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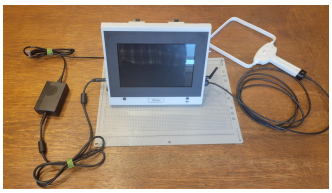
UIAIHS-WR2508TXr1
Issued: **March 20, 2025**

EMC Test Report

regarding

USA: CFR Title 47, Part 15.225 (Emissions)
Canada: RSS-210v11/GENv5 (Emissions)

for



AIHS-MU

Category: RFID Reader

Judgments:
Aligns with FCC Part 15.225 and ISED RSS-210v11
Testing Completed: March 19, 2025

TESTING
NVLAP LAB CODE 200129-0

Prepared for:

UIM Pressure Implant, Inc.

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John Nantz

Date of Issue: March 20, 2025

Revision History

Rev. No.	Date	Details	Revised By
r0	March 20, 2025	Initial Release.	J. Nantz
r1	July 24, 2025	Misc. corrections.	J. Nantz

Contents

List of Tables

List of Figures

1 Test Report Scope and Limitations

1.1 Laboratory Authorization

Test Facility description and attenuation characteristics are on file with the FCC Laboratory, Columbia, Maryland (FCC Reg. No: US5348 and US5356) and with ISED Canada, Ottawa, ON (File Ref. No: 3161A and 24249). Amber Helm Development L.C. holds accreditation under NVLAP Lab Code 200129-0.

1.2 Report Retention

For equipment verified to comply with the regulations herein, the manufacturer is obliged to retain this report with the product records for the life of the product, and no less than ten years. A copy of this Report will remain on file with this laboratory until March 2035.

1.3 Subcontracted Testing

This report does not contain data produced under subcontract.

1.4 Test Data

This test report contains data included within the laboratory's scope of accreditation. Any data in this report that is not covered under the laboratory's scope is clearly identified.

1.5 Limitation of Results

The test results contained in this report relate only to the item(s) tested. Any electrical or mechanical modification made to the test item subsequent to the test date shall invalidate the data presented in this report. Any electrical or mechanical modification made to the test item subsequent to this test date shall require reevaluation.

1.6 Copyright

This report shall not be reproduced, except in full, without the written approval of Amber Helm Development L.C.

1.7 Endorsements

This report shall not be used to claim product endorsement by any accrediting, regulatory, or governmental agency.

1.8 Test Location

The EUT was fully tested by **Amber Helm Development L.C.**, headquartered at 92723 Michigan Hwy-152, Sister Lakes, Michigan 49047 USA. Table 1.8.0 lists all sites employed herein. Specific test sites utilized are also listed in the test results sections of this report where needed.

Table 1.8.0 Test Site List.

Description	Location	Quality Num.
OATS (3 meter)	3615 E Grand River Rd., Williamston, Michigan 48895	OATSD

1.9 Traceability and Equipment Used

Pertinent test equipment used for measurements at this facility is listed in Table 1.9.0 . The quality system employed at Amber Helm Development L.C. has been established to ensure all equipment has a clearly identifiable classification, calibration expiry date, and that all calibrations are traceable to the SI through NIST, other recognized national laboratories, accepted fundamental or natural physical constants, ratio type of calibration, or by comparison to consensus standards. All equipment is evaluated on a cycle no greater than 12 months following laboratory validation procedures and is calibrated following manufacturer recommended intervals.

Table 1.9.0 Equipment List.

Description	Manufacturer/Model	SN	Quality Num.	Cal/Ver By / Date Due
Spectrum Analyzer	R & S / FSW67	103233	RSFSW67	RS / Sept-2025
Shielded Loop Antenna	EMCO / 6502	9502-2926	EMCOLOOP1	Keysight / Jul-2026
Biconical	EMCO / 93110B	9802-3039	BICEMCO01	Keysight / Aug-2025
Log Periodic Antenna	EMCO / 3146	9305-3614	LOGEMCO01	Keysight / Aug-2025
Quad Ridge Horn	Singer / A6100	C35200	HQR1TO18S01	Keysight / Aug-2025

2 Test Specifications and Procedures

2.1 Test Specification and General Procedures

The goal of UIM Pressure Implant, Inc. is to demonstrate that the Equipment Under Test (EUT) complies with the Rules and/or Directives below. Detailed in this report are the results of testing the UIM Pressure Implant, Inc. AIHS-MU for compliance to:

Country/Region/Manu.	**Rules or Directive**	**Referenced Section(s)**
United States	Code of Federal Regulations	CFR Title 47, Part 15.225
Canada	ISED Canada	RSS-210v11/GENv5

It has been determined that the equipment under test is subject to the rules and directives above at the date of this testing. In conjunction with these rules and directives, the following specifications and procedures are followed herein to demonstrate compliance (in whole or in part) with these regulations.

ANSI C63.4:2014	"Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
ANSI C63.10:2020+C1:2023	"American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices"
ANSI C63.10a:2024	"Errata to American National Standard for Procedures for Compliance Testing of Unlicensed Wireless Devices"
WR-ITP0102RA	"AHD Internal Document - Radiated Emissions Test Method"
WR-ITP0101LC	"AHD Internal Document - Conducted Emissions Test Method"
ICES-003; Issue 7 (2020)	"Information Technology Equipment (ITE) - Limits and methods of measurement"

3 Configuration and Identification of the Equipment Under Test

3.1 Description and Declarations

The EUT is a portable RFID Reader. The EUT is approximately 37.3 x 11.6 x 23.3 cm in dimension, and is depicted in Figure 3.1.0 . It is powered by 12 VDC power adaptor to AC mains. This product is used as an RFID reader for tags embedded within animals or humans. Table 3.1.0 outlines provider declared EUT specifications.

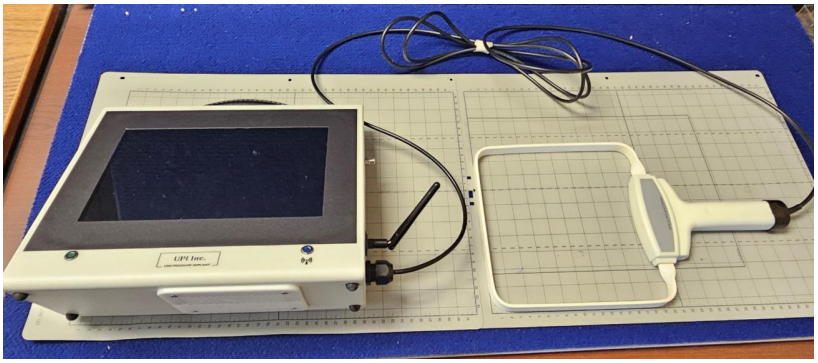


Figure 3.1.0 Photos of EUT.

Table 3.1.0 EUT Declarations.

General Declarations	
Equipment Type:	RFID Reader
Country of Origin:	Not Declared
Nominal Supply:	12 VDC
Oper. Temp Range:	Not Declared
Frequency Range:	13.56 MHz
Antenna Dimension:	20 cm x 20 cm
Antenna Type:	Coil
Antenna Gain:	External Coil
Number of Channels:	1
Channel Spacing:	None
Alignment Range:	Not Declared
Type of Modulation:	CW
United States	
FCC ID Number:	2B0PDAIHS202888
Classification:	DXX
Canada	
IC Number:	33816-AIHS202888
Classification:	Remote Control Device

3.1.1 EUT Configuration

The EUT is configured for testing as depicted in Figure 3.1.1 .

