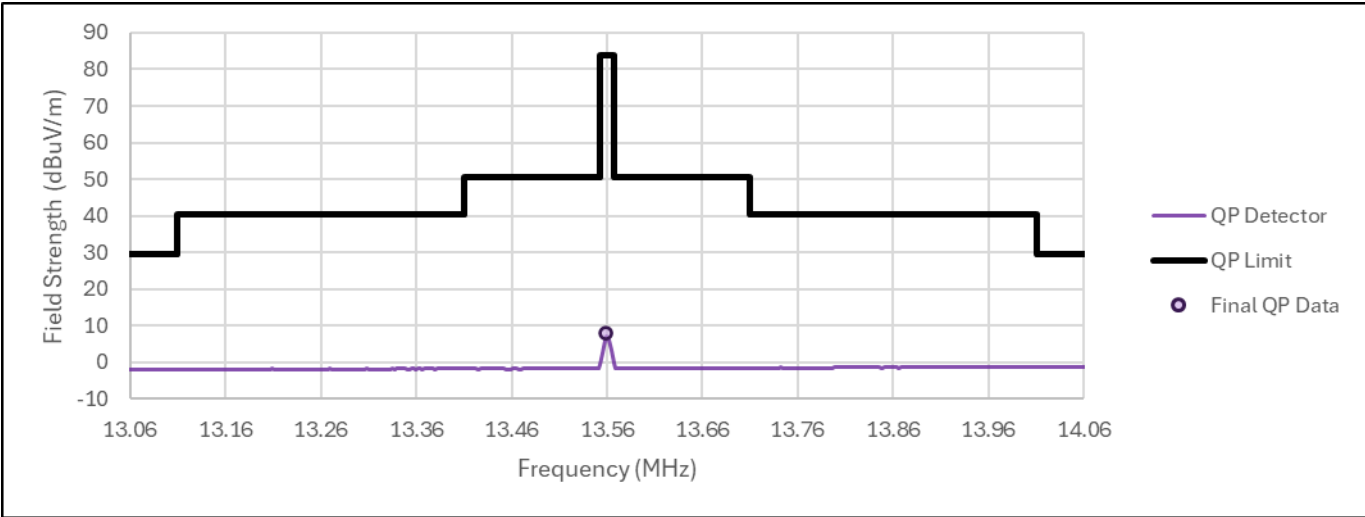


Figure RE35.2: Spectral data (NFC Type A)

Setup Photographs

The following photographs show the EUT configured and arranged in the manner in which it was measured.

