EMISSIONS TEST REPORT

Report Number: 101276754BOX-001
Project Number: G101276754

Report Issue Date: 08/18/2013

Product Designation: Troy 2.0 (Part of 7000C Wireless Communicator)

Standards: FCC 47CFR Part 15:2013 Subpart C 15.249
FCC 47CFR Part 15:2013 Subpart B Class B
RSS-210 Issue 8 December 2010
ICES-003 Issue 5 August 2012

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

Client:
Lifeline System Inc.
111 Lawrence Street
Framingham, MA 01702-8156
USA

Report prepared by Reviewer

Kouma Sinn / Senior Project Engineer

Report reviewed by

Michael F. Murphy / Sr. Staff Engineer, EMC

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.

2 Test Summary

Section	Test full name	Result
3	Client Information	--
4	Description of Equipment Under Test	--
5	System Setup and Method	--
6	Fundamental Frequency Radiated Emissions FCC 47CFR Part 15:2013 Subpart C 15.249, RSS-210 Issue 8 December 2010	Pass
--	AC Mains Conducted Emissions	N/A
7	Transmitter Spurious Radiated Emissions FCC 47CFR Part 15:2013 Subpart C 15.249, 15.209 RSS-210 Issue 8 December 2010, ICES-003 Issue 5 August 2012	Pass
8	Receiver Spurious Radiated Emissions FCC 47CFR Part 15:2013 Subpart B Class B ICES-003 Issue 5 August 2012	Pass
9	20 dB Bandwidth FCC 47CFR Part 15:2013 Subpart C 15.249, RSS-210 Issue 8 December 2010	Pass
10	Revision History	--

3 Client Information

This EUT was tested at the request of:

Client: Lifeline System Inc.
111 Lawrence Street
Framingham, MA 01702-8156 USA
Contact: Escipion Baez
Telephone: (508) 988-3032
Fax: (508) 988-1384
Email: Escipion.Baez@philips.com

4 Description of Equipment Under Test

Manufacturer: Lifeline System Inc.
111 Lawrence Street
Framingham, MA 01702-8156 USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Alert Pendant	Lifeline System Inc.	Troy 2.0	0002

Receive Date:	08/05/2013
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
The EUT is an alert pendant (Help Button). It is part of the Philips Lifeline Medical Alert Service HomeSafe System. It normal uses with the 7000C Wireless Communicator.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3.6VDC (Internal Battery)	N/A	N/A	N/A

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmit Mode at 917 MHz, 919 MHz, and 921 MHz
2	Idle/Receive

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	None

5 System Setup and Method

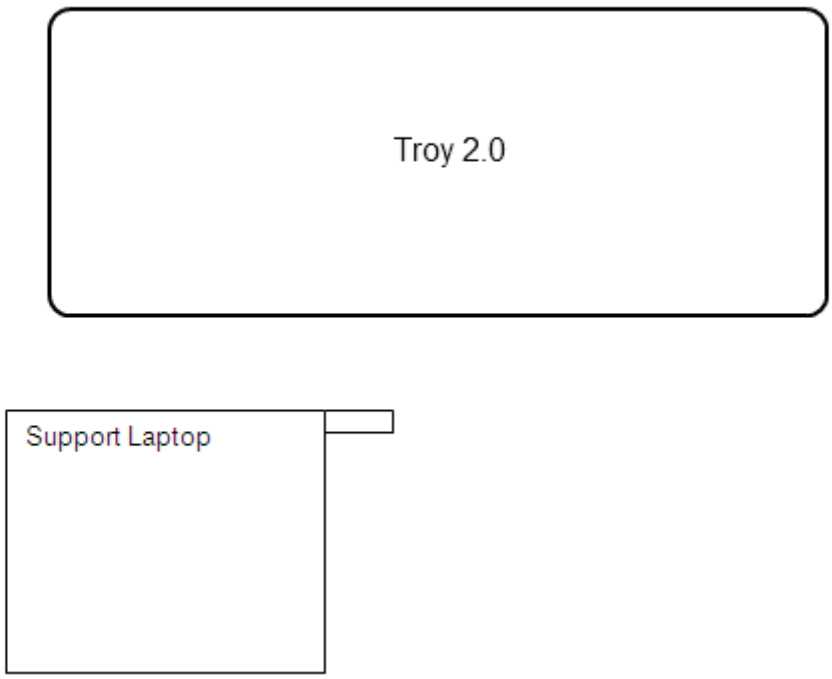
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
	None				

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None			

5.1 Method:

Configuration as required by FCC 47CFR Part 15:2013 Subpart C 15.249, FCC 47CFR Part 15:2013 Subpart B Class B, RSS-210 Issue 8 December 2010 ICES-003 Issue 5 August 2012, and ANSI C63.4:2009.

5.2 EUT Block Diagram:



6 Fundamental Frequency Radiated Emissions

6.1 Method

Tests are performed in accordance with FCC 47CFR Part 15:2013 Subpart C 15.249, RSS-210 Issue 8 December 2010 ICES-003 Issue 5 August 2012, 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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

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

Sample Calculation

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

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

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

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

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

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

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

Example:

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

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	09/25/2012	09/25/2014
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	09/04/2012	09/04/2013
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
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013

Software Utilized:

Name	Manufacturer	Version
C5	Teseq	5.26.46.46

6.3 Results:

The sample tested found to Comply.

6.4 Setup Photographs:

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC
Test Setups(7000AHB)

Y-Axis (EUT on its long side)

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC Test Setups(7000AHB)

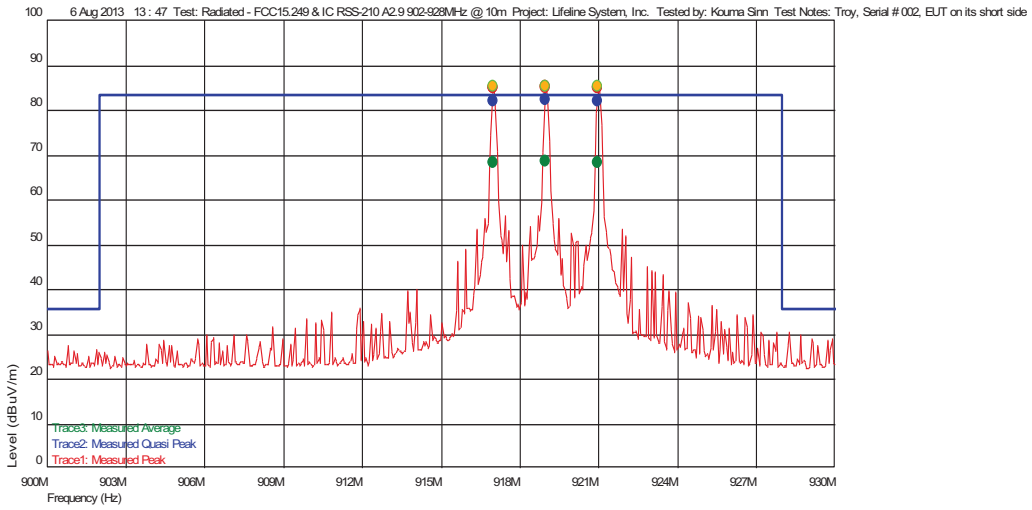
6.5 Plots/Data:

X-Axis (EUT on its short side)

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy, Serial # 002, EUT on its short side	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Kouma Sinn	
Test Started:	6 Aug 2013 13 : 47	

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

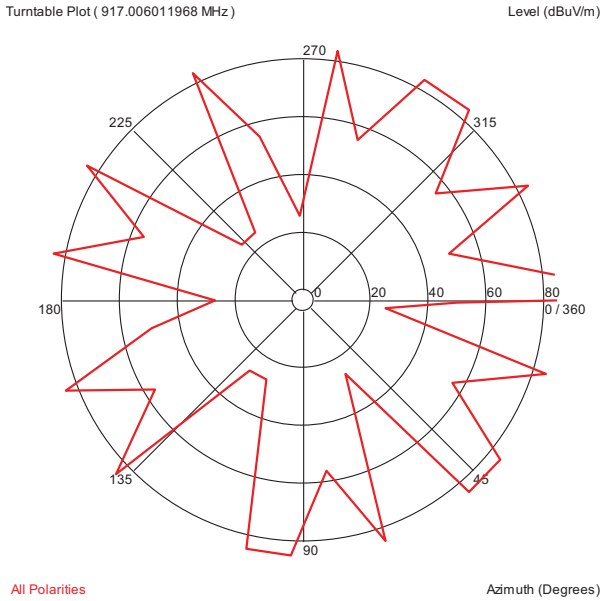
Trace1: Measured Peak

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
917.006011968 M	84.91	22.800	-22.883	--	--	|	115	1.98	120 k	
920.983567206 M	85.00	22.820	-22.892	--	--	|	106	1.87	120 k	
918.991583174 M	85.12	22.800	-22.887	--	--	|	115	1.98	120 k	

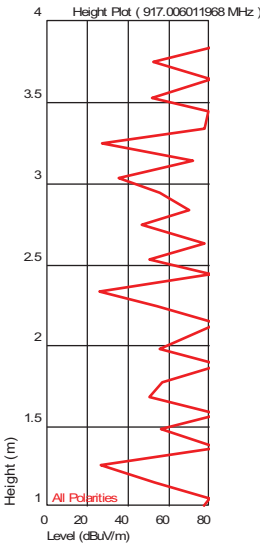
Trace2: Measured Quasi Peak

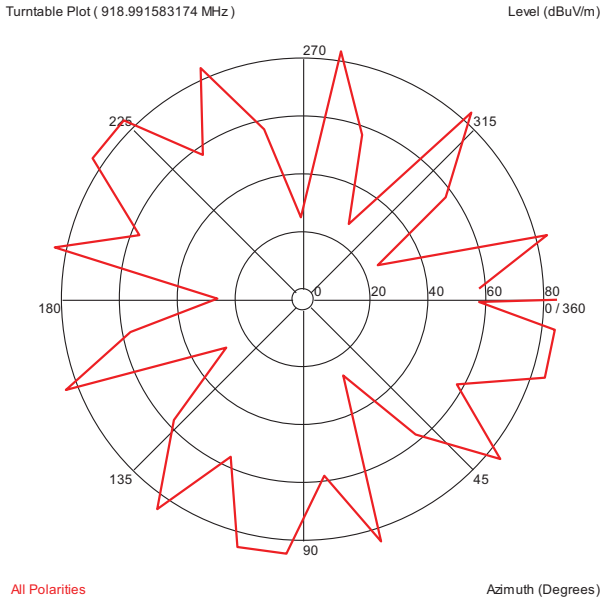
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
917.006011968 M	82.03	22.800	-22.883	83.520	-1.49	|	115	1.98	120 k	
920.983567206 M	82.08	22.820	-22.892	83.520	-1.44	|	106	1.87	120 k	
918.991583174 M	82.24	22.800	-22.887	83.520	-1.28	|	115	1.98	120 k	

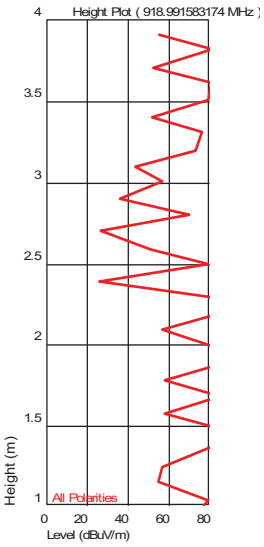
Azimuth Plots

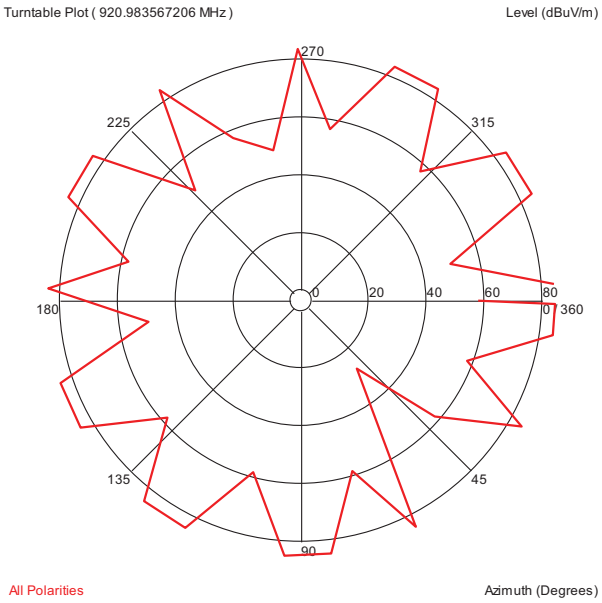


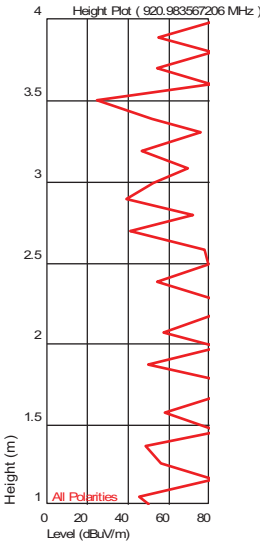
Turntable Plots








Turntable Plot (920.983567206 MHz)
Level (dBuV/m)
270
225
315
180
0
360
135
45
90
0
20
40
60
80
All Polarities
Azimuth (Degrees)

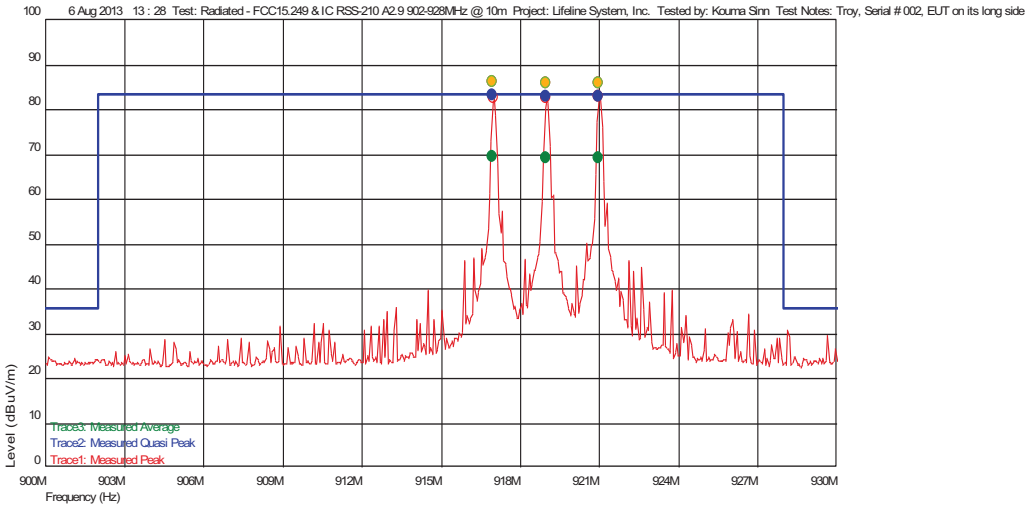

Height Plot (920.983567206 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Y-Axis (EUT on its long side)

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy, Serial # 002, EUT on its long side	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Kouma Sinn	
Test Started:	6 Aug 2013 13 : 28	

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

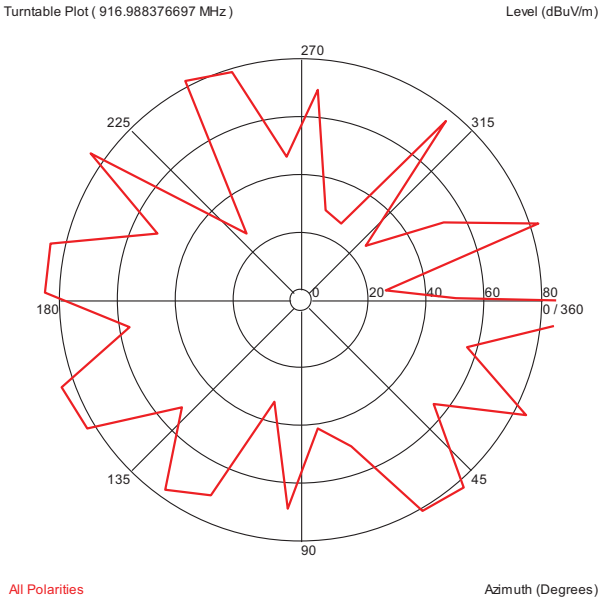
Trace1: Measured Peak

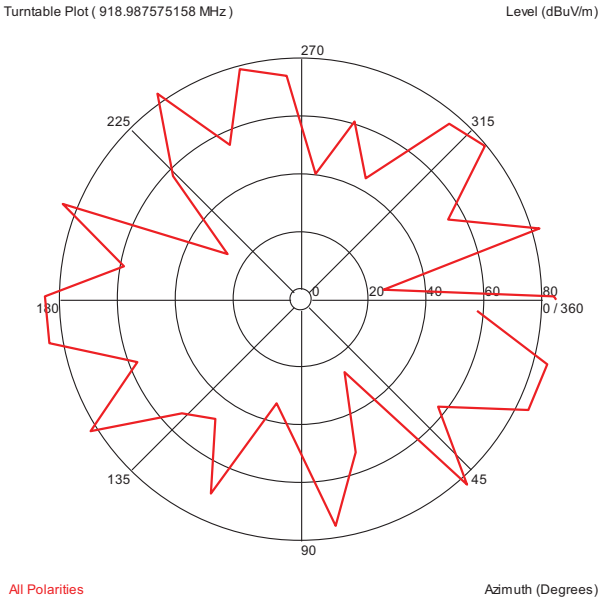
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
920.987575222 M	85.76	22.820	-22.892	--	--	--	188	1.05	120 k	
918.987575158 M	85.78	22.800	-22.887	--	--	--	191	1.04	120 k	
916.988376697 M	86.01	22.800	-22.882	--	--	--	182	1.04	120 k	

Trace2: Measured Quasi Peak

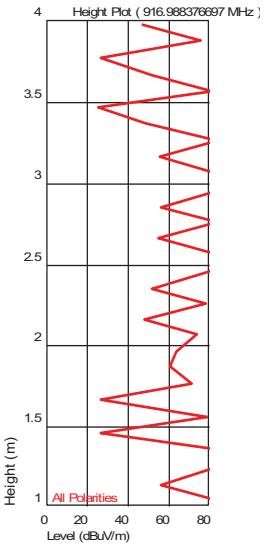
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
920.987575222 M	82.86	22.820	-22.892	83.520	-0.66	--	188	1.05	120 k	
918.987575158 M	82.87	22.800	-22.887	83.520	-0.65	--	191	1.04	120 k	
916.988376697 M	83.15	22.800	-22.882	83.520	-0.37	--	182	1.04	120 k	

