EMISSIONS TEST REPORT

Report Number: 100990439BOX-004b
Project Number: G100990439

Report Issue Date: 04/24/2013

Product Designation: ANDE-1

Standards: CFR47 FCC Part 15 Subpart C:2012 15.225,
FCC Part 15 Subpart B:2012,
IC RSS-210 Issue 8 December 2010 Annex 2.6,
RSS-Gen Issue 3 December 2010+Notice DRS 2012-DRS0126

Tested by:
Intertek Testing Services NA, Inc.
70 Codman Hill Road
Boxborough, MA 01719

Client:
Analogic Corporation
8 Centennial Drive
Peabody, MA 01960

Report prepared by Reviewer

Kouma Sinn / Senior Project Engineer, EMC

Report reviewed by

Jeff Goulet / EMC Manager

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested Comply with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	--
4	Description of Equipment Under Test	--
5	System Setup and Method	--
6	Fundamental Radiated Emissions FCC Part 15 Subpart C:2012 15.225(a), (b), (c), (d) IC RSS-210 Issue 8 December 2010 A2.6 (a), (b), (c), (d)	Pass
7	Transmitter Spurious Emissions Below 30MHz FCC Part 15 Subpart C:2012 15.209, 15.225(d), IC RSS-210 Issue 8 December 2010 A2.6(d)	Pass
8	Transmitter Spurious Emissions Above 30MHz FCC Part 15 Subpart C:2012 15.209, 15.225(d), IC RSS-210 Issue 8 December 2010 A2.6(d)	Pass
--	Receiver Spurious Emissions Below 30MHz FCC Part 15 Subpart B:2012 15.109, IC RSS-Gen Issue 3 December 2010: Section 6.0	N/A*
9	Receiver Spurious Emissions Above 30MHz FCC Part 15 Subpart B:2012 15.109, IC RSS-Gen Issue 3 December 2010: Section 6.0	Pass
10	AC Line-Conducted Emissions CFR47 FCC Part 15 Subpart B:2012, FCC Part 15:2011 Section 15.207 (a) RSS-Gen Issue 3 December 2010, 7.2.2 (Table 2) IC ICES-003 Issue 5 August 2012	Pass
11	20dB Bandwidth FCC Part 15 Subpart C:2012 15.215 IC RSS-Gen Issue 3 December 2010 Section 4.6	Pass
12	Frequency Stability FCC Part 15 Subpart C:2012 15.225(e), IC RSS-Gen Issue 3 December 2010 Section 4.7 IC RSS-210 December 2010 A2.6	Pass
13	Revision History	--

* - no limits below 30 MHz

3 Client Information

This EUT was tested at the request of:

Company: Analogic Corporation
8 Centennial Drive
Peabody, MA 01960
Contact: Bernard Weinberg
Telephone: (978) 326-4066
Fax: (978) 977-6808
Email: bweinberg@analogic.com

4 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Rapid DNA Analysis Instrument	Analogic Corporation	ANDE-1	Proto 8

Receive Date:	12/18/2012
Received Condition:	Good
Type:	Prototype

Description of Equipment Under Test (provided by client)
The EUT is a Rapid DNA Analysis Instrument.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
100-240VAC	15/7.5A	50/60Hz	1

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	The RFID was programmed to switches between the following antennas: Front, Back, Top Front, at an interval of 0.001 second and then looped.

5 System Setup and Method

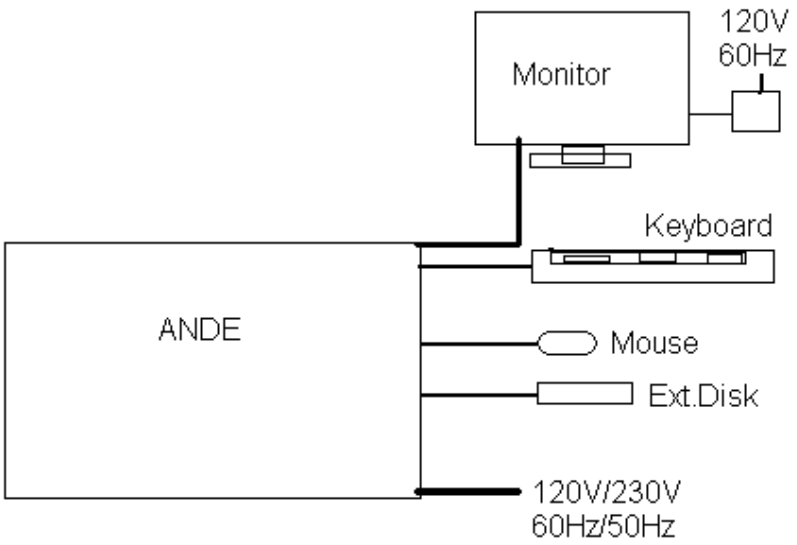
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	AC Mains	2.5	None	None	AC Mains
2	Video Cable	1.5	Braid	Two	Monitor
3	Mouse Cable - USB	1.25	Braid	None	Mouse
4	Keyboard Cable - USB	1.25	Braid	One	Keyboard
5	Ext Hard Drive Cable - USB	0.25	Braid	None	Ext. Disk

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Multisync LCD Monitor	NEC	LCD1860NX	36140037YA
Keyboard	DELL	SK-8115	CN-0DJ331-71616-71E-0AWA
Mouse	Belkin	F8E812-BLK-USB	053000997
External Harddrive	Western Digital	WDBAAA5000ABC-00	WX41A20EB027
Monitor	HP	L1910	CNC940PGSF

5.1 Method:

Configuration as required by ANSI C63.4-2009.

5.2 EUT Block Diagram:



6 Fundamental Frequency Radiated Emissions

6.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2012 15.225(a), (b), (c), (d), IC RSS-210 Issue 8 December 2010 A2.6 (a), (b), (c), (d), ANSI C63.4-2009.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV/m
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	09/25/2012	09/25/2014
LOOP2'	LOOP ANTENNA	Empire	LP-105	905	12/17/2012	12/17/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/2010

6.3 Results:

The sample tested was found to comply.

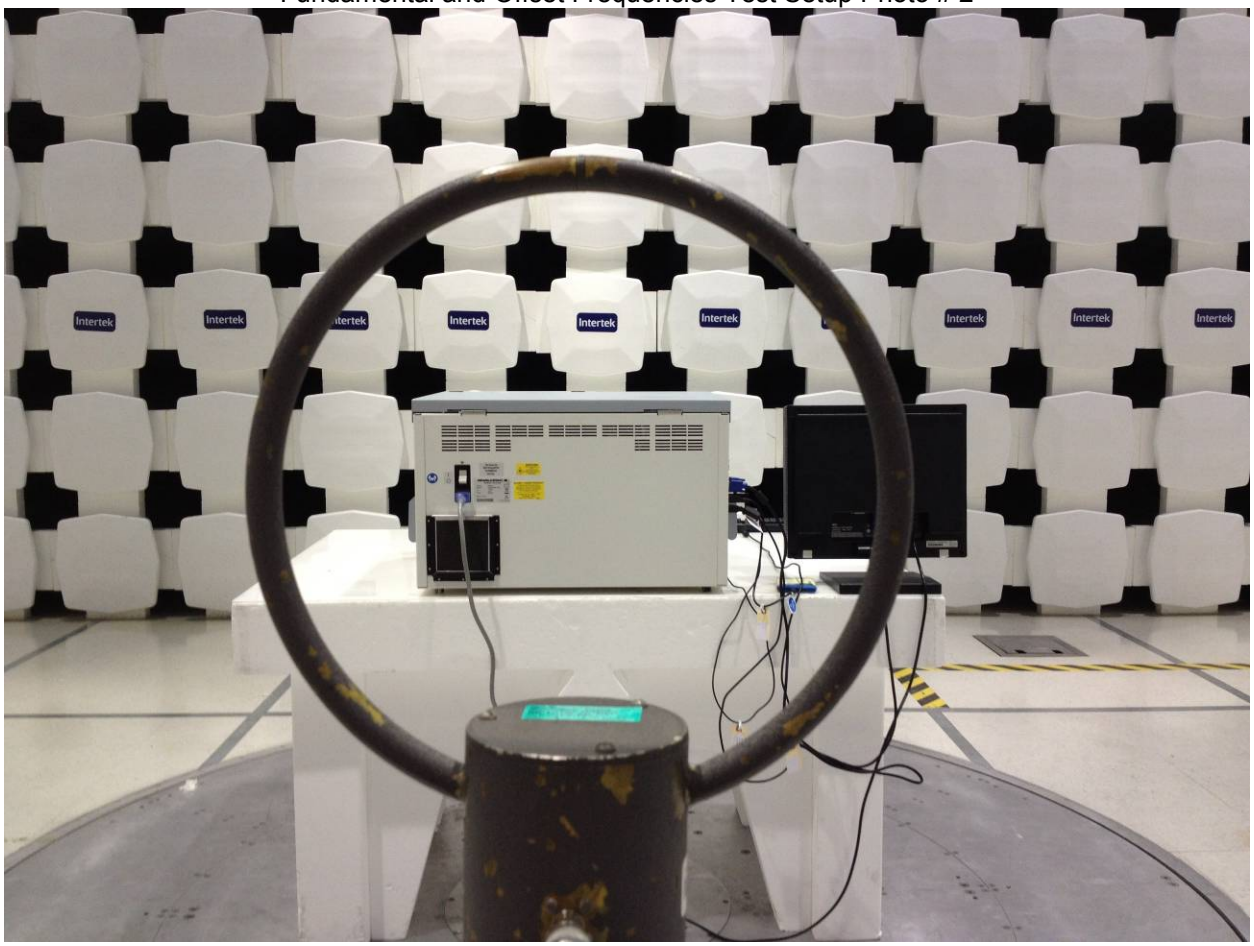
The field strength of any emissions shall not exceed the limits as follows:

Frequency Bands	Field Strength Limits		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
13.553 –13.567	15,848	84.00	30
13.410 –13.553	334	50.50	30
13.567 –13.710	334	50.50	30
13.110 –13.410	106	40.51	30
13.710 –14.010	106	40.51	30
Outside of 13.110 –14.010	§15.209		

6.4 Setup Photographs:

Fundamental and Offset Frequencies Test Setup Photo # 1

Fundamental and Offset Frequencies Test Setup Photo # 2



6.5 Test Data:

Radiated Emissions

Company: Analogic | Antenna & Cables: N | Bands: N, LF, HF, SHF
Model #: ANDE-1 | Antenna: LOOP2 E-Field 12-17-13.txt | LOOP2 H-Field 12-17-13.txt
Serial #: Proto 8 | Cable(s): 145-416 3mTrkB 10-04-2013.txt | NONE.
Engineers: Kouma Sinn | Location: 10m Chamber | Barometer: DAV004 | Filter: NONE
Project #: G100990439 | Date(s): 12/29/12
Standard: FCC Part 15.225 & RSS-210 Annex 2 (A2.6) | Temp/Humidity/Pressure: 21C | 18% | 1000mbar
Receiver: 145-128 | Limit Distance (m): 30
PreAmp: NONE. | Test Distance (m): 2
PreAmp Used? (Y or N): N | Voltage/Frequency: 120VAC/60Hz | Frequency Range: Fund + Offset Freq.

