



EMISSIONS TEST REPORT

(FULL COMPLIANCE)

Report Number: 102364216BOX-001d

Project Number: G102364216

Report Issue Date: 04/18/2016

Model(s) Tested: GTP1

Model(s) Partially Tested: None

Model(s) Not Tested but declared equivalent by the client: None

Standards: FCC CFR 47 Part 15.231 (2016)
FCC CFR 47 Part 15 Subpart B (2016)
RSS-210 Issue 8 December 2010, Annex 1
ICES-003 Issue 6 January 2016

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

Client:
Ghost Controls
1572 Capital Circle Northwest
Tallahassee, FL 32303
USA

Report prepared by Reviewer

Vathana Ven / Staff Engineer, EMC

Report reviewed by

Michael Murphy / Sr. 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 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 **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	--
4	Description of Equipment Under Test and Variant Models	--
5	System Setup and Method	--
6	Fundamental Field Strength (CFR47 Part 15 Subpart C Section 15.231(b) IC RSS-210 Annex 1.1.2 and Table A)	Pass
7	Occupied Bandwidth (CFR47 Part 15 Subpart C Sections 15.215, 15.231(c) IC RSS-Gen Section 6.6, IC RSS-210 Annex1.1.3)	Pass
8	Radiated Spurious Emissions (CFR47 Part 15 Subpart C Sections 15.205, 15.209, and 15.231(b)(1-3), IC RSS-Gen Section 8.9 Table 4, IC RSS-210 Annex 1.1.2 and Table A)	Pass
9	Duty Cycle (CFR47 Part 15 Section 15.35 and Subpart C Section 15.231(b)(2) IC RSS-Gen Section 6.10)	Pass
10	5 Second Shut Off Time (CFR47 Part 15 Subpart C Section 15.231(a)(1) IC RSS-210 Section A1.1.1(a))	Pass
--	AC Line-Conducted Emissions (CFR47 FCC Part 15 Subpart C 15.207; IC RSS-Gen Section 7.2.4)	N/A, Battery
11	Revision History	--

3 Client Information

This EUT was tested at the request of:

Client: Ghost Controls
1572 Capital Circle Northwest
Tallahassee, FL 32303
USA

Contact: Mickey Nguyen
Telephone: (850) 635-0191
Fax: None
Email: mnguyen@ghostcontrols.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: Ghost Controls
1572 Capital Circle Northwest
Tallahassee, FL 32303
USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Garage Remote Control	Ghost Controls	GTP1	BOX1601141615-001 (Intertek Assigned)
Garage Remote Control	Ghost Controls	GTP1	Not labeled

Receive Date:	01/11/2016, 01/14/2016
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
Garage Remote Control

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

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmit mode
2	Normal operation mode

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	None

Radio/Receiver Characteristics	
Frequency Band(s)	433.92 MHz
Modulation Type(s)	On-Off-Key (OOK)
Maximum Output Power	0.001156 mW
Test Channels	1
Occupied Bandwidth	18.79 kHz
Frequency Hopper: Number of Hopping Channels	N/A
Frequency Hopper: Channel Dwell Time	N/A
Frequency Hopper: Max interval between two instances of use of the same channel	N/A
MIMO Information (# of Transmit and Receive antenna ports)	N/A
Equipment Type	Standalone
ETSI LBT/Adaptivity	N/A
ETSI Adaptivity Type	N/A
ETSI Temperature Category (I, II, III)	N/A
ETSI Receiver Category (1, 2, 3)	N/A
Antenna Type and Gain	Integral antenna (antenna gain 0 dBi)

Variant Models:

The following variant models were not tested as part of this evaluation, but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 System Setup and Method

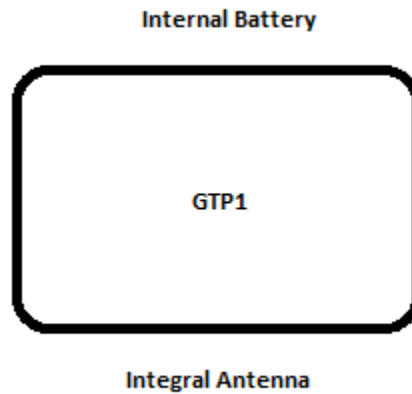
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
	None				

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None			

5.1 Method:

Configuration as required by ANSI C63.4:2014 and ANSI C63.10:2013.

5.2 EUT Block Diagram:



6 Fundamental Field Strength

6.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisp
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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 = Net Reading in dB μ V

Example:

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

Alternately, when C5 Software is used, the "Level" includes all losses and gains and is compared directly in the "Margin" column to the "Limit". "AF" is the Antenna Factor; "PA+CL" are Preamp and Cable Loss. These are already accounted for in the "Level" column.

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV002'	Weather Station	Davis Instruments	7400	PE80519A93	09/28/2015	09/28/2016
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/14/2015	03/14/2016
145013'	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2944A07027	10/12/2015	10/12/2016
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/01/2015	09/01/2016
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	11/10/2015	11/10/2016
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/08/2015	10/08/2016
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	05/13/2015	05/13/2016
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	04/10/2015	04/10/2016

Software Utilized:

Name	Manufacturer	Version
Compliance 5	Teseq	3.26.46.46

6.3 Results:

The sample tested was found to Comply. The Fundamental field strength must meet the following limits:

Fundamental Frequency (MHz), excluding restricted band frequencies of RSS-Gen	Field Strength of the Fundamental ^(Note 1) (microvolts/m at 3 metres)	Field Strength of Unwanted Emissions ^(Note 1) (microvolts/m at 3 metres)
40.66-40.70	See Section A2.7	
70-130	1,250	125
130-174	1,250 to 3,750*	125 to 375
174-260 ^(Note 2)	3,750	375
260-470 ^(Note 2)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Note 1: Limits on the field strength of emissions, as shown in this table, are based on the average value of the measured emissions. As an alternative, compliance with the limits in this table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

* Linear interpolation with frequency F in MHz:

For 130-174 MHz: FS (microvolts/m) = (56.82 x F)-6136

For 260-470 MHz: FS (microvolts/m) = (41.67 x F)-7083

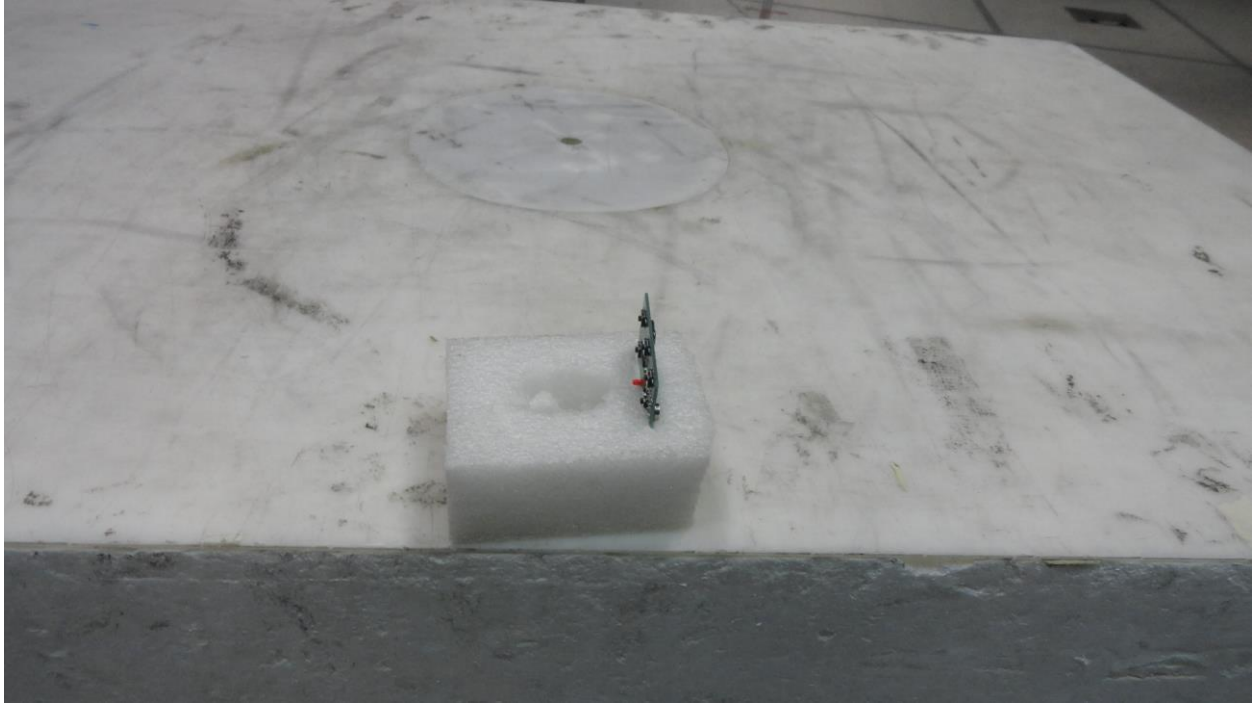
For a fundamental frequency of 433.92 MHz, this corresponds to a limit of 100.8 dBuV/m peak and 80.8 dBuV/m average at a 3 meter test distance or 90.3 dBuV/m peak and 70.3 dBuV/m average at a 10 meter test distance.

6.4 Setup Photographs:

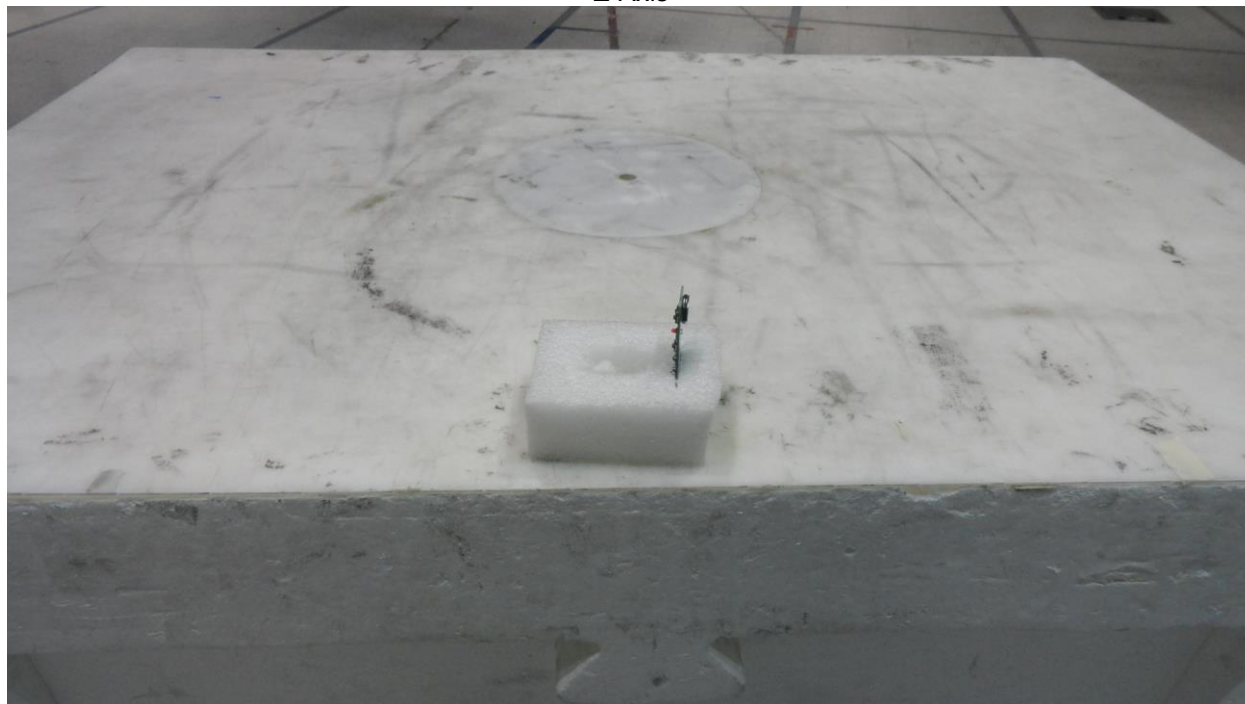
X-Axis



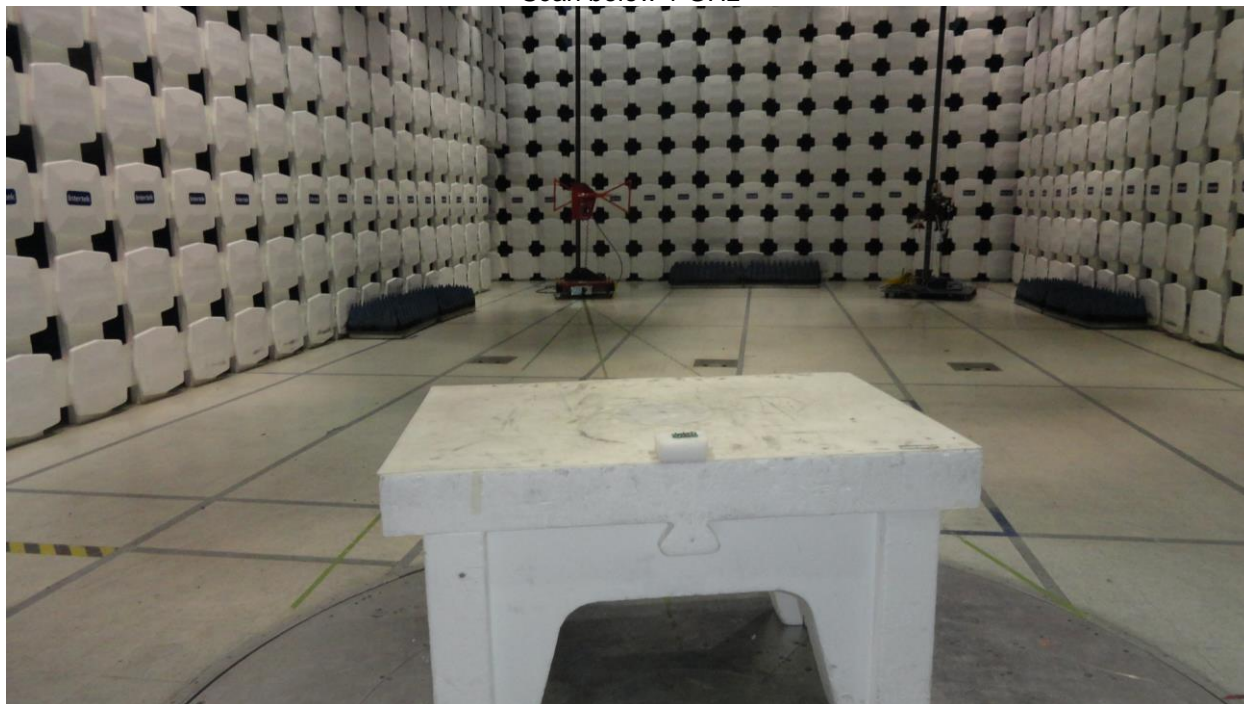
Y-Axis



Z-Axis



Scan below 1 GHz



6.5 Plots/Data:

X-Axis

Test Information

Test Details

Test:

Project:

Test Notes:

Tested by:

Test Started:

User Entry

Radiated - FCC15 C.231 @ 10m

Ghost Control G102364216

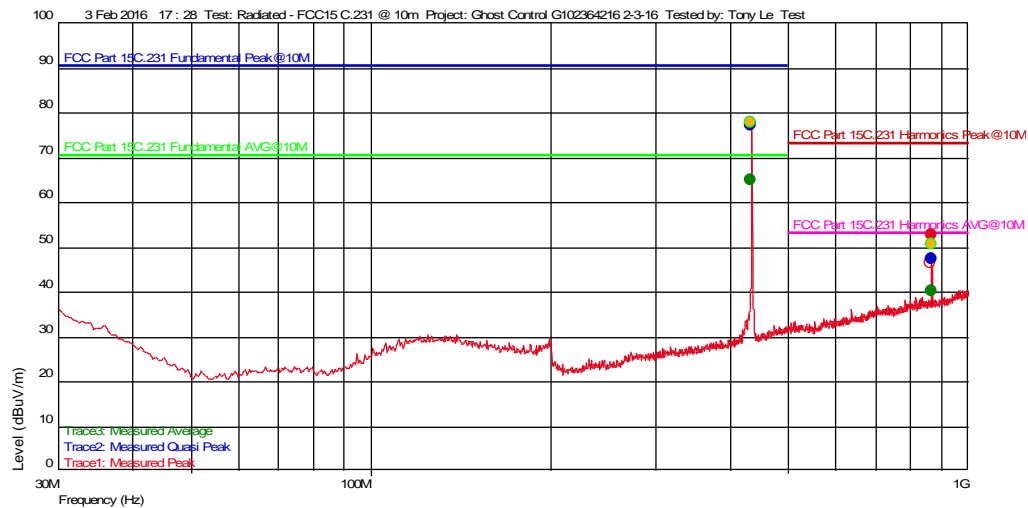
X axis_Battery power

Tony Le

3 Feb 2016 17 : 28

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

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
434.022444575 M	75.63	14.600	0.000	90.30	-14.67	--	331	2.17	120 k	

Trace3: Measured Average

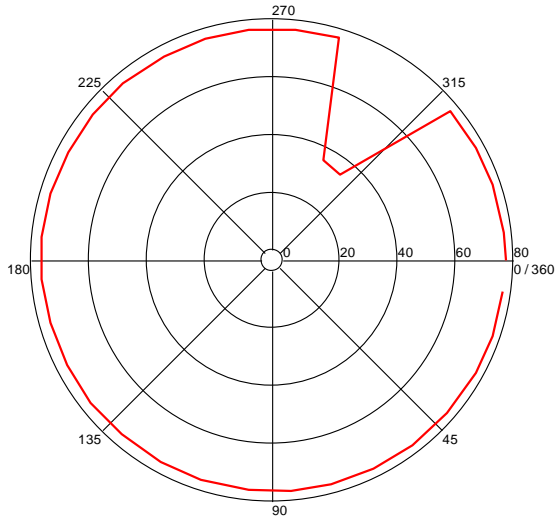
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver ()	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
434.022444575 M	63.95	14.600	0.000	70.30	-6.36	--	331	2.17	120 k	

Note: Average readings were obtained by applying average factor of 11.68 dB to peak readings.