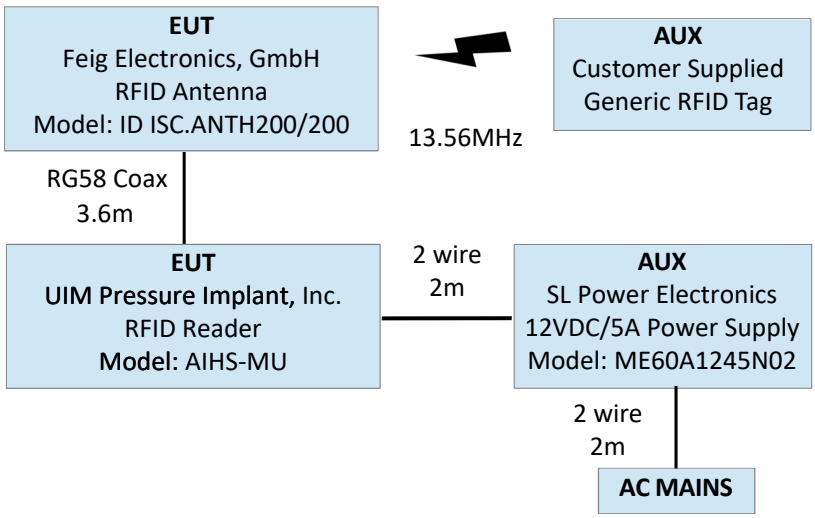


Figure 3.1.1 EUT Test Configuration Diagram.

3.1.2 Modes of Operation

The EUT is capable of only one mode of operation: as a CW RFID transmitter reading ID tags present within roughly 8 inches of its wand antenna.

3.1.3 Variants

There is only a single version of the EUT, as tested.

3.1.4 Test Samples

One sample was provided for testing (SN:60LB9268) capable of normal operation.

3.1.5 Functional Exerciser

Normal functionality was confirmed by measurement of transmitted signals.

3.1.6 Modifications Made

There were no modifications made to the EUT by this laboratory.

3.1.7 Production Intent

The EUT appears to be a production ready sample.

3.1.8 Declared Exemptions and Additional Product Notes

The EUT's console (base) hosts a pre-certified modular radio (FCC ID: PPD-QCNFA364AH, IC: 4104A-QCNFA364A), included following manufacturer SDoC procedures and active throughout testing of the RFID system.

4 Emissions

4.1 General Test Procedures

4.1.1 Radiated Test Setup and Procedures

Radiated electromagnetic emissions from the EUT are first pre-scanned in our screen room. Spectrum and modulation characteristics of all emissions are recorded. Instrumentation, including spectrum analyzers and other test equipment as detailed in Section 1.8 are employed. After pre-scan, emission measurements are made on the test site of record. If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in relevant test standards are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed if the resulting emissions appear to be worst-case in such a configuration. See Figure 4.1.1 . All intentionally radiating elements that are not fixed-mounted in use are placed on the test table lying flat, on their side, and on their end (3-axes) and the resulting worst case emissions are recorded. If the EUT is fixed-mounted in use, measurements are made with the device oriented in the manner consistent with installation and then emissions are recorded. If the EUT exhibits spurious emissions due to internal receiver circuitry, such emissions are measured with an appropriate carrier signal applied.

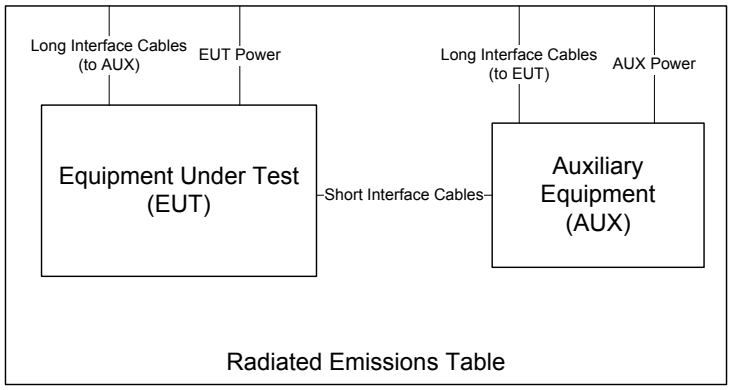


Figure 4.1.1 Radiated Emissions Diagram of the EUT.

For devices with intentional emissions below 30 MHz, a shielded loop antenna and/or E-field and H-Field broadband probes are used depending on the regulation. Shielded loops are placed at a 1 meter receive height at the desired measurement distance. For exposure in this band, 10cm diameter single-axis broadband probes meeting the requirements of ISED RSS-102.NS.MEAS are employed. Measurements are repeated and summed over three axes, and the entire frequency range is measured with and without the EUT transmitting.

Emissions between 30 MHz and 1 GHz are measured using calibrated broadband antennas. For both horizontal and vertical polarizations, the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected. The EUT is then rotated through 360^o in azimuth until the highest emission is detected. The test antenna is then raised and lowered one last time from 1 to 4 m and the worst case value is recorded. Emissions above 1 GHz are characterized using standard gain or broadband ridge-horn antennas on our OATS with a 4×5 m rectangle of ECCOSORB absorber covering the OATS ground screen and a 1.5m table height. Care is taken to ensure that test receiver resolution and video bandwidths meet the regulatory requirements, and that the emission bandwidth of the EUT is not reduced. Photographs of the test setup employed are depicted in Figure 4.1.1 .

Where regulations allow for direct measurement of field strength, power values (dBm) measured on the test receiver / analyzer are converted to dBμV/m at the regulatory distance, using

$$E_{dist} = 107 + P_R + K_A - K_G + K_E - C_F$$

where P_R is the power recorded on spectrum analyzer, in dBm, K_A is the test antenna factor in dB/m, K_G is the combined pre-amplifier gain and cable loss in dB, K_E is duty correction factor (when applicable) in dB, and C_F is a distance conversion (employed only if limits are specified at alternate distance) in dB. This field strength value is then compared with the regulatory limit. If effective isotropic radiated power (EIRP) is computed, it is computed as

$$EIRP(dBm) = E_{3m}(dB\mu V/m) - 95.2.$$

When presenting data at each frequency, the highest measured emission under all possible EUT orientations (3-axes) is reported.

Figure 4.1.1 Radiated Emissions Test Setup Photograph(s).

4.1.2 Conducted Emissions Test Setup and Procedures

AC Port Conducted Spurious Spurious emissions from the EUT AC power port(s) are measured in our screen room. The EUT and auxiliary equipment are configured as prescribed by the standard. A layout most representative of actual use may be employed if the resulting emissions appear to be worst-case in such a configuration. Conducted emissions are measured and recorded for each AC mains port over the range of frequencies mandated in the standard, and on each conductor. The test receiver first measures peak emissions, after which worst case emissions are measured using quasi-peak and average detection if emissions approach the regulatory limit. See Figure 4.1.2 . Photographs of the test setup employed are depicted in Figure 4.1.2 .

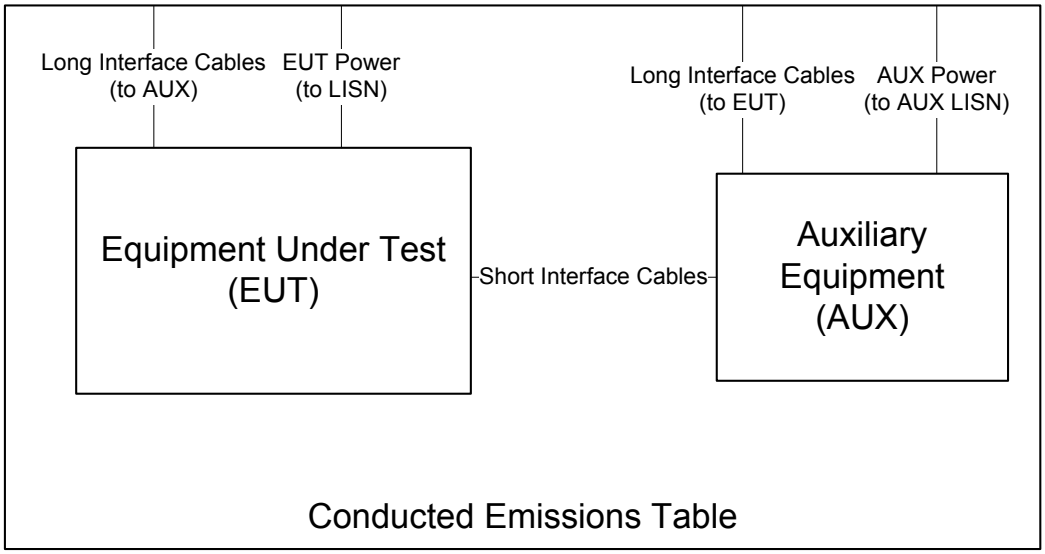


Figure 4.1.2 AC Conducted Emissions Setup Diagram of the EUT.

