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Middlefield, Ohio 44062  
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## CERTIFICATION TEST REPORT

**Manufacturer:** Heat Watch LLC  
818 Sixth Avenue, Suite 4N  
New York, New York 10001 USA

**Applicant:** Same as Above

**Product Name:** Heat Watch Gateway Module

**Product Description:** Product repeats temperature sensors through a wireless RF network. It can also be connected directly to the Heat Watch Boiler Control to serve as a gateway (bringing the temperatures of the apartments onto the Heat Watch box).

**Operating Voltage/Frequency:** 3.6VDC

**Model:** Gateway V4.0

**FCC ID:** 2AQX2-HWGATE915

**Testing Commenced:** July 2, 2018

**Testing Ended:** Oct. 19, 2018

**Summary of Test Results:** In Compliance

The EUT complies with the EMC requirements when manufactured identically as the unit tested in this report, including any required modifications. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.

**Standards:**

- FCC Part 15 Subpart C, Section 15.247
- FCC15.207 - Conducted Limits
- FCC Part 15.31(e)
- ANSI C63.10:2013



Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

**Evaluation Conducted by:**

Julius Chiller, EMC/Wireless Engineer

**Report Reviewed by:**

Ken Littell, Director of EMC & Wireless Operations

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## 1 ADMINISTRATIVE INFORMATION

### 1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

### 1.2 Measurement Procedure:

All measurements were performed according to the 2013 version of ANSI C63.10 and recommended FCC procedure of measurement of DTS operating under Section 15.247 and in KDB558074. A list of the measurement equipment can be found in Section 6.

### 1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used, and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainty
Radiated Emissions <1 GHz @ 3m	±5.07dB	±2.54
Radiated Emissions <1 GHz @ 10m	±5.09dB	±2.55
Radiated Emissions 1 GHz to 2.7 GHz	±3.62dB	±1.81
Radiated Emissions 2.7 GHz to 18 GHz	±3.10dB	±1.55
AC Power Line Conducted Emissions, 150kHz to 30 MHz	±2.76dB	±1.38

This Uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 1.4 Document History

Document Number	Description	Issue Date	Approved By
F2LQ10163C-01E	First Issue	Oct. 22, 2018	K. Littell



Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

## 2 SUMMARY OF TEST RESULTS

Test Name	Standard(s)	Results
-6dB Occupied Bandwidth	CFR 47 Part 15.247(a)(2) / KDB558074	Complies
Conducted Output Power	CFR 47 Part 15.247(b)(3) / KDB558074	Complies
Voltage Variations	CFR 47 Part 15.31(e)	Complies
Radiated Spurious Emission	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies
Peak Power Spectral Density	CFR 47 Part 15.247(e) / KDB558074	Complies
Conducted Emissions	CFR 47 Part 15.207(a)	Complies

### Modifications Made to the EUT

The following modifications were made to the EUT to meet Peak Power Spectral Density requirements:

- The empty PCB position for C6 was populated with a 1.5pF capacitor.



### 3 TABLE OF MEASURED RESULTS

Test	915 MHz
Conducted Output Power	69.82mW (18.44dBm)
Conducted Output Power Limit	1 Watt, (30dBm)
E.I.R.P., Whip Antenna	115.88mW (20.64dBm)
E.I.R.P., Dipole Antenna	110.67mW (20.44dBm)
E.I.R.P. Limit	4 Watts, (36.02dBm)
Peak Power Spectral Density	7.67 dBm
Peak Power Spectral Density Limit	8 dBm
-6dB Occupied Bandwidth, Conducted	0.594 MHz
-6dB Occupied Bandwidth, Conducted, Limit	≥ 500KHz
Voltage Variations	915.195 MHz
	18.26dBm
	915.189 MHz
	18.34dBm

Note: To meet the requirements of 15.31, voltage was varied by  $\pm 15\%$  of the nominal voltage. All tests were then performed at the highest output power voltage setting.



Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

#### 4 ENGINEERING STATEMENT

This report has been prepared on behalf of Heat Watch LLC to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.247 of the FCC Rules using ANSI C63.10:2013 and KDB558074 standards. The test results found in this test report relate only to the items tested.



Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

## 5 EUT INFORMATION AND DATA

### 5.1 Equipment Under Test:

Product: Heat Watch Gateway Module

Model: **Gateway V4.0**

Serial No.: None Specified

FCC ID: **2AQX2-HWGATE915**

### 5.2 Trade Name:

Heat Watch LLC

### 5.3 Power Supply:

3.6VDC

### 5.4 Applicable Rules:

CFR 47, Part 15.247, subpart C

### 5.5 Equipment Category:

Radio Transmitter-DTS

### 5.6 Antenna(s):

Whip, 2.2dBi gain

Dipole, 2dBi gain

### 5.7 Accessories:

N/A

### 5.8 Test Item Condition:

The equipment to be tested was received in good condition.

### 5.9 Testing Algorithm:

The EUT was configured to operate at full output power on the single intended operating frequency of 915 MHz. For RF antenna conducted tests, the EUT was equipped with an SMA connector for connection to the measuring equipment. For radiated emissions tests, in a semi-anechoic chamber, the EUT was first equipped with a 2.2dBi whip antenna and measurements were made. The antenna was then replaced with a 2dBi dipole antenna and measurements were repeated. The highest emissions were recorded in the data tables.



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Applicant: Heat Watch LLC

Model: Gateway V4.0

## 6 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	Albatross Projects	B83117-DF435-T261	US140023	Jan. 9, 2019
Shield Room	0175-3V	Ray Proof	N/A	11645	Feb. 28, 2019
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Nov. 17, 2019
Antenna 1-Chamber	0142	ETS/EMCO	3142B	9811-1330	Verified
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	Oct.11, 2019
Pre-amplifier	0197	Hewlett Packard	8447D	1726A01006	Verified
Pre-amplifier	CL153	Keysight Tech.	83006A	MY39500791	Sept. 20, 2018
Amplifier w/Monopole & 18" Loop	CL163-Loop	A.H. Systems, Inc.	EHA-52B	100	June 4, 2019
Horn Antenna	CL098	Emco	3115	9809-5580	Dec. 28, 2018
Spectrum Analyzer	CL147	Agilent	E7402A	MY45101241	Nov. 16, 2018
Transient Limiter	0202	Hewlett Packard	11947A	3107A00729	June 19, 2019
LISN	CL181	Com-Power	LI-125A	191226	July 3, 2021
LISN	CL182	Com-Power	LI-125A	191225	July 3, 2021
Software:	Tile Version 3.4.B.3.		Software Verified: July 2, 2018; Oct. 19, 2018		
Software:	EMC 32, Version 8.53.0		Software Verified: July 2, 2018		



## 7 OCCUPIED BANDWIDTH

### 7.1 Requirements:

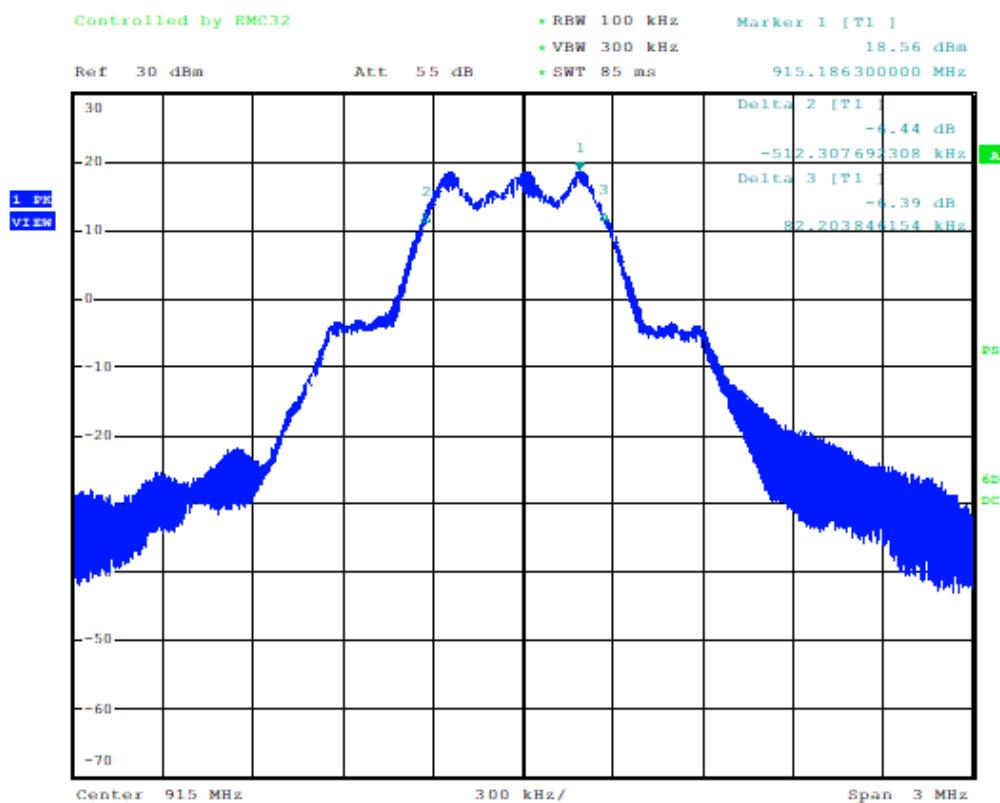
The 6dB bandwidth shall be greater than 500 kHz.

Bandwidth measurements were made at the single intended operating frequency of 915 MHz with the resolution Bandwidth set at 100 kHz (video bandwidth set at 300 kHz) while the span was set at 5 MHz. The bandwidth was measured using the analyzer's marker function.

