Measurement of RF Emissions from a GWWCP / OWWCP Wireless Wall Console Transmitter

For	Genie Company One Door Drive Mount Hope, OH 44660
P.O. Number	921434
Date Tested	July 20, 2018 and July 23, 2018
Test Personnel	Mark Longinotti
Test Specification	FCC "Code of Federal Regulations" Title 47 Part15, Subpart C Innovation, Science and Economic Development Canada RSS-GEN Innovation, Science and Economic Development Canada RSS-210

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Approved By: Raymond J Klouda

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REVISION HISTORY

Revision	Date	Description
—	24 July 2018	Initial release

Measurement of RF Emissions from a Wireless Wall Console, Model No. GWWCP / OWWCP Transmitter

1. INTRODUCTION

1.1. Scope of Tests

This report presents the results of the RF emissions measurements performed on a Wireless Wall Console, Model No. GWWCP / OWWCP, Serial No. None Assigned, (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was designed to transmit at approximately 315MHz and 390MHz using a PCB loop antenna. The EUT was manufactured and submitted for testing by Genie Company located in Mount Hope, OH.

1.2. Purpose

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.231 for Intentional Radiators. Testing was performed in accordance with ANSI C63.4-2014.

The test series was also performed to determine if the EUT meets the conducted and radiated RF emission requirements of the Innovation, Science and Economic Development Canada RSS-Gen Section 8.8 and Innovation, Science and Economic Development Canada RSS-210, Annex A for momentarily operated transmitters. Testing was performed in accordance with ANSI C63.4-2014.

1.3. Deviations, Additions and Exclusions

There were no deviations, additions to, or exclusions from the test specification during this test series.

1.4. EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by The American Association for Laboratory Accreditation (A2LA). A2LA Certificate Number: 1786.01.

1.5. Laboratory Conditions

The temperature at the time of the test was 23^{o}C and the relative humidity was 45%.

2. APPLICABLE DOCUMENTS

The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart C
- ANSI C63.4-2014, "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"
- Innovation, Science and Economic Development Canada, Spectrum Management and Telecommunications, Radio Standards Specification, RSS-Gen, “General Requirements for Compliance of Radio Apparatus”, Issue 5, April 2018
- Innovation, Science and Economic Development Canada, Spectrum Management and Telecommunications, Radio Standards Specification, RSS-210, Issue 9, August 2016

3. EUT Setup and Operation

3.1. General Description

The EUT is a Genie Company, Wireless Wall Console, Model No. GWWCP / OWWCP. A block diagram of the EUT setup is shown as Figure 1. A photograph of the EUT is shown as Figure 2.

3.1.1. Power Input

The EUT obtained 3VDC from two (2) internal “AAA” batteries.

3.1.2. Peripheral Equipment

The EUT was submitted for testing with no peripheral equipment.

3.1.3. Signal Input/Output Leads

The EUT was submitted for testing with no interconnect cables.

3.1.4. Grounding

The EUT was not grounded during testing.

3.2. Software

For all tests the EUT had Firmware Version WWC-_V0-17_A loaded onto the device to provide correct load characteristics.

3.3. Operational Mode

For all tests the EUT and all peripheral equipment were placed on a non-conductive stand. The EUT and all peripheral equipment were energized. The EUT was programmed so that when the button on the EUT was pushed, it would begin continuously transmitting at 315MHz. When the button was pushed a second time, it would begin transmitting continuously at 390MHz.

3.4. EUT Modifications

No modifications were required for compliance to the FCC requirements or the Innovation, Science and Economic Development Canada requirements.

4. Test Facility and Test Instrumentation

4.1. Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.

4.3. Calibration Traceability

Test equipment is maintained and calibrated on a regular basis with a calibration interval not greater than two years. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4. Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

Values of Expanded Measurement Uncertainty (95% Confidence) are presented below:

Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2

5. TEST PROCEDURES

5.1. Powerline Conducted Emissions

5.1.1. Requirements

Since the EUT is powered by internal batteries and has no connections for AC power, no conducted emissions tests are required.

5.2. Periodic Operation Measurements

5.2.1. Requirements

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

5.2.2. Procedures

The spectrum analyzer was set up to display the time domain trace. The EUT was set to transmit normally. The spectrum analyzer was used to record the amount of time that the EUT remained active following activation.

5.2.3. Results

315MHz:
The plot of the periodic timing is shown on data page 16. The data shows that the EUT ceases operation within the allotted time.

390MHz:
The plot of the periodic timing is shown on data page 17. The data shows that the EUT ceases operation within the allotted time.

5.3. Duty Cycle Factor Measurements

5.3.1. Procedures

The duty cycle factor is used to convert peak detected readings to average readings. This factor is computed from the time domain trace of the pulse modulation signal.

With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The duration of the “wide pulses” and “narrow pulses” are measured by setting the markers to the beginning and end of each pulse. Then the number of “narrow pulses” and “wide pulses” in

each word are counted. The total On-Time is calculated by multiplying the number of “narrow pulses” by the duration of the “narrow pulses” then adding that to the number of “wide pulses” multiplied by the duration of the “wide pulses”. If the word period exceeds 100 msec the word period is set to 100 msec. The duty cycle correction factor is calculated using the following formula:

- Duty Cycle Correction Factor (dB) = 20 * log (On-Time/100msec)

5.3.2.Results

315MHz:
The plots of the duty cycle are shown on data pages 18 through 21. The duty cycle factor was computed to be -12.9 dB.

390MHz:
The plots of the duty cycle are shown on data pages 22 through 25. The duty cycle factor was computed to be -12.9 dB.

5.4. Radiated Measurements

5.4.1.Requirements

The EUT must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.209(a) and RSS-210 Annex A Table A1:

Fundamental Frequency MHz	Field Intensity uV/m @ 3 meters	Field Strength Harmonics and Spurious @ 3 meters
260 to 470	3,750 to 12,500*	375 to 1,250*

* - Linear Interpolation

*Example For 390MHz, the limit at the fundamental is 9166.7uV/m @ 3m and the limit on the harmonics is 916.7uV/m @ 3m.

In addition, emissions appearing in the Restricted Bands of Operation listed in FCC “Code of Federal Regulations Title 47”, Part 15, Subpart C section 15.205(a) and RSS-Gen Table 7 shall not exceed the general requirements shown in paragraph 15.209.

5.4.2.Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

The field strengths of all emissions below 1 GHz were measured using a bi-log antenna. The bi-log antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.

The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.

A preliminary radiated emissions test was performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 4.0GHz was investigated using a peak detector function. The data was then processed by the computer to calculate equivalent field intensity.

The final radiated emission tests were then manually performed over the frequency range of 30MHz to 4000MHz. Between 30MHz and 1000MHz, a bi-log antenna was used as the pick-up device. A broadband double ridged waveguide antenna was used as the pick-up device for all frequencies above 1GHz. All significant broadband and narrowband signals were measured and recorded. The peak detected levels were converted to average levels using a duty cycle factor which was computed from the pulse train.

To ensure that maximum or worst case, emission levels were measured, the following steps were taken:

1) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
2) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
3) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

5.4.3.Results

315MHz:

The preliminary plots, with the EUT transmitting at 315MHz, are presented on data pages 26 through 29. The plots are presented for reference only and are not used to determine compliance. The final open area radiated levels, with the EUT transmitting at 315MHz, are presented on data page 30. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 315MHz. The emissions level at this frequency was 10.4dB within the limit. See data page 30 for details. Photographs of the test configuration which yielded the highest or worst case radiated emission levels are shown in Figures 3 and 4.

390MHz:

The preliminary plots, with the EUT transmitting at 390MHz, are presented on data pages 31 through 34. The plots are presented for reference only and are not used to determine compliance. The final open area radiated levels, with the EUT transmitting at 390MHz, are presented on data page 35. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 1170MHz. The emissions level at this frequency was 3.9dB within the limit. See data page 35 for details. Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown in Figures 3 and 4.

5.5. Occupied Bandwidth Measurements

5.5.1.Requirement

In accordance with FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.209(a) and RSS-210 Annex A, Section A.1.3, all emissions within 20dB of the peak amplitude level of the center frequency are required to be within a band less than 0.25% of the center frequency wide.

5.5.2.Procedures

The EUT was placed on an 80cm high non-conductive stand. The unit was set to transmit continuously. With an antenna positioned nearby, occupied bandwidth emissions were displayed on the spectrum analyzer. The resolution bandwidth was set to 30 kHz and span was set to 4 MHz. The frequency spectrum near the fundamental was plotted.

5.5.3.Results

The plots of the emissions near the fundamental frequency are presented on pages 36 and 37. As can be seen from these data pages, the transmitter met the occupied bandwidth requirements. The 99% bandwidth was measured to be 136 kHz.

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated. The test series was witnessed by Genie Company personnel.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to Genie Company upon completion of the tests.

7. CONCLUSIONS

It was determined that the Genie Company Wireless Wall Console, Model No. GWWCP / OWWCP, Serial No. None Assigned, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.231 for Intentional Radiators when tested per ANSI C63.4-2014.

It was also determined that the Genie Company Wireless Wall Console, Model No. GWWCP / OWWCP, Serial No. None Assigned did fully meet the conducted and radiated emission requirements of the Innovation, Science and Economic Development Canada RSS-Gen Section 8.8 and Innovation, Science and Economic Development Canada RSS-210, Annex A for momentarily operated transmitters when tested per ANSI C63.4-2014.

8. CERTIFICATION

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

The data presented in this test report pertains to the EUT at the test date as operated by Genie Company personnel. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST or any agency of the Federal Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
CDY0	WORKSTATION	ELITE	WORKSTATION		WINDOWS 7	N/A	
NTA4	BILOG ANTENNA	TESEQ	6112D	46660	20-2000GHZ	8/18/2017	8/18/2018
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/10/2018	4/10/2020
PHA0	MAGNETIC FIELD PROBE	ELECTRO-METRICS	EM-6882	134	22-230MHZ	NOTE 1	
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	2/20/2018	2/20/2019

I/O: Initial Only
N/A: Not Applicable
Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

