

COMPLIANCE WORLDWIDE INC. TEST REPORT 333-19

In Accordance with the Requirements of
Federal Communications Commission CFR Title 47 Part 15.225, Subpart C
Innovation, Science and Economic Development Canada
RSS 210, Issue 9
Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to
Cyrellis Biosystems, Inc.
299C Washington Street
Woburn, MA 01801

for the
NFC Board
PN7462AU

FCC ID: 2AUPV-830-00013

Report Issued on September 26, 2019

Tested by



Brian F. Breault
EMC Test Engineer

Reviewed By



Larry K. Stillings

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1. Scope

This test report certifies that the Cytrellis Biosystems NFC Board PN7462AU, as tested, meets the FCC Part 15.225 Subpart C, and ISED Canada RSS 210 requirements. The scope of this test report is limited to the test samples provided by the client, only in as much as those samples represent other production units. If any significant changes are made to the units, the changes shall be evaluated and a retest may be required.

2. Product Details

- 2.1. Manufacturer:** Cytrellis Biosystems, Inc.
- 2.2. Model Number:** 830-00013
- 2.3. Serial Numbers:** 000062-02
- 2.4. Description:** The Cytrellis NFC Board is used for reading tagged disposables used in the handpiece of the micro-coring device.
- 2.5. Power Source:** 120 VAC, 60 Hz
- 2.6. Hardware Revision:** N/A
- 2.7. Software Revision:** N/A
- 2.8. Modulation Type:** Pulse Modulation
- 2.9. Operating Frequencies:** 13.56 MHz
- 2.10. EMC Modifications:** None

3. Product Configuration

3.1. Operational Characteristics & Software

The Cytrellis Biosystems NFC Board 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	Freq (Hz)	Description/Function
Cytrellis	PN9462AU	000062-02	120	60	NFC Board 13.56 MHz RFID

3.3. EUT Connected Hardware

Manufacturer	Model/Part # / Options	Serial Number	Input Voltage	Freq (Hz)	Description/Function
None					

3.4. EUT Cables/Transducers

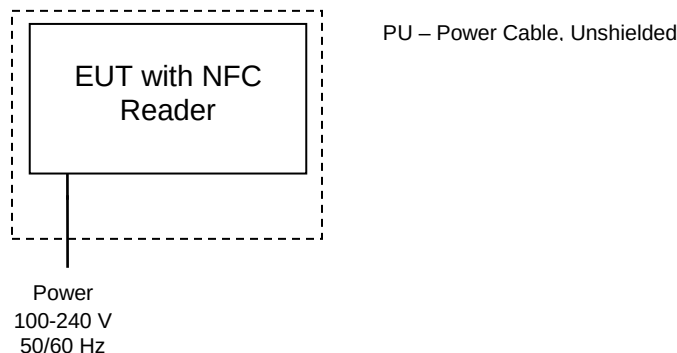
Cable Type	Length	Shield	From	To
Power	2M	No	EUT	120 VAC, 60 Hz
Handpiece	2M	Yes	EUT	Handpiece with NFC Reader

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 20 to 21 st and 28 th , 2019
Test Engineer:	Larry Stillings, Brian Breault
Normal Site Temperature (15 - 35°C):	24.0
Relative Humidity (20 -75%RH):	33%
Frequency Range:	10 kHz to 1 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 15.225, Operation within the band 13.110 – 14.010 MHz.

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 13.56 MHz

6. Measurement Summary

Test Requirement	FCC Part 15 Reference	ISED RSS Reference	Test Report Section	Result	Comment
Antenna Requirement	15.203	RSS-GEN Section 7.1.2	7.1	Compliant	
Operation within the Band 13.110 MHz – 14.010 MHz (Radiated Field Strength)	15.225 (a), (b), (c)	RSS-210 Section A2.6	7.2	Compliant	
Spurious Radiated Emissions	15.209		7.3	Compliant	
Operation within the Band 13.110 MHz – 14.010 MHz (Frequency Stability)	15.225 (e)	RSS-210 Section A2.6	7.4	Compliant	
Occupied Bandwidth/ Lower and Upper Band Edges	15.215(c) C63.10	N/A	7.5	Compliant	
99% Power Bandwidth	N/A	RSS-GEN Section 4.6.1	7.6	Compliant	
Power Line Conducted Emissions	15.207	RSS-GEN Section 7.2.4	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 (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: Compliant - The antenna utilized by the device under test is contained inside a sealed plastic enclosure.

7. Measurement Data (continued)

7.2. Operation within the Band 13.110 MHz – 14.010 MHz (15.225 (a), (b) and (c))

Radiated Field Strength of Fundamental (15.225 (a), (b) and (c))

Requirement: (a) The field strength of any emissions within the band 13.553 - 13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

Test Note: 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:

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

FS_{limit} is the calculation of field strength at the limit distance (dBμV/m)

38.52

FS_{max} is the measured field strength, expressed in (dBμV/m)

59.91

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

3.52

d_{measure} is the distance of the measurement point from the EUT (Meters)

3.00

d_{limit} is the reference limit distance (Meters)

30.00

The screen captures on the following pages display the value measured at a distance of 3 meters. This distance value was adjusted to the limit distance using the formula detailed in Equation 1.