Azimuth Plots

Turntable Plot (434.022444575 MHz)

Level (dBuV/m)

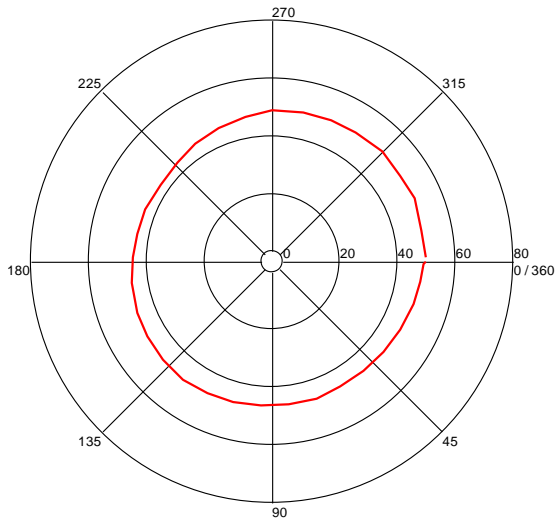


All Polarities

Azimuth (Degrees)

Turntable Plot (868.083366471 MHz)

Level (dBuV/m)

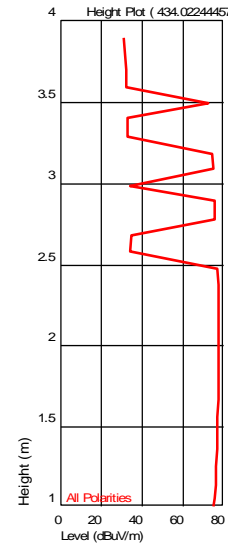


All Polarities

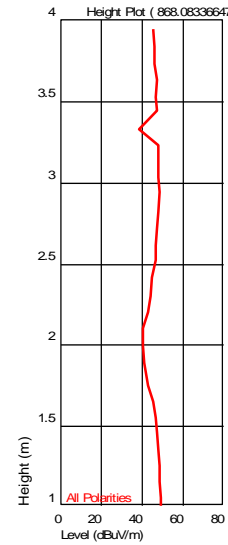
Azimuth (Degrees)

Turntable Plots

Height Plot (434.022444575 MHz)



Height Plot (868.083366471 MHz)



Y-Axis

Test Information

Test Details

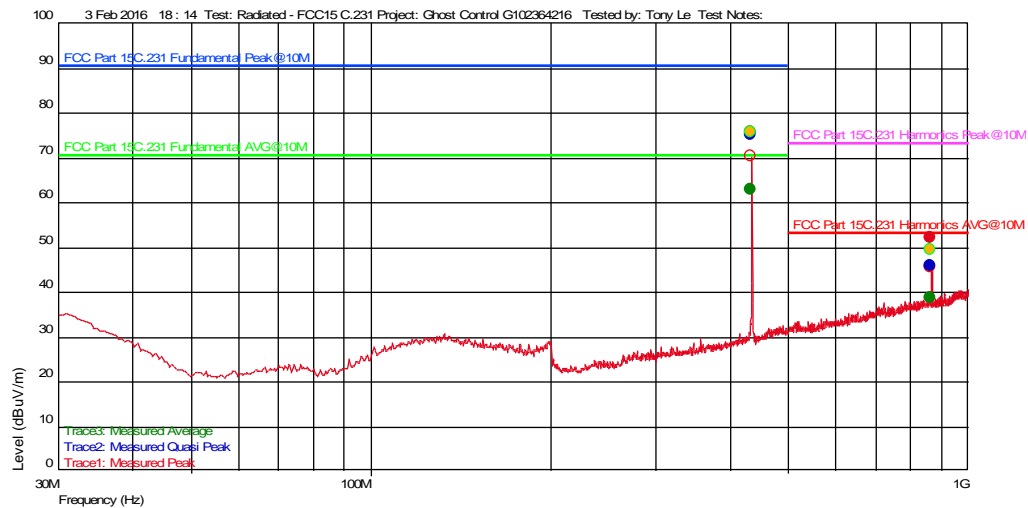
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated - FCC15 Class B @ 10m
Ghost Control G102364216
Y axis_Battery power
Tony Le
3 Feb 2016 18 : 14

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

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
434.008015717 M	73.56	14.600	0.000	90.30	-16.74		182	4.00	120 k	

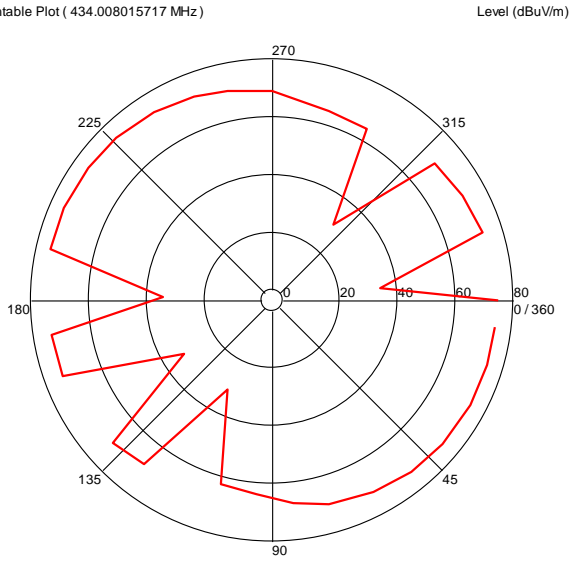
Trace3: Measured Average

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
434.008015717 M	61.88	14.600	0.000	70.30	-8.42		182	4.00	120 k	

Note: Average readings were obtained by applying average factor of 11.68 dB to peak readings.

Azimuth Plots

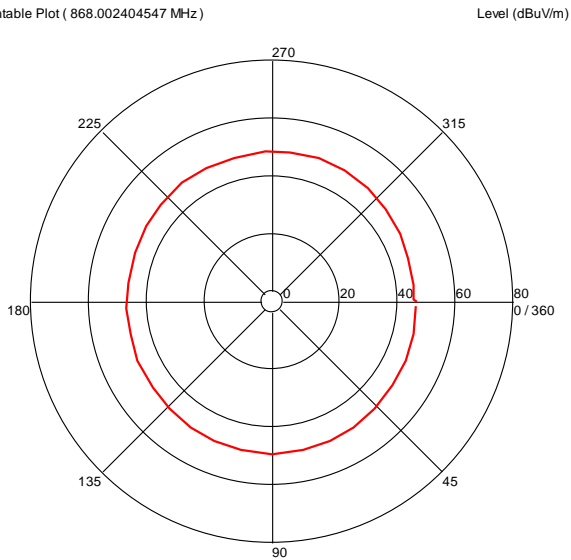
Turntable Plot (434.008015717 MHz)



All Polarities

Azimuth (Degrees)

Turntable Plot (868.002404547 MHz)

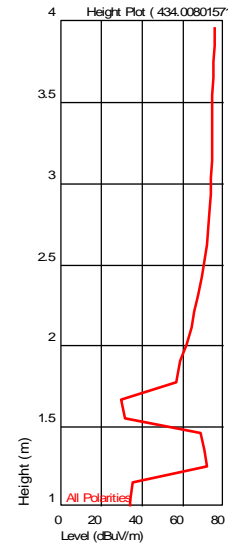


All Polarities

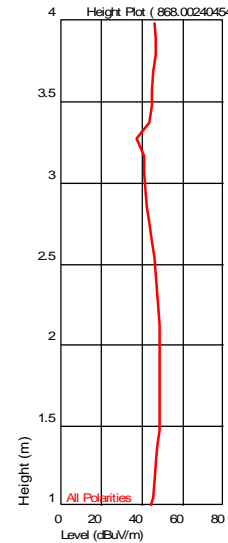
Azimuth (Degrees)

Turntable Plots

Height Plot (434.008015717 MHz)



Height Plot (868.002404547 MHz)



Z-Axis

Test Information

Test Details

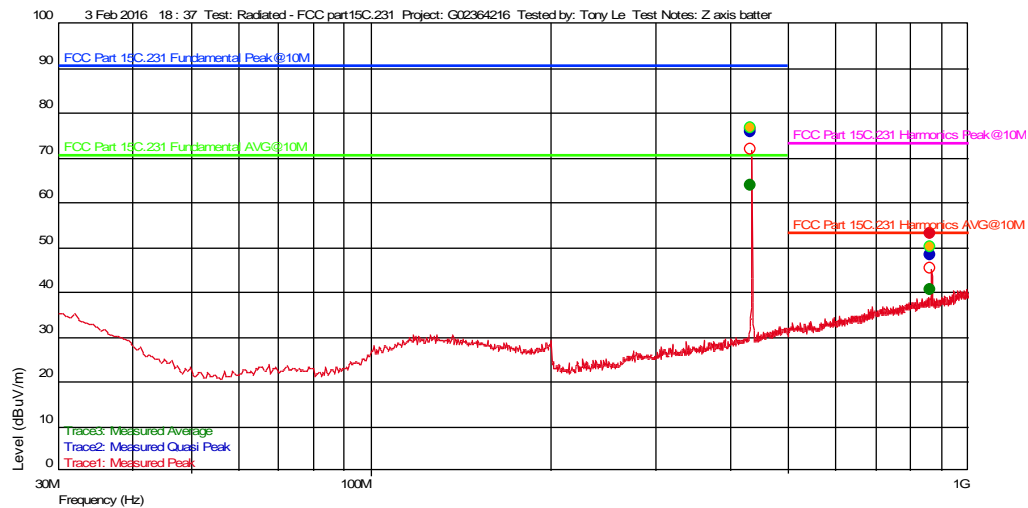
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated – CFCC part15 C.231 @ 10m
G02364216
Z axis battery power
Tony Le
3 Feb 2016 18 : 37

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

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
434.003206098 M	74.31	14.600	0.000	90.30	-15.99		357	1.05	120 k	

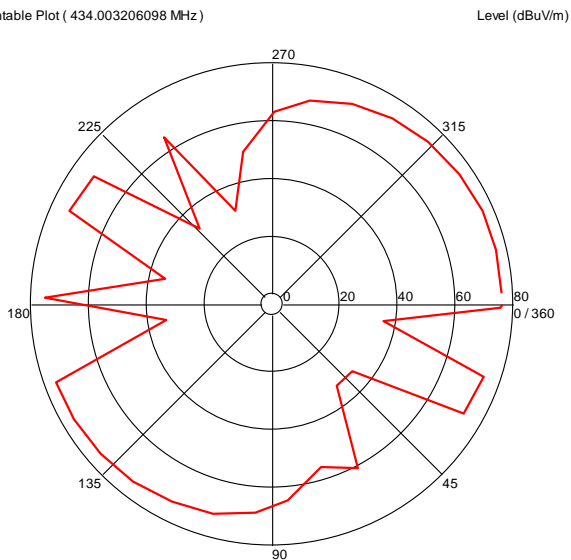
Trace3: Measured Average

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
434.003206098 M	62.63	14.600	0.000	70.30	-7.67		357	1.05	120 k	

Note: Average readings were obtained by applying average factor of 11.68 dB to peak readings.

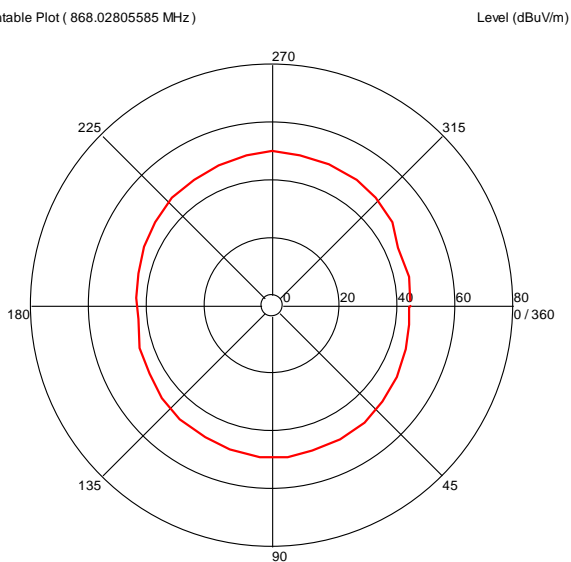
Azimuth Plots

Turntable Plot (434.003206098 MHz)



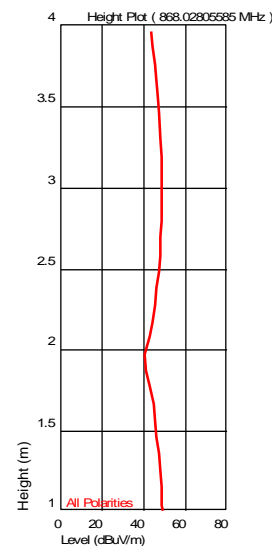
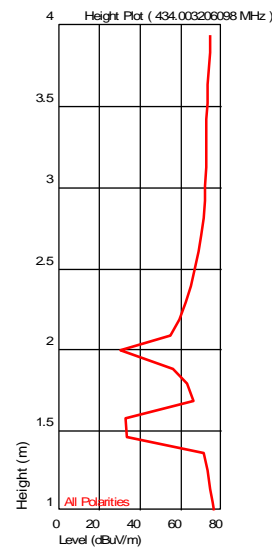
All Polarities

Turntable Plot (868.02805585 MHz)



All Polarities

Turntable Plots



Test Personnel: Tony Le *TL*
Supervising/Reviewing
Engineer: Vathana F. Ven *VFV*
(Where Applicable)
Product Standard: 15.231 and RSS-210
Input Voltage: Fresh battery
Pretest Verification w/
Ambient Signals or
BB Source: Yes

Test Date: 02/03/2016Limit Applied: Below specified limitsAmbient Temperature: 22 °CRelative Humidity: 18 %Atmospheric Pressure: 1005 mbars

Deviations, Additions, or Exclusions: None

7 Occupied Bandwidth

7.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisp
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV002'	Weather Station	Davis Instruments	7400	PE80519A93	09/28/2015	09/28/2016
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/14/2015	03/14/2016
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	11/10/2015	11/10/2016
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/01/2015	09/01/2016

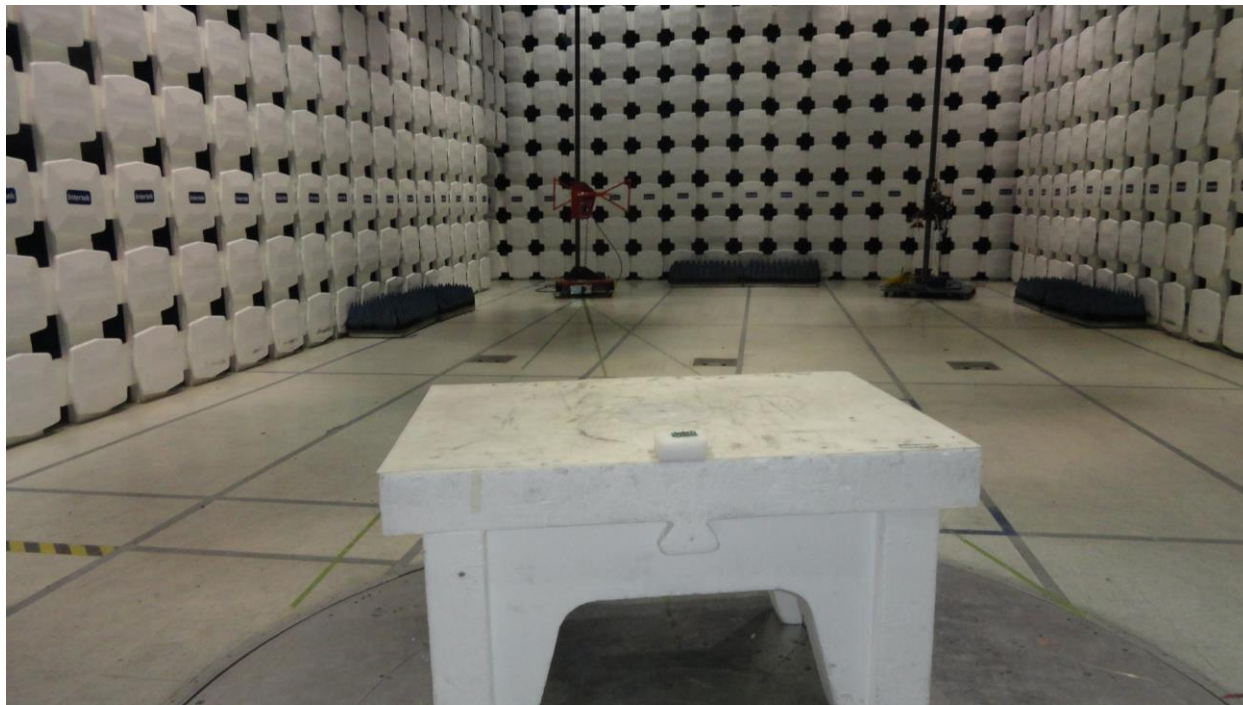
Software Utilized:

Name	Manufacturer	Version
None		

7.3 Results:

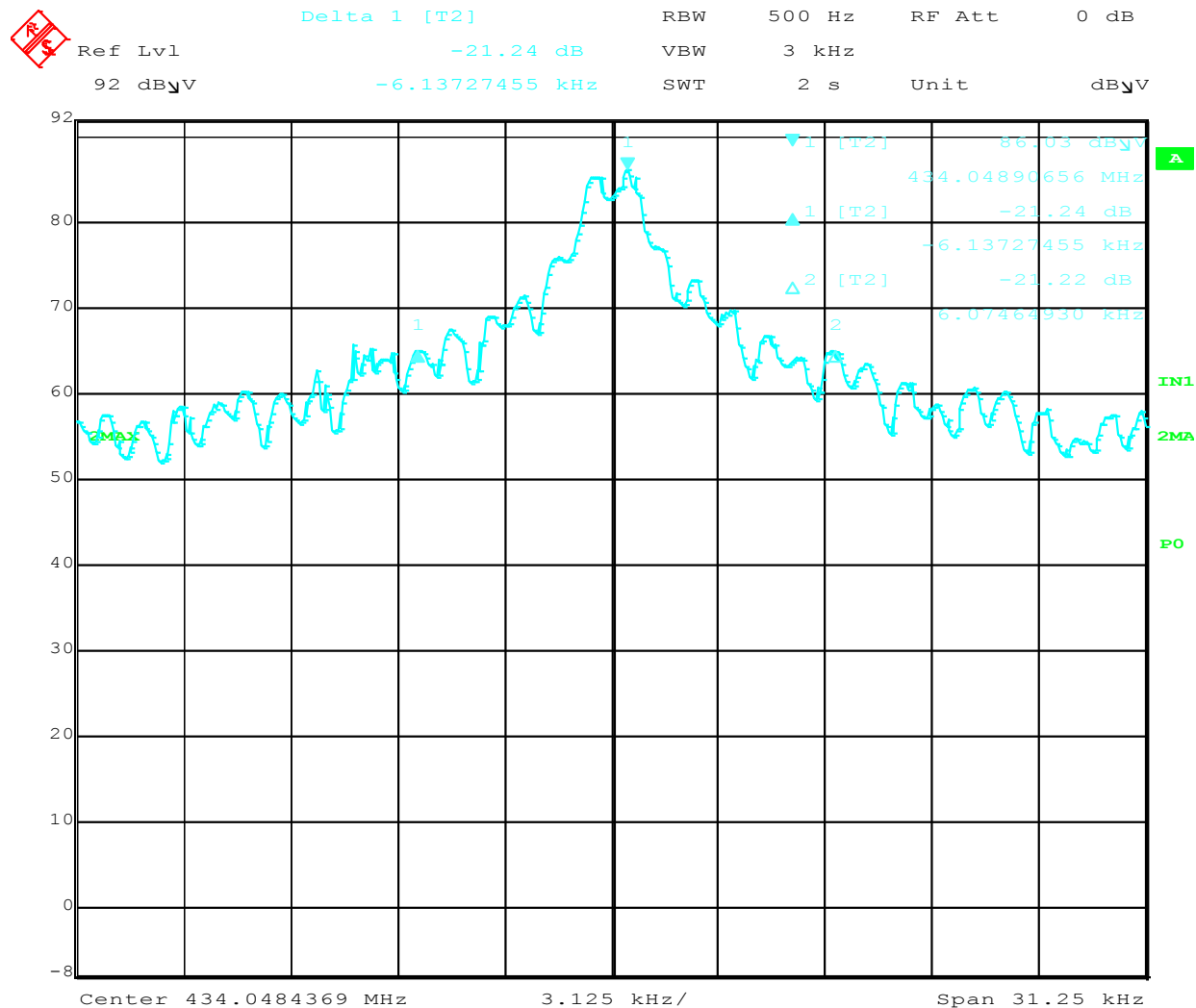
The sample tested was found to Comply. The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier. Therefore the bandwidth must not exceed 1084.8 kHz.

