# FCC & ISED CANADA CERTIFICATION TEST REPORT

for the

## FREDERICK ENERGY PRODUCTS, LLC
## FMM-EA

## FCC ID: QUI-FMM-EA
## IC ID: 11625A-FMMEA

## WLL REPORT# 18291-01 REV 0

Prepared for:

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Prepared By:

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Testing Certificate AT-1448

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Frederick Energy Products, LLC

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August 21, 2023

WLL Report# 18291-01 Rev 0

Prepared by:

Ryan Mascaro
RF Test Engineer

Reviewed by:

Steven D. Koster
President

# Abstract

This report has been prepared on behalf of Frederick Energy Products, LLC to support the attached Application for Equipment Authorization. The test report and application are submitted for an Intentional Radiator under Part 15.231 of the FCC Rules and Regulations current at the time of testing and Innovation, Science and Economic Development (ISED) Canada Spectrum Management and Telecommunications Policy RSS-210, Issue 10 (6/2019). This Certification Test Report documents the test configuration and test results for the Frederick Energy Products, LLC FMM-EA. The information provided on this report is only applicable to device herein documented, as the EUT.

Radiated testing was performed in the Free-space Anechoic Chamber Test-site (FACT) 3m chamber of Washington Laboratories, Ltd., located at 4840 Winchester Boulevard, Suite #5. Frederick, MD 21703. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD.

Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Certificate AT-1448 as an independent FCC test laboratory (ISED Canada number 3035A).

The Frederick Energy Products, LLC, FMM-EA complies with the requirements for an Intentional Radiator under FCC Part 15.231 and RSS-210 Issue 10 (6/2019).

| Revision History | Description of Change | Date |
|---|---|---|
| Rev 0 | Initial Release | August 21, 2023 |
| | | |

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# 1 Introduction

## 1.1 Compliance Statement

The Frederick Energy Products, LLC, FMM-EA complies with the requirements for an Intentional Radiator under FCC Part 15.231 and RSS-210 Issue 10 (6/2019).

## 1.2 Test Scope

Tests for radiated emissions were performed. All measurements were performed in accordance with ANSI C63.10. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

## 1.3 Contract Information

| | |
|---|---|
| Customer: | Frederick Energy Products, LLC |
| Purchase Order Number: | FEP10660 |
| Quotation Number: | 74055A |

## 1.4 Test and Support Personnel

| | |
|---|---|
| Washington Laboratories, LTD | Ryan Mascaro |
| Customer Representative | Will Murrey |

## 1.5 Test Dates

The Frederick Energy Products, FMM-EA (Periodic Transmitter) was tested during the following dates:

8/14/2023 to 8/16/2023

# 2 Equipment Under Test

## 2.1 EUT Identification & Description

Table 1: Device Summary

| | | |
|---|---|---|
| Manufacturer: | Frederick Energy Products, LLC | |
| FCC ID: | QUI-FMM-EA | |
| ISED ID: | 11625A-FMMEA | |
| HVIN: | FMM-EA | |
| Rule Parts: | FCC: §15.231 | ISED: RSS-210 |
| FCC Emission Designator: | 141K9F1DXN (recommended, or TCB to correct) | |
| IC Emission Designator: | 171K1F1DXN (recommended, or TCB to correct) | |
| Fixed Transmit Frequency: | 918.075 MHz | |
| Occupied Bandwidth: | 20dB | 141.9 kHz |
| | 99% | 171.08 kHz |
| Keying: | Automatic | |
| Modulation or Protocol: | FM, FSK | |
| Type of Information: | Proximity, Telemetry | |
| Number of Channels: | 1 | |
| 3m Radiated Field Strength: | Peak: 89.48 dBuV/m | Average: 63.98 dBuV/m |
| 3m EIRP (from FS): | Peak: -5.67 dBm | Average: N/A |
| Worst-Case Spurious Emission: | 9.997 GHz, 42.947 dBuV/m at 3m (AVG) (see Table 10) | |
| Power Density for Canada: | 0.00068 W/m$^2$ (calculated) | |
| Antenna Type: | LINX, Splatch Antenna (PCB Mounted); P/N: ANT-916-SP | |
| Maximum Antenna Gain: | + 1.4 dBi | |
| Test Software/Firmware: | FEPL Proprietary Test Mode | |
| Power Source & Voltage: | Battery Powered Only via (1) 3.6VDC Lithium Battery | |

The Frederick Energy Products, LLC, FMM-EA is a proximity monitoring device, used for collision avoidance. The FMM-EA has the ability to detect a 73 kHz H-Field, from a Generator device (MFG). The FMM-EA only transmits when in the proximity of a Generator. Upon initial power-up, the FMM-EA enters a sleep-mode, and remains idle until triggered by the 73 kHz MFG. Once triggered, the 918.075 MHz transmitter employs a timing scheme of 5.3%. See Section 4.8 of this report for DCCF details.

The FMM-EA is only powered by one (1) 3.6VDC battery, which is not rechargeable.

## 2.2 Testing Algorithm

The FMM-EA was tested in a powered-on, steady state, with the transmitter enabled as appropriate. A DCCF of -25.5, as denoted in the table below, shall be employed when averaging the Peak field strength of the transmitter emissions. Overall, the worst-case emissions are provided throughout this report. Table 2 provides a summary of the transmit mode, and the duty cycle information.

Table 2: TX Mode Summary with DCCF

| **Proximity to Generator** | **Transmit Mode** | **Duty Cycle** | **DCCF** |
|---|---|---|---|
| | | | |
| ≥ 3-meters * | Sleep/Idle | N/A | N/A |
| | | | |
| ≤ 3-meters * | Danger/Triggered | 5.3 % | 25.5 dB |

** note: these distances were solely used for testing purposes. Actual zone/mode distance may vary, as defined by the manufacturer's theory of operation, or user's manual.*

## 2.3 Test Configuration

The FMM-EA was tested in a stand-alone configuration. As necessary, the EUT was positioned in proximity to a 73 kHz generator (MFG) as a means to trigger the 918.075 MHz radio. The MFG was not introduced onto the test site. The MFG did not influence the testing results.

