Test Certificate

A sample of the following product received on October 11, 2011 and tested on October 12, 13, 15, 16, and 18, 2011 complied with the requirements of,

- **Subpart B of Part 15 of FCC Rules for Class B digital devices**
- **Industry Canada Interference Causing Equipment Standard ICES 003, dated February 2004 (Class B)**
- **VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment, dated April 2011 (Class B).**
- **EN 55022:2006 including amendment A1:2007, "Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement" (Class B)**
- **AS/NZS CISPR 22:2006 "Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement" (Class B)**
- **EN 55024:1998 including amendments A1:2001 and A2:2003 "Information technology equipment – Immunity characteristics, Limits and method of measurement."**
- **CISPR 24:1997 including amendments A1:2001 and A2:2002 "Information technology equipment – Immunity characteristics, Limits and method of measurement."**

given the measurement uncertainties detailed in Elliott report R85223.

Ubiquiti Networks
Model AirCam Mini

Michael Findley
Senior EMC Engineer

_____
Ubiquiti Networks

_____
Printed Name

Testing Cert #2016.01

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EMC Test Report

Class B Information Technology Equipment
Class B Digital Device

FCC Part 15; Industry Canada ICES 003
VCCI Regulations 2011
EN 55022:2006 + A1:2007
CISPR 22:2008 ; AS/NZS CISPR 22:2006
EN 55024:1998 +A1:2001 +A2:2003
CISPR 24:1997 + A1:2001 + A2:2002

Model: AirCam Mini

COMPANY:	Ubiquiti Networks 91 E. Tasman Drive San Jose, CA 95134
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road Fremont, CA. 94538-2435
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Testing Cert #2016.01

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	11-7-2011	First release	-

TABLE OF CONTENTS

SCOPE

Governments and standards organizations around the world have published requirements regarding the electromagnetic compatibility (EMC) of electronic equipment. Testing has been performed on the Ubiquiti Networks model AirCam Mini, pursuant to the following standards.

Standard	Title	Standard Date
FCC Part 15, Subpart B	Radio Frequency Devices	October 2010 as Amended
ICES-003, Issue 4	Digital apparatus	2004
VCCI V-3	VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment	April 2011
CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2008
AS/NZS CISPR 22	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2006
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement	2006 + A1:2007
EN 55024	Information technology equipment – Immunity characteristics, Limits and method of measurement	1998 +A1:2001 +A2:2003
CISPR 24	Information technology equipment – Immunity characteristics, Limits and method of measurement	1997 +A1:2001 +A2:2002

All measurements and evaluations have been in accordance with these specifications, test procedures, and measurement guidelines as outlined in Elliott Laboratories test procedures, and in accordance with the standards referenced therein (refer to Appendix G).

OBJECTIVE

The objective of Ubiquiti Networks is to:

- declare conformity with the essential requirements of the EMC directive 2004/108/EC using the harmonized standard(s) referenced in this report;
- declare conformity with the electromagnetic compatibility (EMC) regulatory arrangement of the Australian Communications and Media Authority (ACMA);
- verify compliance with FCC requirements for digital devices and Canada's requirements for digital devices;
- verify compliance to the Japanese VCCI requirements for Information Technology Equipment.

STATEMENT OF COMPLIANCE

The tested sample of Ubiquiti Networks model AirCam Mini complied with the requirements of:

Standard/Regulation	Equipment Type/Class	Standard Date
Subpart B of Part 15 of the FCC Rules (CFR title 47)	Class B	2010 as amended
ICES-003, Issue 4	Class B	2004
VCCI Regulations V-3	Class B	2011
EN 55022	Class B	2006 + A1:2007
CISPR 22 Edition 6	Class B	2008
AS/NZS CISPR 22	Class B	2006
EN55024	-	1998 +A1:2001 +A2:2003
CISPR 24	-	1997 +A1:2001 +A2:2002

This report is suitable for demonstrating compliance with the EMC requirements in Australia and New Zealand. Refer to *Appendix F* for more details.

The test results recorded herein are based on a single type test of the Ubiquiti Networks model AirCam Mini and therefore apply only to the tested sample(s). The sample was selected and prepared by Jennifer Sanchez of Ubiquiti Networks.

Maintenance of compliance is the responsibility of the company. Any modification of the product that could result in increased emissions or susceptibility should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different enclosure, different line filter or power supply, harnessing and/or interface cable changes, etc.).

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

INFORMATION TECHNOLOGY EQUIPMENT EMISSIONS TEST RESULTS

The following emissions tests were performed on the Ubiquiti Networks model AirCam Mini. The measurements were extracted from the data recorded during testing and represent the highest amplitude emissions relative to the specification limits. The complete test data is provided in the appendices of this report.

CONDUCTED EMISSIONS (MAINS PORT)

Frequency Range Operating Voltage	Standard/Section	Requirement	Measurement	Margin	Status
0.15-30 MHz, 120V, 60Hz	FCC § 15.107(a) VCCI Table 4.2 CISPR 22 Table 2 EN 55022 Table 2 AS/NZS CISPR 22 Table 2 (Class B)	0.15-0.5 MHz: 66-56 dBµV QP 56-46 dBµV Av 0.5-5.0 MHz: 56 dBµV QP 46 dBµV Av 5.0-30.0 MHz: 60 dBµV QP 50 dBµV Av	39.7dBµV @ 0.344MHz	-9.4dB	Complied
0.15-30 MHz, 230V, 50Hz			43.8dBµV @ 0.347MHz	-5.2dB	Complied

CONDUCTED EMISSIONS (TELECOMMUNICATIONS PORTS)

The EUT does not have any telecommunication ports.

RADIATED EMISSIONS

Frequency Range	Standard/Section	Requirement	Measurement	Margin	Status
30-1000 MHz	EN 55022 Table 6 CISPR 22 Table 6 FCC §15.109(g) VCCI Table 4.6 AS/NZS CISPR 22 Table 6 Class B	30 – 230, 30 dBµV/m 230 – 1000, 37 dBµV/m (10m limit)	29.7dBµV/m @ 400.02MHz	-7.3dB	Complied
1000-2000 MHz Note 1	FCC §15.109(a) Class B	54.0 dBµV/m Av 74.0 dBµV/m Pk (3m limit)	44.3dBµV/m @ 1200.1MHz	-9.7dB	Complied
1000-6000 MHz Note 1	EN 55022 Table 8 CISPR 22 Table 8 VCCI Table 4.8 (Free-Space Measurement) Class B	1 – 3GHz 50 dBµV/m Av 70 dBµV/m Pk 3 – 6GHz 54 dBµV/m Av 74 dBµV/m Pk (3m limit)	40.8dBµV/m @ 1600.1MHz	-9.2dB	Complied

Note 1 As the highest frequency generated in the EUT was declared to be between 108 MHz and 500 MHz, the upper frequency for radiated measurements was 2 GHz.

Note 2 As the highest frequency of the internal sources of the EUT was declared to be above 1 GHz, the upper frequency for radiated measurements was 5 times the highest frequency or 6 GHz, whichever is less. For this device the highest frequency declared was 400 MHz so the highest frequency measured was 6 GHz.

INFORMATION TECHNOLOGY EQUIPMENT IMMUNITY TEST RESULTS

The following tests were performed on the Ubiquiti Networks model AirCam Mini. The results are based upon performance criteria defined by the company and as detailed in this test report.

Test	Basic Standard	Level Tested	Criterion Required	Criterion Met	Status
ESD	EN 61000-4-2 IEC 61000-4-2	4 kV CD 8 kV AD	B	A	Complied
RF EM Field AM 80% AM 1kHz	EN 61000-4-3 IEC 61000-4-3	80-1000 MHz 3 V/m	A	A	Complied
EFT, AC Power Port	EN 61000-4-4 IEC 61000-4-4	± 1 kV	B	A	Complied
EFT, DC Power Port		N/A – Note 1			
EFT, Signal Ports		± 0.5 kV	B	A	Complied
Surge, AC Power Port	EN 61000-4-5 IEC 61000-4-5	1 kV DM, 2 kV CM 1.2/50 µs	B	A	Complied
Surge, DC Power Port		N/A – Note 1			
Surge, Signal Ports		N/A – Note 2			
RF, conducted continuous, Signal Ports	EN 61000-4-6 IEC 61000-4-6	N/A – Note 3			
RF, conducted continuous, AC Power Port		0.15-80 MHz, 3 Vrms 80% AM 1kHz	A	A	Complied
RF, conducted continuous, DC Power Port		N/A – Note 1			
Power Frequency Magnetic Field	EN 61000-4-8 IEC 61000-4-8	N/A – Note 4			
Voltage Dips and Interrupts (50Hz)	IEC 61000-4-11	>95%, 0.5 cycles 30%, 25 cycles >95%, 250 cycles	B C C	A A C	Complied

Note 1 The EUT does not have any DC power ports
Note 2 Ubiquiti Networks stated that the EUT's interface ports are not intended to connect to outdoor cables
Note 3 Ubiquiti Networks stated that the EUT's interface ports are not intended to connect to longer than 3m.
Note 4 Ubiquiti Networks stated that the EUT does not contain any components susceptible to 50Hz magnetic fields.

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below were calculated using the approach described in CISPR 16-4-2:2003 using a coverage factor of k=2, which gives a level of confidence of approximately 95%. The levels were found to be below levels of *U*cispr and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
Conducted Emissions	dBuV or dBuA	150kHz – 30MHz	± 2.2 dB
Radiated Electric Field	dBuV/m	30 – 1000 MHz	± 3.6 dB
		1000 – 40,000 MHz	± 6.0 dB
Radiated Immunity	V/m	80 – 2700 MHz	- 26.3%, + 29.97%
ESD	KV	N/A	± 8.6%
Fast Transients	Voltage	N/A	± 5.98 %
	Timing	N/A	± 8.60 %
Surge	Voltage	N/A	± 4.92 %
RF Common Mode (CDN method)	Vrms	N/A	-12.64 %, +13.33 %
RF Common Mode (BCI method)	Vrms	N/A	-13.45 %, +15.32 %
Voltage Dips	Voltage	N/A	± 2.32 %
Voltage Dips	Timing	N/A	± 0.08mS

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Ubiquiti Networks model AirCam Mini is a Security camera that is designed to stream live video. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the AirCam Mini is 24 Vdc and 1 Amp. The electrical rating of the POE Adapter is 100-240V, 50-60Hz and 0.5A.

The sample was received on October 11, 2011 and tested on October 12, 13, 15, 16, and 18, 2011. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Ubiquiti Networks	AirCam Mini	Security Camera		N/A
Ubiquiti Networks	UBI-POE-24-5	Carrier POE Adapter		N/A

OTHER EUT DETAILS

The following EUT details should be noted: EUT is a POE (Power Over Ethernet) device.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 9 cm wide by 9 cm deep by 10 cm high.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

No local support equipment was used during emissions testing.

The following equipment was used as remote support equipment for emissions testing:

Company	Model	Description	Serial Number	FCC ID
HP	G42	PC Laptop	584037-001	-

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port		Cable(s)		
From	To	Description	Shielded/Unshielded	Length(m)
POE(EUT)	POE Injector	CAT5	Shielded	5.0
AC Power(POE Injector)	AC Mains	3 Wire	Shielded	1.0
LAN(POE Injector)	PC Laptop	CAT5	Shielded	10.0

EUT OPERATION

During emissions testing the EUT was streaming live video.

During immunity testing the EUT was steaming live video. Normal operation is indicated by the EUT continuously streaming live video displayed on the PC Laptop and shall be monitored by the PC Laptop.

The performance criteria applied during immunity testing were:

Criterion A:
During and after testing the EUT shall continue to show the video stream on the PC Laptop.

Criterion B:
During application of the transient test, degradation of performance including loss of signal is allowed provided that the EUT self-recovers to normal operation after testing without any operator intervention.

Criterion C:
Loss of function is allowed provided that normal operation can be restored by operator intervention.

