Lab Code: 200167-0

FCC PART 15B/ ICES-003 CLASS B
TEST AND MEASUREMENT REPORT

For

Meru Networks, Inc.

894 Ross Drive
Sunnyvale, CA 94089, USA

Model: AP433e, AP433i, AP433is and OAP433e

Report Type:	**Product Type:**
Original Report	Access Point

Test Engineer:	Jerry Huang 
Report Number:	R1110122
Report Date:	2012-01-27
Reviewed By:	Victor Zhang EMC/RF Lead 
Prepared By: **(84)**	Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732 9164

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1110122	Original Report	2012-01-27

1 General Information

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report was prepared on behalf of *Meru Networks, Inc*., and their product, models: AP433e, AP433i, AP433is, and OAP433e, which will henceforth be referred to as the EUT "Equipment under Test". The EUTs are dual-band access points.

1.2 Mechanical Description of EUT

The EUT (model number: AP433e) measures approximately 20.0 cm (L) x 16.5 cm (W) x 3.5 cm (H) and weighs 0.9 kg.

The data gathered are from a sample provided by the manufacture. Serial number: 3311A433eOA5DCC, provided by Meru Networks.

The EUT (model number: AP433i) measures approximately 23.6 cm (L) x 22.2 cm (W) x 5.6 cm (H) and weighs 1.3 kg.

The data gathered are from a sample provided by the manufacturer serial number: 3411A433iOA5E2E, provided by Meru Networks.

The EUT (model number: AP433is) measures approximately 23.6 (L) x 22.2 cm (W) x 5.6 cm (H) and weighs 1.35 kg.

The data gathered are from a sample provided by the manufacture. Serial number: 311A43isOA60F3, provided by Meru Networks.

The EUT (model number: OAP433e) measures approximately 25.9 cm (L) x 25.0 cm (W) x 7.6 cm (H) and weighs 1.86 kg.

The data gathered are from a sample provided by the manufacturer serial number: 3911OA433OA6114, provided by Meru Networks.

1.3 Objective

This report is prepared on behalf of *Meru Networks, in* accordance with Part 15, Subparts B of the Federal Communications Commission rules, and Issue 4 of Industry Canada ICES-003, Interference – Causing Equipment Standards for Digital Apparatus.

The objective is to determine compliance with Part 15 of the FCC Rules and Industry Canada ICES-003 Standard using CISPR 22: 2006 Standard, Class B limits for conducted and radiated emission requirements for Information Technology Equipment.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All tests were performed at Bay Area Compliance Laboratories Corp.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2008 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz as well as ANSI C63.4-2003, ANSI C63.4-2009, TIA/EIA-603 & CISPR 24:2010.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-3729, C-4176, G-469, and T-1206. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is a National Institute of Standards and Technology (NIST) accredited laboratory under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/Standards/scopes/2001670.htm

2 System Test Configuration

2.1 Justification

The EUT was configured in accordance to ANSI C63.4-2003 Standards.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

The software, ART_1.8, used during testing was provided by customer and verified by Ning Ma to comply with the standard requirements being tested against.

2.3 Equipment Modifications

No modifications were made to the EUT.

2.4 Local Support Equipment

Manufacturers	Description	Models	Serial Number
DELL	Laptop	1XDRM A00	4SD2LQ1
NETGEAR	Router	GS605 v2	1FE1715K02A42

2.5 Power Supply List and Details

Manufacturer	Description	Model Number	Serial Number
PowerDsine	Power Adapter	PD-9001G	D11176500000B4AA00

2.6 External I/O Cabling List and AC Cord

Cable Description	Length (M)	From	To
RJ 45	< 1.0	Power Adapter	Router
RJ 45	< 1.0	Power Adapter	EUT
RJ 45	< 1.0	Router	Laptop
USB	< 1.0	Termination	EUT

2.7 EUT Internal Configurations

EUT with model Number: AP433e

Objects/Parts	Manufacturers	Model	Series Number
Main Board	Meru Network, Inc	8501-601207-01	1850146
Wifi Module X 3	Meru Network, Inc	8500-601204-02	-

EUT with model Number: AP433i

Objects/Parts	Manufacturers	Model	Series Number
Main Board	Meru Network, Inc	8501-601207-01	1850012
Wifi Module X 3	Meru Network, Inc	8500-601204-02	-

EUT with model Number: AP433is

Objects/Parts	Manufacturers	Model	Series Number
Main Board	Meru Network, Inc	8501-601207-01	1850322
Wifi Module X 3	Meru Network, Inc	8500-601204-02	-

EUT with model Number: OAP433e

Objects/Parts	Manufacturers	Model	Series Number
Main Board	Meru Network, Inc	8501-601207-01	19A0100
Wifi Module X 3	Meru Network, Inc	8500-601204-02	-
Wifi Module Adapter Card	Meru Network, Inc	8500-602206-01	18VD145

3 Summary of Test Results

FCC & IC Rules	Descriptions of Test	Result(s)
FCC §15.107, IC ICES-003 §5.3	Conducted Emissions	Compliance
FCC §15.109, IC ICES-003 §5.5	Radiated Emissions	Compliance

4 FCC §15.107 & IC ICES-003 §5.3 – Conducted Emissions

4.1 Applicable Standards

As per FCC §15.107: Conducted Limits

(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Table 1- Limits for conducted disturbance at the mains ports of class B ITE

Frequency range (MHz)	Limits dB (μV/)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

As per IC ICES-003 §5.3:

The voltage of radio noise emissions that are conducted along the power supply lines of a Class B digital apparatus shall not exceed the limits specified in Table 2 of the publication referred to in Section 7.1, within the indicated frequency range.

The equipment under test (EUT) shall meet the limits in Table 2 including the average limit and the quasi-peak limit when using, respectively, an average detector receiver and quasi-peak detector receiver and measured in accordance with the methods described in Clause 9. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

Table 2 – Limits for conducted disturbance at the mains ports of class B ITE

Frequency range (MHz)	Limits dB (μV/)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

NOTE 1: The lower limit shall apply at the transition frequency.
NOTE 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

4.2 Test Setup

The conducted emission tests were performed in the 5-meter test chamber 3, using the setup in accordance with FCC Part 15 measurement procedures. The specifications used were in accordance with FCC Part 15B and IC ICES-003, Class B limits.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and bundled as required.

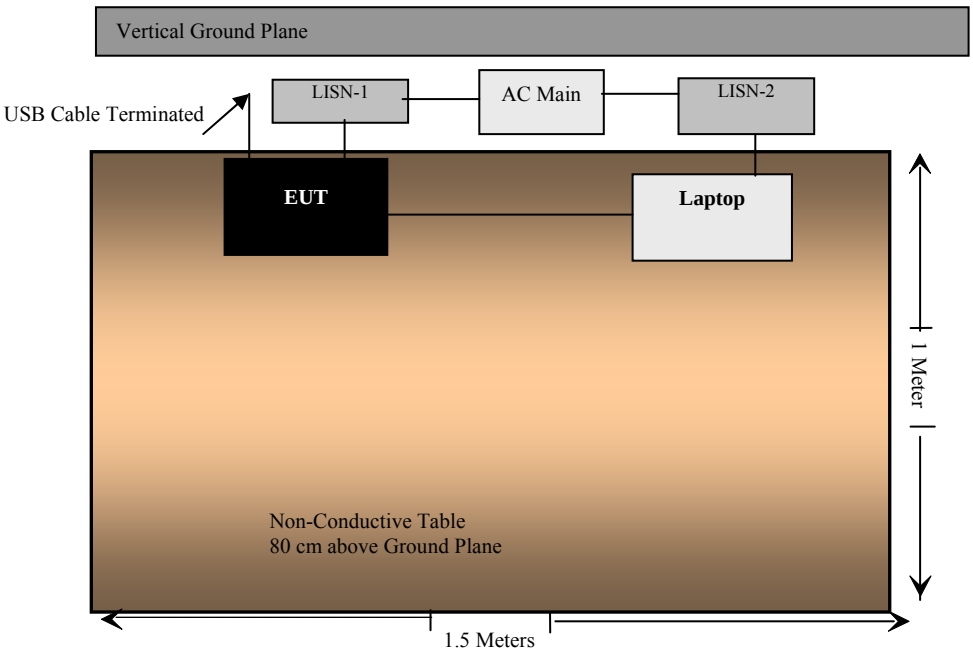
The EUT was connected to a 120 V, 60 Hz AC line power source.

4.3 Test Procedure

During the conducted emissions test, the power cord of the EUT was connected to the main outlet of the LISN.

Maximization procedure was performed on the six (6) highest emission readings from the EUT.

4.4 Test Setup Block Diagram



4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Class B Limit

4.6 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Solar Electronics	LISN	9252-R-24-BNC	511205	2011-06-25
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2011-06-10
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2011-04-24

***Statement of Traceability*:** BACL Corp. attests that all calibrations have been performed according to NVLAP requirements, traceable to the NIST.

4.7 Test Environmental Conditions

Temperature:	18º C
Relative Humidity:	41%
ATM Pressure:	101.56kPa

Testing was performed by Jerry Huang on 2011-12-23 in 5 meter chamber 3.

4.8 Summary of Test Results

According to the recorded data, the EUT complied with FCC Part 15B & IC ICES-003, Class B limits, and had the worst margin reading of:

EUT with Model Number: AP433e

Mode: 120 V/ 60 Hz			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-0.73	19.5123	Neutral	0.15-30

EUT with Model Number: AP433i (worst case between EUT Model Numbers: AP433is and AP433i)

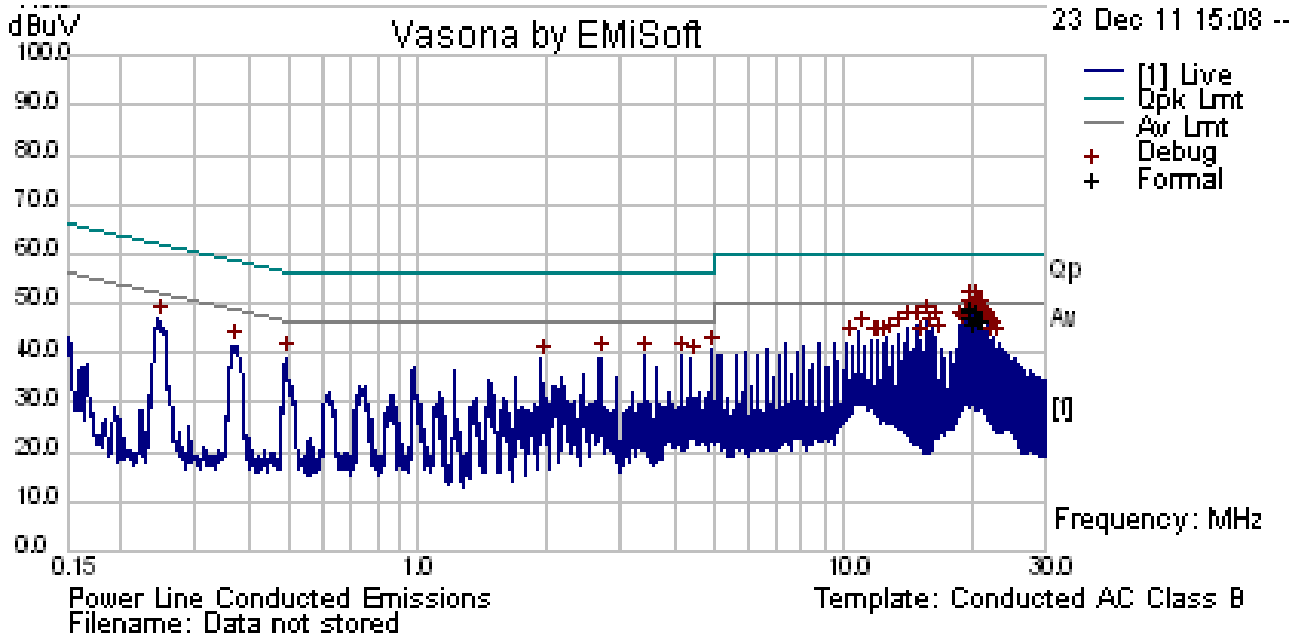
Mode: 120 V/ 60 Hz			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-1.35	15.91994	Line	0.15-30

EUT with Model Number: OAP433e

Mode: 120 V/ 60 Hz			
Margin (dB)	**Frequency (MHz)**	**Conductor (Line/Neutral)**	**Range (MHz)**
-16.28	0.468656	Neutral	0.15-30

4.9 Conducted Emission Test Plots and Data

EUT with Model Number: AP433e - 120 V, 60 Hz – Line



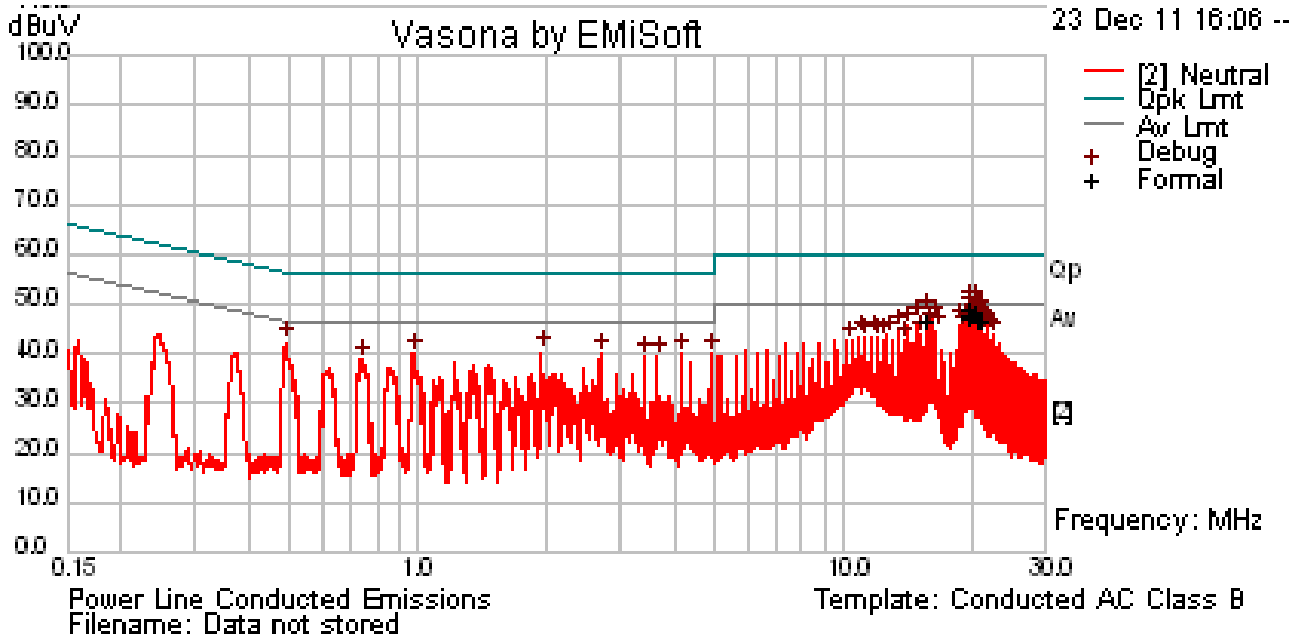
Quasi-Peak Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
19.51221	48.75	Line	60	-11.25
20.244	48.69	Line	60	-11.31
19.75545	47.26	Line	60	-12.74
20.48768	46.81	Line	60	-13.19
20.97575	46.56	Line	60	-13.44
20.0008	46.08	Line	60	-13.92

Average Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
19.51221	48.81	Line	50	-1.19
20.244	48.5	Line	50	-1.50
19.75545	47.17	Line	50	-2.83
20.48768	46.74	Line	50	-3.26
20.97575	46.6	Line	50	-3.40
20.0008	45.88	Line	50	-4.12

EUT with Model Number: AP433e - 120 V, 60 Hz – Neutral



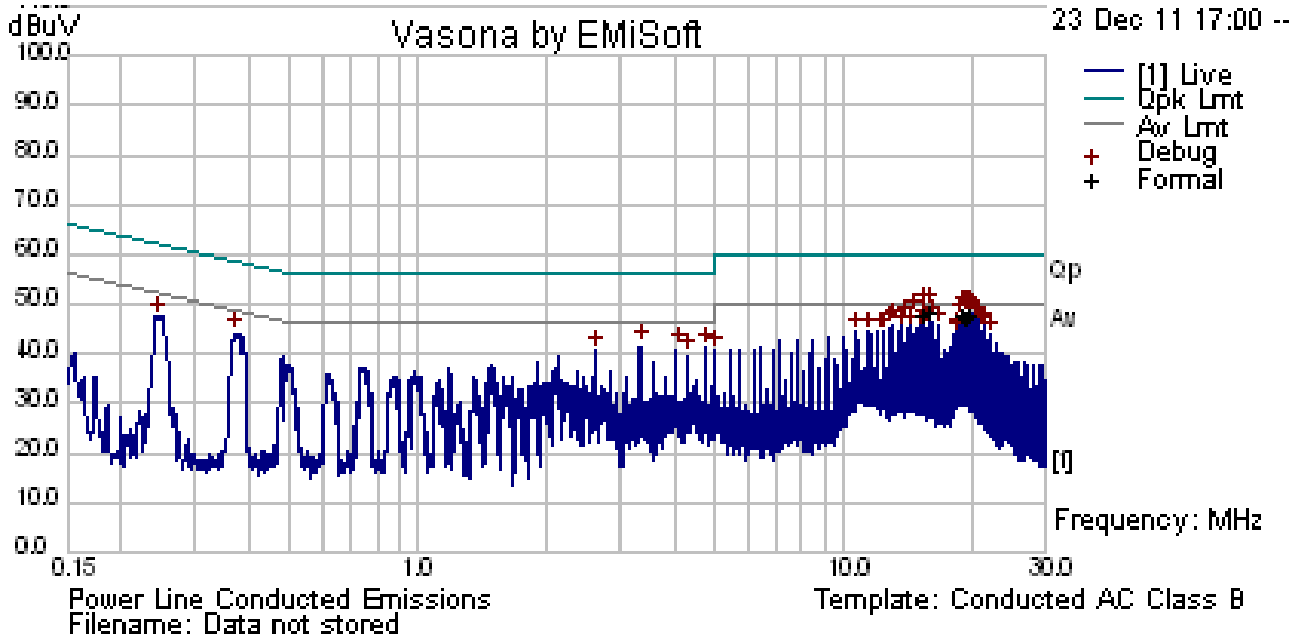
Quasi-Peak Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
19.5123	49.17	Neutral	60	-10.83
20.2448	48.63	Neutral	60	-11.37
19.7552	47.51	Neutral	60	-12.49
20.48741	46.84	Neutral	60	-13.16
15.60871	46.6	Neutral	60	-13.40
20.97549	46.57	Neutral	60	-13.43