Result: Compliant - The fundamental frequency radiated field strength of the device under test complies with the requirements detailed in FCC Part 15.225, Section (a).

Freq. (MHz)	Amplitude ¹ (dBμV/m)	Corr. Ampl. ² (dBμV/m)	FCC 15.225 Limit (dBμV/m) Quasi-Peak	Margin (dB)	Ant Pos.	Ant Height	Turntable Azimuth	Result
	Peak	Quasi Peak			Par/Per Gnd Par	cm	Deg	
13.56	38.52	N/A	84.00	-45.48	Par	100	10	Compliant

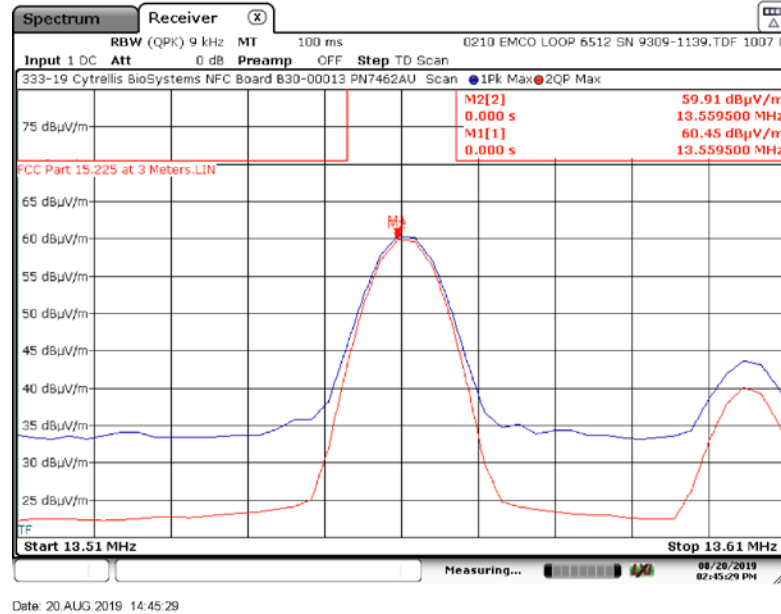
¹ Measurement has been extrapolated from 3 meters to 30 meters using Equation 1 on this page.

7. Measurement Data (continued)

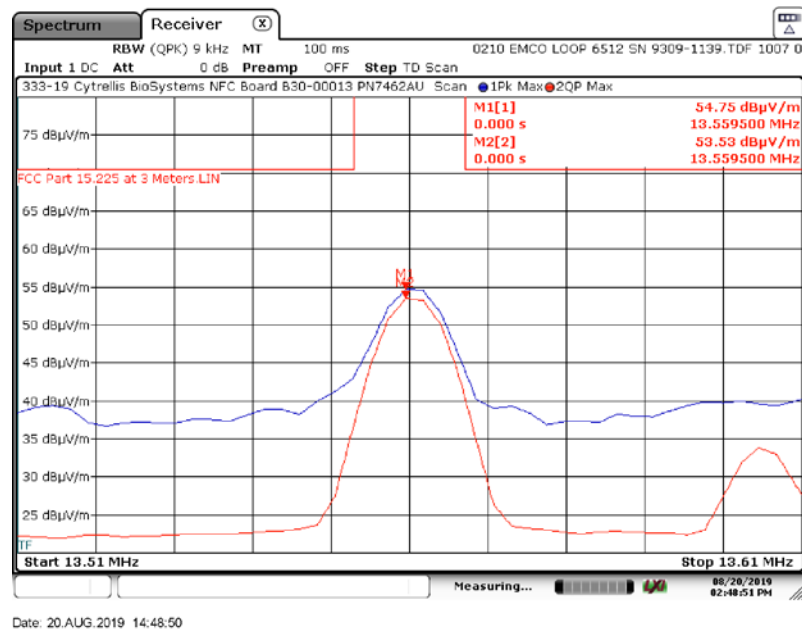
7.2. Operation within the Band 13.110 MHz – 14.010 MHz (15.225 (a), (b) and (c))

Radiated Field Strength of Fundamental (15.225 (a), (b) and (c))

7.2.1. Worst Case Field Strength of the Fundamental – Parallel Antenna



7.2.2. Worst Case Field Strength of the Fundamental – Perpendicular Antenna

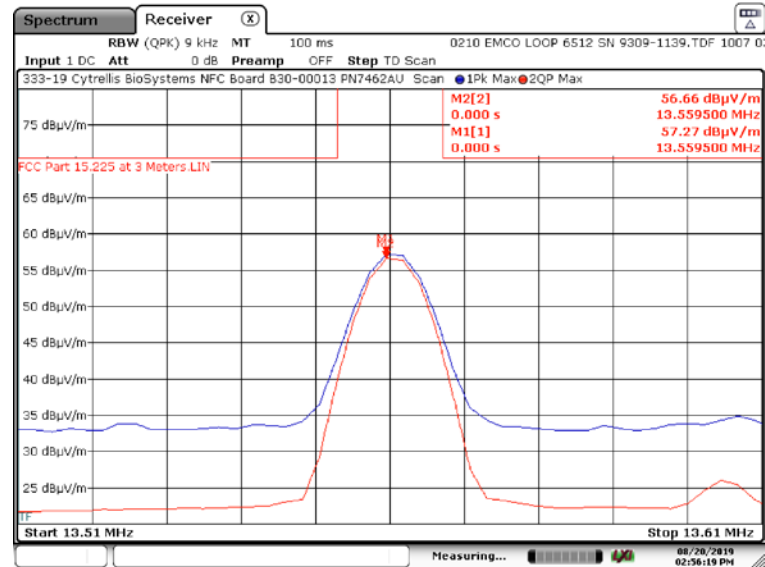


7. Measurement Data (continued)

7.2. Operation within the Band 13.110 MHz – 14.010 MHz (15.225 (a), (b) and (c))

Radiated Field Strength of Fundamental (15.225 (a), (b) and (c))

