COMPLIANCE WORLDWIDE INC.
TEST REPORT 292-23

In Accordance with the Requirements of

FCC TITLE 47 CFR Part 15.519, Subpart F
Technical Requirements for Handheld UWB Systems
Class II Permissive Change

Issued to

Wiser Systems, Inc.
819 W Hargett St
Raleigh, NC 27603
(919) 551-5566

For the
Handheld Tag
Models: TAGV1.2, TAGV1.2W

FCC ID: 2AGZM-B01017

Report Issued on October 6, 2023

Tested by

Sean P. Defelice

Sean P. Defelice

Reviewed by

Larry K. Stillings

Larry K. Stillings

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1. Scope

This test report certifies that the Wiser Systems Handheld Tag as tested, meets the FCC Part 15, Subpart F requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2. Product Details

2.1. Manufacturer:	Wiser Systems, Inc.
2.2. Model Numbers:	TAGV1.2, TAGV1.2W
2.3. Serial Numbers:	3208
2.4. Description:	RRLT Locator System leverages new advances in Ultra-Wideband technology to deliver low cost/high accuracy, real-time localization.
2.5. Power Source:	3.0 VDC (CR2032 Lithium)
2.6. Hardware Revision:	N/A
2.7. Software Revision:	N/A
2.8. Modulation Type:	Pulse Modulation, Frequency Hopping
2.9. Operating Frequencies:	4.5 GHz Center Frequency Nominal (Channel 3 – 500 MHz BW), 4.5 GHz Center Frequency Nominal (Channel 3 – 900 MHz BW)
2.10. EMC Modifications:	None

3. Product Configuration

3.1 Operational Characteristics & Software

Hardware Setup:

Connect the Wiser USB Dongle to a laptop computer via USB. Place a battery into the handheld tag.

Using the software tool configure the USB dongle to control the tag to transmit on Channel 3, normal and wide modes.

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Volts	Freq (Hz)	Description/Function
Wiser Systems	TAGV1.2	3208	3.0	DC	Handheld Tag

3.3. EUT Cables/Transducers

Cable Type	Length	Shield	From	To
None				

3.4. Support Equipment

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
Wiser Systems	USB Dongle	n/a	5.0	DC	For setting up the DUT operation.
Dell	XPS 13 – L321X	41647808737	120	60	For controlling the USB Dongle

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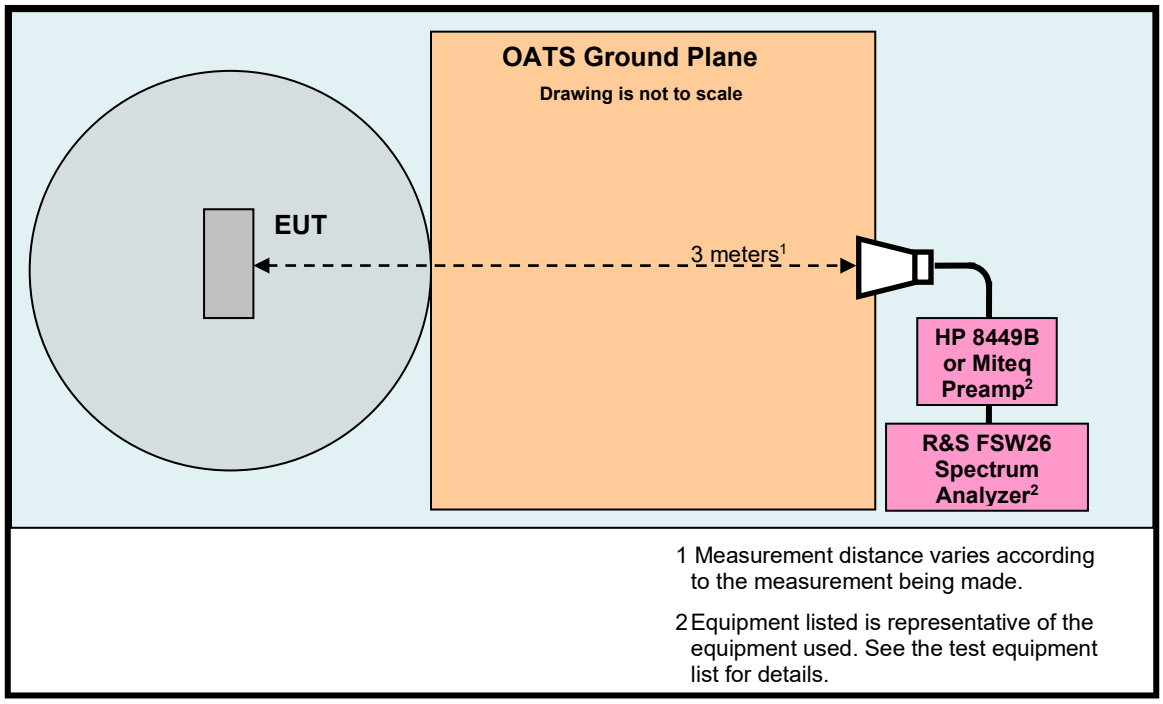
3. Product Configuration (cont.)

3.5. Test Setup Diagram



3.6. EUT Orientation Diagram

In addition, the measurements were performed with the device in three orthogonal positions in accordance with ANSI C63.10-2013, sections 5.10.1, 6.3.1, Figure 8 and Annex H. The three orthogonal axes were defined as follows:

X-Axis

Y-Axis

Z-Axis

X Axis	Sideways on Edge	Clip of unit is facing the antenna at 0º
Y Axis	On Edge on Table	Top/Face of unit is facing the antenna at 0º
Z Axis	Flat on the Table	Clip of unit is facing the antenna at 0º

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4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9kHz - 7GHz [1]	Rohde & Schwarz	ESR7	101156	10/25/2023	2 Years
EMI Test Receiver, 10 Hz - 7GHz [1]	Rohde & Schwarz	ESR7	101770	7/23/2024	3 Years
Spectrum Analyzer, 2 Hz to 26.5 GHz[2]	Rohde & Schwarz	FSW26	102057	6/24/2024	3 Years
Spectrum Analyzer, 9 kHz to 40 GHz[3]	Rohde & Schwarz	FSV40	100899	8/12/2024	4 Years
Spectrum Analyzer 10 Hz – 40 GHz[4]	Rohde & Schwarz	FSVR40	100909	9/18/2024	4 Years
Loop Antenna 9 kHz - 30 MHz	EMCO	6512	9309-1139	4/14/2025	3 Years
Biconilog Antenna, 30 MHz - 2 GHz	Sunol Sciences	JB1	A050913	7/1/2024	3 Years
Dbl Ridged Guide Antenna 1- 18 GHz	ETS-Lindgren	3117	00143292	5/11/2024	2 Years
Dbl Ridged Guide Antenna 1- 18 GHz	ETS-Lindgren	3117	00227631	4/21/2024	2 Years
Preamplifier 100 MHz to 7 GHz	Miteq	AFS3-00100200-10-15P-4	988773	2/28/2024	1 Year
Preamplifier 100 MHz to 18 GHz	Miteq	AMF-7D-00101800-30-10P	1953081	2/28/2024	1 Year
Preamplifier 2 to 12 GHz	JCA	JCA48-4111B1	7087S	2/28/2024	1 Year
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B	3008A01323	11/30/2023	2 Years
Preamplifier 18 to 40 GHz	Miteq	JSD42-21004200-40-5P	649199/649219	2/28/2024	1 Year
Horn Antenna 18 to 40 GHz	Com Power	AH-840	101032	1/25/2024	2 Years
High Pass Filter 8 to 18 GHz	Micro-Tronics	HPM50107	G036	2/28/2024	1 Year
High Pass Filter 6.4 to 18 GHz	Micro-Tronics	HPM50112	14	2/28/2024	1 Year
Low Pass Filter DC to 2700 MHz	Mini-Circuits	NLP-2950+	15542	11/21/2023	1 Year
10 dB Attenuator	Pasternack	PE7004-10	ID473	12/19/2023	1 Year
Barometric Pressure/Humidity & Temp Datalogger	Extech Instruments	SD700	Q590483	10/14/2023	2 Years

[1] ESR7 Firmware revision: V3.48 SP3, Date installed: 09/30/2020 Previous V3.48 SP2, installed 07/23/2020.
[2] FSW26 Firmware revision: V4.71 SP1, Date installed: 11/16/2020 Previous V4.61, installed 08/11/2020.
[3] FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016 Previous V2.30 SP1, installed 10/22/2014.
[4] FSVR40 Firmware revision: V2.23 SP1, Date installed: 08/19/2016 Previous V2.23, installed 10/22/2014.

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4. Measurements Parameters (continued)

4.2. Measurement & Equipment Setup

Test Dates:	9/13/2023, 9/14/2023, 9/20/2023, 9/21/2023, 9/22/2023, 9/25/2023, 9/26/2023, 10/6/2023
Test Engineers:	Sean Defelice
Normal Site Temperature (15 – 35°C):	21.6
Relative Humidity (20 -75%RH):	35
Frequency Range:	30 kHz to 40 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	200 Hz – 30 kHz to 150 kHz 9 kHz – 150 kHz to 30 MHz 120 kHz - 30 MHz to 1 GHz 1 MHz - Above 1 GHz
EMI Receiver Avg Bandwidth:	>= 3 * RBW
Detector Function:	Peak, Quasi-Peak & Average

4.3. Measurement Procedure

Test measurements were made in accordance FCC Parts 15.209 Subpart C and 15.519 Subpart F requirements.

The test methods used to generate the data is this test report is in accordance with ANSI C63.10:2013, American National Standard for Testing Unlicensed Wireless Devices.

4.4. Measurement Uncertainty

The following uncertainties are expressed for an expansion/coverage factor of K=2.

RF Frequency (out of band)	$\pm$ 1x10^{-8}
Radiated Emission of Transmitter to 100 GHz	$\pm$ 4.55 dB
Radiated Emission of Receiver	$\pm$ 4.55 dB
Temperature	$\pm$ 0.91° C
Humidity	$\pm$ 5%

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5. Measurements Summary

Test Requirement	FCC Rule Requirement	Test Report Section	Result	Comment
Antenna Requirement	15.203	6.1	Compliant	
Operational Requirements	15.519 (a) (1)	6.2	Compliant	
UWB Bandwidth	15.503 (a) (d) 15.519 (b)	6.3	Compliant	
Radiated Emissions below 960 MHz	15.209	6.4	Compliant	
Radiated Emissions above 960 MHz	15.519 (c) 15.521 (d)	6.5	Compliant	
Radiated Emissions in GPS Bands	15.519 (d)	6.6	Compliant	
RMS Emissions of UWB Transmission in a 1 MHz Bandwidth	15.519 (c) 15.521 (d)	6.7	Compliant	
Peak Emissions in a 50 MHz Bandwidth	15.519 (e) 15.521 (g)	6.8	Compliant	
Conducted Emissions	15.207	6.9	N/A	EUT is Battery Powered

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6. Measurement Data

6.1. Antenna Requirement (15.203)

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 a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply.

Result: The antenna utilized by the device under test is a pcb chip type.

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6. Measurement Data (continued)

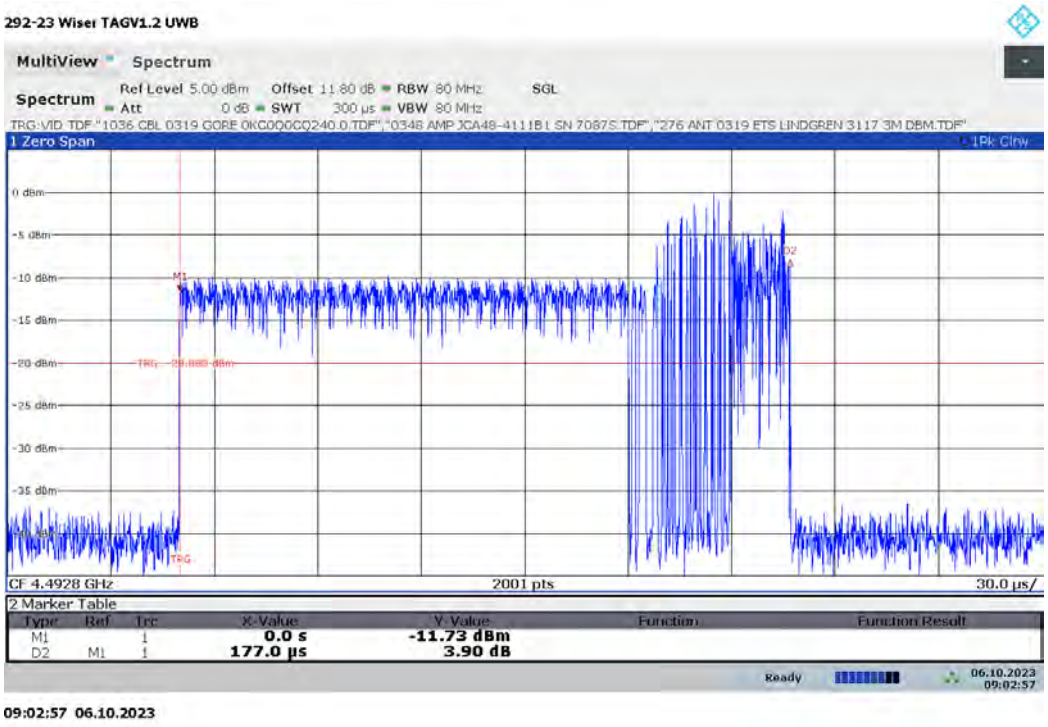
6.2. Operational Requirements of the Device under Test (15.519 (a) (1))

Requirement: UWB device operating under the provisions of this section must be hand held, i.e., they are relatively small device that are primarily hand held while being operated and do not employ a fixed infrastructure. UWB devices operating under the provisions of this section may operate indoors or outdoors.

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

Result: Compliant, the EUT transmits a 0.177 mS burst of location information every 11.610 seconds to an associated receiver.

6.2.1 Plot of Transmission CH3



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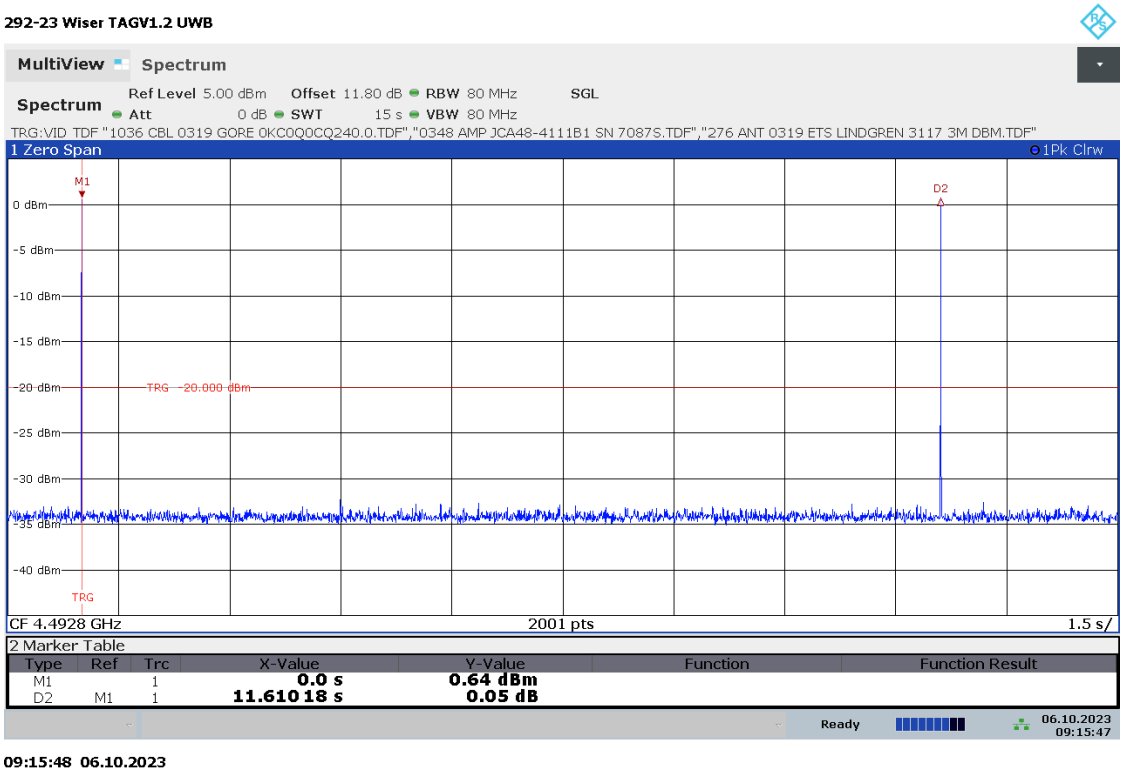
6. Measurement Data (continued)

6.2. Operational Requirements of the Device under Test (15.519 (a) (1))

6.2.2 Plot of Transmission Period –



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6. Measurement Data (continued)

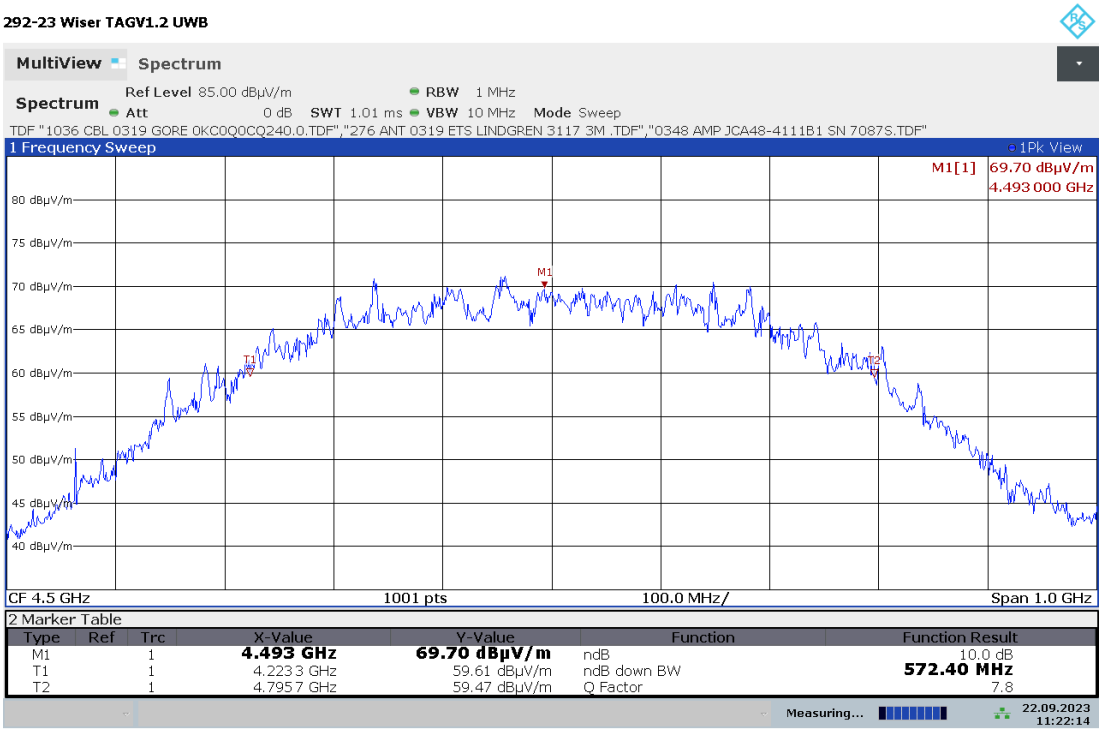
6.3. UWB Bandwidth (15.503 (a) (d), 15.519 (b))

Requirement: The UWB bandwidth of a device operating under the provisions of this section shall be contained between 3,100 MHz and 10,600 MHz and at any point in time and has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

6.3.1. Measurement Data – Values in GHz

		CH3
f_M	The highest emission peak	4.4930
f_L	10 dB below the highest peak	4.2233
f_H	10 dB above the highest peak	4.7957
f_C	Calculated: $(f_H + f_L) / 2$	4.5095
Bandwidth	Calculated: $(f_H - f_L)$	0.5724
Fractional BW	Calculated: $2*(f_H - f_L) / (f_H + f_L)$	0.1269

6.3.2. Measurement Plot of 10 dB frequencies (Channel 3 Normal)



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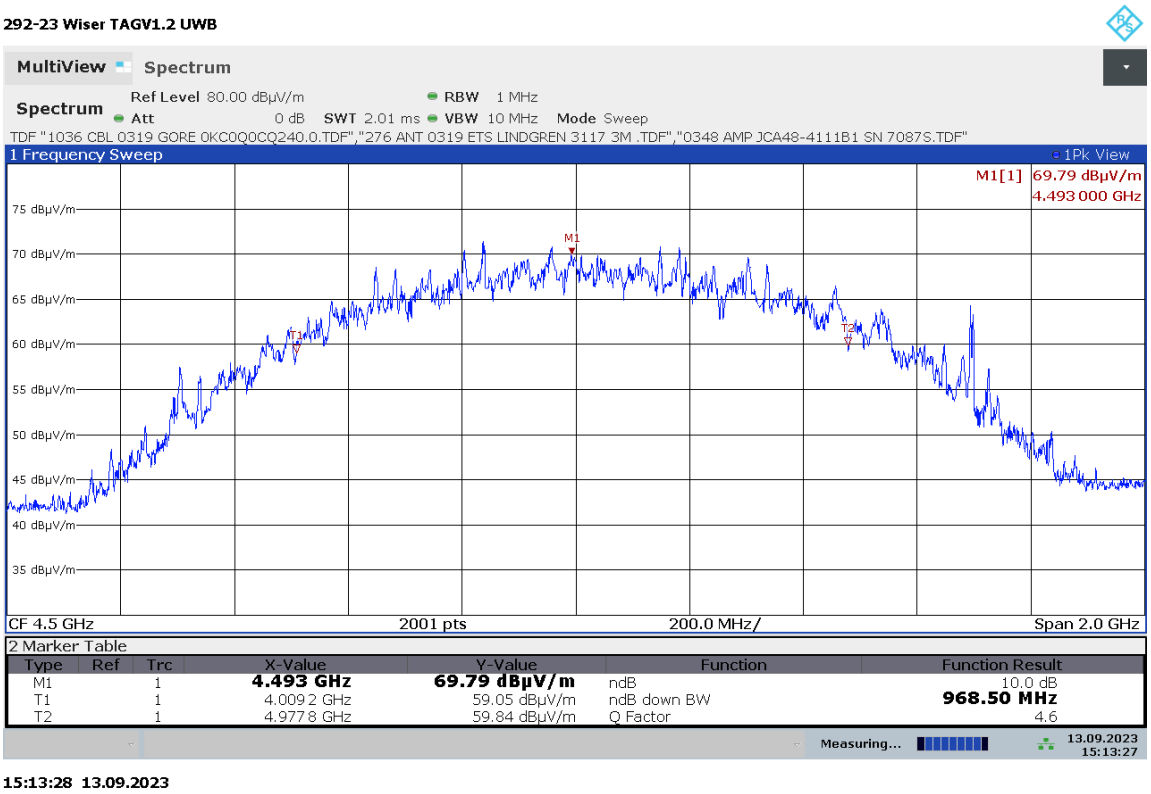
6. Measurement Data (continued)

6.3. UWB Bandwidth (15.503 (a) (d), 15.519 (b) continued)

6.3.3. Measurement Data – Values in GHz

		CH3
f_M	The highest emission peak	4.4930
f_L	10 dB below the highest peak	4.0092
f_H	10 dB above the highest peak	4.9778
f_C	Calculated: (f_H + f_L) / 2	4.4935
Bandwidth	Calculated: (f_H - f_L)	0.9686
Fractional BW	Calculated: 2*(f_H - f_L) / (f_H + f_L)	0.2156

6.3.4. Measurement Plot of 10 dB frequencies (Channel 3 Wide)



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6. Measurement Data (continued)

6.4. Spurious Radiated Emissions below 960 MHz (15.519 (c), 15.209)

Requirement: The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in Section 15.209.

Radiated Emissions Field Strength Limits at 3 Meters (Section 15.209, RSS-220)

Frequency (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)
0.009 to 0.490	2,400/F (F in kHz)	128.5 to 93.8
0.490 to 1.705	24,000/F (F in kHz)	73.8 to 63
1.705 - 30	30	69.5
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46

Test Notes: Refer to Section 4.1 for the test equipment used.

Frequency Range:	30 kHz to 960 MHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	200 Hz – 30 kHz to 150 kHz 9 kHz – 150 kHz to 30 MHz 120 kHz - 30 MHz to 960 MHz
EMI Receiver Avg Bandwidth:	≥ 3 * RBW or IF(BW)
Detector Function:	Peak, Quasi-Peak & CISPR Average

Sample Calculation: Final Result (dBµV/m) = Measurement Value (dBµV) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

Note: All correction factors are loaded into the measurement instrument prior to testing to determine the final result.

