



Electromagnetic Compatibility Test Report

Tests Performed on a Timekeeping Systems

ID Badge Transceiver, Model Tag-008

Radiometrics Document RP-9206



Product Detail:

FCC ID: MTD-0009
IC: 12375A-0009
Equipment type: 2.4 GHz transmitter

Test Standards:

US CFR Title 47, Chapter I, FCC Part 15 Subpart C
FCC Part 15 CFR Title 47: 2020
Canada ISSED; RSS-210, Issue 9: 2016 as required for Category I Equipment
IC RSS-GEN Issue 5: 2018

This report concerns: Original Grant for Certification
FCC Part 15.249

Tests Performed For:

Timekeeping Systems
30100 Bainbridge Road, Suite H
Solon, Ohio 44139

Test Facility:

Radiometrics Midwest Corporation
12 Devonwood Avenue
Romeoville, IL 60446-1349
(815) 293-0772

Test Date(s):

December 13 to January 3, 2020

Document RP-9206 Revisions:

Rev.	Issue Date	Revised By
0	February 6, 2020	



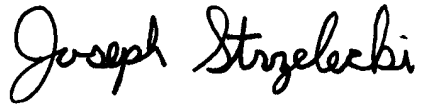
Contents

1.0 ADMINISTRATIVE DATA	3
2.0 TEST SUMMARY AND RESULTS	3
3.0 EQUIPMENT UNDER TEST (EUT) DETAILS	4
3.1 EUT Description	4
3.1.1 FCC Section 15.203 & RSS-GEN Antenna Requirements	4
4.0 TESTED SYSTEM DETAILS	4
4.1 Tested System Configuration	4
4.2 EUT Operating Modes	4
4.3 Special Accessories	4
4.4 Equipment Modifications	4
5.0 TEST SPECIFICATIONS.....	5
6.0 TEST PROCEDURE DOCUMENTS.....	5
7.0 RADIOMETRICS' TEST FACILITIES	5
8.0 DEVIATIONS AND EXCLUSIONS FROM THE TEST SPECIFICATIONS	6
9.0 CERTIFICATION	6
10.0 TEST EQUIPMENT TABLE	6
11.0 TEST SECTIONS	7
11.1 Radiated RF Emissions.....	7
11.1.1 Field Strength Calculation.....	7
11.1.2 Radiated Emissions Test Results	8
11.2 Occupied Bandwidth Data.....	10
11.3 Duty Cycle.....	12
11.4 Peak Output Power	15
11.4.1 Measurement Instrumentation Uncertainty	15
12.0 REVISION HISTORY	15

Notice: This report must not be reproduced (except in full) without the written approval of Radiometrics Midwest Corporation.



1.0 ADMINISTRATIVE DATA

<i>Equipment Under Test:</i> A Timekeeping Systems, ID Badge Model: Tag-008 Serial Number: None This will be referred to as the EUT in this Report	
<i>Date EUT Received at Radiometrics:</i> December 12, 2020	<i>Test Dates:</i> December 13 to January 3, 2020
<i>Test Report Written and Authorized By:</i> Joseph Strzelecki Senior EMC Engineer	<i>Test Witnessed By:</i> The tests were not witnessed by personnel from Timekeeping Systems.
<i>Radiometrics' Personnel Responsible for Test:</i>  02/05/2020 Date Joseph Strzelecki Senior EMC Engineer NARTE EMC-000877-NE Dave Jarvis EMC Technician Richard L. Tichgelaar EMC Technician	<i>EUT Checked By:</i> Joseph Strzelecki Richard Tichgelaar Dave Jarvis Radiometrics

2.0 TEST SUMMARY AND RESULTS

The EUT (Equipment Under Test) is an ID Badge, Model Tag-008, manufactured by Timekeeping Systems. The detailed test results are presented in a separate section. The following is a summary of the test results.

Emissions Tests Results

Environmental Phenomena	Frequency Range	Basic Standard	Test Result
RF Radiated Emissions	30-25,000 MHz	RSS-210 & FCC Part 15	Pass
Occupied Bandwidth Test	Fundamental Freq.	RSS-210 & FCC Part 15	Pass

Since the EUT is battery operated, no AC conducted emissions were performed.

IEC 17025 Decision Rule:

The declaration of pass or fail is based on the specifications listed above. The declaration of pass or fail did not consider measurement uncertainty.



3.0 EQUIPMENT UNDER TEST (EUT) DETAILS

3.1 EUT Description

The EUT is an ID Badge, Model Tag-008, manufactured by Timekeeping Systems. The EUT was in good working condition during the tests, with no known defects. The EUT uses 2.4 GHz transmissions to track locations of personnel wearing the tags.

3.1.1 FCC Section 15.203 & RSS-GEN Antenna Requirements

The antenna is permanently attached to the printed circuit board. The antenna is internal to the EUT and it is not readily available to be modified by the end user. Therefore, it meets the 15.203 Requirements.

4.0 TESTED SYSTEM DETAILS

4.1 Tested System Configuration

The system was configured for testing in a typical fashion. The EUT was placed on an 80-cm or 150 cm high, nonconductive test stand. The testing was performed in conditions as close as possible to installed conditions. The EUT was tested as a stand-alone device. Power was supplied with a new battery.

The device is battery powered with no external cables.