7.4 Setup Photograph:



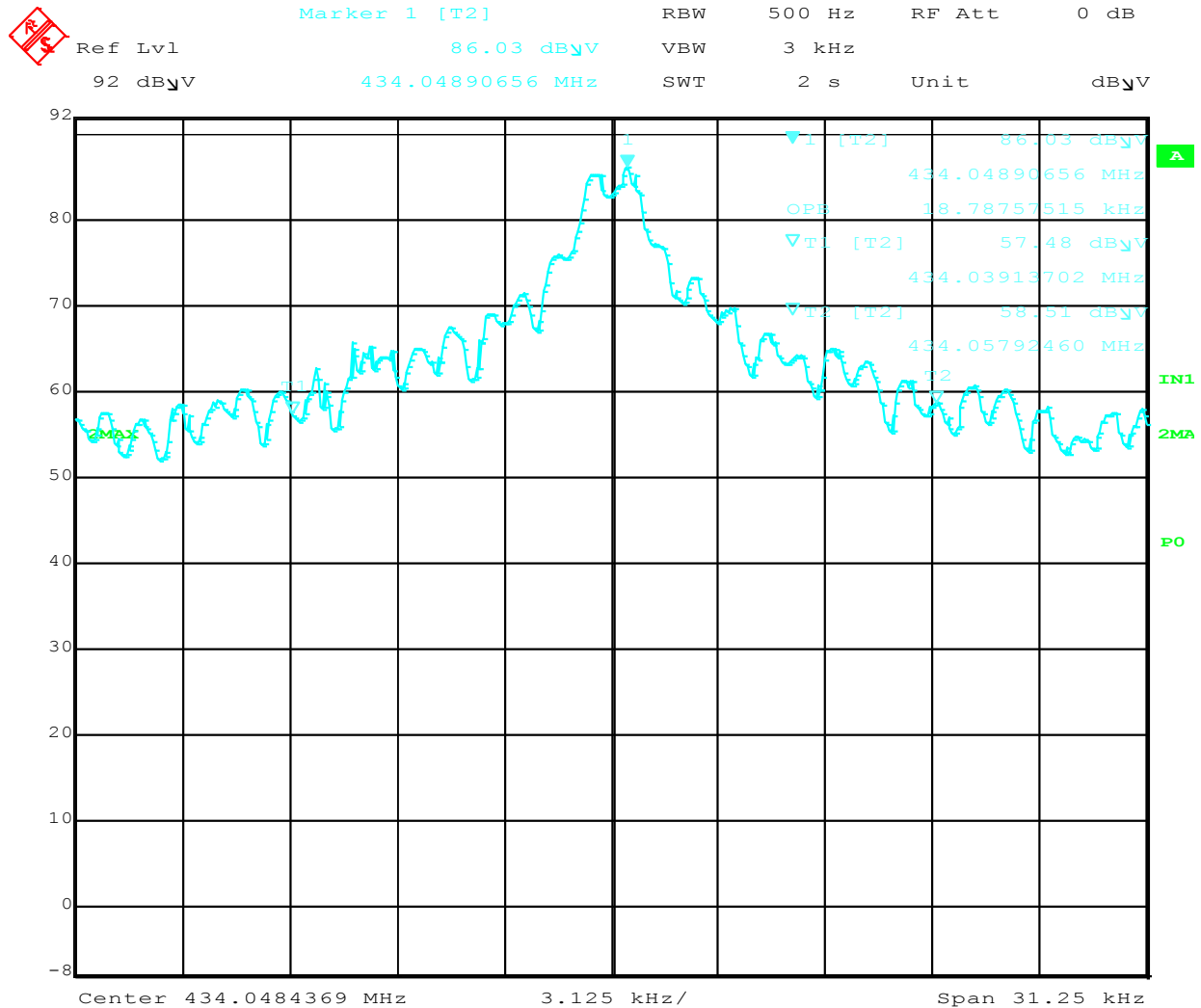
7.5 Plots/Data:

20 dB Bandwidth, 12.20 kHz



Date: 12.JAN.2016 21:06:06

Occupied Bandwidth, 18.79 kHz



Date: 12.JAN.2016 21:05:13

Test Personnel: Vathana Ven
Supervising/Reviewing
Engineer:
(Where Applicable) N/A
Product Standard: 15.231 and RSS-210
Input Voltage: Fresh battery
Pretest Verification w/
Ambient Signals or
BB Source: Yes

Test Date: 01/12/2016

Limit Applied: Below specified limits
Ambient Temperature: 23 °C
Relative Humidity: 42 %
Atmospheric Pressure: 1005 mbars

Deviations, Additions, or Exclusions: None

8 Radiated and Spurious Emissions

8.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisp
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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:

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

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

Alternately, when C5 Software is used, the "Level" includes all losses and gains and is compared directly in the "Margin" column to the "Limit". "AF" is the Antenna Factor; "PA+CL" are Preamp and Cable Loss. These are already accounted for in the "Level" column.

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV002'	Weather Station	Davis Instruments	7400	PE80519A93	09/28/2015	09/28/2016
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/14/2015	03/14/2016
145013'	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2944A07027	10/12/2015	10/12/2016
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/01/2015	09/01/2016
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	11/10/2015	11/10/2016
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/08/2015	10/08/2016
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	05/13/2015	05/13/2016
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	04/10/2015	04/10/2016

Software Utilized:

Name	Manufacturer	Version
Compliance 5	Teseq	3.26.46.46

8.3 Results:

The sample tested was found to Comply. The Fundamental field strength must meet the following limits:

Fundamental Frequency (MHz), excluding restricted band frequencies of RSS-Gen	Field Strength of the Fundamental ^(Note 1) (microvolts/m at 3 metres)	Field Strength of Unwanted Emissions ^(Note 1) (microvolts/m at 3 metres)
40.66-40.70	See Section A2.7	
70-130	1,250	125
130-174	1,250 to 3,750*	125 to 375
174-260 ^(Note 2)	3,750	375
260-470 ^(Note 2)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

Note 1: Limits on the field strength of emissions, as shown in this table, are based on the average value of the measured emissions. As an alternative, compliance with the limits in this table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

* Linear interpolation with frequency F in MHz:

For 130-174 MHz: FS (microvolts/m) = (56.82 x F)-6136

For 260-470 MHz: FS (microvolts/m) = (41.67 x F)-7083

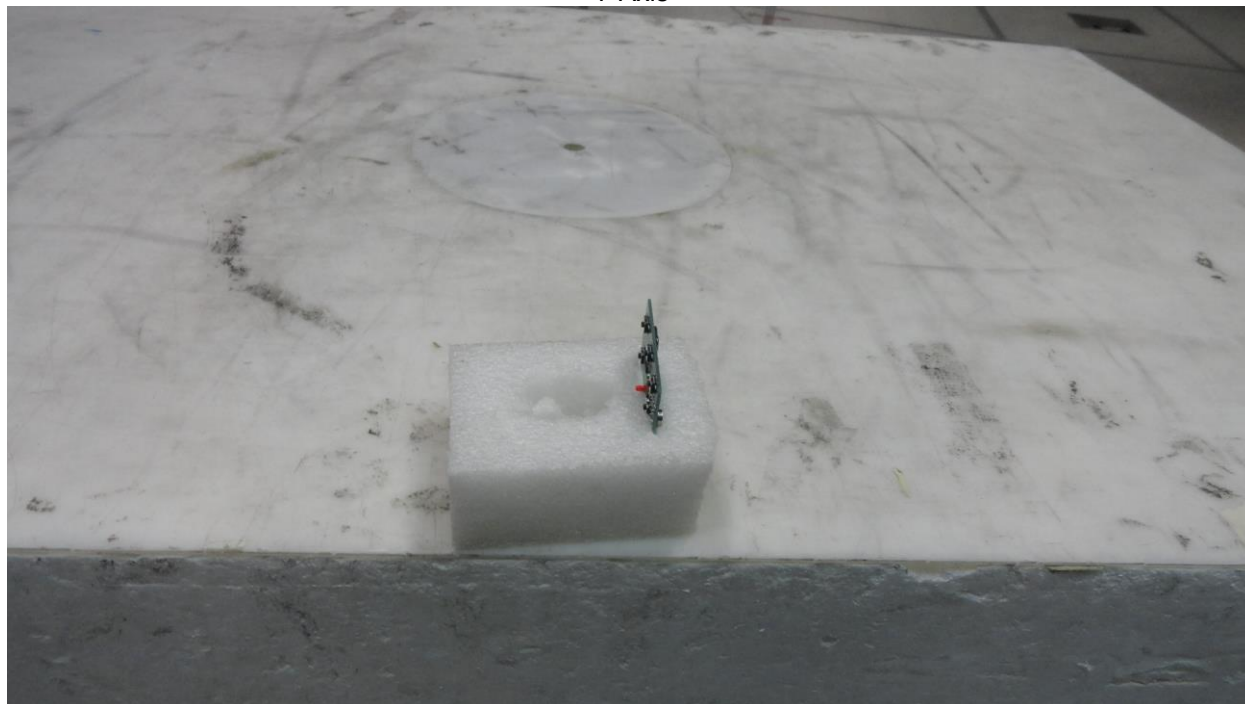
For a fundamental frequency of 433.92 MHz, this corresponds to a limit of 80.80 dBuV/m peak and 60.80 dBuV/m average at a 3 meter test distance or 70.30 dBuV/m peak and 50.30 dBuV/m average at a 10 meter test distance.

8.4 Setup Photographs:

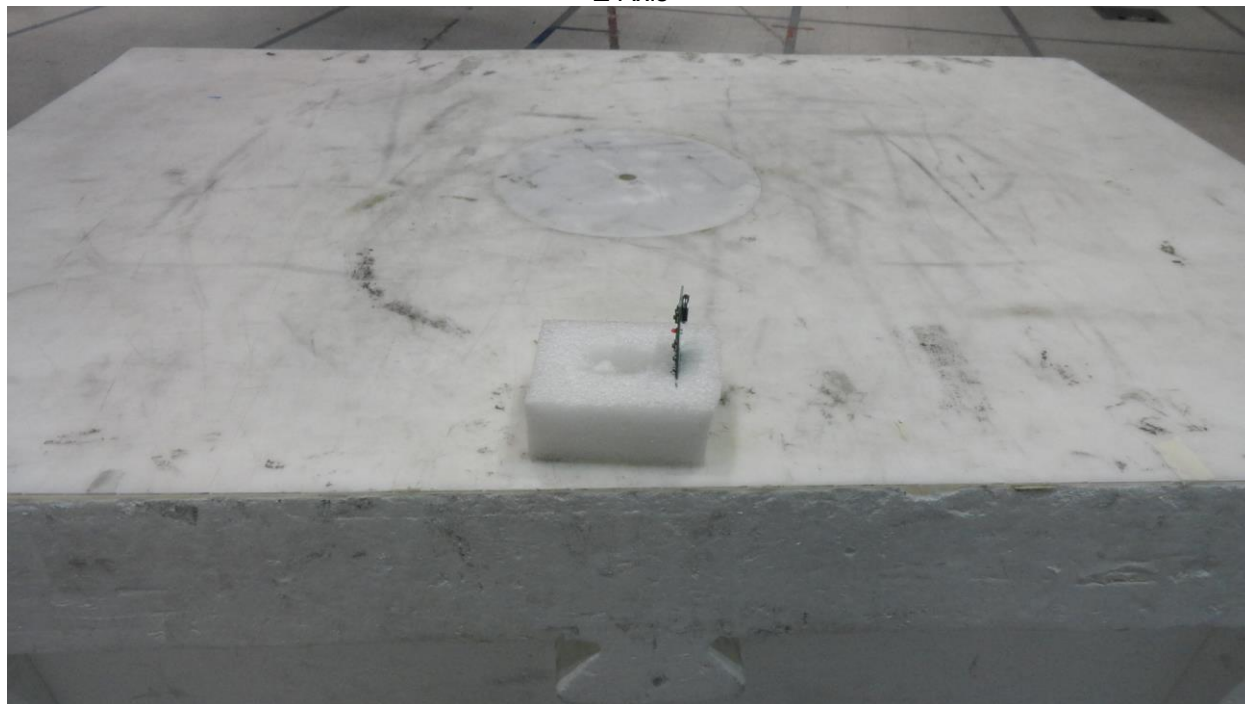
X-Axis



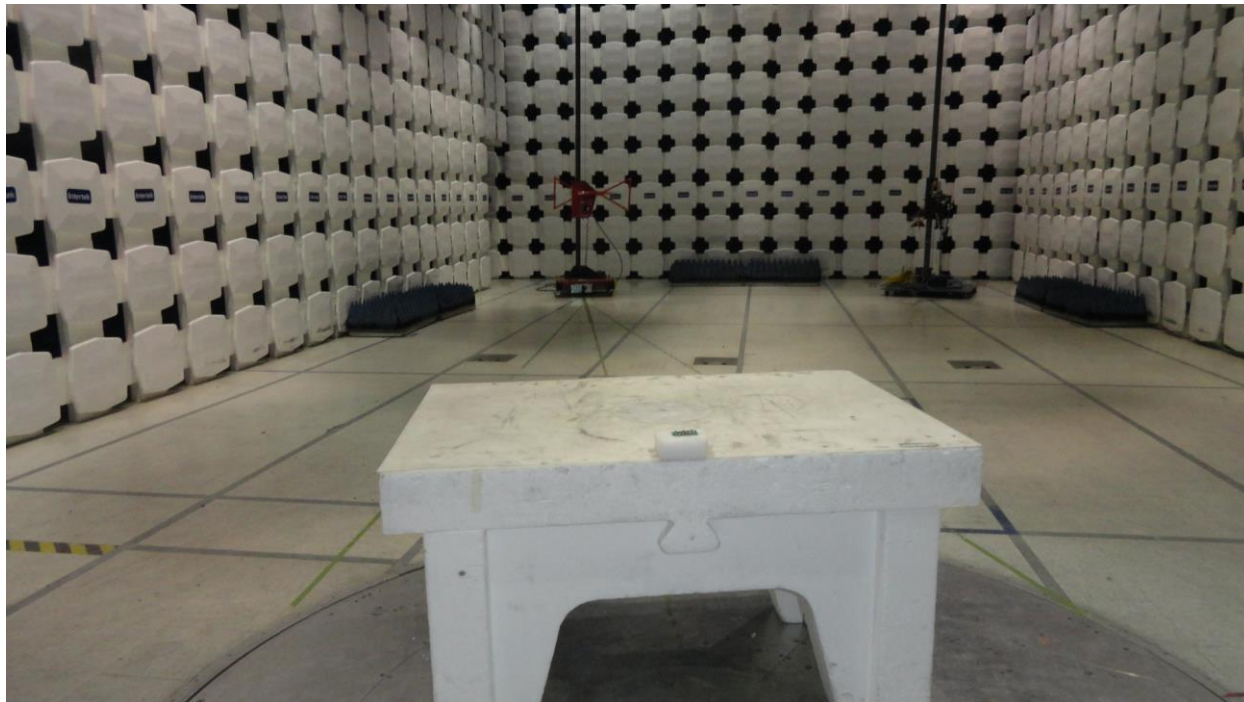
Y-Axis



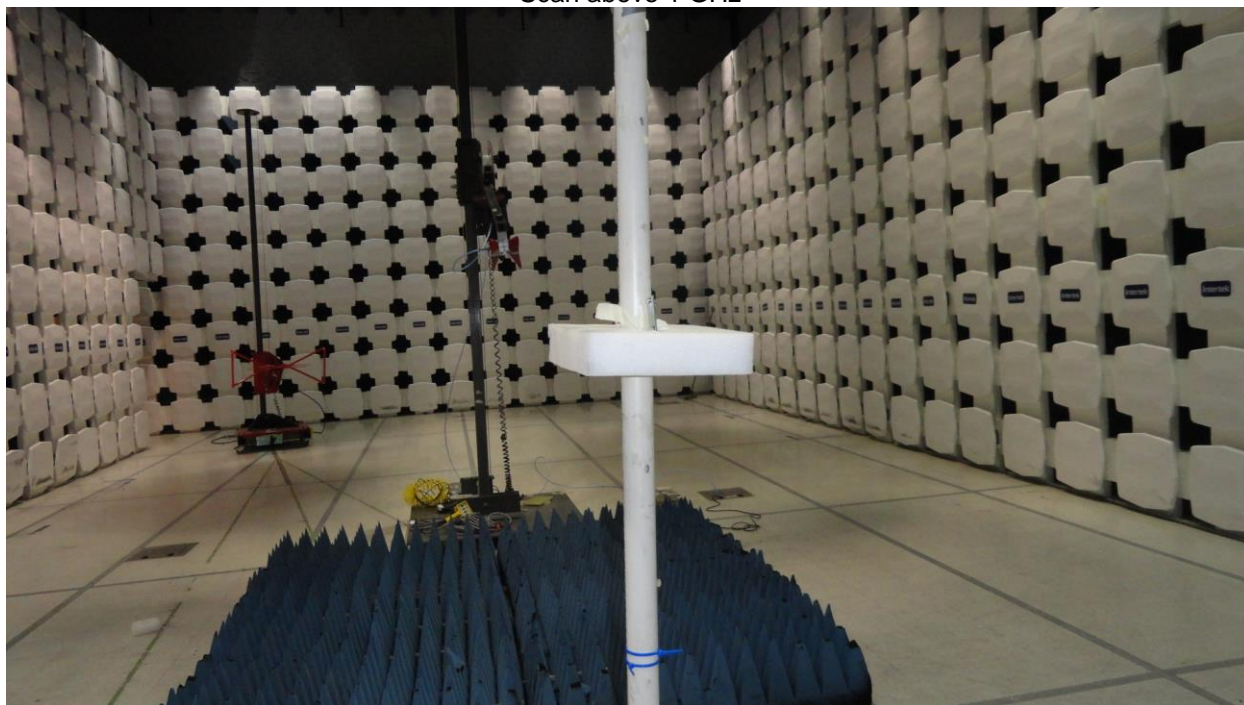
Z-Axis



Scan below 1 GHz



Scan above 1 GHz



8.5 Plots/Data:

X-Axis (30-1000 MHz)