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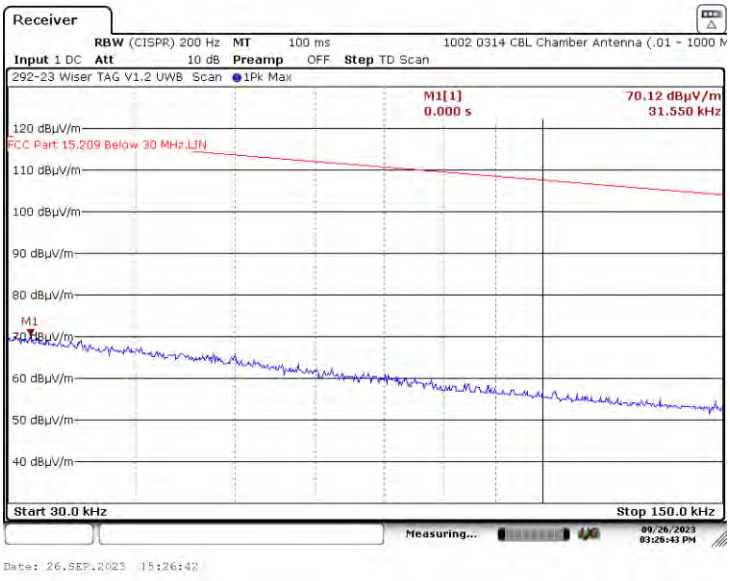
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

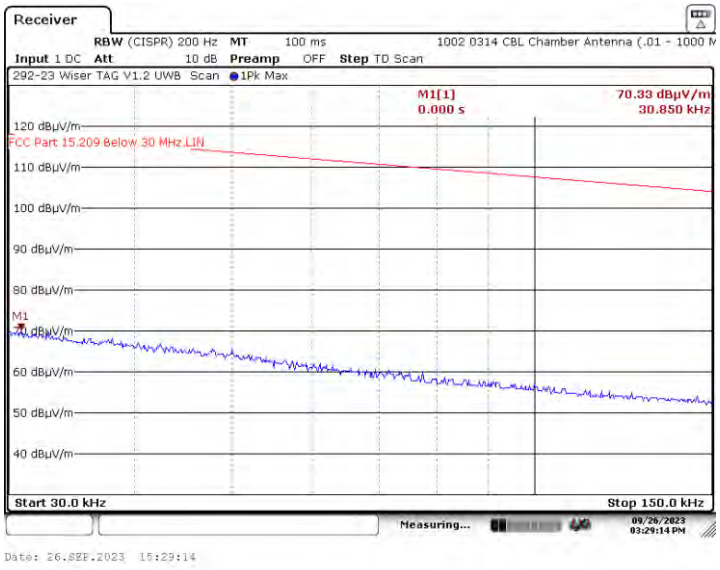
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.1 Parallel Measurement Antenna – 30 to 150 kHz – X Axis CH3 Normal



6.4.1.2 Perpendicular Measurement Antenna – 30 to 150 kHz – X Axis CH3



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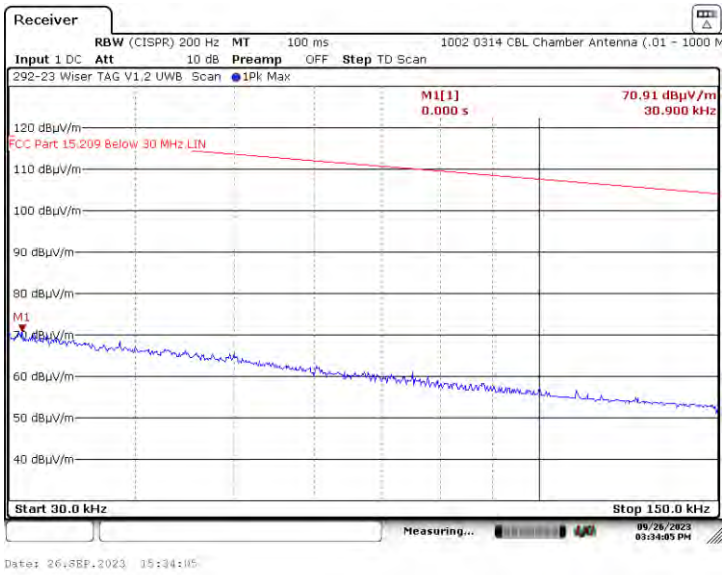
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

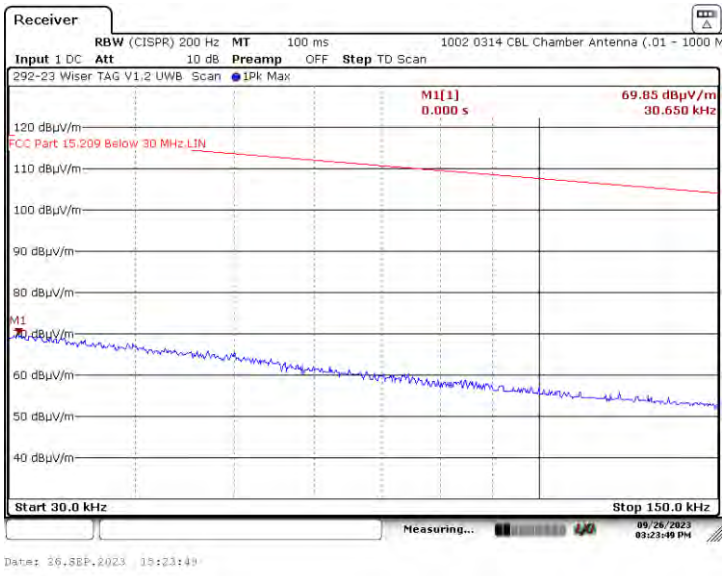
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.3 Ground Parallel Measurement Antenna – 30 to 150 kHz – X Axis CH3



6.4.1.4 Parallel Measurement Antenna – 30 to 150 kHz – Y Axis CH3



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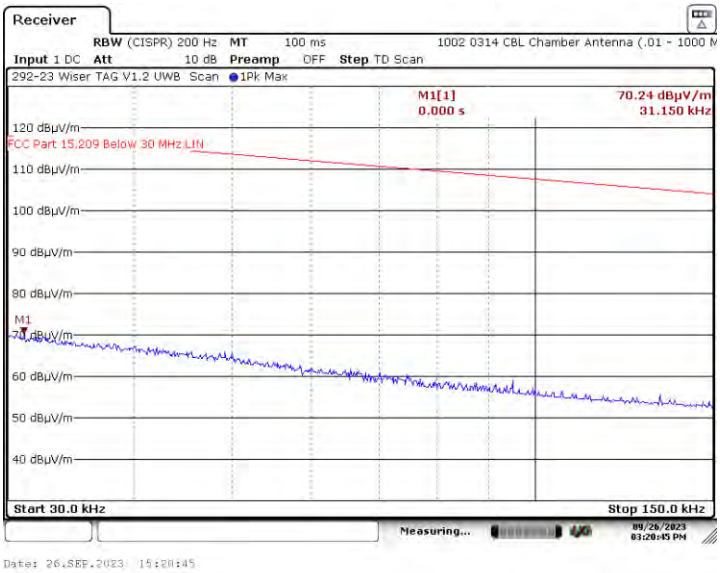
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

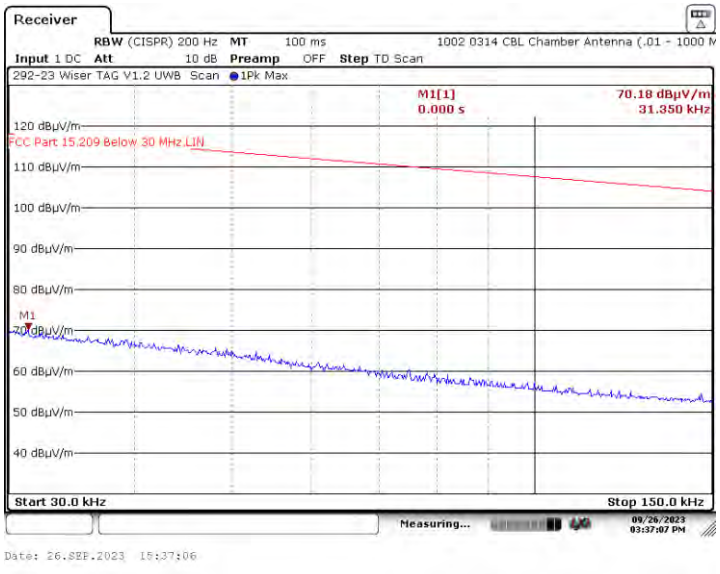
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.5 Perpendicular Measurement Antenna – 30 to 150 kHz – Y Axis CH3



6.4.1.6 Ground Parallel Measurement Antenna – 30 to 150 kHz – Y Axis CH3



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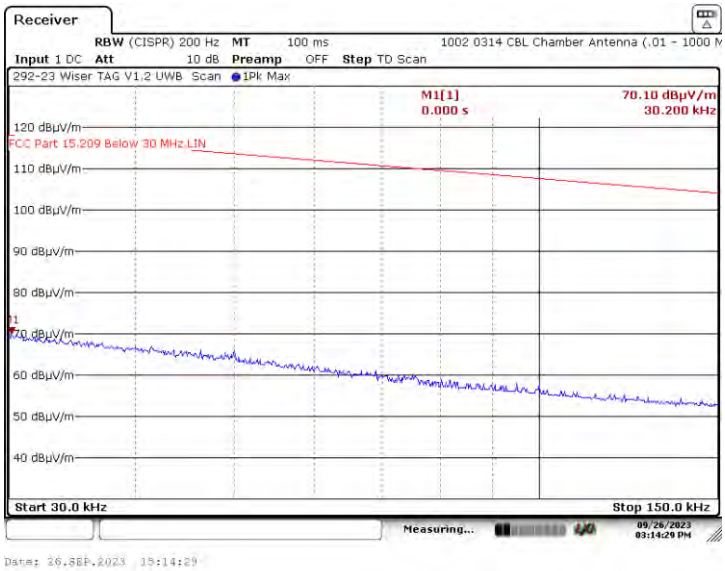
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

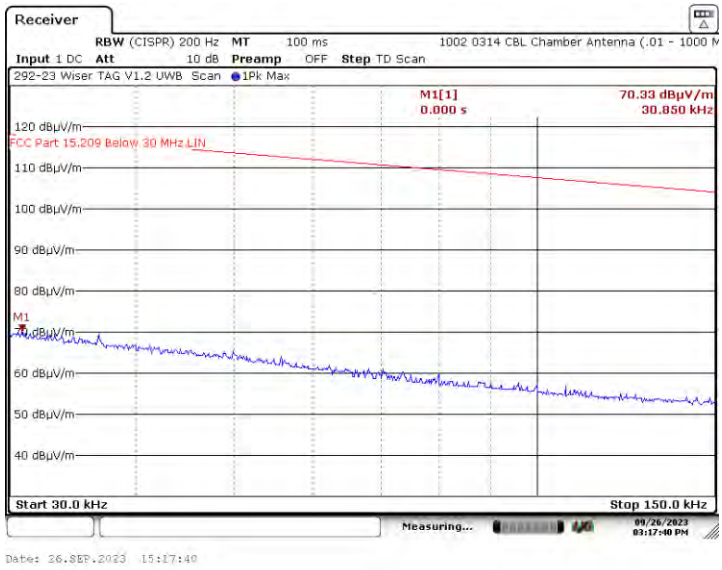
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.7 Parallel Measurement Antenna – 30 to 150 kHz – Z Axis CH3



6.4.1.8 Perpendicular Measurement Antenna – 30 to 150 kHz – Z Axis CH3



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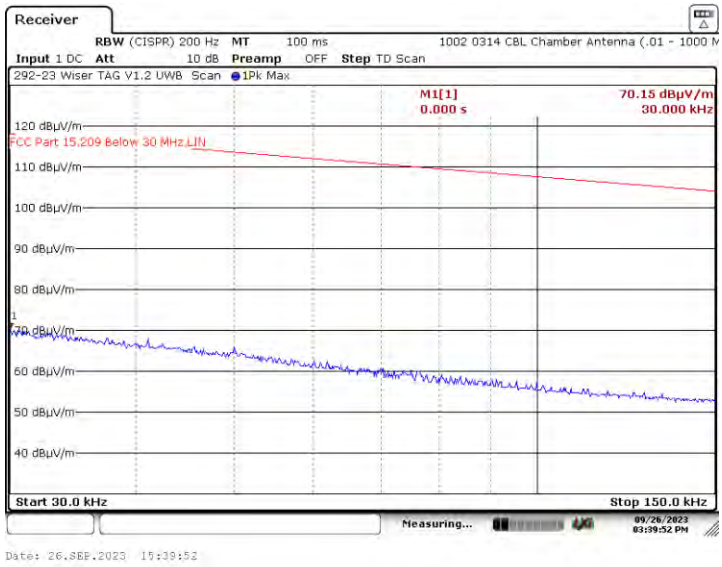
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

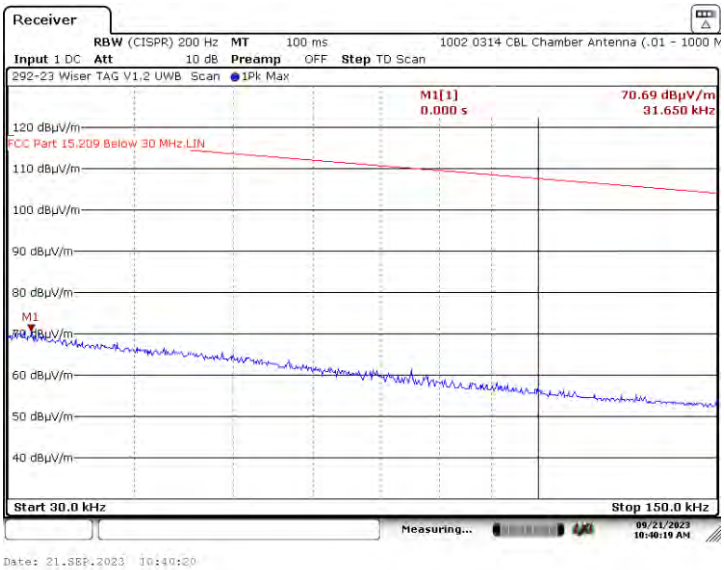
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.9 Ground Parallel Measurement Antenna – 30 to 150 kHz – Z Axis CH3



6.4.1.10 Parallel Measurement Antenna – 30 to 150 kHz – X Axis CH3 Wide



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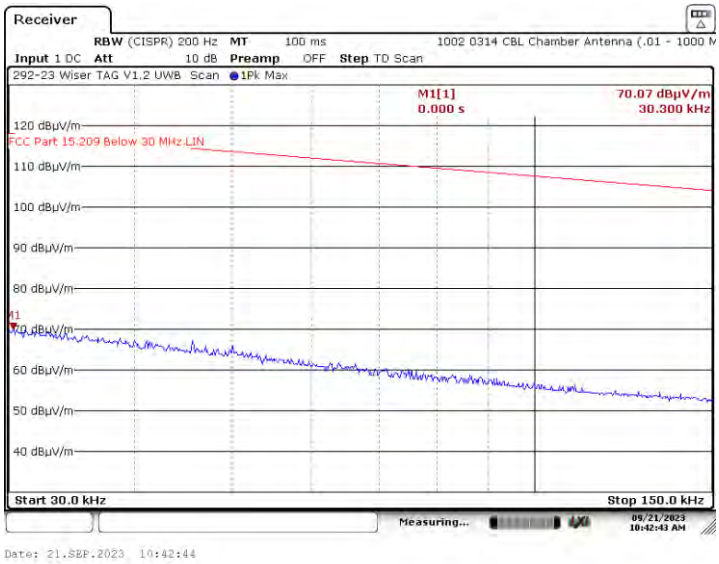
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

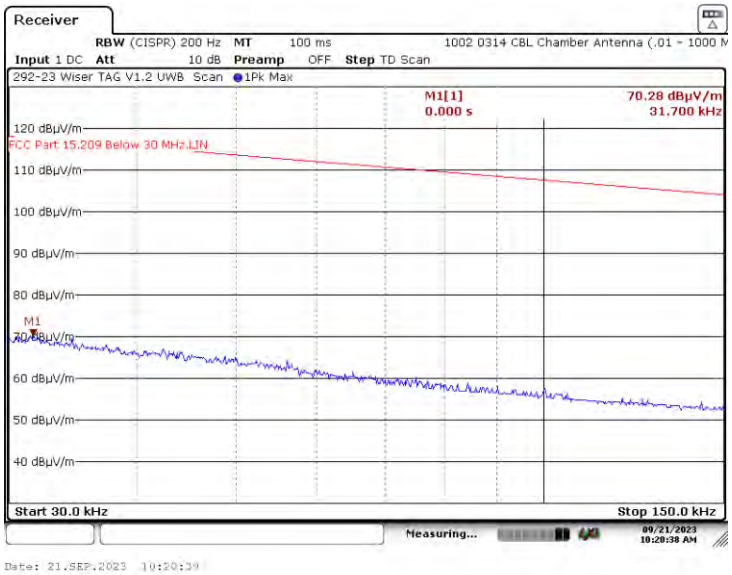
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.11 Perpendicular Measurement Antenna – 30 to 150 kHz – X Axis CH3



6.4.1.12 Ground Parallel Measurement Antenna – 30 to 150 kHz – X Axis CH3



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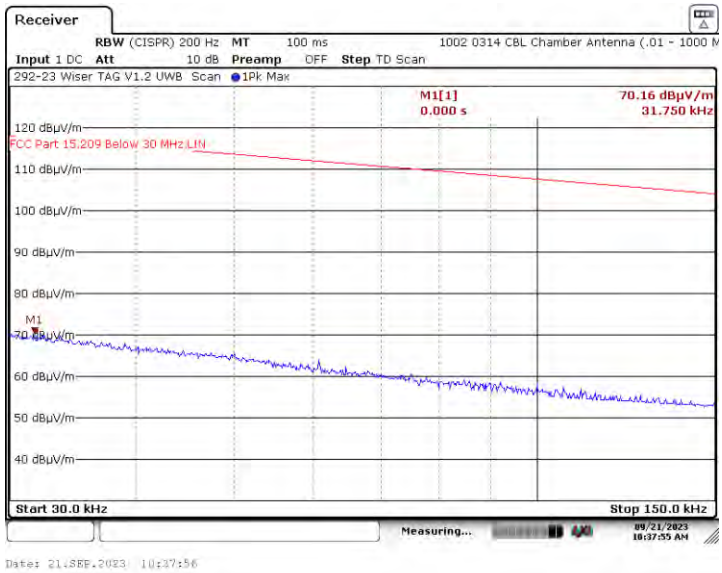
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

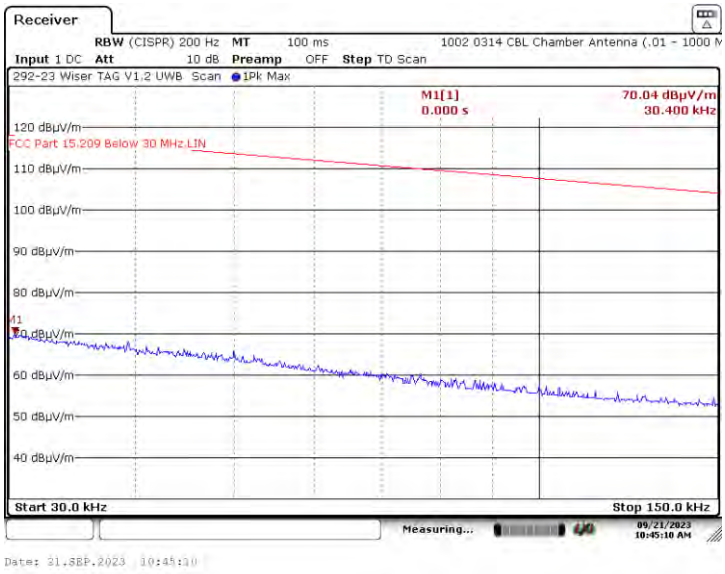
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.13 Parallel Measurement Antenna – 30 to 150 kHz – Y Axis CH3



6.4.1.14 Perpendicular Measurement Antenna – 30 to 150 kHz – Y Axis CH3



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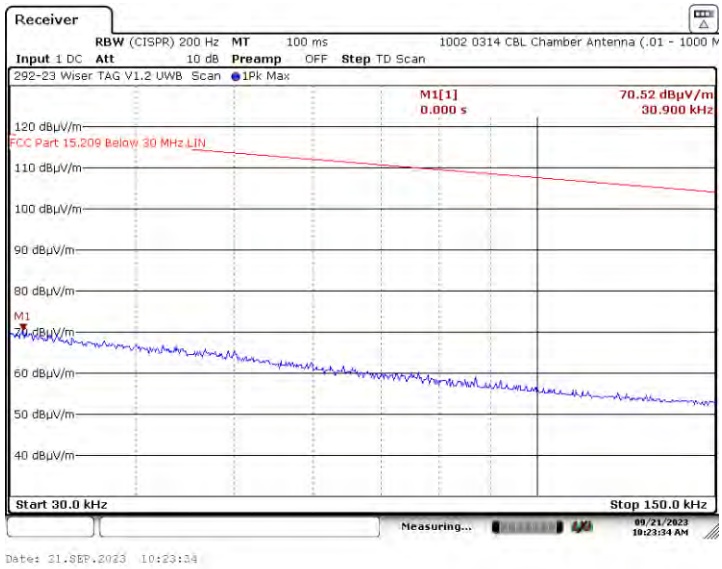
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

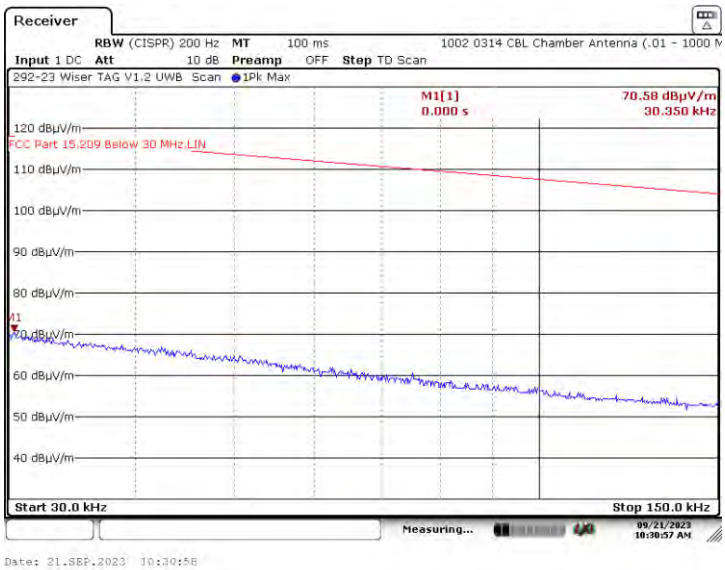
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.15 Ground Parallel Measurement Antenna – 30 to 150 kHz – Y Axis CH3



6.4.1.16 Parallel Measurement Antenna – 30 to 150 kHz – Z Axis CH3



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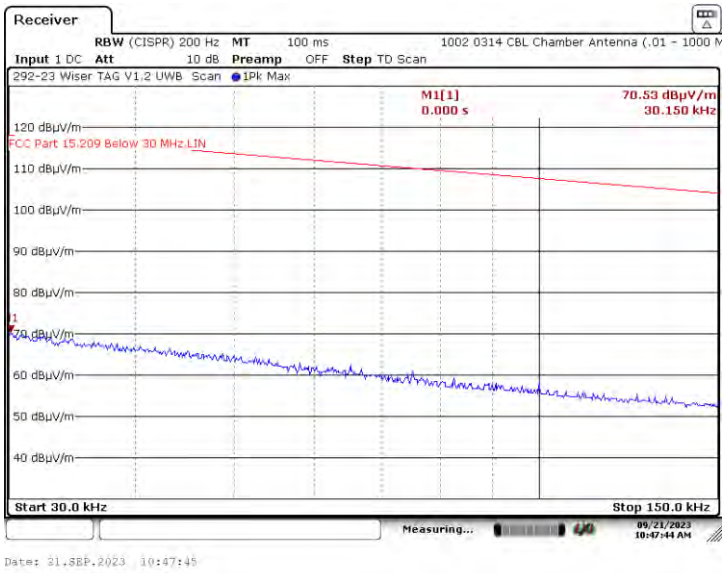
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

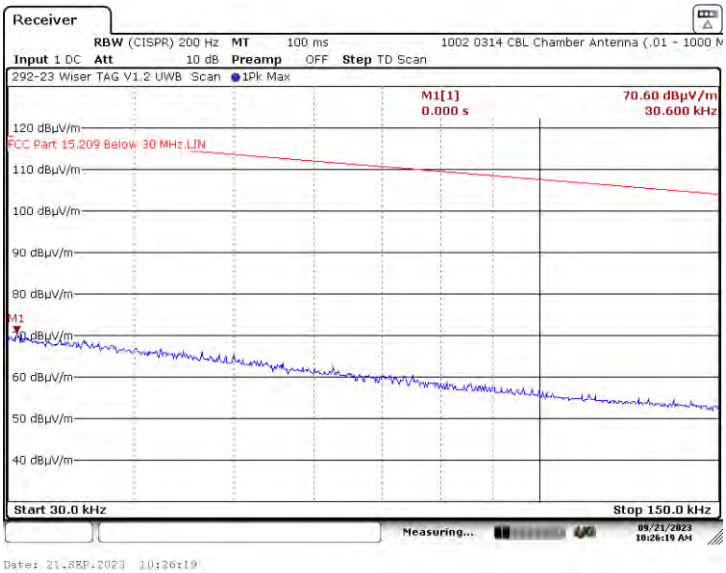
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.17 Perpendicular Measurement Antenna – 30 to 150 kHz – Z Axis CH3



6.4.1.18 Ground Parallel Measurement Antenna – 30 to 150 kHz – Z Axis CH3



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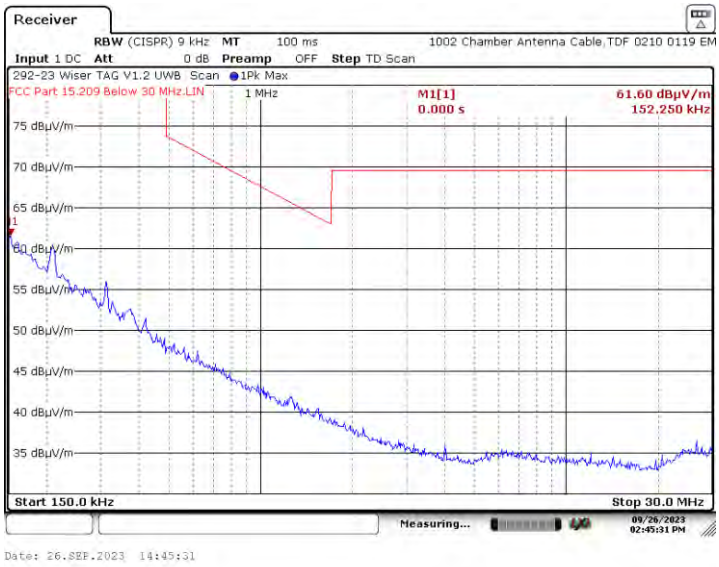
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

