RF Test Report

Project Number:	**5224763**	**Proposal:**	**SUW-202407006851**
Report Number:	**5224763EMC03**	**Revision Level:**	**2**
Client:	**Renesas Electronics America, Inc**		

Equipment Under Test:	**Arduino Shield**
Model Number:	**WS031-NFCSchield-REFZ PTX105R Arduino Shield**
FCC ID:	**2AU6X-WS031NFCSD**
IC ID:	**20519-WS031NFCSD**

Applicable Standards:	**FCC Part 15 Subpart B, § 15.109**
	FCC Part 15 Subpart C, § 15.209; 15.215; 15.225
	ANSI C63.10: 2013
	RSS-210, Issue 11, June 2024
	RSS-GEN Issue 5, April 2018

Report issued on:	**30 October 2024**
Report revised on:	**10 April 2025**
Test Result:	**Compliant**

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01
This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Prepared by: Daniel Alvarez, RF/EMC Sr. Staff Engineer

Reviewed by: Martin Taylor, Project Engineer

Table of Contents

1 Summary of Test Results

Test Description	Test Specification	Test Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.203 RSS-GEN Section 8.3	Compliant
Bandwidth	15.215(c); RSS-GEN 6.7	Compliant
Radiated Emissions (Unintentional Radiator)	47 CFR Part 15, Subpart B 15.109 ANSI C63.4:2014, Section 8.3 RSS-210, A.1.2	Compliant
Field strength of fundamental	47 CFR Part 15, Subpart C 15.225; 15.209 ANSI C63.10:2013, Section 6.3 RSS-Gen S7.2.5	Compliant
Radiated Spurious Emissions	47 CFR Part 15, Subpart C; 15.215; 15.225; 15.209; RSS-210 B.6(a) ANSI C63.10:2013, Section 6.2 through 6.5	Compliant
Frequency Stability	15.225(e); RSS-210 B.6(b)	Compliant
Conducted Emissions	47 CFR Part 15, Subpart C 15.207 ANSI C63.10:2013, Section 6.2	N/A(1)

1) Product is DC powered. Test is not applicable.

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name:	Renesas Electronics America, Inc
Address:	710 Slater Rd, Suite 200
City, State, Zip, Country:	Morrisville, North Carolina 27560

2.2 *Test Laboratory*

Name:	SGS North America, Inc.
Address:	620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country:	Suwanee, GA 30024, USA
Accrediting Body:	A2LA
Type of lab:	Testing Laboratory
Certificate Number:	3212.01
ISED CAB Identifier:	US0186
FCC Designation Number:	US1126

2.3 *General Information of EUT*

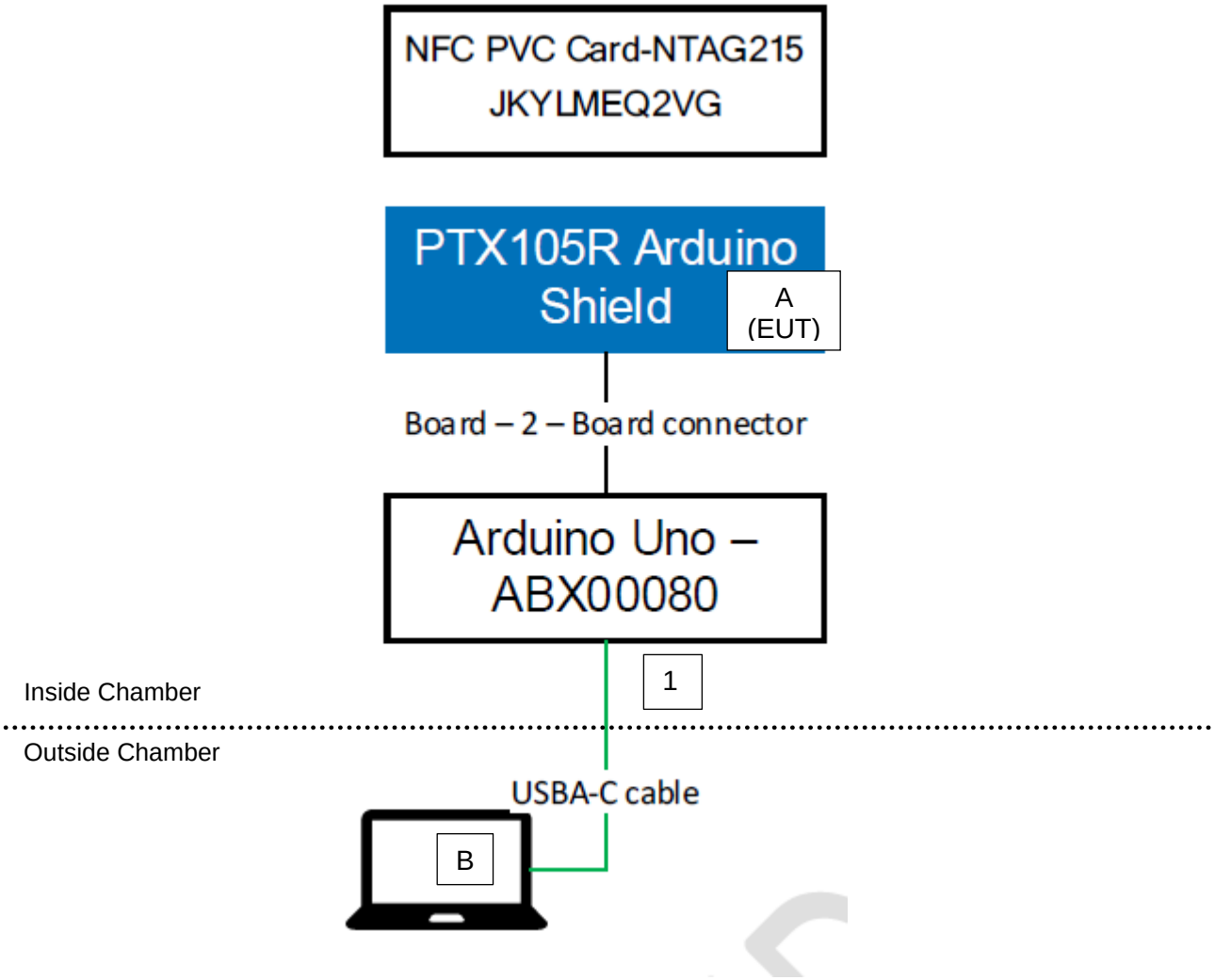
Product Marketing Name (PMN):	Arduino Shield
Model Number (HVIN):	WS031-NFCSchield-REFZ PTX105R Arduino Shield
Firmware Version ID (FVIN):	N/A
Serial Number:	SGS ID# 20240903638
FCC ID:	2AU6X-WS031NFCSD
ISED ID:	20519-WS031NFCSD
Operating Frequency:	13.56 MHz
Transmitter:	PTX105R NFC Reader
Data Modes:	RFID – ASK
Antenna:	PCB Loop Antenna*
Rated Voltage:	+5 VDC
Test Voltage:	+5 VDC
Sample Received Date:	14 September 2024
Dates of testing:	14 September 2024 – 08 April 2025

**Data was not measured; therefore, the lab is not responsible for accuracy. Data was obtained via customer, specification sheet, previous regulatory filing, or other means.*

2.4 *Operating Modes and Conditions*

During emissions testing, the EUT was powered and set into a test mode to exercise the product transmitter during testing. NFC was set with a high duty cycle and continuously read the RFID card during testing.

2.5 *EUT Connection Block Diagram – Radiated Measurements*



2.6 *System Configurations*

Device reference	Manufacturer	Description	Model Number	Serial Number
A	Renesas	Arduino Shield	WS031-NFCSchield-REFZ PTX105R Arduino Shield	SGS ID# 20240903638
B	Lenovo	ThinkPad	T440p	Lab PC#2

2.7 *Cable List*

Cable reference	Port Name	Start	End	Cable Length (m)	Ferrite installed?	Shielded?
1	USB Cable	EUT	External AC Adapter	1	N	N

3 Antenna Requirement

3.1 *Result*

Test Description	Test Specification		Test Result
Antenna requirement	FCC 15.203	RSS-GEN S8.3	Compliant

3.2 *Requirement*

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

3.3 *Conclusion*

PCB Loop Antenna is permanently attached and does not allow the user to disconnect. This meets the antenna requirements for FCC and ISED.

3.4 *Photograph*

The photograph of the antenna is shown in a separate exhibit.

