

**COMPLIANCE WORLDWIDE INC.
TEST REPORT 328-19R1**

**In Accordance with the Requirements of
FCC PART 15.209, SUBPART C
INDUSTRY CANADA RSS-210, ISSUE 9**

**Low Power License-Exempt Radio Communication Devices
Intentional Radiators**

**Issued to
Kronos Incorporated
900 Chelmsford Street
Lowell, MA 01851**

**for the
InTouch DX
With New 125 kHz
Smart Card Prox Reader**

**FCC ID: P5W-8610K003
IC: 1416A-8610K003**

**Report Issued on August 27, 2019
Revision R1 Issued on August 29, 2019**

Tested by



Brian F. Breault

Reviewed by



Larry K. Stillings

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Table of Contents

1 Scope	3
2 Product Details	3
2.1 Manufacturer	3
2.2 Model Number	3
2.3 Serial Number	3
2.4 Description	3
2.5 Power Source	3
2.6 Hardware Revision	3
2.7 Software Revision	3
2.8 Modulation Type	3
2.9 Operating Frequencies	3
2.10 EMC Modifications	3
3 Product Configuration	3
3.1 Operational Characteristics & Software	3
3.2 EUT Hardware	3
3.3 EUT Connected Hardware	3
3.4 EUT Cables/Transducers	3
3.4 Miscellaneous EUT Items	4
3.5 Support Equipment	4
3.6 Block Diagram	4
4 Measurements Parameters	4
4.1 Measurement Equipment and Software Used to Perform Test	4
4.2 Measurement & Equipment Setup	5
4.3 Measurement Procedure	5
5 Choice of Equipment for Test Suits	6
5.1 Choice of Model	7
5.2 Presentation	8
5.3 Choice of Operating Frequencies	9
6 Measurement Summary	6
7 Measurement Data	7
6.1 Antenna Requirement	7
6.2 Radiated Field Strength of Fundamental	8
6.3 Emission Bandwidth	9
6.4 99% (Occupied) Bandwidth	10
6.5 Combined Spurious Harmonic Emissions	11
6.6 Spurious Radiated Emissions	12
6.7 Power Line Conducted Emissions	21
6.8 Public Exposure to RF Energy Levels	24
8 Test Site Description	25
9 Test Setup Images	26

1. Scope

This test report certifies that the InTouch DX with the 125 KHz HID Prox Reader, as tested, meets the FCC Part 15.209, and Industry Canada RSS-Gen, Issue 4 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. Revision R1 adds RF Exposure for Mobile device calculation exemption in Section 7.8.

2. Product Details

- 2.1. Manufacturer:** Kronos, Inc.
- 2.2. Model Number:** InTouch 9100 DX
- 2.3. Serial Numbers:** Beta Rev 1, # 102
HID 4065ALN00 Prox Module Ser. # E093780180
- 2.4. Description:** A time clock built for today's modern workforce.
- 2.5. Power Source:** 18 VDC, 2.22A (internal power adapter – 100-240 VAC, 50/60 Hz, 1.0A) Model: EA10442G-180
- 2.6. Hardware Revision:** N/A
- 2.7. Software Revision:** N/A
- 2.8. Modulation Type:** Pulse Modulation
- 2.9. Operating Frequencies:** 125 kHz
- 2.10. EMC Modifications:** None

3. Product Configuration

3.1. Operational Characteristics & Software

The Kronos InTouch DX with RFID module was configured to transmit continuously to the RFID tags once power is applied to the unit.

3.2. EUT Hardware

Manufacturer	Model/Part # / Options	Serial Number	Volts	Frq (Hz)	Description/Function
Kronos, Inc.	InTouch DX	Beta Rev 1, #102	18	VDC	Time clock with 125 k Prox Reader

3.3. EUT Connected Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Frq (Hz)	Description/Function
EDACPower Elec.	EA10442G-180	N/A	100-240	50/60	Internal power adapter

3.4. EUT Cables/Transducers

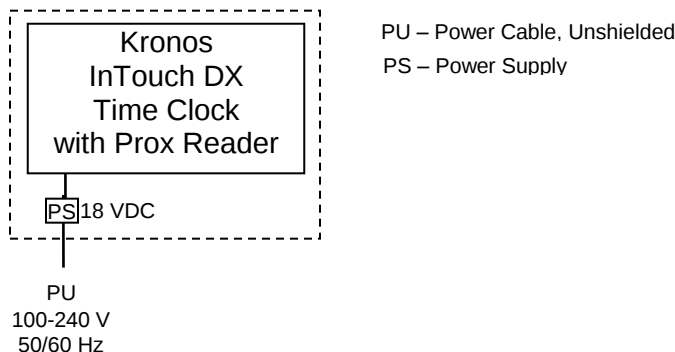
Cable Type	Length	Shield	From	To
None	N/A	N/A		

3. Product Configuration (continued)

3.5. Support Equipment

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
N/A					

3.6. Block Diagram



4. Measurements Parameters

4.1. Measurement Equipment and Software Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due	Interval
EMI Test Receiver, 9kHz - 7GHz ¹	Rohde & Schwarz	ESR7	101156	9/10/2020	2 Years
EMI Test Receiver, 10 Hz - 7GHz ¹	Rohde & Schwarz	ESR7	101770	10/3/2020	2 Years
Spectrum Analyzer, 2 Hz to 26.5 GHz ²	Rohde & Schwarz	FSW26	102057	9/13/2020	2 Years
Spectrum Analyzer, 9 kHz to 40 GHz ³	Rohde & Schwarz	FSV40	100899	9/10/2020	2 Years
EMI Receiver 9 kHz - 1 GHz	Hewlett Packard	8546A	3650A00360	9/11/2020	2 Years
Loop Antenna 9 kHz - 30 MHz	EMCO	6512	9309-1139	1/28/2022	3 Years
Biconilog Antenna, 30 MHz - 2 GHz	Sunol Sciences	JB1	A050913	6/5/2022	2 Years
Horn Antenna, 960 MHz to 18 GHz	Electro-Metrics	EM-6961	6337	10/3/2020	2 Years
Horn Antenna, 18 GHz to 26.5 GHz	Electro-Metrics	AH-826	081051	9/28/2019	2 Years
Preamplifier, 1 GHz to 26.5 GHz	Hewlett Packard	8449B	3008A01323	9/11/2020	2 Years
Digital Barometer	Control Company	4195	ID236	4/3/2020	2 Years
Temperature Chamber ⁴	Associated Environmental	SD-308	10782	CNR	

¹ ESR7 Firmware revision: V3.46 SP1, Date installed: 12/22/2018

² FSW26 Firmware revision: V4.30 SP1, Date installed: 02/22/2019

³ FSV40 Firmware revision: V2.30 SP4, Date installed: 05/04/2016

⁴ Used with calibrated measurement equipment.

Previous V3.36 SP2, installed 12/5/2018.

Previous V3.36 SP2, installed 10/26/2018.

Previous V2.30 SP1, installed 10/22/2014.

Manufacturer	Software Description	Title or Model #	Rev.	Report Sections
Compliance Worldwide	Test Report Generation Software	Test Report Generator	1.0	Used to process conducted emissions data

4. Measurements Parameters (continued)

4.2. Measurement & Equipment Setup

Test Dates:	August 15 th - August 31 st , 2019
Test Engineer:	Brian Breault
Normal Site Temperature (15 - 35°C):	24.0
Relative Humidity (20 - 75%RH):	33%
Frequency Range:	.01 MHz to 26.5 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz - 30 MHz to 1 GHz 1 MHz - Above 1 GHz
EMI Receiver Avg Bandwidth:	300 kHz - 30 MHz to 1 GHz 3 MHz - Above 1 GHz
Detector Function:	Peak, QP - 30 MHz to 1 GHz Peak, Avg - Above 1 GHz Unless otherwise specified.

4.3 Measurement Procedure

The test measurements contained in this report are based on the requirements detailed in FCC Part 15, Subpart C - Intentional Radiators, notably Section 15.209, Radiated emission limits; general requirements.

