

**COMPLIANCE WORLDWIDE INC.
TEST REPORT 242-22ARF**

In Accordance with the Requirements of
**FCC PART 2.1093 Radio Frequency Exposure Evaluation:
Portable Devices
ISED RSS-102, Issue 5 + Amendment 1:2021
Radio Frequency (RF) Exposure Compliance of
Radiocommunication Apparatus**

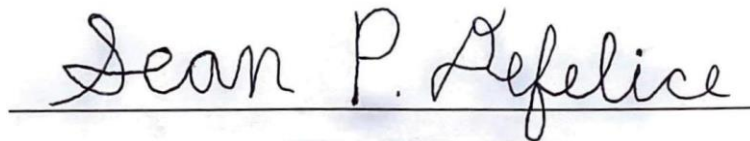
Issued to
**Wiser Systems, Inc.
819 W Hargett St
Raleigh, NC 27603
(919) 551-5566**

For the
**Client Tag
Model: TAGV1.2T**

**FCC ID: 2AGZM-B11017
IC: 25948-B01017**

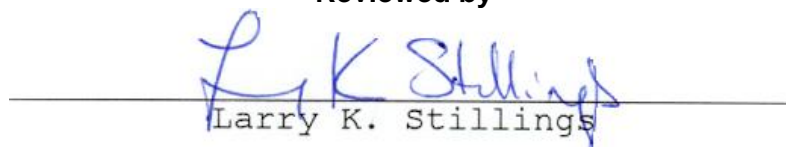
Report Issued on December 22, 2022

Tested by



Sean P. Defelice

Reviewed by



Larry K. Stillings

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1. Scope

This test report certifies that the Wiser Systems Client Tag as tested, meets the FCC Part 2.1093 and ISSED RSS-102 requirements exempting the device from a SAR Evaluation. 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:** TAGV1.2T
- 2.3. **Serial Numbers:** SLS7
- 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 GHz Center Frequency Nominal (Channel 2 – 500 MHz BW),
4 GHz Center Frequency Nominal (Channel 4 – 900 MHz BW),
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 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 Channels 2, 4 or 5 (16M or 64M PRF) using a data rates of 6.8 Mbps. The devices also support a data rate of 110 kbps.

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Volts	Freq (Hz)	Description/Function
Wiser Systems	TAGV1.2T	SLS7	3.0	DC	Client Tag

3.3. EUT Cables/Transducers

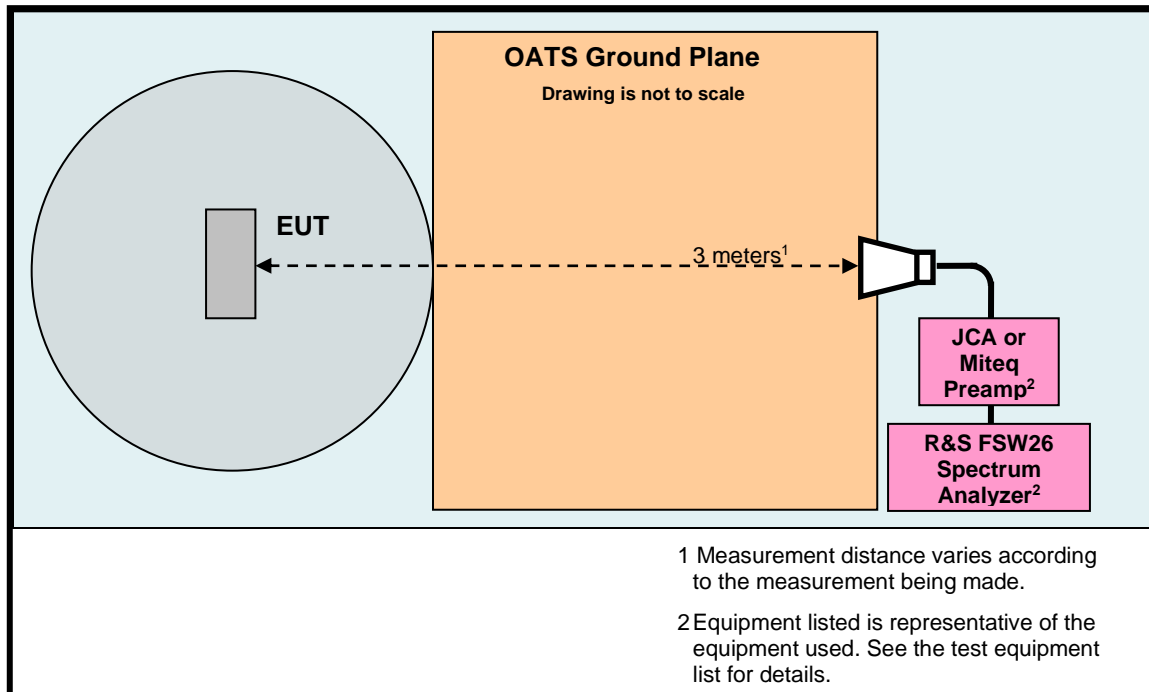
Cable Type	Length	Shield	From	To
None				

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

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
Spectrum Analyzer, 2 Hz to 26.5 GHz ²	Rohde & Schwarz	FSW26	102057	6/24/2023	2 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 2 to 12 GHz	JCA	JCA48-4111B1	7087S	3/31/2023	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.

4.2. Measurement & Equipment Setup

Test Dates: 7/19/2022, 7/20/2022, 7/26/2022,
8/23/2022

Test Engineers: Sean Defelice

Normal Site Temperature (15 - 35°C): 21.6

Relative Humidity (20 -75%RH): 35

Frequency Range: 3.5 to 4.5 GHz, 3 to 5 GHz, 6 to 7 GHz

Measurement Distance: 3 Meters

EMI Receiver IF Bandwidth: 1 MHz - Above 1 GHz

EMI Receiver Avg Bandwidth: ≥ 3 * RBW or IF(BW)

Detector Function: Peak

4. Measurements Parameters (continued)

4.3. Measurement Procedure

Test measurements were made in accordance FCC Part 15.519 Subpart F, and ISED RSS-220.

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)	$\pm 1 \times 10^{-8}$
Radiated Emission of Transmitter to 100 GHz	± 4.55 dB
Radiated Emission of Receiver	± 4.55 dB
Temperature	$\pm 0.91^{\circ}$ C
Humidity	$\pm 5\%$

5. Measurement Data

5.1. 99% Emission Bandwidth (RSS-GEN 6.7)