Tested System Configuration List

Item	Description	Type*	Manufacturer	Model Number	Serial Number
1	ID Badge	E	Timekeeping Systems	Tag-008	None

* Type: E = EUT, P = Peripheral, S = Support Equipment; H = Host Computer

4.2 EUT Operating Modes

The EUT was tested as a stand-alone device, since in the field it is a battery-operated stand-alone product.

4.3 Special Accessories

No special accessories were used during the tests in order to achieve compliance.

4.4 Equipment Modifications

No modifications were made to the EUT at Radiometrics' test facility in order to comply with the standards listed in this report.



5.0 TEST SPECIFICATIONS

Document	Date	Title
FCC CFR Title 47	2020	Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15 - Radio Frequency Devices
IC RSS-210 Issue 9	2016	Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands) Category I Equipment
IC RSS-Gen Issue 5	2019	General Requirements and Information for the Certification of Radiocommunication Equipment (RSS-Gen)

6.0 TEST PROCEDURE DOCUMENTS

The tests were performed using the procedures from the following specifications:

Document	Date	Title
ANSI C63.4-2014	2014	Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2013	2013	American National Standard for Testing Unlicensed Wireless Devices
558074 D01 DTS Meas Guidance	2016	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247; v03r04

7.0 RADIOMETRICS' TEST FACILITIES

The results of these tests were obtained at Radiometrics Midwest Corp. in Romeoville, Illinois, USA. Radiometrics is accredited by A2LA (American Association for Laboratory Accreditation) to conform to ISO/IEC 17025: 2005 "General Requirements for the Competence of Calibration and Testing Laboratories". Radiometrics' Lab Code is 121191 and Certification Number is 1495.01. Radiometrics' scope of accreditation includes all of the test methods listed herein. A copy of the accreditation can be accessed on our web site (www.radiomet.com). Radiometrics accreditation status can be verified at A2LA's web site (www.a2la2.org).

The following is a list of shielded enclosures located in Romeoville, Illinois used during the tests:

Chamber E: Is a custom-made anechoic chamber that measures 52' L X 30' W X 18' H. The walls and ceiling are fully lined with RF absorber. Pro-shield of Collinsville, Oklahoma manufactured the chamber. The floor has a 9' x 9' section of microwave absorber for testing above 1 GHz.

Test Station F: Is an area that measures 10' D X 12' W X 10' H. The floor and back wall are metal shielded. This area is used for conducted emissions measurements.

A separate ten-foot long, brass plated, steel ground rod attached via a 6-inch copper braid grounds each of the above chambers. Each enclosure is also equipped with low-pass power line filters.

The FCC has accepted these sites as test site number US1065. The FCC test site Registration Number is 732175. Details of the site characteristics are on file with the Industry Canada as site number IC 3124A-1.

A complete list of the test equipment is provided herein. The calibration due dates are indicated on the equipment list. The equipment is calibrated in accordance to ANSI/NCSL Z540-1 with traceability to the National Institute of Standards and Technology (NIST).



8.0 DEVIATIONS AND EXCLUSIONS FROM THE TEST SPECIFICATIONS

There were no deviations or exclusions from the test specifications.

9.0 CERTIFICATION

Radiometrics Midwest Corporation certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specification and the data contained herein was taken with calibrated test equipment. The results relate only to the EUT listed herein.

10.0 TEST EQUIPMENT TABLE

RMC ID	Manufacturer	Description	Model No.	Serial No.	Frequency Range	Cal Period	Cal Date
AMP-05	RMC/Celeritek	Pre-amplifier	MW110G	1001	1.0-12GHz	12 Mo.	01/10/19
AMP-20	Avantek	Pre-amplifier	SF8-0652	15221	8-18GHz	12 Mo	04/22/19
AMP-59	Amplitech	Pre-amplifier	APTMP44	AMP-59	18-26 GHz	12 Mo.	01/10/19
ANT-08	RMC	Log-Periodic Ant.	LP1000	1002	200-1000MHz	24 Mo.	11/19/18
ANT-13	EMCO	Horn Antenna	3115	2502	1.0-18GHz	24 Mo.	01/16/19
ANT-36	Ailtech (Eaton)	Horn Antenna	96001	2013	1.0-18GHz	24 Mo.	11/19/18
ANT-48	RMC	Std Gain Horn	HW2020	1001	18-26 GHz	36 Mo.	08/09/19
ANT-66	ETS-Lindgren	Horn Antenna	3115	62580	1.0-18GHz	24 Mo.	03/05/19
ANT-80	AH Systems	Bicon Antenna	SAS-540	294	20-330MHz	24 Mo.	12/14/18
CAB-106A	Teledyne	Coaxial Cable	N/A	106A	DC-2 GHz	24 Mo.	05/07/18
CAB-1090	Teledyne	Coaxial Cable	N/A	1090	DC-18 GHz	24 Mo.	02/12/19
CAB-160B	Teledyne	Coaxial Cable	N/A	160B	DC-18 GHz	24 Mo.	05/09/18
CAB-090A	Teledyne	Coaxial Cable	N/A	090A	DC-26 GHz	24 Mo.	05/15/18
CAB-295A	Teledyne	Coaxial Cable	N/A	295A	DC-26 GHz	24 Mo.	05/09/18
HPF-01	Solar	High Pass Filter	7930-100	HPF-1	0.15-30MHz	24 Mo.	03/04/18
REC-11	HP / Agilent	Spectrum Analyzer	E7405A	US39110103	9Hz-26.5GHz	24 Mo	04/02/18
REC-21	Agilent	Spectrum Analyzer	E7405A	MY45118341	9Hz-26.5 GHz	24 Mo.	01/06/18
REC-22	Rohde Schwarz	Spectrum Analyzer	ESIB 26	100145	26.5 GHz	24 Mo	09/16/19
REC-43	Adventest	Spectrum Analyzer	U3772	150800305	9Hz-43GHz	24 Mo.	06/24/19
RNT-17	Agilent	Spectrum Analyzer	E4440A	MY42510244	E4440A	36 Mo.	07/19/17
THM-03	Fluke	Temp/Humid Meter	971	95850465	N/A	12 Mo.	04/30/18

Note: All calibrated equipment is subject to periodic checks.