4.1.3 Power Supply Variation

Tests at extreme supply voltages are made if required by the procedures specified in the test standard, and results of this testing are detailed in this report.

In the case of this EUT, measurements of the worst-case radiated emissions are performed with the supply voltage varied by no less than 85% and 115% of the nominal rated value for devices connecting to AC power mains.

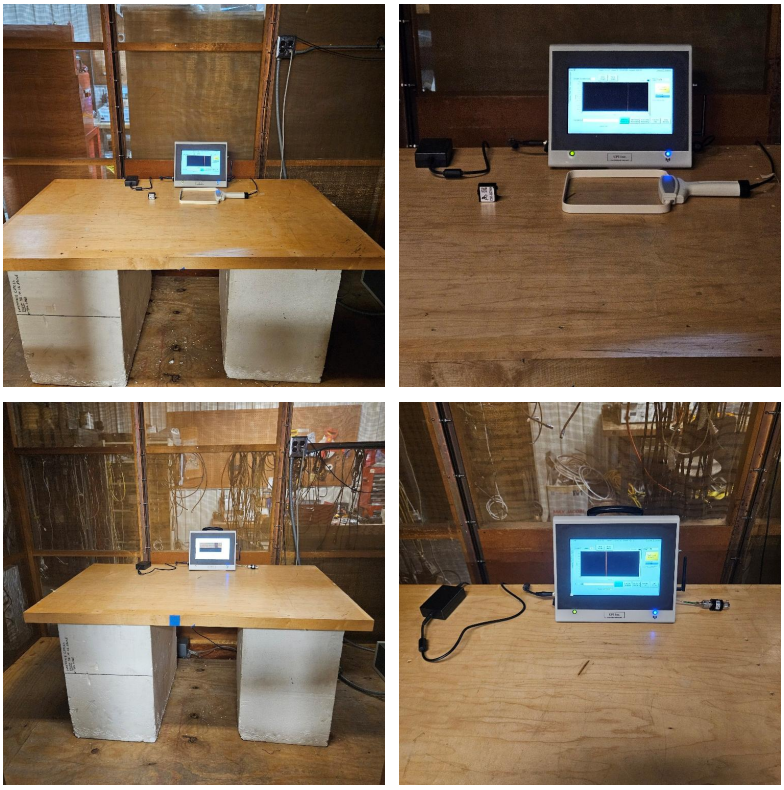


Figure 4.1.2 AC Conducted Emissions Test Setup Photograph(s).

4.2 Intentional Emissions

4.2.1 Fundamental Emission Pulsed Operation

The details and results of testing the EUT for pulsed operation are summarized in Table 4.2.1 .

Table 4.2.1 Pulsed Emission Characteristics (Duty Cycle).

Frequency Range	Det	IF Bandwidth	Video Bandwidth
9 kHz ≤ f ≤ 150 kHz	Pk/QPk	200 Hz	300 Hz
150 kHz ≤ f ≤ 30 MHz	Pk/QPk	9 kHz/10 kHz	30 kHz
25 MHz ≤ f ≤ 1 000 MHz	Pk/QPk	120 kHz	300 kHz
f > 1 000 MHz	Pk	3 MHz	3MHz
f > 1 000 MHz	Avg	3 MHz	10kHz

Test Date:	17-Mar-25		
Test Engineer:	J. Nantz		
EUT Mode:	Normal Operating		
Meas. Distance:	0.1 meters		
EUT Tested:	UIM AIHS-MU		

R0		Overall Transmission			Internal Frame Characteristics			Computed Duty Cycle	
	EUT Mode	Min. Repetition Rate (sec)	Max. No. of Frames	Total Transmission Length (sec)	Max. Frame Length (ms)	Min. Frame Period (ms)	Frame Encoding	(%)	Duty (dB)
R1	Tag Read	Single	N/A	240	N/A	N/A	In normal operation the EUT NFC reader transmits a CW signal reading any tag that is within range of the coil. The coil is energized for a maximum of 4 minutes.	N/A	N/A
#	C1	C2	C3	C4	C5	C6	C7	C8	C9

(ROW) (COLUMN) NOTE:
R0 C8/C9 No Duty Cycle is employed when demonstrating compliance.

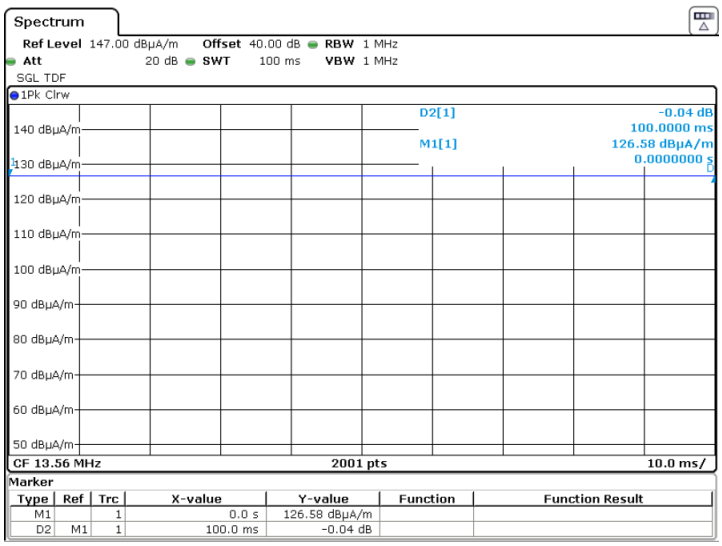


Figure 4.2.1 Example Pulsed Emission Characteristics (Duty Cycle).

4.2.2 Fundamental Emission Bandwidth

Emission bandwidth (EBW) of the EUT is measured with the device placed in the test mode(s) with the shortest available frame length and minimum frame spacing. Radiated emissions are recorded following the test procedures listed in Section 2.1. The 20 dB EBW is measured as the max-held peak-detected signal when the IF bandwidth is greater than or equal to 1% of the receiver span. For complex modulations other than ASK and FSK, the 99% emission bandwidth per IC test procedures has a different result, and is also separately reported.The results of EBW testing are summarized in Table 4.2.2 . Plots showing measurements employed to obtain the emission bandwidth reported are provided in Figure 4.2.2 .

Table 4.2.2 Intentional Emission Bandwidth.

Frequency Range	Det	IF Bandwidth	Video Bandwidth		
9 kHz ≤ f ≤ 150 kHz	Pk	> 1% Span	>= 3 * IFBW	**Test Date:**	17-Mar-25
150 kHz ≤ f ≤ 30 MHz	Pk	> 1% Span	>= 3 * IFBW	**Test Engineer:**	J. Nantz
				EUT Mode:	See Below
				Meas. Distance:	0.1 meters
				EUT Tested:	UIM AIHS-MU

R0	Mode	Frequency Range (MHz)	Temp (C)	Supply (V)	99% PWR BW (kHz)	20 dB EBW (kHz)	fL (20 dBc) (MHz)	fH (20 dBc) (MHz)
R1	Tag Read	13.56	20.1	12	21.24	25.24	13.547	13.573
#	C1	C2	C3	C4	C5	C6	C7	C9

(ROW) (COLUMN) NOTE:

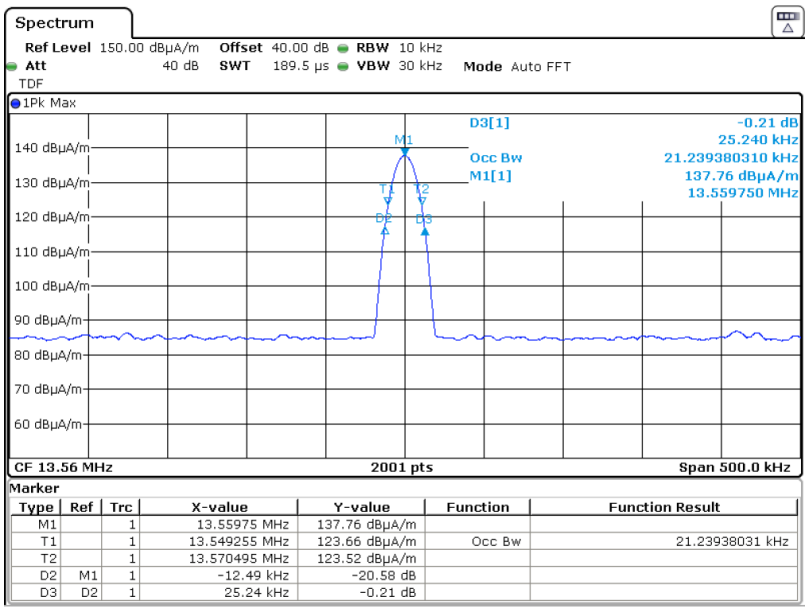


Figure 4.2.2 Example Intentional Emission Bandwidth.