## 7.2 Occupied Bandwidth Test Data

Test Date:	July 20, 2018	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(a)(2); KDB558074	Air Temperature:	21.9°C

**-6dB, Conducted**



Date: 20.JUL.2018 13:01:08



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Applicant: Heat Watch LLC

Model: Gateway V4.0

## 8 FCC PART 15.247(b)(3) – CONDUCTED OUTPUT POWER

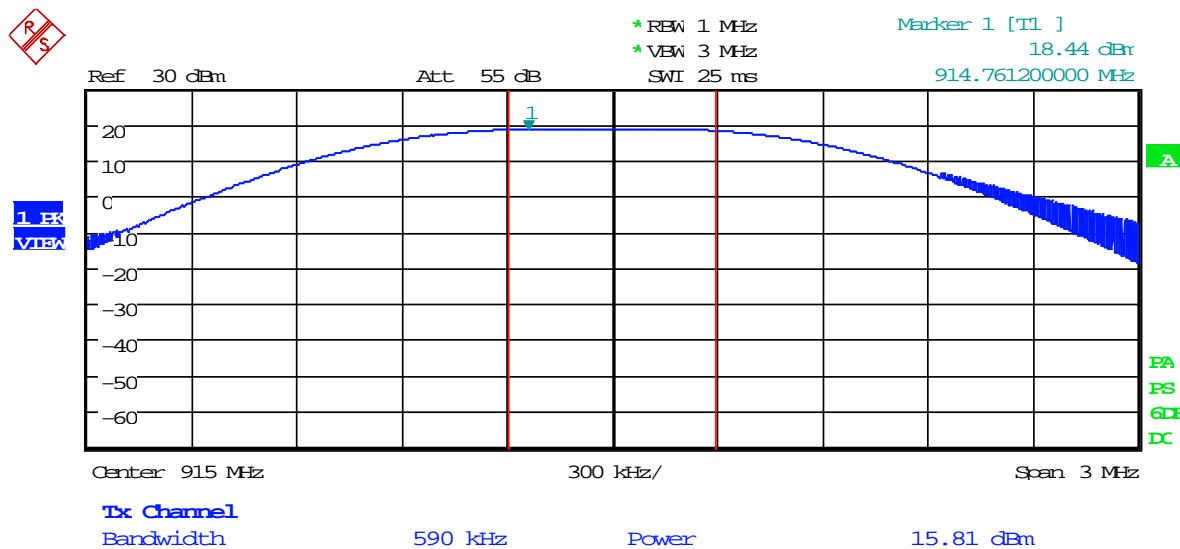
The EUT antenna port was fitted with an SMA connector and directly connected to the input of the receiver. The peak power output was measured.

### 8.1 Requirements:

The peak power output shall be 1 watt (30 dBm) or less when using an antenna with a gain of less than 6dBi. For antennas having a gain of more than 6dBi, the limit is reduced by 1dB for every dB the antenna gain is over 6dBi.

## 8.2 Conducted Output Power Test Data

Test Date:	July 2, 2018	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	21.9°C
		Relative Humidity:	47%



Date: 2.JUL.2018 12:33:47



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Applicant: Heat Watch LLC

Model: Gateway V4.0

## 9 FCC PART 15.31(e) – VOLTAGE VARIATIONS

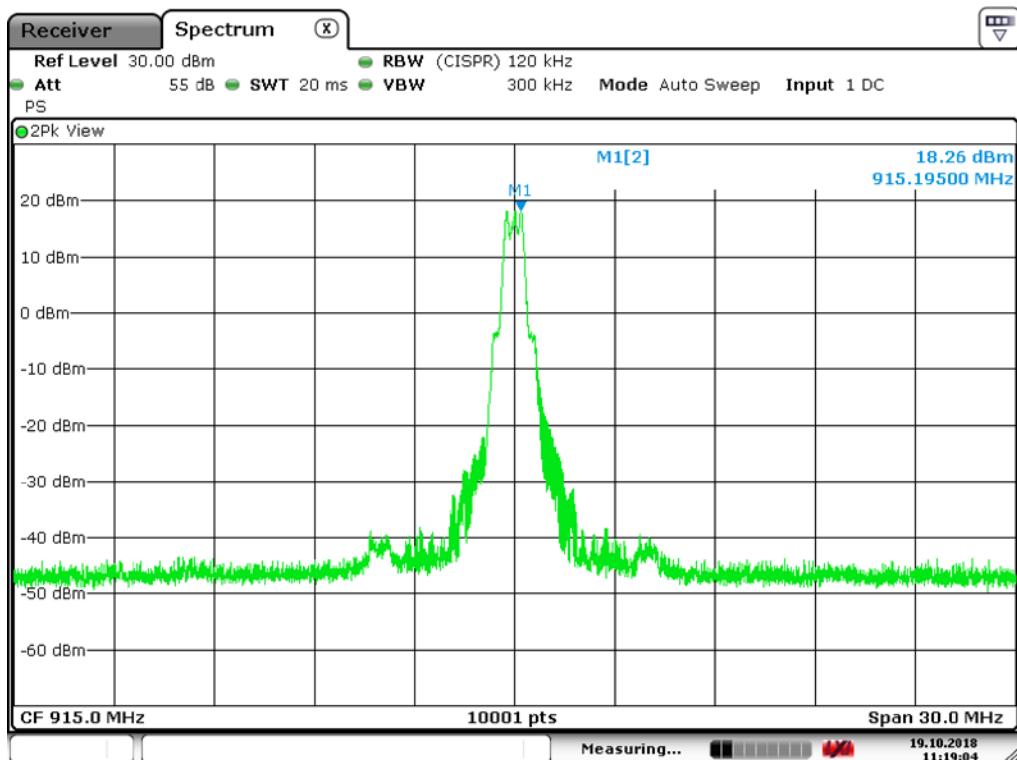
### 9.1 Requirements

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery-operated equipment, the equipment tests shall be performed using a new battery.

## 9.2 Voltage Variations Test Data

<b>Test Date(s):</b>	Oct. 19, 2018	<b>Test Engineer:</b>	J. Chiller
<b>Rule:</b>	15.31(e)	<b>Air Temperature:</b>	22.1° C
<b>Test Results:</b>	Complies	<b>Relative Humidity:</b>	48%

**3.06VDC**



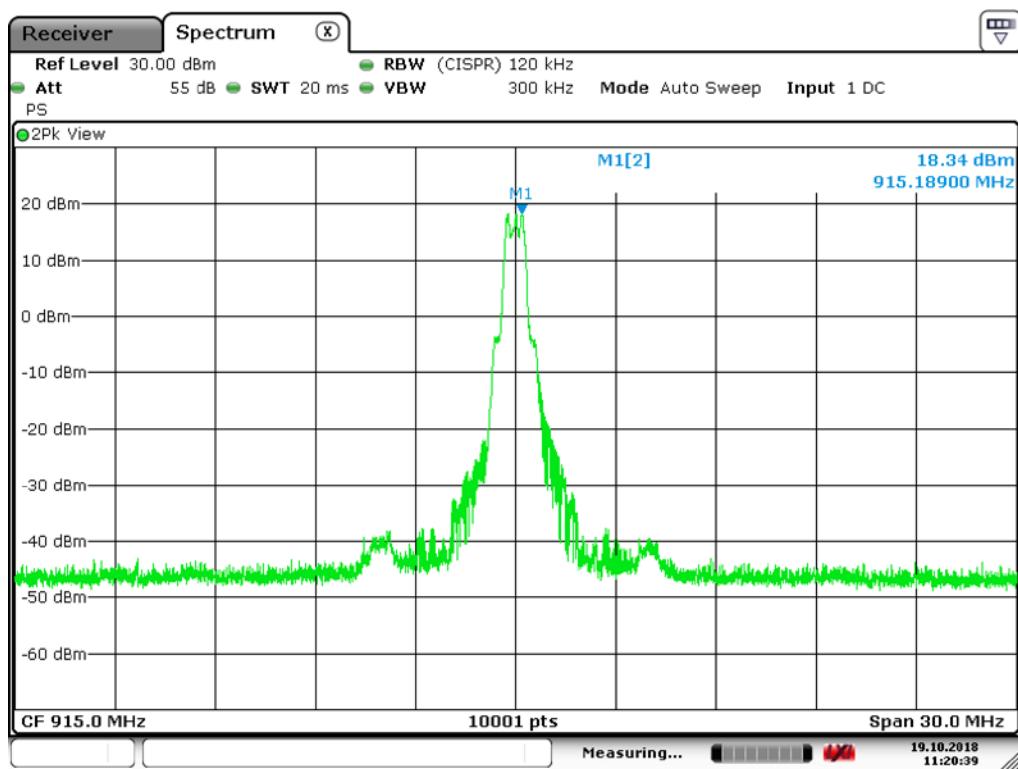


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Model: Gateway V4.0

4.14VDC



Date: 19.OCT.2018 11:20:39

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Applicant: Heat Watch LLC

Model: Gateway V4.0

## 10 CONDUCTED SPURIOUS EMISSIONS

The following tests were performed to demonstrate compliance.

### RF Antenna Conducted Test

The EUT antenna port was fitted with an SMA connector and directly connected to the input of the spectrum analyzer.

#### 10.1 Requirements:

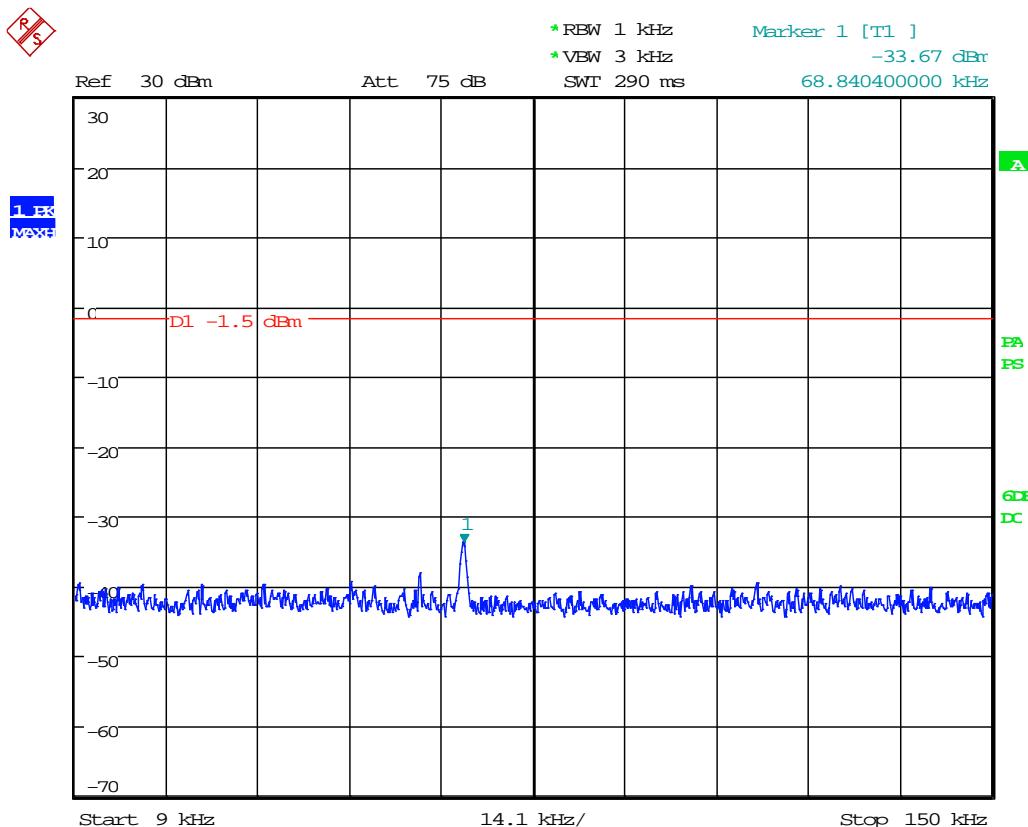
All Spurious Emissions must be at least 20dB down from the highest emission level measured within the authorized band up through the tenth harmonic.