7.2.3. Worst Case Field Strength of the Fundamental – Ground Parallel Antenna



Note: Signal on the right hand side of the plots is an ambient

7. Measurement Data (continued)

7.3. Transmitter Spurious Radiated Emissions (15.225 (d), 15.209)

Requirement: The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table (Reference FCC 15.209):

Frequency (MHz)	Field Strength (μV/m)	Meas. Dist. (meters)	Field Strength (dBμV/m)	Distance (Meters)
0.009–0.490	2400/F(kHz)	300	128.5 to 93.8	3
0.490–1.705	24000/F(kHz)	30	73.8 to 63.0	3
1.705–30.0	30	30	69.5	3
30–88	100	3	40	3
88–216	150	3	43.5	3
216–960	200	3	46	3
Above 960	500	3	54	3

¹Measurements 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.

² Extrapolation below 30 MHz is calculated at 40 dB/decade.

Procedure: Test measurements were made in accordance with ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices, Section 6.5.

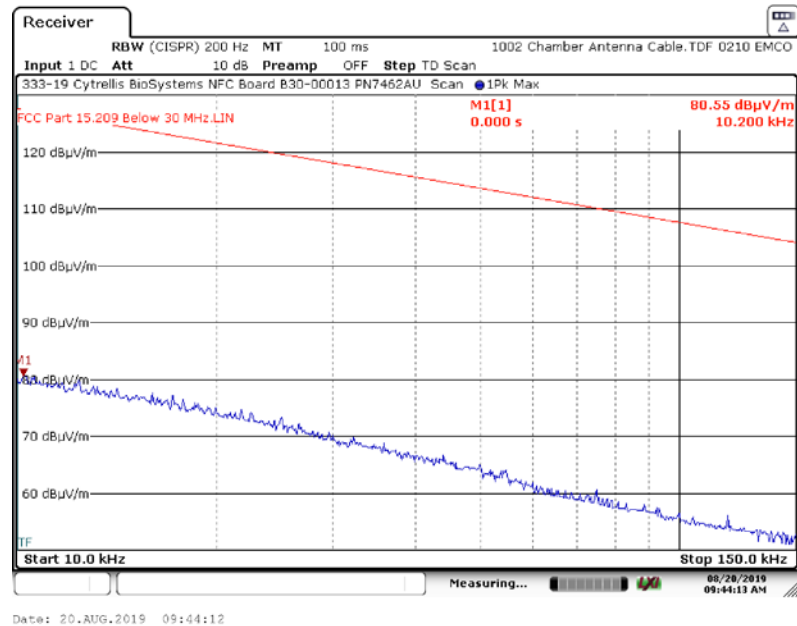
Results: Compliant - The transmitter installed in the unit under test meet the FCC Part 15.209 emissions requirements.

7. Measurement Data (continued)

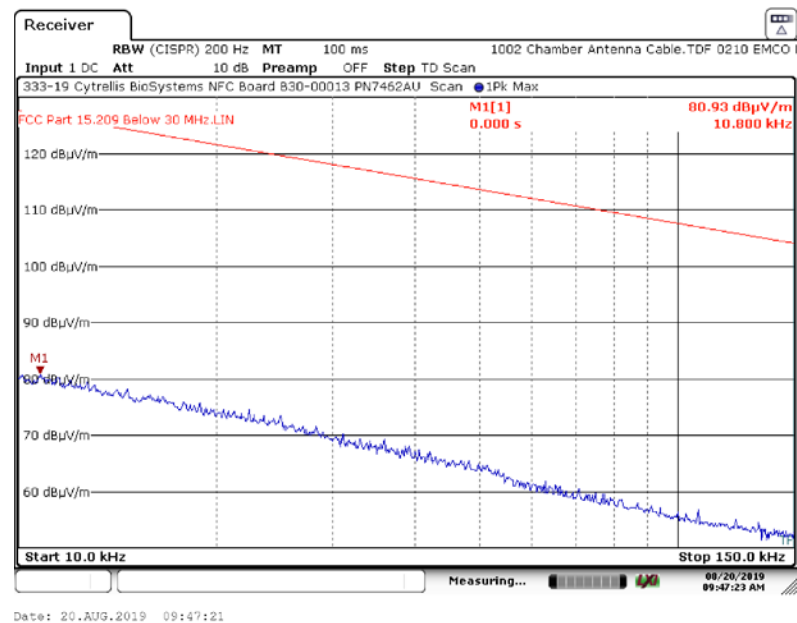
7.3. Spurious Radiated Emissions, 10 kHz to 1 GHz (15.225, § (d), 15.209) (cont'd)