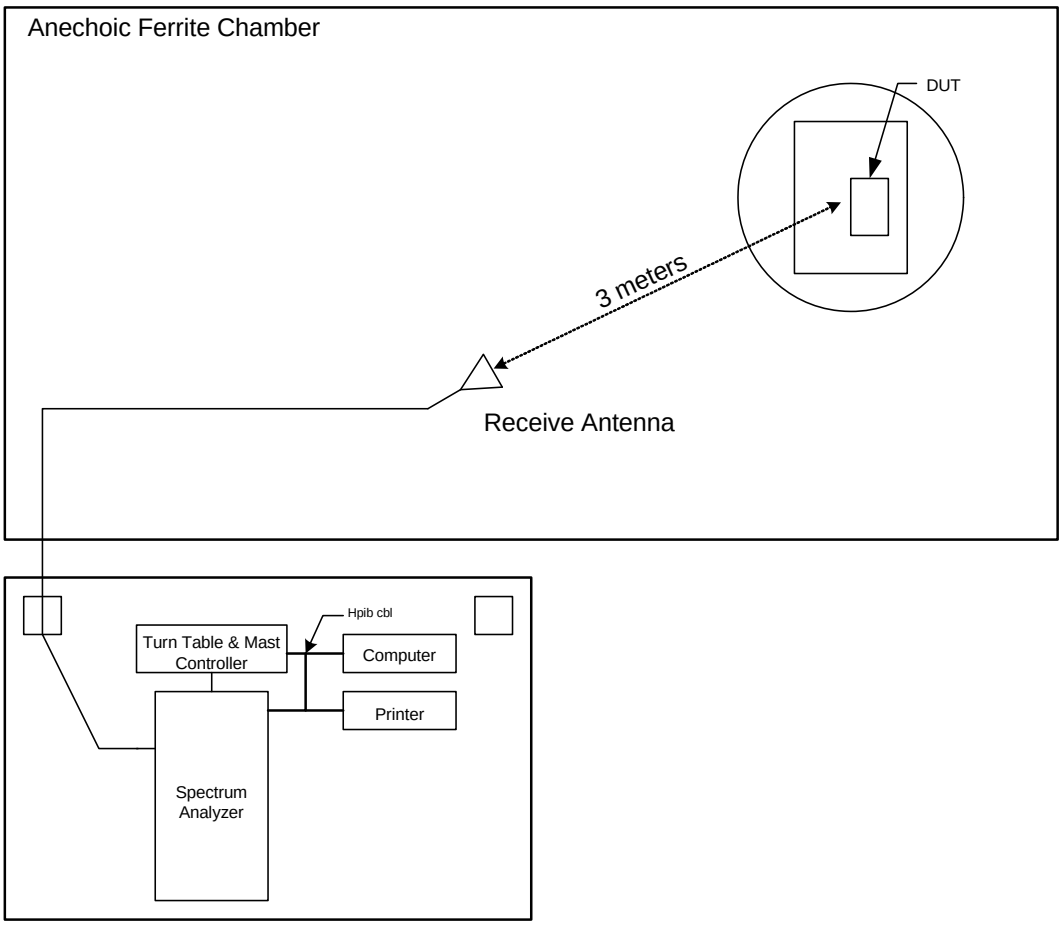


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

Photograph of the EUT

Figure 3

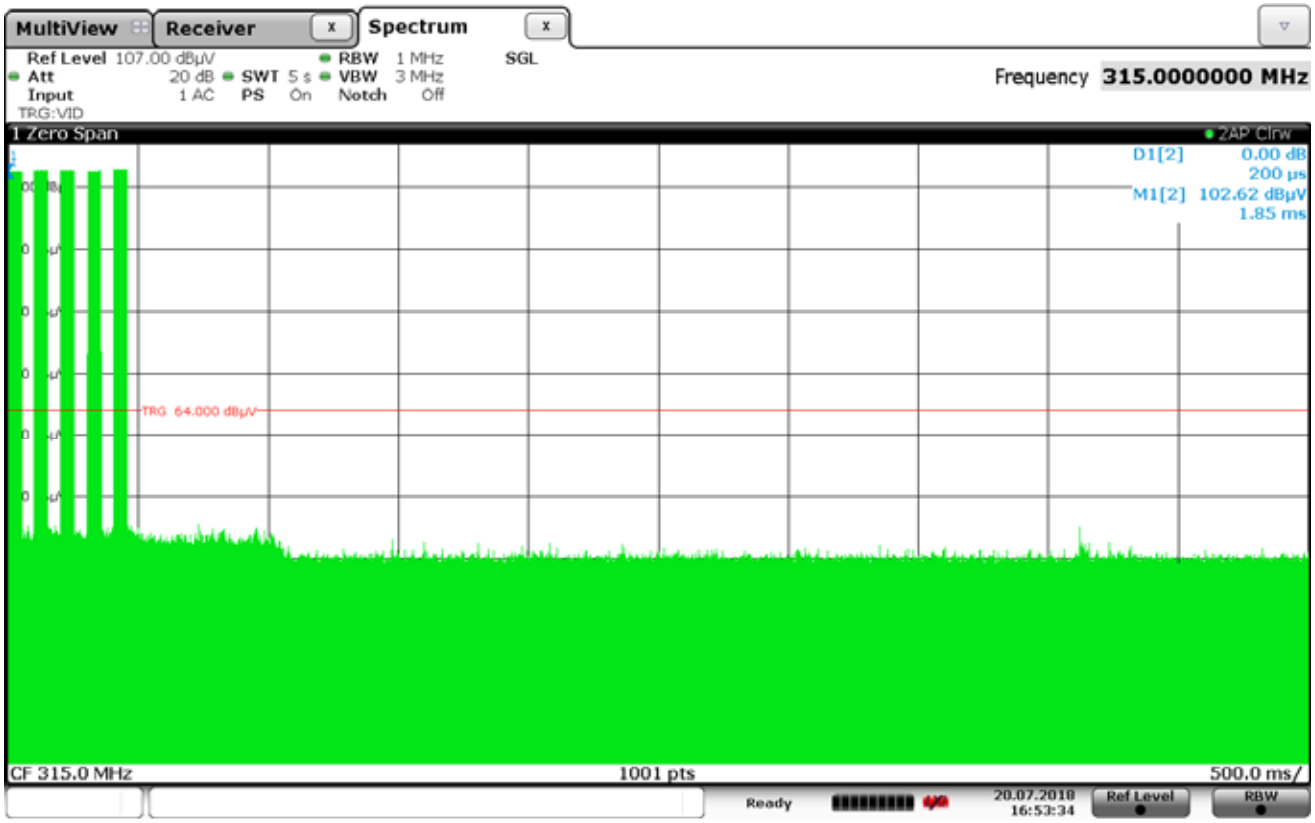
Test Setup for Radiated Emissions, 30MHz to 1GHz – Horizontal Polarization

Test Setup for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 4

Test Setup for Radiated Emissions above 1GHz – Horizontal Polarization

Test Setup for Radiated Emissions above 1GHz – Vertical Polarization



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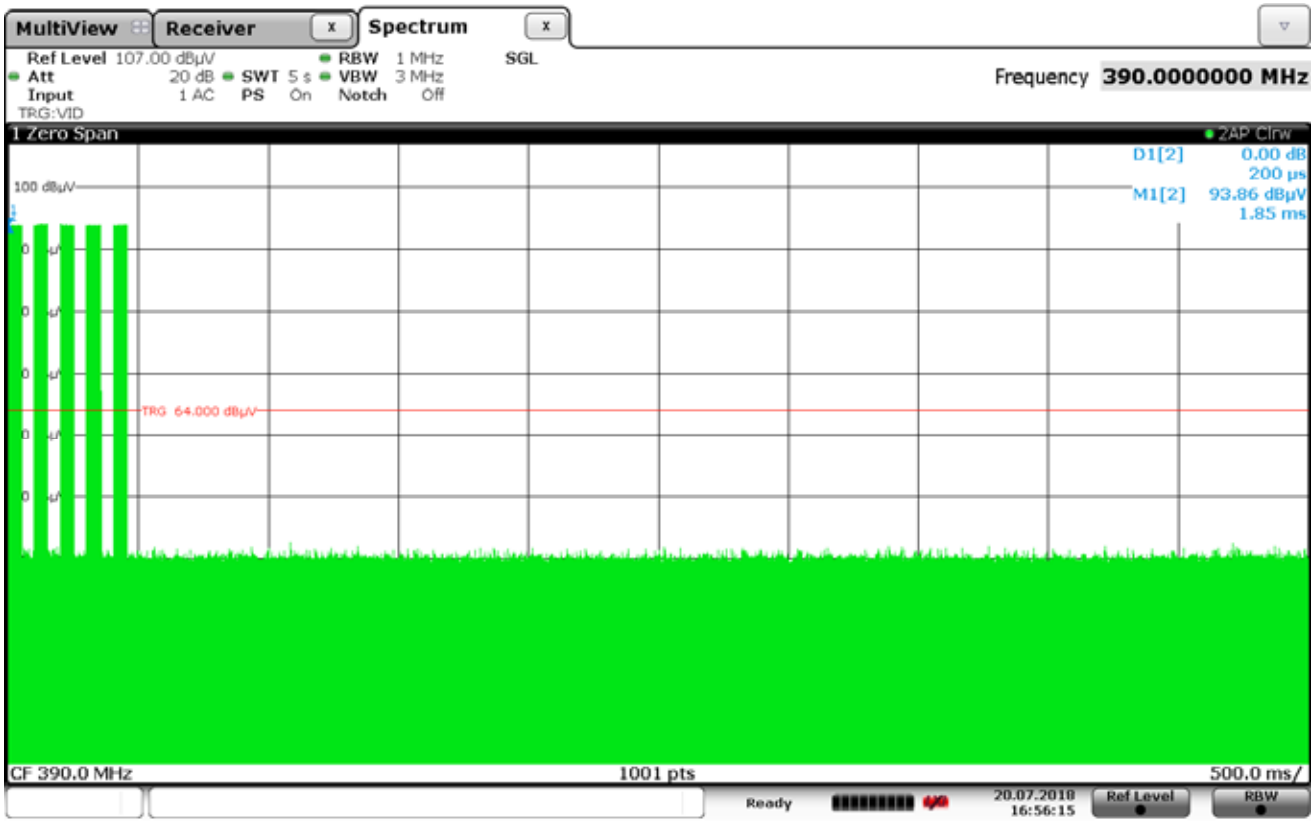
FCC 15.231(a)(1) and RSS-210 Annex A A.1.1(a) Momentary Operation

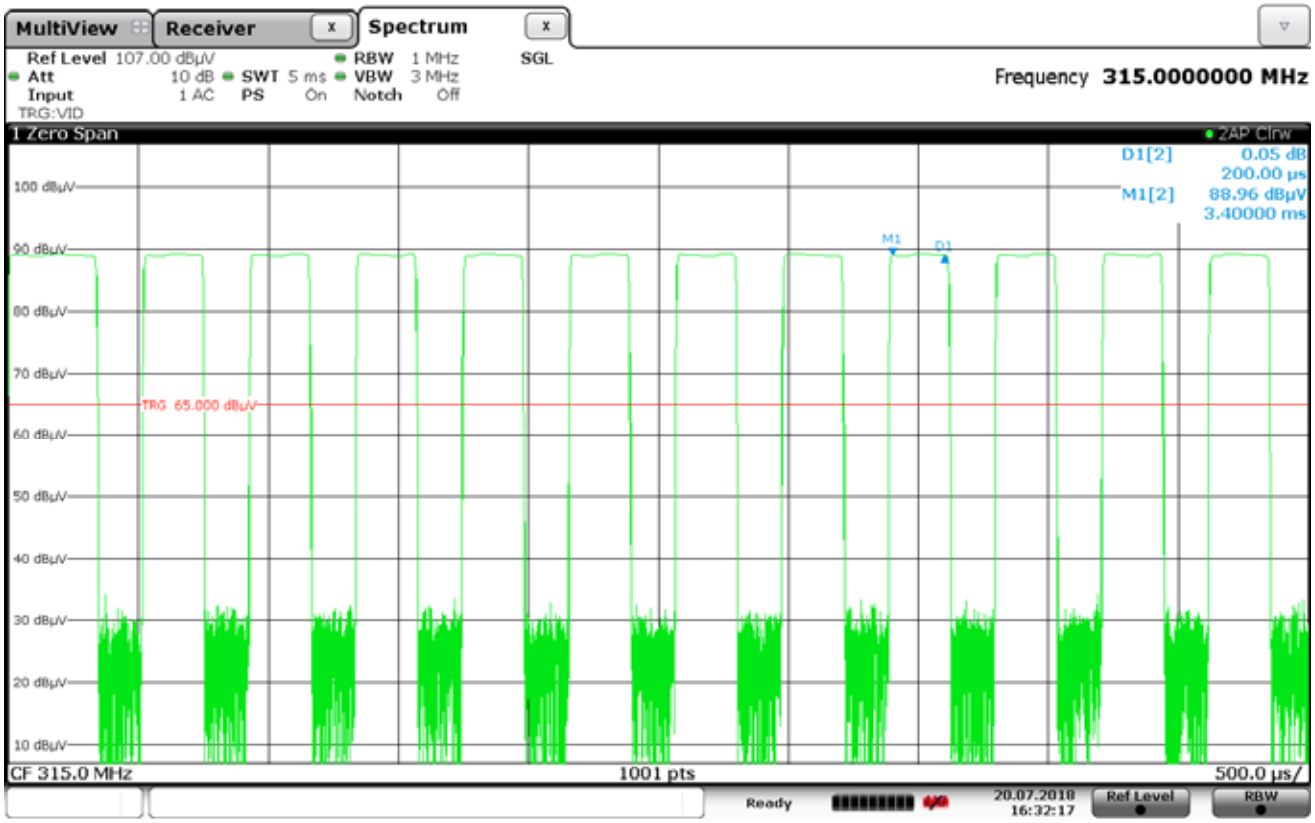
MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 315MHz
TEST PARAMETERS	:	Momentary Operation
NOTES	:	A manually operated transmitter shall be equipped with a push-to-operate switch
	:	and be under manual control at all times during transmission. When released, the
	:	transmitter shall cease transmission within no more than 5 seconds of being
	:	released