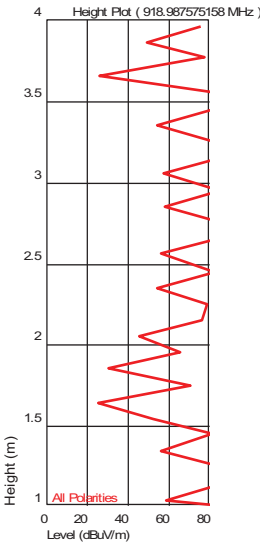
Azimuth Plots

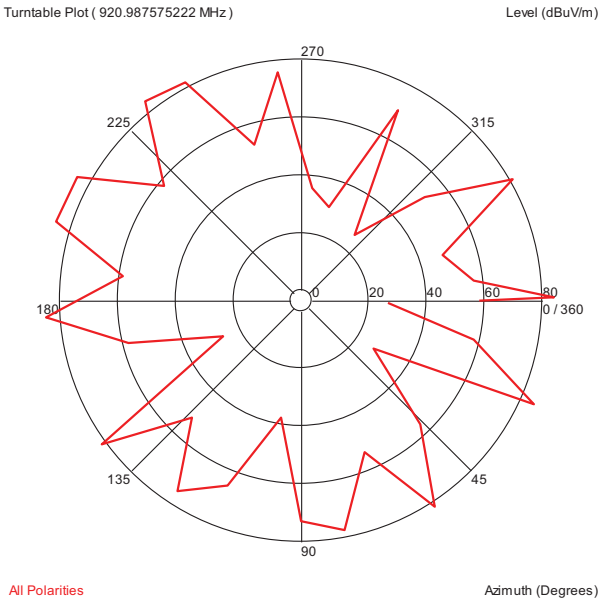


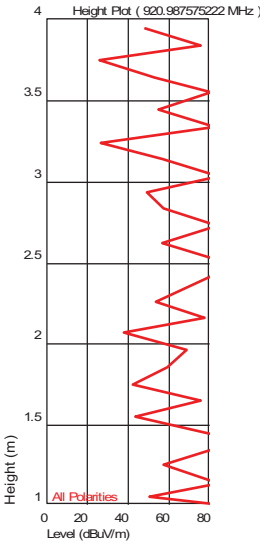


Turntable Plots






Turntable Plot (920.987575222 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

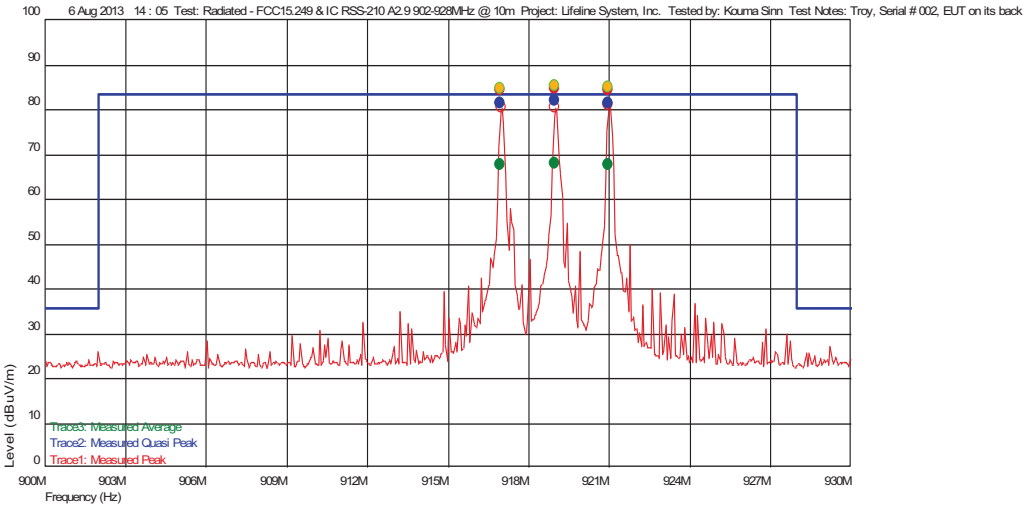

Height Plot (920.987575222 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Z-Axis (EUT on its back)

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy, Serial # 002, EUT on its back	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Kouma Sinn	
Test Started:	6 Aug 2013 14 : 05	

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

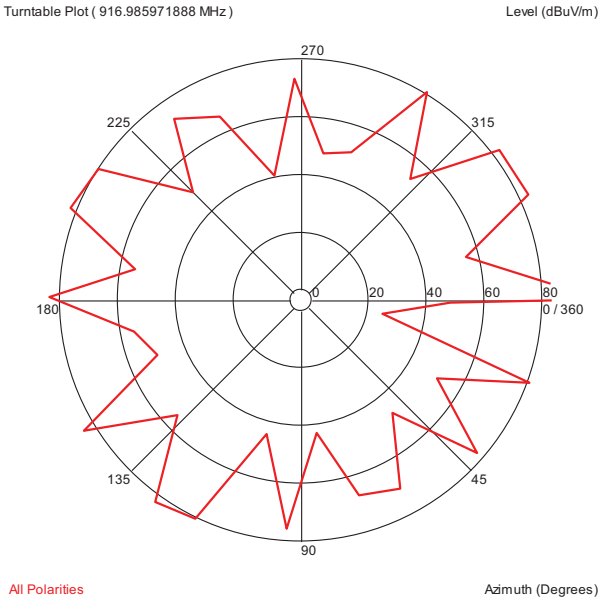
Trace1: Measured Peak

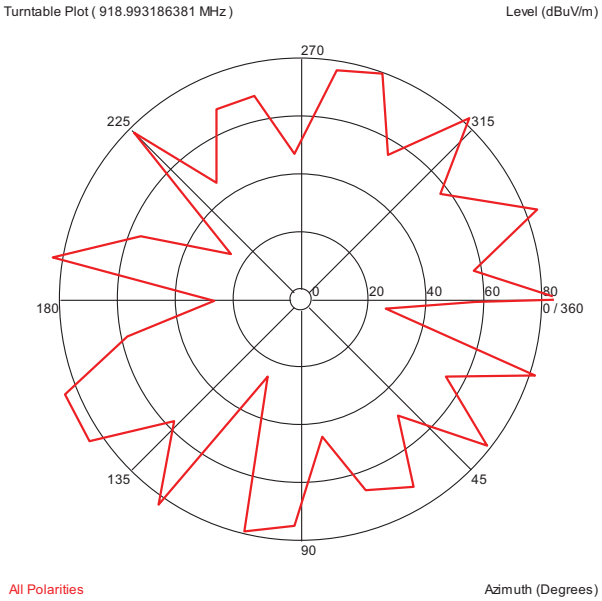
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
920.994789651 M	84.30	22.820	-22.892	--	--	--	164	1.14	120 k	
916.985971888 M	84.37	22.800	-22.882	--	--	--	159	1.14	120 k	
918.993186381 M	84.77	22.800	-22.887	--	--	--	168	1.05	120 k	

Trace2: Measured Quasi Peak

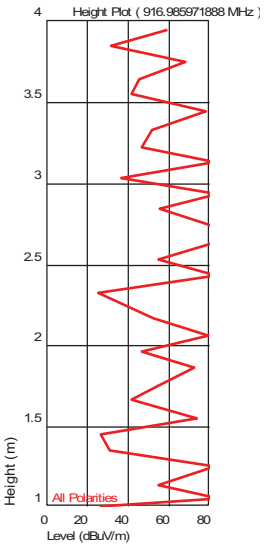
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
920.994789651 M	81.39	22.820	-22.892	83.520	-2.13	--	164	1.14	120 k	
916.985971888 M	81.41	22.800	-22.882	83.520	-2.11	--	159	1.14	120 k	
918.993186381 M	81.88	22.800	-22.887	83.520	-1.64	--	168	1.05	120 k	

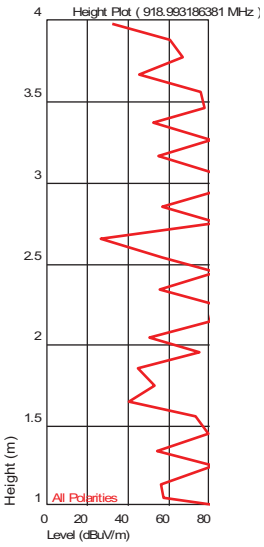
Azimuth Plots

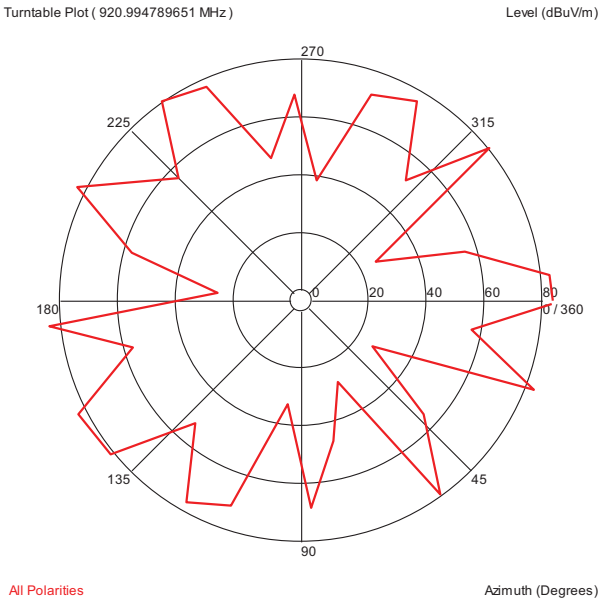


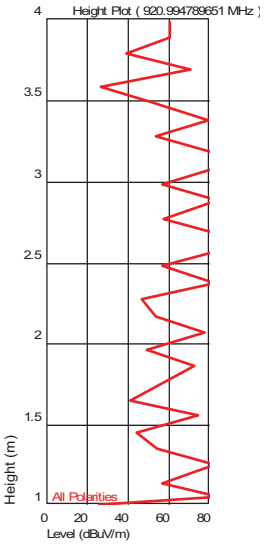


Turntable Plots









Test Personnel:	Kouma Sinn KPS	Test Date:	08/06/2013
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC 15.249, RSS-210	Limit Applied:	83.52 dBuV/m at 10 meters
Input Voltage:	Battery power	Ambient Temperature:	23 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Yes**	Relative Humidity:	43 %
		Atmospheric Pressure:	1010 mbars

Deviations, Additions, or Exclusions: None

7 Transmitter Spurious Radiated Emissions

7.1 Method

Tests are performed in accordance with FCC 47CFR Part 15:2013 Subpart C 15.249 & 15.209, RSS-210 Issue 8 December 2010 ICES-003 Issue 5 August 2012, 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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

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

Sample Calculation

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

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

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

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

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

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

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

Example:

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

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	09/25/2012	09/25/2014
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	09/04/2012	09/04/2013
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
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
ETS001'	1-18GHz DRG Horn Antenna	ETS-Lindgren	3117	00143259	12/17/2012	12/17/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	12/13/2012	12/13/2013
REA003'	1GHz High Pass Filter	Reactel, Inc	7HS-1G/10G-S11	06-1	11/30/2011	11/30/2013

Software Utilized:

Name	Manufacturer	Version
C5	Teseq	5.26.46.46

7.3 Results:

The sample tested was found to Comply.

7.4 Setup Photographs:

X-Axis (EUT on its short side), 30-1000 MHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC Test Setups(7000AHB)

Y-Axis (EUT on its long side), 30-1000 MHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC Test Setups(7000AHB)

X-Axis (EUT on its short side), 1-10 GHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC Test Setups(7000AHB)

Y-Axis (EUT on its long side), 1-10 GHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC Test Setups(7000AHB)

Z-Axis (EUT on its back), 1-10 GHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC Test Setups(7000AHB)

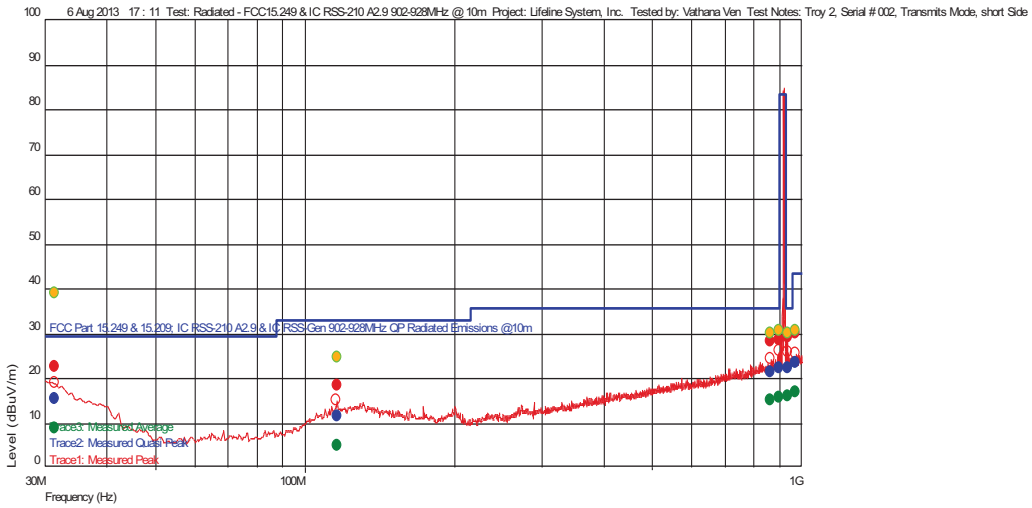
7.5 Plots/Data:

X-Axis (EUT on its short side), 30-1000 MHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy 2, Serial # 002, Transmits Mode, short Side	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Vathana Ven	
Test Started:	6 Aug 2013 17 : 11	

Prescan Emission Graph



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

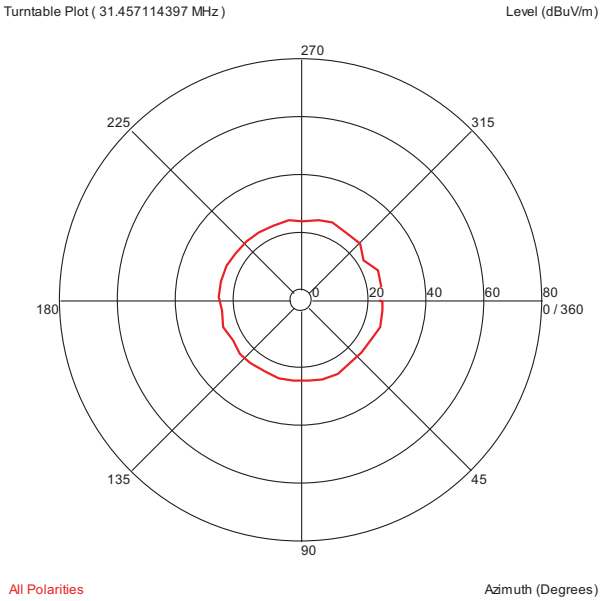
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

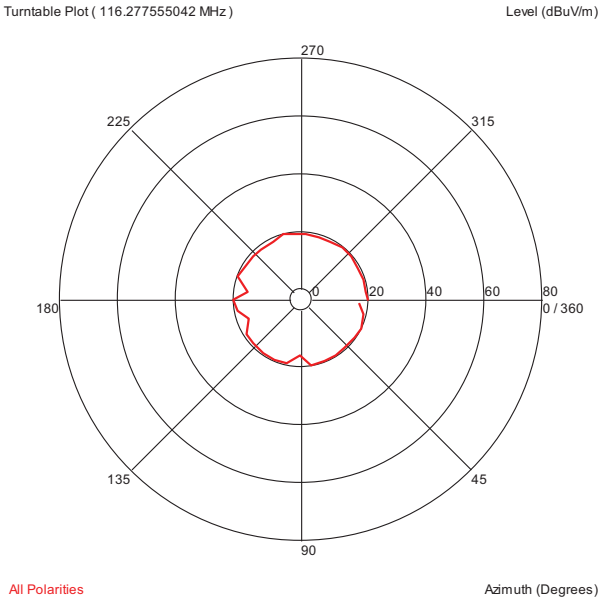
Emissions Test Data

Trace2: Measured Quasi Peak

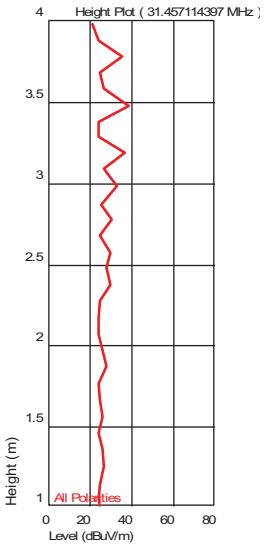
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver (|)	Azimuth (deg) (Deg)	Mast Height (m)	RBW (Hz)	Comment
116.277555042 M	11.54	13.402	-24.681	33.040	-21.50	--	244	3.68	120 k	
971.567334359 M	23.43	23.469	-22.855	43.540	-20.11	--	180	2.98	120 k	
31.457114397 M	15.39	19.780	-26.444	29.540	-14.15	|	30	3.58	120 k	
867.668737156 M	21.43	22.253	-23.095	35.540	-14.11	|	211	1.55	120 k	
900.978957525 M	22.16	22.620	-22.842	35.540	-13.38	|	113	4.00	120 k	
937.989779433 M	22.30	22.960	-22.935	35.540	-13.24	|	105	2.37	120 k	