5. Choice of Equipment for Test Suits

5.1. Choice of Model

This test report is based on the test samples supplied by the manufacturer and are 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

The transmitter in the unit under test utilizes a single operating frequency at approximately 125 kHz.

6. Measurements Summary

Test Requirement	FCC Rule Requirement	ISED Rule Requirement	Report Section	Result
Antenna requirement	15.203	RSS-GEN 6.8	7.1	Compliant
Radiated Field Strength of Fundamental	15.209(a)	RSS-GEN Table 5	7.2	Compliant
Emission Bandwidth	15.209 Not Specified	Not Specified	7.3	Compliant
99% (Occupied) Bandwidth		RSS-GEN 6.7	7.4	Compliant
Combined Spurious Harmonic Emissions	15.209	RSS-210 A8.9	7.5	Compliant
Spurious Radiated Emissions	15.209	RSS-210 A8.9	7.6	Compliant
Power Line Conducted Emissions	15.207	RSS-GEN 8.8	7.7	Compliant
Public Exposure to Radio Frequency Energy Levels.	1.1307 (b)(1)	RSS 102, Issue 5	7.8	Compliant

7. Measurement Data

7.1. Antenna Requirement (15.203, RSS-GEN, ISSUE 4 Section 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: For the 125 kHz transmitter, the device under test utilizes an internal, PCB mounted coil antenna. There is no user access to this antenna.

7.2. Radiated Field Strength of Fundamental (15.209, Section (a), Rss-GEN Tbl 6)

Requirement: Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

For 125 kHz: Field Strength ($\mu\text{V/m}$) = $2400/F(\text{kHz})$ at 300 meters.

Field Strength ($\mu\text{V/m}$) = $2400/125$

Field Strength ($\mu\text{V/m}$) = 19.2

Field Strength ($\text{dB}\mu\text{V/m}$) = $20 \text{ LOG}_{10}(19.2)$

Field Strength ($\text{dB}\mu\text{V/m}$) = 25.62 at 300 meters.

Test Notes: From 110 kHz to 490 kHz, the field strength limit employs an average detector (FCC Part 15.209(d)).

Reference ANSI C63.10-2013 sections 5.3.2 and 6.4.4.2. The following formula was used to extrapolate the measurement distance to the limit distance:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{near field}}}{d_{\text{measure}}} \right) - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{near field}}} \right) \quad \text{Equation 1}$$

FS_{limit} is the calculation of field strength at the limit distance ($\text{dB}\mu\text{V/m}$) **-8.53**

FS_{max} is the measured field strength, expressed in ($\text{dB}\mu\text{V/m}$) (average) 71.47

$d_{\text{near field}}$ is the $\lambda/2\pi$ distance (Meters) 380.16

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

Since $d_{\text{near field}}$ is greater than d_{limit} , the measurement formula was simplified to:

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log (d_{\text{limit}}/d_{\text{measure}}).$$

Results: Compliant

7. Measurement Data (continued)

7.2. Radiated Field Strength of Fundamental (15.209, Section (a), Rss-GEN Tbl 6)

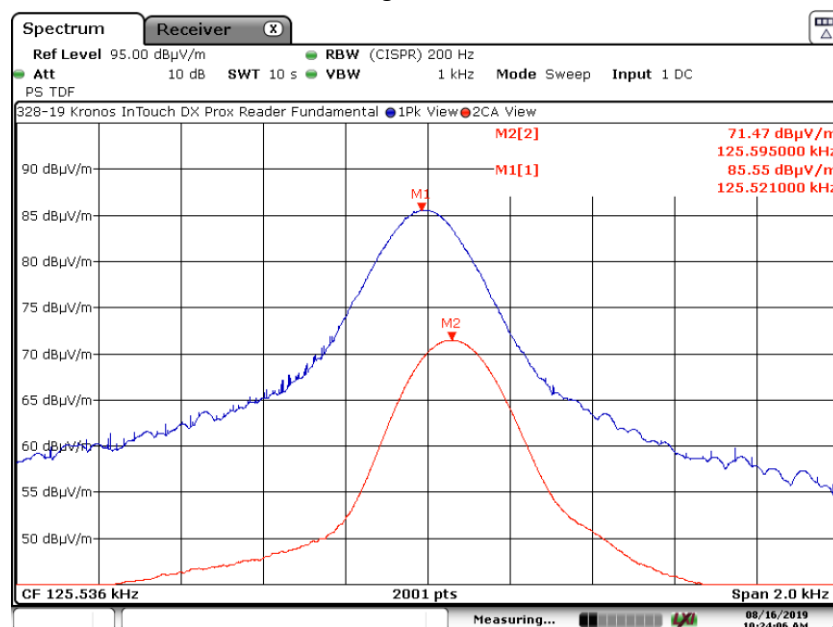
7.2.1. Worst Case Radiated Field Strength of Fundamental

Freq. (MHz)	Amplitude ¹ (dBμV/m)	Duty Cycle Correction ²	Corr. Ampl. ² (dBμV/m)	FCC 15.209 Limit (dBμV/m)	Margin (dB)	Ant Position	Ant Height	Turntable Azimuth	Result
	Average	dB	Average	(Average)		Par/Per	cm	Deg	
0.1255	-8.53	0.00	0.00	25.62	-34.15	Par	100	170	Compliant

¹ Measurement has been extrapolated from 3 meters to 300 meters using Equation 1 on the previous page.

² The test signal was transmitting at close to a 100% duty cycle. Therefore, a correction factor to the peak field strength as not necessary.

7.2.2. Worst Case Radiated Field Strength of Fundamental



Date: 16.AUG.2019 10:24:06

7. Measurement Data (continued)

7.3. Emission Bandwidth (FCC Sections 15.209, IC RSS-210 Section A2.3)

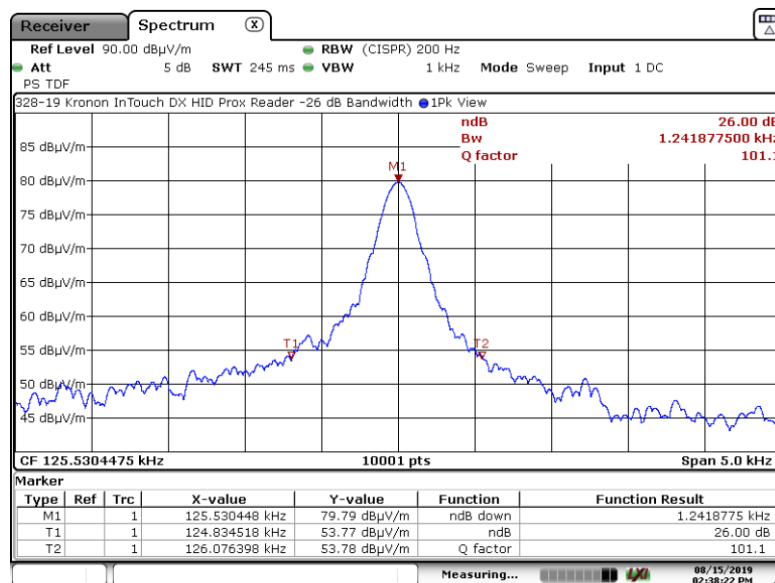
Requirement: For FCC Part 15.209, the bandwidth requirement is not specified. The 26 dB bandwidth has been included as part of this test report.

Test Note: Reference ANSI C63.10-2013, Section 6.9.1. for the bandwidth measurement method.

7.3.1. -26 dB Bandwidth of the Fundamental Frequency

Fundamental Frequency	-26 dB Bandwidth	Required Bandwidth	Result
(MHz)	(kHz)	(kHz)	
0.125	1.2419	Not Specified	N/A

7.3.2. Emission Bandwidth Measurement Results



HDMI-HDMI Insignia Monitor - Cable carefully inserted so monitor recognizes connection - Vertical
Date: 15.AUG.2019 14:38:22

7. Measurement Data (continued)

7.4. 99% (Occupied) Bandwidth

Requirement: The requirement for the occupied bandwidth is not specified for intentional radiators in this part of the frequency spectrum.