4 Occupied Bandwidth

4.1 *Test Result*

Test Description	Basic Standards	Test Result
99% Bandwidth	RSS-GEN 6.7	Compliant
20dB Bandwidth	15.215(c)	Compliant

4.2 *Test Method*

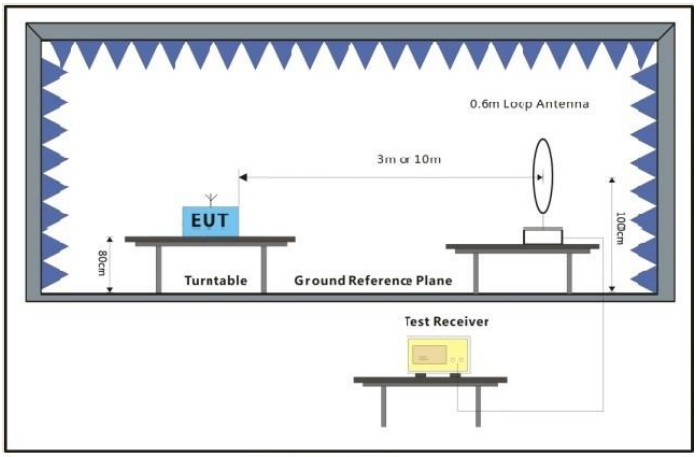
The 99% occupied bandwidth and 20dB down measurement was employed.

4.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.4 °C
Relative Humidity: 19.7 %
Atmospheric Pressure: 7.8 kPa



Below 30MHz

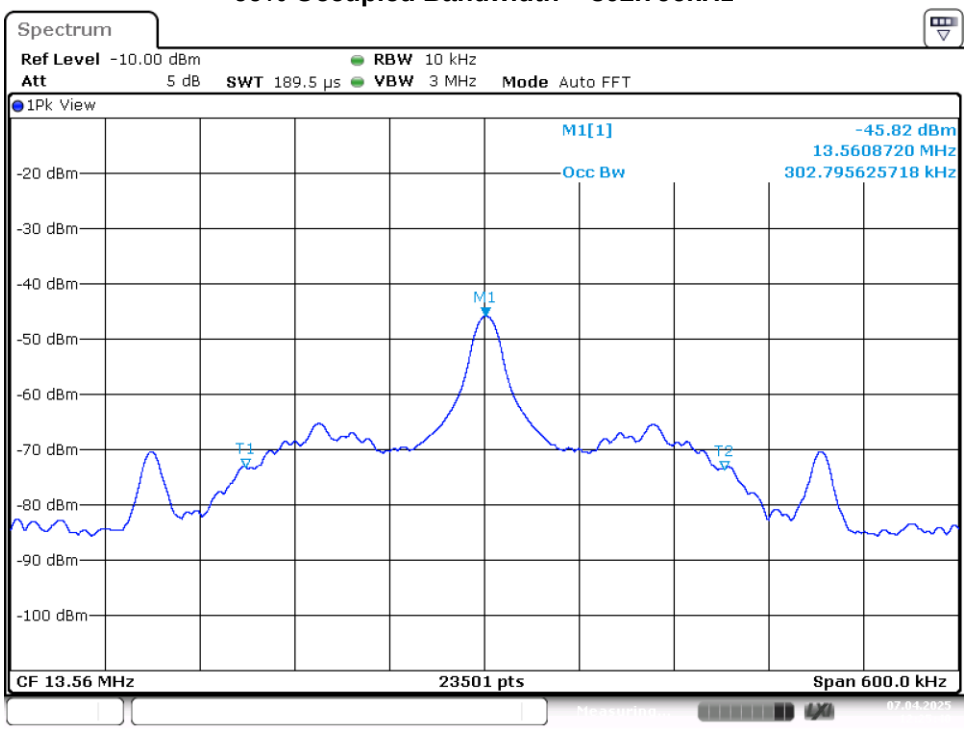
4.4 *Test Equipment*

Test End Date: 7-April-2025 Tester: DA

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE (TS8997)	HUBER & SUHNER	141	B095585	8-Jul-2024	8-Jul-2025
NEAR FIELD PROBES	COM-POWER CORPORATION	N/A	16016	CNR	CNR
SIGNAL ANALYZER (TS8997)	ROHDE & SCHWARZ	FSV30	B085749	4-Mar-2025	4-Mar-2026

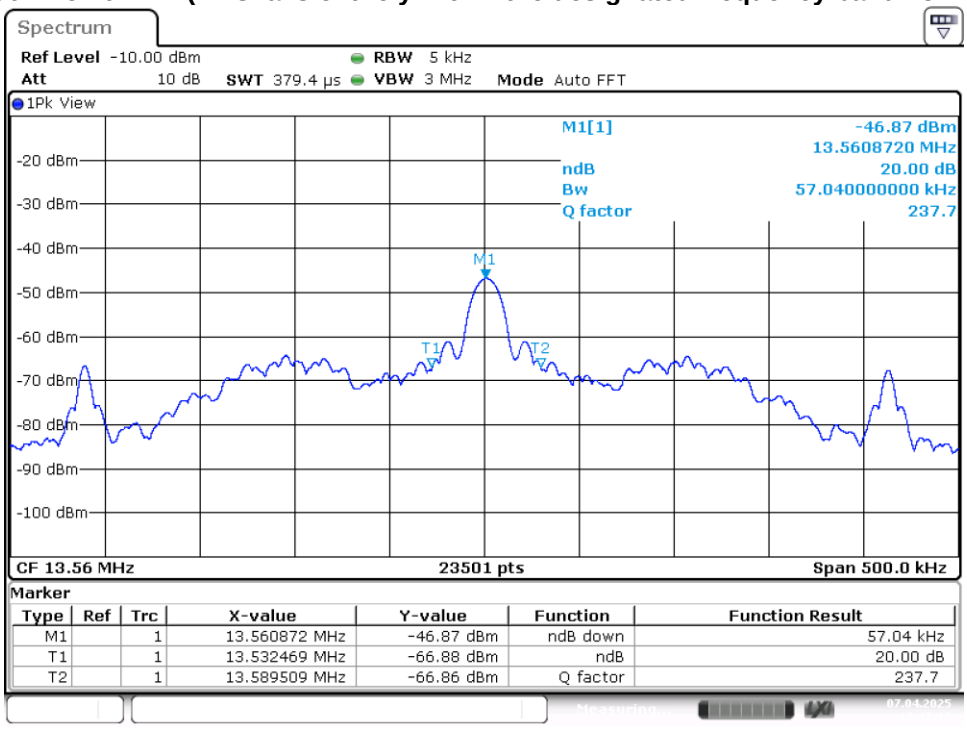
4.5 *Test Data*

99% Occupied Bandwidth = 302.796kHz



Date: 7.APR.2025 12:25:41

20dB Bandwidth = 57.04kHz (This falls entirely within the designated frequency band 13.110-14.010MHz)



Date: 7.APR.2025 12:47:18

5 Radiated Emissions

5.1 *Test Result*

Test Description	Basic Standards	Test Result
Radiated Emissions	FCC Part 15, Subpart B, 15.109 RSS-Gen S7.2.5 ANSI C63.4: 2014	Compliant

5.2 *Test Method*

Exploratory scans were performed over the frequency range as indicated in the tables below using the max hold function and incorporating a Peak detector and using TILE! software. The final test data was measured using a Quasi-Peak detector below 1GHz and a Peak and Average detector above 1GHz. The receivers resolution bandwidth was set to 1kHz for measurements taken below 150kHz, 9kHz for in the 150kHz to 30MHz range, 120 kHz in the 30MHz to 1GHz frequency range, and 1MHz for measurements of 1GHz and higher. For testing below 30MHz, a loop antenna was employed, and peak scans were taken with the loop open towards the EUT (Co-Axial) and with the loop in-line with the EUT (Co-Planar). Above 30MHz, a biconilog antenna was used and measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Radiated emissions limits (testing above 1GHz was not required for this device)

Frequency Range (MHz)	Limits (uV/m) Quasi-Peak or Average	Measurement Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note: Limits were converted to dBuV/m using the equation 20*LOG(x). Additionally, for measurements below 30MHz, the limits were adjusted to a distance of 3m using a 40dB/decade correction per §15.31(f)(2)

Example: at 20MHz, the limit is expressed as 30uV/m at 30m
20*log(30) = 29.5dBuV/m
30 to 3 meters is a single decade, so 29.5 + 40 = 69.5dBuV/m

5.3 *Test Site*

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature:	22.72
Relative Humidity:	55%
Atmospheric Pressure:	98.26 kPa

5.4 *Test Equipment*

Test End Date: 2-Oct-2024 Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
PASSIVE LOOP ANTENNA, 9KHZ - 30MHZ	ETS LINDGREN	6512	20151	13-Feb-2024	13-Feb-2025
N to N RF Cable	ECHELON	EM-B810NM-276	23007	31-Mar-2024	31-Mar-2025
N-FEMALE TO N-MALE RF CABLE	ECHELON	EM-B810NMNF-118	23010	17-Apr-2024	17-Apr-2025
RF CABLE NM TO NM, 0.01-18GHZ	TELEDYNE STORM MICROWAVE	90-195-118	20126	6-Feb-2024	6-Feb-2025
BROADBAND PREAMPLIFIER 9KHZ-2GHZ	SCHWARZBECK MESS ELEKTRONIK	BBV 9745	20157	10-Oct-2023	10-Oct-2024
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	22032	15-Nov-2023	15-Nov-2024