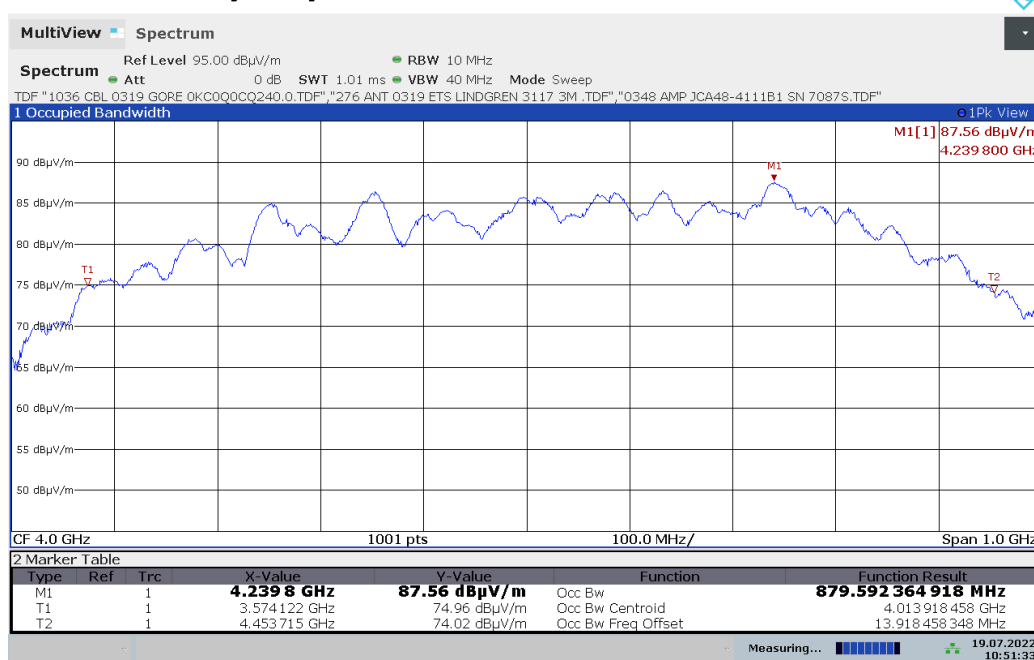
Requirement: The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs RSS-Gen, Section 6.7.

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.

5.1.1 Plot of 99% Emission Bandwidth (CH2, 6.8 Mbps, 16M PRF)

242-22 Wiser Handheld UWB Tag New Design



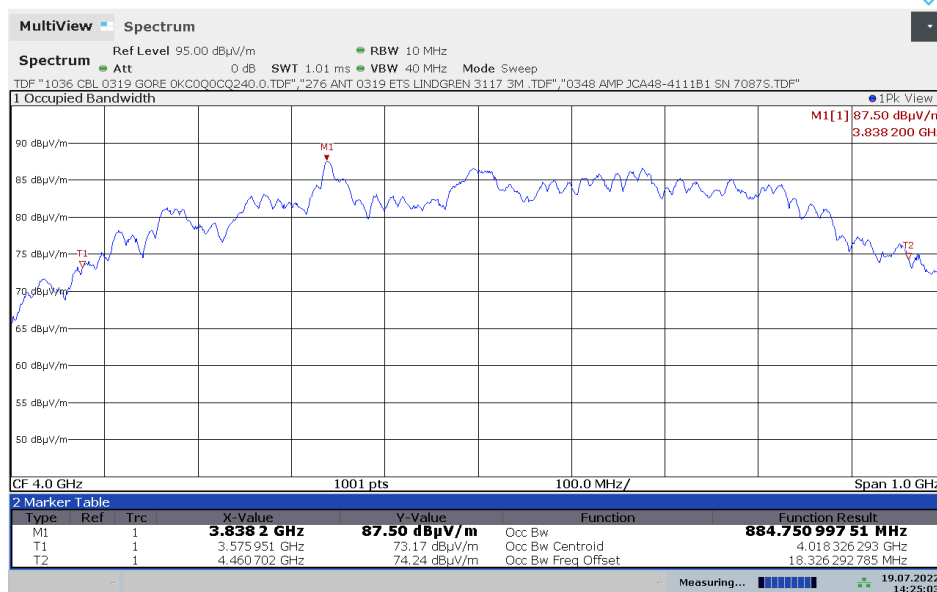
10:51:34 19.07.2022

5. Measurement Data (continued)

5.1. 99% Emission Bandwidth (RSS-GEN 6.7)

5.1.2 Plot of 99% Emission Bandwidth (CH2, 6.8 Mbps, 64M PRF)

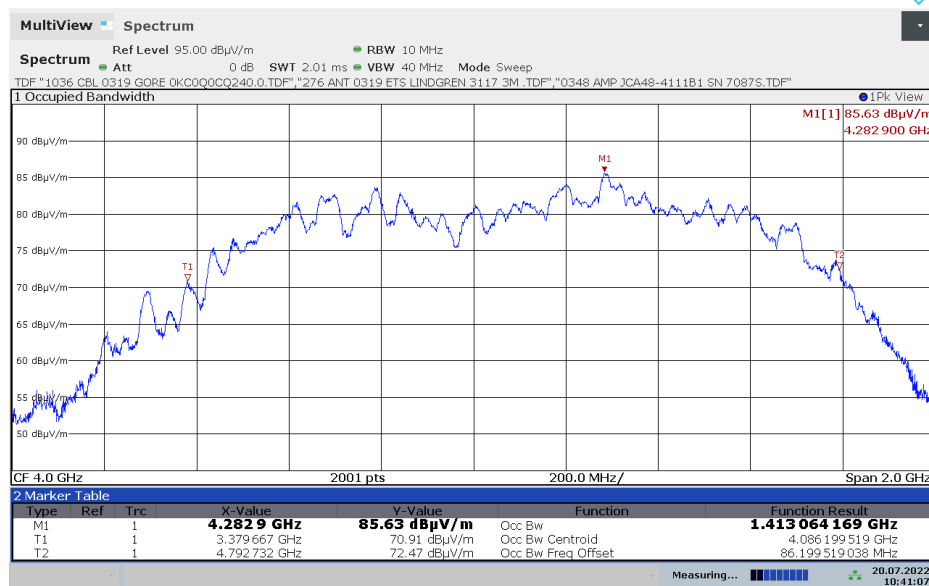
242-22 Wiser Handheld UWB Tag New Design



14:25:03 19.07.2022

5.1.3 Plot of 99% Emission Bandwidth (CH4, 6.8 Mbps, 16M PRF)

242-22 Wiser Handheld UWB Tag New Design

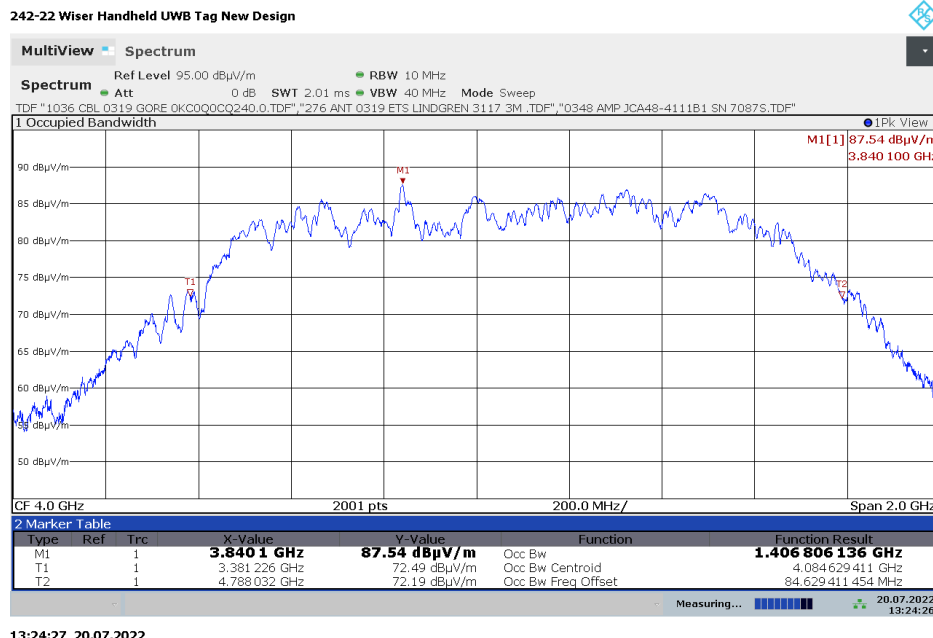


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5. Measurement Data (continued)