The test equipment was in calibration during the tests.

Software Company	Test Software Name	Version	Applicable Tests
Radiometrics	RRECE11D	07.16.19	RF Radiated Emissions (FCC Part 15 & EN 55032)
Agilent	PSA/ESA-E/L/EMC	2.4.0.42	Bandwidth and screen shots



11.0 TEST SECTIONS

11.1 Radiated RF Emissions

Radiated Emissions Field Strength Limits

Frequency Range (MHz)	Test Distance (meters)	Class B Limits	
		uV/m	dB(uV/m)
30 - 88	3	100	40.0
88 - 216	3	150	43.5
216 - 960	3	200	46.0
Above 960	3	500	54.0

The emission limits shown in the above table are based on measurements using a CISPR quasi-peak detector except for above 1000 MHz which is based on measurements employing an average detector.

Radiated emission measurements were performed with linearly polarized broadband antennas. The results obtained with these antennas can be correlated with results obtained with a tuned dipole antenna. The radiated emission measurements were performed with a spectrum analyzer. The bandwidth used from 150 kHz to 30 MHz is 9 or 10 kHz and the bandwidth from 30 MHz to 1000 MHz is 100 or 120 kHz. Above 1 GHz, a 1 MHz bandwidth is used. A 10 dB linearity check is performed prior to start of testing in order to determine if an overload condition exists. Figure 4 herein lists the details of the test equipment used during radiated emissions tests.

In addition, a high pass filter was used to reduce the fundamental emission. High pass filters were not needed above 10 GHz, since the preamplifiers attenuated the fundamental emission. The EUT was rotated through three orthogonal axis as per 5.10.1 of ANSI C63.10 during the radiated tests.

Final radiated emissions measurements were performed inside of an anechoic chamber at a test distance of 3 meters. The anechoic chamber is designated as Chamber E. This Chamber meets the Site Attenuation requirements of ANSI C63.4 and CISPR 16-1. Chamber E is located at 12 Devonwood Ave. Romeoville, Illinois EMI test lab.

The entire frequency range from 30 to 25,000 MHz was slowly scanned. Measurements were performed using two antenna polarizations, (vertical and horizontal). The worst case emissions were recorded. All measurements may be performed using either the peak, average or quasi-peak detector functions. If the peak detector data exceeds or is marginally close to the limits, the measurements are repeated using a quasi-peak detector or average function as required by the specification for final determination of compliance. The QP and average detectors have a linear response.

The detected emission levels were maximized by rotating the EUT, adjusting the positions of all cables, and by scanning the measurement antenna from 1 to 4 meters above the ground.

11.1.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and by subtracting the Amplifier Gain from the measured reading. The basic equation is as follows:

$$FS = RA + AF + CF - AG$$

Where: FS = Field Strength in dBuV/m

RA = Receiver Amplitude dBuV

AF = Antenna Factor dB/m

CF = Cable Attenuation Factor dB

AG = Amplifier Gain dB

HPF = High pass Filter Loss dB

**11.1.2 Radiated Emissions Test Results**

Test Date	December 20, 2019 & January 3, 2020
Test Distance	3 Meters
Specification	FCC Part 15 Subpart C & RSS-210 Section B.10
Notes	
Abbreviations	Pol = Antenna Polarization; V = Vertical; H = Horizontal; P = peak; Q = QP
Configuration	Constant transmit mode

This table includes all emissions except Fundamental, Band edge, and harmonics emissions.