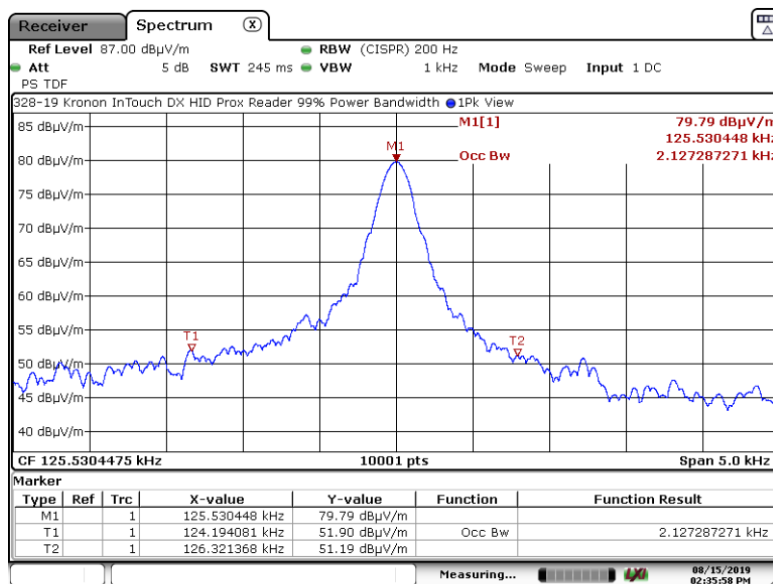
Test Note: RSS-Gen states that the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. However the resolution and video bandwidths were not able to meet these criteria due to the low measurement frequency and limitations of the measurement receiver. To perform this measurement, the following settings were used:

Resolution Bandwidth : 200 Hz

7.4.1. 99% (Occupied) Bandwidth of the Fundamental Frequency

Frequency (MHz)	99% Power Bandwidth (kHz)
0.125	2.2173

7.4.2. 99% Power Bandwidth Measurement Results



HDMI-HDMI Insignia Monitor - Cable carefully inserted so monitor recognizes connection - Vertical

Date: 15.AUG.2019 14:35:58

7. Measurement Data (continued)

7.5. Combined Spurious Harmonic Emissions (FCC Part 15.209, RSS-210 A8.9)

Requirement: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (reference Section 15.205(c)).

Test Note: The following table represents the worst case measurement of each harmonic emission.

Resolution Bandwidth : 9 kHz
Video Bandwidth : 30 kHz

Results: Compliant

Freq. (MHz)	Measured Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dBμV/m) ²		w/c Antenna Position (Par/Per G Par)	Turntable Position (Deg)	Result
	Peak	Quasi-Pk ¹	Peak	Quasi-Pk	Peak	Quasi-Pk			
0.250	40.76	38.19	119.64	99.64	-66.88	-57.32	G Par	0	Compliant
0.375	47.02	44.47	116.12	96.12	-67.00	-58.76	G Par	0	Compliant
0.500	53.01	46.42	93.63	73.63	-45.79	-33.12	Per	0	Compliant
0.625	38.59	34.94	91.69	71.69	-44.26	-32.37	G Par	0	Compliant
0.750	43.66	36.82	90.11	70.11	-48.06	-30.74	Per	0	Compliant
0.875	45.98	38.50	88.78	68.78	-44.11	-29.44	G Par	0	Compliant
1.000	43.66	39.74	87.62	67.62	-43.96	-28.27	G Par	0	Compliant
1.125	47.24	37.55	86.60	66.60	-38.18	-24.23	G Par	0	Compliant
1.250	45.41	44.47	85.69	65.69	-42.26	-26.76	Per	0	Compliant

¹ The measurements made at 250 kHz and 375 kHz utilized a CISPR average detector.

7. Measurement Data (continued)

7.6. Spurious Radiated Emissions (15.209), RSS-GEN 8.9

Requirement: Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Regulatory Limits: FCC Part 15.209

Frequency Range (MHz)	Distance (Meters)	Limit (dBμV/m) ¹
0.009 to 0.490	3	128.5 to 93.8
0.490 to 1.705	3	73.8 to 63.0
1.705 to 30	3	69.5
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
>960	3	54.0

¹ Measurements in the 9 to 90 kHz, 110 to 490 kHz and above 1000 MHz ranges employ an average detector. Otherwise a quasi-peak detector is used.

Procedure: Test measurements were made in accordance with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

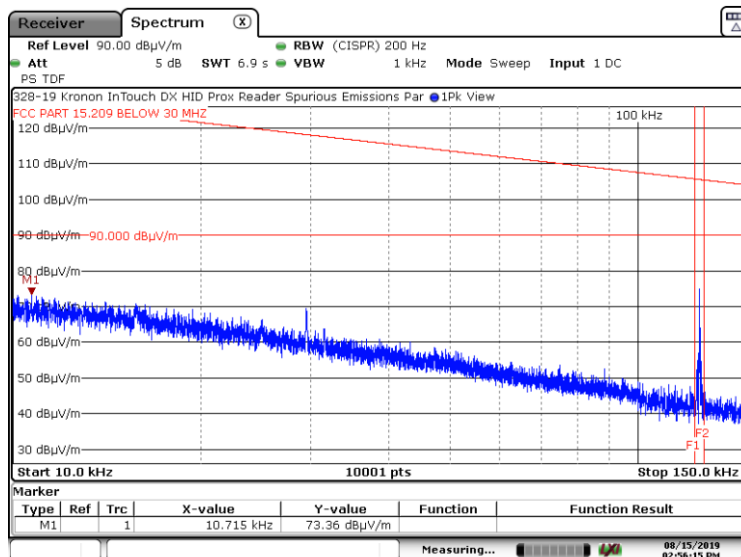
Results: Compliant. The device under test met the spurious radiated emissions requirements.

7. Measurement Data (continued)

7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

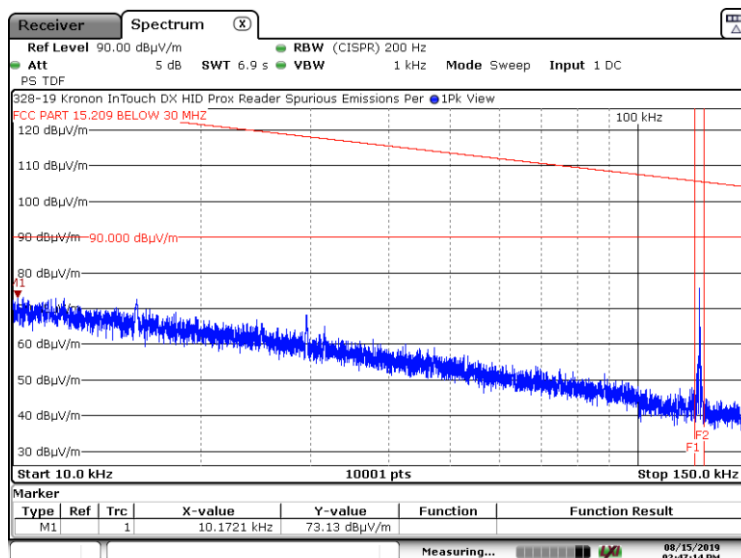
7.6.1. 10 kHz to 150 kHz

6.6.1.1. Parallel Receive Antenna Orientation



HDMI-HDMI Insignia Monitor - Cable carefully inserted so monitor recognizes connection - Vertical
Date: 15.AUG.2019 14:56:15