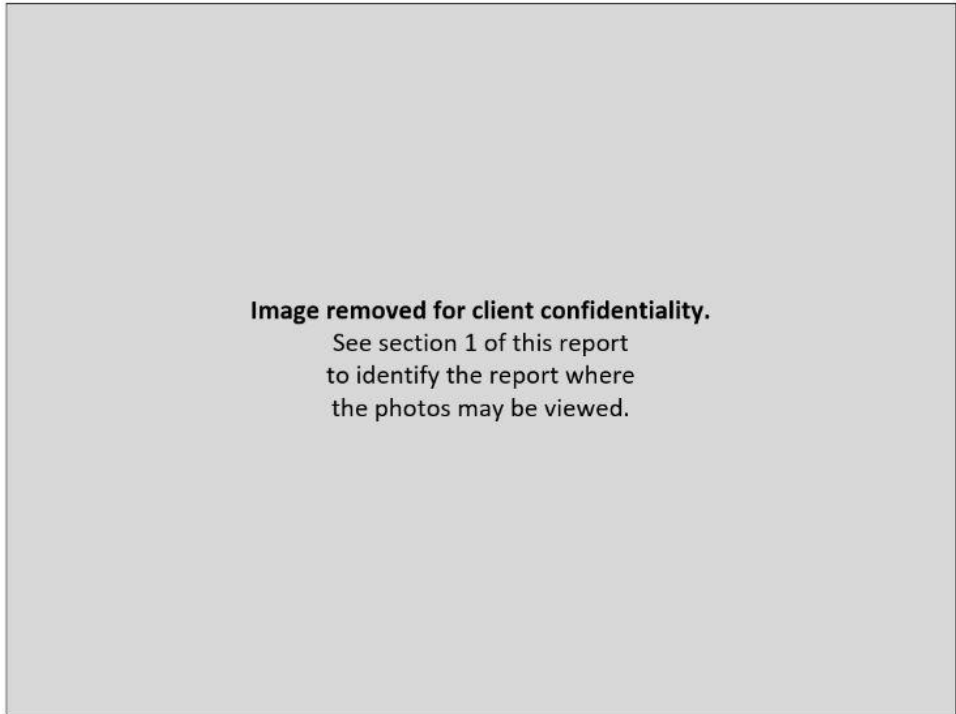


Figure RE35.3: EUT test setup, first view

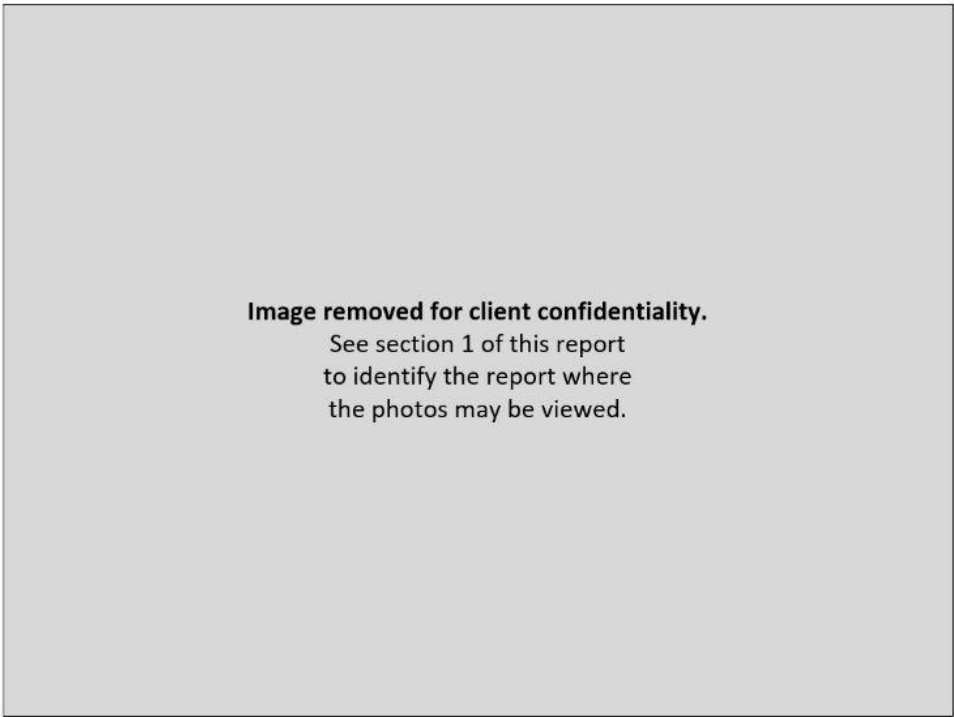


Figure RE35.4: EUT test setup, second view (Antenna, X orientation)



Figure RE35.5: EUT test setup, third view (Antenna, Z orientation)

This line is the end of the test record.

10.1.2 Radiated Emissions, Unwanted, Above 30 MHz

Relevant standards include:

CFR47 Part 15.209

RSS-GEN 8.9, 8.10

ANSI C63.10 sections 6.3, 6.5, 6.6

Test and Data Overview

The US and Canadian standards provide relaxed limits for emissions within the frequency band allocated for radio operation. One must demonstrate compliance for unwanted signals that arise outside the band.

The limits outside the allocated band are a combination of stepped and sloped limits. These are the general limits found in FCC Part 15.209 and RSS-GEN table 5 and 6 (which are essentially an extension of the Class B limits in FCC Part 15.109 and ICES-003 tables 2 and 3). These radiated emission test data are evidence of compliance for any emission, whether inside or outside the restricted bands of operation.

The NFC radio operates at 13.56 MHz. Unwanted emissions tests are typically required to ten times the carrier frequency, or 136 MHz. However, CFR47 Part 15.33(a)(5) explains that an extended frequency search applies when the equipment being tested includes a digital device. In that scenario, the upper test frequency depends on the highest frequency generated or used in the digital device as described at 15.33(b)(1). See [section 4.2](#) of this report to find that digital frequency.

The test method followed ANSI C63.10 sections 6.3, and 6.5 was also applied in the frequency range up to 1 GHz. Section 6.6 was applied to any signals measured above 1 GHz.

Test Record
Radiated Emission Test
Test ID RE38
Project GCL1030

Test Date(s): 17 Apr 2026
Test Personnel: Andy Heier

Product Model: A05147
Serial Number tested: 8WP000266

Operating Mode: NFCRead
Arrangement: A1 (Solo)
Input Power: Battery

Test Standards: FCC Part 15.225, RSS-210, RSS-GEN, ANSI 63.10 (as noted in Section 5 of the report).

Frequency Range: 30 MHz to 1000 MHz
Pass/Fail Judgment: PASS

Test record created by: Andy Heier
Date of this record: 20 Apr 2026

Original record, Version A.

Test Equipment

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
PXE Receiver 26 GHz	Keysight	N9048B	MY59290135	9-Dec-2025	9-Dec-2026
Antenna, Biconilog, 30M-6 GHz	ETS Lindgren	3142E	00233204	11-Nov-2025	11-Nov-2027
SAC 3m, below 1 GHz	Frankonia	SAC3	F199004	11-Dec-2024	11-Dec-2027
Tape Measure, 1-3/16 in x 33 ft	Crecent Lufkin	L1135CME-02	GMN0013783	Calibration	Not Required

Table RE38.1: Test Equipment Used

Software Used: Keysight PXE software A.32.06, EPX test software Version 2025.01.000

Test Data

For test standards that require reorienting the test sample, preliminary scans were taken in those alternate orientations to find the orientation that produced that largest field at the receive antenna. With intentional radiators, that highest field is usually found at the carrier frequency. The alternate orientations are typically described as X, Y, and Z and explained with a photograph. Subsequent testing was done using on the orientation identified in this way.

The radiated emission test process continued with a preliminary scan at multiple turntable angles, antenna heights, and both antenna polarizations. Where the test standard requires cable manipulation, this was done at one of more likely worst case frequencies selected by the test personnel while observing the receiver display. At each of the frequencies selected for final measurements, the turntable angle, antenna height, and antenna polarization were explored to find the worst-case settings. Final field strength measurements were taken in that set of positions. Full maximization was not performed at frequencies that are noise floor measurements included per the test standard requirements.

At azimuth angle 180° the ‘front’ reference mark of the turntable is pointed Southward. At 270° the reference mark points West. At 90° it points East. At 173° the turntable reference mark is pointed directly at the antenna. The designation of the X, Y, and Z orientations of the test sample are sample dependent, so these are reported by use of photographs.

The table shows the selected final measurement data between 30 MHz and 1 GHz. It includes at least the six strongest emissions observed relative to the test limit, along with other data points of interest. Where a data point is highlighted is yellow, this is an aid to indicate the data point(s) with the least margin to the test limit. A positive margin value indicates that the emission was below the test limit. The test limit is the FCC Class B Limit at 3m. Any unintentional radio emission limits are not applied to intentional radio signals.

Emissions within the restricted bands were measured with an averaging process described in the ANSI C63.10 methods noted in this paragraph. (See also section 6.3 of this test report.) The duty cycle for the BTC radio had a duty cycle of 98% or greater and so the trace-averaging method of clause 11.12.2.5.1 was applied.

