EMISSIONS TEST REPORT

Report Number: 100415538BOX-008
Project Number: G100415538

Report Issue Date: 06/22/2011

Product Designation: **672A01 EchoPlus® Wireless Junction Box**

Standards: **Industry Canada RSS-210 Issue 8 December 2010, "Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment"**
Industry Canada RSS-Gen Issue 3 December 2010 "General Requirements and Information for the Certification of Radio Apparatus"
ICES-003: Issue 4 (2004), "Technical requirements relative to the radiated and conducted radio noise emissions from digital apparatus"
CFR47 "Telecommunications" FCC Part 15 Subpart C:2010 "Intentional Radiators" 15.249 "Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHZ, and 24.0-24.25 GHz"

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

Client:
PCB Piezotronics Inc
3425 Walden Avenue
Depew, NY 14043

Report prepared by

Vathana F. Ven/Senior Project Engineer

Report reviewed by

Michael F. Murphy/EMC Staff Engineer

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

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

2 Test Summary

Section	Test full name	Result
3	Client Information	
4	Description of Equipment Under Test	
5	System Setup and Method	
6	Fundamental Field Strength (IC RSS-210 A2.9(a), FCC §15.249(a),(e))	Pass
7	Transmitter Occupied Bandwidth (IC RSS-Gen Section 4.6, FCC 15.215)	Pass
8	Transmitter Radiated Spurious Emissions (IC RSS-210 A2.9; IC RSS-Gen Section 4.9, 4.10, 6.0, FCC §15.209, 15.249(a),(d))	Pass
9	AC Mains Conducted Emissions (IC RSS-Gen Section 7.2.4, FCC §15.207)	N/A*
10	10 Revision History	

* - EUT is powered by +24VDC

3 Client Information

This EUT was tested at the request of:

Company: PCB Piezotronics Inc
3425 Walden Avenue
Depew, NY 14043

Contact: Dave Corelli
Telephone: (716) 684-0002 EXT. 2294
Fax: (716) 684-0978
Email: DCorelli@pcb.com

4 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
672A01 EchoPlus® Wireless Junction Box	PCB Piezotronics Inc	672A01 EchoPlus®	32800

Receive Date:	05/24, 05/31, 06/17/2011
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
The EUT is a Wireless Junction Box.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency (Hz)	Number of Phases
24.0V	N/L	N/A (DC)	N/A

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	The EUT was activated from a fresh battery throughout testing. Testing was performed with the 916 MHz transmitter set to normal burst lengths but configured to transmit the burst repetitively to aid in testing. The EUT was also tested in idle mode.
2	

5 System Setup and Method

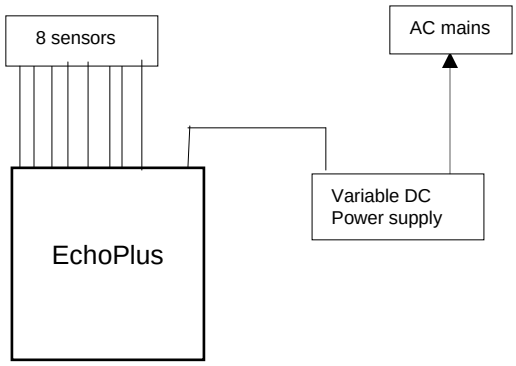
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	DC leads	<3	None	None	DC supply
2	Sensors cables (8)	>3	None	None	Sensors

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
DC power supply	BK Precision	1670	281-8004
Sensor	IMI	622A01	23160
Sensor	IMI	62300	8769
Sensor	IMI	622A01	23162
Sensor	IMI	622A01	23159
Sensor	IMI	622A01	31015
Sensor	IMI	622A01	31014
Sensor	IMI	622A01	31013
Sensor	IMI	626B02	9866

5.1 Method:

Configuration as required by RSS-Gen Issue 3 December 2010 and ANSI C63.4:2003.

5.2 EUT Block Diagram:



6 Fundamental Field Strength

6.1 Method

Tests are performed in accordance with IC RSS-210 A2.9(a), FCC §15.249(a),(e).

TEST SITE: 10m ALSE

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

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
~DAV004	Weather Station	Davis Instruments	7400	PE80529A61 A	06/11/2010	06/11/2011
~145128	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/10/2010	08/10/2011
~145-410	Cables 145-400 145-406 145-407 145-405 145-403	Huber + Suhner	10m Track A Cables	multiple	08/31/2010	08/31/2011
~ 145 106	Bilog Antenna	Sunol Sciences	JB5	A111003	07/20/2010	07/20/2011
~145 003	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2443A04077	09/16/2010	09/16/2011
~BAR3	Digital 4 Line Barometer	Mannix	0ABA116	BAR3	08/11/2010	08/11/2011

Software Utilized:

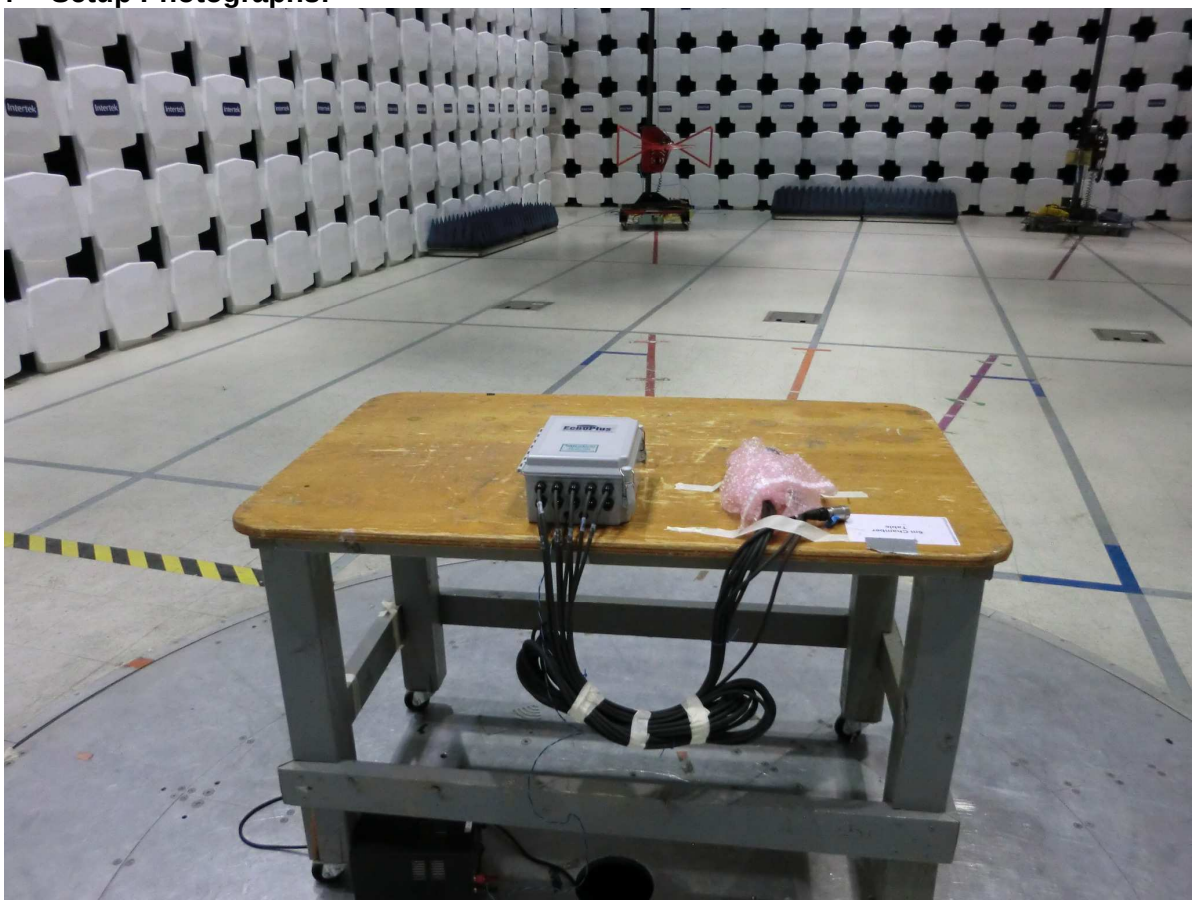
Name	Manufacturer	Version
EMI Boxborough.xls	Intertek	08/27/2010

6.3 Results:

The fundamental field strength must not exceed an average limit of 94 dBuV/m and a peak limit of 114 dBuV/m, which is 20 dB higher than the average limit.

The sample tested was found to Comply.

6.4 Setup Photographs:



6.5 Test Data:

Radiated Emissions

Company: PCB Piezotronics | Antenna & Cables: N | Bands: N, LF, HF, SHF
Model #: 672A01 EchoPlus® | Antenna: 145-106 10M VER 07-20-11.txt | 145-106 10M HOR 07-20-11.txt
Serial #: 32800 | Cable(s): 10mTrackA 145-410 08-31-2011.txt | NONE.
Engineers: Vathana Ven | Location: 10M | Barometer: DAV004 | Filter: NONE
Project #: G100415538 | Date(s): 05/27/11
Standard: 15.249/RSS-210 | Temp/Humidity/Pressure: 23 deg C | 55% | 1000mB
Receiver: R&S ESI (145-128) 08-10-2011 | Limit Distance (m): 3
PreAmp: PRE145003 9-24-11.txt | Test Distance (m): 10
PreAmp Used? (Y or N): Y | Voltage/Frequency: Battery powered | Frequency Range: Fundamental Freq.
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	Harmonic?
PK	H	916.402	74.69	22.20	5.20	28.03	-10.46	84.52	94.00	-9.48	120/300 kHz			
AVG	H	916.402	74.69	22.20	5.20	28.03	-10.46	84.52	94.00	-9.48	120/300 kHz			
PK	V	916.402	68.10	22.53	5.20	28.03	-10.46	78.26	94.00	-15.74	120/300 kHz			
AVG	V	916.402	68.00	22.53	5.20	28.03	-10.46	78.16	94.00	-15.84	120/300 kHz			

Note: Peak measurements passed Average limits

Tested on 06/20/2011

Radiated Emissions

Company: PCB Piezotronics | Antenna & Cables: N | Bands: N, LF, HF, SHF
Model #: 672A01 EchoPlus® | Antenna: 145-106 10M VER 07-20-11.txt | 145-106 10M HOR 07-20-11.txt
Serial #: 32800 | Cable(s): 10mTrackA 145-410 08-31-2011.txt | NONE.
Engineers: Vathana Ven | Location: 10M | Barometer: BAR3 | Filter: NONE
Project #: G100415538 | Date(s): 06/20/11
Standard: FCC Part 15 Subpart B Class B | Temp/Humidity/Pressure: 21 deg C | 42% | 1000mB
Receiver: R&S ESI (145-128) 08-10-2011 | Limit Distance (m): 3
PreAmp: PRE145003 9-24-11.txt | Test Distance (m): 10
PreAmp Used? (Y or N): Y | Voltage/Frequency: Battery powered | Frequency Range: Fundamental Freq.
Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	Harmonic?
PK	H	916.396	78.38	22.20	5.20	28.03	-10.46	88.21	94.00	-5.79	120/300 kHz			
AVG	H	916.396	78.02	22.20	5.20	28.03	-10.46	87.85	94.00	-6.15	120/300 kHz			
PK	V	916.396	69.32	22.53	5.20	28.03	-10.46	79.48	94.00	-14.52	120/300 kHz			
AVG	V	916.396	69.22	22.53	5.20	28.03	-10.46	79.38	94.00	-14.62	120/300 kHz			