Software:
“Radiated Emissions” TILE! profile dated (12- 2015)

5.5 *Test Setup Photographs*

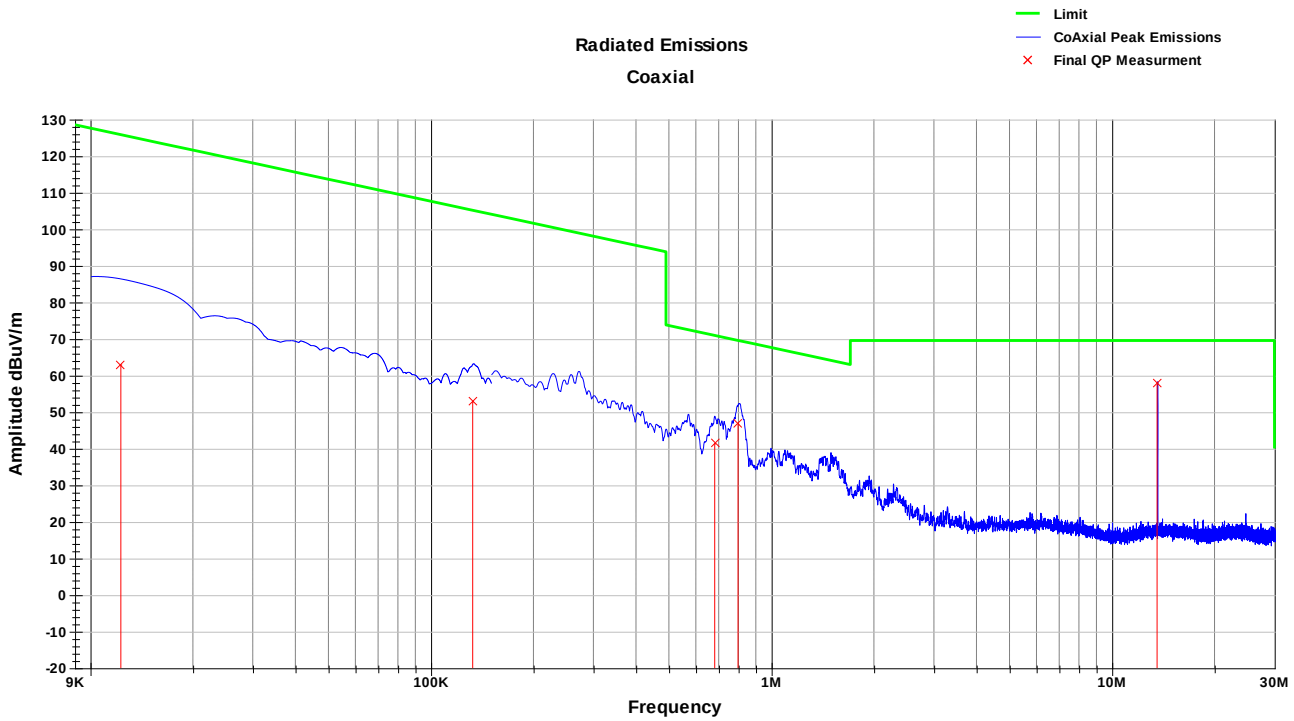
Photographs are shown in a separate exhibit.

5.6 *9kHz – 30 MHz*

No discernable difference in emissions between axis. Worst case reported.

No discernable difference in emissions between axis. Worst case reported.

Coaxial Plot

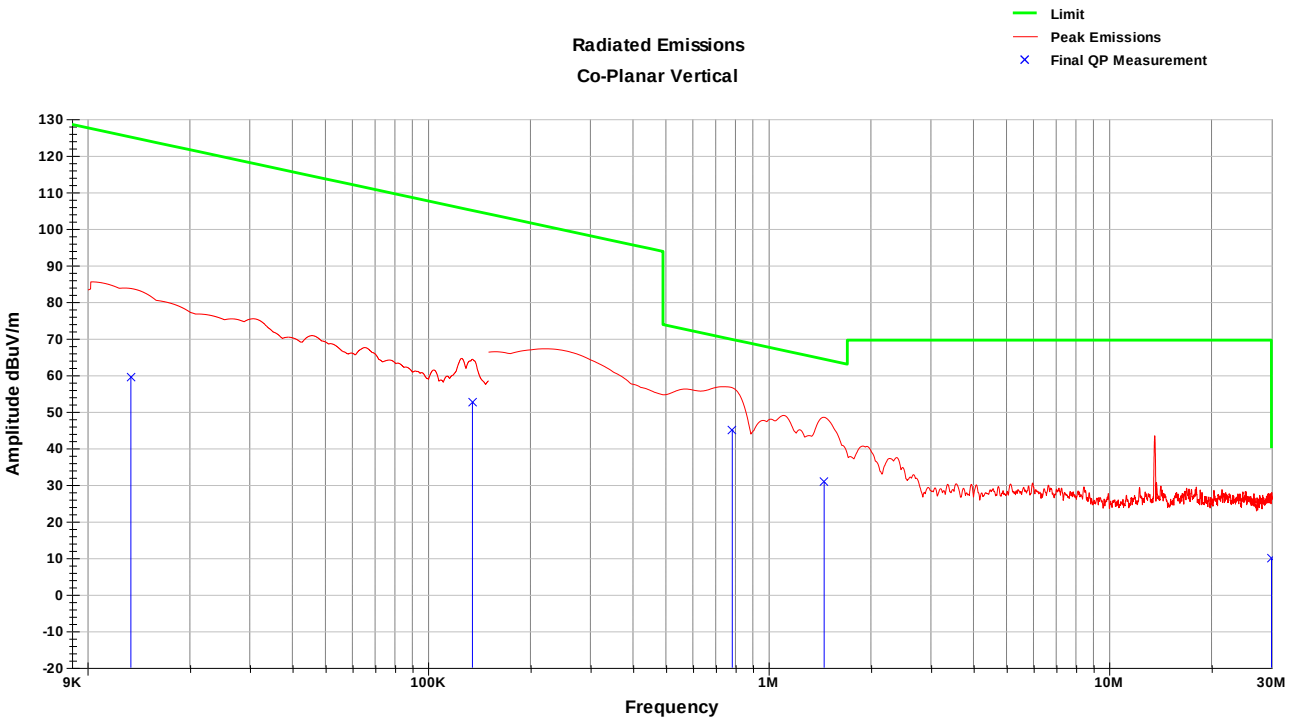


Note: Frequency at 0.012 MHz was noise floor related and not related to the transmitter emissions.

Coaxial Data

Frequency MHz	Raw QP dBuV	Azimuth degrees	Height cm	AF dB	CL dB	QP Value dBuV/m	QP Limit dBuV/m	Margin dB
0.012	12.0	226.0	0.0	82.8	0.0	63.0	125.8	-62.8
0.133	21.7	170.0	0.0	63.1	0.0	53.0	105.1	-52.2
0.681	23.5	281.0	0.0	49.3	0.1	41.5	70.9	-29.5
0.798	30.0	60.0	0.0	48.1	0.1	46.8	69.6	-22.8
13.560	54.4	328.0	0.0	34.1	0.2	57.8	69.5	-11.7
Level + AF + CL - Amp								
Margin = QP Value - Limit								