Table 3: System Configuration List

| Name / Description | HVIN | Part Number | Serial Number | Revision |
|---|---|---|---|---|
| FMM-EA | FMM-EA | N/A | N/A | N/A |

Table 4: Support Equipment

| Item | Model/Part Number | Serial Number |
|---|---|---|
| 73 kHz Generator | MFG | N/A |

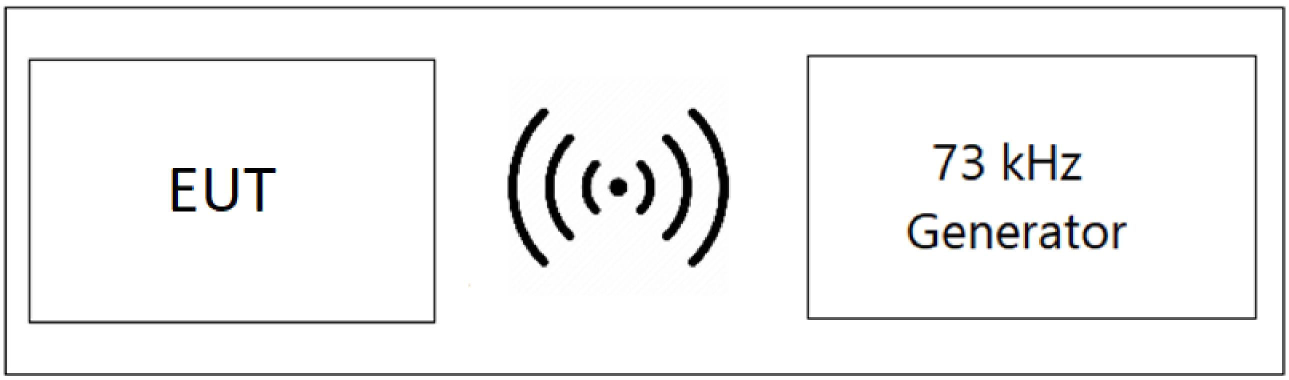
Table 5: Cable Configuration

| Port Identification | Connector Type | Cable Length | Shielded (Y/N) | Termination Point |
|---|---|---|---|---|
| N/A | N/A | N/A | N/A | N/A |

## 2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Frederick, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. The ISED Canada number for Washington Laboratories, Ltd. is 3035A. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ANAB under Testing Certificate AT-1448 as an independent FCC test laboratory.

Figure 1: Test Configuration (Example Only)




## 2.5 Measurements

### 2.5.1 References

ANSI C63.2 (Jan-2016) Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 (Jan 2014) American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ANSI C63.10 (Jun 2013) American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

### 2.5.2 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are included into the antenna factor (AF) column of the table and in the cable factor (CF) column of the table. The AF (in dB/m) and the CF (in dB) is algebraically added to the raw Spectrum Analyzer Voltage in dBµV to obtain the Radiated Electric Field in dBµV/m. This logarithm amplitude is converted to a linear amplitude, then compared to the FCC limit.

Example:

| | |
|---|---|
| Spectrum Analyzer Voltage: | VdBµV (SA) |
| Antenna Correction Factor: | AFdB/m |
| Cable Correction Factor: | CFdB |
| Pre-Amplifier Gain (if applicable): | GdB |
| Electric Field: | EdBµV/m = V dBµV (SA) + AFdB/m + CFdB - GdB |
| To convert to linear units of measure: | Inv Log (EdBµV/m/20) |

## 2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 (R2002) with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1 to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

Equation 1: Standard Uncertainty

$$u_c = \pm\sqrt{\frac{a^2}{{div_a}^2} + \frac{b^2}{{div_b}^2} + \frac{c^2}{{div_c}^2} + \ldots\ldots}$$

Where

| | |
|---|---|
| uc | = standard uncertainty |
| a, b, c,.. | = individual uncertainty elements |
| Diva, b, c | = the individual uncertainty element divisor based on the probability distribution |
| Divisor | = 1.732 for rectangular distribution |
| Divisor | = 2 for normal distribution |
| Divisor | = 1.414 for trapezoid distribution |

Equation 2: Expanded Uncertainty

$$U = ku_c$$

where:

U = expanded uncertainty
k = coverage factor
k ≤ 2 for 95% coverage (ANSI/NCSL Z540-2 Annex G)
uc = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in Table 6 below.

Table 6: Expanded Uncertainty List

| Scope | Standard(s) | Expanded Uncertainty |
|---|---|---|
| Conducted Emissions | CISPR11, CISPR22, CISPR32, CISPR14, FCC Part 15 | ± 2.63 dB |
| Radiated Emissions | CISPR11, CISPR22, CISPR32, CISPR14, FCC Part 15 | ± 4.55 dB |

# 3 Test Sequence and Results Summary

Table 7: Transmitter Testing to 15.231 – Summary

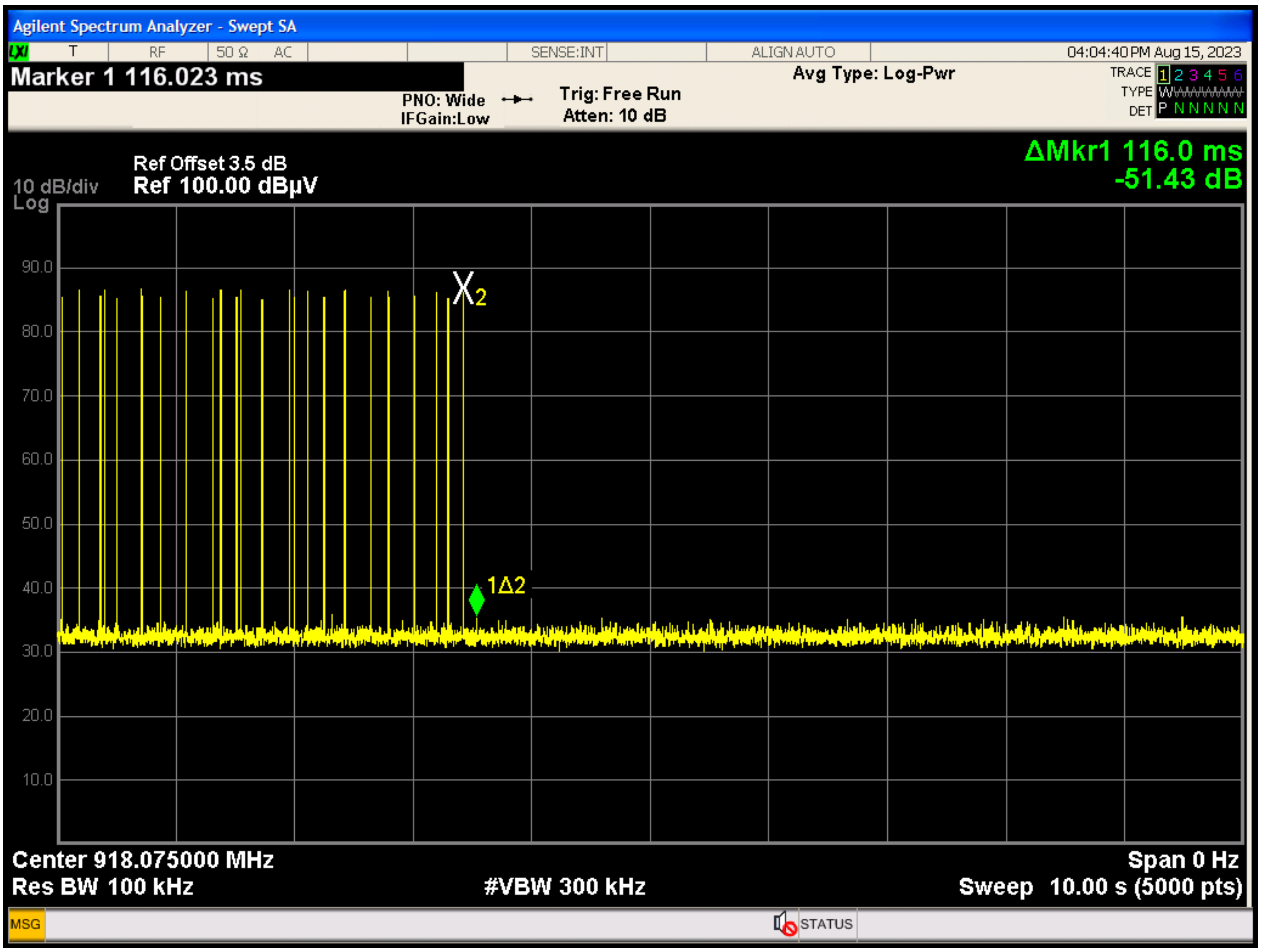
| FCC Rule Part | ISED Rule Part | Description | Result |
|---|---|---|---|
| 15.231(a)(1) | RSS-210 | Transmit Cessation from Release | Pass |
| 15.231(a)(2) | RSS-210 | Transmit Cessation from Activation | Pass |
| 15.231(a)(3) | RSS-210 | Transmission Polling | Pass |
| 15.231(a)(4) | RSS-210 | Pendency of Alarm Conditions | Adopted |
| 15.231(c) | RSS-210 | Occupied Bandwidth | Pass |
| 15.231(b) | RSS-210 | Field Strength, Fundamental | Pass |
| 15.207(a) | RSS-GEN | AC Power Line Emissions | N/A |
| 15.35(c) | RSS-GEN | 100ms Duty Cycle | Completed |