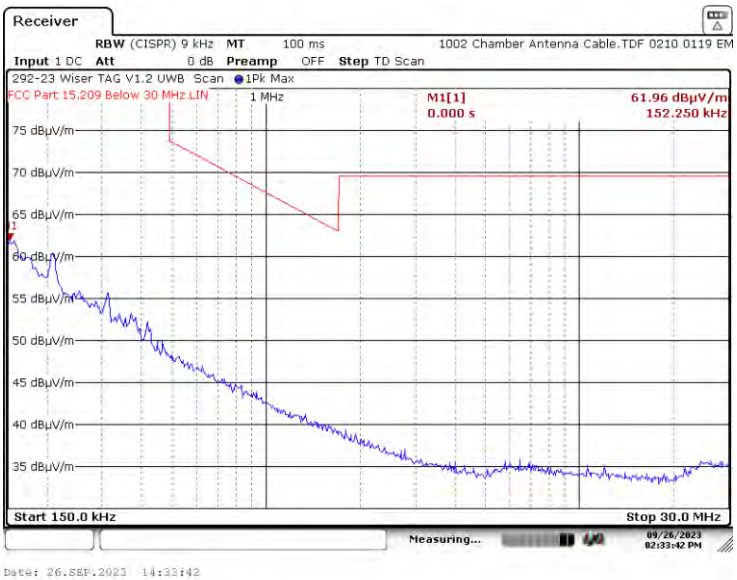
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.19 Parallel Measurement Antenna – 150 kHz to 30 MHz – X Axis CH3 Normal



6.4.1.20 Perpendicular Measurement Antenna – 150 kHz to 30 MHz – X Axis CH3



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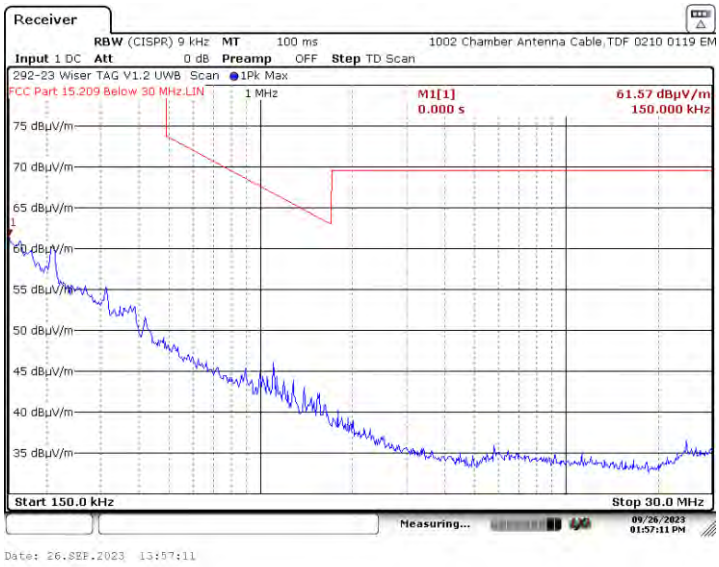
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

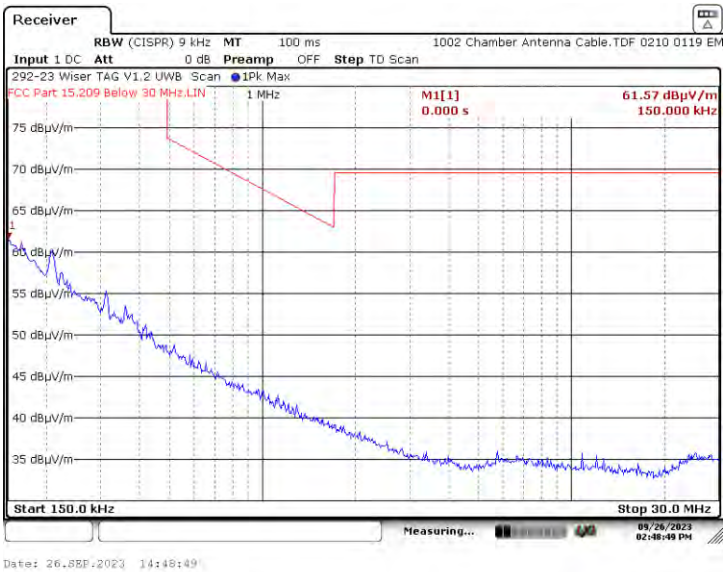
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.21 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz – X Axis CH3



6.4.1.22 Parallel Measurement Antenna – 150 kHz to 30 MHz – Y Axis CH3



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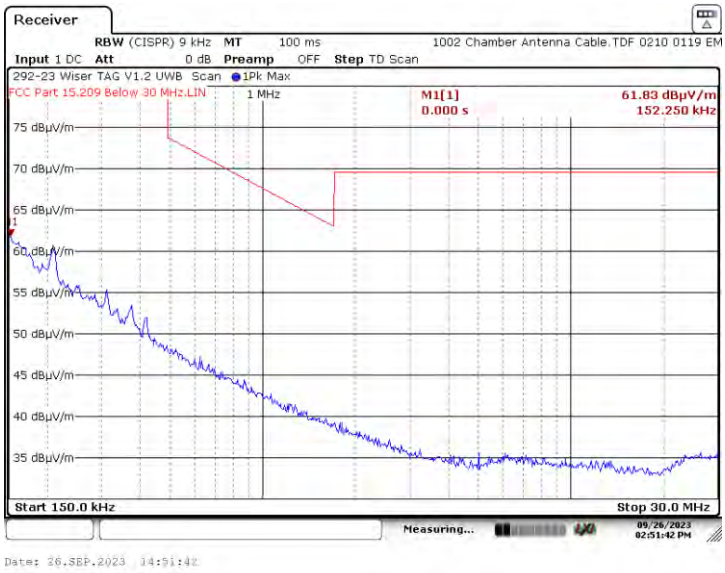
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

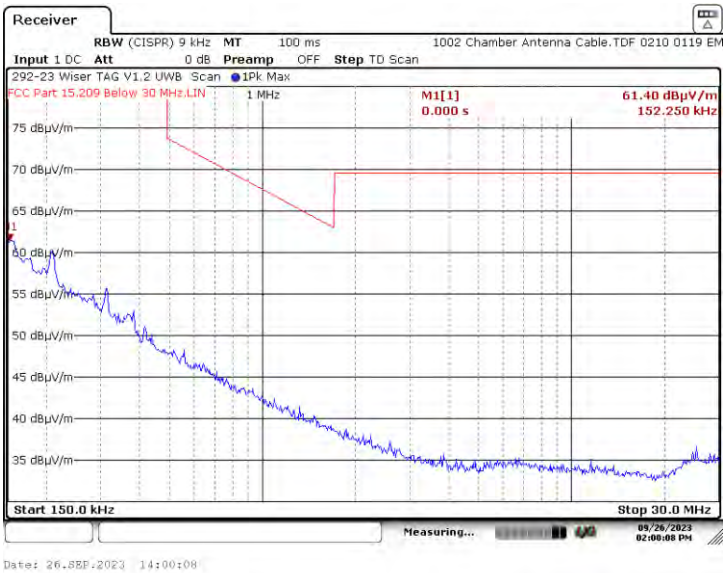
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.23 Perpendicular Measurement Antenna – 150 kHz to 30 MHz – Y Axis CH3



6.4.1.24 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz – Y Axis CH3



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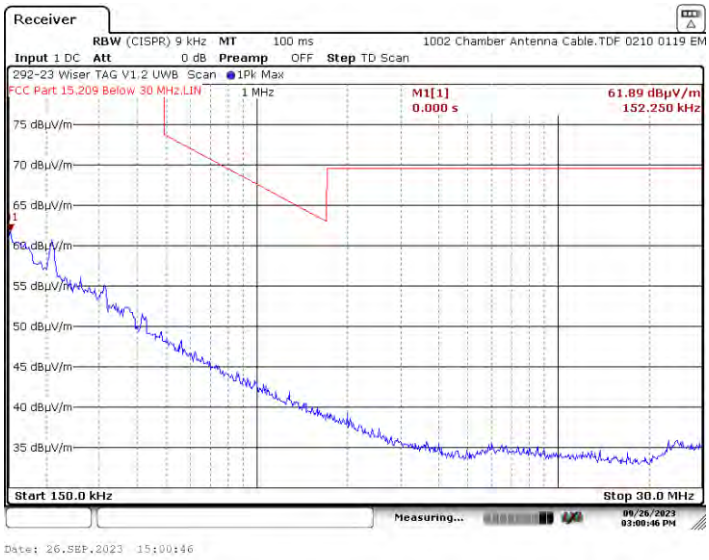
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

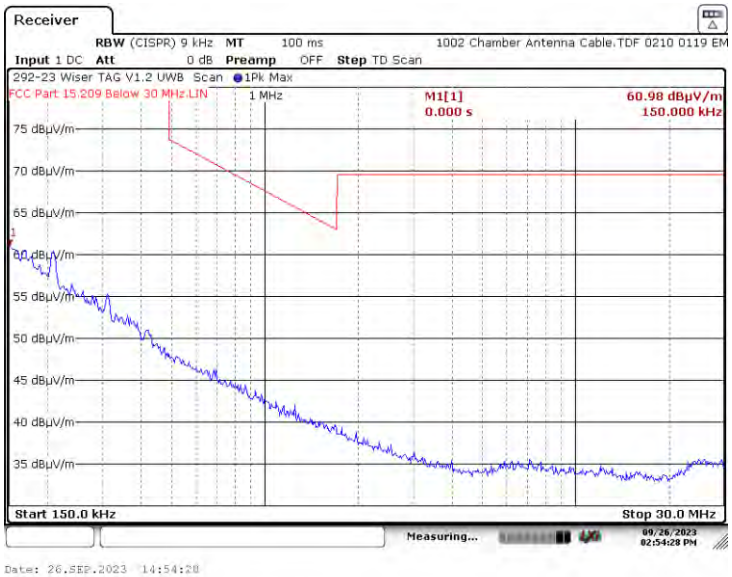
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.25 Parallel Measurement Antenna – 150 kHz to 30 MHz – Z Axis CH3



6.4.1.26 Perpendicular Measurement Antenna – 150 kHz to 30 MHz – Z Axis CH3



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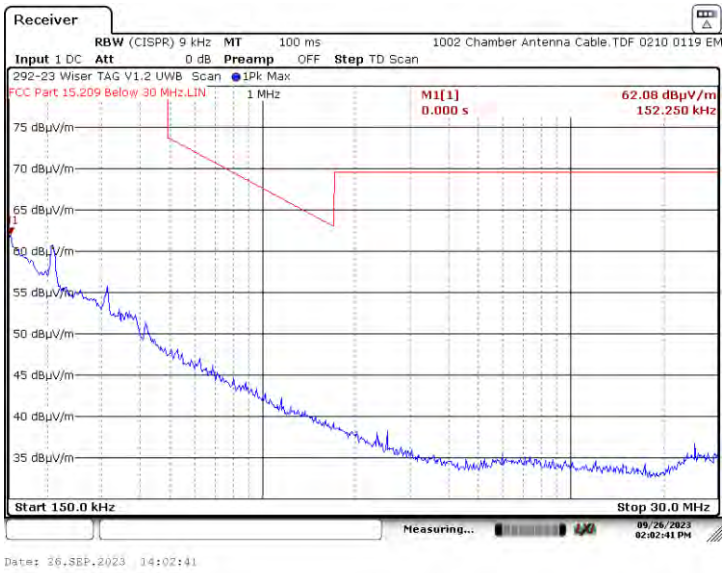
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

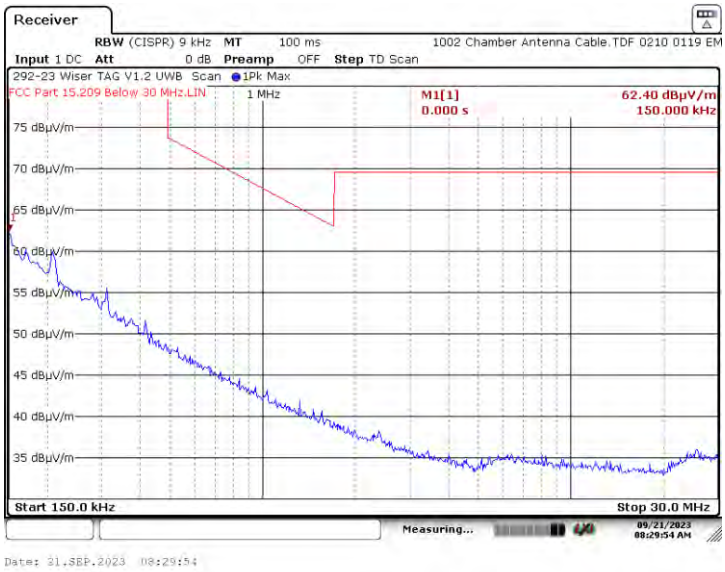
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.27 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz – Z Axis CH3



6.4.1.28 Parallel Measurement Antenna – 150 kHz to 30 MHz – X Axis CH3 Wide



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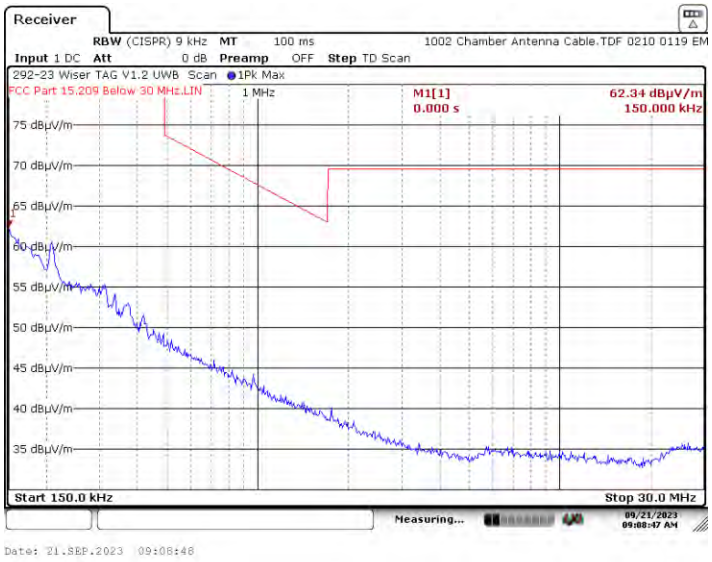
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

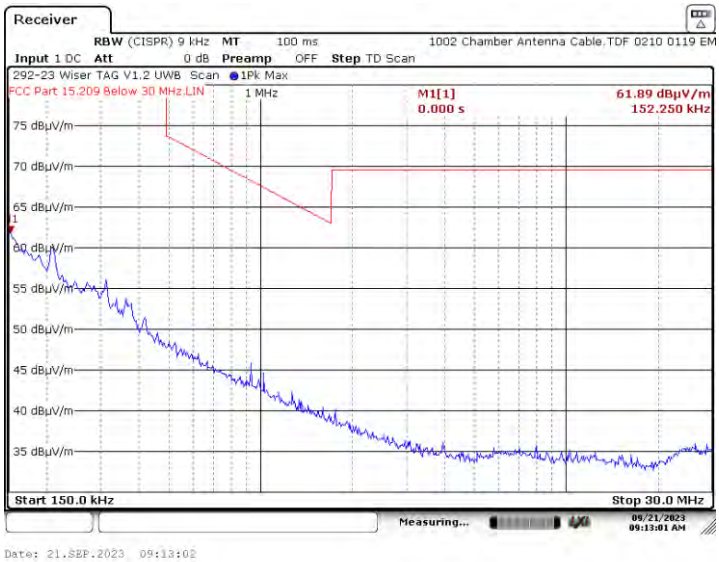
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.29 Perpendicular Measurement Antenna – 150 kHz to 30 MHz – X Axis CH3



6.4.1.30 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz – X Axis CH3



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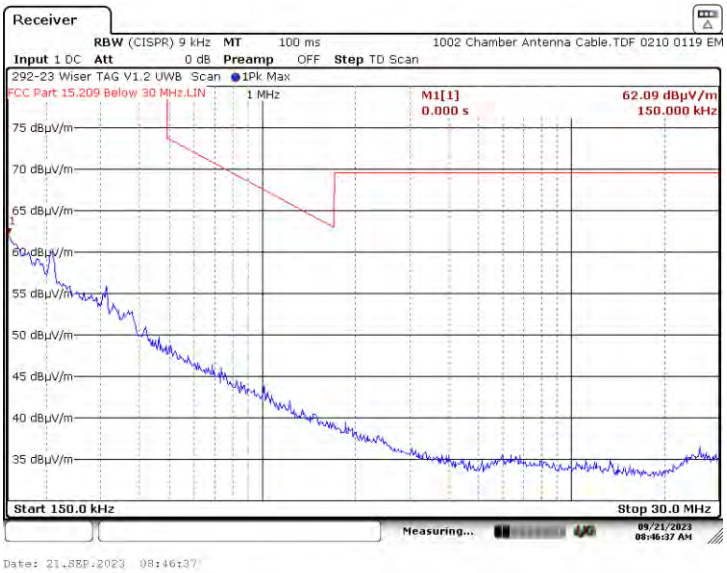
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

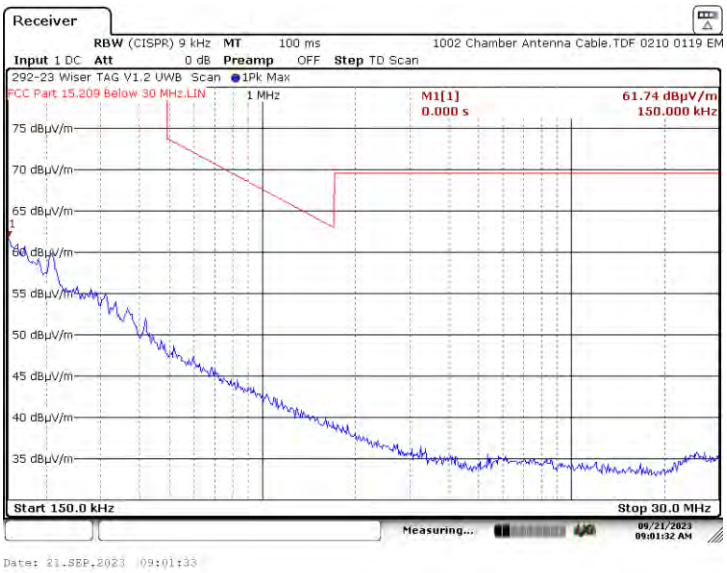
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.31 Parallel Measurement Antenna – 150 kHz to 30 MHz – Y Axis CH3



6.4.1.32 Perpendicular Measurement Antenna – 150 kHz to 30 MHz – Y Axis CH3



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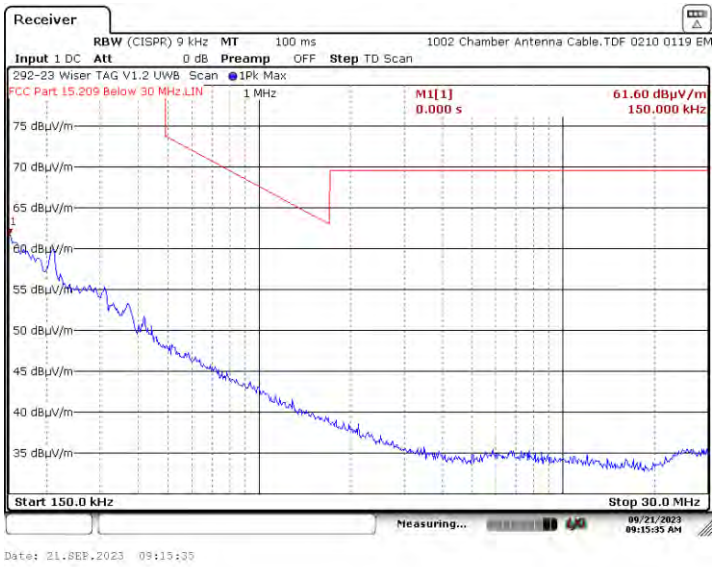
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

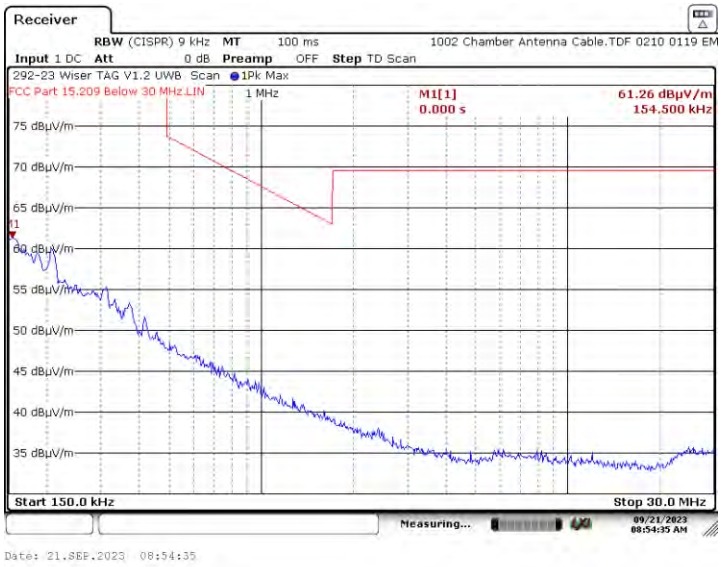
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.33 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz – Y Axis CH3



6.4.1.34 Parallel Measurement Antenna – 150 kHz to 30 MHz – Z Axis CH3



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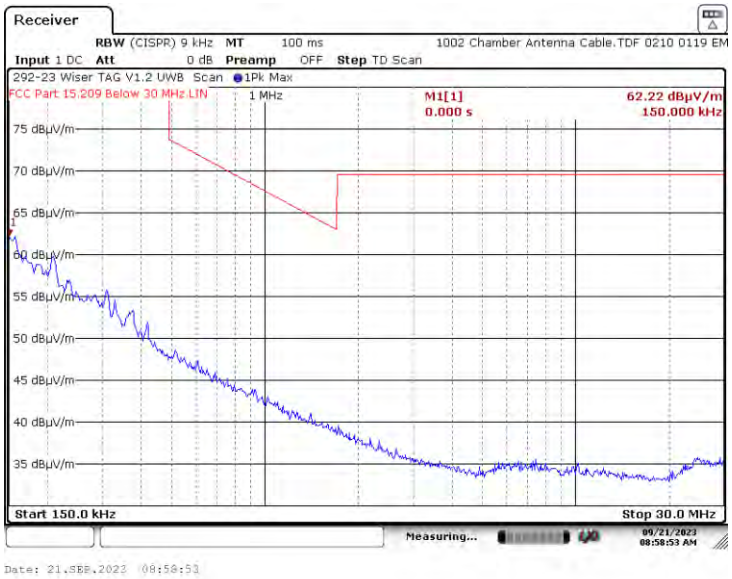
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

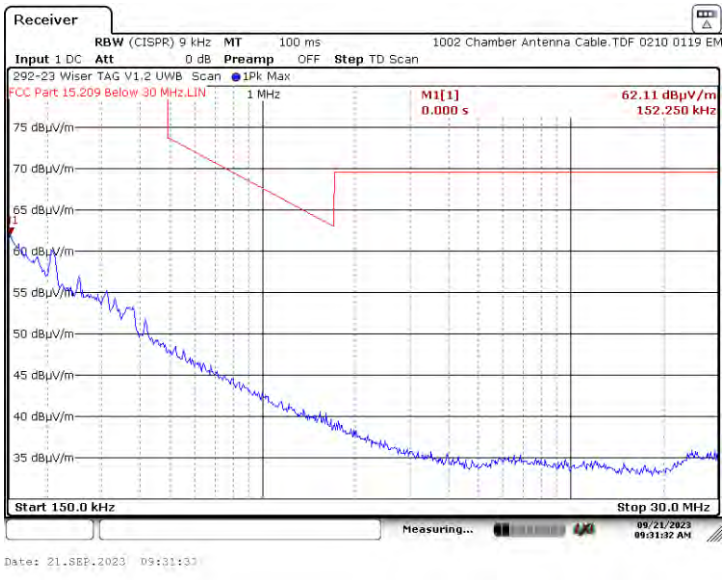
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.35 Perpendicular Measurement Antenna – 150 kHz to 30 MHz – Z Axis CH3



6.4.1.36 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz – Z Axis CH3



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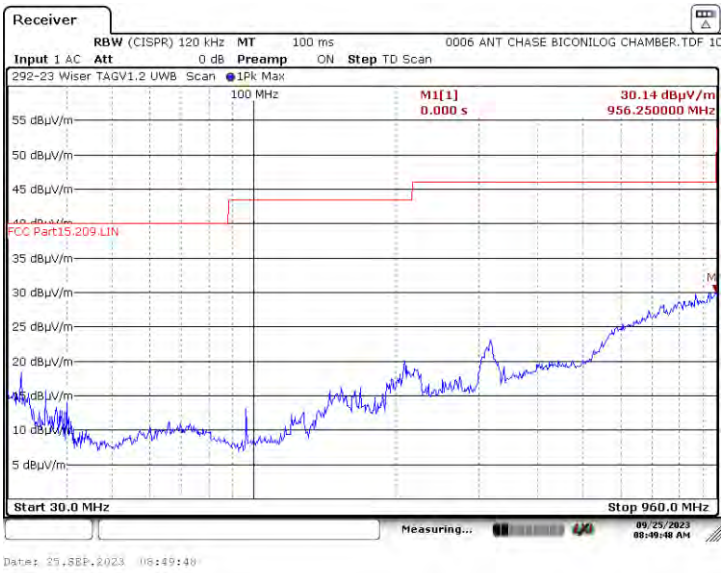
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