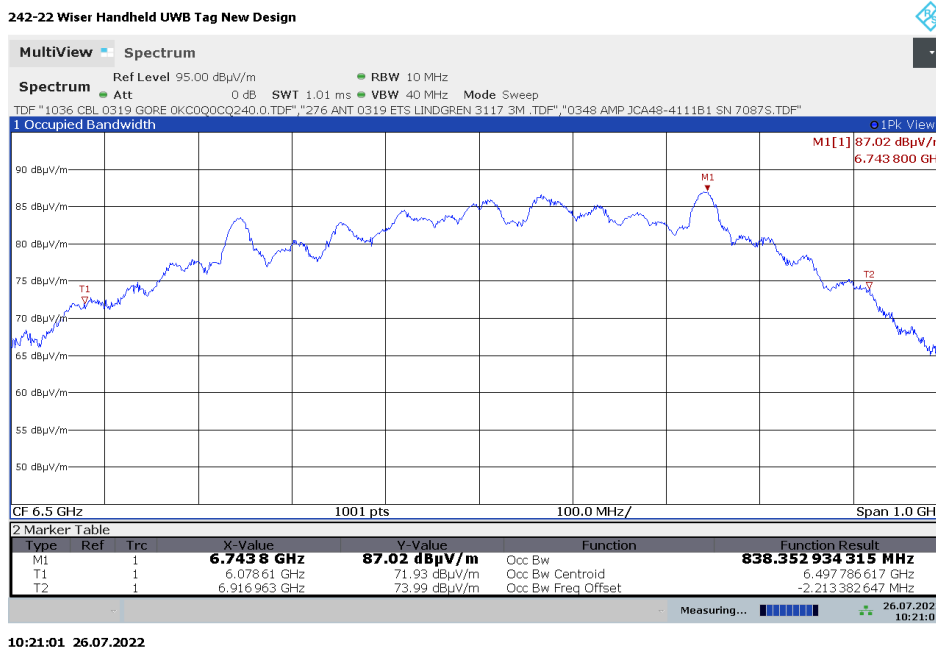
5.1. 99% Emission Bandwidth (RSS-GEN 6.7)

5.1.4 Plot of 99% Emission Bandwidth (CH4, 6.8 Mbps, 64M PRF)



13:24:27 20.07.2022

5.1.5 Plot of 99% Emission Bandwidth (CH5, 6.8 Mbps, 16M PRF)



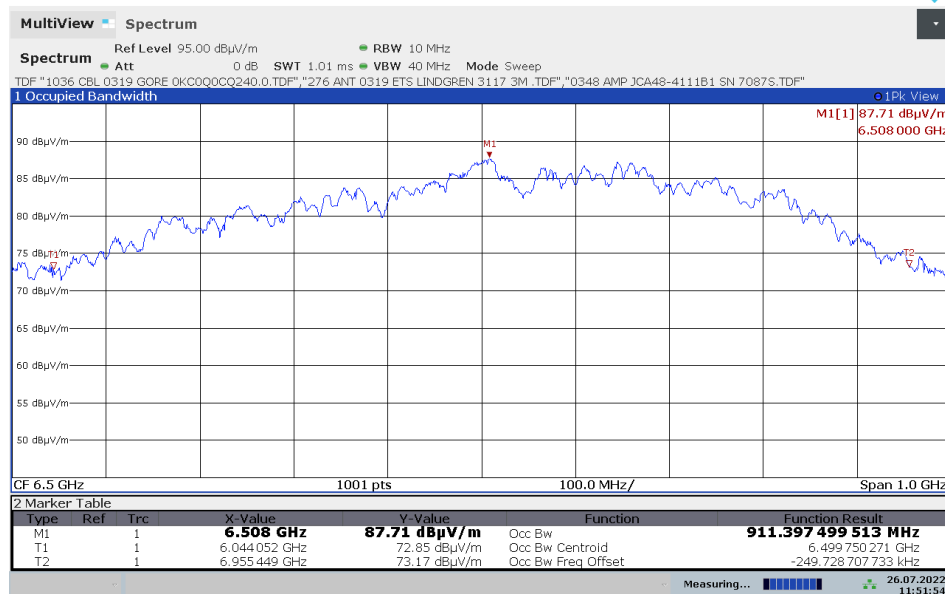
10:21:01 26.07.2022

5. Measurement Data (continued)

5.1. 99% Emission Bandwidth (RSS-GEN 6.7)