Note: Peak measurements passed Average limits

Test Personnel: Vathana Ven VJV
Product Standard: IC RSS-210 A2.9(a), FCC §15.249(a),(e)
Input Voltage: 24VDC
Pretest Verification w/ BB Source: **Ambient**

Test Date: 05/27, 06/20/2011
Test Levels: Below specified limit
Ambient Temperature: 23 ºC
Relative Humidity: 55 %
Atmospheric Pressure: 1000 mbars

Deviations, Additions, or Exclusions: None

7 Transmitter Occupied Bandwidth

7.1 Method

Tests are performed in accordance with IC RSS-Gen Section 4.6, FCC 15.215.

TEST SITE: 10m ALSE

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

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
~DAV004	Weather Station	Davis Instruments	7400	PE80529A61 A	06/11/2010	06/11/2011
~ROS002	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K0 3	100067	04/15/2011	04/15/2012
~CBLBNC61	Cables 145-400 145-408 145-402 145-404	Huber + Suhner	3m Track B cables	multiple	08/31/2010	08/31/2011

Software Utilized:

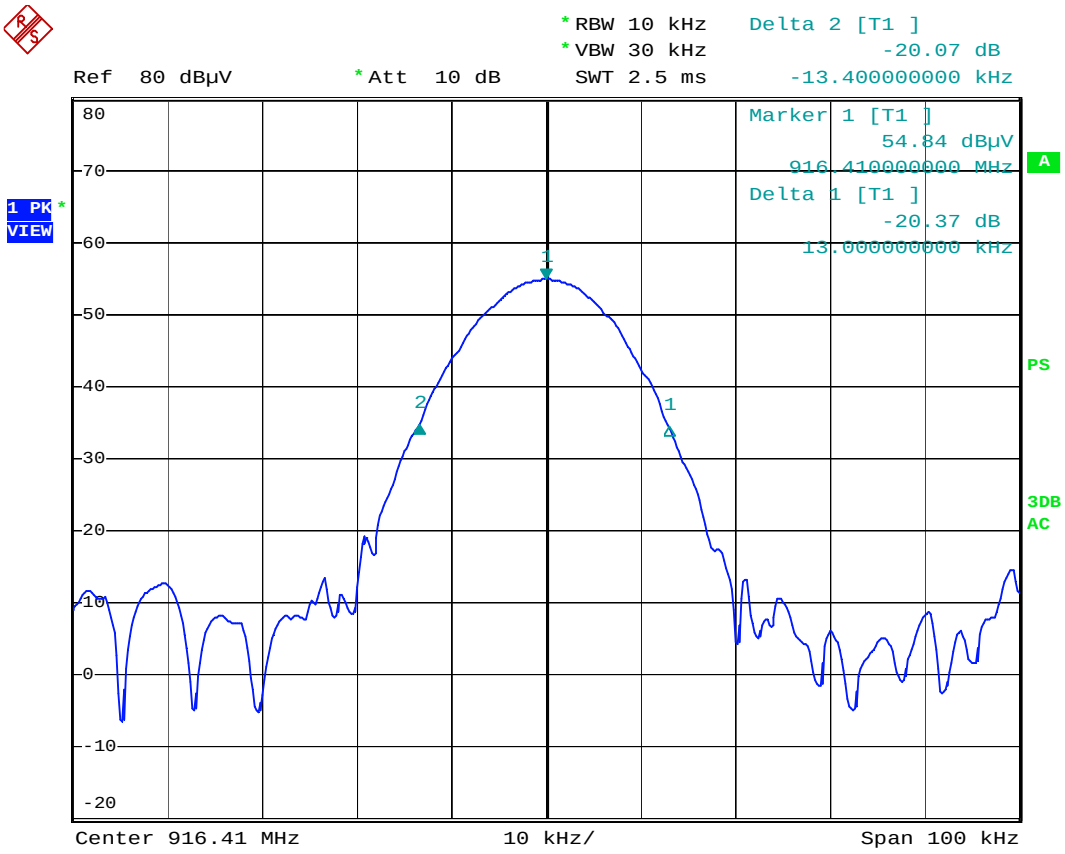
Name	Manufacturer	Version
None (Receiver Firmware)		

7.3 Results:

The 20 dB bandwidth of the fundamental must remain inside the band of operation, 902-928 MHz.

The sample tested was found to Comply.

7.4 Test Data:



Date: 28.MAY.2011 20:40:35

Test Personnel:	Vathana Ven VJV
Product Standard:	IC RSS-210 A2.9(a), FCC §15.249(a),(e)
Input Voltage:	24VDC
Pretest Verification w/ BB Source:	**Ambient**

Test Date:	05/27/2011
Test Levels:	Below specified limit
Ambient Temperature:	23 ºC
Relative Humidity:	55 %
Atmospheric Pressure:	1000 mbars

Deviations, Additions, or Exclusions: None

8 Transmitter Radiated Spurious Emissions

8.1 Method

Tests are performed in accordance with IC RSS-210 A2.9; IC RSS-Gen Section 4.9, 4.10, 6.0, FCC §15.209, 15.249(a),(d).