4.2.3 Fundamental Emission

Following the test procedures listed in Section 2.1, field emissions measurements are made on the EUT for both Horizontal and Vertically polarized coupling fields. The EUT's loop antenna(s) are measured along all three axes, including when the EUT loop axes are aligned in the same axis as the test loop and aligned coplanar (in the same plane) with the test loop antenna. Table 4.2.3 details the results of these measurements.

Table 4.2.3 Fundamental Radiated Emissions.

Frequency Range	Det	IF Bandwidth	Video Bandwidth
9 kHz ≤ f ≤ 150 kHz	Pk/QPk	200 Hz	300 Hz
150 kHz ≤ f ≤ 30 MHz	Pk/QPk	9 kHz	30 kHz
30 MHz ≤ f ≤ 1 000 MHz	Pk/QPk	120 kHz	300 kHz

Test Date:	17-Mar-25
Test Engineer:	J. Nantz
Meas. Distance:	3 meters
EUT Tested:	UIM AIHS-MU
EUT Mode:	CW
Temperature:	-3C
RH:	56%

Fundamental Emissions Measurements

R0	EUT Description	Test Antenna Polarization	Freq. MHz	Ant. Used	Ant Ht.	Table Angle	Meas. Dist. m	Pr dBm	Ka dB/m	Kg dB	NF/FF boundary m	Cf 3 m / 30 m dB	E3m (Pk) Pk dBuV/m	E30m Pk	E30m QPk/Avg dBuV/m	E30m Limit	H30m Pk	H30m QPk/Avg dBuA/m	H30m Limit	Pass By
R1	EUT (SN: 3398)	Coaxial - Horz	13.56	EMCOLOOP1	1.0	330.0	3.0		10.6	0.8	3.5	40.0	108.6	68.6		84.0	17.1			**15.4**
R2		Coplanar – Horz	13.56	EMCOLOOP1	1.0	330.0	3.0		10.6	0.8	3.5	40.0	96.2	56.2		84.0	4.7			27.8
R3		Coplanar – Vert	13.56	EMCOLOOP1	1.0	330.0	3.0		10.6	0.8	3.5	40.0	99.5	59.5		84.0	8.0			24.5
R4																				
R5																				

Frequency Stability over Temperature/Voltage

R6	Mode	Temp (°C)	Freq. (MHz)	Voltage (VDC)	Freq. Variation (+/- ppm)	Freq. Variation Limit (+/- ppm)	Pass
R7	CM	50	13.560003	12.0	-5	100	TRUE
R8	CM	40	13.560014	12.0	-4	100	TRUE
R9	CM	30	13.560039	12.0	-2	100	TRUE
R10	CM	20	13.560068	10.2	0	100	TRUE
R11	CM	20	13.560069	12.0	BASELINE		
R12	CM	20	13.560069	13.8	0	100	TRUE
R13	CM	10	13.560104	12.0	3	100	TRUE
R14	CM	0	13.560123	12.0	4	100	TRUE
R15	CM	-10	13.560135	12.0	5	100	TRUE
R16	CM	-20	13.560152	12.0	6	100	TRUE

#	C1	C2	C3	12	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20

(ROW)	(COLUMN)	NOTE:
R0	C1	EUT was tested in CW mode. No averaging applied, Peak data reported to demonstrate compliance.
R0	C11	NF/FF Boundary at lambda/2pi distance for small radiator.
R0	C12	40 dB/dec near field conversion factor is permitted according to FCC part 15.31(f)(2). Measured decay rate is 46.5dB/dec.
R0	C13	When E-field is reported directly from Spectrum Analyzer, Antenna Factors and Cable losses are included directly in SA settings.
R0	C17	H-field is computed by subtracting dBΩ in freespace from E-Field measurements = 20*log(120π) = 51.5dB

4.3 Unintentional Emissions

4.3.1 Transmit Chain Spurious Emissions

The results for the measurement of transmit chain spurious emissions at the nominal voltage and temperature are provided in Table 4.3.1 . Following the test procedures listed in Section 2.1, field emissions measurements are made on the EUT for both Horizontal and Vertically polarized coupling fields. The EUT's loop antenna(s) are measured when the EUT loop axes placed in all three axes, including when they are aligned along the same axis as the test loop antenna and are aligned coplanar with the test loop antenna. For all arrangements, test loop is rotated for maximum field. The results for the measurement of transmit chain spurious emissions at the nominal voltage and temperature are provided in Table 4.3.1 . Measurements are performed to 10 times the highest fundamental operating frequency.

Table 4.3.1 Transmit Chain Spurious Emissions.

Frequency Range	Det	IF Bandwidth	Video Bandwidth
9 kHz ≤ f ≤ 150 kHz	Pk/QPk	200 Hz	300 Hz
150 kHz ≤ f ≤ 30 MHz	Pk/QPk	9 kHz	30 kHz
25 MHz ≤ f ≤ 1 000 MHz	Pk/QPk	120 kHz	300 kHz

Test Date:	17-Mar-25
Test Engineer:	J. Nantz
Meas. Distance:	3 meters
EUT Tested:	UIM AIHS-MU
Temperature:	-3C
RH:	56%