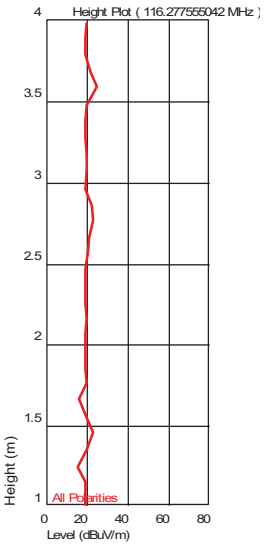
Azimuth Plots

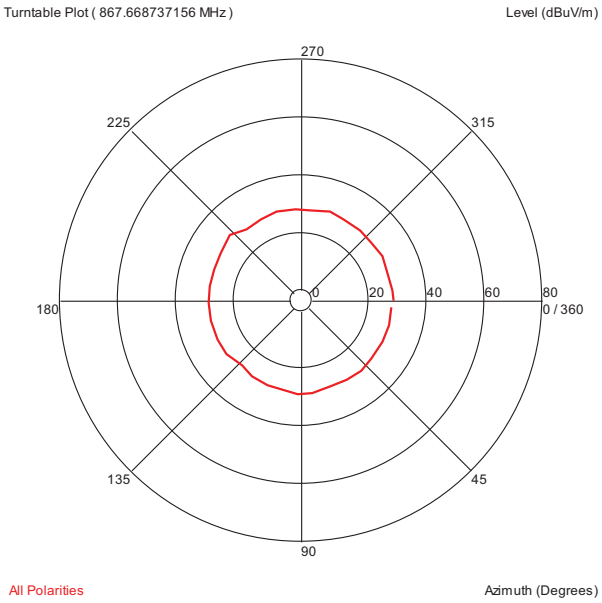


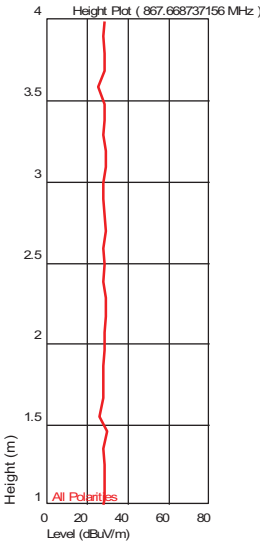


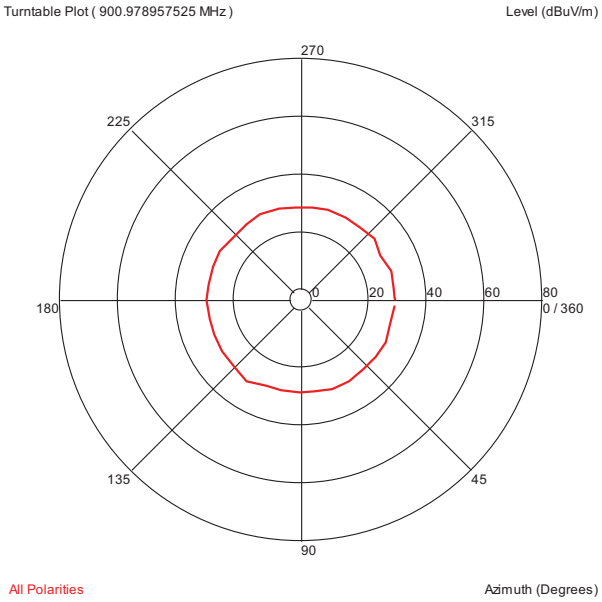
Turntable Plots

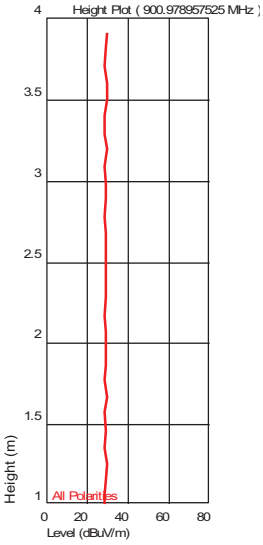


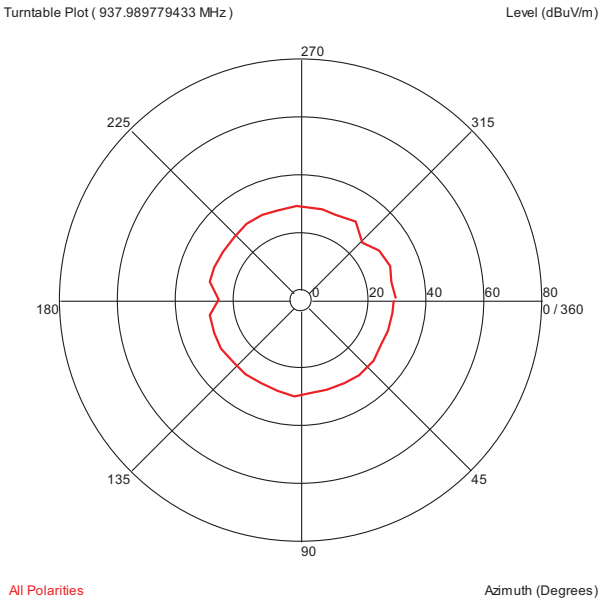


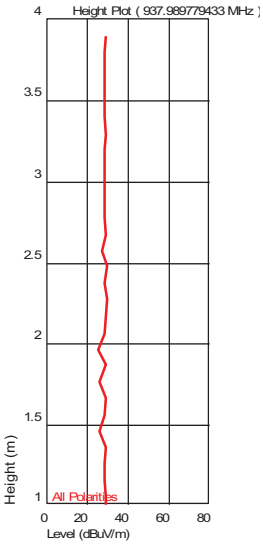

Turntable Plot (867.668737156 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

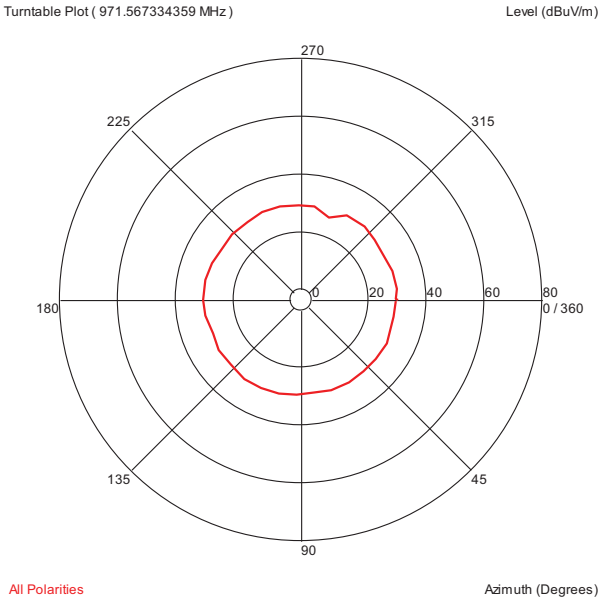

Height Plot (867.668737156 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

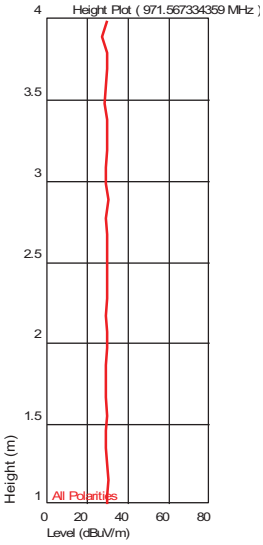

Turntable Plot (900.978957525 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (900.978957525 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (937.989779433 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (937.989779433 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (971.567334359 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

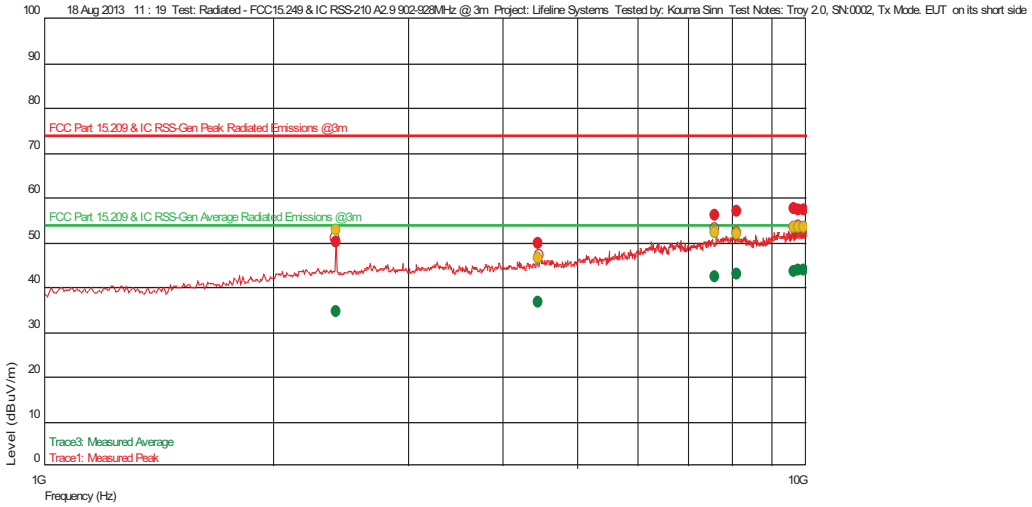

Height Plot (971.567334359 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

X-Axis (EUT on its short side), 1-10 GHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 3m	
Project:	Lifeline Systems	
Test Notes:	Troy 2.0, SN:0002, Tx Mode. EUT on its short side	
Temperature:	22C	
Humidity:	51%, 1014mbar	
Tested by:	Kouma Sinn	
Test Started:	18 Aug 2013 11 : 19	

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

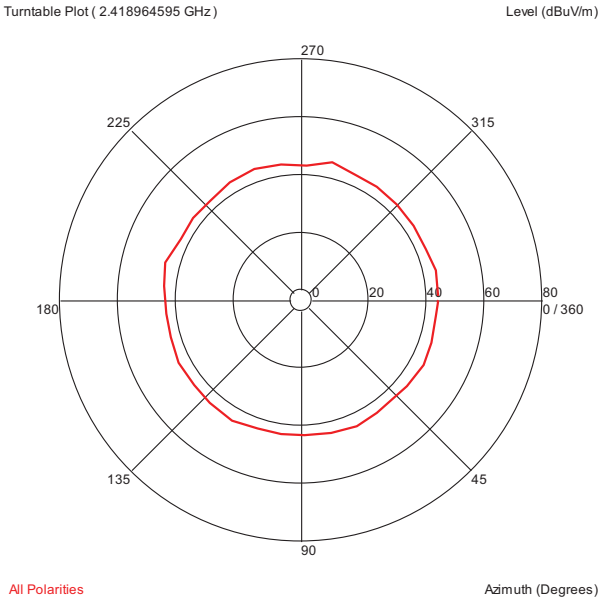
Trace1: Measured Peak

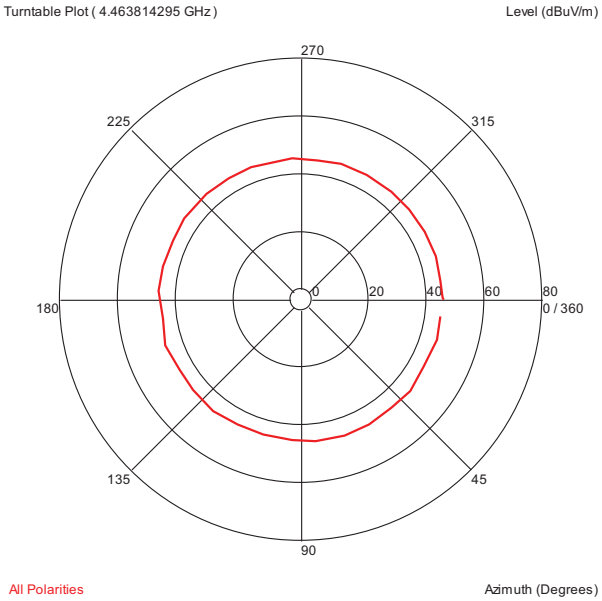
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
4.463814295 G	49.84	34.342	-26.501	74.000	-24.16	--	205	1.52	1 M	
2.418964595 G	50.07	32.370	-27.516	74.000	-23.93	|	207	3.54	1 M	
7.615337341 G	55.91	36.192	-22.951	74.000	-18.09	|	269	4.01	1 M	
8.136840347 G	56.76	36.445	-22.481	74.000	-17.24	|	73	4.01	1 M	
9.802117568 G	57.19	37.663	-22.617	74.000	-16.81	|	278	3.36	1 M	
9.937047429 G	57.31	37.824	-22.660	74.000	-16.69	|	94	2.80	1 M	
9.667181028 G	57.35	37.534	-22.573	74.000	-16.65	|	342	3.49	1 M	

Trace3: Measured Average

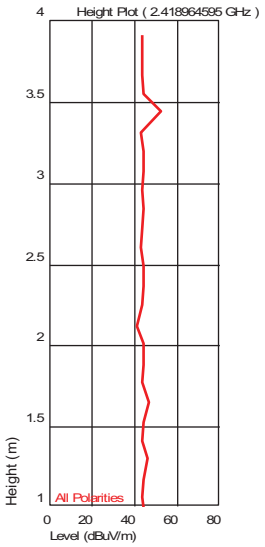
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.418964595 G	34.41	32.370	-27.516	54.000	-19.59	|	207	3.54	1 M	
4.463814295 G	36.43	34.342	-26.501	54.000	-17.57	--	205	1.52	1 M	
7.615337341 G	42.32	36.192	-22.951	54.000	-11.68	|	269	4.01	1 M	
8.136840347 G	42.72	36.445	-22.481	54.000	-11.28	|	73	4.01	1 M	
9.667181028 G	43.37	37.534	-22.573	54.000	-10.63	|	342	3.49	1 M	
9.802117568 G	43.63	37.663	-22.617	54.000	-10.37	|	278	3.36	1 M	
9.937047429 G	43.75	37.824	-22.660	54.000	-10.25	|	94	2.80	1 M	

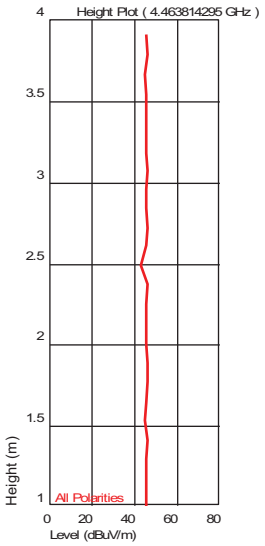
Azimuth Plots

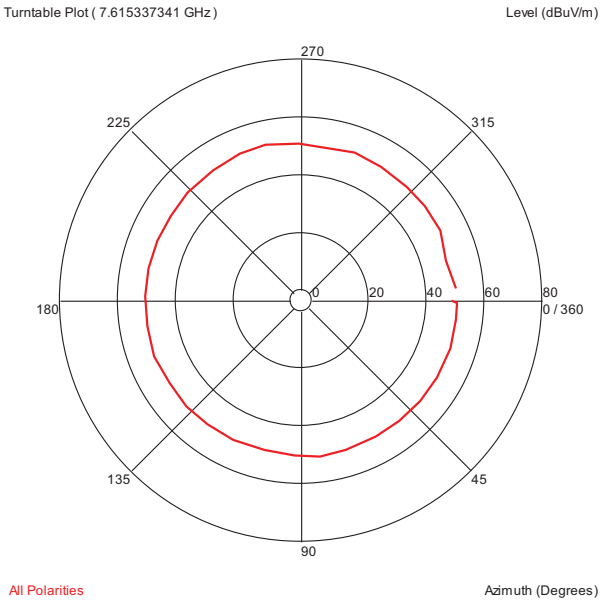


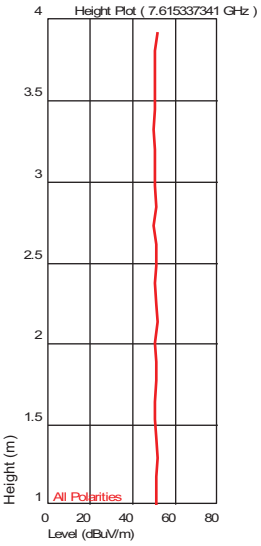


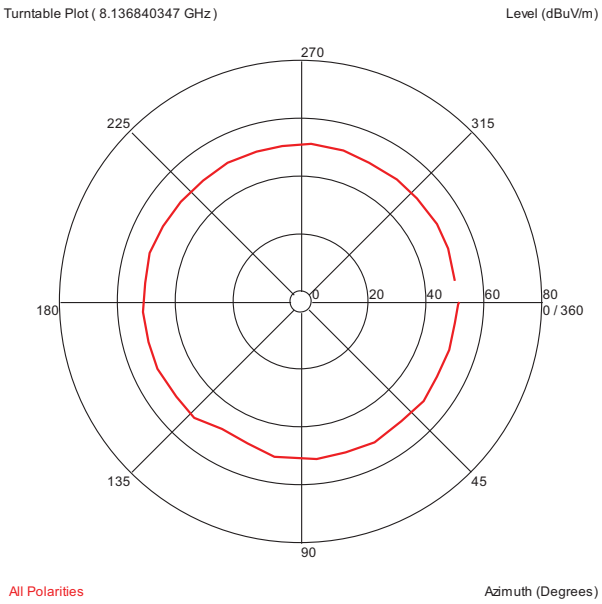
Turntable Plots

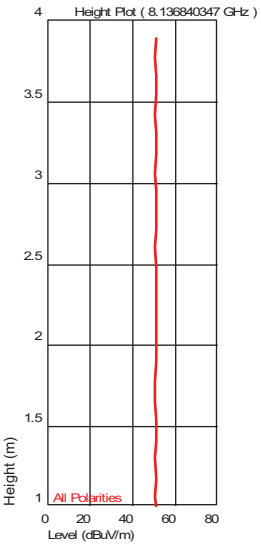


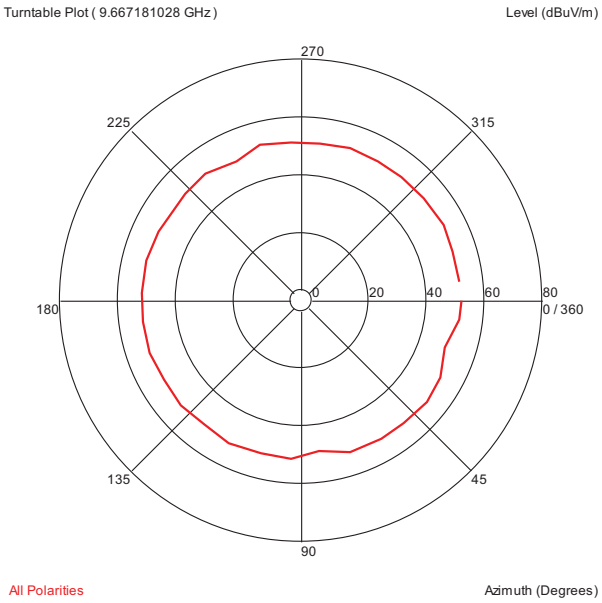


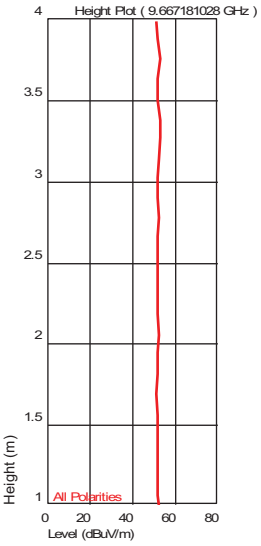

Turntable Plot (7.615337341 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