7.6.1.2. Perpendicular Receive Antenna Orientation



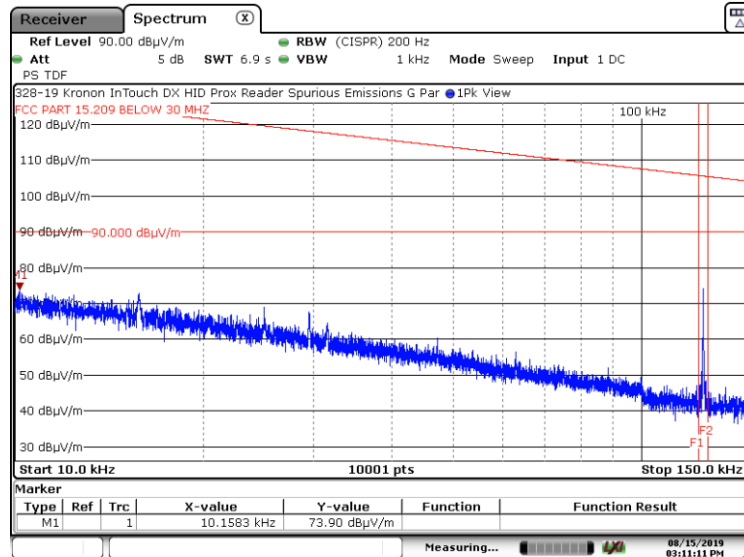
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Date: 15.AUG.2019 14:47:14

7. Measurement Data (continued)

7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

7.6.1. 10 kHz to 150 kHz

7.6.1.3. Ground Parallel Receive Antenna Orientation

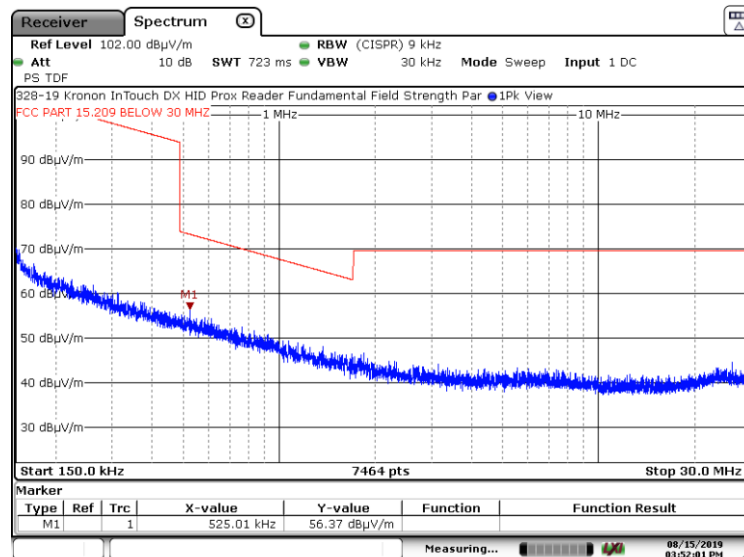


HDMI-HDMI Insignia Monitor - Cable carefully inserted so monitor recognizes connection - Vertical

Date: 15.AUG.2019 15:11:11

7.6.2. 150 kHz to 30 MHz

6.6.2.1. Parallel Receive Antenna Orientation



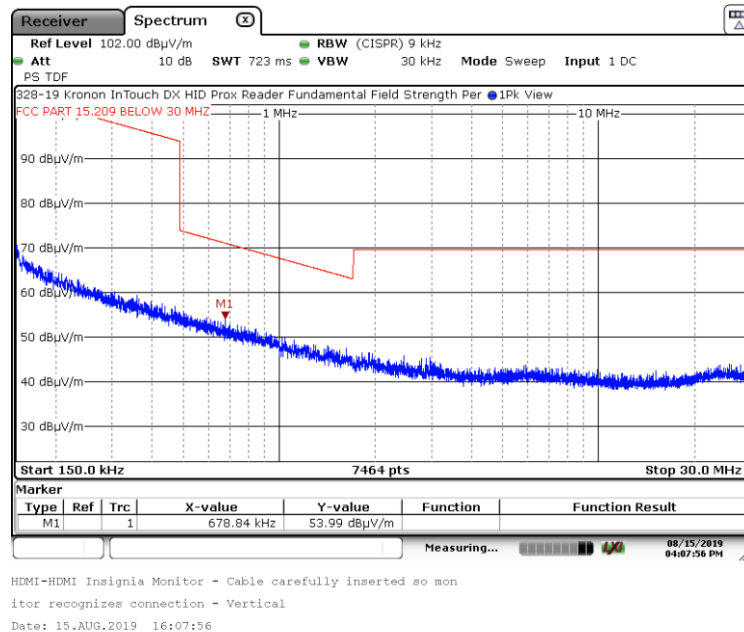
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Date: 15.AUG.2019 15:52:02

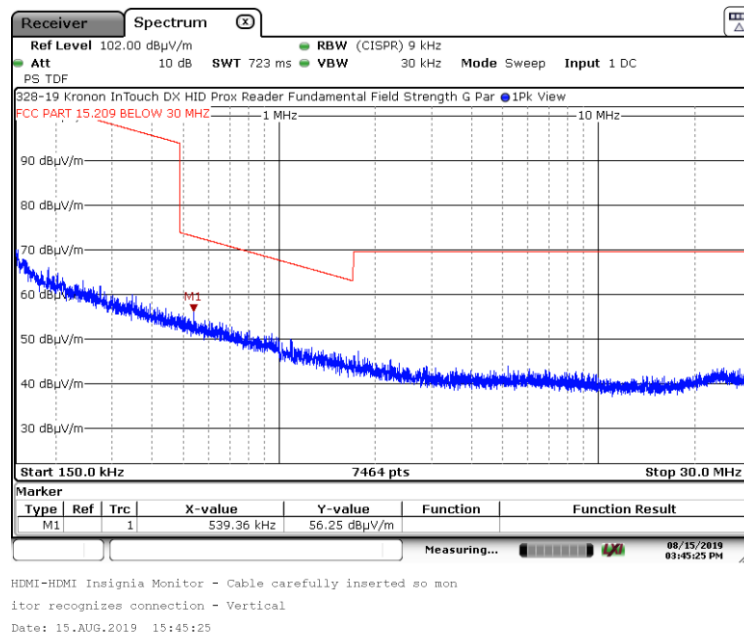
7. Measurement Data (continued)