Average Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
19.5123	49.27	Neutral	50	-0.73
20.2448	48.43	Neutral	50	-1.57
19.7552	47.54	Neutral	50	-2.46
20.48741	46.88	Neutral	50	-3.12
20.97549	46.77	Neutral	50	-3.23
15.60871	46.56	Neutral	50	-3.44

EUT with Model Number: AP433i - 120 V, 60 Hz – Line



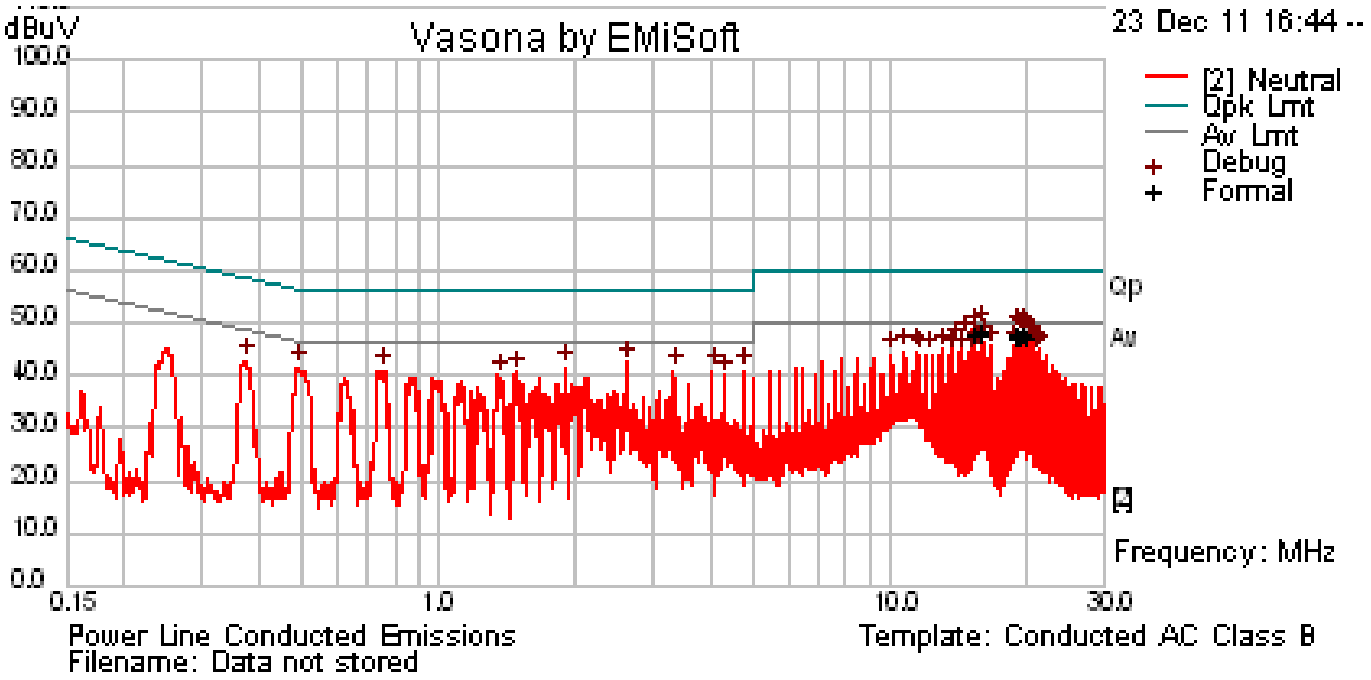
Quasi-Peak Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
15.91994	48.49	Line	60	-11.51
15.2061	47.9	Line	60	-12.10
19.72165	47.79	Line	60	-12.21
19.01001	47.69	Line	60	-12.31
19.24715	47.38	Line	60	-12.62
19.48444	47.24	Line	60	-12.76

Average Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
15.91994	48.65	Line	50	-1.35
15.2061	48	Line	50	-2.00
19.72165	47.78	Line	50	-2.22
19.01001	47.68	Line	50	-2.32
19.24715	47.37	Line	50	-2.63
19.48444	47.19	Line	50	-2.81

EUT with Model Number: AP433i, 120 V, 60 Hz – Neutral



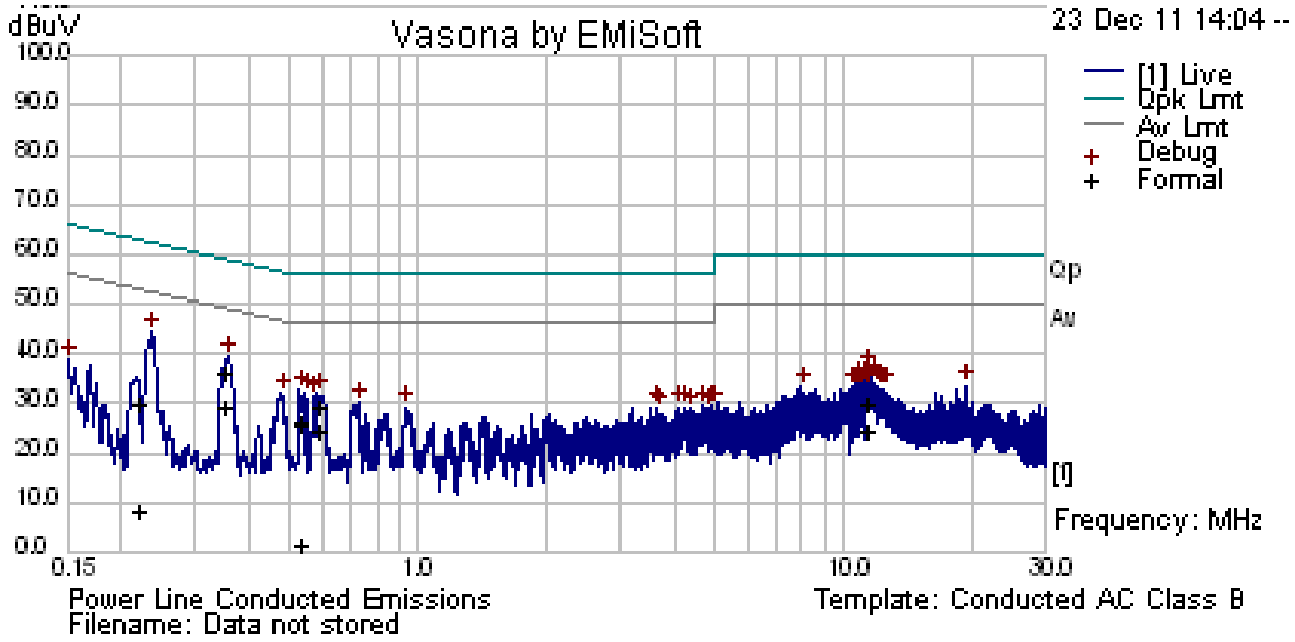
Quasi-Peak Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
15.91957	48.02	Neutral	60	-11.98
19.72056	47.84	Neutral	60	-12.16
15.20459	47.68	Neutral	60	-12.32
19.00845	47.5	Neutral	60	-12.50
19.24453	47.34	Neutral	60	-12.66
19.95909	47.22	Neutral	60	-12.78

Average Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
15.91957	48.44	Neutral	50	-1.56
19.72056	48	Neutral	50	-2.00
15.20459	47.85	Neutral	50	-2.15
19.00845	47.85	Neutral	50	-2.15
19.24453	47.45	Neutral	50	-2.55
19.95909	47.29	Neutral	50	-2.71

EUT with Model Number: OAP433e - 120 V, 60 Hz – Line



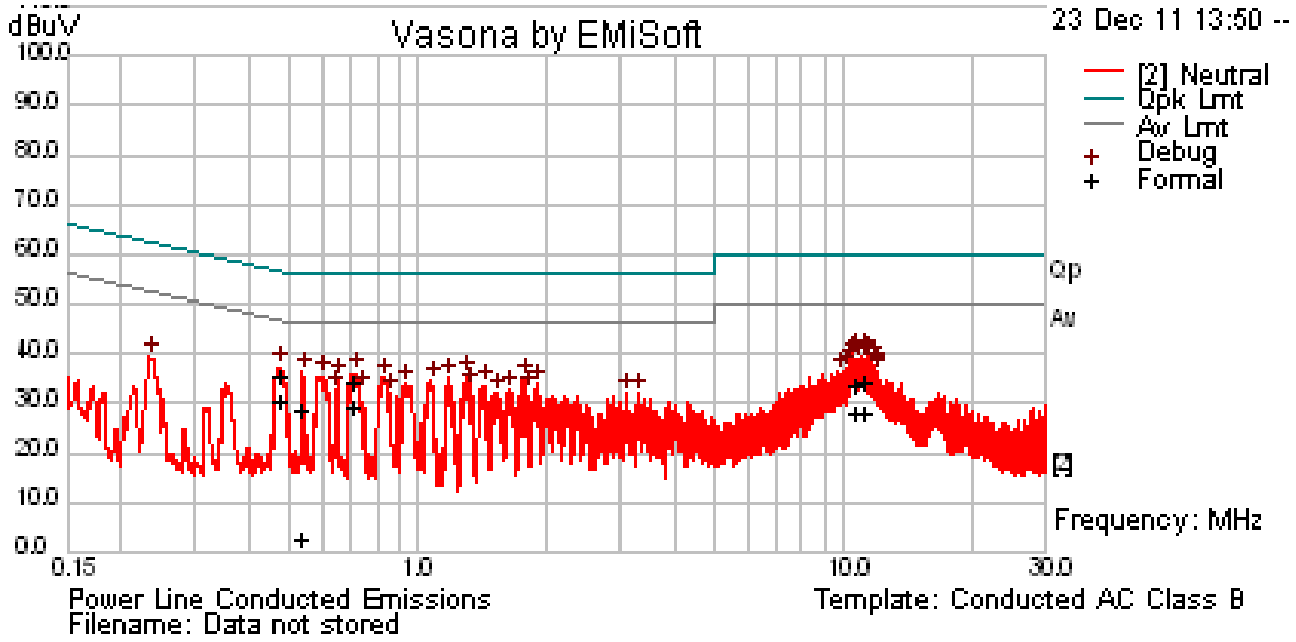
Quasi-Peak Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
0.348882	35.84	Line	58.99	-23.15
0.587025	29.26	Line	56	-26.74
0.531771	26.45	Line	56	-29.55
11.38711	29.74	Line	60	-30.26
0.529472	25.43	Line	56	-30.57
0.220103	29.99	Line	62.82	-32.82

Average Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
0.348882	29.19	Line	48.99	-19.80
0.587025	24.32	Line	46	-21.68
11.38711	24.09	Line	50	-25.91
0.531771	1.56	Line	46	-44.44
0.529472	1.3	Line	46	-44.70
0.220103	8.03	Line	52.82	-44.78

EUT with Model Number: OAP433e, 120 V, 60 Hz – Neutral



Quasi-Peak Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
0.468656	35.43	Neutral	56.54	-21.11
0.706604	34.1	Neutral	56	-21.90
11.15688	34	Neutral	60	-26.00
10.5798	33.87	Neutral	60	-26.13
10.55496	33.87	Neutral	60	-26.13
0.529085	28.9	Neutral	56	-27.10

Average Measurement:

Frequency (MHz)	Corrected Amplitude (dBuV)	Conductor (Line/Neutral)	Limit (dBuV)	Margin (dB)
0.468656	30.26	Neutral	46.54	-16.28
0.706604	29.17	Neutral	46	-16.83
11.15688	28.34	Neutral	50	-21.66
10.5798	27.96	Neutral	50	-22.04
10.55496	27.91	Neutral	50	-22.09
0.529085	2.64	Neutral	46	-43.36

5 FCC § 15.109 & IC ICES-003 §5.5 – Radiated Emissions

5.1 Applicable Standard

As per FCC §15.109: Radiated Emission Limits

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field Strength (µV/m)
30-88	100
88-216	150
216-960	200
Above 960	500

(g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement."

Note: The CISPR 22 §6 Standard, Class B limits are applied to the test data hereinafter.

As per IC ICES-003 §5.5:

The field intensity of radio noise emissions that are radiated from a Class B digital apparatus shall not exceed the limits specified in Table 6 of the publication referred to in Section 7.1, within the indicated frequency range.

The EUT shall meet the limits of Table 6 when measured at the measuring distance *R* in accordance with the methods described in Clause 10. if the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the highest reading shall be recorded, with the exception of any brief isolated high reading, which shall be ignored.

Frequency Range (MHz)	Quasi-peak Limits (dBµV/m)
30 to 230	30
230 to 1,000	37

NOTE 1: The lower limit shall apply at the transition frequency.
NOTE 2: Additional provisions may be required for cases where interference occurs.

5.2 Test Setup

The radiated emissions tests were performed in the 10-meter test chamber, using the setup in accordance with ANSI C63.4-2003 measurement procedures. The specifications used were in accordance with CISPR 22 §6 Standard, Class B limits for frequencies between 30 MHz and 1 GHz, and FCC Part 15B, IC ICES-003 Class A limits for frequencies above 1 GHz.

The spacing between the peripherals was 10 cm.

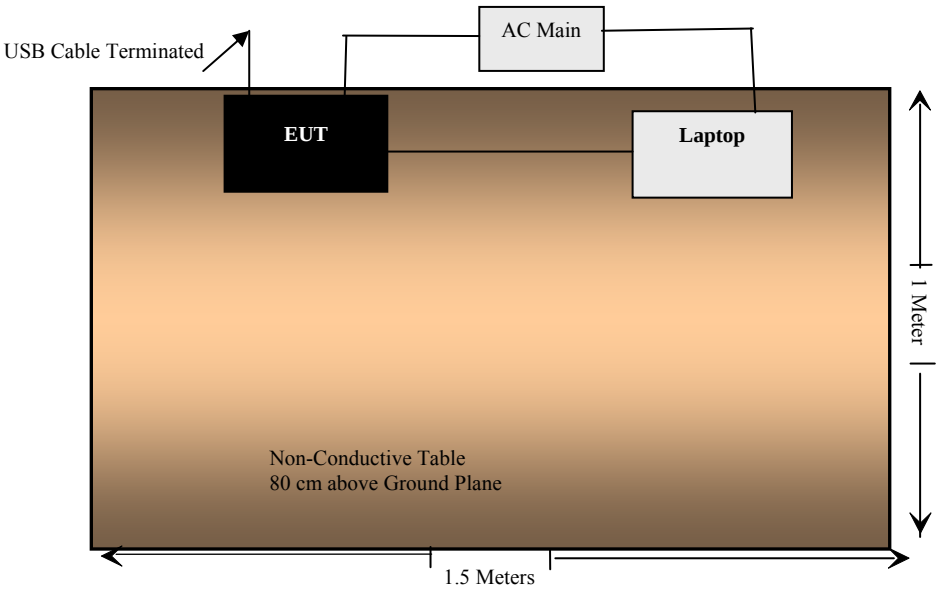
The external I/O cables were draped along the test table and bundled as required.

5.3 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions readings to ensure the EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings were performed only when an emission was found to be marginal (within -4 dB of specification limits).

5.4 Test Setup Block Diagram



5.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to the indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, the Corrected Amplitude (CA) of 40.3 dBuV/m = indicated Amplitude reading (Ai) 32.5 dBuV + Antenna Factor (AF) 23.5dB + Cable Loss (CL) 3.7 dB + Attenuator (Atten) 10 dB - Amplifier Gain (Ga) 29.4 dB

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corrected Amplitude - Class B Limit

5.6 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Dates
Hewlett Packard	Pre amplifier	8447D	2944A07030	2011-04-11
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2011-06-24
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB1	A020106-1	2011-05-17
HP	Pre Amplifier	8449B	3147A00400	2011-02-01
A.R.A Inc.	Horn antenna	DRG-1181A	1132	2011-11-29
Agilent	PSA Series Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed according to NVLAP requirements, traceable to the NIST.

5.7 Test Environmental Conditions

Temperature:	19º C
Relative Humidity:	42%
ATM Pressure:	101.57kPa

Testing was performed by Jerry Huang on 2011-11-14 to 2011-11-22 in 5 meters chamber 3.