EMISSIONS TESTING

RADIATED AND CONDUCTED EMISSIONS

Final test measurements were taken at the Elliott Laboratories Anechoic Chambers listed below. The test sites contain separate areas for radiated and conducted emissions testing. The sites conform to the requirements of 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* and CISPR 16-1-4:2007 - *Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus Ancillary equipment Radiated disturbances*. They are registered with the VCCI and are on file with the FCC and Industry Canada.

Site	Registration Numbers			Location
	VCCI	FCC	Canada	
Chamber 3	R-1683 G-58 C-1795	769238	IC 2845B-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	G-57	211948	IC 2845B-4	

RADIATED EMISSIONS CONSIDERATIONS

Radiated emissions measurements were made with the EUT powered from a supply voltage within the expected tolerances of each nominal operating voltage/frequency for each geographical regions covered by the scope of the standards referenced in this report.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4 and CISPR 22.

Mains port measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

EMISSIONS MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1:2006 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7 GHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000 MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.

INSTRUMENT CONTROL COMPUTER

Measurements are converted to the field strength at an antenna or voltage developed at the LISN (or ISN) measurement port, which is then compared directly with the appropriate specification limit under software control of the test receivers and spectrum analyzers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted emission measurements utilize a fifty micro-Henry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250-uH CISPR adapter. This network provides for calibrated radio-frequency noise measurements by the design of the internal low-pass and high-pass filters on the EUT and measurement ports, respectively.

IMPEDANCE STABILIZATION NETWORK (ISN)

Telecommunication port conducted emission measurements utilize an Impedance Stabilization Network with a 150-ohm termination impedance and specific longitudinal conversion loss as the voltage monitoring point. This network provides for calibrated radio-frequency noise measurements by the design of the internal circuitry on the EUT and measurement ports, respectively. For current measurements, a current probe with a uniform frequency response and less than 1-ohm insertion impedance is used.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high-amplitude transient events.

ANTENNAS

A bilog antenna or combination of biconnical and log periodic antennas are used to cover the range from 30 MHz to 1000 MHz. Narrowband tuned dipole antennas may be used over the entire 30 to 1000 MHz frequency range for precision measurements of field strength. Above 1000 MHz, horn antennas are used. The antenna calibration factors are included in site factors that are programmed into the test receivers or data collection software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor drive to vary the antenna height.

ANSI C63.4, CISPR 22 and KN22 specify that the test height above ground for table-mounted devices shall be 80 centimeters. Floor-mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material up to 12-mm thick if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the company's specifications. An appendix of this report contains the list of test equipment used and calibration information.

EMISSIONS TEST PROCEDURES

EUT AND CABLE PLACEMENT

The standards require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4, CISPR 22 and KN22, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS (MAINS)

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest-amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak-mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord. Emissions that have peak values close to the specification limit are also measured in the quasi-peak and average detection modes to determine compliance except when the amplitude of the emission when measured with the quasi-peak detector is more than 10 dB below the specification limit for average measurements. In this case only quasi-peak measurements are performed.

RADIATED EMISSIONS (SEMI-ANECHOIC and/or OATS TEST ENVIRONMENT)

Radiated emissions measurements in a semi-anechoic environment are performed in two phases (preliminary scan and final maximization). Final maximization may be performed on an OATS.

Preliminary Scan

A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed from 30 MHz up to the frequency required by the regulations specified on page 1. One or more of these are performed with the antenna polarized vertically and one or more of these are performed with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit. A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions if required. Other methods used during the preliminary scan for EUT emissions involve scanning with near-field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final Maximization

During final maximization, the highest-amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth that results in the highest emission is then maintained while varying the antenna height from one to four meters. The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain. Emissions that have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

For measurements above 1GHz every effort is made to ensure the EUT remains within the cone of radiation of the measurement antenna (i.e. 3dB beam-width of the antenna). This may include rotating the product and/or angling the measurement antenna.

RADIATED EMISSIONS (FREE-SPACE TEST ENVIRONMENT)

Anechoic material is placed on the floor between the EUT and the measurement antenna and behind the EUT to ensure that the test site complies with the requirements of CISPR 16 for measurements of radiated field strength above 1GHz in a free-space environment.

The measurements are made in two phases (preliminary scan and final maximization).

Preliminary Scan

A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in one or more given modes of operation. Scans are performed from 1 GHz up to the frequency required with the antenna polarized vertically and repeated with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360° with the measurement antenna set at a height equal to the center height of the EUT. If necessary additional scans are performed with the antenna height adjusted up and down to ensure the measurement antenna illuminates the entire height of the EUT. A peak detector is used for the preliminary scan and results compared to the average limit.

Final Maximization

During final maximization, the highest-amplitude emissions identified in the preliminary scan are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. For small EUT fitting within the beam-width of the measurement antenna, the azimuth resulting in the highest emission is the maintained, and the measurement antenna is positioned at a fixed height for final measurements.

For large EUT not fitting within the beam-width of the measurement antenna, the azimuth that results in the highest emission is then maintained while varying the antenna height from one meter up to the height of the top of the EUT (when necessary). A second rotation of the EUT at the new height may be performed to ensure the highest field strength is obtained.

Peak and average measurements are made of the signal with the level maximized for EUT azimuth and, where necessary, antenna height. Each recorded level is corrected by test software using appropriate factors for cables, connectors, antennas, and preamplifier gain.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements. A distance factor, when used for electric field measurements, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m
F_d = Distance Factor in dB
R_c = Corrected Reading in dBuV/m
L_s = Specification Limit in dBuV/m
M = Margin in dB Relative to Spec

IMMUNITY TESTING

GENERAL INFORMATION

Final tests were performed at the Elliott Laboratories Test Sites located at 41039 Boyce Road, Fremont, CA 94538-2435. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent CENELEC and IEC standards.

All immunity tests were performed with the host system operating from an AC source voltage within the operating ranges specified for the product, meeting the requirement detailed in EN 55024 / CISPR 24 section 6.1 and, where appropriate, KN24.

IMMUNITY MEASUREMENT INSTRUMENTATION

ELECTROSTATIC DISCHARGE TEST SYSTEM

An ESD generator is used for all testing. It is capable of applying electrostatic discharges in both contact discharge mode to 8 kV and air discharge mode to 16.5 kV in both positive and negative polarities in accordance with the IEC/EN/KN 61000-4-2 basic EMC publication.

ELECTROMAGNETIC FIELD TEST SYSTEM

A signal generator and power amplifiers are used to provide a signal at the appropriate power and frequency to an antenna to obtain the required electromagnetic field at the position of the EUT in accordance with the IEC/EN/KN 61000-4-3 basic EMC publication.

ELECTRICAL FAST TRANSIENT/BURST TEST SYSTEM

An electrical fast transient/burst generator is used for all testing. It is capable of applying the required fast transient immunity test levels to the mains at any phase angle with respect to the mains voltage waveform and to attached cables via a capacitive coupling clamp in accordance with the IEC/EN/KN 61000-4-4 basic EMC publication.

SURGE TEST SYSTEM

A surge generator is used for all testing. It is capable of providing the required surge immunity test levels to the mains port at any phase angle with respect to the mains line voltage waveform or to the signal port in accordance with the IEC/EN/KN 61000-4-5 basic EMC publication.

CONDUCTED INTERFERENCE TEST SYSTEM

A signal generator and power amplifier are used to provide a signal at the appropriate power and frequency through a coupling network to obtain the required electromagnetic signal on the power cord and attached cables of the EUT in accordance with the IEC/EN/KN 61000-4-6 basic immunity standard.

VOLTAGE VARIATION TEST SYSTEM

A power-line disturbance simulator and variable transformer are used for all testing. These two units are, when used together, capable of simulating mains voltage variations between 0 and 100% for periods up to 100 seconds in duration in accordance with the IEC/EN/KN 61000-4-11 basic EMC standard.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the company's specifications. An appendix of this report contains the list of test equipment used and calibration information.

IMMUNITY TEST PROCEDURES

EQUIPMENT PLACEMENT

The basic standards for evaluating immunity to electrostatic discharges specify that a tabletop EUT shall be placed on a non-conducting table 80 centimeters above a ground reference plane and that floor-mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement. For tabletop equipment, a 1.6 by 0.8 meter metal sheet is placed on the table and connected to the ground plane via a metal strap with two 470-kOhm resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material.

The basic standards for evaluating immunity to radiated electric fields specify that a tabletop EUT be placed on a non-conducting table 80 centimeters high and that floor-mounted equipment may be mounted on non-conductive supports 0.05 to 0.15m high. During the IEC 61000-4-3 tests, the EUT is positioned in a shielded anechoic test chamber to reduce reflections from the internal surfaces of the chamber.

The basic standards for evaluating immunity electrically fast transient bursts specify that the EUT and attached cables be placed on an insulating support 10 centimeters above a ground reference plane. During the tests, the EUT was positioned on a table with a ground reference plane or on the floor in conformance with this requirement.

The basic standards for evaluating immunity to surge transients do not specify positioning of the EUT. The EUT was therefore placed on a table or on the floor.

The basic standards for evaluating immunity to conducted rf disturbances specify that the EUT be placed on an insulating support 10 centimeters above a ground reference plane and that the attached cables be maintained between 30 and 50 millimeters above this plane where possible. During the tests, the EUT was positioned on a table with a ground reference plane or on the floor in conformance with this requirement.

The basic standards for evaluating immunity to voltage dips and interruptions do not specify positioning of the EUT. The EUT was therefore placed on a table or on the floor.

APPLICATION OF ELECTROSTATIC DISCHARGES

The points of application of the test discharges directly to the EUT are determined after consideration of the parts of the EUT that are accessible to the operator during normal operation. Contact and air discharges are applied to the EUT, contact discharges to conducting surfaces and air-gap discharges to insulating surfaces. Contact discharges are also applied to the coupling planes to simulate nearby ESD events.

APPLICATION OF ELECTROMAGNETIC FIELD

The electromagnetic field is established at the front edge of the EUT.

The frequency range is swept through the frequency range of the test using a power level necessary to obtain the required field strength at the EUT. The field is amplitude modulated using a 1-kHz sine wave to a depth of 80% for the swept frequency test in accordance with the applicable basic standard(s).

The test is repeated with each of the four sides of the EUT facing the field-generating antenna. For small, portable products the test is also performed with the top and bottom sides of the EUT facing the antenna.

APPLICATION OF ELECTRICAL FAST TRANSIENTS

The application of the test voltage to the EUT is made to the cable connected to the power port under test via discrete capacitors and through a capacitive coupling clamp in the case of cables connected to signal ports.

APPLICATION OF SURGES

The application of the surge to the EUT's AC or DC power port is made to the power cable attached to the unit via the coupling/decoupling network within the surge generator.

For coupling to unshielded signal lines a coupling network is used to give the correct coupling path (resistor and capacitor/spark gap) to the line under test. Coupling to shielded signal lines is made directly to the shield at the far end of the cable, with the cable length set to the shorter of 20m or the maximum specified cable length. Whenever possible a decoupling network is placed in series with the I/O line under test and the support equipment to ensure that any susceptibility observed is due to the EUT and not the support equipment. Decoupling networks are not available for high-speed signal lines.

APPLICATION OF CONDUCTED INTERFERENCE

The application of the test voltage to the EUT is made through either a coupling-decoupling network (CDN), by direct injection, or through an inductive coupling clamp as appropriate to the cable being tested. The frequency range is swept from 0.15 to 80 MHz using a power level necessary to obtain the specified interference voltage.

APPLICATION OF VOLTAGE VARIATIONS

The applications of the variations in mains voltage to the EUT are made through the AC power cable attached to the unit.