7.3.1. Spurious Radiated Emissions, 10 kHz to 150 kHz Test Results

7.3.1.1. Parallel Antenna



7.3.1.2. Perpendicular Antenna

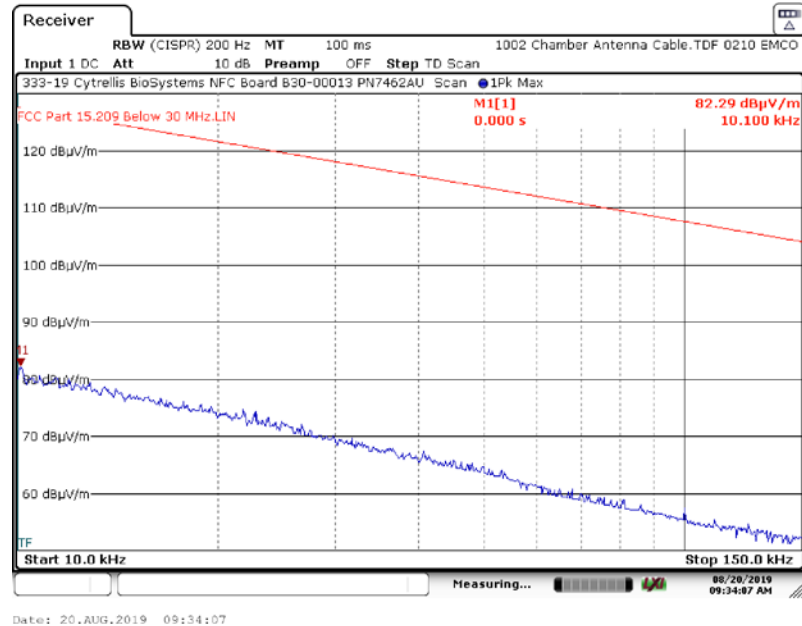


7. Measurement Data (continued)

7.3. Spurious Radiated Emissions, 10 kHz to 1 GHz (15.225, § (d), 15.209) (cont'd)

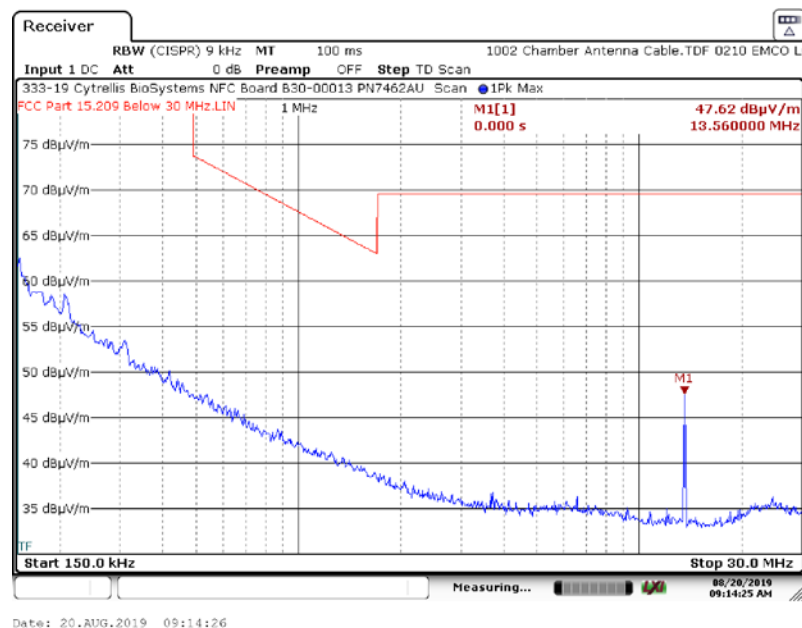
7.3.1. Spurious Radiated Emissions, 10 kHz to 150 kHz Test Results