Vertical Co-Planar Plot

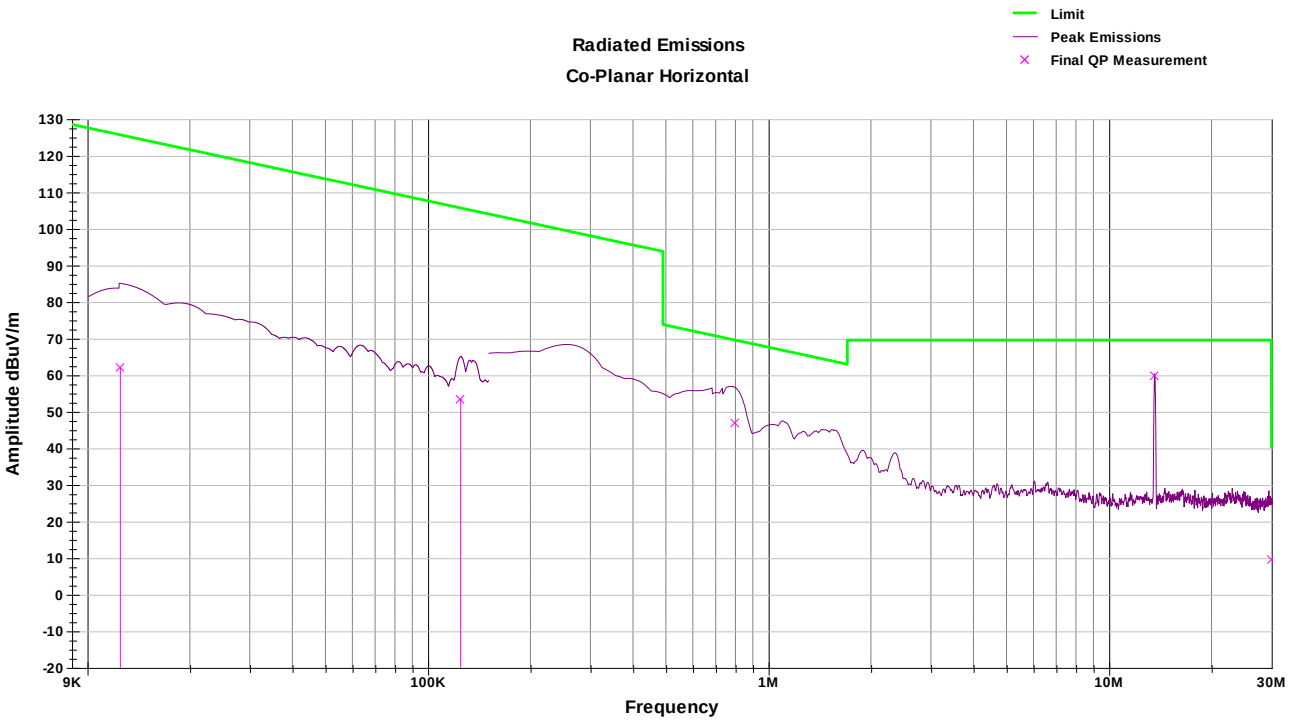


Note: Frequencies at 0.013, 0.135, 0.783 MHz was noise floor or un-intentional emissions and not related to the transmitter emissions.

Vertical Co-Planar Data

Frequency MHz	Raw QP dBuV	Azimuth degrees	Height cm	AF dB	CL dB	QP Valu dBuV/m	Limit dBuV/r	Margin dB
0.013	9.0	360.0	0.0	82.4	0.0	59.6	125.0	-65.5
0.135	21.5	155.0	0.0	62.9	0.0	52.6	105.0	-52.4
0.783	28.0	194.0	0.0	48.2	0.1	44.9	69.7	-24.8
1.46	17.9	-1.0	0.0	43.9	0.1	30.8	64.3	-33.6
30.00	6.7	175.0	0.0	33.8	0.3	9.8	40.0	-30.2
QP Value = Level + AF + CL - Amp								
Margin = QP Value - Limit								

Horizontal Co-Planar Plot

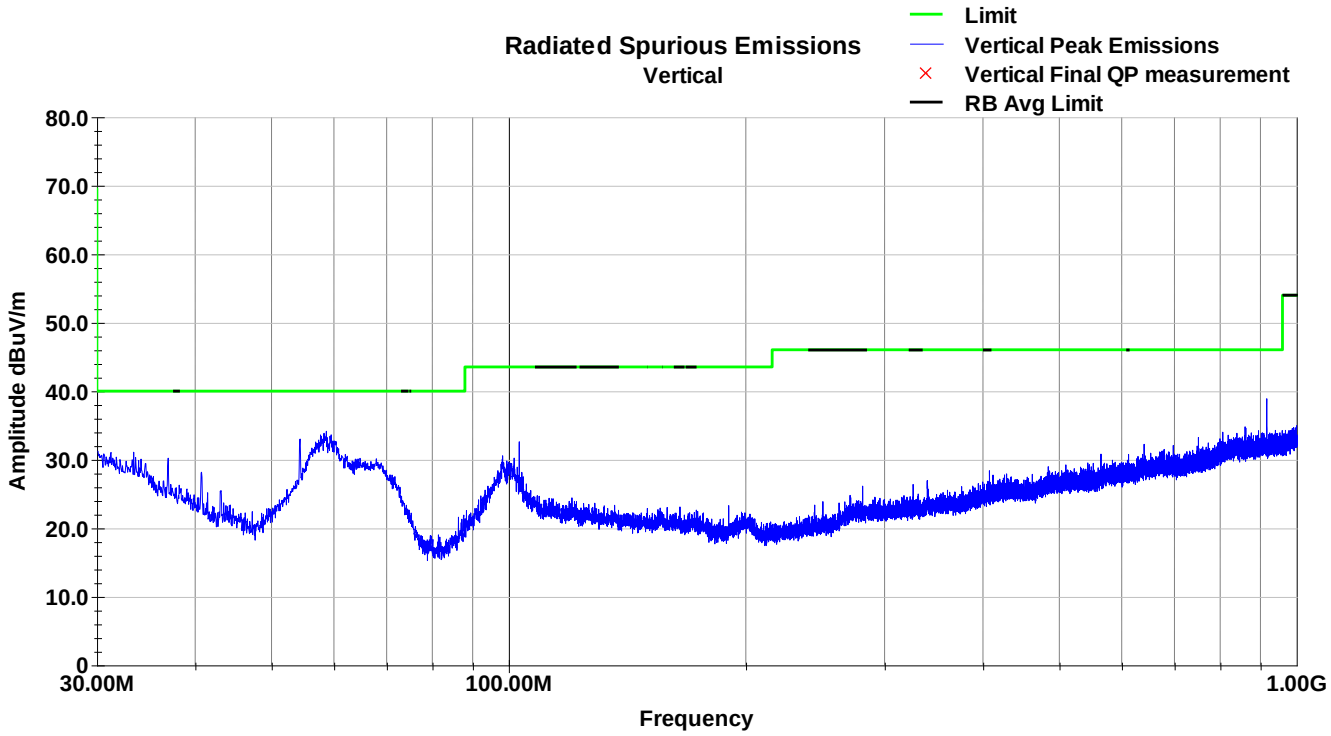


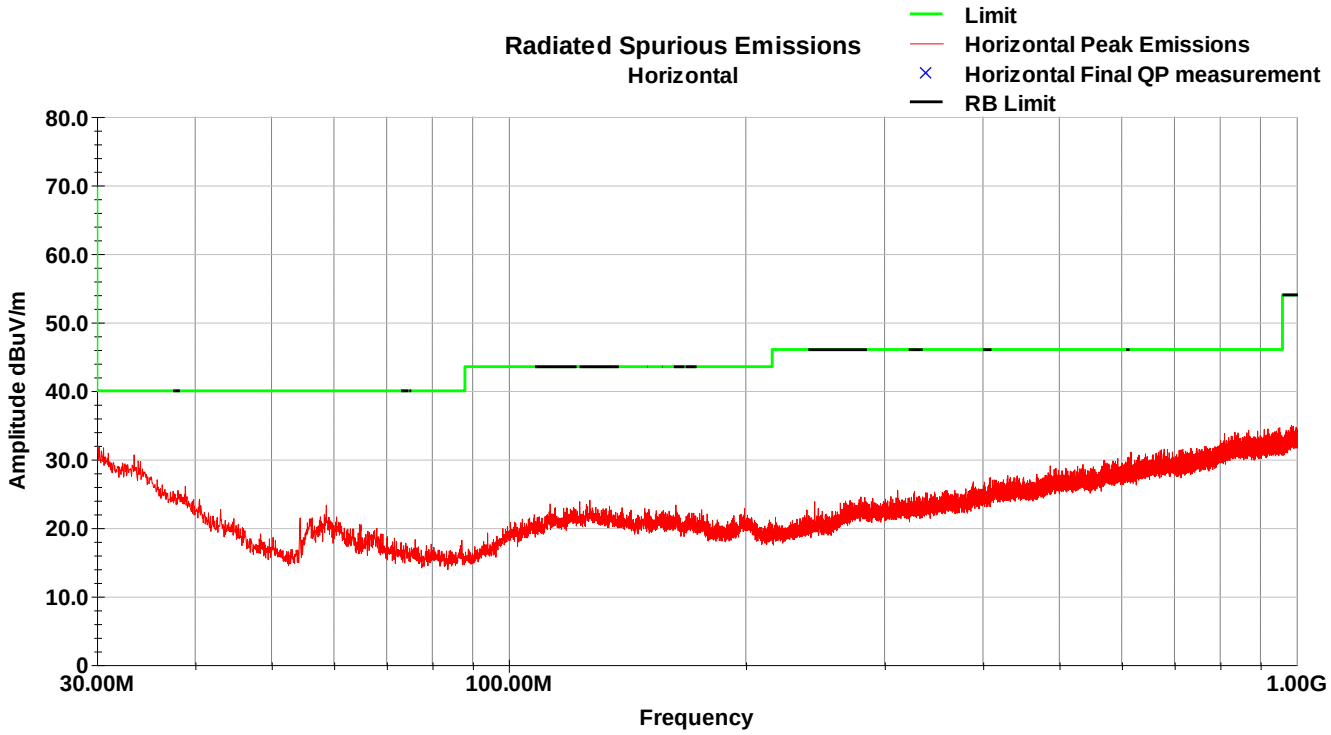
Note: Frequency at 0.013MHz was noise floor and not related to the transmitter emissions.