Frequency	Pol.	Reading	Factor	Level	Limit	Margin	Height	Angle
MHz		dB(μV)	dB(1/m)	dB(μV/m)	dB(μV/m)	dB	cm	deg
		QP		QP	QP	QP		
30.000	V	5.0	22.8	27.8	40.0	12.2	242.5	6.0
62.490	V	9.8	14.1	23.9	40.0	16.1	100.0	36.0
67.800	V	9.5	14.3	23.8	40.0	16.2	127.7	102.0
94.920	V	13.0	15.2	28.2	43.5	15.3	100.0	131.0
135.600	H	8.4	16.3	24.7	43.5	18.8	195.8	264.0
162.720	H	6.1	17.8	23.9	43.5	19.6	120.0	249.0
189.840	H	6.9	17.8	24.7	43.5	18.8	160.9	266.0
216.960	H	7.6	19.0	26.6	46.0	19.4	120.0	87.0
244.080	H	6.3	20.7	27.0	46.0	19.0	116.1	82.0
938.190	V	0.6	35.7	36.3	46.0	9.7	217.2	49.0

Table RE38.2: Emission summary (NFC Type A)

The graph below shows the background spectrum observed during pre-scan, as well as the final data points from the table above.

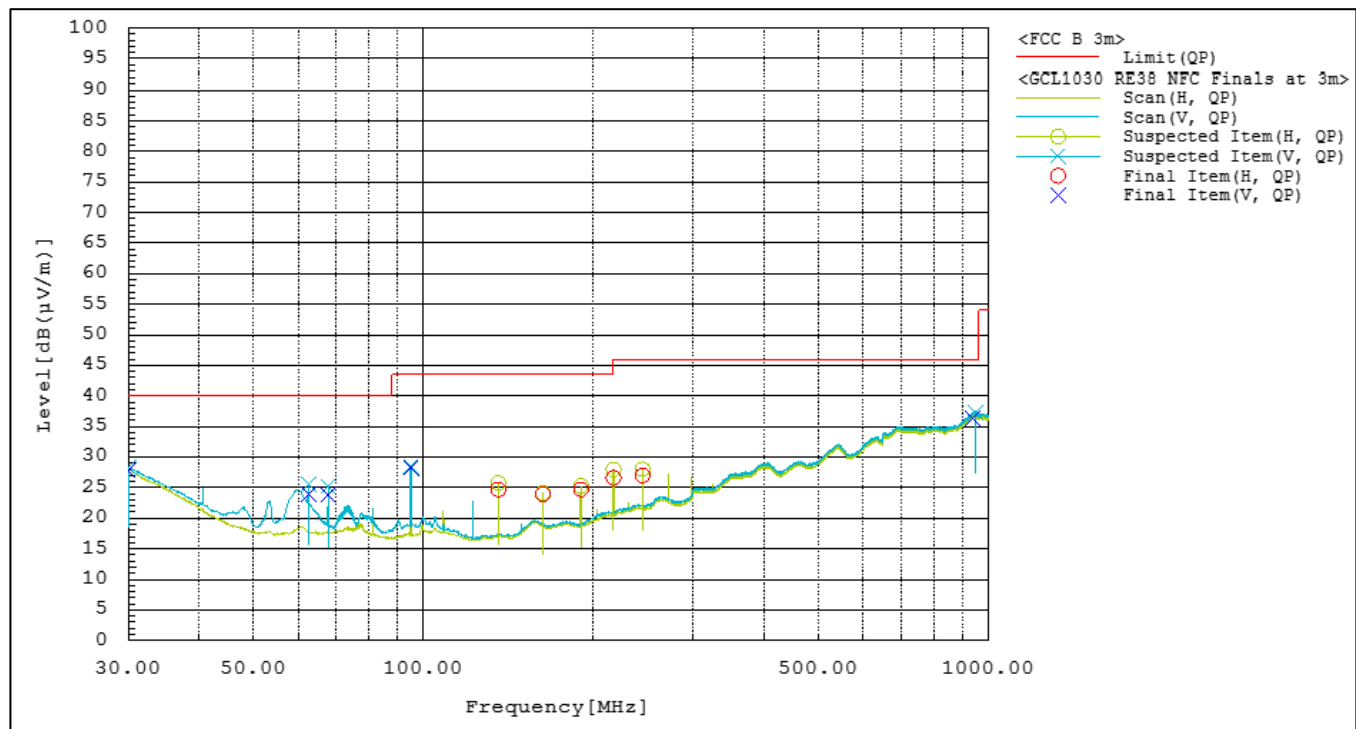


Figure RE38.1: Spectral data (NFC Type A)

Setup Photographs

The following photographs show the EUT configured and arranged in the manner in which it was measured.



Figure RE38.2: EUT test setup, first view



Figure RE38.3: EUT test setup, second view

This line is the end of the test record.

Test Record**Radiated Emission Test RE82****Project GCL1030**

Test Date(s): 18 Mar 2026
Test Personnel: David Kerr

Product Model: A05147
Serial Number tested: 8WP000276

Operating Mode: NFCRead
Arrangement: A1 (Solo)
Input Power: Battery

Test Standards: FCC Part 15.225; RSS-210; RSS-GEN; ANSI-C63.10 (as noted in Section 5 of the report).

Frequency Range: 1GHz to 2 GHz
Pass/Fail Judgment: PASS

Test record created by: David A Kerr
Date of this record: 15 Apr 2026

Original record, Version A.

Test Equipment

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
PXE Receiver 26 GHz	Keysight	N9048B	MY59290135	9-Dec-2025	9-Dec-2026
Antenna, Horn, 1-18 GHz	ETS Lindgren	3117	227596	11-Nov-2025	11-Nov-2027
Preamplifier, 500 MHz 18 GHz	Com-Power	PAM-118A	18040133	Calibration	Not Required
FSOATS 3m, above 1 GHz	Frankonia	SAC3	F199004	13-Dec-2024	13-Dec-2027

Table RE82.1: Test Equipment Used

Software Used: Keysight PXE software A.32.06, , EPX test software Version 2025.01.000

Test Data

For test standards that require reorienting the test sample, preliminary scans were taken in those alternate orientations to find the orientation that produced that largest field at the receive antenna. With intentional radiators, that highest field is usually found at the carrier frequency. The alternate orientations are typically described as X, Y, and Z and explained with a photograph. Subsequent testing was done using on the orientation identified in this way.

The radiated emission test process continued with a preliminary scan at multiple turntable angles, antenna heights, and both antenna polarizations. Where the test standard requires cable manipulation, this was done at one of more likely worst case frequencies selected by the test personnel while observing the receiver display. At each of the frequencies selected for final measurements, the turntable angle, antenna height, and antenna polarization were explored to find the worst-case settings. Final field strength measurements were taken in that set of positions. Full maximization was not performed at frequencies that are noise floor measurements included per the test standard requirements.