# 4 Test Results

## 4.1 Transmission Cessation from Time of Release – FCC Part §15.231(a)(1)

A periodic intentional radiator shall cease transmission within a five second period from release of automatic or manual keying of operation. Testing was done to verify that the FMM-EA stopped transmitting within the required time period. A 10-second sweep was made, during which time, the transmitter was triggered from Danger Mode into Health Mode. By moving the EUT away from the Generator, the transmitter was triggered into a mode that periodically deactivates transmission. Figure 2 provides the indicated period from un-keying the device until cessation of transmission. The EUT complies with the requirements of this section, as the cessation time is << 5-seconds.

Figure 2: Deactivation of Transmitter



## 4.2 Transmission Cessation from Time of Activation – FCC Part §15.231(a)(2)

Under this provision, a periodic transmitter, that is activated automatically, shall cease transmission within 5 seconds after activation.

Given the safety of life of this device, and how the proximity detection is incorporated into the transmitter operation, it is important to note that the transmitter remains enabled for the duration of the alarm condition, specifically for safety of life application. However, when the alarm condition is cleared, the EUT reverts back to an idle mode. When this occurs, the transmitter is disabled as shown above.

Under the exception of §15.231(a)(4), the EUT complies with the requirements of this rule part.

## 4.3 Transmission Polling – FCC Part §15.231(a)(3)

Under this provision, polling transmissions, or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed. However, the total duration of transmissions shall not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

The EUT does not have a polling mode.

Upon initial power-up, the FMM-EA enters a sleep-mode, and remains idle until triggered by a MFG.

The EUT complies with the requirements of this rule part.

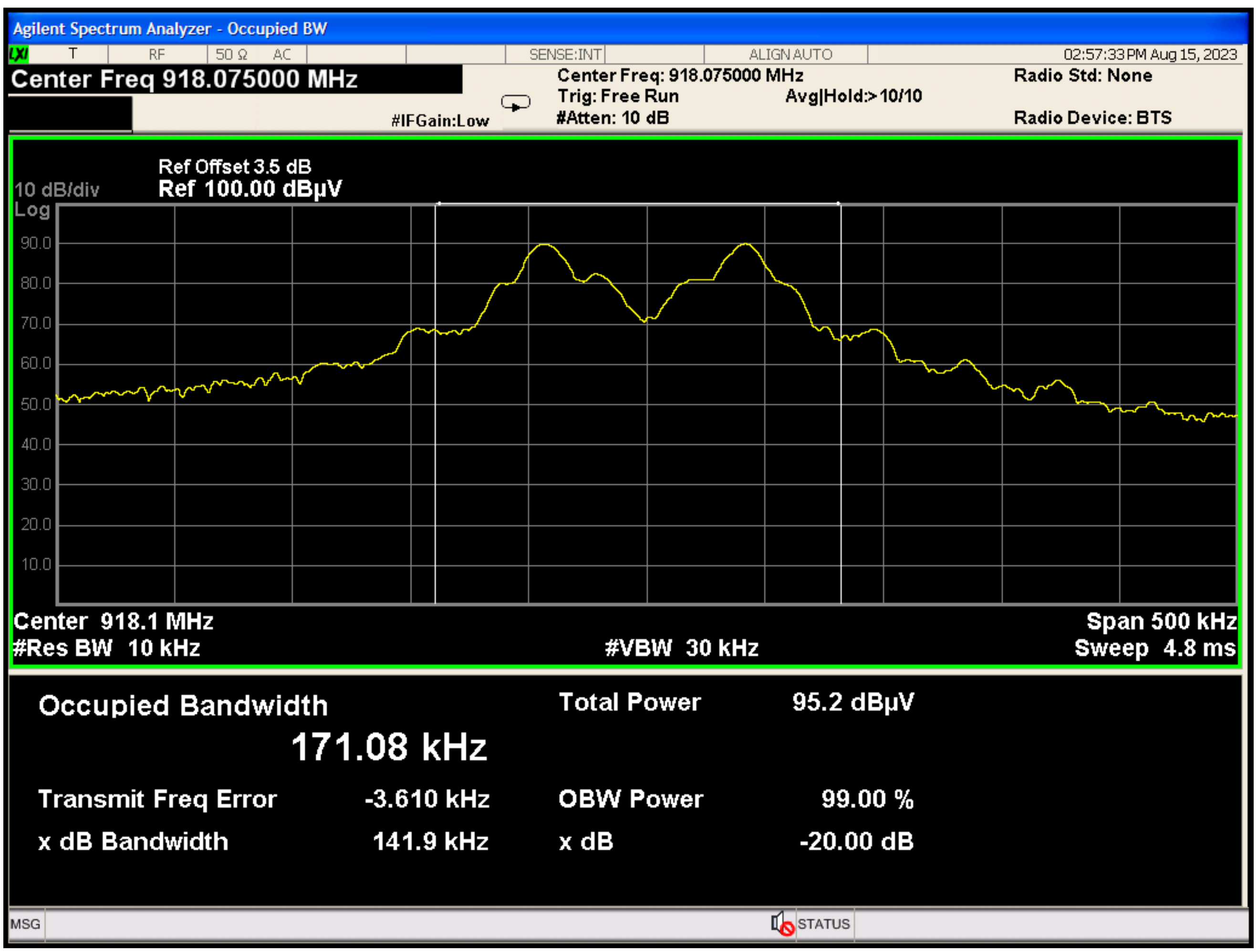
## 4.4 Occupied Bandwidth – FCC Part §15.231(c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. The OBW is determined at the points 20 dB down from the peak of the transmitter carrier. As 918.075 * 0.005 = 4.5904, the EUT complies with the requirements of this section.