Horizontal Co-Planar Data

Frequency MHz	Raw QP dBuV	Azimuth degrees	Height cm	AF dB	CL dB	QP Valu dBuV/m	Limit dBuV/r	Margin dB
0.013	11.1	62.0	0.0	82.7	0.0	62.0	125.7	-63.6
0.125	21.8	90.0	0.0	63.5	0.0	53.5	105.7	-52.2
0.798	30.1	142.0	0.0	48.1	0.1	46.9	69.6	-22.7
13.56	56.6	-1.0	0.0	34.1	0.2	60.0	69.5	-9.6
29.99	6.5	146.0	0.0	33.8	0.3	9.6	69.5	-59.9
Level + AF + CL - Amp								
Margin = QP Value - Limit								

5.7 *30 MHz - 1000 MHz*





6 Field Strength of Fundamental

6.1 *Test Result*

Test Description	Test Specification		Test Result
Field strength of fundamental	FCC Part 15, Subpart C, 15.225; 15.209	RSS-210, B.6(a)	Compliant
	ANSI C63.10:2013, Section 6.3		

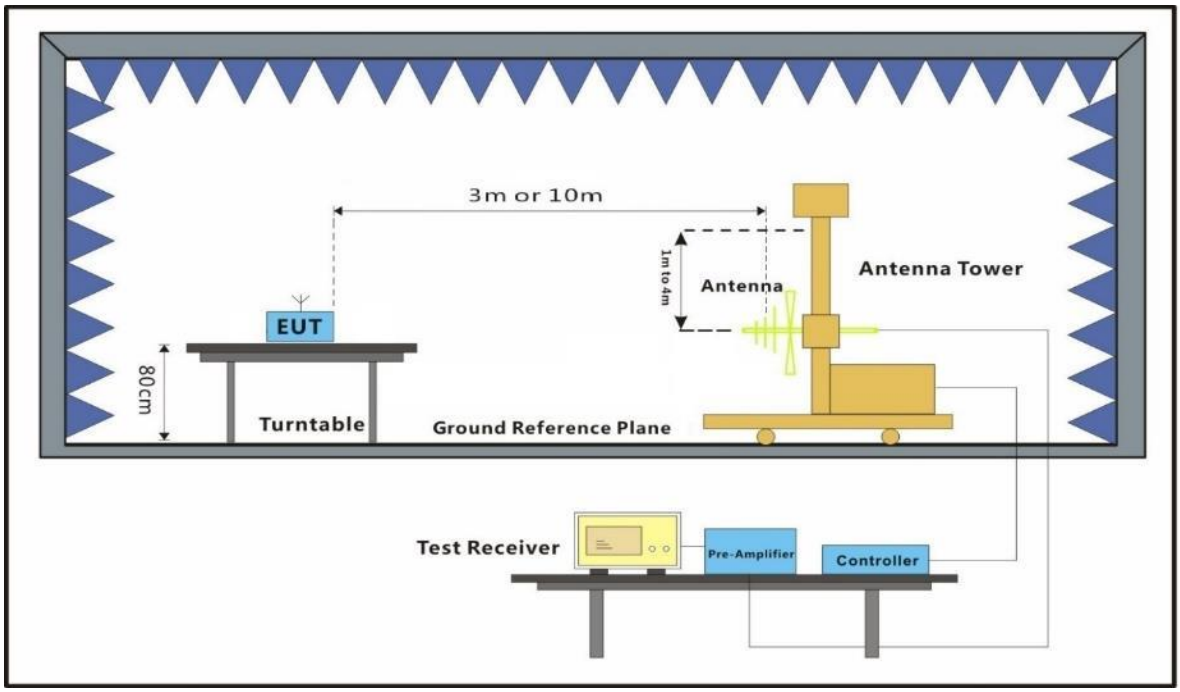
6.2 *Test Method*

The test data was measured using a Peak detector. Average measurements were made by correcting the peak value with the duty cycle correction factor. The receiver's resolution bandwidth was set to 200 Hz for measurements taken in the 9kHz to 30MHz frequency range and 120kHz for measurements for 30MHz and higher. Measurements were made with the antenna positioned at a 3m distance from the EUT in both the horizontal and vertical planes of polarization. The antenna height varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

The radiation measurements were performed in X, Y, Z axis positioning.

Calculations: Field Strength = measured value + antenna factor + cable loss – pre-amp factor

6.3 *Test Setup Diagram*



6.4 *Test Site*

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature:	22.72
Relative Humidity:	55%
Atmospheric Pressure:	98.26 kPa

6.5 *Test Equipment*

Test End Date: 2-Oct-2024 Tester: SGM

Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
PASSIVE LOOP ANTENNA, 9KHZ - 30MHZ	ETS LINDGREN	6512	20151	13-Feb-2024	13-Feb-2025
N to N RF Cable	ECHELON	EM-B810NM-276	23007	31-Mar-2024	31-Mar-2025
N-FEMALE TO N-MALE RF CABLE	ECHELON	EM-B810NMNF-118	23010	17-Apr-2024	17-Apr-2025
RF CABLE NM TO NM, 0.01-18GHZ	TELEDYNE STORM MICROWAVE	90-195-118	20126	6-Feb-2024	6-Feb-2025
BROADBAND PREAMPLIFIER 9KHZ-2GHZ	SCHWARZBECK MESS ELEKTRONIK	BBV 9745	20157	10-Oct-2023	10-Oct-2024
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	22032	15-Nov-2023	15-Nov-2024

Software:
“Radiated Emissions” TILE! profile dated (12- 2015)

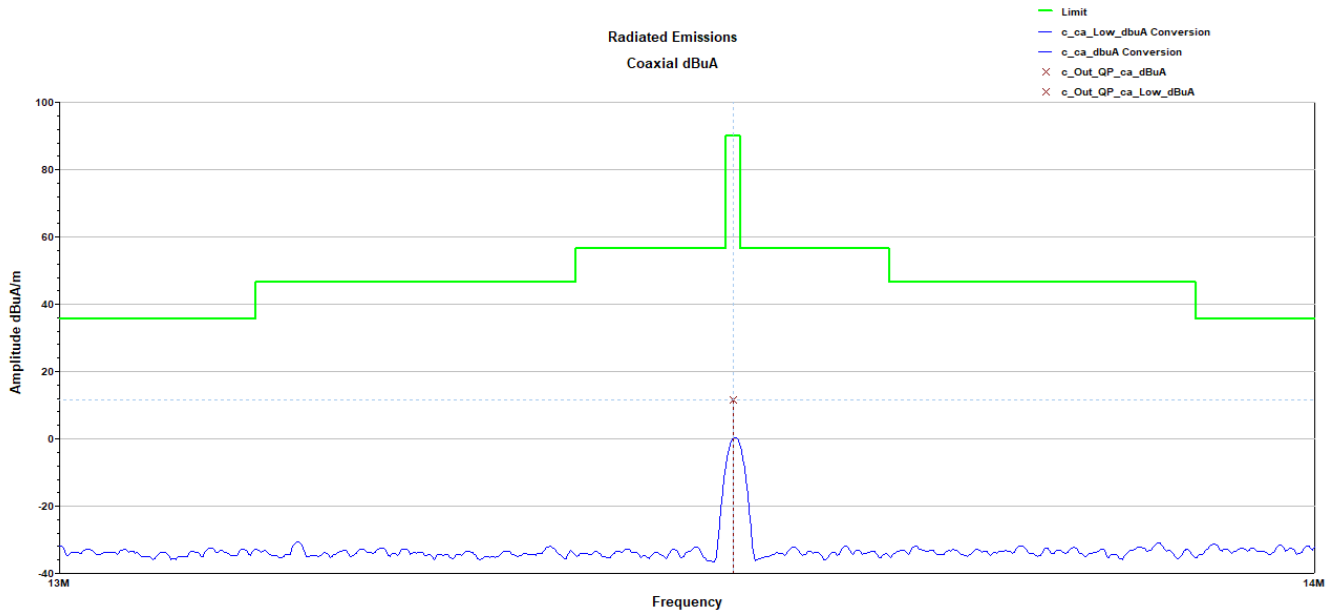
6.6 *Test Setup Photographs*

Photographs are shown in a separate exhibit.

6.7 *Test Data:*

No discernable difference in emissions between axis. Worst case reported.