Test Information

Test Details

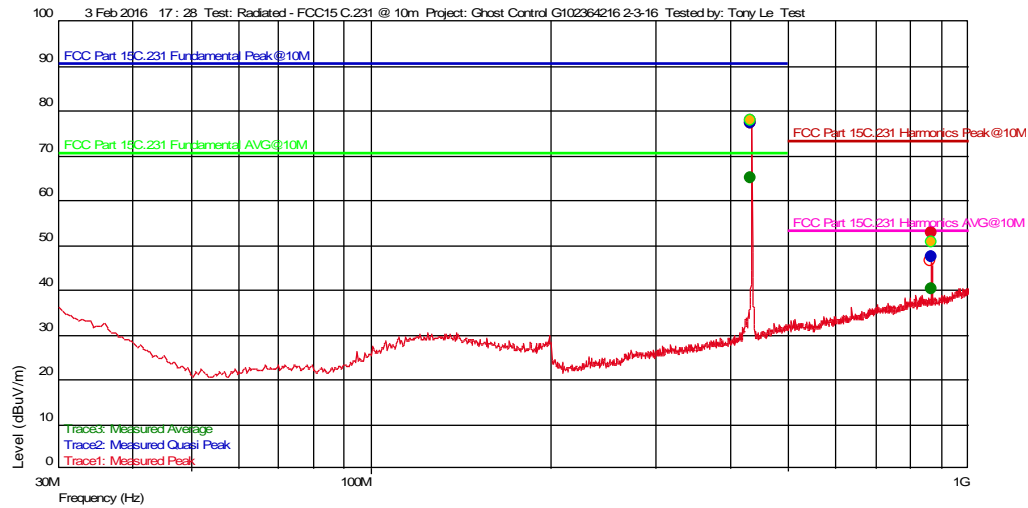
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated - FCC15 C.231 @ 10m
Ghost Control G102364216
X axis_Battery power
Tony Le
3 Feb 2016 17 : 28

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

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
868.083366471 M	52.61	21.900	0.000	70.30	-17.69	--	348	1.15	120 k	

Trace3: Measured Average

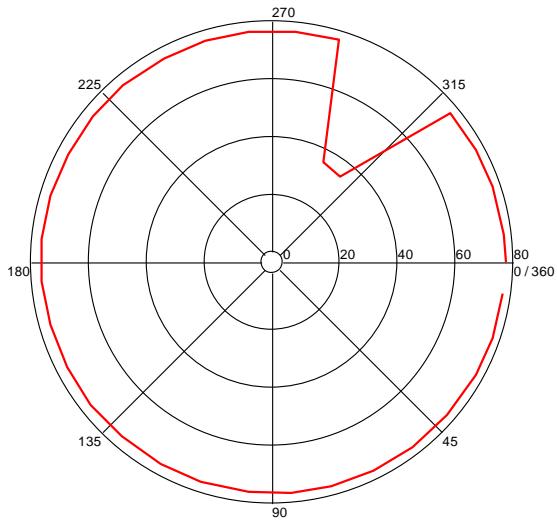
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver ()	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
868.083366471 M	40.93	21.900	0.000	50.30	-9.37	--	348	1.15	120 k	

Note: Average readings were obtained by applying average factor of 11.68 dB to peak readings.

Azimuth Plots

Turntable Plot (434.022444575 MHz)

Level (dBuV/m)

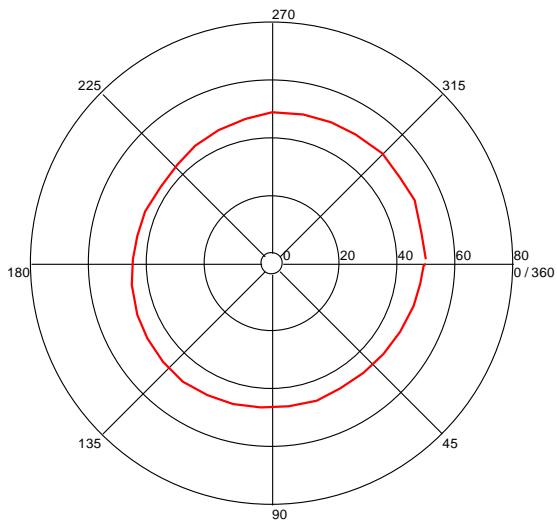


All Polarities

Azimuth (Degrees)

Turntable Plot (868.083366471 MHz)

Level (dBuV/m)

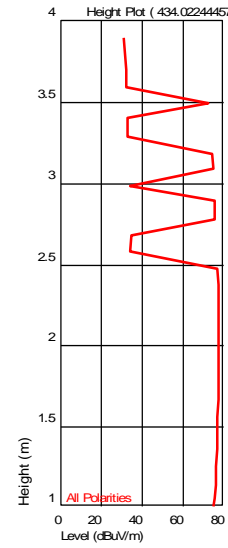


All Polarities

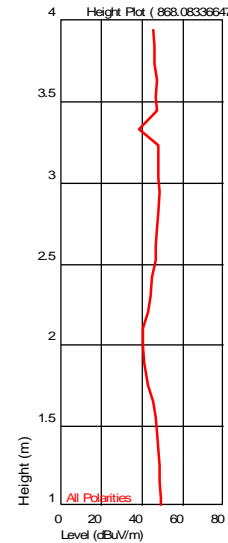
Azimuth (Degrees)

Turntable Plots

Height Plot (434.022444575 MHz)



Height Plot (868.083366471 MHz)



Y-Axis (30-1000 MHz)

Test Information

Test Details

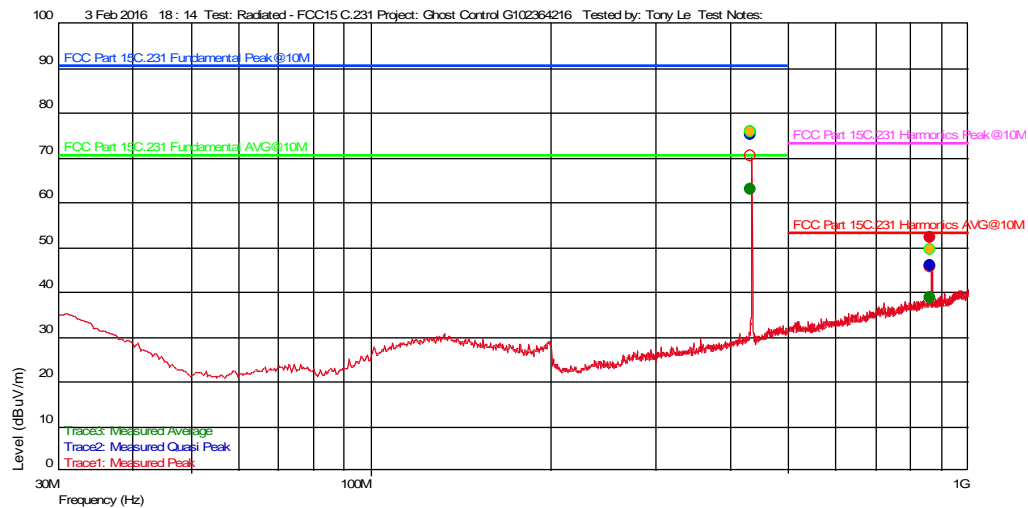
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated - FCC15 Class B @ 10m
Ghost Control G102364216
Y axis_Battery power
Tony Le
3 Feb 2016 18 : 14

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

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
868.002404547 M	52.00	21.900	0.000	70.30	-18.3		78	2.02	120 k	

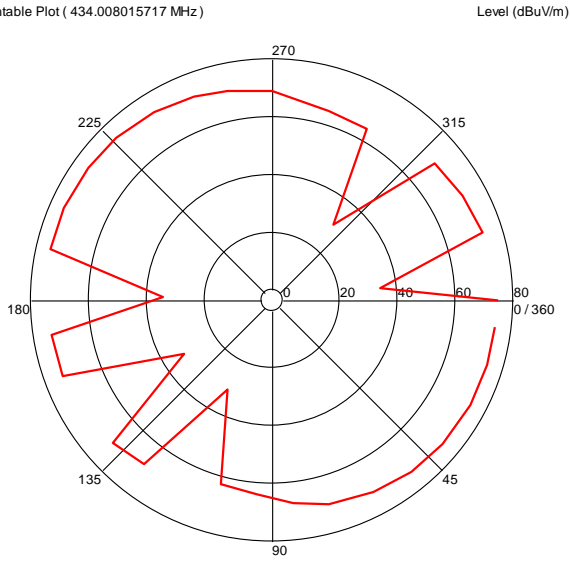
Trace3: Measured Average

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
868.002404547 M	40.32	21.900	0.000	50.30	-9.98		78	2.02	120 k	

Note: Average readings were obtained by applying average factor of 11.68 dB to peak readings.

Azimuth Plots

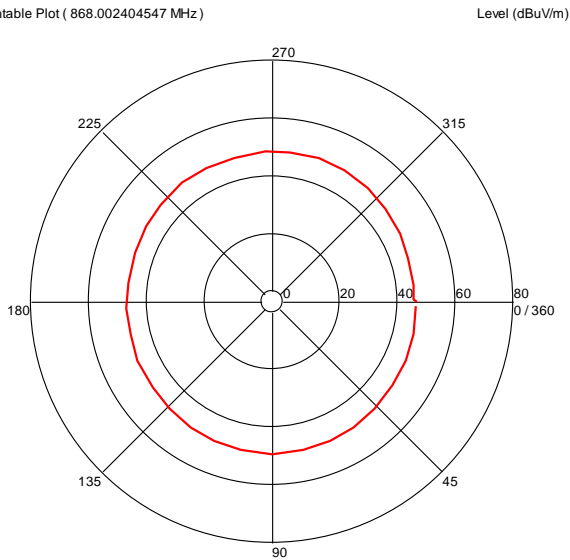
Turntable Plot (434.008015717 MHz)



All Polarities

Azimuth (Degrees)

Turntable Plot (868.002404547 MHz)

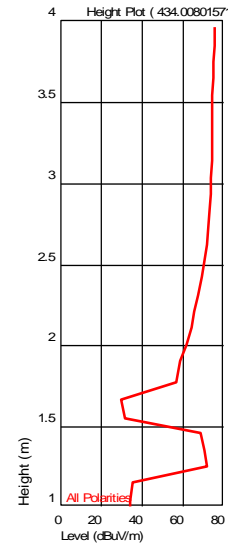


All Polarities

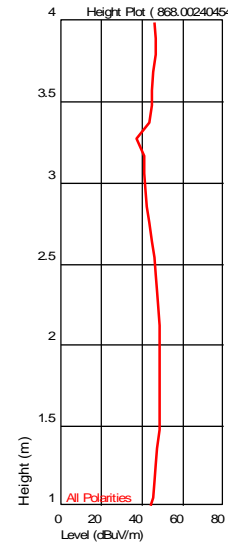
Azimuth (Degrees)

Turntable Plots

Height Plot (434.008015717 MHz)



Height Plot (868.002404547 MHz)



Z-Axis (30-1000 MHz)

Test Information

Test Details

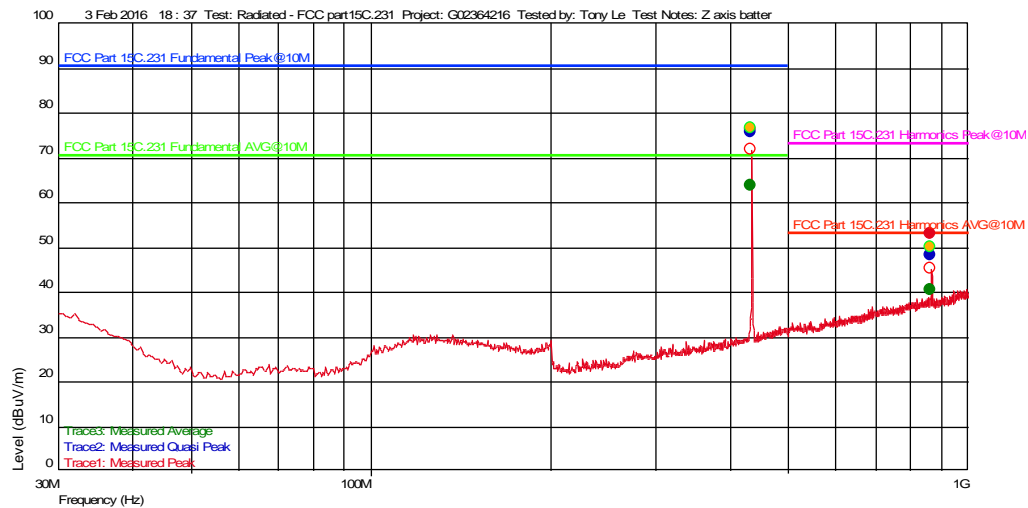
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated -- CFCC part15 C.231 @ 10m
G02364216
Z axis battery power
Tony Le
3 Feb 2016 18 : 37

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

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
868.02805585 M	52.90	21.900	0.000	70.30	-17.40	--	292	1.04	120 k	

Trace3: Measured Average

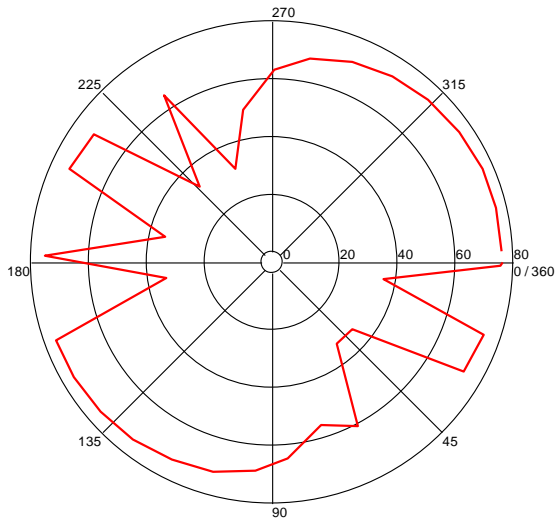
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver ()	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
868.02805585 M	41.22	21.900	0.000	50.30	-9.08	--	292	1.04	120 k	

Note: Average readings were obtained by applying average factor of 11.68 dB to peak readings.

Azimuth Plots

Turntable Plot (434.003206098 MHz)

Level (dBuV/m)

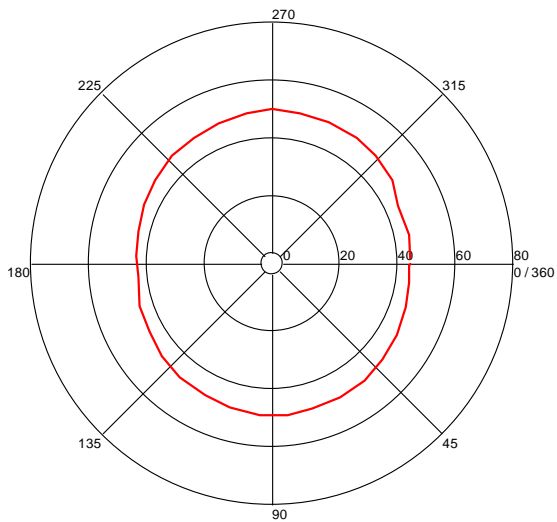


All Polarities

Azimuth (Degrees)

Turntable Plot (868.02805585 MHz)

Level (dBuV/m)

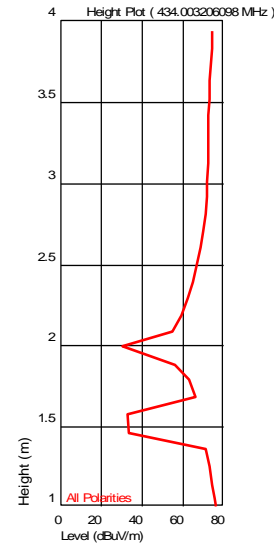


All Polarities

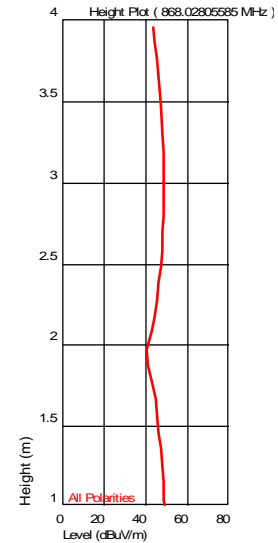
Azimuth (Degrees)

Turntable Plots

Height Plot (434.003206098 MHz)



Height Plot (868.02805585 MHz)



X-Axis (1-4.5 GHz)

Test Information

Test Details

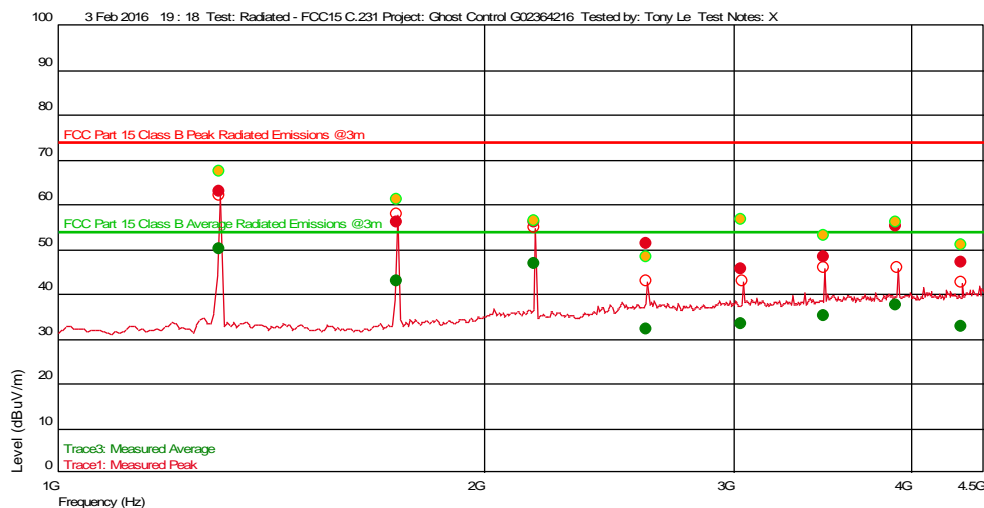
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated - FCC15 C.231 @ 3m
Ghost Control G02364216
X axis battery power
Tony Le
3 Feb 2016 19:18