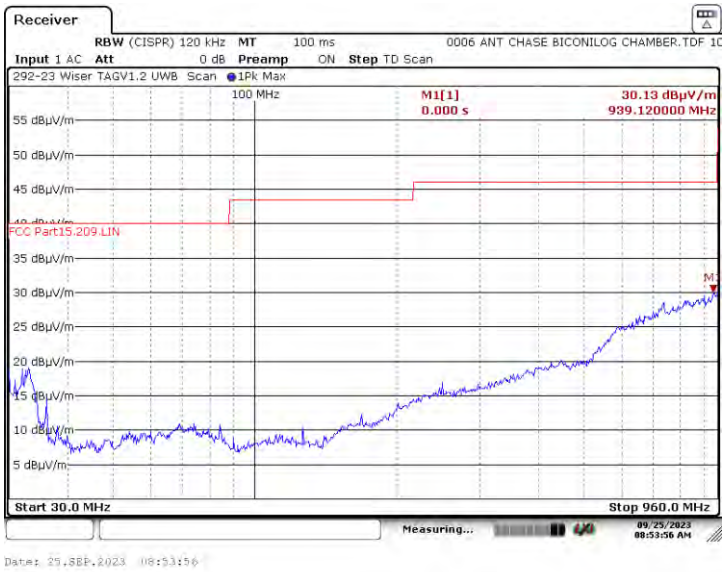
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.37 Horizontal Polarity – 30 to 960 MHz – X Axis CH3 Normal



6.4.1.38 Vertical Polarity – 30 to 960 MHz – X Axis CH3



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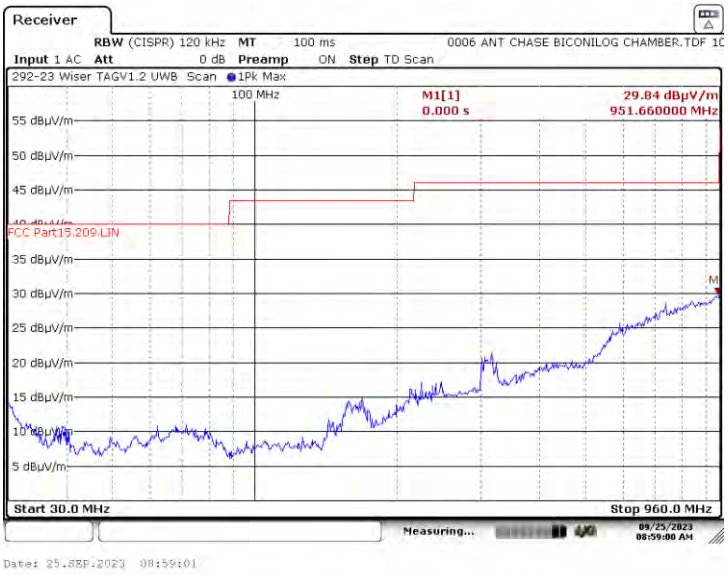
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

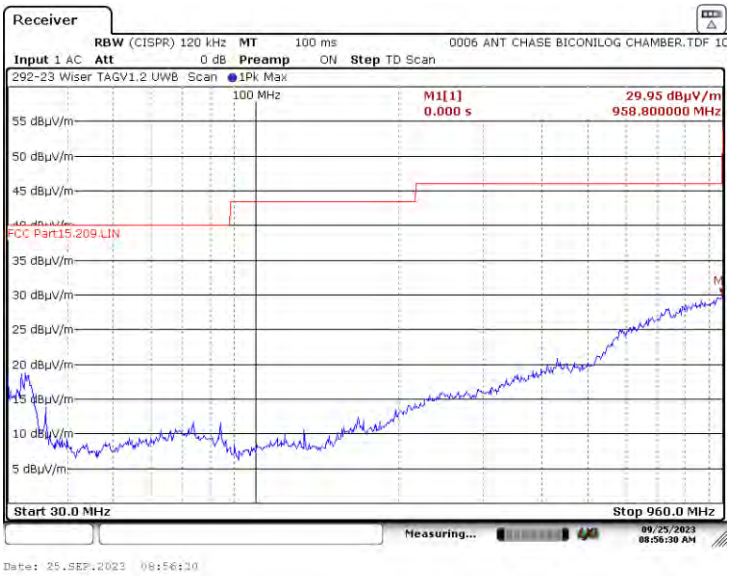
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.39 Horizontal Polarity – 30 to 960 MHz – Y Axis CH3



6.4.1.40 Vertical Polarity – 30 to 960 MHz – Y Axis CH3



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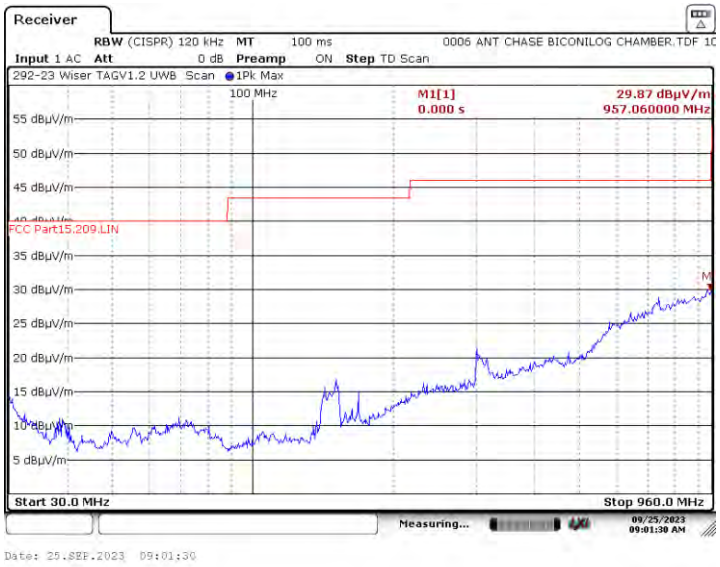
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

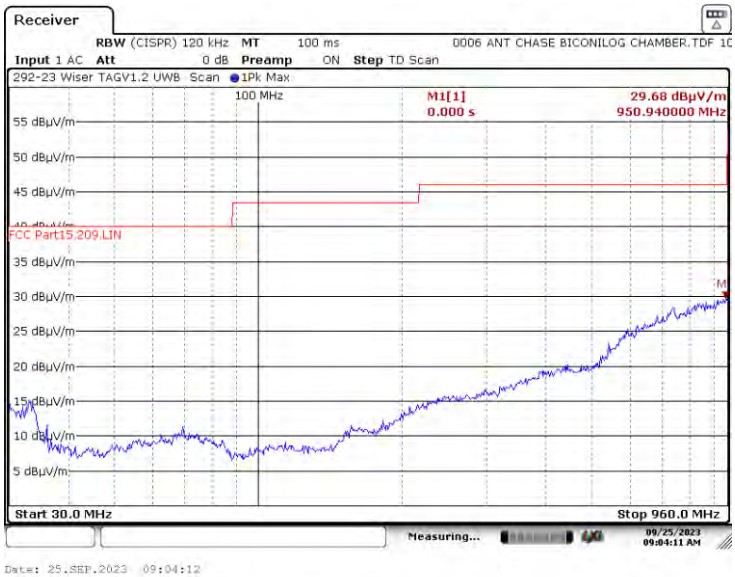
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.41 Horizontal Polarity – 30 to 960 MHz – Z Axis CH3



6.4.1.42 Vertical Polarity – 30 to 960 MHz – Z Axis CH3



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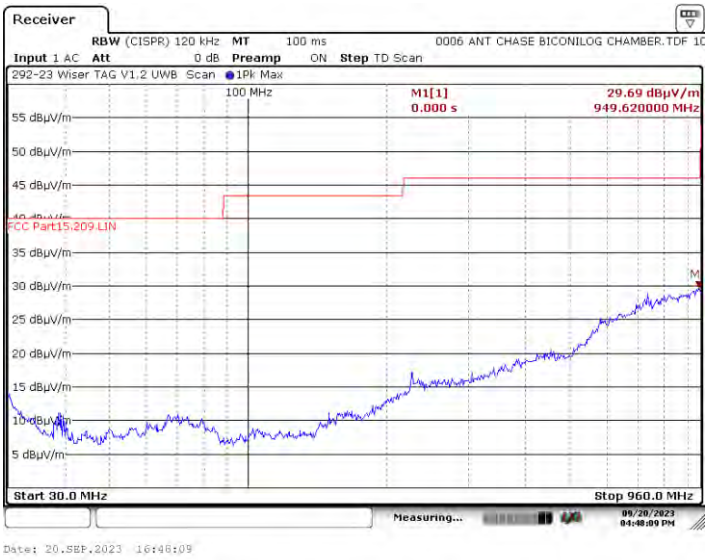
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

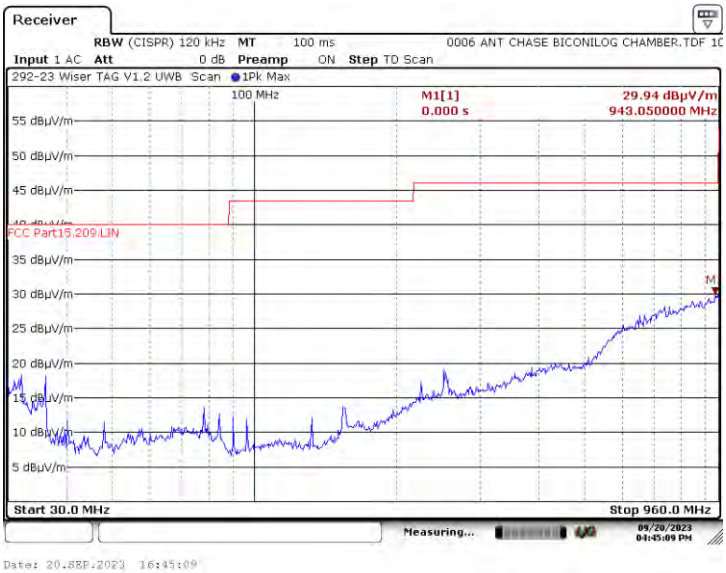
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.43 Horizontal Polarity – 30 to 960 MHz – X Axis CH3 Wide



6.4.1.44 Vertical Polarity – 30 to 960 MHz – X Axis CH3



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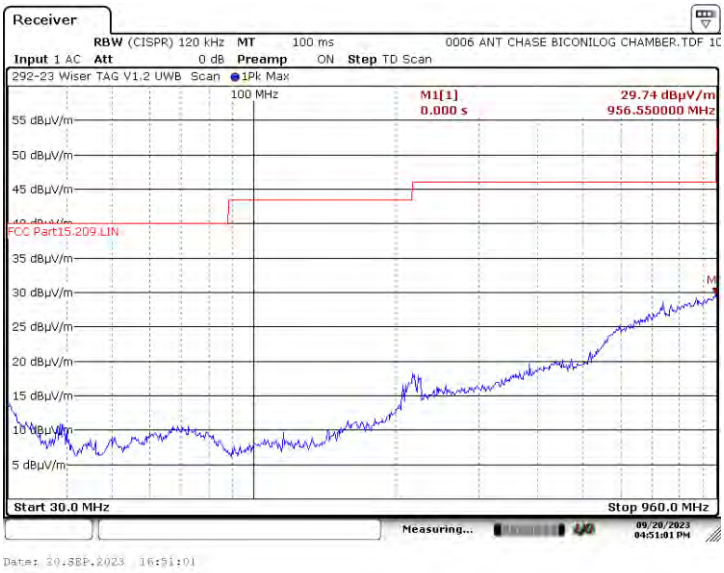
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

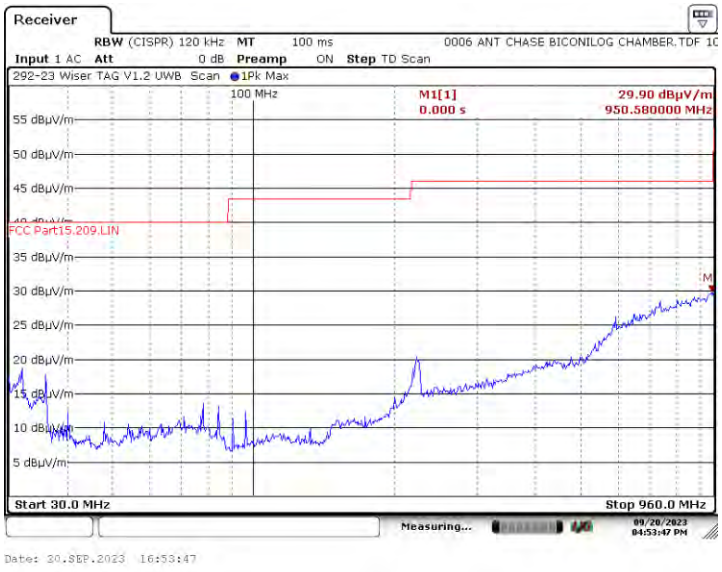
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.45 Horizontal Polarity – 30 to 960 MHz – Y Axis CH3



6.4.1.46 Vertical Polarity – 30 to 960 MHz – Y Axis CH3



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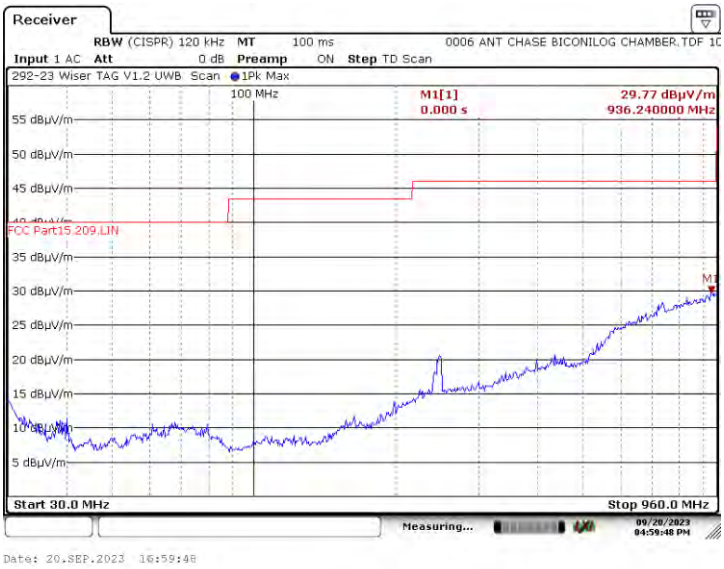
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

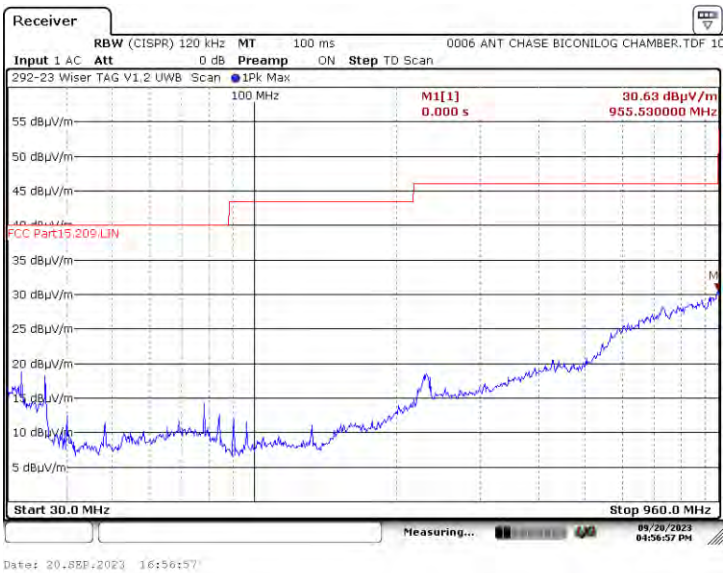
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

The device was prescreened in our 3 Meter Semi-Anechoic Chamber. There were no measurable emissions below 960 MHz on our 3 Meter OATS.

6.4.1.47 Horizontal Polarity – 30 to 960 MHz – Z Axis CH3



6.4.1.48 Vertical Polarity – 30 to 960 MHz – Z Axis CH3



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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions above 960 MHz (15.519 (c), 15.521 (d))

Requirement: The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

The RMS average measurement is based on the use of a spectrum analyzer with a resolution bandwidth of 1 MHz, an RMS detector, and a 1 millisecond or less averaging time.

The EIRP in terms of dBm, can be converted to a field strength, in dBµV/m at 3 Meters by adding 95.2.

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dBµV/m)
960 - 1610	-75.3	19.9
1610 - 1990	-63.3	31.9
1990 - 3100	-61.3	33.9
3100 - 10600	-41.3	53.9
Above 10600	-61.3	33.9

Frequency Range:	960 MHz to 40 GHz
Measurement Distance:	1 Meter and 0.3 Meter
EMI Receiver IF Bandwidth:	1 MHz
EMI Receiver Avg Bandwidth	10 MHz
Detector Function:	RMS 1 mS Average as defined in 15.521(d)

Notes: Measurements made from 960 MHz to 18 GHz were made in a semi-anechoic chamber at 1 Meter using a -9.54 dB distance offset was programmed into the spectrum analyzer.

Measurements made from 6.4 to 18 GHz and 8 to 18 GHz were done with the aid of a High Pass Filter before the low noise amplifier.

Measurements made from 18 to 40 GHz were done at 0.3 meters and a -20.00 dB distance offset was programmed into the spectrum analyzer.

Sample Calculation: Final Result (dBµV/m) = Measurement Value (dBµV) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

Note: All correction factors are loaded into the measurement instrument prior to testing to determine the final result.

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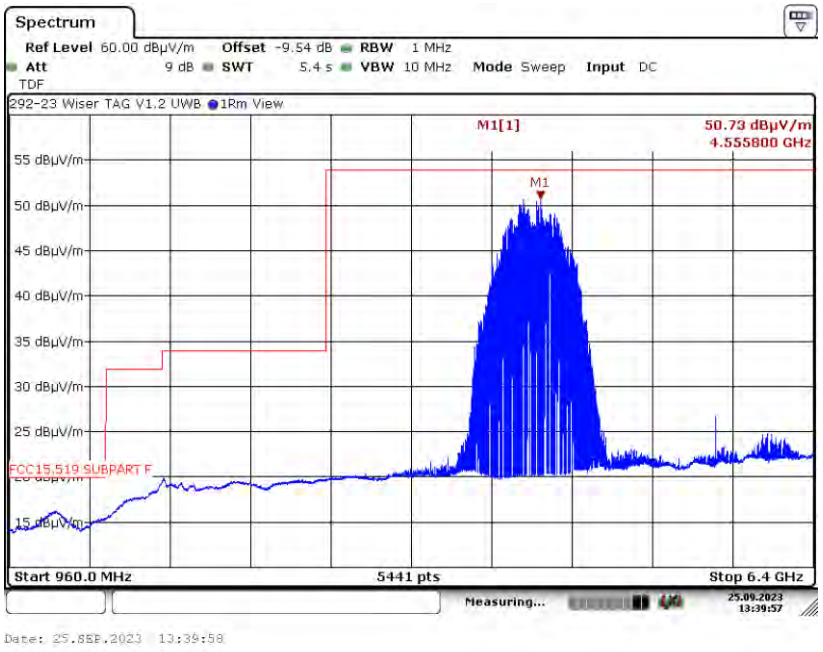
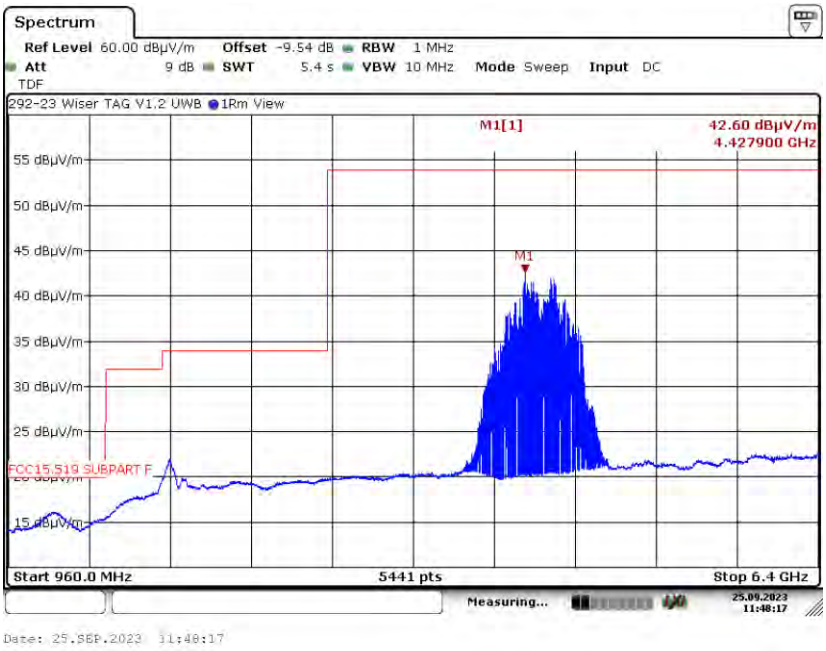
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.1. 960 MHz to 6.4 GHz Horizontal at 1 Meter, X Axis CH3 Normal



6.5.2. 960 MHz to 6.4 GHz Vertical at 1 Meter, X Axis CH3



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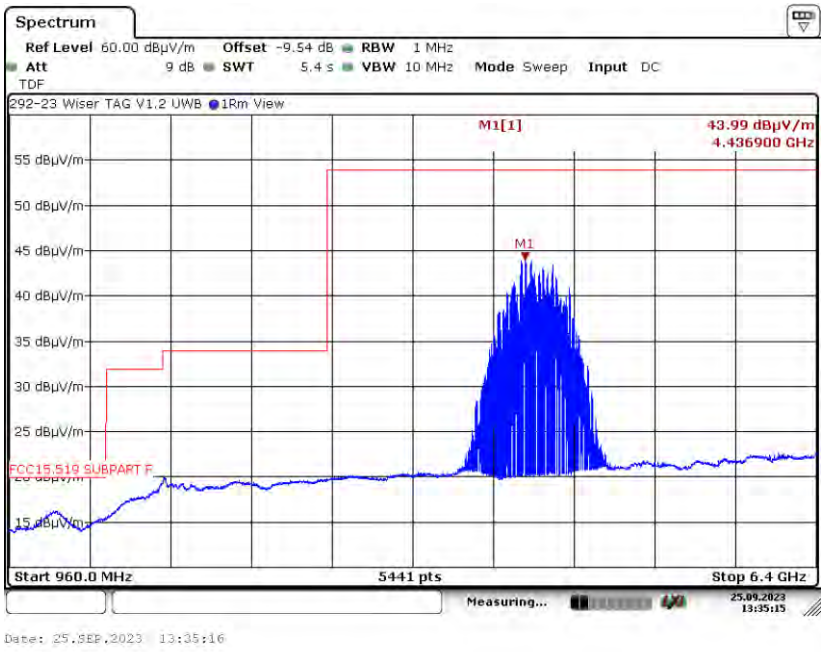
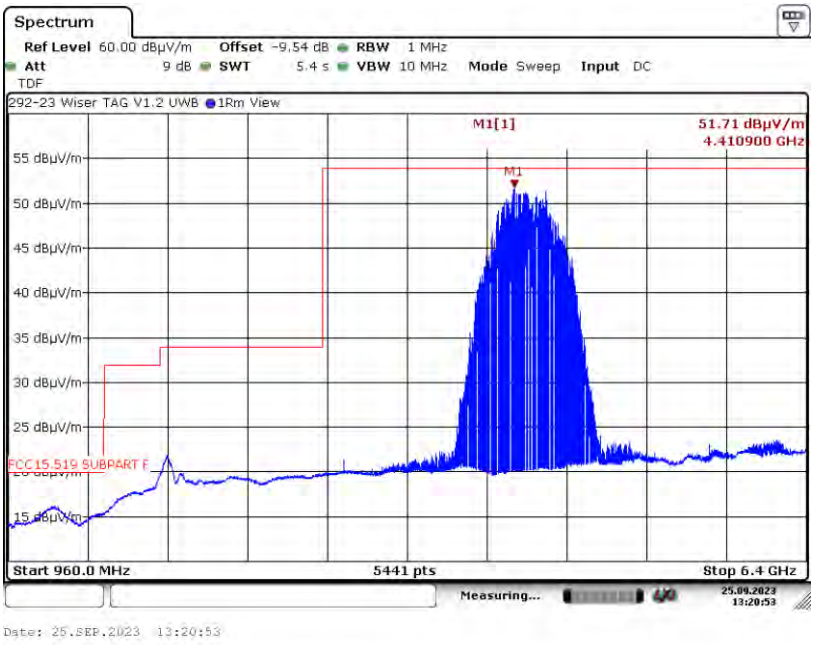
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.3. 960 MHz to 6.4 GHz Horizontal at 1 Meter, Y Axis CH3



