

COMPLIANCE WORLDWIDE INC. TEST REPORT 150-24

In Accordance with the Requirements of
FCC TITLE 47 CFR Part 15.519, Subpart F
Technical Requirements for Handheld UWB Systems

ISED RSS-220, Issue 1 (March 2009) + Amendment 1 (July 2018)
Devices Using Ultra-Wideband (UWB) Technology

Issued to

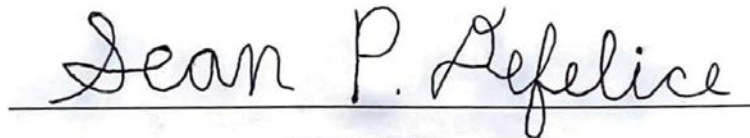
Wiser Systems, Inc.
811 W. Hargett Street
Raleigh, NC 27603
(919) 551-5566

For the
USB Dongle Antenna
Model: USB5V2.0

FCC ID: 2AGZM-C00524
IC: 25948-C00524

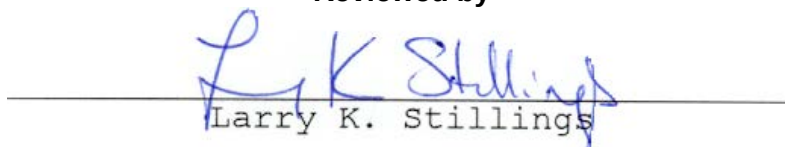
Report Issued on June 26, 2024

Tested by



Sean P. Defelice

Reviewed by



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1. Scope

This test report certifies that the Wiser Systems USB Dongle Antenna Model USB5V2.0 as tested, meets the FCC Part 15, Subpart F and ISSED RSS-220 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. Measurement Uncertainty will not be applied to any of the measurement / testing results in this test report to determine pass/fail criteria per the Decision Rule as defined in ISO/IEC Guide 17025-2017 Clause 3.7.

2. Product Details

- 2.1. Manufacturer: Wiser Systems, Inc.
- 2.2. Model Numbers: USB5V2.0
- 2.3. Serial Numbers: Pre-production
- 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: 5.0 VDC via USB, External Battery or USB to AC Adapter
- 2.6. Hardware Revision: V2
- 2.7. Software Revision: N/A
- 2.8. Modulation Type: Pulse Modulation, Frequency Hopping
- 2.9. Operating Frequencies: 6.5 GHz Center Frequency Nominal (Channel 5 – 500 MHz BW)
- 2.10. EMC Modifications: None

3. Product Configuration

3.1 Operational Characteristics & Software

Hardware Setup:

Connect the Wiser USB Dongle to a remotely located laptop computer via USB.

Using the software tool configure the USB dongle to transmit on Channel 5.

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Volts	Freq (Hz)	Description/Function
Wiser Systems	USB5V2.0	Pre-production	5.0	DC	USB Dongle Antenna

3.3. EUT Cables/Transducers

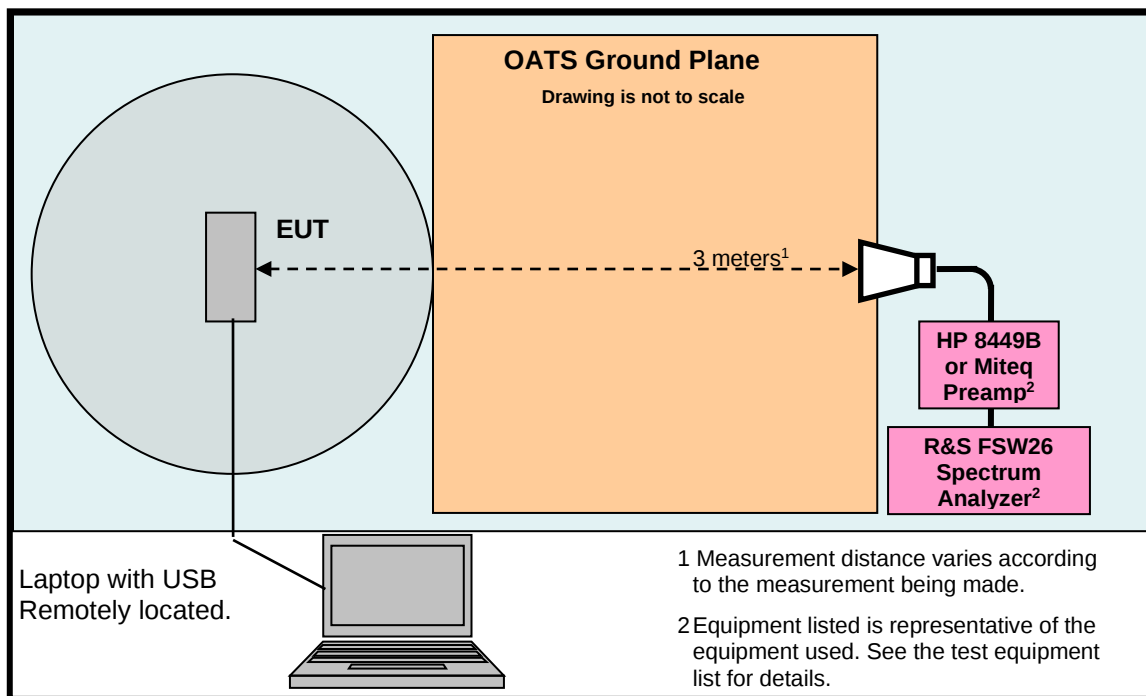
Cable Type	Length	Shield	From	To
USB	1M	Yes	EUT	Laptop for Control / Battery Power

3.4. Support Equipment

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
Lenovo	ThinkPad T440P	PB-031DX9	120	60	For controlling the USB Dongle

3. Product Configuration (cont.)

3.5. Test Setup Diagram



4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9 kHz – 7 GHz ¹	Rohde & Schwarz	ESR7	101156	10/25/2024	3 Years
EMI Test Receiver, 10 Hz – 7 GHz ¹	Rohde & Schwarz	ESR7	101770	7/23/2024	3 Years
EMI Test Receiver, 9 kHz – 26.5 GHz ¹	Rohde & Schwarz	ESR26	101693	6/26/2024	1 Year
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	5/11/2025	3 Years
Dbl Ridged Guide Antenna 1 - 18 GHz	ETS-Lindgren	3117	00227631	4/21/2025	3 Years
Preamplifier 100 MHz to 7 GHz	Miteq	AFS3-00100200-10-15P-4	988773	9/28/2024	1 Year
Preamplifier 100 MHz to 18 GHz	Miteq	AMF-7D-00101800-30-10P	1953081	9/27/2024	1 Year
Preamplifier 2 to 12 GHz	JCA	JCA48-4111B1	7087S	9/28/2024	1 Year
Preamplifier 18 to 40 GHz	Miteq	JSD42-21004200-40-5P	649199/649219	9/27/2024	1 Year
Horn Antenna 18 to 40 GHz	Com Power	AH-840	101032	1/25/2025	3 Years
High Pass Filter 6.4 to 18 GHz	Micro-Tronics	HPM50112	014	2/27/2025	1 Year
Barometric Pressure/Humidity & Temp Datalogger	Extech Instruments	SD700	Q590483	4/4/2025	1 Year

¹ ESR7/26 Firmware revision: V3.48 SP3, Date installed: 09/30/2020

² FSW26 Firmware revision: V4.71 SP1, Date installed: 11/16/2020

³ FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016

⁴ FSVR40 Firmware revision: V2.23 SP1, Date installed: 08/19/2016

Previous V3.48 SP2, installed 07/23/2020.

Previous V4.61, installed 08/11/2020.

Previous V2.30 SP1, installed 10/22/2014.

Previous V2.23, installed 10/22/2014.

4. Measurements Parameters (continued)

4.2. Measurement & Equipment Setup

Test Dates:	4/8/2024, 4/10/2024, 6/26/2024
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
	200 Hz – 30 kHz to 150 kHz
EMI Receiver IF Bandwidth:	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
Antenna Height:	1 to 4 meters
Measurement Uncertainty 30 to 200 MHz:	± 4.76 dB (H), ± 4.88 dB (V)
Measurement Uncertainty 200 to 1 GHz:	± 5.01 dB (H), ± 5.00 dB (V)
Measurement Uncertainty 1 to 6 GHz:	± 5.17 dB
Measurement Uncertainty 6 to 18 GHz:	± 5.48 dB
Measurement Uncertainty 18 to 40 GHz:	± 5.49 dB

4.3. Measurement Procedure

Test measurements were made in accordance FCC Parts 15.209 Subpart C, 15.519 Subpart F and ISSED RSS-220 and RSS-GEN requirements.

