



element

Garrett Metal Detectors

Paragon

13.56 MHz Radio

FCC 15.207:2024, FCC 15.225:2024

RSS-210 Issue 10:2019+A1:2020, RSS-Gen Issue 5:2018+A1:2019+A2:2021

Report: GARR0118.1 Rev. 1, Issue Date: February 15, 2024



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CERTIFICATE OF TEST



Last Date of Test: February 2, 2024
Garrett Metal Detectors
EUT: Paragon

Radio Equipment Testing Standards

Specification	Method
FCC 15.207:2024	ANSI C63.10:2013
FCC 15.225:2024	
RSS-210 Issue 10:2019+A1:2020	
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Guidance

Notice 2020 - DRS0023

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions	Pass	15.207	RSS-Gen 8.8	6.2	All radio emissions were at least 10 dB below the limit. Measurements were taken with the radio transmitting and not transmitting to show the remaining emissions are non-radio which will be tested to the applicable product family standard.
Emissions Bandwidth (20 dB)	Pass	15.215(c)	N/A	6.9.2	
Field Strength of Fundamental	Pass	15.225(a)-(c)	RSS-210 B.6(a)(i-iv)	6.4	
Field Strength of Spurious Emissions (Less Than 30 MHz)	Pass	15.225(d), 15.209	RSS-210 B.6(a)(iv)	6.4	
Field Strength of Spurious Emissions (Greater Than 30 MHz)	Pass	15.225(d), 15.209	RSS-210 B.6(a)(iv)	6.5	
Frequency Stability	Pass	15.225(e), 15.31(e), 15.215(c), 2.1055	RSS-210 B.6(b)	6.8	
Occupied Bandwidth (99%)	Pass	N/A	RSS-Gen 6.7	6.9.3	

Note: A gap analysis was performed and the results continue to show compliance.

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

CERTIFICATE OF TEST

Deviations From Test Standards

None

Approved By:



Adam Bruno, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Corrected standards details	2024-02-14	1,3
01	Added Power Settings and Antenna page	2024-02-14	13
01	Edited comments regarding loop antenna for clarity	2024-02-14	36,39

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit:

[California](#)

[Minnesota](#)

[Oregon](#)

[Texas](#)

[Washington](#)

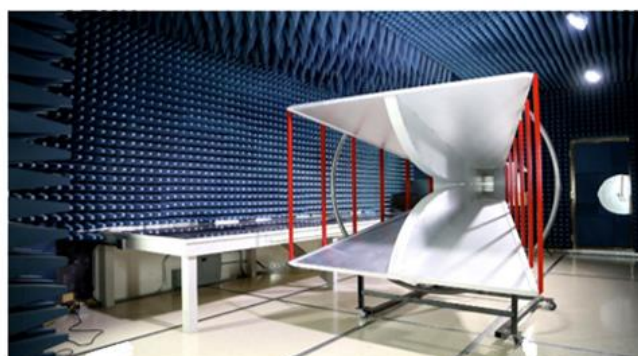
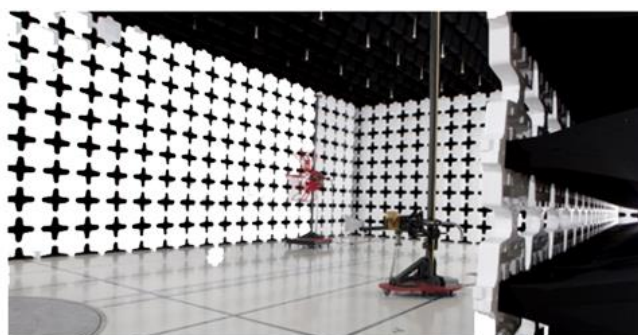
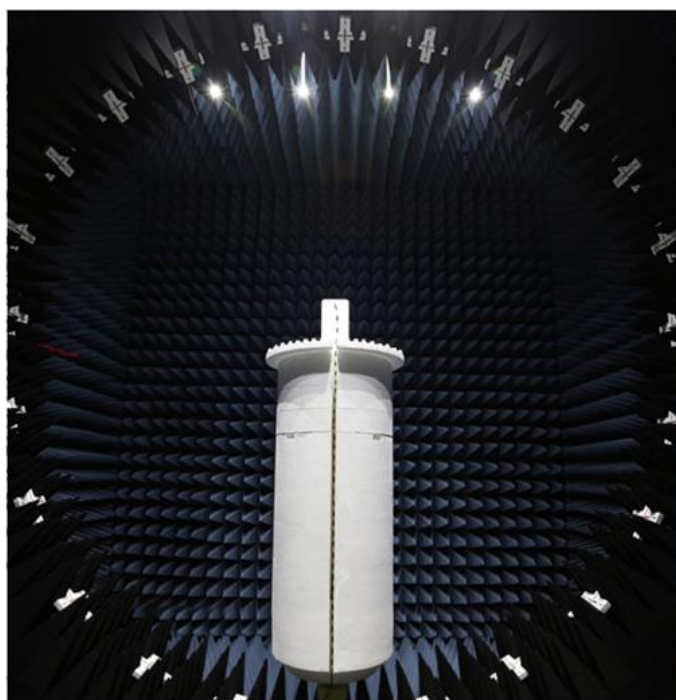
FACILITIES

Testing was performed at the following location(s)

	Location	Labs ⁽¹⁾	Address	A2LA ⁽²⁾	ISED ⁽³⁾	BSMI ⁽⁴⁾	VCCI ⁽⁵⁾	CAB ⁽⁶⁾	FDA ⁽⁷⁾
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☐	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☒	Texas	TX01-09	3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	3310.03	2834G	SL2-IN-E-1158R	A-0201	US0191	TL-54
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

- (1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
- (2) A2LA Certificate No.
- (3) ISED Company No.
- (4) BSMI No.
- (5) VCCI Site Filing No.
- (6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
- (7) FDA ASCA No.



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.1 dB	-3.1 dB

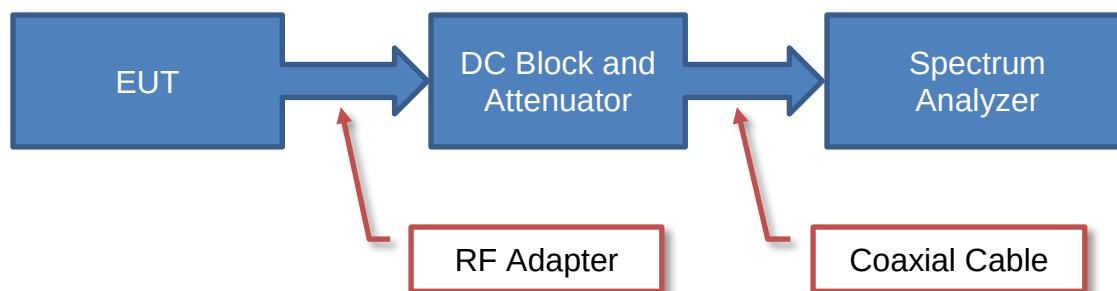
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

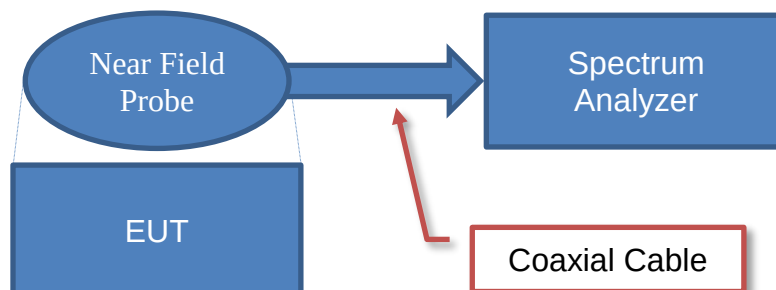
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements

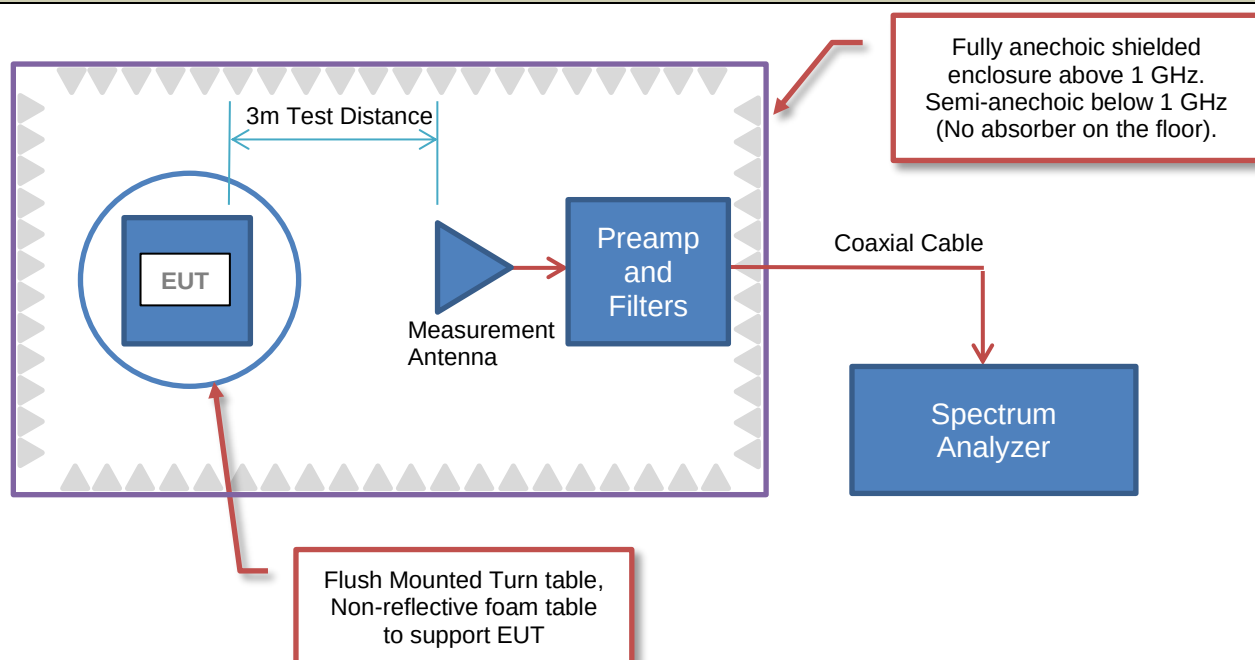


Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)	Factor			Distance Adjustment Factor	External Attenuation	Field Strength
	Antenna Factor	Cable Factor	Amplifier Gain			
42.6	28.6	3.1	40.8	0.0	0.0	33.5

Conducted Emissions:

Measured Level (Amplitude)	Factor		External Attenuation	Adjusted Level
	Transducer Factor	Cable Factor		
26.7	0.3	0.1	20.0	47.1