At azimuth angle 180° the 'front' reference mark of the turntable is pointed Southward. At 270° the reference mark points West. At 90° it points East. At 173° the turntable reference mark is pointed directly at the antenna. The designation of the X, Y, and Z orientations of the test sample are sample dependent, so these are reported by use of photographs.

The table shows the selected final measurement data between 1 GHz and 2 GHz. It includes at least the six strongest emissions observed relative to the test limit, along with other data points of interest. Where a data point is highlighted is yellow, this is an aid to indicate the data point(s) with the least margin to the test limit. A positive margin value indicates that the emission was below the test limit. The test limit is the FCC Class B Limit at 3m. Any unintentional radio emission limits are not applied to intentional radio signals.

Test limits for electric fields above 30 MHz that are stated for a distance other than 3 m are adjusted to 3 m with a factor of 20 dB per decade of distance. Test limits for electric or magnetic fields below 30 MHz that are stated for a distance other than 3 m are adjusted to 3 m. The conservative method of ANSI C63.10 clause 6.4.4.1 is applied: 40 dB per decade for distances within the boundary (wavelength / 2 Pi), 20 dB per decade beyond that distance boundary.

For FCC and ISSED testing, the 3 m data is adjusted to an equivalent value at the 30 m or 300 m reference distance. Extrapolation of each data result uses the conservative method of ANSI C63.10 clause 6.4.4.1: 40 dB per decade for the part of the distance within the boundary (wavelength / 2 Pi), and 20 dB per decade for any part of the distance beyond that boundary.

In this test, fewer than six emissions were observed within 20 dB of the limit. The relevant emissions were measured, including one or more noise floor signals as judged appropriate to the spectrum.

Frequency	Pol.	Reading		Factor	Level		Limit		Margin		Height	Angle
MHz		dB(μV)		dB(1/m)	dB(μV/m)		dB(μV/m)		dB		cm	deg
		RMS	PK		RMS	PK	AV	PK	RMS	PK		
1969.366	H	34.3	43.4	-2.3	32.0	41.1	54.0	74.0	22.0	32.9	310.0	38.0

Table RE82.2: Emission summary

The graph below shows the background spectrum observed during pre-scan, as well as the final data points from the table above.

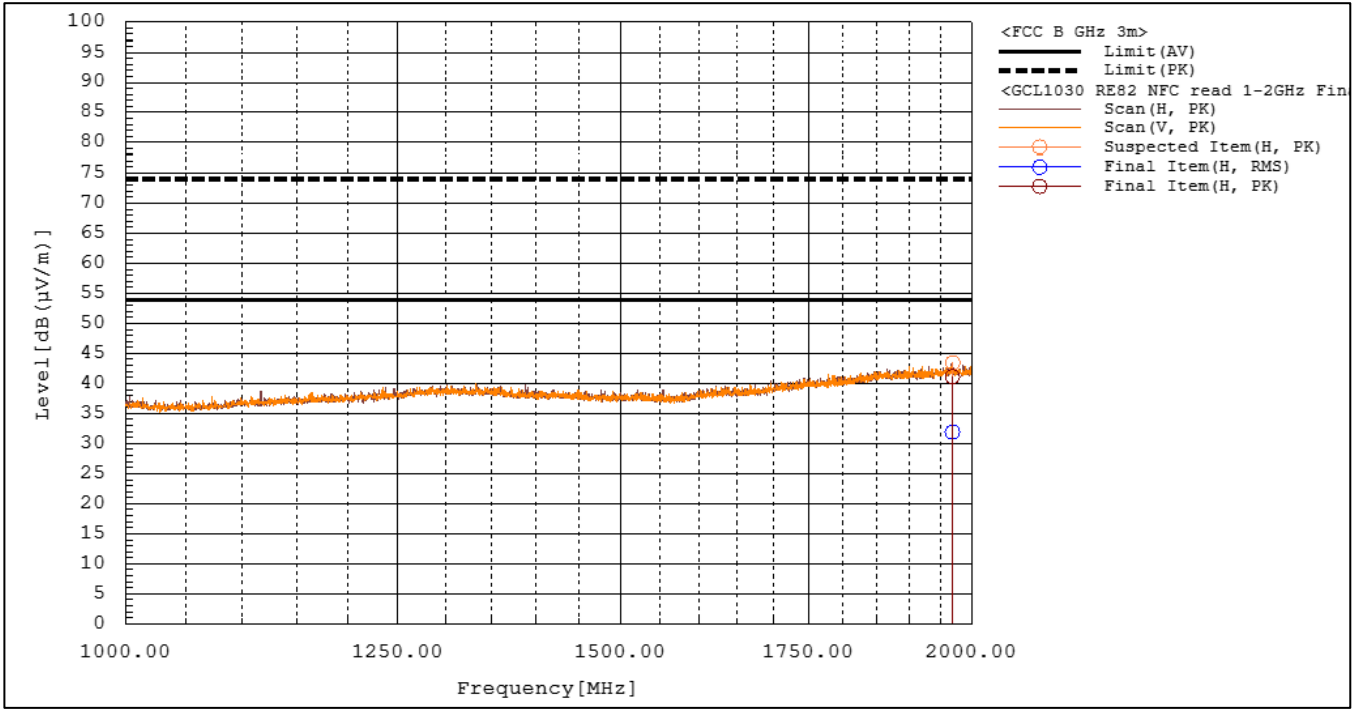


Figure RE82.1: Spectral data

Setup Photographs

The following photographs show the EUT configured and arranged in the manner in which it was measured.



Figure RE82.2: EUT test setup, first view



Figure RE82.3: EUT test setup, second view

This line is the end of the test record.

10.2 Other Data

This report section will include AC Mains conducted emission data, occupied bandwidth data, and frequency stability data.