7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

7.6.2.2. Perpendicular Receive Antenna Orientation



7.6.2.3. Ground Parallel Receive Antenna Orientation

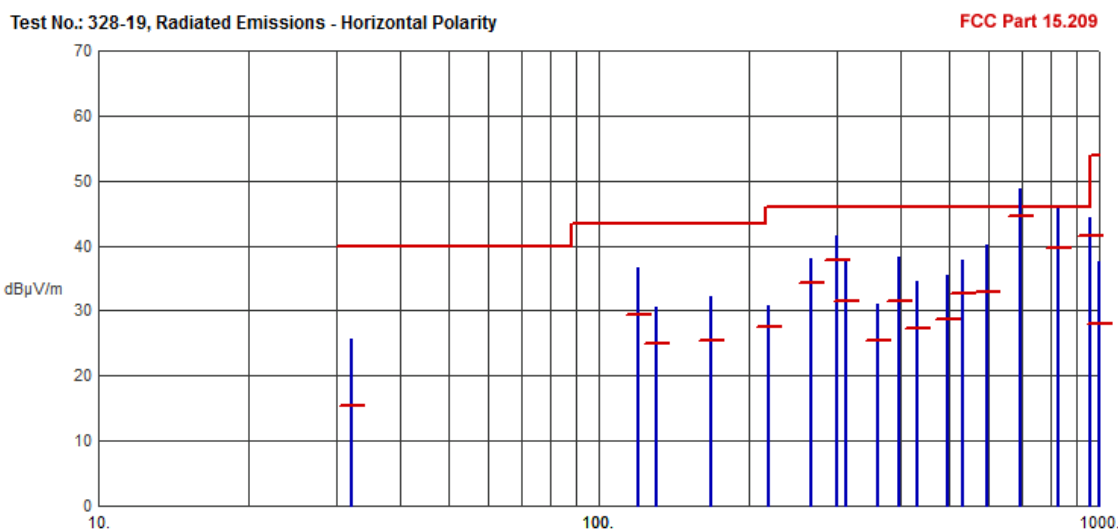


7. Measurement Data (continued)

7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

6.6.3. 30 MHz to 1 GHz

6.6.3.1. Horizontal Polarity



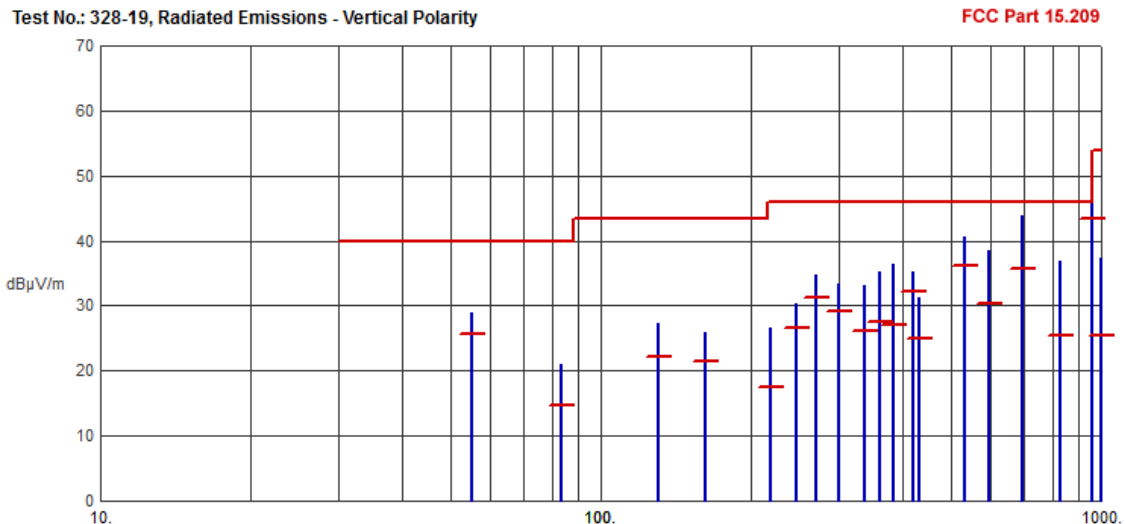
Frequency (MHz)	Pk Amp (dBμV/m)	QP Amp (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
32.0100	25.74	15.48	40.00	-24.52	N/A	N/A	
120.0050	36.70	29.30	43.50	-14.20	N/A	N/A	
130.5500	30.56	24.96	43.50	-18.54	N/A	N/A	
167.2500	32.30	25.47	43.50	-18.03	N/A	N/A	
218.4450	30.84	27.64	46.00	-18.36	N/A	N/A	
265.9200	37.99	34.29	46.00	-11.71	N/A	N/A	
299.1100	41.42	37.87	46.00	-8.13	N/A	N/A	
311.2700	37.71	31.52	46.00	-14.48	N/A	N/A	
359.9850	31.02	25.54	46.00	-20.46	N/A	N/A	
398.9800	38.34	31.51	46.00	-14.49	N/A	N/A	
432.2400	34.62	27.24	46.00	-18.76	N/A	N/A	
498.5450	35.37	28.61	46.00	-17.39	N/A	N/A	
531.9950	37.79	32.63	46.00	-13.37	N/A	N/A	
598.4500	40.04	33.00	46.00	-13.00	N/A	N/A	
697.8800	48.84	44.67	46.00	-1.33	N/A	N/A	
831.1100	45.74	39.74	46.00	-6.26	N/A	N/A	
960.0000	44.44	41.61	46.00	-4.39	N/A	N/A	
997.5800	37.66	28.04	54.00	-25.96	N/A	N/A	

7. Measurement Data (continued)

7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

7.6.3. 30 MHz to 1 GHz

7.6.3.2. Vertical Polarity



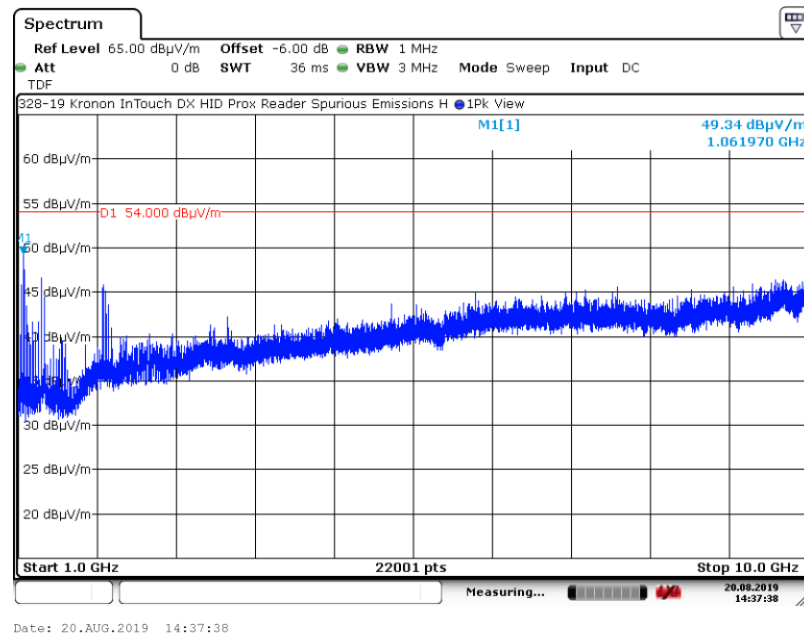
Frequency (MHz)	Pk Amp (dBμV/m)	QP Amp (dBμV/m)	QP Limit (dBμV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
55.3050	28.86	25.69	40.00	-14.31	N/A	N/A	
83.5350	21.06	14.71	40.00	-25.29	N/A	N/A	
130.5450	27.41	22.22	43.50	-21.28	N/A	N/A	
162.0050	25.85	21.45	43.50	-22.05	N/A	N/A	
218.4450	26.61	17.60	46.00	-28.40	N/A	N/A	
246.0050	30.30	26.60	46.00	-19.40	N/A	N/A	
270.0050	34.71	31.35	46.00	-14.65	N/A	N/A	
299.2250	33.38	29.13	46.00	-16.87	N/A	N/A	
335.9950	33.13	26.18	46.00	-19.82	N/A	N/A	
359.9950	35.17	27.46	46.00	-18.54	N/A	N/A	
383.9950	36.36	27.08	46.00	-18.92	N/A	N/A	
419.9850	35.34	32.23	46.00	-13.77	N/A	N/A	
431.9950	31.19	24.90	46.00	-21.10	N/A	N/A	
531.9950	40.55	36.19	46.00	-9.81	N/A	N/A	
598.4250	38.59	30.24	46.00	-15.76	N/A	N/A	
698.0950	43.75	35.67	46.00	-10.33	N/A	N/A	
831.1450	36.78	25.51	46.00	-20.49	N/A	N/A	
959.9950	45.72	43.36	46.00	-2.64	N/A	N/A	
997.6850	37.26	25.39	54.00	-28.61	N/A	N/A	