7.3.1.3. Ground Parallel Antenna



7.3.2. Spurious Radiated Emissions, 150 kHz to 30 MHz Test Results

7.3.2.1. Parallel Antenna

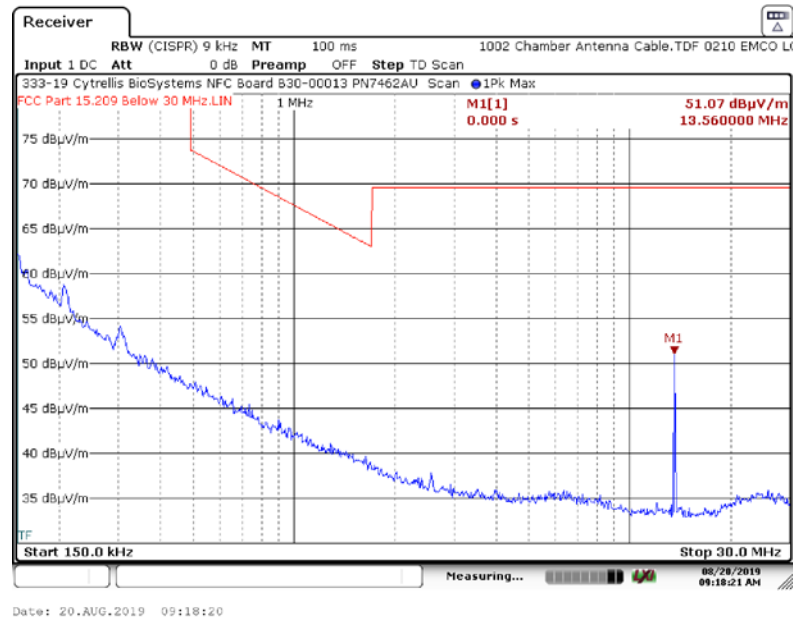


7. Measurement Data (continued)

7.3. Spurious Radiated Emissions, 10 kHz to 1 GHz (15.225, § (d), 15.209) (cont'd)

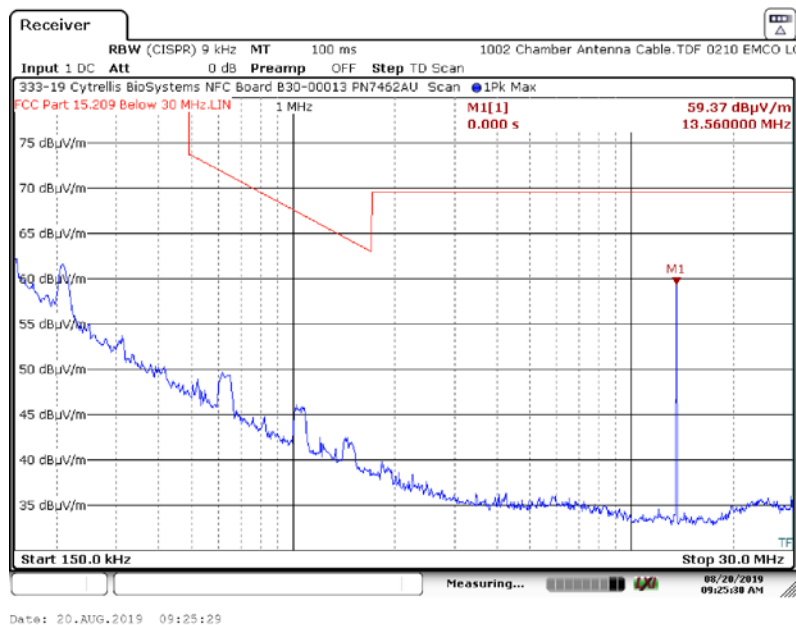
7.3.2. Spurious Radiated Emissions, 150 kHz to 30 MHz Test Results

7.3.2.2. Perpendicular Antenna



7.3.2. Spurious Radiated Emissions, 150 kHz to 30 MHz Test Results

7.3.2.3. Ground Parallel Antenna



7. Measurement Data (continued)

7.3. Spurious Radiated Emissions, 10 kHz to 1 GHz (15.225, § (d), 15.209) (cont'd)

7.3.3. Spurious Radiated Emissions, 30 MHz to 1 GHz Test Results

7.3.3.1. Horizontal Polarity



7.3.3.2. Vertical Polarity



7. Measurement Data (continued)

7.4. Frequency Stability (§ 15.225 (e))

Requirement: The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Note: The device under test was powered by a wall adapter with an input voltage rating of 100 to 240 volts, AC. Minimum voltage was set for 102 volts, AC and Maximum voltage was set for 138 volts, AC.

Result: Compliant - The unit under test complies with the requirements detailed in FCC Part 15.225 (e).

7.4.1. Temperature and Voltage Variation

Temp °C	Supply Voltage	Meas Freq.	Limit			Offset	Result
		(MHz)	F _{MIN} (MHz)	F _{MAX} (MHz)	%	(%)	
Ambient	120 VAC	13.5603940	N/A			N/A	
-20		13.5604255	13.559038	13.561750	± 0.01	0.00023229	Compliant
-10		13.5604305	13.559038	13.561750	± 0.01	0.00026917	Compliant
0		13.5604010	13.559038	13.561750	± 0.01	0.00005162	Compliant
+10		13.5604340	13.559038	13.561750	± 0.01	0.00029498	Compliant
+20		13.5604245	13.559038	13.561750	± 0.01	0.00022492	Compliant
+30		13.5604015	13.559038	13.561750	± 0.01	0.00005531	Compliant
+40		13.5603885	13.559038	13.561750	± 0.01	0.00004056	Compliant
+50		13.5603875	13.559038	13.561750	± 0.01	0.00004793	Compliant
+20	102 VAC	13.5603880	13.559074	13.561787	± 0.01	0.00031341	Compliant
	138 VAC	13.5603800	13.559074	13.561787	± 0.01	0.00037241	Compliant

7. Measurement Data (continued)

7.5. Occupied Bandwidth (Section 15.215 (c) and ANSI C63.10, Section 6.9)

Requirement: Intentional radiators operating under the alternative provisions to the general emission limits, as contained in Sections 15.217 through 15.255 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule.