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
FCC limit @ 30 meters. Test distance at 2 meters												
PK	V	13.560	6.42	41.17	0.42	0.00	47.04	0.97	84.00	-83.03	9/30kHz	
QP	V	13.560	3.98	41.17	0.42	0.00	47.04	-1.47	84.00	-85.47	9/30kHz	
FCC limit @ 30 meters. Test distance at 2 meters.												
Offset Freq., 13.410–13.553 MHz and 13.567–13.710 MHz, 13.110–13.410 MHz and 13.710–14.010 MHz												
PK	V	13.410	-6.95	41.16	0.42	0.00	47.04	-12.41	50.50	-62.91	9/30kHz	RB, NF
PK	V	13.553	-1.73	41.17	0.42	0.00	47.04	-7.18	50.50	-57.68	9/30kHz	
PK	V	13.567	-3.93	41.18	0.42	0.00	47.04	-9.38	50.50	-59.88	9/30kHz	
PK	V	13.710	-4.32	41.19	0.42	0.00	47.04	-9.75	50.50	-60.25	9/30kHz	NF
PK	V	13.110	-5.39	41.14	0.41	0.00	47.04	-10.89	40.51	-51.40	9/30kHz	NF
PK	V	14.010	-4.99	41.21	0.43	0.00	47.04	-10.39	40.51	-50.90	9/30kHz	

Test Personnel(s): Kouma Sinn KPS
Supervising Engineer: (Where Applicable) N/A
Product Standard: FCC 15.225, IC RSS-210
Input Voltage: 120VAC/60Hz
Pretest Verification w/ Ambient Signals or BB Source: **Ambient Signals**

Test Date(s): 12/29/2012
Test Levels: Per section 6.3
Ambient Temperature: 21 ºC
Relative Humidity: 18 %
Atmospheric Pressure: 1000 mbars

Deviations, Additions, or Exclusions: None

7 Transmitter Spurious Emissions Below 30MHz

7.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2012, 15.209, 15.225(d), IC RSS-210 Issue 8 December 2010 A2.6(d), ANSI C63.4-2009.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV/m
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	09/25/2012	09/25/2014
LOOP2'	LOOP ANTENNA	Empire	LP-105	905	12/17/2012	12/17/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013
LOOP1'	LOOP ANTENNA	Empire	LG-105	61	08/18/2012	08/18/2013

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/2010

7.3 Results:

The sample tested was found to comply.

The field strength of any emissions shall not exceed the limits as follows:

FCC Part 15.209

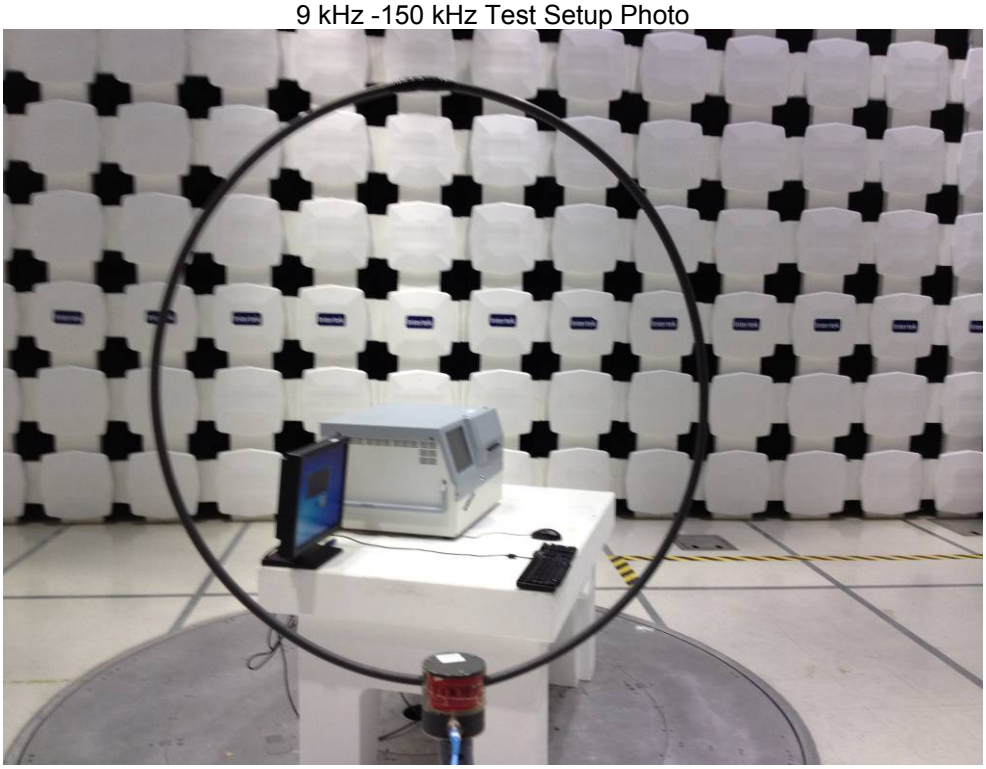
Frequency	Field Strength		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
0.009–0.490	2400/F(kHz)	20*Log(2400/F(kHz))	300
0.490–1.705	24000/F(kHz)	20*Log(24000/F(kHz))	30
1.705–30.0	30.00	29.54	30

Note: The emission limits for the bands 9-90kHz and 110-490kHz are based on measurements employing an average detector.

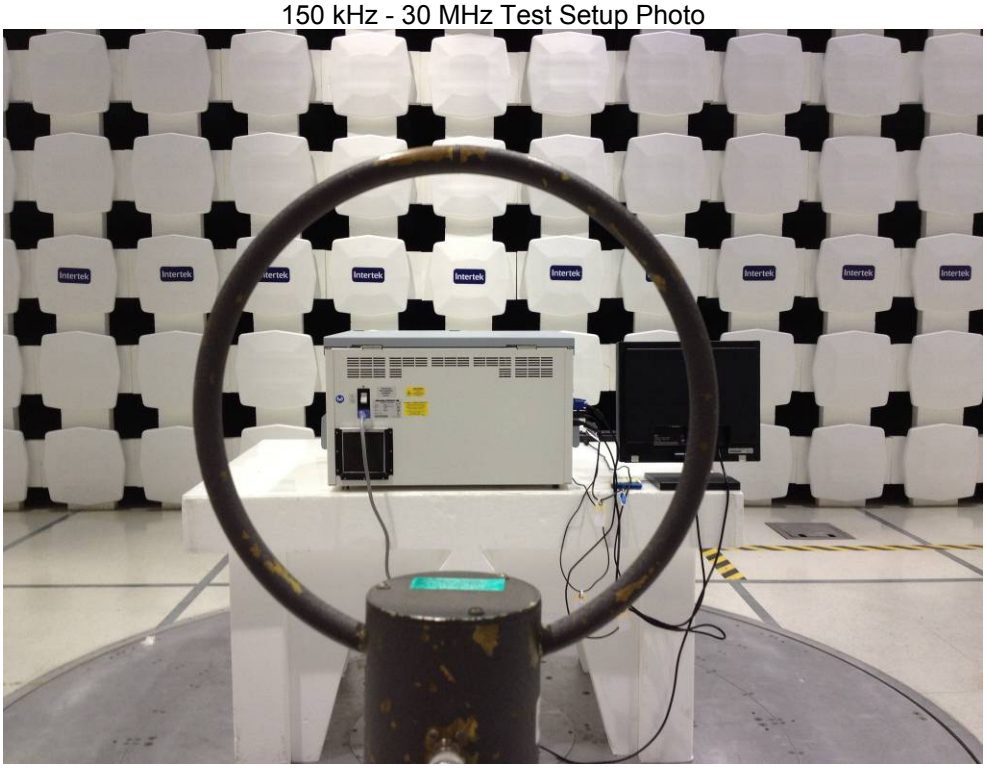
IC RSS-210 A2.6(d): emissions outside the band 13.110-14.010 MHz must not exceed 30 microvolts/m (29.5 dBµV/m) at 30 m.

7.4 Setup Photographs:

9 kHz -150 kHz Test Setup Photo



150 kHz - 30 MHz Test Setup Photo



7.5 Test Data:

9-150 kHz Radiated Emissions

Company:	Analogic						Antenna & Cables:	LF	Bands: N, LF, HF, SHF		
Model #:	ANDE-1						Antenna:	Loop1 08-18-13 1m E.txt	Loop1 08-18-13 1m H.txt		
Serial #:	Proto 8						Cable(s):	145-416 3mTrkB 10-04-2013.txt	NONE.		
Engineers:	Kouma Sinn		Location:	10m Chamber			Barometer:	DAV004	Filter:	NONE	
Project #:	G100990439	Date(s):	12/29/12								
Standard:	FCC Part 15.225 & RSS-210 Annex 2 (A2.6)						Temp/Humidity/Pressure:	21C	18%	1000mbar	
Receiver:	145-128		Limit Distance (m):	30							
PreAmp:	NONE.		Test Distance (m):	2							
PreAmp Used? (Y or N):	N		Voltage/Frequency:	120VAC/60Hz			Frequency Range:	9kHz-150kHz			
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)											
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW											

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
FCC limit = 2400/F(kHz) @ 30 meters.											
PK	V	0.019	0.90	61.11	0.04	0.00	47.04	15.00	42.03	-27.03	200/300Hz
PK	V	0.047	10.81	53.38	0.06	0.00	47.04	17.21	34.16	-16.95	200/300Hz
PK	V	0.127	-7.13	48.65	0.09	0.00	47.04	-5.43	25.53	-30.96	200/300Hz

150 kHz - 30 MHz Radiated Emissions

Company:	Analogic						Antenna & Cables:	N	Bands: N, LF, HF, SHF		
Model #:	ANDE-1						Antenna:	LOOP2 E-Field 12-17-13.txt	LOOP2 H-Field 12-17-13.txt		
Serial #:	Proto 8						Cable(s):	145-416 3mTrkB 10-04-2013.txt	NONE.		
Engineers:	Kouma Sinn		Location:	10m Chamber			Barometer:	DAV004	Filter:	NONE	
Project #:	G100990439	Date(s):	12/29/12								
Standard:	FCC Part 15.225 & RSS-210 Annex 2 (A2.6)						Temp/Humidity/Pressure:	21C	18%	1000mbar	
Receiver:	145-128		Limit Distance (m):	30							
PreAmp:	NONE.		Test Distance (m):	2							
PreAmp Used? (Y or N):	N		Voltage/Frequency:	120VAC/60Hz			Frequency Range:	150kHz-30MHz			
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)											
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW											

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
FCC. Limit @ 30 meters. Test distance at 2 meters. Spurious Emissions												
QP	V	13.410	-6.95	41.16	0.42	0.00	47.04	-12.41	50.50	-62.91	9/30kHz	NF
QP	V	13.710	-4.32	41.19	0.42	0.00	47.04	-9.75	50.50	-60.25	9/30kHz	NF
QP	V	13.110	-5.39	41.14	0.41	0.00	47.04	-10.89	40.51	-51.40	9/30kHz	NF
QP	V	14.010	-4.99	41.21	0.43	0.00	47.04	-10.39	40.51	-50.90	9/30kHz	NF
QP	V	10.000	-5.19	41.50	0.35	0.00	47.04	-10.38	29.54	-39.92	9/30kHz	NF
QP	V	27.120	-3.07	40.08	0.63	0.00	47.04	-9.41	29.54	-38.95	9/30kHz	NF
QP	V	29.000	-4.45	39.44	0.65	0.00	47.04	-11.40	29.54	-40.94	9/30kHz	NF

Test Personnel(s):	Kouma Sinn KPS	Test Date(s):	12/29/2012
Supervising Engineer: (Where Applicable)	N/A	Test Levels:	Per section 7.3
Product Standard:	FCC 15.225, IC RSS-210	Ambient Temperature:	21 ºC
Input Voltage:	120VAC/60Hz	Relative Humidity:	18 %
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient Signals**	Atmospheric Pressure:	1000 mbars

Deviations, Additions, or Exclusions: None

8 Transmitter Spurious Above 30MHz

8.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2012, 15.209, 15.225(d), IC RSS-210 Issue 8 December 2010 A2.6(d), ANSI C63.4-2009.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV/m
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV003'	Weather Station	Davis Instruments	7400	PE80529A39A	09/25/2012	09/25/2014
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	09/04/2012	09/04/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	10/04/2012	10/04/2013
145003'	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2443A04077	10/04/2012	10/04/2013

Software Utilized:

Name	Manufacturer	Version
C5	Teseq	5.26.46.46

8.3 Results:

The sample tested was found to Comply.