10.2.1 AC Powerline Conducted Emissions

Relevant standards include:

- FCC Part 15.207
- RSS-GEN at 8.8
- ANSI C63.10 section 6.2

Test and Data Overview

The standards limit the RF emission currents that can be conducted onto the line and neutral AC mains power conductors, which could then act as transmitting antennas for these RF currents. This requirement applies if the transmitter can be active while receiving mains-sourced electrical power. It applies whether the product has its own AC mains connection or is powered from the AC mains by an intermediary device like an AC/DC power converter.

The limits are found in FCC Part 15.207 and RSS-GEN table 4 (which are the same as the Class B limits in FCC Part 15.107 and ICES-003 tables 1). The test method is found in ANSI C63.10 section 6.2. These limits are not generally applied to the carrier or related intentional emissions.

Test Record**Conducted Emissions Mains Test****Test ID CE05****Project GCL1030**

Test Date(s): 16 Apr 2026
Test Personnel: Aditya Prakash

Product Model: A05147
Serial Number tested: 8WP000271

Operating Mode: NFCRead
Arrangement: A4 (Udc)
Input Power: 120 Vac 60 Hz

Test Standards: FCC Part 15, ANSI C63.10, RSS-247, RSS-GEN (as noted in Section 5 of the report).

Frequency Range: 150 kHz to 30 MHz
Pass/Fail Judgment: **PASS**

Test record created by: Aditya Prakash
Date of this record: 17 Apr 2026

Original record, Version A.

Test Equipment Used

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
PXE Receiver 44 GHz	Keysight	N9048B	MY62220139	4-Sep-2025	4-Sep-2026
Tape Measure, 1-3/16 in x 33 ft	Crecent Lufkin	L1135CME-02	GMN0013782	Calibration	Not Required
LISN multiline; 15A to 9kHz	Com-Power	LI-215A	192027	19-Feb-2024	15-Feb-2027
Coaxial Power Cable	Garmin	RG214/U	20240123-01	19-Feb-2024	15-Feb-2027

Table CE05.1: Test Equipment Used

Software Used: Keysight PXE software A.33.03; CE Mains 150k to 30M Data Analysis V4b NS.xlsx

Test Data

The conducted emission test process began with a set of preliminary scans on both power conductors using both Quasi-Peak and Average detectors across the frequency range. Where the test standard requires cable manipulation, one or more likely worst case frequencies selected by the test personnel. Cables were manipulated to find the maximal signal strength while observing the receiver levels at those selected frequencies. At each of the frequencies selected for final measurements, Quasi-peak and Average detector readings were taken on each conductor.

The table shows the selected final measurement data. It includes at least the six strongest emissions observed relative to the limit lines, along with other data points of interest. The yellow highlight indicate the data points with the least margin to the quasi-peak detector limit and the average detector limit. A positive margin value indicates that the emission was below the test limit. The test limit is the Composite FCC/CISPR Class B Limit.

Unintentional emission limits are not applied to intentional transmission signals. In this data set, no limit is applied to the signal observed at 13.56 MHz.

Frequency	QP Limit	AV Limit	L1 QP	L2 QP	L1 AV	L2 AV	QP Margin	AV Margin
(kHz)	(dB μ V)	(dB μ V)	(dB μ V)	(dB μ V)	(dB μ V)	(dB μ V)	(dB)	(dB)
150	66.00	56.00	30.83	31.05	21.00	20.95	34.95	35.00
164	65.28	55.28	28.27	28.52	20.51	20.53	36.76	34.76
436	57.14	47.14	23.41	21.84	19.83	17.01	33.73	27.32
715	56.00	46.00	17.31	17.47	12.47	12.58	38.53	33.42
10001	60.00	50.00	21.86	23.00	18.07	19.30	37.00	30.70
13560	60.00	50.00	28.16	27.20	21.32	22.00	31.84	28.00

Table CE05.1: Emission summary

The graph below shows preliminary scan data as continuous curves. Superimposed are the final measurement data points reported in the table above.

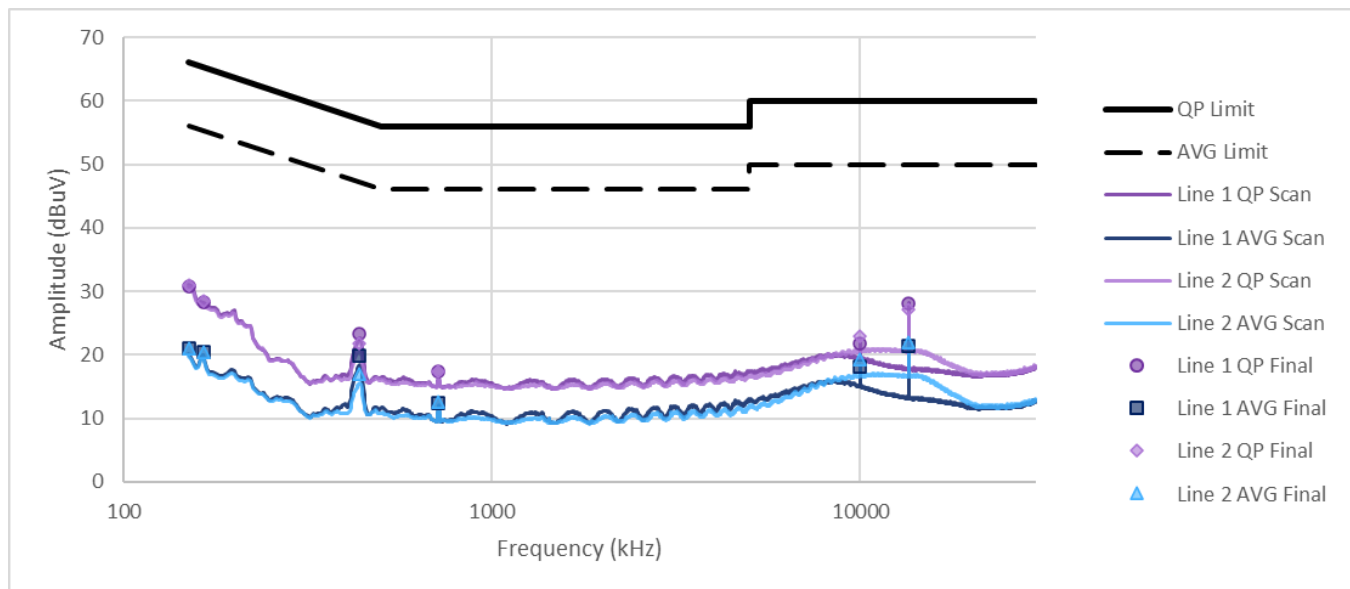


Figure CE05.1: Spectral data

Setup Photographs

The following photographs show the EUT configured and arranged in the manner in which it was measured.

