COMPLIANCE WORLDWIDE INC.
TEST REPORT 338-17

In Accordance with the Requirements of

FCC PART 15.209, Subpart C

Issued to

The Museum of the Bible, Inc.
7507 SW 44th Street
Oklahoma City, OK 73179

for the

DGuide
EX3117

FCC ID: 2ALMG-DGUIDE1-2

Report Issued on January 3, 2018

Tested by

Brian F. Breault

Reviewed by

Larry K. Stillings

Table of Contents

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1. Scope

This test report certifies that the The Museum of the Bible, Inc. DGuide, as tested, meets the FCC Part 15.209, Subpart C requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2. Product Details

2.1. Manufacturer: The Museum of the Bible, Inc.

2.2. Model Number: DGuide

2.3. Serial Number: Pre production unit

2.4. Description: A Dguide is a guide and educator assigned for a specific purpose, such as a museum tour. The DGuide is a tablet type device that performs this task. The DGuide Dock is the Qi wireless charging station nominally operating from 110 to 205 kHz for the DGuide.

2.5. Power Source: 120 volts, 60 Hz

2.6. Hardware Rev.: 2.0

2.7. Software Rev.: N.A

2.8. EMC Modifications: None

3. Product Configuration

3.1. Operational Characteristics & Software

The DGuide Dock was tested while charging a DGuide tablet.

3.2. EUT Cables/Transducers

Manufacturer	Model/Part #	Length (m)	Shield Y/N	Description	From	To
Amazon	HP01-V2	2	Y	Headphone Cable	DGuide	Headphones

3.3. Support Equipment

Device	Manufacture	Model	Serial No.	Comment
Headphones	Amazon	HP01-V2	N/A	To populate DUT headphone port

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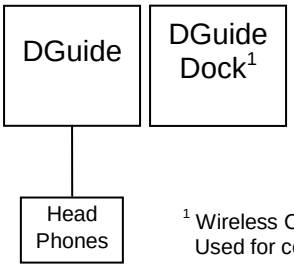
3. Product Configuration (continued)

3.4. Block Diagram



[1] Wireless Charging Station.
Used for conducted emissions.

4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Tests

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9kHz - 7GHz [1]	Rohde & Schwarz	ESR7	101156	7/23/2018	3 Years
Spectrum Analyzer 20 Hz – 40 GHz [2]	Rohde & Schwarz	FSV40	100899	7/23/2018	3 Years
Spectrum Analyzer, 9 kHz - 40 GHz [3]	Rohde & Schwarz	FSVR40	100909	5/3/2019	2 Years
Spectrum Analyzer, 2 Hz - 26 GHz [4]	Rohde & Schwarz	FSW26	102057	12/7/2018	2 Years
EMI Receiver	Hewlett Packard	8546A	3650A00360	12/6/2018	3 Years
Passive Loop Antenna, 9 kHz to 30 MHz	EMCO	6512	9309-1139	10/26/2018	2 Years
Biconilog Antenna, 30 MHz to 2 GHz	Sunol Sciences	JB1	A050913	6/3/2019	3 Years
Horn Antenna, 960 MHz to 18 GHz	Electro-Metrics	EM-6961	6337	5/2/2018	1 Year
Horn Antenna, 18 GHz to 40 GHz	Com-Power	AH-840	101032	2/24/2018	2 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B	3008A00329	7/22/2018	3 Years
EMI Receiver, 9 kHz to 6.5 GHz	Hewlett Packard	8546A	3330A00115	12/4/2018	2 Years
Annex A Magnetic Loop	Compliance Worldwide	EN 55103-1	001	CNR	---
Differential Amplifier	LeCroy	DA1855A	LDCB800426706	10/11/2018	3 Years
EM Radiation Meter w/100 kHz – 3 GHz Probe	Wandel & Goltermann	EMR-200 w/ Type 8	BN/2244 /21 060019	10/15/2018	3 Years
Temperature Chamber	Associated Environmental Systems	SD-308	N/A	NR	---

[1] ESR7 Firmware revision: V3.36, Date installed: 05/16/2017 Previous V2.26 SP2, installed 11/15/2016.
[2] FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016 Previous V2.30 SP1, installed 10/22/2014.
[3] FSVR40 Firmware revision: V2.23 SP1, Date installed: 08/19/2016 Previous V2.23, installed 10/20/2014.
[4] FSW26 Firmware revision: V2.61 SP1, Date installed: 04/04/2017 Previous V2.40, installed 05/04/2016.

4.2. Measurement Software

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	Not used for this test report

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4. Measurements Parameters

4.3. Measurement & Equipment Setup

Test Dates:	December 5, 2017 – January 2, 2018
Test Engineer:	Brian Breault
Normal Site Temperature (15 - 35°C):	21.0
Relative Humidity (20 - 75%RH):	33%
Frequency Range:	.009 MHz to 1 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	200 Hz – 9 kHz to 150 kHz 9 kHz – 150 kHz to 30 MHz 120 kHz - 30 MHz to 1 GHz 1 MHz - Above 1 GHz
EMI Receiver Avg Bandwidth:	300 Hz – 9 kHz to 150 kHz 30 kHz – 150 kHz to 30 MHz 300 kHz - 30 MHz to 1 GHz 3 MHz - Above 1 GHz
Detector Function:	Peak, QP, Avg – 150 kHz to 30 MHz Peak, QP - 30 MHz to 1 GHz Peak, Avg - Above 1 GHz Unless otherwise specified.

4.4. Test Procedure

The test measurements contained in this report are based on the requirements detailed in FCC Part 15, Section 15.209: Radiated emission limits; general requirements.

The test methods used to generate the data is this test report is in accordance with ANSI C63.10: 20013, American National Standard for Testing Wireless Devices.

The device under test was initially rotated through three orthogonal axes to determine which attitude produced the highest emission relative to the limit in accordance with ANSI C63.10-20013, section 6.3.2, b). It was determined that the axis that positioned the transmit antenna so that it was facing and parallel to the receive antenna at 0º azimuth was the worst case for all measurements. The test images at the end of this report illustrate the worst case test orientation.

5. Choice of Equipment for Test Suits

5.1. Choice of Model

This test report is based on the test sample supplied by the manufacturer and is reported by the manufacturer to be equivalent to the production units.

5.2. Presentation

The test sample was tested complete with all required ancillary equipment. Refer to Section 3 of this report for the product equipment configuration.

5.3. Choice of Operating Frequencies

This unit utilizes a nominal operating frequency range of approximately 110 to 205 kHz.

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6. Measurement Summary

Test Requirement	FCC Reference	Test Report Sect.	Result	Comment
Antenna Requirement	15.203	7.1	Compliant	Unit has a permanently mounted internal antenna.
Transmitter Emissions Field Strength	15.209 (a)	7.2	Compliant	
Occupied Bandwidth (-20 dB)	ANSI C63.10:2013§ 6.9	7.3	Compliant	
Transmitter Frequency Stability	15.215 (c)	7.4	Compliant	
Transmitter Radiated (Spurious) Emissions Measurements	ANSI C63.10:2013 6.3	7.5	Compliant	
Radiated Emissions 30 to 1000 MHz	ANSI C63.10:2013 § 6.3	7.6	Compliant	
Radiated (Harmonic) Emissions Measurements	ANSI C63.10:2013 § 6.3	7.7	Compliant	
AC Power-line Conducted Emissions Measurements	ANSI C63.10:2013 § 6.2	7.8	N/A	Unit is powered by 6 Volts DC
RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications	47 CFR 1.1307(c & d)	7.9	Compliant	

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7. Measurement Data

7.1. Antenna Requirement (Section 15.203, RSS-GEN 7.1.2)

Requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

Status: The unit under test employs a permanent, internally mounted antenna.

7.2. Transmitter Emissions Field Strength

Requirement: (15.209, Section(a))

Frequency (MHz)		Field Strength (µV/m)	Measurement Distance (meters)
0.009	0.490	2400/F(kHz)	300

Limit = 20 Log10(2400/118)

Limit = 25.17 dBµV/m @ 300m

Test Note: Reference ANSI C63.10-2013 sections 5.3.2 and 6.4.4.2, Equation 2. Both the single point distance and the limit distance were equal to or closer to the EUT than λ/2π. Therefore, the following formula was used to extrapolate the measurement distance to the limit distance:

$$FS_{limit} = FS_{max} - 40\log\left(\frac{d_{near\ field}}{d_{measure}}\right) - 20\log\left(\frac{d_{limit}}{d_{near\ field}}\right)$$

ANSI C63.10-2013, Section 6.4.4.2, Equation 2

FS_{limit} is the calculation of the average field strength at the limit distance (dBµV/m)	**-14.11**
FS_{max} is the measured average field strength, expressed in (dBµV/m)	65.89
$d_{near\ field}$ is the λ/2π distance (Meters)	404.63
$d_{measure}$ is the distance of the measurement point from the EUT (Meters)	3.00
d_{limit} is the reference limit distance (Meters)	300.00

Results: Compliant.