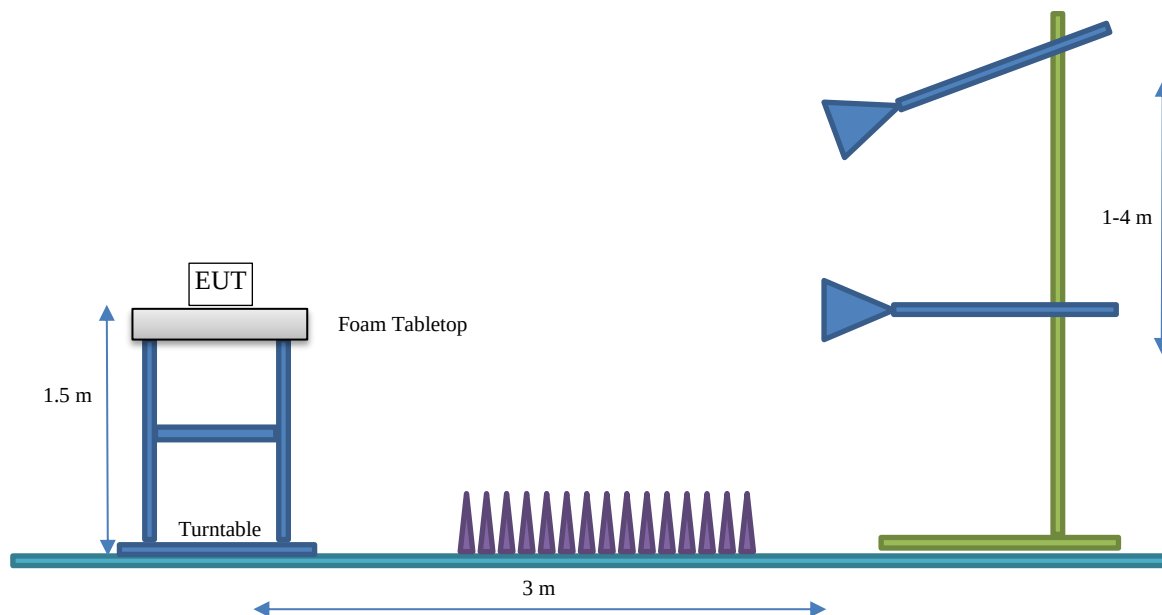
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

Company Name:	Garrett Metal Detectors
Address:	1881 West State Street
City, State, Zip:	Garland, TX 75042
Test Requested By:	Bob Podhrasky
EUT:	Paragon
First Date of Test:	November 8, 2023
Last Date of Test:	February 2, 2024
Receipt Date of Samples:	November 8, 2023
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Walk Through Metal Detector containing a low frequency inductive radio, a 13.56 MHz NFC radio and a 2.4 GHz radio module.

Testing Objective:

To demonstrate compliance of the 13.56 MHz radio to FCC 15.225 requirements and RSS-210 Annex B.6 specifications.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)
Inductive Loop 20mm x 50mm	Garrett Metal Detectors	13.56 MHz

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- ☒ Test software settings Test software/firmware installed on EUT: UI Firmware 3.46
- ☐ Rated power settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Modulation Details	Type	Frequency (MHz)	Power Setting
ISO 14443A with Mill Encoding and AM modulation: • Mode 0 = 1580 pulses per second (all testing completed with Mode 0 unless otherwise indicated) • Mode 2300 = 480 pulses per second	NFC A	13.56	300 mW

CONFIGURATIONS

Configuration GARR0118-1

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Walk Through Metal Detector	Garrett Metal Detectors	1557900	63202294

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power Cable	Yes	1.0m	No	AC Power Cable Extension	Metal Detector
AC Power Cable	Yes	1.0m	No	AC Power Cable Extension	Metal Detector
AC Power Cable Extension	Yes	1.6m	No	AC Mains	AC Power Cable
AC Power Cable Extension	Yes	1.6m	No	AC Mains	AC Power Cable

Configuration GARR0118-2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Control PCB with NFC	Garrett Metal Detectors	2354000rB	M146

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-11-08	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2023-11-08	Field Strength of Spurious Emissions (Greater than 30MHz)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2023-11-08	Field Strength of Spurious Emissions (Less than 30MHz)	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2023-11-20	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2023-12-13	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
6	2024-02-02	Emissions Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2024-02-02	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT.

The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10.

In the event that the operating frequency of 13.56 MHz is causing the product to fail the FCC 15.207 limits, the following guidance can be used:

FCC KDB 174176 D01 AC Conducted FAQ v01r01, June 3, 2015 Section Q5:

For a device with a permanent or detachable antenna operating at or below 30 MHz, the FCC will accept measurements performed with a suitable dummy load in lieu of the antenna under the following conditions:

- (1) perform the AC power-line conducted tests with the antenna connected to determine compliance with Section 15.207 limits outside the transmitter's fundamental emission band;
- (2) retest with a dummy load in lieu of the antenna to determine compliance with Section 15.207 limits within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network which simulates the antenna in the fundamental frequency band.

All measurements must be performed as specified in clause 6.2 of ANSI C63.10-2013.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Rohde & Schwarz	ESCI	ARF	2023-10-02	2024-10-02
LISN	Solar Electronics	9252-50-R-24-BNC	LJK	2023-07-25	2024-07-25
Power Source/Analyzer	Hewlett Packard	6841A	THC	NCR	NCR
Cable - Conducted Cable Assembly	Northwest EMC	TXA, HFC, TQU, VAC	TXAA	2023-04-18	2024-04-18

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.1 dB	-3.1 dB

CONFIGURATIONS INVESTIGATED

GARR0118-1

MODES INVESTIGATED

Transmitting 13.56 MHz, NFC A

POWERLINE CONDUCTED EMISSIONS

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-12-13
Customer:	Garrett Metal Detectors	Temperature:	23.2°C
Attendees:	None	Relative Humidity:	26.9%
Customer Project:	None	Bar. Pressure (PMSL):	1033 mb
Tested By:	Marty Martin	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	28	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

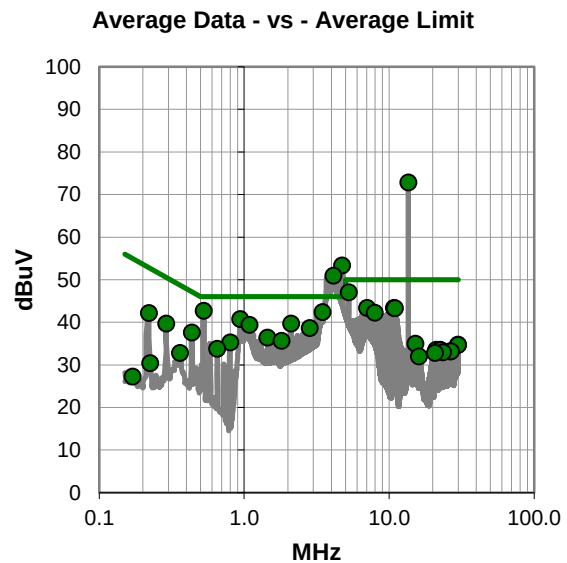
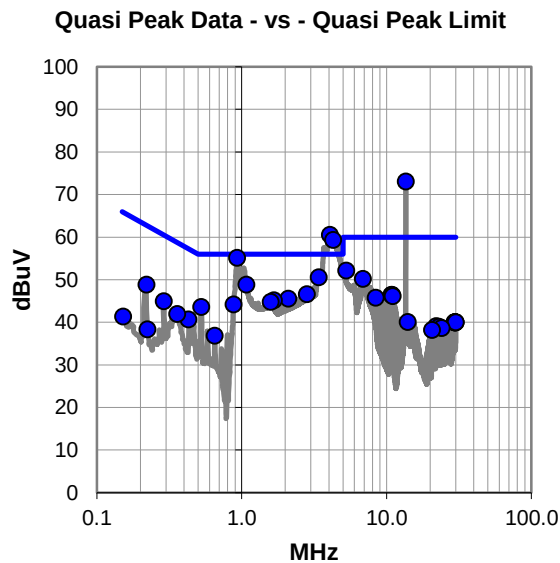
Floor Standing Equipment. Class A Commercial Product. Primary power cord tested, redundant power disconnected.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #28

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	52.3	20.8	73.1	60.0	13.1
4.058	40.2	20.4	60.6	56.0	4.6
4.274	39.0	20.4	59.4	56.0	3.4
0.931	35.0	20.2	55.2	56.0	-0.8
3.406	30.2	20.4	50.6	56.0	-5.4
1.080	28.7	20.2	48.9	56.0	-7.1
5.260	31.8	20.4	52.2	60.0	-7.8
2.825	26.3	20.3	46.6	56.0	-9.4
6.884	29.8	20.4	50.2	60.0	-9.8
2.100	25.3	20.3	45.6	56.0	-10.4
1.670	25.0	20.2	45.2	56.0	-10.8
1.590	24.6	20.2	44.8	56.0	-11.2
0.880	24.0	20.2	44.2	56.0	-11.8
0.526	23.4	20.2	43.6	56.0	-12.4
10.800	25.9	20.6	46.5	60.0	-13.5
10.940	25.9	20.6	46.5	60.0	-13.5
11.015	25.6	20.6	46.2	60.0	-13.8
0.220	28.3	20.6	48.9	62.8	-13.9
8.405	25.2	20.6	45.8	60.0	-14.2
0.290	24.7	20.3	45.0	60.5	-15.5
0.430	20.5	20.2	40.7	57.3	-16.6
0.359	21.8	20.2	42.0	58.7	-16.7
0.652	16.7	20.2	36.9	56.0	-19.1
13.985	19.3	20.8	40.1	60.0	-19.9
29.490	17.5	22.5	40.0	60.0	-20.0

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	52.1	20.8	72.9	50.0	22.9
4.740	33.0	20.4	53.4	46.0	7.4
4.130	30.6	20.4	51.0	46.0	5.0
5.260	26.7	20.4	47.1	50.0	-2.9
0.526	22.5	20.2	42.7	46.0	-3.3
3.478	22.0	20.4	42.4	46.0	-3.6
0.940	20.6	20.2	40.8	46.0	-5.2
2.105	19.4	20.3	39.7	46.0	-6.3
7.028	23.0	20.4	43.4	50.0	-6.6
10.800	22.8	20.6	43.4	50.0	-6.6
1.090	19.2	20.2	39.4	46.0	-6.6
10.943	22.7	20.6	43.3	50.0	-6.7
2.825	18.4	20.3	38.7	46.0	-7.3
7.970	21.8	20.5	42.3	50.0	-7.7
0.436	17.4	20.2	37.6	47.1	-9.5
1.448	16.2	20.2	36.4	46.0	-9.6
1.810	15.4	20.3	35.7	46.0	-10.3
0.220	21.6	20.6	42.2	52.8	-10.6
0.800	15.1	20.2	35.3	46.0	-10.7
0.290	19.4	20.3	39.7	50.5	-10.8
0.652	13.6	20.2	33.8	46.0	-12.2
15.140	14.1	20.9	35.0	50.0	-15.0
29.852	12.4	22.4	34.8	50.0	-15.2
29.924	12.4	22.3	34.7	50.0	-15.3
0.360	12.6	20.2	32.8	48.7	-15.9

CONCLUSION

Evaluation

POWERLINE CONDUCTED EMISSIONS

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-12-13
Customer:	Garrett Metal Detectors	Temperature:	23.2°C
Attendees:	None	Relative Humidity:	26.9%
Customer Project:	None	Bar. Pressure (PMSL):	1033 mb
Tested By:	Marty Martin	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	29	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