5.8 Summary of Test Results

According to the recorded data, the EUT complied with FCC §15.109 and ICES 003 Standard, Class B limits, and had the worst margin reading – when calculated using CISPR 22 §6 Standard, Class B limits – of:

EUT with Model Number: AP433e

Mode: 30 MHz to 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-10.18	167.981	Vertical	30 - 1000

Mode: Above 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-14.555	1101.635942	Vertical	Above 1000

EUT with Model Number: AP433is

Mode: 30 MHz to 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-4.31	74.571	Vertical	30 - 1000

Mode: Above 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-15.61	2128.433646	Vertical	Above 1000

EUT with Model Number: AP433i

Mode: 30 MHz to 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-4.05	42.986	Vertical	30 - 1000

Mode: Above 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-15.09	1252.167013	Vertical	Above 1000

EUT with Model Number: OAP443e

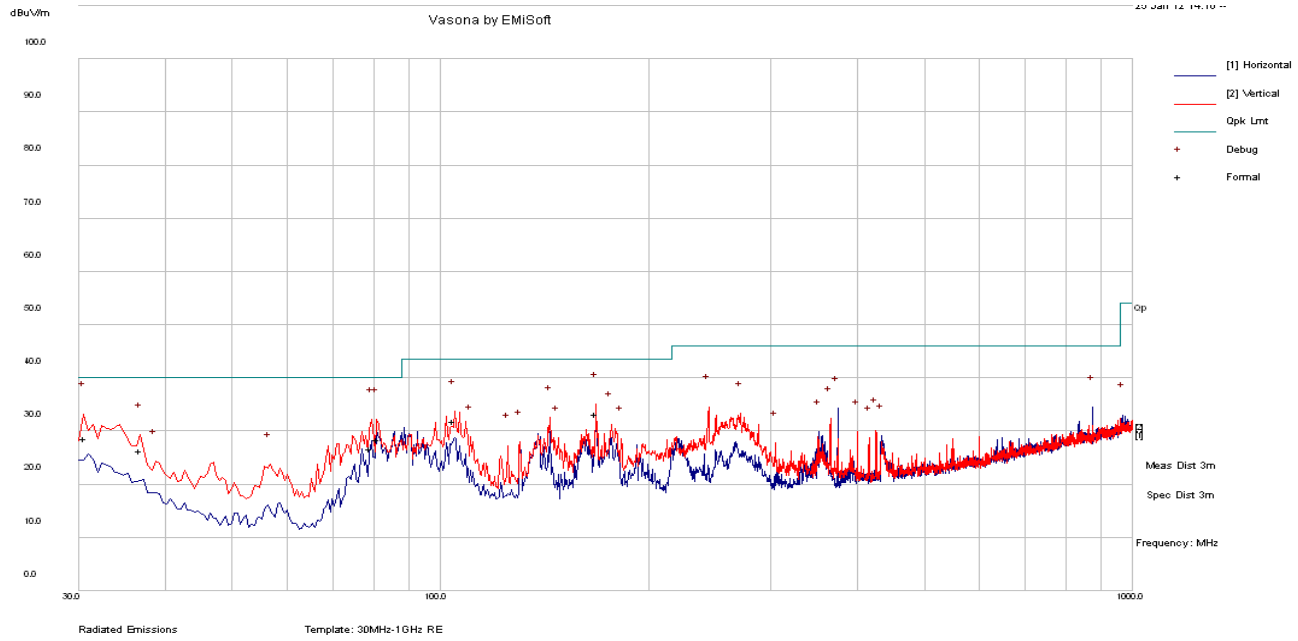
Mode: 30 MHz to 1 GHz			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-7.33	34.60725	Vertical	30 - 1000

Mode: Above 1 GHz (The test was done manually)			
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**	**Range (MHz)**
-17.63	1154.376755	Vertical	Above 1000

5.9 Radiated Emission Test Plots and Data

EUT with Model Number: AP433e

30-1000 MHz measured at 3 meters distance



Quasi-Peak Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
30.6285	28.56	175	V	186	40	-11.44
81.16325	28.44	110	V	4	40	-11.56
79.26575	26.72	100	V	331	40	-13.28
167.981	33.32	102	V	166	43.5	-10.18
104.7515	31.82	100	V	323	43.5	-11.68
36.84275	26.37	100	V	184	40	-13.63

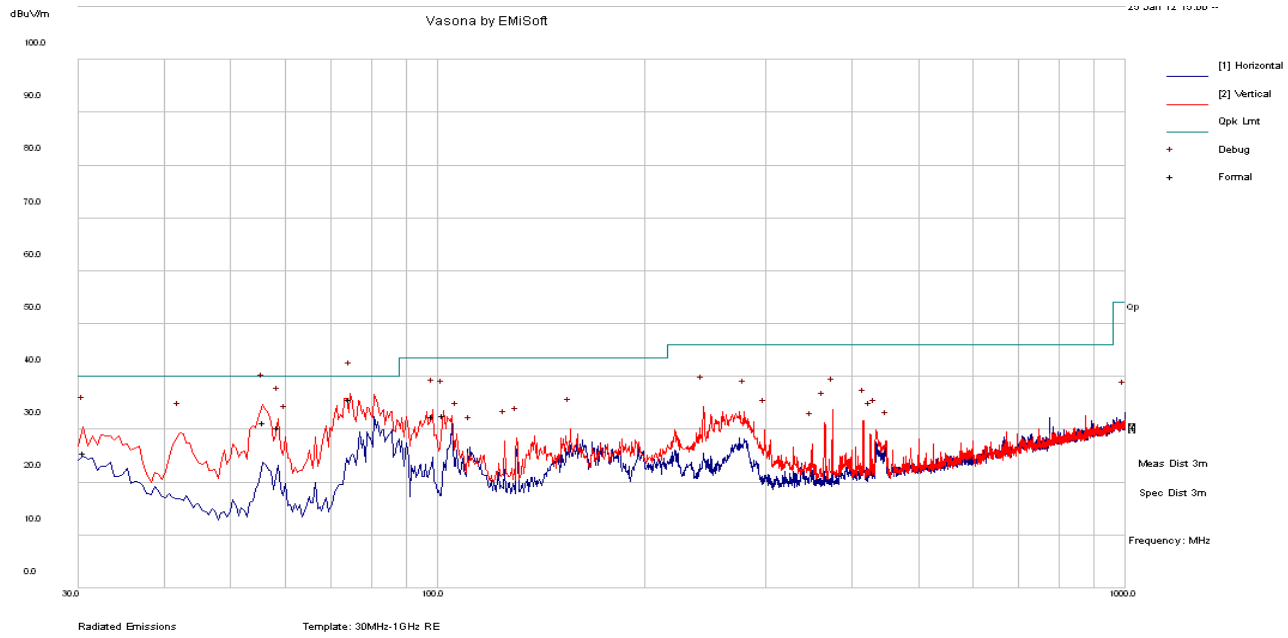
Above 1000 MHz measured at 3 meters distance

Average Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
1101.635942	39.45	100	V	0	54	-14.55
1397.753632	38.5	100	H	0	54	-15.50
2143.267	37.84	100	H	0	54	-16.16
2130.081797	37.36	100	H	0	54	-16.64
1789.464046	36.76	100	H	0	54	-17.24
2219.631303	36.63	100	V	0	54	-17.37

EUT with Model Number: AP433is

30-1000 MHz measured at 3 meters distance



Quasi-Peak Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
74.571	35.69	135	V	346	40	-4.31
55.86525	31.34	108	V	251	40	-8.66
58.707	30.44	140	V	49	40	-9.56
30.63825	25.55	135	V	265	40	-14.45
98.416	32.44	117	V	192	43.5	-11.06
101.898	32.74	106	V	360	43.5	-10.76

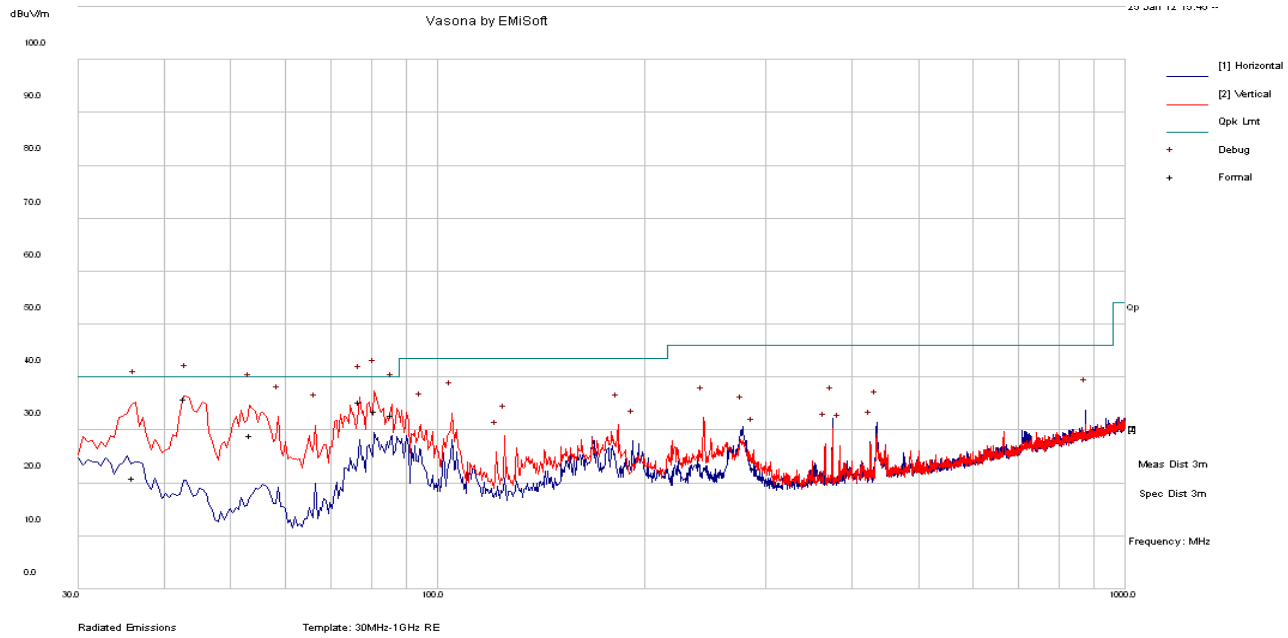
Above 1000 MHz measured at 3 meters distance

Average Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
1125.25943	38.81	100	V	0	54	-15.19
2128.433646	38.39	100	V	0	54	-15.61
2148.760835	37.64	100	V	0	54	-16.36
1251.617628	37.85	100	H	0	54	-16.42
1527.957514	37.48	100	H	0	54	-16.52
1608.716884	36.39	100	V	0	54	-17.51

EUT with Model Number: AP433i

30-1000 MHz measured at 3 meters distance



Quasi-Peak Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
42.986	35.95	100	V	67	40	-4.05
77.202	35.33	136	V	2	40	-4.67
81.17025	33.59	100	V	304	40	-6.41
86.02125	32.94	101	V	360	40	-7.06
53.527	29.12	113	V	269	40	-10.88
36.13125	21.01	108	V	40	40	-18.99

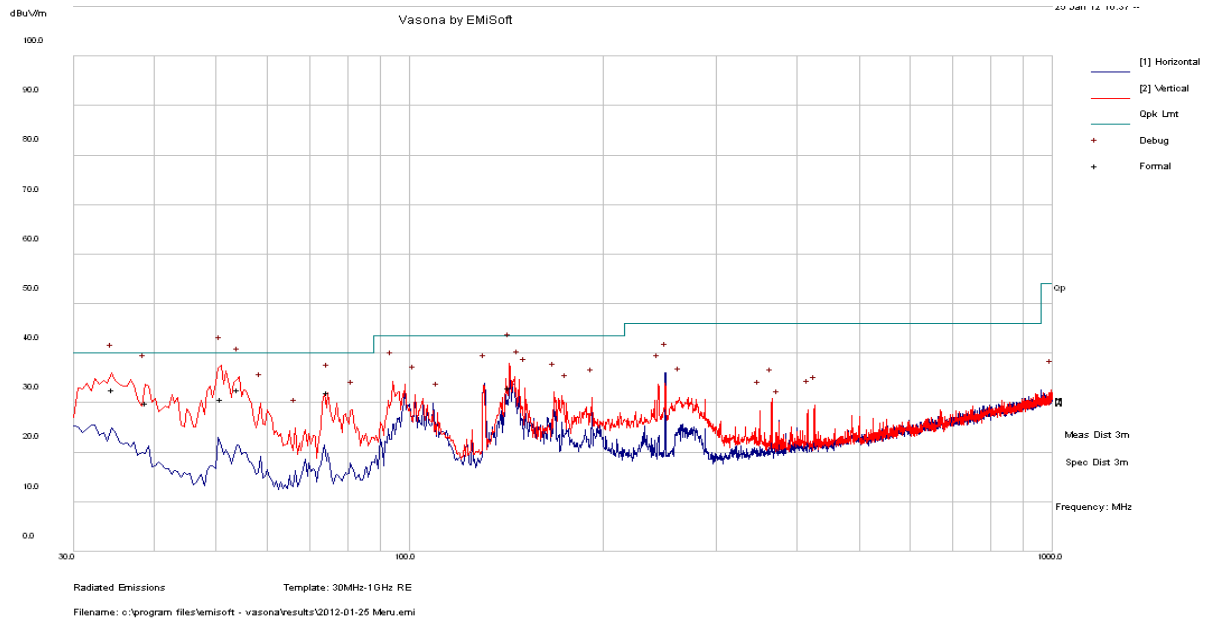
Above 1000 MHz measured at 3 meters distance

Average Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
2175.131242	38.91	100	V	0	54	-16.09
1252.167013	37.79	100	V	0	54	-16.21
1976.803809	37.71	100	H	0	54	-16.29
1966.914907	37.69	100	H	0	54	-16.31
1328.531315	37.58	100	V	0	54	-16.42
9280.857038	37.44	100	H	0	54	-16.56

EUT with Model Number: OAP443e

30-1000 MHz measured at 3 meters distance



Quasi-Peak Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
34.60725	32.67	119	V	37	40	-7.33
54.18375	32.59	108	V	260	40	-7.41
74.56625	32.05	101	V	262	40	-7.95
51.07575	30.71	201	V	344	40	-9.29
38.95075	30.01	110	V	360	40	-9.99
143.2183	33.13	103	V	152	43.5	-10.37

Above 1000 MHz measured at 3 meters distance

Average Measurements:

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Test Antenna		Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
		Height (cm)	Polarity (H/V)			
1154.377	36.37	100	V	0	54	-17.63
1327.433	35.08	100	V	0	54	-18.92
3307.166	34.97	100	H	0	54	-19.03
1219.204	34.95	100	V	0	54	-19.05
1000	34.87	100	V	0	54	-19.13
3312.538	34.07	100	H	0	54	-19.93

6 Exhibit A – FCC & IC Product Labeling Requirements

6.1 Label Information

As per FCC §15.19: Labeling Requirements Paragraph 3

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Specifications: Text is white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened and shall be affixed at a conspicuous location on the EUT.

As per FCC §15.105: Information to the User

(a) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

6.2 IC ICES-003 Labeling Requirements

As per IC ICES-003 §6.2 of Procedural Requirements

A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement included in the user's manual. A suggested text for the notice, in English and in French, is provided in the Annex.

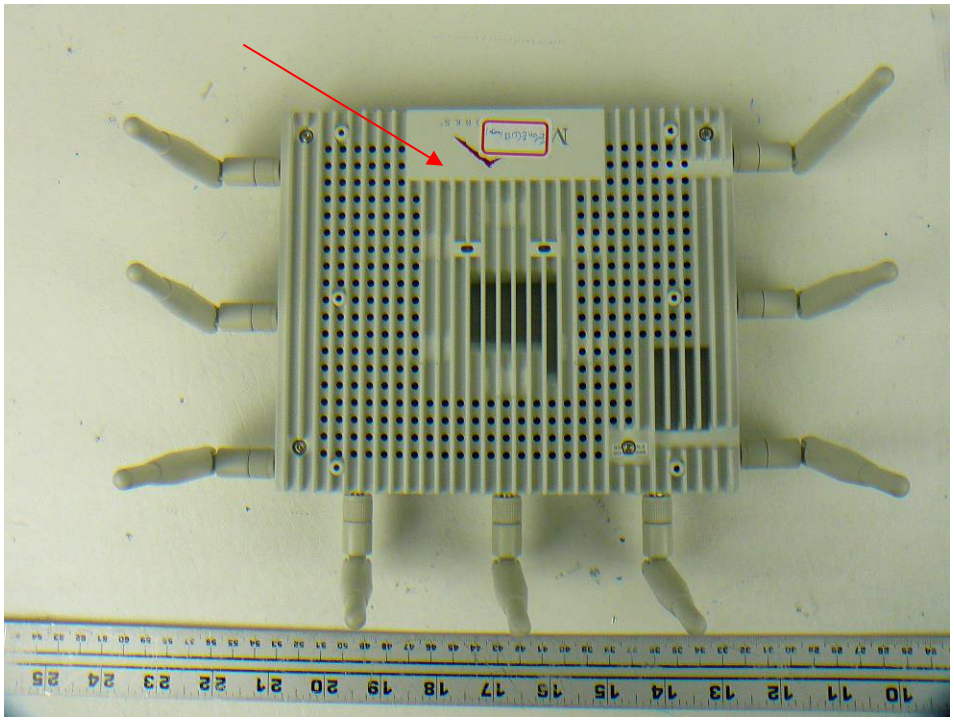
As per IC ICES-003 Annex

Suggested text for the notice indicating compliance with this Standard:

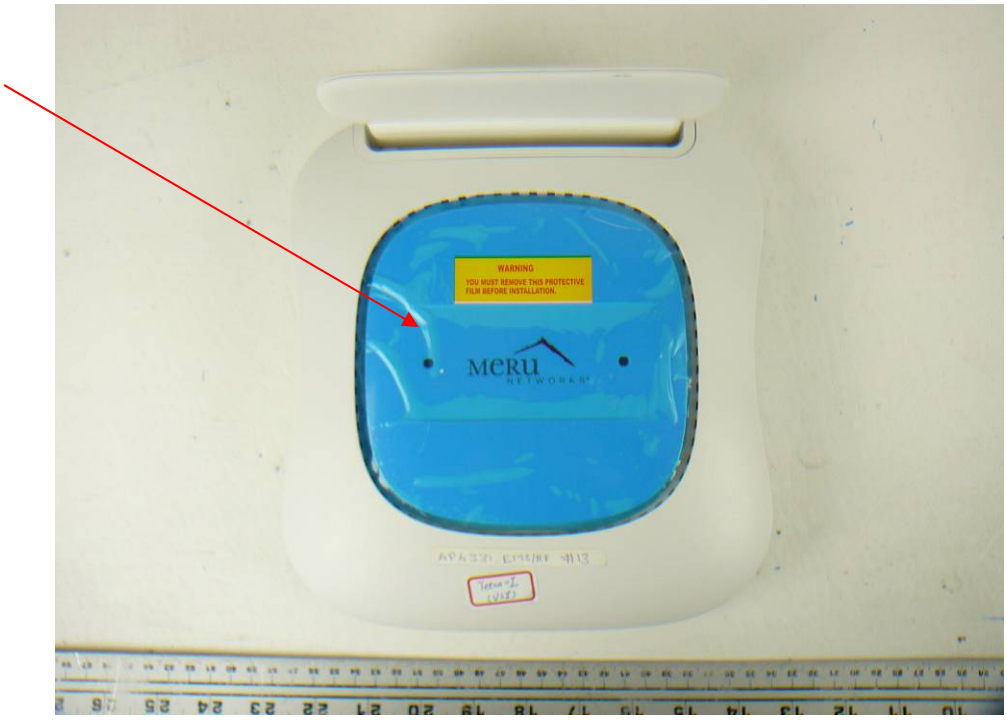
> This Class [*] digital apparatus complies with Canadian ICES-003.
> Cet appareil numérique de la classe [*] est conforme à la norme NMB-003 du Canada.