Frequency (MHz)	Meas. Distance (Meters)	Field Strength @ 3M dBµV/m		Field Strength @ 300M[1] dBµV/m	
		Peak	Average	Peak	Average
0.1197	3	65.89	N/A	-14.11	N/A

[1] Measurement has been extrapolated from 3 meters to 300 meters using the above equation.
[2] The average field strength was not calculated using a duty cycle correction because the peak field strength met the FCC Part 15.209 limit.

Frequency (MHz)	Ampl. (dBµV/m)	Ampl. (dBµV/m)	FCC 15.209 Limit (dBµV/m) (@300m)	Avg. Margin (dB)	Ant Position	Ant Height	Turntable Azimuth
	Peak	Average			Par/Per/GPar	cm	Deg
0.1197	-14.11	N/A	26.17	-40.28	GPar	100	80

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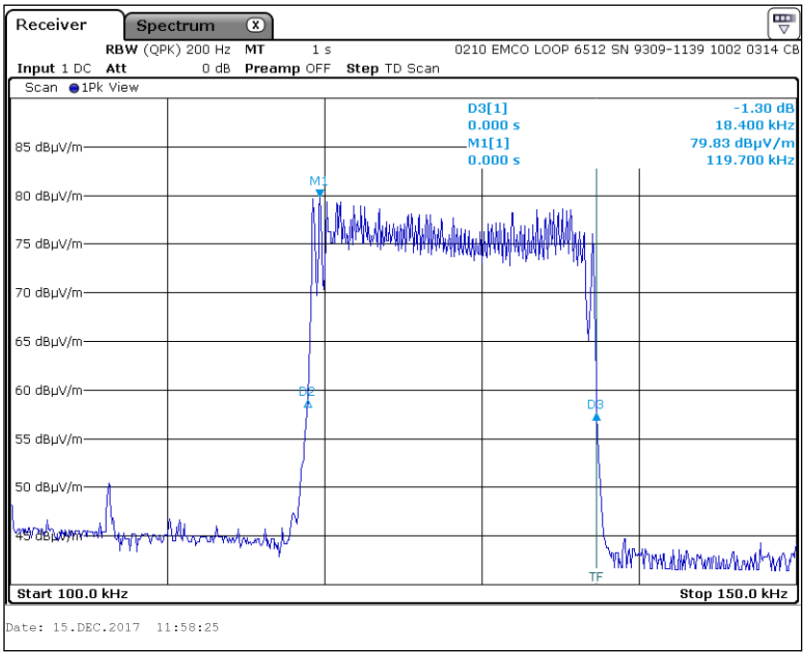
7. Measurement Data

7.2. Transmitter Emissions Field Strength

7.2.1. Transmitter Emissions Field Strength (3 Meter Measurement)



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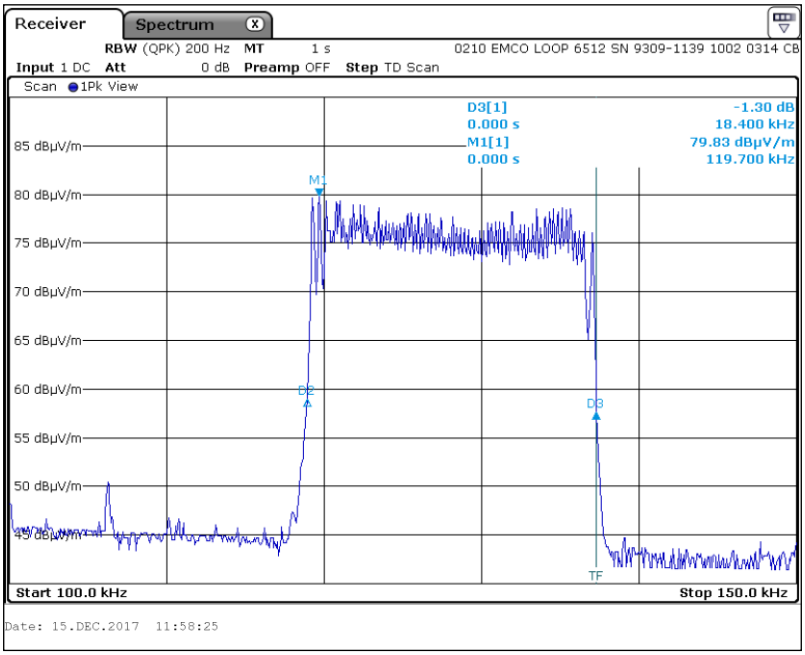
7. Measurement Data (continued)

7.3. Occupied Bandwidth (-20 dB) (15.215 (c), ANSI C63.10, Section 6.9)

Requirement: Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the -20 dB with respect to the reference level.

Resolution Bandwidth : 200 Hz
Video Bandwidth : 1 kHz
Sweep Time : 1 Sec

Frequency (kHz)	-20 dB Bandwidth (kHz)
119.7	18.4



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7. Measurement Data (continued)

7.4. Transmitter Frequency Stability (15.215 (c))

Requirement: Frequency stability is a measure of frequency drift due to temperature and supply voltage variations with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage.

With the transmitter installed in an environment test chamber, the unmodulated carrier frequency shall be measured under the conditions specified below. A sufficient stabilization period at each temperature shall be used prior to each frequency measurement. The following temperatures and supply voltage ranges apply, unless specified otherwise in the applicable RSS.

- At temperatures of -30°C, +20°C and +50°C, and the manufacturer's rated supply voltage.
- At a temperature of +20°C and at ±15 percent of the manufacturer's rated supply voltage.

Test Notes: The mode of operation for the device under test requires a modulated transmission.

For each measurement, the transmitter frequency was determined by the following formula:

$$(F_L + F_H) / 2$$

F_L and F_H were determined by the two measurement points that were -20 dB below the peak of the signal. A resolution bandwidth of 50 Hz and a video bandwidth of 200 Hz were used for the measurements.

±15 percent of the manufacturer's rated supply voltage could not be achieved with the device under test. Below 4.75 volts DC, the device under test ceased transmitting. For this reason, test voltages were set at -5/+15 percent.

Test Condition		Measured Frequency (kHz)	Measured Offset
Temp	Voltage		
-30 ºC	5 VDC	149.0085	0.002477%
+20 ºC		149.3785	Nominal
+50 ºC		148.9105	0.003133%
+20 ºC	4.75 VDC	149.4164	0.000254%
	5.75 VDC	149.1405	0.001593%

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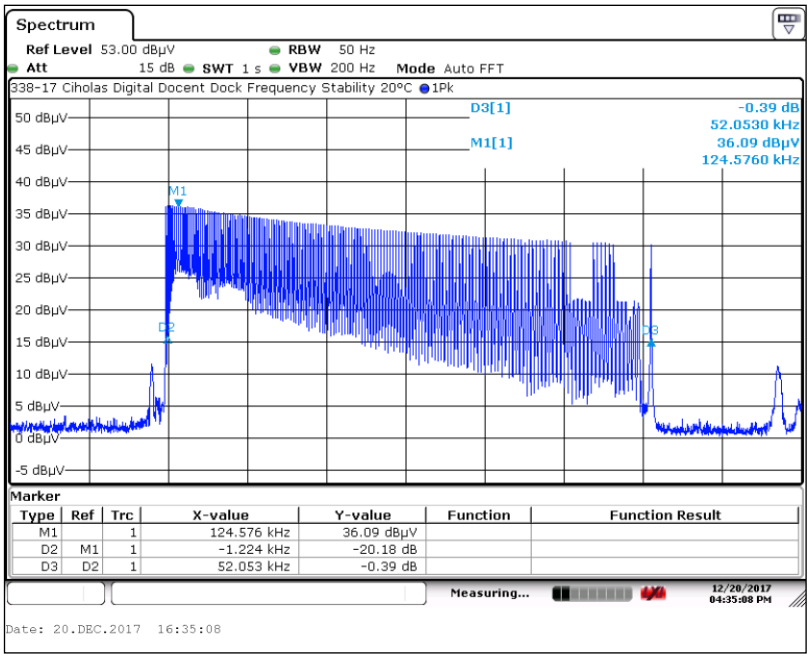
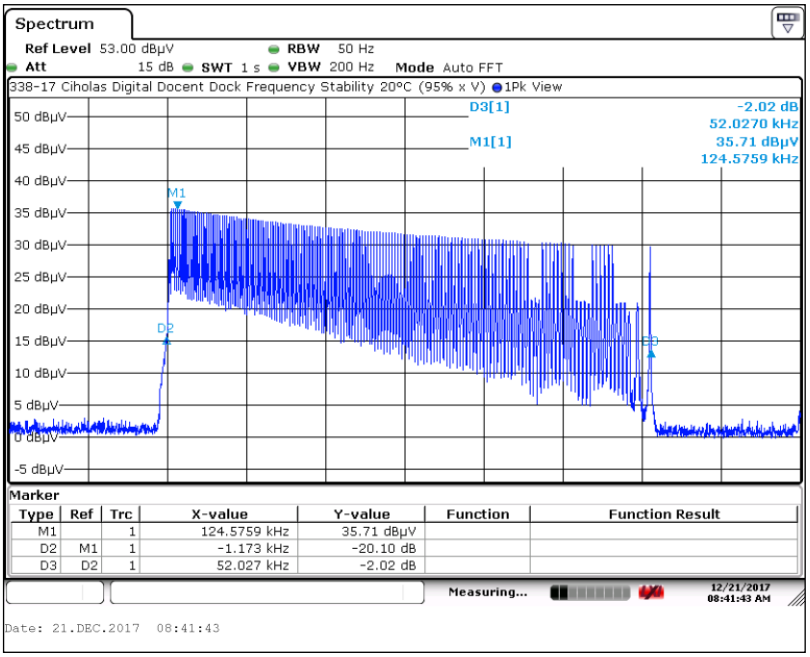
7. Measurement Data (continued)