Transmit Chain Spurious Emissions

#	Mode	Test Antenna Polarization	Freq. Start MHz	Freq. Stop MHz	Ant. Used	Ant Ht. m	Table Angle deg	Meas. Dist. m	Ka dB/m	Kg dB	NF/FF boundary m	Cf (3 to 30m) dB	E3m (Pk) Pk dBuV/m	E-field (Pk) dBuV/m	E-field (Qpk/Avg) dBuV/m	E-field Limit (30m / 3m) dBuV/m	H-field (Pk) dBuA/m	H-field (Qpk/Avg) dBuA/m	ISED H-field Limit (30m / 3m) dBuA/m	Pass By	Comments
R1	CW (SN: 60LB9268)	Coplanar-Vertical	27.1	27.1	EMCOLOOP1	1.0	330.0	3.0	8.7	1.0	1.8	20.0	45.4	25.4	22.8	29.5	-26.2		-21.9	**4.2**	Max all orientations
R2		H	40.7	40.7	BICEMCO01	3.0	180.0	3.0	11.5	-.4	1.2	.0	33.2	33.2	30.6	40.0				9.4	Max all
R3		V	40.7	40.7	BICEMCO01	1.0	00.0	3.0	11.5	-.4	1.2	.0	38.1	38.1	35.5	40.0				4.5	Max all
R4		H	54.2	54.2	BICEMCO01	3.0	180.0	3.0	10.1	-.4	0.9	.0	28.8	28.8	26.2	40.0				13.8	Max all
R5		V	54.2	54.2	BICEMCO01	1.0	00.0	3.0	10.1	-.4	0.9	.0	36.1	36.1	33.5	40.0				6.5	Max all
R6		H	67.8	67.8	BICEMCO01	2.0	180.0	3.0	9.7	-.4	0.7	.0	33.3	33.3	30.7	40.0				9.3	Max all
R7		V	67.8	67.8	BICEMCO01	1.0	00.0	3.0	9.7	-.4	0.7	.0	32.5	32.5	29.9	40.0				10.1	Max all
R8		H	81.4	81.4	BICEMCO01	2.0	180.0	3.0	9.5	-.5	0.6	.0	29.8	29.8	27.2	40.0				12.8	Max all
R9		V	81.4	81.4	BICEMCO01	1.0	00.0	3.0	9.5	-.5	0.6	.0	29.5	29.5	26.9	40.0				13.1	Max all
R10		H	94.9	94.9	BICEMCO01	2.0	180.0	3.0	9.7	-.5	0.5	.0	33.7	33.7		43.5				9.8	Background
R11		V	94.9	94.9	BICEMCO01	1.0	00.0	3.0	9.7	-.5	0.5	.0	33.0	33.0		43.5				10.5	Background
R12		H	108.5	108.5	BICEMCO01	2.0	180.0	3.0	10.6	-.6	0.4	.0	31.2	31.2	28.6	43.5				14.9	Max all
R13		V	108.5	108.5	BICEMCO01	1.0	00.0	3.0	10.6	-.6	0.4	.0	30.1	30.1	27.5	43.5				16.0	Max all
R14		H	122.0	122.0	BICEMCO01	2.0	180.0	3.0	11.7	-.6	0.4	.0	29.4	29.4	26.8	43.5				16.7	Max all
R15		V	122.0	122.0	BICEMCO01	1.0	00.0	3.0	11.7	-.6	0.4	.0	27.7	27.7	25.1	43.5				18.4	Max all
R16		H	135.6	135.6	BICEMCO01	2.0	180.0	3.0	12.3	-.6	0.4	.0	25.3	25.3	22.7	43.5				20.8	Max all
R17		V	135.6	135.6	BICEMCO01	1.0	00.0	3.0	12.3	-.6	0.4	.0	26.9	26.9	24.3	43.5				19.2	Max all
R18																					
R19																					
R20																					
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21

(ROW)	(COLUMN)	NOTE:
R0	C1	EUT was tested in CW mode.
R0	C11	NF/FF Boundary at lambda/2pi distance for small radiator.
R1	C12	40 dB/dec near field conversion factor, 20 dB/dec far-field conversion factors are permitted. 20dB is chosen to show compliance under worst case conversion.
R0	C13	When E-field is reported directly from Spectrum Analyzer, Antenna Factors and Cable losses are included directly in SA settings.
R0	C17	H-field is computed by subtracting dBΩ in freespace from E-Field measurements = 20*log(120π) = 51.5dB

4.3.2 General Radiated and Cabinet Spurious

The results for the measurement of general spurious emissions (emissions arising from digital circuitry) at the nominal voltage and temperature are provided in Table 4.3.2 . Radiation from digital components are measured up to 1000 MHz or to the highest frequency required by the applied standards, whichever is greater.

Table 4.3.2 (i) Radiated Spurious Emissions.

Frequency Range	Det	IF Bandwidth	Video Bandwidth
25 MHz ≤ f ≤ 1 000 MHz	Pk/QPk	120 kHz	300 kHz
f > 1 000 MHz	Pk	1 MHz	3 MHz
f > 1 000 MHz	Avg/RMS	1 MHz	3 MHz

Test Date:	16-Mar-25
Test Engineer:	J. Nantz
EUT:	UIM AIHS-MU
EUT Mode:	Powered - Radio on - Antenna 50Ω Termination
Meas. Distance:	3 m
Temperature:	7°C
Rel. Humidty:	59%

Digital Spurious Emissions - RADIATED (OATS) FCC/ISED/CE

	Test	Antenna				E-Field @ 3m**			CISPR32 CLB (QPk)		FCC/ISED CLB (QPk)		FCC/ISED CLA (QPk)		
	Freq.	QN	Test	Ka	Kg	Pk	Qpk	Avg	E3lim	Pass	E3lim	Pass	E3lim	Pass	
R0	MHz		Pol.	dB/m	dB	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dBµV/m	dB	dBµV/m	dB	Comments
R1	103.5	BICEMCO01	H	8.7	-.5	31.2	22.4		40.0	17.6	43.5	21.1	54.0	31.6	
R2	113.5	BICEMCO01	H	9.4	-.6	28.4	18.4		40.0	21.6	43.5	25.1	54.0	35.6	
R3	162.7	BICEMCO01	H	13.3	-.7	29.5	27.1		40.0	12.9	43.5	16.4	54.0	26.9	
R4	203.4	LOGEMCO01	H	10.8	-.8	39.9	37.7		40.0	2.3	43.5	5.8	54.0	16.3	
R5	217.0	LOGEMCO01	H	11.3	-.9	35	32.8		40.0	7.2	46.0	13.2	56.9	24.1	
R6	230.5	LOGEMCO01	H	11.8	-.9	28.7	25.9		47.0	21.1	46.0	20.1	56.9	31.0	
R7	244.1	LOGEMCO01	H	12.3	-1.0	28.6	25.4		47.0	21.6	46.0	20.6	56.9	31.5	
R8	271.2	LOGEMCO01	H	13.0	-1.0	38.3	37.4		47.0	9.6	46.0	8.6	56.9	19.5	
R9	433.9	LOGEMCO01	H	16.3	-1.5	42.6	40.5		47.0	6.5	46.0	5.5	56.9	16.4	
R10	515.2	LOGEMCO01	H	17.7	-1.8	34.6	30.6		47.0	16.4	46.0	15.4	56.9	26.3	
R11	542.4	LOGEMCO01	H	18.1	-1.8	42.6	41.6		47.0	5.4	46.0	4.4	56.9	15.3	
R12	1268.0	HQR1TO18S01	H	21.5	-3.8	38.4		33.8	50.0	16.2	54.0	20.2	60.0	26.2	
R13															
R14	2390.0	HQR1TO18S01	H	21.5	-6.5	53.6		41.4	50.0	8.6	54.0	12.6	60.0	18.6	WiFi Radio Bandedges
R15	2483.5	HQR1TO18S01	H	21.5	-6.7	56.3		45.9	50.0	4.1	54.0	8.1	60.0	14.1	WiFi Radio Bandedges
R16															
R17															
R18															
R19															
R20															
R21															
R22															
R23															
R24															
R25															
R26															
R27															
R28															
R29															
R30															
R31															
R32															
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15

*Pk+Avg detection (narrowband), Pk + QPk detection (wideband) emissions

** When E-field is reported directly from Spectrum Analyzer, Antenna Factors and Cable losses are included directly in SA settings.

*** Values reported are the maximum of EUT emissions or background noise, whichever is highest.

Table 4.3.2 (ii) Radiated Spurious Emissions.