The field strength of any emissions shall not exceed the limits as follows:

FCC Part 15.209

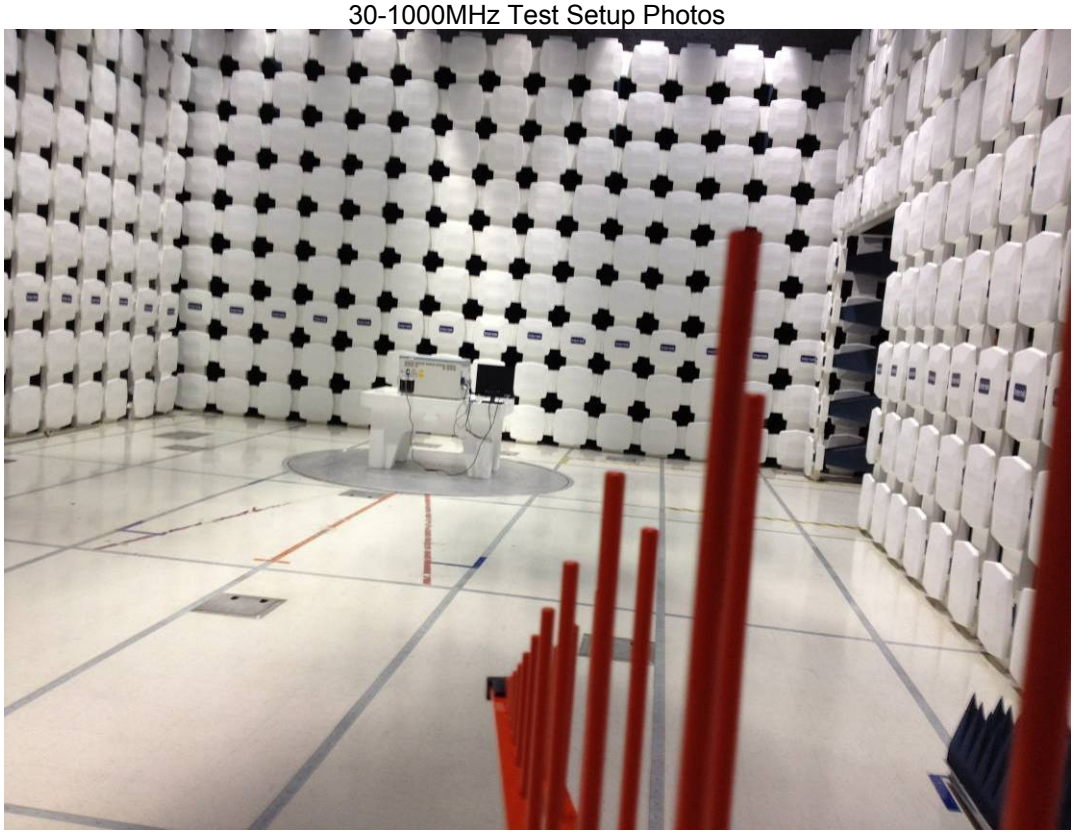
Frequency	Field Strength		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
30–88	100	40.00	3
88–216	150	43.52	3
216–960	200	46.02	3
Above 960	500	53.98	3

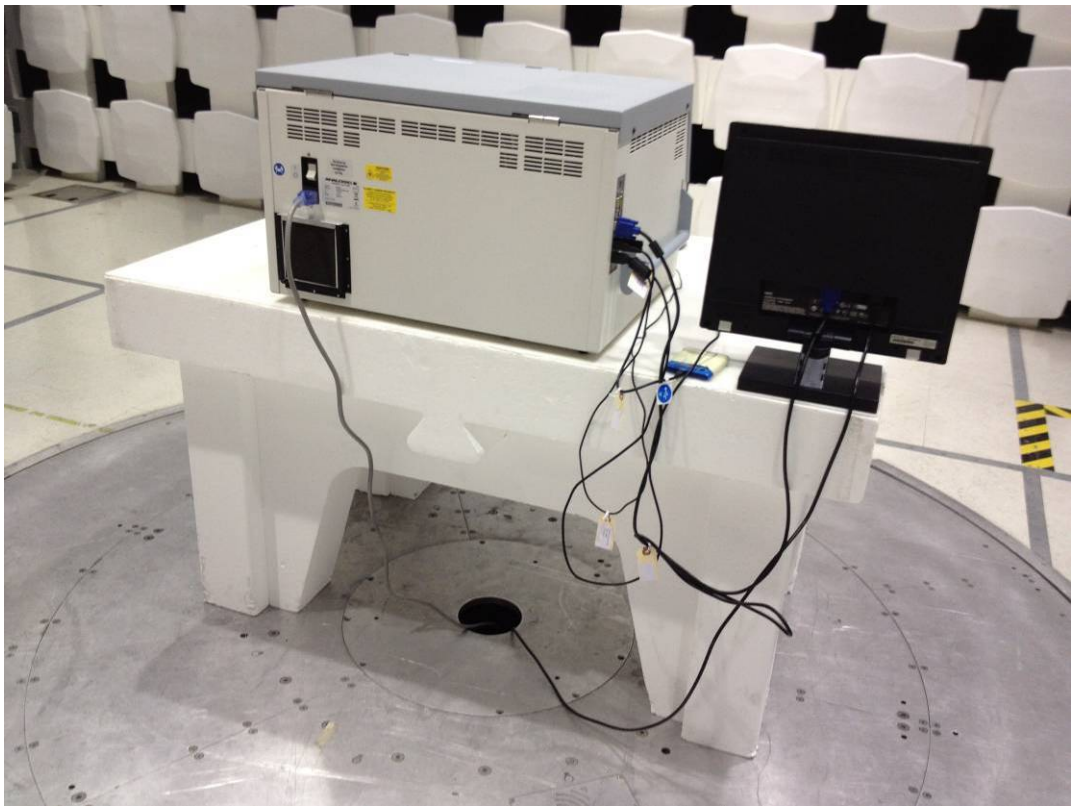
IC RSS-210 A2.6(d): emissions outside the band 13.110-14.010 MHz must not exceed 30 microvolts/m (29.5 dBµV/m) at 30 m (49.5 dBµV/m at 3m)

Since the IC RSS-210 limits are less stringent than the FCC 15.209 limits under 960 MHz, the FCC limits were used.

8.4 Setup Photograph:

30-1000MHz Test Setup Photos



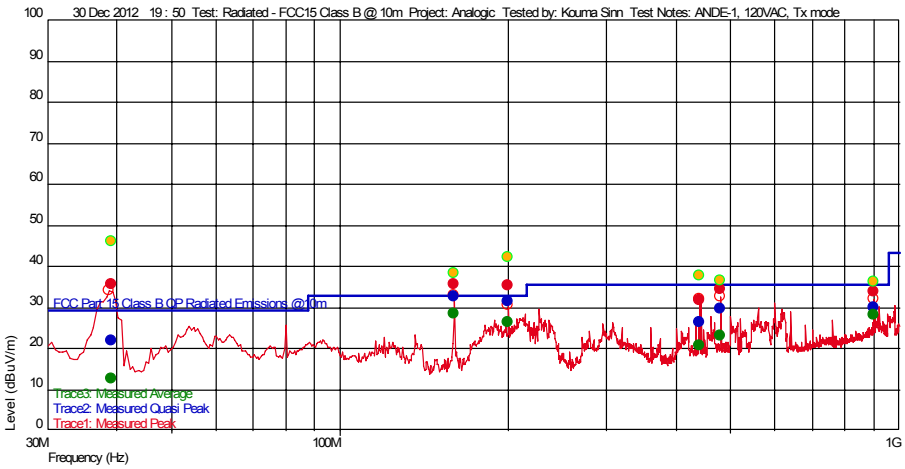


8.5 Plots/Data:

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15 Class B @ 10m	
Project:	Analogic	
Test Notes:	ANDE-1, 120VAC, Tx mode (with HP Monitor)	
Temperature:	21C	
Humidity:	15%, 1001mbar	
Tested by:	Kouma Sinn	
Test Started:	30 Dec 2012 19 : 50	

Prescan Emission Graph



Measured Peak Value
Measured Quasi Peak Value
Measured Average Value
Maximum Value of Mast and Turntable
Swept Peak Data
Swept Quasi Peak Data
Swept Average Data

Emissions Test Data

Trace1: Measured Peak

Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
439.914228816 M	31.66	16.700	-24.329	--	--	--	189	2.07	120 k	
900.046092625 M	33.93	22.201	-22.810	--	--	--	7	1.31	120 k	
479.933066092 M	34.41	17.897	-24.444	--	--	--	217	1.45	120 k	
199.960320281 M	35.45	12.896	-24.410	--	--	|	160	1.04	120 k	
160.017635309 M	35.67	12.300	-24.906	--	--	|	135	1.09	120 k	
39.177955922 M	35.57	14.693	-26.313	--	--	|	192	1.05	120 k	

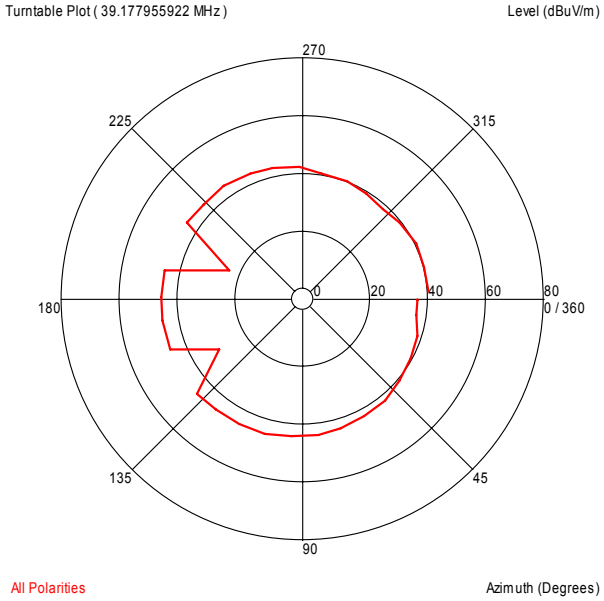
Trace2: Measured Quasi Peak

Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
439.914228816 M	26.55	16.700	-24.329	35.540	-8.99	--	189	2.07	120 k	
39.177955922 M	21.82	14.693	-26.313	29.540	-7.72	|	192	1.05	120 k	
479.933066092 M	29.71	17.897	-24.444	35.540	-5.83	--	217	1.45	120 k	
900.046092625 M	30.10	22.201	-22.810	35.540	-5.44	--	7	1.31	120 k	
199.960320281 M	31.34	12.896	-24.410	33.040	-1.70	|	160	1.04	120 k	
160.017635309 M	32.66	12.300	-24.906	33.040	-0.38	|	135	1.09	120 k	

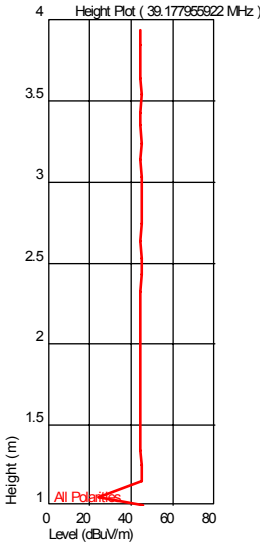
Trace3: Measured Average

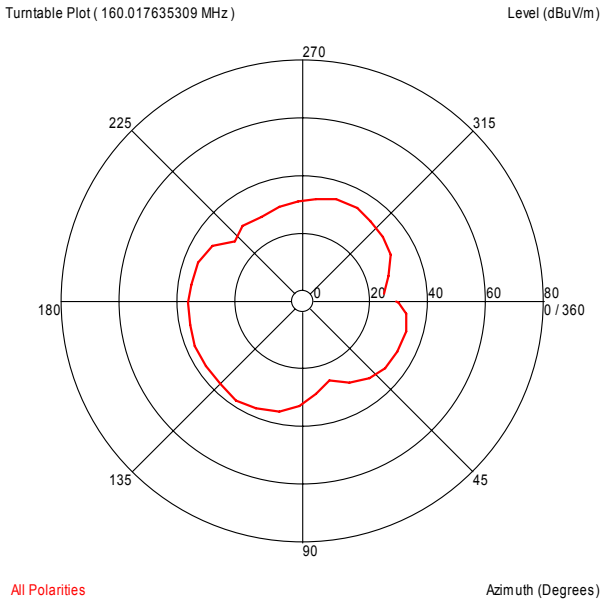
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
39.177955922 M	12.64	14.693	-26.313	--	--	|	192	1.05	120 k	
439.914228816 M	20.78	16.700	-24.329	--	--	--	189	2.07	120 k	
479.933066092 M	23.14	17.897	-24.444	--	--	--	217	1.45	120 k	
199.960320281 M	26.53	12.896	-24.410	--	--	|	160	1.04	120 k	
900.046092625 M	28.18	22.201	-22.810	--	--	--	7	1.31	120 k	
160.017635309 M	28.63	12.300	-24.906	--	--	|	135	1.09	120 k	