The test methods used to generate the data in 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)	± 1x10 ⁻⁸
Radiated Emission of Transmitter to 100 GHz	± 4.55 dB
Radiated Emission of Receiver	± 4.55 dB
Temperature	± 0.91° C
Humidity	± 5%

5. Measurements Summary

Test Requirement	FCC Rule Requirement	ISED Rule Requirement	Test Report Section	Result	Comment
Antenna Requirement	15.203	RSS-220 5.1 (b)	6.1	Compliant	
Operational Requirements	15.519 (a) (1)	RSS-220	6.2	Compliant	
UWB Bandwidth	15.503 (a) (d) 15.519 (b)	RSS-220 2 RSS-220 5.1	6.3	Compliant	
Radiated Emissions below 960 MHz	15.209	RSS-220 3.4	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)	RSS-220 5.3.1 (e)	6.6	Compliant	
RMS Emissions of UWB Transmission in a 1 MHz Bandwidth	15.519 (c) 15.521 (d)	RSS-220 5.3.1 (d)	6.7	Compliant	
Peak Emissions in a 50 MHz Bandwidth	15.519 (e) 15.521 (g)	RSS-220 5.3.1 (g)	6.8	Compliant	
Conducted Emissions	15.207	RSS-GEN	6.9 6.10	Compliant	
99% Emission Bandwidth	N/A	RSS-GEN	6.11	Compliant	

6. Measurement Data

6.1. Antenna Requirement (15.203, RSS-220 5.1(b))

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

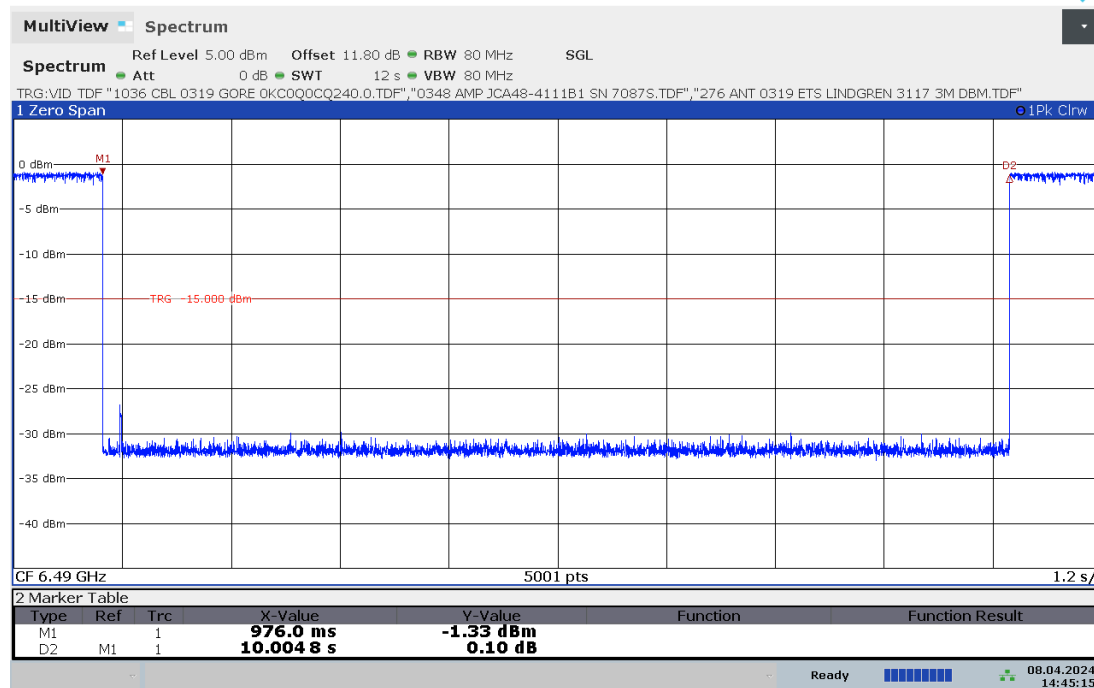
Result: The antenna utilized by the device under test is a custom soldered type.

6. Measurement Data (continued)

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

6.2.2 Plot of Transmission Period – CH2 16M PRF

150-24 Wiser USB5V1.0 UWB



14:45:16 08.04.2024

6. Measurement Data (continued)

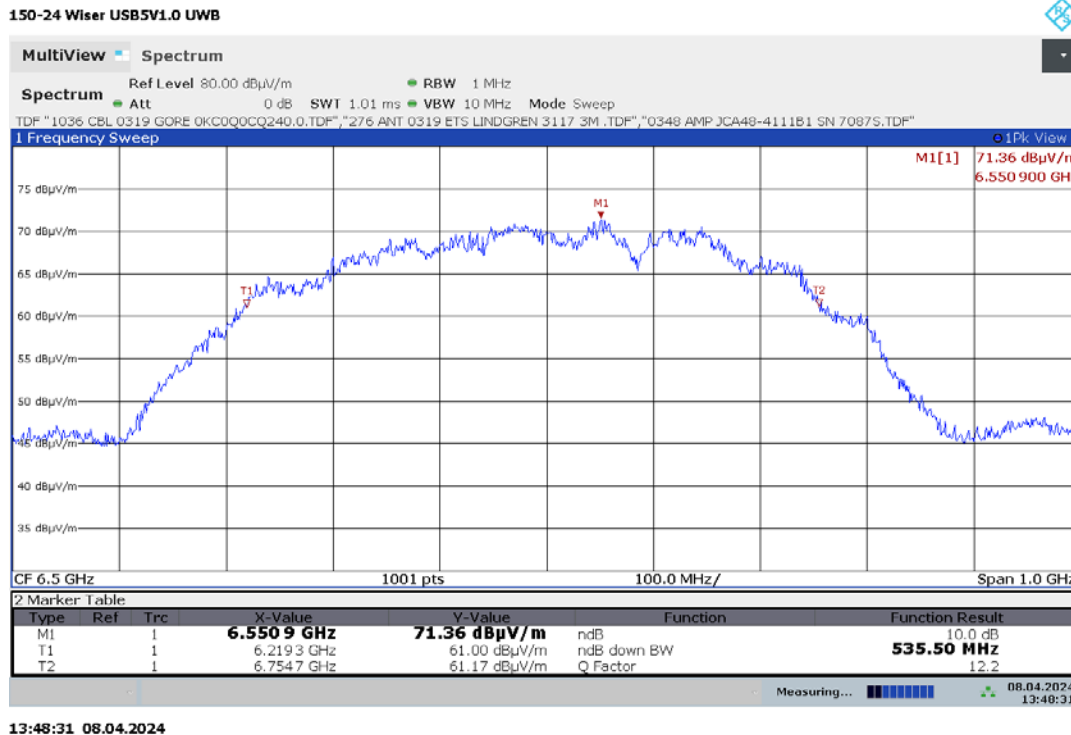
6.3. UWB Bandwidth (15.503 (a) (d), 15.519 (b))

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

f_M	The highest emission peak	6.5509
f_L	10 dB below the highest peak	6.2193
f_H	10 dB above the highest peak	6.7547
f_C	Calculated: $(f_H + f_L) / 2$	6.4870
Bandwidth	Calculated: $(f_H - f_L)$	0.5354
Fractional BW	Calculated: $2 * (f_H - f_L) / (f_H + f_L)$	0.0825

6.3.2. Measurement Plot of 10 dB frequencies



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 ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)
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:	$\geq 3 * \text{RBW or IF(BW)}$
Detector Function:	Peak, Quasi-Peak & CISPR Average

Sample Calculation: Final Result ($\text{dB}\mu\text{V/m}$) = Measurement Value ($\text{dB}\mu\text{V}$) + 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.

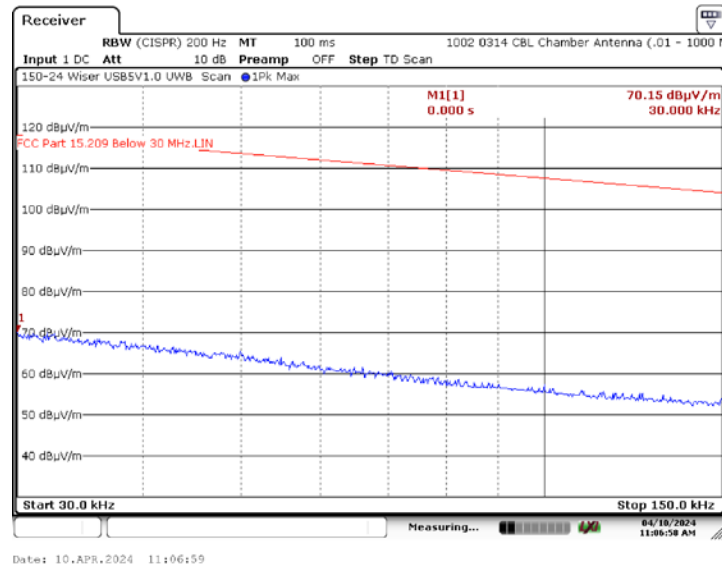
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209, continued)

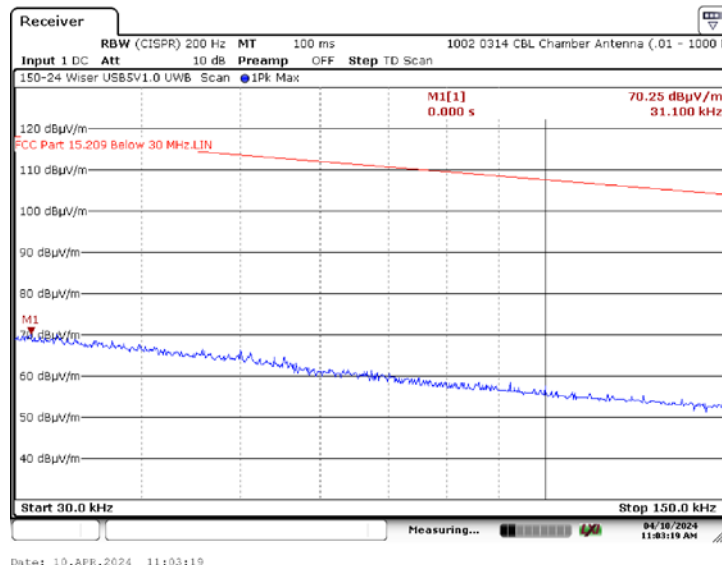
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