Appendix A Test Equipment Calibration Data

Radiated Emissions, 1000 - 6,000 MHz, 12-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/18/2012
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	8/9/2012

Radiated Emissions, 30 - 2,000 MHz, 13-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	1/13/2012
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	2/28/2012
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	4/13/2012
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2237	7/14/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PAM-103	2380	4/13/2012

Conducted Emissions - AC Power Ports, 13-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	812	1/18/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	4/13/2012
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	9/15/2012

Radiated Immunity, 80 - 1,000 MHz, 13-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Sensor, 1 uW-100 mW, DC-18 GHz, 50ohms	NRV-Z51	1070	5/25/2012
Amplifier Research	Field Probe, RF, 0.5 MHz-5 GHz	FP4036	1496	5/18/2012
Werlatone	Directional Coupler, 0.1-1000 MHz, 40dB, 500w	C6021	1533	N/A
ETS Lindgren	Biconilog Antenna 26 MHz - 3 GHz, Radiated Immunity Only	3140B	1775	N/A
Rohde & Schwarz	Power Meter, Dual Channel, DC to 40 GHz, 100 pW to 30 W, 9 kHz to 3 GHz, 200µV to 1000V	NRVD	1786	2/28/2012
Amplifier Research	Amplifier, 250W, 80-1000 MHz	250A1000	1809	N/A

Conducted Immunity (IEC/EN 61000-4-6), 15-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	11/29/2011
Bird Electronics Corp.	Attenuator, 100 Watt ,6 dB	100-SA-FFN-06	1397	11/15/2011
Rohde & Schwarz	Signal Generator, 9 kHz-1.04 GHz	SMY01	1450	10/11/2012
Instruments For Industry	Amplifier, Wideband, 0.01-230MHz	M75	1531	11/15/2011
Fischer Custom Comm.	M3 Network, 150 kHz-230 MHz	FCC-801-M3-25A	1579	5/13/2012
Fischer Custom Comm.	M3 Network, 150 kHz-230 MHz	FCC-801-M3-25A	1581	5/16/2012
Rohde & Schwarz	Pwr Sensor 300 uW - 30 Watts (+ 25dB pad)	NRV-Z54	1788	7/29/2012

EFT, 16-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Amplifier Research	EFT/B Capacitive Coupling clamp	EM Test / C ClampHFK	1583	N/A
EM Test AG	EFT Generator	UCS 500 M6	1585	7/22/2012

VDI, ESD and Surge, 18-Oct-11

Manufacturer	Description	Model	Asset #	Cal Due
Schaffner	ESD Gun	NSG-435	1491	2/7/2012
EM Test AG	Surge Generator	UCS 500 M6	1585	7/22/2012
EM Test AG	VDI Generator	UCS 500 M6	1585	7/19/2012
Elliott Laboratories	ESD, Vertical Plane, 19-3/4 x 19-3/4	ESD, VP, 19-3/4 x 19-3/4	1664	N/A

Appendix B Test Data

T85030 Pages 27 - 64

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Emissions Standard(s):	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

EMC Test Data

For The

Ubiquiti Networks

Model

AirCam Mini

Date of Last Test: 10/18/2011

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Conducted Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/13/2011
Test Engineer: Hong Stenerson
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: 230V/50Hz; 120V/60Hz

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 23 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 230V/50Hz	Class B	Pass	43.8dBµV @ 0.347MHz (-5.2dB)
2	CE, AC Power,120V/60Hz	Class B	Pass	39.7dBµV @ 0.344MHz (-9.4dB)

Modifications Made During Testing

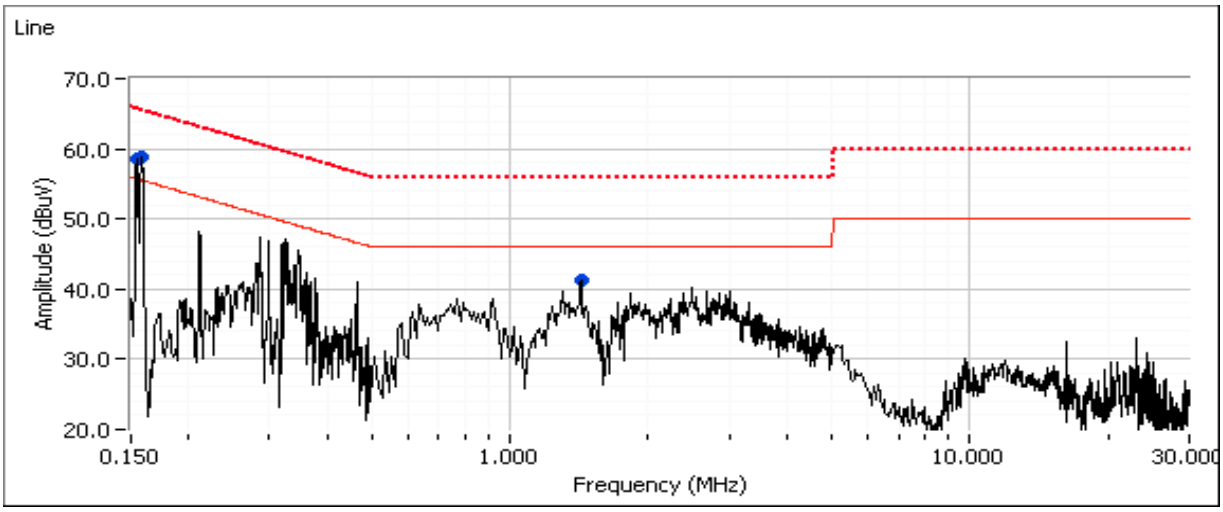
No modifications were made to the EUT during testing

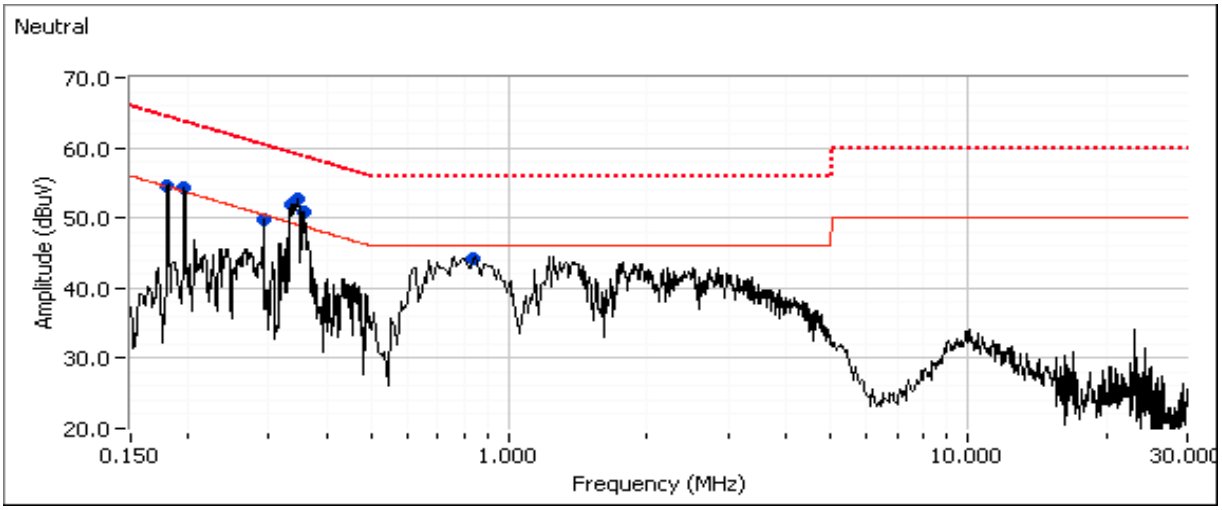
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz





Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #1 (Continued)

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

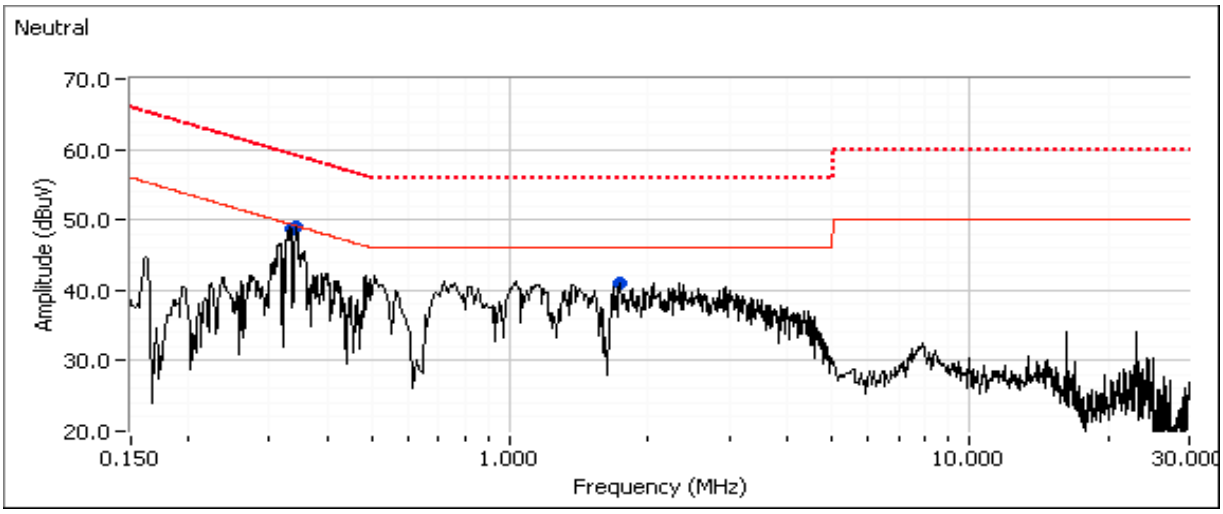
Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.159	58.8	Line 1	55.5	3.3	Peak	
0.155	58.6	Line 1	55.8	2.8	Peak	
1.423	41.4	Line 1	46.0	-4.6	Peak	
0.347	52.6	Neutral	49.0	3.6	Peak	
0.356	50.9	Neutral	48.8	2.1	Peak	
0.197	54.2	Neutral	53.8	0.4	Peak	
0.180	54.7	Neutral	54.5	0.2	Peak	
0.337	51.8	Neutral	49.3	2.5	Peak	
0.292	49.7	Neutral	50.5	-0.8	Peak	
0.825	44.3	Neutral	46.0	-1.7	Peak	