Freq. MHz	Meter Reading dBuV	Dect.	Ant. Pol.	Ant Factor dB/m	Cbl/amp Factors	Dist Fact dB	EUT dBuV/m	Limit dBuV/m	Margin Under Limit dB	Note
41.6	9.8	P	H	10.7	0.7	0.0	21.2	40.0	18.8	
73.6	10.0	P	H	9.3	0.9	0.0	20.2	40.0	19.8	
122.8	10.4	P	H	11.8	1.1	0.0	23.3	43.5	20.2	
198.5	10.6	P	H	14.2	1.5	0.0	26.3	43.5	17.2	
213.4	15.3	P	H	14.8	1.5	0.0	31.6	43.5	11.9	
238.8	12.9	P	H	15.2	1.6	0.0	29.7	46.0	16.3	
286.0	10.6	P	H	13.5	1.8	0.0	25.9	46.0	20.1	
349.0	11.7	P	H	14.5	2.0	0.0	28.2	46.0	17.8	
462.4	12.8	P	H	16.6	2.3	0.0	31.7	46.0	14.3	
553.8	11.9	P	H	18.2	2.5	0.0	32.6	46.0	13.4	
653.8	13.6	P	H	19.4	2.7	0.0	35.7	46.0	10.3	
878.8	12.0	P	H	22.3	3.2	0.0	37.5	46.0	8.5	
32.8	10.1	P	V	13.0	0.6	0.0	23.7	40.0	16.3	
78.1	10.0	P	V	9.3	0.9	0.0	20.2	40.0	19.8	
135.5	10.4	P	V	12.4	1.2	0.0	24.0	43.5	19.5	
214.0	10.9	P	V	14.8	1.5	0.0	27.2	43.5	16.3	
239.4	11.3	P	V	15.2	1.6	0.0	28.1	46.0	17.9	
322.0	12.4	P	V	14.2	1.9	0.0	28.5	46.0	17.5	
414.6	13.4	P	V	15.6	2.1	0.0	31.2	46.0	14.8	
458.0	13.5	P	V	16.0	2.3	0.0	31.8	46.0	14.2	
551.3	10.9	P	V	18.0	2.5	0.0	31.4	46.0	14.6	
755.0	10.7	P	V	21.5	2.9	0.0	35.1	46.0	10.9	
976.3	13.2	P	V	22.5	3.4	0.0	39.0	54.0	15.0	

Judgment: Passed by 8.5 dB



Tested by: Joseph Strzelecki/Richard Tichgelaar

Test Date: January 3, 2020

Fundamental and Harmonic Emissions FCC 15.249; Three axis

	Tx	Spectrum Analyzer Readings dBuV									EUT	Peak	Ave	Peak	Ave	Margin
hrm	Freq	Peak				Ave				Corr.	Emission	Tot. FS		Limit		Under
#	MHz	Vertical Polarization				Horizontal Polarization				Fact dB/m	Freq MHz	dBuV/m		dBuV/m		Limit dB
		X	Y	Z	Max	X	Y	Z	Max							
1	2402	91.8	97.0	101.5	81.5	103.5	96.8	97.3	83.5	-4.7	2402.0	98.8	78.8	114	94	15.2
BE	2402	43.5	46.5	51.3	33.9	53.5	48.3	48.4	39.4	-4.7	2400.0	48.8	34.7	74	54	19.3
2	2402	58.2	55.8	55.0	38.2	55.2	57.8	52.6	37.8	3.9	4804.0	62.1	42.1	74	54	11.9
3	2402	42.9	50.0	44.3	30.0	46.7	46.0	48.2	28.2	8.5	7206.0	58.5	38.5	74	54	15.5
4	2402	36.9	36.4	36.2	16.9	33.6	37.0	36.6	17.0	10.8	9608.0	47.8	27.8	74	54	26.2
1	2426	94.6	99.5	103.6	83.6	101.9	99.6	100.6	81.9	-4.6	2426.0	99.0	79.0	114	94	15.0
2	2426	54.1	51.3	53.3	34.1	53.4	56.0	50.1	36.0	4.0	4852.0	60.0	40.0	74	54	14.0
3	2426	45.6	51.6	46.5	31.6	47.9	47.4	48.7	28.7	8.8	7278.0	60.4	40.4	74	54	13.6
4	2426	36.6	36.7	37.0	17.0	36.5	36.2	37.0	17.0	10.5	9704.0	47.5	27.5	74	54	26.5
1	2480	90.7	95.2	100.3	80.3	103.0	97.6	95.7	83.0	-4.7	2480.0	98.3	78.3	114	94	15.7
BE	2480	45.2	50.0	53.4	35.1	55.6	51.2	50.4	40.1	-4.7	2483.5	50.9	35.4	74	54	18.6
2	2480	48.8	53.5	53.6	33.6	53.4	56.0	52.7	36.0	4.2	4960.0	60.2	40.2	74	54	13.8
3	2480	44.1	48.8	45.7	28.8	44.4	45.9	45.8	25.9	9.4	7440.0	58.2	38.2	74	54	15.8
4	2480	36.6	37.9	37.7	17.9	36.4	37.6	36.8	17.6	10.3	9920.0	48.2	28.2	74	54	25.8
Column numbers (see below for explanations)																
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Column #1. hrm = Harmonic; BE = Band Edge emissions

Column #2. Frequency of Transmitter.

Column #3. Uncorrected readings from the spectrum analyzer with First Axis Rotation.

Column #4. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.

Column #5. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.

Column #6. Maximum Average Reading based on peak reading reduced by the Duty cycle correction

Column #7. Uncorrected readings from the spectrum analyzer with First Axis Rotation.

Column #8. Uncorrected readings from the spectrum analyzer with Second Axis Rotation.

Column #9. Uncorrected readings from the spectrum analyzer with Third Axis Rotation.

Column #10. Average Reading based on peak reading reduced by the Duty cycle correction

Column #11. Corr. Factors = Cable Loss – Preamp Gain + Antenna Factor

Column #12. Frequency of Tested Emission

Column #13. Highest peak field strength at listed frequency.

Column #14. Highest Average field strength at listed frequency.

Column #15. Peak Limit.

Column #16. Average Limit.