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



6.4.1.2 Perpendicular Measurement Antenna – 30 to 150 kHz



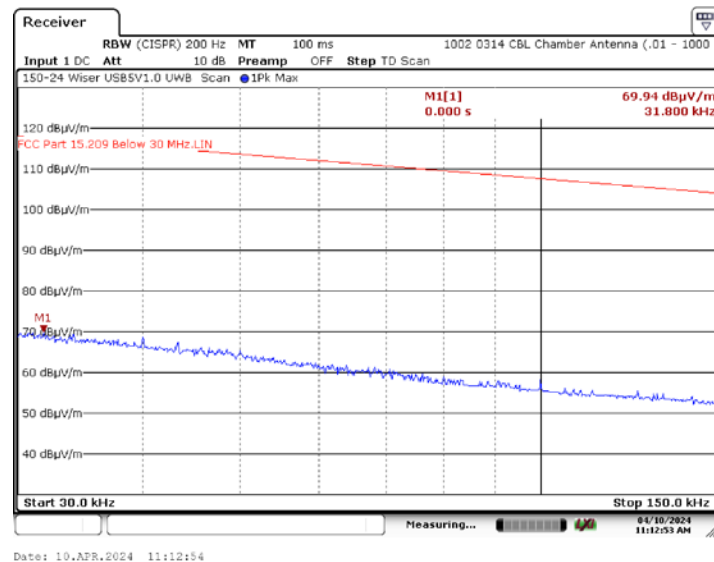
6. Measurement Data (continued)

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



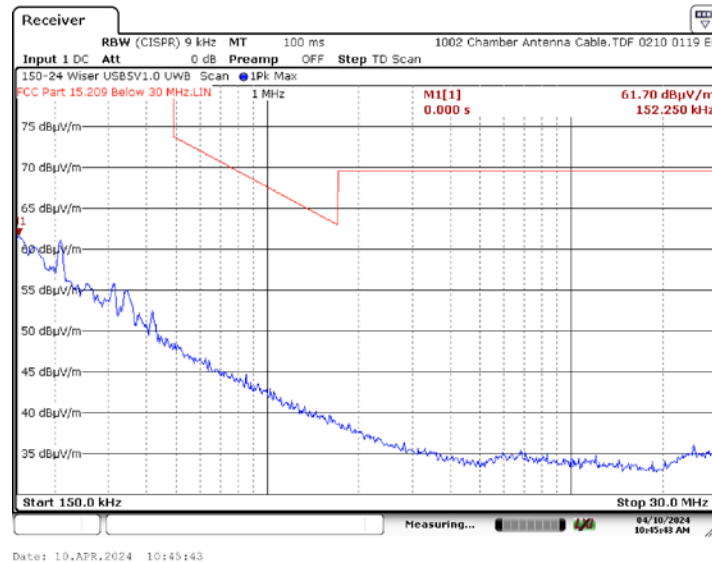
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

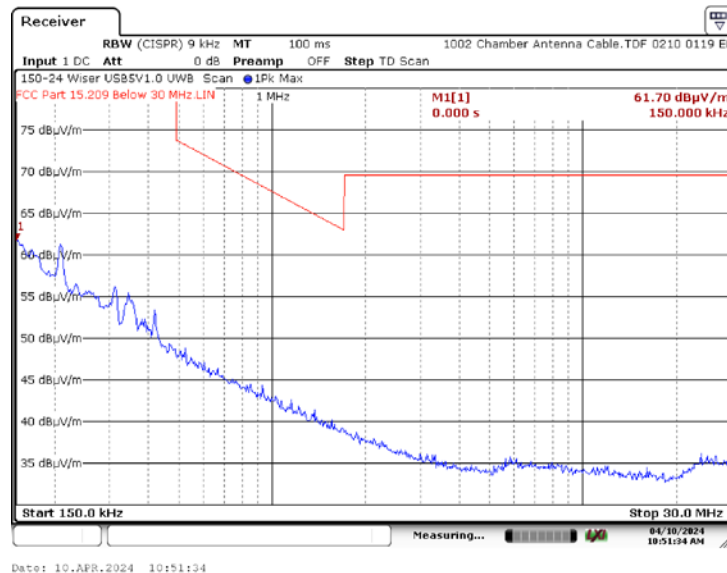
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

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

6.4.1.4 Parallel Measurement Antenna – 150 kHz to 30 MHz



6.4.1.5 Perpendicular Measurement Antenna – 150 kHz to 30 MHz



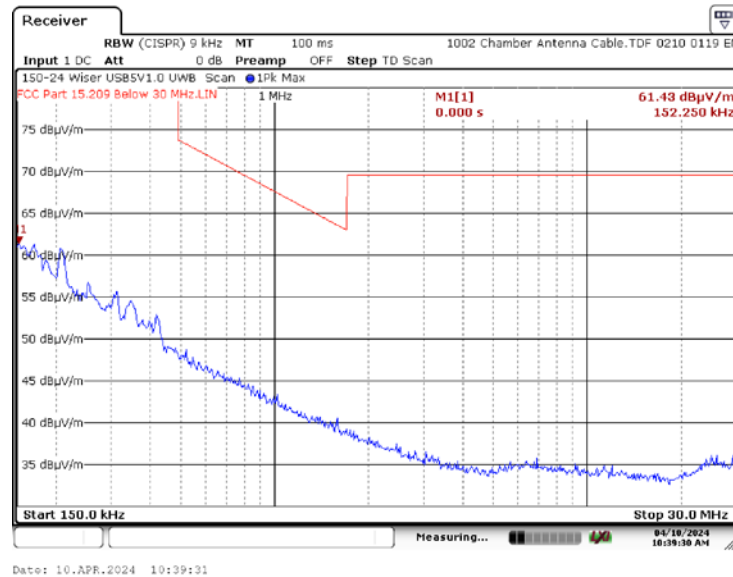
6. Measurement Data (continued)

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.

6.4.1.6 Ground Parallel Measurement Antenna – 150 kHz to 30 MHz



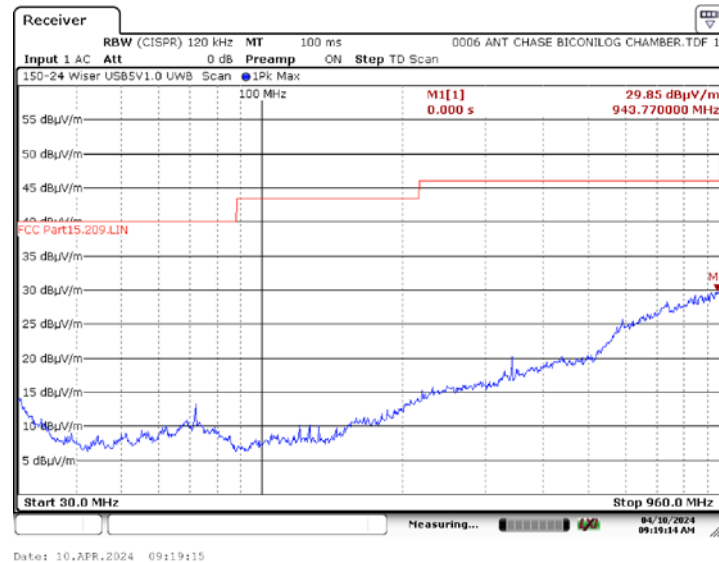
6. Measurement Data (continued)

6.4. Spurious Radiated Emissions (15.209 continued)

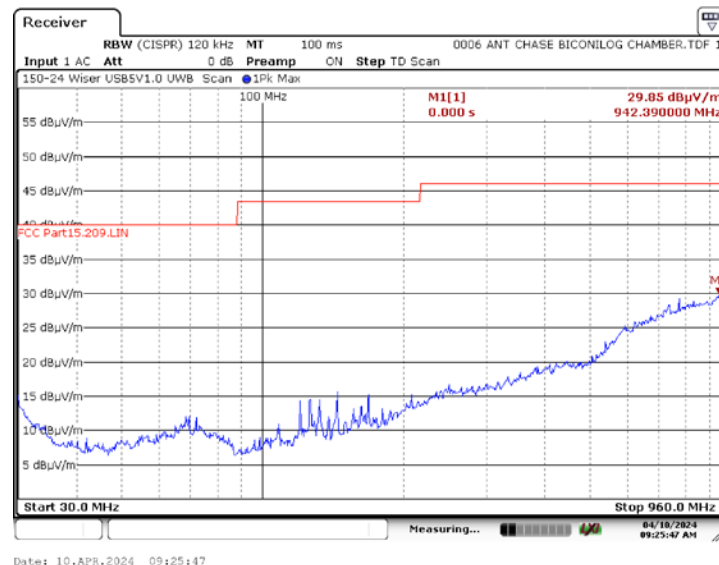
6.4.1. 30 kHz to 960 MHz, measured at 3 Meters

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 Horizontal Polarity – 30 to 960 MHz



6.4.1.8 Vertical Polarity – 30 to 960 MHz



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 8 to 18 GHz were done with the aid of a High Pass Filter before the low noise amplifier. 2nd Harmonic of the LO is not subject to the 15.519 limits and only needs to meet the 15.209 requirements.

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.