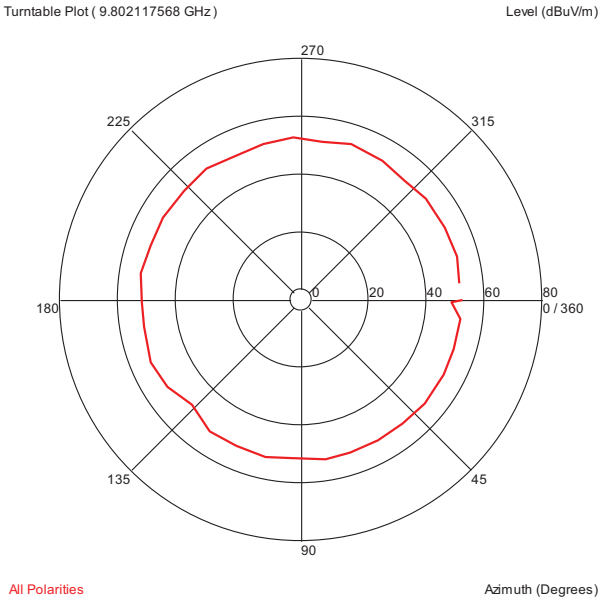

Height Plot (7.615337341 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

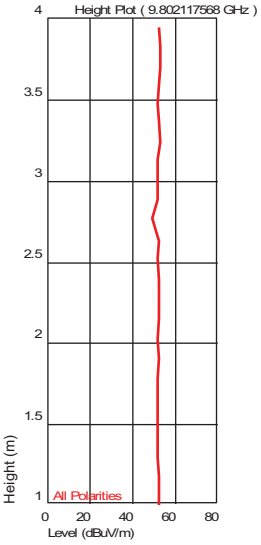

Turntable Plot (8.136840347 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

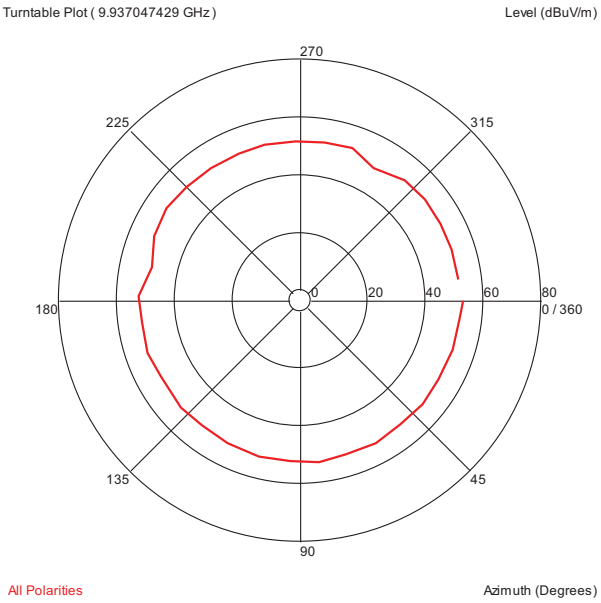

Height Plot (8.136840347 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

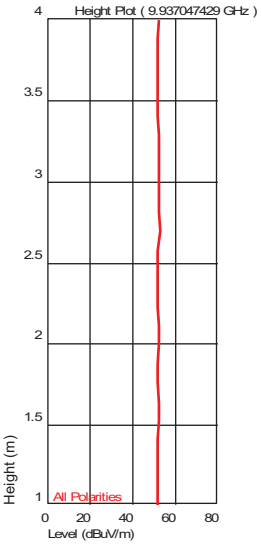

Turntable Plot (9.667181028 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (9.667181028 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (9.802117568 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (9.802117568 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (9.937047429 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

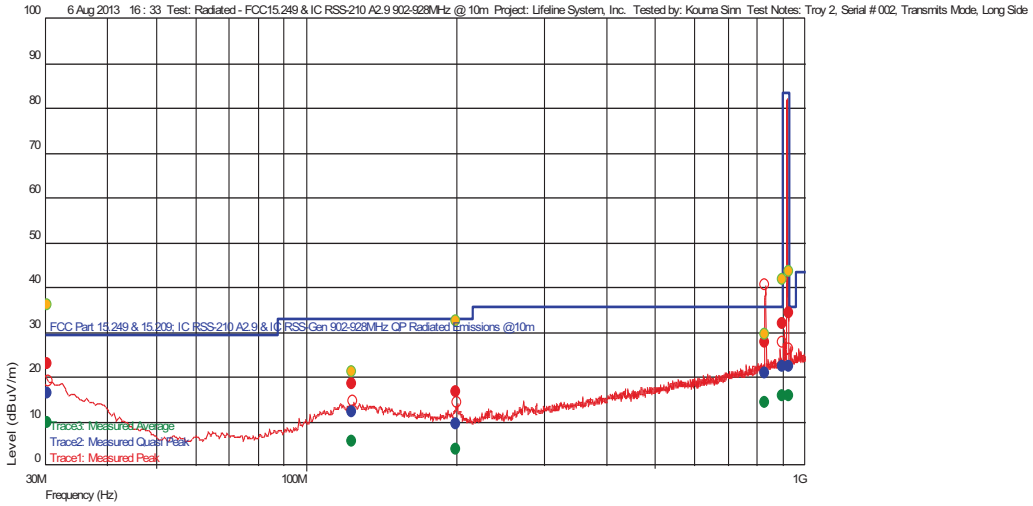

Height Plot (9.937047429 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Y-Axis (EUT on its long side), 30-1000 MHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy 2, Serial # 002, Transmits Mode, Long Side	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Kouma Sinn	
Test Started:	6 Aug 2013 16 : 33	

Prescan Emission Graph



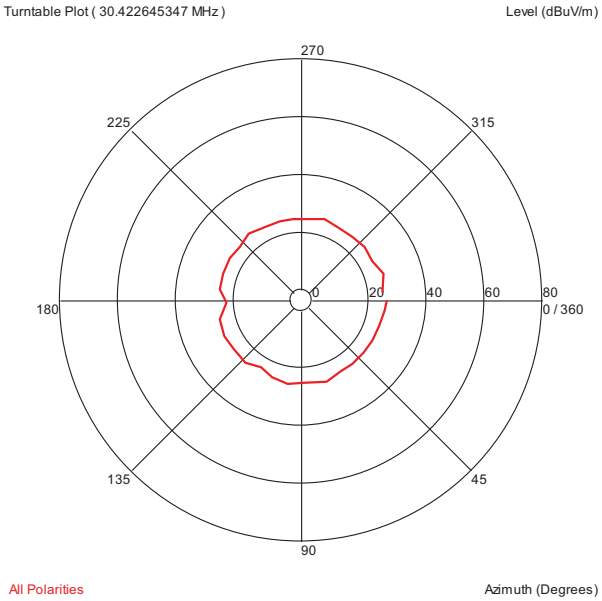
- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

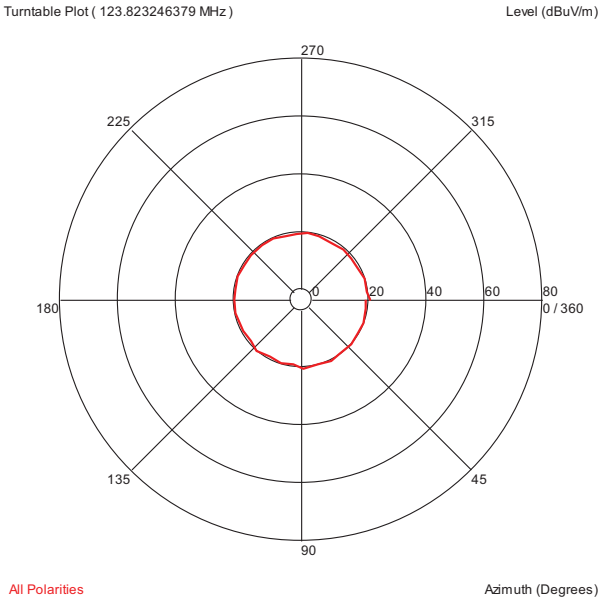
Emissions Test Data

Trace2: Measured Quasi Peak

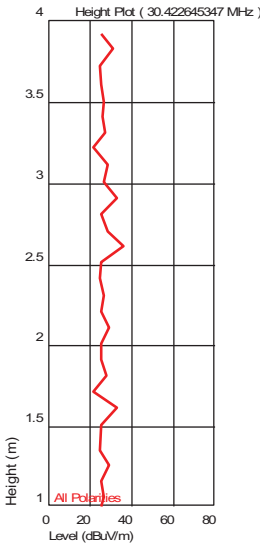
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver (|)	Azimuth (deg) (Deg)	Mast Height (m)	RBW (Hz)	Comment
200.186572842 M	9.49	13.048	-24.379	33.040	-23.55	|	191	2.47	120 k	
123.823246379 M	11.97	13.929	-24.667	33.040	-21.07	--	75	2.59	120 k	
831.027053637 M	20.83	22.079	-23.411	35.540	-14.71	|	117	4.00	120 k	
901.900400523 M	22.18	22.638	-22.845	35.540	-13.36	--	170	1.14	120 k	
30.422645347 M	16.21	20.504	-26.462	29.540	-13.33	--	354	2.70	120 k	
929.829458894 M	22.37	22.900	-22.915	35.540	-13.17	--	180	1.14	120 k	

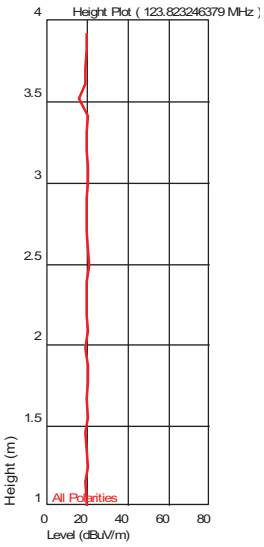
Azimuth Plots

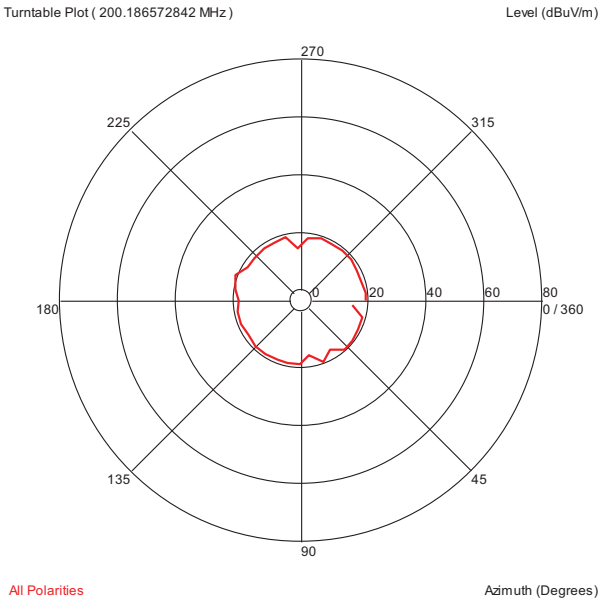


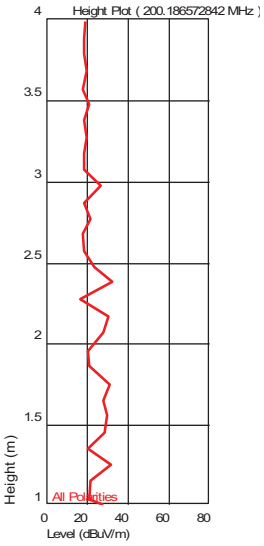


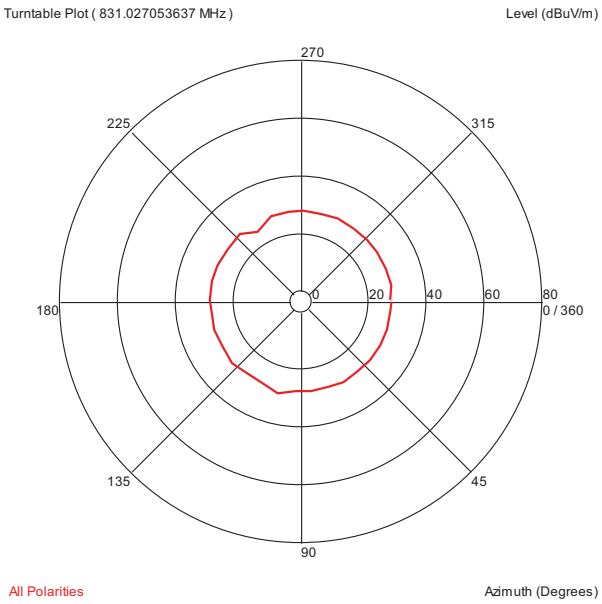
Turntable Plots

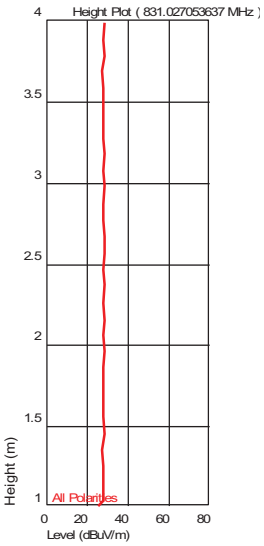


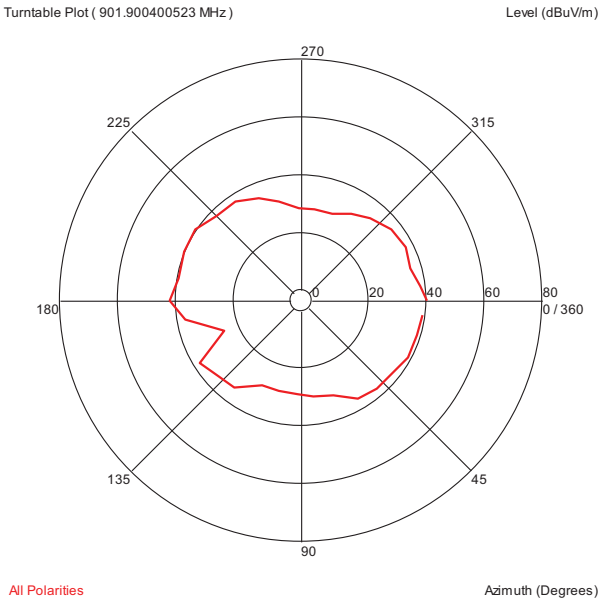


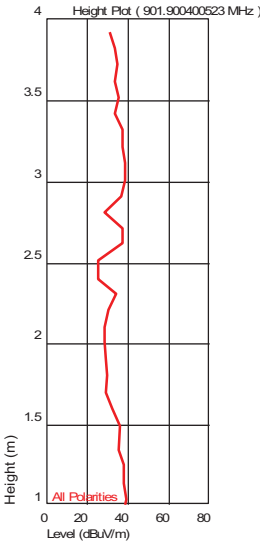

Turntable Plot (200.186572842 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

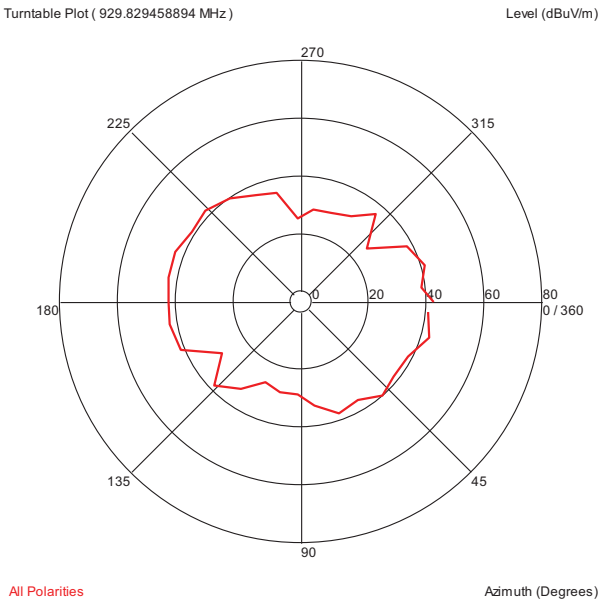

Height Plot (200.186572842 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

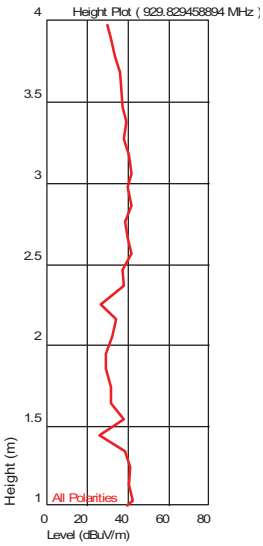

Turntable Plot (831.027053637 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (831.027053637 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (901.900400523 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (901.900400523 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (929.829458894 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

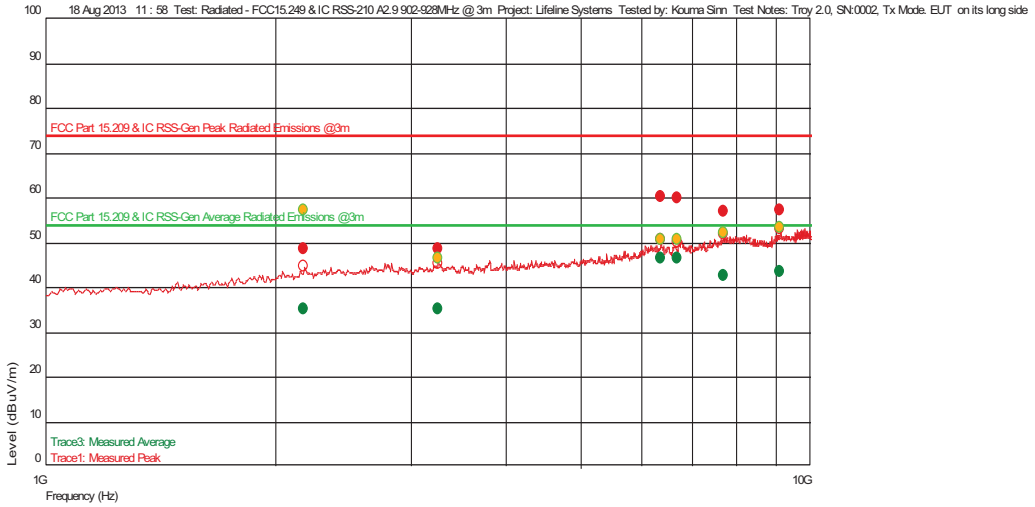

Height Plot (929.829458894 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Y-Axis (EUT on its long side), 1-10 GHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 3m	
Project:	Lifeline Systems	
Test Notes:	Troy 2.0, SN:0002, Tx Mode. EUT on its long side	
Temperature:	22C	
Humidity:	51%, 1014mbar	
Tested by:	Kouma Sinn	
Test Started:	18 Aug 2013 11 : 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