5.1.6 Plot of 99% Emission Bandwidth (CH5, 6.8 Mbps, 64M PRF)

242-22 Wiser Handheld UWB Tag New Design



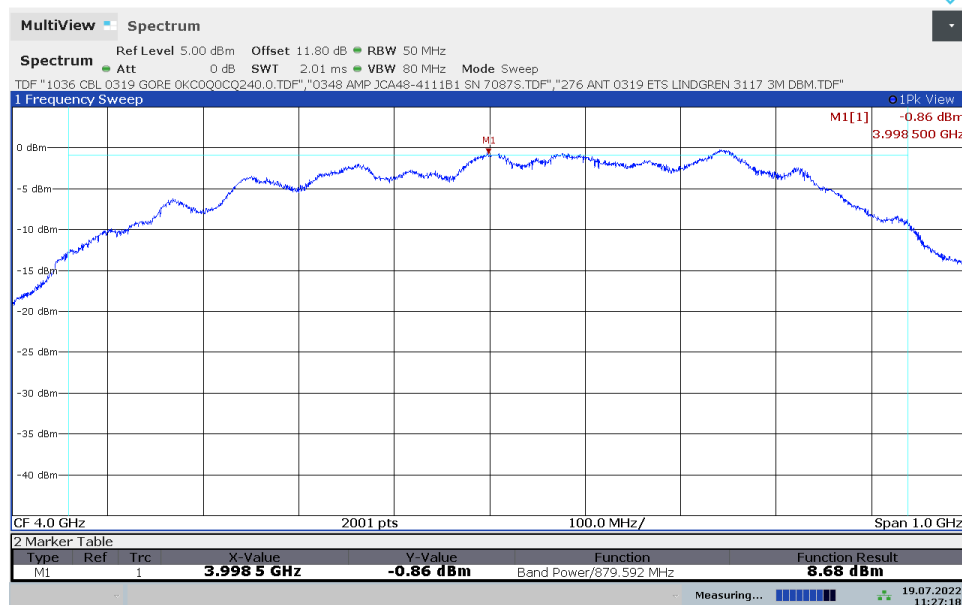
11:51:55 26.07.2022

5. Measurement Data (continued)

5.2. Band Power based on 99% Occupied Bandwidth

5.2.1 Band Power CH2 16M PRF 8.68 dBm

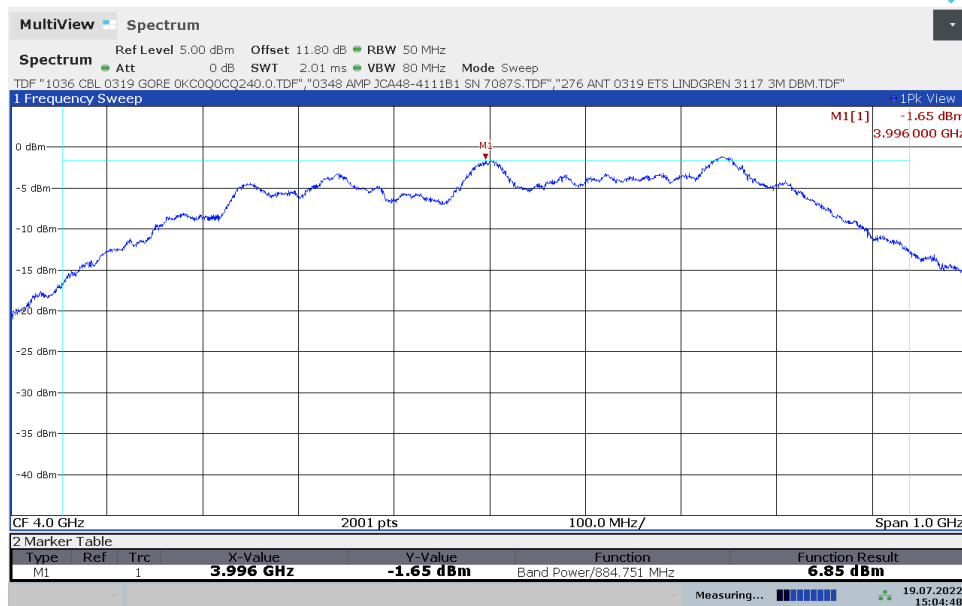
242-22 Wiser Handheld UWB Tag New Design



11:27:19 19.07.2022

5.2.2 Band Power CH2 64M PRF 6.85 dBm

242-22 Wiser Handheld UWB Tag New Design



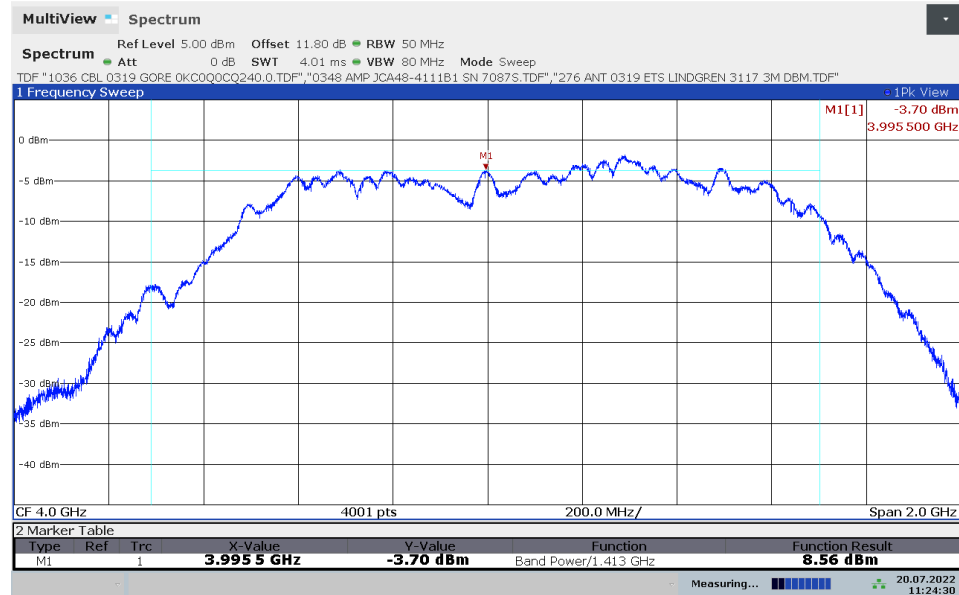
15:04:48 19.07.2022

5. Measurement Data (continued)

5.2. Band Power based on 99% Occupied Bandwidth

5.2.3 Band Power CH4 16M PRF 8.56 dBm

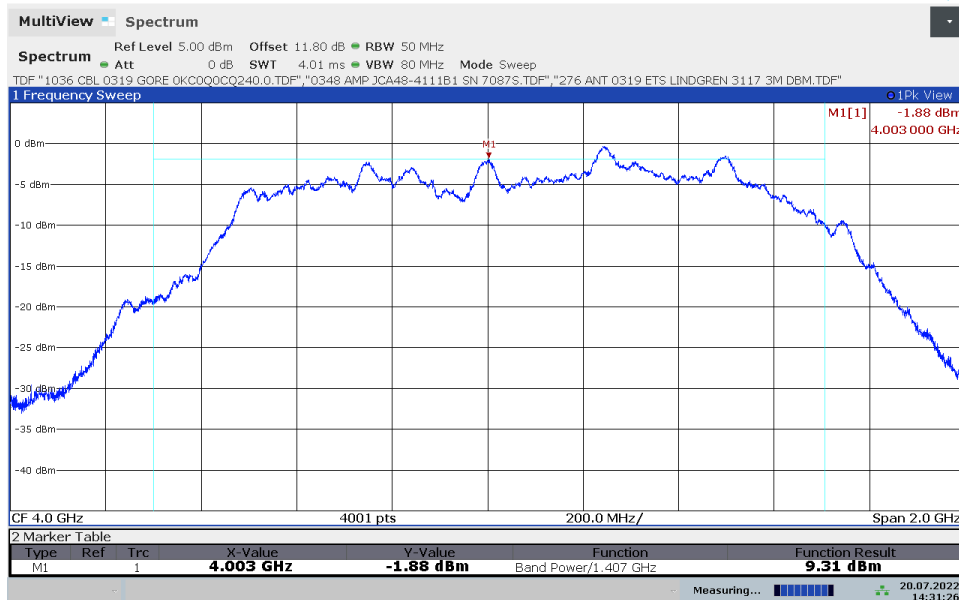
242-22 Wiser Handheld UWB Tag New Design



11:24:31 20.07.2022

5.2.4 Band Power CH4 64M PRF 9.31 dBm

242-22 Wiser Handheld UWB Tag New Design



14:31:27 20.07.2022

5. Measurement Data (continued)

5.2. Band Power based on 99% Occupied Bandwidth

5.2.5 Band Power CH5 16M PRF 7.74 dBm

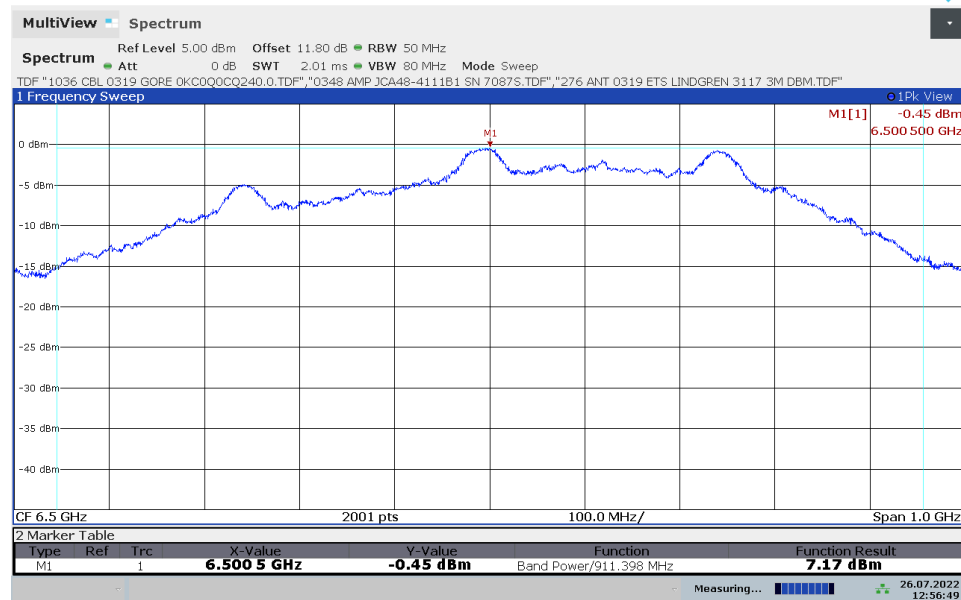
242-22 Wiser Handheld UWB Tag New Design



10:47:38 26.07.2022

5.2.6 Band Power CH5 64M PRF 7.17 dBm

242-22 Wiser Handheld UWB Tag New Design



12:56:50 26.07.2022

5. Measurement Data (continued)

5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2)

Requirement: When the field strength or envelope power is not constant or it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train during which the field strength or power is at its maximum value, including blanking intervals within the pulse train, provided that the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 seconds, the average value of field strength or output power shall be determined during a 0.1 seconds interval during which the field strength or power is at its maximum value.