7.4. Transmitter Frequency Stability (15.215 (c)) (continued)

7.4.1. Transmitter Frequency Stability – Nominal (5 VDC, 20ºC)



7.4.2. Transmitter Frequency Stability – Voltage 1 of 2 (-5% - 4.75 VDC, 20ºC)



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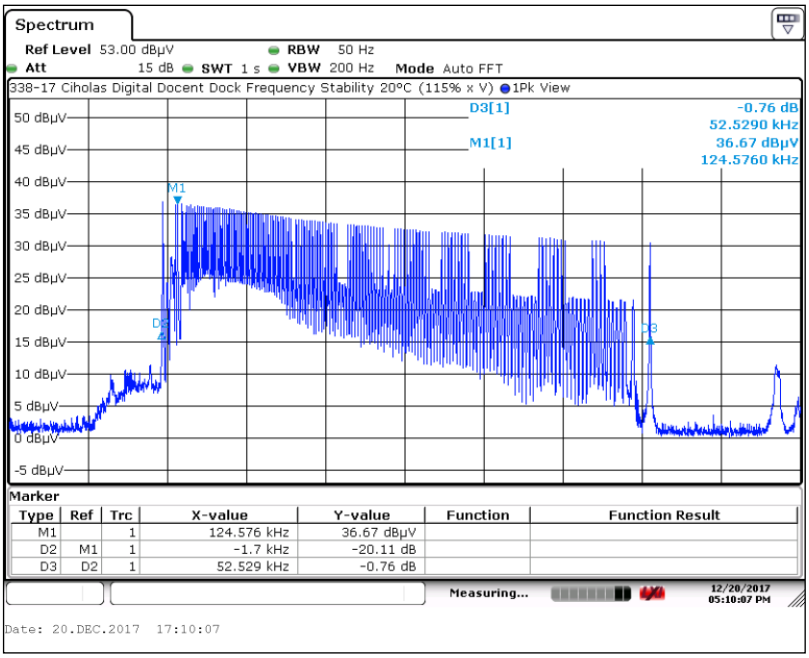
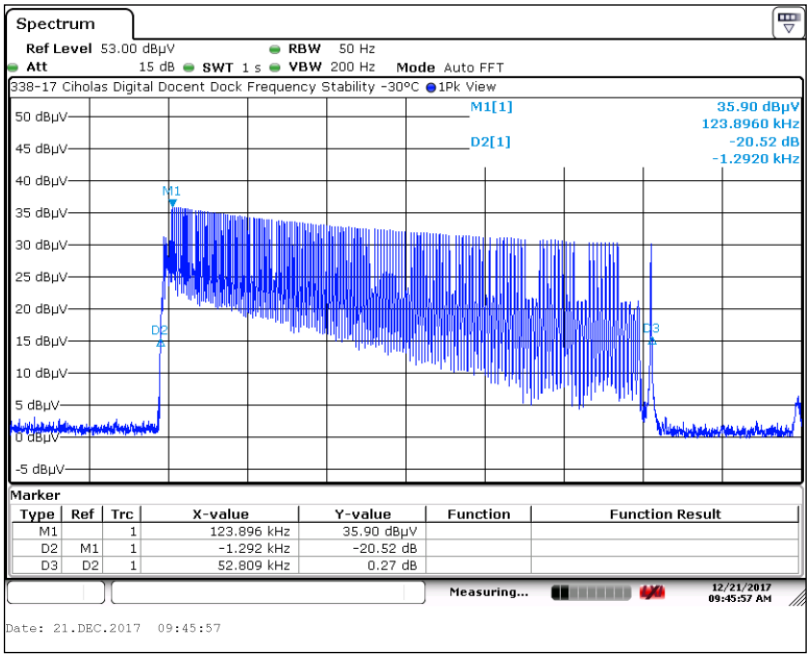
7. Measurement Data (continued)

7.4. Transmitter Frequency Stability (15.215 (c)) (continued)

7.4.3. Transmitter Frequency Stability – Voltage 2 of 2 (+15% - 5.75 VDC, 20ºC)



7.4.4. Transmitter Frequency Stability – Temperature 1 of 2 (5.0 VDC, -30ºC)



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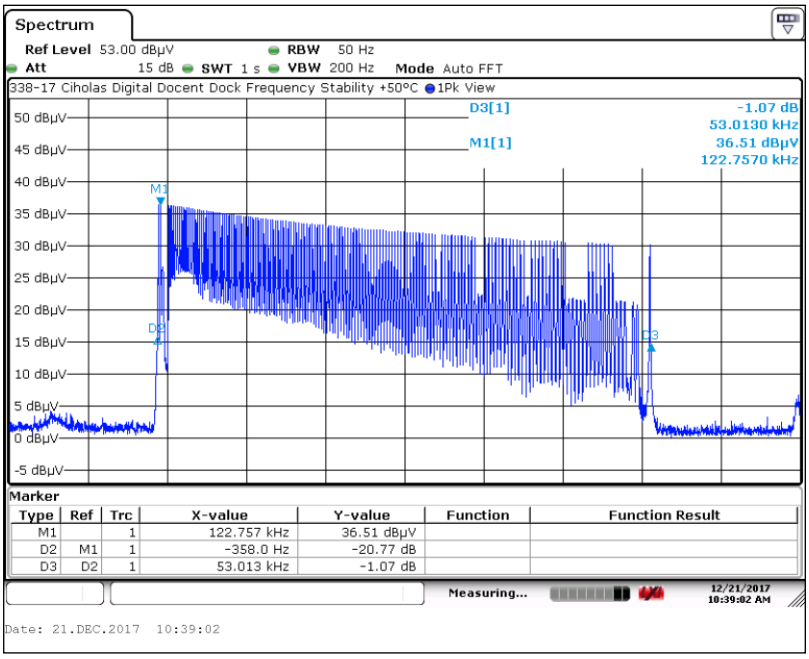
7. Measurement Data (continued)

7.4. Transmitter Frequency Stability (15.215 (c)) (continued)

7.4.5. Transmitter Frequency Stability – Temperature 2 of 2 (5 VDC, +50ºC)



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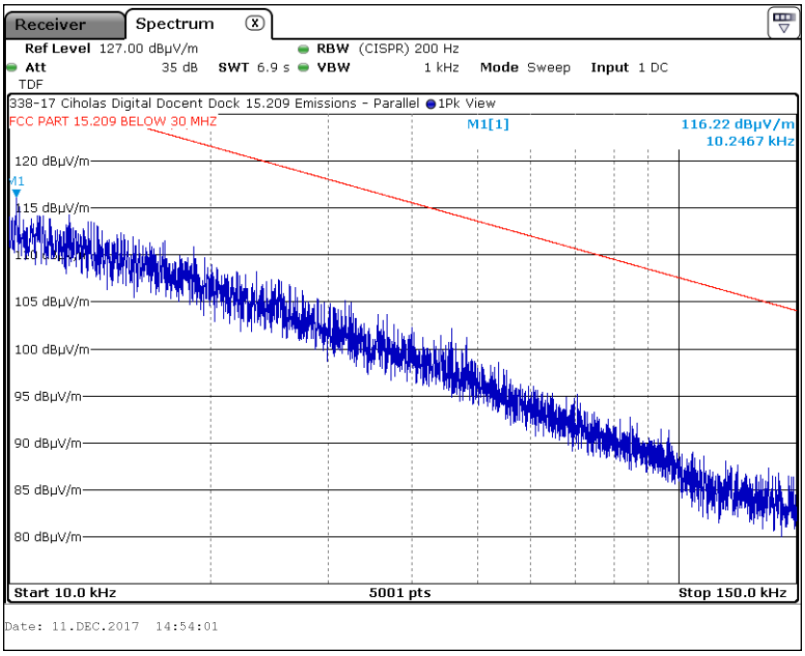
7. Measurement Data (continued)