Date: 20.JUL.2018 16:56:15

FCC 15.231(a)(1) and RSS-210 Annex A A.1.1(a) Momentary Operation

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 390MHz
TEST PARAMETERS	:	Momentary Operation
NOTES	:	A manually operated transmitter shall be equipped with a push-to-operate switch
	:	and be under manual control at all times during transmission. When released, the
	:	transmitter shall cease transmission within no more than 5 seconds of being
	:	released



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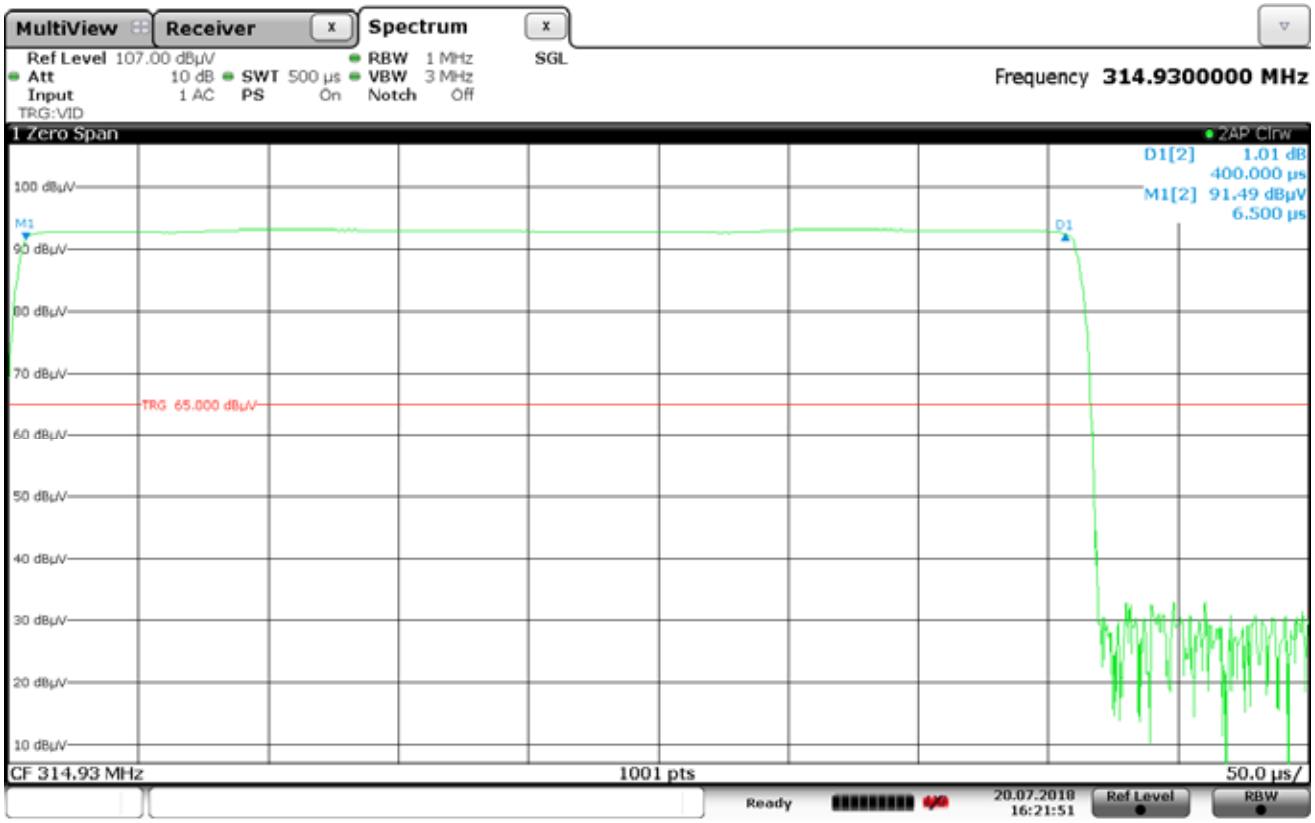
FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 315MHz
TEST PARAMETERS	:	Narrow Pulse Width
NOTES	:	Narrow Pulse width = 200usec



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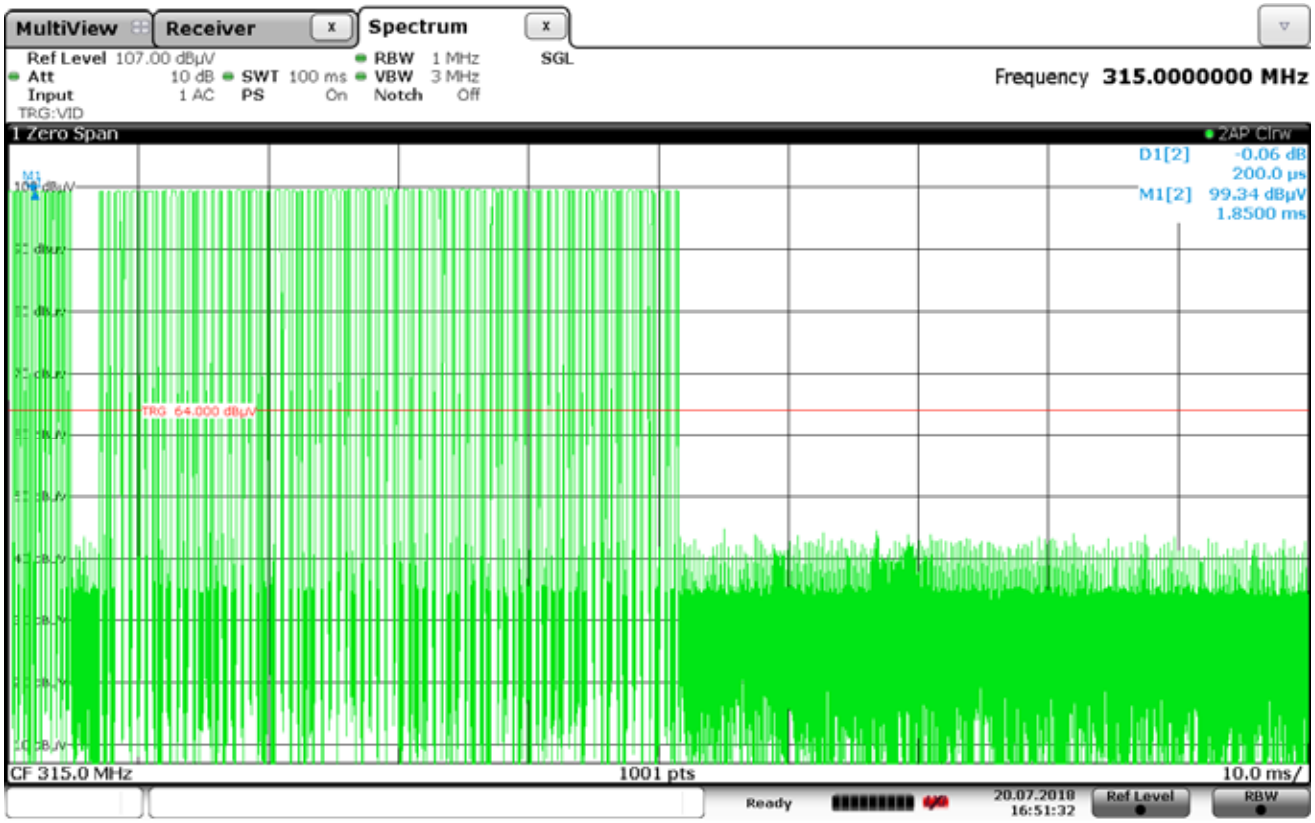
FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 315MHz
TEST PARAMETERS	:	Wide Pulse Width
NOTES	:	Wide Pulse Width = 400usec

Date: 20.JUL.2018 16:20:00

FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 315MHz
TEST PARAMETERS	:	Number of Pulses
NOTES	:	Preamble: 1 long pulse and 11 short pulses
	:	Word: 33 long pulses and 34 short pulses



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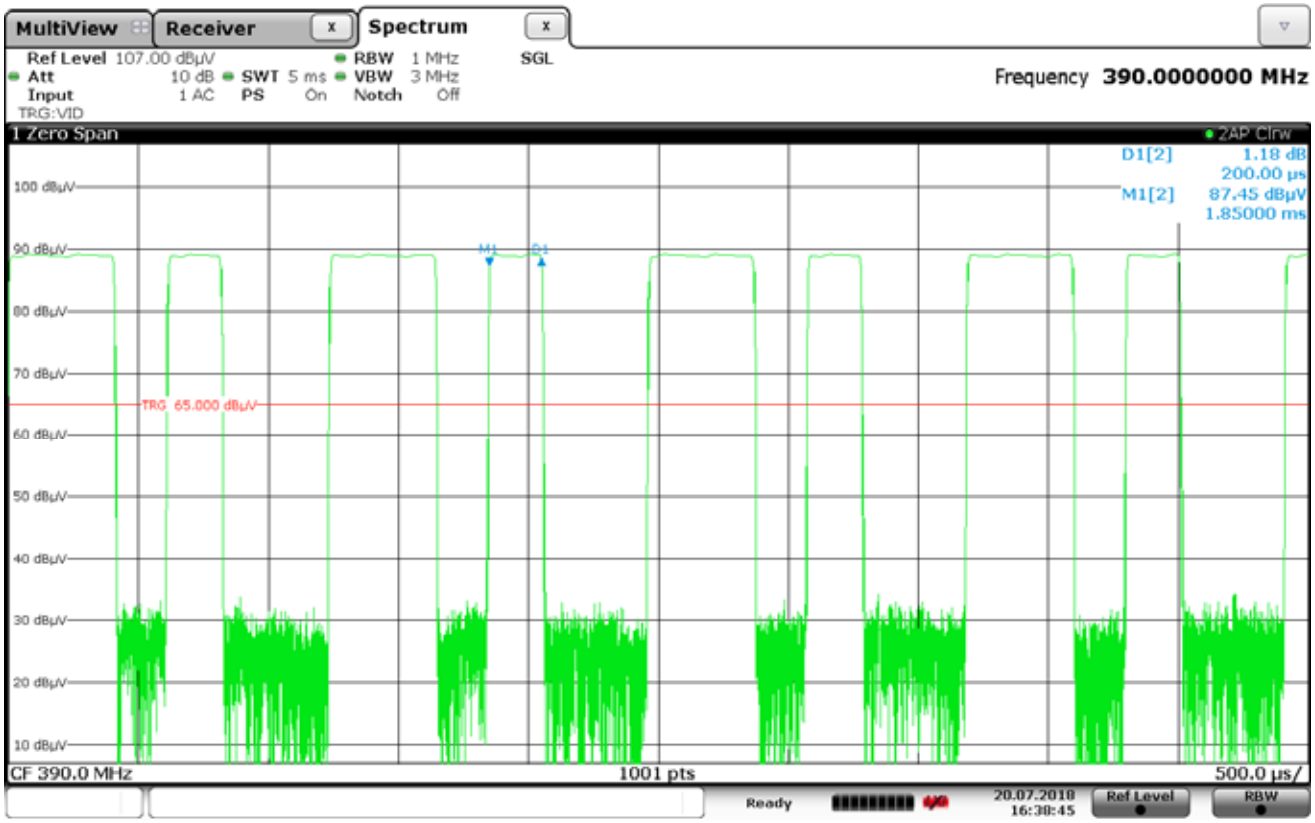
FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 315MHz
TEST PARAMETERS	:	Duty Cycle Correction Factor
NOTES	:	Preamble: 1 long pulse and 11 short pulses
	:	Word: 33 long pulses and 34 short pulses
	:	Total: 34 long pulses and 45 short pulses
	:	Duty Cycle Correction Factor = 20xlog((#short pulses)x(short pulse length) + (#long
	:	pulses)x(long pulse length))/100
	:	Duty Cycle Correction Factor = 20xlog((45)x (200usec) + (34)x(400usec)/100)
	:	Duty Cycle Correction Factor = 20 x log((9.0msec) + (13.6msec))/100msec
	:	Duty Cycle Correction Factor = -12.9dB