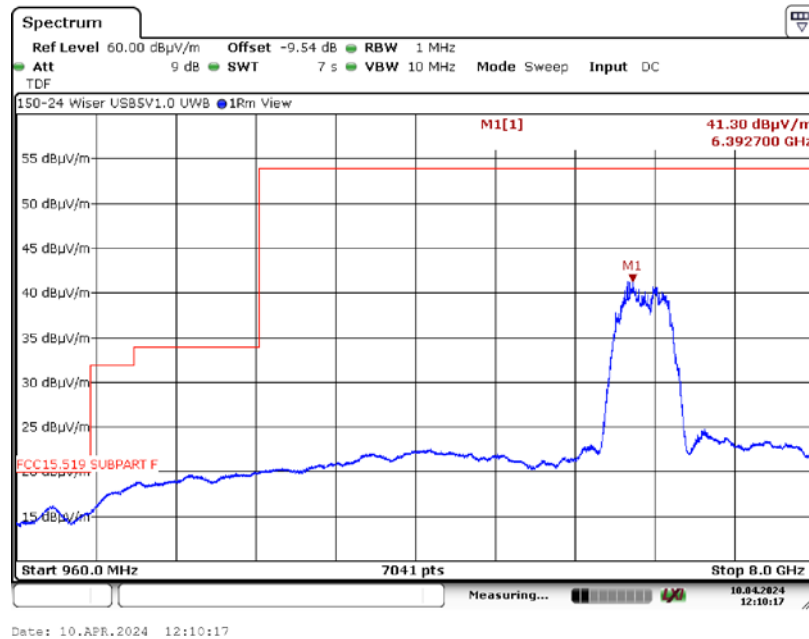
Sample Calculation: Final Result (dBμV/m) = Measurement Value (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

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

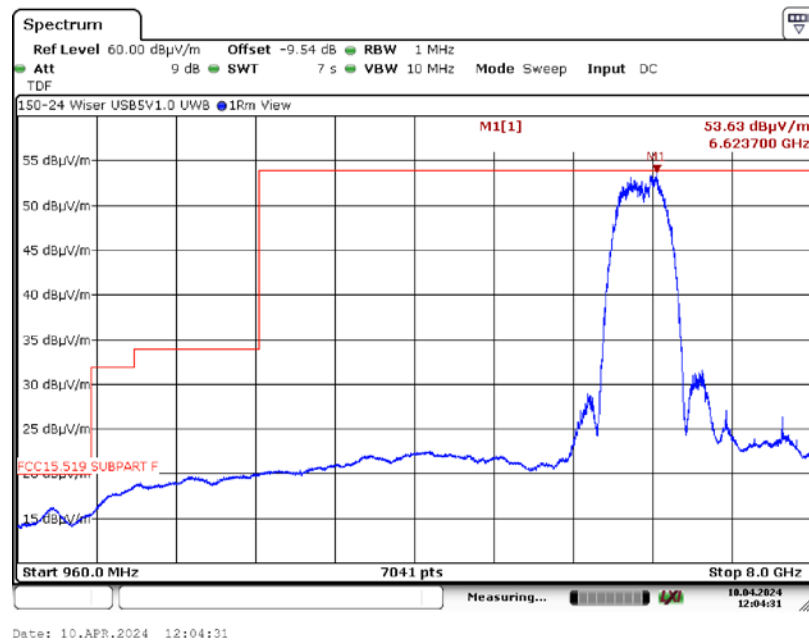
6. Measurement Data (continued)

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

6.5.1. 960 MHz to 8 GHz Horizontal at 1 Meter



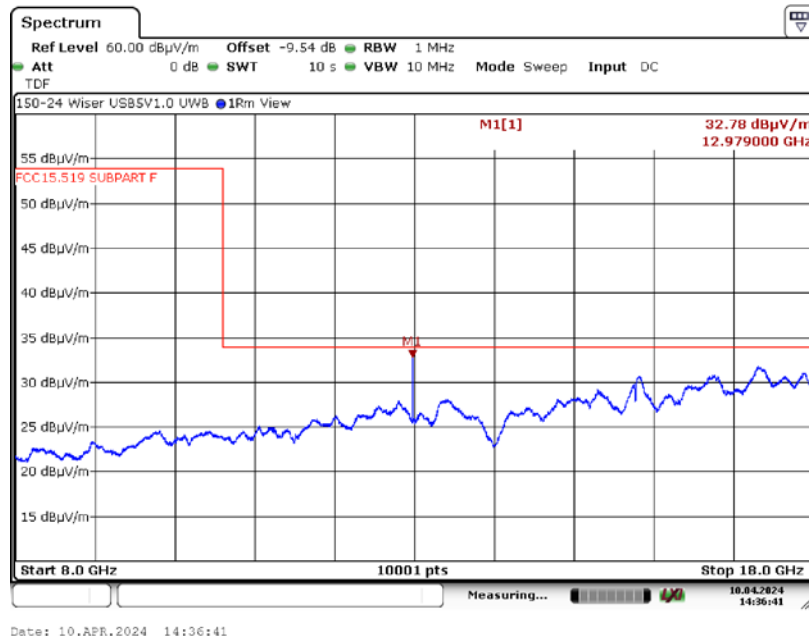
6.5.2. 960 MHz to 8 GHz Vertical at 1 Meter



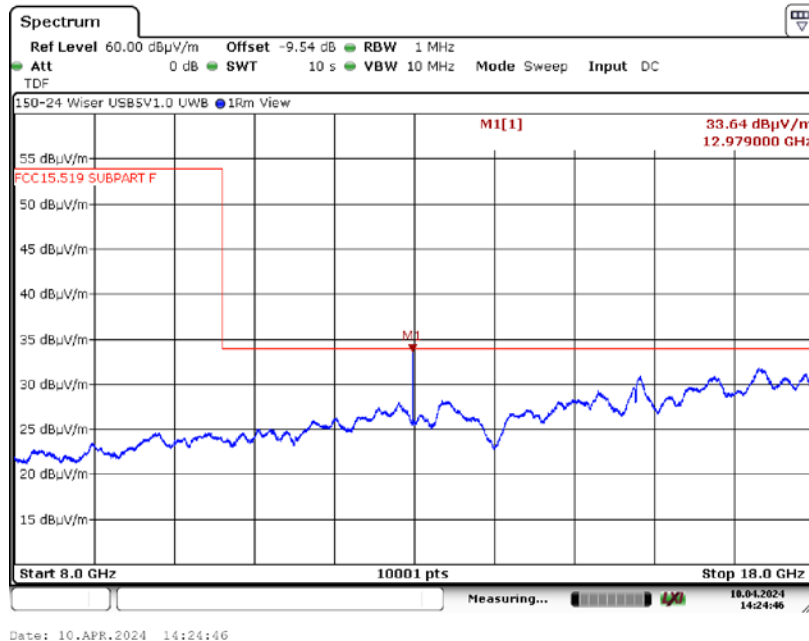
6. Measurement Data (continued)

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

6.5.3. 8 to 18 GHz Horizontal at 1 Meter



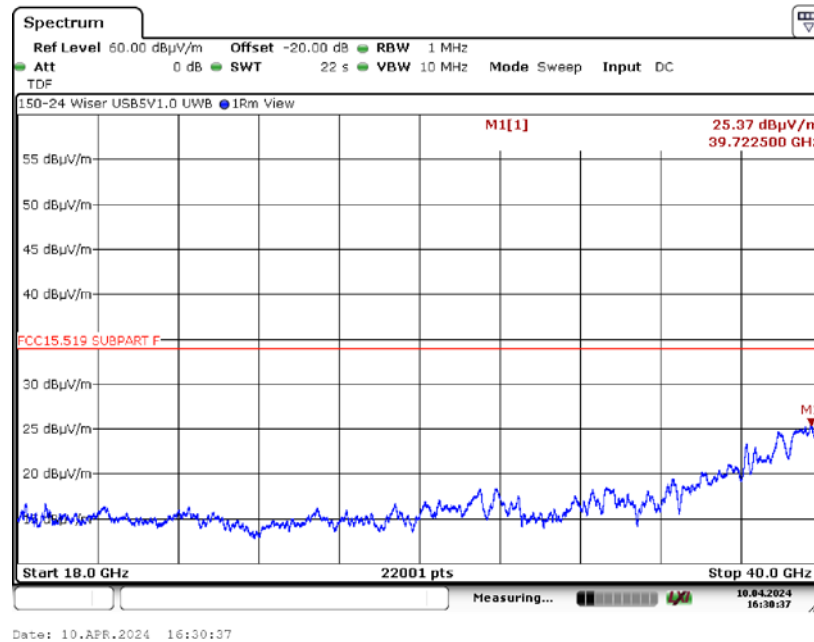
6.5.4. 8 to 18 GHz Vertical at 1 Meter



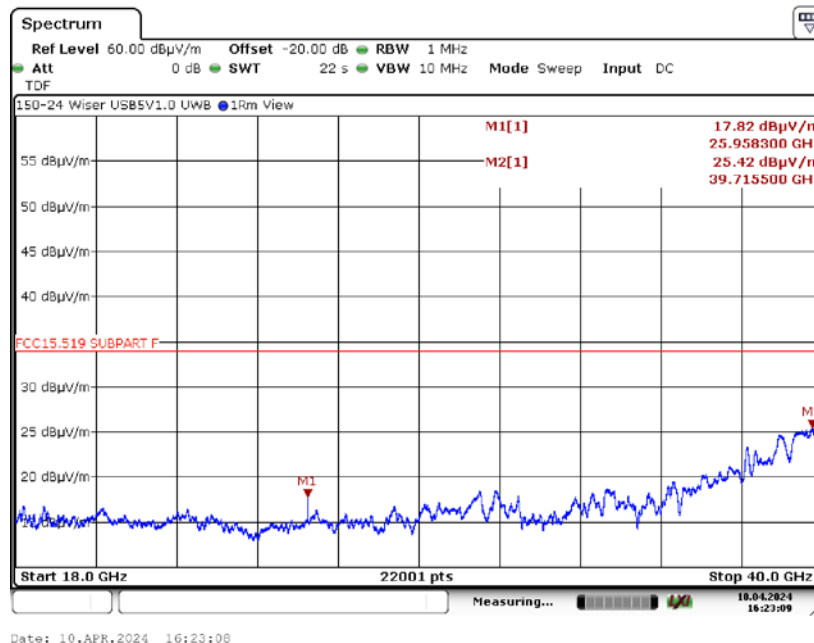
6. Measurement Data (continued)

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

6.5.5. 18 to 40 GHz Horizontal at 0.3 Meter



6.5.6. 18 to 40 GHz Vertical at 0.3 Meter



6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (RSS-220 5.3.1 (d) continued)

Requirement: The radiated emissions at or below 960 MHz from a device shall not exceed the limits in Section 3.4. The radiated emissions above 960 MHz from a device 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 dB μ V/m at 3 Meters by adding 95.2.