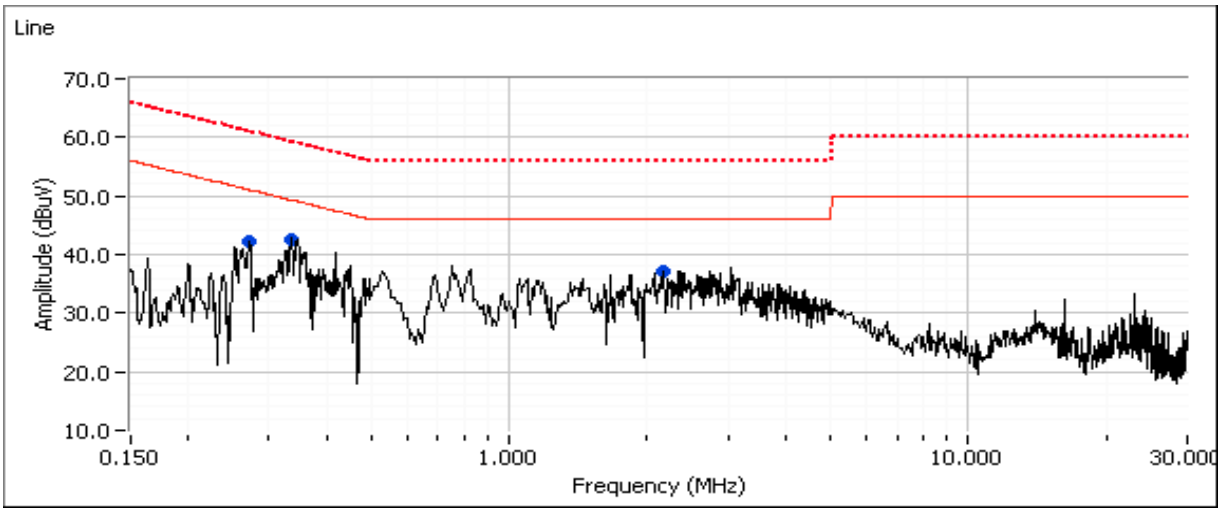
Final quasi-peak and average readings

Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.347	43.8	Neutral	49.0	-5.2	AVG	AVG (0.10s)
0.337	43.3	Neutral	49.3	-6.0	AVG	AVG (0.10s)
0.347	52.1	Neutral	59.0	-6.9	QP	QP (1.00s)
0.337	51.6	Neutral	59.3	-7.7	QP	QP (1.00s)
0.356	40.2	Neutral	48.8	-8.6	AVG	AVG (0.10s)
0.356	49.8	Neutral	58.8	-9.0	QP	QP (1.00s)
0.825	35.5	Neutral	46.0	-10.5	AVG	AVG (0.10s)
0.825	43.5	Neutral	56.0	-12.5	QP	QP (1.00s)
0.159	52.5	Line 1	65.5	-13.0	QP	QP (1.00s)
0.155	52.5	Line 1	65.7	-13.2	QP	QP (1.00s)
0.180	49.8	Neutral	64.5	-14.7	QP	QP (1.00s)
0.197	47.7	Neutral	63.7	-16.0	QP	QP (1.00s)
0.292	34.0	Neutral	50.5	-16.5	AVG	AVG (0.10s)
0.292	43.2	Neutral	60.5	-17.3	QP	QP (1.00s)
1.423	28.6	Line 1	46.0	-17.4	AVG	AVG (0.10s)
1.423	36.7	Line 1	56.0	-19.3	QP	QP (1.00s)
0.180	33.8	Neutral	54.5	-20.7	AVG	AVG (0.10s)
0.197	32.2	Neutral	53.7	-21.5	AVG	AVG (0.10s)
0.159	31.9	Line 1	55.5	-23.6	AVG	AVG (0.10s)
0.155	31.2	Line 1	55.7	-24.5	AVG	AVG (0.10s)

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #2 (Continued)

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

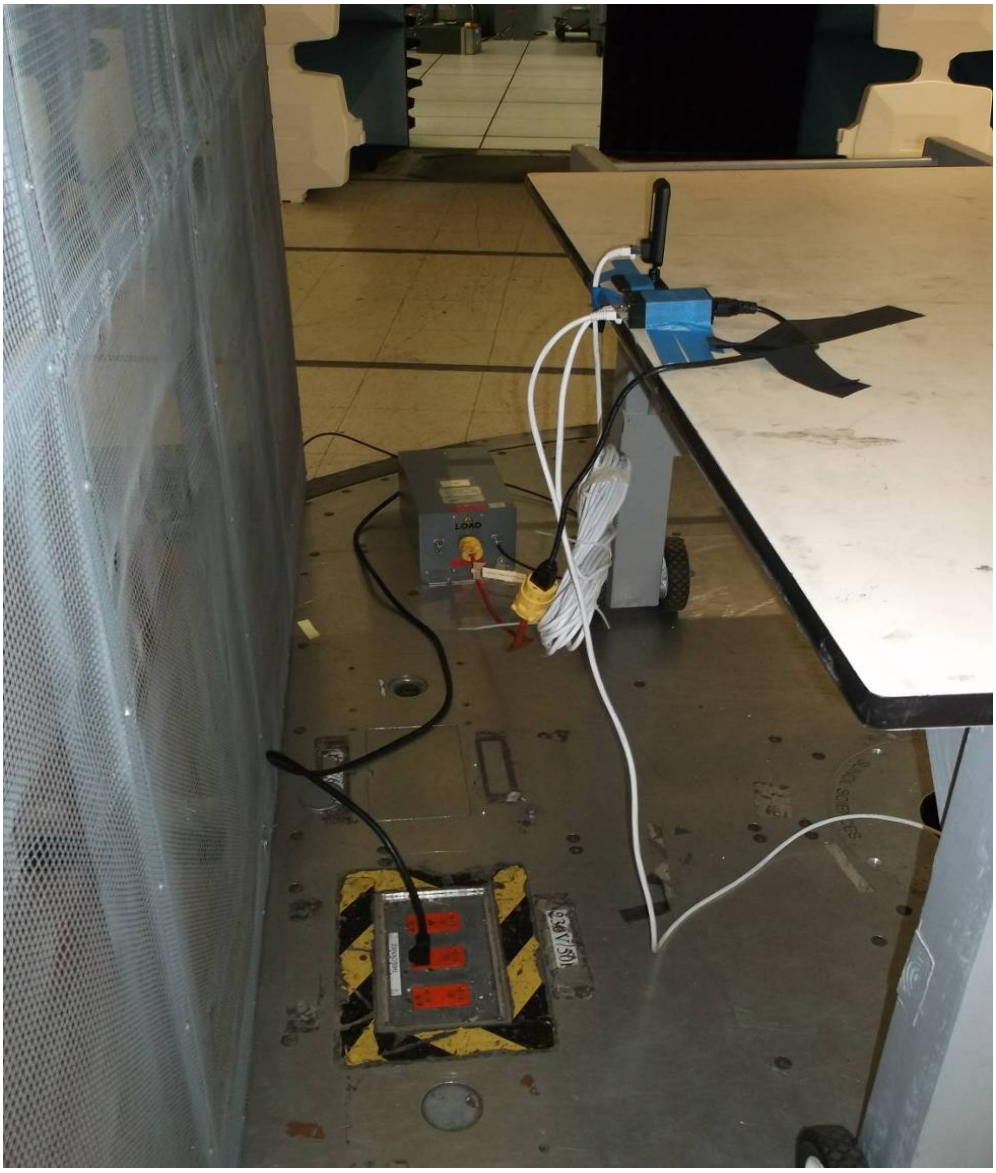
Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.334	48.8	Neutral	49.3	-0.5	Peak	
0.344	49.0	Neutral	49.1	-0.1	Peak	
1.742	40.9	Neutral	46.0	-5.1	Peak	
0.336	42.6	Line 1	49.3	-6.7	Peak	
0.271	42.1	Line 1	51.1	-9.0	Peak	
2.174	37.0	Line 1	46.0	-9.0	Peak	

Final quasi-peak and average readings

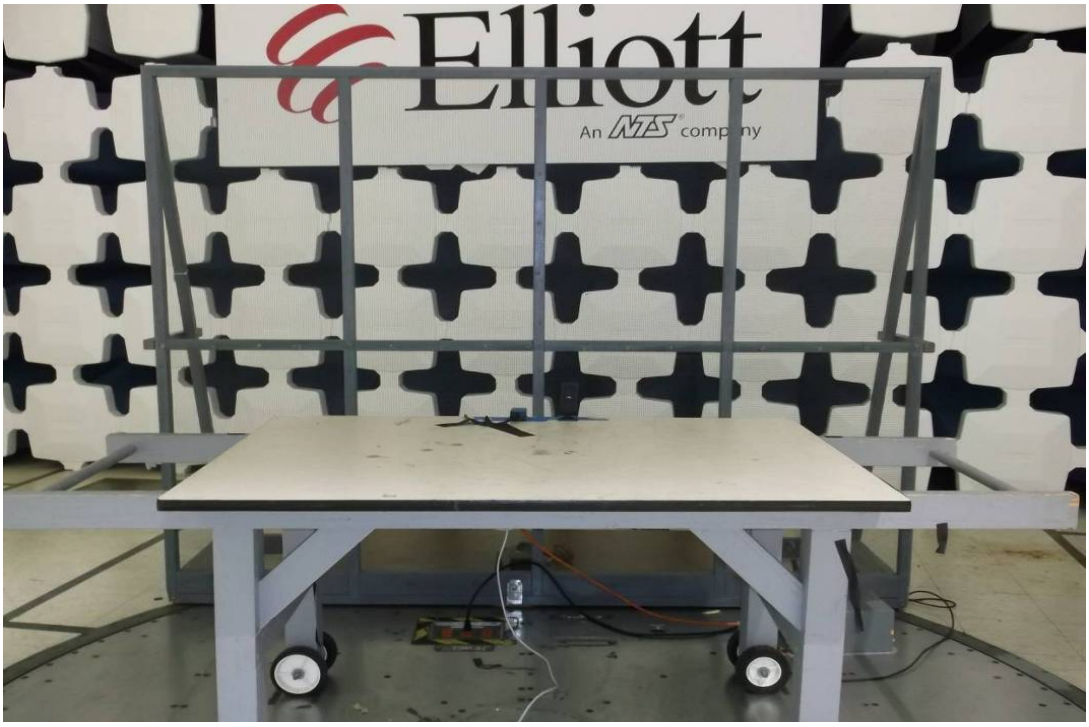
Frequency	Level	AC	Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.344	39.7	Neutral	49.1	-9.4	AVG	AVG (0.10s)
0.334	39.9	Neutral	49.4	-9.5	AVG	AVG (0.10s)
0.334	48.8	Neutral	59.4	-10.6	QP	QP (1.00s)
0.344	48.4	Neutral	59.1	-10.7	QP	QP (1.00s)
0.336	34.1	Line 1	49.3	-15.2	AVG	AVG (0.10s)
1.742	30.3	Neutral	46.0	-15.7	AVG	AVG (0.10s)
0.336	43.5	Line 1	59.3	-15.8	QP	QP (1.00s)
1.742	39.2	Neutral	56.0	-16.8	QP	QP (1.00s)
0.271	38.3	Line 1	61.1	-22.8	QP	QP (1.00s)
2.174	22.8	Line 1	46.0	-23.2	AVG	AVG (0.10s)
2.174	32.6	Line 1	56.0	-23.4	QP	QP (1.00s)
0.271	27.2	Line 1	51.1	-23.9	AVG	AVG (0.10s)

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Test Configuration Photograph(s)



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Radiated Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/12/2011
Test Engineer: Vishal Narayan
Test Location: Fremont Chamber #3
Config. Used: 1
Config Change: None
EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions 30 - 1000 MHz, Preliminary	Class B	Pass	29.7dBµV/m @ 400.02MHz (-7.3dB)
2	Radiated Emissions 30 - 1000 MHz, Maximized	Class B	Pass	29.7dBµV/m @ 400.02MHz (-7.3dB)
3	Radiated Emissions 1 GHz - 2 GHz Maximized	FCC Class B	Pass	44.3dBµV/m @ 1200.1MHz (-9.7dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