Spurious emissions measurements were made at the single intended operating frequency of 915 MHz with the appropriate spectrum analyzer impulse bandwidth. Different RBW was used for 9kHz to 30 MHz range for a clearer detailed scan. No emissions were detected. Additionally, 20dB down points were measured for the low and high channels to verify band edge compliance.

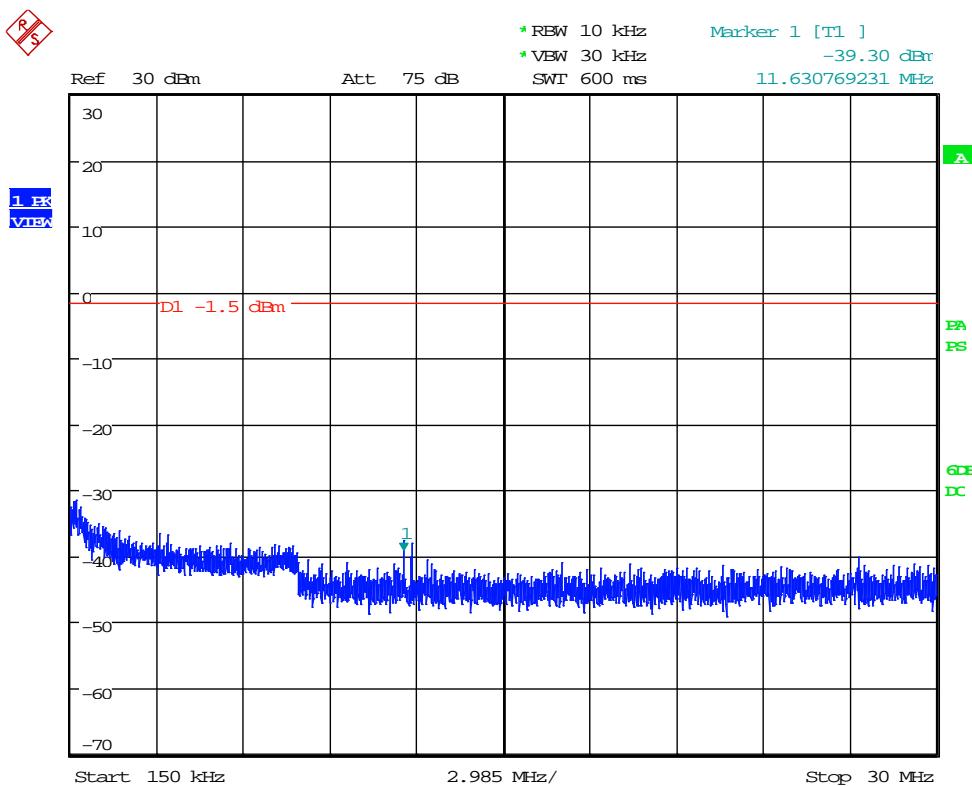
## 10.2 Conducted Spurious Emissions Test Data

Test Date:	July 2, 2018	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(d) KDB558074	Air Temperature:	21.6°C
		Relative Humidity:	48%

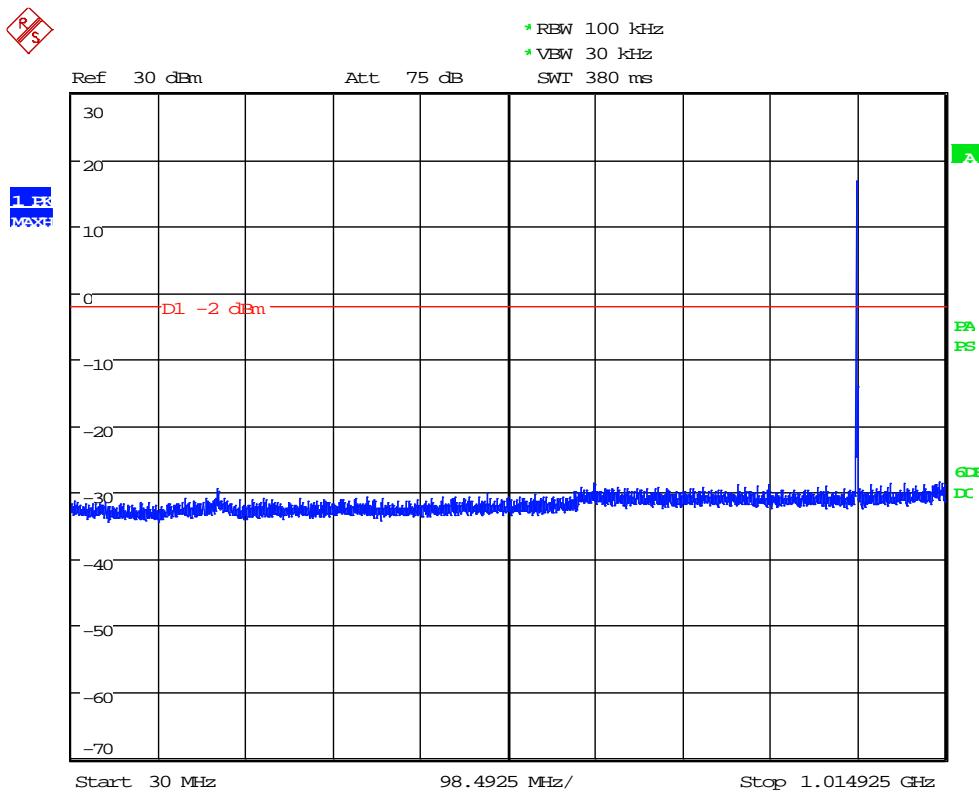
### 0.009 MHz to 0.15 MHz



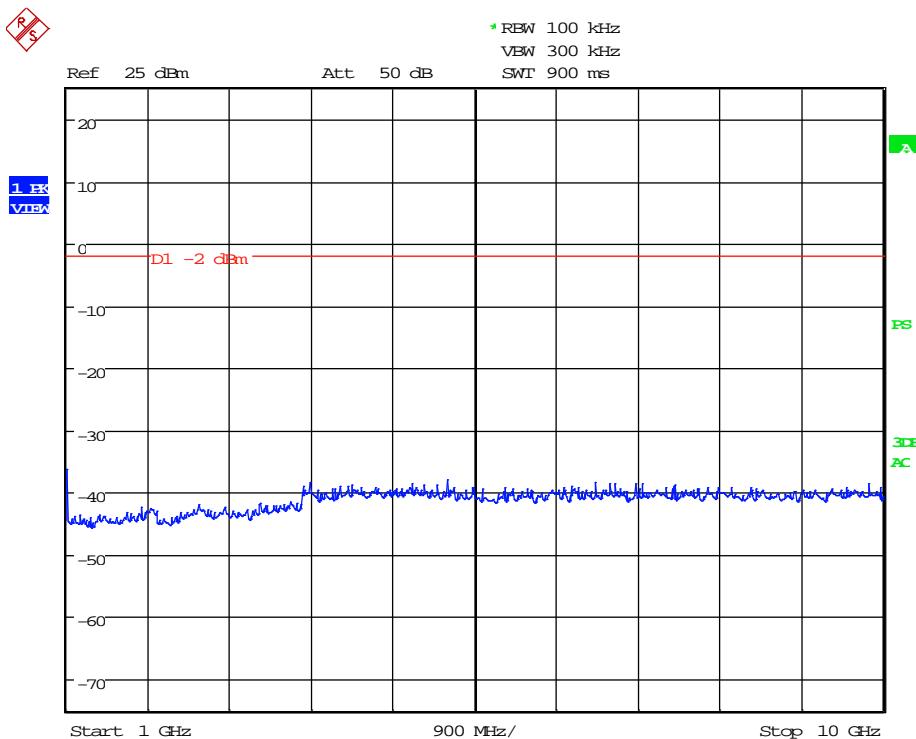
Date: 2.JUL.2018 12:51:59

**0.15 MHz to 30.0 MHz**

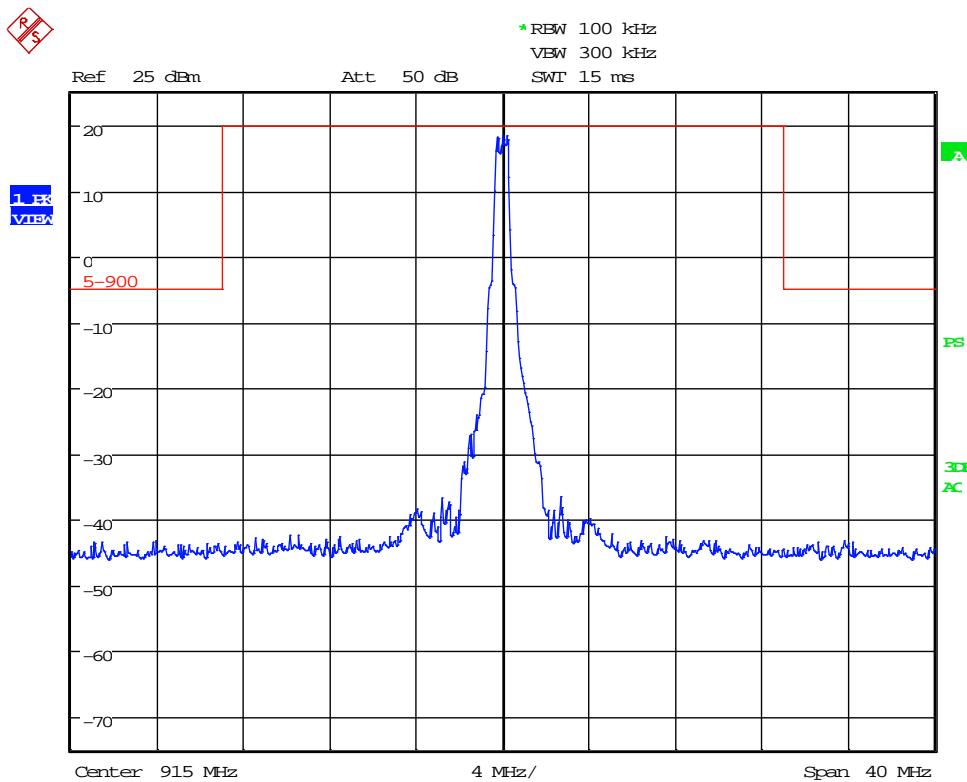
Date: 2.JUL.2018 12:54:23

**30 MHz to 1000 MHz**

Date: 2.JUL.2018 12:59:44

**1 GHz to 10 GHz**

Date: 2.JUL.2018 14:03:36

**Band Edges**

Date: 2.JUL.2018 13:27:50



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Applicant: Heat Watch LLC

Model: Gateway V4.0

## 11 RADIATED SPURIOUS EMISSION

The EUT antenna port was fitted with a 2.2dBi Whip antenna and also with a 2dBi Dipole antenna. Radiated emissions were measured in a Semi-Anechoic Chamber. All emissions generated that fall in the restricted bands per FCC Part 15.205 were examined.