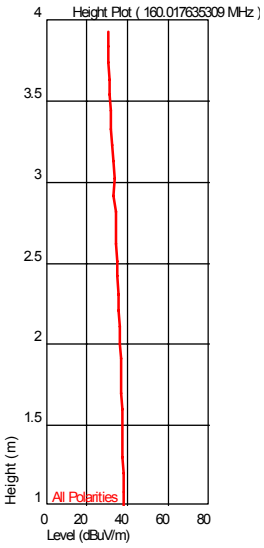
Azimuth Plots

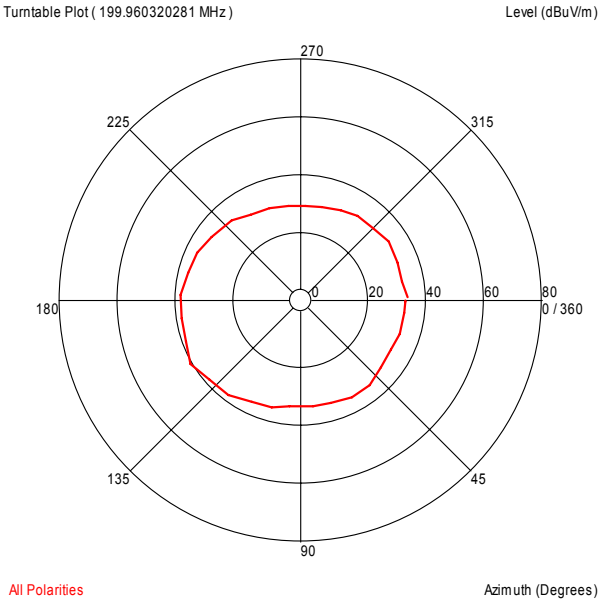


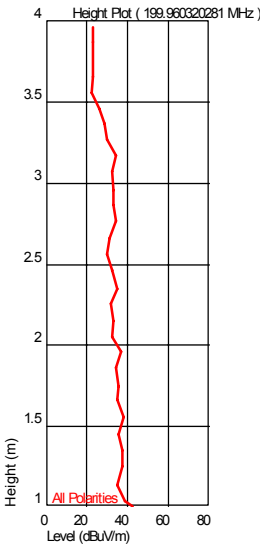
Turntable Plots

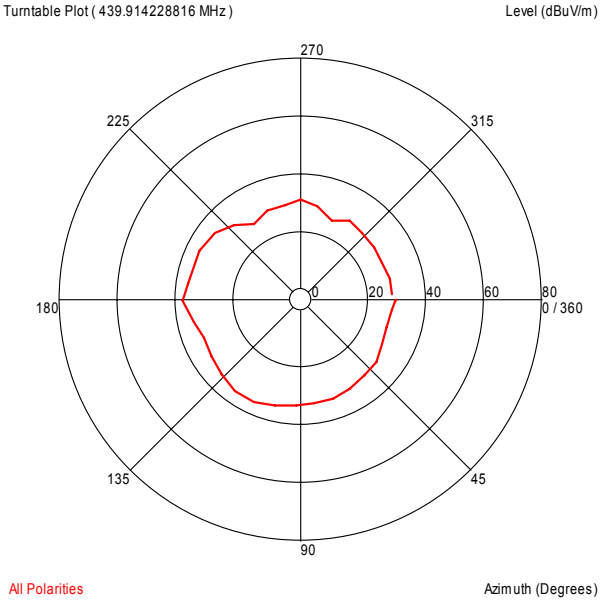


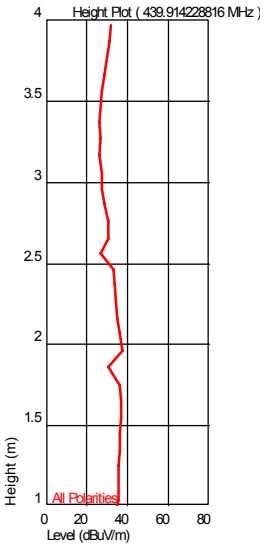


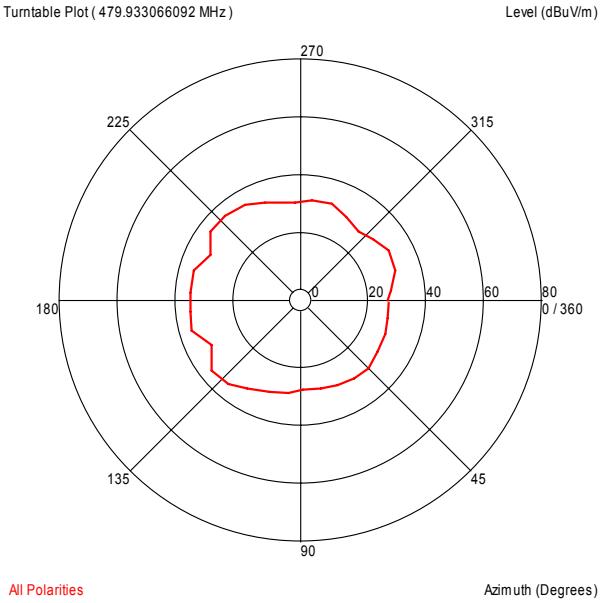


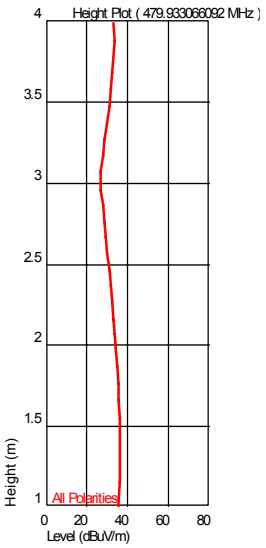

Turntable Plot (199.960320281 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

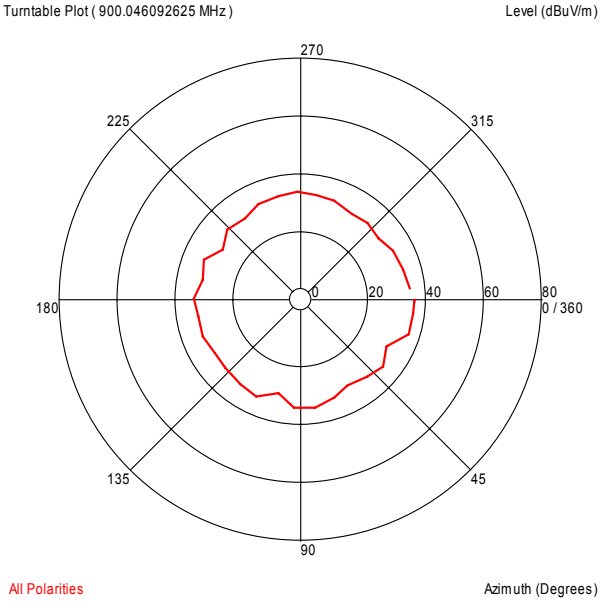

Height Plot (199.960320281 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

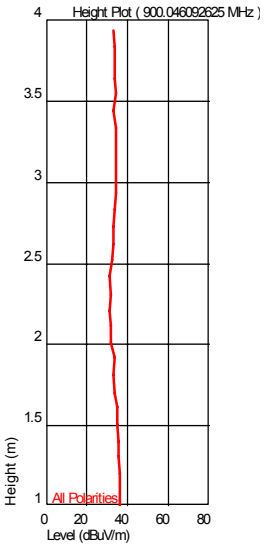

Turntable Plot (439.914228816 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (439.914228816 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)









Test Personnel:	Kouma Sinn KPS	Test Date:	12/30/2012
Supervising/Reviewing Engineer:	N/A	Test Levels:	Per section 8.3
Product Standard:	FCC 15.225, IC RSS-210	Performance Criteria:	N/A
Input Voltage:	120VAC/60Hz	Ambient Temperature:	21 ºC
		Relative Humidity:	15 %
Pretest Verification w/ Ambient Signals or BB Source:	Ambient Signals	Atmospheric Pressure:	1001 mbars

Deviations, Additions, or Exclusions: None

9 Receiver Spurious Emissions Above 30MHz

9.1 Method

Tests are performed in accordance with FCC Part 15 Subpart B:2012, 15.109, IC RSS-Gen Issue 3 December 2010: Section 6.0, ANSI C63.4-2009.

TEST SITE: 10m ALSE

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A wooden table 80 cm high is used for table-top equipment.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.5 dB at 3m and 3.5 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV/m
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV003'	Weather Station	Davis Instruments	7400	PE80529A39A	09/25/2012	09/25/2014
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	09/04/2012	09/04/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	10/04/2012	10/04/2013
145003'	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2443A04077	10/04/2012	10/04/2013

Software Utilized:

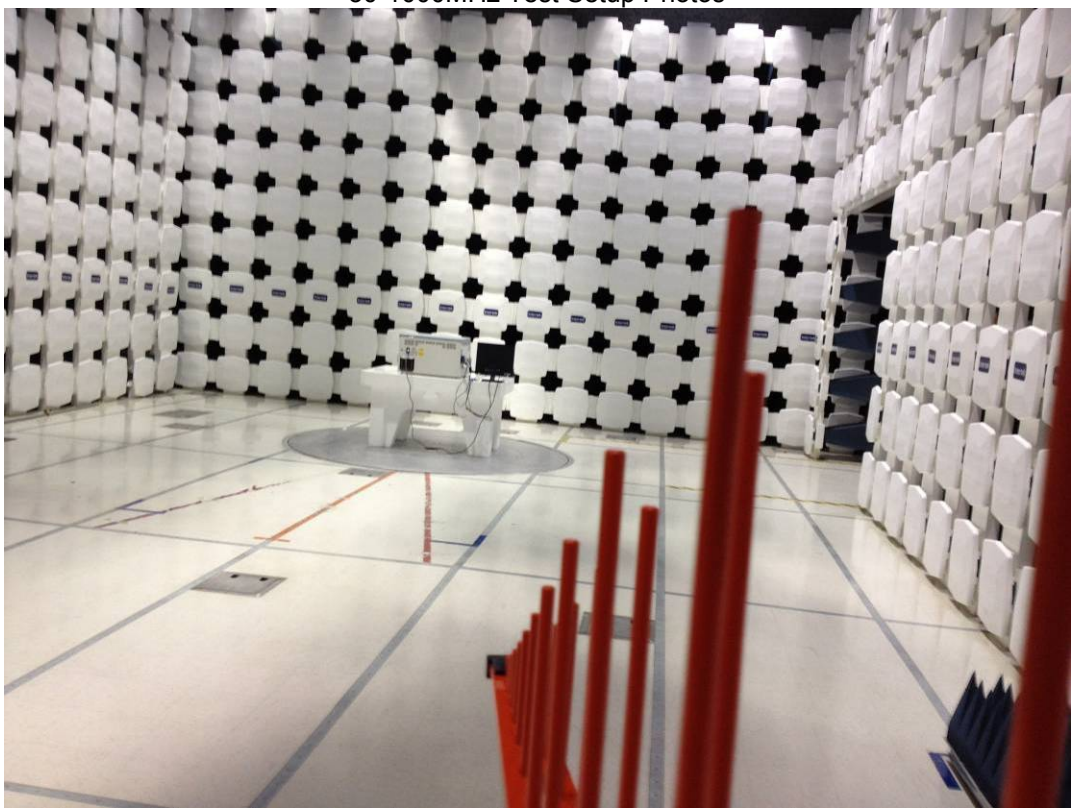
Name	Manufacturer	Version
C5	Teseq	5.26.46.46

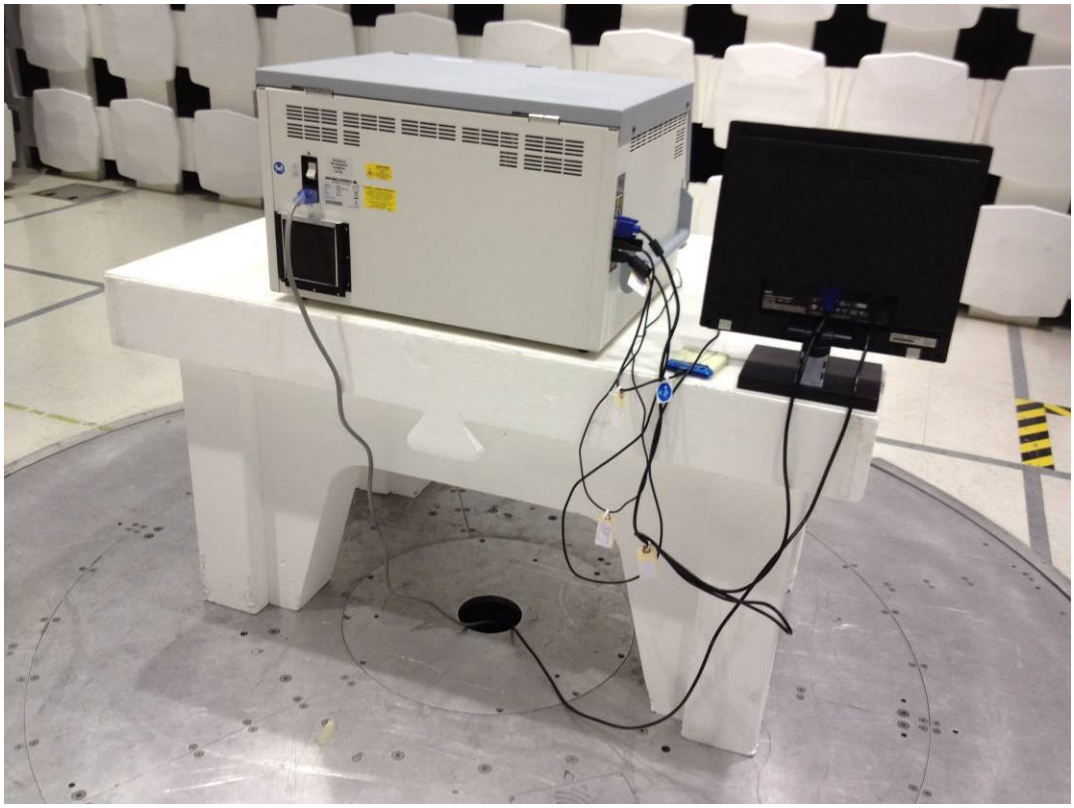
9.3 Results:

The sample tested was found to Comply.

