

EMISSIONS TEST REPORT

Report Number: 100961088BOX-008

Project Number: G100961088

Report Issue Date: 11/28/2012

Product Designation: M010

Standards: CFR47 FCC Part 15:2012 Subpart C Section 15.209
Industry Canada RSS-210 Issue 8 December 2010
IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6+Notice DRS
2012-DRS0126

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

Client:
Timex Group USA Inc
555 Christian Road
Middlebury, CT 06762

Report prepared by



Kouma Sinn / Senior Project Engineer, EMC

Report reviewed by



Nicholas Abbondante / Transmitter Staff
Engineer, EMC

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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. 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 **complies** 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 15:2012 Subpart C 15.209(a) IC RSS-210 Issue 8 December 2010 and IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6	Pass
7	Transmitter Spurious Emissions Below 30MHz FCC Part 15:2012 Subpart C 15.209(a) IC RSS-210 Issue 8 December 2010 and IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6	Pass
8	Transmitter Spurious Emissions Above 30MHz FCC Part 15:2012 Subpart C 15.209(a) IC RSS-210 Issue 8 December 2010 and IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6	Pass
--	Receiver Spurious Emissions Below 30MHz FCC Part 15:2012 Subpart B 15.109, IC RSS-Gen Issue 3 December 2010: Section 6.0	N/A*
--	Receiver Spurious Emissions Above 30MHz FCC Part 15:2012 Subpart B 15.109, IC RSS-Gen Issue 3 December 2010: Section 6.0	N/A*
9	20dB Bandwidth FCC Part 15:2012 Subpart C 15.215 IC RSS-Gen Issue 3 December 2010 Section 4.6	Pass
10	Revision History	--

* - The device is a transmitter only

3 Client Information

This EUT was tested at the request of:

Company: Timex Group USA Inc
 555 Christian Road
 Middlebury, CT 06762

Contact: Sam Everett
Telephone: (203) 346-5603
Fax: (203) 573-5139
Email: severett@timexgroup.com

4 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Heart Rate Monitor	Timex	M010	204

Receive Date:	11/19/2012
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
The device is a Heart Rate Monitor. It utilizes an integrated antenna.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3V Lithium Battery	N/A	N/A	N/A

Operating modes of the EUT:	
No.	Descriptions of EUT Exercising
1	During testing, the 137.5-141 kHz transmitter was operating as near to continuously as possible. A modulated carrier was used.

5 System Setup and Method

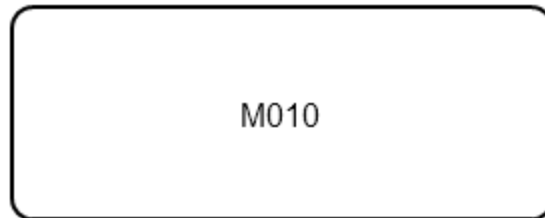
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
	None				

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None			

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 15:2012 Subpart C 15.209(a) IC RSS-210 Issue 8 December 2010 and IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6, and 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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

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
LOOP1'	LOOP ANTENNA	Empire	LG-105	61	08/18/2012	08/18/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/10

6.3 Results:

The sample tested was found compliant.

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

§ 15.209 Radiated emission limits; general requirements.

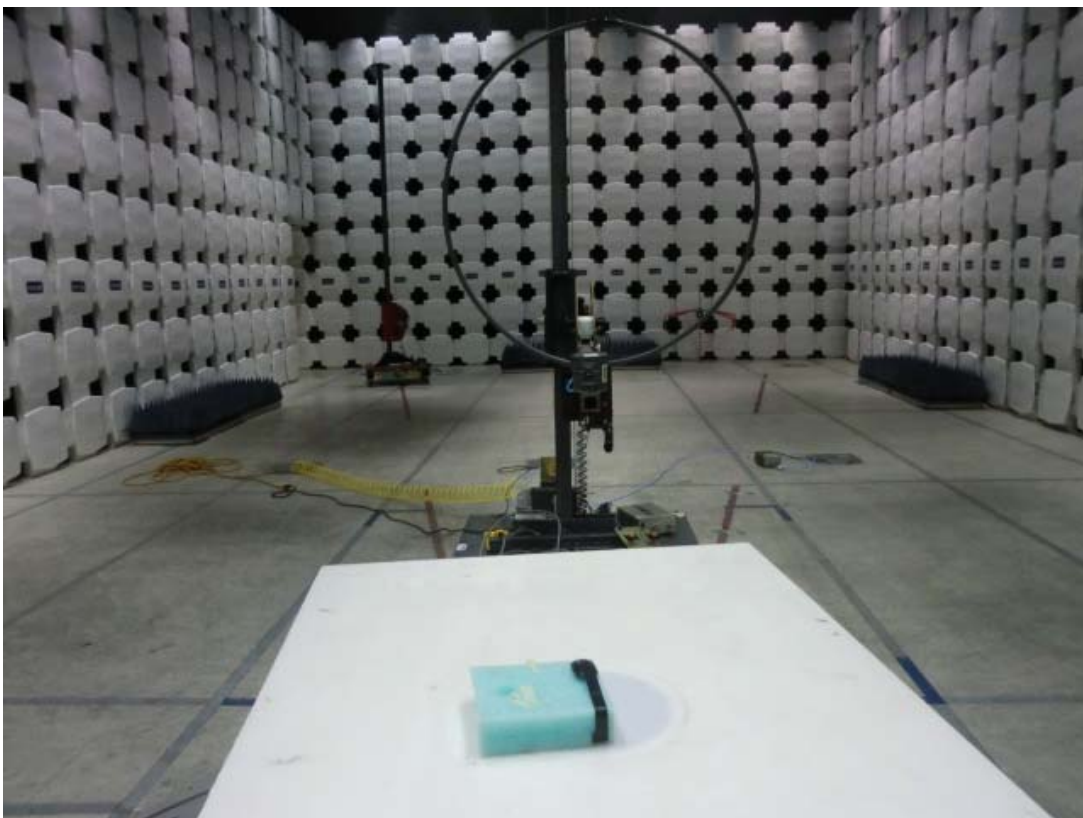
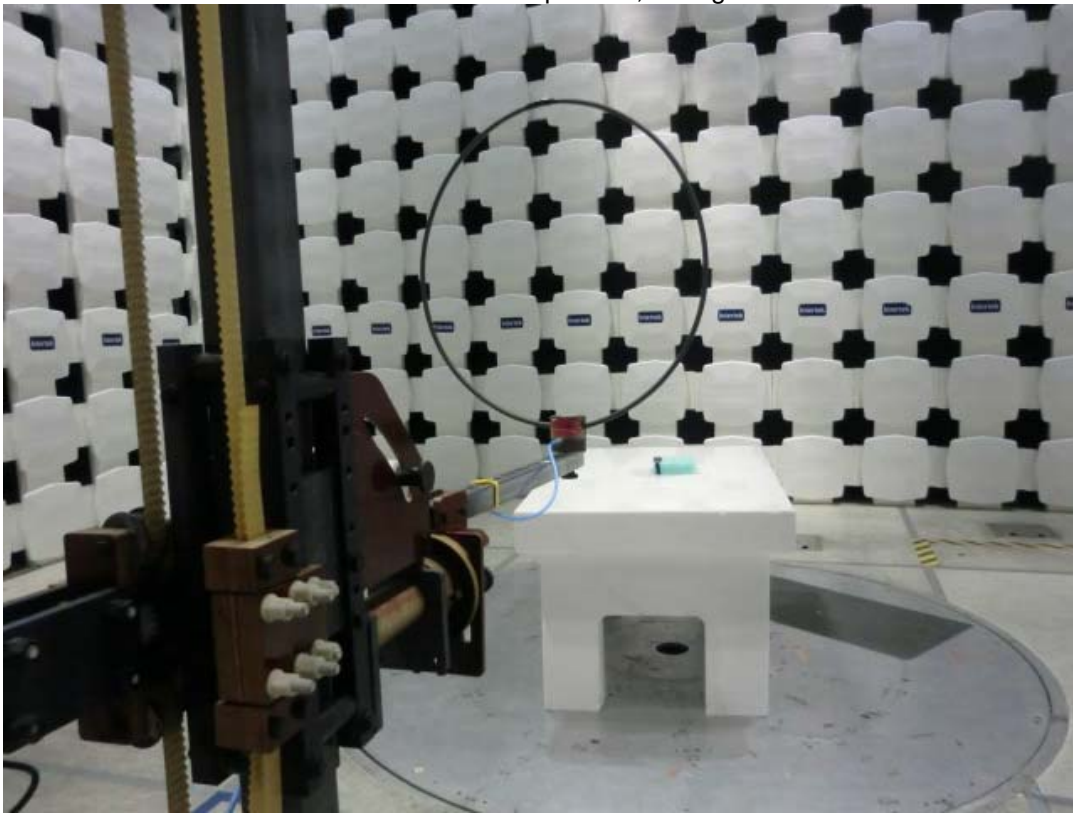
(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