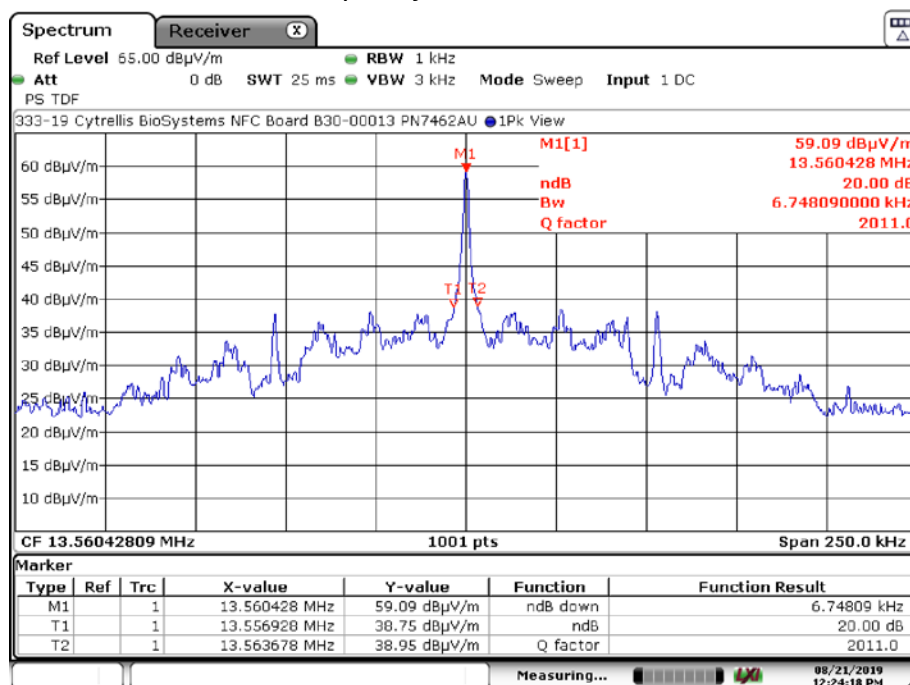
Frequency Band: $F_{MIN} = 13.110 \text{ MHz}$

$F_{MAX} = 14.010 \text{ MHz}$

Result: Compliant.

-20 dB Frequency Measured		Lower & Upper Band Edge		Result
(F _{LO} & F _{HI})		(F _{MIN} & F _{Max})		
MHz		MHz		
F _{LO}	13.556	F _{MIN}	13.11	Compliant (F _{LO} > F _{MIN})
F _{HI}	13.564	F _{MAX}	14.01	Compliant (F _{HI} < F _{Max})

7.5.1. Plot of 20 dB Bandwidth vs. Frequency Band



Date: 21.AUG 2019 12:24:16

7. Measurement Data (continued)

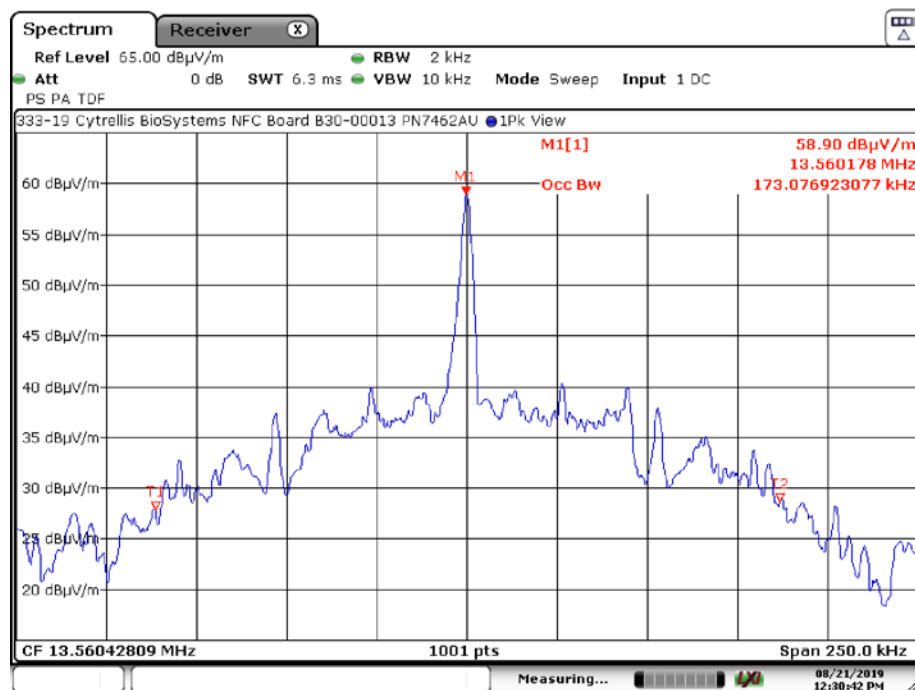
7.6. 99% Power Bandwidth (RSS-GEN Section 4.6.1)

Requirement: When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

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. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

Procedure: This test was performed utilizing the automated 99% bandwidth function of the spectrum analyzer.

Frequency	99% Power Bandwidth
(MHz)	(kHz)
13.56	173.07



7. Measurement Data (continued)

7.7. Power Line Conducted Emissions (FCC Part 15.207)

Requirement: 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 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.

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, Section 6.2: Standard test method for ac power-line conducted emissions from unlicensed wireless devices.

Results: The device under test meets the FCC Part 15.207 conducted emissions requirements.