9.4 Setup Photographs:

30-1000MHz Test Setup Photos



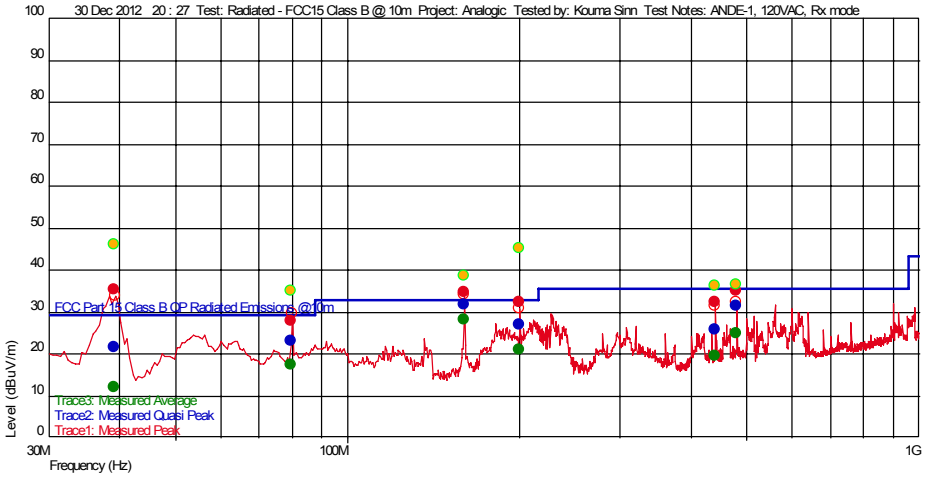


9.5 Test Data:

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15 Class B @ 10m	
Project:	Analogic	
Test Notes:	ANDE-1, 120VAC, Rx mode (with HP Monitor)	
Temperature:	21C	
Humidity:	15%, 1001mbar	
Tested by:	Kouma Sinn	
Test Started:	30 Dec 2012 20 : 27	

Prescan Emission Graph



- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

Emissions Test Data

Trace1: Measured Peak

Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
439.870942242 M	32.34	16.700	-24.329	--	--	--	201	1.46	120 k	
79.911623026 M	27.99	7.500	-25.814	--	--	|	82	2.58	120 k	
199.911422485 M	32.40	12.891	-24.411	--	--	|	159	1.05	120 k	
480.036472906 M	35.07	17.901	-24.444	--	--	--	206	1.55	120 k	
159.974348735 M	34.64	12.300	-24.906	--	--	|	150	1.05	120 k	
39.160521108 M	35.28	14.704	-26.313	--	--	|	182	1.04	120 k	

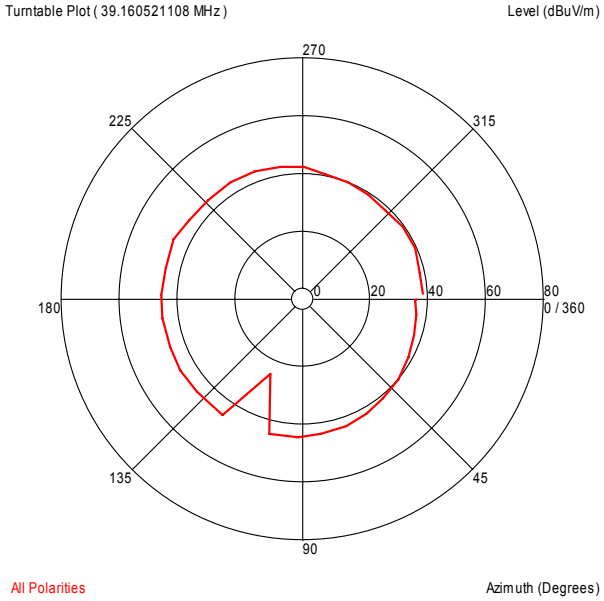
Trace2: Measured Quasi Peak

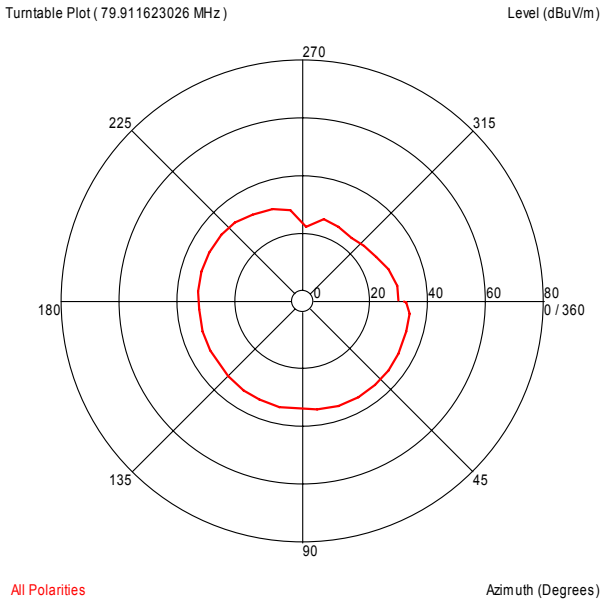
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
439.870942242 M	25.81	16.700	-24.329	35.540	-9.73	--	201	1.46	120 k	
39.160521108 M	21.52	14.704	-26.313	29.540	-8.02	|	182	1.04	120 k	
79.911623026 M	23.02	7.500	-25.814	29.540	-6.52	|	82	2.58	120 k	
199.911422485 M	27.13	12.891	-24.411	33.040	-5.91	|	159	1.05	120 k	
480.036472906 M	31.46	17.901	-24.444	35.540	-4.08	--	206	1.55	120 k	
159.974348735 M	31.71	12.300	-24.906	33.040	-1.33	|	150	1.05	120 k	

Trace3: Measured Average

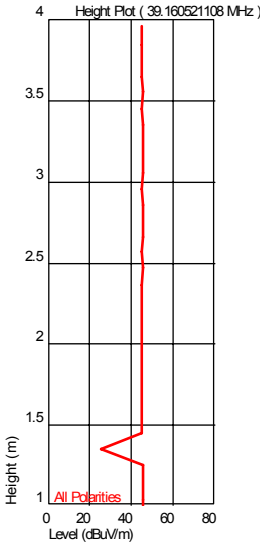
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
39.160521108 M	12.10	14.704	-26.313	--	--	|	182	1.04	120 k	
79.911623026 M	17.34	7.500	-25.814	--	--	|	82	2.58	120 k	
439.870942242 M	19.48	16.700	-24.329	--	--	--	201	1.46	120 k	
199.911422485 M	21.18	12.891	-24.411	--	--	|	159	1.05	120 k	
480.036472906 M	25.01	17.901	-24.444	--	--	--	206	1.55	120 k	
159.974348735 M	28.19	12.300	-24.906	--	--	|	150	1.05	120 k	