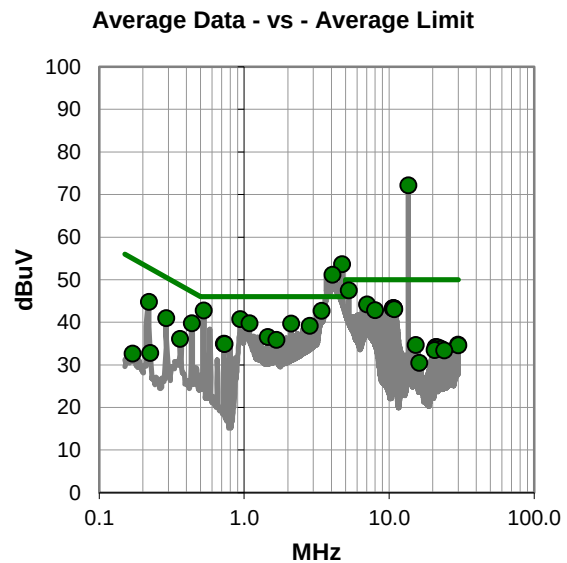
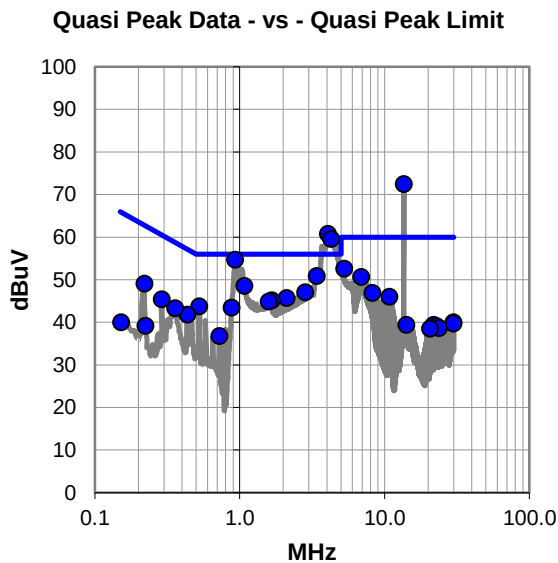
Floor Standing Equipment. Class A Commercial Product. Primary power cord tested, redundant power disconnected.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #29

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	51.7	20.8	72.5	60.0	12.5
4.060	40.4	20.4	60.8	56.0	4.8
4.280	39.2	20.4	59.6	56.0	3.6
0.931	34.5	20.2	54.7	56.0	-1.3
3.410	30.5	20.4	50.9	56.0	-5.1
1.080	28.4	20.2	48.6	56.0	-7.4
5.264	32.2	20.4	52.6	60.0	-7.4
2.830	26.8	20.3	47.1	56.0	-8.9
6.890	30.3	20.4	50.7	60.0	-9.3
2.105	25.4	20.3	45.7	56.0	-10.3
1.670	25.0	20.2	45.2	56.0	-10.8
1.590	24.7	20.2	44.9	56.0	-11.1
0.526	23.6	20.2	43.8	56.0	-12.2
0.880	23.3	20.2	43.5	56.0	-12.5
8.266	26.4	20.5	46.9	60.0	-13.1
0.220	28.5	20.6	49.1	62.8	-13.7
10.800	25.4	20.6	46.0	60.0	-14.0
0.290	25.1	20.3	45.4	60.5	-15.1
0.436	21.6	20.2	41.8	57.1	-15.3
0.360	23.1	20.2	43.3	58.7	-15.4
0.724	16.6	20.2	36.8	56.0	-19.2
29.870	17.6	22.4	40.0	60.0	-20.0
29.942	17.4	22.3	39.7	60.0	-20.3
21.824	17.9	21.5	39.4	60.0	-20.6
14.138	18.6	20.8	39.4	60.0	-20.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
13.560	51.4	20.8	72.2	50.0	22.2
4.740	33.3	20.4	53.7	46.0	7.7
4.058	30.8	20.4	51.2	46.0	5.2
5.270	27.1	20.4	47.5	50.0	-2.5
0.526	22.6	20.2	42.8	46.0	-3.2
3.410	22.3	20.4	42.7	46.0	-3.3
0.940	20.6	20.2	40.8	46.0	-5.2
7.033	23.8	20.4	44.2	50.0	-5.8
1.090	19.6	20.2	39.8	46.0	-6.2
2.105	19.4	20.3	39.7	46.0	-6.3
10.583	22.7	20.6	43.3	50.0	-6.7
10.660	22.7	20.6	43.3	50.0	-6.7
10.727	22.7	20.6	43.3	50.0	-6.7
10.800	22.7	20.6	43.3	50.0	-6.7
2.830	18.9	20.3	39.2	46.0	-6.8
10.870	22.5	20.6	43.1	50.0	-6.9
7.973	22.4	20.5	42.9	50.0	-7.1
0.436	19.6	20.2	39.8	47.1	-7.3
0.220	24.2	20.6	44.8	52.8	-8.0
1.450	16.4	20.2	36.6	46.0	-9.4
0.290	20.7	20.3	41.0	50.5	-9.5
1.670	15.7	20.2	35.9	46.0	-10.1
0.724	14.8	20.2	35.0	46.0	-11.0
0.730	14.7	20.2	34.9	46.0	-11.1
0.360	15.9	20.2	36.1	48.7	-12.6

CONCLUSION

Evaluation

POWERLINE CONDUCTED EMISSIONS

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-12-08
Customer:	Garrett Metal Detectors	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	44.3%
Customer Project:	None	Bar. Pressure (PMSL):	1009 mb
Tested By:	Jarrold Brenden	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	23	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

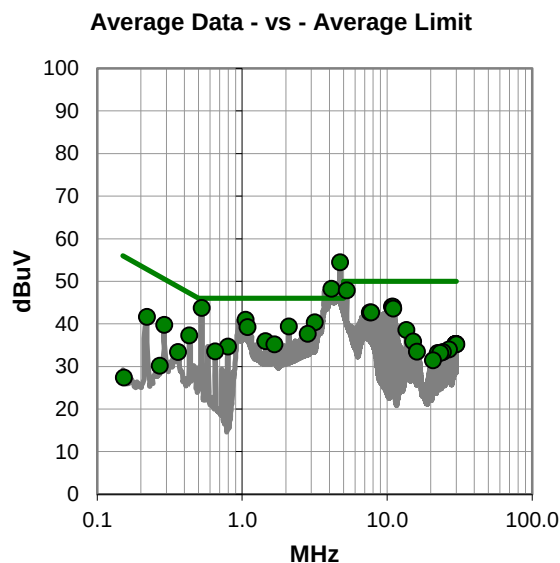
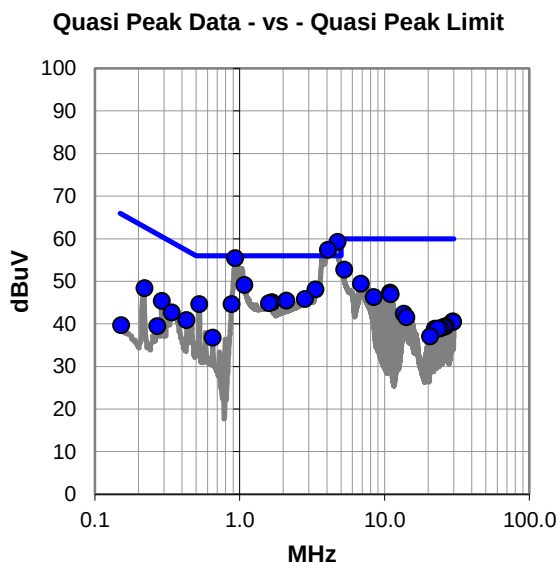
Floor Standing Equipment. Class A Commercial Product. Primary power cord tested, redundant power disconnected.
Antenna path terminated with load.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #23

Quasi Peak Data - vs - Quasi Peak Limit

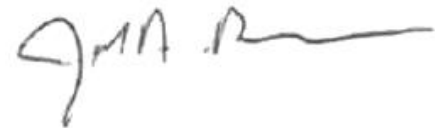
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.733	38.9	20.4	59.3	56.0	3.3
4.060	37.0	20.4	57.4	56.0	1.4
0.931	35.3	20.2	55.5	56.0	-0.5
1.080	29.0	20.2	49.2	56.0	-6.8
5.260	32.4	20.4	52.8	60.0	-7.2
3.330	27.7	20.4	48.1	56.0	-7.9
2.825	25.6	20.3	45.9	56.0	-10.1
6.880	29.1	20.4	49.5	60.0	-10.5
2.100	25.2	20.3	45.5	56.0	-10.5
1.670	24.9	20.2	45.1	56.0	-10.9
1.592	24.7	20.2	44.9	56.0	-11.1
0.526	24.5	20.2	44.7	56.0	-11.3
0.880	24.5	20.2	44.7	56.0	-11.3
10.939	26.8	20.6	47.4	60.0	-12.6
11.011	26.4	20.6	47.0	60.0	-13.0
8.400	25.7	20.6	46.3	60.0	-13.7
0.220	27.8	20.6	48.4	62.8	-14.4
0.290	25.1	20.3	45.4	60.5	-15.1
0.430	20.7	20.2	40.9	57.3	-16.4
0.340	22.5	20.2	42.7	59.2	-16.5
13.560	21.6	20.8	42.4	60.0	-17.6
14.130	20.8	20.8	41.6	60.0	-18.4
0.652	16.6	20.2	36.8	56.0	-19.2
29.627	18.2	22.4	40.6	60.0	-19.4
29.700	18.1	22.4	40.5	60.0	-19.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.733	34.1	20.4	54.5	46.0	8.5
4.130	27.9	20.4	48.3	46.0	2.3
5.260	27.5	20.4	47.9	50.0	-2.1
0.526	23.6	20.2	43.8	46.0	-2.2
1.052	20.8	20.2	41.0	46.0	-5.0
3.160	20.1	20.3	40.4	46.0	-5.6
10.790	23.5	20.6	44.1	50.0	-5.9
10.939	23.5	20.6	44.1	50.0	-5.9
11.011	23.0	20.6	43.6	50.0	-6.4
2.100	19.1	20.3	39.4	46.0	-6.6
1.090	19.1	20.2	39.3	46.0	-6.7
7.610	22.3	20.4	42.7	50.0	-7.3
7.750	22.2	20.5	42.7	50.0	-7.3
2.825	17.4	20.3	37.7	46.0	-8.3
0.430	17.1	20.2	37.3	47.3	-10.0
1.448	15.8	20.2	36.0	46.0	-10.0
0.290	19.5	20.3	39.8	50.5	-10.7
1.670	15.0	20.2	35.2	46.0	-10.8
0.220	21.1	20.6	41.7	52.8	-11.1
0.796	14.5	20.2	34.7	46.0	-11.3
13.560	17.8	20.8	38.6	50.0	-11.4
0.652	13.4	20.2	33.6	46.0	-12.4
15.070	15.0	20.9	35.9	50.0	-14.1
29.490	12.8	22.5	35.3	50.0	-14.7
29.560	12.8	22.5	35.3	50.0	-14.7

CONCLUSION

See Certificate of Test for Results.