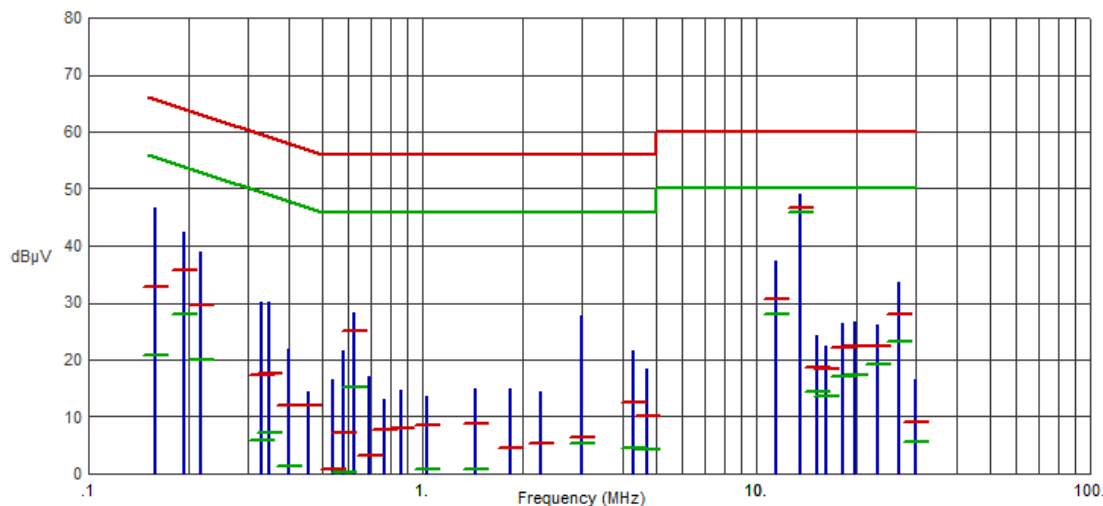
7. Conducted Emissions Test Results

7.7. Power Line Conducted Emissions (15.207)

7.7.1. 120 Volts, 60 Hz Phase

Test No.: 333-19, 120 Volts, 60 Hz Phase

FCC, Class B



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1590	46.66	32.90	65.52	-32.62	20.74	55.52	-34.78	
.1928	42.51	35.64	63.92	-28.28	28.01	53.92	-25.91	
.2175	38.80	29.63	62.91	-33.28	19.97	52.91	-32.94	
.3300	30.18	17.35	59.45	-42.10	5.86	49.45	-43.59	
.3480	30.04	17.57	59.01	-41.44	7.14	49.01	-41.87	
.3975	21.79	12.11	57.91	-45.80	1.29	47.91	-46.62	
.4583	14.33	11.89	56.72	-44.83	-1.21	46.72	-47.93	
.5393	16.50	.81	56.00	-55.19	-5.24	46.00	-51.24	
.5798	21.69	7.21	56.00	-48.79	.32	46.00	-45.68	
.6225	28.35	25.11	56.00	-30.89	15.13	46.00	-30.87	
.6900	17.16	3.30	56.00	-52.70	-2.07	46.00	-48.07	
.7710	13.07	7.69	56.00	-48.31	-1.64	46.00	-47.64	
.8678	14.70	8.04	56.00	-47.96	-3.67	46.00	-49.67	
1.0298	13.69	8.59	56.00	-47.41	.81	46.00	-45.19	
1.4415	14.97	8.81	56.00	-47.19	.69	46.00	-45.31	
1.8308	14.85	4.55	56.00	-51.45	-2.40	46.00	-48.40	
2.2673	14.29	5.27	56.00	-50.73	-1.66	46.00	-47.66	
2.9918	27.81	6.46	56.00	-49.54	5.20	46.00	-40.80	
4.2765	21.64	12.43	56.00	-43.57	4.54	46.00	-41.46	
4.7198	18.36	10.18	56.00	-45.82	4.23	46.00	-41.77	
11.4653	37.34	30.59	60.00	-29.41	27.90	50.00	-22.10	
13.5600	49.11	46.56	60.00	-13.44	45.74	50.00	-4.26	
15.2520	24.33	18.58	60.00	-41.42	14.30	50.00	-35.70	
16.2285	22.42	18.32	60.00	-41.68	13.62	50.00	-36.38	
18.2445	26.31	22.16	60.00	-37.84	17.20	50.00	-32.80	
19.7093	26.59	22.31	60.00	-37.69	17.41	50.00	-32.59	
23.1293	26.12	22.32	60.00	-37.68	19.15	50.00	-30.85	
26.8013	33.66	28.08	60.00	-31.92	23.32	50.00	-26.68	
29.9063	16.61	8.98	60.00	-51.02	5.70	50.00	-44.30	