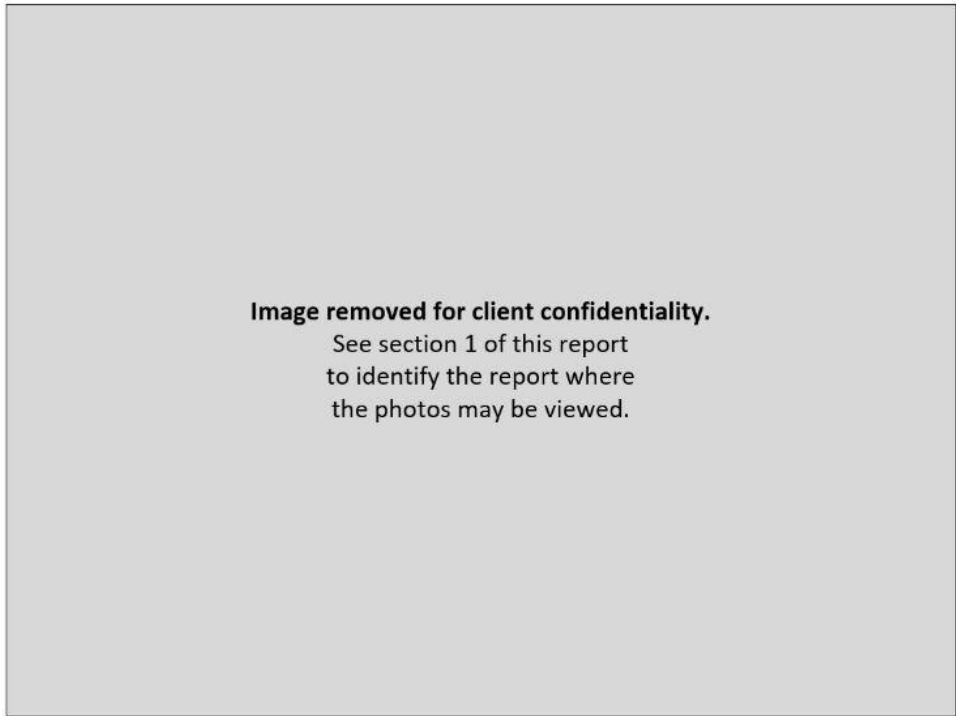


Figure CE05.2: Test setup, first view

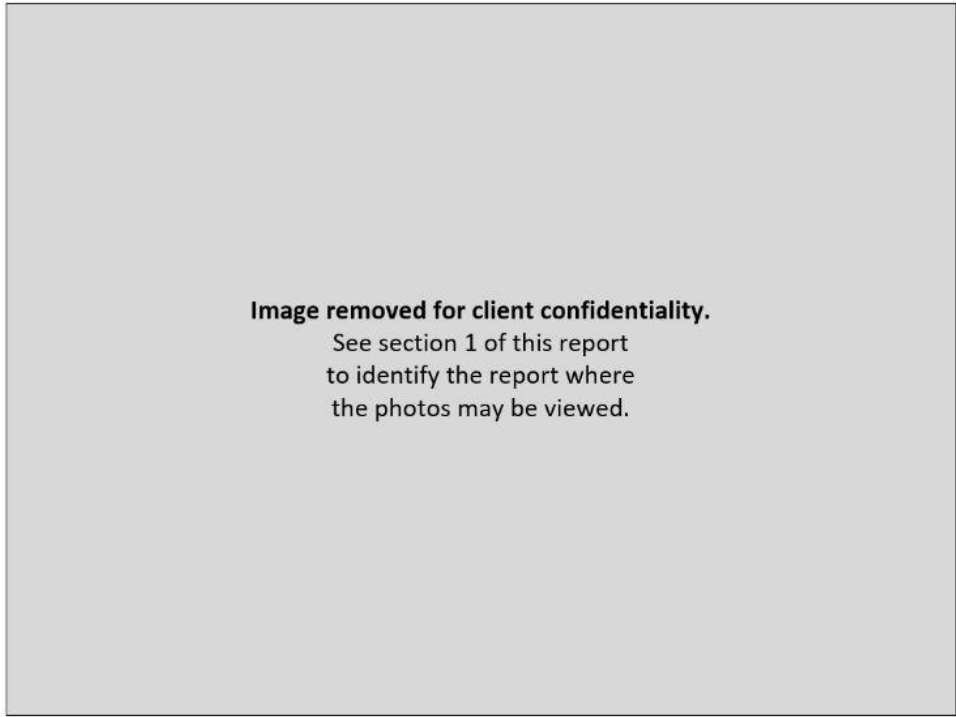


Figure CE05.3: Test setup, second view

This line is the end of the test record.

10.2.2 Occupied Bandwidth, 99% Method

Relevant standards include:

- FCC Part 2.202(a)
- RSS-GEN at 6.7
- ANSI C63.10 section 6.9.3

Test and Data Overview

These bandwidths were measured using the methods at ANSI C63.10 section 6.9. The 99% bandwidth is reported but has no limits or requirements on the result.

Test Record**Transmitter Bandwidth Test****Test ID TR31****Project GCL-1030**

Test Date(s) 27 Feb 2026

Test Personnel Jim Solum

Product Model A05147

Serial Number tested 8WP000264

Operating Mode NFCRead

Arrangement A2(Upwr)

Input Power USB 5 Vdc

Test Standards: FCC Part 15, ANSI C63.10, RSS-GEN (as noted in Section 5 of the report).

Radio Protocol NFC A mode

Radio Band 13.56 MHz

Pass/Fail Judgment: Reported

Test record created by: Jim Solum

Date of this record: 02 Mar 2026

Original record, Version A.