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-12-08
Customer:	Garrett Metal Detectors	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	44.3%
Customer Project:	None	Bar. Pressure (PMSL):	1009 mb
Tested By:	Jarrod Brenden	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	24	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

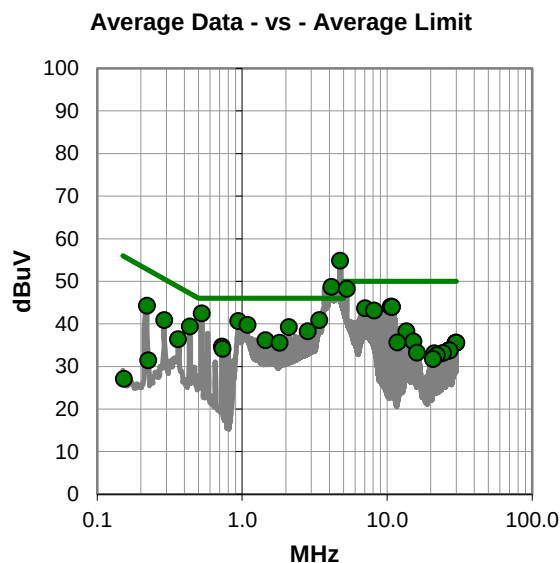
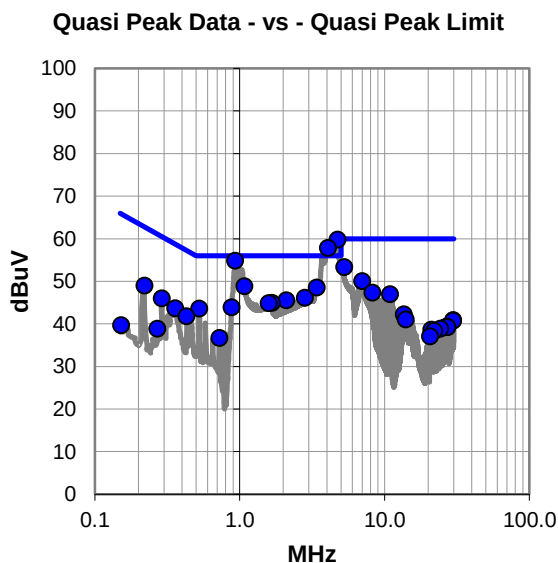
Floor Standing Equipment. Class A Commercial Product. Primary power cord tested, redundant power disconnected.
Antenna path terminated with load.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #24

Quasi Peak Data - vs - Quasi Peak Limit

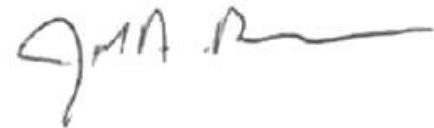
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.740	39.4	20.4	59.8	56.0	3.8
4.058	37.5	20.4	57.9	56.0	1.9
0.931	34.7	20.2	54.9	56.0	-1.1
5.260	33.0	20.4	53.4	60.0	-6.6
1.080	28.7	20.2	48.9	56.0	-7.1
3.406	28.2	20.4	48.6	56.0	-7.4
2.825	25.9	20.3	46.2	56.0	-9.8
7.028	29.7	20.4	50.1	60.0	-9.9
2.100	25.3	20.3	45.6	56.0	-10.4
1.670	24.8	20.2	45.0	56.0	-11.0
1.590	24.7	20.2	44.9	56.0	-11.1
0.880	23.7	20.2	43.9	56.0	-12.1
0.526	23.4	20.2	43.6	56.0	-12.4
8.260	26.9	20.5	47.4	60.0	-12.6
10.940	26.4	20.6	47.0	60.0	-13.0
0.220	28.4	20.6	49.0	62.8	-13.8
0.290	25.7	20.3	46.0	60.5	-14.5
0.360	23.5	20.2	43.7	58.7	-15.0
0.430	21.6	20.2	41.8	57.3	-15.5
13.560	21.6	20.8	42.3	60.0	-17.7
13.985	20.3	20.8	41.1	60.0	-18.9
29.708	18.5	22.4	40.9	60.0	-19.1
29.780	18.4	22.4	40.8	60.0	-19.2
0.724	16.5	20.2	36.7	56.0	-19.3
26.520	16.7	22.6	39.3	60.0	-20.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.740	34.5	20.4	54.9	46.0	8.9
4.130	28.3	20.4	48.7	46.0	2.7
5.260	27.9	20.4	48.3	50.0	-1.7
0.526	22.3	20.2	42.5	46.0	-3.5
3.406	20.5	20.4	40.9	46.0	-5.1
0.940	20.5	20.2	40.7	46.0	-5.3
10.579	23.5	20.6	44.1	50.0	-5.9
10.723	23.5	20.6	44.1	50.0	-5.9
10.795	23.4	20.6	44.0	50.0	-6.0
1.090	19.6	20.2	39.8	46.0	-6.2
7.028	23.3	20.4	43.7	50.0	-6.3
2.100	19.0	20.3	39.3	46.0	-6.7
8.120	22.7	20.5	43.2	50.0	-6.8
0.436	19.2	20.2	39.4	47.1	-7.7
2.825	18.0	20.3	38.3	46.0	-7.7
0.220	23.7	20.6	44.3	52.8	-8.5
0.290	20.6	20.3	40.9	50.5	-9.6
1.448	16.0	20.2	36.2	46.0	-9.8
1.810	15.3	20.3	35.6	46.0	-10.4
0.724	14.5	20.2	34.7	46.0	-11.3
13.560	17.5	20.8	38.3	50.0	-11.7
0.730	14.0	20.2	34.2	46.0	-11.8
0.360	16.2	20.2	36.4	48.7	-12.3
15.140	15.0	20.9	35.9	50.0	-14.1
11.740	15.0	20.7	35.7	50.0	-14.3

CONCLUSION

See Certificate of Test for Results.



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-12-08
Customer:	Garrett Metal Detectors	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	44.3%
Customer Project:	None	Bar. Pressure (PMSL):	1009 mb
Tested By:	Jarrod Brenden	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	25	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

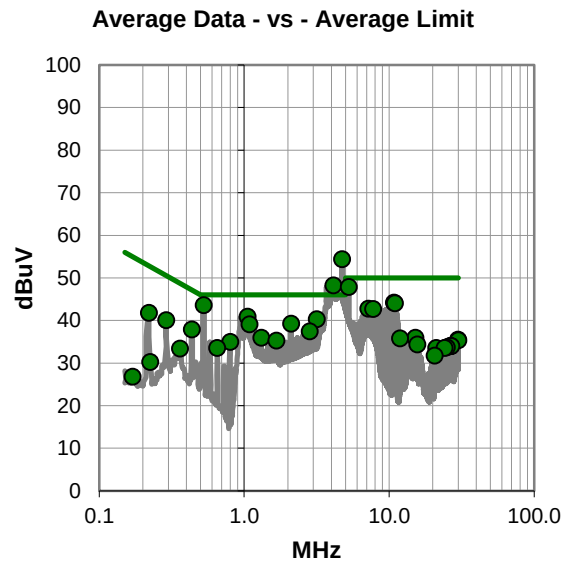
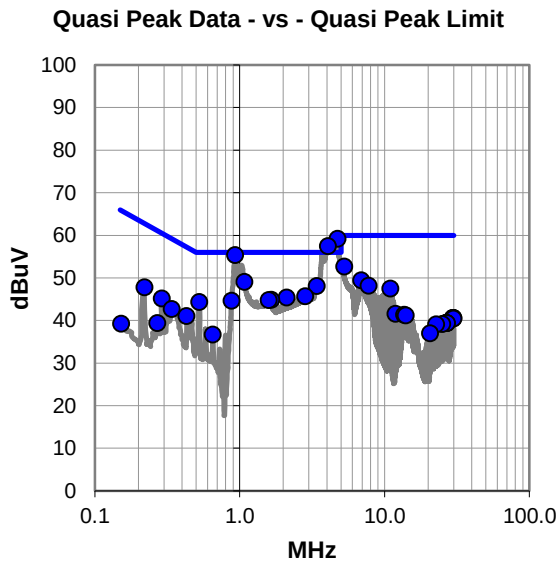
Floor Standing Equipment. Class A Commercial Product. Primary power cord tested, redundant power disconnected. All radios disabled; inductive loops, 13.56 MHz NFC, and 2.4GHz Bluetooth LE. EUT tested independently to FCC 15.107, Class A and meets those requirements and use cases.

EUT OPERATING MODES

Idle / Standby

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #25

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.738	38.8	20.4	59.2	56.0	3.2
4.058	37.1	20.4	57.5	56.0	1.5
0.931	35.2	20.2	55.4	56.0	-0.6
1.080	28.9	20.2	49.1	56.0	-6.9
5.264	32.3	20.4	52.7	60.0	-7.3
3.406	27.7	20.4	48.1	56.0	-7.9
2.830	25.4	20.3	45.7	56.0	-10.3
6.890	29.1	20.4	49.5	60.0	-10.5
2.105	25.1	20.3	45.4	56.0	-10.6
1.650	24.7	20.2	44.9	56.0	-11.1
1.590	24.6	20.2	44.8	56.0	-11.2
0.880	24.5	20.2	44.7	56.0	-11.3
0.526	24.2	20.2	44.4	56.0	-11.6
7.757	27.7	20.5	48.2	60.0	-11.8
10.950	26.9	20.6	47.5	60.0	-12.5
0.220	27.2	20.6	47.8	62.8	-15.0
0.290	24.9	20.3	45.2	60.5	-15.3
0.430	20.9	20.2	41.1	57.3	-16.2
0.340	22.5	20.2	42.7	59.2	-16.5
11.888	20.9	20.7	41.6	60.0	-18.4
13.630	20.6	20.8	41.4	60.0	-18.6
13.990	20.4	20.8	41.2	60.0	-18.8
0.652	16.5	20.2	36.7	56.0	-19.3
29.578	18.1	22.5	40.6	60.0	-19.4
29.800	18.2	22.4	40.6	60.0	-19.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.738	34.0	20.4	54.4	46.0	8.4
4.130	27.9	20.4	48.3	46.0	2.3
5.264	27.5	20.4	47.9	50.0	-2.1
0.526	23.4	20.2	43.6	46.0	-2.4
1.052	20.7	20.2	40.9	46.0	-5.1
3.158	20.0	20.3	40.3	46.0	-5.7
10.800	23.6	20.6	44.2	50.0	-5.8
10.950	23.5	20.6	44.1	50.0	-5.9
2.105	19.0	20.3	39.3	46.0	-6.7
1.090	18.9	20.2	39.1	46.0	-6.9
7.177	22.4	20.4	42.8	50.0	-7.2
7.757	22.2	20.5	42.7	50.0	-7.3
2.830	17.2	20.3	37.5	46.0	-8.5
0.436	17.7	20.2	37.9	47.1	-9.2
1.310	15.8	20.2	36.0	46.0	-10.0
0.290	19.8	20.3	40.1	50.5	-10.4
1.670	15.1	20.2	35.3	46.0	-10.7
0.220	21.2	20.6	41.8	52.8	-11.0
0.800	14.8	20.2	35.0	46.0	-11.0
0.652	13.4	20.2	33.6	46.0	-12.4
15.151	15.1	20.9	36.0	50.0	-14.0
11.888	15.1	20.7	35.8	50.0	-14.2
29.870	13.1	22.4	35.5	50.0	-14.5
29.940	13.1	22.3	35.4	50.0	-14.6
0.360	13.2	20.2	33.4	48.7	-15.3