6.4 Setup Photographs:

Fundamental Test Setup Photo, orthogonal #1



Orthogonal #2



Orthogonal #3



7 Transmitter Spurious Emissions Below 30 MHz

7.1 Method

Tests are performed in accordance with FCC Part 15:2012 Subpart C 15.209(a) IC RSS-210 Issue 8 December 2010 and IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6, 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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where UF = Net Reading in } \mu\text{V}$$

NF = Net Reading in dB μ V

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

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
LOOP1'	LOOP ANTENNA	Empire	LG-105	61	08/18/2012	08/18/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
LOOP2'	LOOP ANTENNA	Empire	LP-105	905	10/26/2011	10/26/2013

Software Utilized:

Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/10

7.3 Results:

The sample tested was found compliant.

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

§ 15.209 Radiated emission limits; general requirements.

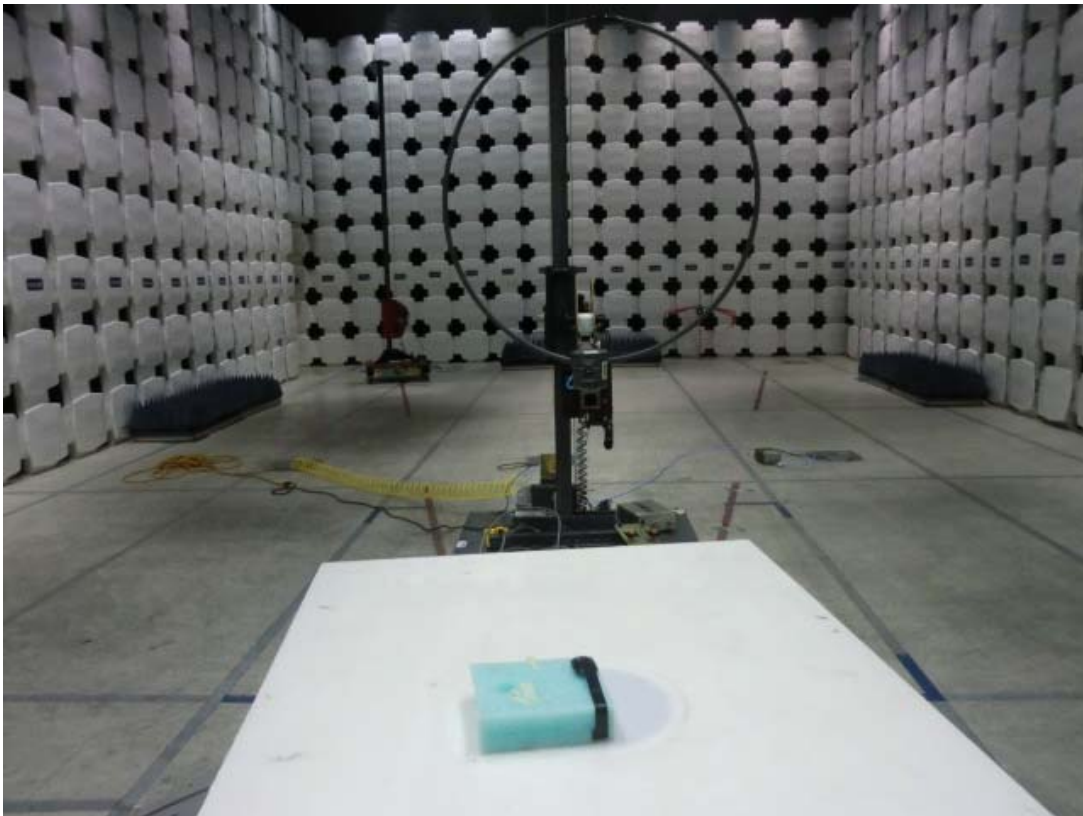
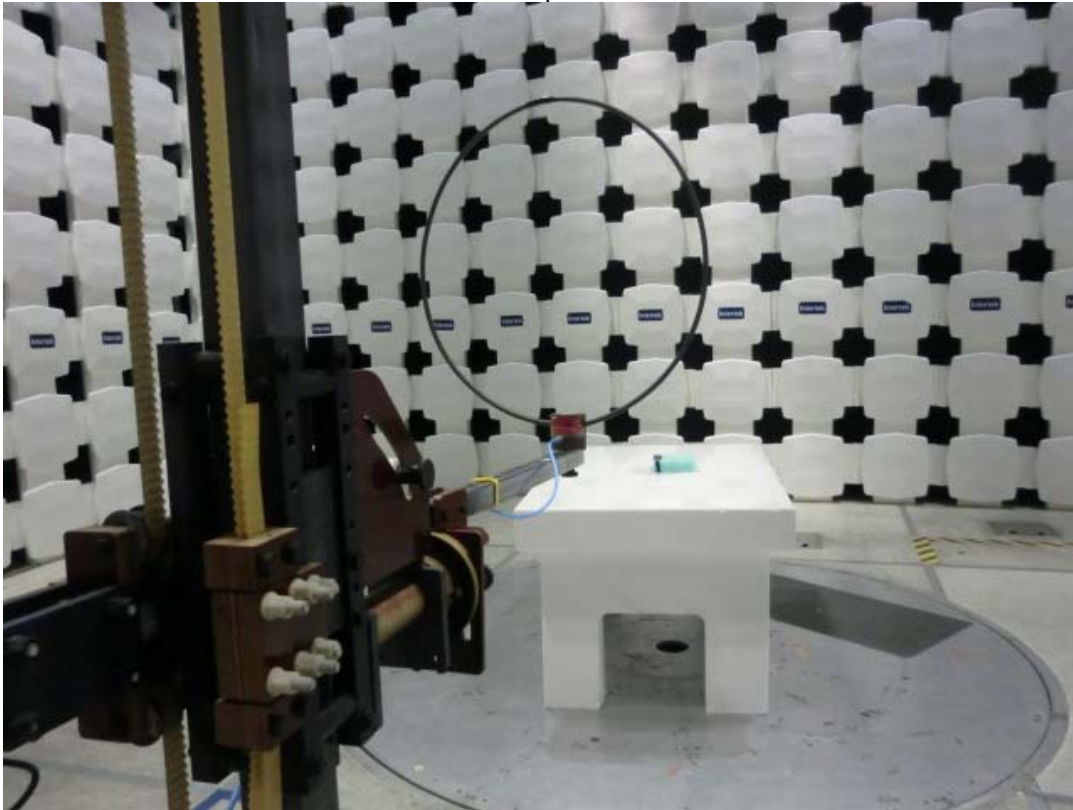
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0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

7.4 Setup Photographs:

Test Setup Photos





Test Personnel(s): Vathana Ven *VVV*
Supervising Engineer: _____
(Where Applicable) N/A
Product Standard: FCC Part 15.209(a) and IC RSS-210