Table 8: Occupied Bandwidth Results (Worst-Case)

| TX Frequency | 20dB Bandwidth | Limit | Results |
|---|---|---|---|
| 918.075 MHz | 141.9 kHz | 4.590 MHz | Pass |

Figure 3: 20dB Occupied Bandwidth



## 4.5 Radiated Emissions, Fundamental Transmitter – FCC Part §15.231(b)

The field strength of emissions from intentional radiators operated under this section shall not exceed the following limits, as measured at a distance of 3m:

| Fundamental Frequency (MHz) | Field Strength of Fundamental (µV/m) |
|---|---|
| 40.66 – 40.70 | 2250 |
| 70 – 130 | 1250 |
| 130 – 174 | 1250 to 3750 |
| 174 – 260 | 3750 |
| 260 – 470 | 3750 to 12500 |
| Above 470 | 12500 |

The above limits are based on the average value of the measured emissions. The provisions in §15.35(c) for averaging pulsed emissions, and for limiting peak emissions, shall apply. The calculated DCCF of -25.5 dB shall be applied to the Peak Field Strength to obtain the Average Field Strength and compared to limits in the table above.

The requirements for this test call for the EUT to be placed on a 1m X 1.5m non-conductive motorized turntable for radiated testing at 3-meters. The height of the table shall be 80cm for testing below 1000 MHz, and 1.5m for testing above 1000 MHz, both in accordance with ANSI C63.10. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. A log periodic broadband antenna was mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The output of the antenna was connected to the input of the spectrum analyzer and the 918.075 MHz radio emissions were measured. the horizontal and vertical field components were measured, to determine the worst-case levels. The detector function was set to peak mode, for measurements of the fundamental. The measurement bandwidth of the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth.

The EUT complies with the requirements of this section.

The EUT was evaluated at three orthogonal axes (X, Y, Z) to determine the orientation that yielded the highest radiated field strength. The worst-case emissions are reported below.

The final test data appears on the next page.

Table 9: Fundamental Field Strength, Test Results (3-meters)

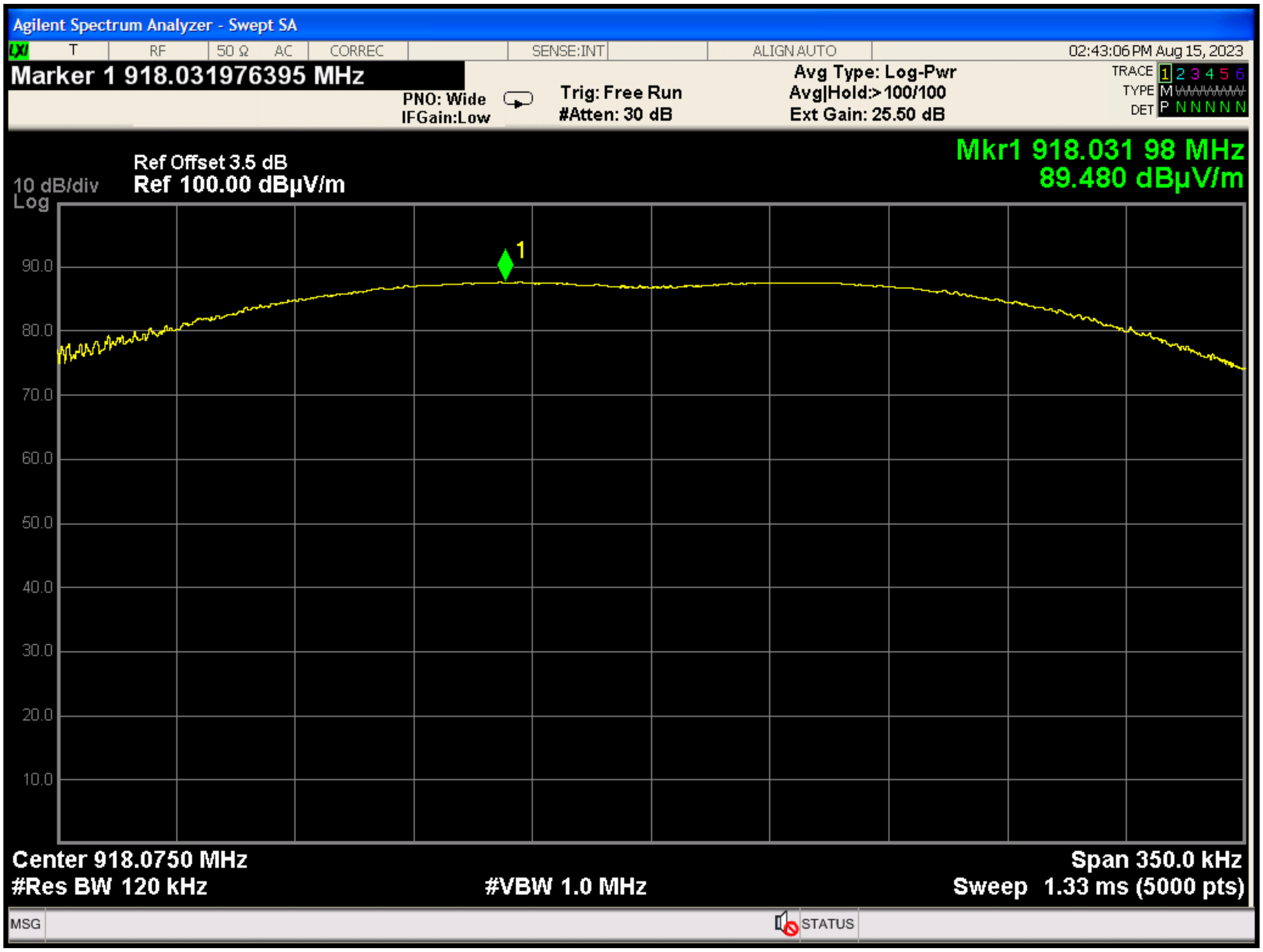
| Frequency (MHz) | Antenna Polarity | EUT Axis | Field Strength (dBuV/m) | DCCF (dB) | Corr. Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Emission Type |
|---|---|---|---|---|---|---|---|---|
| 918.075 | V | Y | 86.30 | 0.00 | 86.30 | 101.94 | -15.64 | Peak |
| | | Y | 86.30 | -25.50 | 60.80 | 81.94 | -21.14 | AVG |
| | | | | | | | | |
| 918.075 | H | Z | 89.48 | 0.00 | 89.48 | 101.94 | -12.46 | Peak |
| | | Z | 89.48 | -25.50 | 63.98 | 81.94 | -17.96 | AVG |

Limit Conversion:

20LOG(12,500 uV/m) = 81.94 dBuV/m (AVG)

81.94 dBuV/m + 20 = 101.94 dBuV/m (Peak)

Figure 4: Worst-Case Fundamental, 3-meter Field Strength




* for Table 9, the device was set to transmit at full power in the Danger Mode. All three orthogonal planes were investigated. The data provided in this section is final and represents the highest possible fundamental field strength from the transmitter. Figure 4 provides the worst-case data point and supports Table 9. The Peak level of 89.48 dBuV/m is corrected and taken at a measurement distance of 3-meters.