TEST SITE: 10m ALSE

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

Measurement Uncertainty

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

Sample Calculation

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

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

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

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

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

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

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
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	PE80529A61 A	06/11/2010	06/11/2011
~145-410	Cables 145-400 145-406 145-407 145-405 145-403	Huber + Suhner	10m Track A Cables	multiple	08/31/2010	08/31/2011
~145106	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	07/20/2010	07/20/2011
~145003	Preamplifier (150 KHz to 1.3 GHz)	Hewlett Packard	8447D	2443A04077	09/24/2010	09/24/2011
~145128	EMI Receiver 40 GHz (20 Hz - 40 Ghz)	Rohde & Schwarz	ESI	8392831001	08/10/2010	08/10/2011
~HORN2	HORN ANTENNA	EMCO	3115	9602-4675	10/08/2010	10/08/2011
~145-416	Cables 145-400 145-408 145-402 145-404	Huber + Suhner	3m Track B cables	multiple	08/31/2010	08/31/2011
~REA003	1GHz High Pass Filter	Reactel, Inc	7HS-1G/10G-S11	06-1	12/06/2010	12/06/2011
~145 014	Preamplifier (1 GHz to 26.5 GHz)	Hewlett Packard	8449B	3008A00232	12/28/2010	12/28/2011
~BAR3	Digital 4 Line Barometer	Mannix	0ABA116	BAR3	08/11/2010	08/11/2011

Software Utilized:

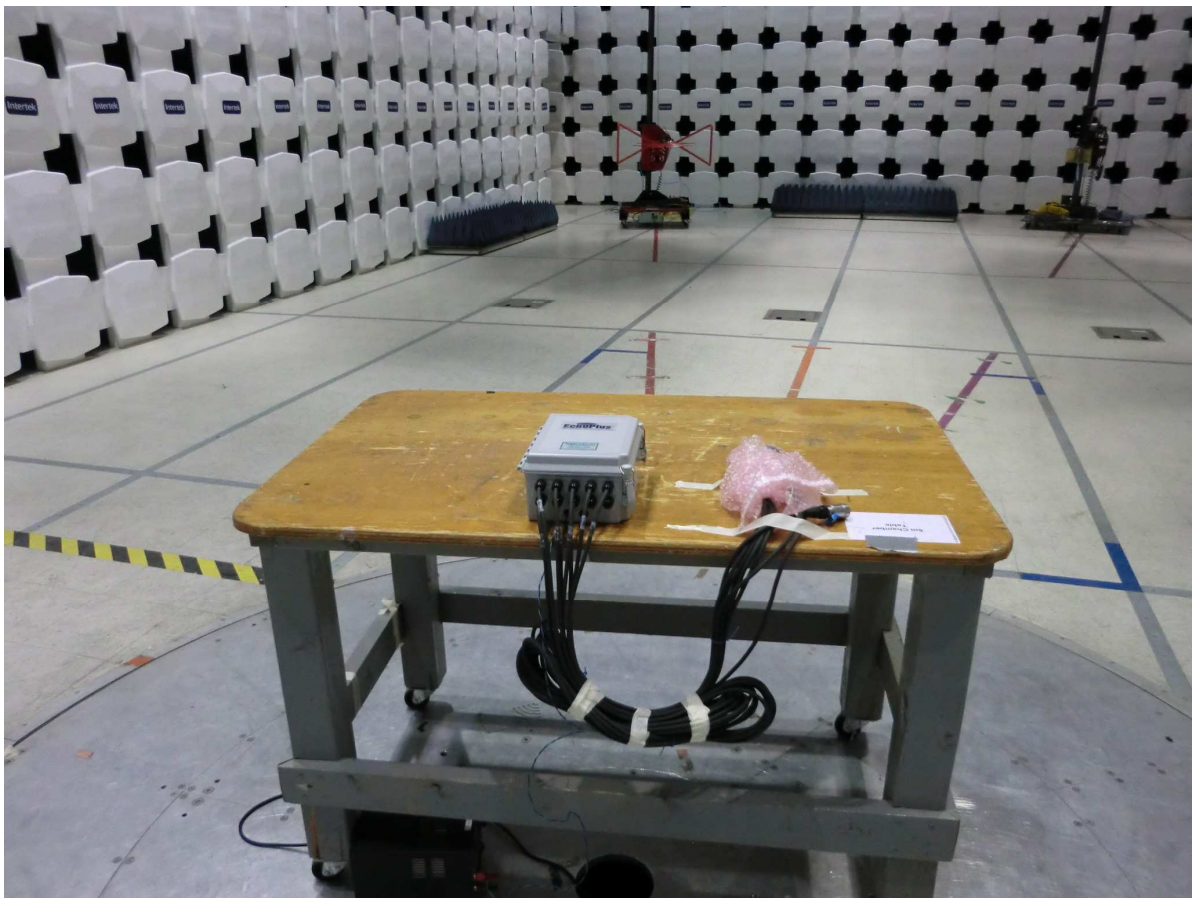
Name	Manufacturer	Version
C5	Teseq	Build 5.26.00.3
EMI Boxborough.xls	Intertek	08/27/2010