7.5. Transmitter Radiated (Spurious) Emissions (ANSI C63.10:2013 §6.3 - §6.6)

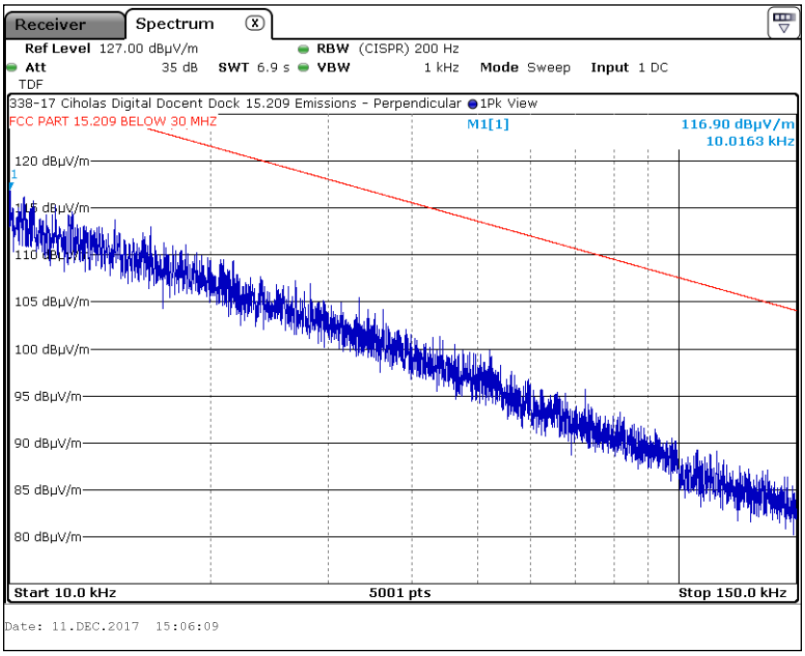
Requirement: General part 15.209 emissions limits requirement.

Results: Compliant.

7.5.1. 10 kHz to 150 kHz, Parallel Antenna



7.5.2. 10 kHz to 150 kHz, Perpendicular Antenna



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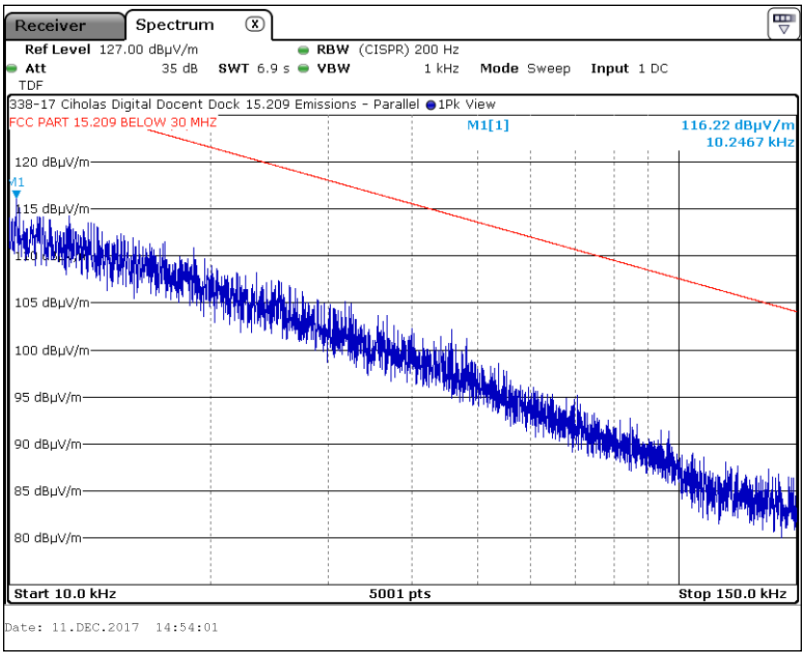
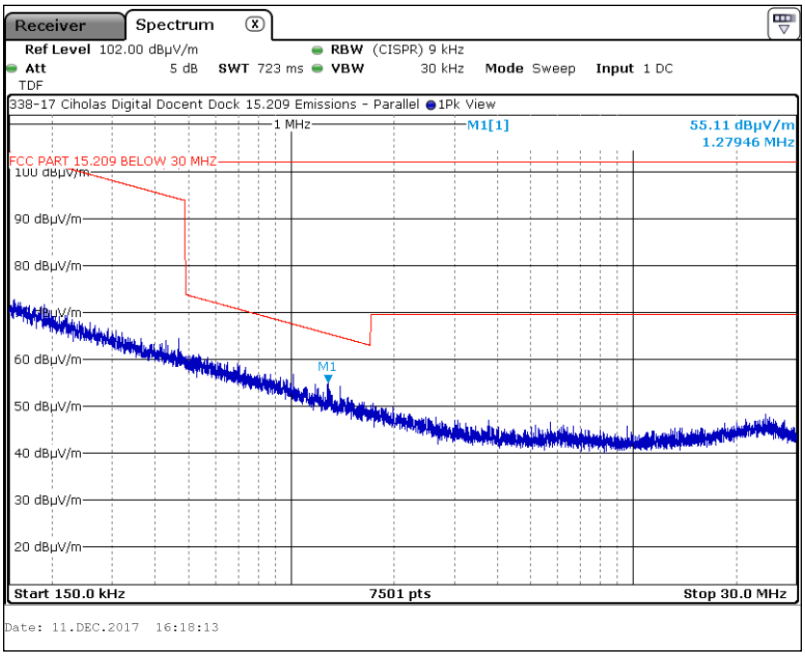
7. Measurement Data (continued)

7.5. Transmitter Radiated (Spurious) Emissions (ANSI C63.10:2013 §6.3 - §6.6)

7.5.3. 10 kHz to 150 kHz, Ground Parallel Antenna



7.5.4. 150 kHz to 30 MHz, Parallel Antenna



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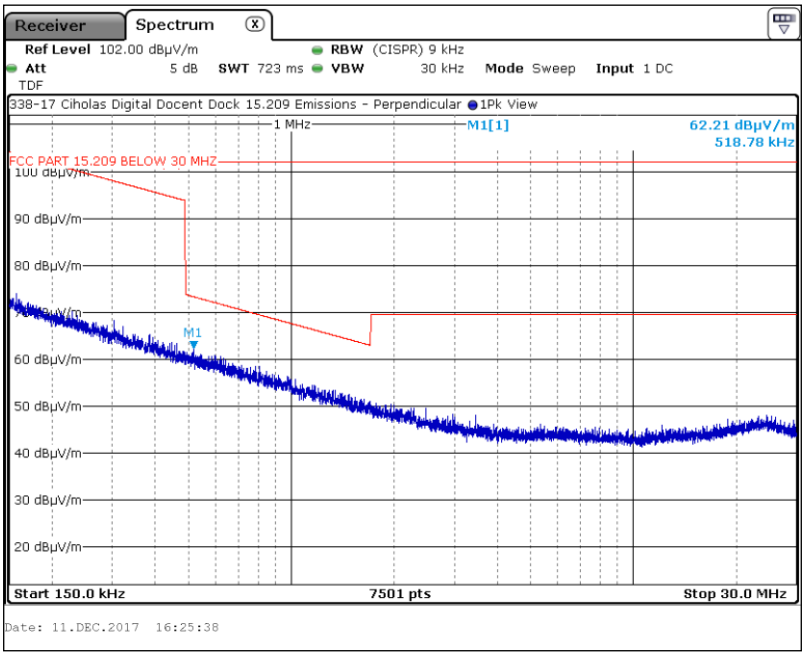
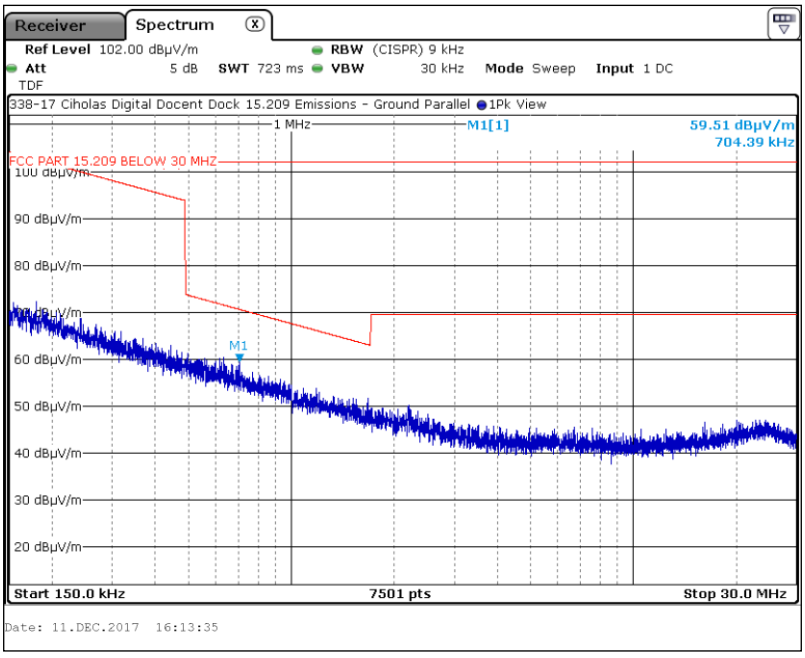
7. Measurement Data (continued)