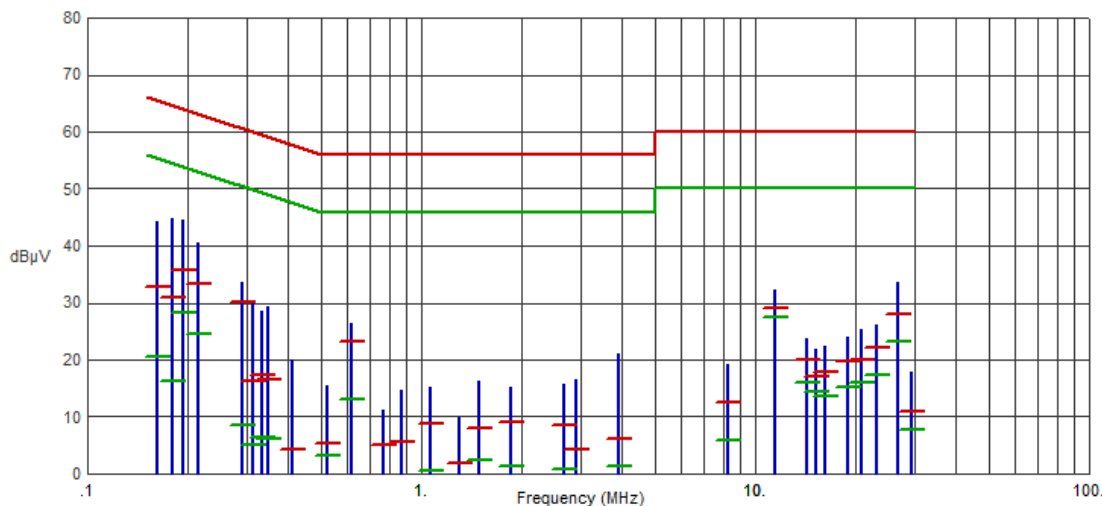
7. Conducted Emissions Test Results

7.7. Power Line Conducted Emissions (15.207)

7.7.2. 120 Volts, 60 Hz Neutral

Test No.: 333-19, 120 Volts, 60 Hz Neutral

FCC, Class B



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1613	44.24	32.93	65.40	-32.47	20.45	55.40	-34.95	
.1793	44.76	30.82	64.52	-33.70	16.26	54.52	-38.26	
.1928	44.56	35.78	63.92	-28.14	28.31	53.92	-25.61	
.2153	40.61	33.21	63.00	-29.79	24.50	53.00	-28.50	
.2895	33.62	30.26	60.54	-30.28	8.54	50.54	-42.00	
.3120	29.76	16.20	59.92	-43.72	4.94	49.92	-44.98	
.3323	28.42	17.35	59.39	-42.04	6.33	49.39	-43.06	
.3480	29.35	16.54	59.01	-42.47	6.06	49.01	-42.95	
.4110	20.04	4.35	57.63	-53.28	-2.97	47.63	-50.60	
.5235	15.38	5.20	56.00	-50.80	3.31	46.00	-42.69	
.6203	26.38	23.13	56.00	-32.87	12.99	46.00	-33.01	
.7710	11.33	4.98	56.00	-51.02	-1.77	46.00	-47.77	
.8700	14.72	5.72	56.00	-50.28	-3.47	46.00	-49.47	
1.0658	15.33	8.84	56.00	-47.16	.43	46.00	-45.57	
1.2998	9.81	1.87	56.00	-54.13	-3.14	46.00	-49.14	
1.4933	16.20	8.12	56.00	-47.88	2.52	46.00	-43.48	
1.8488	15.16	9.03	56.00	-46.97	1.27	46.00	-44.73	
2.6633	15.61	8.46	56.00	-47.54	.68	46.00	-45.32	
2.9018	16.52	4.17	56.00	-51.83	-1.68	46.00	-47.68	
3.8918	21.07	6.23	56.00	-49.77	1.22	46.00	-44.78	
8.3130	19.08	12.42	60.00	-47.58	6.00	50.00	-44.00	
11.4653	32.37	29.19	60.00	-30.81	27.43	50.00	-22.57	
14.2733	23.81	20.11	60.00	-39.89	15.87	50.00	-34.13	
15.2520	21.79	17.14	60.00	-42.86	14.48	50.00	-35.52	
16.2285	22.29	17.81	60.00	-42.19	13.59	50.00	-36.41	
18.9150	24.08	19.85	60.00	-40.15	15.29	50.00	-34.71	
20.8073	25.43	19.94	60.00	-40.06	16.03	50.00	-33.97	
23.1293	26.08	22.16	60.00	-37.84	17.35	50.00	-32.65	
26.8013	33.70	28.08	60.00	-31.92	23.24	50.00	-26.76	
29.2358	17.94	10.82	60.00	-49.18	7.68	50.00	-42.32	

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)	
13.56	≤50	0.00029580	442.9735	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) $\frac{1}{2}(1 + \log(100/f(\text{MHz})))$
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)	
13.56	≤5 mm	0.00029580	71	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 $1 \leq 300 \text{ MHz} = 71 \text{ mW at } \leq 5\text{mm}$

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 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. 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.

9. Test Setup Photographs

9.1. Radiated Emissions Front View



9. Test Setup Photographs

9.2. Radiated Emissions Rear View – Fundamental, Spurious below 30 MHz



9. Test Setup Photographs

9.3. Radiated Emissions Front View 30 MHz – 1 GHz



9. Test Setup Photographs

9.4. Radiated Emissions Rear View 30 MHz – 1 GHz



9. Test Setup Photographs

9.5. Frequency Stability Test - Setup



9. Test Setup Photographs

9.6. Frequency Stability Test – DUT



9. Test Setup Photographs

9.7. Power Line Conducted Emissions - Front



9. Test Setup Photographs

9.8. Power Line Conducted Emissions – Back