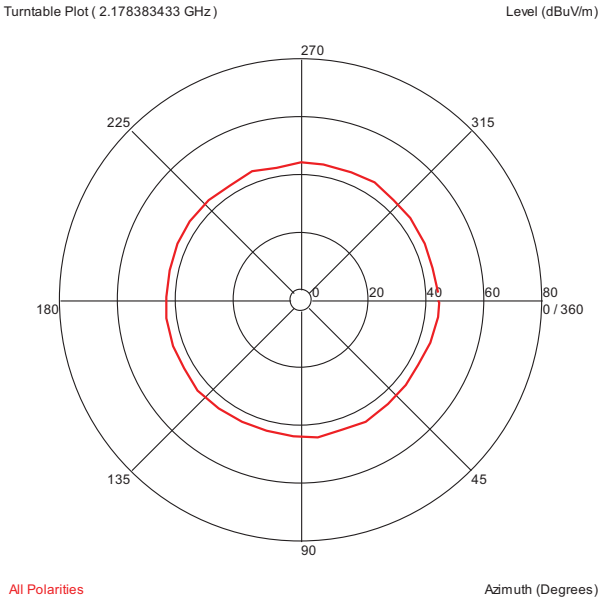
Trace1: Measured Peak

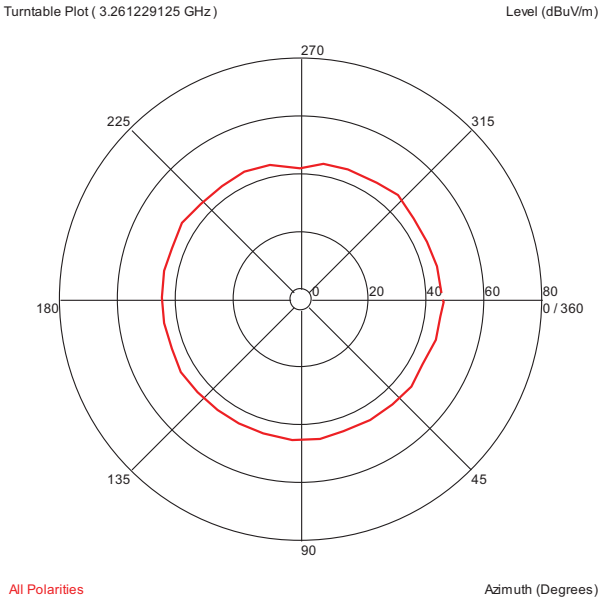
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.178383433 G	48.51	32.014	-27.742	74.000	-25.49	|	7	1.94	1 M	
3.261229125 G	48.63	33.396	-27.293	74.000	-25.37	|	324	2.73	1 M	
7.698022713 G	56.76	36.258	-22.815	74.000	-17.24	|	7	1.52	1 M	
9.128056112 G	57.06	37.002	-22.334	74.000	-16.94	|	9	1.18	1 M	
6.715597863 G	59.80	35.814	-23.665	74.000	-14.20	|	360	4.01	1 M	
6.371910488 G	60.01	35.849	-23.637	74.000	-13.99	--	360	2.91	1 M	

Trace3: Measured Average

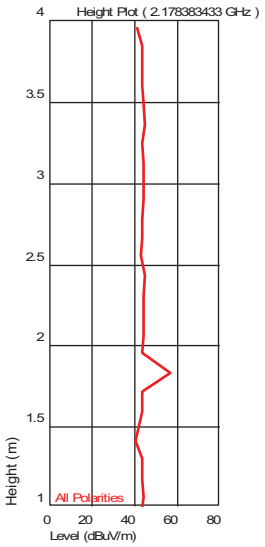
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.178383433 G	34.96	32.014	-27.742	54.000	-19.04	|	7	1.94	1 M	
3.261229125 G	35.02	33.396	-27.293	54.000	-18.98	|	324	2.73	1 M	
7.698022713 G	42.69	36.258	-22.815	54.000	-11.31	|	7	1.52	1 M	
9.128056112 G	43.42	37.002	-22.334	54.000	-10.58	|	9	1.18	1 M	
6.715597863 G	46.32	35.814	-23.665	54.000	-7.68	|	360	4.01	1 M	
6.371910488 G	46.38	35.849	-23.637	54.000	-7.62	--	360	2.91	1 M	

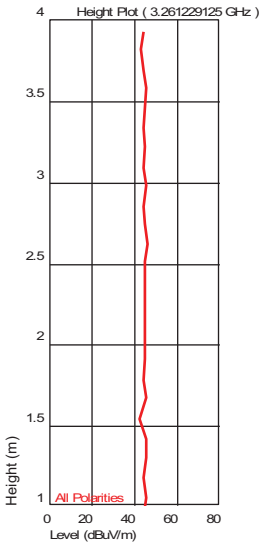
Azimuth Plots

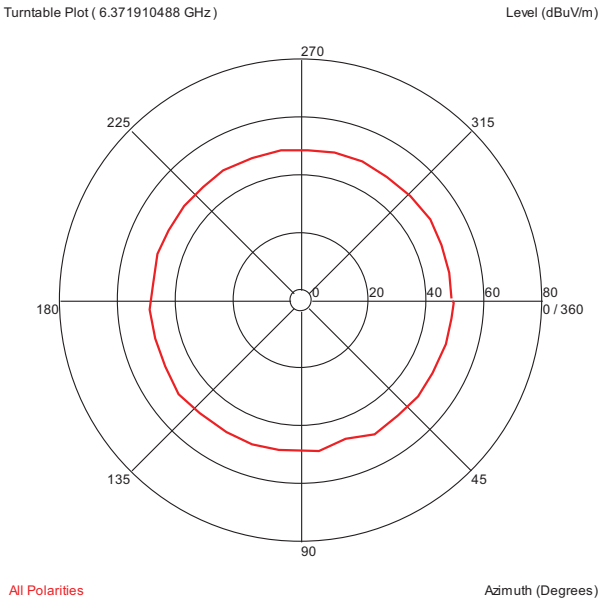


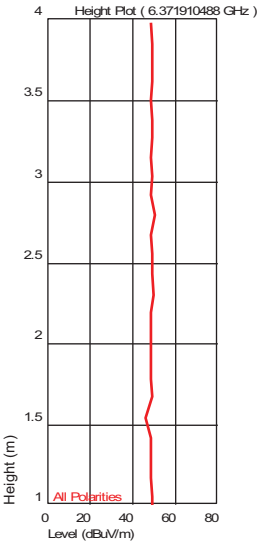


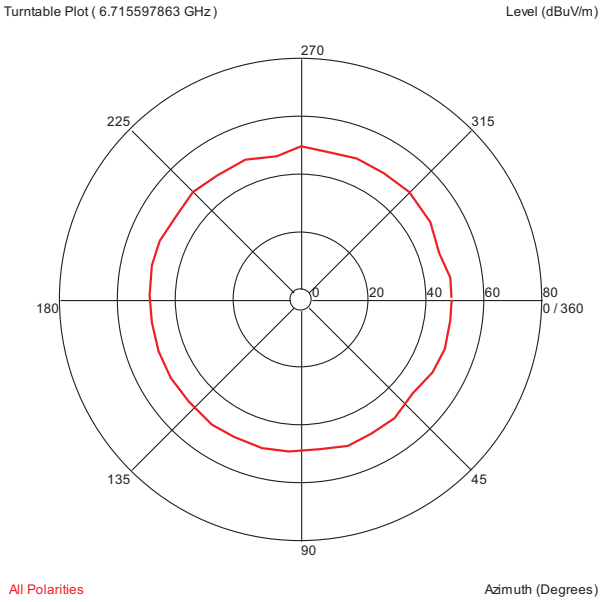
Turntable Plots

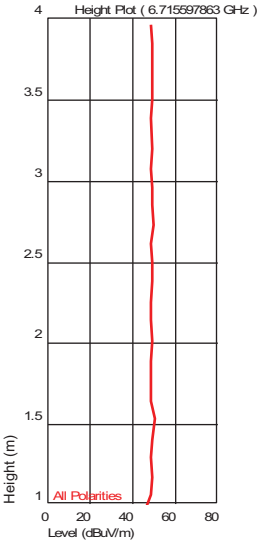


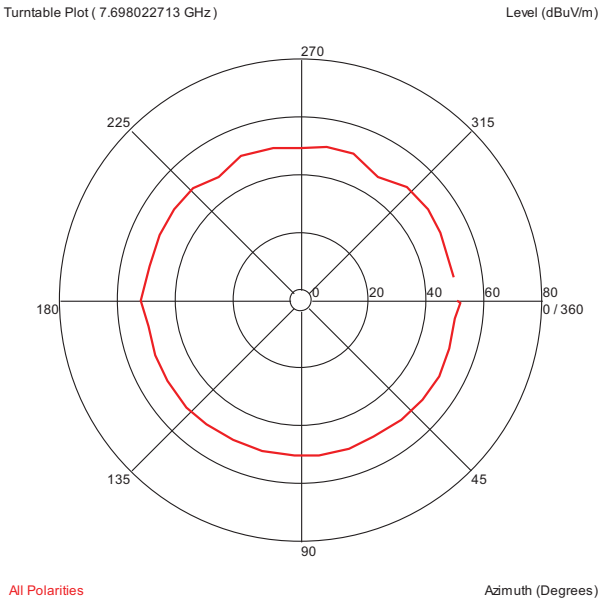


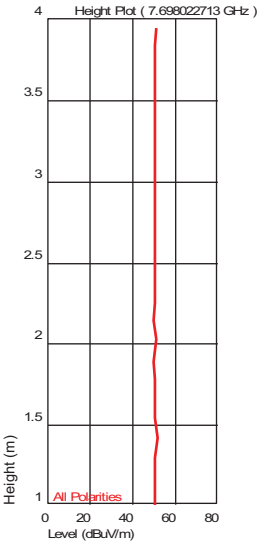

Turntable Plot (6.371910488 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

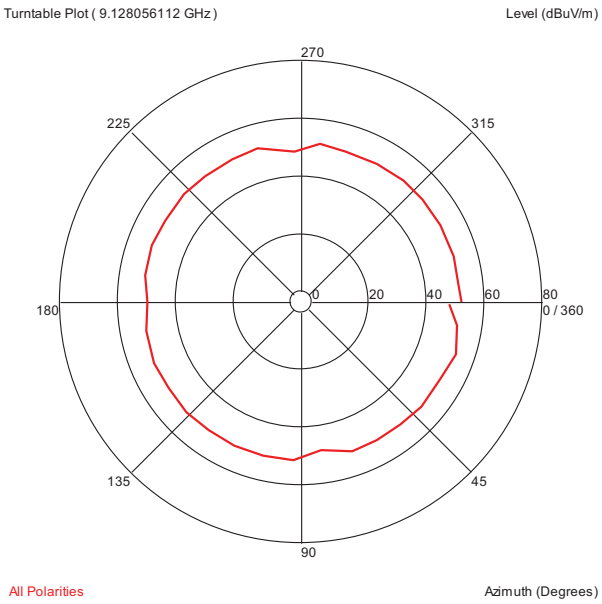

Height Plot (6.371910488 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

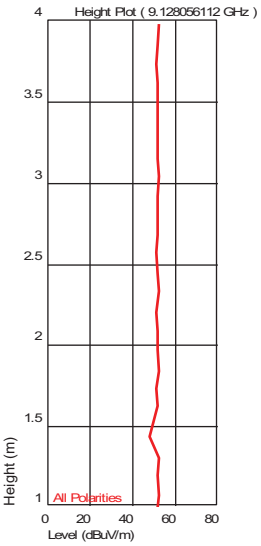

Turntable Plot (6.715597863 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (6.715597863 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (7.698022713 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (7.698022713 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (9.128056112 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

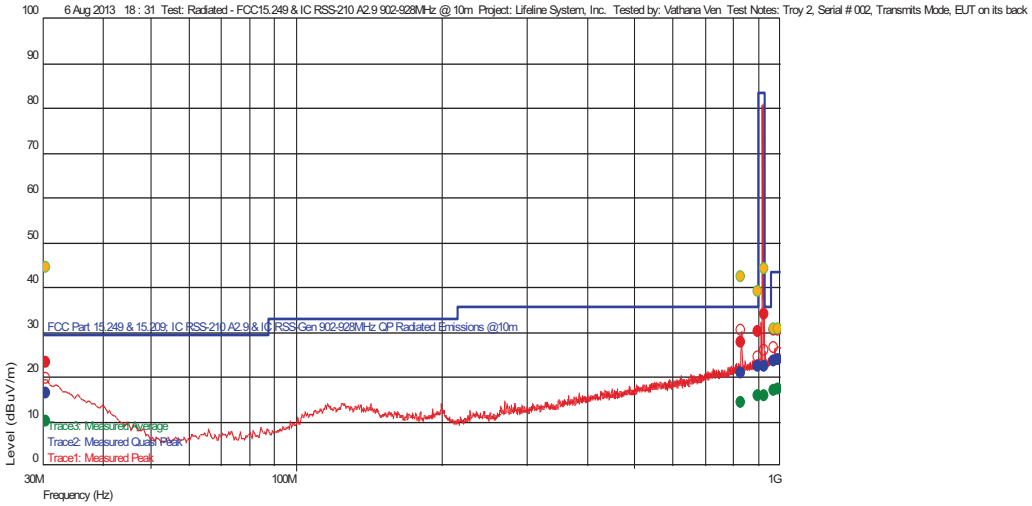

Height Plot (9.128056112 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Z-Axis (EUT on its back), 30-1000 MHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy 2, Serial # 002, Transmits Mode, EUT on its back	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Vathana Ven	
Test Started:	6 Aug 2013 18 : 31	

Prescan Emission Graph



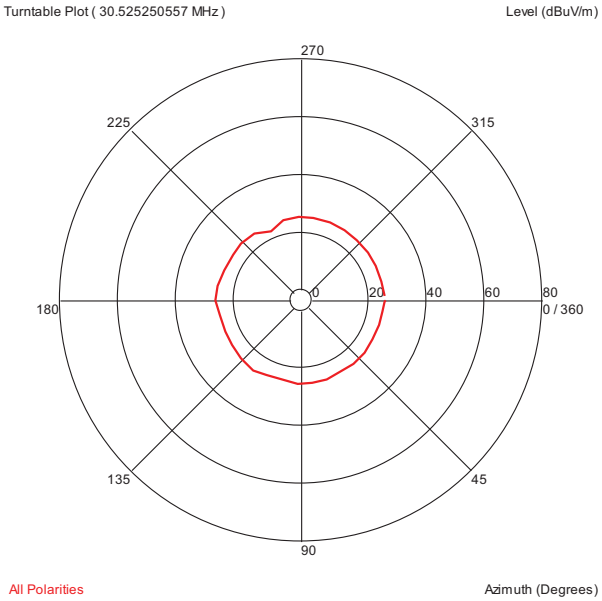
- Measured Peak Value
- Measured Quasi Peak Value
- Measured Average Value
- Maximum Value of Mast and Turntable
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

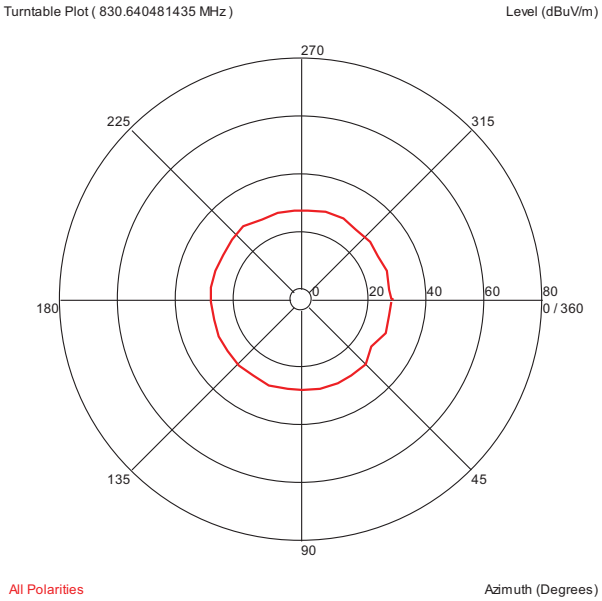
Emissions Test Data

Trace2: Measured Quasi Peak

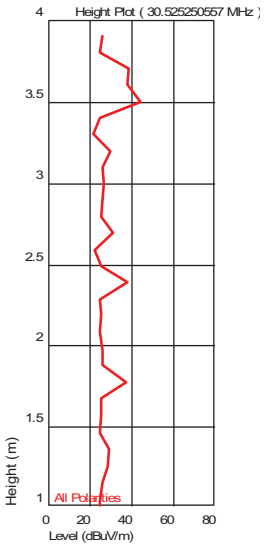
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver (|)	Azimuth (deg) (Deg)	Mast Height (m)	RBW (Hz)	Comment
972.958917749 M	23.41	23.441	-22.848	43.540	-20.13	|	360	4.00	120 k	
994.900601641 M	23.79	23.502	-22.736	43.540	-19.75	|	146	3.08	120 k	
830.640481435 M	20.84	22.087	-23.415	35.540	-14.70	|	221	2.12	120 k	
30.525250557 M	16.14	20.432	-26.461	29.540	-13.40	--	202	3.61	120 k	
901.188376419 M	22.17	22.624	-22.843	35.540	-13.37	--	168	2.98	120 k	
928.507815439 M	22.27	22.900	-22.911	35.540	-13.27	--	0	2.88	120 k	