7.5. Transmitter Radiated (Spurious) Emissions (ANSI C63.10:2013 §6.3 - §6.6)

7.5.5. 150 kHz to 30 MHz, Perpendicular Antenna



7.5.6. 150 kHz to 30 MHz, Ground Parallel Antenna



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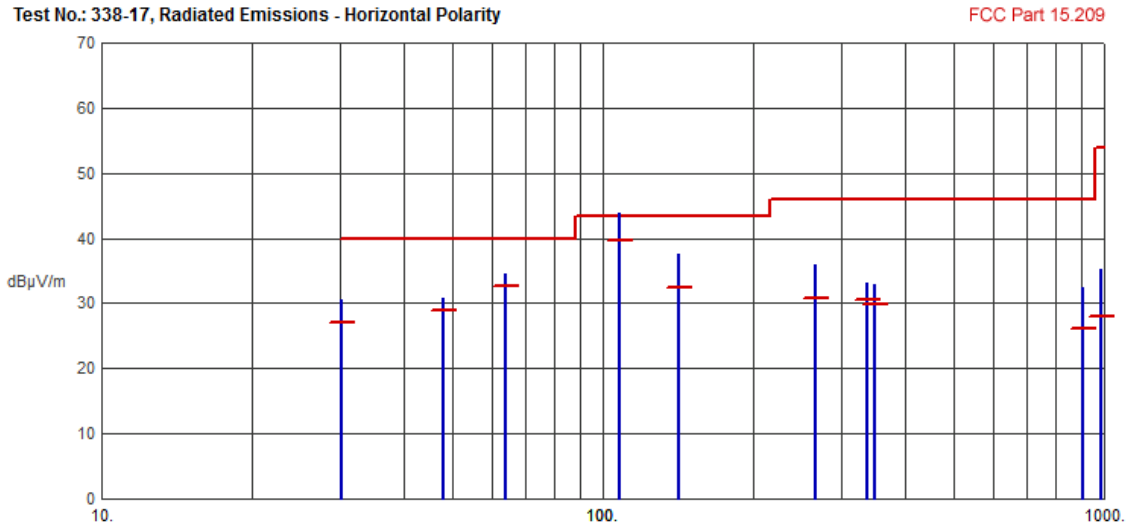
7. Measurement Data (continued)

7. 6. Radiated Emissions (30 MHz to 1 GHz) Test Results

7.6.1. Horizontal Polarity



Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
30.2231	30.58	27.13	40.00	-12.87	N/A	N/A	
47.9053	30.76	29.05	40.00	-10.95	N/A	N/A	
63.8438	34.62	32.59	40.00	-7.41	N/A	N/A	
108.2269	43.93	39.74	43.50	-3.76	N/A	N/A	
141.4459	37.66	32.51	43.50	-10.99	N/A	N/A	
265.6538	36.00	30.79	46.00	-15.21	N/A	N/A	
335.7161	33.18	30.54	46.00	-15.46	N/A	N/A	
347.7598	32.90	29.82	46.00	-16.18	N/A	N/A	
907.7194	32.49	26.04	46.00	-19.96	N/A	N/A	
989.4539	35.26	27.96	54.00	-26.04	N/A	N/A	

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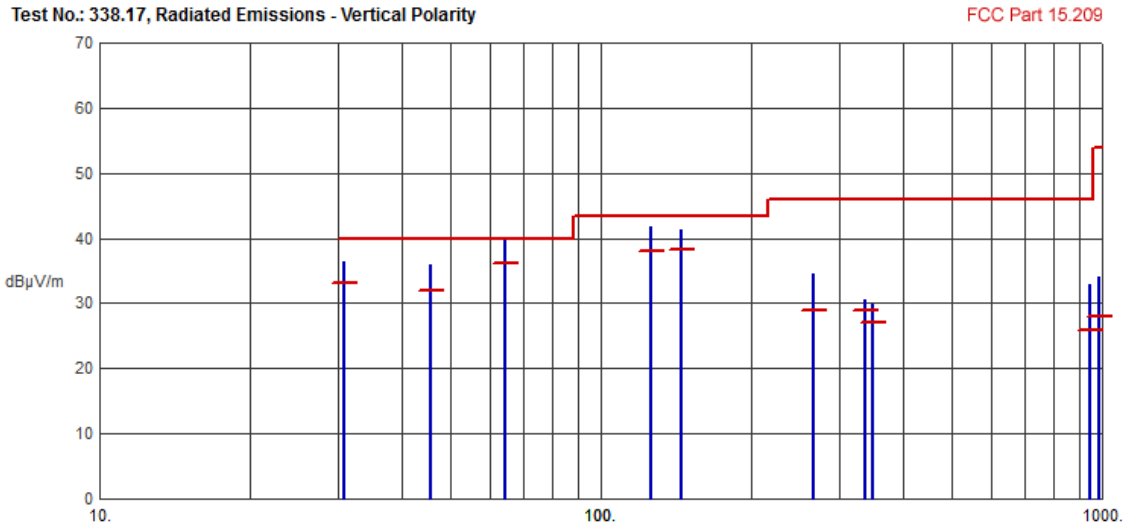
7. Measurement Data (continued)

7. 6. Radiated Emissions (30 MHz to 1 GHz) Test Results

7.6.2. Vertical Polarity



Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
30.7633	36.37	33.18	40.00	-6.82	N/A	N/A	
45.8965	35.88	32.06	40.00	-7.94	N/A	N/A	
64.5166	39.75	36.07	40.00	-3.93	N/A	N/A	
125.5402	41.67	37.99	43.50	-5.51	N/A	N/A	
144.7042	41.37	38.21	43.50	-5.29	N/A	N/A	
265.6058	34.43	28.85	46.00	-17.15	N/A	N/A	
335.7161	30.52	28.87	46.00	-17.13	N/A	N/A	
348.1372	29.86	26.99	46.00	-19.01	N/A	N/A	
946.2510	32.82	25.88	46.00	-20.12	N/A	N/A	
986.5965	34.02	27.92	54.00	-26.08	N/A	N/A	

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7. Measurement Data (continued)

7.7. Radiated (Harmonic) Emissions (ANSI C63.4:2009 §13.4)

Requirement: FCC 15.209(c)

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental.

Test Notes: Measurements were made in accordance with ANSI C63.10, Section 5.4. Reference Section 7.2 for the extrapolation equation.