6.5.4. 960 MHz to 6.4 GHz Vertical at 1 Meter, Y Axis CH3



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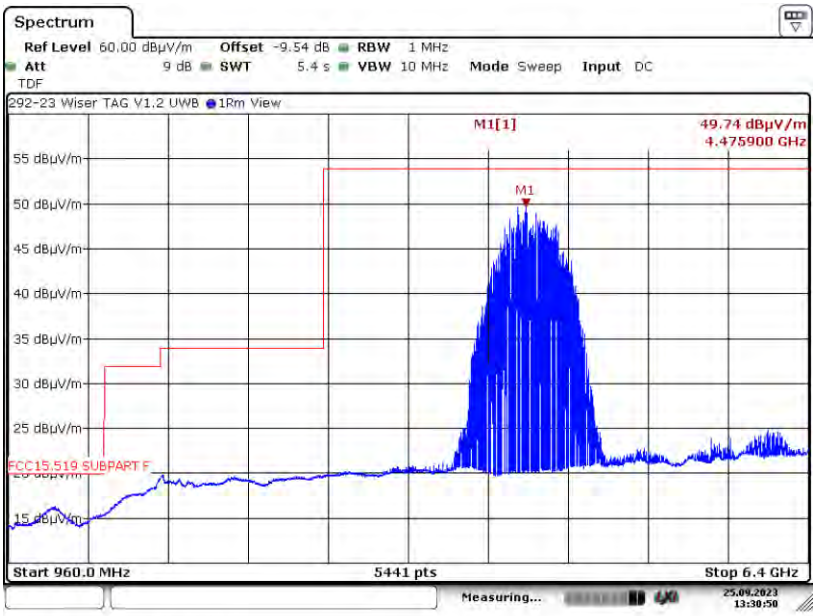
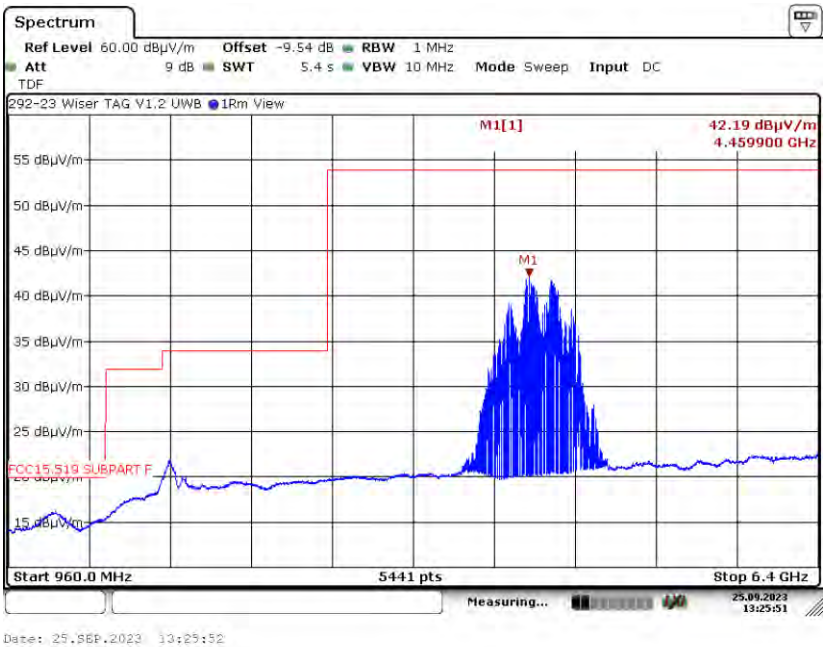
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.5. 960 MHz to 6.4 GHz Horizontal at 1 Meter, Z Axis CH3



6.5.6. 960 MHz to 6.4 GHz Vertical at 1 Meter, Z Axis CH3



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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.7. 960 MHz to 1.99 GHz Horizontal at 1 Meter, X Axis CH3 Wide

6.5.8. 960 MHz to 1.99 GHz Vertical at 1 Meter, X Axis CH3

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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.9. 960 MHz to 1.99 GHz Horizontal at 1 Meter, Y Axis CH3

6.5.10. 960 MHz to 1.99 GHz Vertical at 1 Meter, Y Axis CH3

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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.11. 960 MHz to 1.99 GHz Horizontal at 1 Meter, Z Axis CH3

6.5.12. 960 MHz to 1.99 GHz Vertical at 1 Meter, Z Axis CH3

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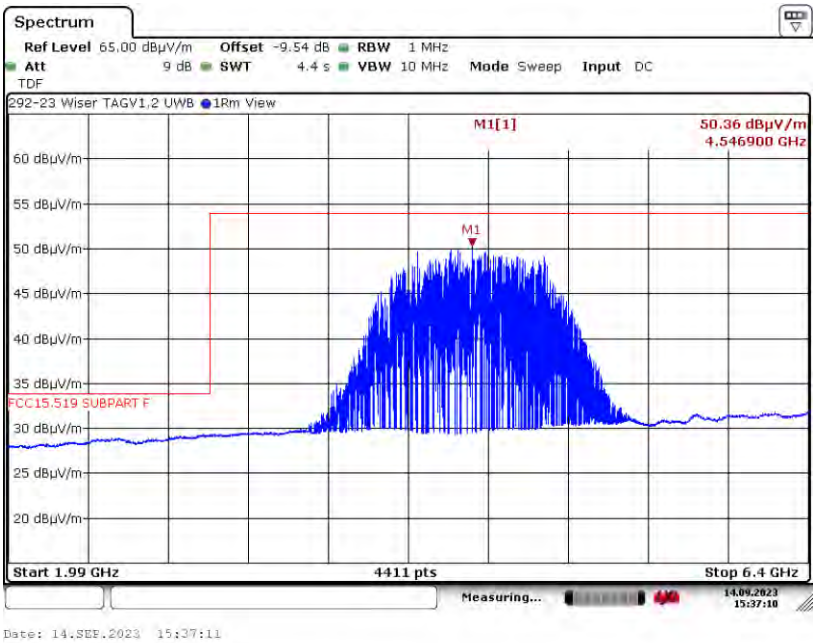
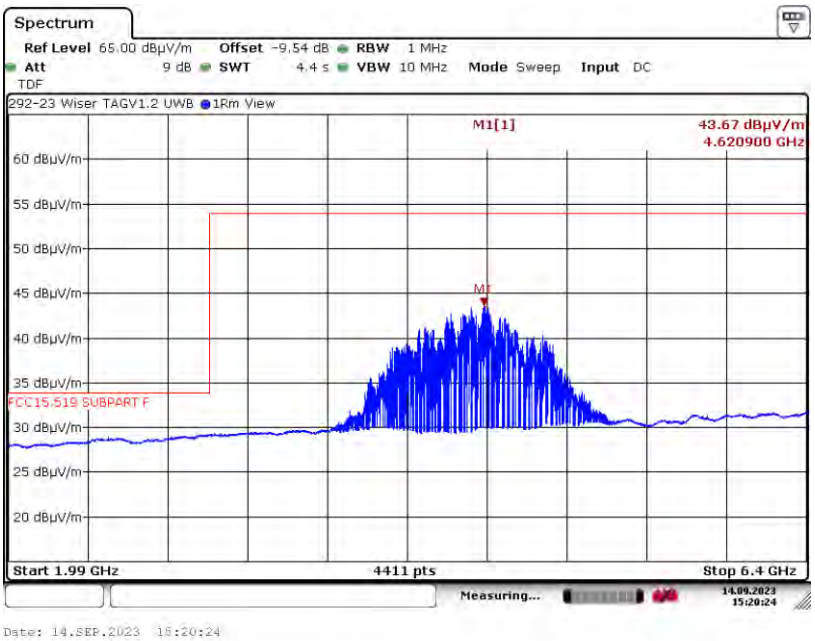
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.13. 1.99 GHz to 6.4 GHz Horizontal at 1 Meter, X Axis CH3 Wide



6.5.14. 1.99 GHz to 6.4 GHz Vertical at 1 Meter, X Axis CH3



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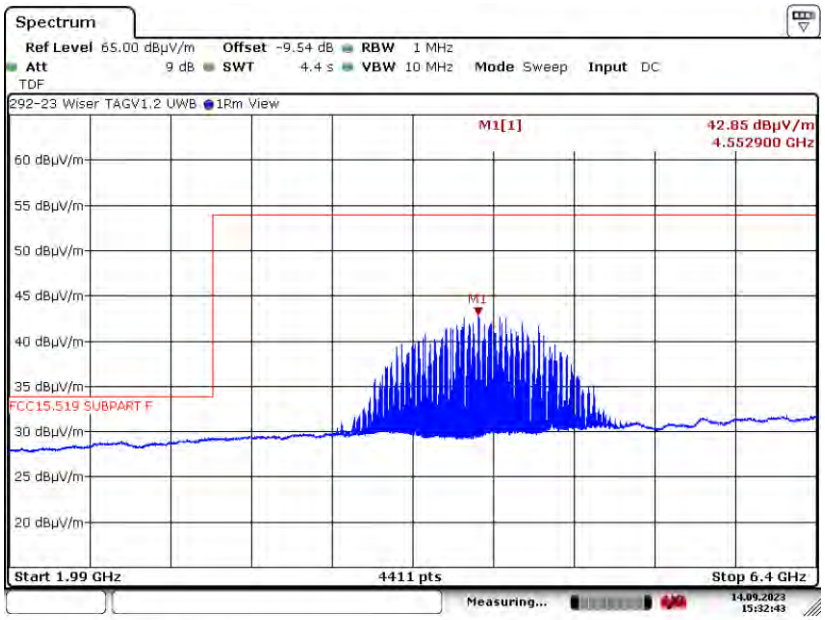
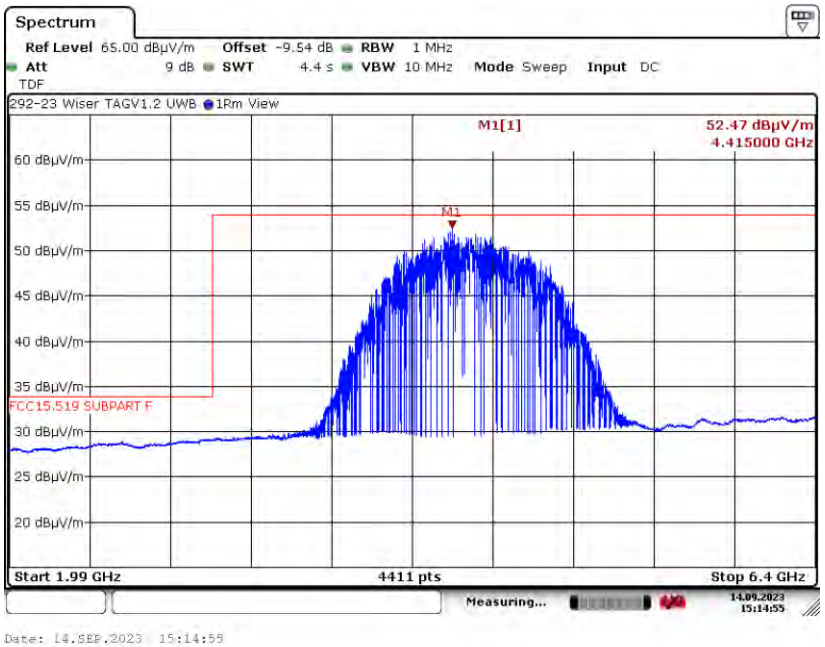
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.15. 1.99 GHz to 6.4 GHz Horizontal at 1 Meter, Y Axis CH3



6.5.16. 1.99 GHz to 6.4 GHz Vertical at 1 Meter, Y Axis CH3



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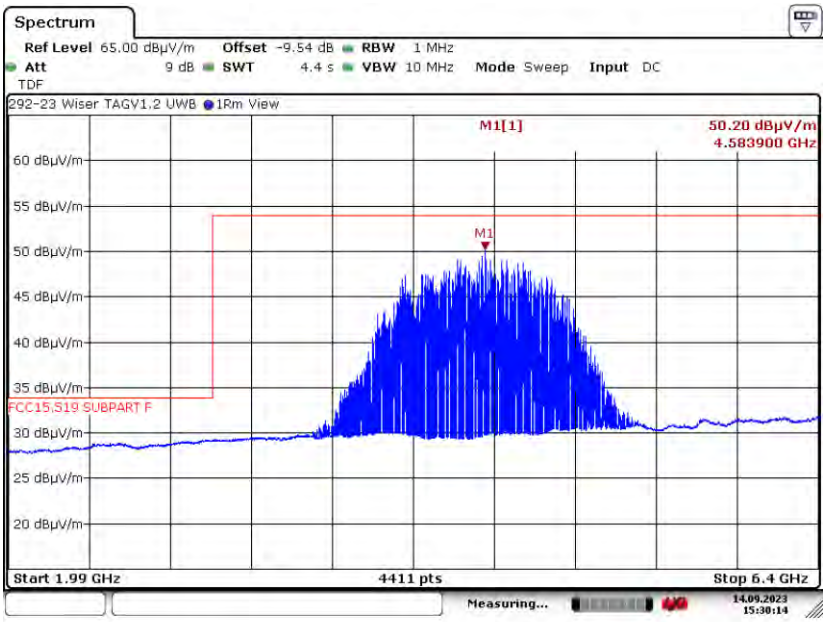
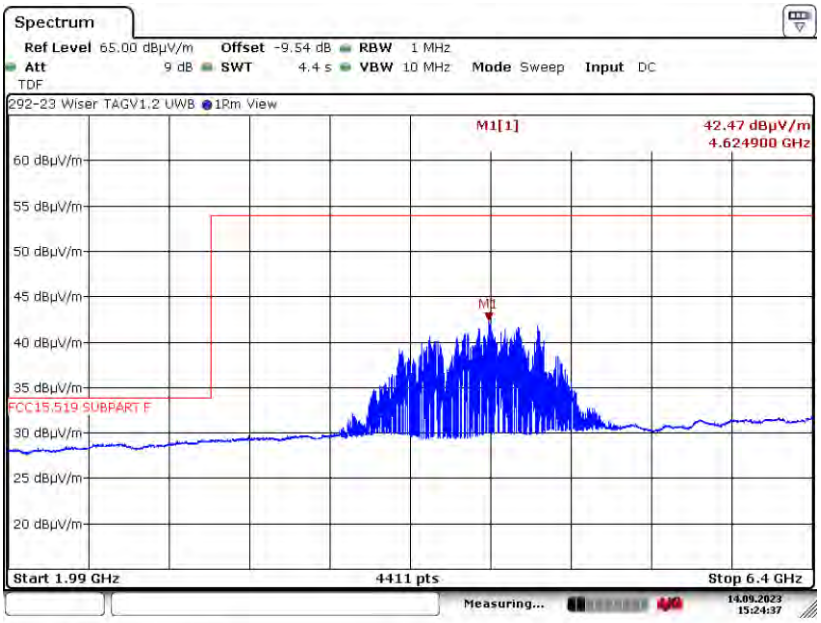
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.17. 1.99 GHz to 6.4 GHz Horizontal at 1 Meter, Z Axis CH3



6.5.18. 1.99 GHz to 6.4 GHz Vertical at 1 Meter, Z Axis CH3



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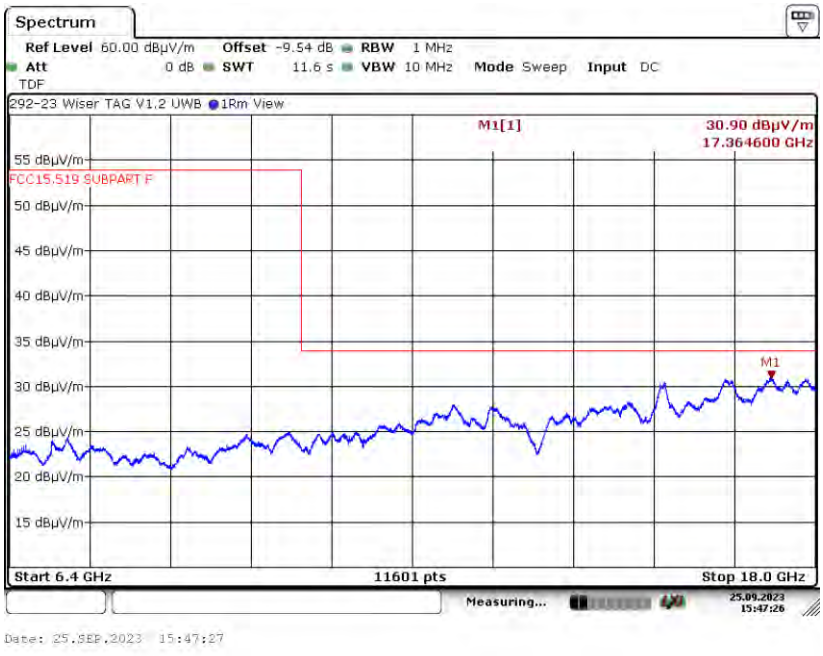
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.19. 6.4 to 18 GHz Horizontal at 1 Meter, X Axis CH3 Normal



6.5.20. 6.4 to 18 GHz Vertical at 1 Meter, X Axis CH3

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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.21. 6.4 to 18 GHz Horizontal at 1 Meter, Y Axis CH3

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6.5.22. 6.4 to 18 GHz Vertical at 1 Meter, Y Axis CH3

Date: 25.SEP.2023 15:33:38

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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.23. 6.4 to 18 GHz Horizontal at 1 Meter, Z Axis CH3

6.5.24. 6.4 to 18 GHz Vertical at 1 Meter, Z Axis CH3

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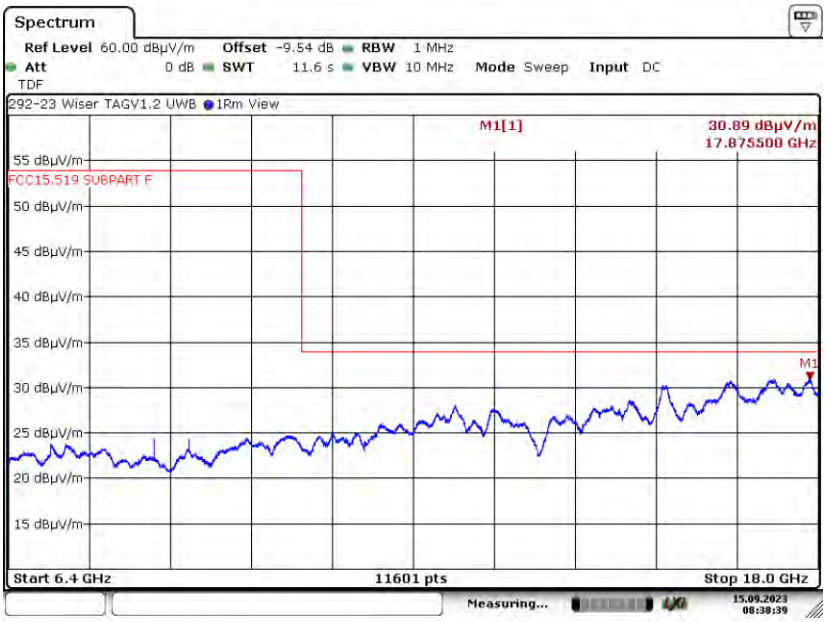
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.25. 6.4 to 18 GHz Horizontal at 1 Meter, X Axis CH3 Wide



6.5.26. 6.4 to 18 GHz Vertical at 1 Meter, X Axis CH3

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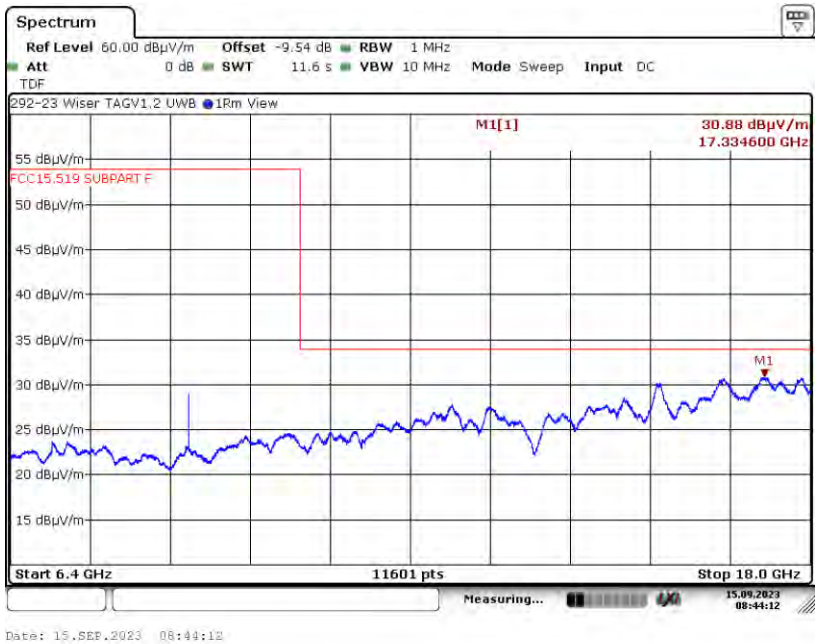
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.27. 6.4 to 18 GHz Horizontal at 1 Meter, Y Axis CH3



6.5.28. 6.4 to 18 GHz Vertical at 1 Meter, Y Axis CH3

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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.29. 6.4 to 18 GHz Horizontal at 1 Meter, Z Axis CH3

6.5.30. 6.4 to 18 GHz Vertical at 1 Meter, Z Axis CH3

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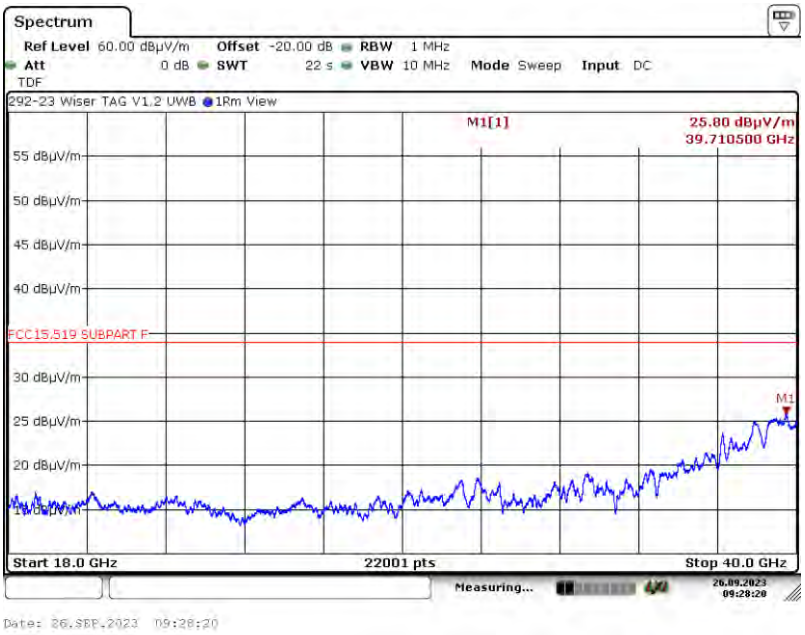
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.31. 18 to 40 GHz Horizontal at 0.3 Meter, X Axis CH3 Normal



6.5.32. 18 to 40 GHz Vertical at 0.3 Meter, X Axis CH3

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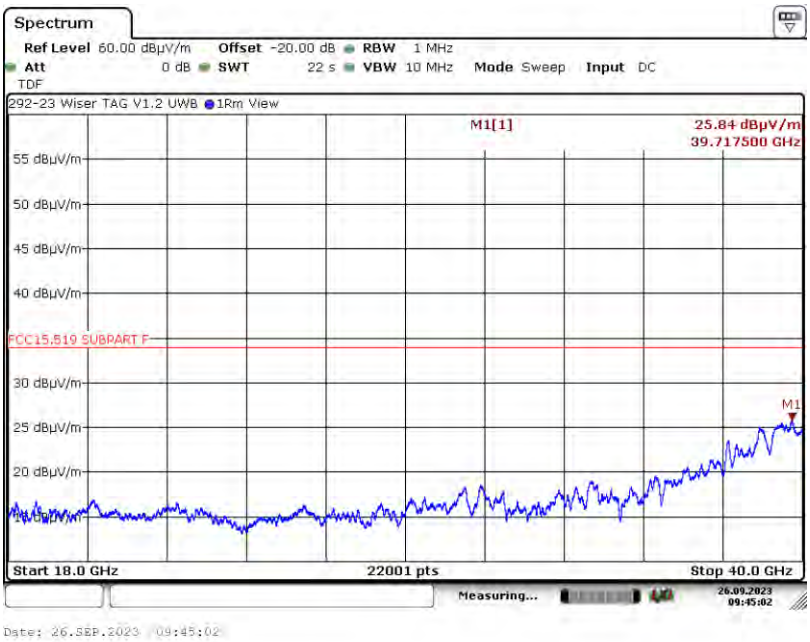
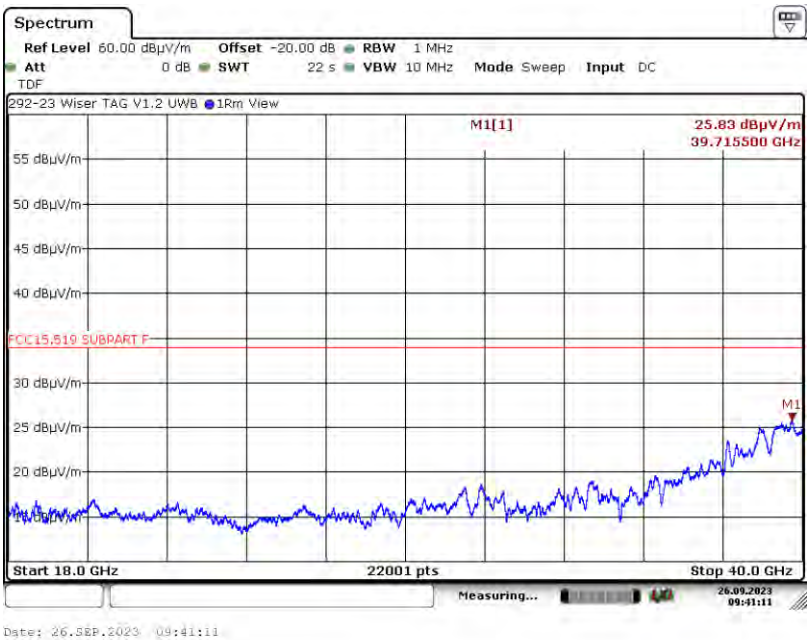
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.33. 18 to 40 GHz Horizontal at 0.3 Meter, Y Axis CH3