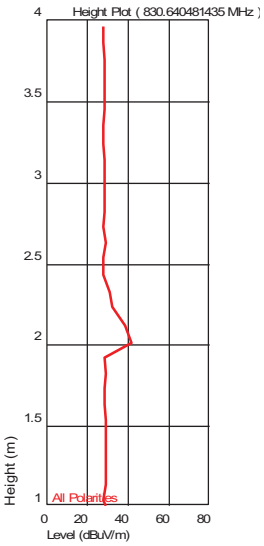
Azimuth Plots

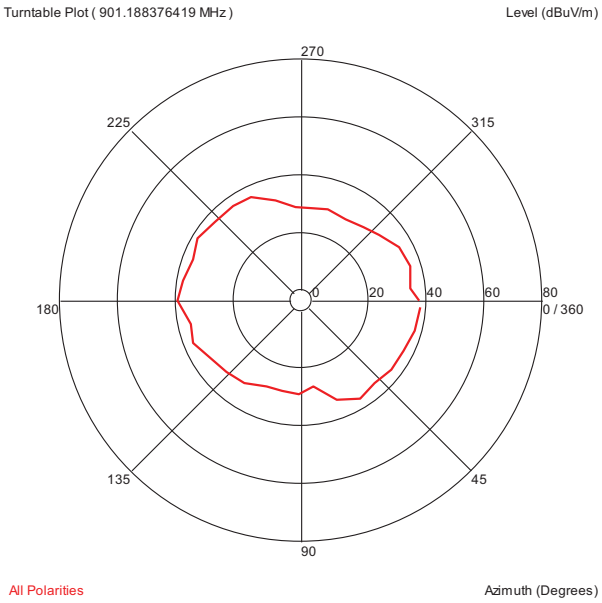


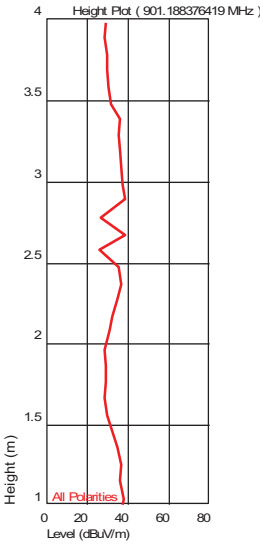


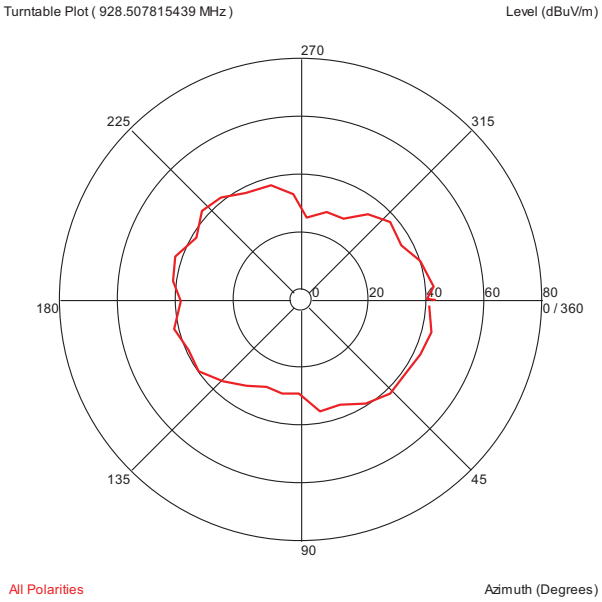
Turntable Plots

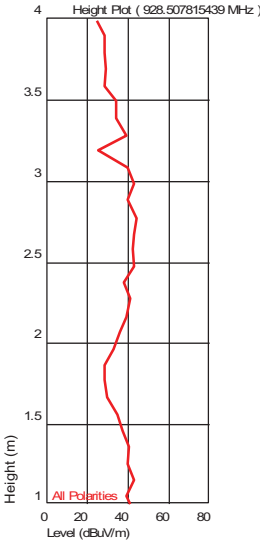


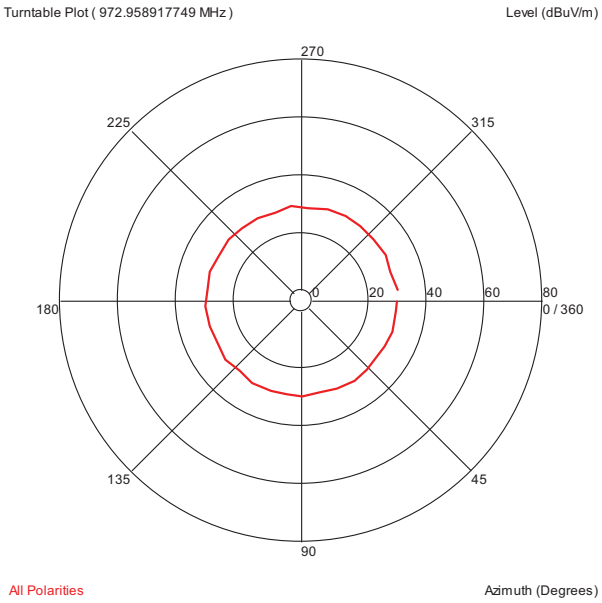


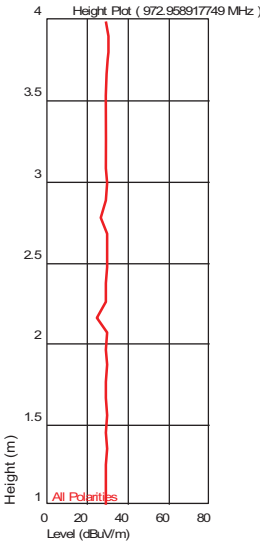

Turntable Plot (901.188376419 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

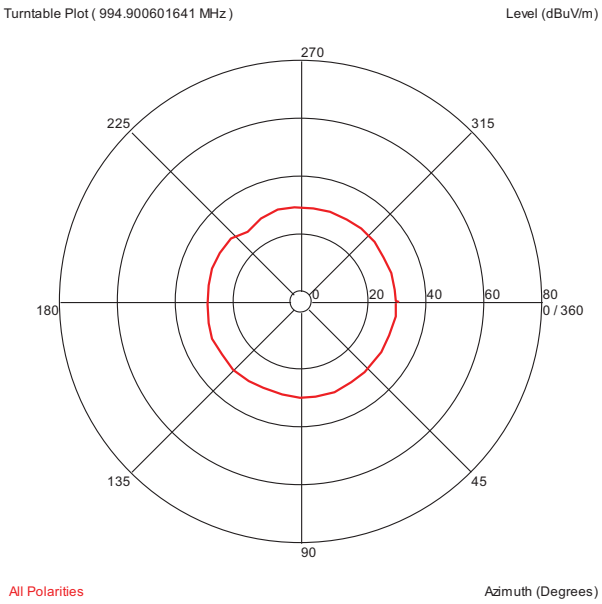

Height Plot (901.188376419 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

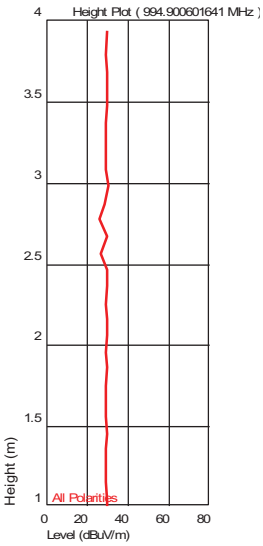

Turntable Plot (928.507815439 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (928.507815439 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (972.958917749 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (972.958917749 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (994.900601641 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

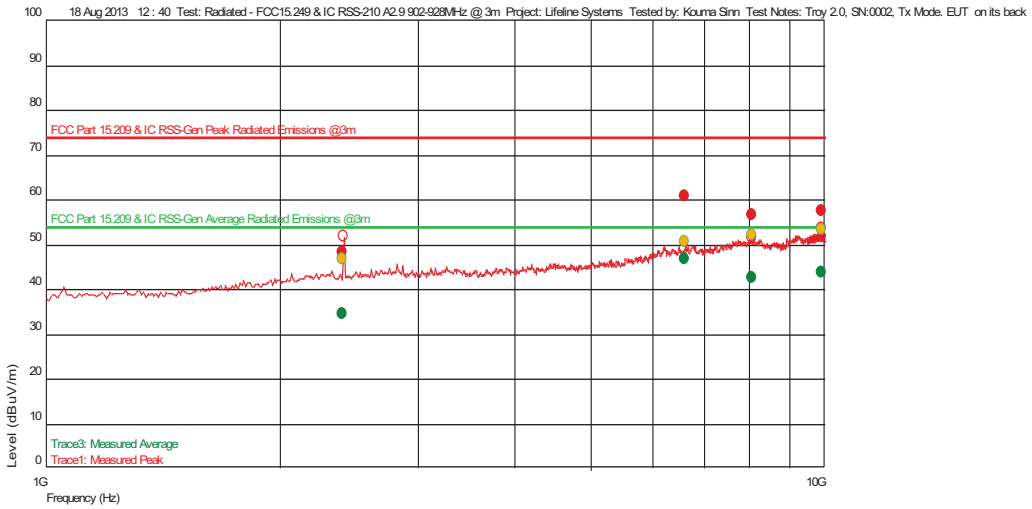

Height Plot (994.900601641 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Z-Axis (EUT on its back), 1-10 GHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 3m	
Project:	Lifeline Systems	
Test Notes:	Troy 2.0, SN:0002, Tx Mode. EUT on its back	
Temperature:	22C	
Humidity:	51%, 1014mbar	
Tested by:	Kouma Sinn	
Test Started:	18 Aug 2013 12 : 40	

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

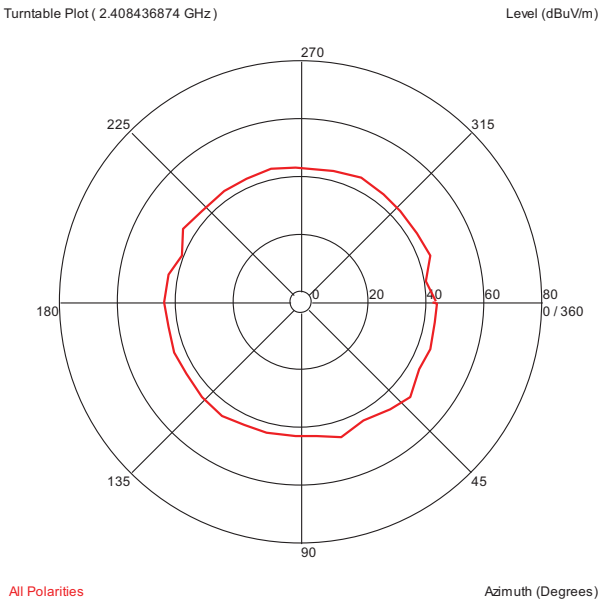
Trace1: Measured Peak

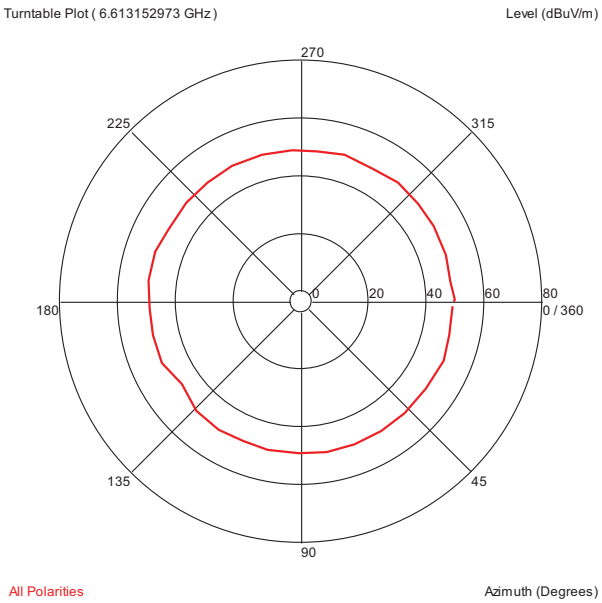
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.408436874 G	48.14	32.353	-27.526	74.000	-25.86	|	50	1.90	1 M	
8.067862392 G	56.60	36.473	-22.400	74.000	-17.40	--	234	1.04	1 M	
9.932324649 G	57.41	37.819	-22.658	74.000	-16.59	--	315	3.77	1 M	
6.613152973 G	60.68	35.855	-23.515	74.000	-13.32	--	0	3.45	1 M	

Trace3: Measured Average

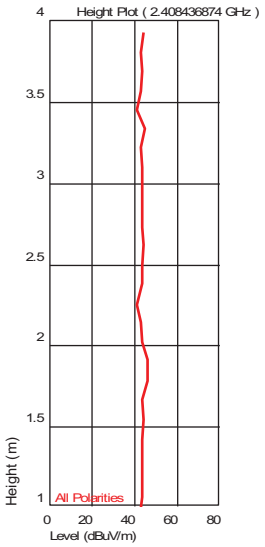
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.408436874 G	34.38	32.353	-27.526	54.000	-19.62	|	50	1.90	1 M	
8.067862392 G	42.66	36.473	-22.400	54.000	-11.34	--	234	1.04	1 M	
9.932324649 G	43.75	37.819	-22.658	54.000	-10.25	--	315	3.77	1 M	
6.613152973 G	46.77	35.855	-23.515	54.000	-7.23	--	0	3.45	1 M	

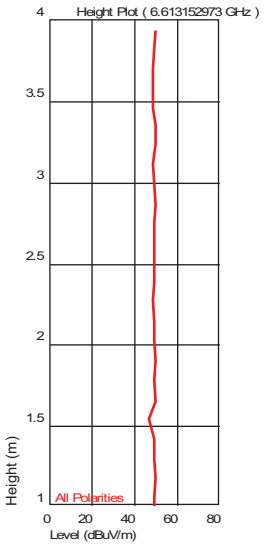
Azimuth Plots

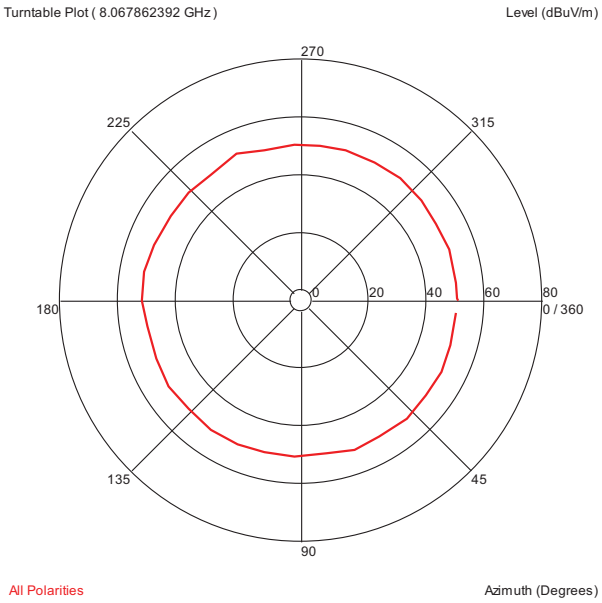


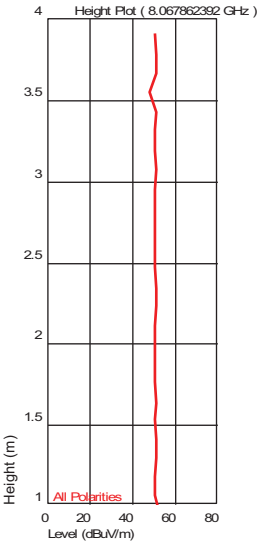


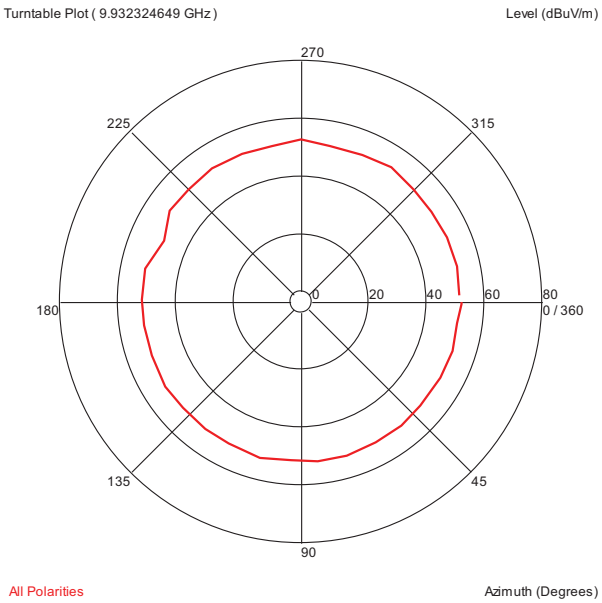
Turntable Plots

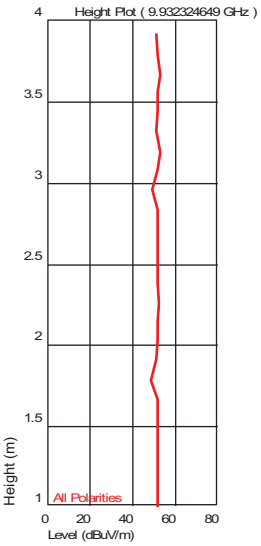












Test Personnel:	Kouma Sinn KPS	Test Date:	08/06/2013 (1 shift), 08/18/2013
	Vathana Ven VSV		08/06/2013 (2nd shift)
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC 15 Subpart B, ICES-003	Limit Applied:	All Class B
Input Voltage:	3.6V (internal battery)	Ambient Temperature:	23, 23, 22 ºC
Pretest Verification w/ Ambient Signals or BB Source:	Ambient Signals	Relative Humidity:	43, 43, 51 %
		Atmospheric Pressure:	1010, 1010, 1014 mbars

Deviations, Additions, or Exclusions: None

8 Receiver Spurious Radiated Emissions

8.1 Method

Tests are performed in accordance with FCC 47CFR Part 15:2013 Subpart B Class B, ICES-003 Issue 5 August 2012, 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 Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

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

Sample Calculation

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

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

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

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

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

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

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

Example:

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

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV004'	Weather Station	Davis Instruments	7400	PE80529A61A	09/25/2012	09/25/2014
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	09/04/2012	09/04/2013
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
145128'	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	09/28/2012	09/28/2013
ETS001'	1-18GHz DRG Horn Antenna	ETS-Lindgren	3117	00143259	12/17/2012	12/17/2013
145-416'	Cables 145-400 145-402 145-404 145-408	Huber + Suhner	3m Track B cables	multiple	10/04/2012	10/04/2013
145014'	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	12/13/2012	12/13/2013

Software Utilized:

Name	Manufacturer	Version
C5	Teseq	5.26.46.46

8.3 Results:

The sample tested was found to Comply.