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

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
3.038223113 G	45.41	32.836	-33.013	74.000	-28.59	--	175	2.17	1 M	
4.340253841 G	46.88	33.627	-30.583	74.000	-27.12	--	108	2.18	1 M	
3.472171009 G	48.25	33.046	-32.136	74.000	-25.75	--	63	3.49	1 M	
2.604061456 G	51.26	32.305	-33.822	74.000	-22.74	--	314	2.78	1 M	
3.906299265 G	54.94	33.565	-31.259	74.000	-19.06	--	62	2.16	1 M	
1.736065464 G	55.90	29.429	-35.014	74.000	-18.10	--	142	1.82	1 M	
2.17010688 G	55.90	31.424	-34.625	74.000	-18.10	--	353	2.19	1 M	
1.302037408 G	62.87	29.051	-35.135	74.000	-11.13	--	96	1.93	1 M	

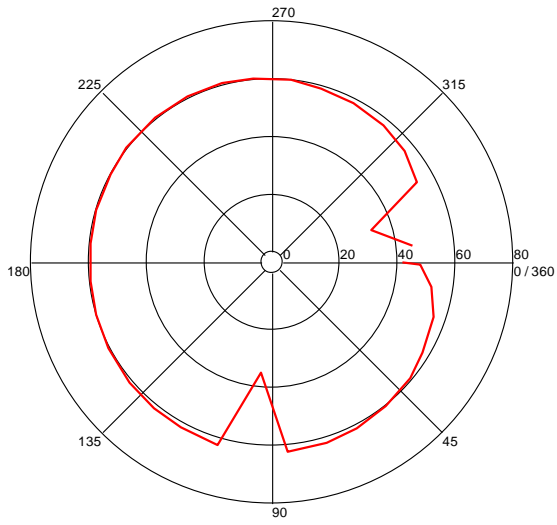
Trace3: Measured Average

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
2.604061456 G	32.10	32.305	-33.822	54.000	-21.90	--	314	2.78	1 M	
4.340253841 G	32.60	33.627	-30.583	54.000	-21.40	--	108	2.18	1 M	
3.038223113 G	33.34	32.836	-33.013	54.000	-20.66	--	175	2.17	1 M	
3.472171009 G	34.99	33.046	-32.136	54.000	-19.01	--	63	3.49	1 M	
3.906299265 G	37.57	33.565	-31.259	54.000	-16.43	--	62	2.16	1 M	
1.736065464 G	42.72	29.429	-35.014	54.000	-11.28	--	142	1.82	1 M	
2.17010688 G	46.83	31.424	-34.625	54.000	-7.17	--	353	2.19	1 M	
1.302037408 G	49.88	29.051	-35.135	54.000	-4.12	--	96	1.93	1 M	

Azimuth Plots

Turntable Plot (1.302037408 GHz)

Level (dBuV/m)

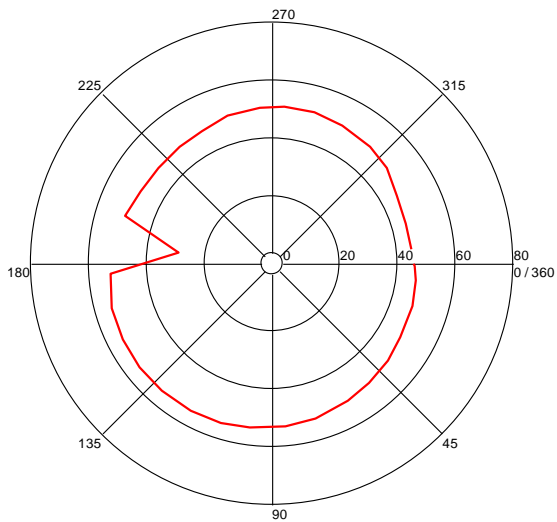


All Polarities

Azimuth (Degrees)

Turntable Plot (1.736065464 GHz)

Level (dBuV/m)

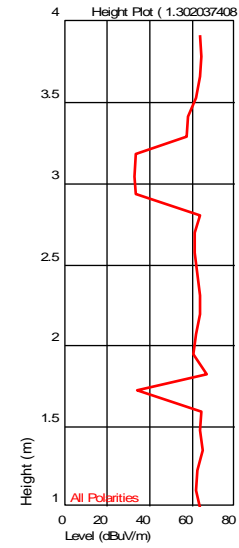


All Polarities

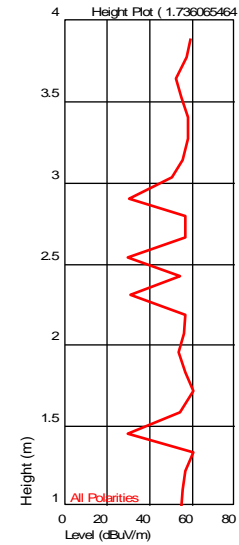
Azimuth (Degrees)

Turntable Plots

Height Plot (1.302037408 GHz)

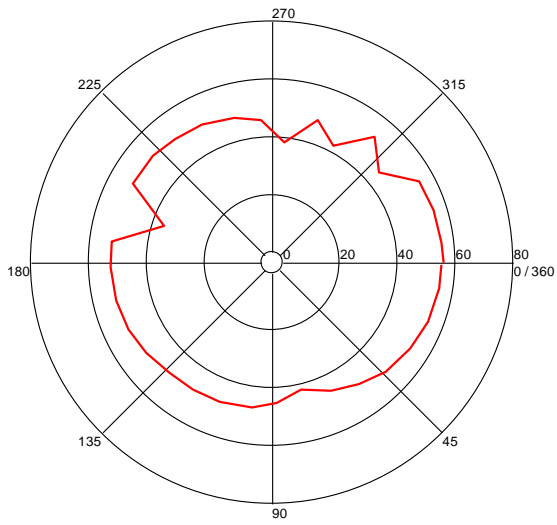


Height Plot (1.736065464 GHz)



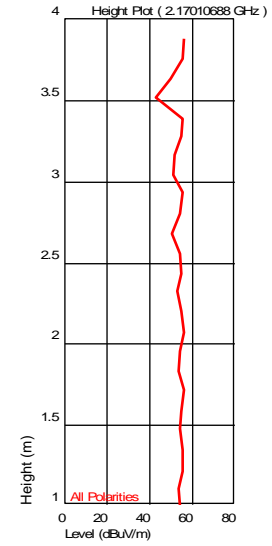
Turntable Plot (2.17010688 GHz)

Level (dBuV/m)



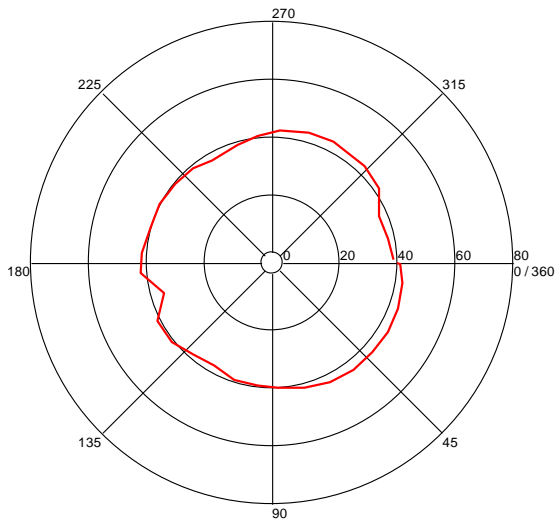
All Polarities

Azimuth (Degrees)



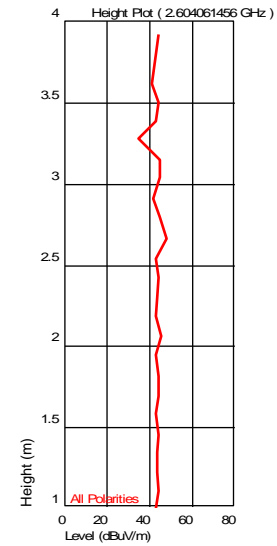
Turntable Plot (2.604061456 GHz)

Level (dBuV/m)



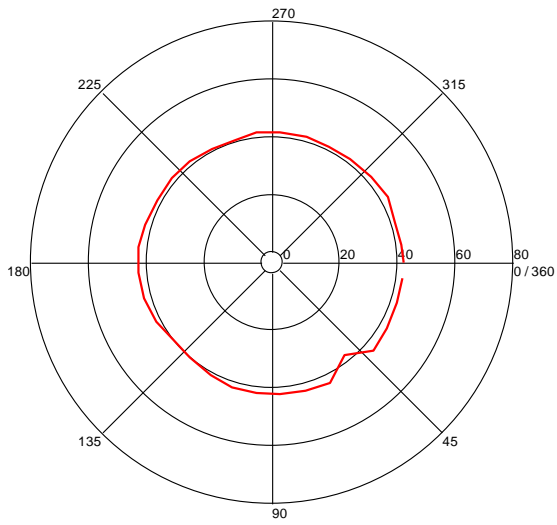
All Polarities

Azimuth (Degrees)



Turntable Plot (3.038223113 GHz)

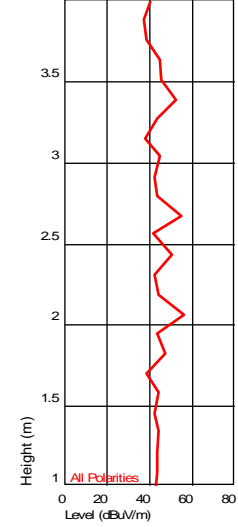
Level (dBuV/m)



All Polarities

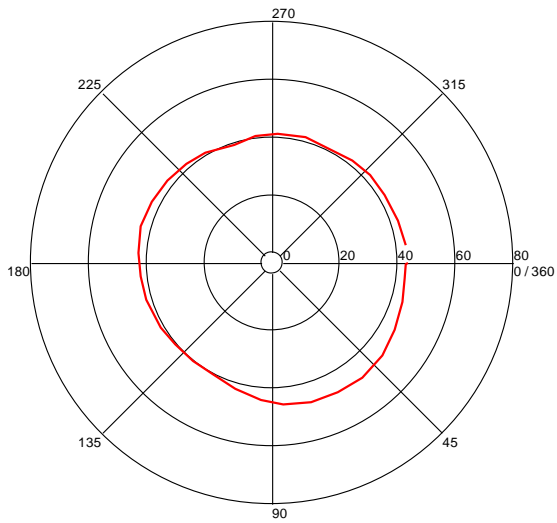
Azimuth (Degrees)

Height Plot (3.038223113 GHz)



Turntable Plot (3.472171009 GHz)

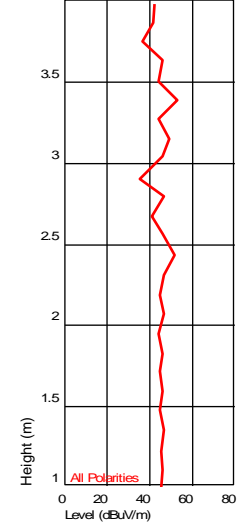
Level (dBuV/m)



All Polarities

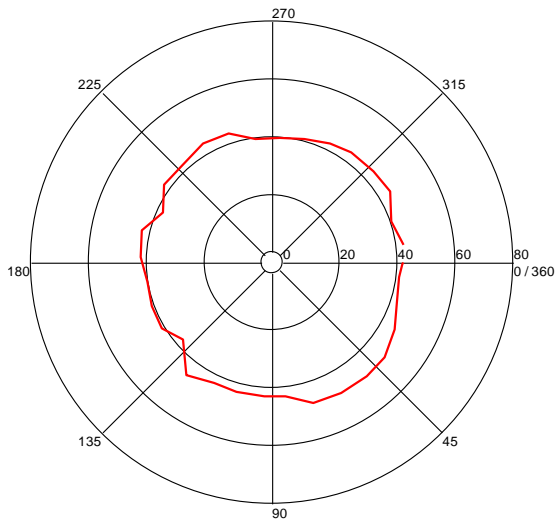
Azimuth (Degrees)

Height Plot (3.472171009 GHz)



Turntable Plot (3.906299265 GHz)

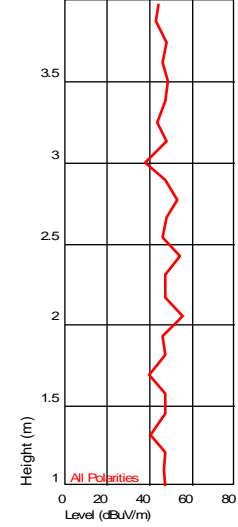
Level (dBuV/m)



All Polarities

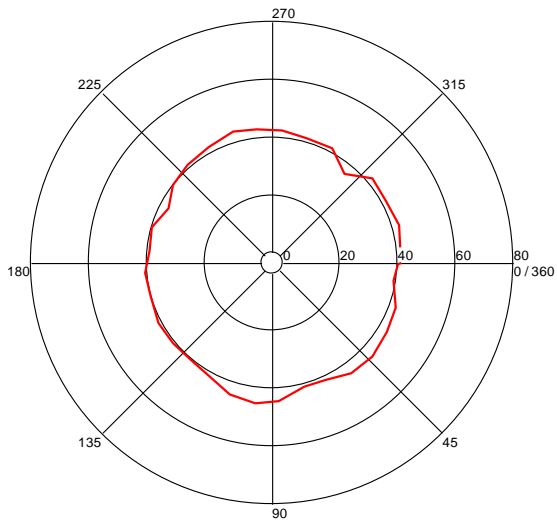
Azimuth (Degrees)

Height Plot (3.906299265 GHz)



Turntable Plot (4.340253841 GHz)

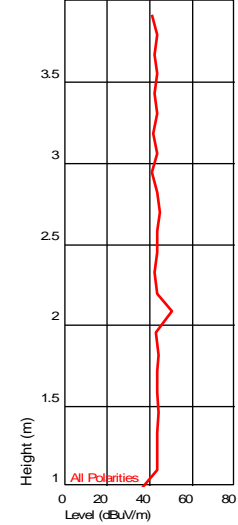
Level (dBuV/m)



All Polarities

Azimuth (Degrees)

Height Plot (4.340253841 GHz)



Y-Axis (1-4.5 GHz)

Test Information

Test Details

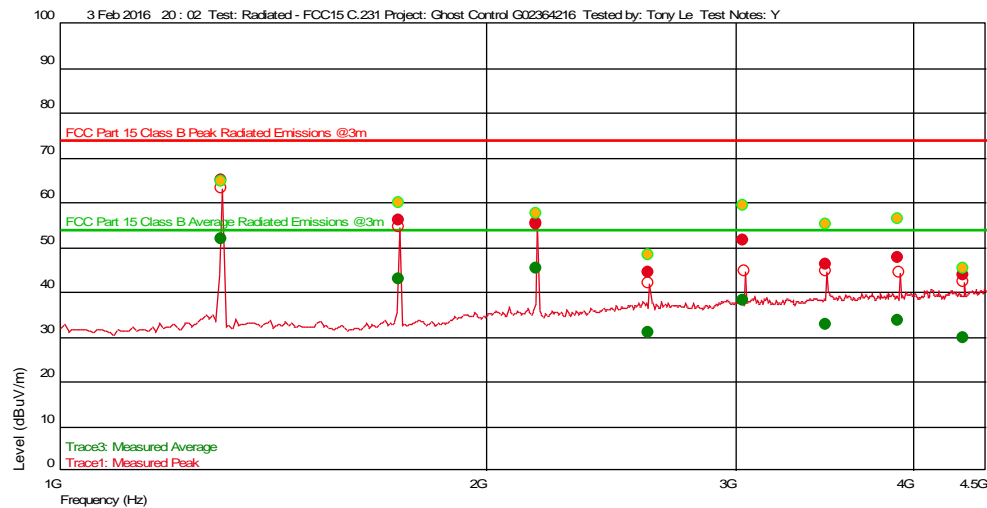
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated - FCC15 C.231 @ 3m
Ghost Control G02364216
Y axis battery power
Tony Le
3 Feb 2016 20 : 02

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

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
4.346599867 G	43.73	33.634	-30.574	74.000	-30.27	--	297	2.44	1 M	
2.604195057 G	44.35	32.305	-33.822	74.000	-29.65		141	3.12	1 M	
3.472184369 G	46.10	33.046	-32.136	74.000	-27.90	--	53	1.57	1 M	
3.906285905 G	47.62	33.565	-31.259	74.000	-26.38	--	51	3.51	1 M	
3.038089512 G	51.51	32.836	-33.013	74.000	-22.49	--	335	2.36	1 M	
2.1701002 G	55.11	31.424	-34.625	74.000	-18.89	--	198	2.07	1 M	
1.736058784 G	55.90	29.429	-35.014	74.000	-18.10	--	2	2.16	1 M	
1.302024048 G	64.79	29.051	-35.135	74.000	-9.21	--	19	3.79	1 M	

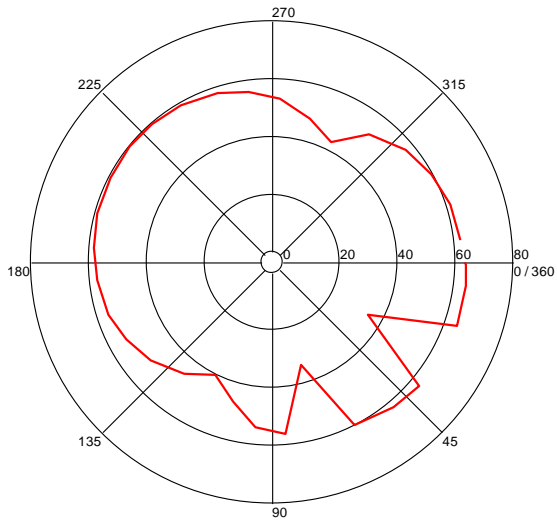
Trace3: Measured Average

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
4.346599867 G	29.75	33.634	-30.574	54.000	-24.25	--	297	2.44	1 M	
2.604195057 G	30.87	32.305	-33.822	54.000	-23.13		141	3.12	1 M	
3.472184369 G	32.61	33.046	-32.136	54.000	-21.39	--	53	1.57	1 M	
3.906285905 G	33.64	33.565	-31.259	54.000	-20.36	--	51	3.51	1 M	
3.038089512 G	38.01	32.836	-33.013	54.000	-15.99	--	335	2.36	1 M	
1.736058784 G	42.79	29.429	-35.014	54.000	-11.21	--	2	2.16	1 M	
2.1701002 G	45.33	31.424	-34.625	54.000	-8.67	--	198	2.07	1 M	
1.302024048 G	51.83	29.051	-35.135	54.000	-2.17	--	19	3.79	1 M	