CONCLUSION

Evaluation

POWERLINE CONDUCTED EMISSIONS

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-12-08
Customer:	Garrett Metal Detectors	Temperature:	24.3°C
Attendees:	None	Relative Humidity:	44.3%
Customer Project:	None	Bar. Pressure (PMSL):	1009 mb
Tested By:	Jarrod Brenden	Job Site:	TX01
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2023	ANSI C63.10:2013
RSS-Gen Issue 5:2018+A1:2019+A2:2021	ANSI C63.10:2013

TEST PARAMETERS

Run #:	26	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

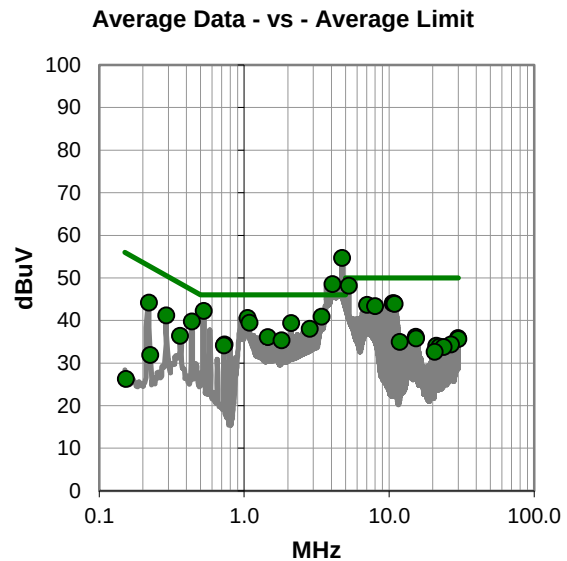
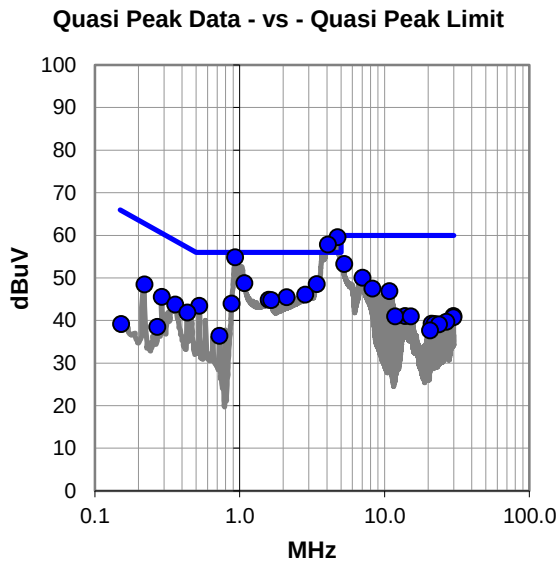
Floor Standing Equipment. Class A Commercial Product. Primary power cord tested, redundant power disconnected. All radios disabled; inductive loops, 13.56 MHz NFC, and 2.4GHz Bluetooth LE. EUT tested independently to FCC 15.107, Class A and meets those requirements and use cases.

EUT OPERATING MODES

Idle / Standby

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #26

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.738	39.2	20.4	59.6	56.0	3.6
4.060	37.5	20.4	57.9	56.0	1.9
0.931	34.7	20.2	54.9	56.0	-1.1
5.264	32.9	20.4	53.3	60.0	-6.7
1.080	28.6	20.2	48.8	56.0	-7.2
3.410	28.2	20.4	48.6	56.0	-7.4
7.033	29.7	20.4	50.1	60.0	-9.9
2.830	25.8	20.3	46.1	56.0	-9.9
2.105	25.2	20.3	45.5	56.0	-10.5
1.590	24.7	20.2	44.9	56.0	-11.1
1.650	24.6	20.2	44.8	56.0	-11.2
0.880	23.8	20.2	44.0	56.0	-12.0
8.266	27.0	20.5	47.5	60.0	-12.5
0.526	23.3	20.2	43.5	56.0	-12.5
10.804	26.3	20.6	46.9	60.0	-13.1
0.220	27.9	20.6	48.5	62.8	-14.3
0.290	25.3	20.3	45.6	60.5	-14.9
0.360	23.6	20.2	43.8	58.7	-14.9
0.436	21.7	20.2	41.9	57.1	-15.2
13.850	20.3	20.8	41.1	60.0	-18.9
29.875	18.7	22.4	41.1	60.0	-18.9
11.820	20.3	20.7	41.0	60.0	-19.0
15.227	20.1	20.9	41.0	60.0	-19.0
29.947	18.5	22.3	40.8	60.0	-19.2
0.724	16.2	20.2	36.4	56.0	-19.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
4.738	34.3	20.4	54.7	46.0	8.7
4.060	28.2	20.4	48.6	46.0	2.6
5.264	27.8	20.4	48.2	50.0	-1.8
0.526	22.1	20.2	42.3	46.0	-3.7
3.410	20.5	20.4	40.9	46.0	-5.1
1.052	20.4	20.2	40.6	46.0	-5.4
10.590	23.5	20.6	44.1	50.0	-5.9
10.804	23.5	20.6	44.1	50.0	-5.9
10.876	23.3	20.6	43.9	50.0	-6.1
7.033	23.3	20.4	43.7	50.0	-6.3
1.090	19.3	20.2	39.5	46.0	-6.5
7.980	22.9	20.5	43.4	50.0	-6.6
2.105	19.1	20.3	39.4	46.0	-6.6
0.436	19.6	20.2	39.8	47.1	-7.3
2.830	17.8	20.3	38.1	46.0	-7.9
0.220	23.6	20.6	44.2	52.8	-8.6
0.290	20.9	20.3	41.2	50.5	-9.3
1.450	15.9	20.2	36.1	46.0	-9.9
1.813	15.1	20.3	35.4	46.0	-10.6
0.730	14.2	20.2	34.4	46.0	-11.6
0.724	14.0	20.2	34.2	46.0	-11.8
0.360	16.2	20.2	36.4	48.7	-12.3
15.227	15.3	20.9	36.2	50.0	-13.8
29.875	13.5	22.4	35.9	50.0	-14.1
15.299	14.9	20.9	35.8	50.0	-14.2

CONCLUSION

Evaluation

EMISSIONS BANDWIDTH (20 DB)

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer.

As defined in FCC 15.215 Part (c), intentional radiators 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 designed in the rule section under which the equipment is operated.

The 20 dB bandwidth must be contained within the band 13.110-14.010 MHz. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the emissions bandwidth (EBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto and a peak detector was used.

The spectrum analyzer bandwidth measurement function was used to measure the 20 dB bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2023-03-17	2024-03-17
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXJ	2023-08-30	2024-08-30
Probe - Near Field Set	ETS Lindgren	7405	IPS	NCR	NCR
Power Supply - DC	Ametek Programmable Power, Inc.	Sorenson XEL30-3D	TQE	NCR	NCR

EMISSIONS BANDWIDTH (20 DB)



EUT:	Walk Through Metal Detector	Work Order:	GARR0118
Serial Number:	63202294	Date:	2024-02-02
Customer:	Garrett Metal Detectors	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	40.2%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mbar
Tested By:	Jarrod Brenden	Job Site:	TX07
Power:	110 VAC / 60 Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013
RSS-210 Issue 10:2019+A1:2020	ANSI C63.10:2013

COMMENTS

Floor Standing Equipment. Inductive loop radio antenna disabled.
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DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

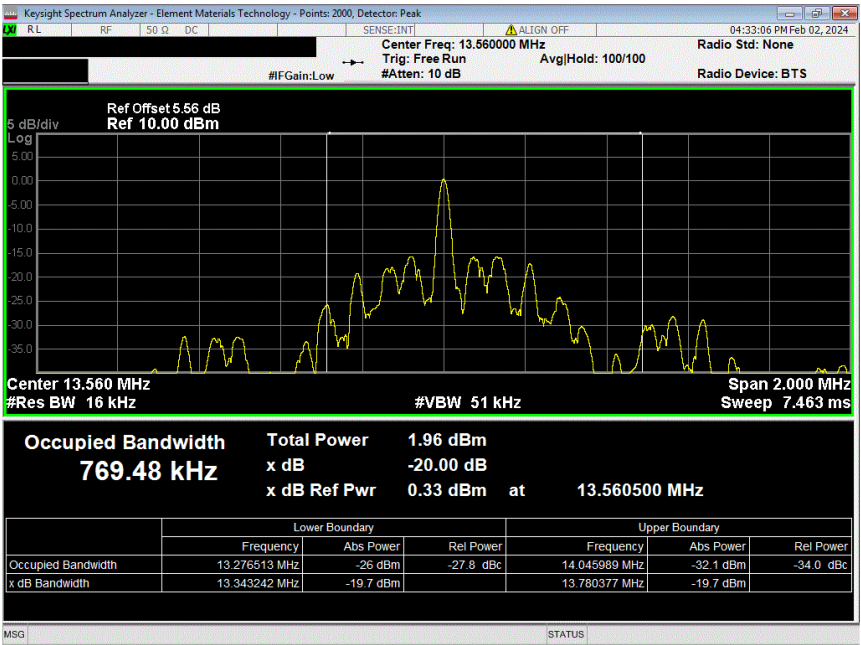
Pass

Tested By

TEST RESULTS

	Value	Limit	Result
13.56 MHz NFC A			
Normal Conditions	437.1 kHz	Within Band	Pass

EMISSIONS BANDWIDTH (20 DB)



13.56 MHz NFC
Normal Conditions

FIELD STRENGTH OF FUNDAMENTAL

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was maximized by rotating the EUT on a turntable and adjusting the measurement antenna height and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	ETS Lindgren	6502	AZM	2022-07-19	2024-07-19
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	2023-05-25	2024-05-25
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.8 dB	-1.8 dB

FREQUENCY RANGE INVESTIGATED

12.06 MHz TO 15.06 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

GARR0118-1

MODES INVESTIGATED

Transmitting 13.56 MHz, NFC A

FIELD STRENGTH OF FUNDAMENTAL

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-11-08
Customer:	Garrett Metal Detectors	Temperature:	22°C
Attendees:	None	Relative Humidity:	49.7%
Customer Project:	None	Bar. Pressure (PMSL):	979 mb
Tested By:	Jarrod Brenden	Job Site:	TX02
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013
RSS-210 Issue 10:2019+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	21	Test Distance (m):	10	Ant. Height(s) (m):	1(m)
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COMMENTS