Input Voltage: 3V Lithium Battery
Pretest Verification w/
Ambient Signals or
BB Source: Ambient Signals

Test Date(s): 11/20/2012
Test Levels: See test results
Ambient Temperature: 22 °C
Relative Humidity: 23 %
Atmospheric Pressure: 1011 mbars

Deviations, Additions, or Exclusions: None

8 Transmitter Spurious Above 30 MHz

8.1 Method

Tests are performed in accordance with FCC Part 15:2012 Subpart C 15.209(a) IC RSS-210 Issue 8 December 2010 and IC RSS-Gen Issue 3 December 2010 Section 7.2.5 Table 6, 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 dB μ V/m
- RA = Receiver Amplitude (including preamplifier) in dB μ V
- 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 dB μ V 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 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

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To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF / 20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

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 was tested found compliant.

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

§ 15.209 Radiated emission limits; general requirements.

(a) 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:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

8.4 Setup Photograph:



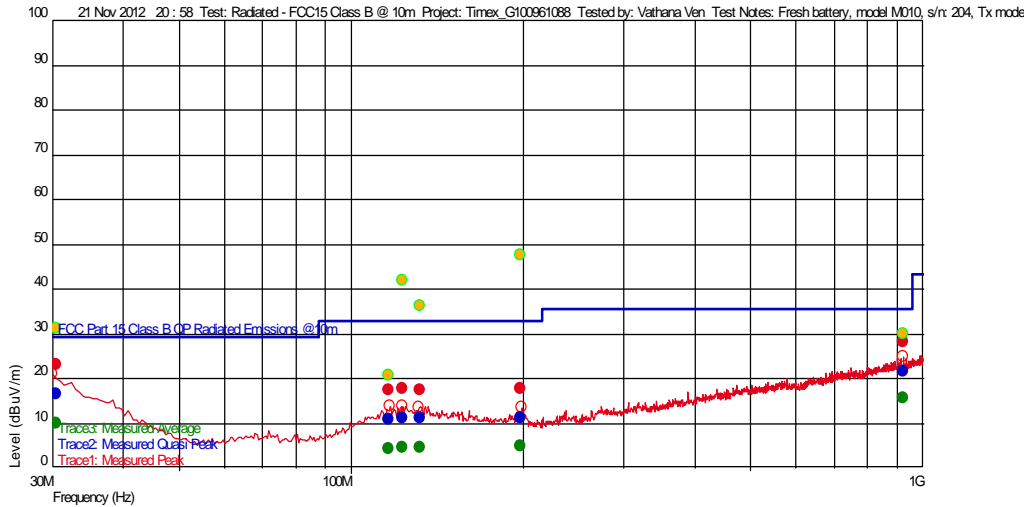
8.5 Test Data:

Transmit Mode

Test Information

Test Details User Entry Additional Information
 Test: Radiated - FCC15 Class B @ 10m
 Project: Timex_G100961088
 Test Notes: Fresh battery, model M010, s/n: 204, Tx mode
 Temperature: 21 deg C
 Humidity: 26%, 1014mB
 Tested by: Vathana Ven
 Test Started: 21 Nov 2012 20 : 58

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

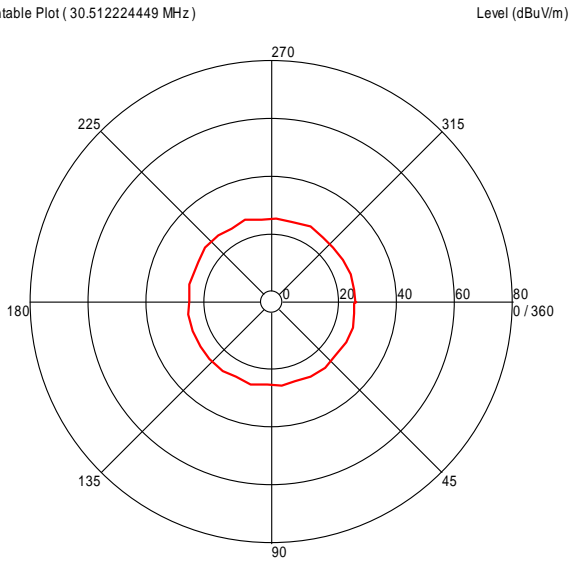
Emissions Test Data

Trace2: Measured Quasi Peak

Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver ()	Azimuth (deg) (Deg)	Mast Height (m)	RBW (Hz)
116.621843731 M	10.90	13.624	-25.330	33.040	-22.14	--	160	2.87	120 k
123.054909593 M	11.11	13.995	-25.273	33.040	-21.93	--	267	3.25	120 k
131.953707142 M	11.20	13.900	-25.192	33.040	-21.84		170	1.14	120 k
198.369339148 M	11.23	12.737	-24.430	33.040	-21.81		147	1.04	120 k
922.915831798 M	21.60	22.458	-22.796	35.540	-13.94	--	332	3.78	120 k
30.512224449 M	16.44	20.839	-26.452	29.540	-13.10	--	263	2.27	120 k

Azimuth Plots

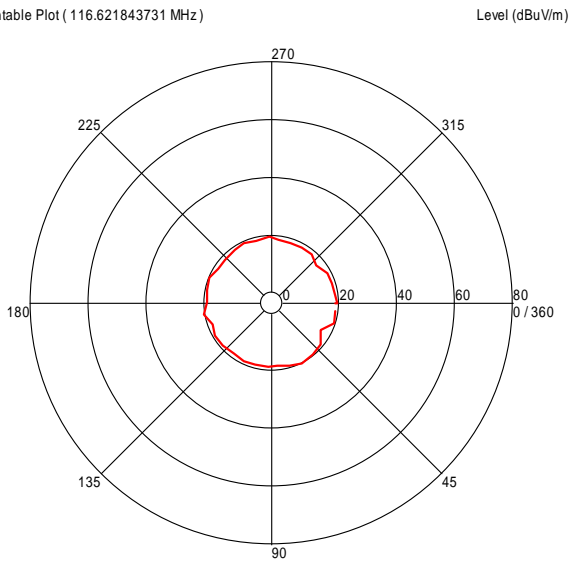
Turntable Plot (30.512224449 MHz)



All Polarities

Azimuth (Degrees)

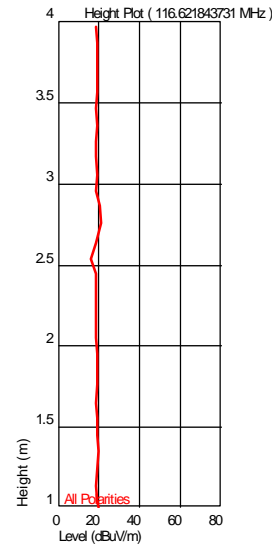
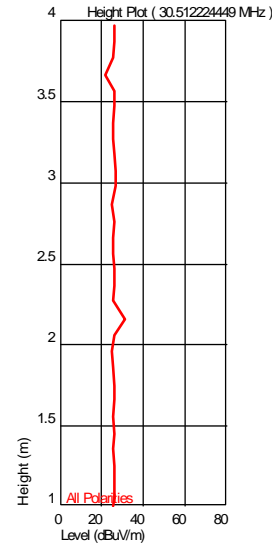
Turntable Plot (116.621843731 MHz)



All Polarities

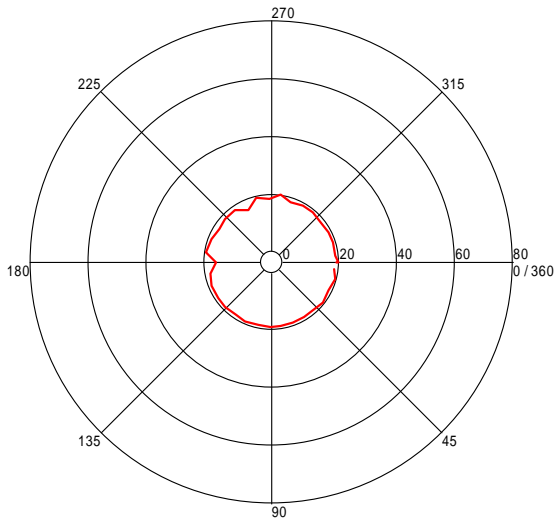
Azimuth (Degrees)

Turntable Plots



Turntable Plot (123.054909593 MHz)

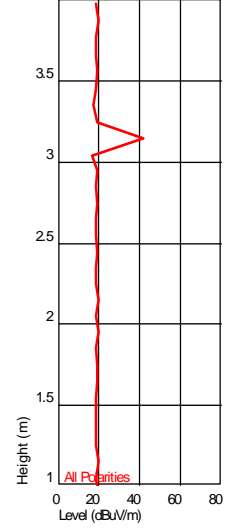
Level (dBuV/m)