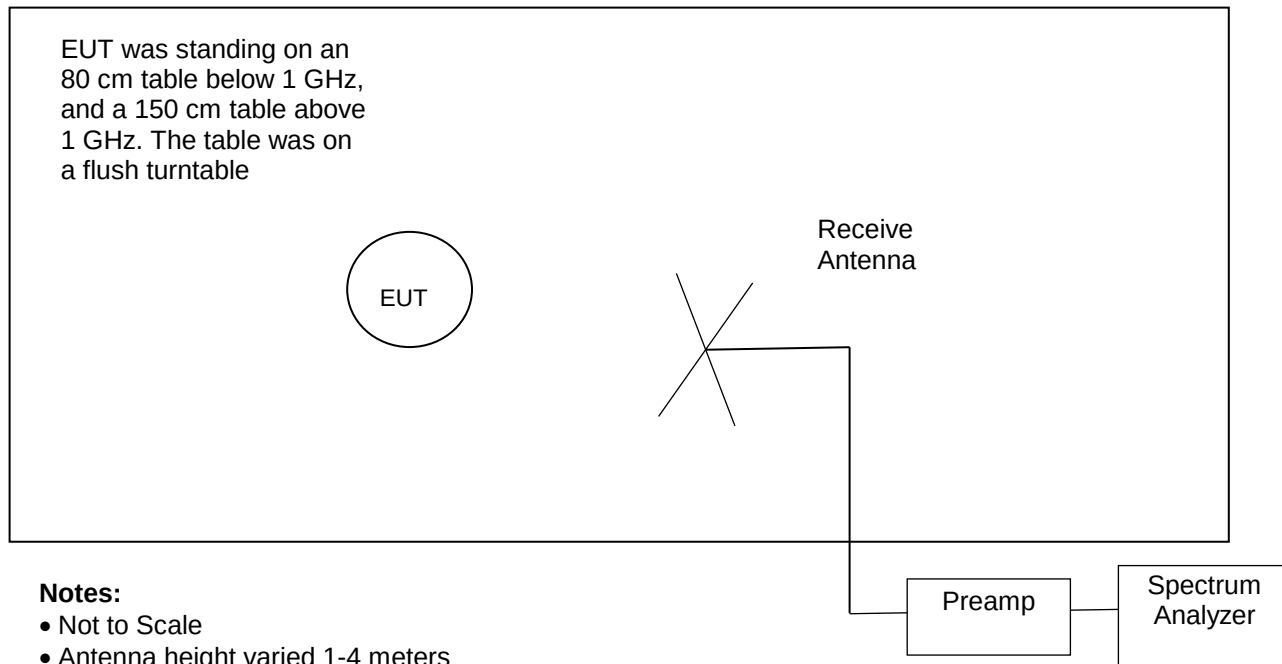
Column #17. The margin (last column) is the worst case margin under the peak or average limits for that row.

Overall Judgment: Passed by 8.5 dB

No other Emissions were detected from 30 to 25,000 MHz within 10 dB of the limits.

**Figure 1. Drawing of Radiated Emissions Setup**

Chamber E, anechoic



Frequency Range	Receive Antenna	Pre-Amplifier	Spectrum Analyzer	High Pass Filter
30 to 200 MHz	ANT-80	AMP-22	REC-11	None*
200 to 1000 MHz	ANT-08	AMP-22	REC-11	None*
1 to 10 GHz	ANT-66	AMP-05	REC-21	HPF-06
10 to 18 GHz	ANT-66	AMP-20	REC-21	None*
18 to 25 GHz	ANT-48	AMP-59	RNT-17	None*

* A high pass filter was not needed since the fundamental frequency was outside of the amplifiers pass band.

11.2 Occupied Bandwidth Data

The occupied bandwidth of the RF output was measured using a spectrum analyzer. The bandwidth was measured using the peak detector function. The spectrum analyzer was set to the MAX HOLD mode to record the worst case of the modulation. The marker-to-peak function was set to the peak of the emission. Then the marker-delta function was used to measure 20 dB down one side of the emission. The marker-delta function was reset and then moved to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the bandwidth of the emission. The plots of the occupied bandwidth for the EUT are supplied on the following pages.