### 11.1 Requirements:

All emissions that fall in the restricted bands defined in FCC Part 15.205 shall not exceed the maximum field strength listed in FCC Part 15.209(a).



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Applicant: Heat Watch LLC

Model: Gateway V4.0

## 11.2 Radiated Spurious Emission Test Data

<b>Test Date(s):</b>	July 2, 2018	<b>Test Engineer:</b>	J. Chiller
<b>Standards:</b>	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	<b>Air Temperature:</b>	21.9°C
		<b>Relative Humidity:</b>	47%

Notes: Plots are peak, max hold pre-scan data included only to determine what frequencies to investigate and measure. The EUT was initially placed in a semi-anechoic chamber and rotated in all three orthogonal positions to maximize the emissions. Characterization measurements were then performed to determine at which frequencies significant emissions occurred. These graphs are shown below.

The equipment was fully exercised with all cabling attached to the EUT and was positioned on a non-conductive table 3 meters from the measuring antenna. While the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength. The tables of measured results can be found below.

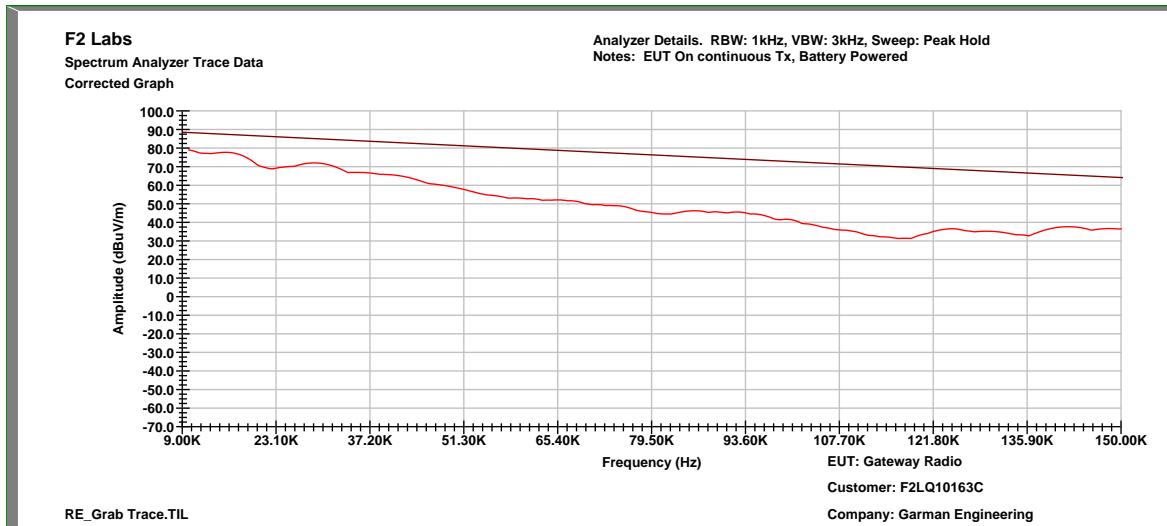


Order Nos.: F2LQ10163C, F2LQ10163C-C1

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Model: Gateway V4.0

### 0.009 MHz to 0.15 MHz – Whip Antenna



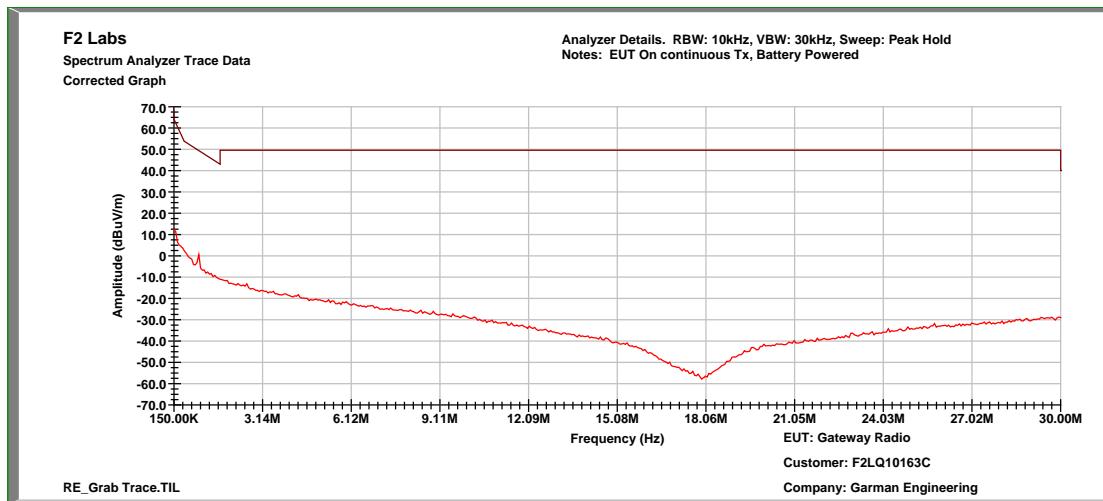


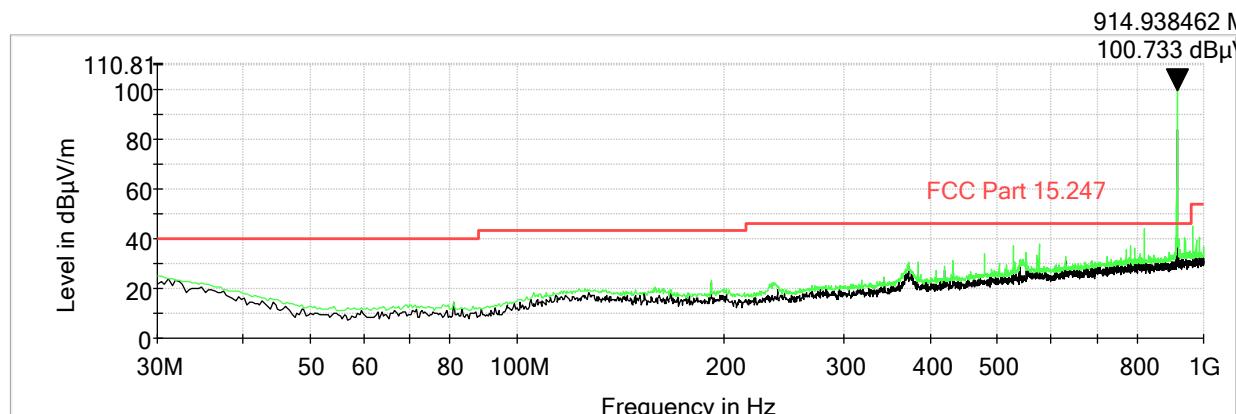
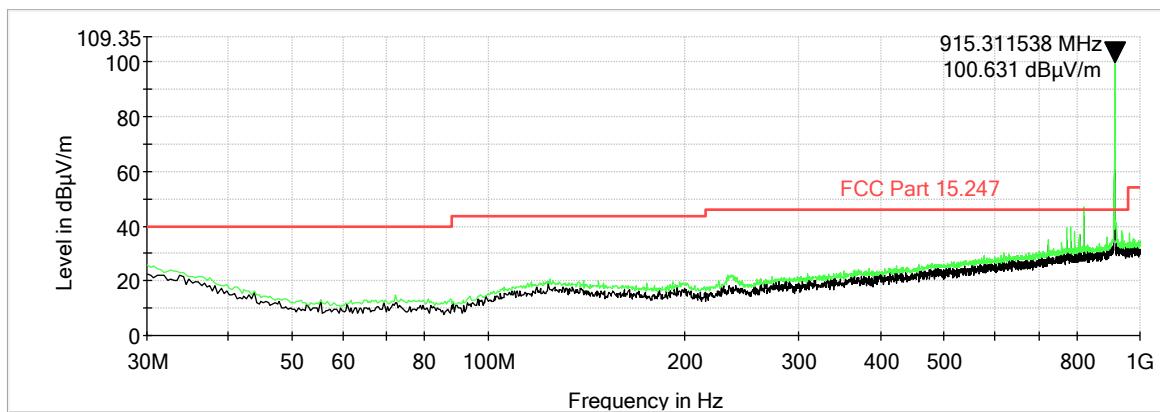
Order Nos.: F2LQ10163C, F2LQ10163C-C1

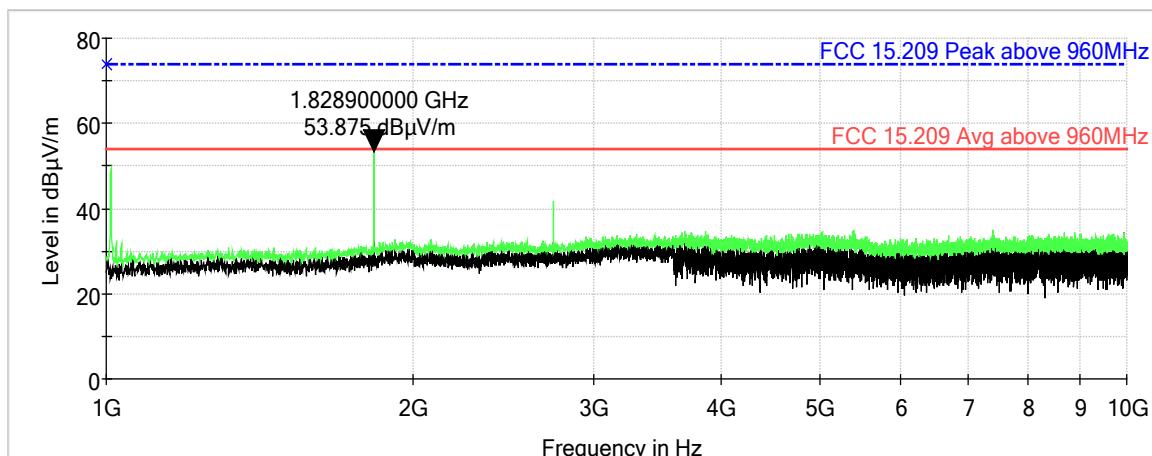
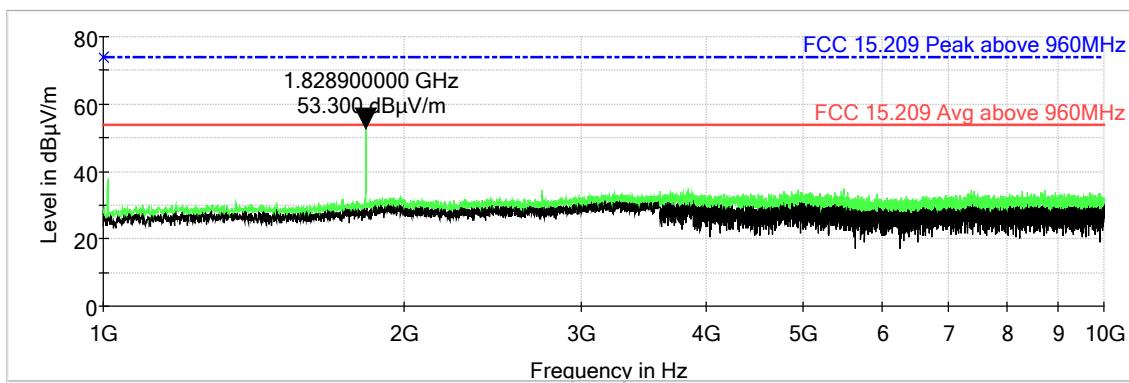
Applicant: Heat Watch LLC