## 4.6 Radiated Spurious Emissions – FCC Part §15.231(b)

The field strength of spurious emissions, related to the transmitter, shall not exceed the following limits, as measured at a distance of 3m:

| Fundamental Frequency (MHz) | Field Strength of Spurious Emissions (µV/M) |
|---|---|
| 40.66 – 40.70 | 225 |
| 70 – 130 | 125 |
| 130 – 174 | 125 to 375 |
| 174 – 260 | 375 |
| 260 – 470 | 375 to 1250 |
| Above 470 | 1250 |

The limits for the field strength of the spurious emissions, in the above table, are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table, or to the general limits shown in §15.209, whichever limit permits a higher field strength. In accordance with the provisions outlined in §15.205(b), compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector, for spurious measurements made below 1000 MHz.

Because the transmitter is pulsed, the harmonic spurious emissions (if detected) shall be measured using only a Peak Detector, and then corrected using a DCCF, in order to calculate the Average Field Strength and compare to the limits in the table above. The Peak Field Strength shall not be more than 20 dB over the Average limit.

The requirements for this test call for the EUT to be placed on a 1m X 1.5m non-conductive motorized turntable for radiated testing at a 3m open air test site. The height of the table shall be 80cm for testing below 1000 MHz, and 1.5m for testing above 1000 MHz, both in accordance with ANSI C63.10. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Bi-conical and log-periodic broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters.

The output of the antenna was connected to the input of the spectrum analyzer and the emissions in the frequency range of 30 MHz to 10 GHz were measured, which covers the tenth harmonic of the fundamental. Both the horizontal and vertical field components were measured. The detector function was set to quasi-peak for measurements below 1 GHz. The measurement bandwidth of the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth.

The EUT complies with the requirements of this section.

The EUT was evaluated at three orthogonal axes (X, Y, Z) to determine the orientation that yielded the highest radiated field strength. The worst-case position was maintained during the test. The worst-case emissions are reported below.

In the frequency range of 30 MHz to 1 GHz, all Peak unwanted emissions meet the QP limit.

In the frequency range of 1 GHz to 7 GHz, all Peak emissions meet the Average limit.

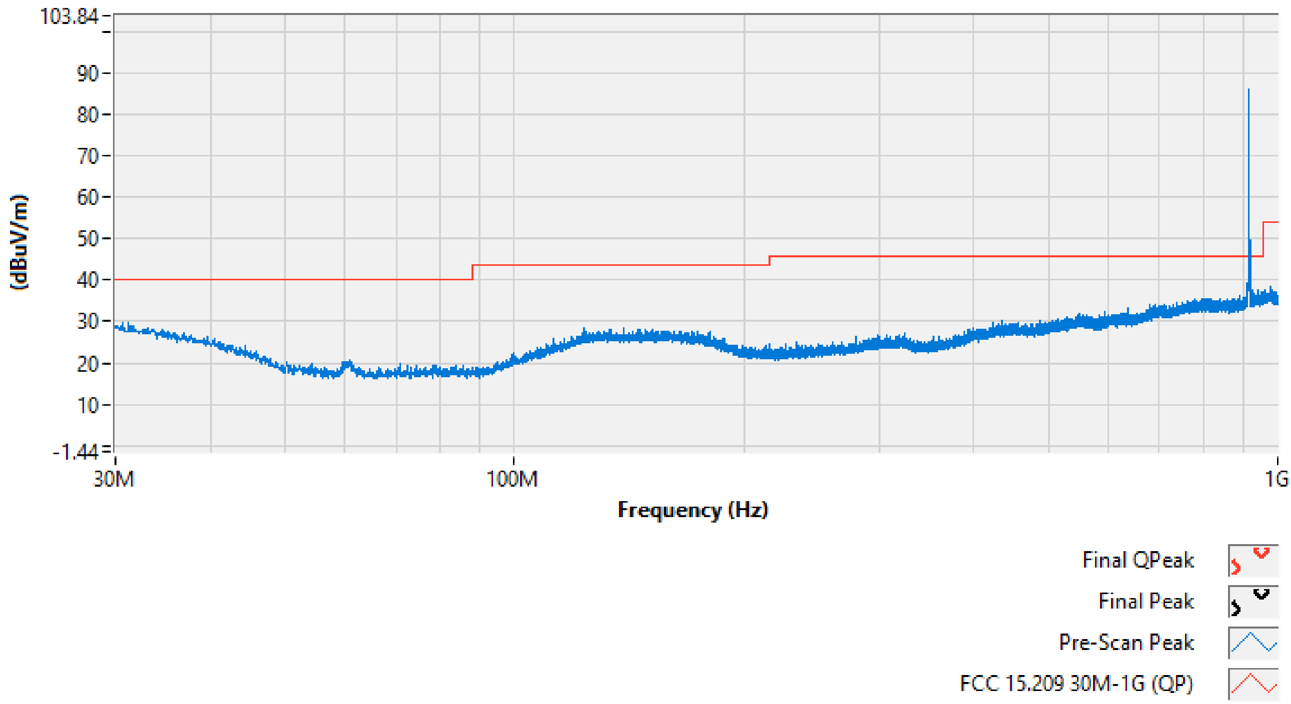
In the frequency range of 7 GHz to 10 GHz, all measurements were made at the noise floor of the measurement system.

Overall, no spurious emissions from the EUT were detected.

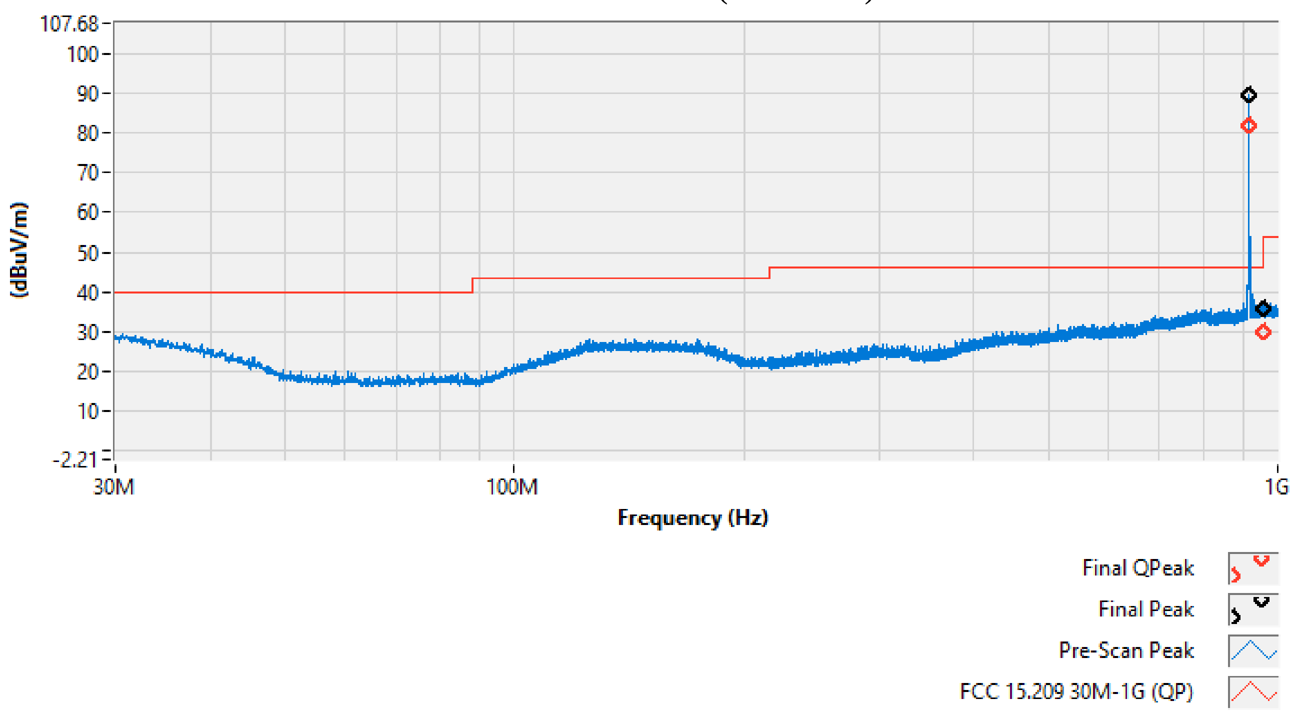
Table 10: 3m Radiated Emissions Test Data