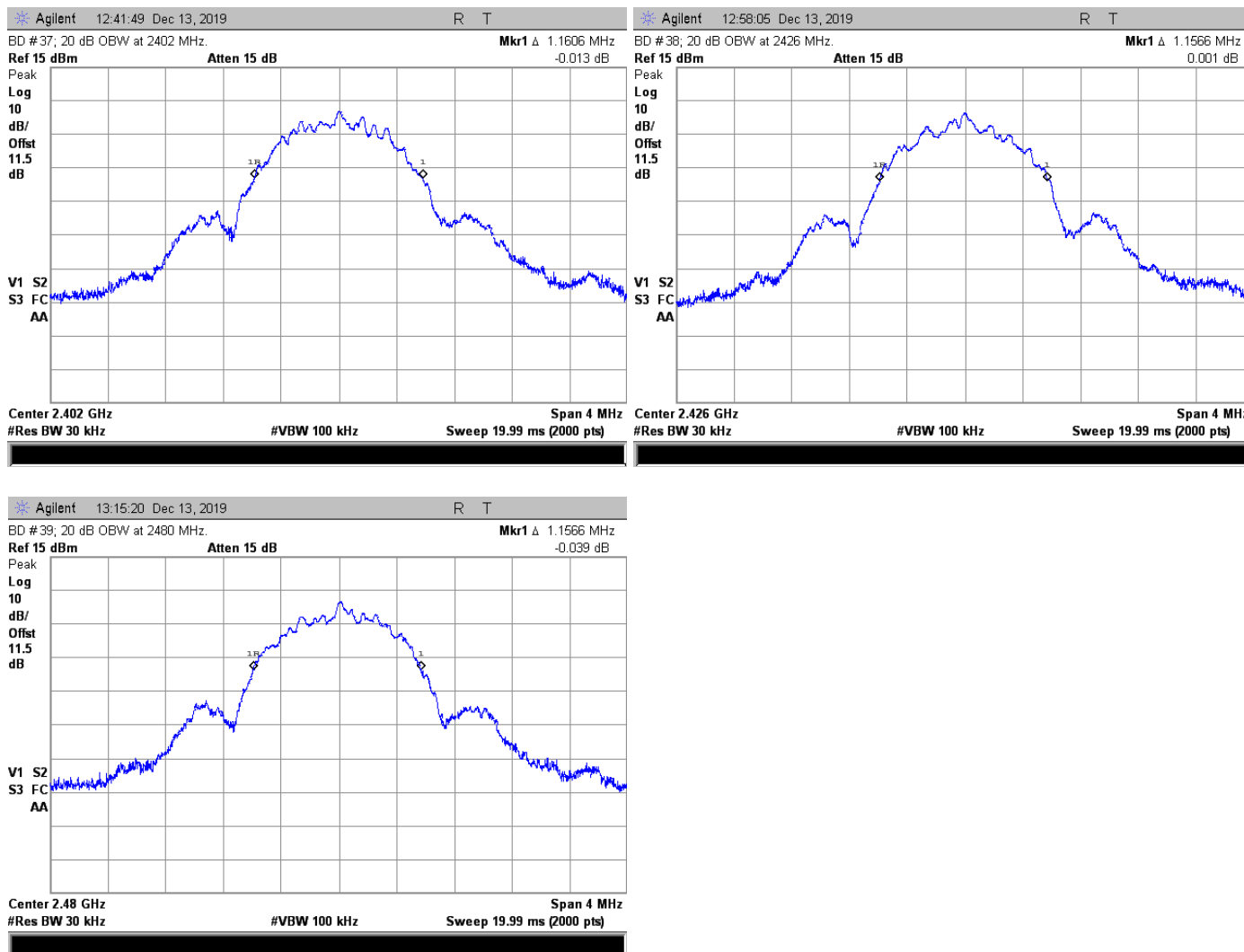
The 20 dB OBW is within the allowed 2400 to 2483.5 MHz authorized band.

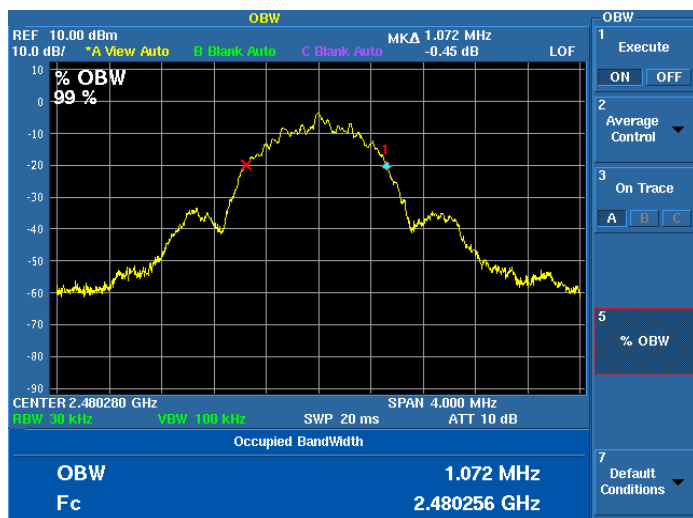


Channel	20 dB OBW MHz	99% EBW MHz
2402	1.1606	1.060
2426	1.1566	1.084
2480	1.1566	1.072

Judgement: Pass

Figure 2. Occupied Bandwidth Plot





11.3 Duty Cycle

The average value of the pulsed emissions were measured as per section 7.5, formula (10) of ANSI C63.10-2013.

- The EUT was set to the “worst-case” pulse ON time.
- The RF output was coupled to the input of a spectrum analyzer by a “near-field” coupling method. The signal received shall be of sufficient level to trigger adequately the spectrum analyzer sweep display.
- The center frequency of the spectrum analyzer was set to the center of the RF signal.
- The spectrum analyzer was set for ZERO SPAN.
- The sweep time of the analyzer was set to 100 ms and other times to show the duty cycle.
- Since the pulse train has a period that exceeds 100 ms, or as an alternative to step f), then:
 - The trigger on the spectrum analyzer was set to capture the greatest amount of pulse “ON time” over 100 ms.
 - The 100 ms period that contains the maximum “on time” was found.
 - The duty cycle was determined by dividing the total maximum “ON time” by 100 ms ($t_{ON}/100$ ms).
- The duty cycle correction factor was used applying Equation (10) of ANSI C63.10 to the duty cycle determined in the preceding steps.