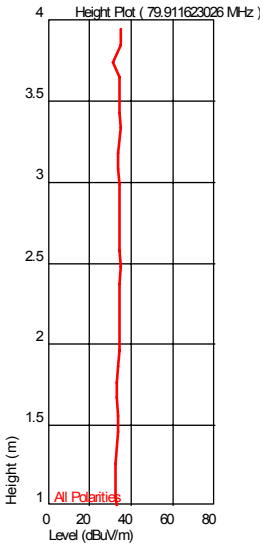
Azimuth Plots

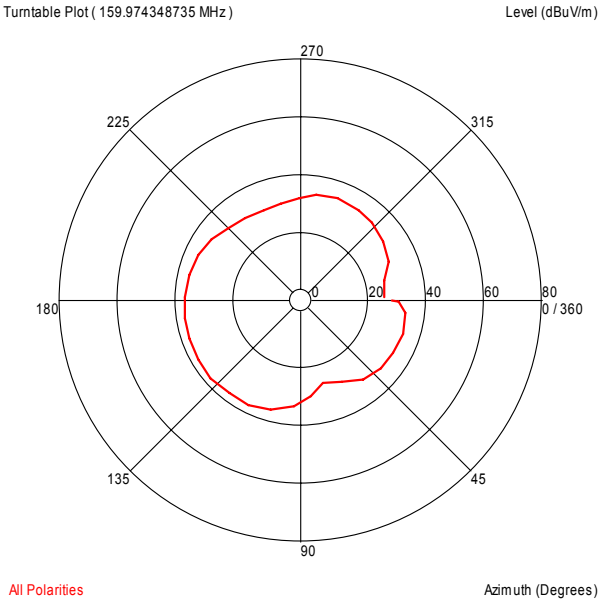


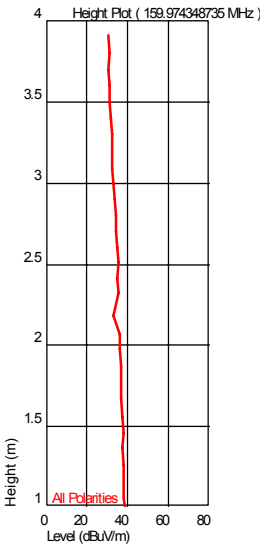


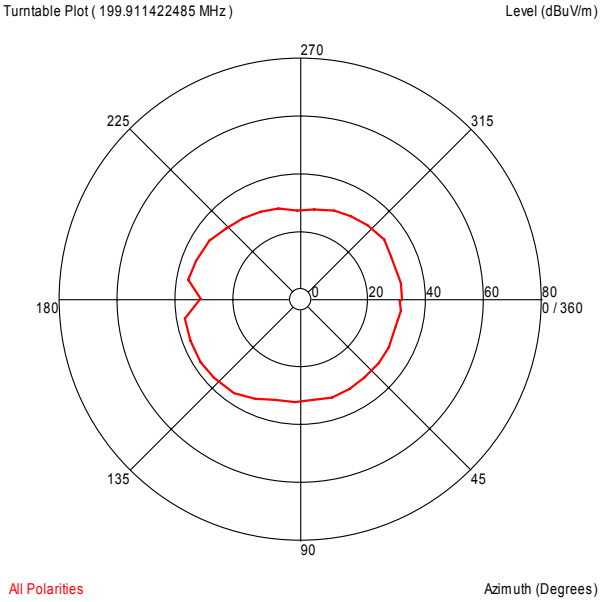
Turntable Plots

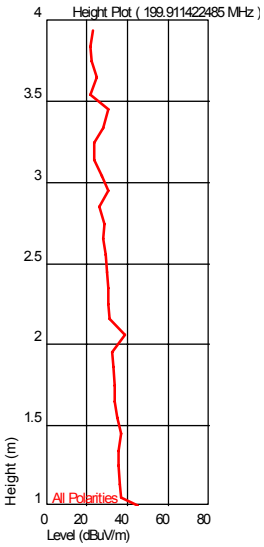


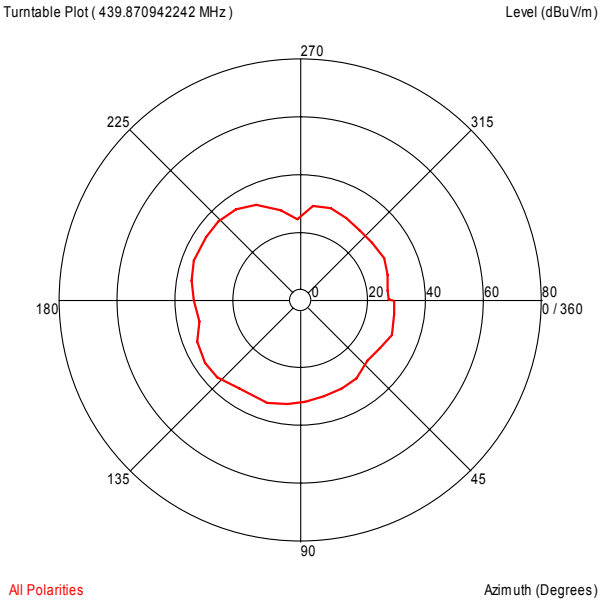


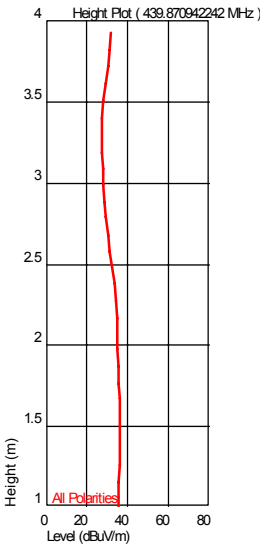

Turntable Plot (159.974348735 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

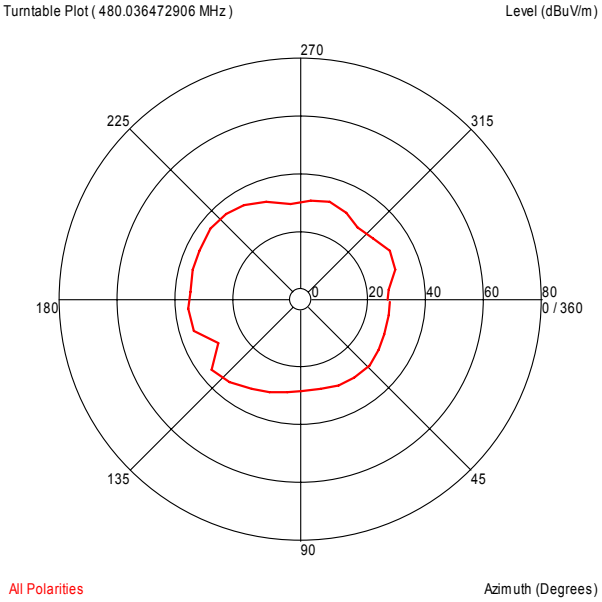

Height Plot (159.974348735 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

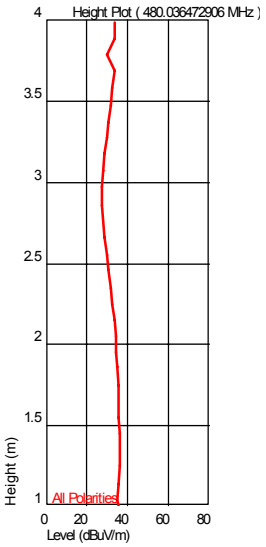

Turntable Plot (199.911422485 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (199.911422485 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)









Test Personnel:	Kouma Sinn KPS	Test Date:	12/30/2012
Supervising/Reviewing Engineer:	N/A		
Product Standard:	FCC 15.225, IC RSS-210	Test Levels:	Per section 9.3
Input Voltage:	120VAC/60Hz	Ambient Temperature:	21 ºC
		Relative Humidity:	15 %
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient Signals**	Atmospheric Pressure:	1001 mbars

Deviations, Additions, or Exclusions: None

10 Line Conducted Emissions

10.1 Method

Tests are performed in accordance with FCC CFR47 Part 15 Subpart B, CISPR 11, ICES-003, RSS-Gen, and ANSI C 63.4:2009.

TEST SITE: 10m Chamber Building Bumpout

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

The AMAP Building and Lab includes general lab space that can be used for testing where a shielded/enclosed environment is not required.

Measurement Uncertainty

For conducted emissions, U_{lab} (3.1 dB in worst case) < U_{CISPR} (3.6 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 μV/m

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	09/25/2012	09/25/2014
145015'	LISN: 50 Ohm/50 microHenry	Solar Electronics	9252-50-R-24-BNC	971617	02/06/2012	02/06/2013
DS26A'	Attenuator, 20dB	Mini Circuits	20dB, 50 ohm	DS26A	10/04/2012	10/04/2013
CBLBNC2012-2'	50 Ohm Coaxial Cable	Pomona	RG-58 C/U	CBLBNC2012-2	09/14/2012	09/14/2013
ROS002'	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	06/13/2012	06/13/2013

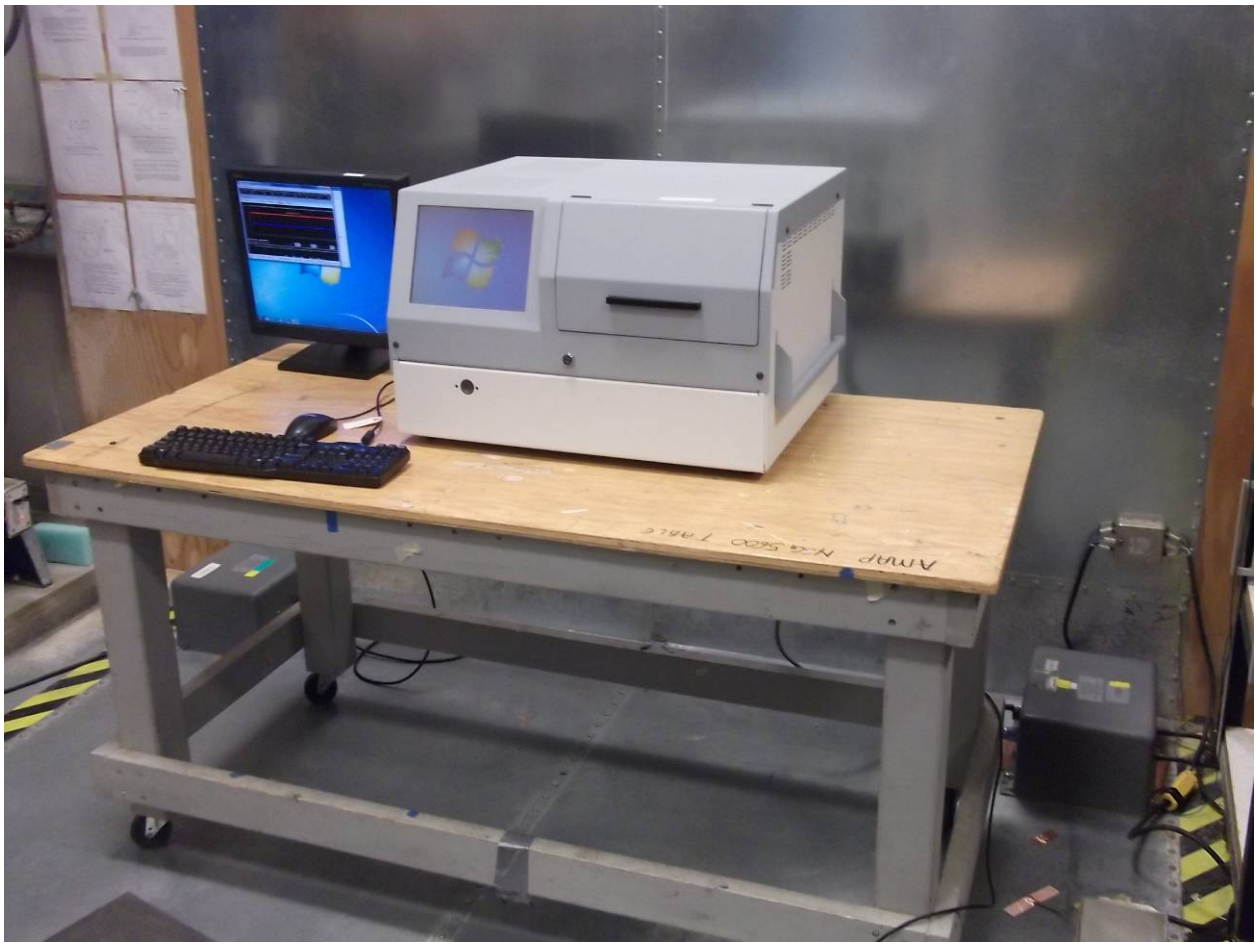
Software Utilized:

Name	Manufacturer	Version
C5 Emissions	TESEQ	5.26.46.46

10.3 Results:

The sample tested was found to Comply.

10.4 Setup Photographs:



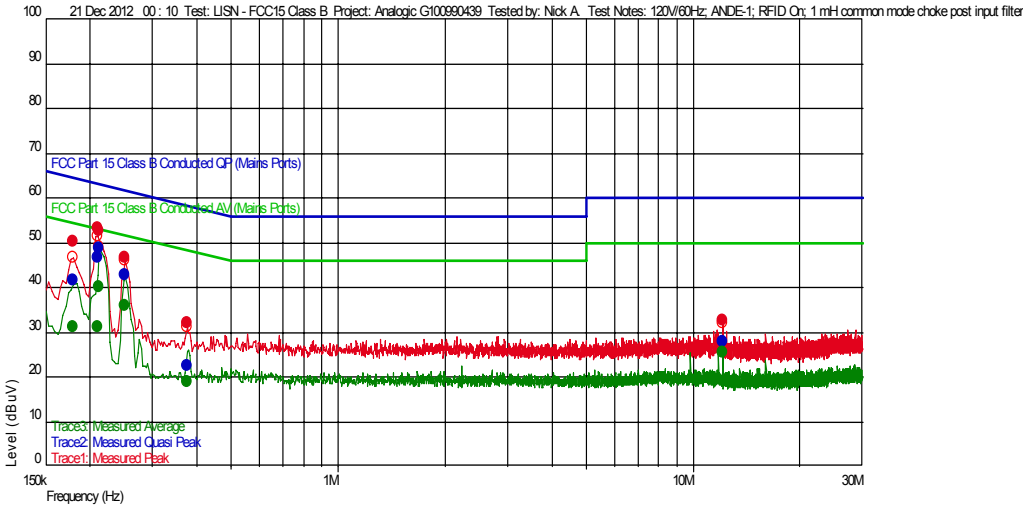
10.5 Plots/Data:

120VAC/60Hz

Test Information

Test Details	User Entry	Additional Information
Test:	LISN - FCC15 Class B	
Project:	Analogic G100990439	
Test Notes:	120V/60Hz; ANDE-1; RFID On; 1 mH common mode choke post input fiter	
Temperature:	22c	
Humidity:	23%, 1009 mB	
Tested by:	Nick A.	
Test Started:	21 Dec 2012 00 : 10	

Prescan Emission Graph



- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

Emissions Test Data

Trace2: Measured Quasi Peak

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
375.0 k	22.64	0.101	20.744	58.389	-35.75	9 k		N
12.138 M	27.87	0.278	20.597	60.000	-32.13	9 k		N
180.0 k	41.64	0.122	20.732	64.486	-22.85	9 k		N
252.0 k	42.78	0.110	20.737	61.691	-18.91	9 k		L1
210.0 k	46.75	0.118	20.734	63.205	-16.45	9 k		N
213.0 k	48.68	0.117	20.734	63.088	-14.41	9 k		N

Trace3: Measured Average

Frequency(Hz)	Level(dBuV)	TF	PA+CL	Limit(dBuV)	Margin(dBuV)	RBW(Hz)	Comment	LINE
375.0 k	18.95	0.101	20.744	48.389	-29.44	9 k		N
12.138 M	25.62	0.278	20.597	50.000	-24.38	9 k		N
180.0 k	31.14	0.122	20.732	54.486	-23.34	9 k		N
210.0 k	31.23	0.118	20.734	53.205	-21.98	9 k		N
252.0 k	35.99	0.110	20.737	51.691	-15.70	9 k		L1
213.0 k	40.14	0.117	20.734	53.088	-12.95	9 k		N

Test Personnel:	Nicholas Abbondante	Test Date:	12/21/2012
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	ICES-003, FCC Part 15 Subpart B	Test Levels:	See tables
Input Voltage:	120VAC/60Hz		
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Ambient Temperature:	22 ºC
		Relative Humidity:	23 %
		Atmospheric Pressure:	1009 mbars

Deviations, Additions, or Exclusions: None

11 20dB Bandwidth

11.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2012, 15.215, IC RSS-Gen Issue 3 December 2010 Section 4.6, ANSI C63.4-2009.