| Frequency (MHz) | Detector | Corr. Meas. (dBuV/m) | Limit (dBuV/m) | Delta (dB) | Turn Table (deg) | Antenna (cm) |
|---|---|---|---|---|---|---|
| **918.075** | Peak | **89.480** | 101.94 | -12.46 | 230 | Horiz, 100 |
| | QP | 82.082 | -- | -- | 230 | Horiz, 100 |
| 960.000 | Peak | 35.575 | -- | -- | 230 | Horiz, 100 |
| | QP | 29.941 | 46 | -16.059 | 230 | Horiz, 100 |
| 7059.00 | Peak | 55.596 | 74 | -18.404 | 215 | Horiz, 165 |
| | AVG | 39.442 | 54 | -14.558 | 215 | Horiz, 165 |
| 7292.00 | Peak | 55.398 | 74 | -18.602 | 90 | Vert, 145 |
| | AVG | 38.776 | 54 | -15.224 | 90 | Vert, 145 |
| 7854.00 | Peak | 55.418 | 74 | -18.582 | 215 | Horiz, 165 |
| | AVG | 38.847 | 54 | -15.153 | 215 | Horiz, 165 |
| 8248.00 | Peak | 54.607 | 74 | -19.393 | 215 | Horiz, 165 |
| | AVG | 38.307 | 54 | -15.693 | 215 | Horiz, 165 |
| 9270.00 | Peak | 56.267 | 74 | -17.733 | 90 | Vert, 145 |
| | AVG | 41.481 | 54 | -12.519 | 90 | Vert, 145 |
| 9586.00 | Peak | 57.170 | 74 | -16.830 | 215 | Horiz, 165 |
| | AVG | 42.137 | 54 | -11.863 | 215 | Horiz, 165 |
| 9997.00 | Peak | 58.412 | 74 | -15.588 | 90 | Vert, 145 |
| | AVG | 42.947 | 54 | -11.053 | 90 | Vert, 145 |

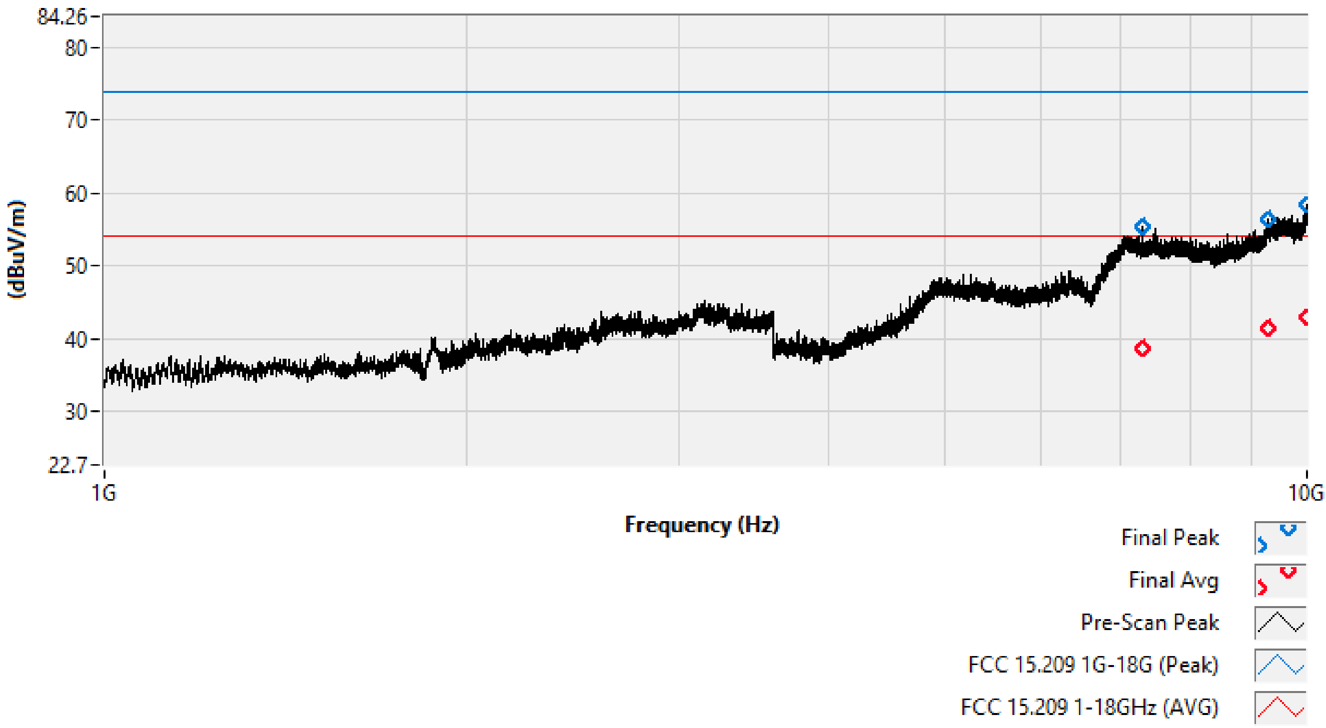
Pre-scan and Final Data (Vertical)