7. Measurement Data (continued)

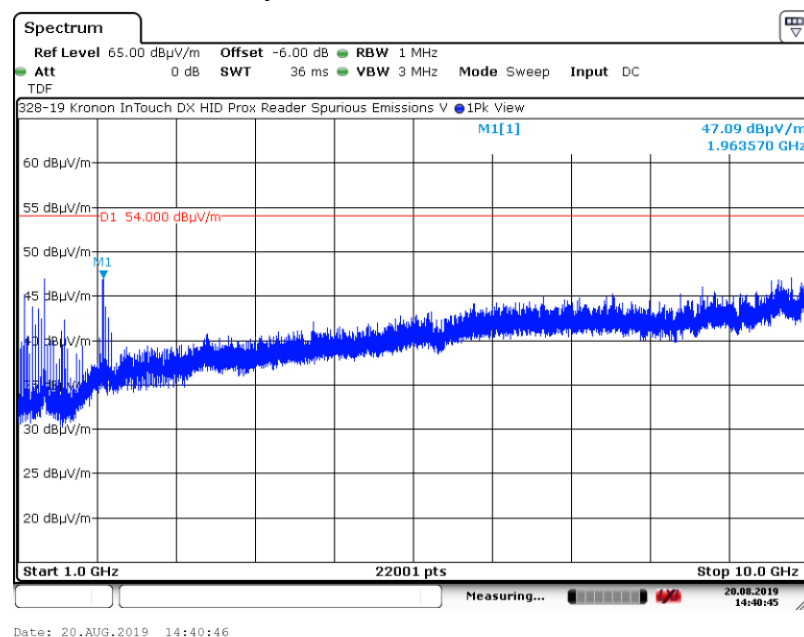
7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

7.6.4. 1 GHz to 10 GHz

7.6.4.1. Horizontal Polarity



7.6.4.2. Vertical Polarity

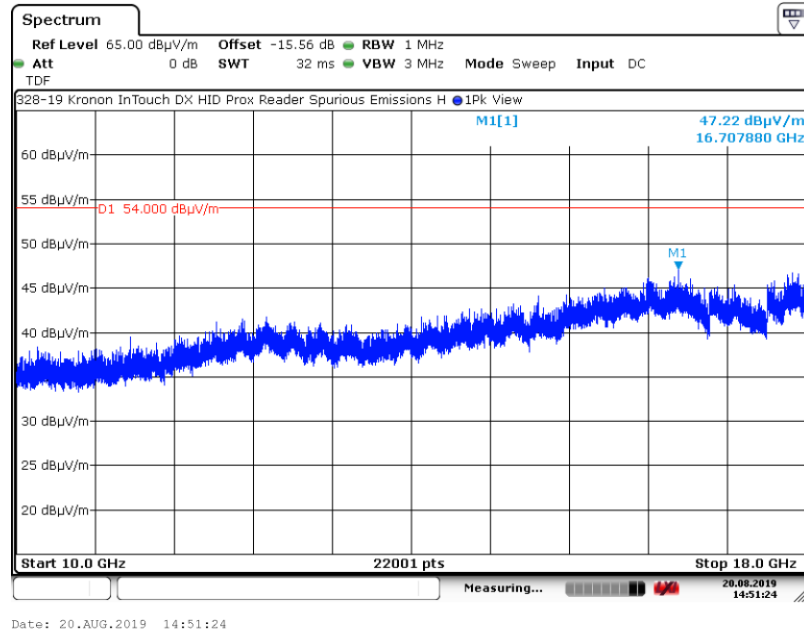


7. Measurement Data (continued)

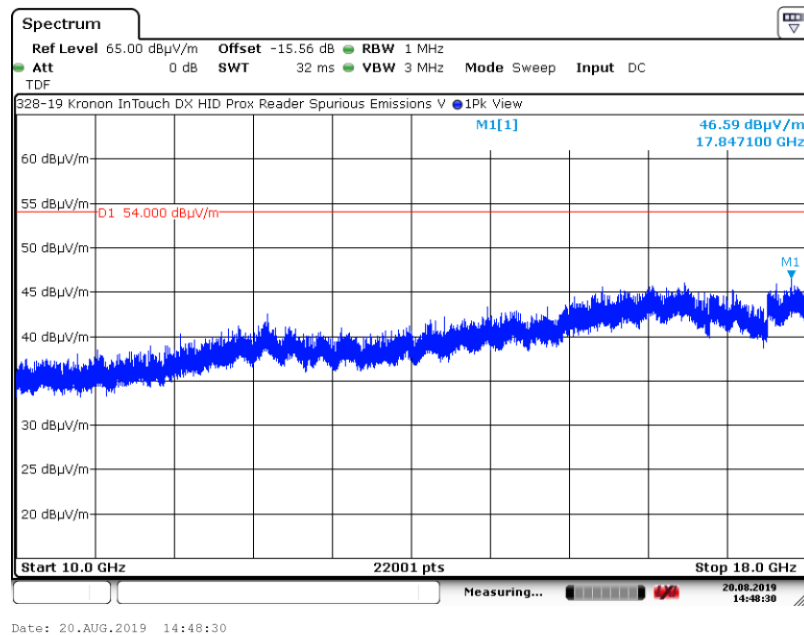
7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

7.6.5. 10 GHz to 18 GHz

7.6.5.1. Horizontal Polarity



7.6.5.2. Vertical Polarity

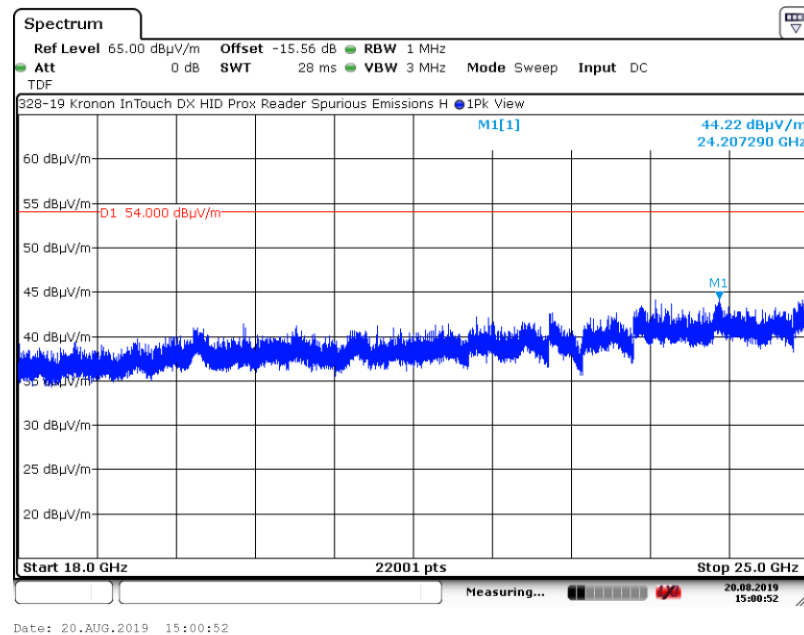


7. Measurement Data (continued)

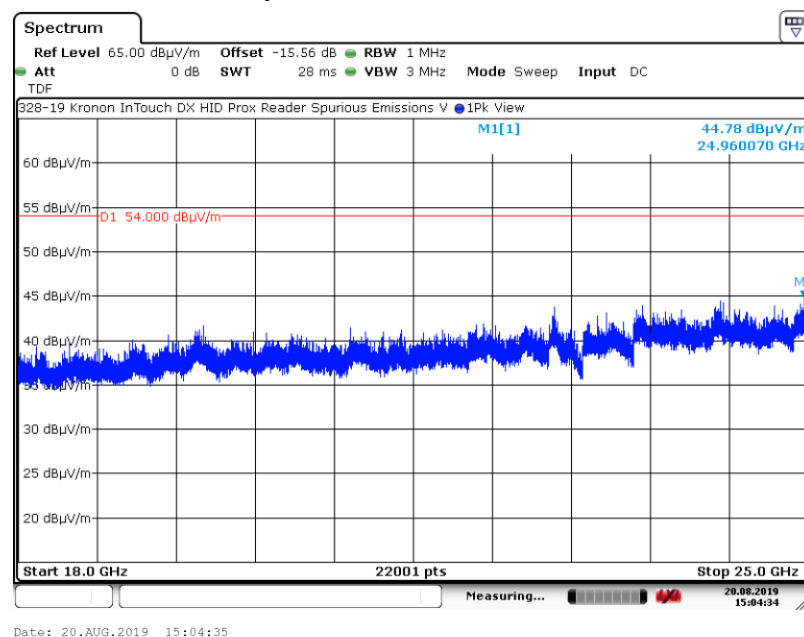
7.6. Spurious Radiated Emissions Test Results (15.209), RSS-GEN 8.9 (continued)

7.6.6. 18 GHz to 25 GHz

7.6.6.1. Horizontal Polarity



7.6.6.2. Vertical Polarity



7. Measurement Data (continued)

7.7. Power Line Conducted Emissions (15.207), RSS-GEN

Requirement: 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 μ 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. (FCC Part 15.207(a).