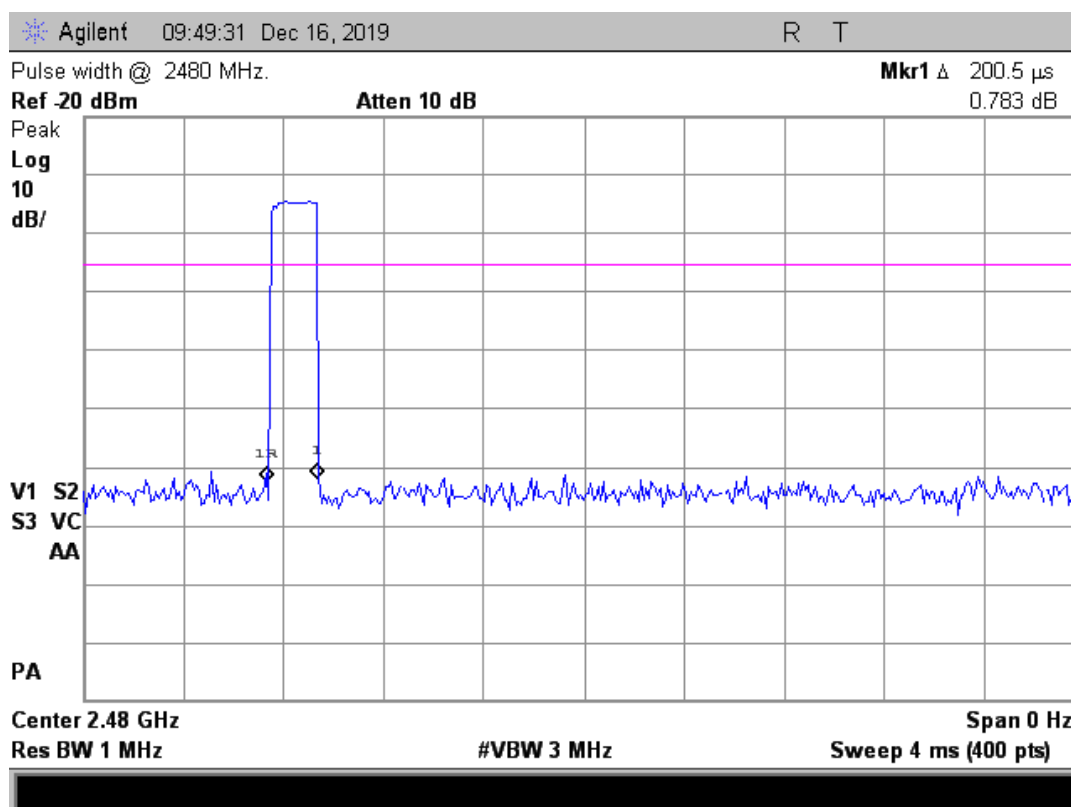
The Peak to average factor is calculated by the highest duty cycle in percent over any 100mS transmission. The factor in dB is $20 * \text{Log}(\text{Duty cycle}/100)$. The transmitter operates for a maximum duration of 0.2 ms in any 100 ms interval for a 0.2% maximum duty cycle. $20 \text{ Log}(0.2\text{mSec}/100\text{mSec}) = -54 \text{ dB}$ Peak to average Correction factor.