Frequency (MHz)	Field Strength (dBµV/m)		Limit[2] (dBµV/m)	Margin (dB)	Antenna Orientation Par/Per/Gpar	Antenna Height (cm)	TT Position (deg)
	Peak 3M	Peak[1]	Avg or QP				
0.240	58.07	-18.36	20.00	-38.36	Parallel	100	320
	57.98	-18.45	20.00	-38.45	Perpendicular	100	220
	58.05	-18.38	20.00	-38.38	Ground Parallel	100	80
0.360	53.90	-19.01	16.48	-35.49	Parallel	100	20
	53.50	-19.41	16.48	-35.89	Perpendicular	100	240
	53.75	-19.16	16.48	-35.64	Ground Parallel	100	0
0.480	51.34	-19.07	13.98	-33.05	Parallel	100	100
	51.02	-19.39	13.98	-33.37	Perpendicular	100	280
	51.10	-19.31	13.98	-33.29	Ground Parallel	100	0
0.600	49.13	9.13	32.04	-22.91	Parallel	100	20
	49.10	9.10	32.04	-22.94	Perpendicular	100	340
	49.14	9.14	32.04	-22.90	Ground Parallel	100	80
0.720	48.03	8.03	30.46	-22.43	Parallel	100	340
	50.38	10.38	30.46	-20.08	Perpendicular	100	80
	47.88	7.88	30.46	-22.58	Ground Parallel	100	20
0.840	46.01	6.01	29.12	-23.11	Parallel	100	20
	47.36	7.36	29.12	-21.76	Perpendicular	100	0
	46.32	6.32	29.12	-22.80	Ground Parallel	100	320
0.960	46.30	6.30	27.96	-21.66	Parallel	100	60
	45.88	5.88	27.96	-22.08	Perpendicular	100	160
	46.20	6.20	27.96	-21.76	Ground Parallel	100	20
1.080	45.30	5.30	26.94	-21.64	Parallel	100	280
	45.10	5.10	26.94	-21.84	Perpendicular	100	340
	45.17	5.17	26.94	-21.77	Ground Parallel	100	320
1.200	43.70	3.70	26.02	-22.32	Parallel	100	260
	43.93	3.93	26.02	-22.09	Perpendicular	100	260
	44.05	4.05	26.02	-21.97	Ground Parallel	100	60

[1] Measurements are extrapolated to the specified limit distances. Reference Section 7.2 Test Note.

[2] Part 15.209 Limit at the specified distances: (0.240 MHz to 0.480 MHz – 300 meter average limit), (0.600 MHz to 1.200 – 30 MHz meter quasi-peak limit).

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7. Measurement Data (continued)

7.8. Conducted Emissions Test Setup (FCC Part 15.207)

7.8.1. Regulatory Limit: FCC Part 15.247

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50
* Decreases with the logarithm of the frequency.		

7.8.2. Measurement Equipment and Software Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	12/6/2018
LISN 50 ohm 50 µH	EMCO	3825/2	9109-1860	11/17/2018

Manufacturer	Software Description	Title/Model #	Rev.
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0

7.8.3. Measurement & Equipment Setup

Test Date:	12/13/2017
Test Engineer:	Brian Breault
Site Temperature (°C):	21.3
Relative Humidity (%RH):	38
Frequency Range:	0.15 MHz to 30 MHz
EMI Receiver IF Bandwidth:	9 kHz
EMI Receiver Avg Bandwidth:	30 kHz
Detector Functions:	Peak, Quasi-Peak. & Average

7.8.4. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2009, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

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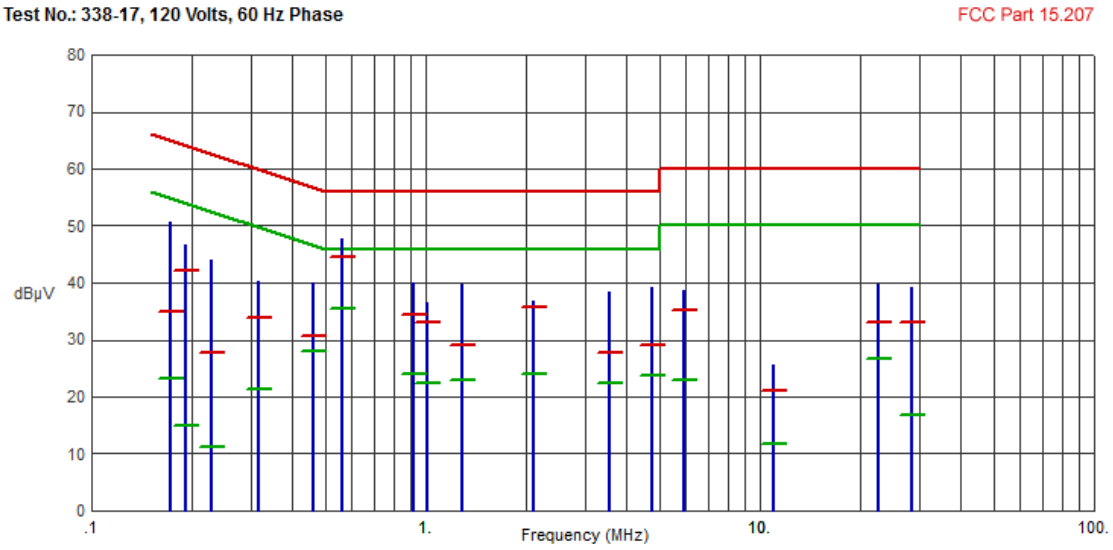
7. Measurement Data (continued)

7.8. Conducted Emissions Test Results (FCC Part 15.207)

7.8.5. 120 Volts, 60 Hz Phase



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1727	50.60	34.81	64.83	-30.02	23.11	54.83	-31.72	
.1911	46.74	42.03	63.99	-21.96	14.90	53.99	-39.09	
.2278	43.99	27.77	62.53	-34.76	11.31	52.53	-41.22	
.3149	40.23	33.76	59.84	-26.08	21.44	49.84	-28.40	
.4607	39.92	30.66	56.68	-26.02	28.03	46.68	-18.65	
.5648	47.68	44.63	56.00	-11.37	35.37	46.00	-10.63	
.9162	39.98	34.36	56.00	-21.64	23.91	46.00	-22.09	
1.0087	36.47	33.13	56.00	-22.87	22.35	46.00	-23.65	
1.2913	39.78	29.11	56.00	-26.89	23.05	46.00	-22.95	
2.0993	36.82	35.82	56.00	-20.18	24.11	46.00	-21.89	
3.5381	38.41	27.86	56.00	-28.14	22.30	46.00	-23.70	
4.7355	39.28	28.94	56.00	-27.06	23.70	46.00	-22.30	
5.9209	38.55	35.21	60.00	-24.79	22.90	50.00	-27.10	
10.9735	25.58	21.10	60.00	-38.90	11.86	50.00	-38.14	
22.5996	39.63	33.06	60.00	-26.94	26.79	50.00	-23.21	
28.5283	39.25	33.04	60.00	-26.96	16.75	50.00	-33.25	

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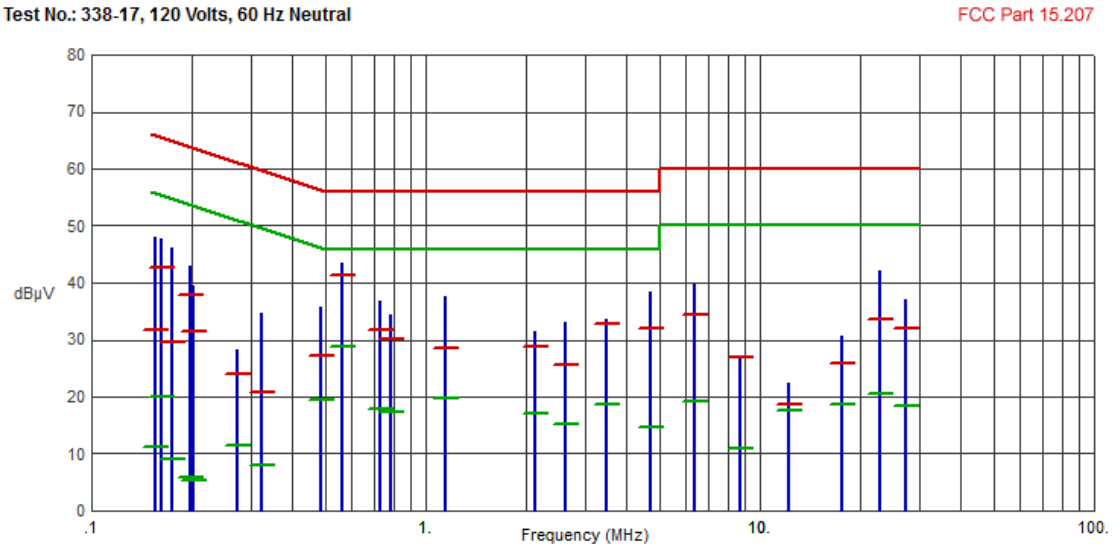
7. Measurement Data (continued)