Regulatory Limits: FCC Part 15.207

Frequency Range (MHz)	Limits (dB μ V)	
	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.		

Procedure: Test measurements were made in accordance with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices.

Results: Compliant. The device under test met the AC power line conducted emissions requirements.

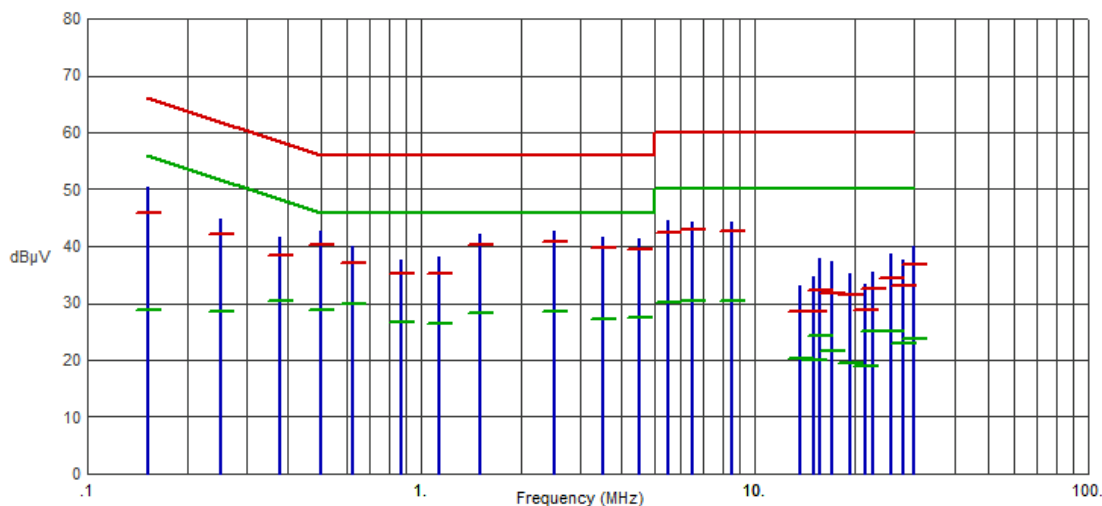
7. Measurement Data (continued)

7.7. Power Line Conducted Emissions (15.207), RSS-GEN (continued)

7.7.1. Phase (L1)

Test No.: 328-19, 120 Volts, 60 Hz Phase

FCC Part 15.207



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.1523	50.31	45.98	65.87	-19.89	28.92	55.87	-26.95	
.2513	44.73	42.02	61.71	-19.69	28.63	51.71	-23.08	
.3773	41.53	38.51	58.34	-19.83	30.35	48.34	-17.99	
.5010	42.68	40.20	56.00	-15.80	28.87	46.00	-17.13	
.6270	40.09	37.12	56.00	-18.88	29.89	46.00	-16.11	
.8768	37.72	35.20	56.00	-20.80	26.79	46.00	-19.21	
1.1288	38.03	35.11	56.00	-20.89	26.41	46.00	-19.59	
1.5045	42.24	40.30	56.00	-15.70	28.24	46.00	-17.76	
2.5080	42.73	40.86	56.00	-15.14	28.61	46.00	-17.39	
3.5093	41.58	39.79	56.00	-16.21	27.29	46.00	-18.71	
4.5128	41.43	39.41	56.00	-16.59	27.44	46.00	-18.56	
5.5163	44.55	42.49	60.00	-17.51	30.08	50.00	-19.92	
6.5198	44.39	42.85	60.00	-17.15	30.45	50.00	-19.55	
8.5245	44.27	42.69	60.00	-17.31	30.44	50.00	-19.56	
13.6658	33.01	28.66	60.00	-31.34	20.26	50.00	-29.74	
14.9753	34.80	28.51	60.00	-31.49	19.98	50.00	-30.02	
15.6705	37.99	32.25	60.00	-27.75	24.29	50.00	-25.71	
17.1128	37.35	31.77	60.00	-28.23	21.58	50.00	-28.42	
19.2525	35.08	31.52	60.00	-28.48	19.37	50.00	-30.63	
21.3945	33.38	28.67	60.00	-31.33	18.84	50.00	-31.16	
22.6928	35.53	32.61	60.00	-27.39	25.01	50.00	-24.99	
25.7010	38.67	34.48	60.00	-25.52	24.95	50.00	-25.05	
27.8385	37.55	33.20	60.00	-26.80	22.96	50.00	-27.04	
29.9423	39.89	36.67	60.00	-23.33	23.69	50.00	-26.31	

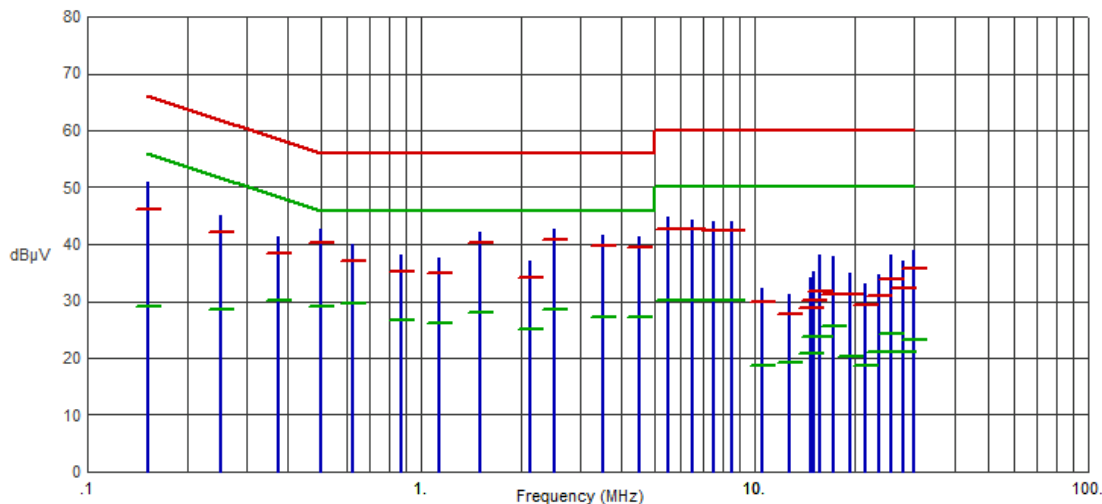
7. Measurement Data (continued)