6.3 Suggested Label Location on EUT

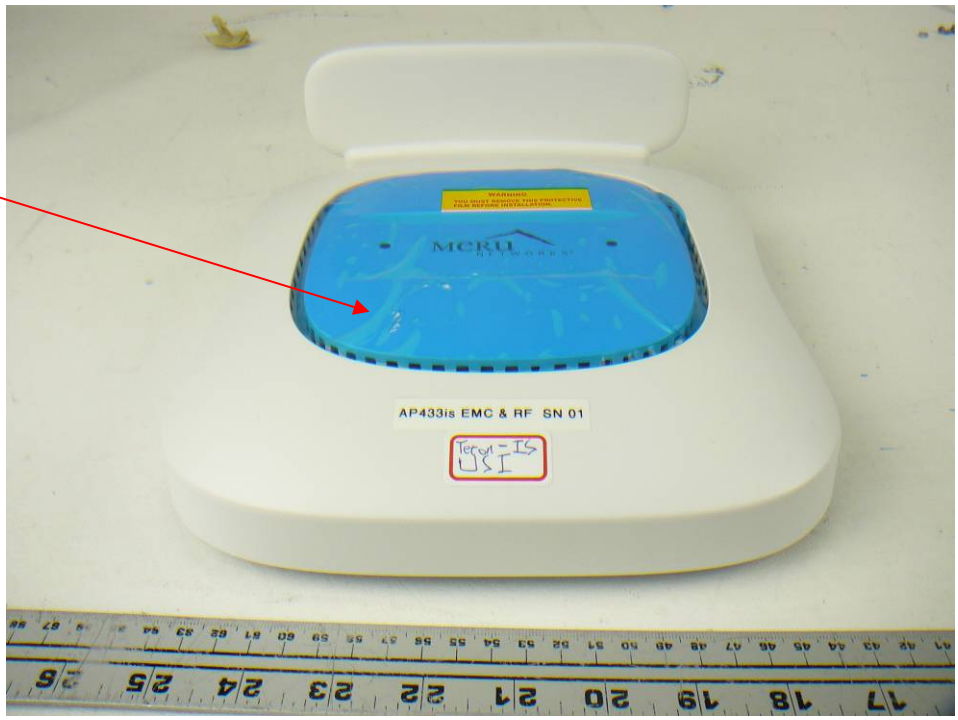
EUT (Model Number: AP433e)



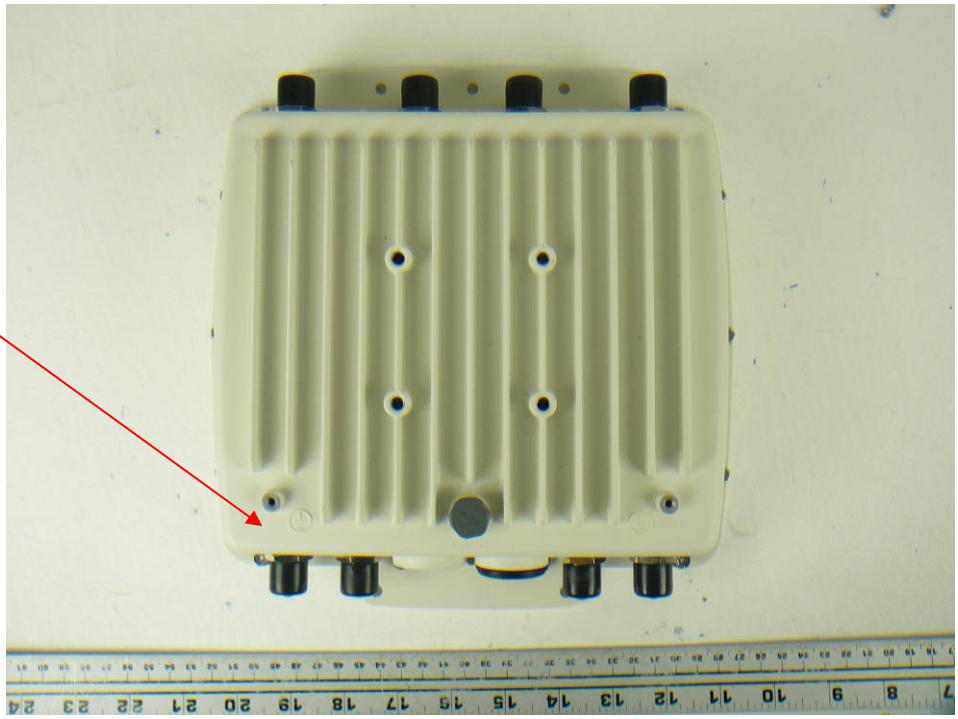
EUT (Model Number: AP433i)



EUT (Model Number: AP433is)

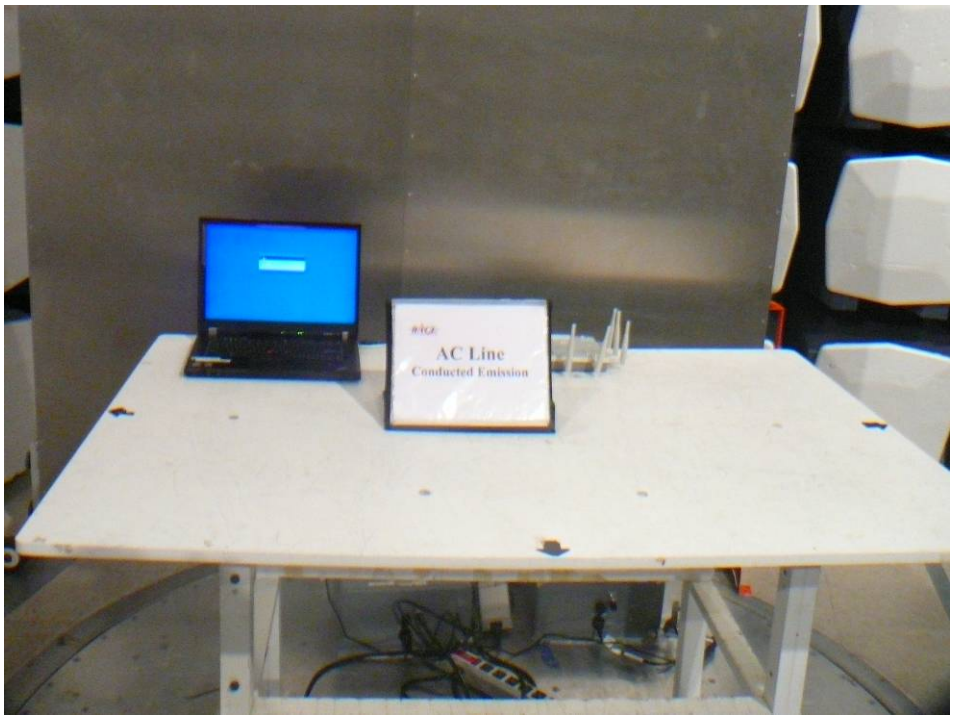


EUT (Model Number: OAP433e)

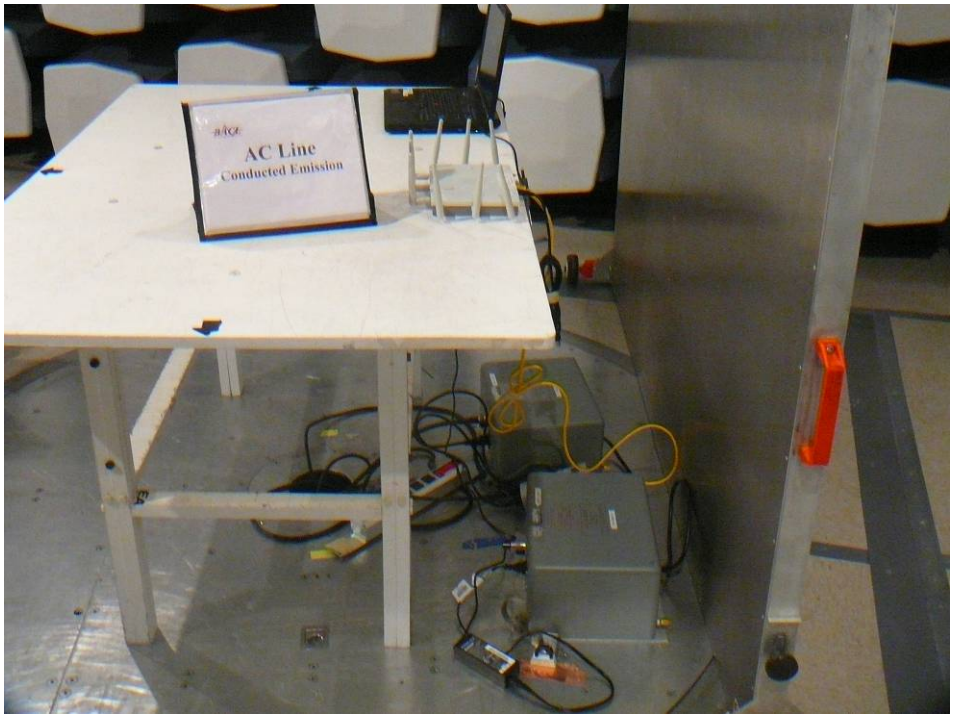


7 Exhibit B- Test Setup Photos

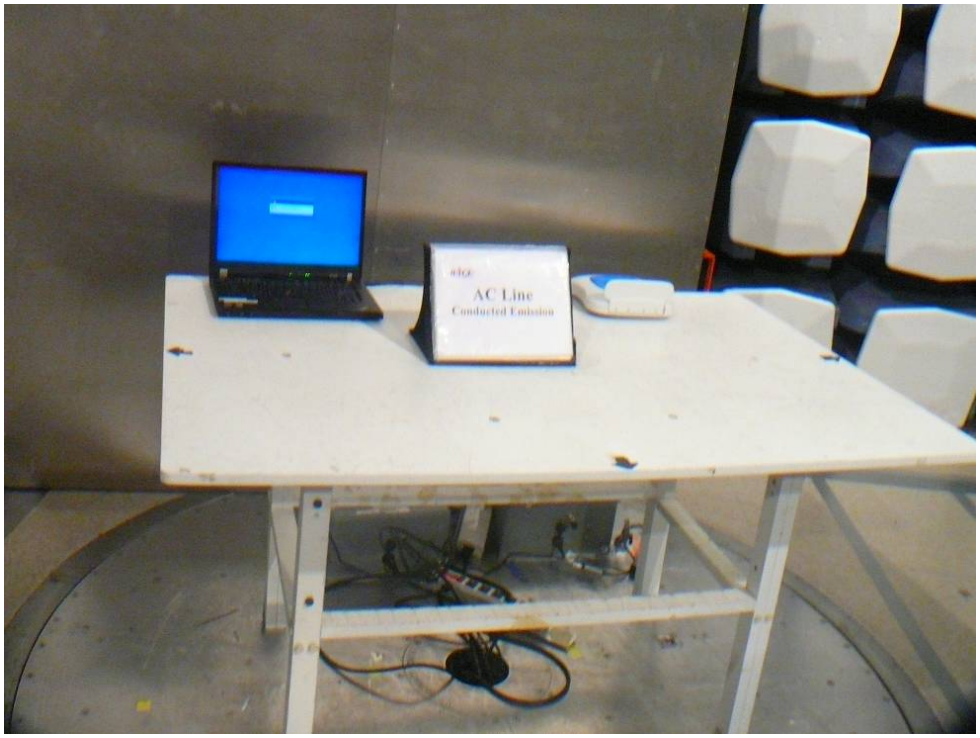
7.1 EUT with Model Number: AP433e Conducted Emission – Front View



7.2 EUT with Model Number: AP433e Conducted Emission – Side View



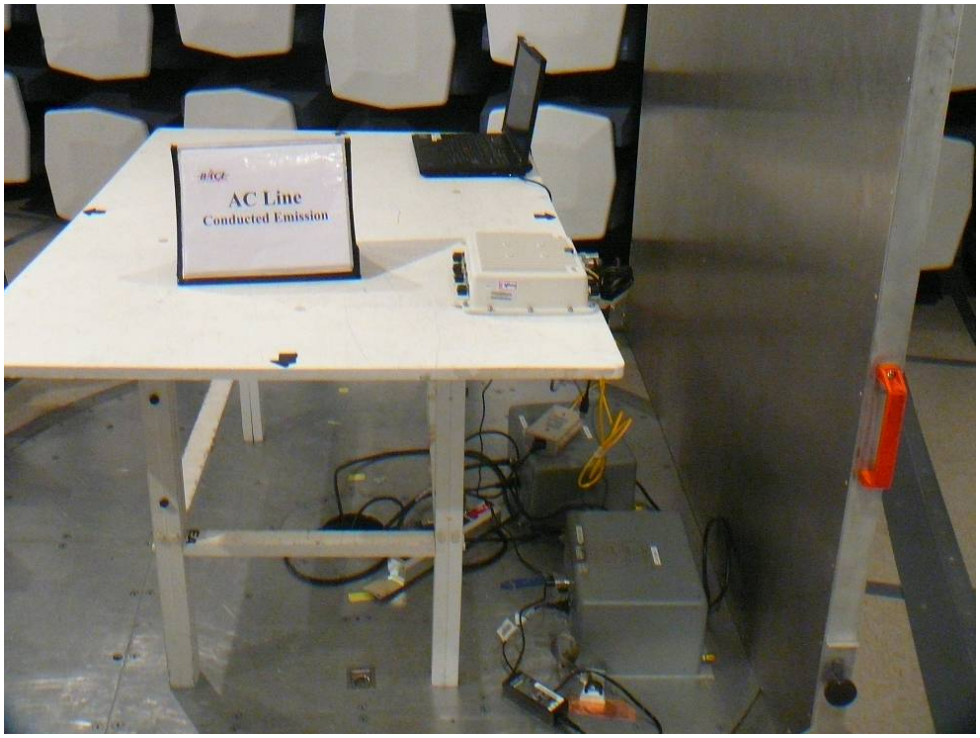
7.3 EUT with Model Number: AP433i Conducted Emission – Front View



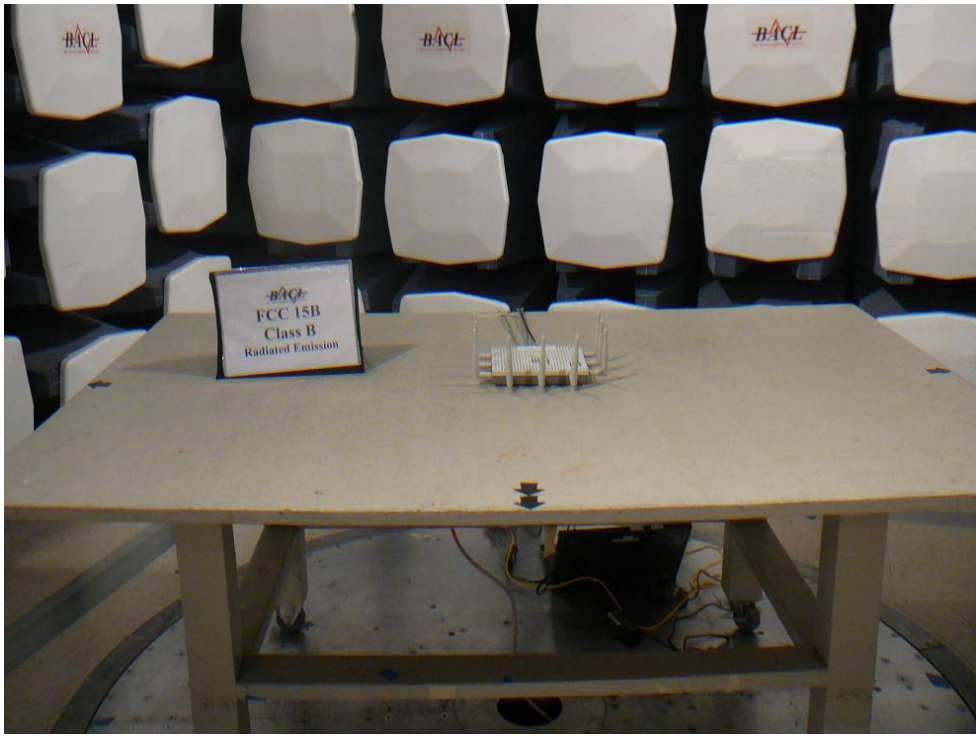
7.4 EUT with Model Number: AP433i Conducted Emission – Side View