All Polarities

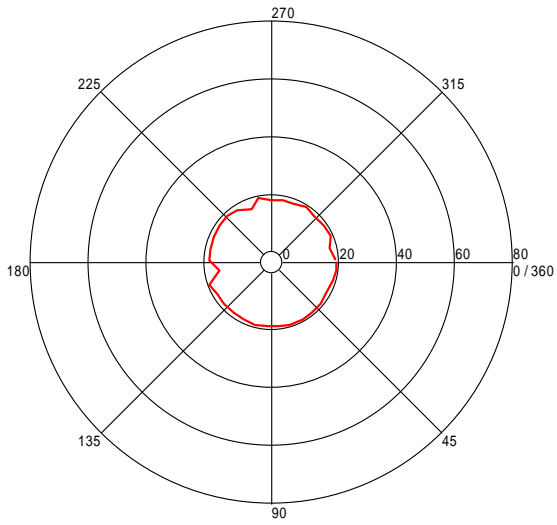
Azimuth (Degrees)

Height Plot (123.054909593 MHz)



Turntable Plot (131.953707142 MHz)

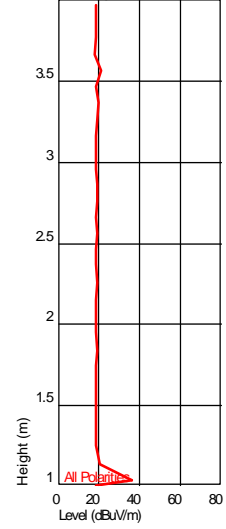
Level (dBuV/m)



All Polarities

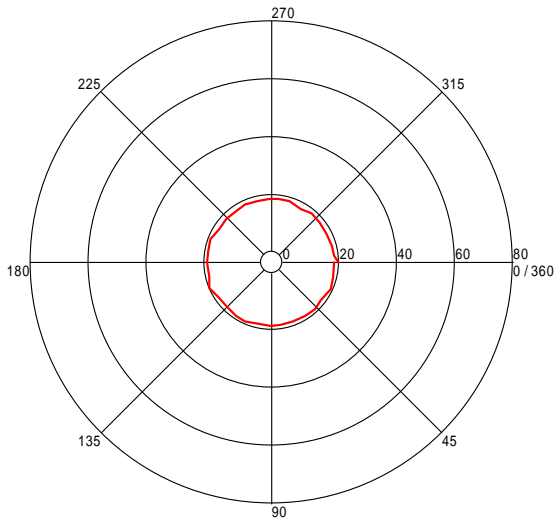
Azimuth (Degrees)

Height Plot (131.953707142 MHz)



Turntable Plot (198.369339148 MHz)

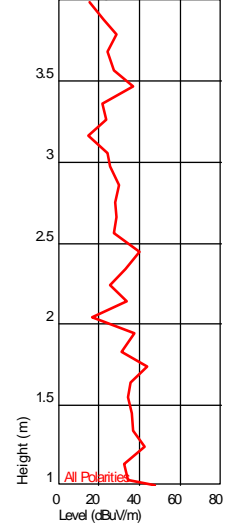
Level (dBuV/m)



All Polarities

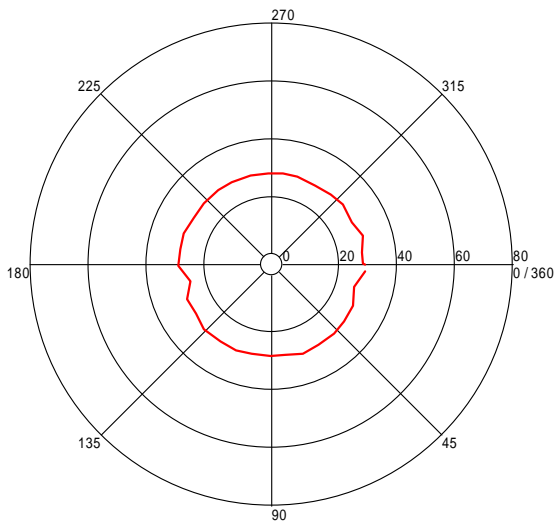
Azimuth (Degrees)

Height Plot (198.369339148 MHz)



Turntable Plot (922.915831798 MHz)

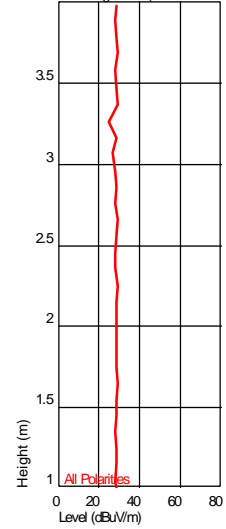
Level (dBuV/m)



All Polarities

Azimuth (Degrees)

Height Plot (922.915831798 MHz)



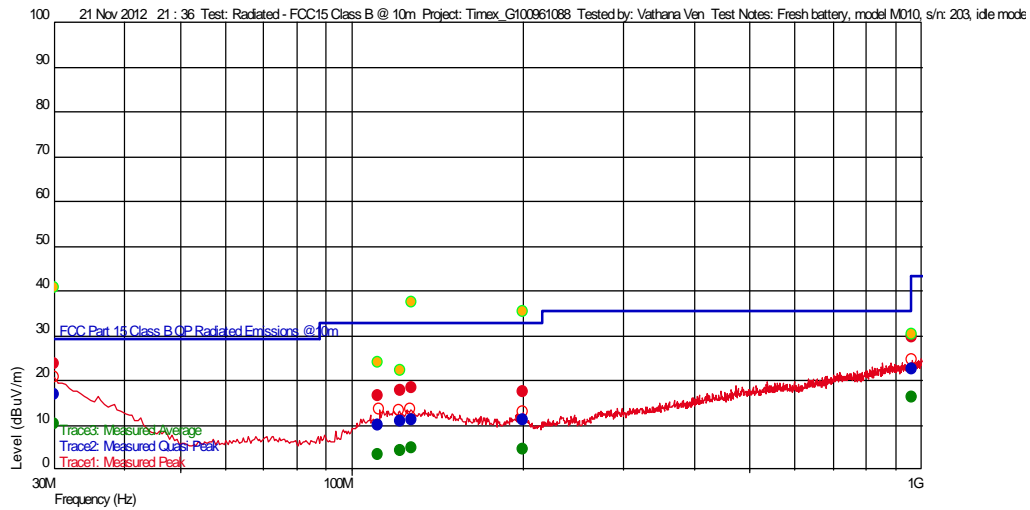
Idle Mode

Test Information

Test Details
 Test: Radiated - FCC15 Class B @ 10m
 Project: Timex_G100961088
 Test Notes: Fresh battery, model M010, s/n: 203, idle mode
 Temperature: 21 deg C
 Humidity: 26%, 1014mB
 Tested by: Vathana Ven
 Test Started: 21 Nov 2012 21 : 36