6.5.34. 18 to 40 GHz Vertical at 0.3 Meter, Y Axis CH3



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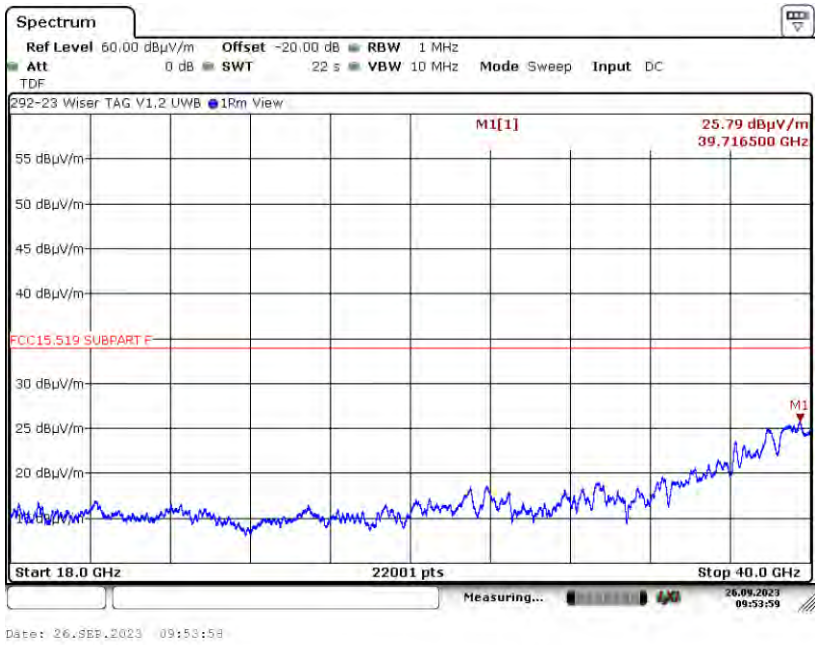
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.35. 18 to 40 GHz Horizontal at 0.3 Meter, Z Axis CH3

6.5.36. 18 to 40 GHz Vertical at 0.3 Meter, Z Axis CH3



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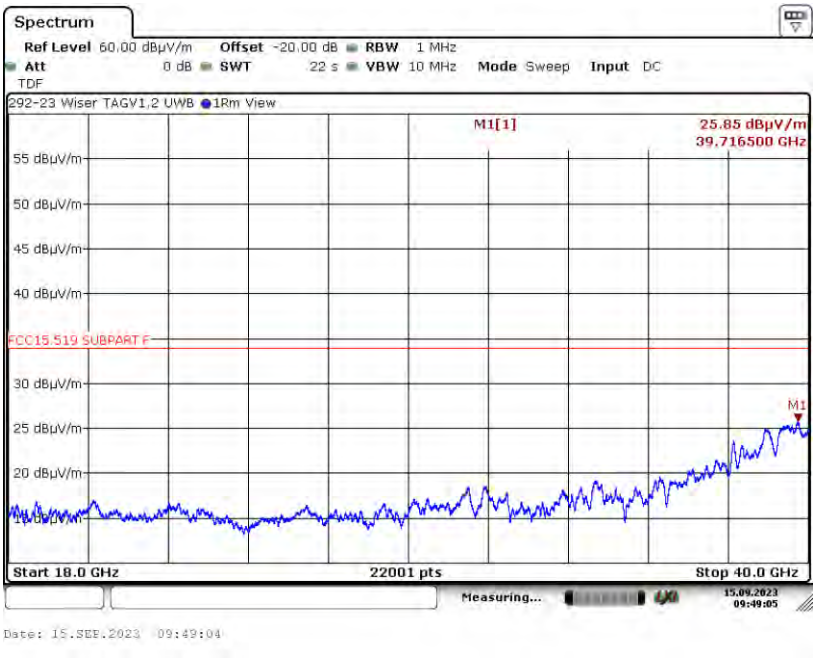
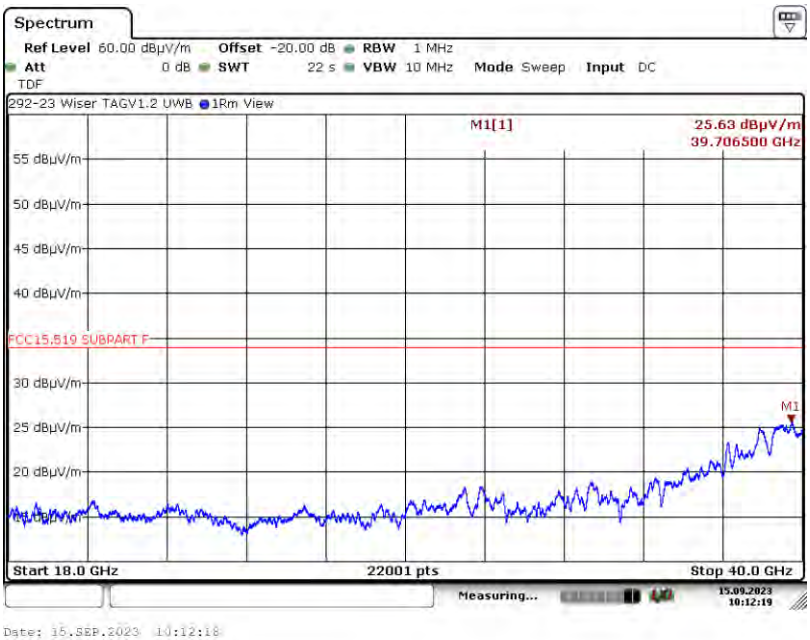
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.37. 18 to 40 GHz Horizontal at 0.3 Meter, X Axis CH3 Wide



6.5.38. 18 to 40 GHz Vertical at 0.3 Meter, X Axis CH3



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6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.39. 18 to 40 GHz Horizontal at 0.3 Meter, Y Axis CH3

Date: 15.SEP.2023 09:54:31

6.5.40. 18 to 40 GHz Vertical at 0.3 Meter, Y Axis CH3

Date: 15.SEP.2023 10:08:10

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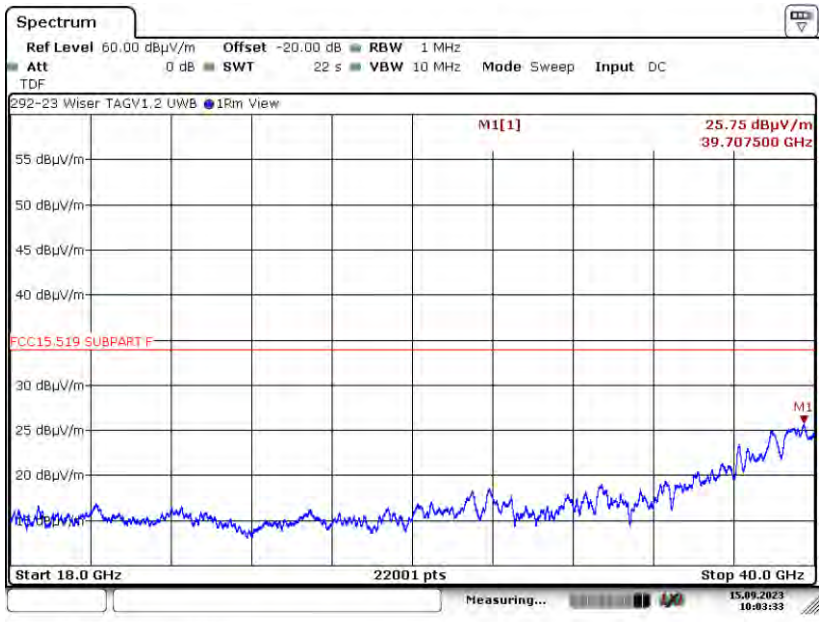
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (15.519 (c) continued)

6.5.41. 18 to 40 GHz Horizontal at 0.3 Meter, Z Axis CH3

6.5.42. 18 to 40 GHz Vertical at 0.3 Meter, Z Axis CH3



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6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d))

Requirement: In addition to the radiated emission limits specified in the table in paragraph (d) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dBµV/m)
1164 - 1240	-85.3	9.9
1559 - 1610	-85.3	9.9

6.6.1. Measurement & Equipment Setup

EMI Receiver IF Bandwidth: 1 kHz

EMI Receiver Avg Bandwidth: 10 kHz

Detector Functions: RMS Average, 1mS / point

6.6.2. 1164 to 1240 MHz & 1559 to 1610 MHz

There were no broadband emissions related to the UWB transmitter. Measured signals were narrowband and related to the microprocessor / clocks and do not fall under the requirements of this section. Measurements were made at 1.0 Meter with a -9.54 dB distance correction factor. The -85.3 dBm limit was converted to a field strength limit of 9.9 dBuV/m using a factor of 95.2.

Sample Calculation: Final Result (dBµV/m) = Measurement Value (dBµV) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

Note: All correction factors are loaded into the measurement instrument prior to testing to determine the final result.

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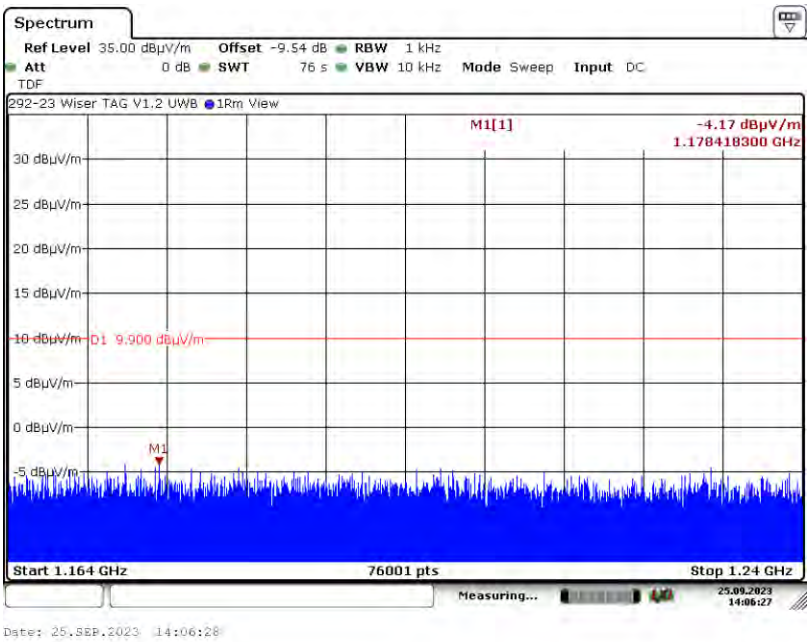
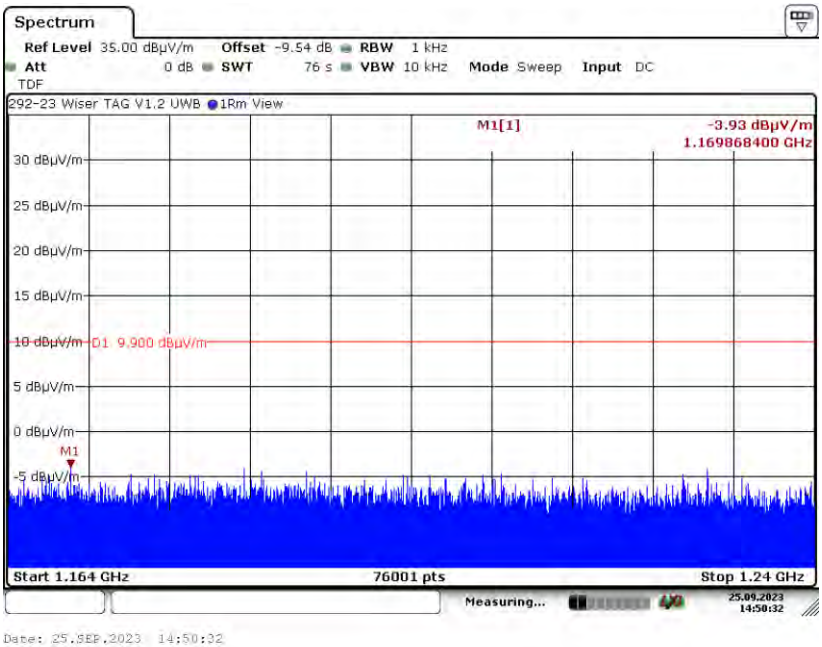
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.1 Horizontal Measurement Polarity 1164 to 1240 MHz, X Axis CH3 Normal



6.6.3.2 Vertical Measurement Polarity 1164 to 1240 MHz, X Axis CH2 16M



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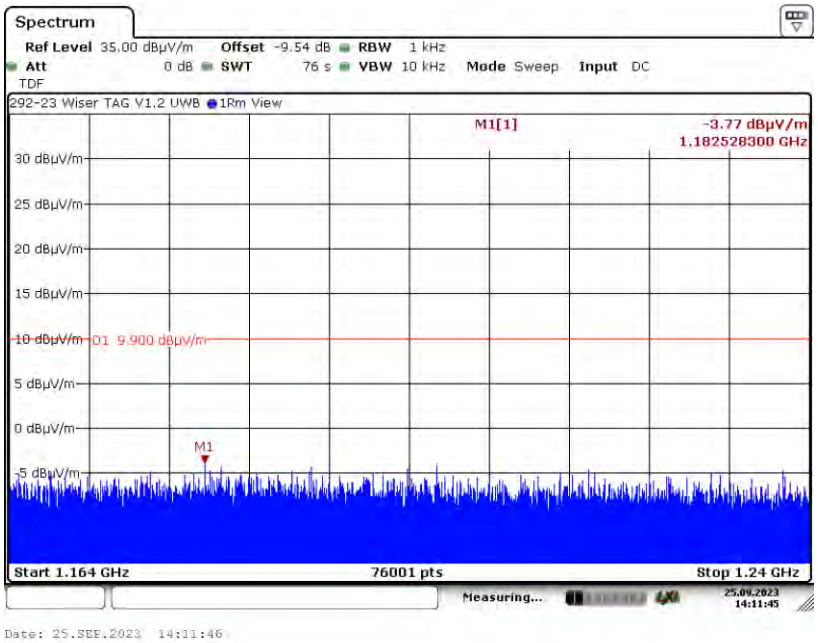
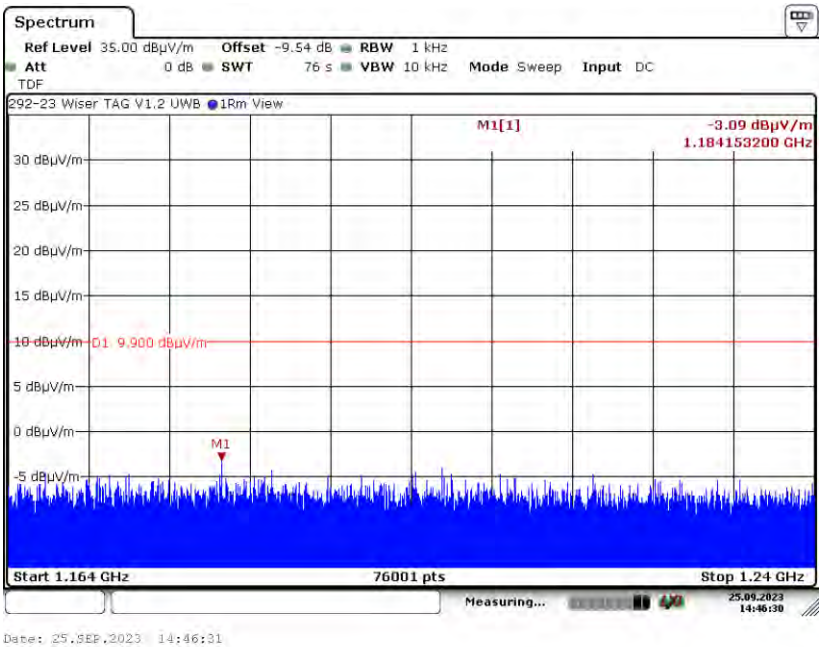
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.3 Horizontal Measurement Polarity 1164 to 1240 MHz, Y Axis CH3



6.6.3.4 Vertical Measurement Polarity 1164 to 1240 MHz, Y Axis CH3



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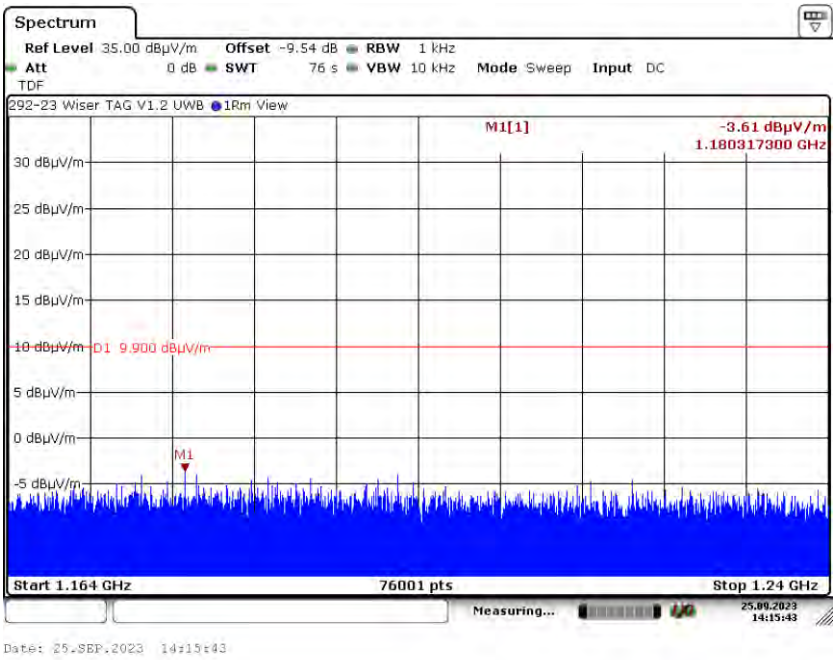
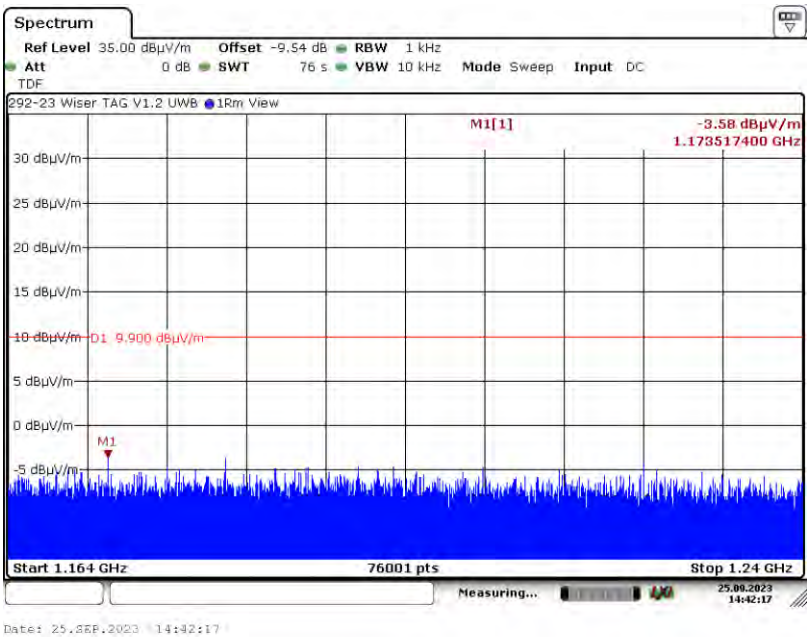
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.5 Horizontal Measurement Polarity 1164 to 1240 MHz, Z Axis CH3



6.6.3.6 Vertical Measurement Polarity 1164 to 1240 MHz, Z Axis CH3



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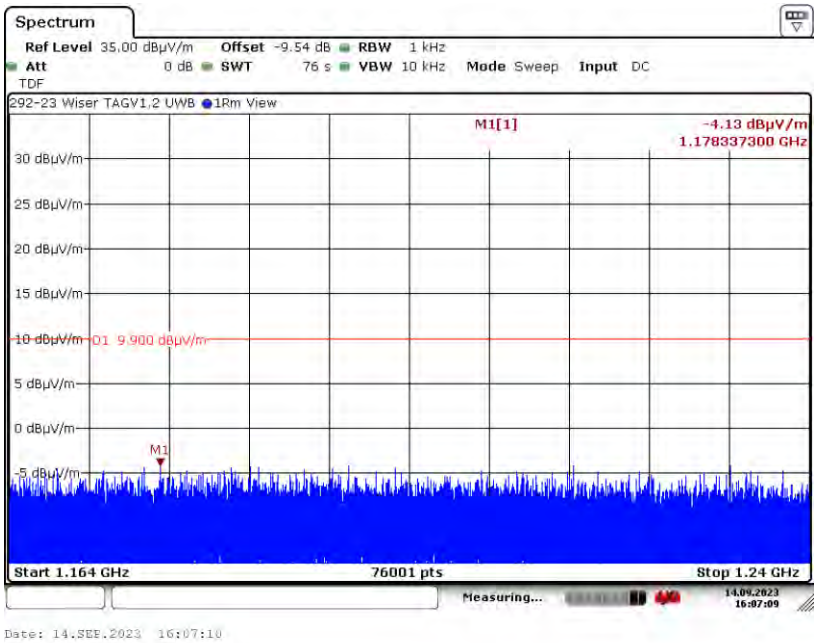
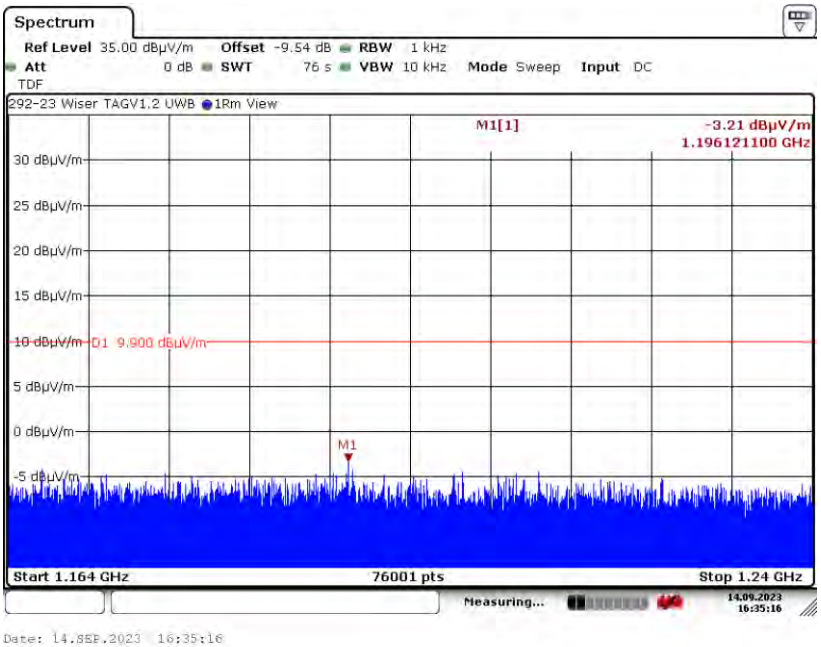
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.7 Horizontal Measurement Polarity 1164 to 1240 MHz, X Axis CH3 Wide



6.6.3.8 Vertical Measurement Polarity 1164 to 1240 MHz, X Axis CH3



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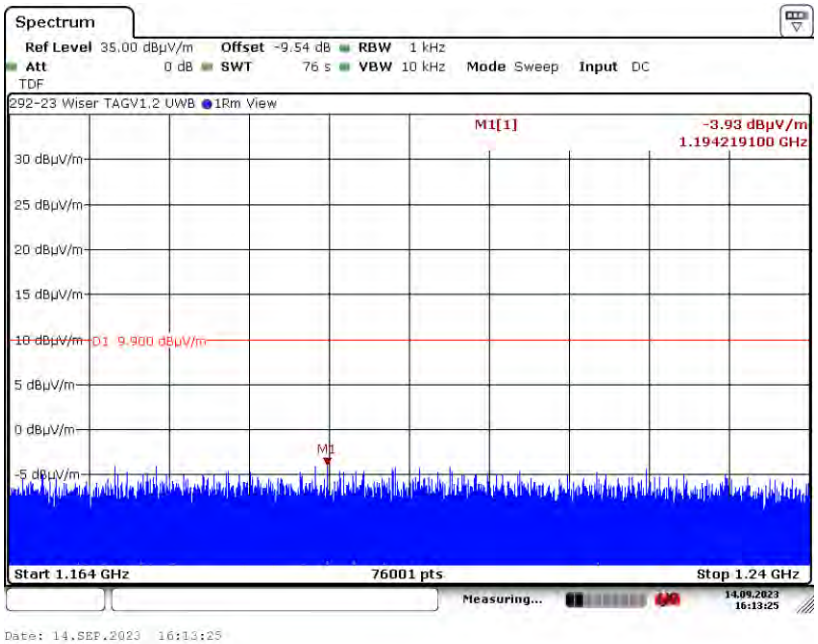
6. Measurement Data (continued)