Coaxial Plot – 3m



Coaxial Data

Frequency MHz	Azimuth degrees	Height cm	AF dB	CL dB	Limit dBuA/m	QP Value dBuA/m	Raw QP Value dBuA	Margin dB
0.26	38.0	0.0	57.4	0.0	65.3	1.3	-24.5	-64.0
13.56	122.0	0.0	34.1	0.2	90.0	11.6	8.2	-78.4
27.13	288.0	0.0	33.6	0.3	35.5	-28.7	-31.5	-64.2

QP Value = Level + AF + CL - Amp
Margin = QP Value - Limit

7 Radiated Spurious Emissions

7.1 *Test Result*

Test Description	Basic Standards	Test Result
Radiated Emissions	FCC Part 15, Subpart C, 15.209, 15.215, 15.225 RSS-Gen S8 ANSI C63.10: 2013	Compliant

7.2 *Test Method*

Exploratory scans were performed over the frequency range as indicated in the tables below using the max hold function and incorporating a Peak detector and using TILE! software. The final test data was measured using a Quasi-Peak detector below 1GHz and a Peak and Average detector above 1GHz. The receivers resolution bandwidth was set to 1kHz for measurements taken below 150kHz, 9kHz for in the 150kHz to 30MHz range, 120 kHz in the 30MHz to 1GHz frequency range, and 1MHz for measurements of 1GHz and higher. For testing below 30MHz, a loop antenna was employed, and peak scans were taken with the loop open towards the EUT (Co-Axial) and with the loop in-line with the EUT (Co-Planar). Above 30MHz, a biconilog antenna was used and measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency. The radiated measurements were recorded and compared to the limits indicated in the table below.

Radiated emissions limits (testing above 1GHz was not required for this device)

Frequency Range (MHz)	Limits (uV/m) Quasi-Peak or Average	Measurement Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note: Limits were converted to dBuV/m using the equation 20*LOG(x). Additionally, for measurements below 30MHz, the limits were adjusted to a distance of 3m using a 40dB/decade correction per §15.31(f)(2)

Example: at 20MHz, the limit is expressed as 30uV/m at 30m
20*log(30) = 29.5dBuV/m
30 to 3 meters is a single decade, so 29.5 + 40 = 69.5dBuV/m

7.3 *Test Site*

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature:	22.72
Relative Humidity:	55%
Atmospheric Pressure:	98.26 kPa

7.4 *Test Equipment*

Test End Date: 2-Oct-2024 Tester: SGM

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EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	22032	15-Nov-2023	15-Nov-2024

Software:
“Radiated Emissions” TILE! profile dated (12- 2015)

7.5 *Test Setup Photographs*

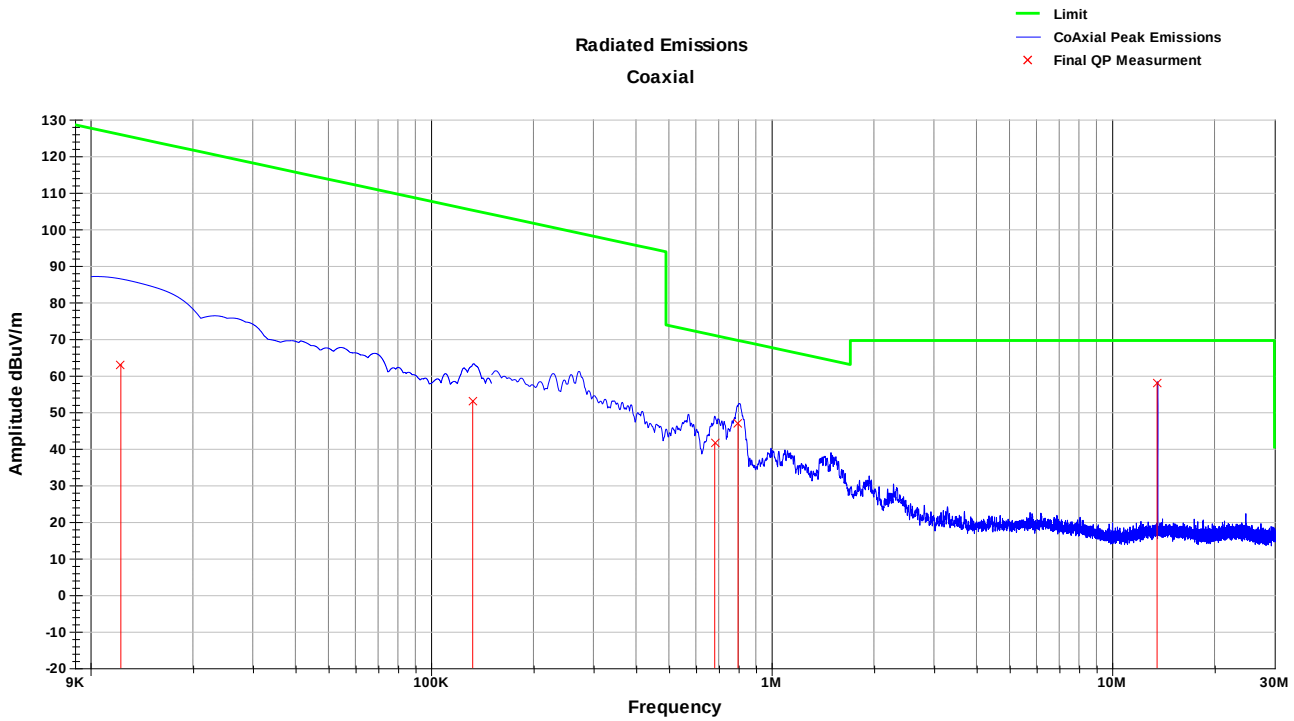
Photographs are shown in a separate exhibit.

7.6 *9kHz – 30 MHz*

No discernable difference in emissions between axis. Worst case reported.

No discernable difference in emissions between axis. Worst case reported.

Coaxial Plot



Coaxial Data

Frequency MHz	Raw QP dBuV	Azimuth degrees	Height cm	AF dB	CL dB	QP Value dBuV/m	QP Limit dBuV/m	Margin dB
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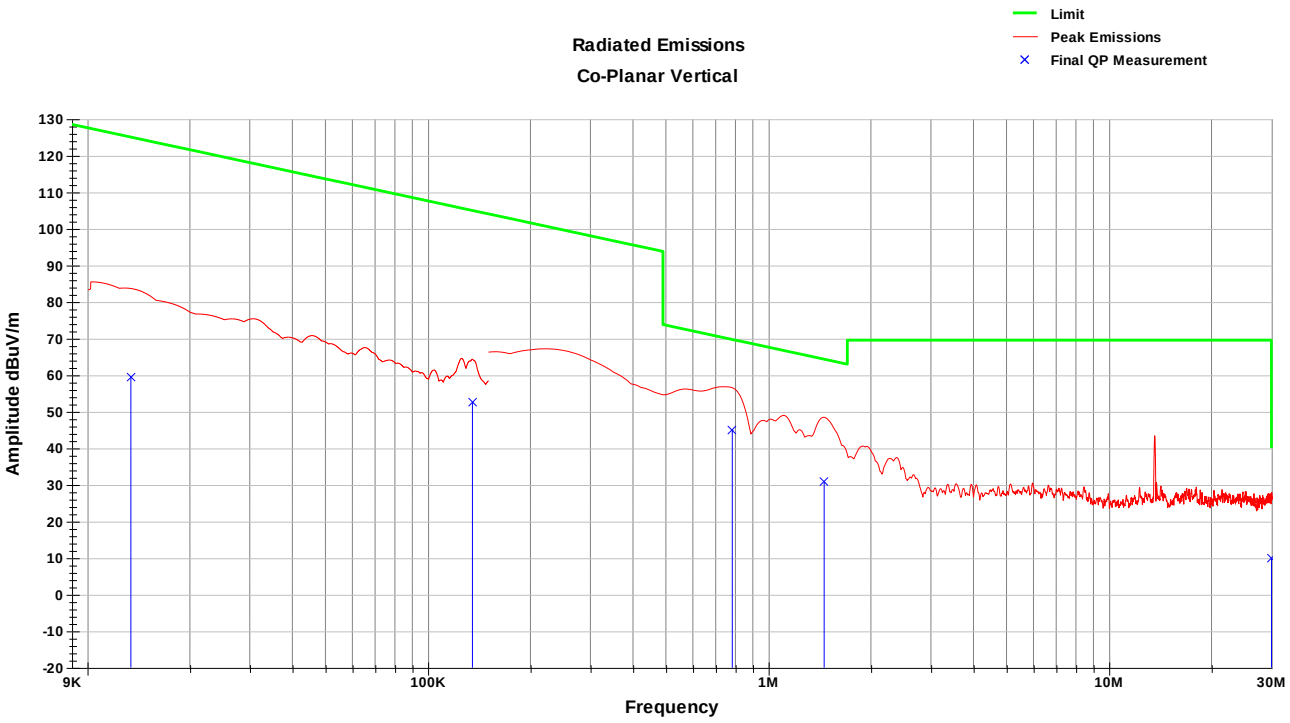
0.133	21.7	170.0	0.0	63.1	0.0	53.0	105.1	-52.2
0.681	23.5	281.0	0.0	49.3	0.1	41.5	70.9	-29.5
0.798	30.0	60.0	0.0	48.1	0.1	46.8	69.6	-22.8
13.560	54.4	328.0	0.0	34.1	0.2	57.8	69.5	-11.7
Level + AF + CL - Amp								
Margin = QP Value - Limit								