TEST SITE: AMAP Lab

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

The AMAP Building and Lab includes general lab space that can be used for testing where a shielded/enclosed environment is not required.

11.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV001'	Weather Station	Davis Instruments	7400	PE80519A61	08/28/2012	08/28/2014
HEW42'	HARMONIC/FLICKER TEST SYSTEM	Hewlett Packard	6843A	3531A00114	05/02/2012	05/02/2014
ROS001'	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	02/10/2012	02/10/2013
148012'	Temp/Humidity Chamber	Envirotronics	SH27C	08015563S11263	10/18/2012	10/18/2013
147237'	DMM	Fluke	85III	73760202	06/13/2012	06/13/2013
MEG005'	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	02/07/2012	02/07/2013

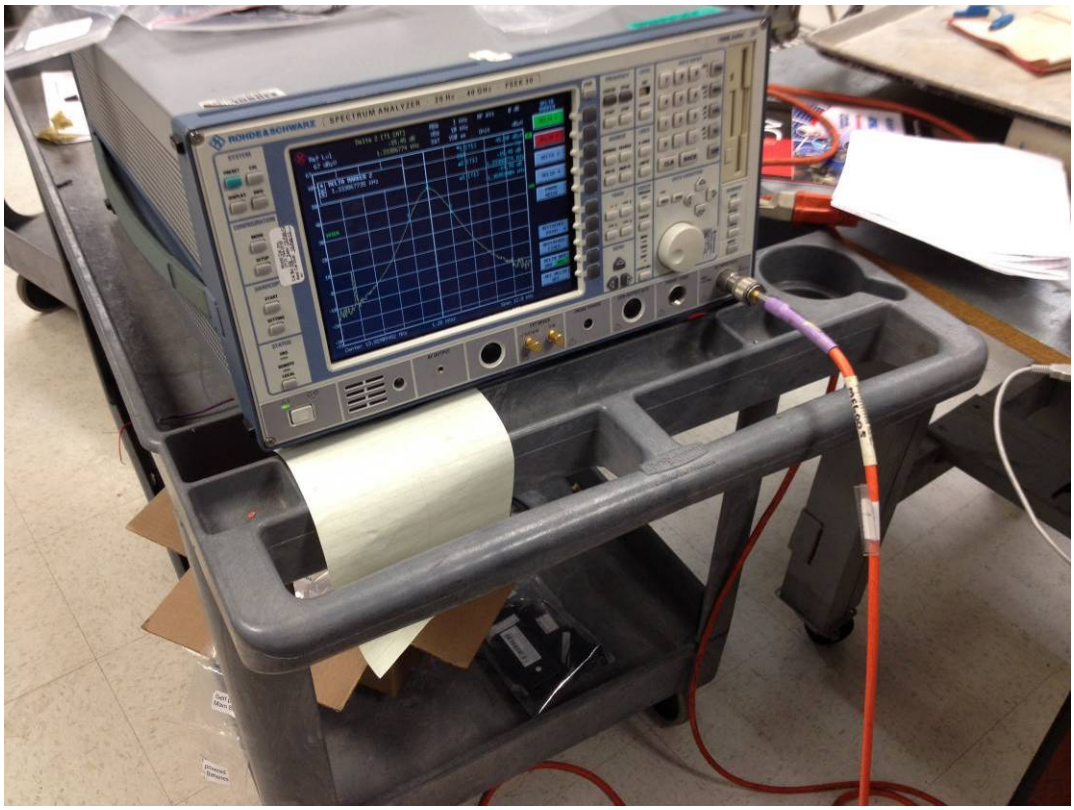
Software Utilized:

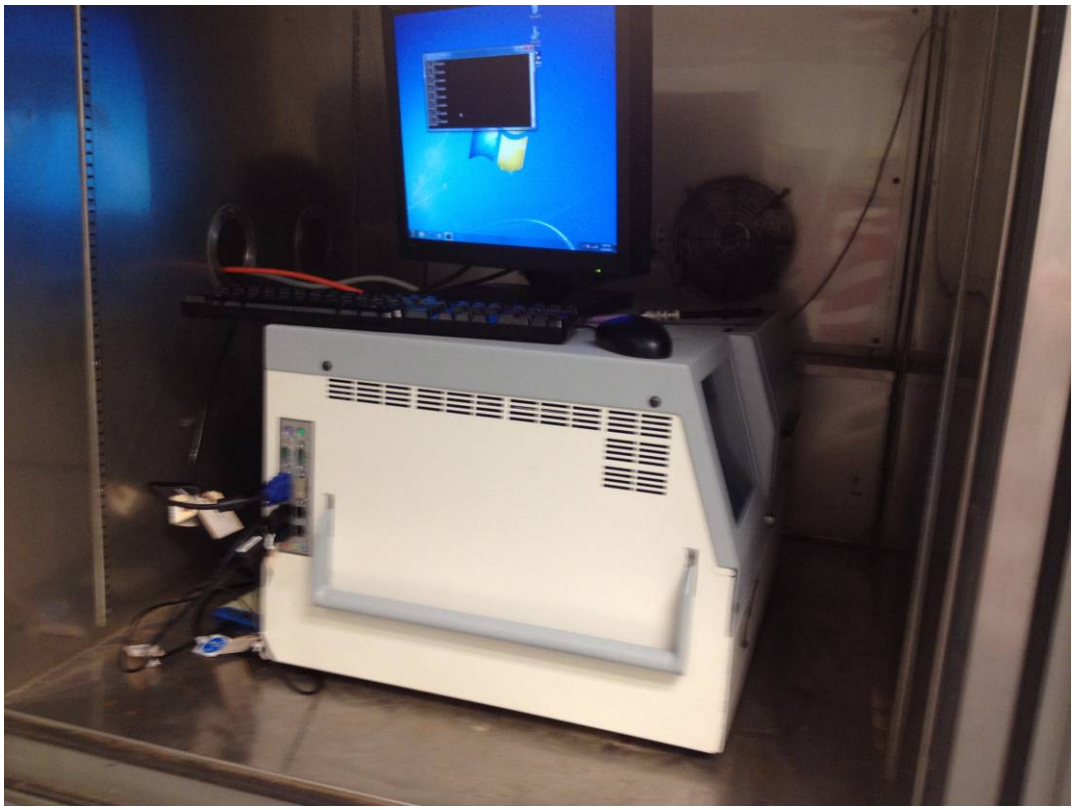
Name	Manufacturer	Version
None		

11.3 Results:

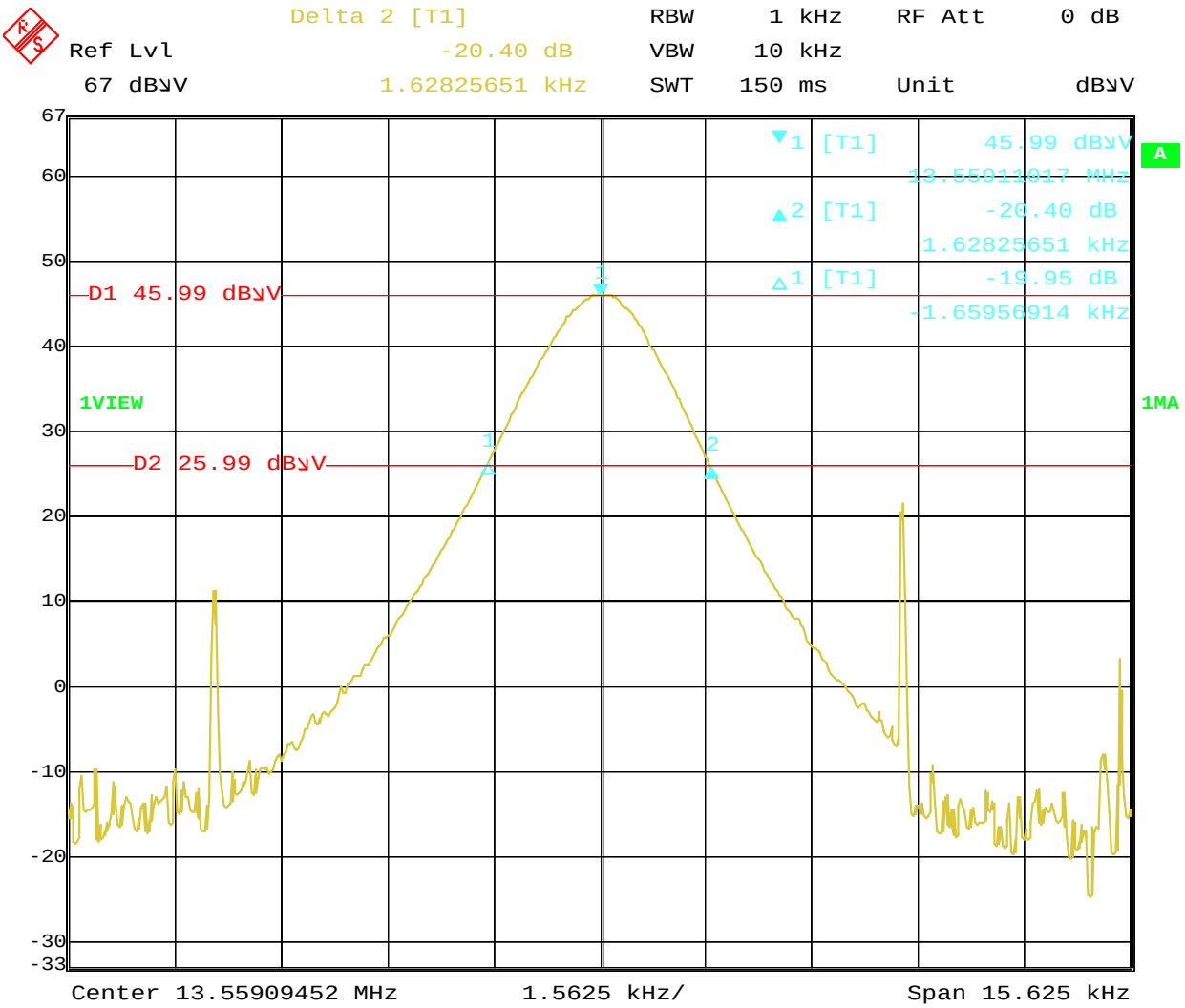
The sample tested was found to Comply. The 20 dB bandwidth remains within the assigned band.

11.4 Setup Photographs:





11.5 Test Data:



Test Personnel(s):	Kouma Sinn KPS	Test Date(s):	12/30/2012
Supervising Engineer: (Where Applicable)	N/A	Test Levels:	Per section 11.3
Product Standard:	FCC 15.225, IC RSS-210	Ambient Temperature:	20 ºC
Input Voltage:	See test data	Relative Humidity:	10 %
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient Signals**	Atmospheric Pressure:	996 mbars

Deviations, Additions, or Exclusions: None

12 Frequency Stability

12.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2012, 15.225(e), IC RSS-Gen Issue 3 December 2010 Section 4.7, IC RSS-210 December 2010 A2.6, ANSI C63.4-2003.

TEST SITE: AMAP lab

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

The AMAP Building and Lab includes general lab space that can be used for testing where a shielded/enclosed environment is not required.