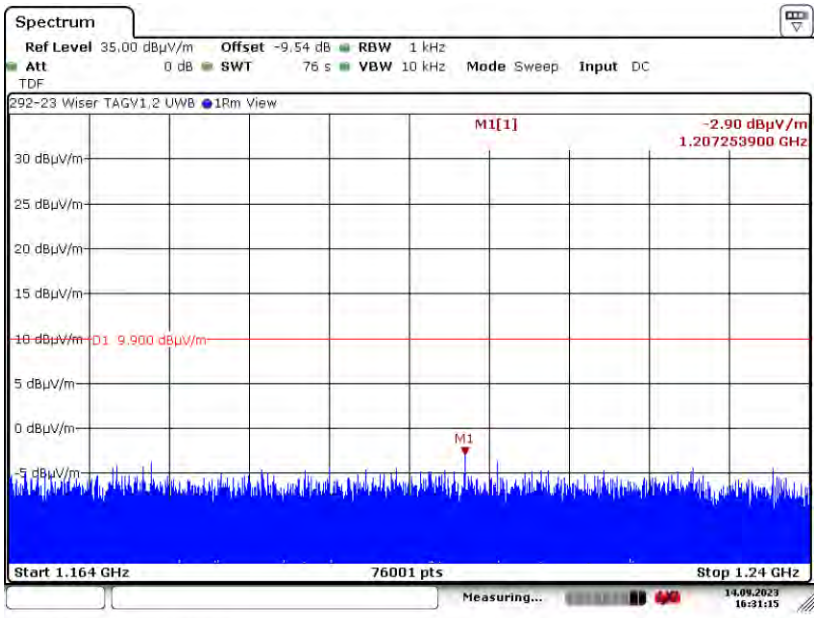
6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.9 Horizontal Measurement Polarity 1164 to 1240 MHz, Y Axis CH3



Date: 14.SEP.2023 16:13:25

6.6.3.10 Vertical Measurement Polarity 1164 to 1240 MHz, Y Axis CH3



Date: 14.SEP.2023 16:31:16

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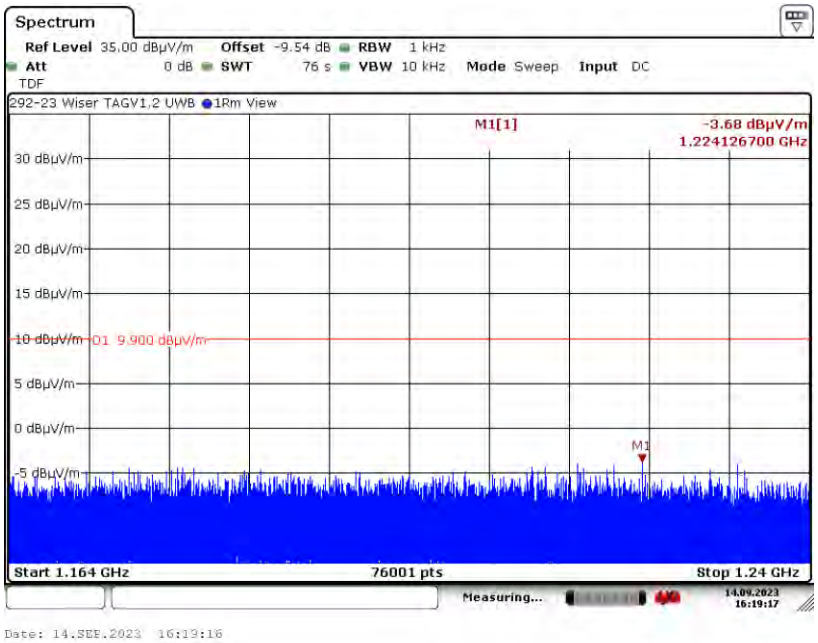
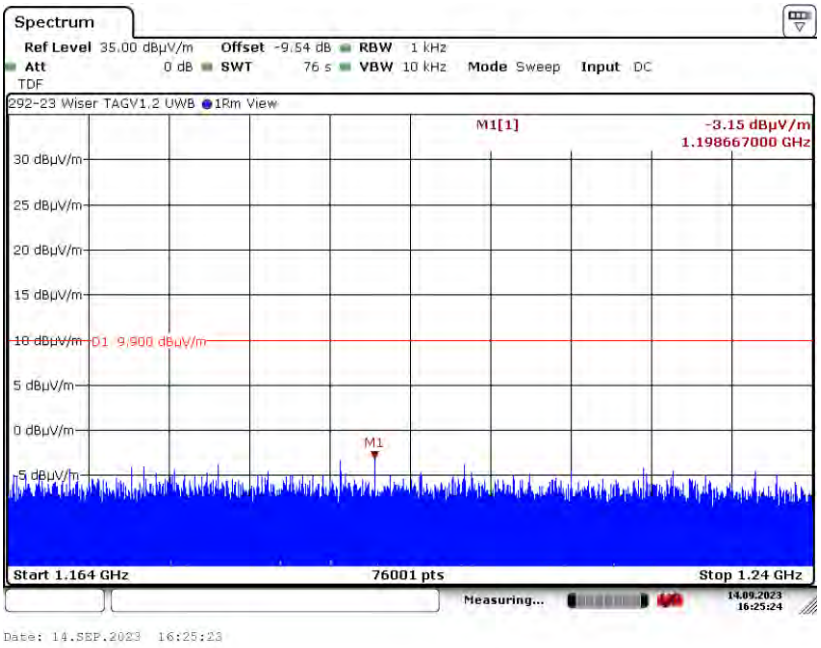
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.11 Horizontal Measurement Polarity 1164 to 1240 MHz, Z Axis CH3



6.6.3.12 Vertical Measurement Polarity 1164 to 1240 MHz, Z Axis CH3



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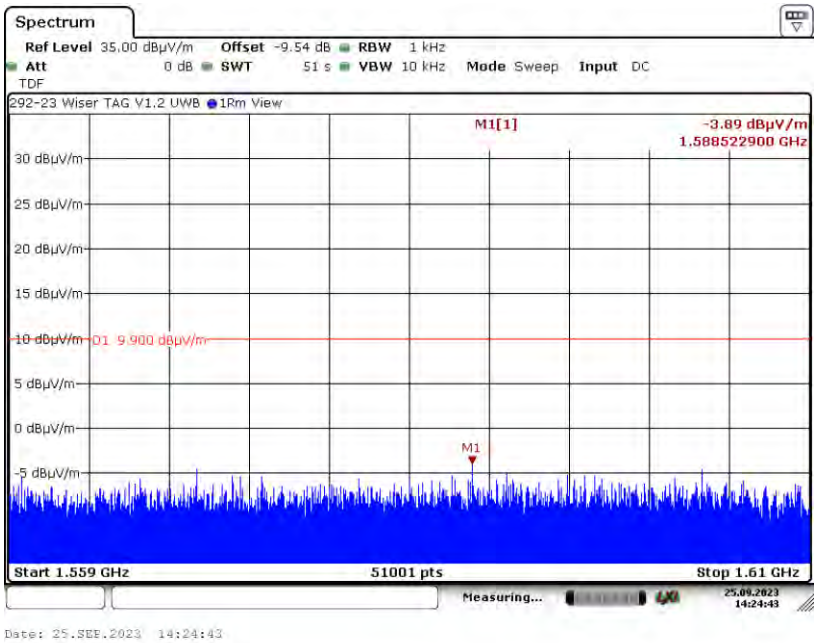
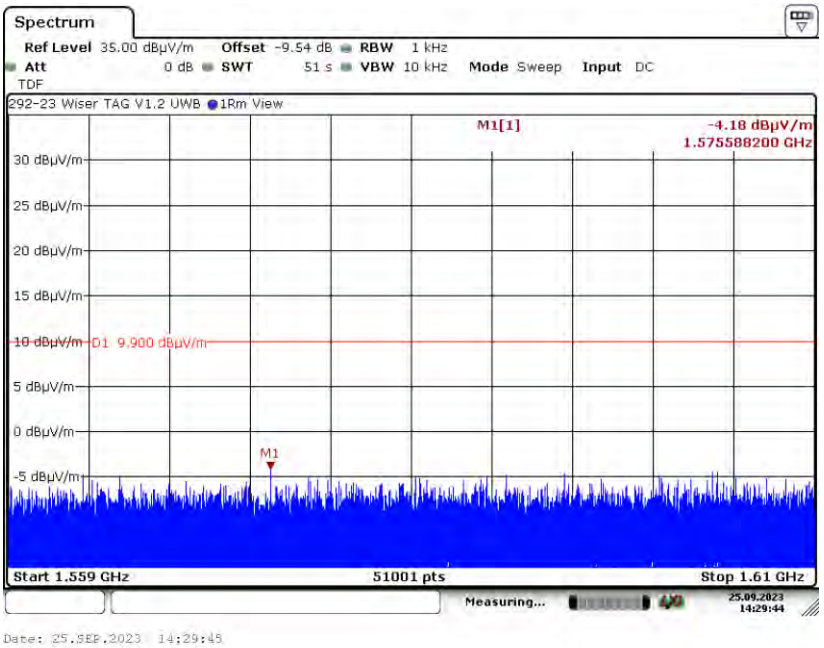
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.13 Horizontal Measurement Polarity 1559 to 1610 MHz, X Axis CH3 Normal



6.6.3.14 Vertical Measurement Polarity 1559 to 1610 MHz, X Axis CH3



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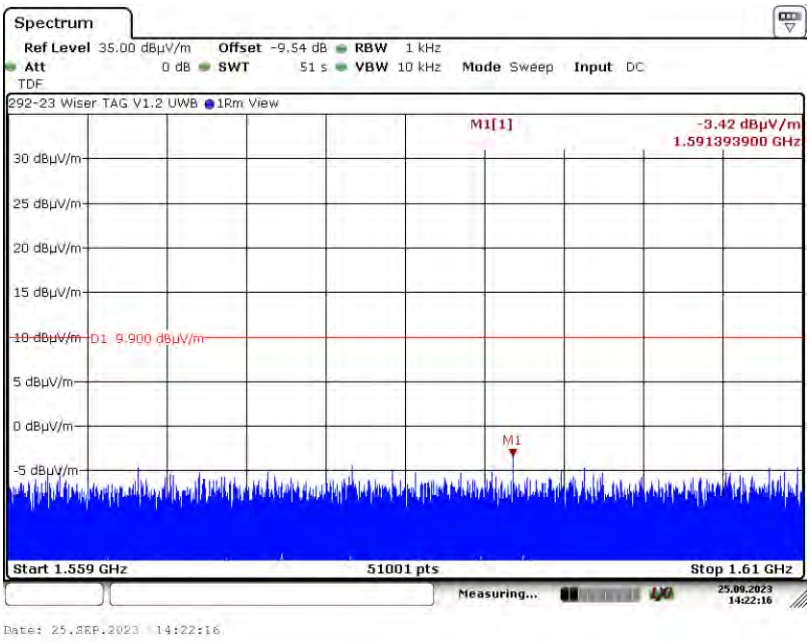
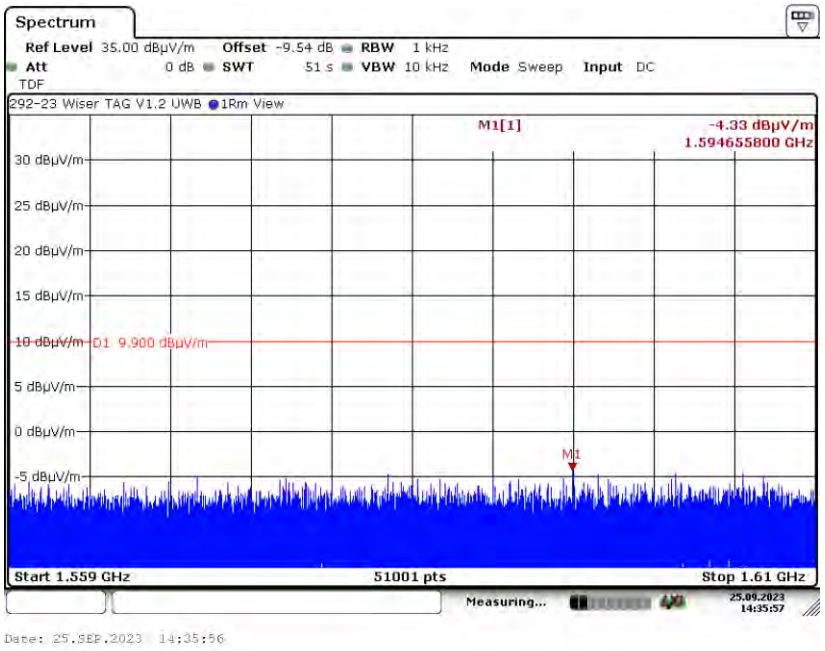
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.15 Horizontal Measurement Polarity 1559 to 1610 MHz, Y Axis CH3



6.6.3.16 Vertical Measurement Polarity 1559 to 1610 MHz, Y Axis CH3



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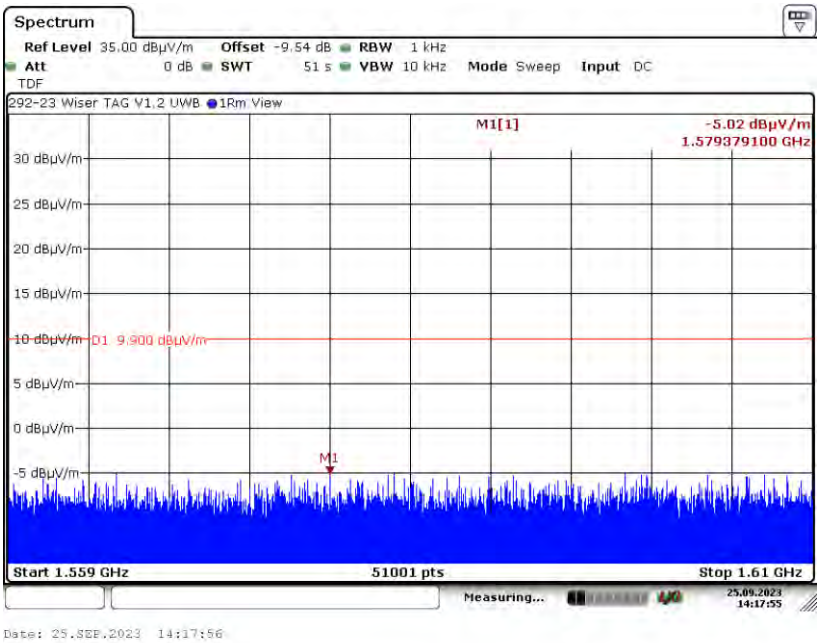
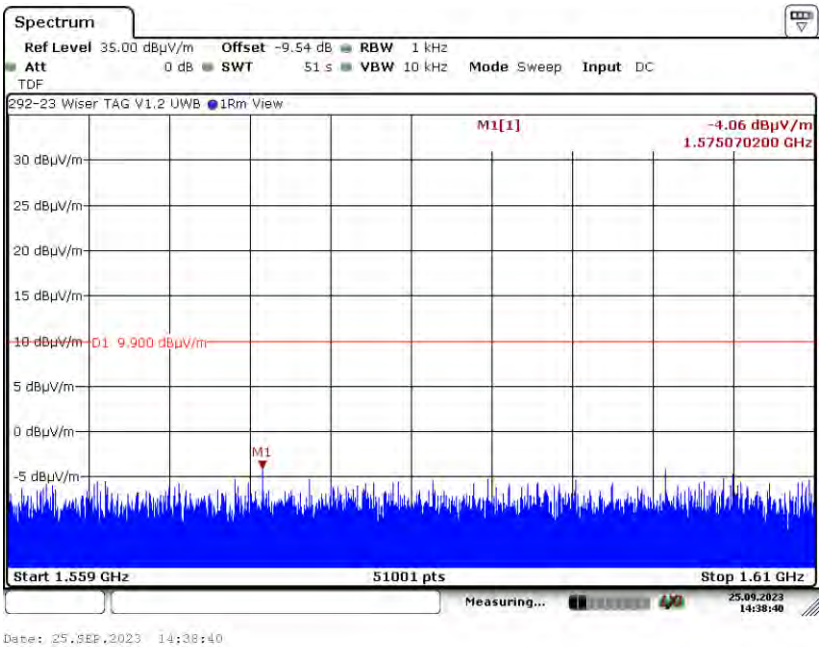
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.17 Horizontal Measurement Polarity 1559 to 1610 MHz, Z Axis CH3



6.6.3.18 Vertical Measurement Polarity 1559 to 1610 MHz, Z Axis CH3



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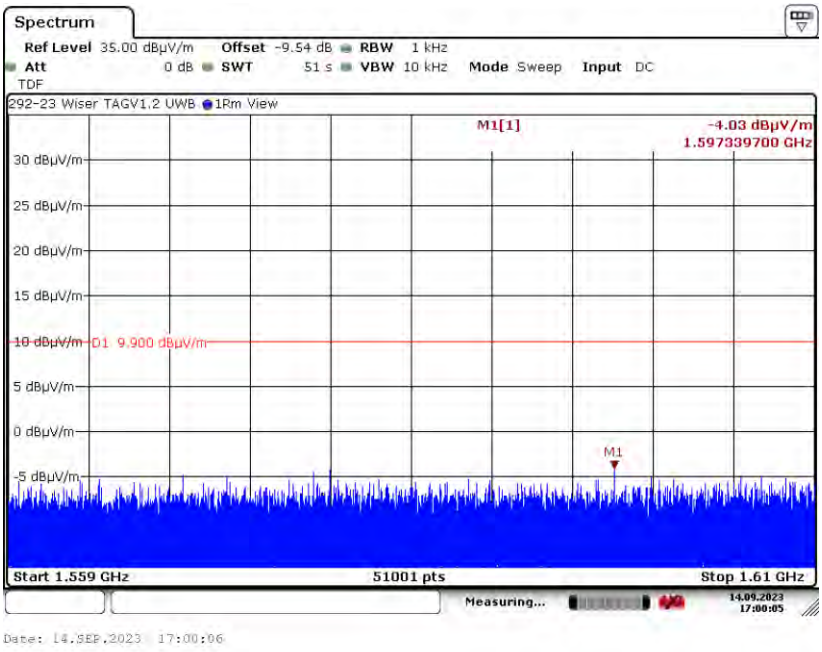
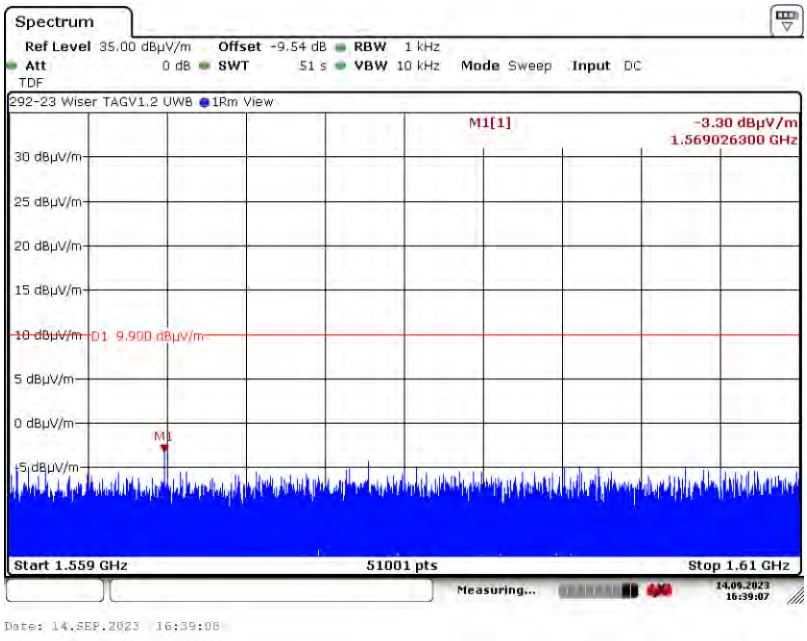
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.19 Horizontal Measurement Polarity 1559 to 1610 MHz, X Axis CH3 Wide



6.6.3.20 Vertical Measurement Polarity 1559 to 1610 MHz, X Axis CH3



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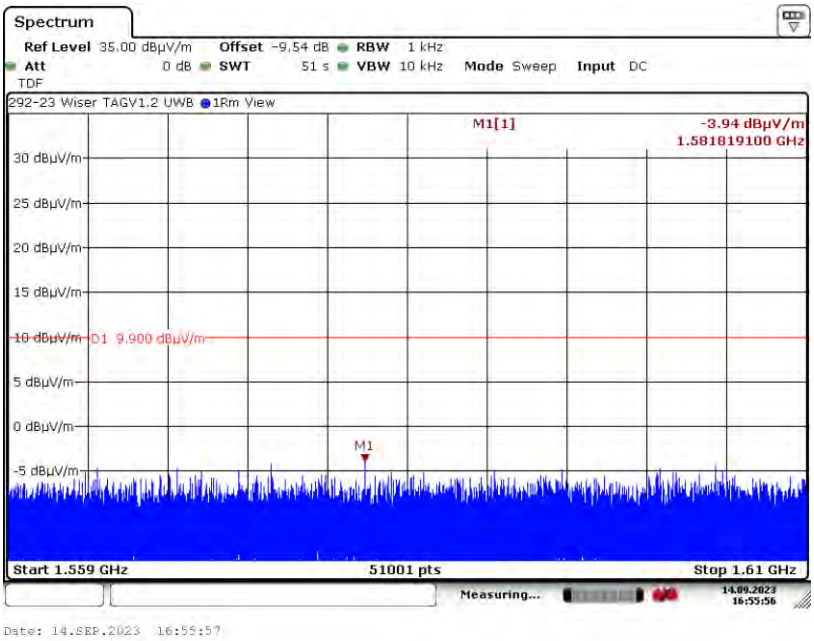
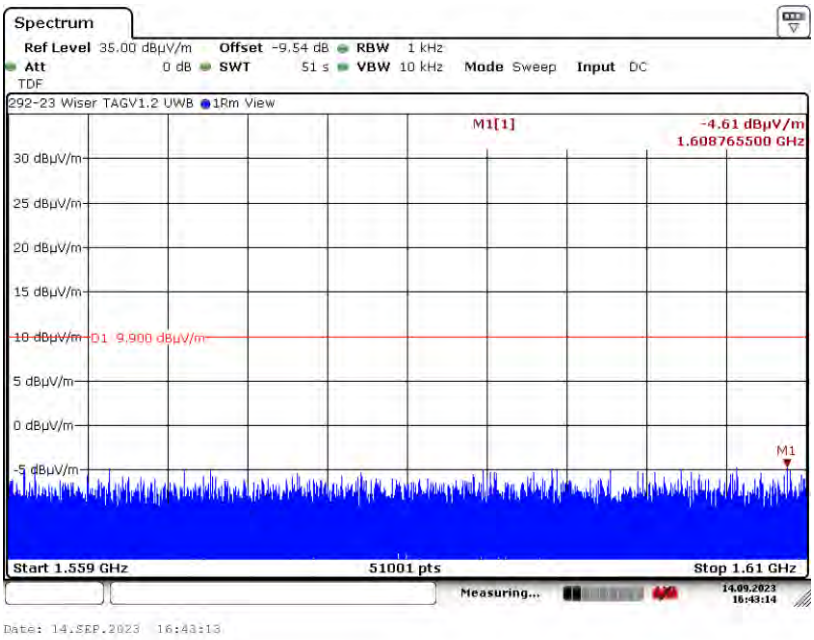
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.21 Horizontal Measurement Polarity 1559 to 1610 MHz, Y Axis CH3



6.6.3.22 Vertical Measurement Polarity 1559 to 1610 MHz, Y Axis CH3



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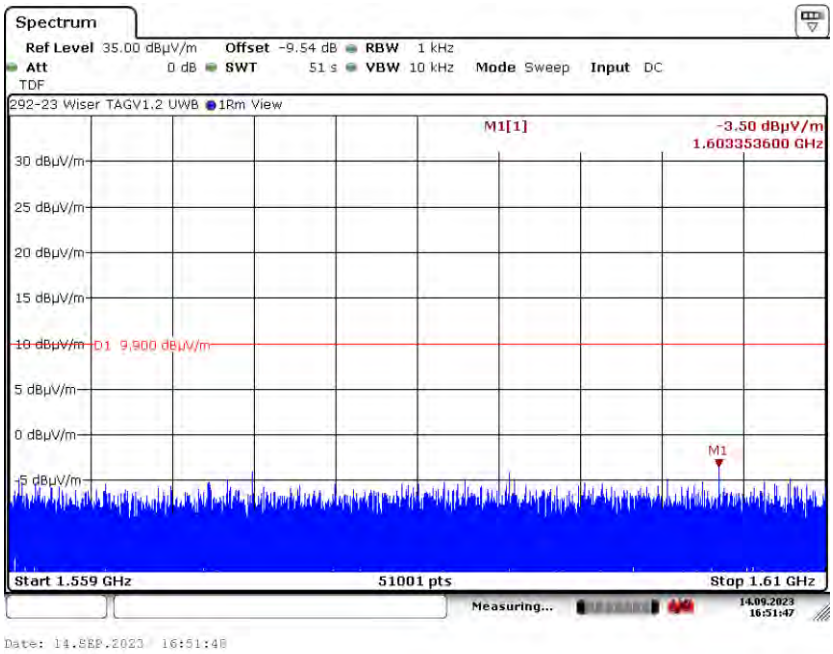
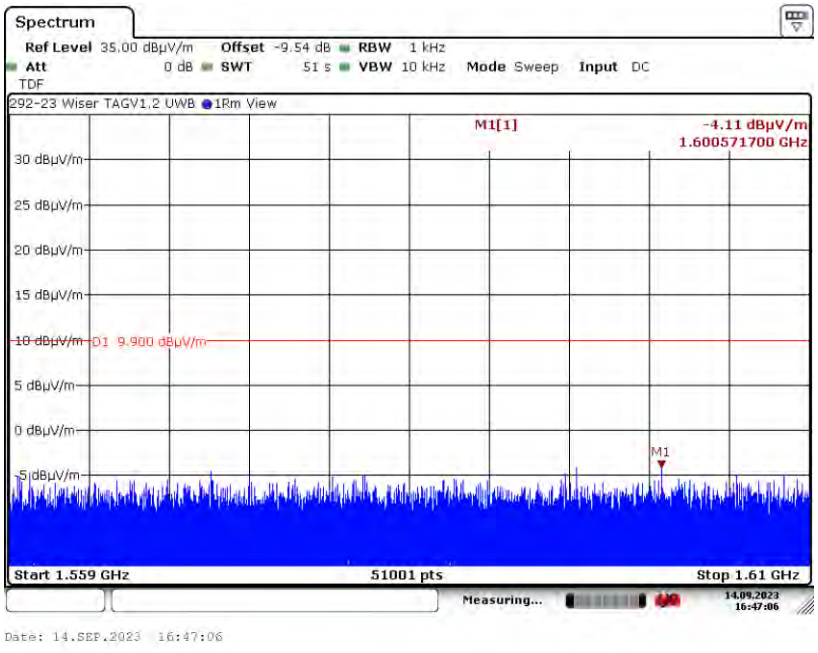
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions in GPS Bands (15.519 (d) continued)

6.6.3.23 Horizontal Measurement Polarity 1559 to 1610 MHz, Z Axis CH3



6.6.3.24 Vertical Measurement Polarity 1559 to 1610 MHz, Z Axis CH3



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6. Measurement Data (continued)

6.7. Radiated Emissions of UWB Transmission (15.519 (c), 15.521 (d))

Requirement: The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

The RMS average measurement is based on the use of a spectrum analyzer with a resolution bandwidth of 1 MHz, an RMS detector, and a 1 millisecond or less averaging time.