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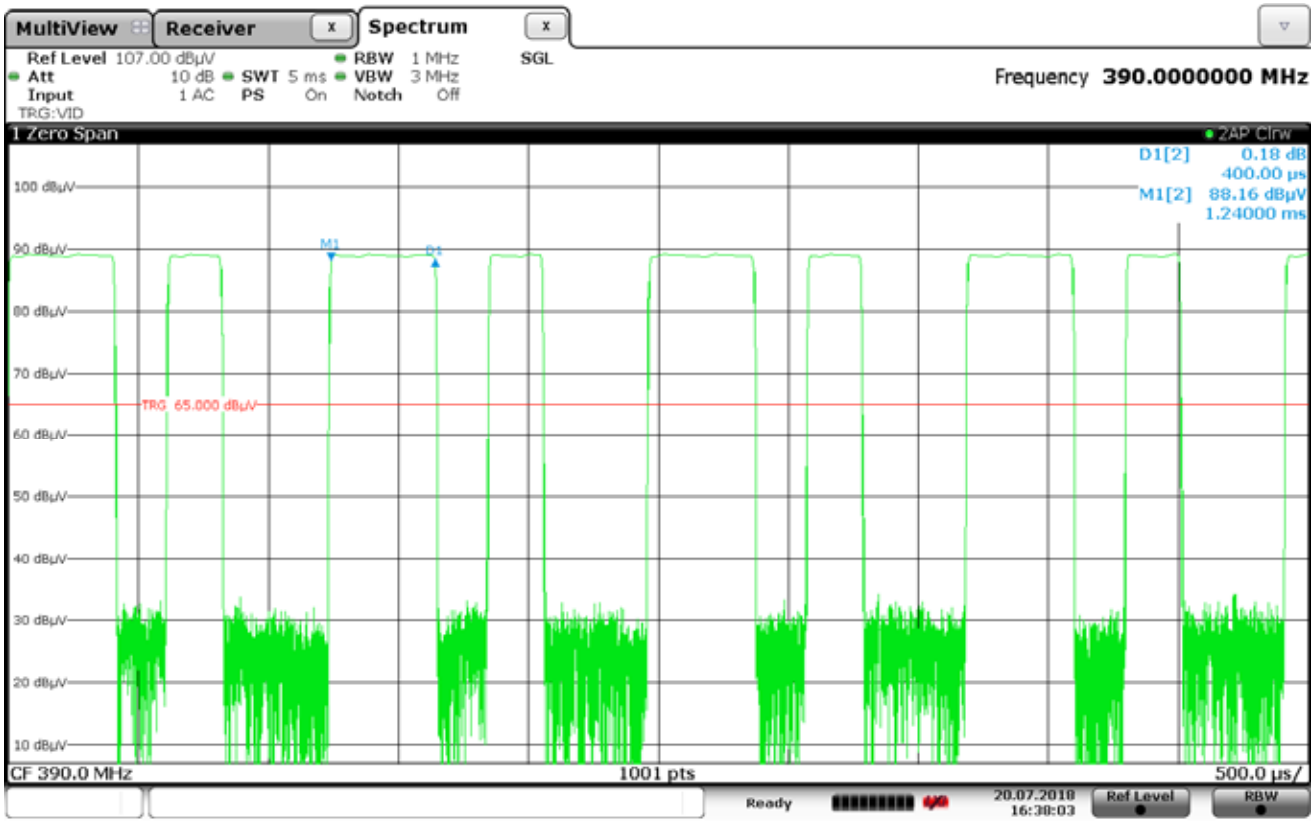
FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 390MHz
TEST PARAMETERS	:	Narrow Pulse Width
NOTES	:	Narrow Pulse width = 200usec



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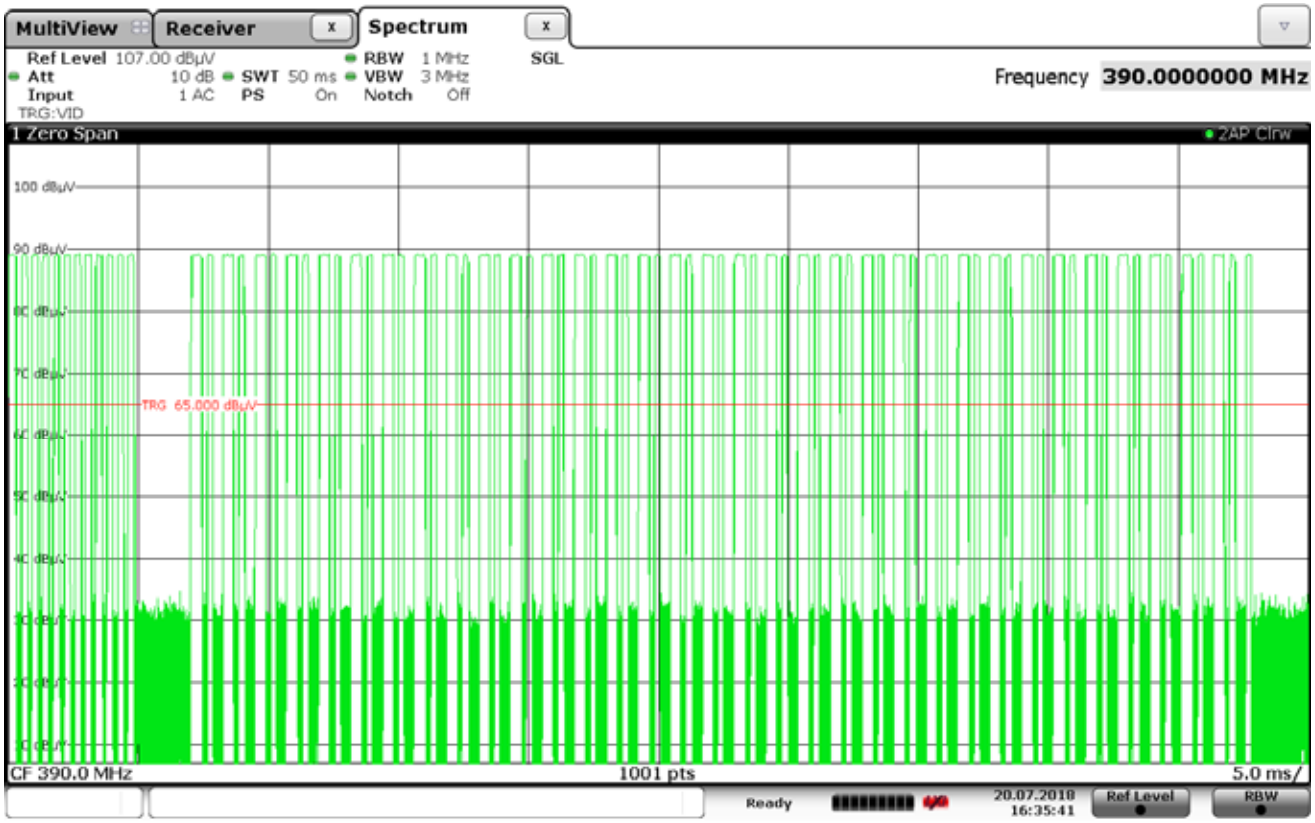
FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

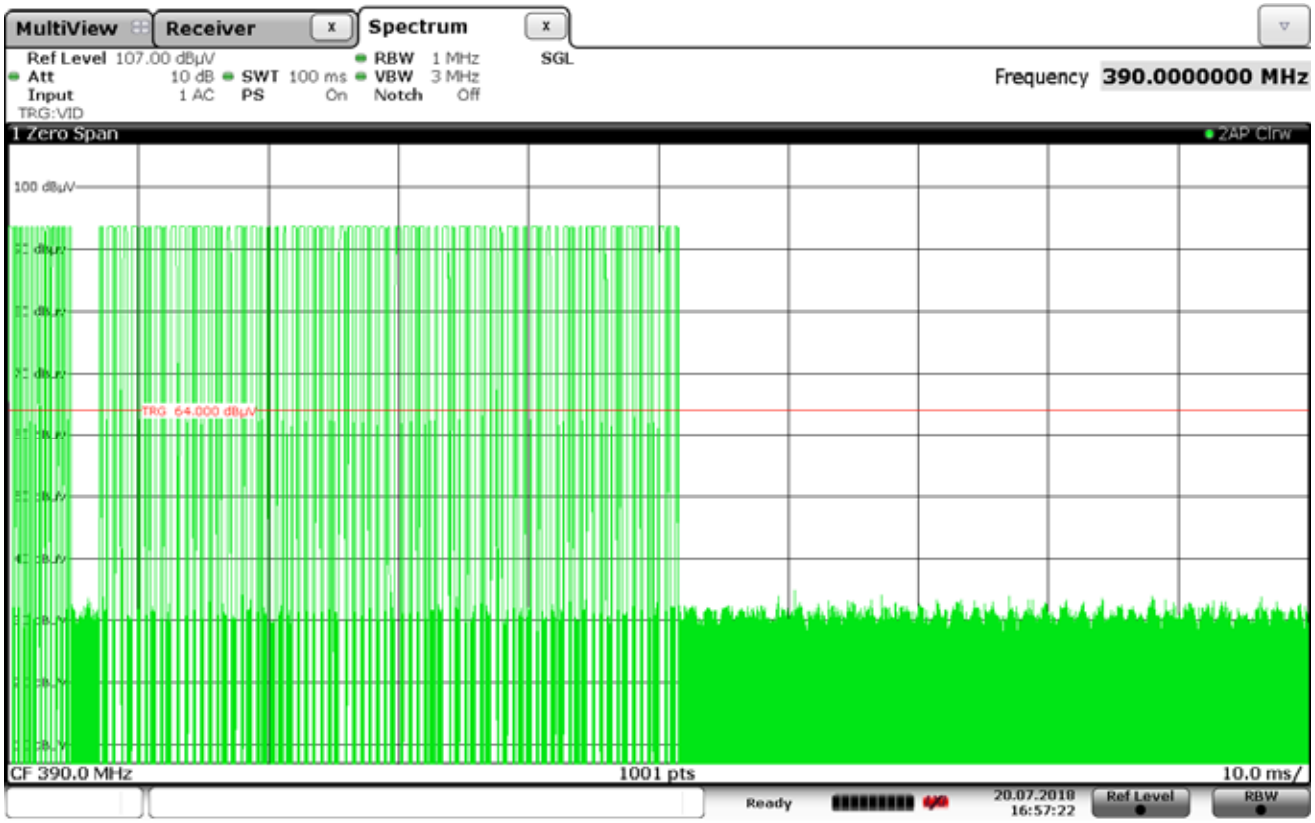
MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 390MHz
TEST PARAMETERS	:	Wide Pulse Width
NOTES	:	Wide Pulse Width = 400usec