8.3 Results:

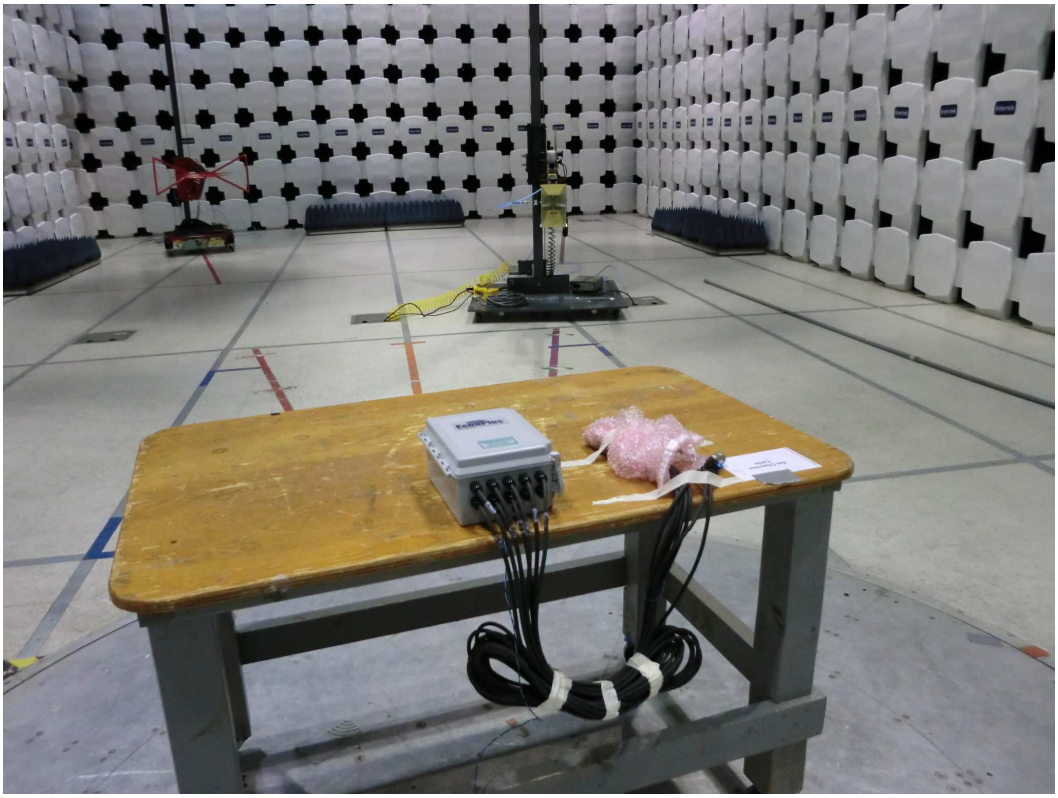
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209 and RSS-Gen Table 1, whichever is the lesser attenuation. Harmonic emissions must not exceed an average limit of 54 dBuV/m and a peak limit of 74 dBuV/m.

The sample tested was found to Comply.

8.4 Setup Photographs:



30-1000 MHz



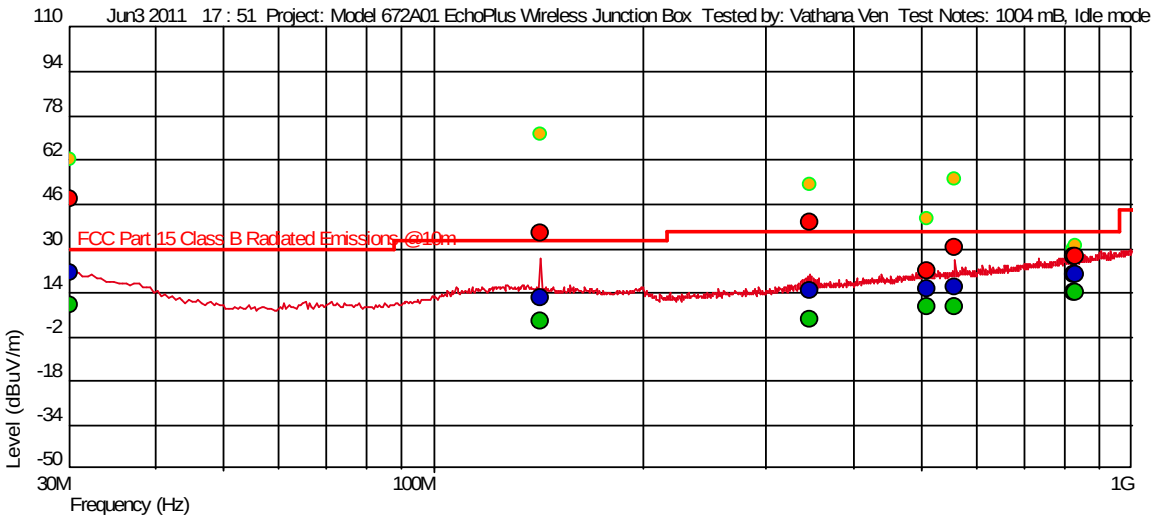
1-10 GHz

Test Data:

IC RSS-210 A2.9(a), FCC §15.249(a),(e), FCC Part 15, Subpart B/ICES003 Class B

Test Information

Test Details	User Input
Project:	Model 672A01 EchoPlus®
Test Notes:	1004 mB, Idle mode
Temperature:	23 deg C
Humidity:	33%
Tested by:	Vathana Ven
Test Started:	Jun3 2011 17 : 51