Procedure: The duty cycle correction was determined using the information provided in ANSI C63.10-2013, Section 7.5: Procedure for determining the average value of pulsed emissions.

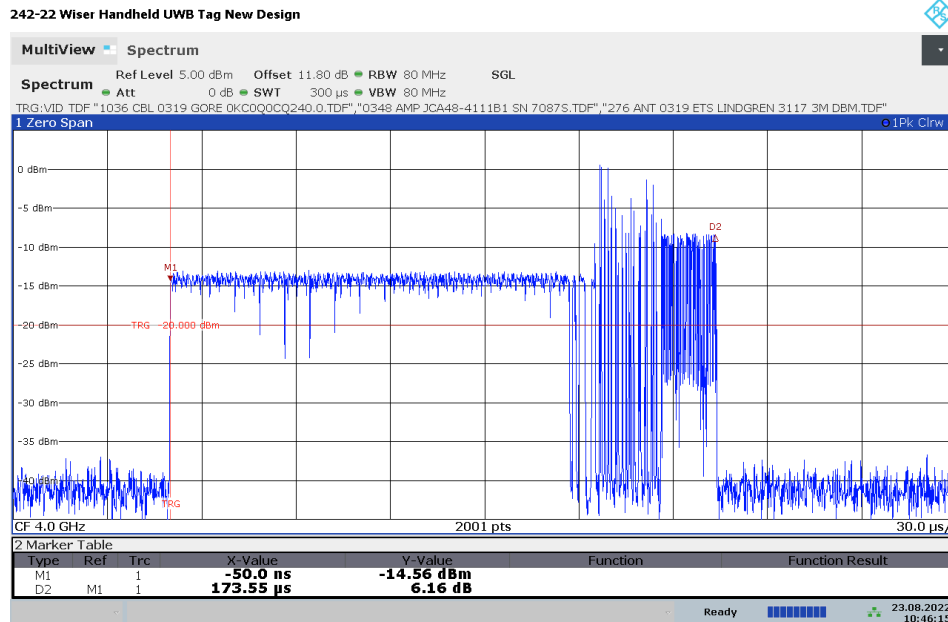
Note: This is the maximum duty cycle allowed by the operational software/firmware for the device.

Channel Frequency	Time On	Time per Period	Duty Cycle (DC)	Maximum Peak Power	Duty Cycle Correction (10 log(DC))	Average Conducted Power	
	T _{on}	T _{on} + T _{off}					
(MHz)	(mS)	(mS)	T _{on} /(T _{on} + T _{off})	(dBm)	dB	dBm	mW
4.000	0.17355	30.9725	0.00560	8.68	-22.52	-13.84	0.0413
4.000	0.17685	30.99	0.00571	6.85	-22.44	-15.59	0.0276
4.000	0.17360	30.955	0.00561	8.56	-22.51	-13.95	0.0403
4.000	0.17675	30.9725	0.00571	9.31	-22.44	-13.13	0.0487
6.500	0.17385	30.99	0.00561	7.74	-22.51	-14.77	0.0333
6.500	0.17685	30.99	0.00571	7.17	-22.44	-15.27	0.0297

5. Measurement Data (continued)

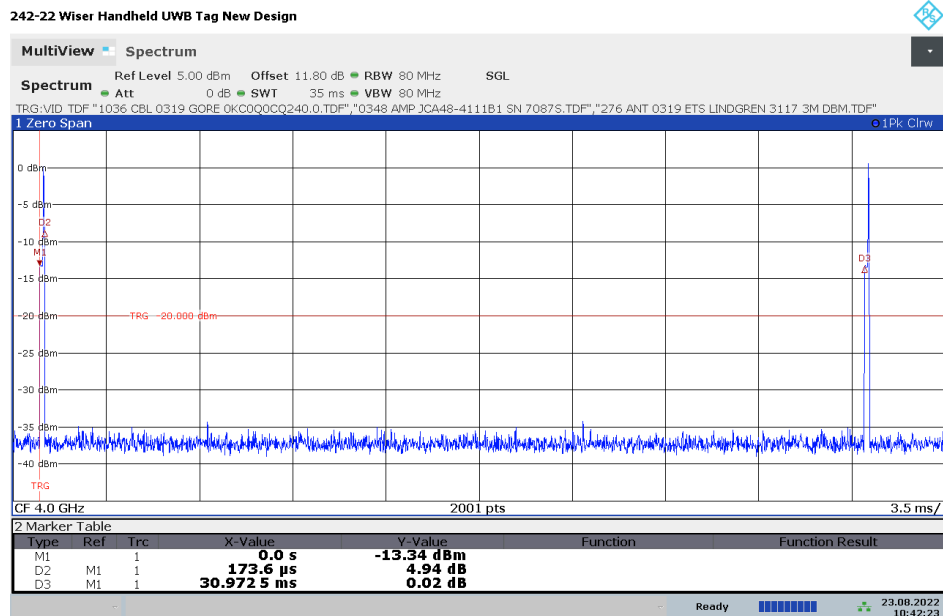
5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2) (continued)