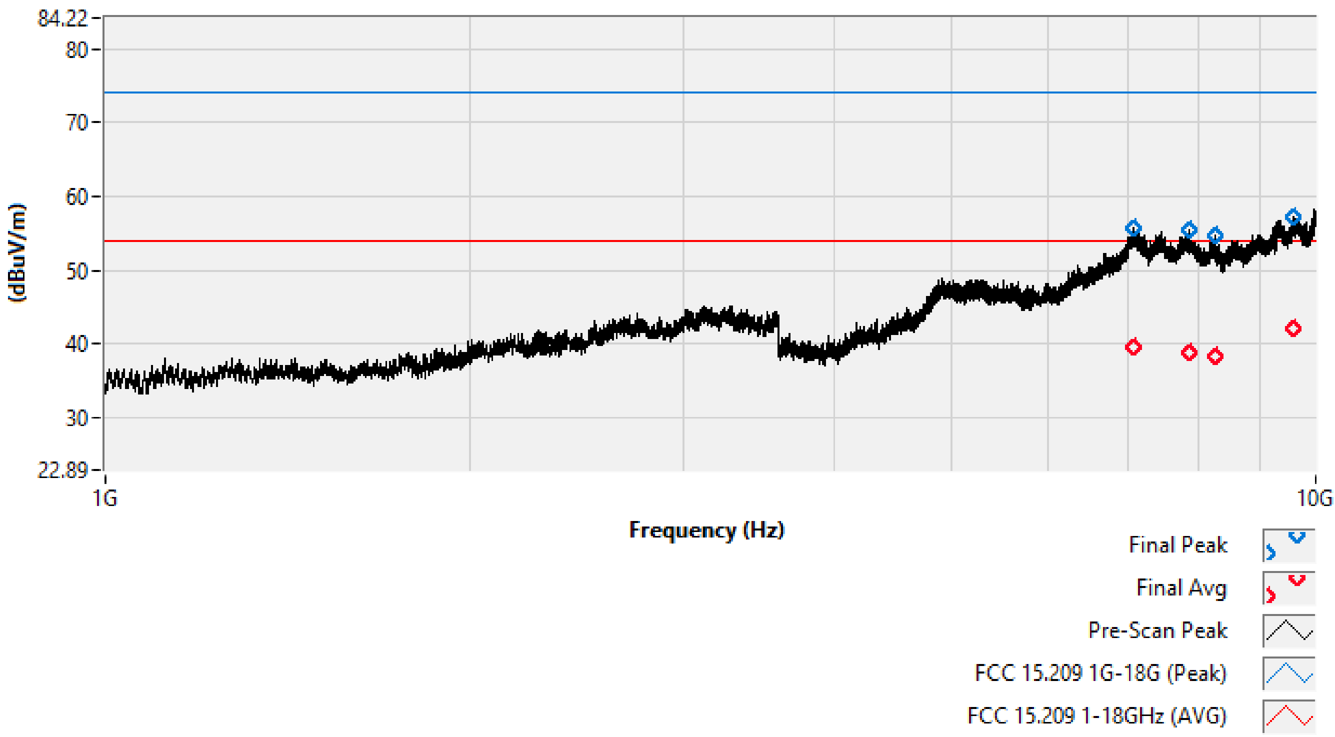

Pre-scan and Final Data (Horizontal)



Pre-scan and Final Data (Vertical)




Pre-scan and Final Data (Horizontal)



## 4.7 AC Power Conducted Emissions, Voltage

Compliance Standard: FCC Part 15, Class B

| FCC Compliance Limits | | | | |
|---|---|---|---|---|
| Frequency Range | Class A Device | | Class B Device | |
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 – 0.5 MHz | 79 dBµV | 66 dBµV | 66 to 56 dBµV | 56 to 46 dBµV |
| 0.5 – 5 MHz | 79 dBµV | 66 dBµV | 56 dBµV | 46 dBµV |
| 0.5 – 30 MHz | 73 dBµV | 60 dBµV | 60 dBµV | 50 dBµV |

Please note that the EUT is battery powered.

The batteries are not rechargeable, and the EUT is not provided with a battery charger.

No portion of the EUT, directly or indirectly, couples to an AC Public Mains Network.

The EUT is not subject to this test.

## 4.8 Transmitter, Duty Cycle Correction Factor (DCCF)

When the average-mode field strength of a pulsed transmitter is measured, a DCCF shall be applied to the Peak value, and compared to the applicable Average limits. Under the provisions of §15.35(c), the duty cycle measurement shall be made in reference to a 100 ms period.