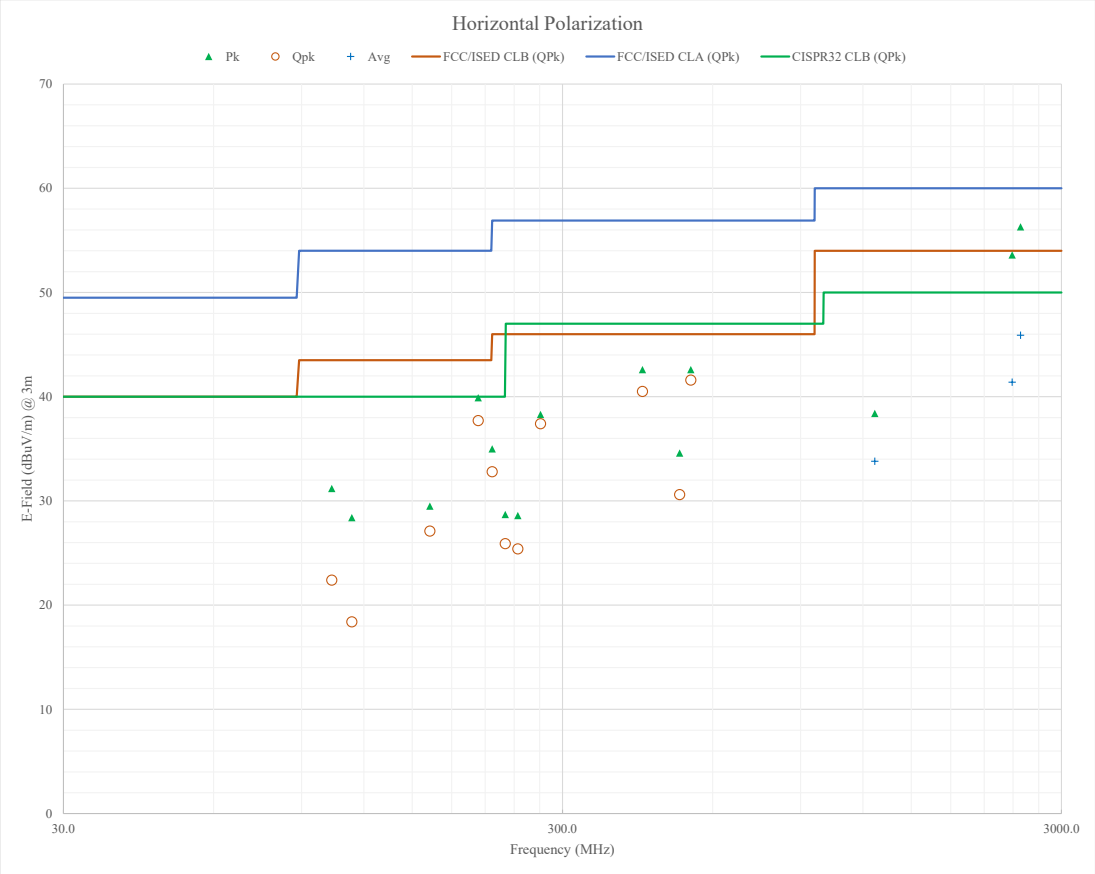


Table 4.3.2 (iii) Radiated Spurious Emissions.

Frequency Range	Det	IF Bandwidth	Video Bandwidth
25 MHz ≤ f ≤ 1 000 MHz	Pk/QPk	120 kHz	300 kHz
f > 1 000 MHz	Pk	1 MHz	3 MHz
f > 1 000 MHz	Avg/RMS	1 MHz	3 MHz

Test Date:	16-Mar-25
Test Engineer:	J. Nantz
EUT:	UIM AIHS-MU
EUT Mode:	Powered - Radio on - Antenna 50Ω Termination
Meas. Distance:	3 m
Temperature:	7°C
Rel. Humidty:	59%

Digital Spurious Emissions - RADIATED (OATS) FCC/ISED/CE

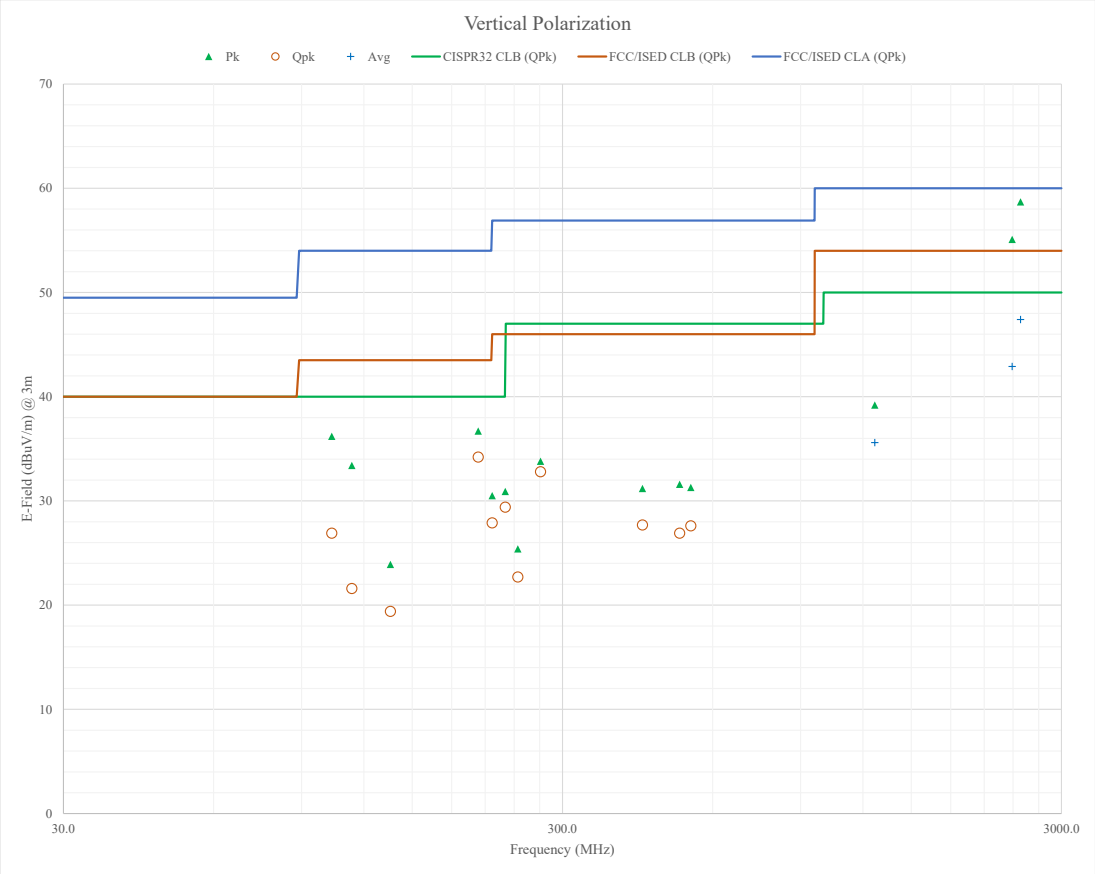
	Test	Antenna				E-Field @ 3m**			CISPR32 CLB (QPk)		FCC/ISED CLB (QPk)		FCC/ISED CLA (QPk)		
	Freq.	QN	Test	Ka	Kg	Pk	Qpk	Avg	E3lim	Pass	E3lim	Pass	E3lim	Pass	
R0	MHz		Pol.	dB/m	dB	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB	dBµV/m	dB	dBµV/m	dB	Comments
R1	103.5	BICEMCO01	V	8.7	-.5	36.2	26.9		40.0	13.1	43.5	16.6	54.0	27.1	
R2	113.5	BICEMCO01	V	9.4	-.6	33.4	21.6		40.0	18.4	43.5	21.9	54.0	32.4	
R3	135.6	BICEMCO01	V	11.3	-.6	23.9	19.4		40.0	20.6	43.5	24.1	54.0	34.6	
R4	203.4	LOGEMCO01	V	10.8	-.8	36.7	34.2		40.0	5.8	43.5	9.3	54.0	19.8	
R5	217.0	LOGEMCO01	V	11.3	-.9	30.5	27.9		40.0	12.1	46.0	18.1	56.9	29.0	
R6	230.5	LOGEMCO01	V	11.8	-.9	30.9	29.4		47.0	17.6	46.0	16.6	56.9	27.5	
R7	244.1	LOGEMCO01	V	12.3	-1.0	25.4	22.7		47.0	24.3	46.0	23.3	56.9	34.2	
R8	271.2	LOGEMCO01	V	13.0	-1.0	33.8	32.8		47.0	14.2	46.0	13.2	56.9	24.1	
R9	433.9	LOGEMCO01	V	16.3	-1.5	31.2	27.7		47.0	19.3	46.0	18.3	56.9	29.2	
R10	515.2	LOGEMCO01	V	17.7	-1.8	31.6	26.9		47.0	20.1	46.0	19.1	56.9	30.0	
R11	542.4	LOGEMCO01	V	18.1	-1.8	31.3	27.6		47.0	19.4	46.0	18.4	56.9	29.3	
R12	1268.0	HQR1TO18S01	V	21.5	-3.8	39.2		35.6	50.0	14.4	54.0	18.4	60.0	24.4	
R13															
R14	2390.0	HQR1TO18S01	V	21.5	-6.5	55.1		42.9	50.0	7.1	54.0	11.1	60.0	17.1	WiFi Radio Bandedges
R15	2483.5	HQR1TO18S01	V	21.5	-6.7	58.7		47.4	50.0	2.6	54.0	6.6	60.0	12.6	WiFi Radio Bandedges
R16															
R17															
R18															
R19															
R20															
R21															
R22															
R23															
R24															
R25															
R26															
R27															
R28															
R29															
R30															
R31															
R32															
#	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15

*Pk+Avg detection (narrowband), Pk + QPk detection (wideband) emissions

** When E-field is reported directly from Spectrum Analyzer, Antenna Factors and Cable losses are included directly in SA settings.