5.3.1. T_{on} CH2 16M PRF



10:46:16 23.08.2022

5.3.2. T_{off} , CH2 16M PRF

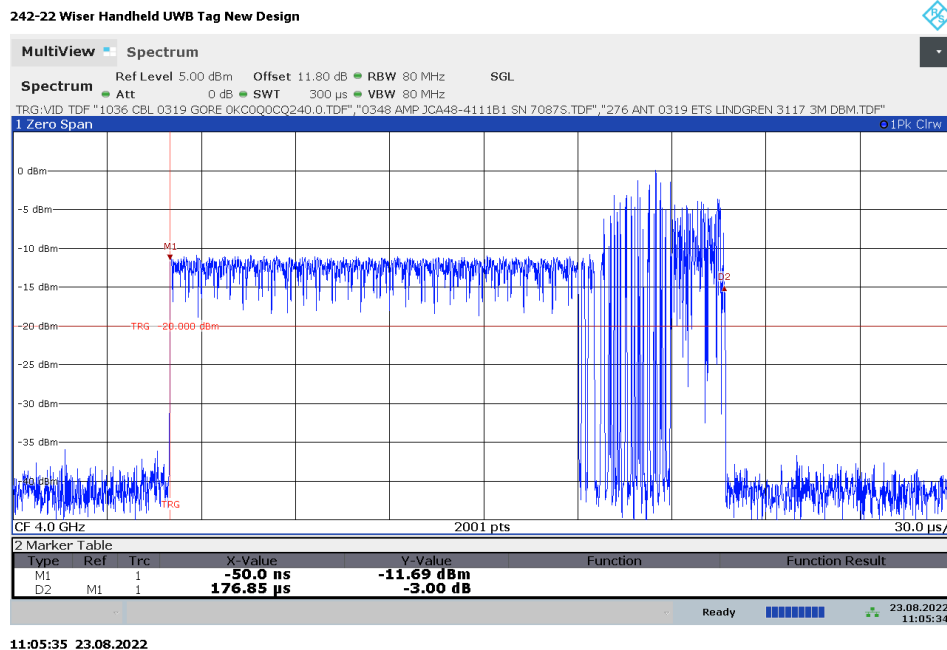


10:42:23 23.08.2022

5. Measurement Data (continued)

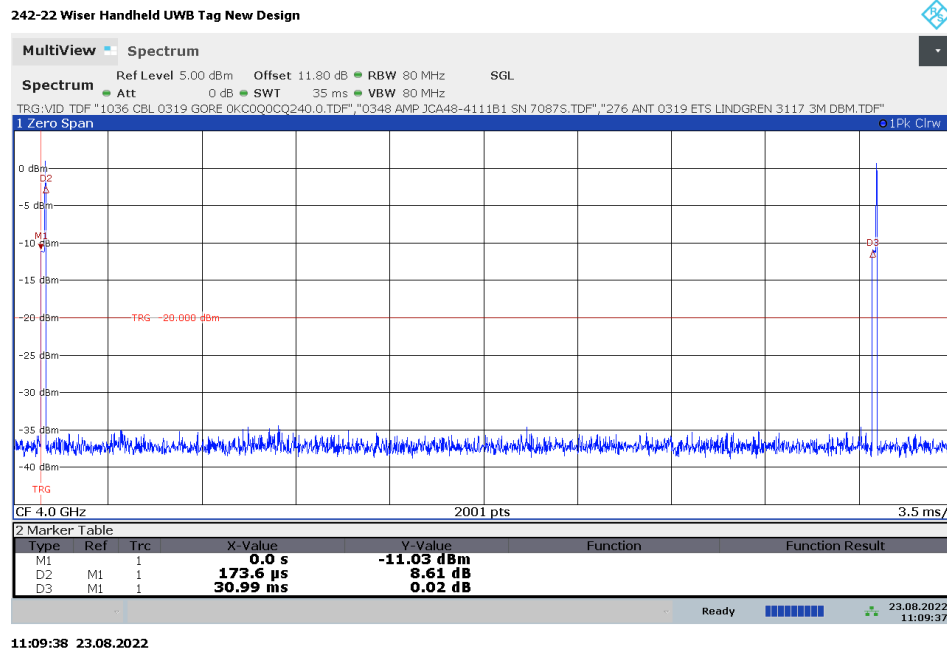
5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2) (continued)

5.3.3. T_{on} CH2 64M PRF



11:05:35 23.08.2022

5.3.4. T_{off} CH2 64M PRF

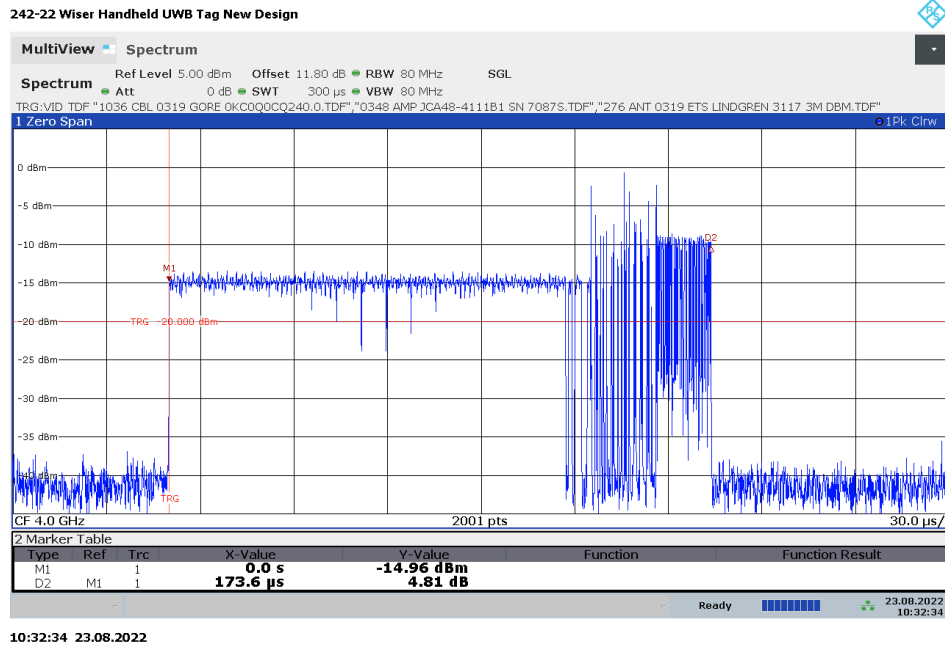


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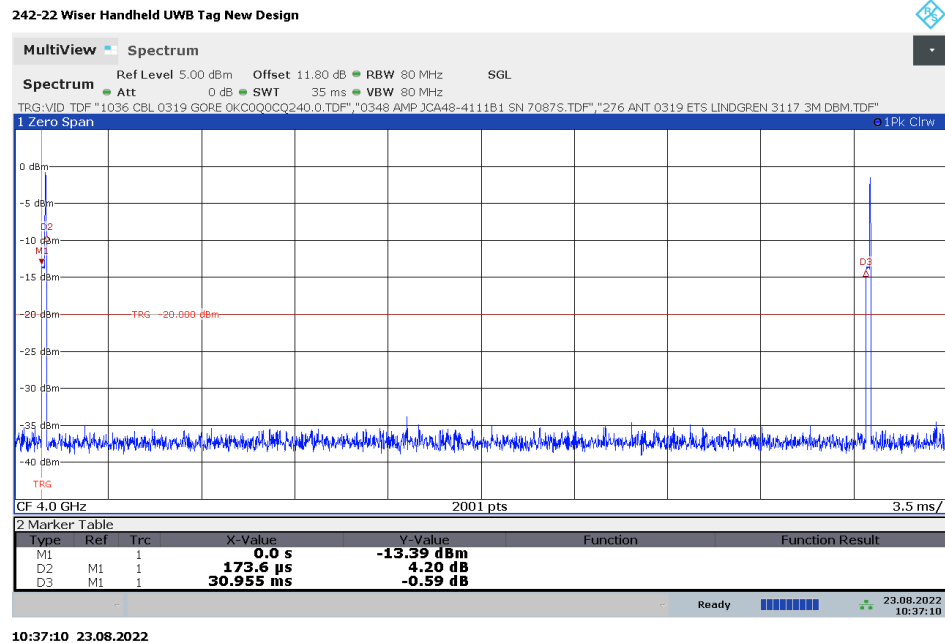
5. Measurement Data (continued)

5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2) (continued)