8.4 Setup Photographs:

30-1000 MHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC
Test Setups(7000AHB)

1-10 GHz

This Picture Can be found in a different Exhibit:

Troy2 – Pictures for EMC
Test Setups(7000AHB)

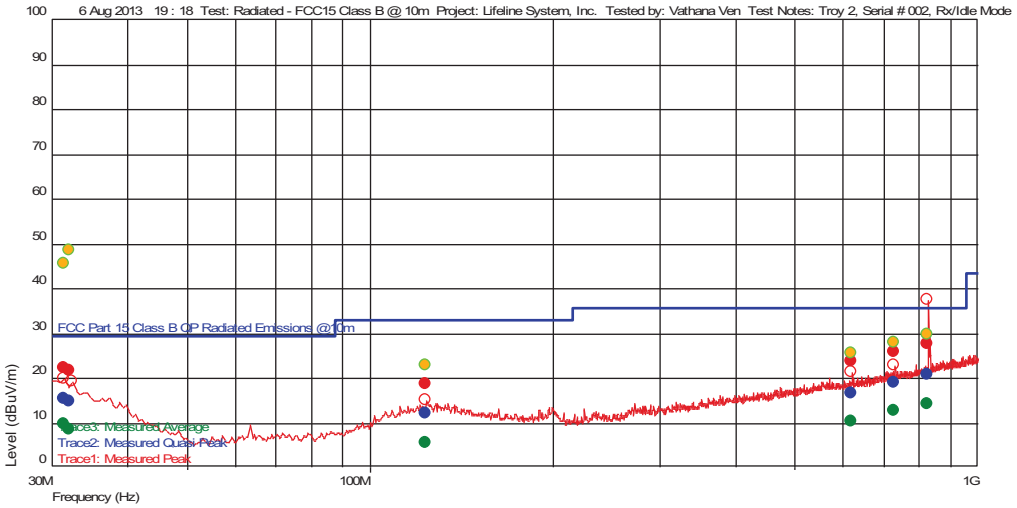
8.5 Plots/Data:

Idle/Receiver Mode, 30-1000 MHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15 Class B @ 10m	
Project:	Lifeline System, Inc.	
Test Notes:	Troy 2, Serial # 002, Rx/Idle Mode	
Temperature:	23C	
Humidity:	43%, 1010mbar	
Tested by:	Vathana Ven	
Test Started:	6 Aug 2013 19 : 18	

Prescan Emission Graph



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

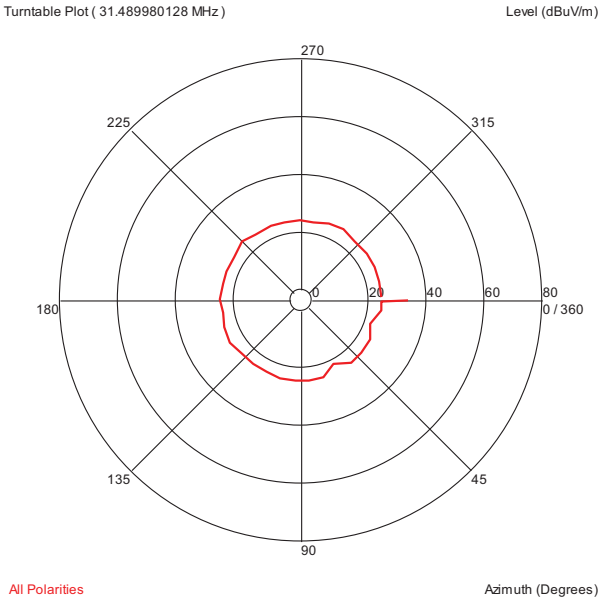
- Swept Peak Data
- Swept Quasi Peak Data
- Swept Average Data

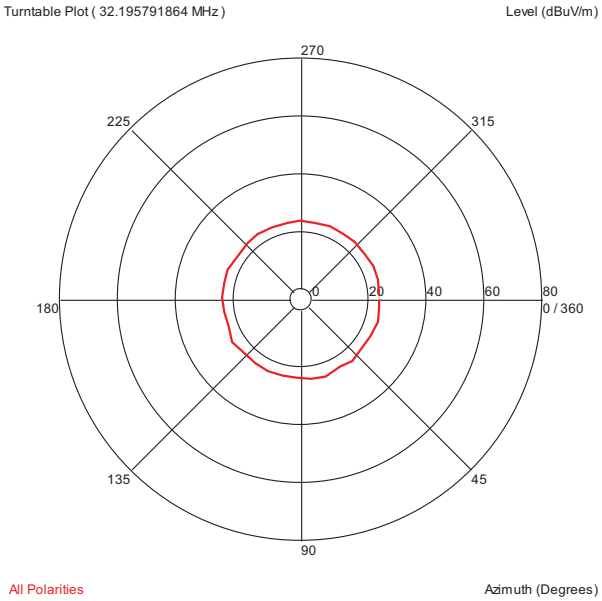
Emissions Test Data

Trace2: Measured Quasi Peak

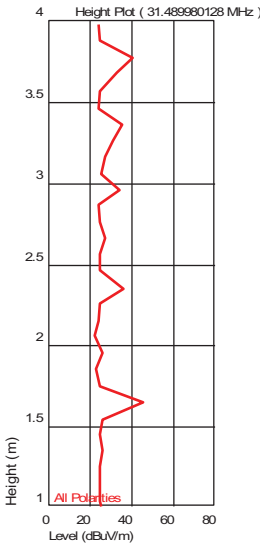
Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dBuV/m)	Hor (--), Ver (|)	Azimuth (deg) (Deg)	Mast Height (m)	RBW (Hz)	Comment
124.053907645 M	12.09	13.943	-24.667	33.040	-20.95	--	212	2.19	120 k	
620.099599263 M	16.68	19.404	-24.548	35.540	-18.86	--	276	4.00	120 k	
730.385170255 M	19.06	20.992	-23.986	35.540	-16.48	|	29	2.58	120 k	
828.933867984 M	20.79	22.057	-23.431	35.540	-14.75	|	29	2.37	120 k	
32.195791864 M	14.88	19.263	-26.430	29.540	-14.66	--	159	3.94	120 k	
31.489980128 M	15.48	19.757	-26.443	29.540	-14.06	|	1	1.75	120 k	

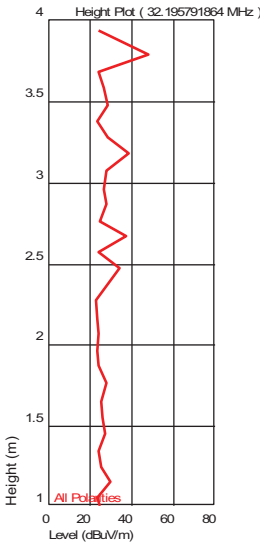
Azimuth Plots

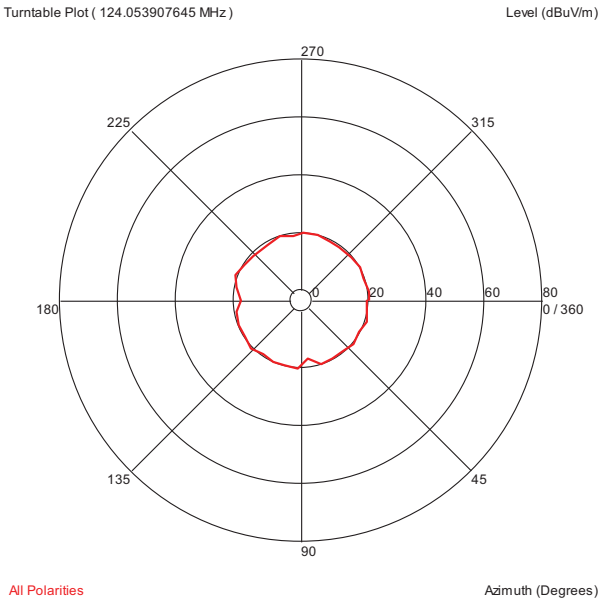


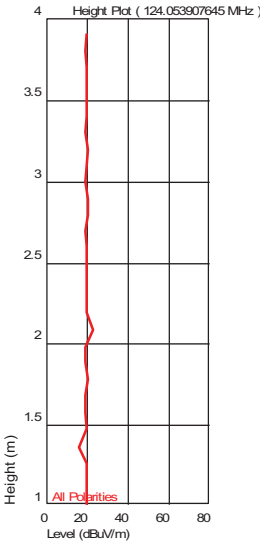


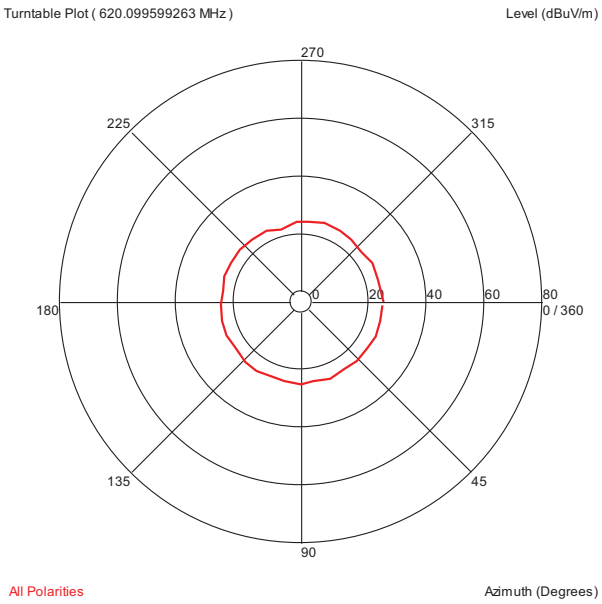
Turntable Plots

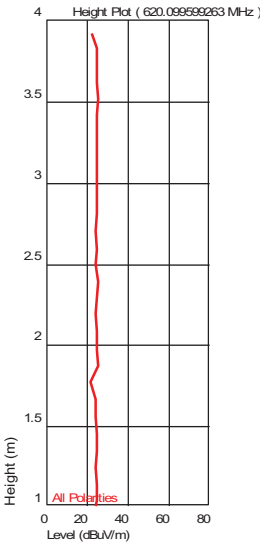


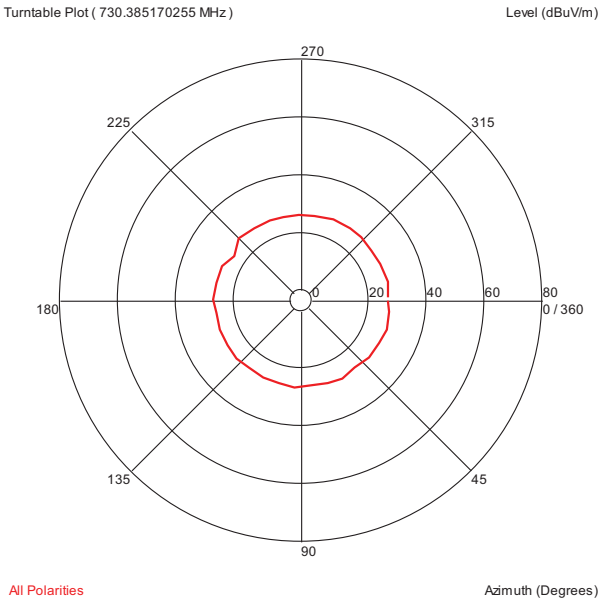


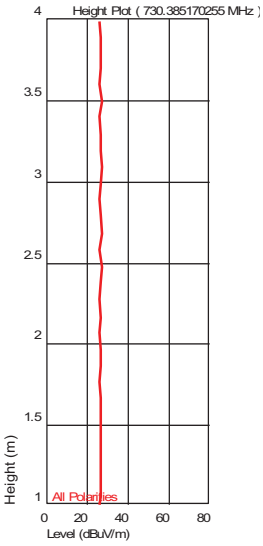

Turntable Plot (124.053907645 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

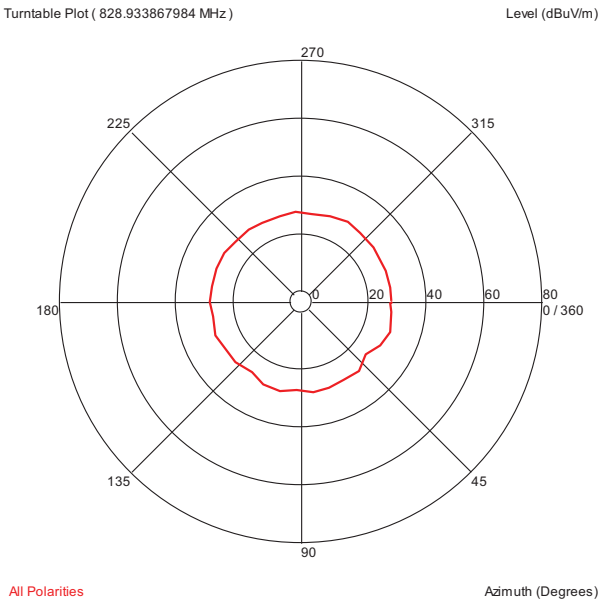

Height Plot (124.053907645 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

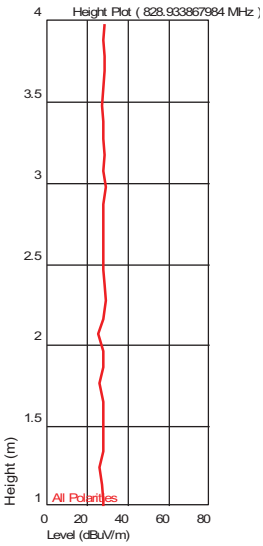

Turntable Plot (620.099599263 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (620.099599263 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (730.385170255 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (730.385170255 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (828.933867984 MHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)

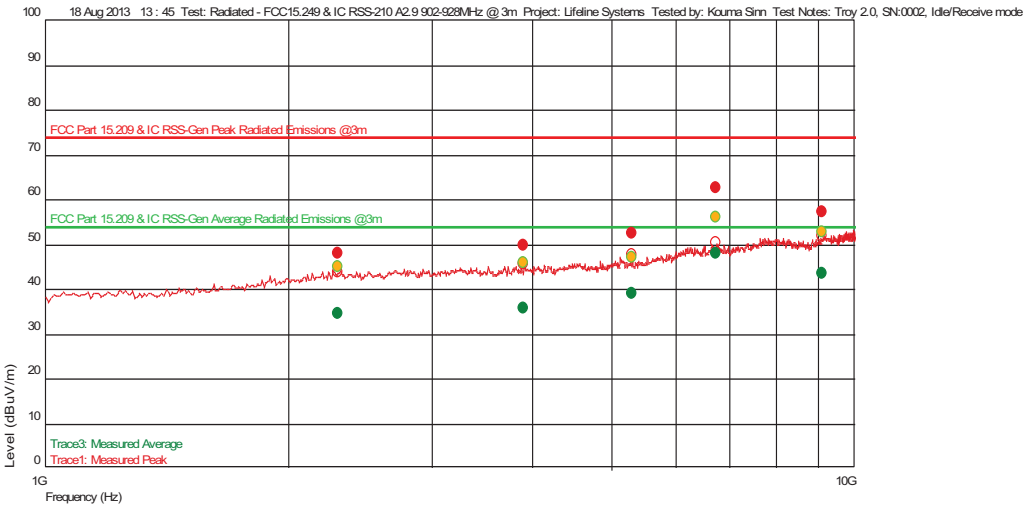

Height Plot (828.933867984 MHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)

Idle/Receiver Mode, 1-10 GHz

Test Information

Test Details	User Entry	Additional Information
Test:	Radiated - FCC15.249 & IC RSS-210 A2.9 902-928MHz @ 3m	
Project:	Lifeline Systems	
Test Notes:	Troy 2.0, SN:0002, Idle/Receive mode	
Temperature:	22C	
Humidity:	51%, 1014mbar	
Tested by:	Kouma Sinn	
Test Started:	18 Aug 2013 13 : 45	

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

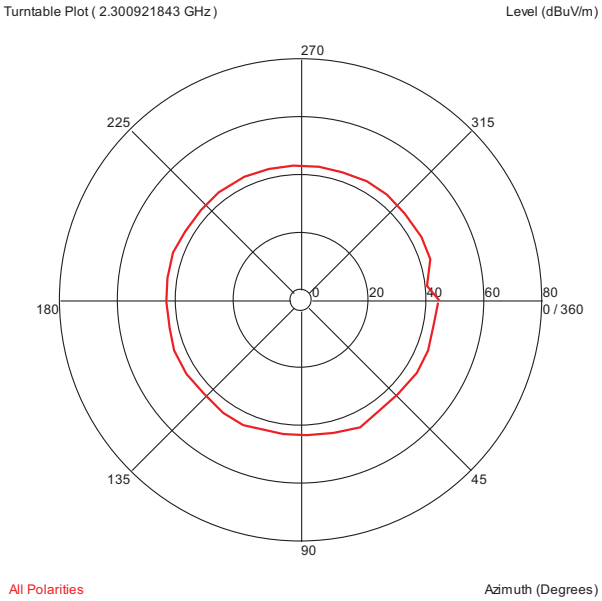
Trace1: Measured Peak

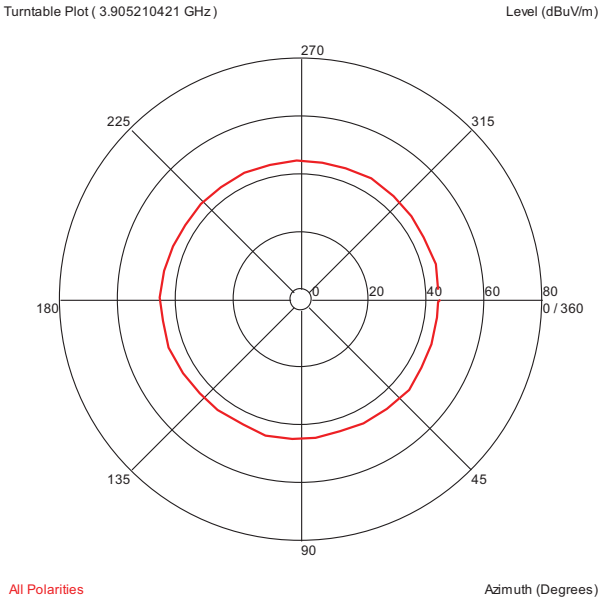
Frequency(Hz)	Level(dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.300921843 G	48.02	32.181	-27.627	74.000	-25.98	|	55	1.54	1 M	
3.905210421 G	49.58	33.800	-26.754	74.000	-24.42	--	192	1.16	1 M	
5.309011356 G	52.39	34.900	-25.307	74.000	-21.61	--	295	2.97	1 M	
9.137374749 G	57.06	37.010	-22.339	74.000	-16.94	|	0	1.84	1 M	
6.74496994 G	62.68	35.802	-23.708	74.000	-11.32	|	106	1.16	1 M	

Trace3: Measured Average

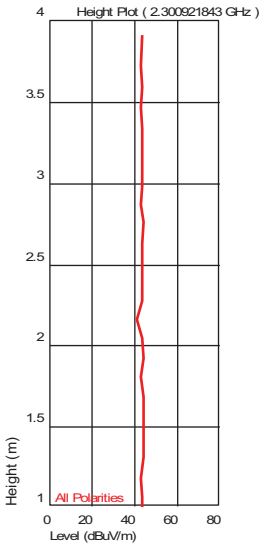
Frequency(Hz)	Level (dBuV/m)	AF	PA+CL	Limit(dBuV/m)	Margin(dBuV/m)	Hor (--), Ver (|)	Azimuth (deg)(Deg)	Mast Height(m)	RBW(Hz)	Comment
2.300921843 G	34.41	32.181	-27.627	54.000	-19.59	|	55	1.54	1 M	
3.905210421 G	35.80	33.800	-26.754	54.000	-18.20	--	192	1.16	1 M	
5.309011356 G	38.99	34.900	-25.307	54.000	-15.01	--	295	2.97	1 M	
9.137374749 G	43.43	37.010	-22.339	54.000	-10.57	|	0	1.84	1 M	
6.74496994 G	48.04	35.802	-23.708	54.000	-5.96	|	106	1.16	1 M	