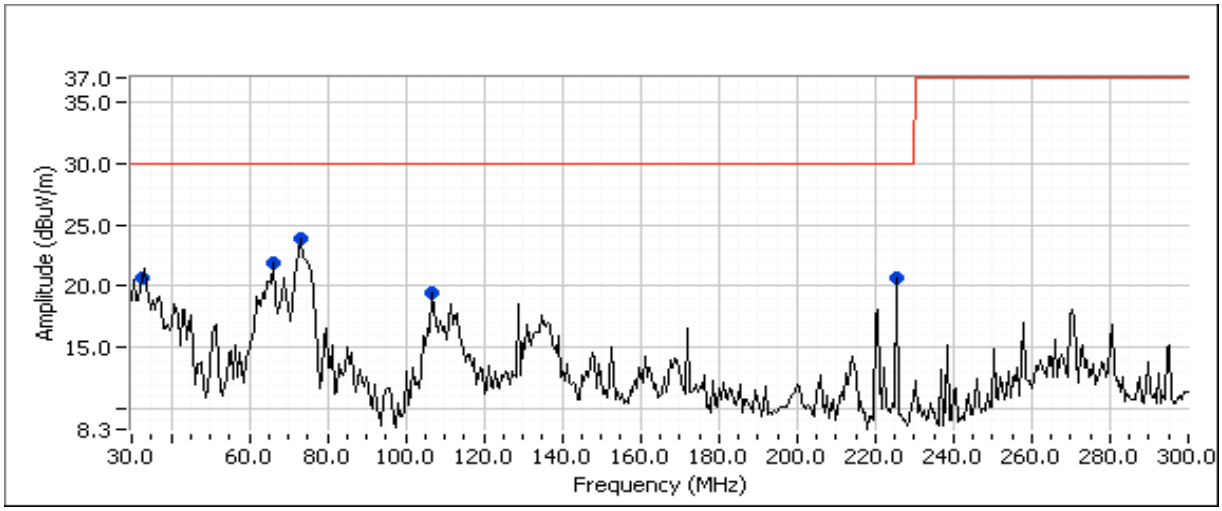
Deviations From The Standard

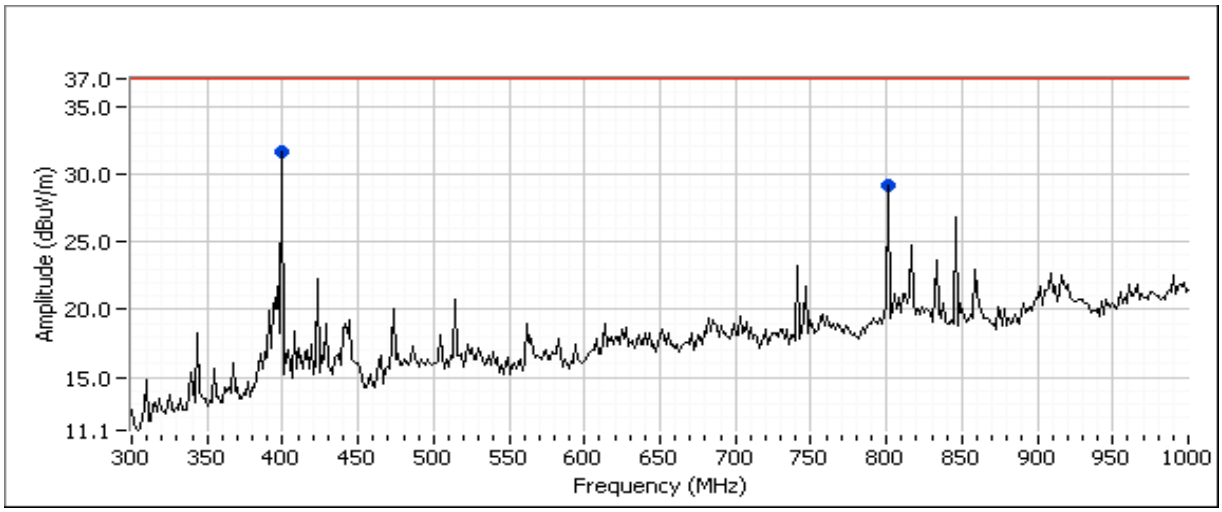
No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	10	10	0.0





Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Continuation of Run #1

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	EN55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
73.893	23.8	V	30.0	-6.2	Peak	75	2.0	
65.766	21.9	V	30.0	-8.1	Peak	46	2.0	
32.705	*20.7*	*V*	*30.0*	*-9.3*	*Peak*	*185*	*1.0*	
224.563	20.7	H	30.0	-9.3	Peak	220	3.0	
106.758	19.5	V	30.0	-10.5	Peak	52	1.5	
400.020	31.6	V	37.0	-5.4	Peak	211	1.0	
800.044	29.2	V	37.0	-7.8	Peak	197	3.5	

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	EN55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
400.020	29.7	V	37.0	-7.3	QP	212	1.0	QP (1.00s)
73.893	20.0	V	30.0	-10.0	QP	76	2.0	QP (1.00s)
800.044	26.9	V	37.0	-10.1	QP	198	3.5	QP (1.00s)
106.758	16.8	V	30.0	-13.2	QP	53	1.5	QP (1.00s)
32.705	16.0	V	30.0	-14.0	QP	186	1.0	QP (1.00s)
65.766	15.5	V	30.0	-14.5	QP	44	2.0	QP (1.00s)
224.563	6.2	H	30.0	-23.8	QP	221	3.0	QP (1.00s)

Run #2: Maximized Readings From Run #1

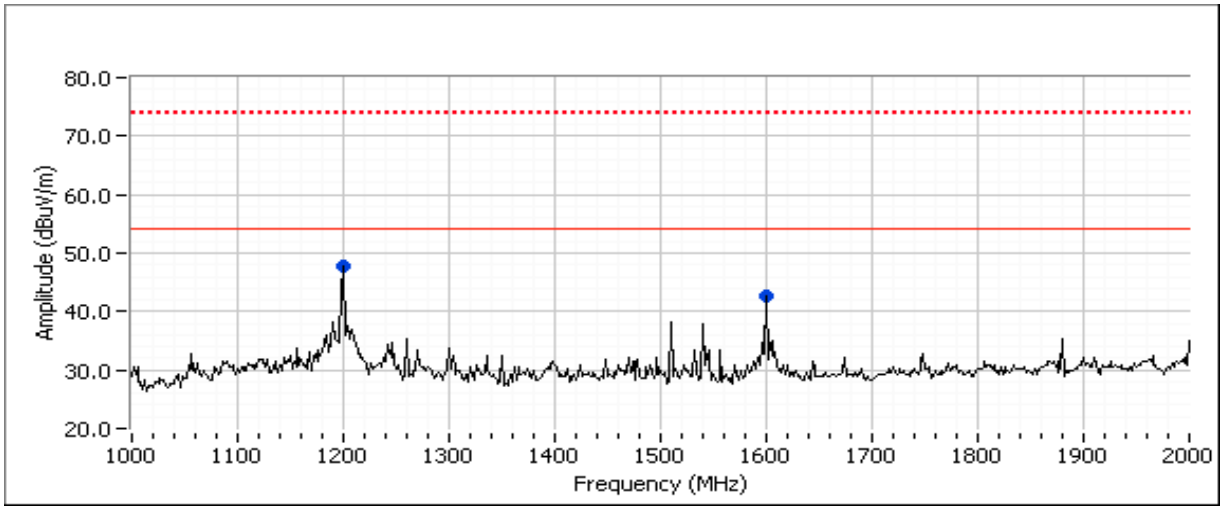
Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	EN55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
400.020	29.7	V	37.0	-7.3	QP	212	1.0	QP (1.00s)
73.893	20.0	V	30.0	-10.0	QP	76	2.0	QP (1.00s)
800.044	26.9	V	37.0	-10.1	QP	198	3.5	QP (1.00s)
106.758	16.8	V	30.0	-13.2	QP	53	1.5	QP (1.00s)
32.705	16.0	V	30.0	-14.0	QP	186	1.0	QP (1.00s)
65.766	15.5	V	30.0	-14.5	QP	44	2.0	QP (1.00s)

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #3: Maximized Readings, 1000 - 2000 MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 2000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.060	47.7	V	54.0	-6.3	Peak	157	1.6	
1600.110	42.6	V	54.0	-11.4	Peak	192	1.6	

Final peak and average readings

Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.080	44.3	V	54.0	-9.7	AVG	166	1.6	RB 1 MHz;VB 10 Hz;Pk
1200.110	50.7	V	74.0	-23.3	PK	166	1.6	RB 1 MHz;VB 3 MHz;Pk
1599.760	39.0	V	54.0	-15.0	AVG	176	1.6	RB 1 MHz;VB 10 Hz;Pk
1599.980	50.2	V	74.0	-23.8	PK	176	1.6	RB 1 MHz;VB 3 MHz;Pk

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Test Configuration Photograph(s)

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Radiated Emissions (Free-Space)

(Elliott Laboratories Fremont Facility, Chamber Configured for Free-Space Measurements)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/12/2011
Test Engineer: Chris Groat
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: none
EUT Voltage: 220V/60Hz

General Test Configuration

Anechoic material was placed on the floor between the EUT and the measurement antenna and behind the EUT to ensure that the test site complies with the requirements of CISPR 16 for measurements of radiated field strength above 1GHz in a free-space environment. The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.
The test was performed at a test distance of 3 meters.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 44 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Free Space Radiated Emissions 1 - 6 GHz, Preliminary	Class B	EVAL	Refer to individual runs
2	Free Space Radiated Emissions 1 - 6 GHz, Maximized	Class B	Pass	40.8dBµV/m @ 1600.1MHz (-9.2dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

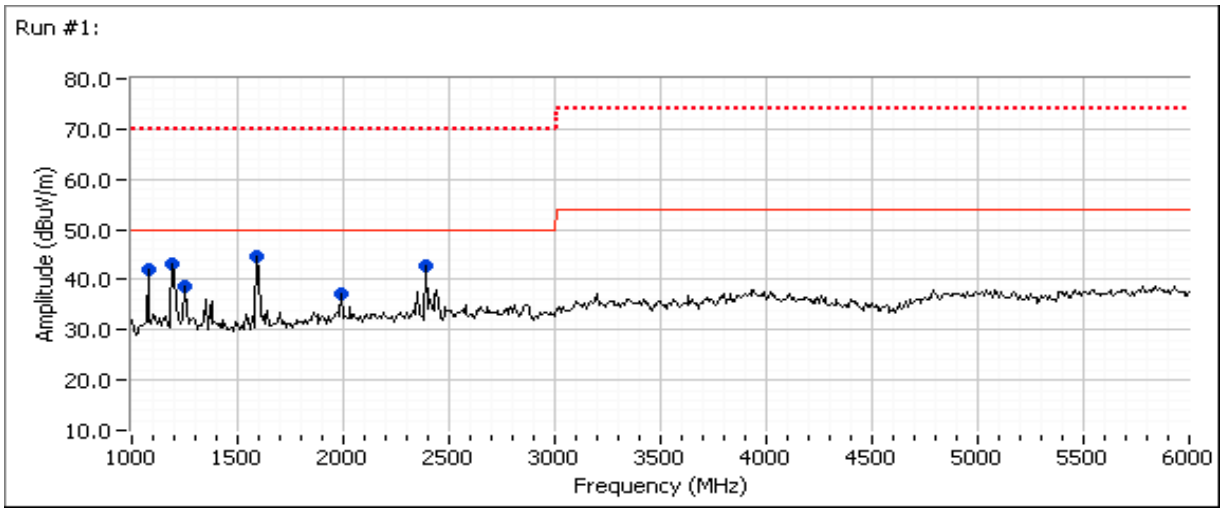
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #1: Preliminary Readings (1 - 6 GHz, EN 55022)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 6000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2399.990	42.9	H	50.0	-7.1	Peak	160	1.0	
1599.990	44.8	V	50.0	-5.2	Peak	199	1.0	
1184.070	43.2	V	50.0	-6.8	Peak	150	1.3	
1077.380	42.0	V	50.0	-8.0	Peak	149	1.6	
1253.160	38.5	V	50.0	-11.5	Peak	129	1.3	
1993.280	37.3	V	50.0	-12.7	Peak	175	1.0	

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Run #1: Preliminary Readings (1 - 6 GHz, EN 55022)

Peak and average readings (including maximization of turntable azimuth and antenna height)

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1600.080	40.8	V	50.0	-9.2	AVG	200	1.0	RB 1 MHz;VB 10 Hz;Pk
2400.040	40.1	H	50.0	-9.9	AVG	159	1.0	RB 1 MHz;VB 10 Hz;Pk
1599.980	49.9	V	70.0	-20.1	PK	200	1.0	RB 1 MHz;VB 3 MHz;Pk
1992.040	28.4	V	50.0	-21.6	AVG	177	1.0	RB 1 MHz;VB 10 Hz;Pk
1251.920	28.1	V	50.0	-21.9	AVG	135	1.3	RB 1 MHz;VB 10 Hz;Pk
1183.530	26.7	V	50.0	-23.3	AVG	123	1.3	RB 1 MHz;VB 10 Hz;Pk
1080.050	26.6	V	50.0	-23.4	AVG	129	1.6	RB 1 MHz;VB 10 Hz;Pk
2399.810	46.3	H	70.0	-23.7	PK	159	1.0	RB 1 MHz;VB 3 MHz;Pk
1992.990	40.3	V	70.0	-29.7	PK	177	1.0	RB 1 MHz;VB 3 MHz;Pk
1252.000	38.5	V	70.0	-31.5	PK	135	1.3	RB 1 MHz;VB 3 MHz;Pk
1078.780	38.1	V	70.0	-31.9	PK	129	1.6	RB 1 MHz;VB 3 MHz;Pk
1185.840	37.1	V	70.0	-32.9	PK	123	1.3	RB 1 MHz;VB 3 MHz;Pk