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dB μ V/m)
960 - 1610	-75.3	19.9
1610 – 4750	-70.0	25.2
4750 – 10,600	-41.3	53.9
Above 10,600	-61.3	33.9

Frequency Range:	960 MHz to 8 GHz
Measurement Distance:	1 Meter
EMI Receiver IF Bandwidth:	1 MHz
EMI Receiver Avg Bandwidth	10 MHz
Detector Function:	RMS 1 mS Average as defined in Annex Section 4(b)

Notes: Measurements made from 960 MHz to 8 GHz were made in a semi-anechoic chamber at 1 Meter using a -9.54 dB distance offset was programmed into the spectrum analyzer.

Measurement data above 8 GHz for Channel 5 is provided in plots 6.5.3 to 6.5.6 on the previous pages.

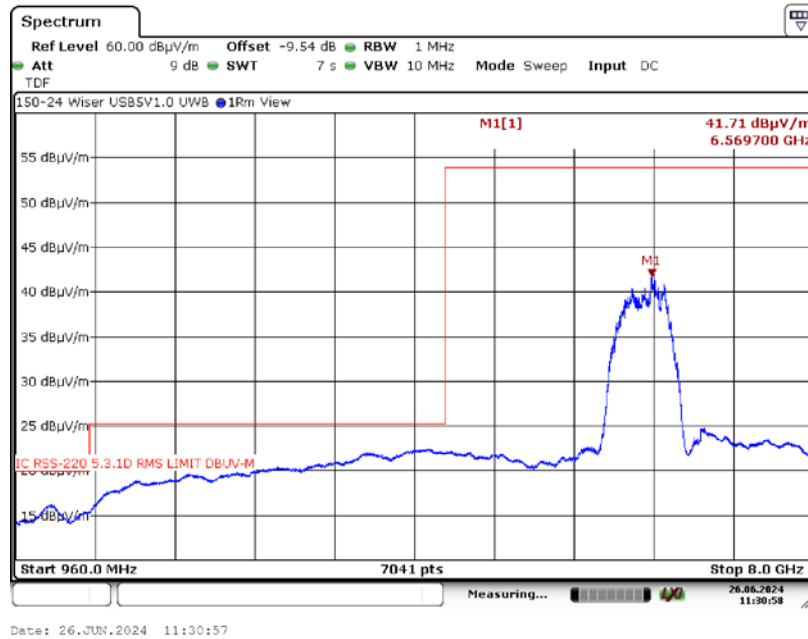
Sample Calculation: Final Result (dB μ V/m) = Measurement Value (dB μ V) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

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

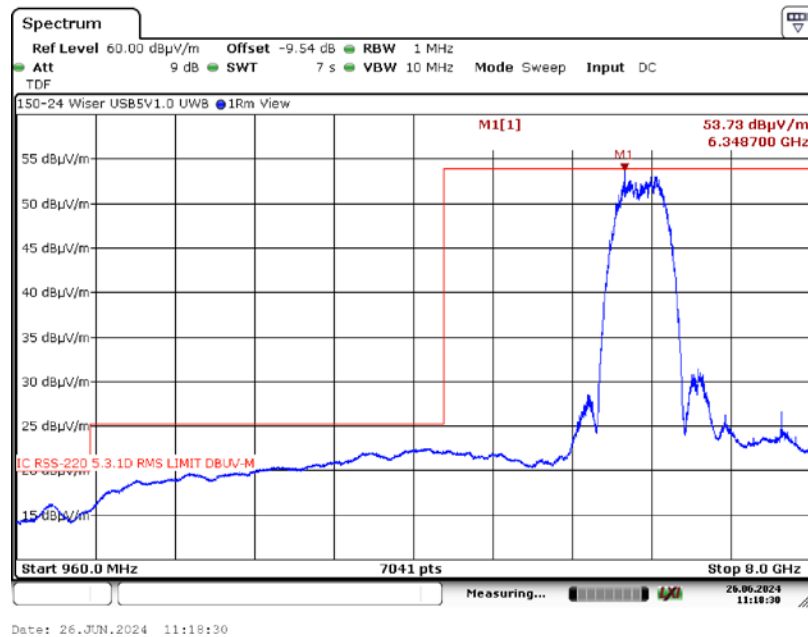
6. Measurement Data (continued)

6.5. Spurious Radiated Emissions (RSS-220 5.3.1 (d)) continued)

6.5.7. 960 MHz to 8 GHz Horizontal at 1 Meter



6.5.8. 960 MHz to 8 GHz Vertical at 1 Meter



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.

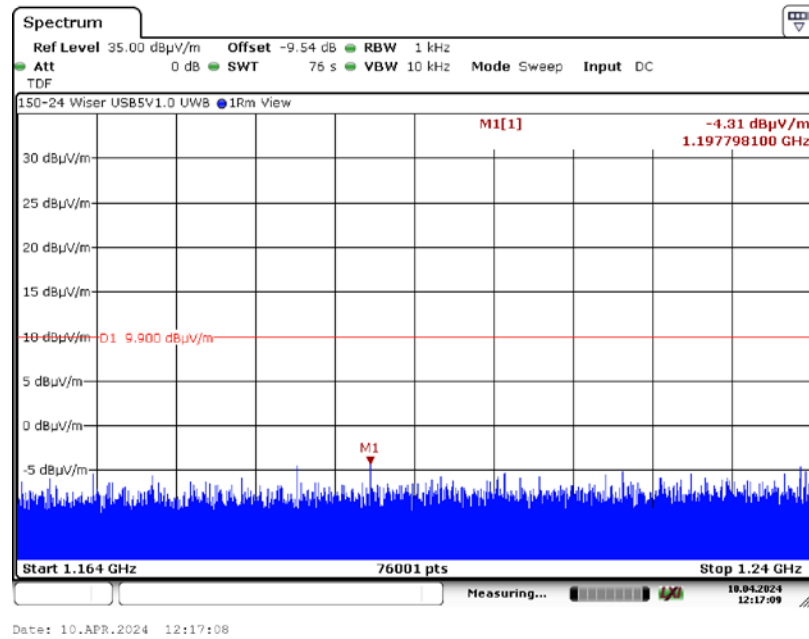
Sample Calculation: Final Result (dBμV/m) = Measurement Value (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) – Pre-amplifier Gain (dB) Internal or External.

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

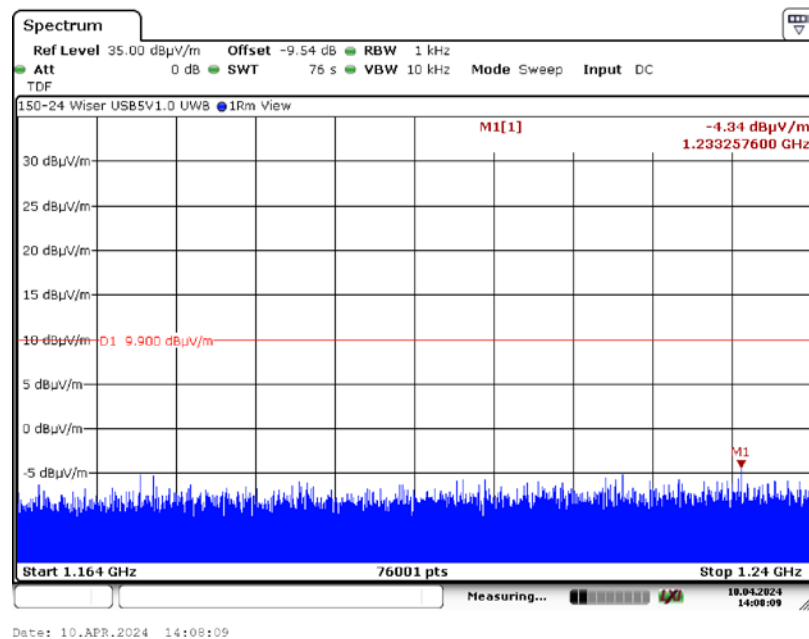
6. Measurement Data (continued)

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

6.6.3.1 Horizontal Measurement Polarity 1164 to 1240 MHz



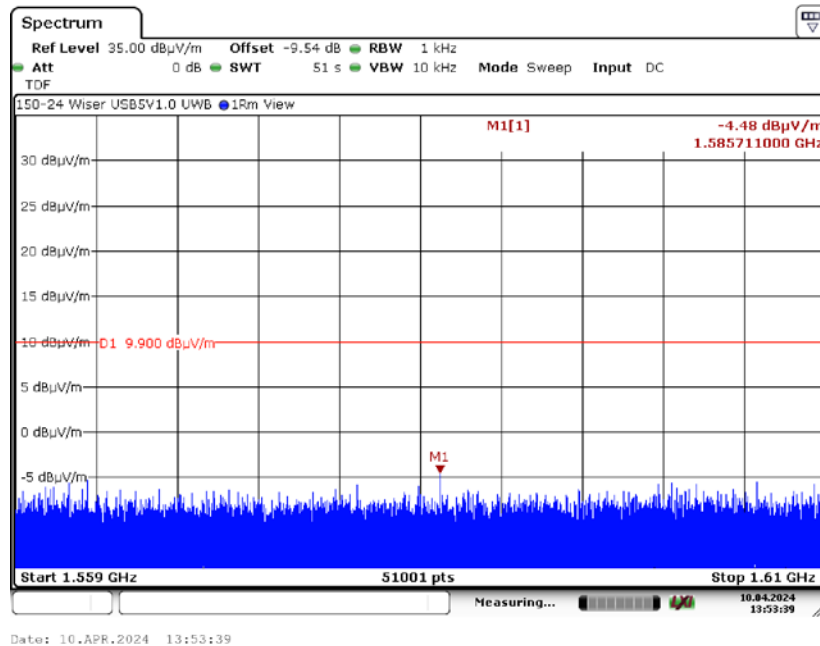
6.6.3.2 Vertical Measurement Polarity 1164 to 1240 MHz