5.3.5. T_{on} CH4 16M PRF



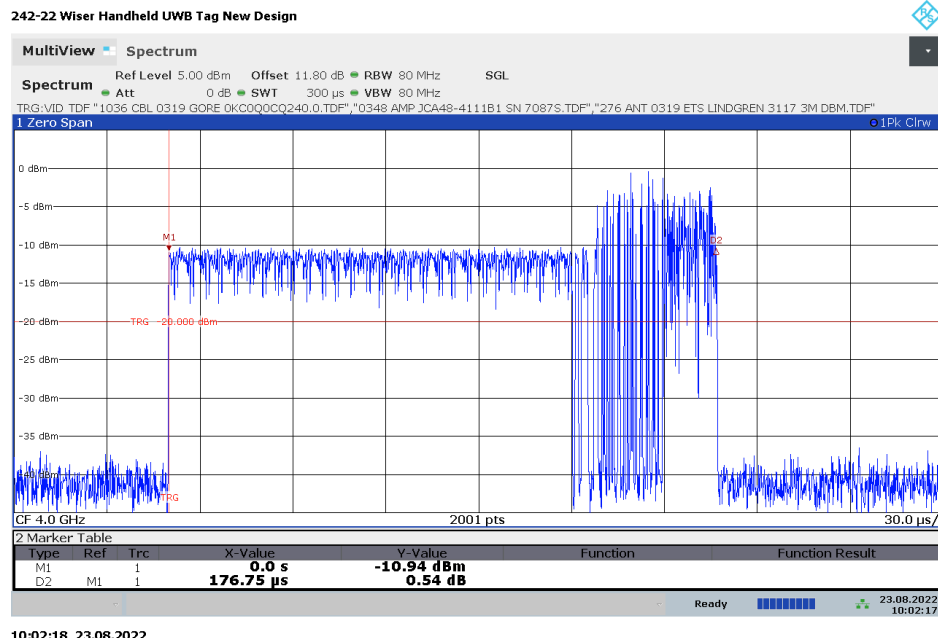
5.3.6. T_{off} CH4 16M PRF



5. Measurement Data (continued)

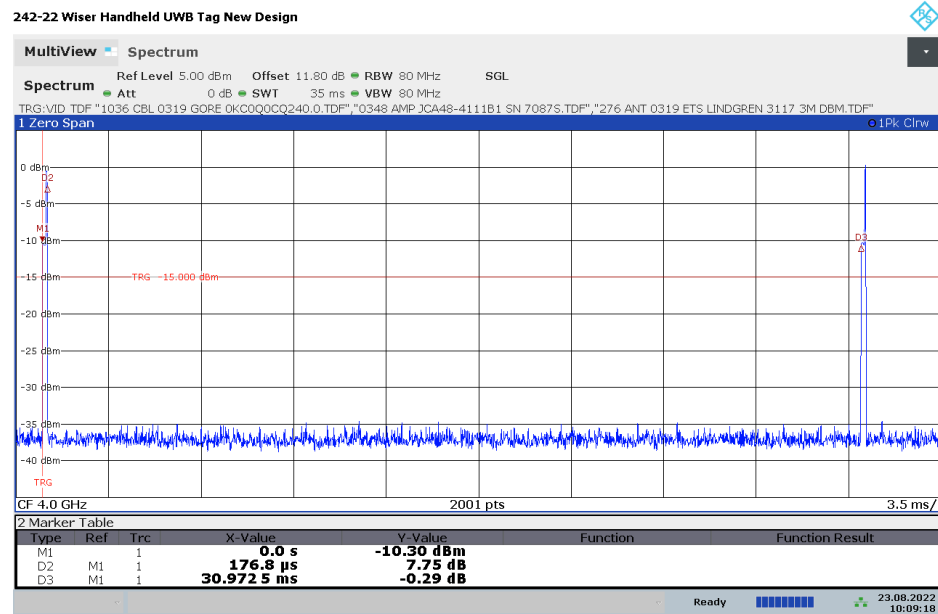
5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2) (continued)

5.3.7. T_{on} CH4 64M PRF



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5.3.8. T_{off} CH4 64M PRF



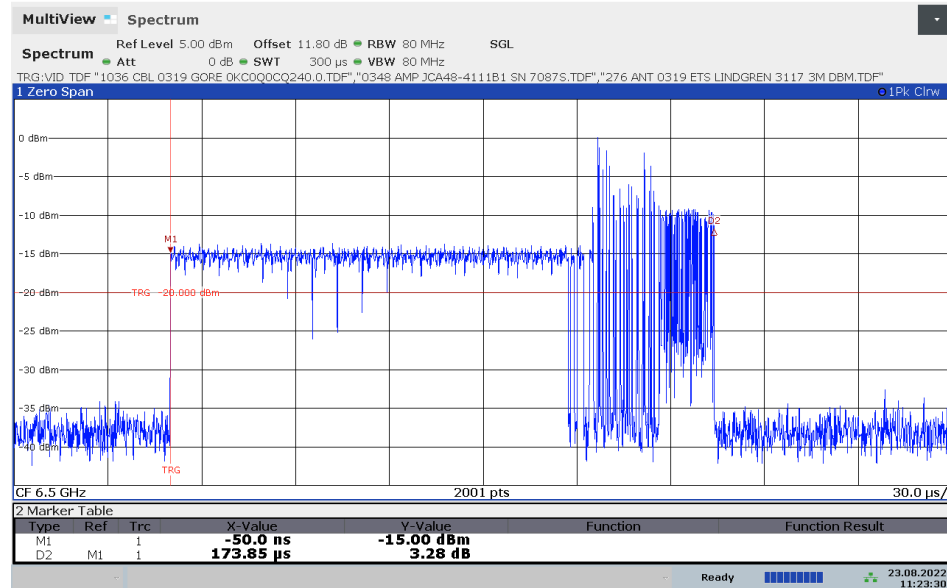
10:09:18 23.08.2022

5. Measurement Data (continued)

5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2) (continued)

5.3.9. T_{on} CH5 16M PRF

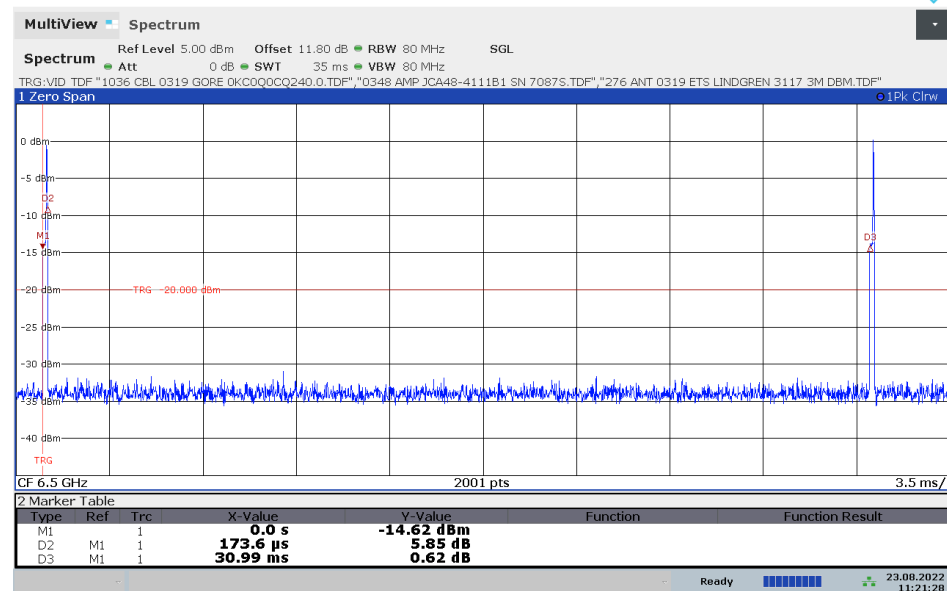
242-22 Wiser Handheld UWB Tag New Design



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5.3.10. T_{off} , CH5 16M PRF