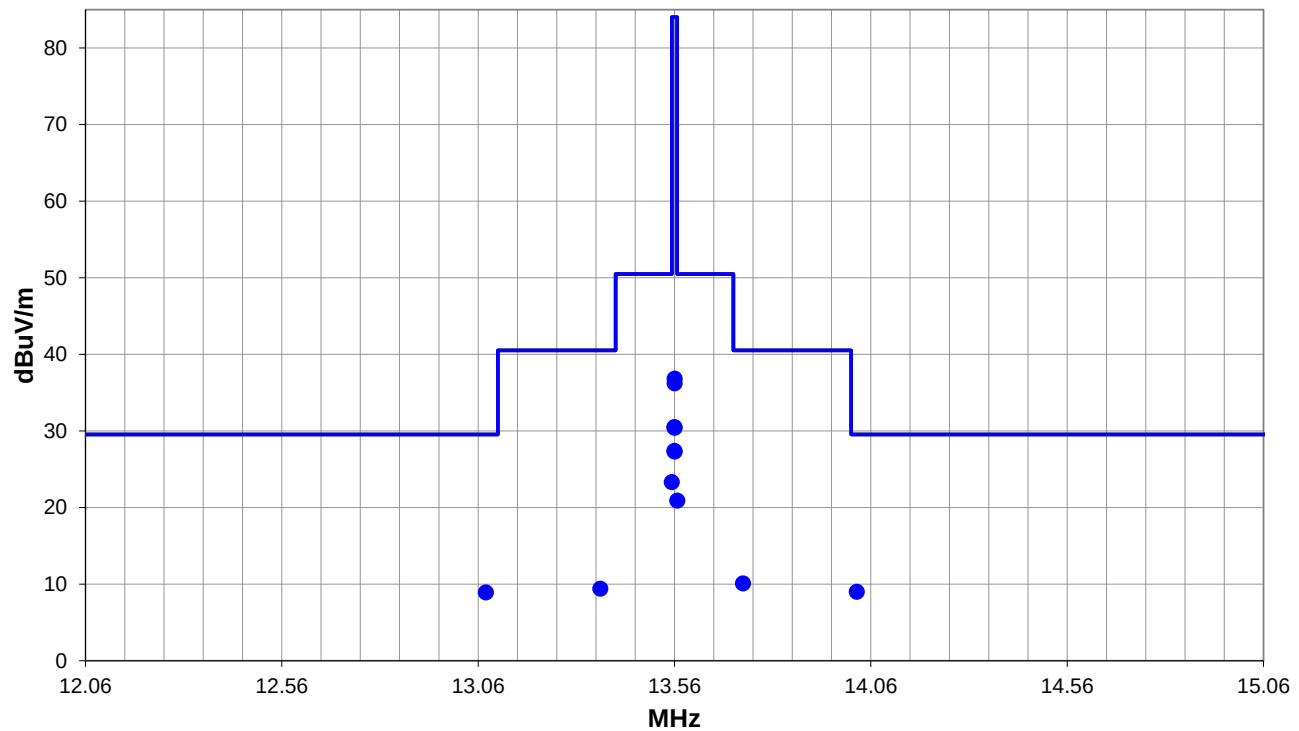
Floor Standing Equipment. Inductive loop radio antenna disabled. Line comments regarding Mode indicate pulse rate of Inductive coil; Mode 0 = 1580pps, Mode 2300 = 480pps.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



Run #: 21

PK AV QP

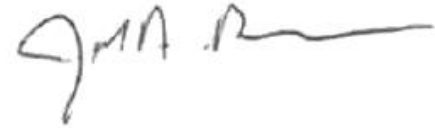
FIELD STRENGTH OF FUNDAMENTAL

RESULTS - Run #21

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
14.024	16.5	11.6	1.0	0.0	10.0	0.0	Perp to EUT	QP	-19.1	9.0	29.5	-20.5	Mode 0
13.080	16.4	11.6	1.0	118.9	10.0	0.0	Perp to EUT	QP	-19.1	8.9	29.5	-20.6	Mode 0
13.553	30.8	11.6	1.0	184.9	10.0	0.0	Perp to EUT	QP	-19.1	23.3	50.5	-27.2	Mode 0
13.567	28.4	11.6	1.0	187.0	10.0	0.0	Perp to EUT	QP	-19.1	20.9	50.5	-29.6	Mode 0
13.735	17.6	11.6	1.0	140.0	10.0	0.0	Perp to EUT	QP	-19.1	10.1	40.5	-30.4	Mode 0
13.371	16.9	11.6	1.0	219.9	10.0	0.0	Perp to EUT	QP	-19.1	9.4	40.5	-31.1	Mode 0
13.560	44.3	11.6	1.0	183.9	10.0	0.0	Perp to EUT	QP	-19.1	36.8	84.0	-47.2	Mode 0
13.560	43.7	11.6	1.0	130.9	10.0	0.0	Perp to EUT	QP	-19.1	36.2	84.0	-47.8	Mode 2300
13.560	38.0	11.6	1.0	190.9	10.0	0.0	Para to EUT	QP	-19.1	30.5	84.0	-53.5	Mode 2300
13.560	37.9	11.6	1.0	190.9	10.0	0.0	Para to EUT	QP	-19.1	30.4	84.0	-53.6	Mode 0
13.560	34.9	11.6	1.0	189.9	10.0	0.0	Para to GND	QP	-19.1	27.4	84.0	-56.6	Mode 2300
13.560	34.8	11.6	1.0	195.0	10.0	0.0	Para to GND	QP	-19.1	27.3	84.0	-56.7	Mode 0

CONCLUSION

Pass



Tested By

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). An active loop antenna was used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

The limits in CFR 47, Part 15C 15.209(a) are identical to those in RSS-Gen section 8.9 Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, an E-Field measurement in dBuV/m can be converted to dBuA/m via the following formula: $\text{dBuV/m} - 51.5 \text{ dB} = \text{dBuA/m}$. E-Field measurements have the same margin in dB to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limits..

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	ETS Lindgren	6502	AZM	2022-07-19	2024-07-19
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	2023-05-25	2024-05-25
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.8 dB	-1.8 dB

FREQUENCY RANGE INVESTIGATED

490 kHz TO 30 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

GARR0118-1

MODES INVESTIGATED

Transmitting 13.56 MHz, NFC A

FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-11-08
Customer:	Garrett Metal Detectors	Temperature:	22°C
Attendees:	None	Relative Humidity:	49.7%
Customer Project:	None	Bar. Pressure (PMSL):	979 mb
Tested By:	Jarrod Brenden	Job Site:	TX02
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013
RSS-210 Issue 10:2019+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	25	Test Distance (m):	10	Ant. Height(s) (m):	1(m)
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COMMENTS

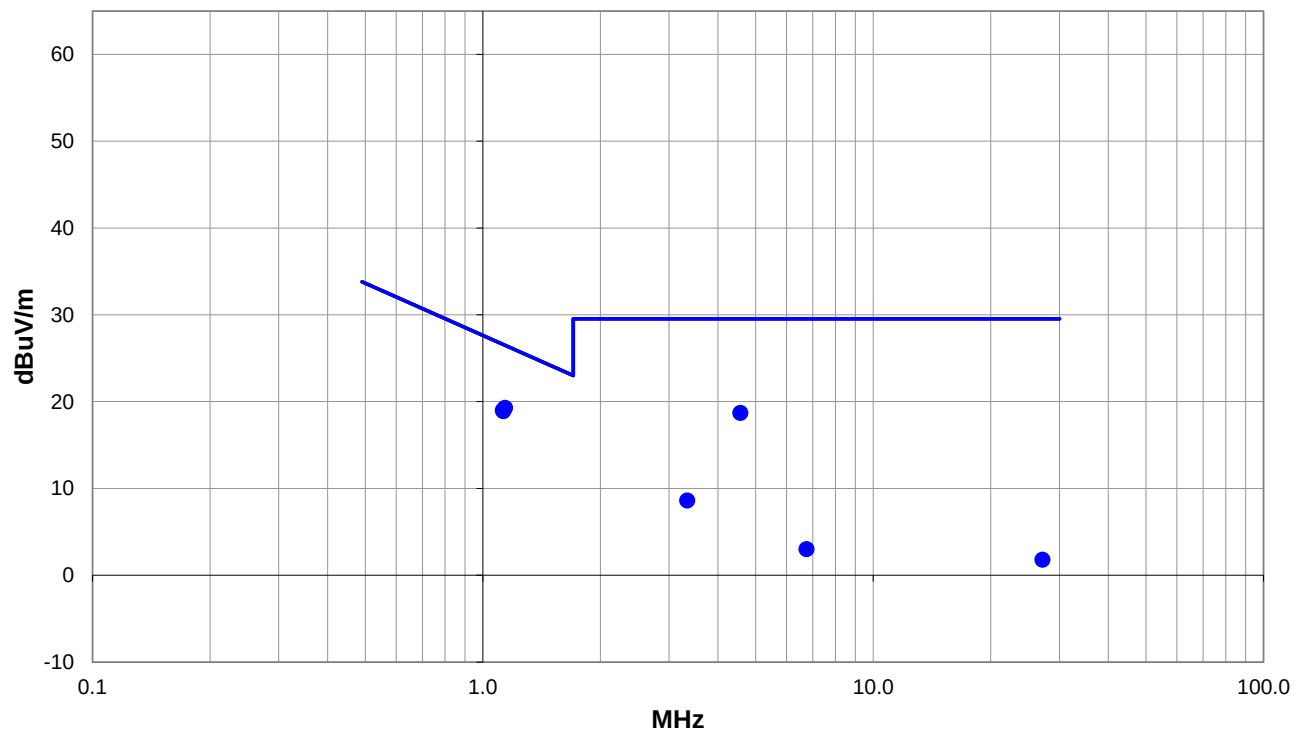
Floor Standing Equipment. Inductive detection loop radio antenna disabled with software controls.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



Run #: 25

■ PK ◆ AV ● QP

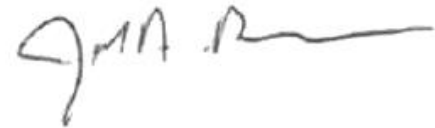
FIELD STRENGTH OF SPURIOUS EMISSIONS (LESS THAN 30 MHz)

RESULTS - Run #25

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
1.140	27.1	11.3	1.0	157.0	10.0	0.0	Perp to EUT	QP	-19.1	19.3	26.5	-7.2
1.124	26.8	11.3	1.0	141.9	10.0	0.0	Para to EUT	QP	-19.1	19.0	26.6	-7.6
1.129	26.7	11.3	1.0	219.0	10.0	0.0	Para to GND	QP	-19.1	18.9	26.6	-7.7
4.569	26.0	11.8	1.0	135.0	10.0	0.0	Perp to EUT	QP	-19.1	18.7	29.5	-10.8
3.336	16.1	11.6	1.0	24.0	10.0	0.0	Perp to EUT	QP	-19.1	8.6	29.5	-20.9
6.745	10.4	11.7	1.0	63.9	10.0	0.0	Perp to EUT	QP	-19.1	3.0	29.5	-26.5
27.135	10.9	10.0	1.0	210.0	10.0	0.0	Perp to EUT	QP	-19.1	1.8	29.5	-27.7

CONCLUSION

Pass



Tested By

FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the operating channel.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Antenna - Biconilog	ETS Lindgren	3143B	AYF	2023-05-03	2025-05-03
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	2023-05-25	2024-05-25
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	2023-04-11	2024-04-11
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	2023-07-21	2024-07-21

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	4.7 dB	-4.7 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

GARR0118-1

MODES INVESTIGATED

Transmitting 13.56 MHz, NFC A

FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

EUT:	Paragon	Work Order:	GARR0118
Serial Number:	63202294	Date:	2023-11-08
Customer:	Garrett Metal Detectors	Temperature:	22°C
Attendees:	None	Relative Humidity:	49.7%
Customer Project:	None	Bar. Pressure (PMSL):	979 mb
Tested By:	Jarrod Brenden	Job Site:	TX02
Power:	110VAC/60Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013
RSS-210 Issue 10:2019+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	29	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