*** Values reported are the maximum of EUT emissions or background noise, whichever is highest.

Table 4.3.2 (iv) Radiated Spurious Emissions.



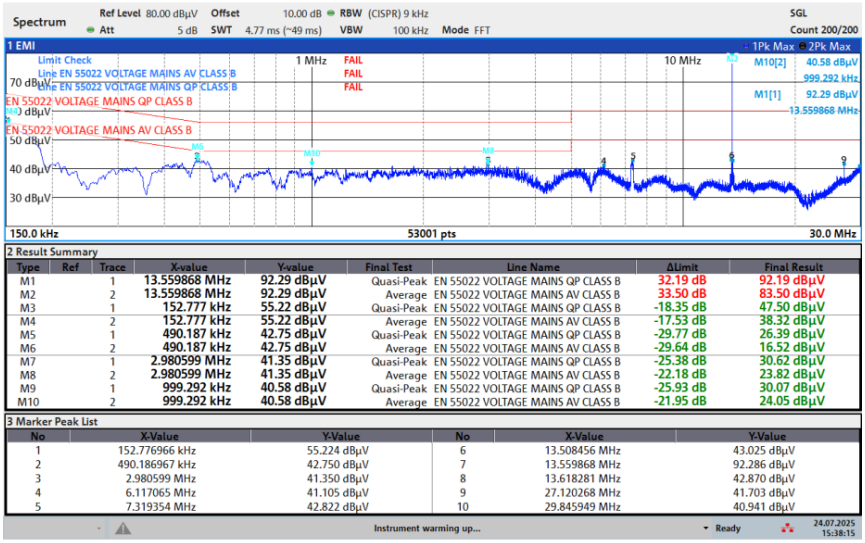
4.3.3 Conducted Emissions Test Results - AC Power Port(s)

The results of emissions from the EUT's AC mains power port(s) are reported in Table 4.3.3 .

Table 4.3.3 (i) AC Mains Power Conducted Emissions Results.

RFID ANTENNA CONNECTED

AC PORT CONDUCTED EMISSIONS – LINE 1



2 Result Summary

Type	Ref	Trace	X-value	Y-value	Final Test	Line Name	ΔLimit	Final Result
M1		1	13.559868 MHz	92.29 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	32.19 dB	92.19 dBµV
M2		2	13.559868 MHz	92.29 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	33.50 dB	83.50 dBµV
M3		1	152.777 kHz	55.22 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-18.35 dB	47.50 dBµV
M4		2	152.777 kHz	55.22 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-17.53 dB	38.32 dBµV
M5		1	490.187 kHz	42.75 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-29.77 dB	26.39 dBµV
M6		2	490.187 kHz	42.75 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-29.64 dB	16.52 dBµV
M7		1	2.980599 MHz	41.35 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-25.38 dB	30.62 dBµV
M8		2	2.980599 MHz	41.35 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-22.18 dB	23.82 dBµV
M9		1	999.292 kHz	40.58 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-25.93 dB	30.07 dBµV
M10		2	999.292 kHz	40.58 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-21.95 dB	24.05 dBµV

3 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	152.776966 kHz	55.224 dBµV	6	13.508456 MHz	43.025 dBµV
2	490.186967 kHz	42.750 dBµV	7	13.559868 MHz	92.286 dBµV
3	2.980599 MHz	41.350 dBµV	8	13.618281 MHz	42.870 dBµV
4	6.117065 MHz	41.105 dBµV	9	27.120268 MHz	41.703 dBµV
5	7.319354 MHz	42.822 dBµV	10	29.845949 MHz	40.941 dBµV

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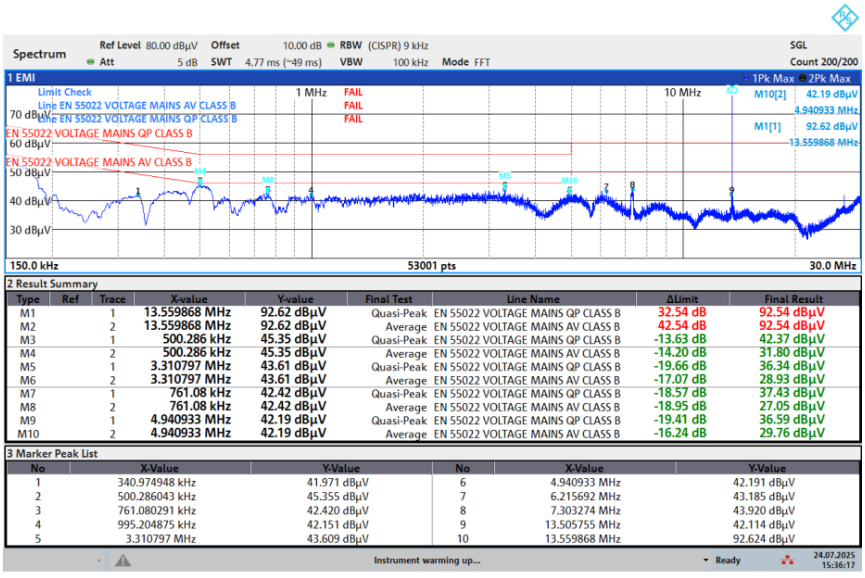
AC PORT CONDUCTED EMISSIONS – LINE 2



2 Result Summary

Type	Ref	Trace	X-value	Y-value	Final Test	Line Name	ΔLimit	Final Result
M1		1	13.559868 MHz	92.62 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	32.54 dB	92.54 dBµV
M2		2	13.559868 MHz	92.62 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	42.54 dB	92.54 dBµV
M3		1	500.286 kHz	45.35 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-13.63 dB	42.37 dBµV
M4		2	500.286 kHz	45.35 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-14.20 dB	31.80 dBµV
M5		1	3.310797 MHz	43.61 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-19.66 dB	36.34 dBµV
M6		2	3.310797 MHz	43.61 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-17.07 dB	28.93 dBµV
M7		1	761.08 kHz	42.42 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-18.57 dB	37.43 dBµV
M8		2	761.08 kHz	42.42 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-18.95 dB	27.05 dBµV
M9		1	4.940933 MHz	42.19 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-19.41 dB	36.59 dBµV
M10		2	4.940933 MHz	42.19 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-16.24 dB	29.76 dBµV

3 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	340.974948 kHz	41.971 dBµV	6	4.940933 MHz	42.191 dBµV
2	500.286043 kHz	45.355 dBµV	7	6.215692 MHz	43.185 dBµV
3	761.080291 kHz	42.420 dBµV	8	7.303274 MHz	43.920 dBµV
4	995.204875 kHz	42.151 dBµV	9	13.505755 MHz	42.114 dBµV
5	3.310797 MHz	43.609 dBµV	10	13.559868 MHz	92.624 dBµV