242-22 Wiser Handheld UWB Tag New Design

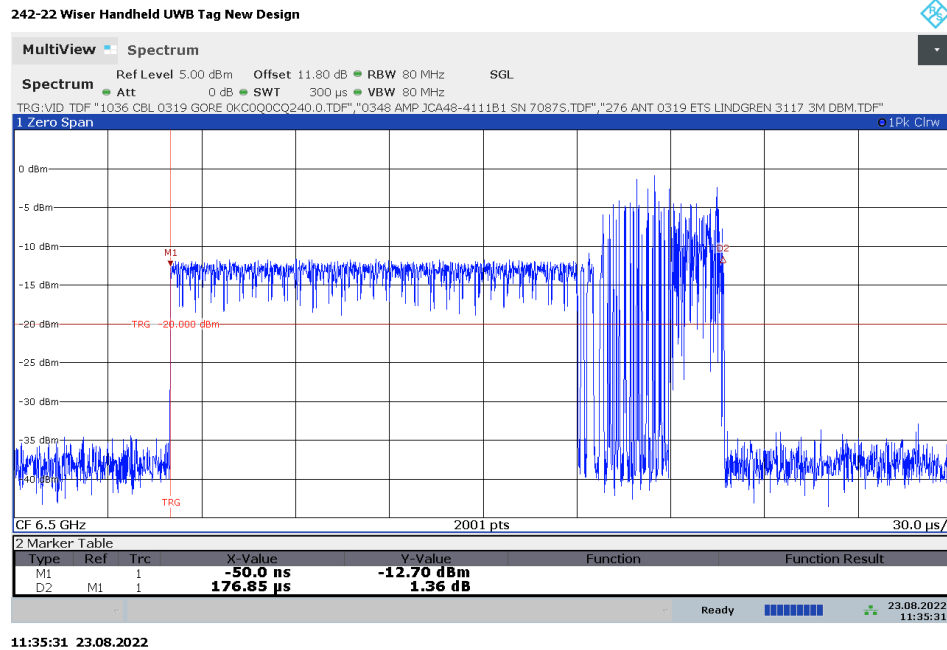


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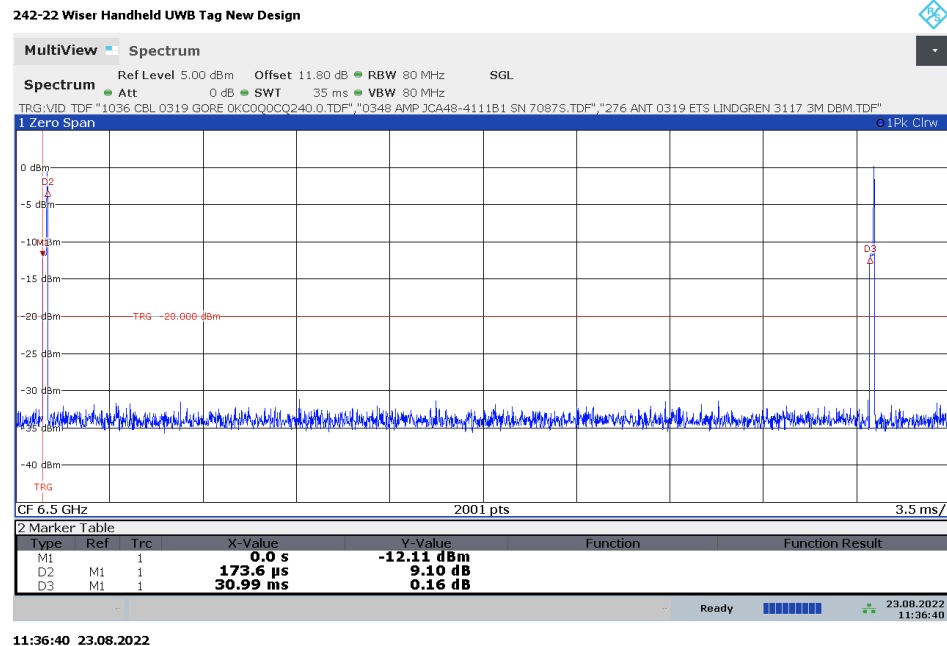
5. Measurement Data (continued)

5.3. Duty Cycle Correction Factor (FCC Part 15.35(c), RSS-GEN 8.2) (continued)

5.3.11. T_{on} CH5 64M PRF



5.3.12. T_{off} CH5 64M PRF



5. Measurement Data (continued)

5.4. Public Exposure to Radio Frequency Energy Levels (2.1093)

5.4.1. 2.1093 Requirements

Requirement: Portable devices are subject to radio frequency radiation exposure requirements. For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

Time-averaging provisions of the MPE guidelines identified in § 1.1310 of

this chapter may not be used in determining typical exposure levels for portable devices intended for use by consumers, such as hand-held cellular telephones, that are considered to operate in general population/uncontrolled environments as defined above. However, "source-based" time-averaging based on an inherent property or duty-cycle of a device is allowed.

Evaluation of compliance with the exposure limits in § 1.1310 of this chapter, and preparation of an EA if the limits are exceeded, is necessary for portable devices having single RF sources with more than an available maximum time-averaged power of 1 mW.

The 1-mW exemption is independent of service type and covers the full range of 100 kHz to 100 GHz, but it may not be used in conjunction with other exemption criteria or in devices with higher-power transmitters operating in the same time-averaging period.

Duty cycle values from Section 5.3 and Power levels from Section 5.2

Frequency	PRF	Ton	Ton+Toff	DC Ton/(Ton+Toff)	Peak Power	Duty Cycle Correction = 10 Log(DC)	Average Power	Average Power
MHz		ms	ms		dBm	dB	dBm	mW
4.000	16M	0.17355	30.9725	0.00560	8.68	-22.52	-13.84	0.0413
4.000	64M	0.17685	30.99	0.00571	6.85	-22.44	-15.59	0.0276
4.000	16M	0.17360	30.955	0.00561	8.56	-22.51	-13.95	0.0403
4.000	64M	0.17675	30.9725	0.00571	9.31	-22.44	-13.13	0.0487
6.500	16M	0.17385	30.99	0.00561	7.74	-22.51	-14.77	0.0333
6.500	64M	0.17685	30.99	0.00571	7.17	-22.44	-15.27	0.0297

Conclusion: The device under test meets the exclusion requirement detailed in FCC OET 447498 D01, dated October 23, 2015 Clause 4.3.1 (a).

5. Measurement Data (continued)

5.5. Radio Frequency Exposure of Radiocommunication Apparatus (RSS-102, Notice 2021-DRS0005)

5.5.1 RF Exposure for devices that operate above 6 GHz

Requirement: ISED respect to Notice 2021-DRS0005: Introduction of an interim exemption limit for routine localized power density evaluations of transmitters operating in the 6 – 30 GHz frequency range.

Duty cycle values from Section 5.3 and Power levels from Section 5.2

Frequency	PRF	Ton	Ton+Toff	DC Ton/(Ton+Toff)	Peak Power	Duty Cycle Correction = 10 Log(DC)	Average Power	Average Power
MHz		ms	ms		dBm	dB	dBm	mW
4.000	16M	0.17355	30.9725	0.00560	8.68	-22.52	-13.84	0.0413
4.000	64M	0.17685	30.99	0.00571	6.85	-22.44	-15.59	0.0276
4.000	16M	0.17360	30.955	0.00561	8.56	-22.51	-13.95	0.0403
4.000	64M	0.17675	30.9725	0.00571	9.31	-22.44	-13.13	0.0487
6.500	16M	0.17385	30.99	0.00561	7.74	-22.51	-14.77	0.0333
6.500	64M	0.17685	30.99	0.00571	7.17	-22.44	-15.27	0.0297

Conclusion: The device under test meets the exclusion requirement of 1 mW detailed in Notice 2021-DRS0005.