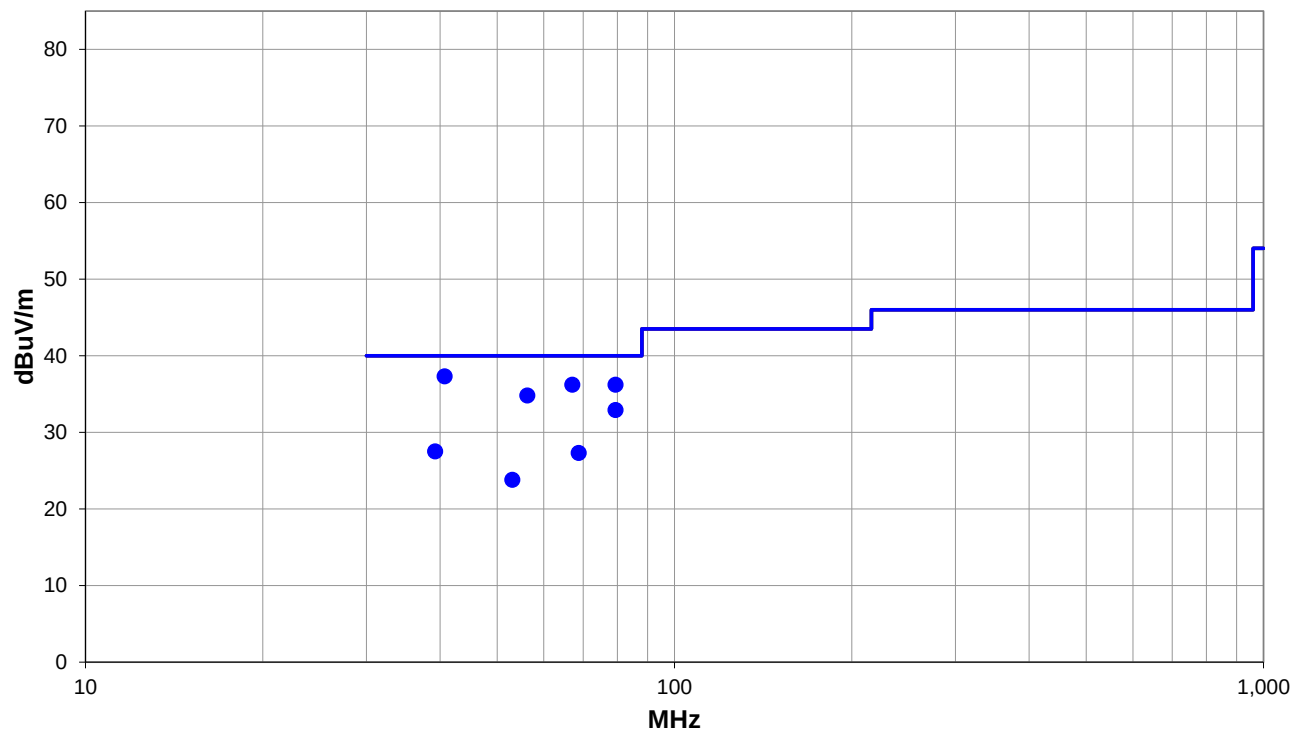
Floor Standing Equipment. Inductive detection loop radio antenna disabled with software controls.

EUT OPERATING MODES

Transmitting 13.56 MHz, NFC A

DEVIATIONS FROM TEST STANDARD

None



Run #: 29

■ PK ◆ AV ● QP

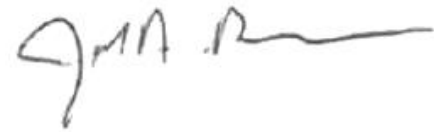
FIELD STRENGTH OF SPURIOUS EMISSIONS (GREATER THAN 30 MHz)

RESULTS - Run #29

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)
40.702	60.7	-23.4	1.0	294.0	3.0	0.0	Vert	QP	0.0	37.3	40.0	-2.7
67.069	62.2	-26.0	1.09	63.0	3.0	0.0	Vert	QP	0.0	36.2	40.0	-3.8
79.373	62.1	-25.9	1.0	21.9	3.0	0.0	Vert	QP	0.0	36.2	40.0	-3.8
56.266	61.5	-26.7	1.4	122.0	3.0	0.0	Vert	QP	0.0	34.8	40.0	-5.2
79.375	58.8	-25.9	2.12	135.0	3.0	0.0	Horz	QP	0.0	32.9	40.0	-7.1
39.243	50.1	-22.6	2.78	255.0	3.0	0.0	Horz	QP	0.0	27.5	40.0	-12.5
68.782	53.2	-25.9	2.41	160.9	3.0	0.0	Horz	QP	0.0	27.3	40.0	-12.7
53.028	50.8	-27.0	3.76	177.0	3.0	0.0	Horz	QP	0.0	23.8	40.0	-16.2

CONCLUSION

Pass



Tested By

FREQUENCY STABILITY

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer.

The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made on the single transmit frequency as called out on the data sheets. Testing was done while the EUT was continuously polling.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage while at ambient temperature. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range of -20 ° to +50° C and at 10°C intervals.

The requirement of a frequency tolerance of $\pm 0.01\%$ is equivalent to 100 ppm
The formula to check for compliance is:

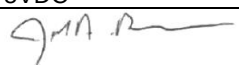
$$\text{ppm} = (\text{Measured Frequency} / \text{Measured Nominal Frequency} - 1) * 1,000,000$$

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2023-03-17	2024-03-17
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXJ	2023-08-30	2024-08-30
Probe - Near Field Set	ETS Lindgren	7405	IPS	NCR	NCR
Power Supply - DC	Ametek Programmable Power, Inc.	Sorenson XEL30-3D	TQE	NCR	NCR
Thermometer	Omega Engineering, Inc.	HH311	DUI	2023-03-02	2024-03-02
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPH-8-2-SCT/AC	TBH	NCR	NCR

FREQUENCY STABILITY



EUT:	Paragon	Work Order:	GARR0118
Serial Number:	2354000	Date:	2023-11-20
Customer:	Garrett Metal Detectors	Temperature:	20.3°C
Attendees:	None	Relative Humidity:	54.2%
Customer Project:	None	Bar. Pressure (PMSL):	1006 mbar
Tested By:	Jarrod Brenden	Job Site:	TX07
Power:	5VDC	Configuration:	GARR0118-2
Signature:			

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.225:2023	ANSI C63.10:2013
RSS-210 Issue 10:2019+A1:2020	ANSI C63.10:2013

COMMENTS

Radio component of Floor Standing Equipment.
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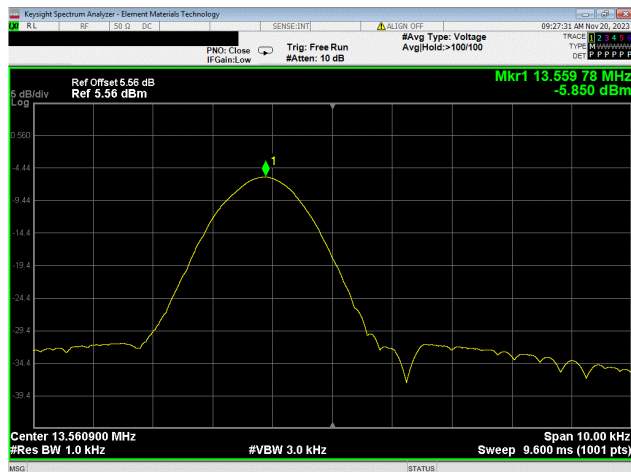
DEVIATIONS FROM TEST STANDARD

None

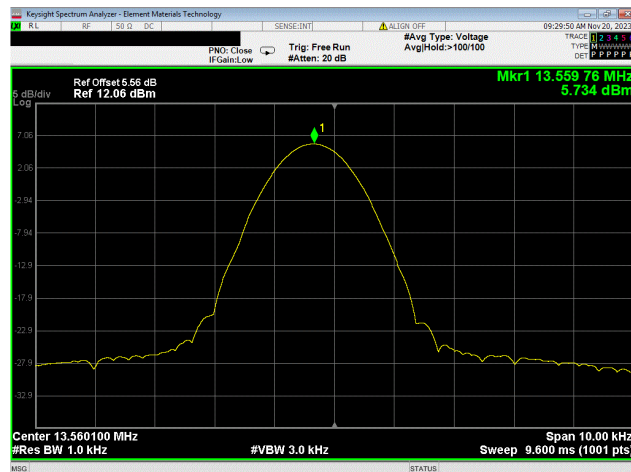
TEST RESULTS

	Measured Value (MHz)	Nominal Value (MHz)	Error (ppm)	Limit (ppm)	Results
13.56 MHz NFC A					
Normal Conditions	13.55978	13.55978	0	100	Pass
Extreme Voltage 115%	13.55976	13.55978	1.47	100	Pass
Extreme Voltage 85%	13.55971	13.55978	5.16	100	Pass
Extreme Temperature +50°C	13.55971	13.55978	5.16	100	Pass
Extreme Temperature +40°C	13.55967	13.55978	8.11	100	Pass
Extreme Temperature +30°C	13.55972	13.55978	4.42	100	Pass
Extreme Temperature +20°C	13.55971	13.55978	5.16	100	Pass
Extreme Temperature +10°C	13.55975	13.55978	2.21	100	Pass
Extreme Temperature +0°C	13.55976	13.55978	1.47	100	Pass
Extreme Temperature -10°C	13.55974	13.55978	2.95	100	Pass
Extreme Temperature -20°C	13.55975	13.55978	2.21	100	Pass