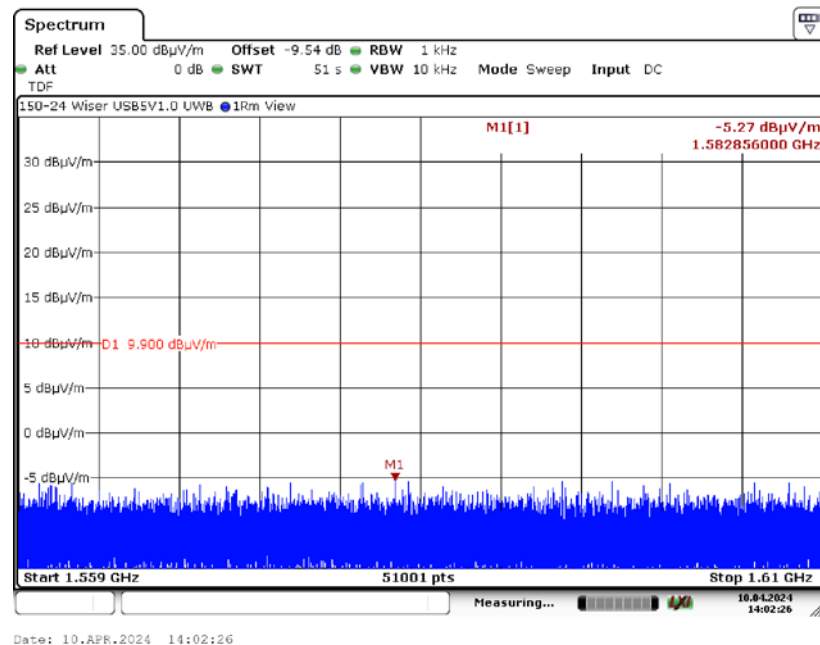
6. Measurement Data (continued)

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

6.6.3.3 Horizontal Measurement Polarity 1559 to 1610 MHz



6.6.3.4 Vertical Measurement Polarity 1559 to 1610 MHz



6. Measurement Data (continued)

6.7. Radiated Emissions of UWB Transmission (15.519 (c), 15.521 (d) RSS 5.3.1(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 dB μ V/m at 3 Meters by adding 95.2.

FCC

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dB μ V/m)
3100 – 10,600	-41.3	53.9

ISED

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dB μ V/m)
4750 – 10,600	-41.3	53.9

Frequency Range:	6 to 7 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)

6. Measurement Data (continued)

6.7. Spurious Radiated Emissions (15.519 (c), 15.521(d), RSS-220 5.3.1 (d))

6.7.1. Plot of RMS Power at 3 Meters

Frequency (GHz)	Amplitude ¹	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBμV/m)	(dBμV/m)	(dB)	H/V	cm	Deg	
6.5569	53.72	53.90	-0.18	V	113	296	Compliant

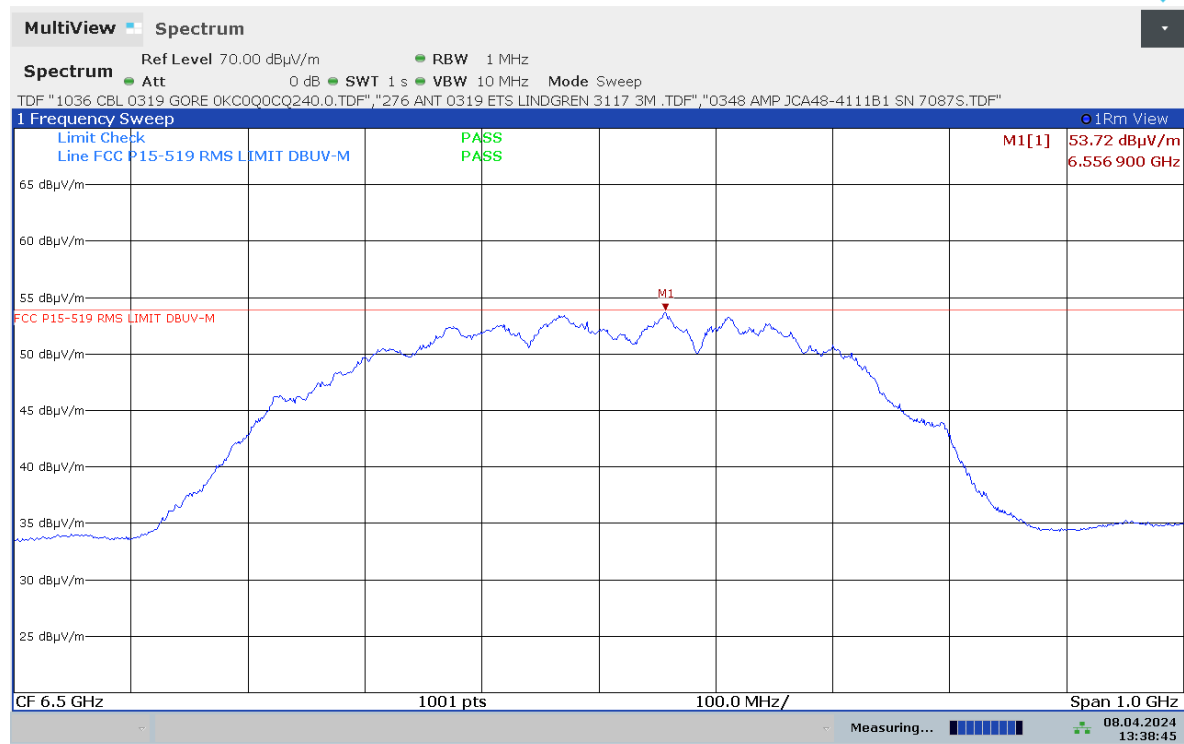
Notes: ¹ Antenna Factor (AF), Cable Factor (CF) and External Preamplifier Gain (PAG) have been entered into the analyzer as transducer factors.

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	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBm)	(dBm)	(dB)	H/V	cm	Deg	
6.5569	-41.48	-41.30	-0.18	V	113	296	Compliant

150-24 Wiser USB5V1.0 UWB



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6. Measurement Data (continued)

6.8. Peak Emissions in a 50 MHz Bandwidth (15.519 (e), 15.521 (g), RSS-220 5.3.1 (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 dB μ V/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.

FCC

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dB μ V/m)
3100 – 10,600	0	95.2

ISED

Frequency (MHz)	EIRP (dBm)	EIRP at 3 Meters (dB μ V/m)
4750 – 10,600	0	95.2

Frequency Range:	6 to 7 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	50 MHz
EMI Receiver Avg Bandwidth	80 MHz
Detector Function:	Peak, Max Held

6. Measurement Data (continued)

6.8. Peak Emissions in a 50 MHz Bandwidth (15.519 (e), 15.521 (g), 5.3.1(g) cont.)

6.8.1 Plot of Peak Power at 3 Meters

Frequency (GHz)	Amplitude ¹	Limit	Margin	Ant Polarity	Ant Height	Turntable Azimuth	Result
	(dBμV/m)	(dBμV/m)	(dB)	H/V	cm	Deg	
6.484	93.00	95.20	-2.20	V	113	296	Compliant

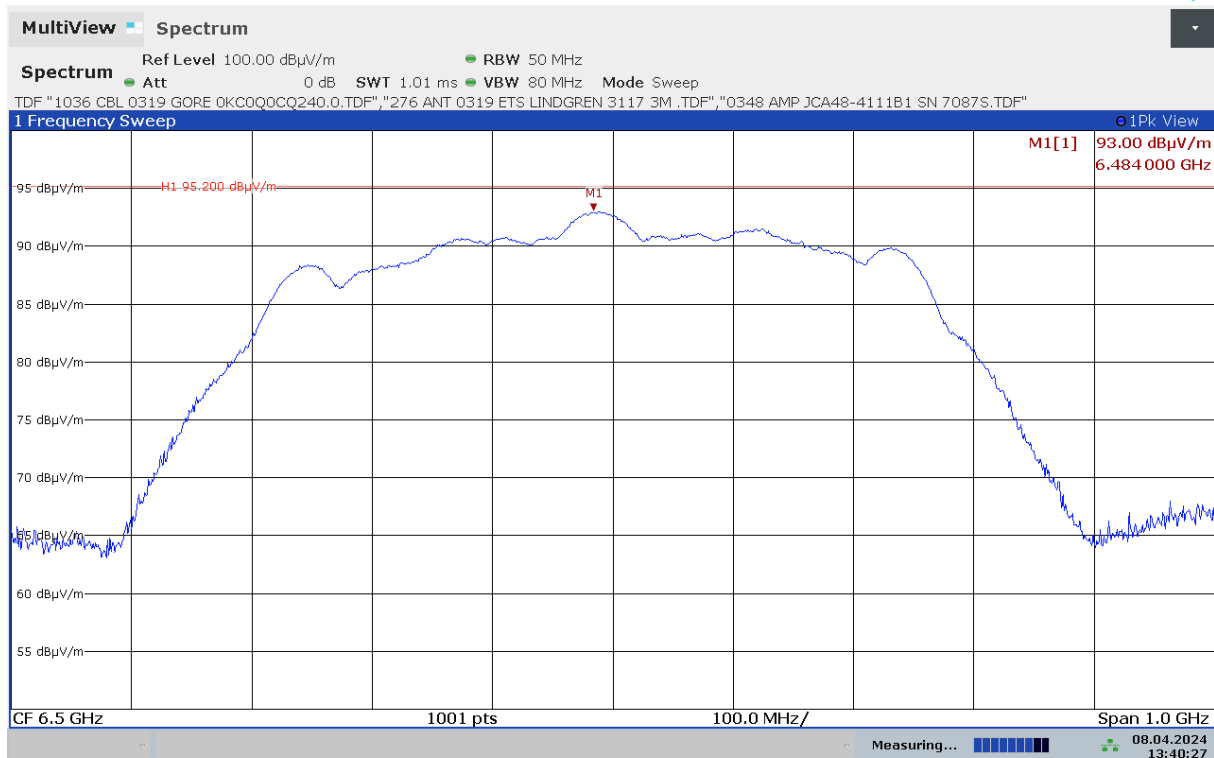
Notes: ¹ Antenna Factor (AF), Cable Factor (CF) and External Preamplifier Gain (PAG) have been entered into the analyzer as transducer factors.