Model: Gateway V4.0

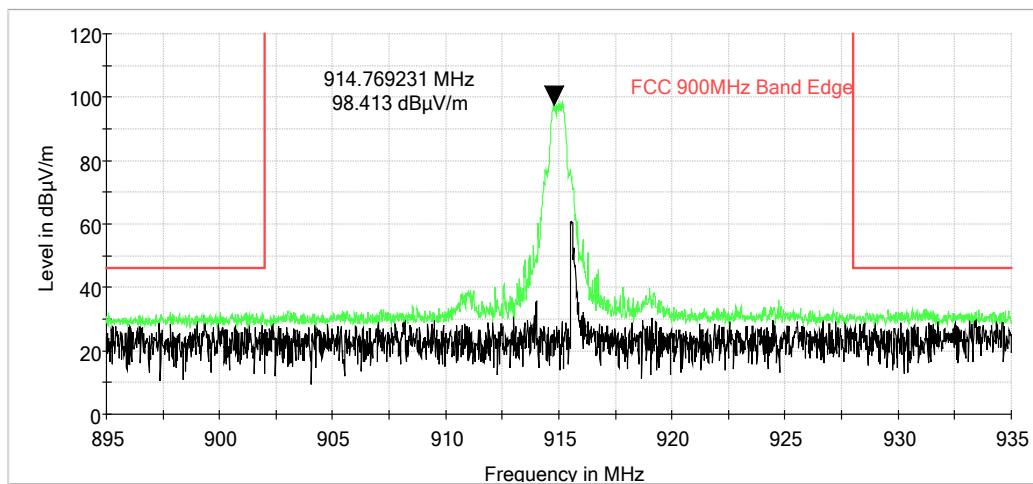
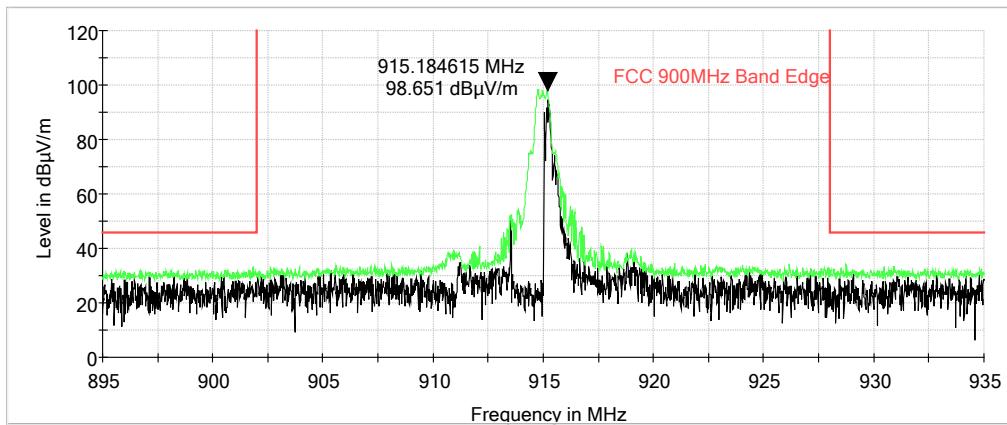
### 0.15 MHz to 30.0 MHz – Whip Antenna



**30 MHz to 1000 MHz, Vertical – Whip Antenna****30 MHz to 1000 MHz, Horizontal – Whip Antenna**

**1 GHz to 10 GHz, Vertical – Whip Antenna**

**1 GHz to 10 GHz, Horizontal – Whip Antenna**


Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (degrees)	Reading (dB $\mu$ V)	Cable Loss & Antenna Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1010.000000	H	150.00	16.00	25.2	-7.3	17.90	54.0	-36.1
1011.000000	V	145.00	187.00	42.5	-7.3	35.20	54.0	-18.8
1830.000000	H	150.00	177.00	53.2	-5.0	48.20	54.0	-5.8
1830.000000	V	155.00	240.00	54.0	-5.0	49.00	54.0	-5.0
2745.000000	H	150.00	6.00	29.2	-4.4	24.80	54.0	-29.2
2745.000000	V	155.00	155.00	37.7	-4.4	33.30	54.0	-20.7

**Band Edges, Vertical – Whip Antenna****Band Edges, Horizontal – Whip Antenna**



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Model: Gateway V4.0

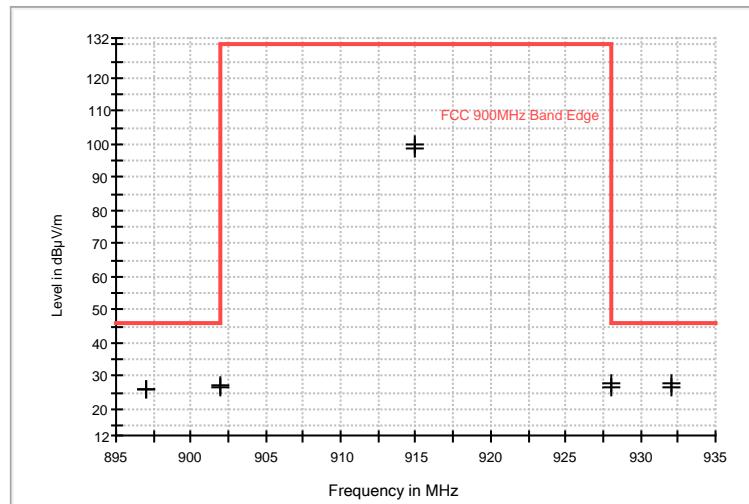
## Measurements – Whip Antenna

### QuasiPeak

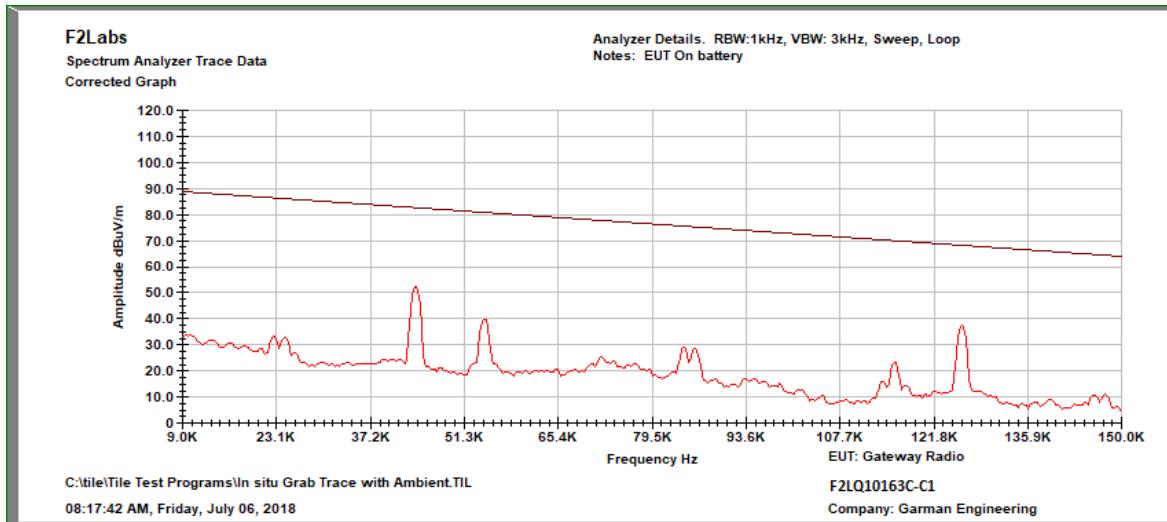
Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dB $\mu$ V)	Cable Loss & Antenna Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
480.000000	V	100.00	0.00	27.4	4.5	31.90	46.0	-14.1
527.960000	V	100.00	47.00	30.0	5.2	35.20	46.0	-10.8
576.000000	V	100.00	53.00	28.3	6.2	34.50	46.0	-11.5
722.920000	H	100.00	169.00	20.8	8.5	29.30	46.0	-16.7
771.240000	H	100.00	155.00	25.6	9.4	35.00	46.0	-11.0
782.760000	H	100.00	158.00	26.0	9.7	35.70	46.0	-10.3
783.200000	V	108.00	251.00	22.9	9.7	32.60	46.0	-13.4
795.160000	H	100.00	338.00	23.2	10.0	33.20	46.0	-12.8
807.200000	H	100.00	144.00	22.1	10.1	32.20	46.0	-13.8
818.760000	H	100.00	174.00	33.9	10.3	44.20	46.0	-1.8
819.200000	V	120.00	49.00	34.6	10.3	44.90	46.0	-1.1
938.760000	H	150.00	344.00	22.2	12.0	34.20	46.0	-11.8
939.200000	V	123.00	177.00	25.4	12.0	37.40	46.0	-8.6
963.160000	V	139.00	161.00	30.1	12.3	42.40	54.0	-11.6

### Band Edges – Whip Antenna

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dB $\mu$ V)	Cable Loss & Antenna Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
897.000000	V	125.00	159.00	14.8	11.4	26.20	46.0	-19.8
897.000000	H	210.00	7.00	14.8	11.4	26.20	46.0	-19.8
902.000000	V	125.00	159.00	15.2	11.5	26.70	46.0	-19.3
928.000000	V	125.00	159.00	15.9	11.9	27.80	46.0	-18.2
932.000000	H	210.00	7.00	14.4	12.0	26.40	46.0	-19.6
932.000000	V	125.00	159.00	15.6	12.0	27.60	46.0	-18.4