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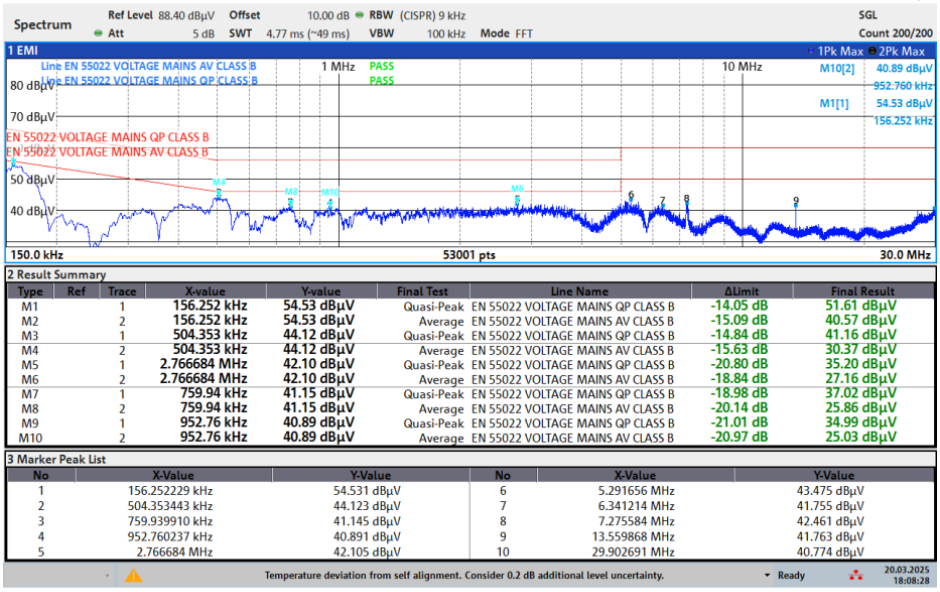
Table 4.3.3 (ii) AC Mains Power Conducted Emissions Results.

DUMMY LOAD CONNECTED

AC PORT CONDUCTED EMISSIONS – LINE 1



2 Result Summary

Type	Ref	Trace	X-value	Y-value	Final Test	Line Name	ΔLimit	Final Result
M1		1	156.252 kHz	54.53 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-14.05 dB	51.61 dBµV
M2		2	156.252 kHz	54.53 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-15.09 dB	40.57 dBµV
M3		1	504.353 kHz	44.12 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-14.84 dB	41.16 dBµV
M4		2	504.353 kHz	44.12 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-15.63 dB	30.37 dBµV
M5		1	2.766684 MHz	42.10 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-20.80 dB	35.20 dBµV
M6		2	2.766684 MHz	42.10 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-18.84 dB	27.16 dBµV
M7		1	759.94 kHz	41.15 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-18.98 dB	37.02 dBµV
M8		2	759.94 kHz	41.15 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-20.14 dB	25.86 dBµV
M9		1	952.76 kHz	40.89 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-21.01 dB	34.99 dBµV
M10		2	952.76 kHz	40.89 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-20.97 dB	25.03 dBµV

3 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	156.252229 kHz	54.531 dBµV	6	5.291656 MHz	43.475 dBµV
2	504.353443 kHz	44.123 dBµV	7	6.341214 MHz	41.755 dBµV
3	759.939910 kHz	41.145 dBµV	8	7.275584 MHz	42.461 dBµV
4	952.760237 kHz	40.891 dBµV	9	13.559868 MHz	41.763 dBµV
5	2.766684 MHz	42.105 dBµV	10	29.902691 MHz	40.774 dBµV

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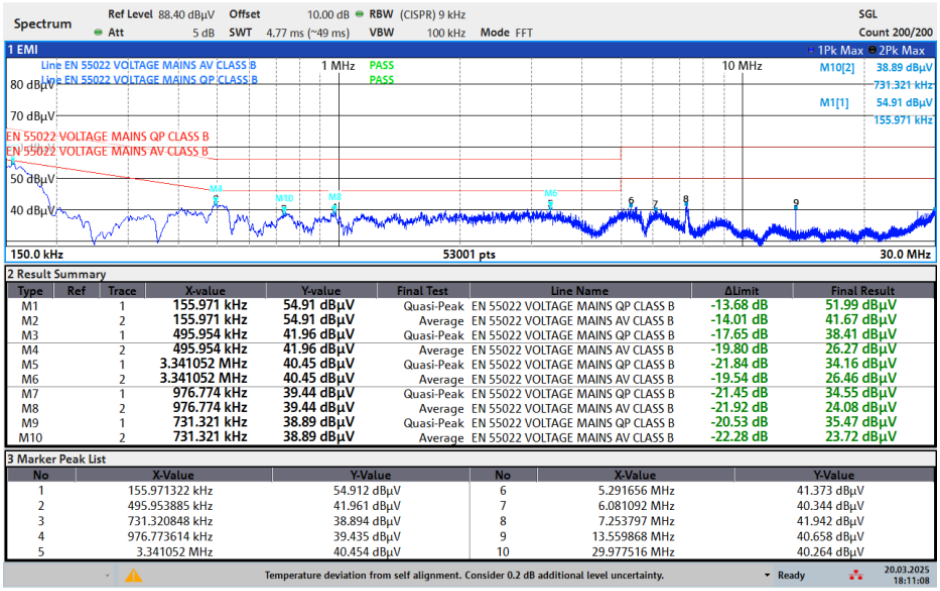
AC PORT CONDUCTED EMISSIONS – LINE 2



2 Result Summary

Type	Ref	Trace	X-value	Y-value	Final Test	Line Name	ΔLimit	Final Result
M1		1	155.971 kHz	54.91 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-13.68 dB	51.99 dBµV
M2		2	155.971 kHz	54.91 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-14.01 dB	41.67 dBµV
M3		1	495.954 kHz	41.96 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-17.65 dB	38.41 dBµV
M4		2	495.954 kHz	41.96 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-19.80 dB	26.27 dBµV
M5		1	3.341052 MHz	40.45 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-21.84 dB	34.16 dBµV
M6		2	3.341052 MHz	40.45 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-19.54 dB	26.46 dBµV
M7		1	976.774 kHz	39.44 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-21.45 dB	34.55 dBµV
M8		2	976.774 kHz	39.44 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-21.92 dB	24.08 dBµV
M9		1	731.321 kHz	38.89 dBµV	Quasi-Peak	EN 55022 VOLTAGE MAINS QP CLASS B	-20.53 dB	35.47 dBµV
M10		2	731.321 kHz	38.89 dBµV	Average	EN 55022 VOLTAGE MAINS AV CLASS B	-22.28 dB	23.72 dBµV

3 Marker Peak List

No	X-Value	Y-Value	No	X-Value	Y-Value
1	155.971322 kHz	54.912 dBµV	6	5.291656 MHz	41.373 dBµV
2	495.953885 kHz	41.961 dBµV	7	6.081092 MHz	40.344 dBµV
3	731.320848 kHz	38.894 dBµV	8	7.253797 MHz	41.942 dBµV
4	976.773614 kHz	39.435 dBµV	9	13.559868 MHz	40.658 dBµV
5	3.341052 MHz	40.454 dBµV	10	29.977516 MHz	40.264 dBµV

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5 Measurement Uncertainty and Accreditation Documents

The maximum values of measurement uncertainty for the laboratory test equipment and facilities associated with each test are given in the table below. This uncertainty is computed for a 95.45% confidence level based on a coverage factor of $k = 2$.

Table 5.0.0 Measurement Uncertainty.

Measured Parameter	Measurement Uncertainty†
Radio Frequency	$\pm(f_{Mkr}/10^7 + RBW/10 + (SPN/(PTS-1))/2 + 1\,\text{Hz})$
Conducted Emm. Amplitude	$\pm 1.9\,\text{dB}$
Radiated Emm. Amplitude ($f < 30\,\text{MHz}$)	$\pm 3.1\,\text{dB}$
Radiated Emm. Amplitude ($30 - 200\,\text{MHz}$)	$\pm 4.0\,\text{dB}$
Radiated Emm. Amplitude ($200 - 1000\,\text{MHz}$)	$\pm 5.2\,\text{dB}$
Radiated Emm. Amplitude ($f > 1000\,\text{MHz}$)	$\pm 3.7\,\text{dB}$

†Ref: CISPR 16-4-2:2011+A1:2014


United States Department of Commerce
National Institute of Standards and Technology

NVLAP® ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200129-0

AHD (Amber Helm Development, L.C.)
Sister Lakes, MI

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).

2025-06-04 through 2026-06-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

Figure 5.0.0 Accreditation Documents