12.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV001'	Weather Station	Davis Instruments	7400	PE80519A61	08/28/2012	08/28/2014
HEW42'	HARMONIC/FLICKER TEST SYSTEM	Hewlett Packard	6843A	3531A00114	05/02/2012	05/02/2014
ROS001'	Spectrum Analyzer 20Hz - 40 GHz	Rohde & Schwartz	FSEK-30	100225	02/10/2012	02/10/2013
148012'	Temp/Humidity Chamber	Envirotronics	SH27C	08015563S11263	10/18/2012	10/18/2013
147237'	DMM	Fluke	85III	73760202	06/13/2012	06/13/2013
MEG005'	High Frequency Cable	Megaphase	TM40-K1K1-197	8148601-001	02/07/2012	02/07/2013

Software Utilized:

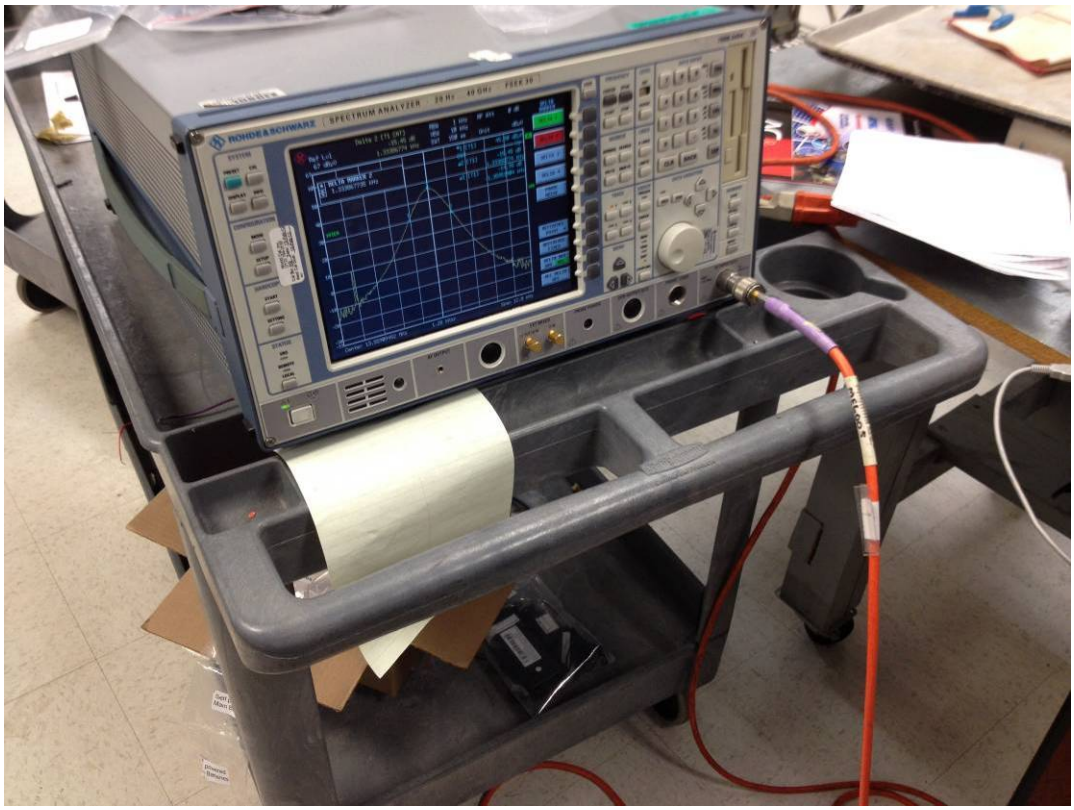
Name	Manufacturer	Version
C5 Emissions	TESEQ	5.26.46.46
EMI Boxborough.xls	Intertek	08/27/2010

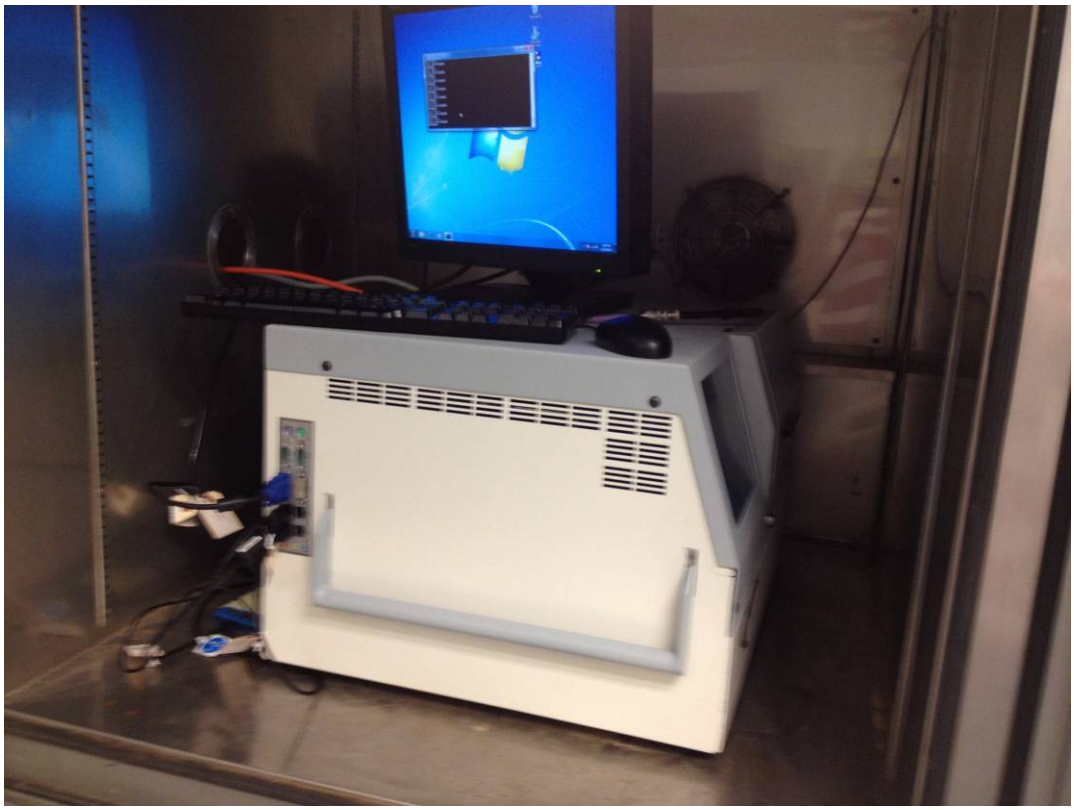
12.3 Results:

The sample tested was found to Comply.

The fundamental frequency shall remain within ±0.01% of the operating frequency over a temperature variation of -30 degrees to +50 degrees. Voltage variations of ±15% were also performed.

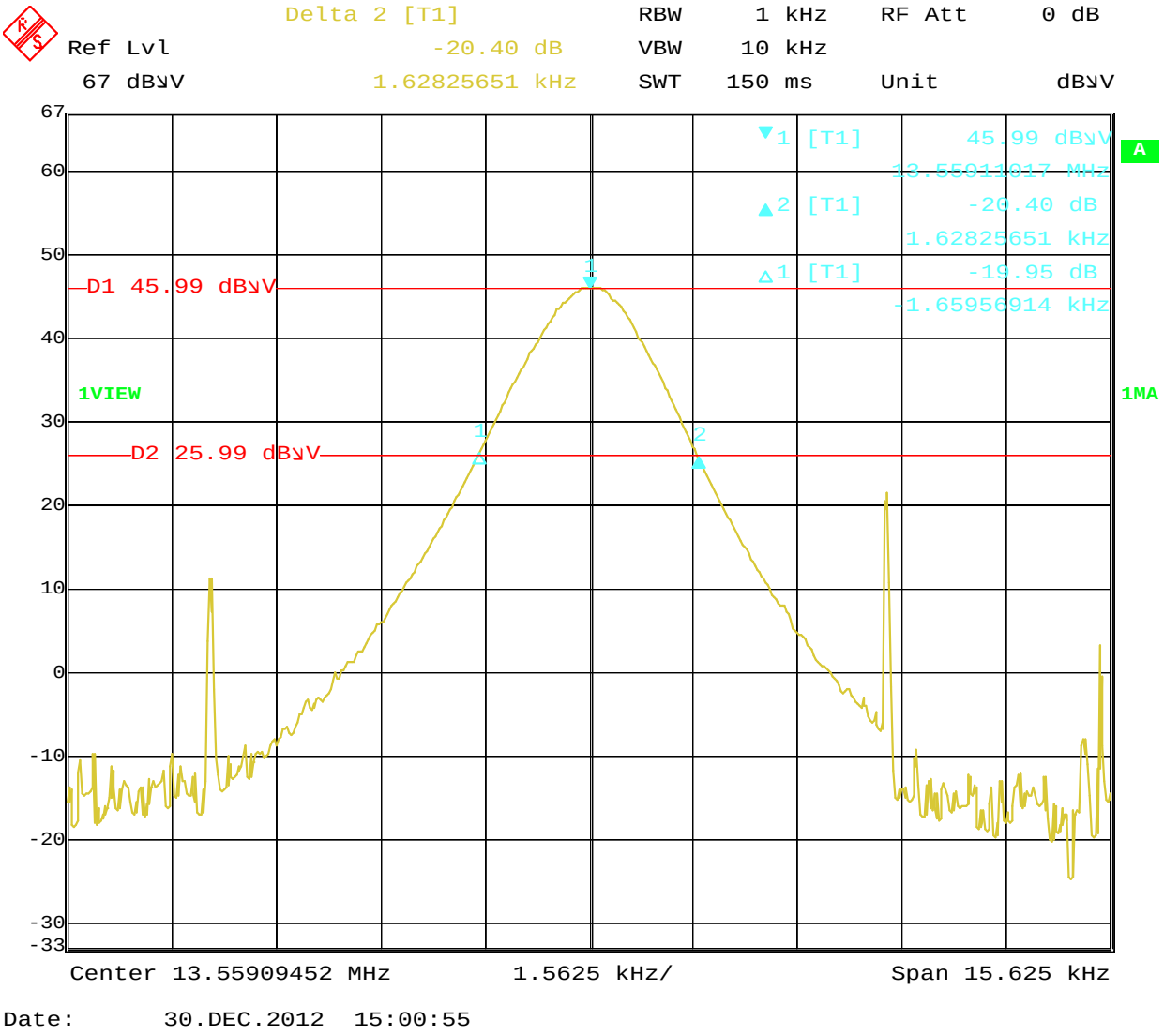
12.4 Setup Photographs:





12.5 Test Data:

Powered by 120VAC/60Hz at 20 °C



Frequency Stability

Company:	Analogic						Test Equipment Used:				
Model #:	ANDE-1						ROS001	HEW42			
Serial #:	Proto 8						148-012	147237			
Engineer(s):	Kouma Sinn				Location:	AMAP Lab	MEG005				
Project #:	G100990439		Date(s):	12/30/12							
Standard:	FCC Part 15 Subpart C Section 15.225 & RSS-210 Annex 2 (A2.6)										
		Limit:	100	PPM							
		Nominal f:	13.56	MHz			Voltage:	120	AC		

%	Voltage Volts	Frequency MHz	Deviation kHz	Limit kHz
-15%	102	13.559107	-0.02565	1.36
-10%	108	13.559107	-0.02565	1.36
-5%	114	13.559133	0	1.36
+0%	120	13.559133	0	1.36
+5%	126	13.559107	-0.02565	1.36
+10%	132	13.559107	-0.02565	1.36
+15%	138	13.559133	0	1.36

Temp Celsius	Frequency MHz	Deviation kHz	Limit kHz
-30	13.559102	0.012	1.36
-20	13.559115	0.025	1.36
-10	13.559111	0.021	1.36
0	13.559093	0.003	1.36
10	13.559090	0	1.36
20	13.559090	0	1.36
30	13.559115	0.025	1.36
40	13.559106	0.016	1.36
50	13.559081	-0.009	1.36

Test Personnel(s):	Kouma Sinn KPS	Test Date(s):	12/30/2012
Supervising Engineer: (Where Applicable)	N/A	Test Levels:	Per section 12.3
Product Standard:	FCC 15.225, IC RSS-210	Ambient Temperature:	20 ºC
Input Voltage:	See test data	Relative Humidity:	10 %
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient Signals**	Atmospheric Pressure:	996 mbars

Deviations, Additions, or Exclusions: None

13 Revision History

Revision Level	Date	Report Number	Notes
0	12/30/2012	100990439BOX-004	Original Issue
1	01/02/2013	100990439BOX-004a	Typo corrections
2	04/24/2013	100990439BOX-004b	Changed product description from 'DNA Sequencer' to 'Rapid DNA Analysis Instrument'