## 0.009 MHz to 0.15 MHz – Dipole Antenna



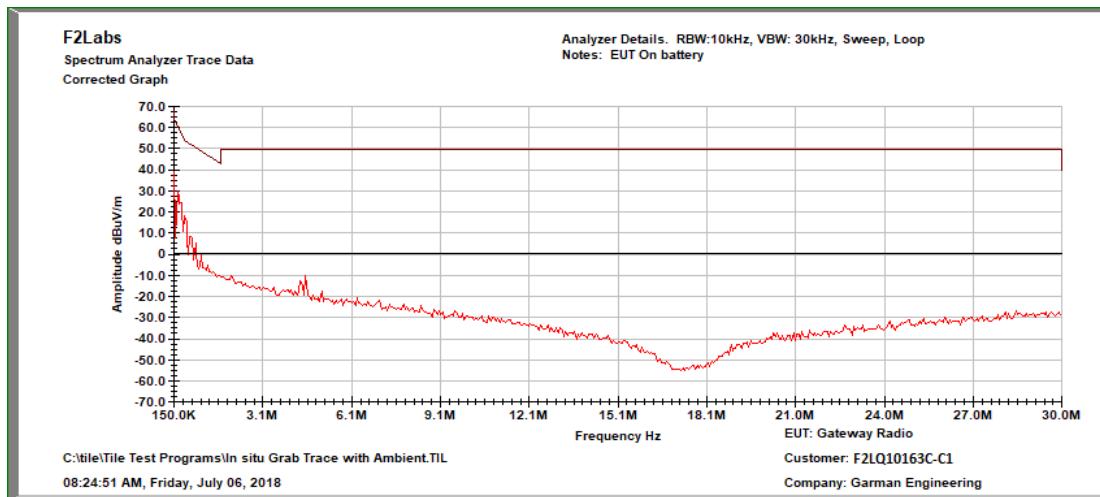


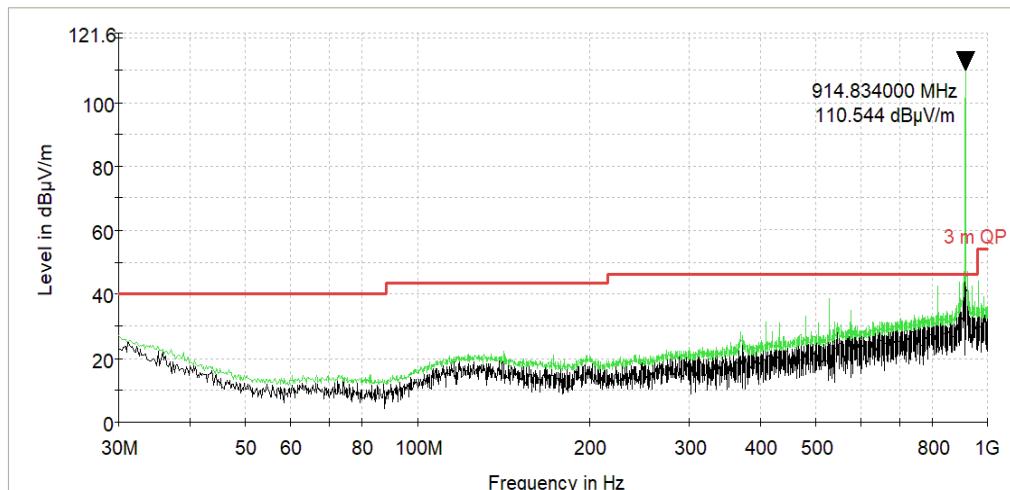
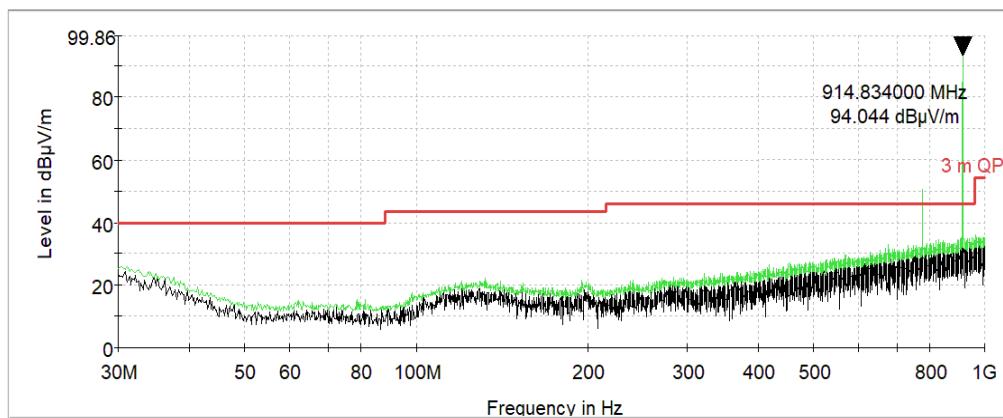
Order Nos.: F2LQ10163C, F2LQ10163C-C1

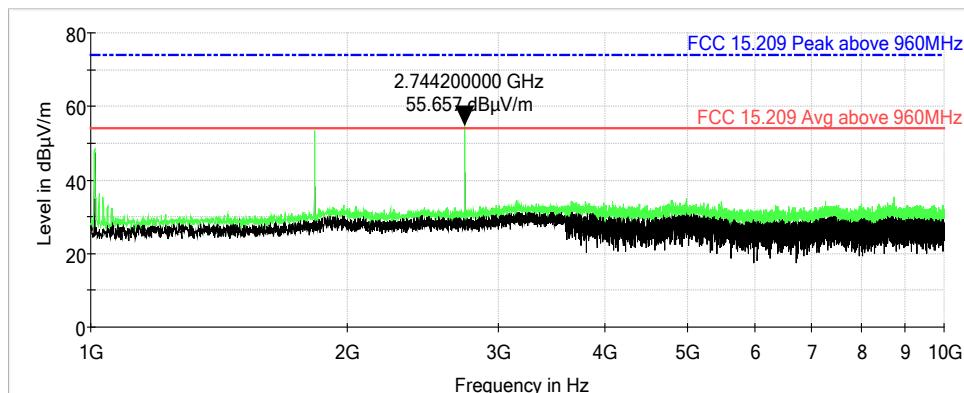
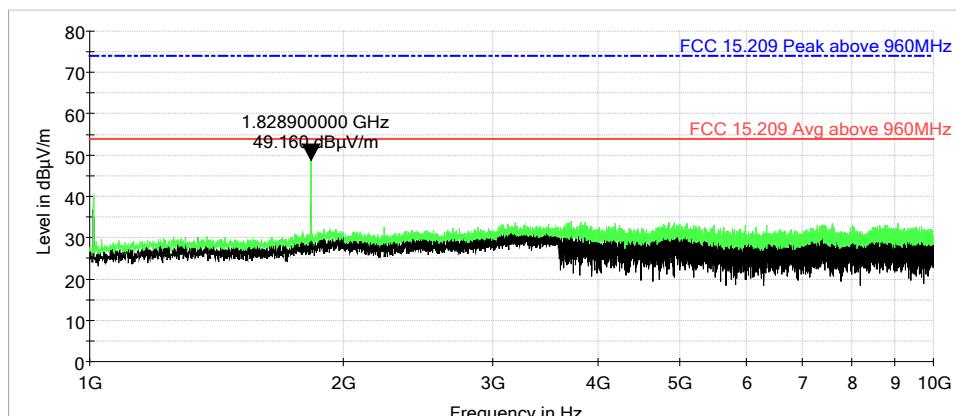
Applicant: Heat Watch LLC

Model: Gateway V4.0

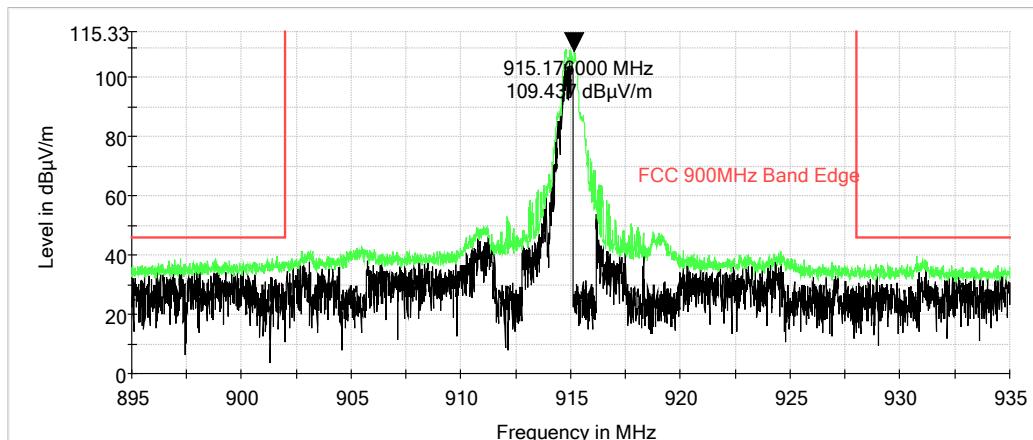
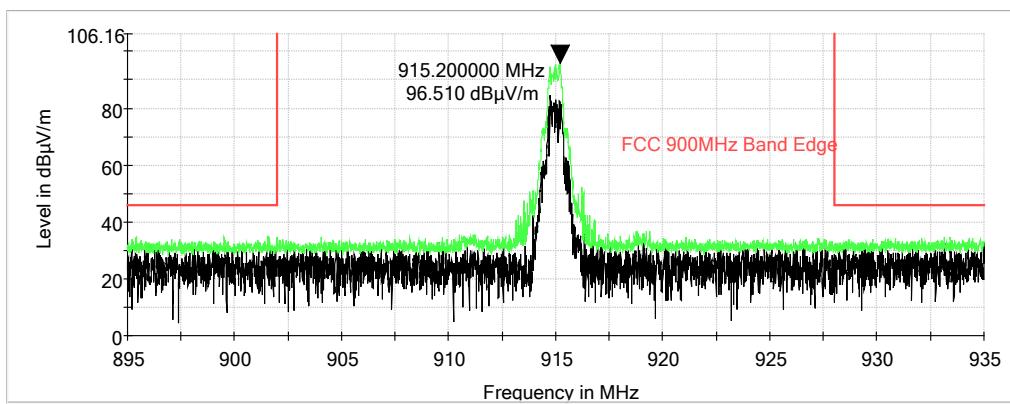
### 0.15 MHz to 30.0 MHz – Dipole Antenna



**30 MHz to 1000 MHz, Vertical – Dipole Antenna****30 MHz to 1000 MHz, Horizontal – Dipole Antenna**

**1 GHz to 10 GHz, Vertical – Dipole Antenna**

**1 GHz to 10 GHz, Horizontal – Dipole Antenna**


Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (degrees)	Reading (dB $\mu$ V)	Cable Loss & Antenna Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1010.000000	V	127.00	278.00	28.6	-7.3	21.30	54.0	-32.7
1011.000000	H	120.00	302.00	32.6	-7.3	25.30	54.0	-28.7
1830.000000	H	120.00	143.00	49.1	-5.0	44.10	54.0	-9.9
1830.000000	V	120.00	210.00	54.7	-5.0	49.70	54.0	-4.3
2745.000000	V	120.00	265.00	57.1	-4.4	52.70	54.0	-1.3