7.5 EUT with Model Number: OAP433e Conducted Emission – Front View

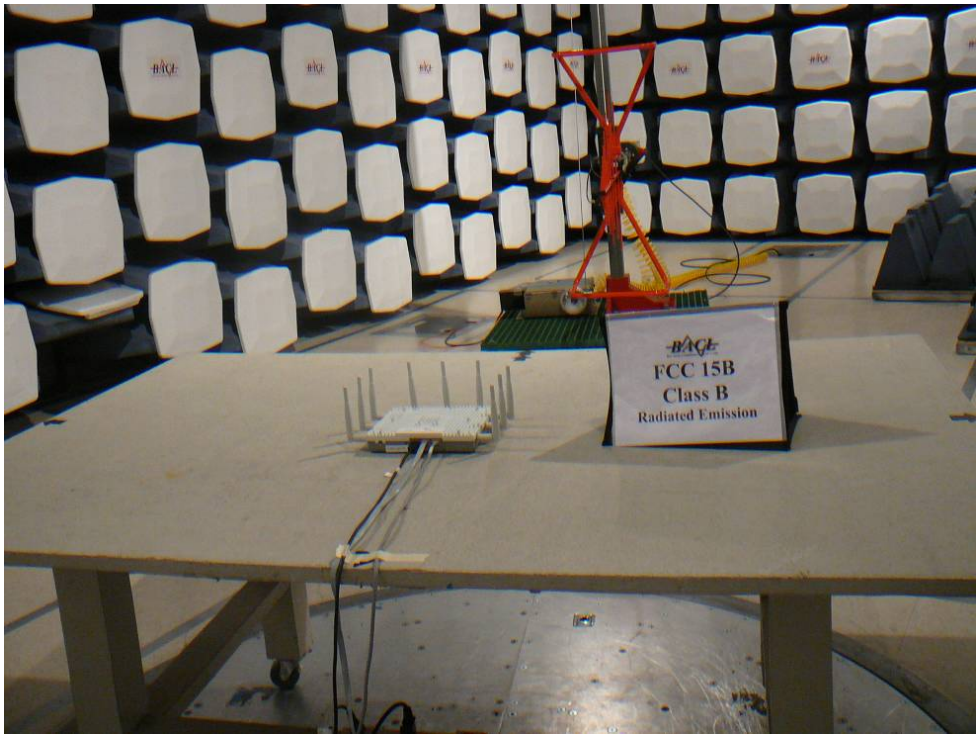
7.6 EUT with Model Number: OAP433e Conducted Emission – Side View



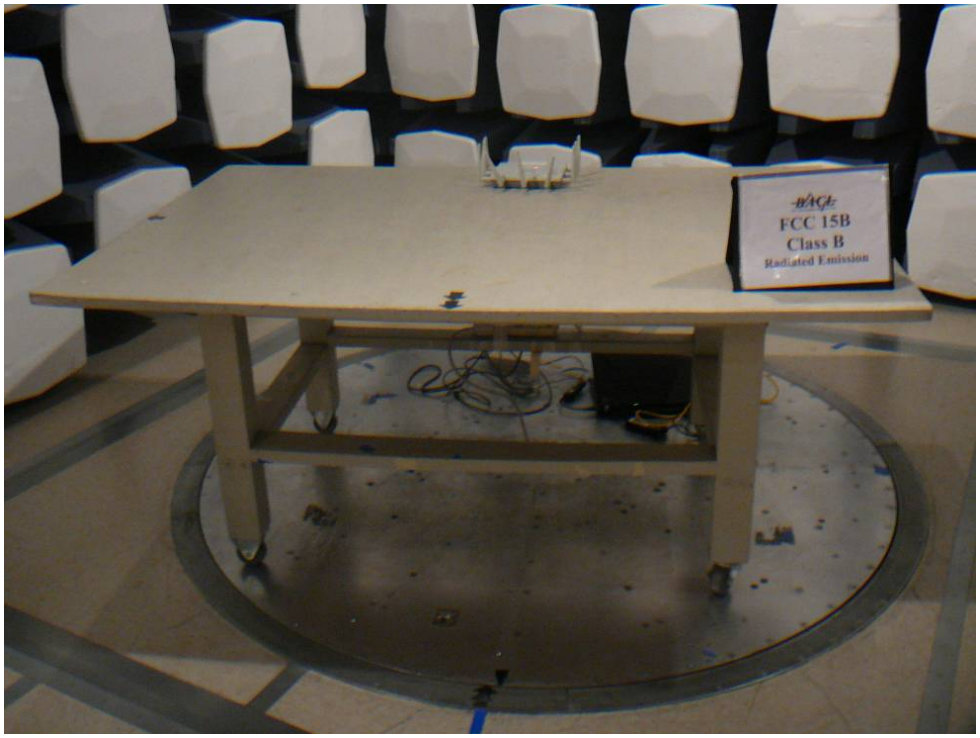
7.7 Radiated Emission (EUT with Model Number: AP433e) 30 MHz – 1000 MHz Front View



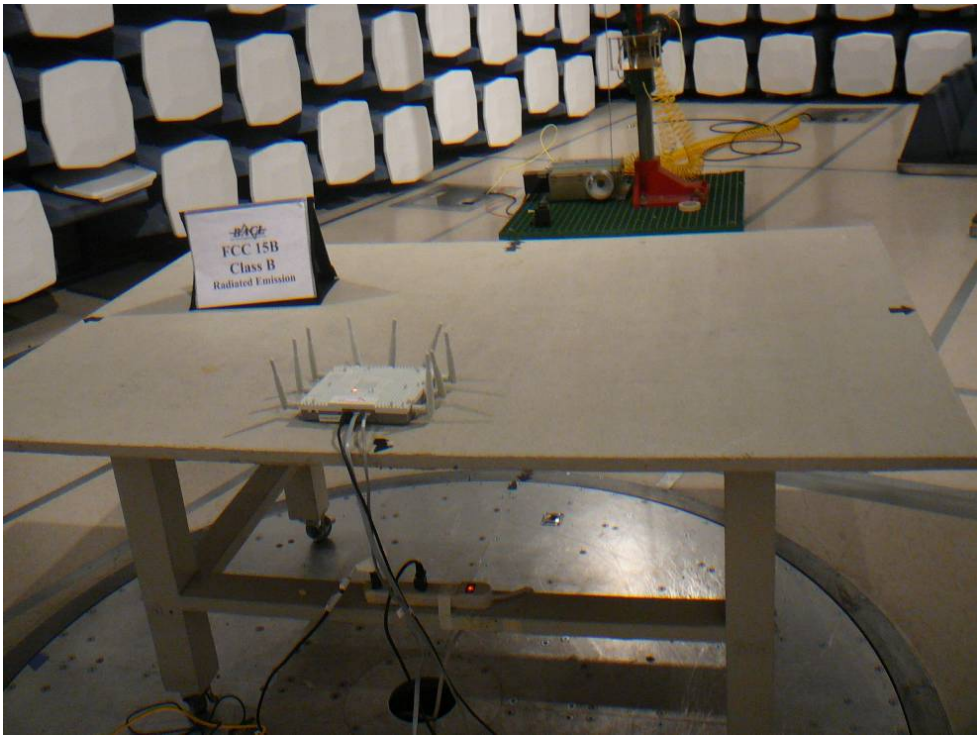
7.8 Radiated Emission (EUT with Model Number: AP433e) 30 MHz – 1000 MHz Rear View



7.9 Radiated Emission (EUT with Model Number: AP433e) above 1 GHz – Front View

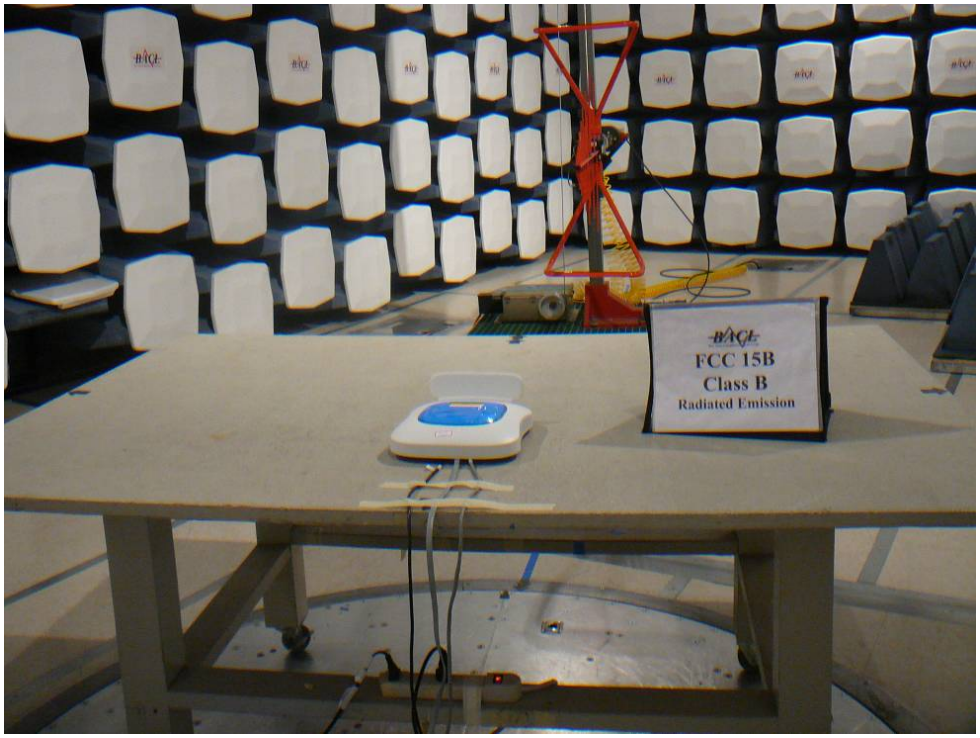


7.10 Radiated Emission (EUT with Model Number: AP433e) above 1 GHz Rear View



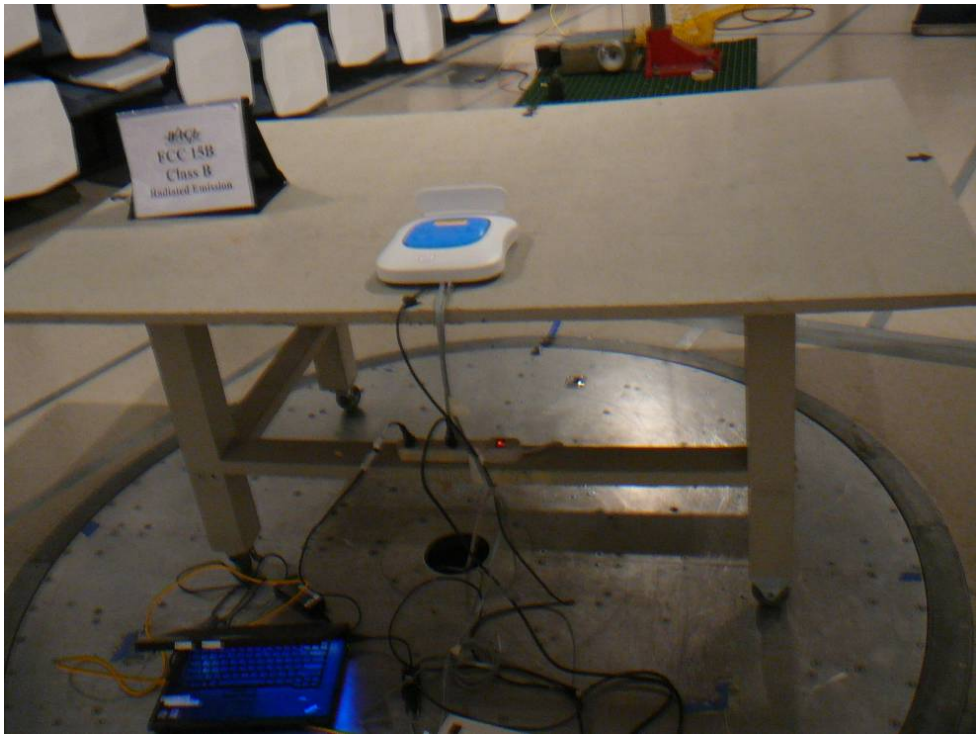
7.11 Radiated Emission (EUT with Model Number: AP433i) 30 MHz -1000 MHz Front View

7.12 Radiated Emission (EUT with Model Number: AP433i) 30 MHz -1000 MHz Rear View



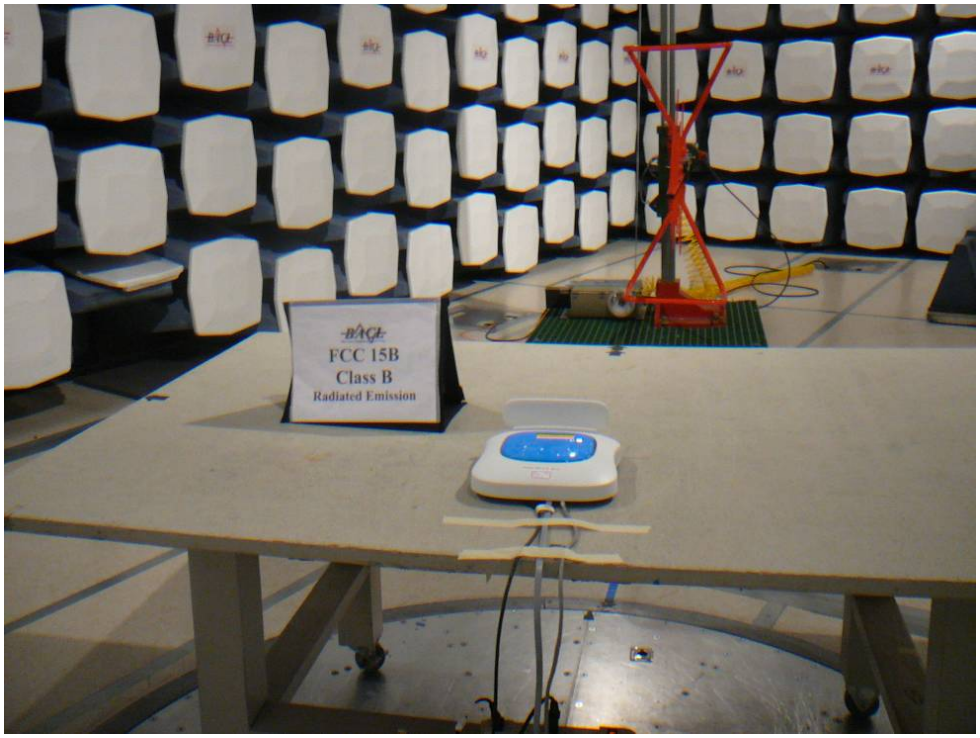
7.13 Radiated Emission (EUT with Model Number: AP433i) above 1GHz Front View

7.14 Radiated Emission (EUT with Model Number: AP433i) above 1GHz Rear View



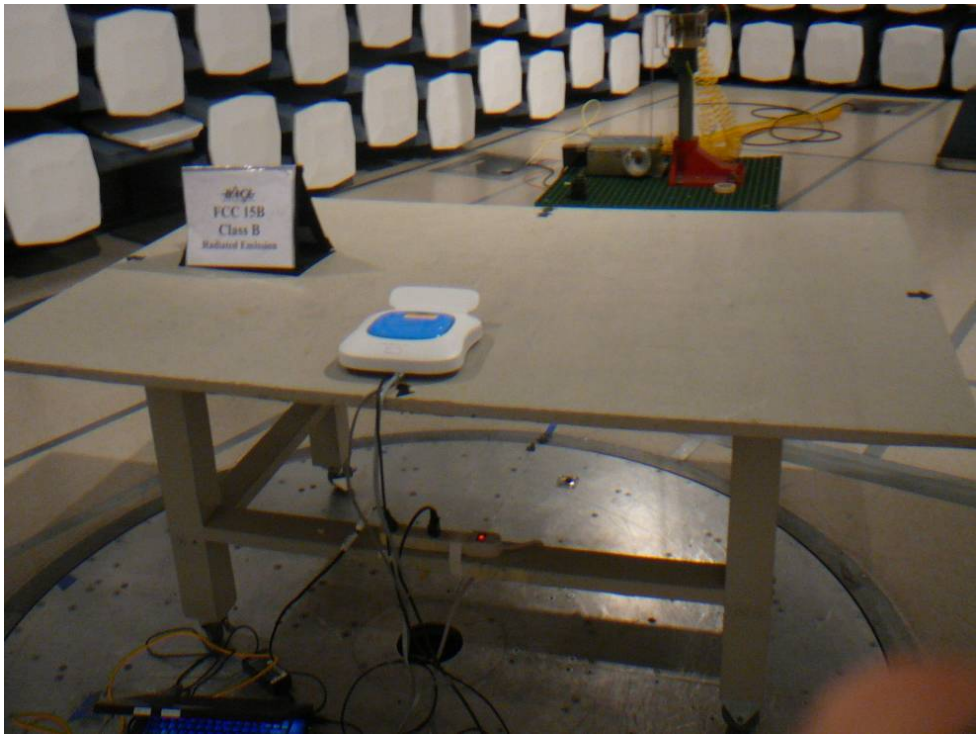
7.15 Radiated Emission (EUT with Model Number: AP433is) 30 MHz -1000 MHz Front View