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	
6.484	-2.20	0.00	-2.20	V	113	296	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	11967C	3/28/2025
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:	Sean Defelice
Site Temperature (°C):	21
Relative Humidity (%RH):	35
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.

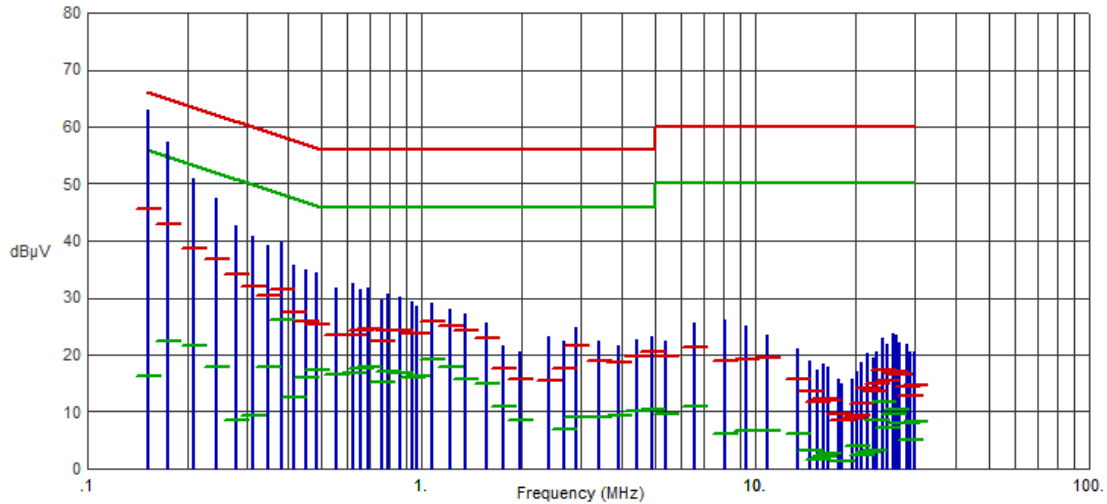
6. Measurement Data (continued)

6.10 Conducted Emissions Test Results

6.10.1. 120 Volts, 60 Hz Phase

Test No.: 157-24, 120 Volts, 60 Hz Phase

EN55032, Class B



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.1523	62.99	45.70	65.87	-20.17	16.35	55.87	-39.52	
.1748	57.24	42.88	64.73	-21.85	22.48	54.73	-32.25	
.2085	51.03	38.73	63.26	-24.53	21.63	53.26	-31.63	
.2423	47.51	36.80	62.02	-25.22	17.98	52.02	-34.04	
.2783	42.64	34.08	60.87	-26.79	8.41	50.87	-42.46	
.3120	40.76	32.09	59.92	-27.83	9.28	49.92	-40.64	
.3458	39.23	30.40	59.06	-28.66	17.81	49.06	-31.25	
.3818	39.78	31.57	58.24	-26.67	26.01	48.24	-22.23	
.4155	35.81	27.35	57.54	-30.19	12.59	47.54	-34.95	
.4515	34.85	25.93	56.85	-30.92	16.07	46.85	-30.78	
.4853	34.27	25.22	56.25	-31.03	17.44	46.25	-28.81	
.5550	31.77	23.52	56.00	-32.48	16.42	46.00	-29.58	
.6248	32.46	23.52	56.00	-32.48	16.69	46.00	-29.31	
.6585	31.56	24.37	56.00	-31.63	17.64	46.00	-28.36	
.6923	31.62	24.59	56.00	-31.41	17.77	46.00	-28.23	
.7620	29.62	22.37	56.00	-33.63	15.13	46.00	-30.87	
.7980	30.68	24.29	56.00	-31.71	17.13	46.00	-28.87	
.8678	30.01	24.30	56.00	-31.70	16.74	46.00	-29.26	
.9375	29.20	23.76	56.00	-32.24	15.90	46.00	-30.10	
.9713	28.46	23.75	56.00	-32.25	16.19	46.00	-29.81	
1.0748	29.09	25.79	56.00	-30.21	19.26	46.00	-26.74	
1.2143	28.00	25.09	56.00	-30.91	17.86	46.00	-28.14	
1.3538	27.22	24.27	56.00	-31.73	15.69	46.00	-30.31	
1.5608	25.64	22.81	56.00	-33.19	14.83	46.00	-31.17	
1.7678	21.72	17.55	56.00	-38.45	10.82	46.00	-35.18	
1.9748	20.52	15.72	56.00	-40.28	8.65	46.00	-37.35	
2.4113	23.07	15.56	56.00	-40.44	-8.4	46.00	-46.84	
2.6700	22.36	17.54	56.00	-38.46	7.01	46.00	-38.99	
2.9130	24.83	21.55	56.00	-34.45	9.06	46.00	-36.94	

6. Measurement Data (continued)

6.10 Conducted Emissions Test Results

6.10.1. 120 Volts, 60 Hz Phase (continued)

Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
3.3968	22.31	18.91	56.00	-37.09	9.04	46.00	-36.96	
3.8805	21.61	18.71	56.00	-37.29	9.27	46.00	-36.73	
4.4003	22.56	19.82	56.00	-36.18	10.12	46.00	-35.88	
4.8863	23.12	20.50	56.00	-35.50	10.33	46.00	-35.67	
5.4060	22.46	19.76	60.00	-40.24	9.59	50.00	-40.41	
6.6098	25.57	21.28	60.00	-38.72	11.00	50.00	-39.00	
8.1285	26.06	18.88	60.00	-41.12	6.02	50.00	-43.98	
9.3570	25.16	19.12	60.00	-40.88	6.55	50.00	-43.45	
10.8713	23.35	19.49	60.00	-40.51	6.67	50.00	-43.33	
13.3575	21.02	15.72	60.00	-44.28	6.07	50.00	-43.93	
14.6423	18.95	13.70	60.00	-46.30	3.12	50.00	-46.88	
15.3060	17.36	11.60	60.00	-48.40	1.64	50.00	-48.36	
15.9855	18.38	12.17	60.00	-47.83	2.17	50.00	-47.83	
16.4693	17.79	11.98	60.00	-48.02	2.72	50.00	-47.28	
17.7068	15.81	9.70	60.00	-50.30	-.43	50.00	-50.43	
18.2445	15.00	8.62	60.00	-51.38	1.31	50.00	-48.69	
19.5518	15.83	8.77	60.00	-51.23	-1.72	50.00	-51.72	
20.2605	17.19	9.25	60.00	-50.75	4.08	50.00	-45.92	
20.8073	18.70	11.52	60.00	-48.48	2.27	50.00	-47.73	
21.6555	20.17	14.15	60.00	-45.85	2.93	50.00	-47.07	
22.5690	19.44	13.48	60.00	-46.52	3.18	50.00	-46.82	
23.1270	20.62	14.92	60.00	-45.08	8.57	50.00	-41.43	
24.0000	22.82	17.22	60.00	-42.78	11.62	50.00	-38.38	
24.8978	21.82	15.53	60.00	-44.47	7.20	50.00	-42.80	
25.8765	23.83	16.97	60.00	-43.03	9.50	50.00	-40.50	
26.4863	23.54	16.86	60.00	-43.14	10.48	50.00	-39.52	
27.1590	22.18	16.57	60.00	-43.43	8.01	50.00	-41.99	
28.5630	21.75	14.44	60.00	-45.56	7.96	50.00	-42.04	
29.2223	20.43	12.82	60.00	-47.18	4.98	50.00	-45.02	
29.9040	20.56	14.54	60.00	-45.46	8.14	50.00	-41.86	

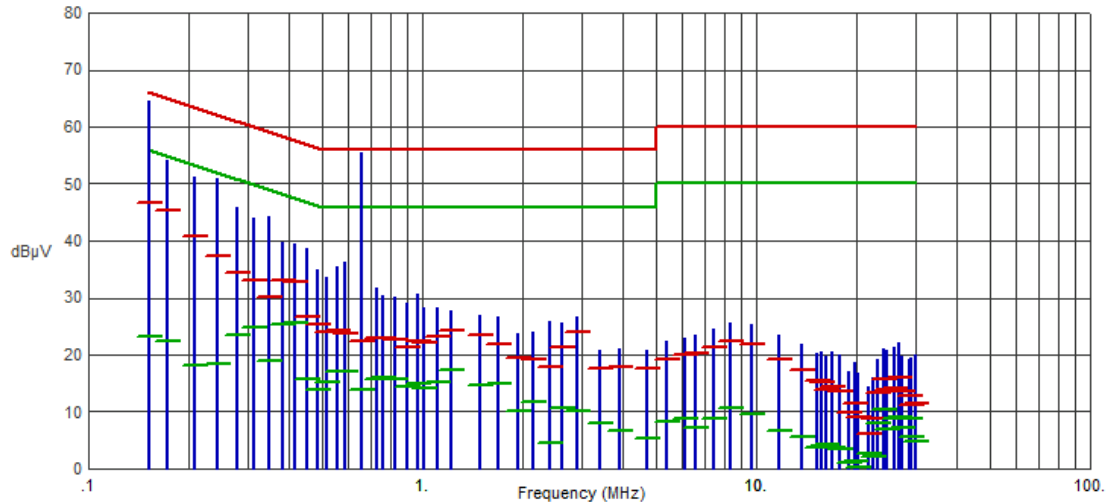
6. Measurement Data (continued)