**Band Edge, Vertical – Dipole Antenna****Band Edge, Horizontal – Dipole Antenna**



Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

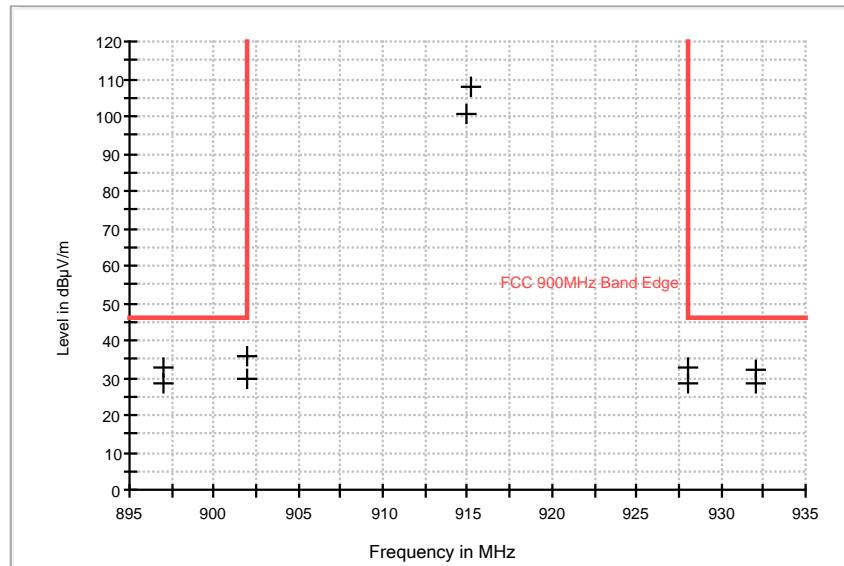
## Measurements – Dipole Antenna

### QuasiPeak

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dB $\mu$ V)	Cable Loss & Antenna Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
527.960000	V	100.00	50.00	32.7	5.2	37.90	46.0	-8.1
778.640000	H	100.00	358.00	16.1	10.0	26.10	46.0	-19.9
819.240000	V	100.00	225.00	27.3	10.5	37.80	46.0	-8.2
890.760000	V	100.00	177.00	29.1	11.4	40.50	46.0	-5.5
938.760000	V	100.00	212.00	28.9	12.1	41.00	46.0	-5.0
963.200000	V	139.00	205.00	31.2	12.5	43.70	54.0	-10.3

### Band Edges – Dipole Antenna

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dB $\mu$ V)	Cable Loss & Antenna Factor (dB)	Emission (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
897.000000	H	120.00	305.00	17.1	11.6	28.70	46.0	-17.3
897.000000	V	120.00	222.00	21.1	11.6	32.70	46.0	-13.3
902.000000	H	120.00	305.00	17.9	11.6	29.50	46.0	-16.5
902.000000	V	120.00	222.00	23.9	11.6	35.50	46.0	-10.5
928.000000	V	120.00	222.00	20.5	12.1	32.60	46.0	-13.4
928.000000	H	120.00	305.00	16.3	12.1	28.40	46.0	-17.6
932.000000	H	120.00	305.00	16.2	12.1	28.30	46.0	-17.7
932.000000	V	120.00	222.00	20.2	12.1	32.30	46.0	-13.7





Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

## 12 PEAK POWER SPECTRAL DENSITY (PSD)

Peak power spectral density measurements were performed.

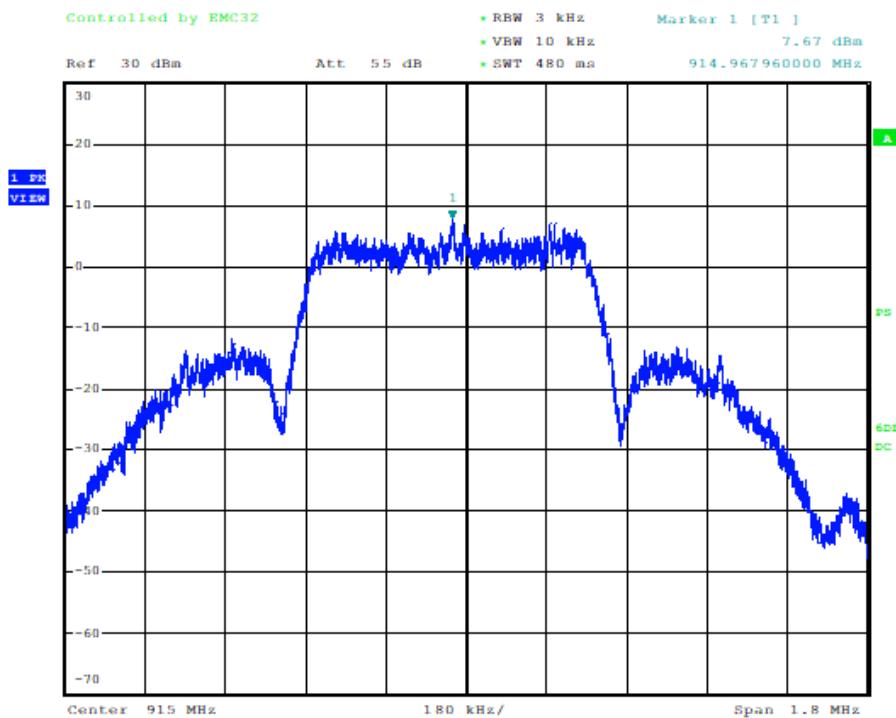
### 12.1 Requirements:

The peak power spectral density shall not exceed +8dBm in any 3 kHz band during any time interval of continuous transmission.

Power spectral density measurements were performed at a resolution bandwidth of 3 kHz (video bandwidth set at 10 kHz). The peak spectral densities were measured at the single intended operating frequency of 915 MHz.

## 12.2 Peak Power Spectral Density Test Data

<b>Test Date(s):</b>	July 2, 2018	<b>Test Engineer:</b>	J. Chiller
<b>Standards:</b>	CFR 47 Part 15.247(e); KDB558074	<b>Air Temperature:</b>	21.9°C
		<b>Relative Humidity:</b>	47%



Date: 20.JUL.2018 13:04:21



## 13 CONDUCTED EMISSIONS

### 13.1 Requirements

In accordance with FCC CFR 47 Part 15.207(a), "Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.



Order Nos.: F2LQ10163C, F2LQ10163C-C1

Applicant: Heat Watch LLC

Model: Gateway V4.0

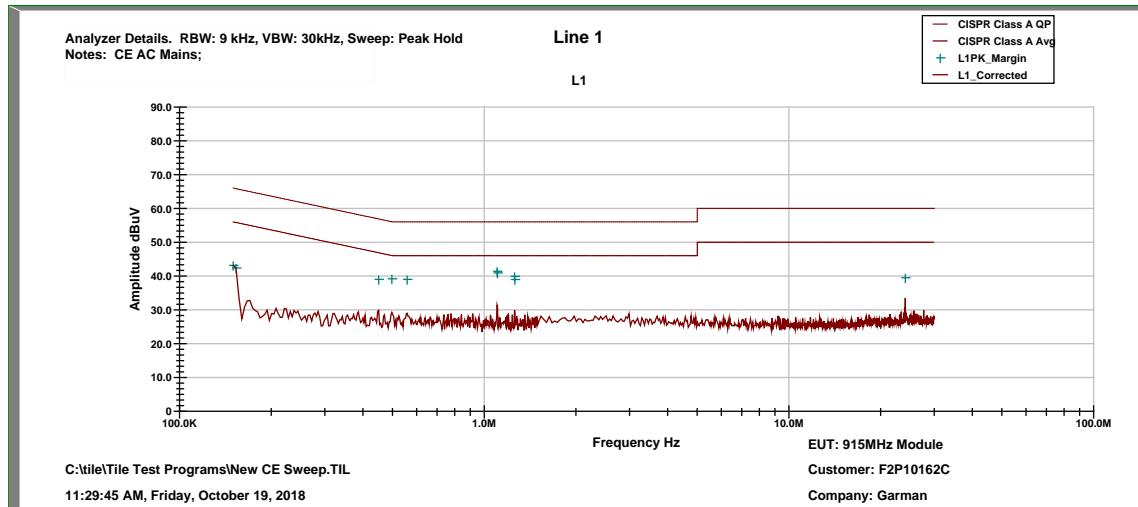
### 13.2 Procedure

The EUT was placed on a 1.0 x 1.5 meter non-conductive table, 0.8 meter above a horizontal ground plane and 0.4 meter from a vertical ground plane. Power was provided to the EUT through a LISN bonded to a 3 x 2 meter ground plane. The LISN and peripherals were supplied power through a filtered AC power source. The output of the LISN was connected to the input of the receiver via a transient limiter, and emissions in the range 150 kHz to 30 MHz were measured. The measurements were recorded using the quasi-peak and average detectors as directed by the standard, and the resolution bandwidth during testing was 9 kHz. The raw measurements were corrected to allow for attenuation from the LISN, transient limiter and cables.

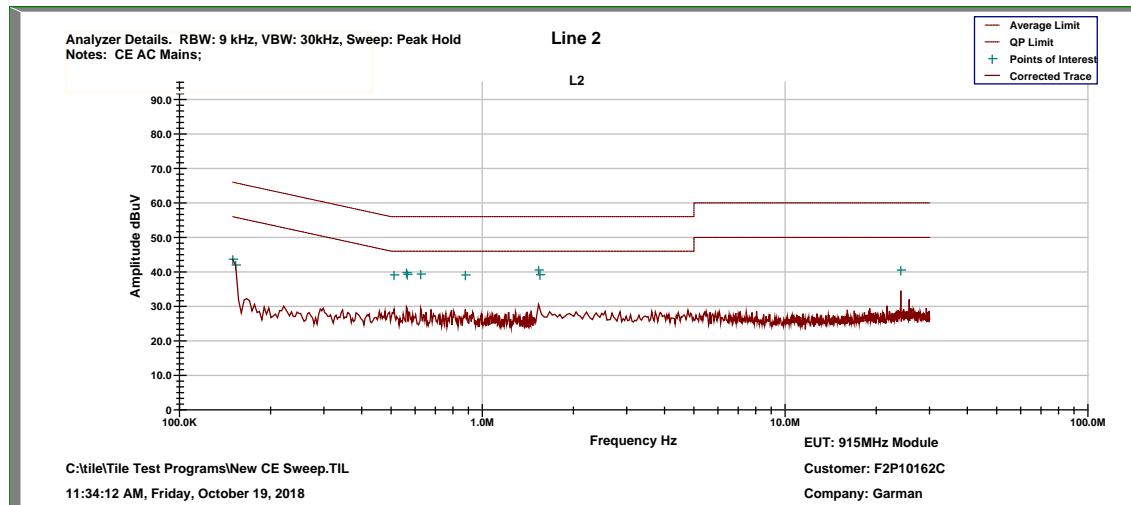
### 13.3 Conducted Emissions Test Data

Test Date:	Oct. 19, 2018	Test Engineer:	J. Chiller
Rule:	15.207	Air Temperature:	22.1° C
Test Results:	Pass	Relative Humidity:	48%