Run #2: Maximized Readings from Run #1 (1 - 6 GHz, EN 55022)

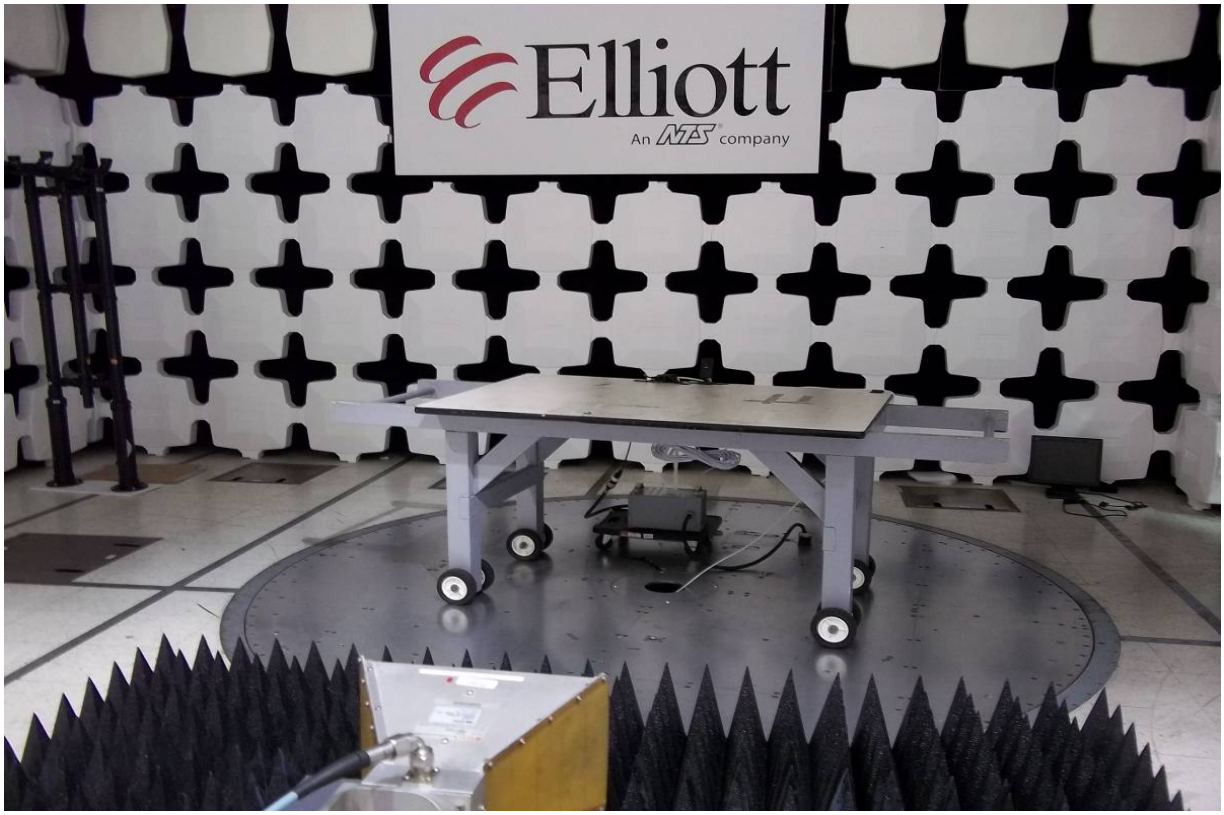
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 6000 MHz	3	3	0.0

Final Peak and average readings
(including maximization of turntable azimuth, antenna height, and manipulation of cable positions)

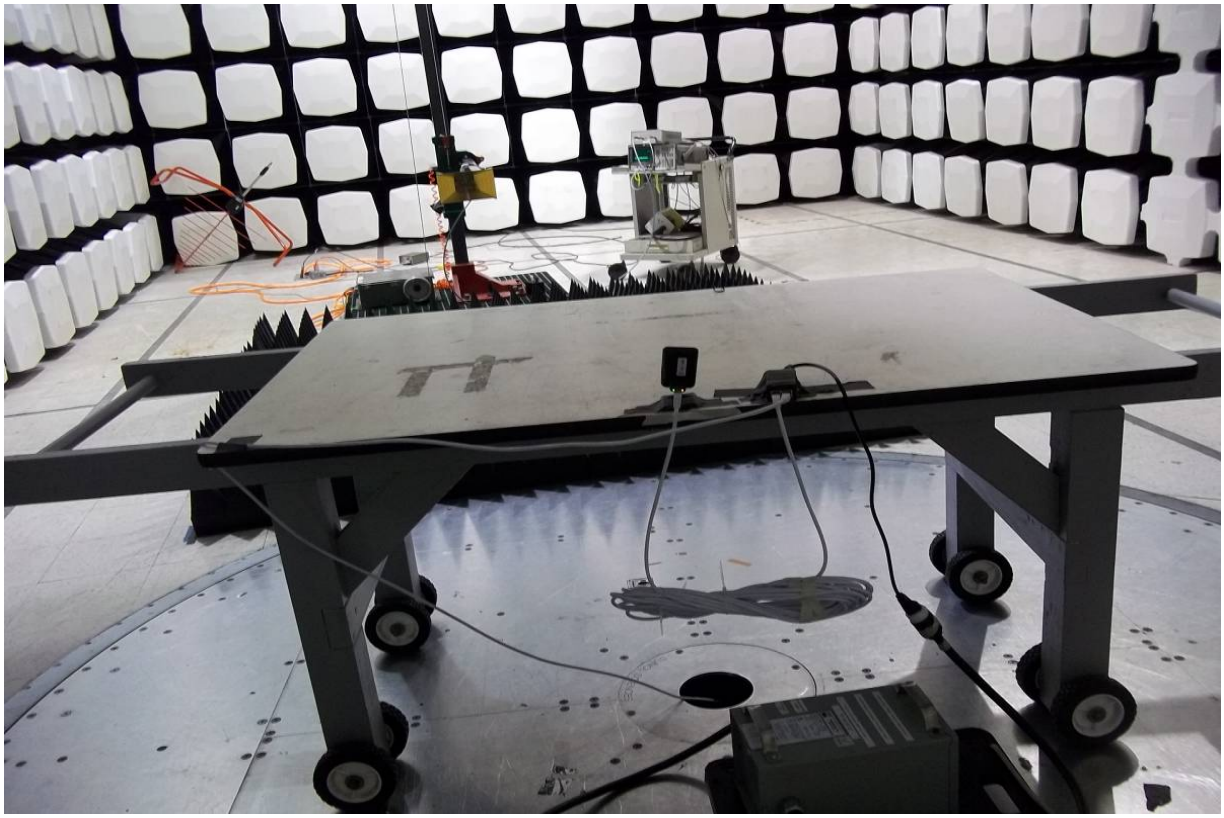
Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1600.080	40.8	V	50.0	-9.2	AVG	200	1.0	RB 1 MHz;VB 10 Hz;Pk
2400.040	40.1	H	50.0	-9.9	AVG	159	1.0	RB 1 MHz;VB 10 Hz;Pk
1599.980	49.9	V	70.0	-20.1	PK	200	1.0	RB 1 MHz;VB 3 MHz;Pk
1992.040	28.4	V	50.0	-21.6	AVG	177	1.0	RB 1 MHz;VB 10 Hz;Pk
1251.920	28.1	V	50.0	-21.9	AVG	135	1.3	RB 1 MHz;VB 10 Hz;Pk
1183.530	26.7	V	50.0	-23.3	AVG	123	1.3	RB 1 MHz;VB 10 Hz;Pk

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B

Test Configuration Photograph(s)



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC Part 15B, EN 55022:2006 + A1, VCCI & KN22	Class:	B



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Electrostatic Discharge (EN 61000-4-2)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/18/2011 2:11 Config. Used: 1
Test Engineer: Vishal Narayan Config Change: None
Test Location: Fremont EMC Lab #1 EUT Voltage: 230V/50Hz

General Test Configuration

For table-top equipment, the EUT and all local support equipment were located on a 0.5-mm thick insulating layer above a horizontal coupling plane, 80 cm above a ground reference plane.

Unless otherwise stated, ten discharges at each voltage, and polarity, were applied to each test point listed. Contact discharges were applied to coupling planes and conductive surfaces of the EUT. Air discharges were applied to any non-conductive surfaces of the EUT. The VCP was located on the table top for table top devices and 80cm above the ground plane for floor standing equipment.

The determination as to the test point being a part of a conductive or non-conductive surface was based on testing the surface for conductivity using an ohmmeter.

Ambient Conditions:

Temperature: 23 °C
Relative Humidity: 45 %
Pressure: 1015 mb

Summary of Results - Electrostatic Discharges

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	Enclosure	4kV CD 8kV AD	4kV CD 8kV AD	B	A / Pass	

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Run #1: Electrostatic Discharge

Indirect Discharges (To Coupling Planes)	Positive Polarity (kV)				Negative Polarity (kV)			
Contact Mode	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4
	2	4	6	8	2	4	6	8
Vertical Coupling Plane (VCP) located 10cm from the front, rear, left and right sides of the EUT	X	X			X	X		
Horizontal Coupling Plane (HCP) located 10cm from the front, rear, left and right sides of the EUT	X	X			X	X		

Direct Discharges (To the EUT)	Positive Polarity (kV)				Negative Polarity (kV)			
Contact Mode	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4
	2	4	6	8	2	4	6	8
All Sides	X	X			X	X		
All Conductive Surfaces	X	X			X	X		
Connector Shields	X	X			X	X		
Air Discharge Mode	Level 1	Level 2	Level 3	Level 4	Level 1	Level 2	Level 3	Level 4
	2	4	8	15	2	4	8	15
All Non-Conductive Surfaces	X	X	X		X	X	X	
All Seams	X	X	X		X	X	X	
Cables	X	X	X		X	X	X	
LED's	X	X	X		X	X	X	

Note:	An "X" indicates that the unit continued to operate as intended. The EUT continuously streaming live video displayed on the PC Laptop. There were no data errors reported by the monitoring software on the PC Laptop.
Note:	ND: No discharge was possible due to the lack of a discharge path to ground from the test point. HCP: Horizontal Coupling Plane. VCP: Vertical Coupling Plane

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Test Configuration Photograph(s)

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Electrical Fast Transient/Burst (EFT/B) (EN 61000-4-4)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/16/2011 14:03 Config. Used: 1
Test Engineer: Chris Groat Config Change: none
Test Location: Fremont EMC Lab #2 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT system was located 10 cm above a ground reference plane. A 0.5m long power cord was used between the EUT's power port and the coupling/decoupling network. Interference was coupled onto the cables connected to the ports identified in the test data tables using the capacitive trench, with a maximum length of 0.5m of cable between the interface port and the trench.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 34 %

Summary of Results

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	AC Power	± 1 kV	± 1 kV	B	A / Pass	Refer to Individual Run
1	Signal	± 0.5 kV	± 0.5 kV	B	A / Pass	Refer to Individual Run

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Run #1: EFT/B Testing

Test Parameters	
Waveform: 5 ns / 50 ns	Burst Period: 300 ms
Repetition Frequency: 5 kHz (2.5 kHz @ 4 kV)	Burst Width: 15 ms