Azimuth Plots

Turntable Plot (1.302024048 GHz)

Level (dBuV/m)

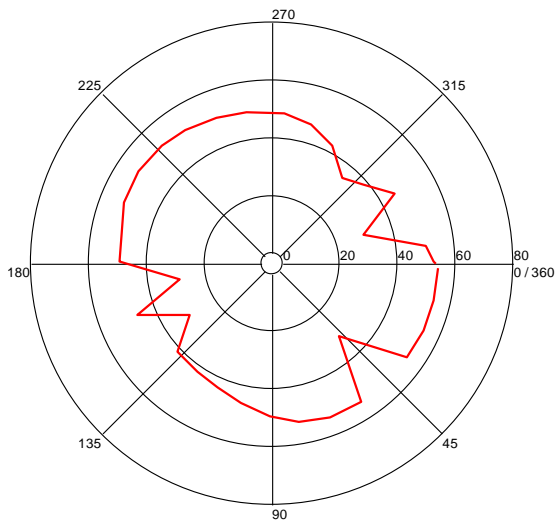


All Polarities

Azimuth (Degrees)

Turntable Plot (1.736058784 GHz)

Level (dBuV/m)

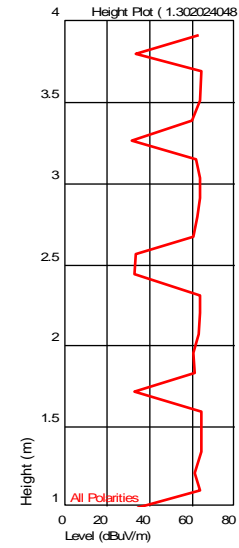


All Polarities

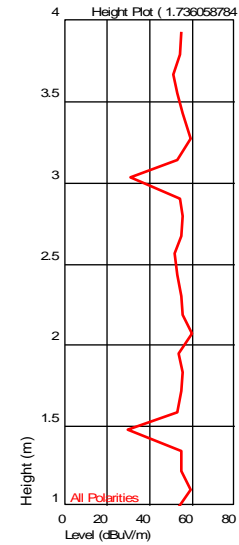
Azimuth (Degrees)

Turntable Plots

Height Plot (1.302024048 GHz)

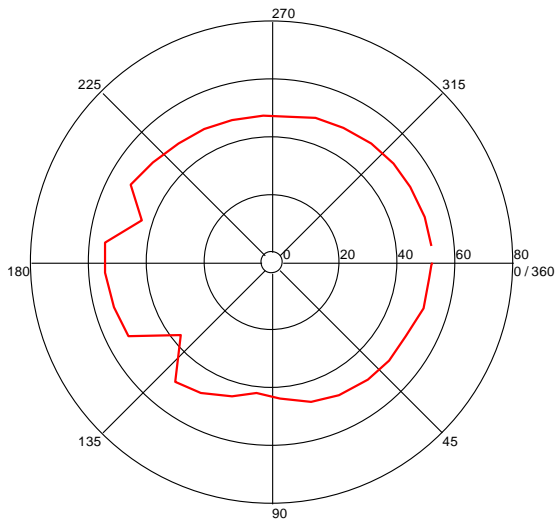


Height Plot (1.736058784 GHz)



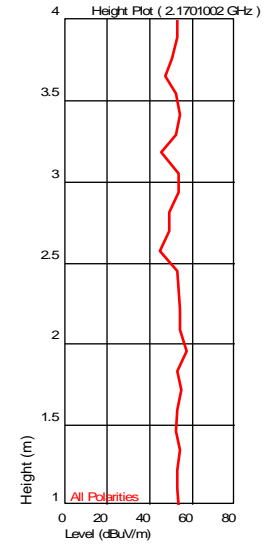
Turntable Plot (2.1701002 GHz)

Level (dBuV/m)



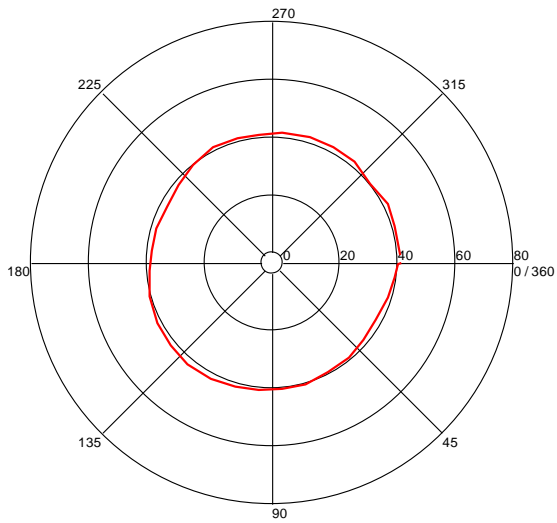
All Polarities

Azimuth (Degrees)



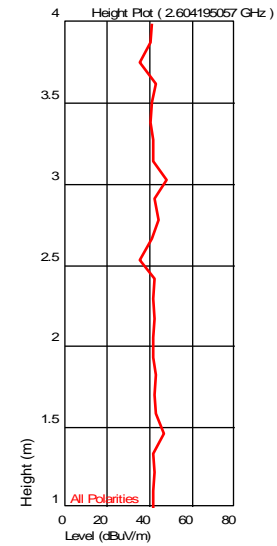
Turntable Plot (2.604195057 GHz)

Level (dBuV/m)



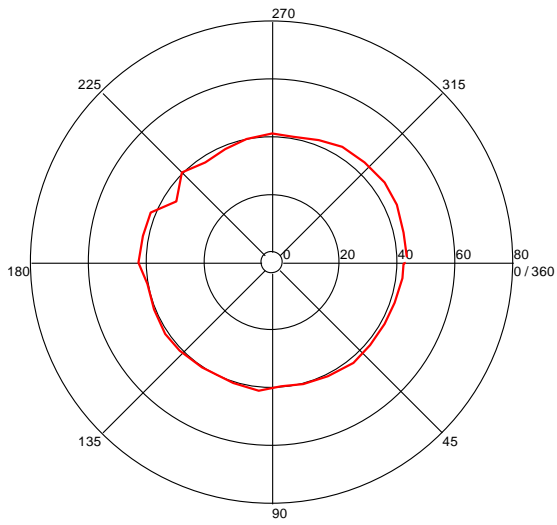
All Polarities

Azimuth (Degrees)



Turntable Plot (3.038089512 GHz)

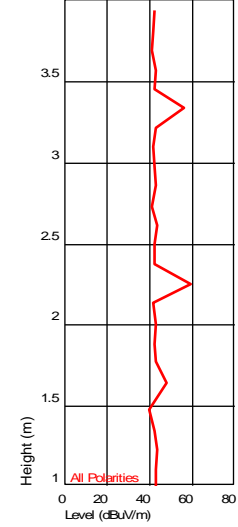
Level (dBuV/m)



All Polarities

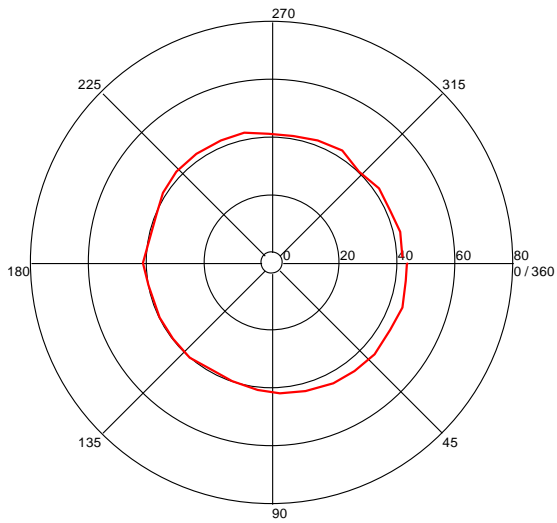
Azimuth (Degrees)

Height Plot (3.038089512 GHz)



Turntable Plot (3.472184369 GHz)

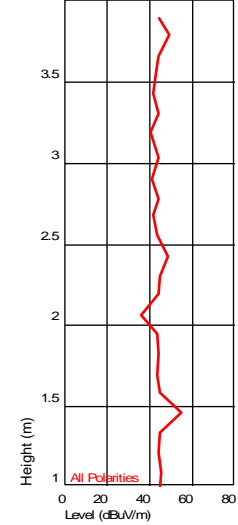
Level (dBuV/m)



All Polarities

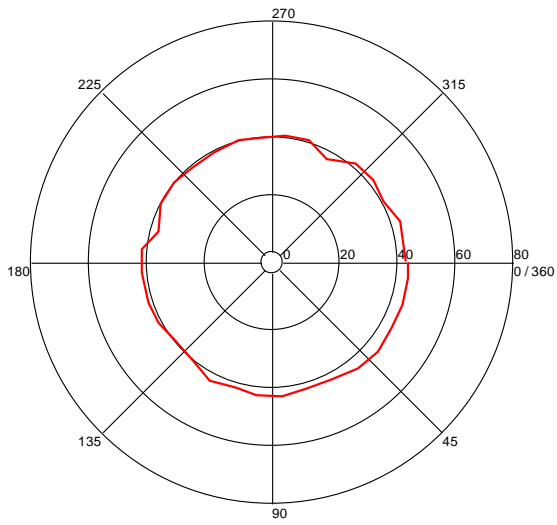
Azimuth (Degrees)

Height Plot (3.472184369 GHz)



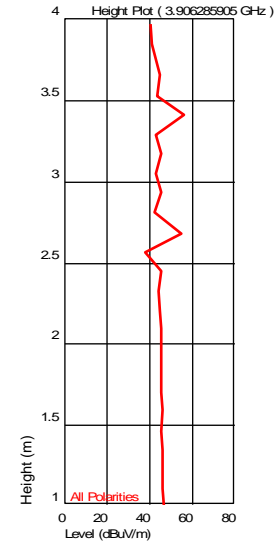
Turntable Plot (3.906285905 GHz)

Level (dBuV/m)



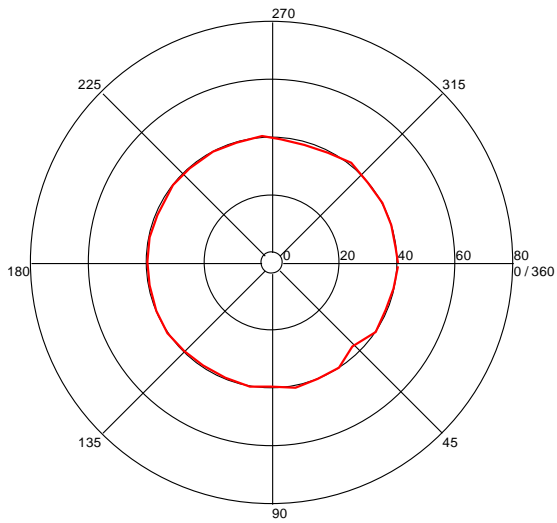
All Polarities

Azimuth (Degrees)



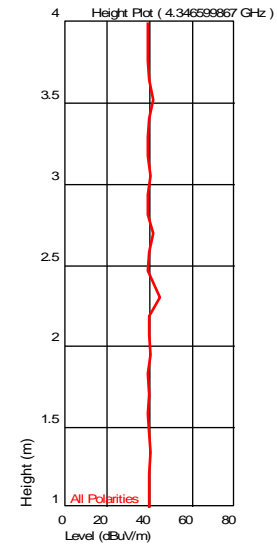
Turntable Plot (4.346599867 GHz)

Level (dBuV/m)



All Polarities

Azimuth (Degrees)



Z-Axis (1-4.5 GHz)

Test Information

Test Details

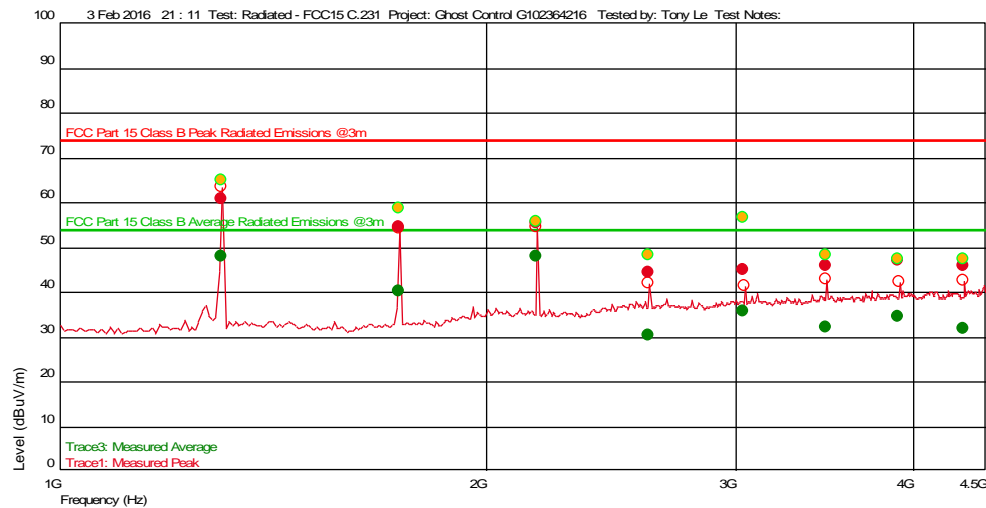
Test:
Project:
Test Notes:
Tested by:
Test Started:

User Entry

Radiated - FCC15 C.231 @ 3m
Ghost Control G102364216
Z Axis Battery power
Tony Le
3 Feb 2016 21:11

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

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
2.604054776 G	44.35	32.305	-33.822	74.000	-29.65		223	3.60	1 M	
3.038142952 G	45.01	32.836	-33.013	74.000	-28.99	--	110	3.51	1 M	
4.340253841 G	45.81	33.627	-30.583	74.000	-28.19		233	3.25	1 M	
3.472217769 G	45.82	33.046	-32.136	74.000	-28.18		215	3.26	1 M	
3.906212425 G	47.08	33.566	-31.259	74.000	-26.92		231	1.78	1 M	
1.736038744 G	54.47	29.429	-35.014	74.000	-19.53		185	2.62	1 M	
2.17016032 G	55.37	31.424	-34.625	74.000	-18.63		211	1.44	1 M	
1.302077488 G	60.76	29.051	-35.135	74.000	-13.24		151	1.80	1 M	

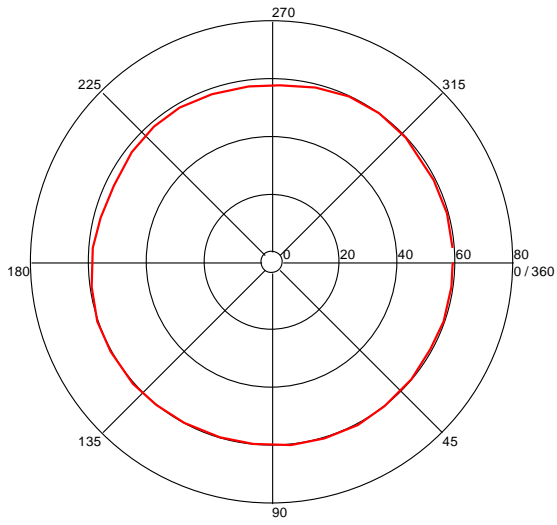
Trace3: Measured Average

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
2.604054776 G	30.18	32.305	-33.822	54.000	-23.82		223	3.60	1 M	
4.340253841 G	31.80	33.627	-30.583	54.000	-22.20		233	3.25	1 M	
3.472217769 G	31.99	33.046	-32.136	54.000	-22.01		215	3.26	1 M	
3.906212425 G	34.58	33.566	-31.259	54.000	-19.42		231	1.78	1 M	
3.038142952 G	35.77	32.836	-33.013	54.000	-18.23	--	110	3.51	1 M	
1.736038744 G	40.14	29.429	-35.014	54.000	-13.86		185	2.62	1 M	
2.17016032 G	47.79	31.424	-34.625	54.000	-6.21		211	1.44	1 M	
1.302077488 G	47.94	29.051	-35.135	54.000	-6.06		151	1.80	1 M	

Azimuth Plots

Turntable Plot (1.302077488 GHz)

Level (dBuV/m)

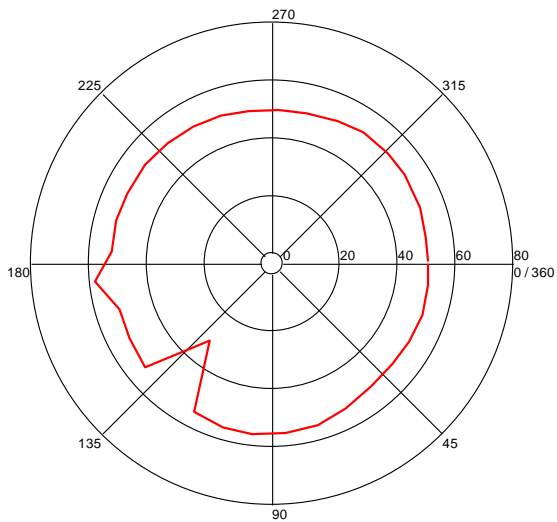


All Polarities

Azimuth (Degrees)

Turntable Plot (1.736038744 GHz)

Level (dBuV/m)

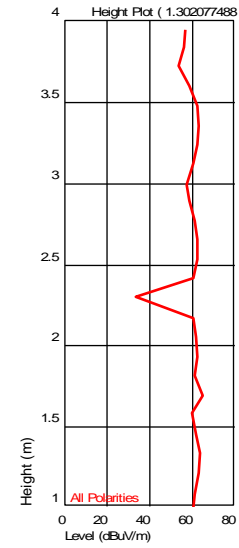


All Polarities

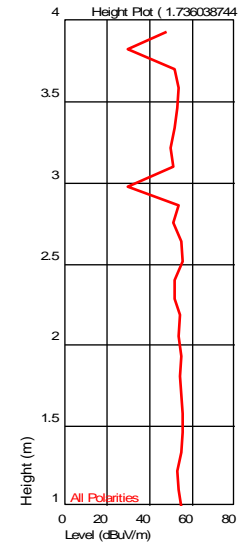
Azimuth (Degrees)

Turntable Plots

Height Plot (1.302077488 GHz)