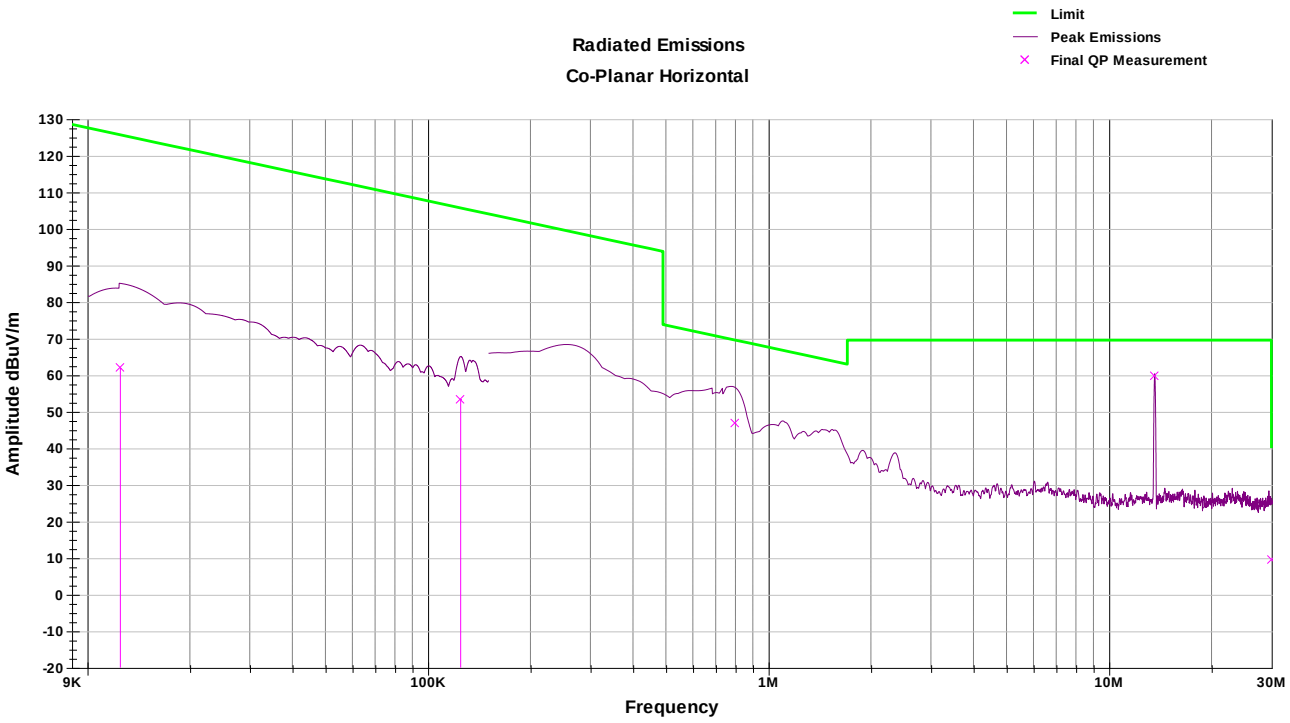
Vertical Co-Planar Plot



Vertical Co-Planar Data

Frequency MHz	Raw QP dBuV	Azimuth degrees	Height cm	AF dB	CL dB	QP Valu dBuV/m	Limit dBuV/r	Margin dB
0.013	9.0	360.0	0.0	82.4	0.0	59.6	125.0	-65.5
0.135	21.5	155.0	0.0	62.9	0.0	52.6	105.0	-52.4
0.783	28.0	194.0	0.0	48.2	0.1	44.9	69.7	-24.8
1.46	17.9	-1.0	0.0	43.9	0.1	30.8	64.3	-33.6
30.00	6.7	175.0	0.0	33.8	0.3	9.8	40.0	-30.2
QP Value = Level + AF + CL - Amp								
Margin = QP Value - Limit								