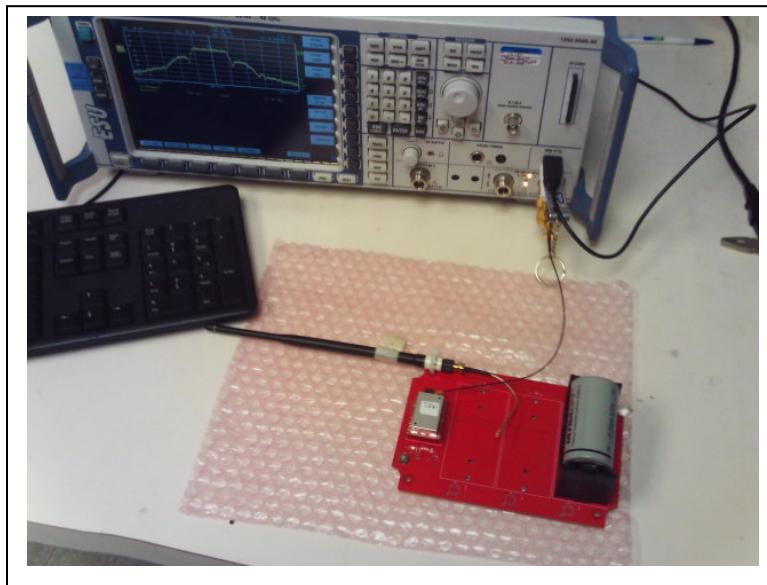
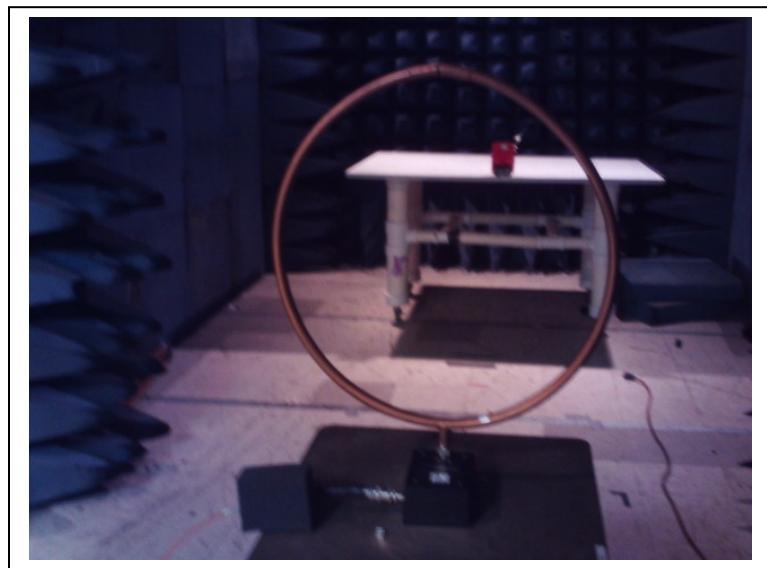
#### Conducted Test – Line 1: 0.15 MHz to 30.0 MHz



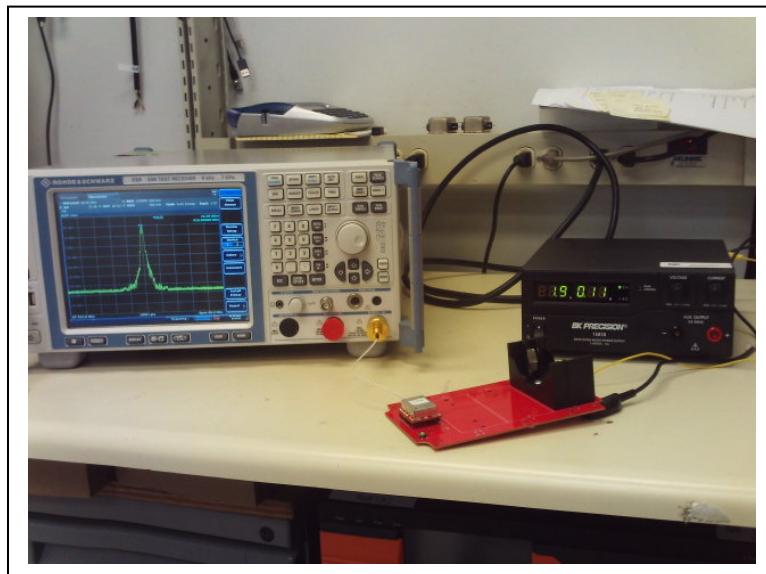
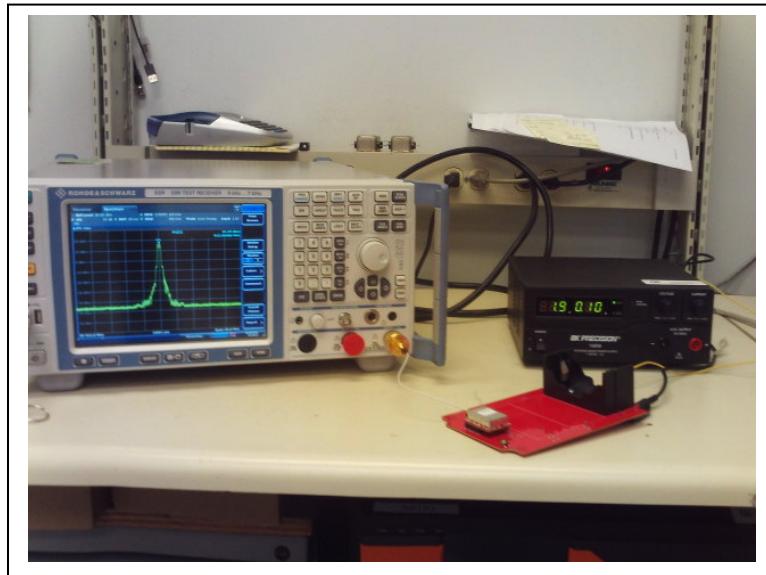
Top Discrete Measurements									
No.	Conductor	Frequency (MHz)	Detector	Level (dB $\mu$ V)	Adjustment (dB)	Results (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	
1	Line 1	0.15	Quasi-Peak	28.124	11.555	39.679	66.0	-26.321	
		0.15	Average	21.411	11.555	32.966	56.0	-23.034	
2	Line 1	0.153375	Quasi-Peak	21.720	11.497	33.217	65.816	-32.60	
		0.153375	Average	16.023	11.497	27.520	55.816	-28.296	
3	Line 1	0.450375	Quasi-Peak	12.876	10.441	23.317	56.868	-33.551	
		0.450375	Average	7.135	10.441	17.576	46.868	-29.292	
4	Line 1	0.497625	Quasi-Peak	12.666	10.405	23.071	56.04	-32.97	
		0.497625	Average	7.139	10.405	17.544	46.04	-28.496	
5	Line 1	0.558375	Quasi-Peak	12.809	10.379	23.188	56.0	-32.812	
		0.558375	Average	6.606	10.379	16.985	46.0	-29.015	
6	Line 1	1.10175	Quasi-Peak	12.440	10.313	22.753	56.0	-33.247	
		1.10175	Average	6.685	10.313	16.998	46.0	-29.002	
7	Line 1	1.10512	Quasi-Peak	12.487	10.313	22.800	56.0	-33.200	
		1.10512	Average	6.605	10.313	16.918	46.0	-29.082	
8	Line 1	1.257	Quasi-Peak	12.358	10.310	22.668	56.0	-33.332	
		1.257	Average	6.153	10.310	16.463	46.0	-29.537	
9	Line 1	1.26038	Quasi-Peak	12.151	10.310	22.461	56.0	-33.539	
		1.26038	Average	6.496	10.310	16.806	46.0	-29.194	
10	Line 1	24.075	Quasi-Peak	10.803	11.082	21.885	60.0	-38.115	
		24.075	Average	4.704	11.082	15.786	50.0	-34.214	

**Conducted Test – Line 2: 0.15 MHz to 30.0 MHz**


Top Discrete Measurements								
No.	Conductor	Frequency (MHz)	Detector	Level (dB $\mu$ V)	Adjustment (dB)	Results (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)
1	Line 2	0.15	Quasi-Peak	28.446	11.555	40.001	66.0	-25.999
		0.15	Average	22.941	11.555	34.496	56.0	-21.504
2	Line 2	0.153375	Quasi-Peak	21.635	11.497	33.132	65.816	-32.684
		0.153375	Average	17.641	11.497	29.138	55.816	-26.678
3	Line 2	0.511125	Quasi-Peak	12.871	10.400	23.271	56.0	-32.729
		0.511125	Average	7.145	10.400	17.545	46.0	-28.455
4	Line 2	0.56175	Quasi-Peak	12.741	10.377	23.118	56.0	-32.882
		0.56175	Average	7.625	10.377	18.002	46.0	-27.998
5	Line 2	0.565125	Quasi-Peak	12.659	10.375	23.034	56.0	-32.97
		0.565125	Average	7.035	10.375	17.410	46.0	-28.590
6	Line 2	0.625875	Quasi-Peak	12.812	10.351	23.163	56.0	-32.837
		0.625875	Average	7.316	10.351	17.667	46.0	-28.333
7	Line 2	0.879	Quasi-Peak	12.621	10.288	22.909	56.0	-33.091
		0.879	Average	7.062	10.288	17.350	46.0	-28.650
8	Line 2	1.53375	Quasi-Peak	12.075	10.307	22.382	56.0	-33.618
		1.53375	Average	6.519	10.307	16.826	46.0	-29.174
9	Line 2	1.55	Quasi-Peak	12.148	10.302	22.450	56.0	-33.550
		1.55	Average	5.986	10.302	16.288	46.0	-29.712
10	Line 2	24.075	Quasi-Peak	10.795	11.082	21.877	60.0	-38.123
		24.075	Average	5.321	11.082	16.403	50.0	-33.597

**14 PHOTOGRAHPS****Occupied Bandwidth-Conducted, Output Power,  
Peak Power Spectral Density, Conducted Spurious Emissions****Radiated Spurious, Loop Antenna (0.009 MHz to 30 MHz)**

**Radiated Spurious Emission, 30 MHz to 1000 MHz****Radiated Spurious Emission, Greater than 1000 MHz**

**Voltage Variations**

**Conducted Emissions**