7.8. Conducted Emissions Test Results (FCC Part 15.207) (continued)

7.8.6. 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1556	48.11	31.71	65.70	-33.99	11.15	55.70	-44.55	
.1623	47.70	42.61	65.35	-22.74	20.12	55.35	-35.23	
.1733	46.03	29.68	64.80	-35.12	9.13	54.80	-45.67	
.1975	42.99	37.75	63.72	-25.97	5.84	53.72	-47.88	
.2026	39.40	31.35	63.50	-32.15	5.27	53.50	-48.23	
.2736	28.33	23.96	61.01	-37.05	11.35	51.01	-39.66	
.3242	34.66	20.77	59.60	-38.83	7.97	49.60	-41.63	
.4852	35.69	27.14	56.25	-29.11	19.45	46.25	-26.80	
.5645	43.45	41.27	56.00	-14.73	28.72	46.00	-17.28	
.7302	36.68	31.67	56.00	-24.33	17.78	46.00	-28.22	
.7821	34.41	30.14	56.00	-25.86	17.28	46.00	-28.72	
1.1472	37.69	28.53	56.00	-27.47	19.75	46.00	-26.25	
2.1151	31.47	28.91	56.00	-27.09	17.05	46.00	-28.95	
2.6117	33.05	25.62	56.00	-30.38	15.18	46.00	-30.82	
3.4696	33.67	32.67	56.00	-23.33	18.76	46.00	-27.24	
4.6824	38.34	31.96	56.00	-24.04	14.67	46.00	-31.33	
6.3448	39.78	34.52	60.00	-25.48	19.24	50.00	-30.76	
8.7488	27.08	26.94	60.00	-33.06	10.92	50.00	-39.08	
12.2204	22.44	18.80	60.00	-41.20	17.47	50.00	-32.53	
17.6661	30.74	25.95	60.00	-34.05	18.63	50.00	-31.37	
22.7435	42.17	33.50	60.00	-26.50	20.50	50.00	-29.50	
27.3340	37.03	31.97	60.00	-28.03	18.41	50.00	-31.59	

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7. Measurement Data (continued)

7.9. RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

Requirement: KDB 680106 D01
RF Exposure Wireless Charging Apps v02, dated 05/31/2013:

Inductive wireless power transfer applications that meet all of the following 6 requirements are excluded from submitting an RF exposure evaluation.

1. Power transfer frequency is less that 1 MHz.

   Compliant - The power transfer frequency is approximately 120 kHz to 149 kHz. Review the data contained in this report.

2. Output power from each primary coil is less than 5 watts.

   Compliant, per the Qi Charging Standard it operates at less than 5 Watts.

3. The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

   Compliant - The device under test utilizes a single primary and a single secondary coil for each charger and client pair.

4. Client device is inserted in or placed directly in contact with the transmitter.

   Compliant - The client device is inserted into a unique housing that aligns the client coil with the transmitter coil.

5. The maximum coupling surface area of the transmit (charging) device is between 60 cm^2 and 400 cm^2.

   Compliant - The diameter of the charging coil is 4.5 cm which yields a coupling surface area of approximately 15.9 cm^2.

6. Aggregate leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 30% of the MPE limit.

E-Field:	
DUT aggregate leakage fields at 10 cm (V/meter):	15.36
47 CFR Part 1, Section 1.1310, Table 1 limit (V/Meter):	614.00
Device Under Test percentage of the MPE limit:	2.50%
Measurement result (must be < 30% of the MPE limit):	Compliant

H-Field:	
DUT aggregate leakage fields at 10 cm (A/meter):	0.000167079
47 CFR Part 1, Section 1.1310, Table 1 limit (A/Meter):	1.630000000
Device Under Test percentage of the MPE limit:	0.0103%
Measurement result (must be < 30% of the MPE limit):	Compliant

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7. Measurement Data (continued)

7.9. RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications

7.9.1. E-field measurements at 10 cm (V/meter)

Top:	3.07	Front:	3.52	Left:	1.75
Bottom:	1.75	Rear:	3.52	Right:	1.75

7.9.2. H-field measurements at 10 cm

7.9.2.1. Primary measurements (mV/meter)

	Volts (mV)	Frequency (Hz)		Volts (mV)	Frequency (Hz)		Volts (mV)	Frequency (Hz)
Top:	0.0211	125987	Front:	0.0205	125987	Left:	0.0085	125749
Bottom:	0.0169	124814	Rear:	0.0034	125749	Right:	0.0126	125749

7.9.2.2. H-field Strength (Reference conversion factor equation)

	(µA/m)			(µA/m)			(µA/m)
Top:	42.3718320		Front:	41.0783867		Left:	17.1496131
Bottom:	34.3113032		Rear:	6.8808499		Right:	25.2873248

Conversion factor[1]: Field Strength H (amperes/meter) = 253 x U/*f*
U = the induced voltage in millivolts
f = the frequency in Hz.

[1] Measurements in the H-field strength table were converted to µA/meter for ease of reading.

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8. Test Images

8.1. Transmitter and Emissions Measurements – Front

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8. Test Images

8.2. Transmitter and Emissions Measurements – Rear (10 kHz to 30 MHz)

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8. Test Images

8.3. Transmitter and Emissions Measurements – Rear (30 MHz to 1 GHz)

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8. Test Images

8.4. Conducted Emissions – Front

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8. Test Images

8.5. Conducted Emissions – Rear

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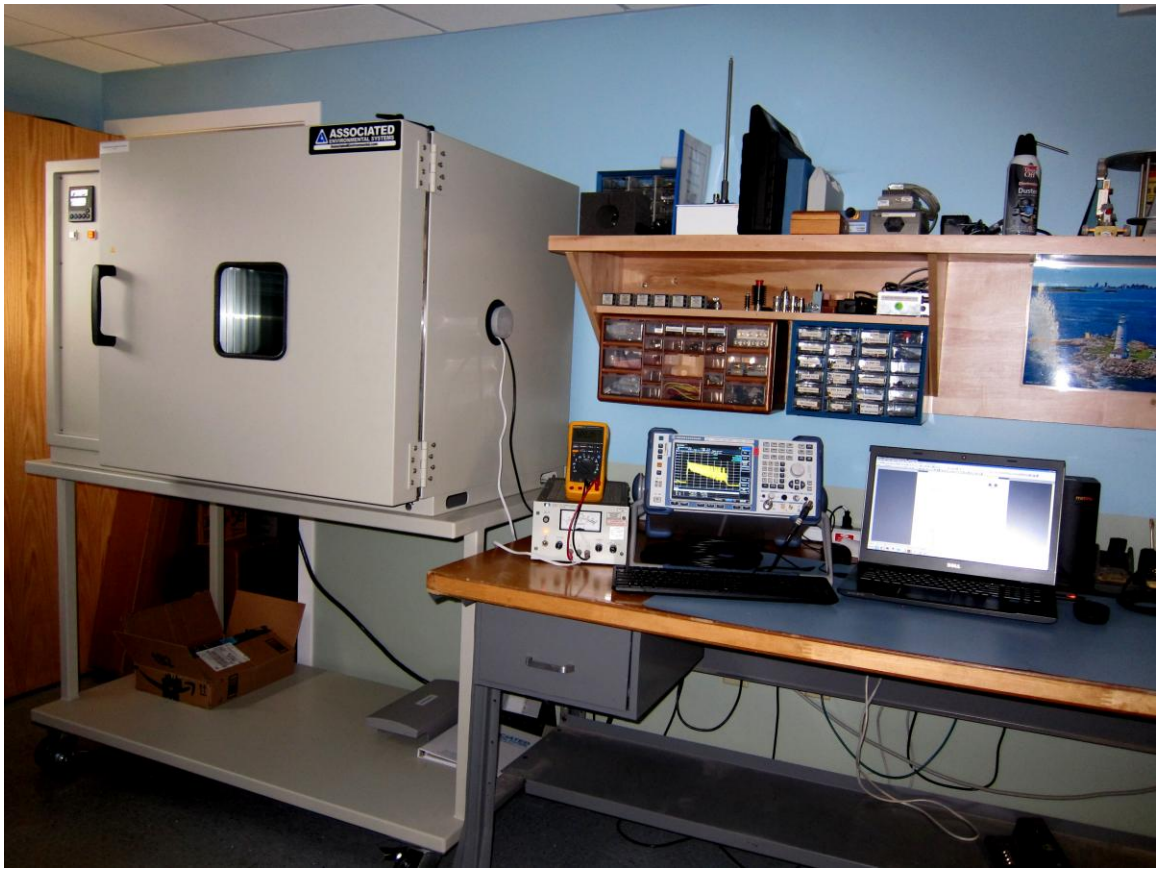
8. Test Images