Date: 20.JUL.2018 16:35:41

FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 390MHz
TEST PARAMETERS	:	Number of Pulses
NOTES	:	Preamble: 1 long pulse and 11 short pulses
	:	Word: 33 long pulses and 34 short pulses



FCC 15.35(b) and RSS-Gen 8.2 Duty Cycle Correction Factor

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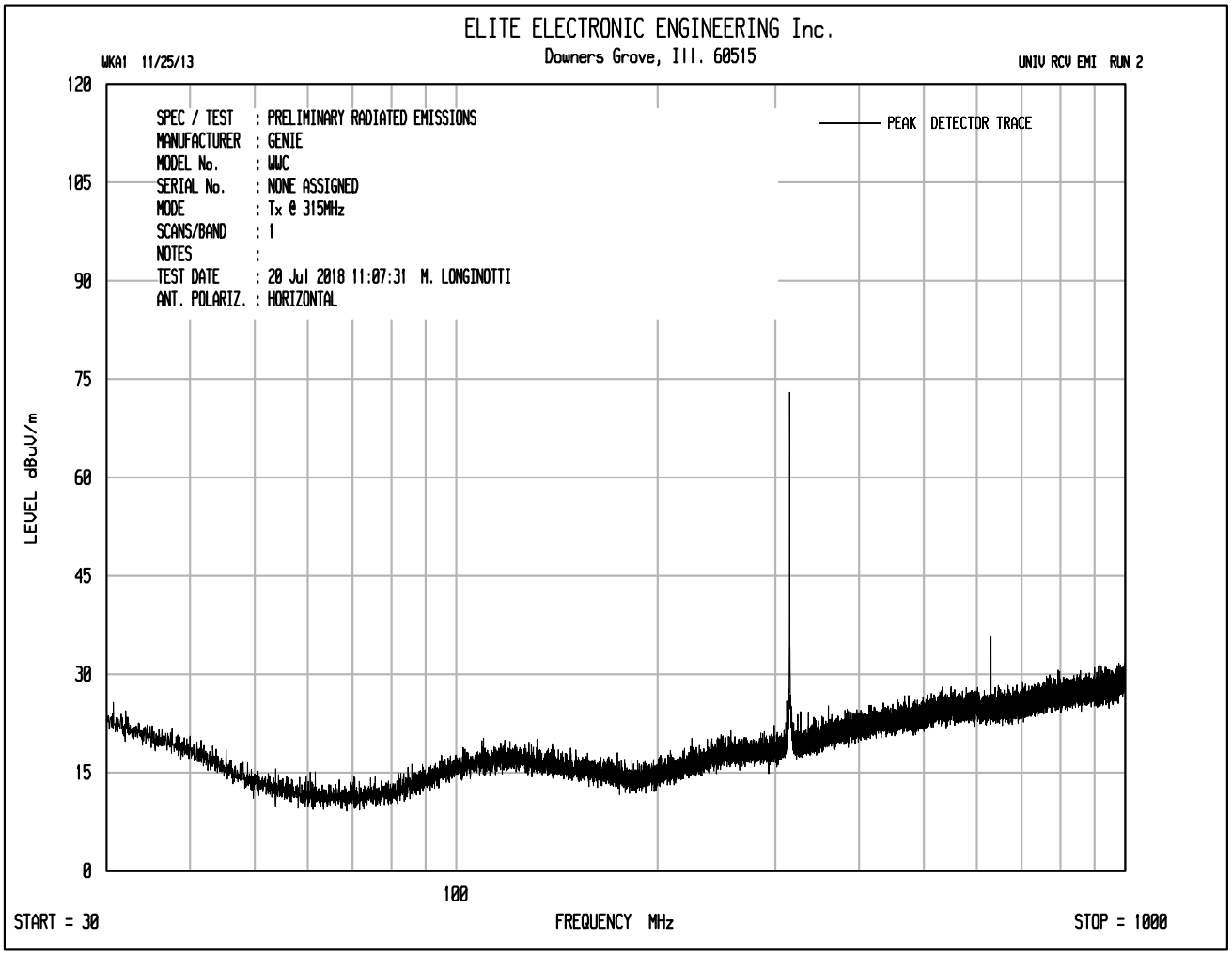
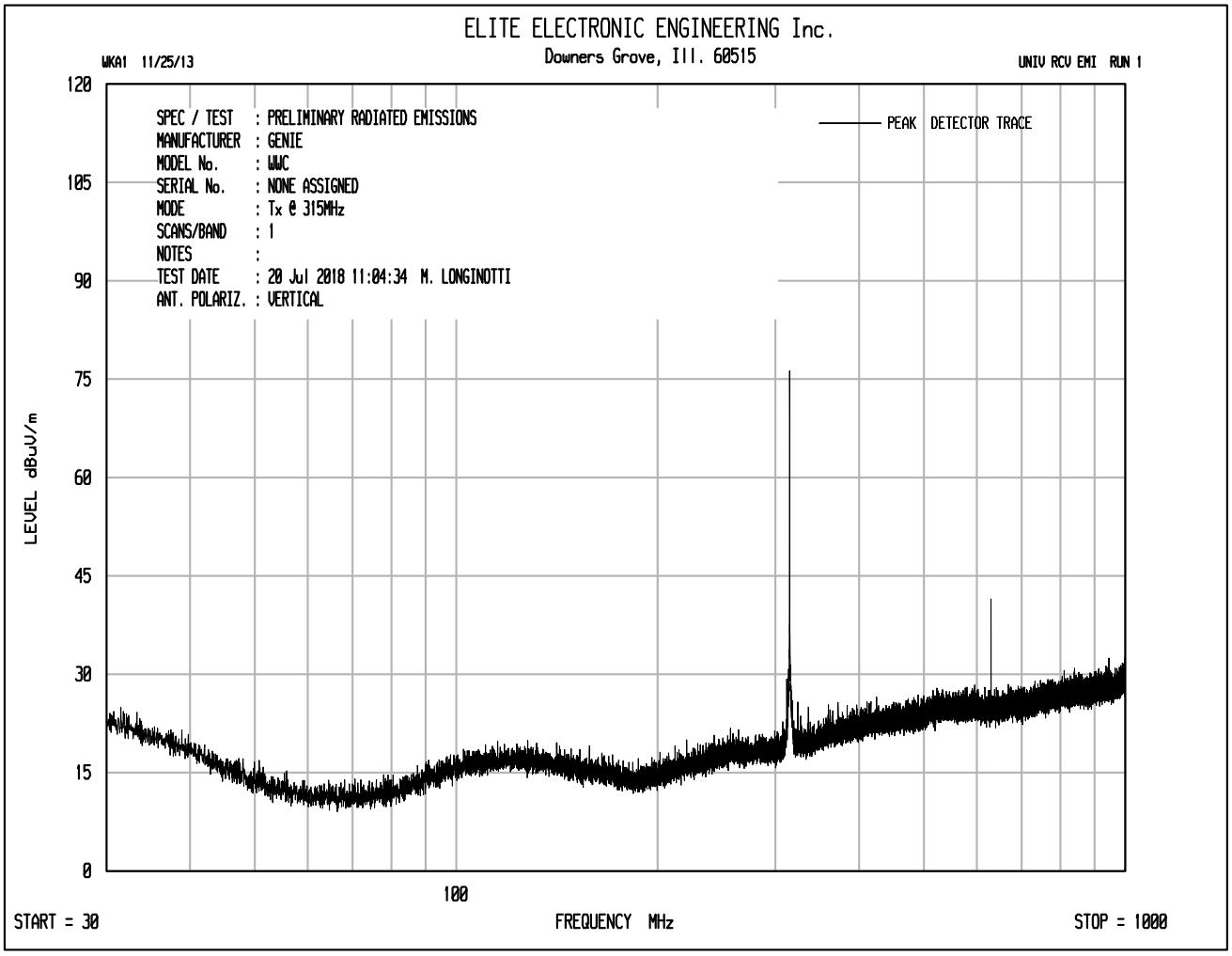
MODEL NUMBER : GWWCP / OWWCP
SERIAL NUMBER : None Assigned
TEST MODE : Transmit at 390MHz
TEST PARAMETERS : Duty Cycle Correction Factor
NOTES : Preamble: 1 long pulse and 11 short pulses
: Word: 33 long pulses and 34 short pulses
: Total: 34 long pulses and 45 short pulses
: Duty Cycle Correction Factor = 20xlog((#short pulses)x(short pulse length) + (#long
: pulses)x(long pulse length))/100
: Duty Cycle Correction Factor = 20xlog((45)x (200usec) + (34)x(400usec)/100)
: Duty Cycle Correction Factor = 20 x log((9.0msec) + (13.6msec))/100msec
: Duty Cycle Correction Factor = -12.9dB