7.16 Radiated Emission (EUT with Model Number: AP433is) 30 MHz -1000 MHz Rear View



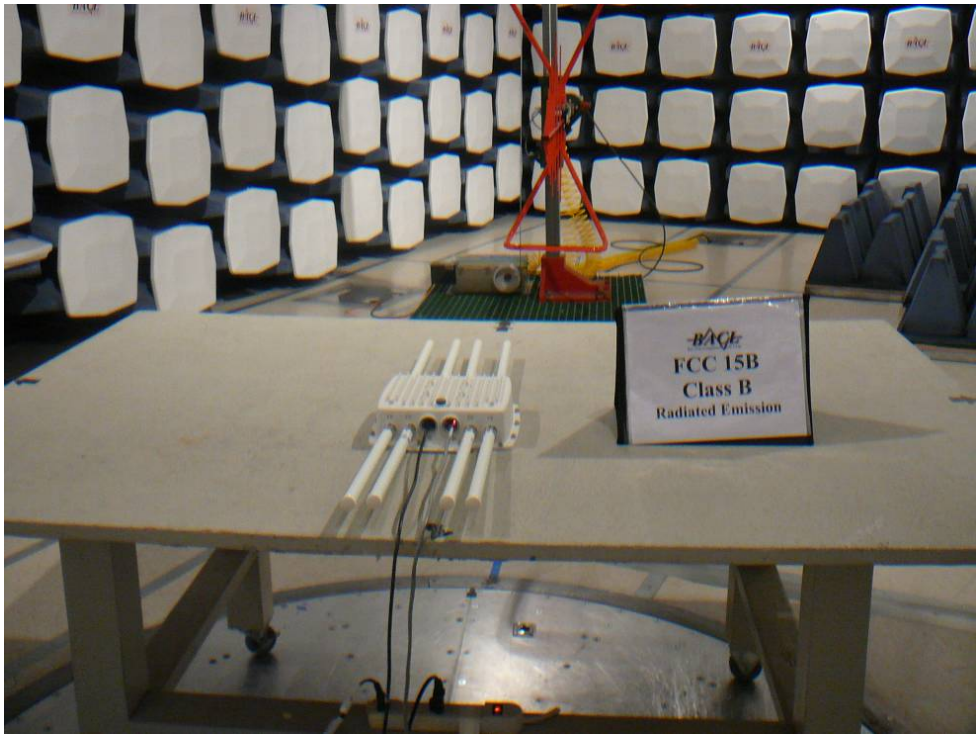
7.17 Radiated Emission (EUT with Model Number: AP433is) above 1GHz Front View

7.18 Radiated Emission (EUT with Model Number: AP433is) above 1GHz Rear View



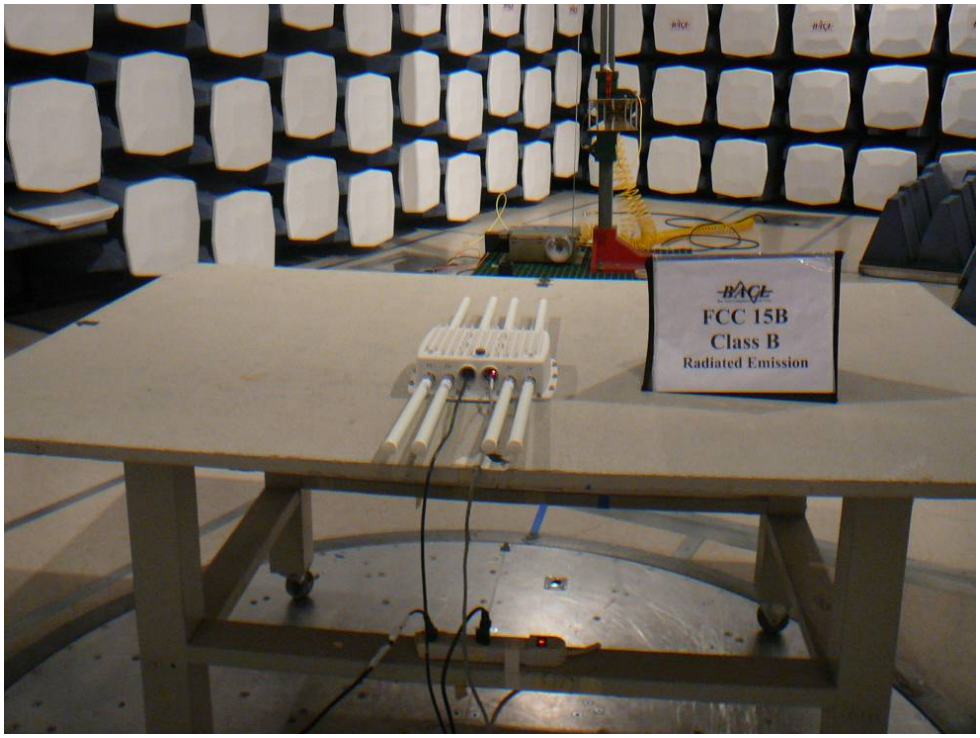
7.19 Radiated Emission (EUT with Model Number: OAP433e) 30 MHz – 1000 MHz Front View

7.20 Radiated Emission (EUT with Model Number: OAP433e) 30 MHz – 1000 MHz Rear View



7.21 Radiated Emission (EUT with Model Number: OAP433e) above 1GHz Front View

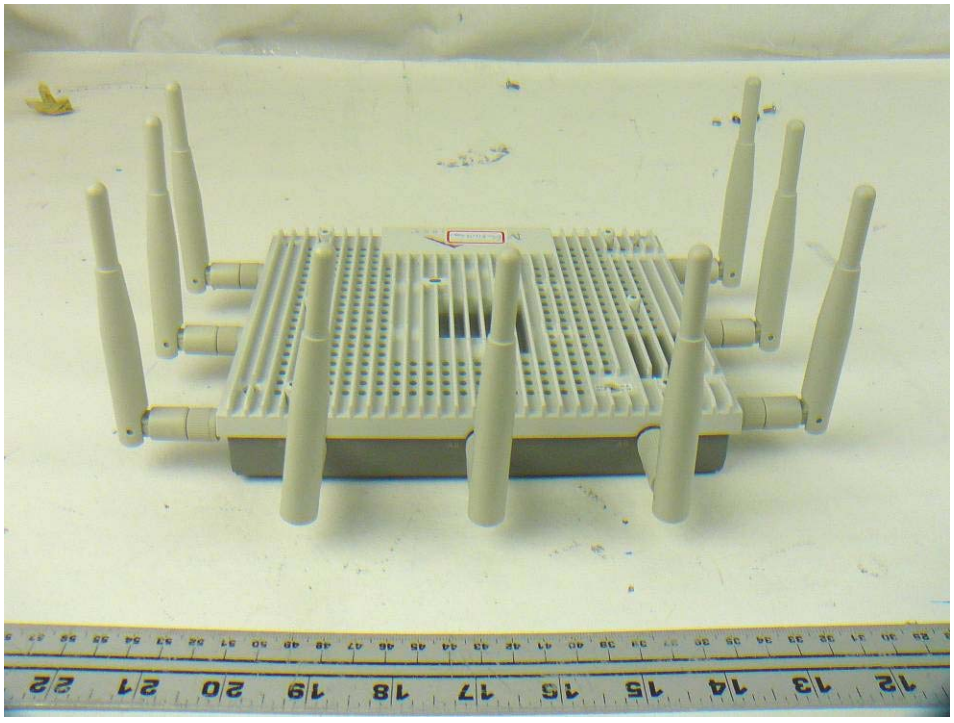
7.22 Radiated Emission (EUT with Model Number: OAP433e) above 1GHz Rear View



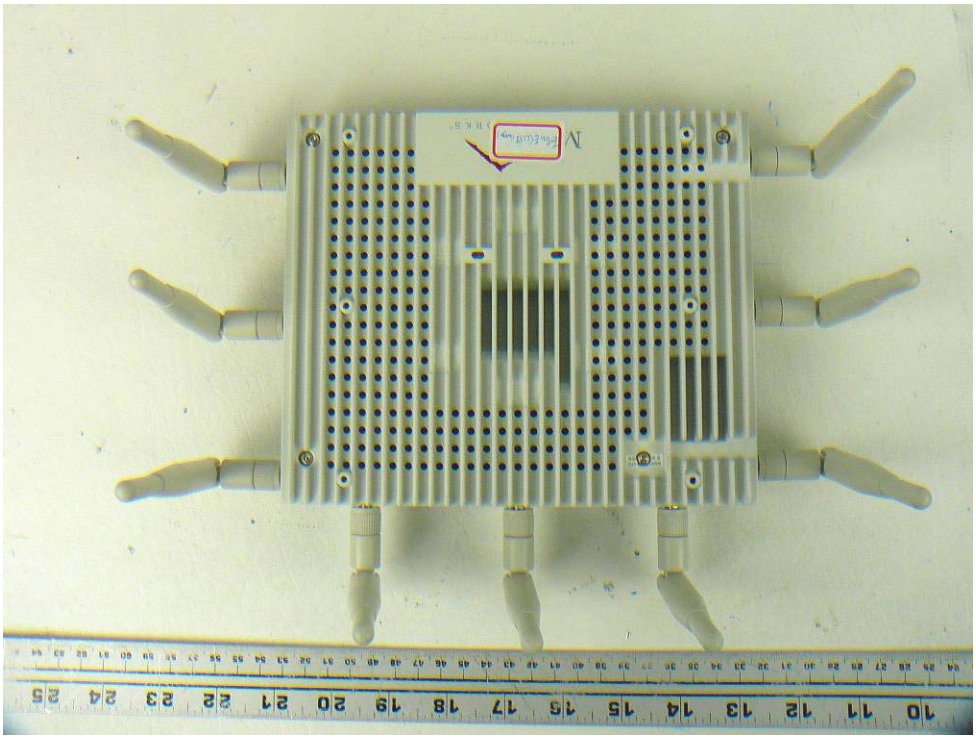
8 Exhibit C – EUT Photographs

8.1 EUT (Model Number: AP433e) - Front View

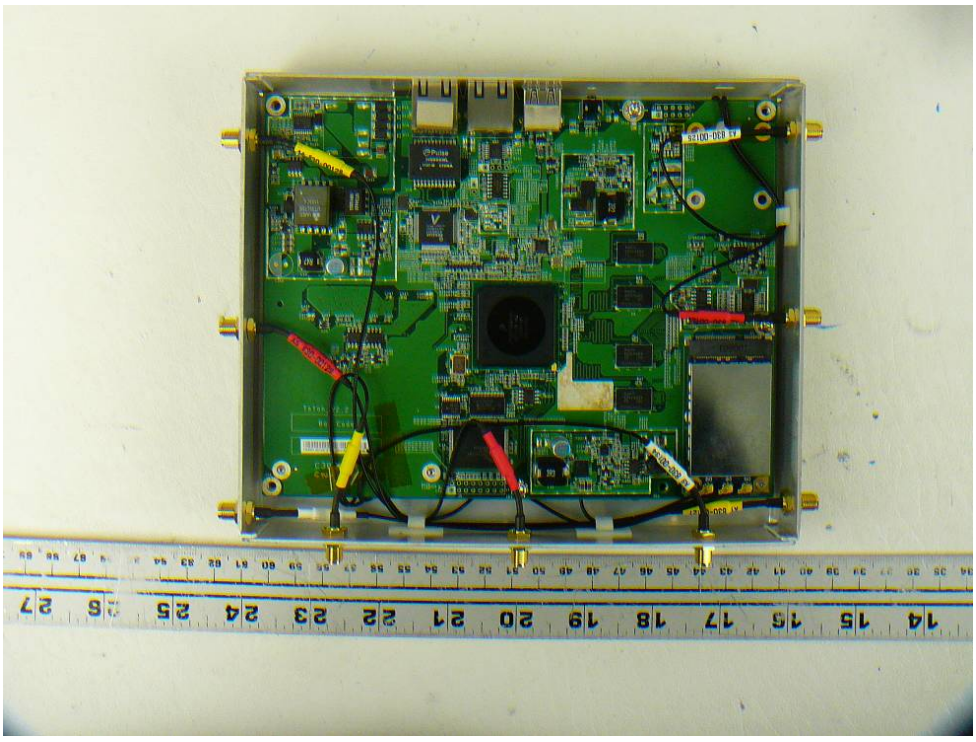
8.2 EUT (Model Number: AP433e) – Rear View