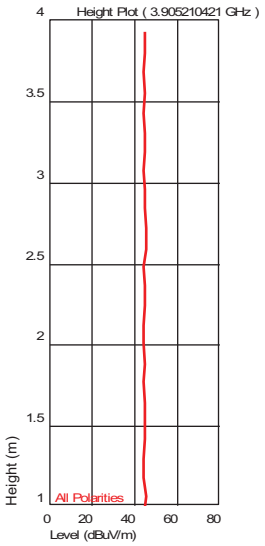
Azimuth Plots

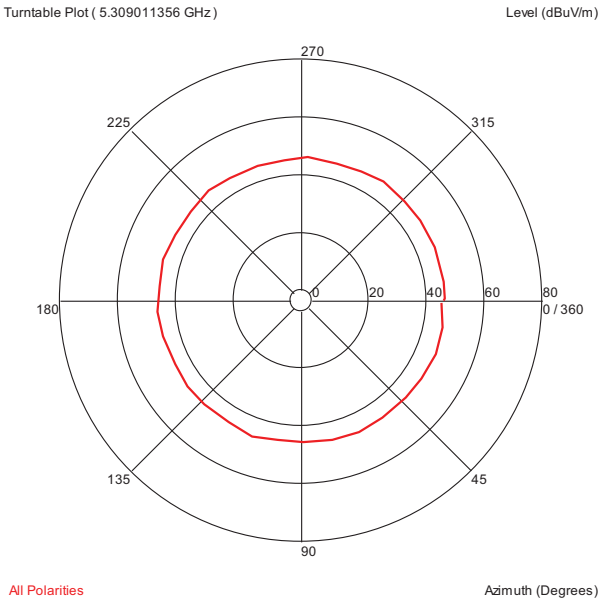


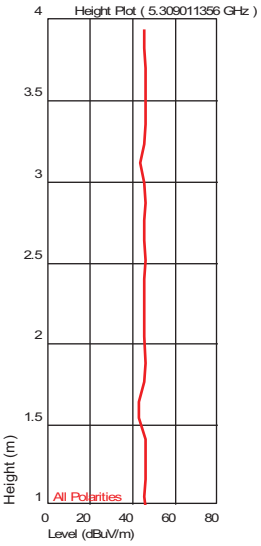


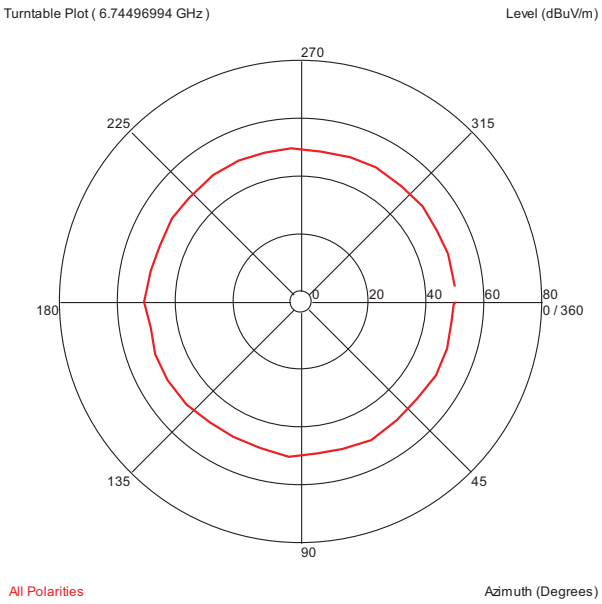
Turntable Plots

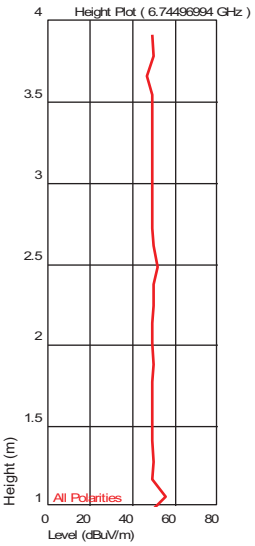


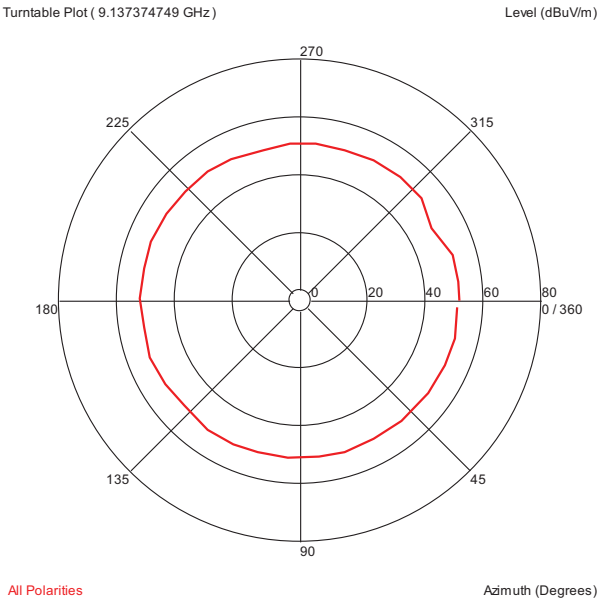


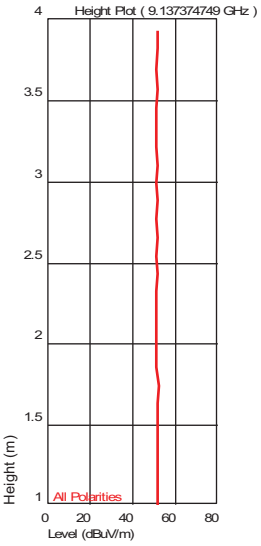

Turntable Plot (5.309011356 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (5.309011356 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)


Turntable Plot (6.74496994 GHz)
Level (dBuV/m)
270
225
315
180
0
20
40
60
80
0 / 360
135
45
90
All Polarities
Azimuth (Degrees)


Height Plot (6.74496994 GHz)
4
3.5
3
2.5
2
1.5
1
Height (m)
All Polarities
0
20
40
60
80
Level (dBuV/m)





Test Personnel:	Vathana Ven VSV	Test Date:	08/06/2013 (2nd shift)
	Kouma Sinn VSV		08/18/2013
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC 15 Subpart B, ICES-003	Limit Applied:	All Class B
Input Voltage:	3.3V (internal battery)	Ambient Temperature:	23, 22 ºC
Pretest Verification w/ Ambient Signals or BB Source:	Ambient Signals	Relative Humidity:	43, 51 %
		Atmospheric Pressure:	1010, 1014 mbars

Deviations, Additions, or Exclusions: None

9 20 dB Bandwidth

9.1 Method

Tests are performed in accordance with FCC 47CFR Part 15:2013 Subpart C 15.249, RSS-210 Issue 8 December 2010, 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 Styrofoam 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
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	09/04/2012	09/04/2013
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
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 to Comply.

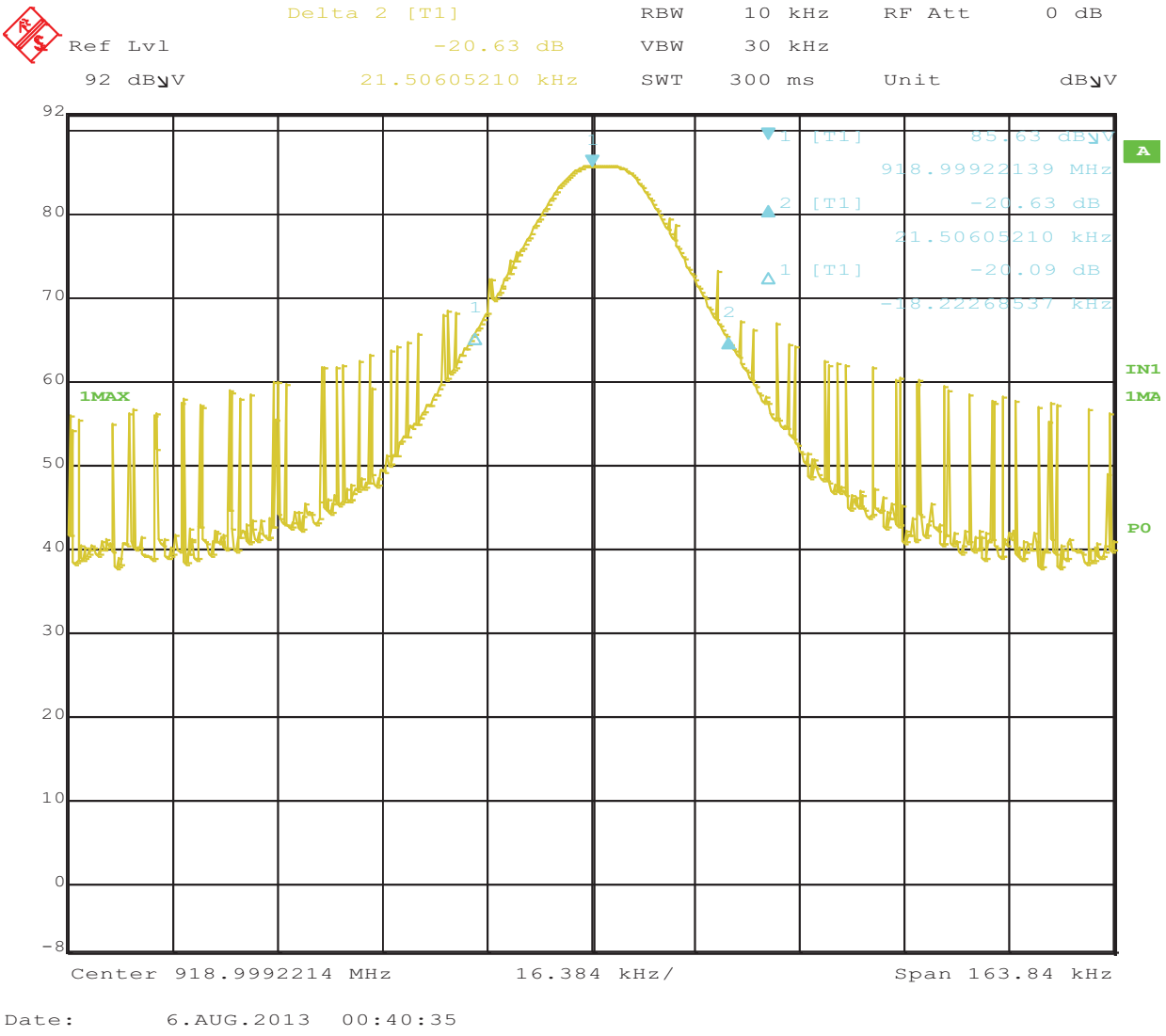
9.4 Setup Photograph:

This Picture Can be found in a different Exhibit:

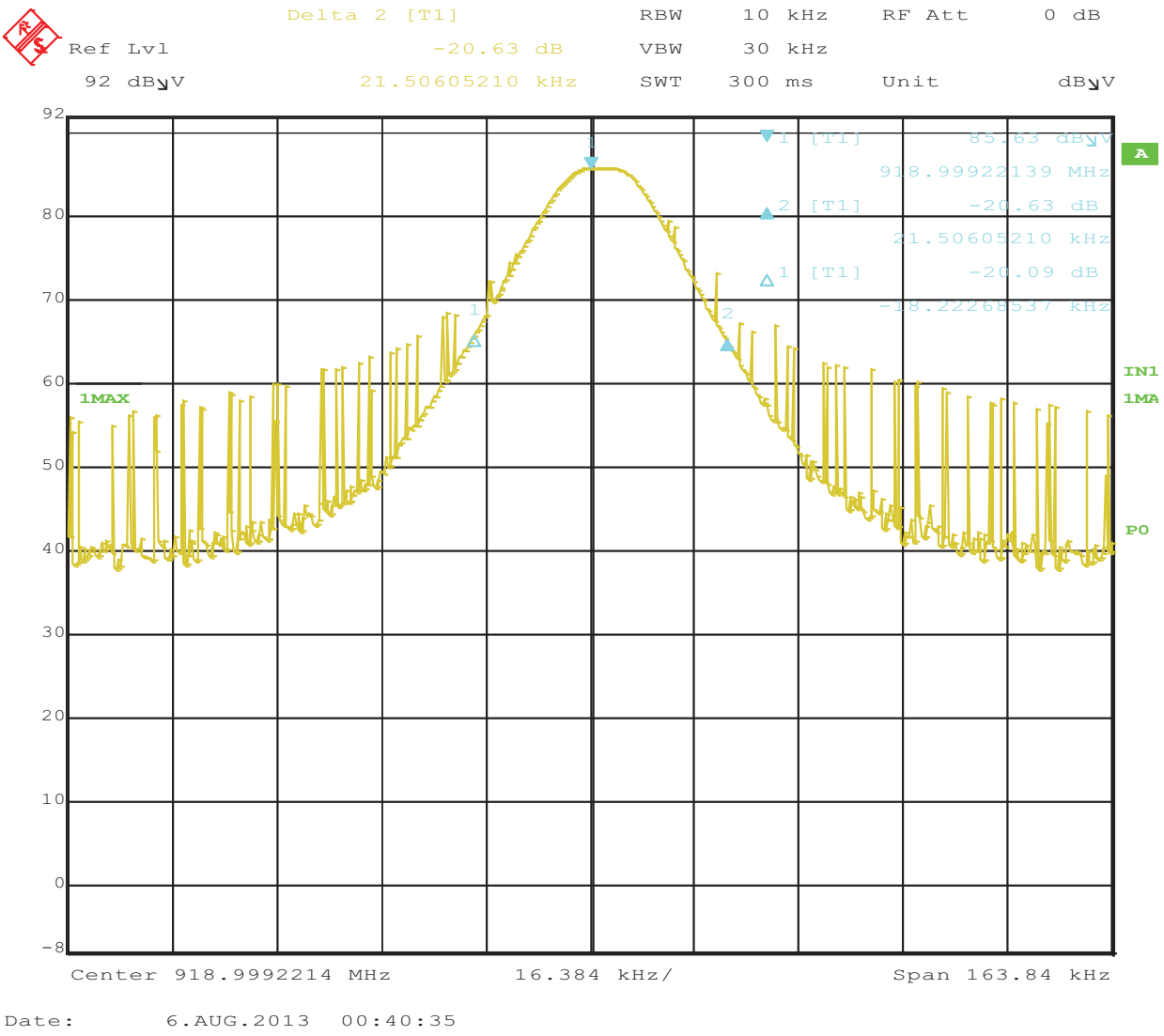
Troy2 – Pictures for EMC
Test Setups(7000AHB)

9.5 Plots/Data:

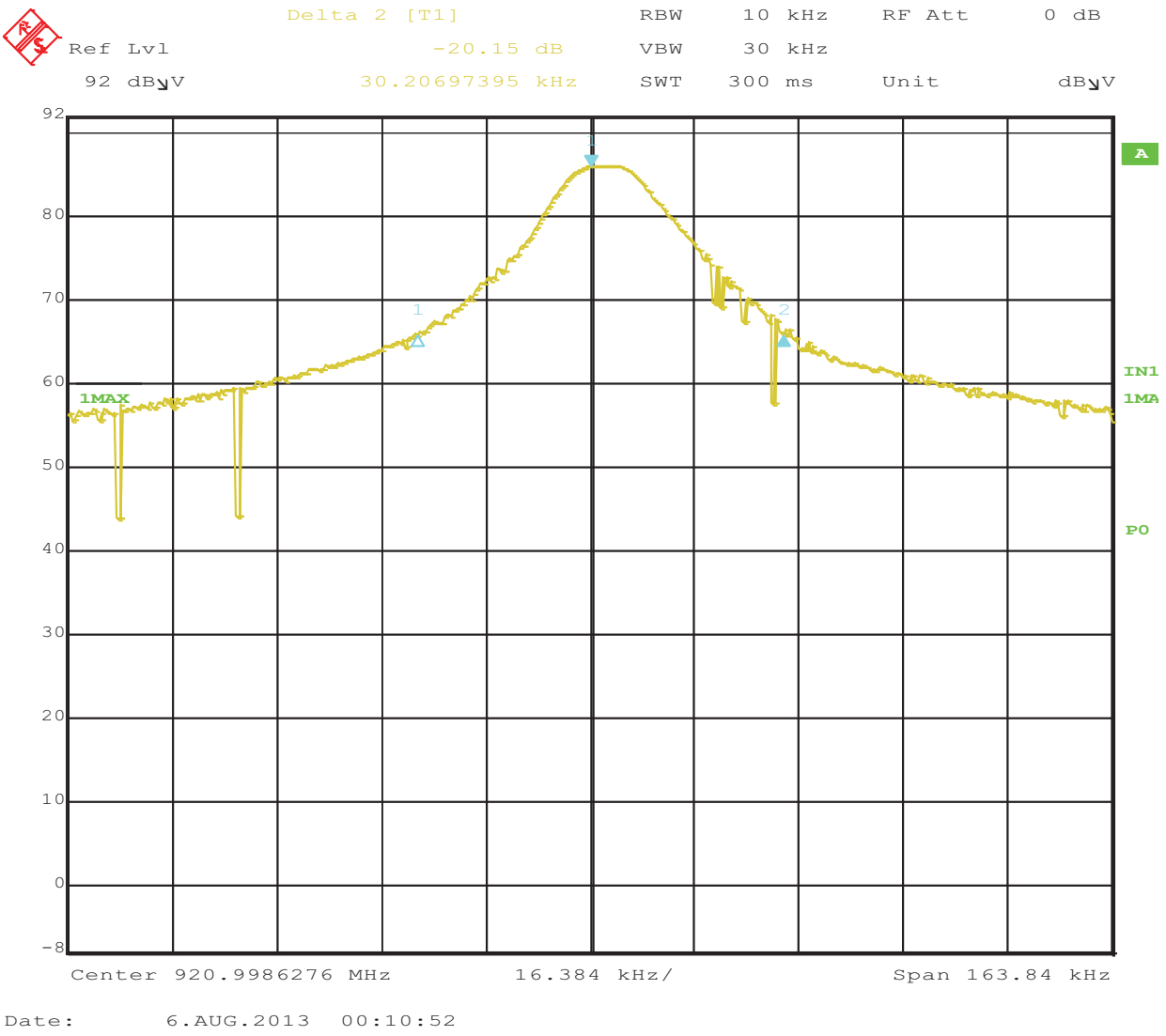
Fundamental Frequency, 917 MHz, 20 dB Bandwidth



Fundamental Frequency, 919 MHz, 20 dB Bandwidth



Fundamental Frequency, 921 MHz, 20 dB Bandwidth



Test Personnel:	Vathana F. Ven VFV	Test Date:	08/06/2013 (2nd shift)
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC15.249, RSS-210	Limit Applied:	No limit
Input Voltage:	3.6V (internal battery)	Ambient Temperature:	23 ºC
Pretest Verification w/ Ambient Signals or BB Source:	**Ambient Signals**	Relative Humidity:	43 %
		Atmospheric Pressure:	1010 mbars

Deviations, Additions, or Exclusions: None

10 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	08/18/2013	101276754BOX-001	KPS	MFM	Original Issue