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Jul 2018 11:07:31 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
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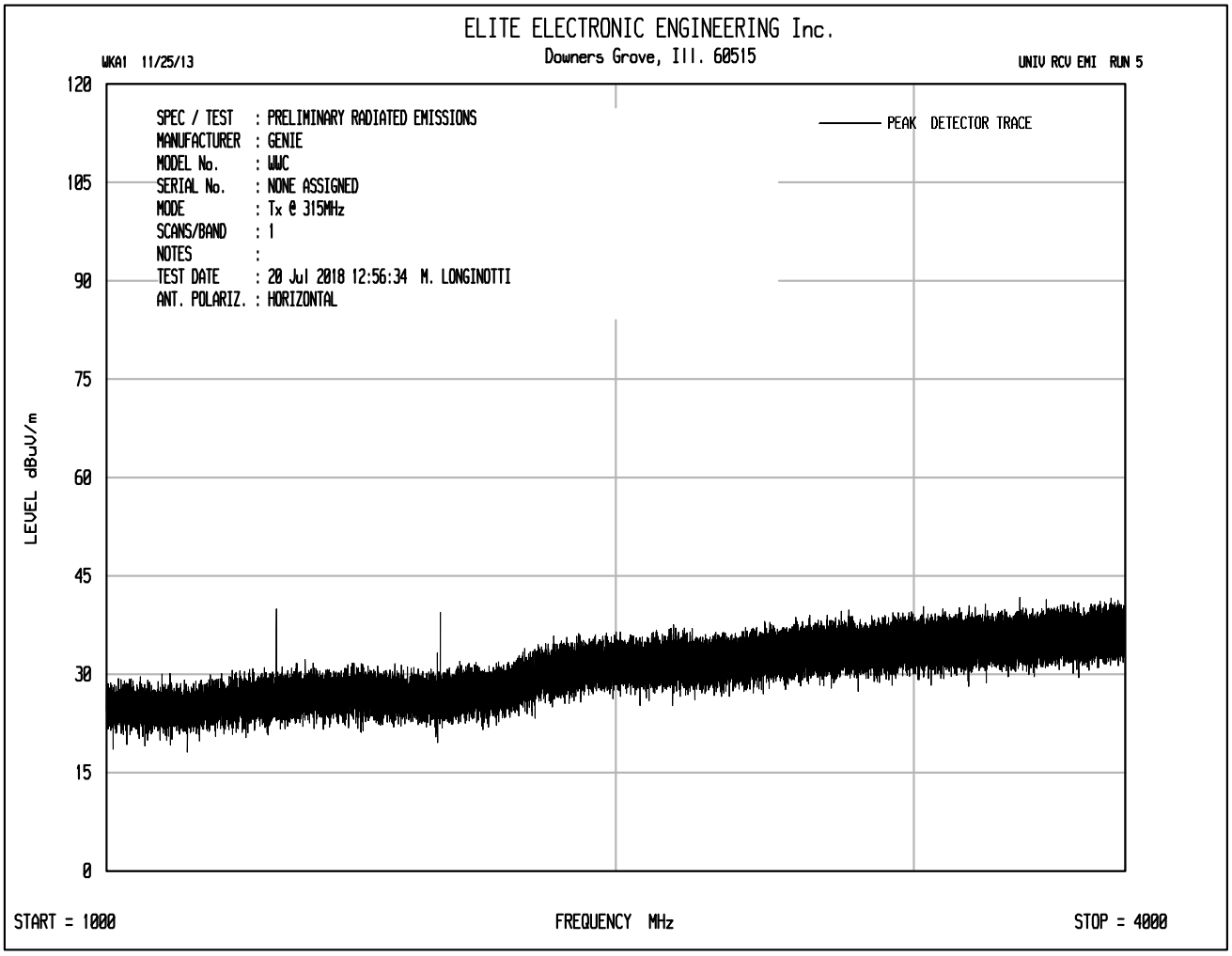
START = 30
FREQUENCY MHz
STOP = 1000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Downers Grove, Ill. 60515
WKA1 11/25/13
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MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
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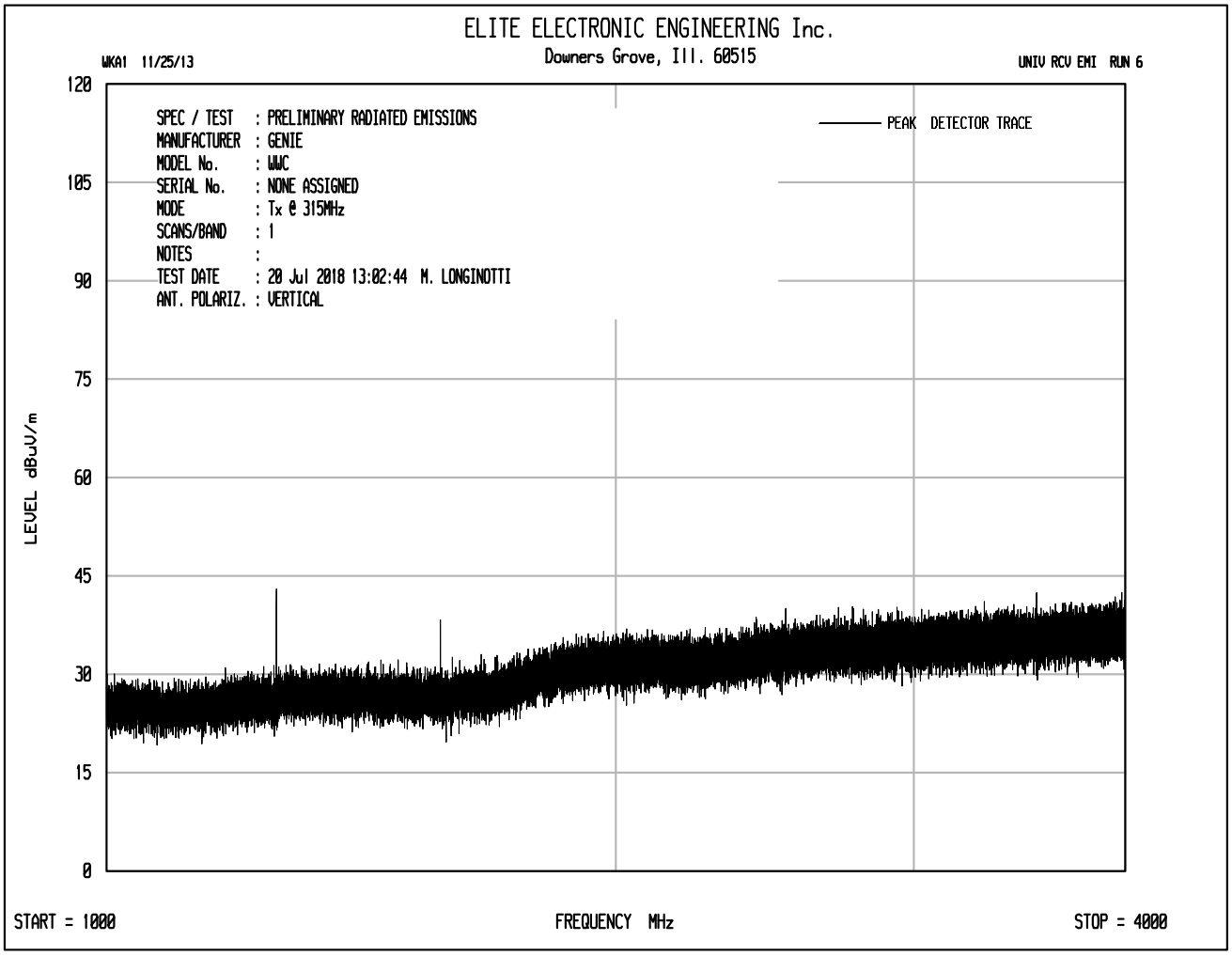
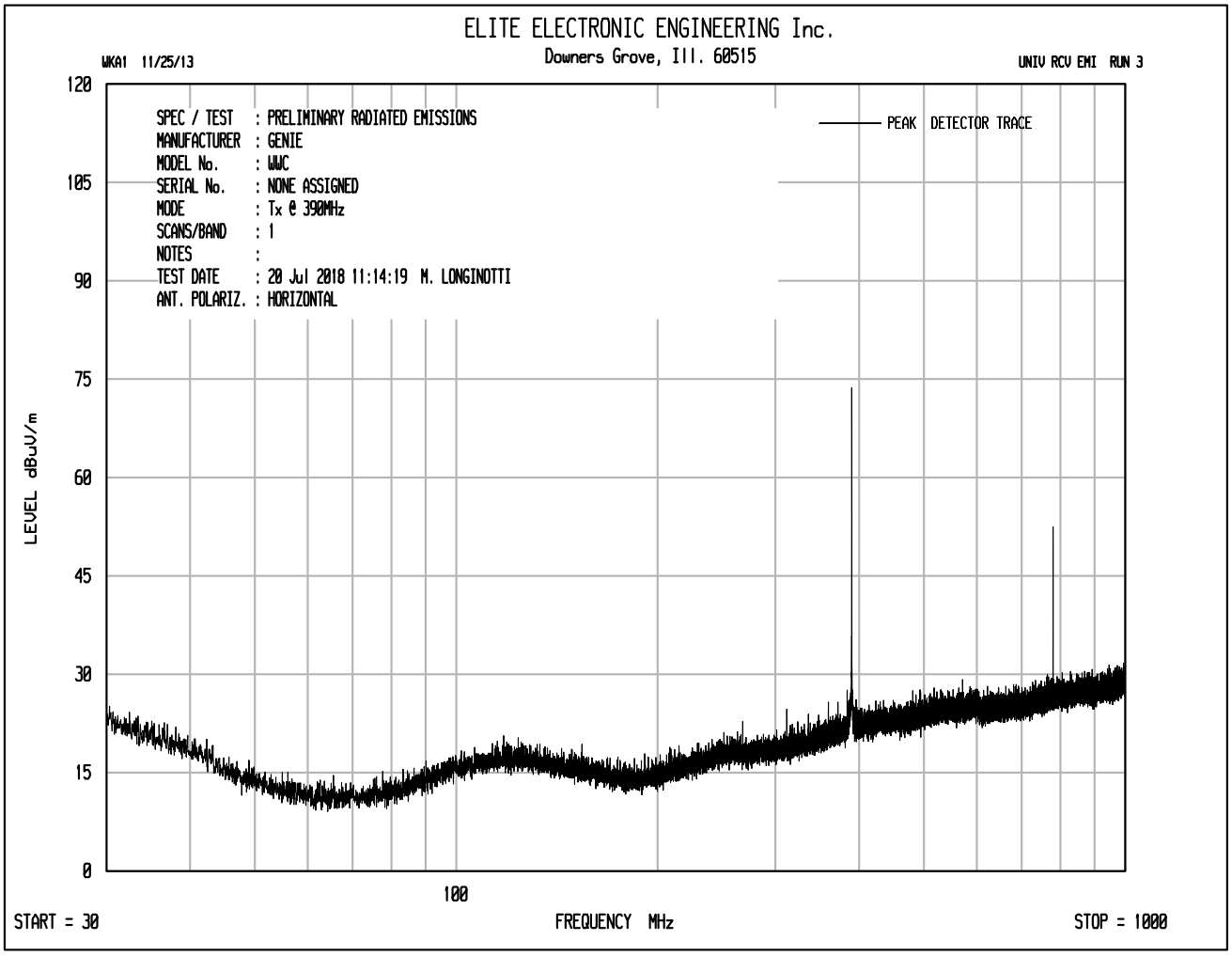
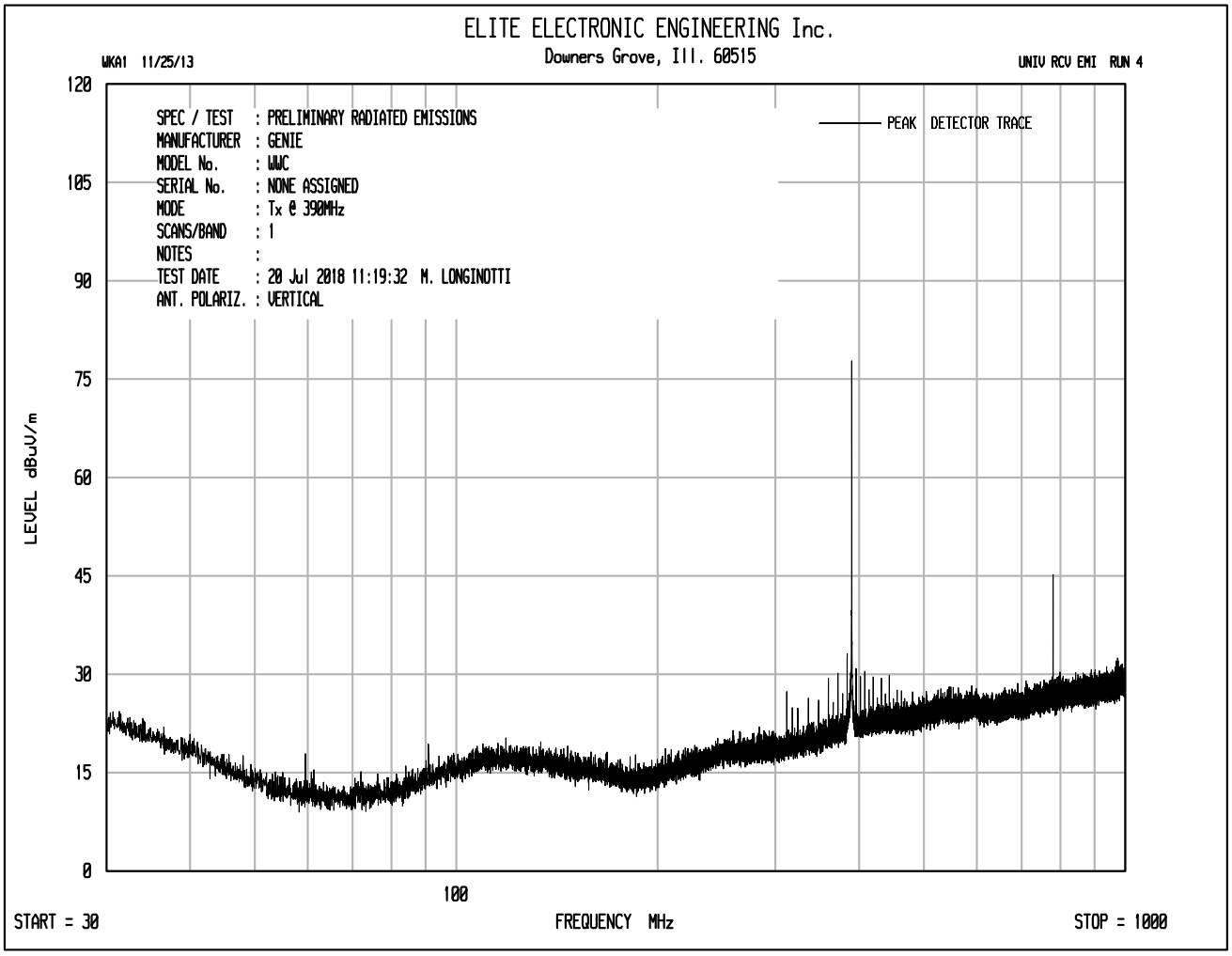
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4000