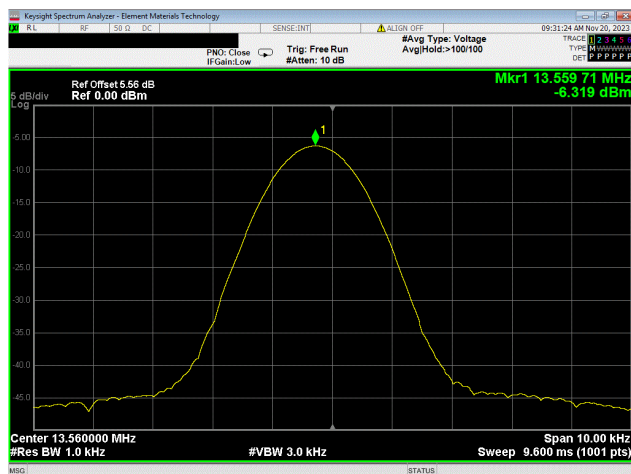
FREQUENCY STABILITY



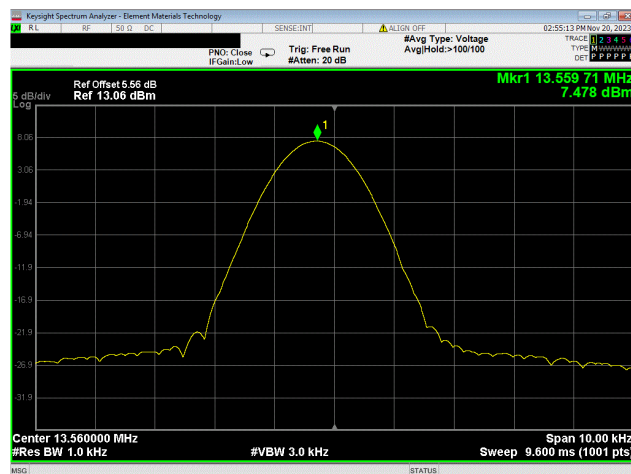
**13.56 MHz NFC
Normal Conditions**



**13.56 MHz NFC
Extreme Voltage 115%**

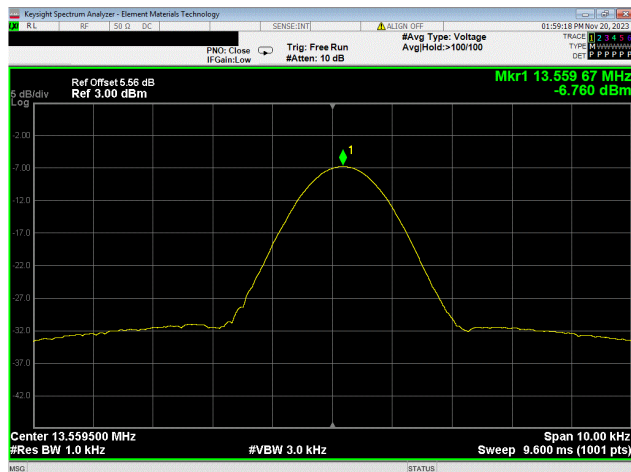


**13.56 MHz NFC
Extreme Voltage 85%**

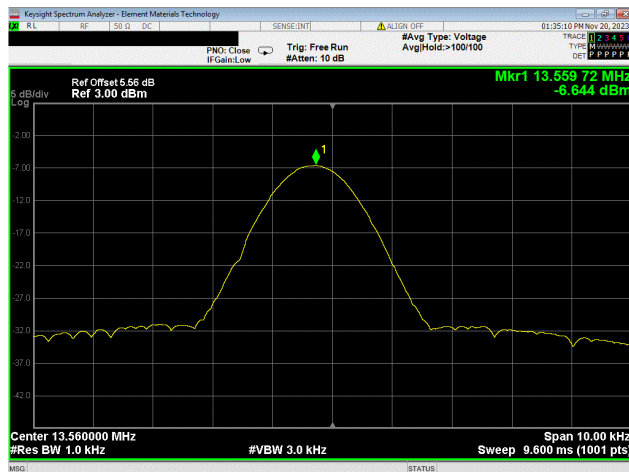


**13.56 MHz NFC
Extreme Temperature +50°C**

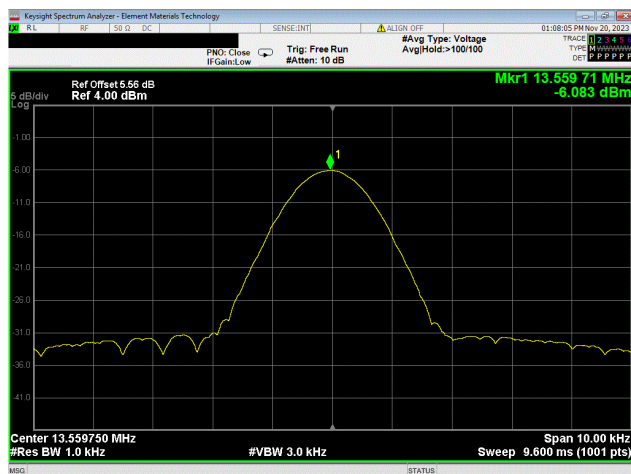
FREQUENCY STABILITY



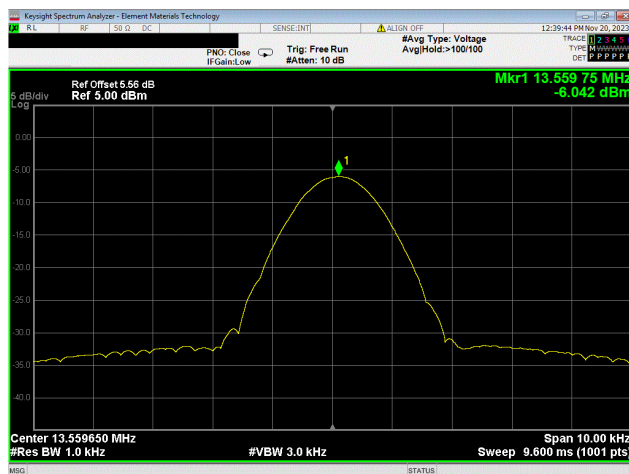
13.56 MHz NFC
Extreme Temperature +40°C



13.56 MHz NFC
Extreme Temperature +30°C

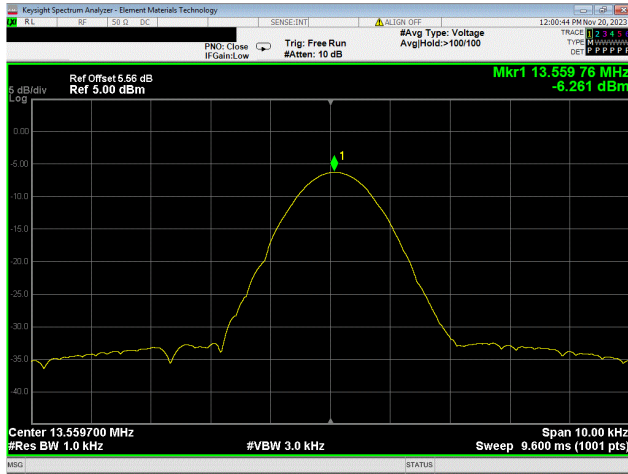


13.56 MHz NFC
Extreme Temperature +20°C

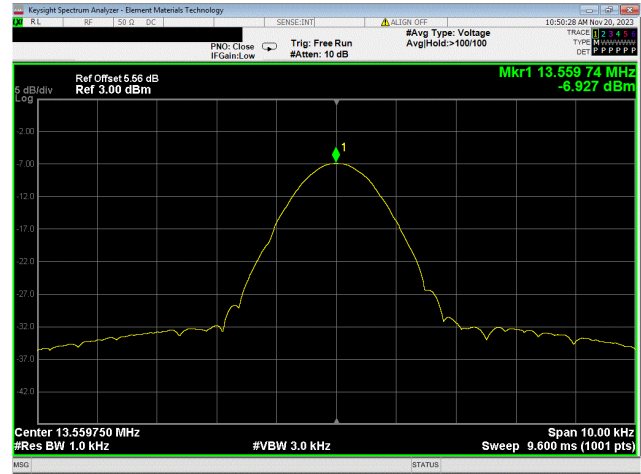


13.56 MHz NFC
Extreme Temperature +10°C

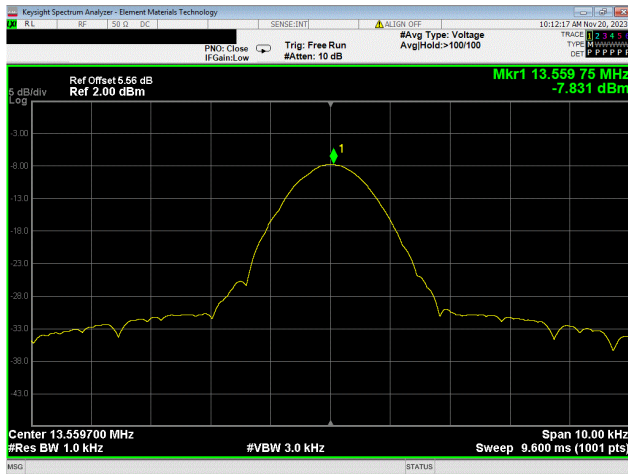
FREQUENCY STABILITY



13.56 MHz NFC
Extreme Temperature +0°C



13.56 MHz NFC
Extreme Temperature -10°C



13.56 MHz NFC
Extreme Temperature -20°C

OCCUPIED BANDWIDTH

TEST DESCRIPTION

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

A near-field probe was placed near the transmitter. A low-loss coaxial cable was used to connect the near-field probe to the spectrum analyzer.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth as defined in RSS-Gen.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

The spectrum analyzer occupied bandwidth measurement function was used to sum the power of the transmission in linear terms to obtain the 99% bandwidth.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2023-03-17	2024-03-17
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXJ	2023-08-30	2024-08-30
Probe - Near Field Set	ETS Lindgren	7405	IPS	NCR	NCR
Power Supply - DC	Ametek Programmable Power, Inc.	Sorenson XEL30-3D	TQE	NCR	NCR

OCCUPIED BANDWIDTH



EUT:	Walk Through Metal Detector	Work Order:	GARR0118
Serial Number:	63202294	Date:	2024-02-02
Customer:	Garrett Metal Detectors	Temperature:	22.4°C
Attendees:	None	Relative Humidity:	40%
Customer Project:	None	Bar. Pressure (PMSL):	1020 mbar
Tested By:	Jarrod Brenden	Job Site:	TX07
Power:	110 VAC / 60 Hz	Configuration:	GARR0118-1

TEST SPECIFICATIONS

Specification:	Method:
RSS-210 Issue 10:2019+A1:2020	ANSI C63.10:2013

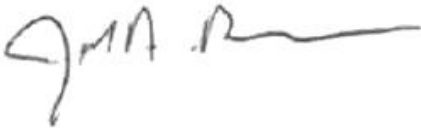
COMMENTS

Floor Standing Equipment. Inductive loop radio antenna disabled.
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DEVIATIONS FROM TEST STANDARD

None

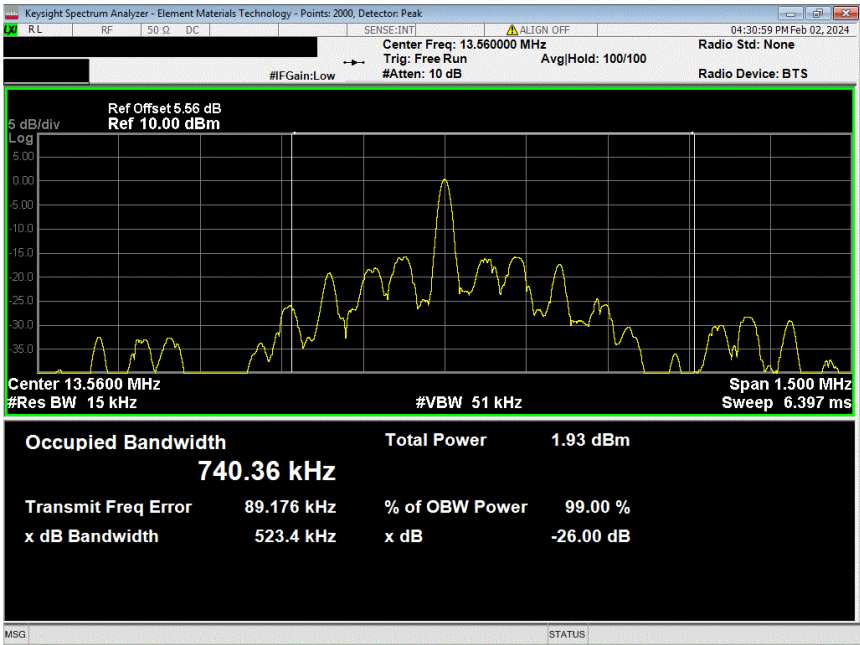
CONCLUSION

Pass	
	Tested By

TEST RESULTS

	Value	Limit	Result
13.56 MHz NFC A			
Normal Conditions	740.36 kHz	N/A	N/A

OCCUPIED BANDWIDTH



13.56 MHz NFC
Normal Conditions

End of Test Report