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

Level (dBuV/m) = AF + CL + PA + Raw

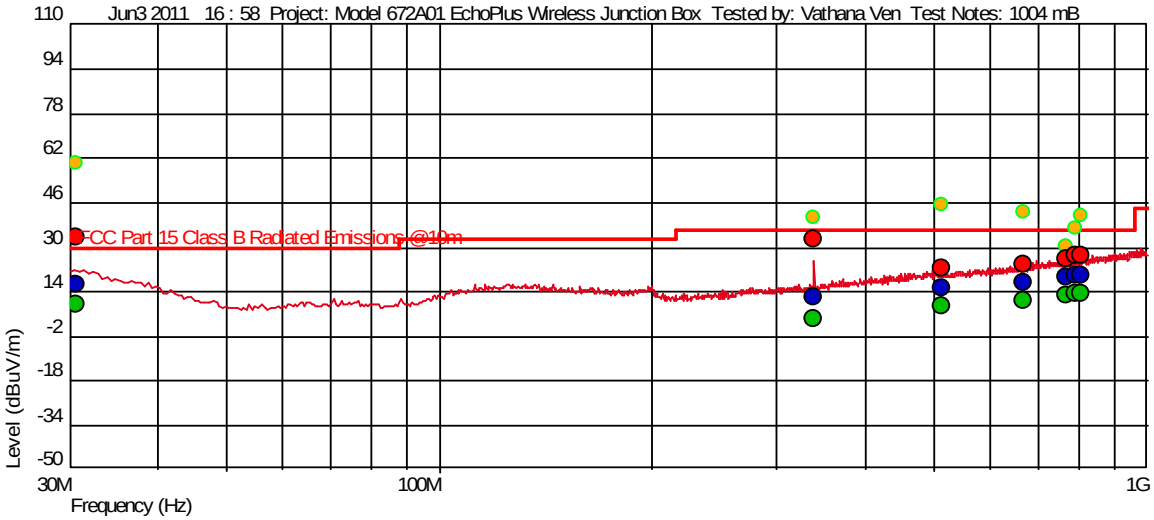
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: QP

Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dB)	Ver (|)	Angle(Deg)	Mast Height (m)	RBW (Hz)
30.0 M	21.02	20.600	-26.558	30.00	-8.98	|	73	2.22	120 k
141.916210188 M	11.94	13.123	-25.439	33.00	-21.06	|	315	1.30	120 k
345.743086208 M	14.80	14.415	-24.477	36.00	-21.20	|	121	2.47	120 k
510.773235515 M	15.21	17.815	-24.538	36.00	-20.79	|	157	2.87	120 k
558.582743263 M	15.90	18.600	-24.523	36.00	-20.10	|	20	3.99	120 k
827.42059683 M	20.83	21.800	-23.355	36.00	-15.17	|	43	3.13	120 k
831.228122788 M	20.73	21.800	-23.349	36.00	-15.27	|	12	1.58	120 k

Test Information

Test Details	User Input
Project:	Model 672A01 EchoPlus®
Test Notes:	1004 mB, Idle mode
Temperature:	23 deg C
Humidity:	33%
Tested by:	Vathana Ven
Test Started:	Jun3 2011 16 : 58



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

Level (dBuV/m) = AF + CL + PA + Raw

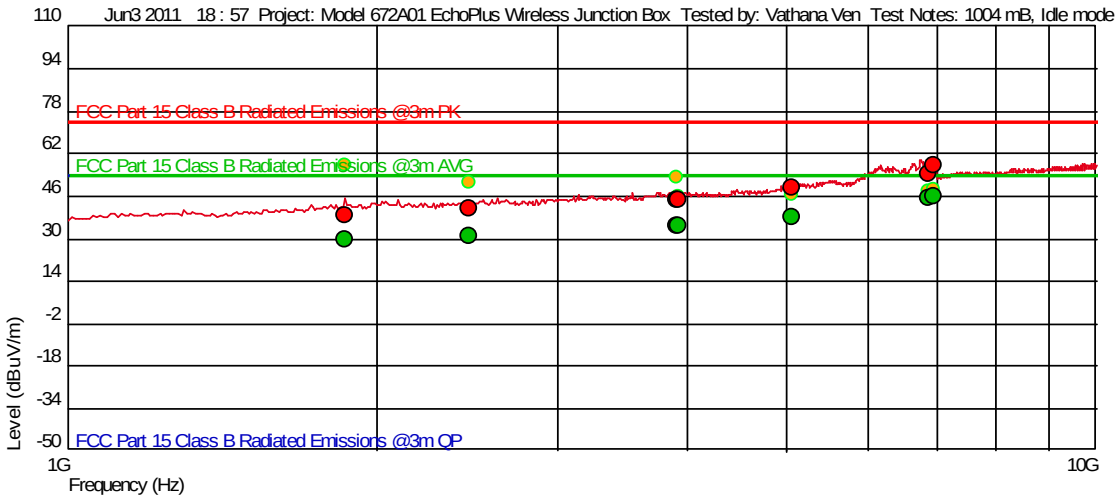
AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: QP

Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dB)	Hor (--)	Angle (Deg)	Mast Height (m)	RBW (Hz)
30.681028605 M	16.53	20.587	-26.554	30.00	-13.47	--	207	3.99	120 k
338.189646006 M	12.10	14.100	-24.497	36.00	-23.90	--	328	1.55	120 k
514.073524992 M	15.28	17.881	-24.537	36.00	-20.72	--	225	1.44	120 k
668.676352689 M	17.36	19.700	-24.273	36.00	-18.64	--	215	3.99	120 k
768.905477647 M	19.29	20.600	-23.701	36.00	-16.71	--	188	1.62	120 k
794.639078236 M	20.12	21.186	-23.451	36.00	-15.88	--	358	3.01	120 k
804.921398473 M	20.20	21.200	-23.392	36.00	-15.80	--	253	3.57	120 k

Test Information

Test Details	User Input
Project:	Model 672A01 EchoPlus®
Test Notes:	1004 mB, Idle mode
Temperature:	33%
Humidity:	33%
Tested by:	Vathana Ven
Test Started:	Jun3 2011 18 : 57



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

Level (dBuV/m) = AF + CL + PA + Raw

AF = Antenna Factor
CL = Cable Losses
PA = Pre-Amplifier
Raw = Raw Instrument Reading (Not listed on Spot Tables)

Measured: PEAK

Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dB)	Hor (--) Ver (|)	Angle (Deg)	Mast Height (m)	RBW (Hz)
1.858662659 G	38.84	27.333	-28.726	74.00	-35.16	--	235	1.58	1 M
2.461327989 G	41.34	28.305	-28.089	74.00	-32.66	--	144	1.20	1 M
3.911558673 G	44.47	32.600	-27.228	74.00	-29.53	--	32	2.22	1 M
3.931693609 G	44.62	32.546	-27.224	74.00	-29.38	|	73	2.35	1 M
5.061303496 G	48.97	33.298	-26.259	74.00	-25.03	|	127	2.12	1 M
6.884162993 G	54.66	34.948	-25.275	74.00	-19.34	--	146	1.68	1 M
6.966899577 G	57.92	34.973	-25.162	74.00	-16.08	--	163	1.69	1 M

Measured: AVERAGE

Frequency (Hz)	Level (dBuV/m)	AF	PA+CL	Limit (dBuV/m)	Margin (dB)	Hor (--) Ver (|)	Angle (Deg)	Mast Height (m)	RBW (Hz)
1.858662659 G	29.56	27.333	-28.726	54.00	-24.44	--	235	1.58	1 M
2.461327989 G	30.91	28.305	-28.089	54.00	-23.09	--	144	1.20	1 M
3.911558673 G	34.61	32.600	-27.228	54.00	-19.39	--	32	2.22	1 M
3.931693609 G	34.56	32.546	-27.224	54.00	-19.44	|	73	2.35	1 M
5.061303496 G	38.25	33.298	-26.259	54.00	-15.75	|	127	2.12	1 M
6.884162993 G	45.01	34.948	-25.275	54.00	-8.99	--	146	1.68	1 M
6.966899577 G	46.25	34.973	-25.162	54.00	-7.75	--	163	1.69	1 M

Special Radiated Emissions

Company:	PCB Pieztronics						Antenna & Cables:	HF	Bands: N, LF, HF, SHF						
Model #:	672A01 EchoPlus®						Antenna:	HORN2 V3m 10-08-2011.txt	HORN2 H3m 10-08-2011.txt						
Serial #:	32800						Cable(s):	3mTrackB 145-416 08-31-2011.txt	NONE.						
Engineers:	Vathana Ven			Location:	10M		Barometer:	DAV004	Filter:	REA003					
Project #:	G100415538	Date(s):	05/27/11												
Standard:	15.249/RSS-210/FCC 15						Temp/Humidity/Pressure:	23 deg C	55%	1000mB					
Receiver:	R&S ESI (145-128) 08-10-2011			Limit Distance (m):	3										
PreAmp:	PRE145003 9-24-11.txt			Test Distance (m):	3										
	PreAmp Used? (Y or N):	Y		Voltage/Frequency:	Battery powered		Frequency Range:	1-10GHz							

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	Harmonic?	
PK	H	1832.822	48.82	27.27	4.97	33.64	0.00	47.42	54.00	-6.58	1/3 MHz				
AVG	H	1832.822	44.93	27.27	4.97	33.64	0.00	43.53	54.00	-10.47	1/3 MHz				
PK	V	2749.233	50.32	28.80	6.20	34.03	0.00	51.29	54.00	-2.71	1/3 MHz	RB	RB		
AVG	V	2749.233	44.60	28.80	6.20	34.03	0.00	45.57	54.00	-8.43	1/3 MHz	RB	RB		
PK	H	3665.620	42.70	31.80	7.23	34.92	0.00	46.81	74.00	-27.19	1/3 MHz	RB	RB		Noise Floor
AVG	H	3665.620	30.60	31.80	7.23	34.92	0.00	34.71	54.00	-19.29	1/3 MHz	RB	RB		Noise Floor
PK	H	4582.025	41.70	32.25	8.25	34.99	0.00	47.21	74.00	-26.79	1/3 MHz	RB	RB		Noise Floor
AVG	H	4582.025	29.90	32.25	8.25	34.99	0.00	35.41	54.00	-18.59	1/3 MHz	RB	RB		Noise Floor
PK	H	5498.430	43.47	34.12	9.00	34.90	0.00	51.69	74.00	-22.31	1/3 MHz				Noise Floor
AVG	H	5498.430	31.10	34.12	9.00	34.90	0.00	39.32	54.00	-14.68	1/3 MHz				Noise Floor
PK	H	6414.835	44.48	34.21	9.84	35.52	0.00	53.01	74.00	-20.99	1/3 MHz				Noise Floor
AVG	H	6414.835	35.20	34.21	9.84	35.52	0.00	43.73	54.00	-10.27	1/3 MHz				Noise Floor
PK	V	7331.240	40.50	36.32	10.59	35.63	0.00	51.77	74.00	-22.23	1/3 MHz	RB	RB		Noise Floor
AVG	V	7331.240	30.50	36.32	10.59	35.63	0.00	41.77	54.00	-12.23	1/3 MHz	RB	RB		Noise Floor
PK	V	8247.645	40.00	36.90	11.30	35.80	0.00	52.40	74.00	-21.60	1/3 MHz	RB	RB		Noise Floor
AVG	V	8247.645	30.70	36.90	11.30	35.80	0.00	43.10	54.00	-10.90	1/3 MHz	RB	RB		Noise Floor
PK	V	9164.050	39.80	37.78	12.04	35.94	0.00	53.67	74.00	-20.33	1/3 MHz	RB	RB		Noise Floor
AVG	V	9164.050	30.40	37.78	12.04	35.94	0.00	44.27	54.00	-9.73	1/3 MHz	RB	RB		Noise Floor