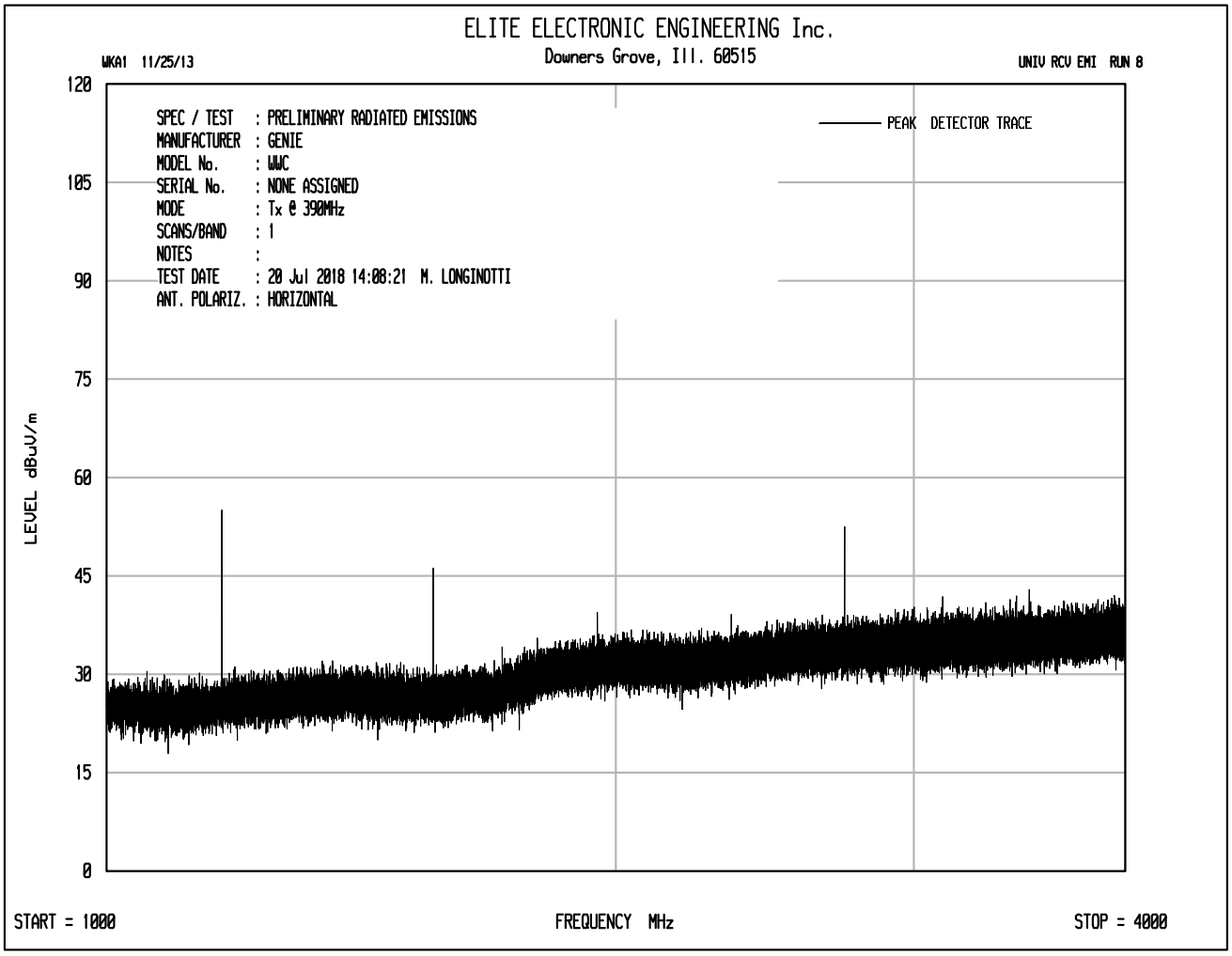

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Jul 2018 13:02:44 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4000

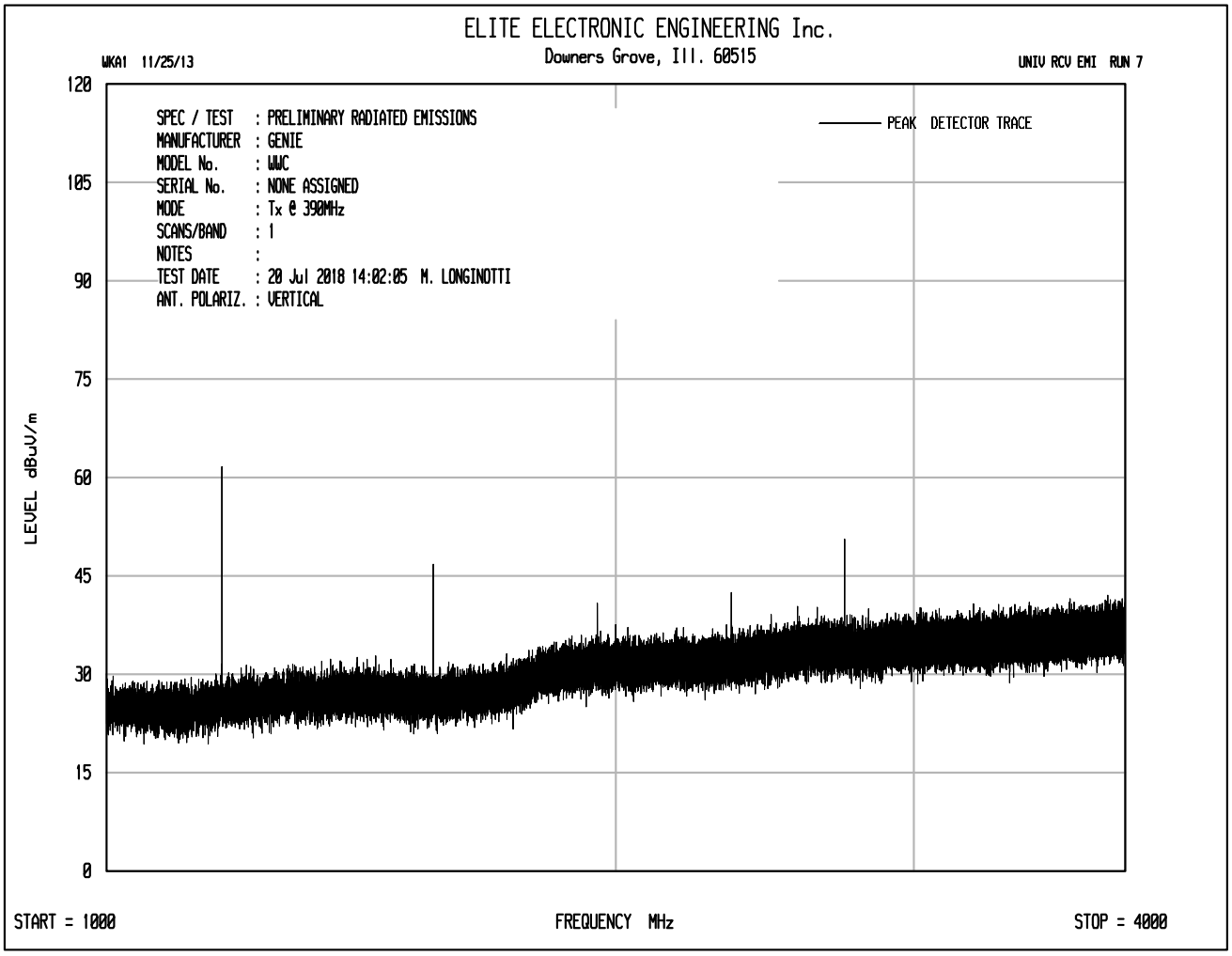
Manufacturer : Genie Company
Test Item : Wireless Wall Console
Model No. : GWWCP / OWWCP
Serial No. : None Assigned
Mode : Transmit at 315MHz
Test Specification : FCC 15.231(b) and RSS-210 Annex A Table A1
Date : July 20, 2018 and July 23, 2018
Test Distance : 3 meters
Notes :

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
315.000	H	53.5		1.2	19.3	0.0	-12.9	61.1	1136.3	6041.7	-14.5
315.000	V	57.1		1.2	19.3	0.0	-12.9	64.7	1719.8	6041.7	-10.9
630.000	H	17.5		1.7	25.0	0.0	-12.9	31.3	36.8	604.2	-24.3
630.000	V	22.3		1.7	25.0	0.0	-12.9	36.1	64.0	604.2	-19.5
945.000	H	15.5	Ambient	2.1	26.7	0.0	-12.9	31.4	37.1	604.2	-24.2
945.000	V	16.0	Ambient	2.1	26.7	0.0	-12.9	31.9	39.2	604.2	-23.7
1260.000	H	15.8		2.5	29.1	0.0	-12.9	34.5	52.8	604.2	-21.2
1260.000	V	18.0		2.5	29.1	0.0	-12.9	36.7	68.1	604.2	-19.0
1575.000	H	16.8		2.7	28.0	0.0	-12.9	34.7	54.3	500.0	-19.3
1575.000	V	16.5		2.7	28.0	0.0	-12.9	34.4	52.4	500.0	-19.6
1890.000	H	14.9	Ambient	3.0	31.1	0.0	-12.9	36.1	64.1	604.2	-19.5
1890.000	V	15.2	Ambient	3.0	31.1	0.0	-12.9	36.4	66.3	604.2	-19.2
2205.000	H	15.6	Ambient	3.3	31.5	0.0	-12.9	37.4	74.2	500.0	-16.6
2205.000	V	15.8	Ambient	3.3	31.5	0.0	-12.9	37.6	76.0	500.0	-16.4
2520.000	H	16.9	Ambient	3.5	32.6	0.0	-12.9	40.1	101.5	604.2	-15.5
2520.000	V	16.4	Ambient	3.5	32.6	0.0	-12.9	39.6	95.8	604.2	-16.0
2835.000	H	16.8	Ambient	3.8	32.5	0.0	-12.9	40.1	101.5	500.0	-13.9
2835.000	V	16.6	Ambient	3.8	32.5	0.0	-12.9	39.9	99.2	500.0	-14.1
3150.000	H	16.6	Ambient	4.0	32.8	0.0	-12.9	40.5	105.8	604.2	-15.1
3150.000	V	17.0	Ambient	4.0	32.8	0.0	-12.9	40.9	110.7	604.2	-14.7