8.6. Stability Measurements – 1 of 2



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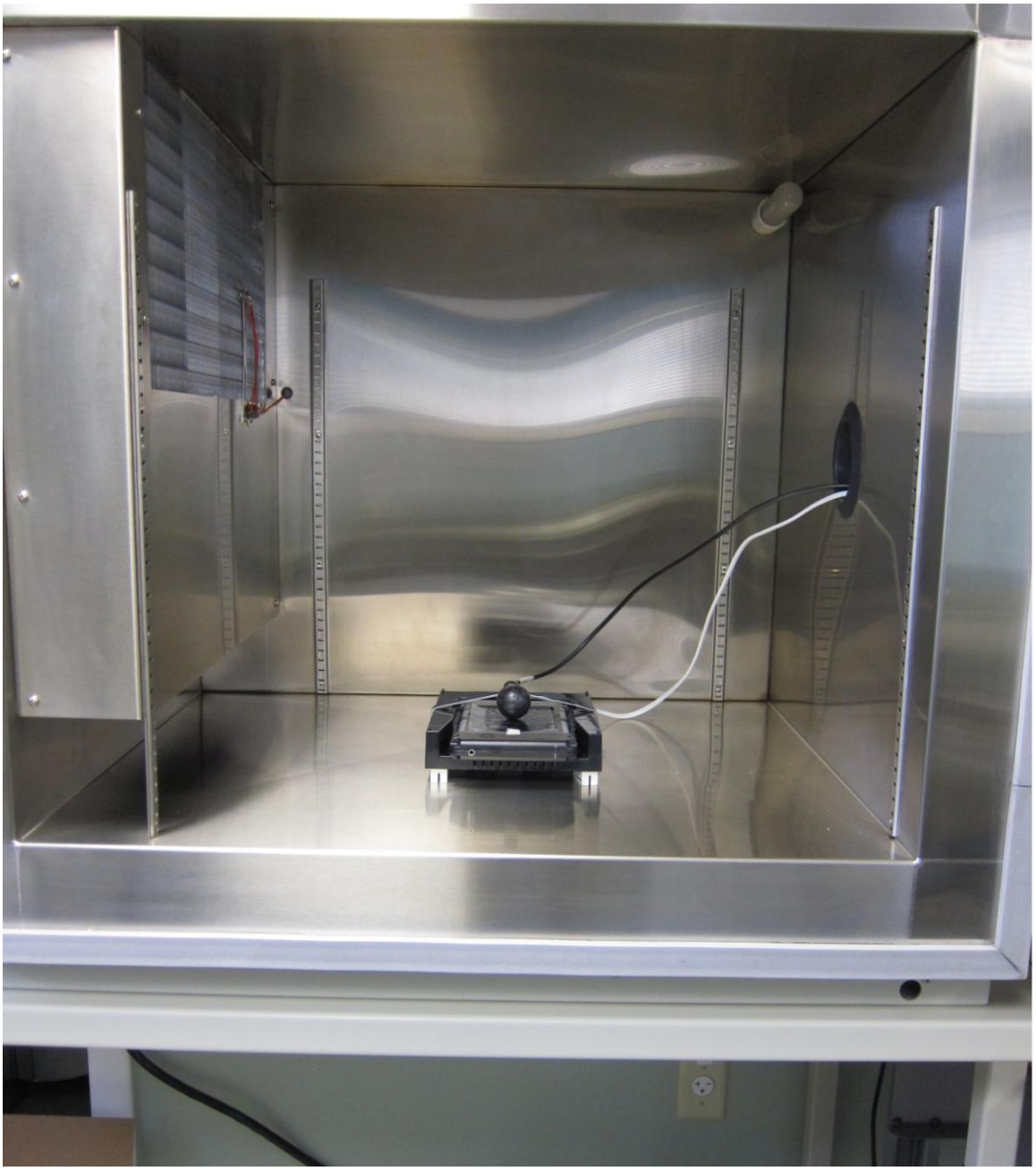
8. Test Images

8.7. Stability Measurements – 2 of 2



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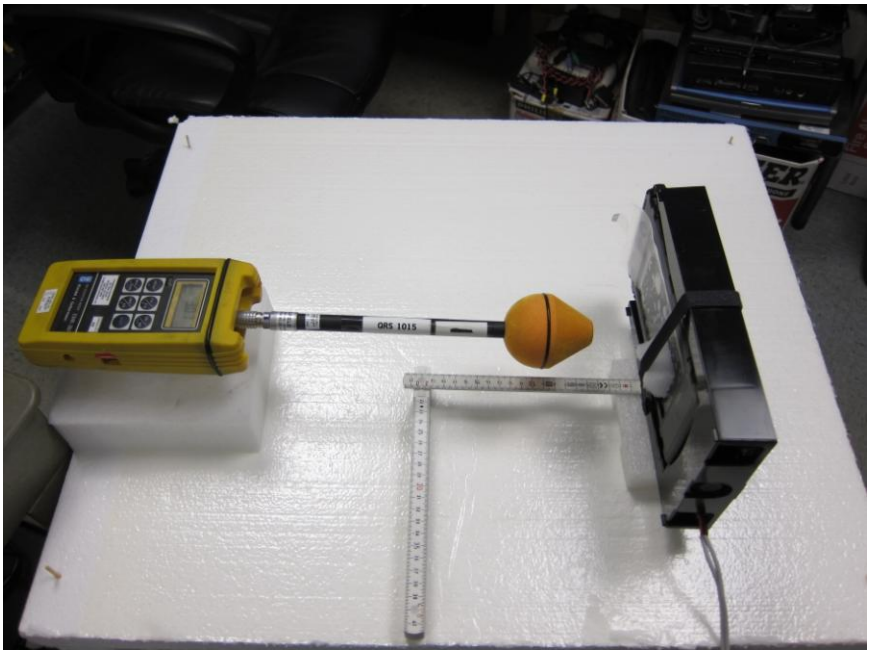
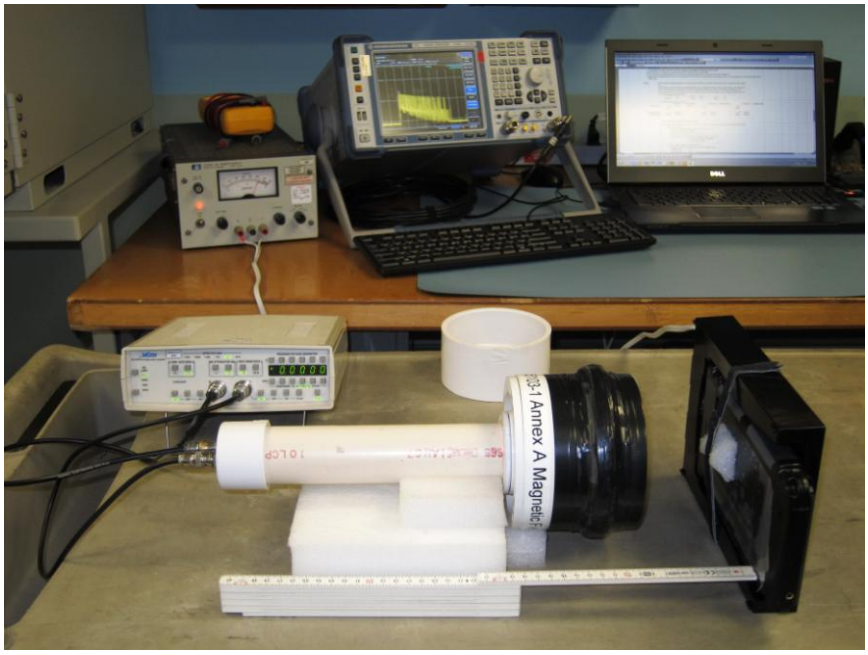
8. Test Images

8.8. RF Exposure – 1 of 2: E-field



8.8. RF Exposure – 2 of 2: H-field



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9. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with the Federal Communications Commission (FCC) and Industry Canada standards. Through our American Association for Laboratory Accreditation (A2LA) ISO Guide 17025:2005 Accreditation our test sites are designated with the FCC (designation number **US1091**), Industry Canada (file number **IC 3023A-1)** and VCCI (Member number 3168) under registration number A-0274.

Compliance Worldwide is also designated as a Phase 1 CAB under APEC-MRA (US0132) for Australia/New Zealand AS/NZS CISPR 22, Chinese-Taipei (Taiwan) BSMI CNS 13438 and Korea (RRA) KN 11, KN 13, KN 14-1, KN 22, KN 32, KN 61000-6-3, KN 61000-6-4.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022. A second conducted emissions site is also located in the basement of the OATS site with a 2.3 x 2.5 meter ground plane and a 2.4 x 2.4 meter vertical wall.

Both sites are designed to test products or systems 1.5 meters W x 1.5 meters L x 2.0 meters H, floor standing or table top.

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