6.10 Conducted Emissions Test Results (continued)

6.10.2. 120 Volts, 60 Hz Neutral

Test No.: 157-24, 120 Volts, 60 Hz Neutral

EN55032, Class B



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.1523	64.58	46.76	65.87	-19.11	23.14	55.87	-32.73	
.1725	54.09	45.26	64.84	-19.58	22.44	54.84	-32.40	
.2085	51.26	40.72	63.26	-22.54	18.16	53.26	-35.10	
.2423	50.82	37.35	62.02	-24.67	18.47	52.02	-33.55	
.2783	45.95	34.31	60.87	-26.56	23.43	50.87	-27.44	
.3120	43.94	32.97	59.92	-26.95	24.70	49.92	-25.22	
.3458	44.35	30.18	59.06	-28.88	18.92	49.06	-30.14	
.3818	39.84	33.13	58.24	-25.11	25.35	48.24	-22.89	
.4155	39.56	32.75	57.54	-24.79	25.69	47.54	-21.85	
.4493	38.64	26.55	56.89	-30.34	15.63	46.89	-31.26	
.4853	34.82	25.22	56.25	-31.03	13.79	46.25	-32.46	
.5190	33.47	23.89	56.00	-32.11	15.22	46.00	-30.78	
.5550	35.54	24.26	56.00	-31.74	17.09	46.00	-28.91	
.5888	36.35	23.85	56.00	-32.15	17.01	46.00	-28.99	
.6585	55.40	22.30	56.00	-33.70	13.99	46.00	-32.01	
.7283	31.70	22.89	56.00	-33.11	15.68	46.00	-30.32	
.7620	30.38	23.06	56.00	-32.94	15.89	46.00	-30.11	
.8318	30.04	22.59	56.00	-33.41	15.70	46.00	-30.30	
.9015	29.01	21.38	56.00	-34.62	14.52	46.00	-31.48	
.9713	30.61	22.45	56.00	-33.55	14.99	46.00	-31.01	
1.0073	28.20	22.14	56.00	-33.86	14.10	46.00	-31.90	
1.1108	28.34	23.27	56.00	-32.73	15.22	46.00	-30.78	
1.2143	27.76	24.33	56.00	-31.67	17.42	46.00	-28.58	
1.4933	27.01	23.44	56.00	-32.56	14.70	46.00	-31.30	
1.6958	26.56	21.80	56.00	-34.20	15.06	46.00	-30.94	
1.9343	23.62	19.56	56.00	-36.44	10.13	46.00	-35.87	
2.1458	23.87	19.13	56.00	-36.87	11.83	46.00	-34.17	
2.4135	25.79	17.78	56.00	-38.22	4.43	46.00	-41.57	
2.6318	25.51	21.20	56.00	-34.80	10.72	46.00	-35.28	

6. Measurement Data (continued)

6.10 Conducted Emissions Test Results (continued)

6.10.2. 120 Volts, 60 Hz Neutral (continued)

Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
2.9108	26.74	23.87	56.00	-32.13	10.15	46.00	-35.85	
3.3968	20.69	17.48	56.00	-38.52	7.94	46.00	-38.06	
3.9188	21.14	17.76	56.00	-38.24	6.79	46.00	-39.21	
4.6838	20.80	17.54	56.00	-38.46	5.40	46.00	-40.60	
5.4083	22.40	19.20	60.00	-40.80	8.27	50.00	-41.73	
6.1350	23.00	19.89	60.00	-40.11	8.84	50.00	-41.16	
6.6075	23.46	20.31	60.00	-39.69	7.13	50.00	-42.87	
7.4535	24.48	21.43	60.00	-38.57	8.76	50.00	-41.24	
8.3828	25.53	22.38	60.00	-37.62	10.58	50.00	-39.42	
9.7058	25.25	21.86	60.00	-38.14	9.63	50.00	-40.37	
11.6790	23.49	19.07	60.00	-40.93	6.68	50.00	-43.32	
13.6793	21.91	17.45	60.00	-42.55	5.53	50.00	-44.47	
15.1328	20.22	15.41	60.00	-44.59	3.72	50.00	-46.28	
15.6143	20.65	15.15	60.00	-44.85	4.09	50.00	-45.91	
16.2285	19.80	13.80	60.00	-46.20	4.35	50.00	-45.65	
16.8990	20.46	14.52	60.00	-45.48	3.86	50.00	-46.14	
17.6955	19.88	13.66	60.00	-46.34	3.35	50.00	-46.65	
18.9173	17.18	9.93	60.00	-50.07	.99	50.00	-49.01	
19.7070	18.70	11.39	60.00	-48.61	1.29	50.00	-48.71	
20.2538	16.74	9.14	60.00	-50.86	.15	50.00	-49.85	
21.6645	14.38	6.16	60.00	-53.84	2.65	50.00	-47.35	
22.4633	15.92	8.83	60.00	-51.17	2.06	50.00	-47.94	
23.1270	19.29	13.22	60.00	-46.78	8.04	50.00	-41.96	
24.0000	21.01	15.69	60.00	-44.31	10.51	50.00	-39.49	
24.7178	20.68	13.86	60.00	-46.14	6.84	50.00	-43.16	
25.8743	21.38	14.10	60.00	-45.90	8.67	50.00	-41.33	
26.6100	22.06	16.00	60.00	-44.00	9.17	50.00	-40.83	
27.3413	19.78	13.61	60.00	-46.39	7.31	50.00	-42.69	
28.6845	19.20	12.69	60.00	-47.31	8.84	50.00	-41.16	
29.1120	19.35	11.13	60.00	-48.87	5.64	50.00	-44.36	
29.9063	19.97	11.55	60.00	-48.45	4.80	50.00	-45.20	

6. Measurement Data (continued)

6.11. 99% Emission Bandwidth (RSS-GEN 6.7)

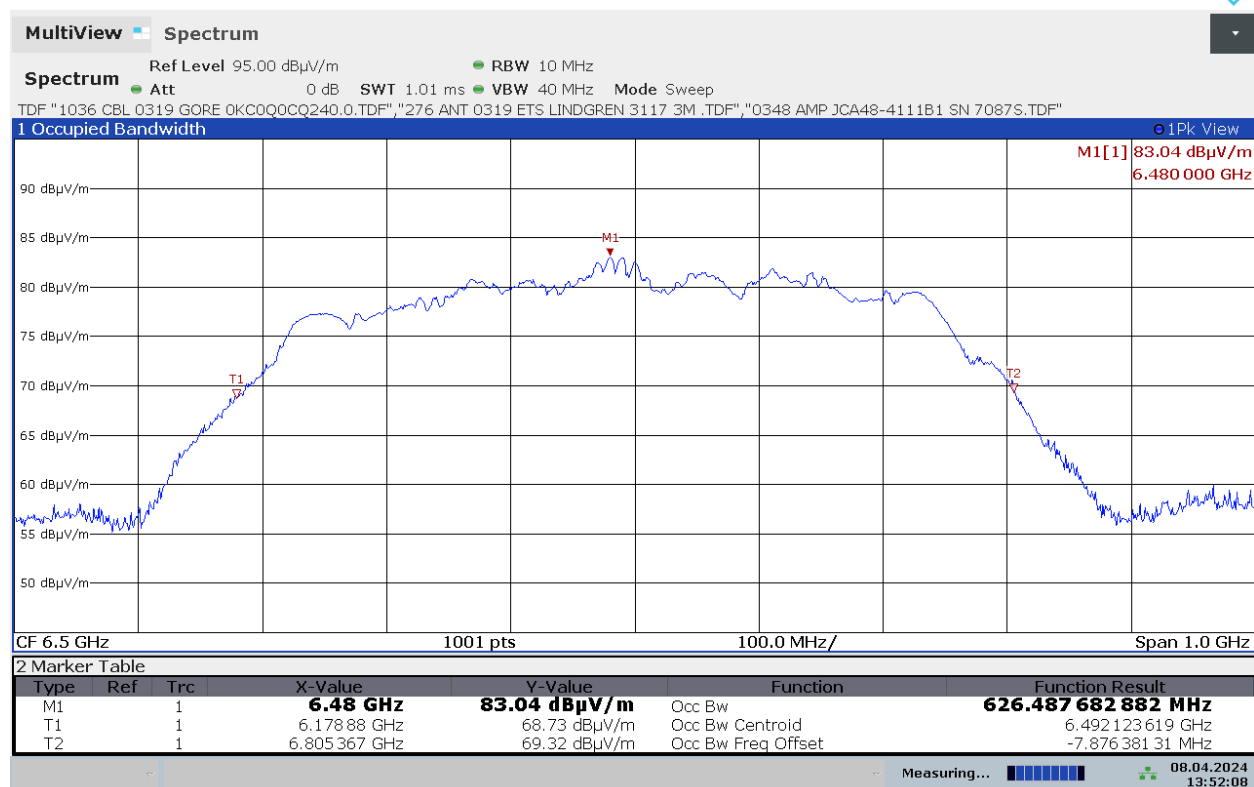
Requirement: The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs RSS-Gen, Section 6.7.

Test Note: The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

6.11.1 Plot of 99% Emission Bandwidth

150-24 Wiser USB5V1.0 UWB



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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 11, AS/NZS CISPR 14-1, AS/NZS CISPR 15, AS/NZS CISPR 32, Chinese-Taipei (Taiwan) BSMI CNS 15936 and Korea (RRA) KS C 9811, KS C 9814-1, KS C 9815, KS C 9832, KS C 9610-6-3 & KS C 9610-6-4.

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 tabletop.

8. Test Images

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



8. Test Images

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



8. Test Images

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



8. Test Images

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



8. Test Images

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



8. Test Images

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



8. Test Images (continued)

8.7. Conducted Emissions, Front View



8. Test Images (continued)

8.8. Conducted Emissions, Rear View