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 390MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Jul 2018 11:14:19 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

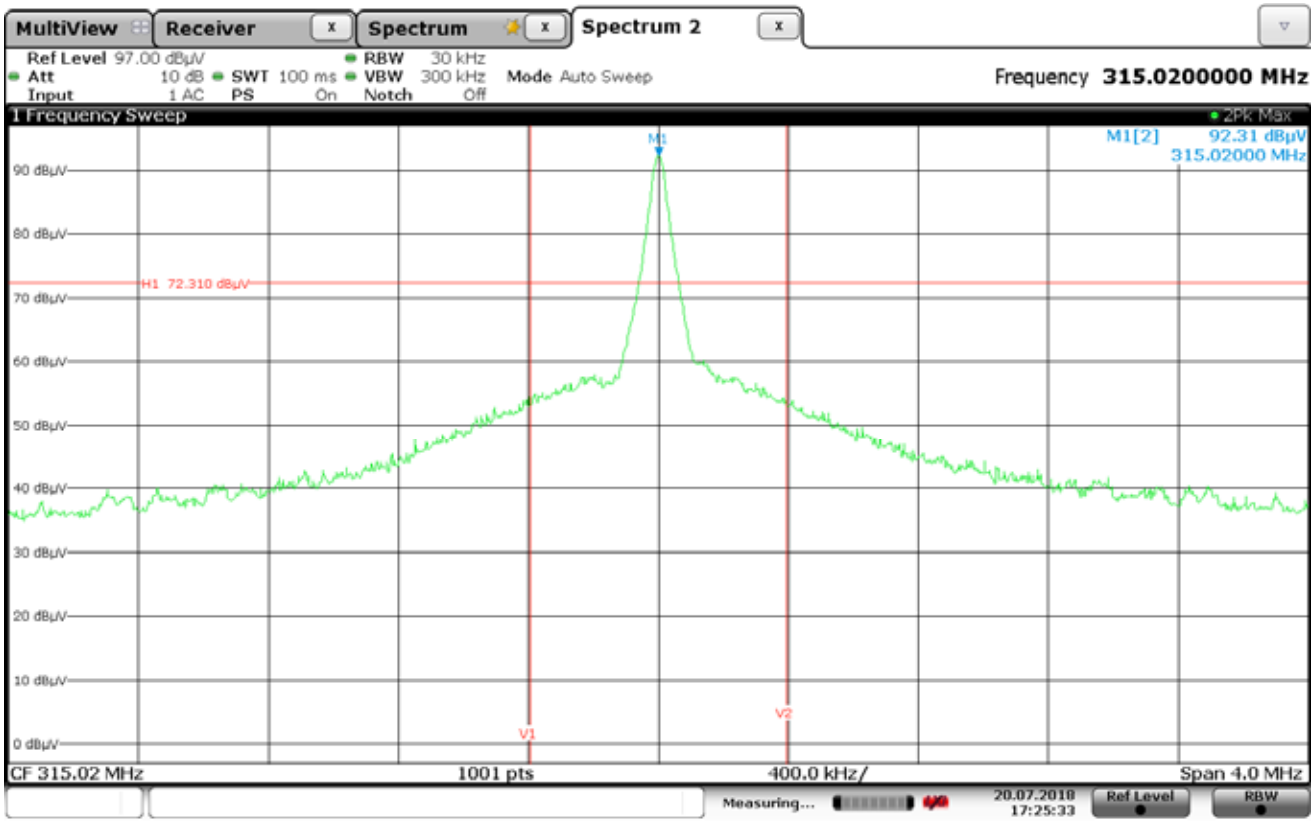

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 390MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Jul 2018 11:19:32 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 390MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Jul 2018 14:08:21 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : GENIE
MODEL No. : WC
SERIAL No. : NONE ASSIGNED
MODE : Tx @ 390MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Jul 2018 14:02:05 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4000

Manufacturer : Genie Company
Test Item : Wireless Wall Console
Model No. : GWWCP / OWWCP
Serial No. : None Assigned
Mode : Transmit at 390MHz
Test Specification : FCC 15.231(b) and RSS-210 Annex A Table A1
Date : July 20, 2018 and July 23, 2018
Test Distance : 3 meters
Notes :

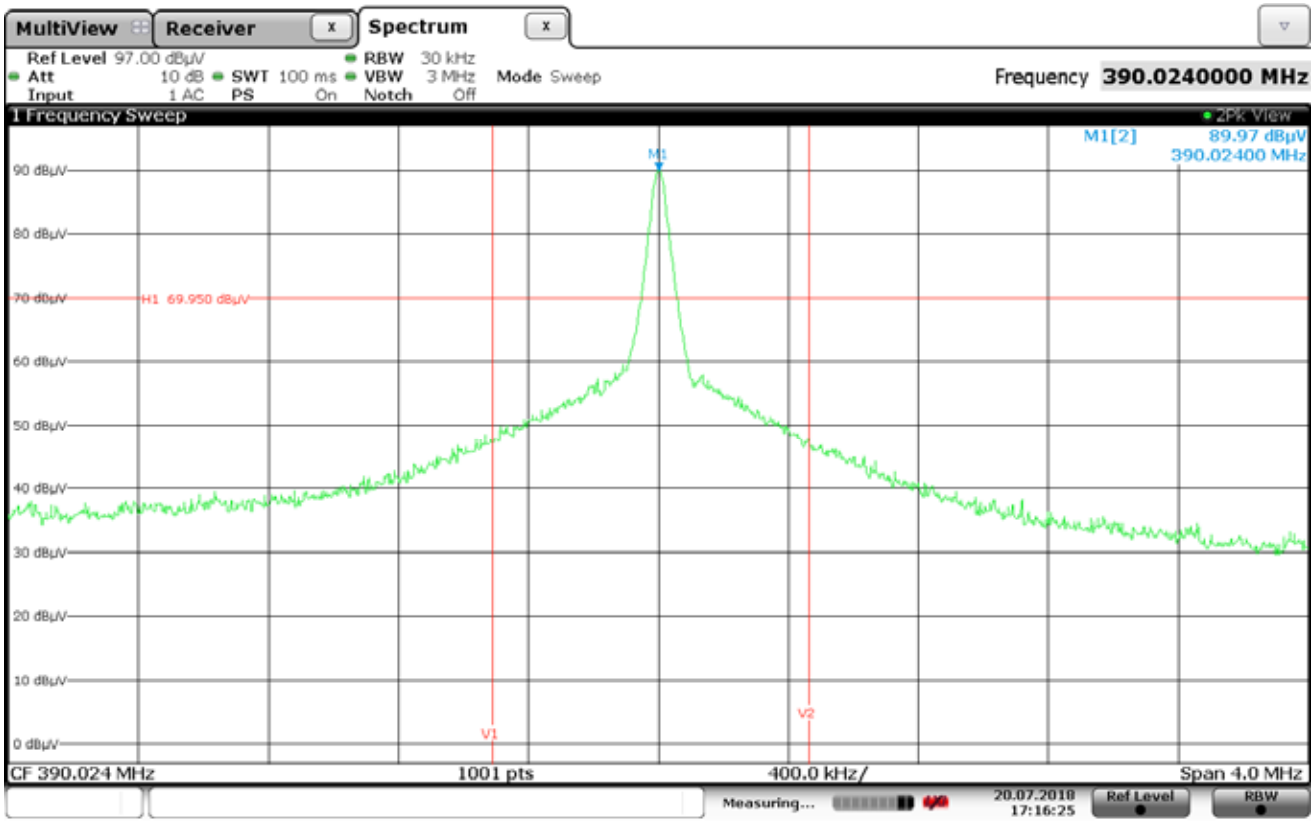
Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
390.000	H	51.4		1.3	21.5	0.0	-12.9	61.3	1167.9	9166.7	-17.9
390.000	V	55.4		1.3	21.5	0.0	-12.9	65.3	1851.0	9166.7	-13.9
780.000	H	27.4		1.9	25.8	0.0	-12.9	42.1	128.0	916.7	-17.1
780.000	V	29.5		1.9	25.8	0.0	-12.9	44.2	163.0	916.7	-15.0
1170.000	H	26.5		2.4	28.3	0.0	-12.9	44.2	162.9	500.0	-9.7
1170.000	V	32.3		2.4	28.3	0.0	-12.9	50.0	317.7	500.0	-3.9
1560.000	H	17.8		2.7	28.0	0.0	-12.9	35.6	60.3	500.0	-18.4
1560.000	V	19.6		2.7	28.0	0.0	-12.9	37.4	74.2	500.0	-16.6
1950.000	H	16.0		3.0	31.2	0.0	-12.9	37.3	73.3	916.7	-21.9
1950.000	V	16.4		3.0	31.2	0.0	-12.9	37.7	76.8	916.7	-21.5
2340.000	H	16.9		3.4	31.9	0.0	-12.9	39.3	91.8	500.0	-14.7
2340.000	V	17.1		3.4	31.9	0.0	-12.9	39.5	93.9	500.0	-14.5
2730.000	H	22.1		3.7	32.5	0.0	-12.9	45.4	186.7	500.0	-8.6
2730.000	V	21.4		3.7	32.5	0.0	-12.9	44.7	172.3	500.0	-9.3
3120.000	H	18.2		4.0	32.8	0.0	-12.9	42.1	126.8	916.7	-17.2
3120.000	V	17.5		4.0	32.8	0.0	-12.9	41.4	117.0	916.7	-17.9
3510.000	H	18.9		4.2	32.9	0.0	-12.9	43.1	143.2	916.7	-16.1
3510.000	V	18.9		4.2	32.9	0.0	-12.9	43.1	143.2	916.7	-16.1
3900.000	H	16.8	Ambient	4.4	33.2	0.0	-12.9	41.6	119.7	500.0	-12.4
3900.000	V	16.6	Ambient	4.4	33.2	0.0	-12.9	41.4	116.9	500.0	-12.6



Date: 20.JUL.2018 17:25:33

FCC 15.231(c) and RSS-210 A.1.3 Bandwidth

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 315MHz
TEST PARAMETERS	:	20dB Bandwidth
NOTES	:	Display lines V1 and V2 represent the 0.25% bandwidth
	:	Display line H1 represents the 20dB down point from the transmit frequency



Date: 20.JUL.2018 17:16:25

FCC 15.231(c) and RSS-210 A.1.3 Bandwidth

MANUFACTURER	:	Genie Company
MODEL NUMBER	:	GWWCP / OWWCP
SERIAL NUMBER	:	None Assigned
TEST MODE	:	Transmit at 390MHz
TEST PARAMETERS	:	20dB Bandwidth
NOTES	:	Display lines V1 and V2 represent the 0.25% bandwidth
	:	Display line H1 represents the 20dB down point from the transmit frequency