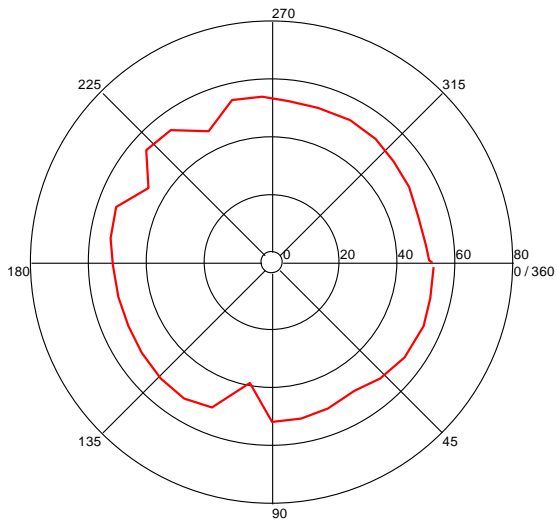


Height Plot (1.736038744 GHz)



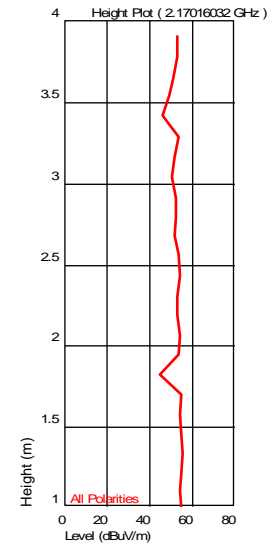
Turntable Plot (2.17016032 GHz)

Level (dBuV/m)



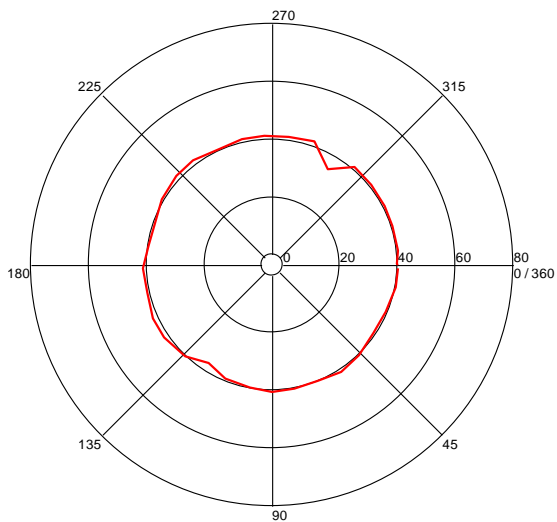
All Polarities

Azimuth (Degrees)



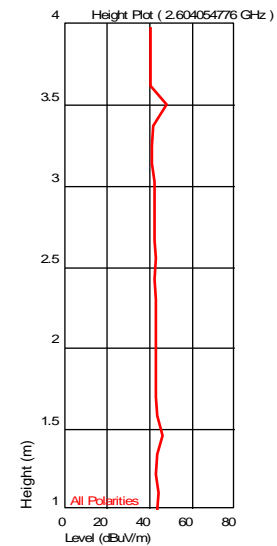
Turntable Plot (2.604054776 GHz)

Level (dBuV/m)



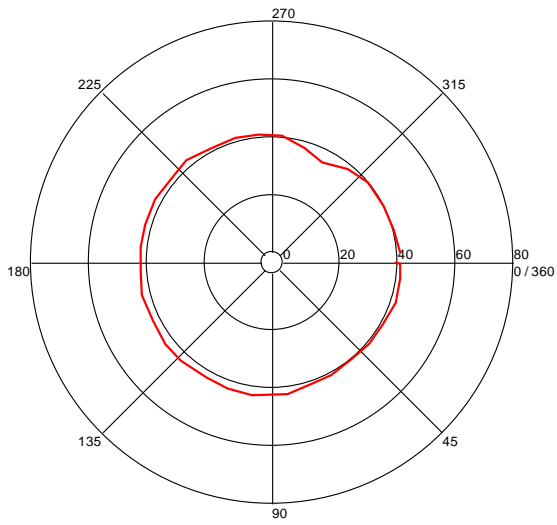
All Polarities

Azimuth (Degrees)



Turntable Plot (3.038142952 GHz)

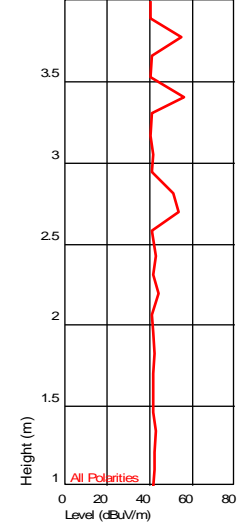
Level (dBuV/m)



All Polarities

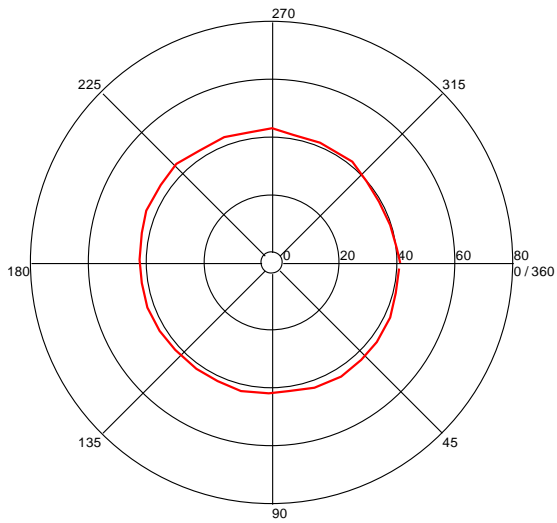
Azimuth (Degrees)

Height Plot (3.038142952 GHz)



Turntable Plot (3.472217769 GHz)

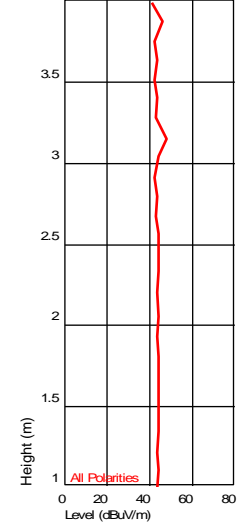
Level (dBuV/m)



All Polarities

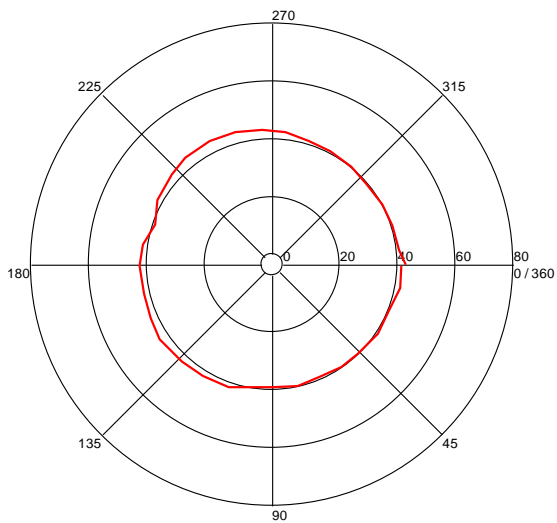
Azimuth (Degrees)

Height Plot (3.472217769 GHz)



Turntable Plot (3.906212425 GHz)

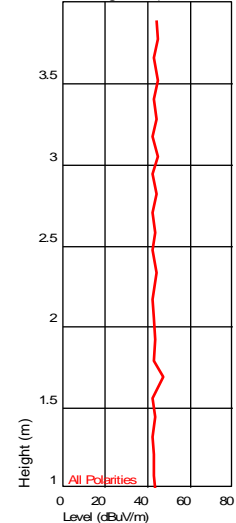
Level (dBuV/m)



All Polarities

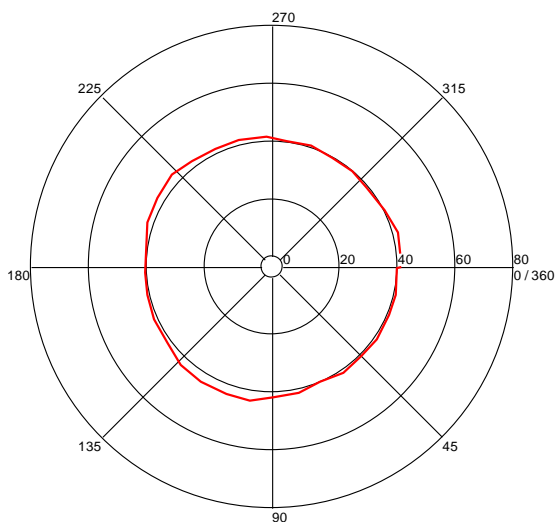
Azimuth (Degrees)

Height Plot (3.906212425 GHz)



Turntable Plot (4.340253841 GHz)

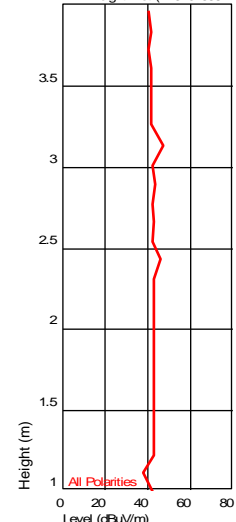
Level (dBuV/m)



All Polarities

Azimuth (Degrees)

Height Plot (4.340253841 GHz)



Test Personnel: Tony Le
 Supervising/Reviewing Engineer:
 (Where Applicable)
 Product Standard: 15.231 and RSS-210
 Input Voltage: Fresh battery
 Pretest Verification w/ Ambient Signals or BB Source: Yes

Test Date: 02/03/2016

Limit Applied: Below specified limits

Ambient Temperature: 22 °C

Relative Humidity: 18 %

Atmospheric Pressure: 1005 mbars

Deviations, Additions, or Exclusions: None

9 Duty Cycle

9.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisp
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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.

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV002'	Weather Station	Davis Instruments	7400	PE80519A93	09/28/2015	09/28/2016
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/14/2015	03/14/2016
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	11/10/2015	11/10/2016
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/01/2015	09/01/2016

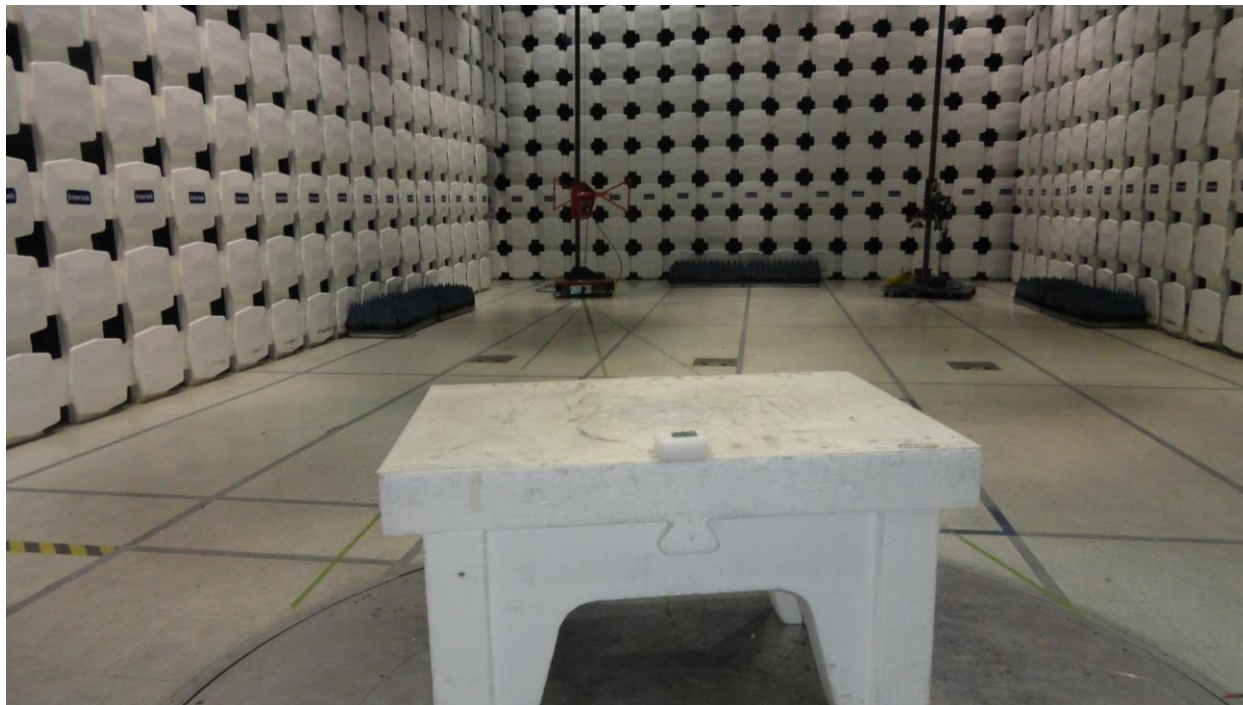
Software Utilized:

Name	Manufacturer	Version
None		

9.3 Results:

The sample tested was found to Comply. There is no limit on duty cycle, it is used to obtain the average value of emissions. The duty cycle average factor was determined to be 11.68 dB.

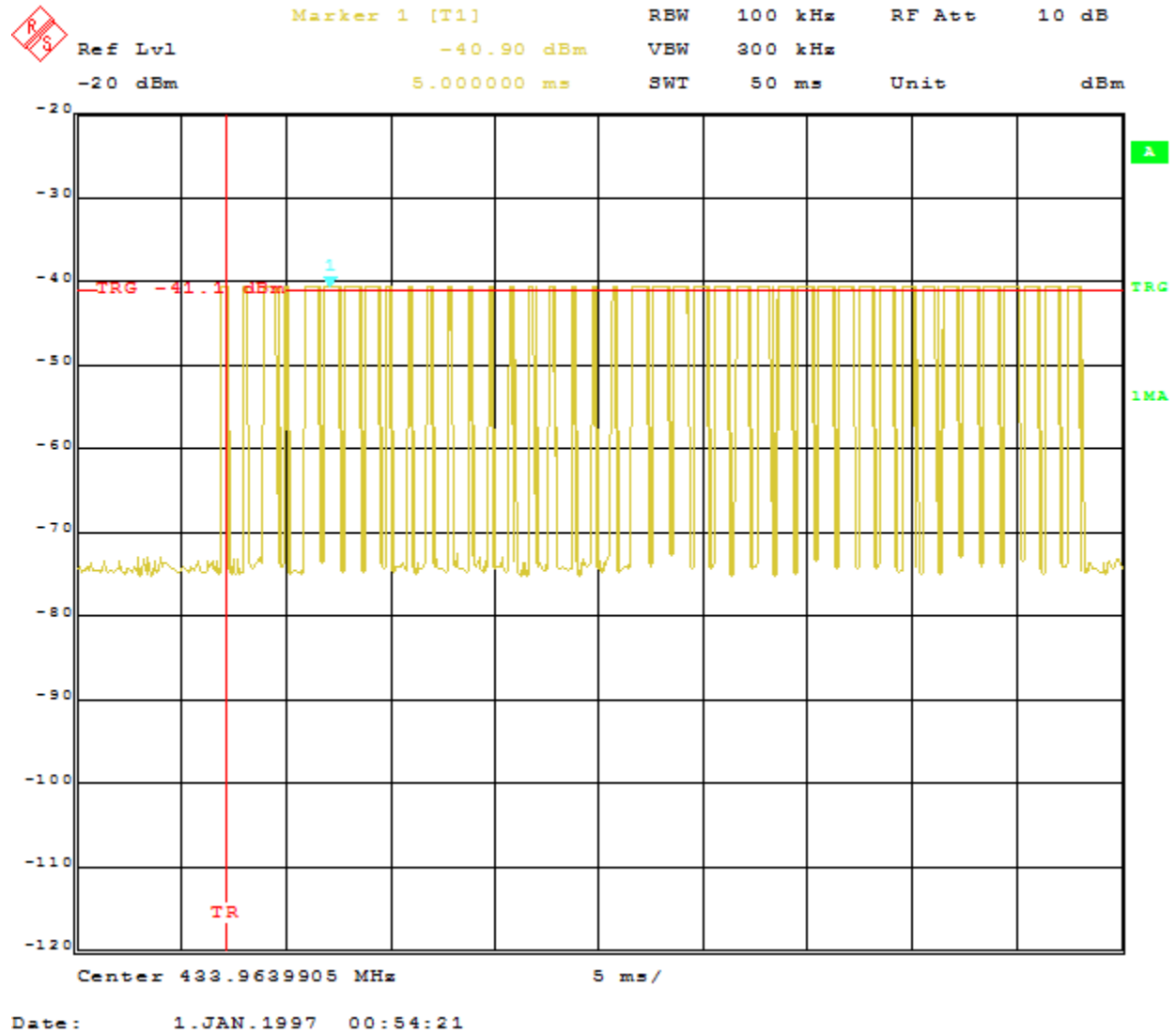
9.4 Setup Photograph:

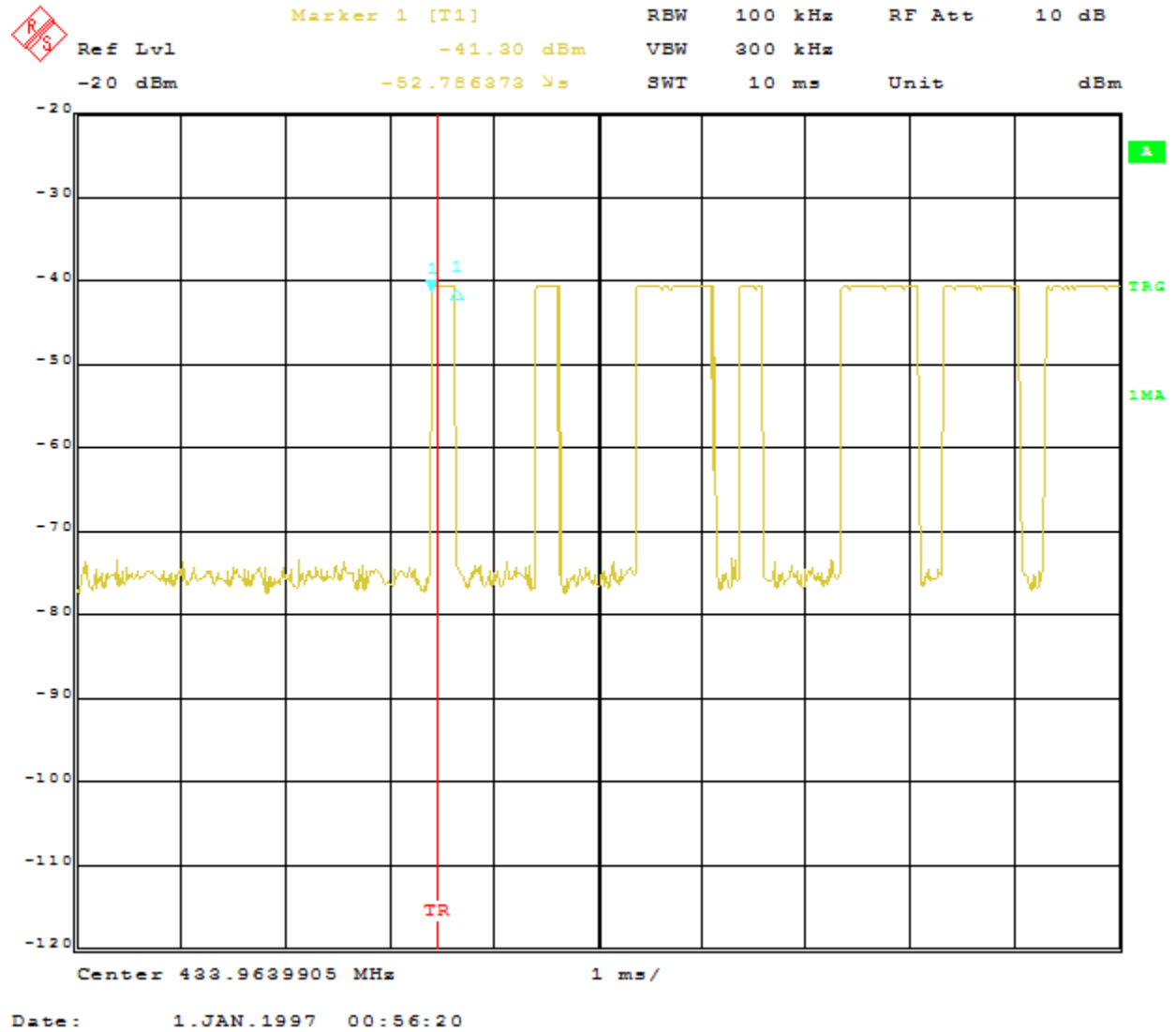


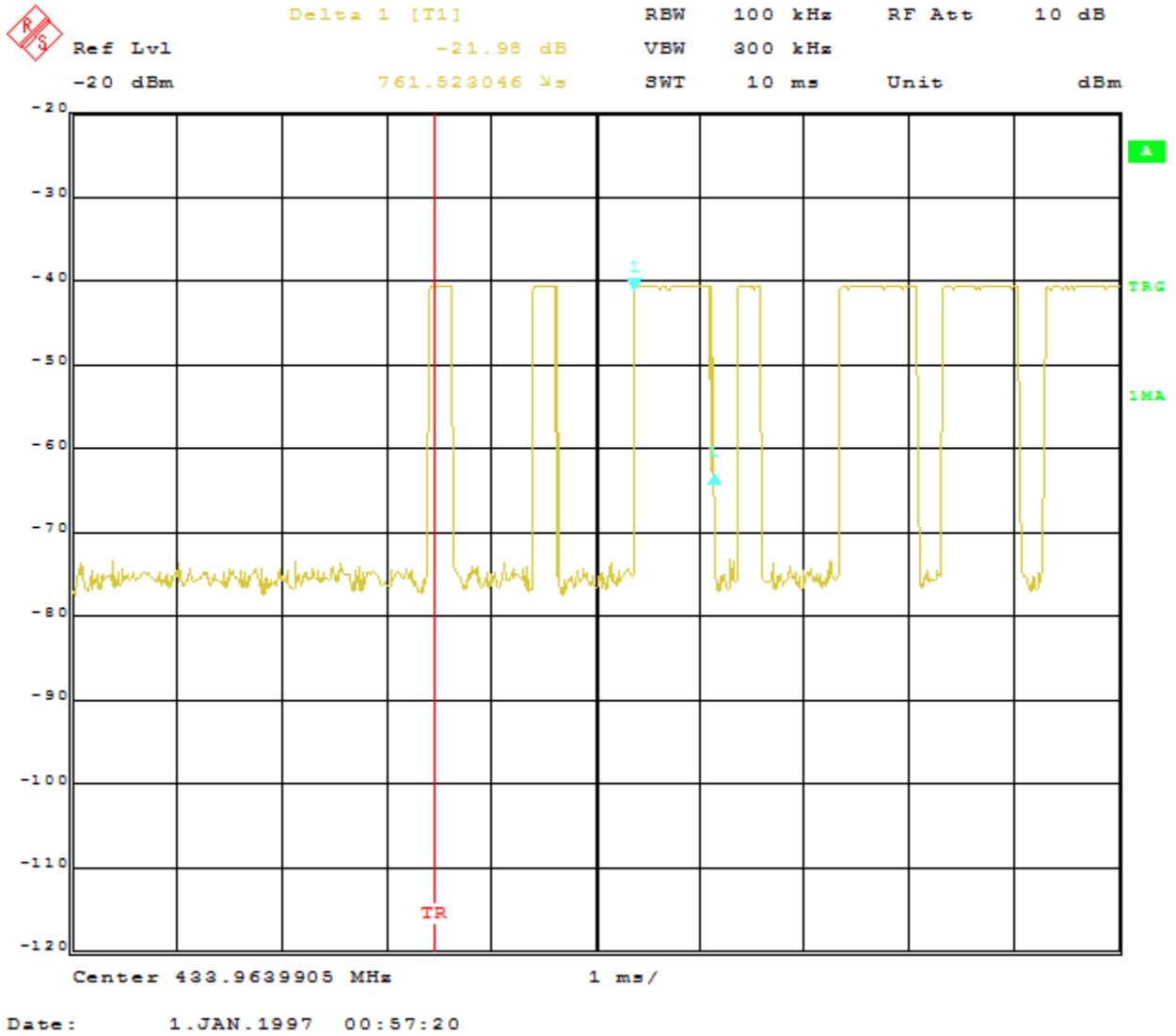
9.5 Plots/Data:

Burst is 21.353 ms

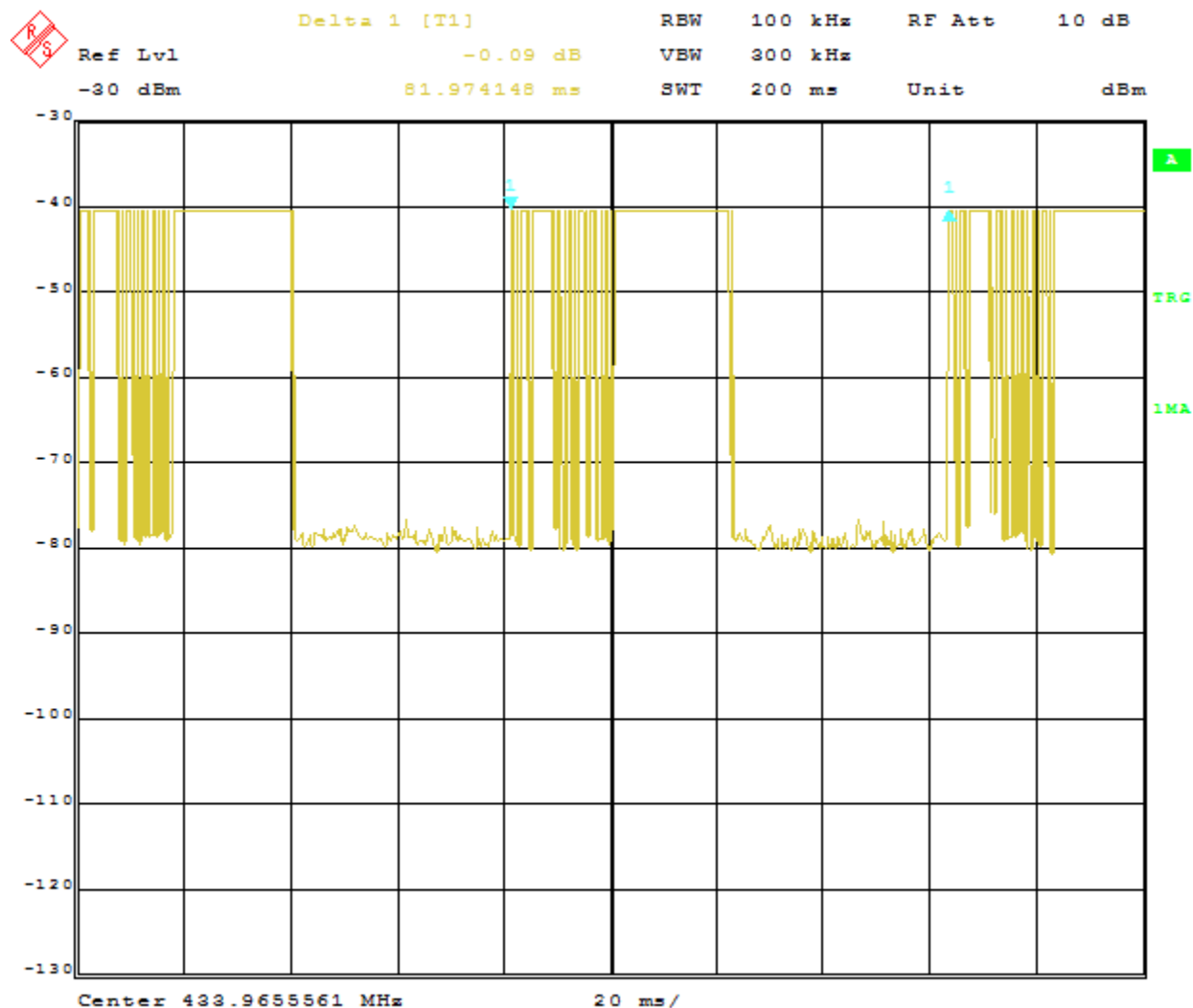
ON time of short pulses = $15 * 52.7864 \text{ uS}$ or 791.796 uS
 ON time of long pulses = $27 * 761.5230 \text{ uS}$ or $20,561.121 \text{ uS}$







Period of the burst is 81.974 ms



Date: 1.JAN.1997 00:57:46

Note that date on the plot was the equipment manufacturer's default date

Average factor = $20 \cdot \text{LOG}(21.353/81.94) = 11.68 \text{ dB}$

Test Personnel: Kouma Sinn *KPS*
 Supervising/Reviewing
 Engineer:
 (Where Applicable) N/A
 Product Standard: FCC 15.231 and RSS-210
 Input Voltage: Fresh batteries
 Pretest Verification w/
 Ambient Signals or
 BB Source: Yes

Test Date: 03/29/2016
 Limit Applied: Below specified limits
 Ambient Temperature: 20 °C
 Relative Humidity: 9 %
 Atmospheric Pressure: 999 mbars

Deviations, Additions, or Exclusions: None

10 5 Second Shut off

10.1 Method

Tests are performed in accordance with FCC 47CFR Part 15 Subpart C Section 15.231 and RSS 210.

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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucisp
Radiated Emissions, 10m	30-1000 MHz	4.6 dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} 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.

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV002'	Weather Station	Davis Instruments	7400	PE80519A93	09/28/2015	09/28/2016
145128'	EMI Receiver (20 Hz - 40 Ghz)	Rohde & Schwarz	ESIB 40	839283/001	03/14/2015	03/14/2016
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	11/10/2015	11/10/2016
145-410'	Cables 145-400 145-403 145-405 145-406 145-407	Huber + Suhner	10m Track A Cables	multiple	09/01/2015	09/01/2016

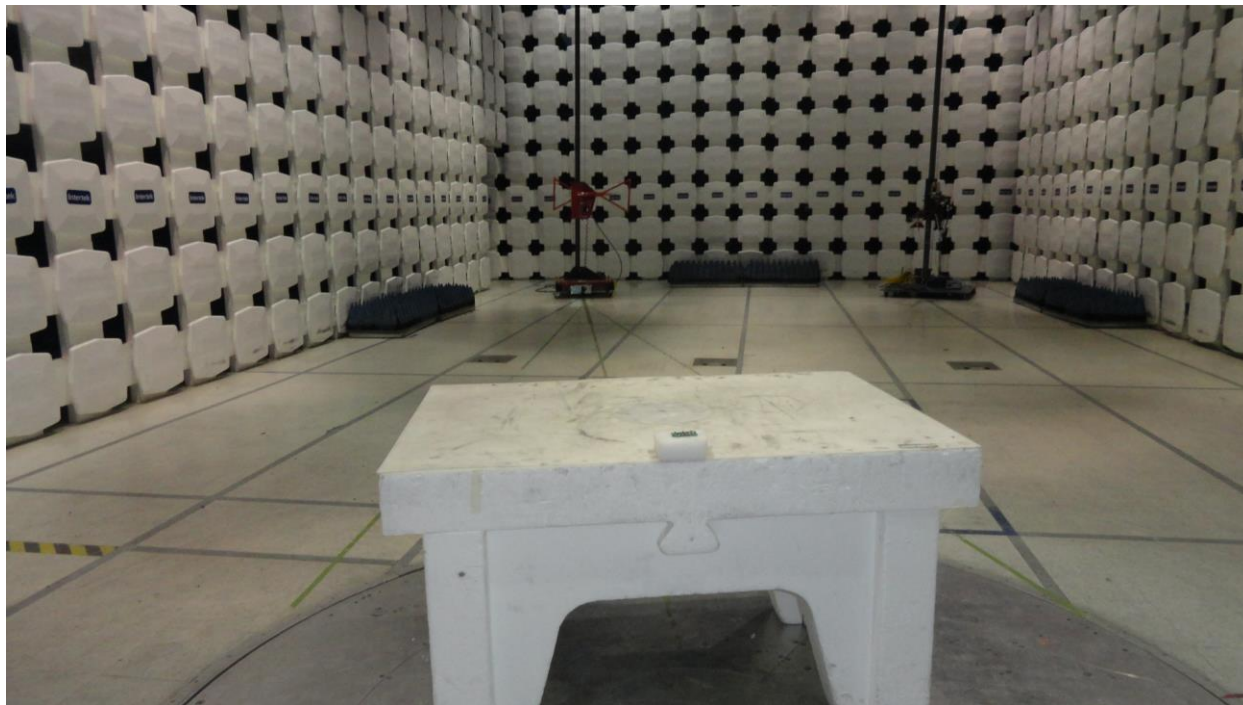
Software Utilized:

Name	Manufacturer	Version
None		

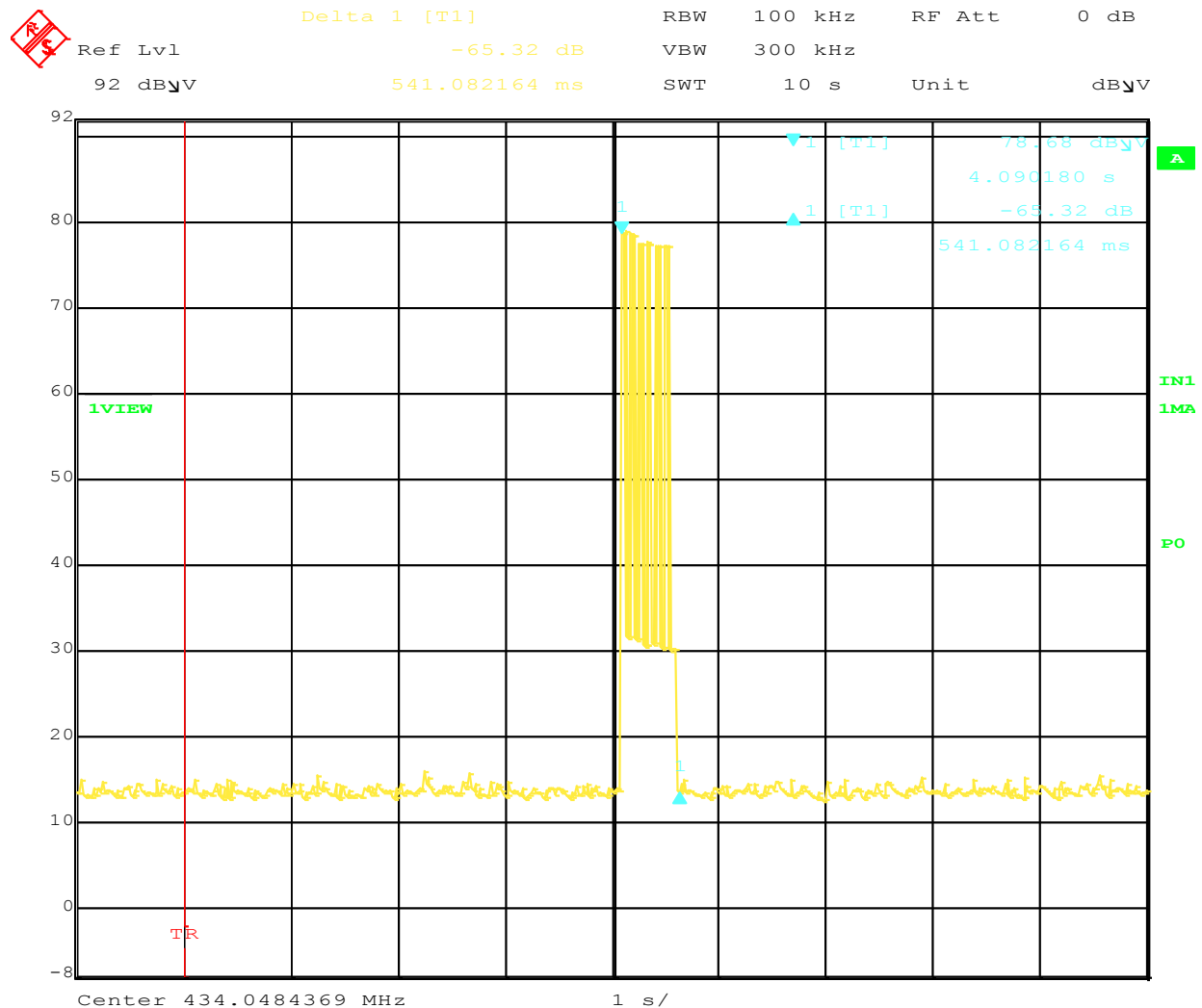
10.3 Results:

The sample tested was found to Comply. A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

10.4 Setup Photograph:



10.5 Plots/Data:



Date: 12.JAN.2016 21:24:24

Total on time when the button is pressed and released is 541.082 ms

Test Personnel: Vathana Ven

Supervising/Reviewing Engineer: N/A

(Where Applicable) Product Standard: 15.231 and RSS-210

Input Voltage: Fresh battery

Pretest Verification w/ Ambient Signals or BB Source: Yes

Test Date: 01/12/2016

Limit Applied: Below specified limits

Ambient Temperature: 23 °C

Relative Humidity: 42 %

Atmospheric Pressure: 1005 mbars

Deviations, Additions, or Exclusions: None

11 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	02/11/2016	102364216BOX-001a	VFV <i>VFV</i>	KPS <i>KPS</i>	Original Issue
1	03/11/2016	102364216BOX-001b	VFV <i>VFV</i>	KPS <i>KPS</i>	Updated duty cycle calculation, corrected fundamental and harmonics limits
2	04/05/2016	102364216BOX-001c	VFV <i>VFV</i>	MFM <i>MFM</i>	Corrected duty cycle calculation
3	04/18/2016	102364216BOX-001d	VFV <i>VFV</i>	MFM <i>MFM</i>	Fixed margin on pages 16 and 18