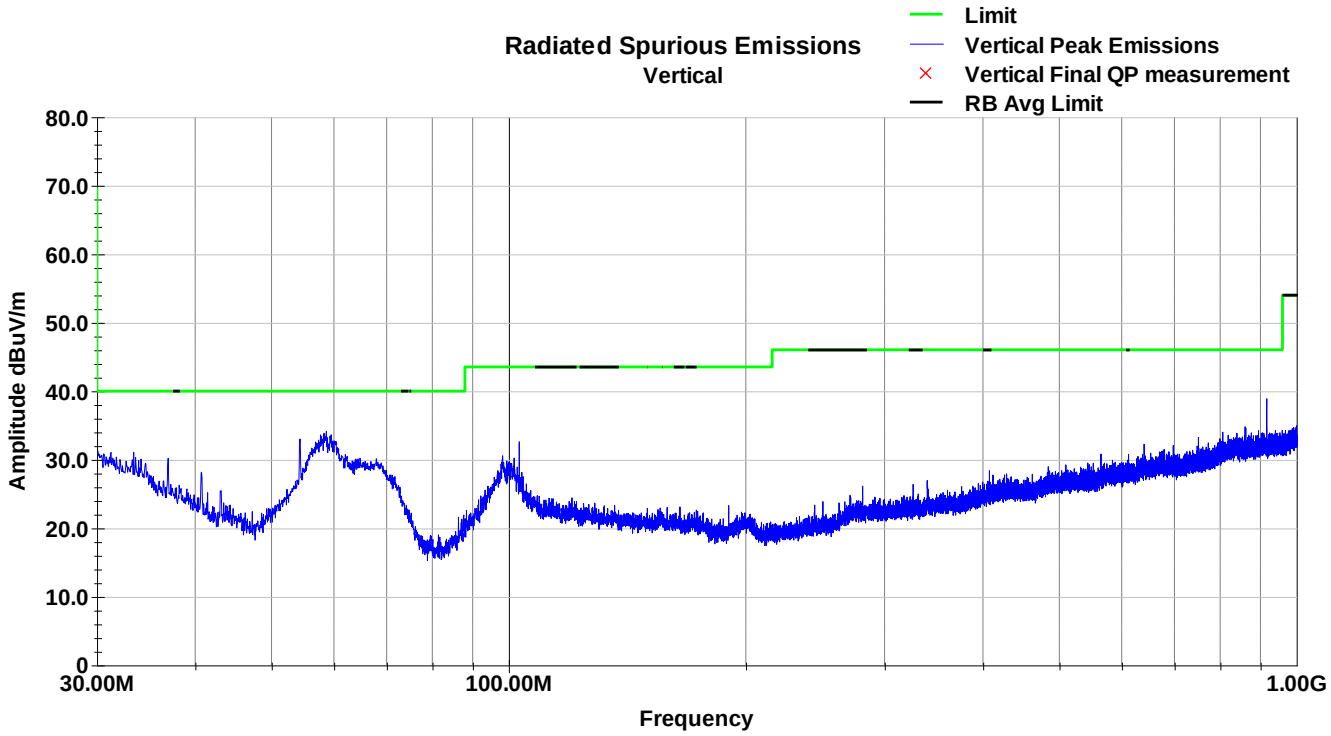
Horizontal Co-Planar Plot

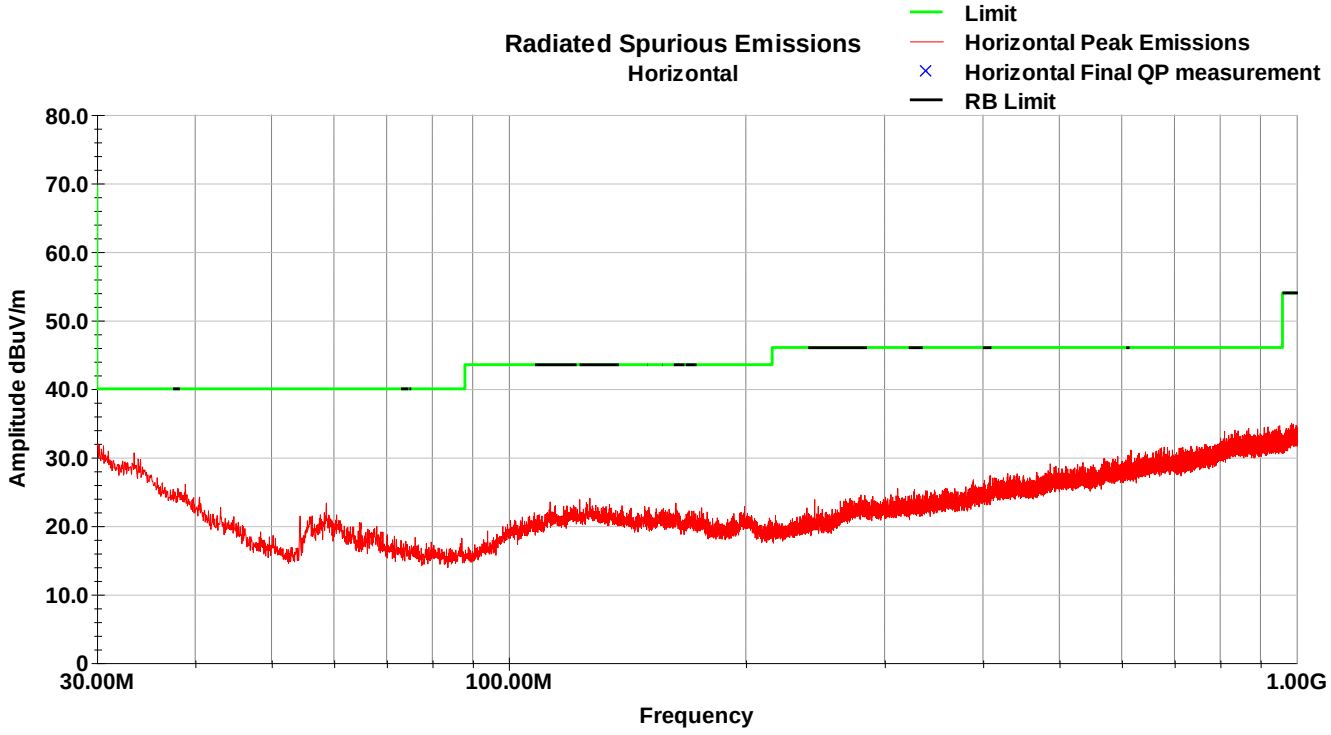


Horizontal Co-Planar Data

Frequency MHz	Raw QP dBuV	Azimuth degrees	Height cm	AF dB	CL dB	QP Valu dBuV/m	Limit dBuV/r	Margin dB
0.013	11.1	62.0	0.0	82.7	0.0	62.0	125.7	-63.6
0.125	21.8	90.0	0.0	63.5	0.0	53.5	105.7	-52.2
0.798	30.1	142.0	0.0	48.1	0.1	46.9	69.6	-22.7
13.56	56.6	-1.0	0.0	34.1	0.2	60.0	69.5	-9.6
29.99	6.5	146.0	0.0	33.8	0.3	9.6	69.5	-59.9
Level + AF + CL - Amp								
Margin = QP Value - Limit								

7.7 *30 MHz - 1000 MHz*





8 Frequency Stability

8.1 *Test Result*

Test Description	Basic Standards	Test Result
Frequency Stability	FCC 15.225(e) RSS-210 B.6(b) ANSI C63.10	Compliant

8.2 *Test Method*

The EUT was placed inside the Environmental Chamber and allowed to stabilize to each set temperature for a minimum of thirty minutes before any measurements were made. The EUT fundamental transmission was coupled to the spectrum analyzer using a near field probe.

8.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.49

Relative Humidity: 39.8%

Atmospheric Pressure: 98.08 kPa

8.4 *Test Equipment*

Test End Date: 8-Apr-2025 Tester: SGM

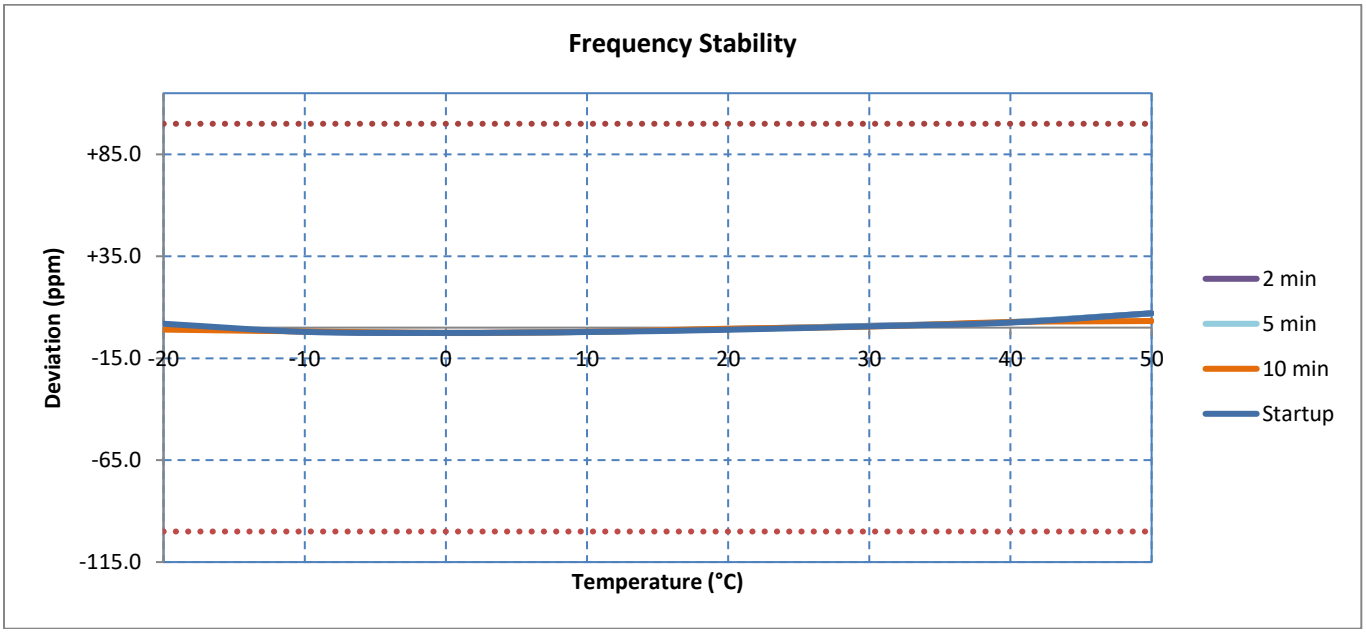
Equipment	Manufacturer	Model	Asset Number	Cal Date	Cal Due Date
RF CABLE (TS8997)	HUBER & SUHNER	141	B095585	8-Jul-2024	8-Jul-2025
NEAR FIELD PROBES	COM-POWER CORPORATION	N/A	16016	CNR	CNR
SIGNAL ANALYZER (TS8997)	ROHDE & SCHWARZ	FSV30	B085749	4-Mar-2025	4-Mar-2026
MULTIMETER	FLUKE	87V	23014	20-Aug-2024	20-Aug-2025

8.5 *Test Data*

The carrier frequency shall not depart from the reference frequency by more than ±100 ppm.

RFID 13.56 MHz

Voltage %	Power V_{DC}	Temp °C	Frequency MHz				Freq Dev ppm			
			Startup	2 min	5 min	10 min	Startup	2 min	5 min	10 min
100%	5.00	+20 (Ref)	13.5610260	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100%	5.00	-20	+13.561000000	+13.56102000	+13.5610310	+13.5610390	+1.92	+0.44	-0.37	-0.96
100%	5.00	-10	+13.561054000	+13.56105200	+13.5610510	+13.56105100	-2.06	-1.92	-1.84	-1.84
100%	5.00	0	+13.561061000	+13.5610610	+13.5610620	+13.5610610	-2.58	-2.58	-2.65	-2.58
100%	5.00	+10	+13.561055000	+13.5610540	+13.5610550	+13.5610540	-2.14	-2.06	-2.14	-2.06
100%	5.00	+20	+13.561040000	+13.5610360	+13.5610340	+13.5610330	-1.03	-0.74	-0.59	-0.52
100%	5.00	+30	+13.561017000	+13.5610140	+13.5610150	+13.561019	+0.66	+0.88	+0.81	+0.52
100%	5.00	+40	+13.560992000	+13.5609900	+13.5609880	+13.5609890	+2.51	+2.65	+2.80	+2.73
100%	5.00	+50	+13.560930100	+13.5609311	+13.5609311	+13.5609820	+7.07	+7.00	+7.00	+3.24
115%	5.75	+20	+13.561038000	N/A	N/A	N/A	-0.88	N/A	N/A	N/A
85%	4.25	+20	+13.561018000	N/A	N/A	N/A	+0.59	N/A	N/A	N/A



9 Measurement Uncertainty

Measurement uncertainty is not used to adjust the measurements to determine compliance.

Measurement uncertainty values in the table below comply with CISPR 16-4-2.

Parameter	Uncertainty
Conducted emissions	±0.8 dB
Radiated emissions, 9 kHz to 30 MHz	±3.5 dB
Radiated emissions, 30 to 200 MHz	±3.1 dB
Radiated emissions, 200 to 1000 MHz	±4.6 dB
Radiated emissions, 1 to 18 GHz	±5.4 dB
Radiated emissions, 18 to 40 GHz	±4.0 dB
Note: The uncertainties provided in this table represent an expanded uncertainty expressed at the ~%95 confidence level using a coverage factor of K=2.	

10 Revision History

Revision Level	Description of changes	Revision Date
Draft	Draft Release	09 October 2024
0	Initial Release	30 October 2024
1	Updated cover page and sections: 2.3, 4.1, 5.1; addition of OBW & Frequency Stability data.	02 April 2025
2	Updated Model/HVIN number	10 April 2025