Test Equipment Used

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
PXE Receiver 44 GHz	Keysight	N9048B	MY62220139	4-Sep-2025	4-Sep-2026

Table TR31.1: List of test equipment used**Test Software Used:** Keysight PXE firmware A.33.03**Background**

There are regulatory requirements to present an additional type of bandwidth analysis: 99% Occupied Bandwidth. There are no limits or functional requirements around this data, beyond a reporting requirement. The contents of this test record are for information, and do not affect compliance of the devices that are the subject of this report.

Test Setup

This block diagram shows the test equipment setup.

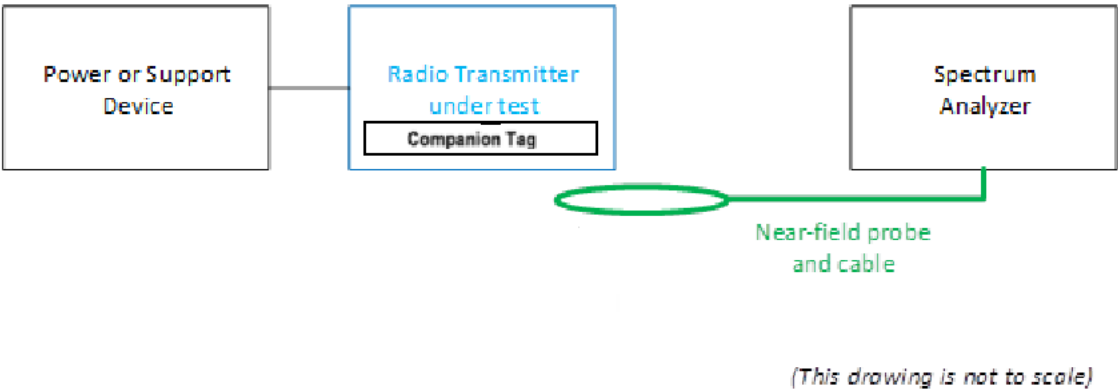


Figure TR31.1: Test setup

Occupied Bandwidth, 99% Test Method

During this test a small loop probe is placed near transmitter and companion device (an NFC tag) because the test sample only transmits in response to a nearby companion device. This loop probe is then connected by a cable to the spectrum analyzer. The analyzer has a built-in capability to identify the minimum bandwidth that contains a specified percentage of the total power observed. The spectrum is scanned with significant sweep so that the varied effects of modulation are appropriately assessed. Since the focus is on the relative distribution of energy across a range of frequencies, the absolute amplitudes recorded during this test are not relevant and may not include cable losses or attenuation factors.

Occupied Bandwidth, 99% Test Data

The measured 99% occupied bandwidth data is 1.5600 MHz shown by the spectral data.

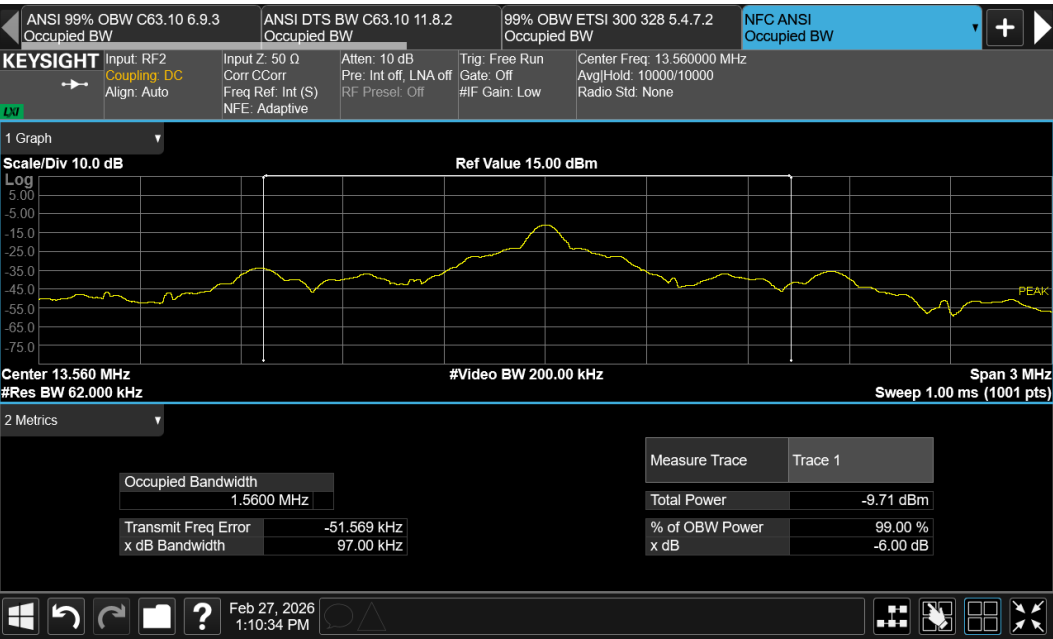


Figure TR31.2: Spectral occupied bandwidth data

This line is the end of the test record.

10.2.3 Necessary Bandwidth

Relevant standards include:

FCC Part 2.202

RSS-GEN at 9

TRC-43 section 9

Data Overview

The standards require the calculation of the necessary bandwidth for use in device classification. This is a requirement to calculate and report, but no limits apply. The bandwidths are calculated below for radios that could be supported by the standards called out in this test report. This text may include data for, and information about, radio protocols that are not included in the test sample. The calculation is generic to the radio protocols cited and is not specific to the product or test samples that are the subject of this report.

The Necessary Bandwidth, B_n , is a theoretical value based on the specifications for a communication protocol, rather than the hardware implementation and a subsequent lab measurement. The analysis methods in FCC Part 2.202 and TRC-43 are the same for NFC.