Tested on 06/20/2011

Special Radiated Emissions

Company:	PCB Pieztronics						Antenna & Cables:	HF	Bands: N, LF, HF, SHF						
Model #:	672A01 EchoPlus®						Antenna:	HORN2 V3m 10-08-2011.txt	HORN2 H3m 10-08-2011.txt						
Serial #:	32800						Cable(s):	3mTrackB 145-416 08-31-2011.txt	NONE.						
Engineers:	Vathana Ven			Location:	10M		Barometer:	BAR3	Filter:	REA003					
Project #:	G100415538	Date(s):	06/20/11												
Standard:	FCC Part 15 Subpart B Class B						Temp/Humidity/Pressure:	21 deg C	42%	1000mB					
Receiver:	R&S ESI (145-128) 08-10-2011			Limit Distance (m):	3										
PreAmp:	PRE145003 9-24-11.txt			Test Distance (m):	3										
	PreAmp Used? (Y or N):	Y		Voltage/Frequency:	Battery powered		Frequency Range:	1-10GHz							

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	FCC	IC	Harmonic?	
PK	V	1832.860	49.88	27.26	4.97	33.64	0.00	48.46	54.00	-5.54	1/3 MHz				
AVG	V	1832.860	45.83	27.26	4.97	33.64	0.00	44.41	54.00	-9.59	1/3 MHz				
PK	V	2749.260	51.64	28.80	6.20	34.03	0.00	52.61	54.00	-1.39	1/3 MHz	RB	RB		
AVG	V	2749.260	49.29	28.80	6.20	34.03	0.00	50.26	54.00	-3.74	1/3 MHz	RB	RB		
PK	H	3665.660	48.86	31.80	7.23	34.92	0.00	52.97	54.00	-1.03	1/3 MHz	RB	RB		
AVG	H	3665.660	45.01	31.80	7.23	34.92	0.00	49.12	54.00	-4.88	1/3 MHz	RB	RB		
PK	H	4582.025	42.47	32.25	8.25	34.99	0.00	47.98	54.00	-6.02	1/3 MHz	RB	RB		
AVG	H	4582.025	33.20	32.25	8.25	34.99	0.00	38.71	54.00	-15.29	1/3 MHz	RB	RB		
PK	H	5498.430	43.47	34.12	9.00	34.90	0.00	51.69	74.00	-22.31	1/3 MHz				Noise Floor
AVG	H	5498.430	31.10	34.12	9.00	34.90	0.00	39.32	54.00	-14.68	1/3 MHz				Noise Floor
PK	H	6414.835	44.48	34.21	9.84	35.52	0.00	53.01	74.00	-20.99	1/3 MHz				Noise Floor
AVG	H	6414.835	35.20	34.21	9.84	35.52	0.00	43.73	54.00	-10.27	1/3 MHz				Noise Floor
PK	V	7331.240	40.50	36.32	10.59	35.63	0.00	51.77	74.00	-22.23	1/3 MHz	RB	RB		Noise Floor
AVG	V	7331.240	30.50	36.32	10.59	35.63	0.00	41.77	54.00	-12.23	1/3 MHz	RB	RB		Noise Floor
PK	V	8247.645	40.00	36.90	11.30	35.80	0.00	52.40	74.00	-21.60	1/3 MHz	RB	RB		Noise Floor
AVG	V	8247.645	30.70	36.90	11.30	35.80	0.00	43.10	54.00	-10.90	1/3 MHz	RB	RB		Noise Floor
PK	V	9164.050	39.80	37.78	12.04	35.94	0.00	53.67	74.00	-20.33	1/3 MHz	RB	RB		Noise Floor
AVG	V	9164.050	30.40	37.78	12.04	35.94	0.00	44.27	54.00	-9.73	1/3 MHz	RB	RB		Noise Floor

Test Personnel: Vathana Ven VJV

Product Standard: IC RSS-210 A2.9(a), FCC §15.249(a),(e), FCC Part 15, Subpart B, ICES003

Input Voltage: 24VDC

Pretest Verification w/ BB Source: **Ambient**

Test Date: 05/27, 06/03, 06/20/2011

Test Levels: Below specified limit

Ambient Temperature: 23, 21 ºC

Relative Humidity: 55, 42 %

Atmospheric Pressure: 1000, 1000 mbars

Deviations, Additions, or Exclusions: None

10 Revision History

Revision Level	Date	Report Number	Notes
0	06/22/2011	100415538BOX-008	Original Issue