7.7. Power Line Conducted Emissions (15.207), RSS-GEN (continued)

7.7.2. Neutral

Test No.: 328-19, 120 Volts, 60 Hz Neutral

FCC Part 15.207



Frequency (MHz)	Pk Amp (dBμV)	QP Amp (dBμV)	QP Limit (dBμV)	QP Margin (dB)	Avg Amp (dBμV)	Avg Limit (dBμV)	Avg Margin (dB)	Comments
.1523	51.04	46.11	65.87	-19.76	29.08	55.87	-26.79	
.2513	44.94	42.02	61.71	-19.69	28.45	51.71	-23.26	
.3750	41.31	38.50	58.39	-19.89	30.20	48.39	-18.19	
.5010	42.62	40.29	56.00	-15.71	29.04	46.00	-16.96	
.6270	39.90	37.12	56.00	-18.88	29.72	46.00	-16.28	
.8768	38.01	35.13	56.00	-20.87	26.65	46.00	-19.35	
1.1288	37.59	35.00	56.00	-21.00	26.15	46.00	-19.85	
1.5045	42.01	40.29	56.00	-15.71	27.88	46.00	-18.12	
2.1323	37.02	34.06	56.00	-21.94	25.14	46.00	-20.86	
2.5080	42.62	40.88	56.00	-15.12	28.61	46.00	-17.39	
3.5093	41.69	39.80	56.00	-16.20	27.29	46.00	-18.71	
4.5128	41.29	39.37	56.00	-16.63	27.21	46.00	-18.79	
5.5163	44.76	42.55	60.00	-17.45	30.12	50.00	-19.88	
6.5198	44.29	42.77	60.00	-17.23	30.26	50.00	-19.74	
7.5233	44.05	42.43	60.00	-17.57	30.13	50.00	-19.87	
8.5245	44.04	42.53	60.00	-17.47	30.17	50.00	-19.83	
10.5315	32.25	29.89	60.00	-30.11	18.68	50.00	-31.32	
12.6623	31.30	27.85	60.00	-32.15	19.28	50.00	-30.72	
14.6670	34.25	28.70	60.00	-31.30	20.79	50.00	-29.21	
15.0405	35.30	30.04	60.00	-29.96	23.79	50.00	-26.21	
15.6683	38.18	31.80	60.00	-28.20	23.73	50.00	-26.27	
17.1803	37.86	31.30	60.00	-28.70	25.48	50.00	-24.52	
19.2548	35.01	31.09	60.00	-28.91	20.30	50.00	-29.70	
21.3945	32.94	29.27	60.00	-30.73	18.60	50.00	-31.40	
23.5703	34.77	30.88	60.00	-29.12	21.19	50.00	-28.81	
25.7010	38.21	33.92	60.00	-26.08	24.23	50.00	-25.77	
27.8363	37.07	32.28	60.00	-27.72	21.09	50.00	-28.91	
29.9535	38.91	35.82	60.00	-24.18	23.07	50.00	-26.93	

7. Measurement Data (continued)

7.8. Public Exposure to Radio Frequency Energy Levels ((FCC KDB 447498 D01 v06, 1.1307 (b)(1), 2.1091(b)) RSS-GEN, RSS 102, Issue 5

7.8.1 SAR Test Exclusion (FCC KDB 447498 D01 v06, Clause 4.3.1.c)2))

Frequency (MHz)	MPE Distance (mm)	DUT Output Power (mW)	SAR Test Exclusion (mW)	Result
	(1)	(2)	(3)	
0.1256	≤50	0.00423643	925.2058	Compliant

- (1) FCC KDB 447498 D01 v06, Clause 4.3.1.(c)(2)
- (2) Converted from 3M field strength measurement ($FS_{dB\mu V/m} - 95.2$)
Reference Section 7.2, Measured Field Strength
- (3) $\frac{1}{2}(1 + \log(100/f_{(MHz)}))$
Formula detailed in KDB 447498 D01 v06, Clause 4.3.1.(c)(2)

7.8.2 Exemption Limits for Routine Evaluation – SAR Evaluation (RSS-102 Clause 2.5.1)

Frequency (MHz)	MPE Distance (mm)	DUT Output Power (mW)	SAR Test Exclusion (mW)	Result
	(1)	(2)	(3)	
0.1256	≤5 mm	0.00423643	71.0	Compliant

- (1) RSS-102, Clause 2.5.1
- (2) Converted from 3M field strength measurement ($FS_{dB\mu V/m} - 95.2$)
Reference Section 7.2, Measured Field Strength
- (3) RSS-102, Clause 2.5.1, Table 1 ≤ 300 MHz = 71 mW at ≤ 5 mm

8. 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 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 32, 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. 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.

9. Test Setup Images

9.1. Radiated Emissions – Front View



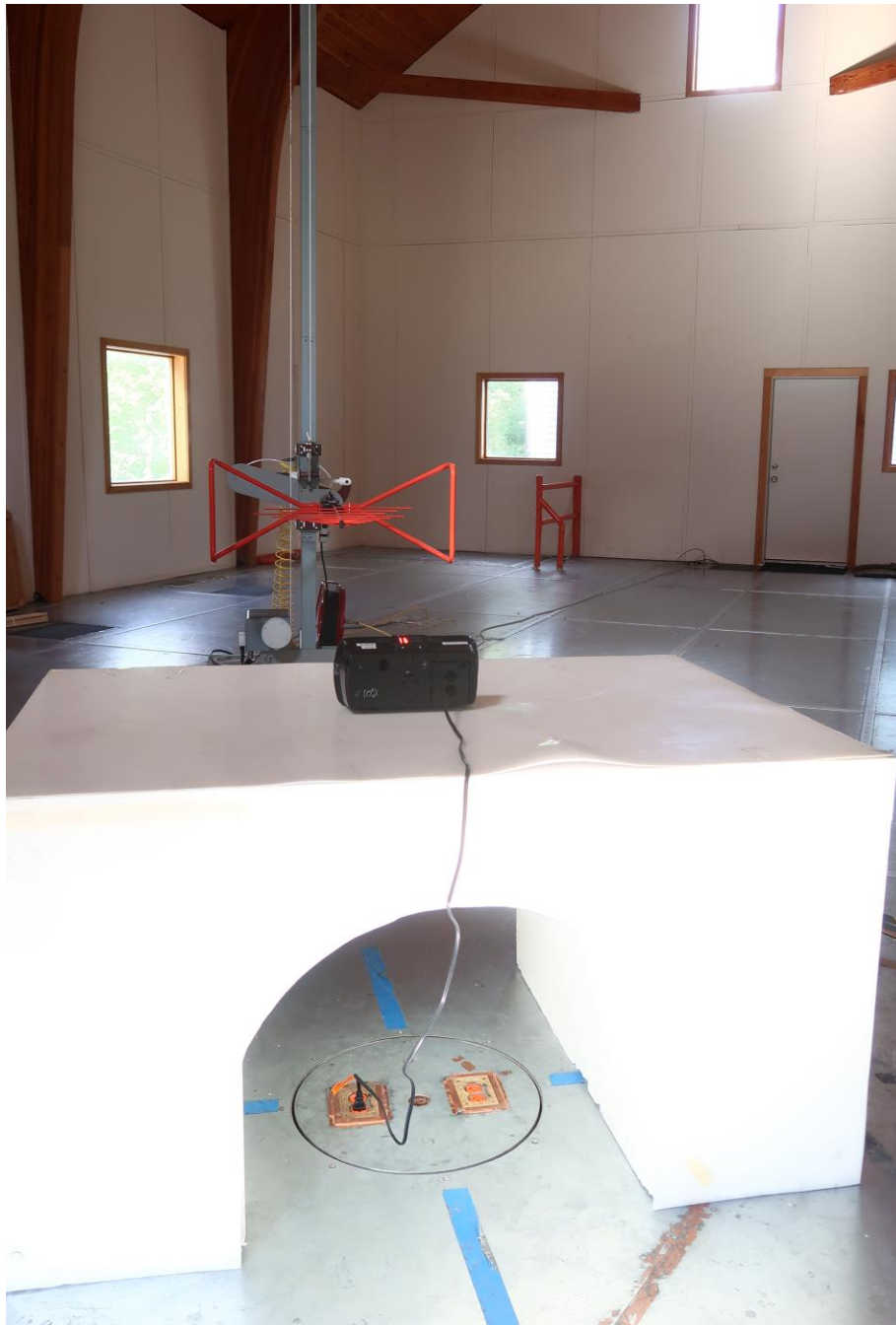
9. Test Setup Images

9.2. Radiated Emissions – Rear View Below 30 MHz



9. Test Setup Images

9.3. Radiated Emissions – Rear View 30 MHz to 1 GHz



9. Test Setup Images

9.4. Radiated Emissions – Front View >1 GHz



9. Test Setup Images

9.5. Radiated Emissions – Rear View >1 GHz



9. Test Setup Images

9.6. Conducted Emissions – Front View



9. Test Setup Images

9.7. Conducted Emissions – Rear View