NFC (Near Field Communication) at 13.56 MHz uses continuous wave telegraphy without tone modulation. The bit rate 'B' in the FCC and TRC equations is split into two parts here, B and C. B is the baud rate. C is a coding factor. $C=1$ for Miller encoding where the transition speed is as high as the bit rate, or $C=2$ for Manchester encoding where the transition speed is as high as twice the bit rate). K is a factor set to 3 for non-fading circuits under the standards. The Necessary Bandwidth is then:

$$B_n = BCK$$

Radio Type	B (kbaud)	C	K	BN (kHz)
NFC A	106	1	3	318.0
NFC B	212	2	3	1272.0
NFC B	424	2	3	2544.0

Table Bn1: Necessary Bandwidth for NFC

10.2.4 Frequency Stability

Relevant standards include:

FCC Part 15.225(e)
RSS-210 at B.6(b)
ANSI C63.10 section 6.8

Test and Data Overview

The frequency stability test ensures that the radio transmission frequency does not drift unacceptably over a range extreme conditions such as high and low temperature, or altered supply voltage. In addition the signal bandwidth, measured on a 20 dB basis, must remain within the allocated band.

Test Record**Transmitter Stability in Extreme Conditions****Test IDs TR15****Project GCL1030**

Test Date(s): 14, 15, 17 April 2026
Test Personnel: Myles Clonch supervised by Jim Solum

Product Model: A05147
Serial Number tested: 8WP000264

Operating Mode: NFCRead
Arrangement: A2(Upwr)
Nominal Input Power: USB 5Vdc

Test Standards: FCC Part 15, ANSI C63.10, RSS-GEN, RSS-210 (as noted in Section 5 of the report)

Radio Protocol: NFC

Pass/Fail Judgment: PASS

Test record created by: Myles Clonch, Jim Solum
Date this record: 12 May 2026

Original record, Version A.

Test Equipment Used

Description	Make	Model #	Serial #	Last Cal/Ver	Next Due
PXE Receiver 44 GHz	Keysight	N9048B	MY62220139	4-Sep-2025	4-Sep-2026
MXE Receiver 8.4 GHz	Keysight	N9038B	MY63460112	17-Mar-2025	22-Apr-2026
Programmable DC power source	Keithley	2260B-30-72 720 W	1411917	27-Jun-2024	27-Jun-2026
Thermometer	Thermco	ACCD370P	220608121	18-Jul-2024	18-Jul-2026
Thermal Chamber	Tenney	T2RC	32774-02	Calibration	Not Required
Thermal Chamber	Tenney	T2RC	31244	Calibration	Not Required

Table TR15.1: List of test equipment used**Test Method**

The standards cited require observation of the stability for transmission frequency and/or power at certain environmental extremes. The reference is performance on nominal input voltage and a temperature of 20 °C. Where the standards cited here impose different limits or conditions, the most stringent limits and conditions have been applied.

The acceptance criterion is that the carrier remains stable within 0.01% of operation frequency. The worst-case frequency deviation was 0.0024%.

The acceptance criterion is that the transmitted signals remain within the band of 13.558644 and 13.561356 MHz. The modes utilized include those that showed emissions closest to the band edge during prior bandwidth testing.

Test Data

The test sample(s) were subjected to extreme conditions and performed as shown below.

Tx Mode	Temp	Volts	NFC carrier frequency (Hz)			
			Time interval (minutes)			
			0	2	5	10
NFC	55	5	13,559,863	13,560,070	13,559,964	13,559,905
NFC	50	5	13,559,919	13,559,909	13,560,031	13,560,191
NFC	40	5	13,560,022	13,559,944	13,560,007	13,560,119
NFC	30	5	13,560,095	13,560,043	13,560,007	13,559,892
NFC	20	5	13,560,030	13,560,010	13,559,978	13,559,965
NFC	20	3.22	13,560,331	N/A	N/A	N/A
NFC	20	4.25	13,560,159	N/A	N/A	N/A
NFC	20	5.75	13,559,991	N/A	N/A	N/A
NFC	10	5	13,559,985	13,559,991	13,560,014	13,560,003
NFC	0	5	13,559,989	13,559,892	13,559,904	13,560,010
NFC	-10	5	13,560,088	13,559,835	13,560,160	13,559,982
NFC	-20	5	13,559,952	13,560,022	13,559,917	13,560,071

Table TR15.2: Frequency stability for NFC data with temperature and voltage variations

Setup Block Diagram

The following block diagram shows the EUT configured and arranged in the manner in which it was measured.

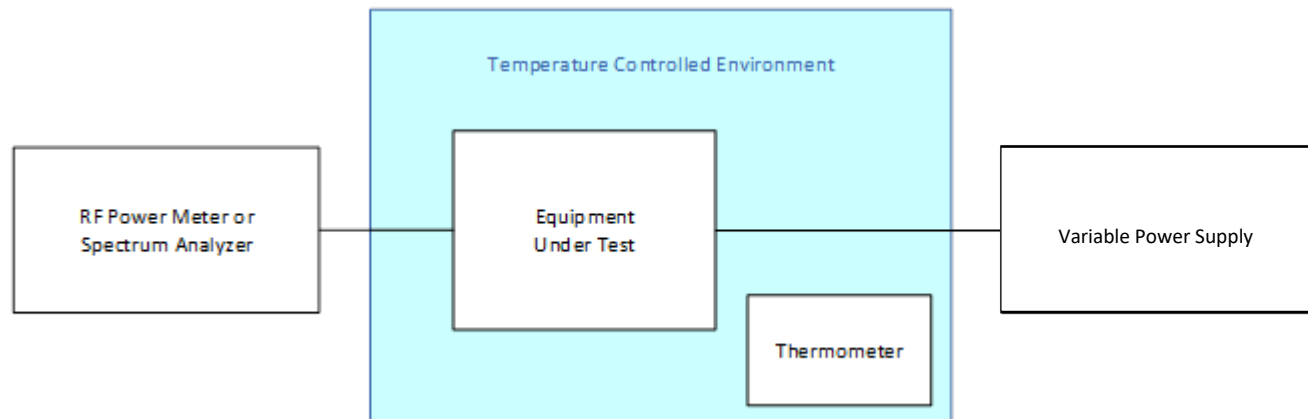


Figure TR15.1: Test Equipment Setup

This line is the end of the test record.

11. CONCLUDING NOTES

This report stands as an integrated record of the tests performed and must be copied or distributed in its complete form. The reproduction of selected pages or sections separate from the complete report would require specific approval from the manager of the Garmin Compliance Lab.

This is the final page of the report.