### 4.8.1 Transmit Mode (Triggered by MFG)

Figure 5: Transmitter Pulse On-Time, Plot 1 – Danger Mode

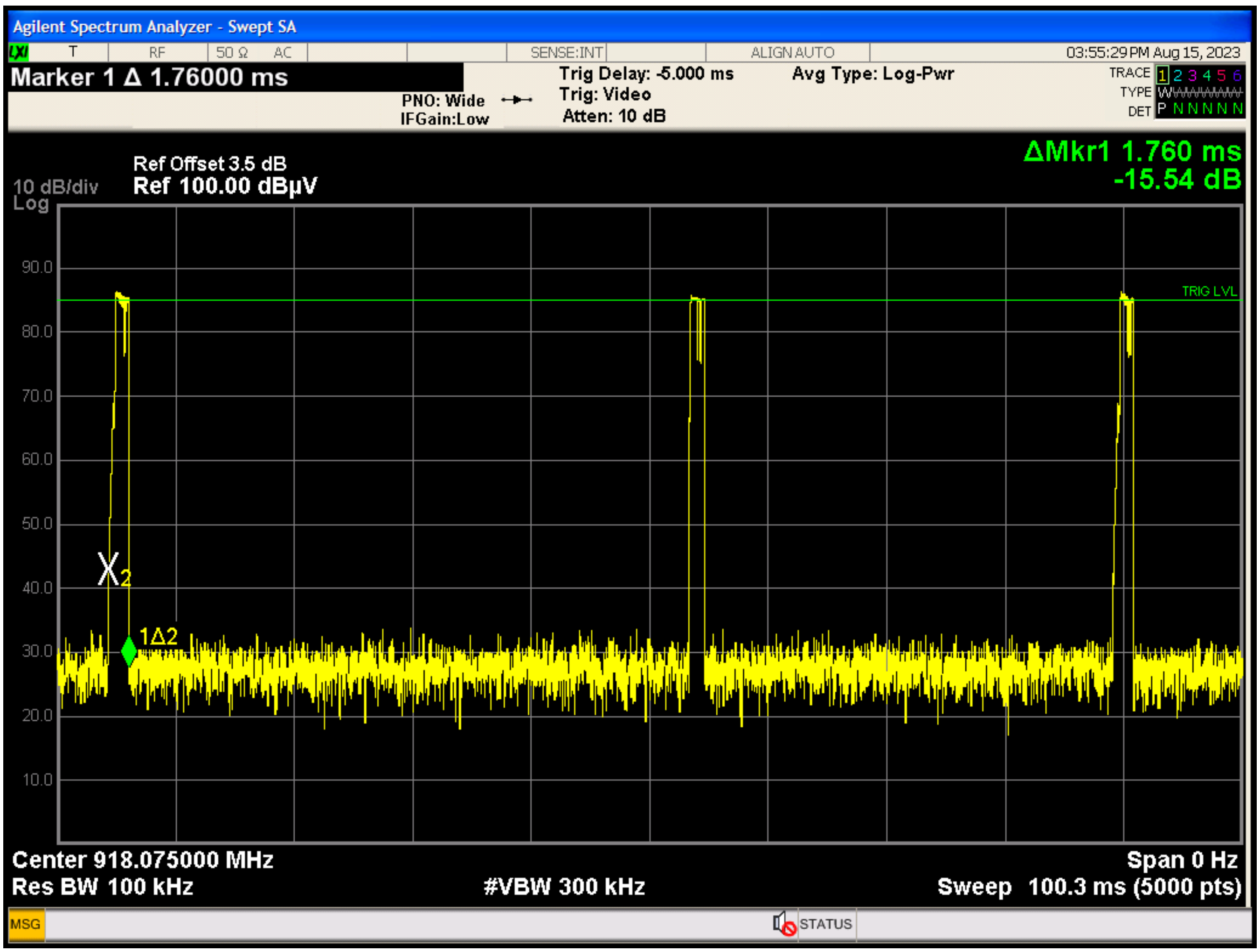
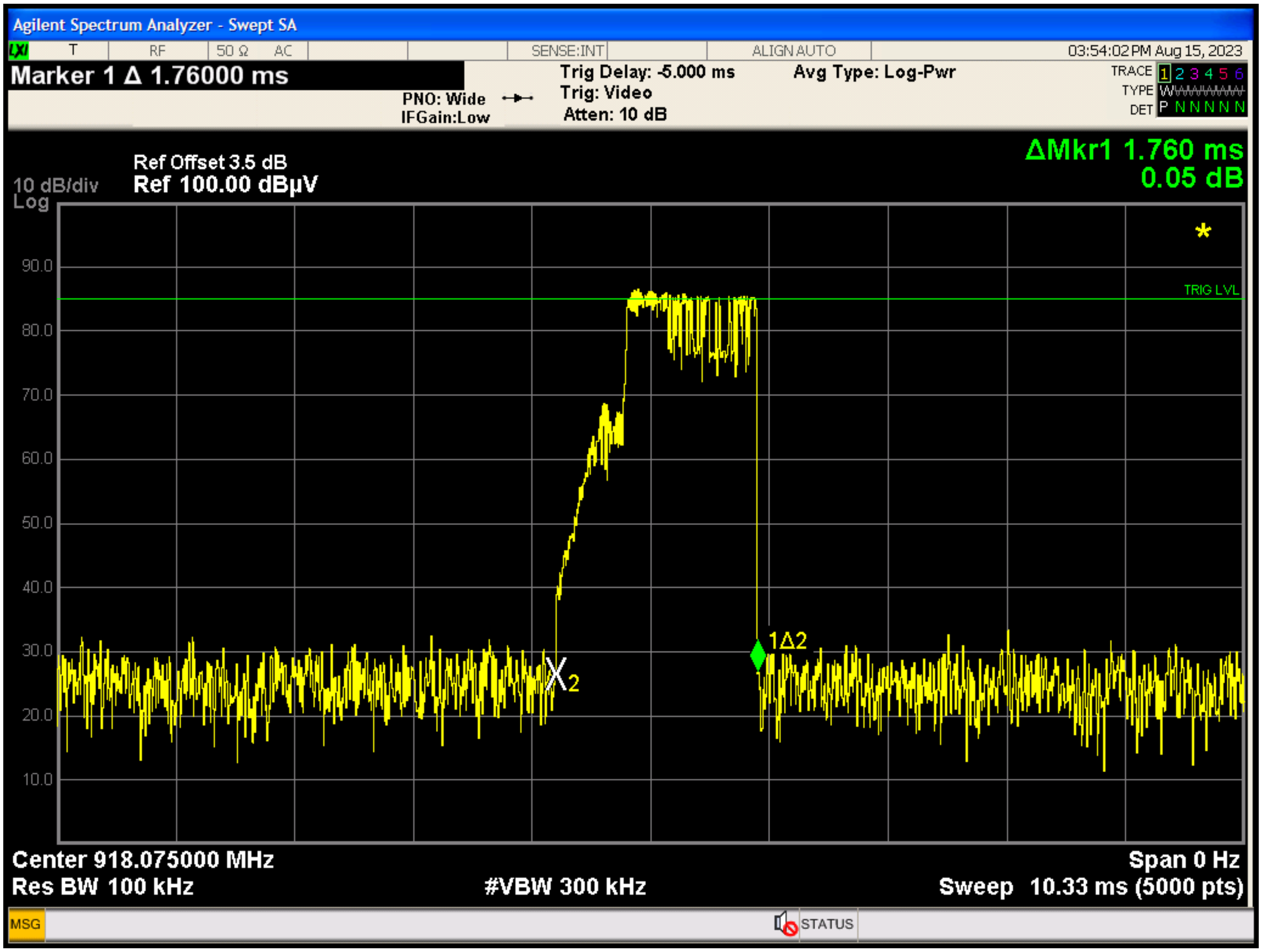


Figure 6: Transmitter Pulse On-Time, Plot 2 – Danger Mode



The Danger Mode pulse train was observed over a 100 ms sweep. In this case, the total pulse train is greater than the measurement period. As such, the cycle time ($T$cycle) shall be 100 ms.

The total transmitter on-time is made of three sub-pulses, that measure 1.76 ms each.

As such, the on-time ($t$on) is: 3(1.76) = 5.28 ms (worst-case).

The duty cycle can be calculated from the following formula:

$t$on ÷ $T$cycle = Δ

5.28 ÷ 100 = 0.0528

Δ = 5.3%

Where Δ is the final duty cycle.

The duty cycle correction factor can be calculated from the following formula:

20LOG(Δ) = δ

20LOG(0.053) = –25.5

δ = 25.5 dB

Where δ is the final DCCF for the Danger Mode.

*(Reference ANSI C63.10-2013, Section 7.5)*

# 5 Test Equipment

Table 11 shows a list of the test equipment used for measurements along with the calibration information.

Table 11: Test Equipment List

| Test Name: | **Radiated Emissions** | Testing Dates: 8/14/2023 to 8/16/2023 | |
|---|---|---|---|
| **Asset #** | **Manufacturer/Model** | **Description** | **Cal. Due** |
| 00823 | AGILENT N9010A | EXA SPECTRUM ANALYZER | 6/7/2024 |
| 00644 | SUNOL SCIENCES CORP JB1 | BICONALOG ANTENNA | 11/7/2024 |
| 00425 | ARA DRG-118/A | ANTENNA DRG 1-18GHZ | 11/7/2024 |
| 00977 | JUNKOSHA MWX322-06000 | SMA COAXIAL CABLE | 12/28/2023 |
| 00806 | MINI-CIRCUITS CBL-6FT-SMSM | SMA COAXIAL CABLE | 12/28/2023 |
| 00834 | ULTIFLEX UFA 2108-0-360 | SMA COAXIAL CABLE | 12/28/2023 |
| 00065 | HP 8447D | RF PRE-AMPLIFIER | 5/9/2024 |
| 00066 | BZ-01002650-401545-282525 | RF PRE-AMPLIFIER | 5/24/2024 |
| 00742 | PENN ENGINEERING WR284 | BANDPASS FILTER | 6/27/2025 |
| 00280 | ITC 21C-3A1 | BANDPASS FILTER | 6/27/2025 |
| 00281 | ITC 21A-3A1 | BANDPASS FILTER | 6/27/2025 |