8.3 EUT (Model Number: AP433e) – Top View

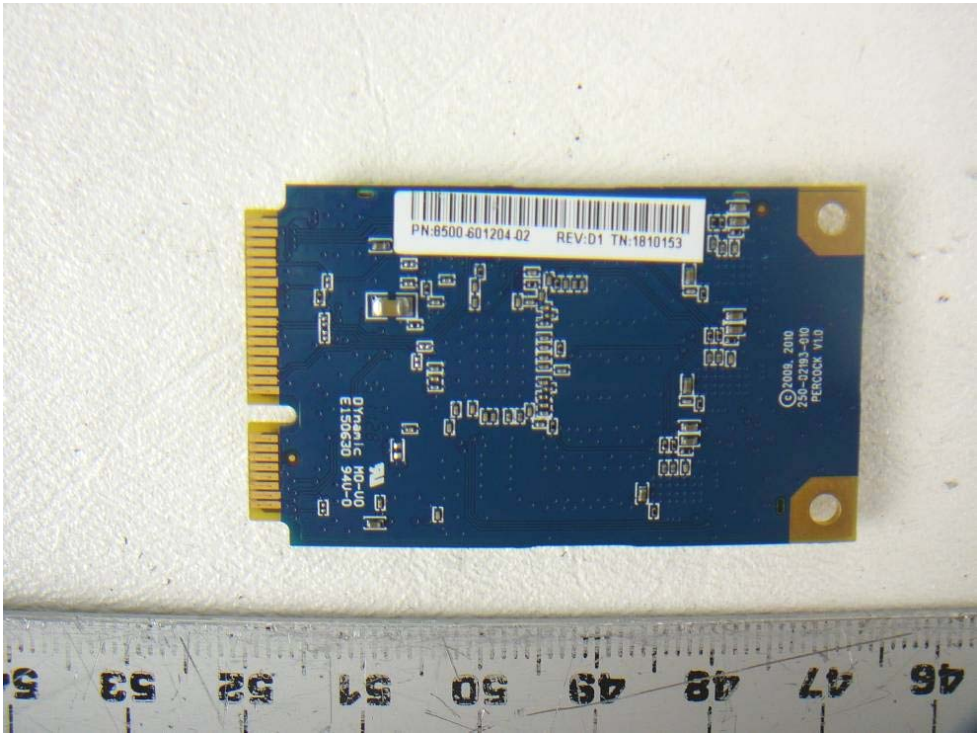


8.4 EUT (Model Number: AP433e) – Open Chasing View

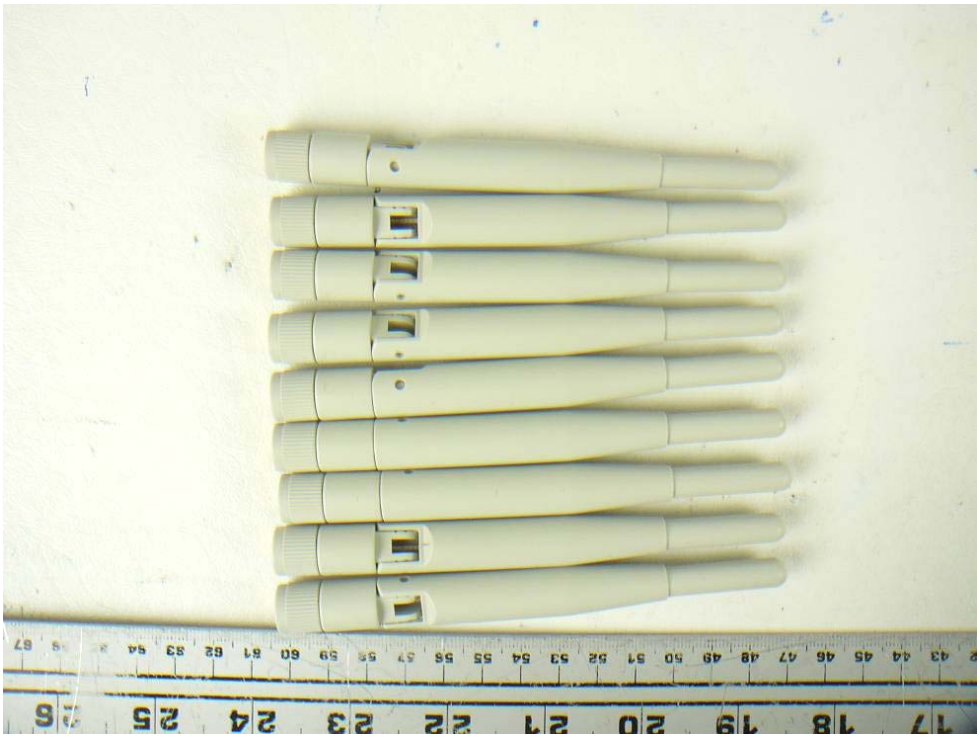


8.5 EUT (Model Number: AP433e) – Main Board

8.6 EUT (Model Number: AP433e) – Wifi Module



8.7 EUT (Model Number: AP433e) – Antennas

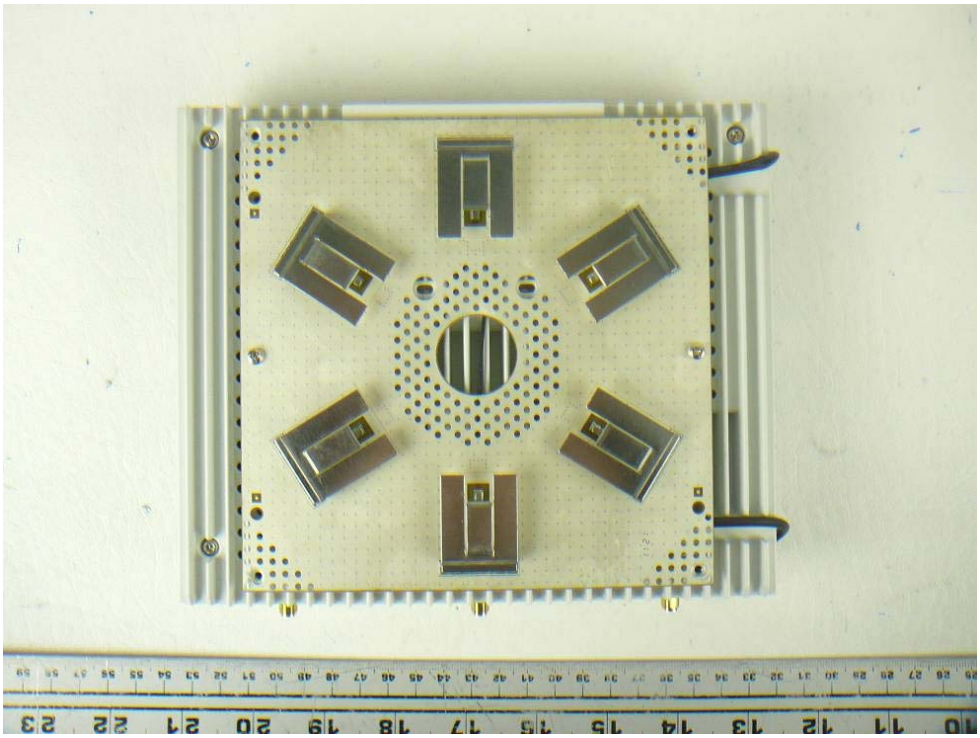


8.8 EUT (Model Number: AP433i) - Front View

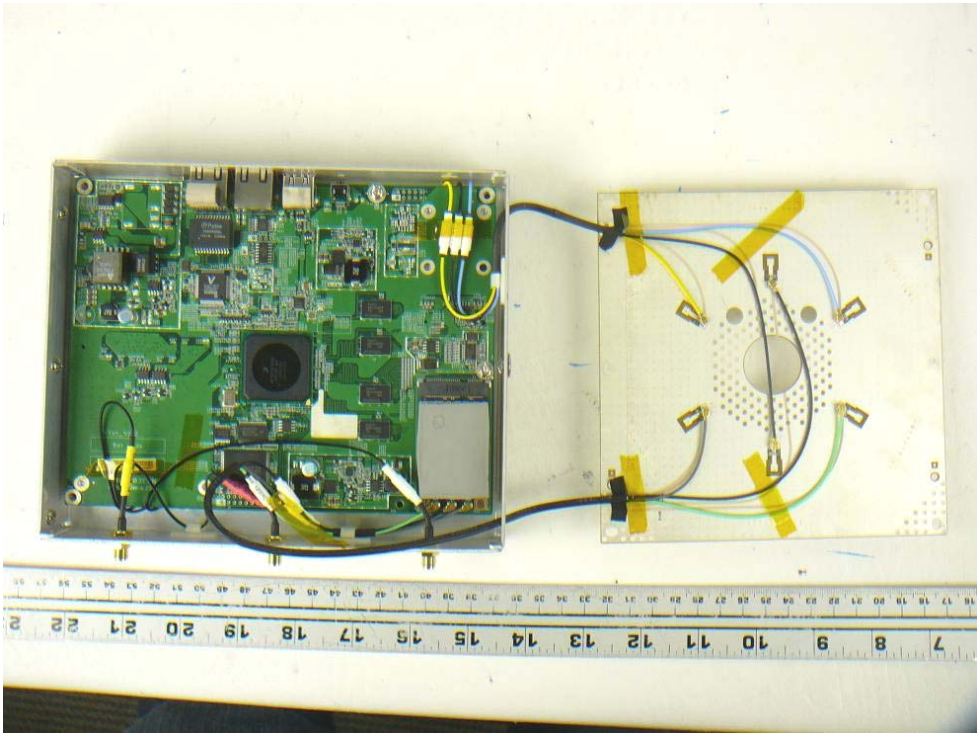
8.9 EUT (Model Number: AP433i) - Rear View

8.10 EUT (Model Number: AP433i) – Top View

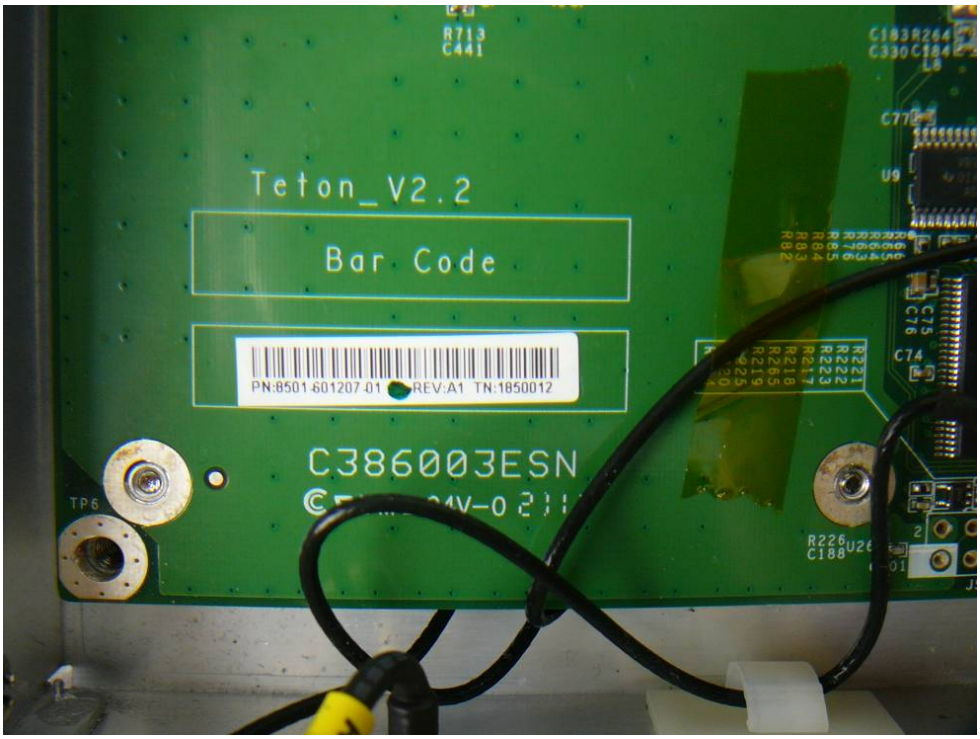
8.11 EUT (Model Number: AP433i) – Open Chasing View 1



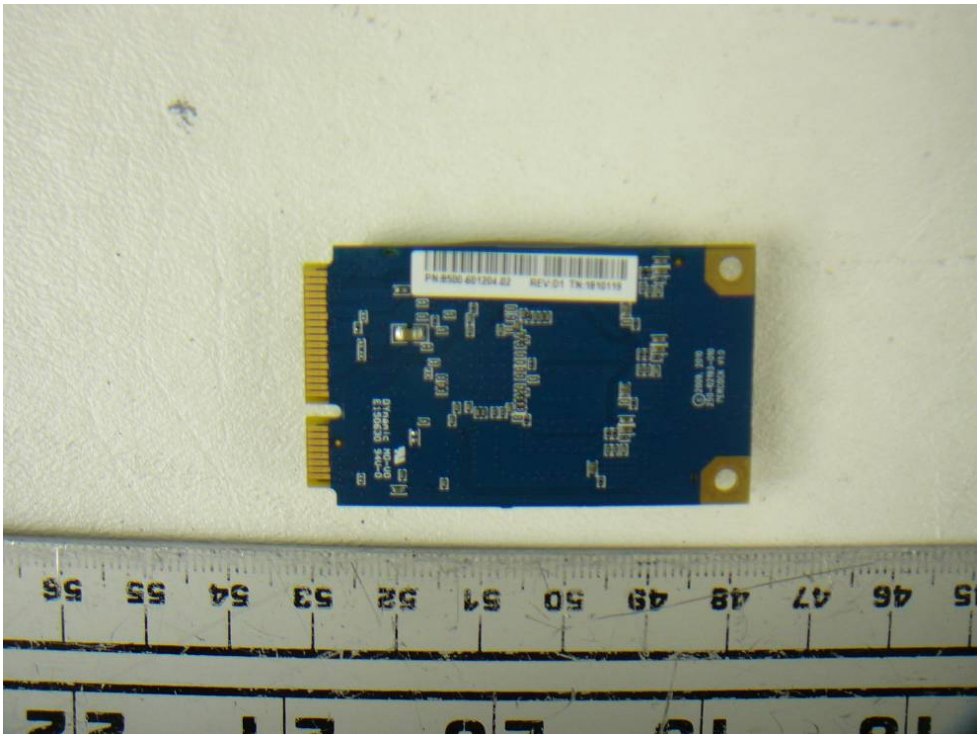
8.12 EUT (Model Number: AP433i) – Open Chasing View 2



8.13 EUT (Model Number: AP433i) – Main Board



8.14 EUT (Model Number: AP433i) – Wifi Module

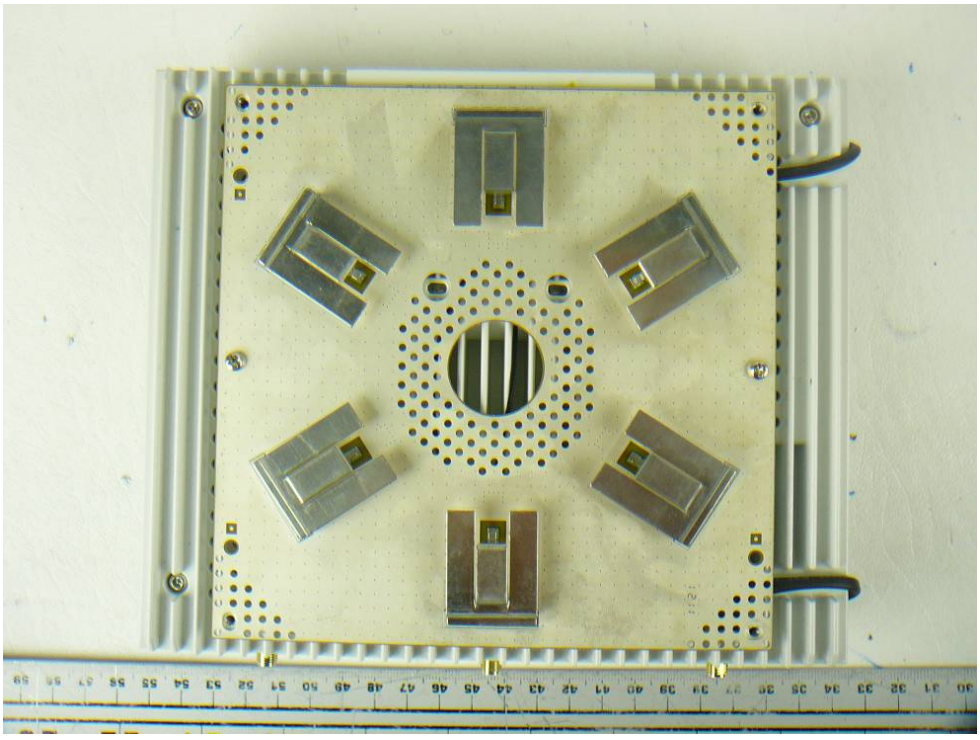


8.15 EUT (Model Number: AP433is) - Front View

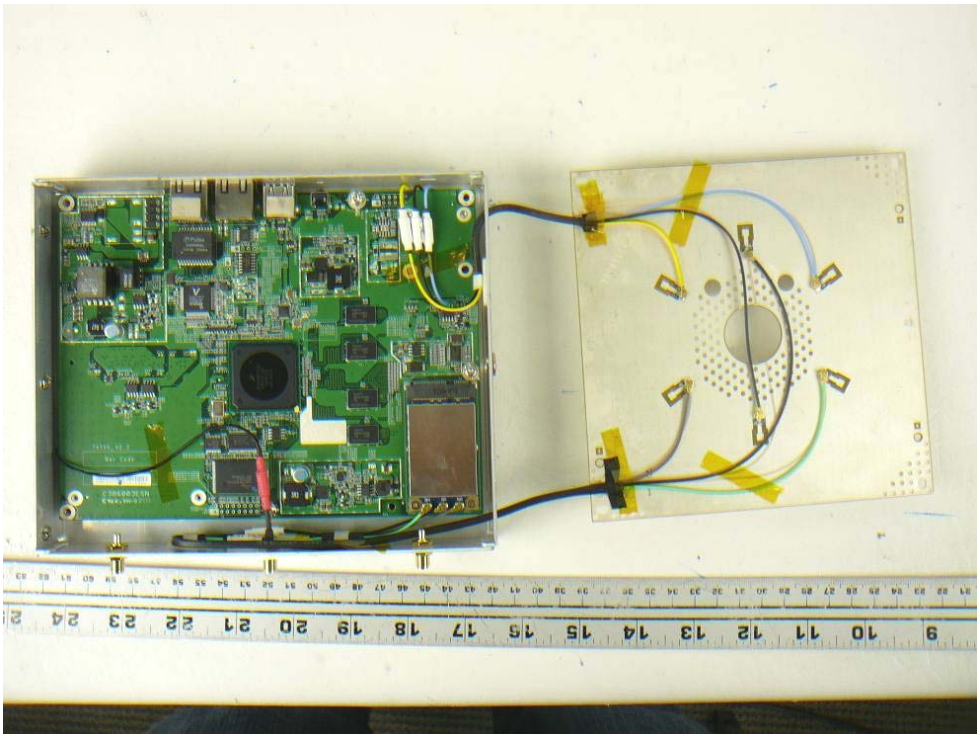
8.16 EUT (Model Number: AP433is) - Rear View