Additional Information

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

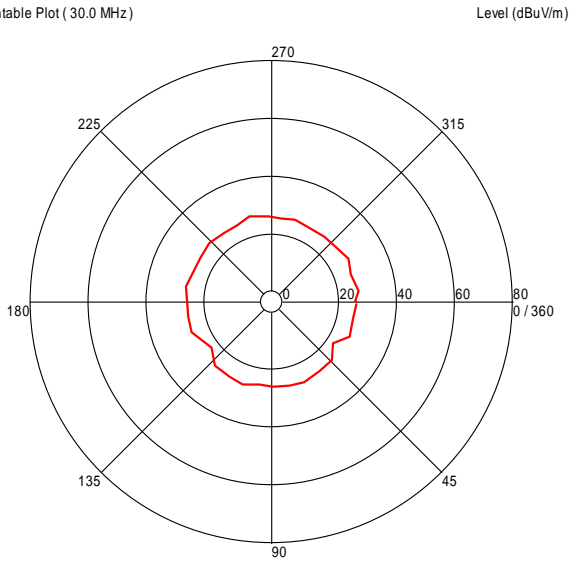
Emissions Test Data

Trace2: Measured Quasi Peak

Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver ()	Azimuth (deg) (Deg)	Mast Height (m)	RBW (Hz)
111.440681846 M	9.90	12.888	-25.377	33.040	-23.14		238	1.05	120 k
121.666532615 M	11.00	13.900	-25.285	33.040	-22.04	--	149	3.86	120 k
199.828055752 M	11.29	12.883	-24.412	33.040	-21.75		13	1.66	120 k
127.411423012 M	11.32	14.059	-25.233	33.040	-21.72		354	1.04	120 k
962.714628882 M	22.56	22.854	-22.678	43.540	-20.98	--	360	1.76	120 k
30.0 M	16.78	21.300	-26.460	29.540	-12.76	--	320	3.50	120 k

Azimuth Plots

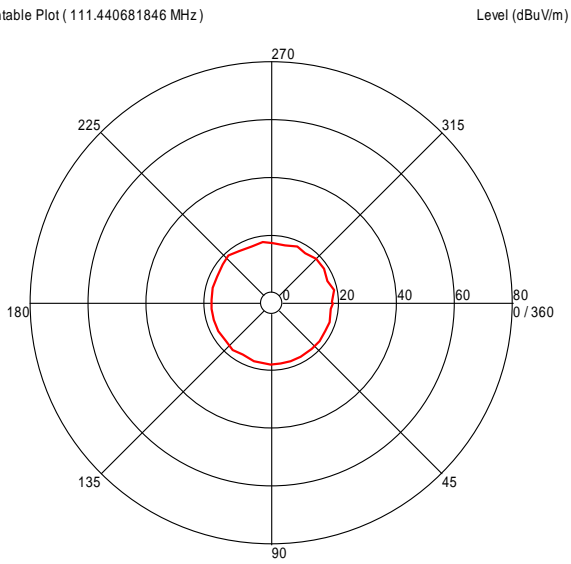
Turntable Plot (30.0 MHz)



All Polarities

Azimuth (Degrees)

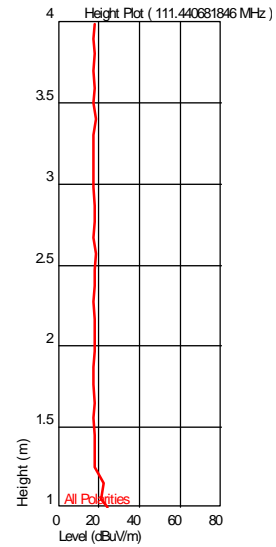
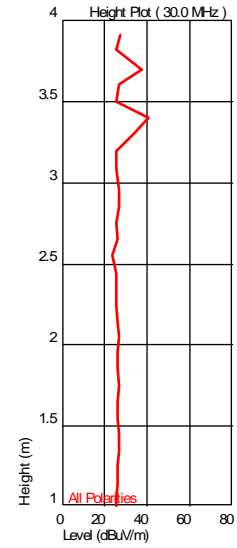
Turntable Plot (111.440681846 MHz)



All Polarities

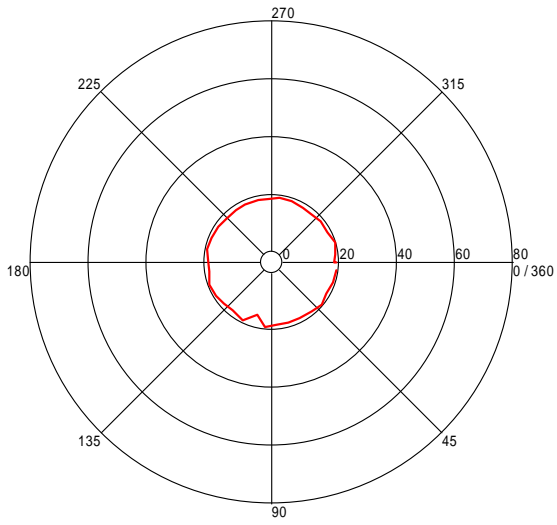
Azimuth (Degrees)

Turntable Plots



Turntable Plot (121.666532615 MHz)

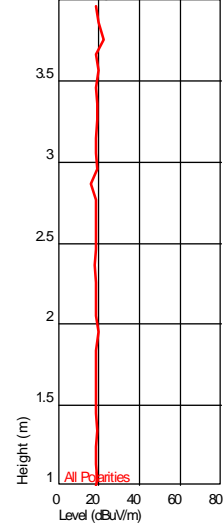
Level (dBuV/m)