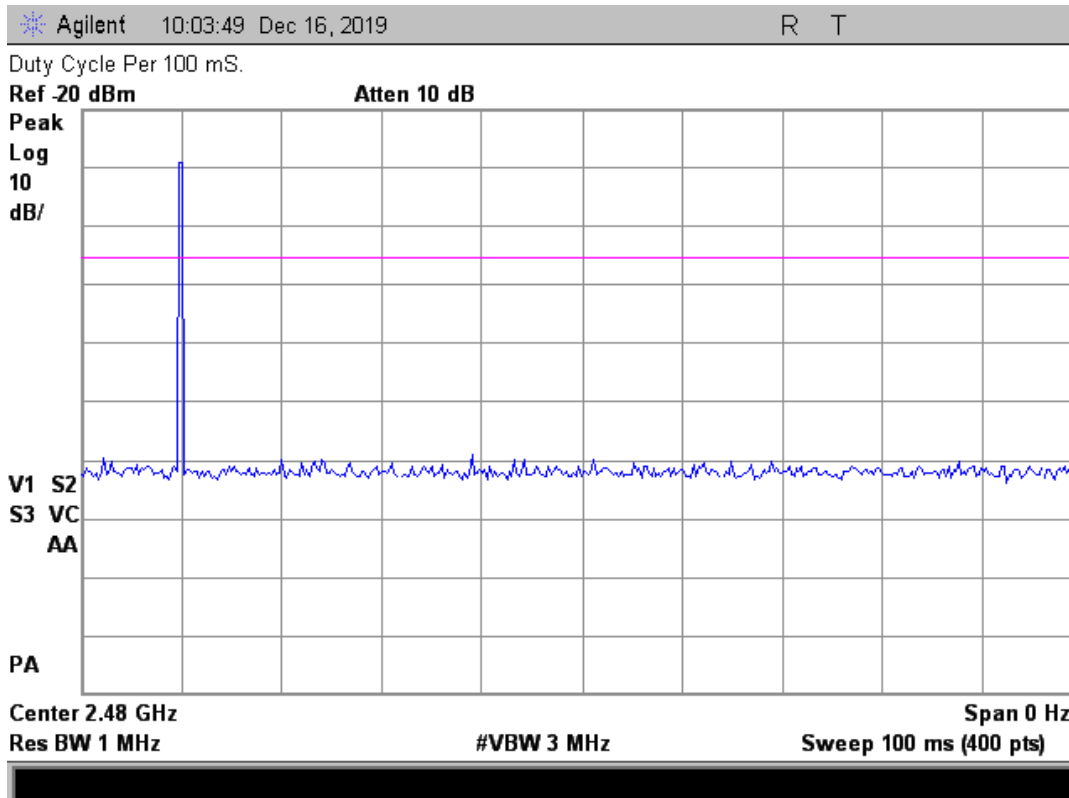
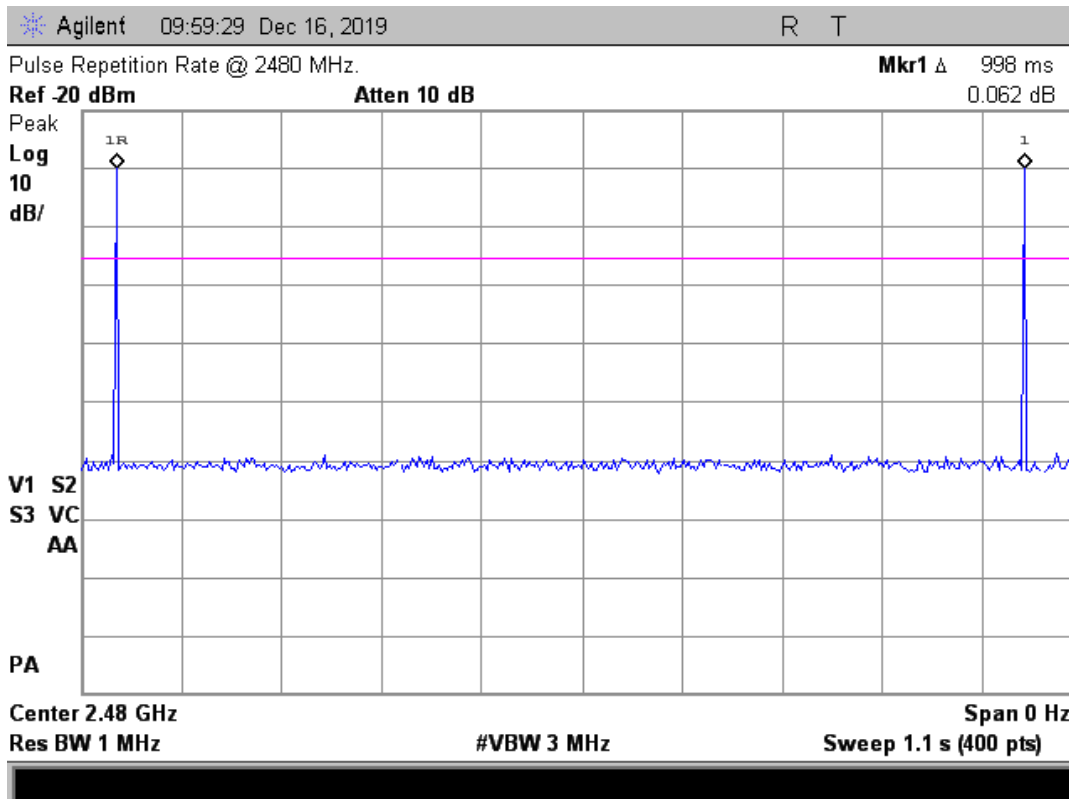
Since the difference between the peak and the average limits are 20 dB, there is no need to use a correction factor of more than 20 dB. Therefore, a 20 dB factor was used.

Tested by: Richard Tichgelaar

Test Date: December 16, 2019

Figure 3. Duty Cycle Plots







11.4 Peak Output Power

The test procedures were in accordance to FCC DTS Measurement Guideline 558074 D01 & ANSI C63.10-2013 section 11.9.1.2. The EUT antenna port was connected to the Spectrum analyzer Via a low loss coaxial cable. The trace was allowed to stabilize. The indicated level is the peak output power. Since the gain of the antenna is always less than 6 dB, the limit is not reduced.

The spectrum analyzer was set to peak channel power. The EUT antenna port was connected to the Spectrum analyzer Via a low loss coaxial cable. The analyzer was corrected for the attenuator and cable loss. Span = 30 MHz; RBW = 3 MHz; VBW = 10 MHz

Tested by: Joseph Strzelecki/Richard Tichelaar

Test Date: 12/13/2019

Mode	Freq. (MHz)	Total Power (dBm)	
		dBm	Watts
802.11b	2402	3.86	0.00243
802.11b	2426	4.08	0.00256
802.11b	2480	3.73	0.00236

Overall Test result: N/A

This is for informational purposes only. It is needed for RF exposure

11.4.1 Measurement Instrumentation Uncertainty

Measurement	Uncertainty
Radiated Emissions, E-field, 3 meters, 30 to 200 MHz	4.7 dB
Radiated Emissions, E-field, 3 meters, 200 to 1000 MHz	6.2 dB
Radiated Emissions, E-field, 3 meters, 1 to 6 GHz	5.0 dB
Radiated Emissions, E-field, 3 meters, 6 to 18 GHz	5.5 dB
Radiated Emissions, E-field, 3 meters, 18 to 26 GHz	5.9 dB
99% Occupied Bandwidth using REC-43	1% of frequency span
Temperature THM-02	0.6 Deg C

The uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2 in accordance with CISPR 16-4-2.

12.0 REVISION HISTORY

Document RP-9206 Revisions:			
Rev.	Affected Sections	Description	Rationale