8.17 EUT (Model Number: AP433is) - Top View

8.18 EUT (Model Number: AP433is) – Open Chasing View 1

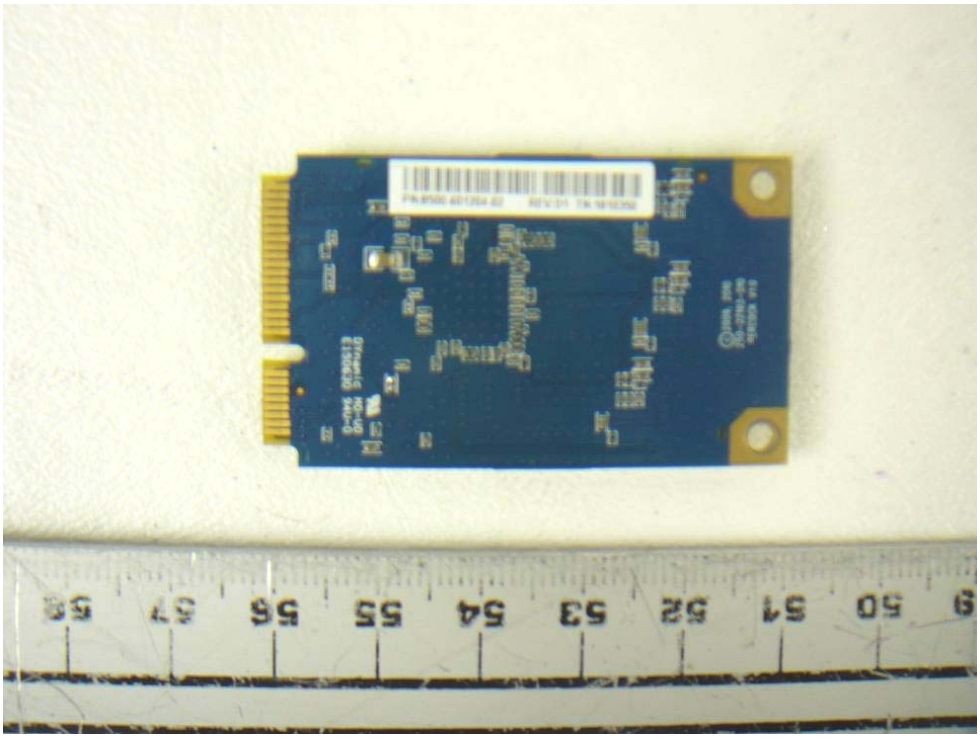


8.19 EUT (Model Number: AP433is) – Open Chasing View 2

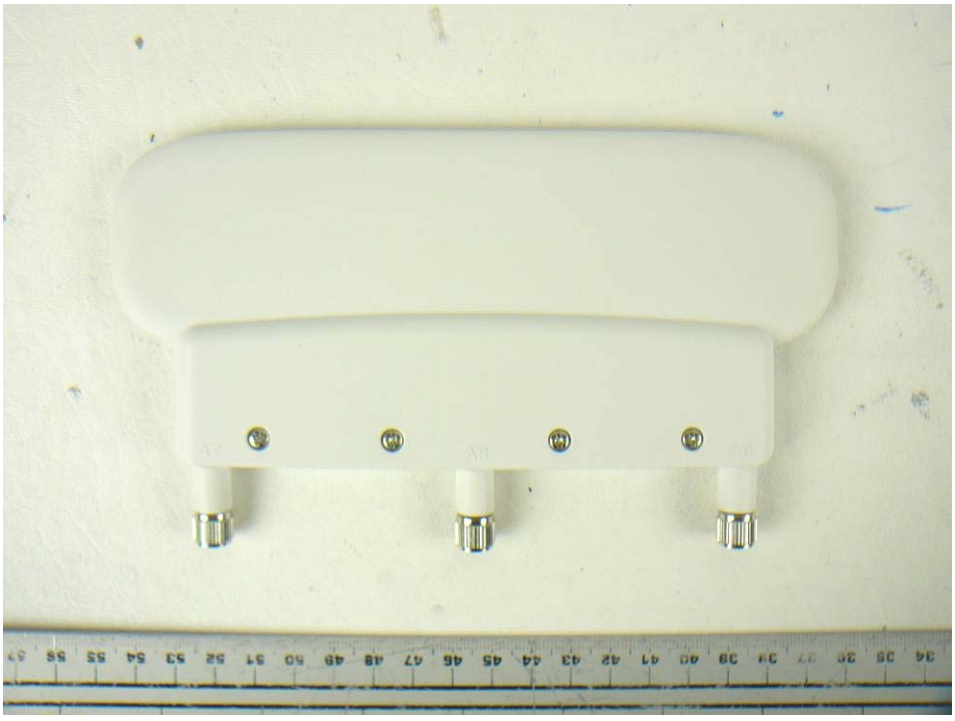


8.20 EUT (Model Number: AP433is) – Main Board

8.21 EUT (Model Number: AP433is) – Wifi Module



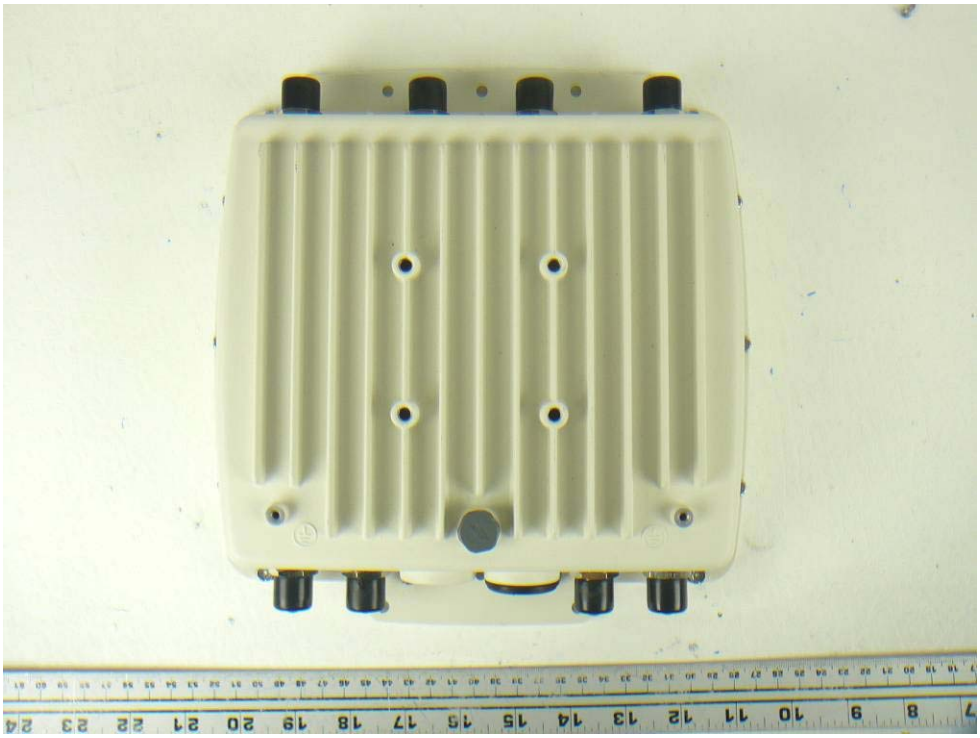
8.22 EUT (Model Number: AP433is) – Antenna



8.23 EUT (Model Number: OAP433e) - Front View

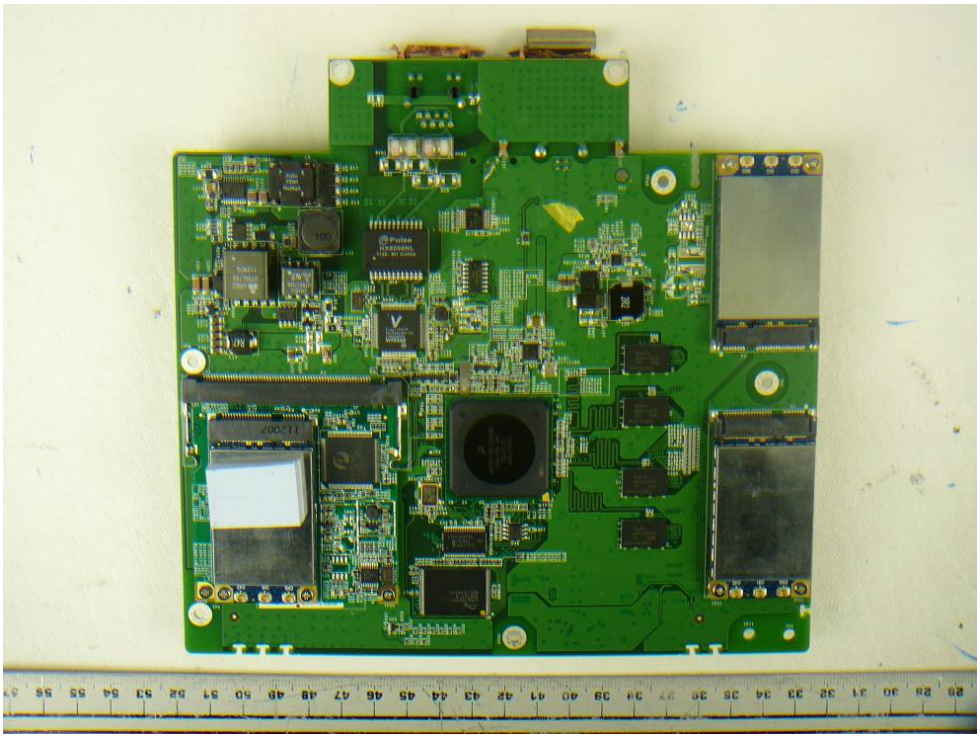
8.24 EUT (Model Number: OAP433e) - Rear View

8.25 EUT (Model Number: OAP433e) - Top View

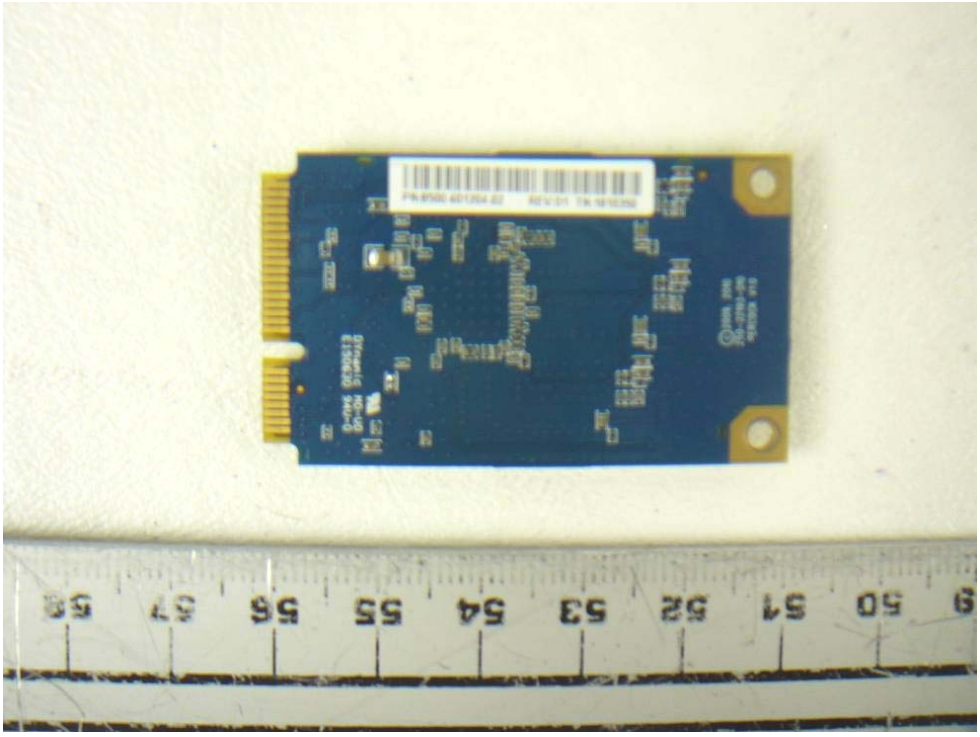


8.26 EUT (Model Number: OAP433e) – Open Chasing View

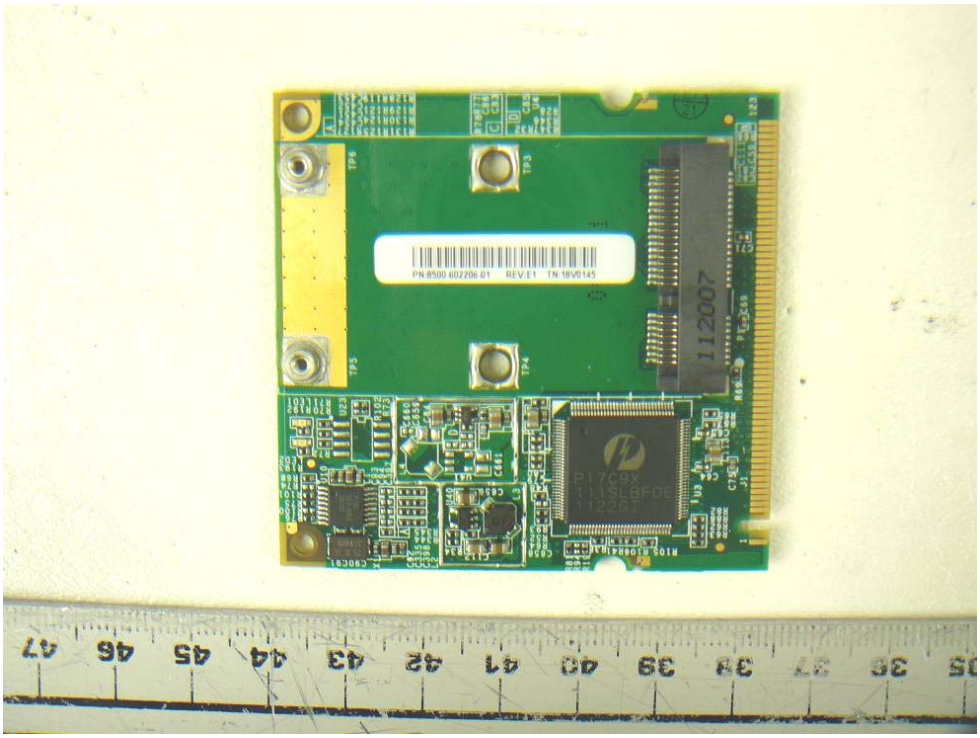
8.27 EUT (Model Number: OAP433e) – Main Board



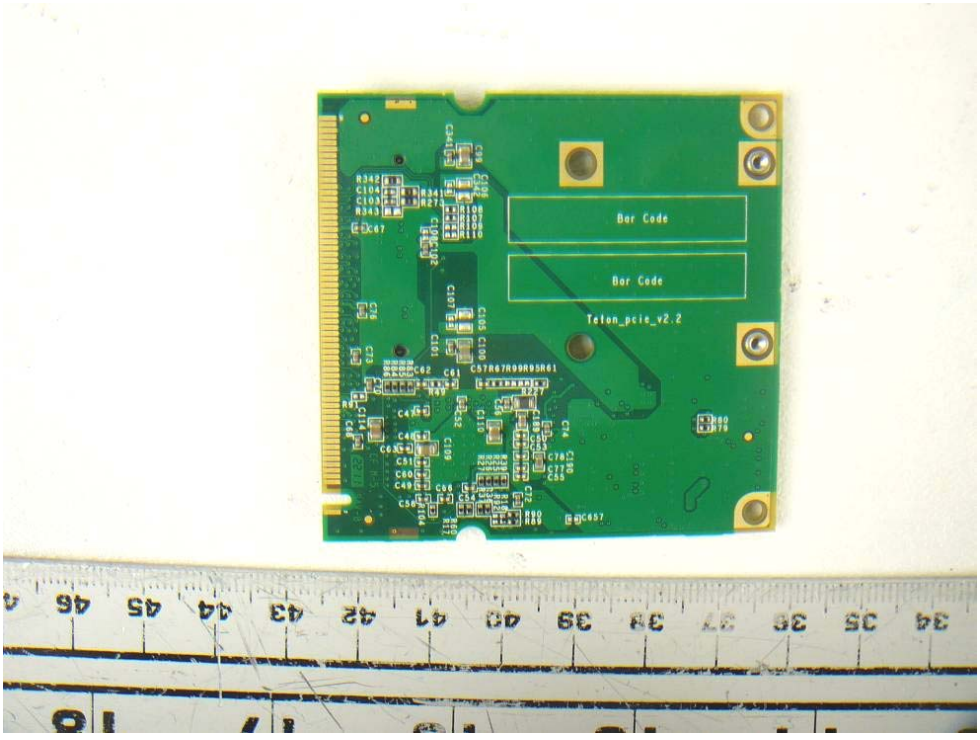
8.28 EUT (Model Number: OAP433e) – Wifi Module



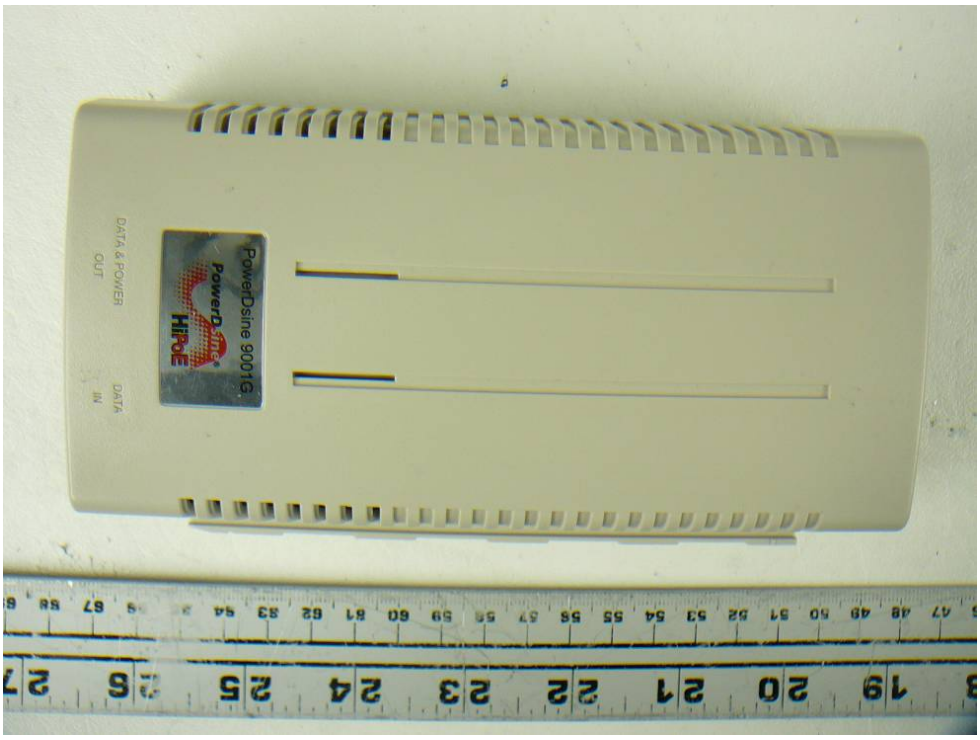
8.29 EUT (Model Number: OAP433e) – Wifi Module Adapter Card- Component View



8.30 EUT (Model Number: OAP433e) – Wifi Module Adapter Card- Solder View



8.31 Power Adapter - Top View



8.32 Power Adapter - Bottom View

9 Exhibit D- Declaration of Similarity

MERU NETWORKS®
Powering the All-Wireless Enterprise™

DECLARATION OF SIMILARITY

December 7, 2011

To:
Bay Area Compliance Laboratories Corp.
1274 Anvilwood Ave.
Sunnyvale, CA 94089
Phone: 408-732-9162, Fax: 408-732-9164
http://www.baclcorp.com

Dear Sir or Madam:

We *Meru Networks, Inc* hereby declare that product AP433e, AP433i, AP433is and OAP433e are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics as model: *AP433* tested by BACL, the results of which are featured in BACL project:R1110122 .

The differences between the tested model and those that are declared similar are as follows:

Model numbers AP433e, AP433i and OAP433 uses three BCM943431MC 802.11n radios and Model number AP433is uses two BCM943431MC 802.11n radios.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Rajendran V. Chary,
Engineering Architect
Meru Networks, Inc
894 Ross Drive,
Sunnyvale,
CA 94089

894 Ross Drive | Sunnyvale | CA 94089 | USA | Main: +1 (408) 215-5300 | Fax: +1 (408) 215-5301 | www.merunetworks.com

---END OF REPORT ---