All Polarities

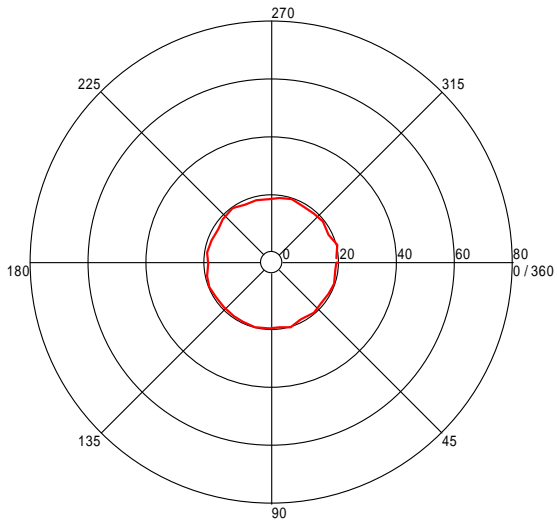
Azimuth (Degrees)

Height Plot (121.666532615 MHz)



Turntable Plot (127.411423012 MHz)

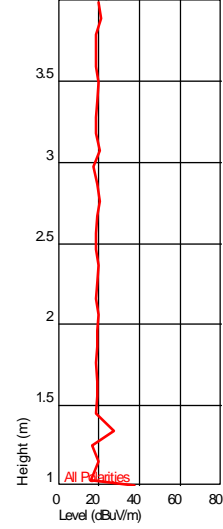
Level (dBuV/m)



All Polarities

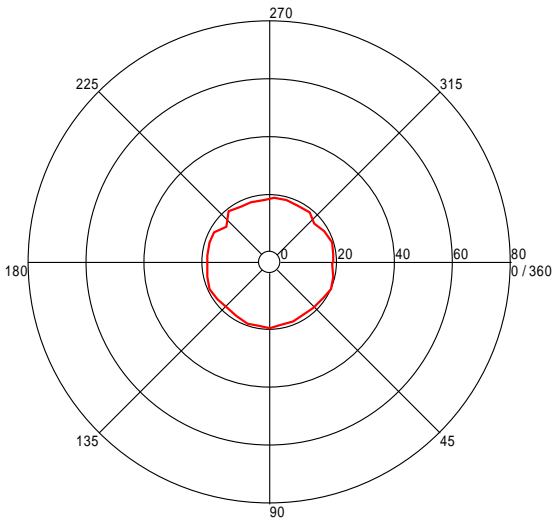
Azimuth (Degrees)

Height Plot (127.411423012 MHz)



Turntable Plot (199.828055752 MHz)

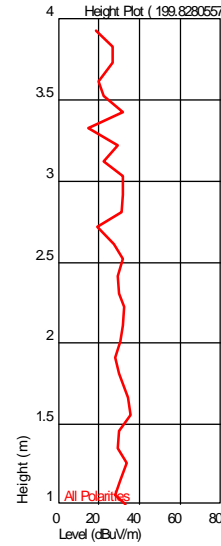
Level (dBuV/m)



All Polarities

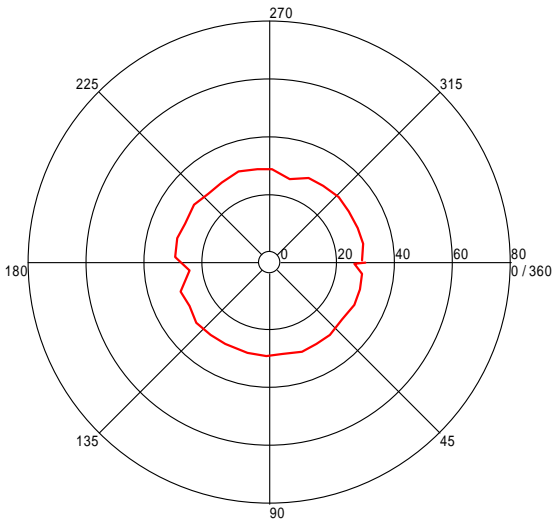
Azimuth (Degrees)

Height Plot (199.828055752 MHz)



Turntable Plot (962.714628882 MHz)

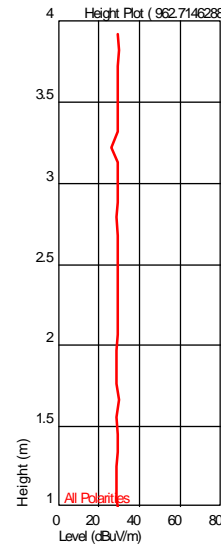
Level (dBuV/m)



All Polarities

Azimuth (Degrees)

Height Plot (962.714628882 MHz)



Test Personnel(s): Vathana Ven *VSV*
 Supervising Engineer: _____
 (Where Applicable) N/A
 Product Standard: FCC Part 15.209(a) and IC RSS-210
 Input Voltage: 3V Lithium Battery
 Pretest Verification w/
 Ambient Signals or
 BB Source: Ambient Signals

Test Date(s): 11/21/2012
 Test Levels: See test results
 Ambient Temperature: 21 °C
 Relative Humidity: 26 %
 Atmospheric Pressure: 1014 mbars

Deviations, Additions, or Exclusions: None

9 20 dB Bandwidth

9.1 Method

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

9.2 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
LOOP1'	LOOP ANTENNA	Empire	LG-105	61	08/18/2012	08/18/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013

Software Utilized:

Name	Manufacturer	Version
None		

9.3 Results:

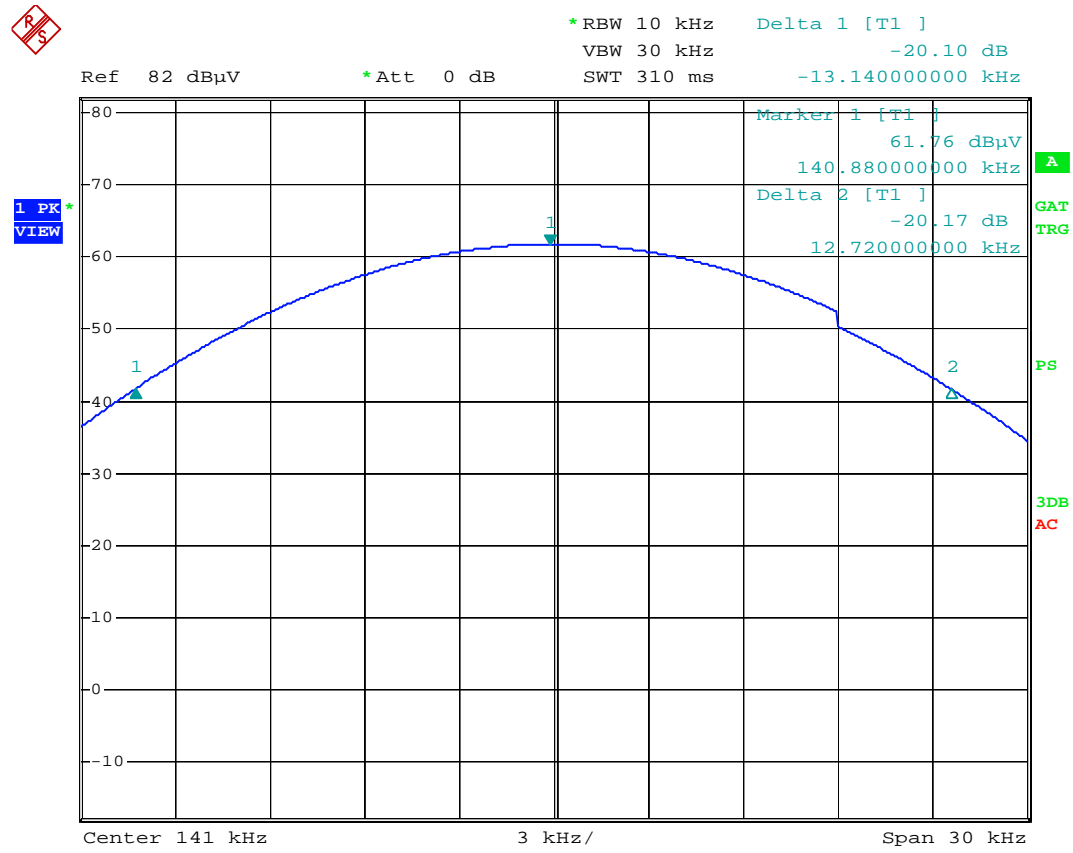
The sample tested was found compliant. The 20 dB bandwidth remains within the assigned band.

9.4 Setup Photograph:



9.5 Test Data:

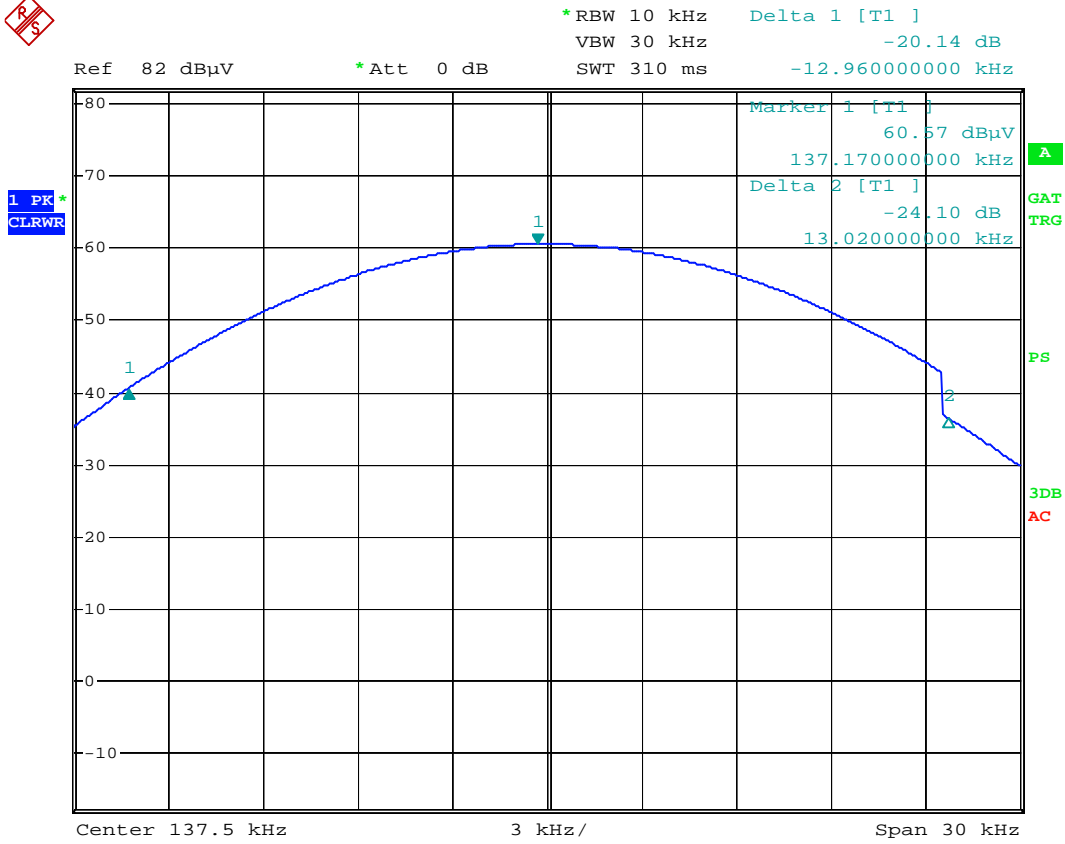
Fundamental Frequency, 137.5 kHz



Date: 21.NOV.2012 22:08:00

20 dB Bandwidth = 25.86 kHz

Fundamental Frequency, 141 kHz



Date: 21.NOV.2012 22:14:05

20 dB Bandwidth = 25.98 kHz

Test Personnel(s): Vathana Ven *VSV*
 Supervising Engineer: _____
 (Where Applicable) N/A
 Product Standard: FCC Part 15.209(a) and IC RSS-210
 Input Voltage: 3V Lithium Battery
 Pretest Verification w/
 Ambient Signals or
 BB Source: Ambient Signals

Test Date(s): 11/20/2012
 Test Levels: See test results
 Ambient Temperature: 22 °C
 Relative Humidity: 23 %
 Atmospheric Pressure: 1011 mbars

Deviations, Additions, or Exclusions: None

10 Revision History

Revision Level	Date	Report Number	Notes
0	11/28/12	100961088BOX-008	Original Issue