The EIRP in terms of dBm, can be converted to a field strength, in dBµV/m at 3 Meters by adding 95.2.

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dBµV/m)
3100 - 10600	-41.3	53.9

Frequency Range:	4 to 5 GHz, 3.5 to 5.5 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	1 MHz
EMI Receiver Avg Bandwidth	10 MHz
Detector Function:	RMS 1 mS Average as defined in 15.521(d)

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6. Measurement Data (continued)

6.7. Radiated Emissions of UWB Transmission (15.519 (c), 15.521(d))

6.7.1. Plot of RMS Power at 3 Meters (CH3 Normal)

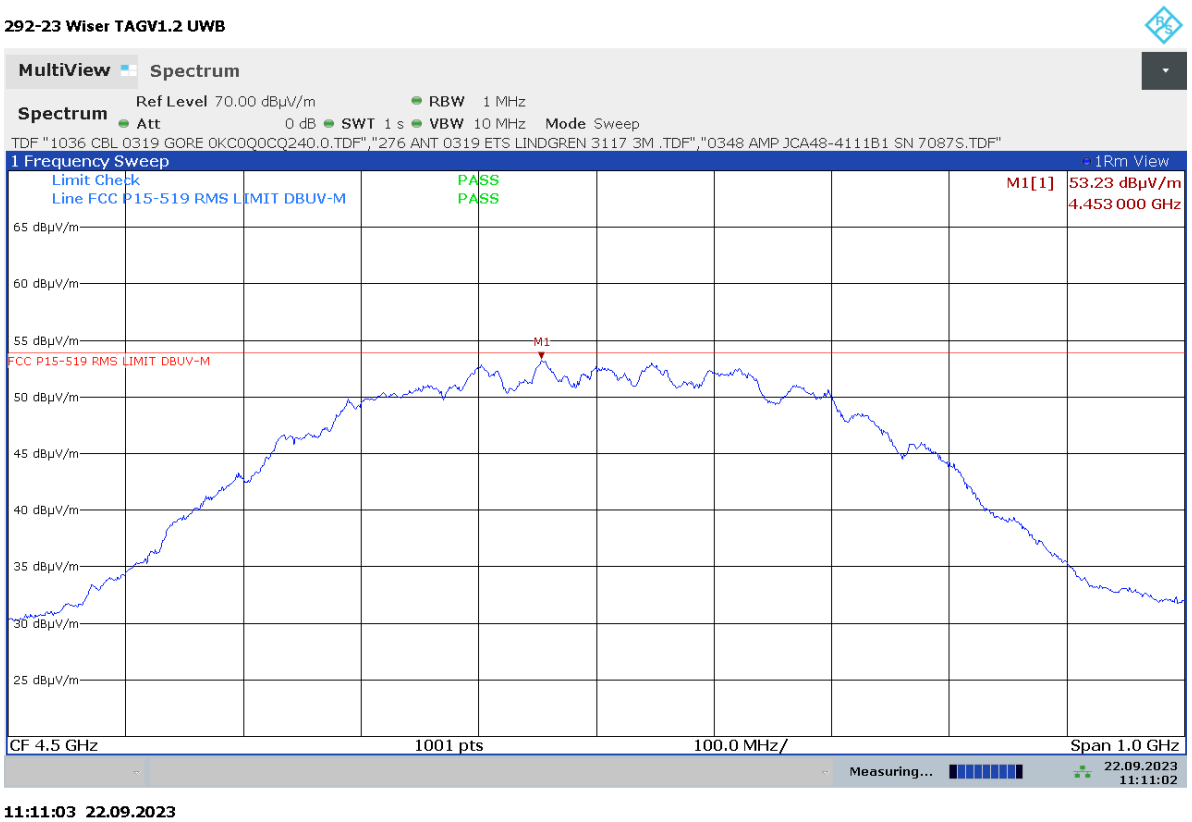
Frequency (GHz)	Amplitude[1]	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBµV/m)	(dBµV/m)	(dB)	H/V	cm	Deg	
4.453	53.23	53.90	-0.67	V	171	165	Compliant

Notes: [1] Antenna Factor (AF), Cable Factor (CF) and External Preamplifier Gain (PAG) have been entered into the analyzer as transducer factors.

Equation (22) from ANSI C63.10-2013, EIRP = E_{meas} + 20 log (d_{meas}) – 104.7; d_{meas} = 3

EIRP (dBm) = E_{meas} (dBµV/m) – 95.2

Frequency (GHz)	Amplitude[1] (dBm)	Limit (dBm)	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	EIRP	EIRP	(dB)	H/V	cm	Deg	
4.453	-41.97	-41.30	-0.67	V	171	165	Compliant



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6. Measurement Data (continued)

6.7. Radiated Emissions of UWB Transmission (15.519 (c), 15.521(d)) continued

6.7.2. Plot of RMS Power at 3 Meters (CH3 Wide)

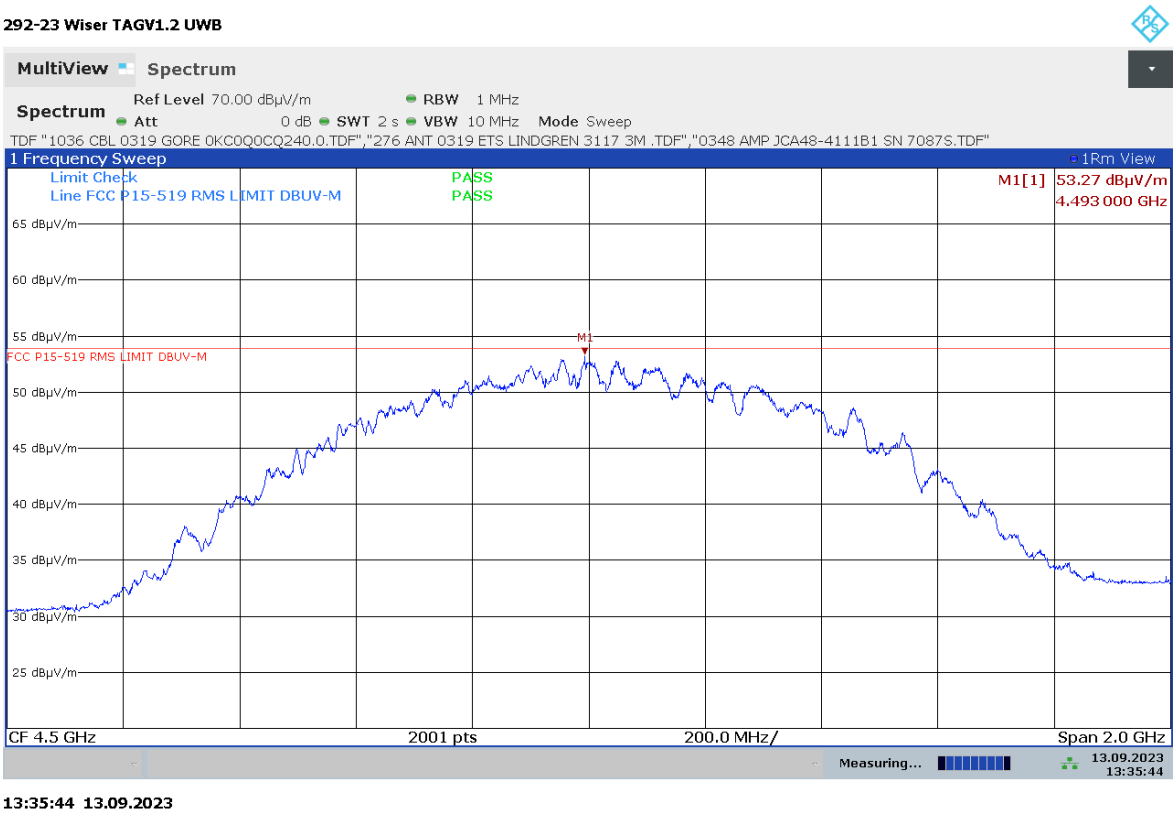
Frequency (GHz)	Amplitude[1]	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBµV/m)	(dBµV/m)	(dB)	H/V	cm	Deg	
4.493	53.27	53.90	-0.63	V	171	165	Compliant

Notes: [1] Antenna Factor (AF), Cable Factor (CF) and External Preamplifier Gain (PAG) have been entered into the analyzer as transducer factors.

Equation (22) from ANSI C63.10-2013, EIRP = E_{meas} + 20 log (d_{meas}) – 104.7; d_{meas} = 3

EIRP (dBm) = E_{meas} (dBµV/m) – 95.2

Frequency (GHz)	Amplitude[1] (dBm)	Limit (dBm)	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	EIRP	EIRP	(dB)	H/V	cm	Deg	
4.493	-41.93	-41.30	-0.63	V	171	165	Compliant



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6. Measurement Data (continued)

6.8. Peak Emissions in a 50 MHz Bandwidth (15.519 (e), 15.521 (g))

Requirement: There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_M. That limit is 0 dBm EIRP.

The EIRP in terms of dBm, can be converted to a field strength, in dBµV/m at 3 Meters by adding 95.2. As used in this subpart, EIRP refers to the highest signal strength measured in any direction and at any frequency from the UWB device.

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dBµV/m)
3100 - 10600	0	95.2

Frequency Range:	4 to 5 GHz, 3.5 to 5.5 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	50 MHz
EMI Receiver Avg Bandwidth	80 MHz
Detector Function:	Peak, Max Held

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6. Measurement Data (continued)

6.8. Peak Emissions in a 50 MHz Bandwidth (15.519 (e), 15.521 (g) continued)

6.8.1 Plot of Peak Power at 3 Meters (CH3 Normal)

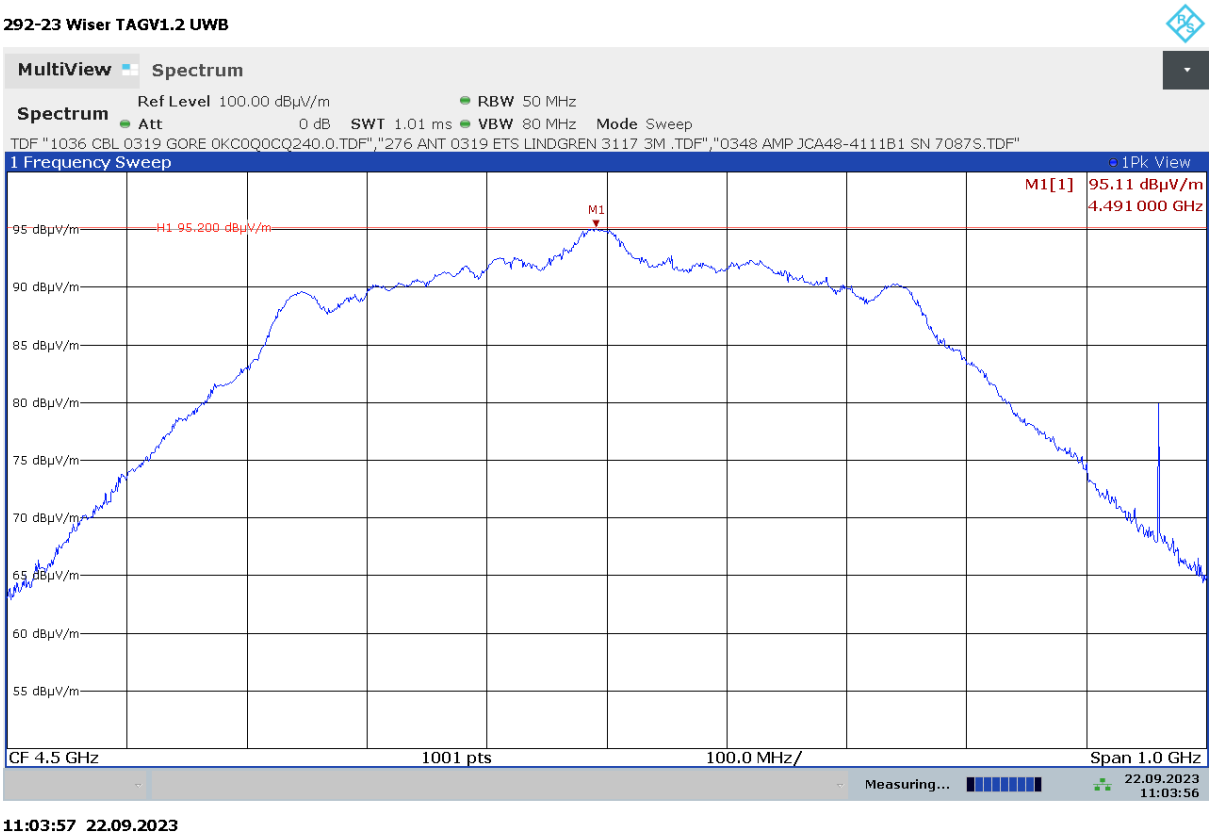
Frequency (GHz)	Amplitude[1]	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBµV/m)	(dBµV/m)	(dB)	H/V	cm	Deg	
4.491	95.11	95.20	-0.09	V	171	165	Compliant

Notes: [1] Antenna Factor (AF), Cable Factor (CF) and External Preamplifier Gain (PAG) have been entered into the analyzer as transducer factors.

Equation (22) from ANSI C63.10-2013, EIRP = E_{meas} + 20 log (d_{meas}) – 104.7; d_{meas} = 3

EIRP (dBm) = E_{meas} (dBµV/m) – 95.2

Frequency (GHz)	Amplitude[1] (dBm)	Limit (dBm)	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	EIRP	EIRP	(dB)	H/V	cm	Deg	
4.491	-0.09	0.00	-0.09	V	171	165	Compliant



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6. Measurement Data (continued)

6.8. Peak Emissions in a 50 MHz Bandwidth (15.519 (e), 15.521 (g) continued)

6.8.2 Plot of Peak Power at 3 Meters (CH3 Wide)

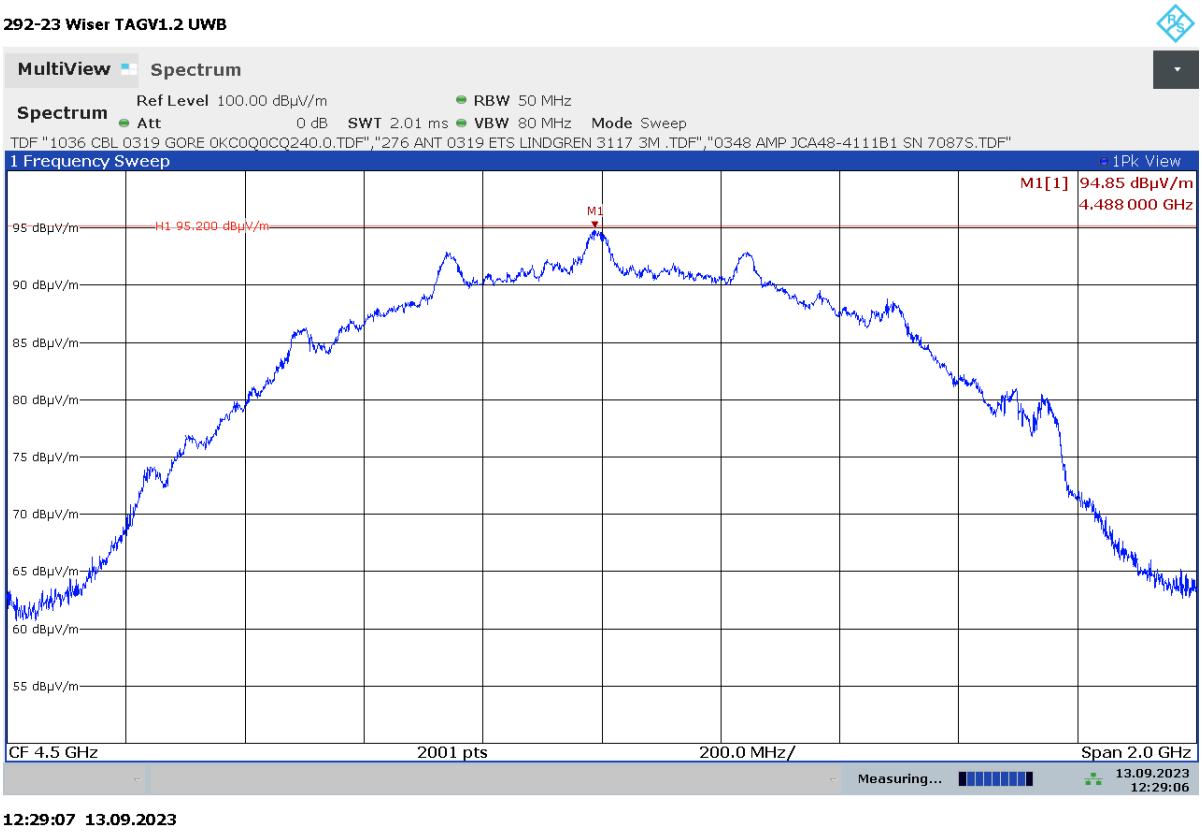
Frequency (GHz)	Amplitude[1]	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBµV/m)	(dBµV/m)	(dB)	H/V	cm	Deg	
4.488	94.85	95.20	-0.25	V	171	165	Compliant

Notes: [1] Antenna Factor (AF), Cable Factor (CF) and External Preamplifier Gain (PAG) have been entered into the analyzer as transducer factors.

Equation (22) from ANSI C63.10-2013, EIRP = E_{meas} + 20 log (d_{meas}) – 104.7; d_{meas} = 3

EIRP (dBm) = E_{meas} (dBµV/m) – 95.2

Frequency (GHz)	Amplitude[1] (dBm)	Limit (dBm)	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	EIRP	EIRP	(dB)	H/V	cm	Deg	
4.488	-0.25	0.00	-0.25	V	171	165	Compliant



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6. Measurement Data (continued)

6.9 Conducted Emissions Test Setup

6.9.1. Regulatory Limit: FCC Part 15, Class B, IC RSS-GEN

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50
* Decreases with the logarithm of the frequency.		

6.9.2 Measurement Equipment and Software Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Rohde & Schwarz	ESR7	101156	10/25/2024
LISN	EMCO	3825/2	9109-1860	1/4/2024
Manufacturer	**Software Description**		**Title/Model #**	**Rev.**
Compliance Worldwide	Test Report Generation Software		Test Report Generator	1.0

6.9.3. Measurement & Equipment Setup

Test Date:	N/A
Test Engineer:	N/A
Site Temperature (°C):	N/A
Relative Humidity (%RH):	N/A
Frequency Range:	0.15 MHz to 30 MHz
EMI Receiver IF Bandwidth:	9 kHz
EMI Receiver Avg Bandwidth:	≥ 3 * RBW or IF(BW)
Detector Functions:	Peak, Quasi-Peak & CISPR Average

6.9.4. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2014, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

Sample Calculation: Final Result (dBµV) = Measurement Value (dBµV) + LISN Factor (dB) + Cable Loss (dB).

Note: All correction factors are loaded into the measurement instrument prior to testing to determine the final result.

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7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with the Federal Communications Commission (FCC) and Industry Canada standards. Through our American Association for Laboratory Accreditation (A2LA) ISO Guide 17025 Accreditation our test sites are designated with the FCC (designation number **US1091**), Industry Canada (file number **IC 3023A-1)** and VCCI (Member number 3168) under registration number A-0274.

Compliance Worldwide is also designated as a Phase 1 CAB under APEC-MRA (US0132) for Australia/New Zealand AS/NZS CISPR 32, Chinese-Taipei (Taiwan) BSMI CNS 13438 and Korea (RRA) KN 11, KN 13, KN 14-1, KN 22, KN 32, KN 61000-6-3, KN 61000-6-4.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane. A second conducted emissions site is also located in the basement of the OATS site with a 2.3 x 2.5 meter ground plane and a 2.4 x 2.4 meter vertical wall.

The radiated emissions test site for measurements above 1GHz is a 3 Meter open area test site (OATS) with a 3.6 by 3.6 meter anechoic absorber floor patch to achieve a quasi-free space measurement environment per ANSI C63.4/C63.10 and CISPR 16-1-4 standards.

The sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.

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8. Test Images

8.1. Spurious and Harmonic Emissions – 30 kHz to 30 MHz Front

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8. Test Images

8.2. Spurious and Harmonic Emissions – 30 kHz to 30 MHz Rear

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8. Test Images

8.3. Spurious and Harmonic Emissions – 30 MHz to 1 GHz Rear

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8. Test Images

8.4. Spurious and Harmonic Emissions – 1 to 18 GHz Front

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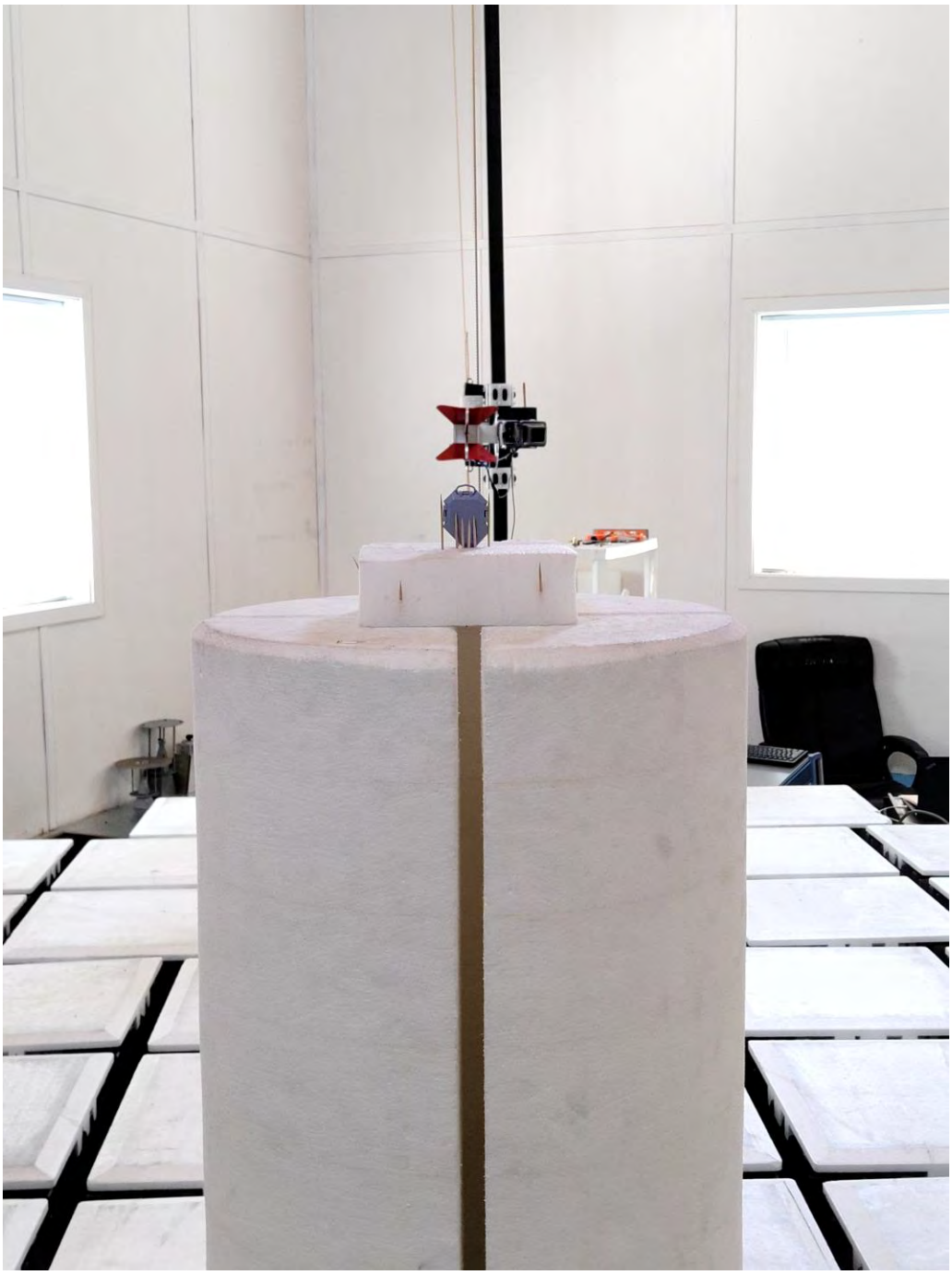
8. Test Images

8.5. Spurious and Harmonic Emissions – 1 to 18 GHz Rear



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8. Test Images

8.6. Spurious and Harmonic Emissions – 18 to 40 GHz Side View

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