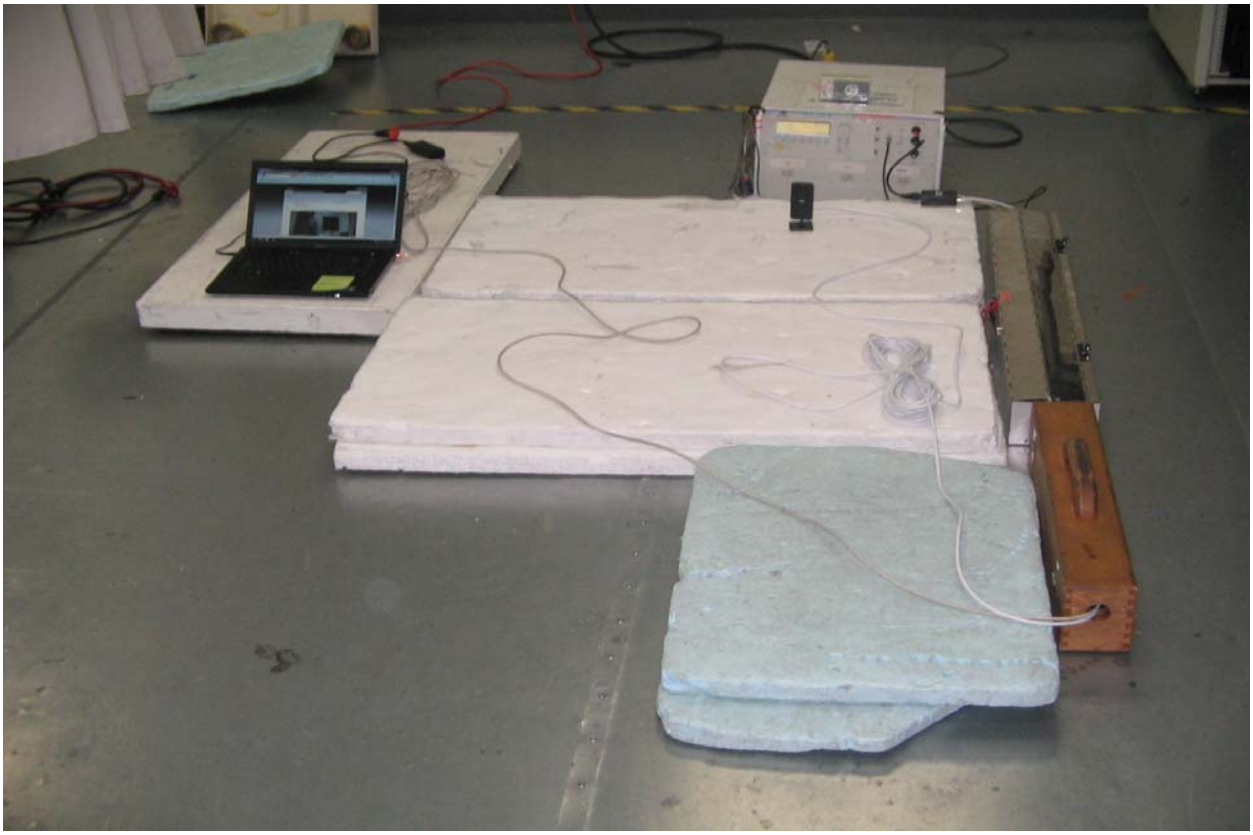
Applied Location	Positive Polarity (kV)				Negative Polarity (kV)			
Power Line AC Power Port(s)	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0
Line + Neutral + Protective Earth *(3-Wire AC Power Port)*	X	X			X	X		

I/O Port	Level 1 0.25	Level 2 0.5	Level 3 1.0	Level 4 2.0	Level 1 0.25	Level 2 0.5	Level 3 1.0	Level 4 2.0
POE	X	X			X	X		
LAN	X	X			X	X		

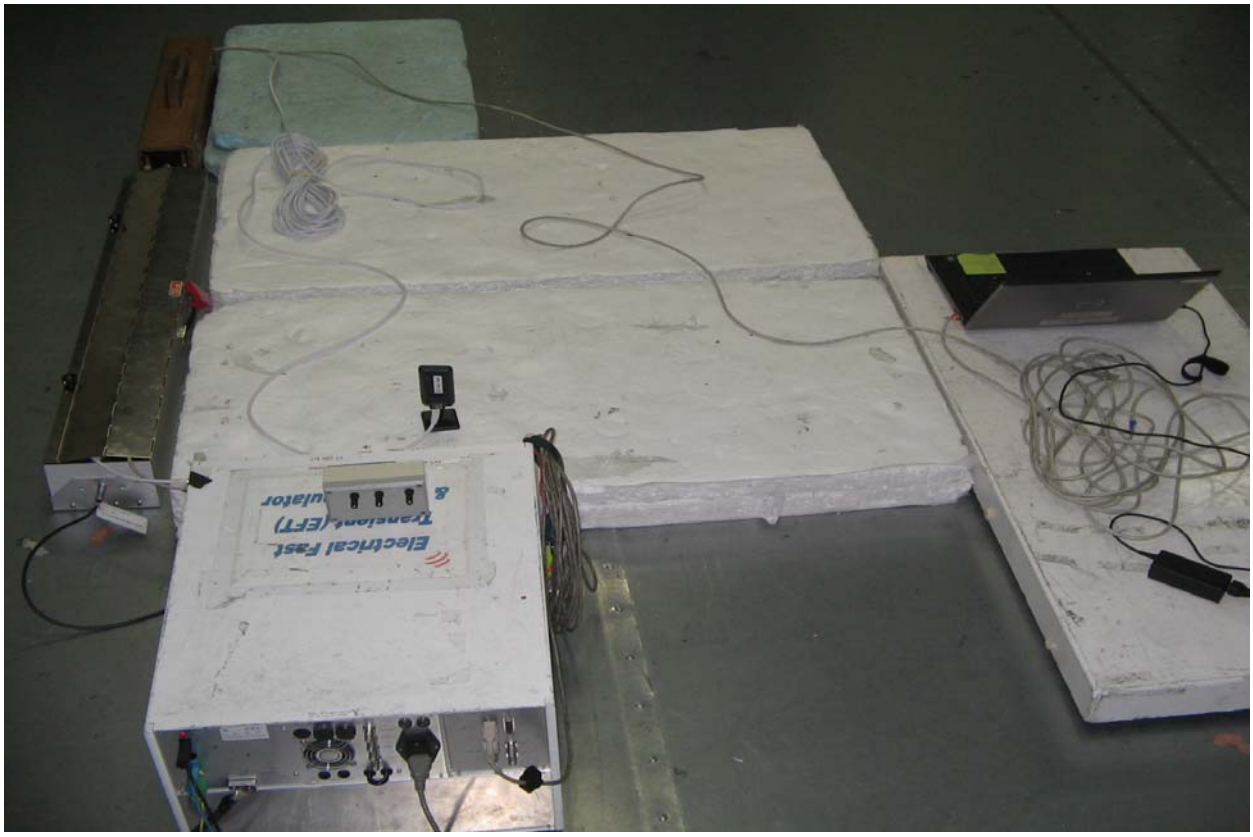
Note:	An "X" indicates that the unit continued to operate as intended. Normal operation was indicated by the EUT continuously streaming live video displayed on the PC Laptop. There were no data errors reported by the monitoring software on the PC Laptop.
Note 1:	The interface cables for the I/O ports tested were routed through the capacitive trench and tested simultaneously.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Test Configuration Photograph(s)



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Surge (EN 61000-4-5)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/18/2011 2:11 Config. Used: 1
Test Engineer: Vishal Narayan Config Change: None
Test Location: Fremont EMC Lab #1 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were located on a non-conductive bench.

Ambient Conditions:

Temperature: 23 °C
Rel. Humidity: 44 %

Summary of Results

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	AC Power	± 2 kV CM ± 1 kV DM	± 2 kV CM ± 1 kV DM	B	A / Pass	

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Run #1: Surge Immunity, Power Line

AC Power Port

Test Parameters
Waveform: 1.2/50µS
Impedance: 12 Ohms (Common Mode), 2 Ohms (Differential Mode)

Applied Location	Positive Polarity (kV)				Negative Polarity (kV)			
Power Line	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0	Level 1 0.5	Level 2 1.0	Level 3 2.0	Level 4 4.0
Line to Line (Differential Mode)								
0°	X	X			X	X		
90°	X	X			X	X		
180°	X	X			X	X		
270°	X	X			X	X		
Line to PE (Common Mode)								
0°	X	X	X		X	X	X	
90°	X	X	X		X	X	X	
180°	X	X	X		X	X	X	
270°	X	X	X		X	X	X	
Neutral to PE (Common Mode)								
0°	X	X	X		X	X	X	
90°	X	X	X		X	X	X	
180°	X	X	X		X	X	X	
270°	X	X	X		X	X	X	

Note: An "X" indicates that the unit continued to operate as intended. The EUT continuously streaming live video displayed on the PC Laptop. There were no data errors reported by the monitoring software on the PC Laptop.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Test Configuration Photograph(s)

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Radiated Immunity (EN 61000-4-3)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/13/2011 Config. Used: 2
Test Engineer: Mehran Birgani Config Change: -
Test Location: Fremont Chamber #6 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were located on a turntable in an anechoic chamber. All remote support equipment was located outside the chamber. Interface cabling to the remote support equipment was routed along the floor and, where possible, passed through ferrite clamps at the exit point from the chamber.

Ambient Conditions:

Temperature: 18 °C
Rel. Humidity: 42 %

Summary of Results-Radiated Immunity

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
EN 55024 Requirements						
1	Enclosure	80-1000 MHz 1kHz 80% AM 3 V/m	80-1000 MHz 1kHz 80% AM 3 V/m	A	A / Pass	

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Run #1: Radiated Immunity, 80-1000 MHz (EN61000-4-3)

Frequency:	80-1000 MHz	
Step Size:	1 %	
Dwell time:	2874 ms	
Field Uniformity:	1.5m x 1.5m	
Test Distance:	2m	

Modulation Details	
Modulating Frequency:	1 kHz
Modulation:	AM
Depth / Deviation:	80%

Frequency	Level	Front		Left Side		Rear		Right		Top		Bottom	
Range (MHz)	V/m	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.
80-1000	3	X	X	X	X	X	X	X	X	N/A	N/A	N/A	N/A

The following calibration files from U:\EMC Stuff\RI Playback Files FT\CH6\Current\ were used:

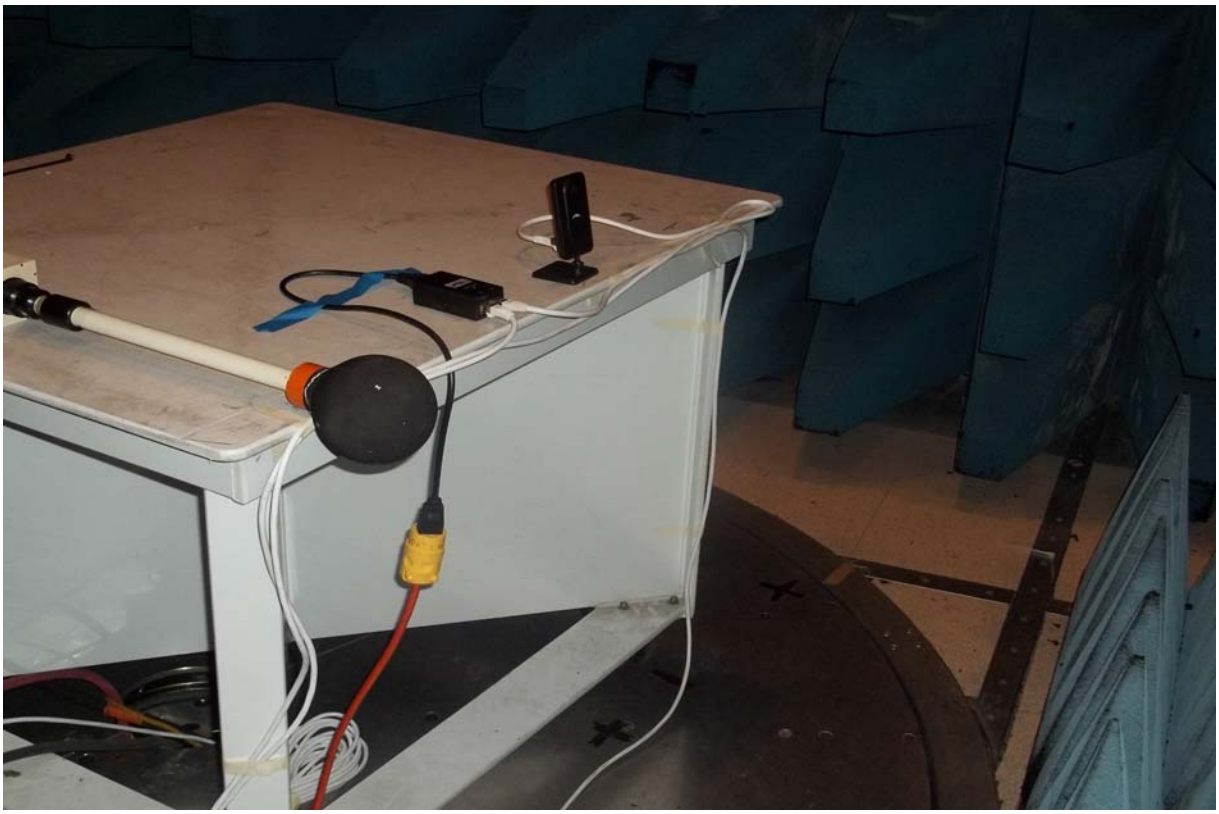
Position A 1.55m 80 MHz - 1000 MHz H 3Vm.crf

Position A 1.55m 80 MHz - 1000 MHz V 3Vm.crf

Note:	An "X" indicates that the unit continued to operate as intended. During and after testing the EUT shall continue to show the video stream on the PC Laptop.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Test Configuration Photograph



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Conducted Immunity (EN 61000-4-6)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/15/2011 2:58 Config. Used: 1
Test Engineer: Vishal Narayan Config Change: None
Test Location: Fremont EMC Lab #1 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were placed on an insulating support 10 cm above a ground reference plane. All interface cables between parts of the EUT (for equipment comprising several units) and to local support equipment were also placed on the insulating support. All interface cabling between the EUT and the coupling and decoupling network(s) were located 3 to 5 cm above the ground reference plane.

Ambient Conditions:

Temperature: 23 °C
Rel. Humidity: 44 %

Summary of Results - Conducted Immunity

Run #	Port	Test Level		Performance Criteria		Comments
		Required	Applied	Required	Met / Result	
1	AC power	0.15-80MHz 1kHz 80% AM 3 Vrms	0.15-80MHz 1kHz 80% AM 3 Vrms	A	A / Pass	

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Run #1: Conducted Susceptibility (EN61000-4-6)

Test Level:	3 Vrms
Step Size:	1 %
Dwell time:	2874 ms

Modulation Details	
Modulating Frequency:	1 kHz
Modulation:	AM
Depth / Deviation:	80%

Frequency Range MHz	Port Under Test	Injection Method	Comments
0.15 - 80	AC Power	M3	Note 1

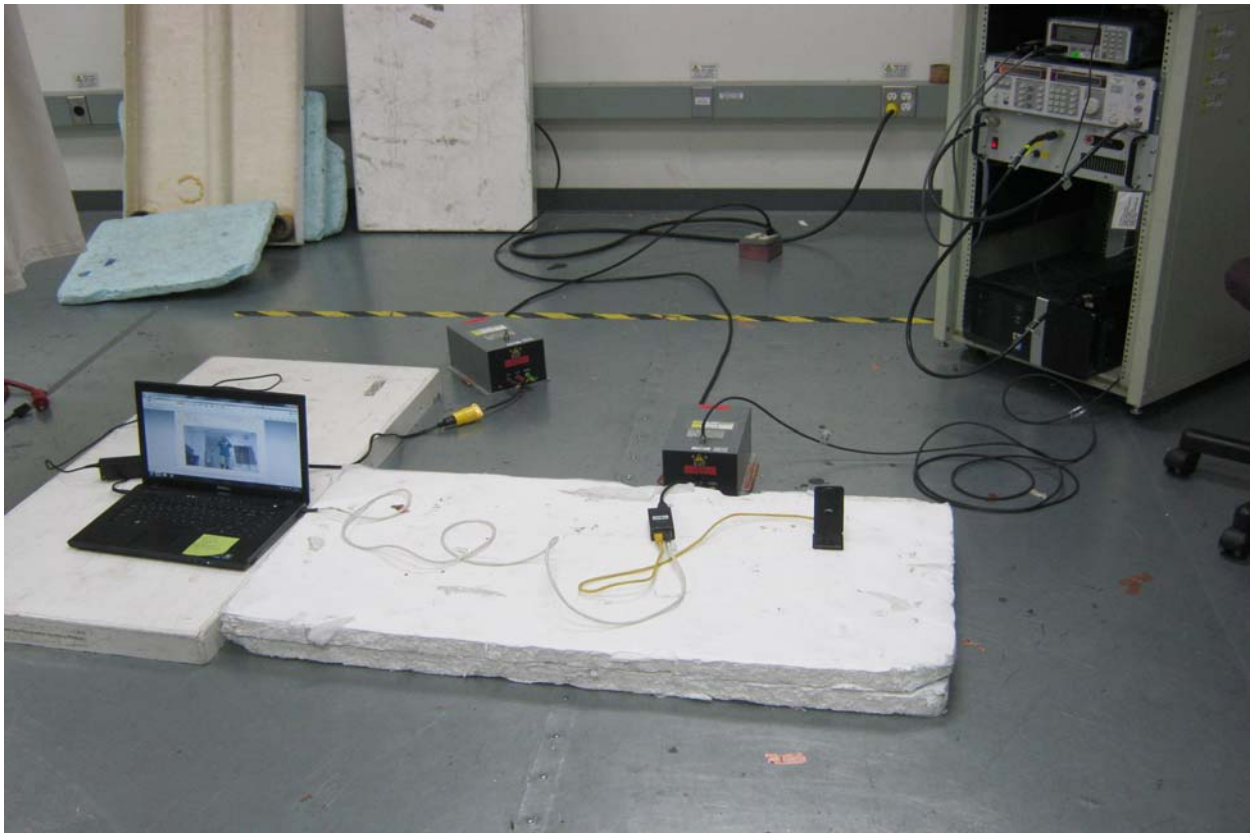
Note :	As the EUT was telecommunications terminal equipment, functional checks of the system were made at the spot frequencies detailed in EN 55024 in accordance with Annex A of the standard.
Note 1:	During and after testing the EUT shall continue to show the video stream on the PC Laptop.

The following interface ports were not tested:

Port(s)	Reason
Ethernet	Client stated that the ports are intended to connect to cables less than 3m in length and the product standard only requires the test to be performed on cables exceeding 3m in length.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Test Configuration Photograph(s)



Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Voltage Dips and Interrupts (EN 61000-4-11)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/17/2011 22:30 Config. Used: 1
Test Engineer: Vishal Narayan Config Change: None
Test Location: Fremont EMC Lab #1 EUT Voltage: 230V/50Hz

General Test Configuration

The EUT and all local support equipment were located on a non-conductive bench.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 45 %

Summary of Results

Run #	Port	Test Level Required	Test Level Applied	Performance Criteria Required	Performance Criteria Met / Result	Comments
EN 55024						
1	AC power	>95% ½ period	>95% ½ period	B	A / Pass	230V/50Hz nominal (½ period at 50Hz = 10 ms)
1	AC power	30% 25 periods	30% 25 periods	C	A / Pass	230V/50Hz nominal (25 periods at 50Hz = 500 ms)
1	AC power	>95% 250 periods	>95% 250 periods	C	C / Pass	230V/50Hz nominal (250 periods at 50Hz = 5 sec)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Run #1: Voltage Dips and Interrupts

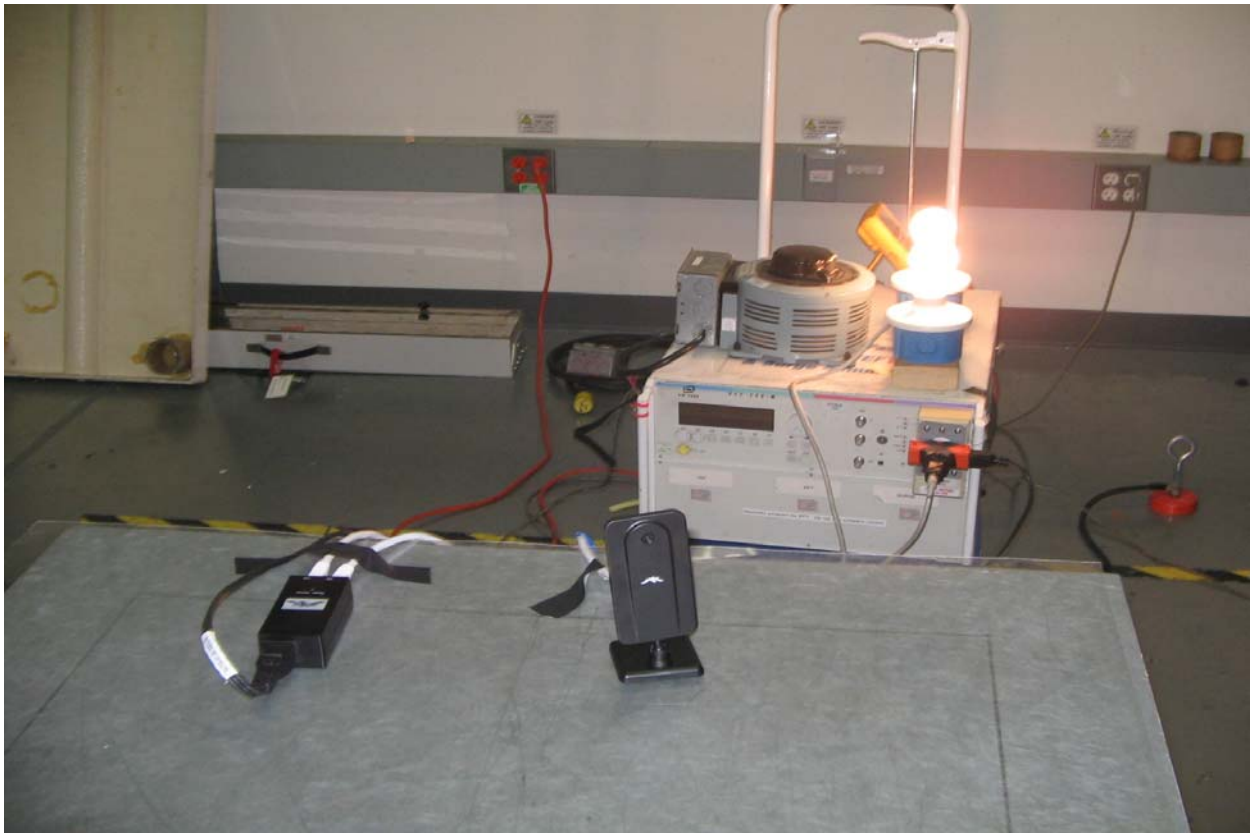
Nominal Operating Voltage of EUT:	230 Volts	50 Hz

Voltage Dips/Time % / ms or % / periods	Port Under Test	Interrupt Voltage	Comments
>95% ½ period	AC Power	0V	Note 1
30% 25 periods	AC Power	161V	Note 1
>95% 250 periods	AC Power	0V	Note 2

Note 1:	The EUT continuously streaming live video displayed on the PC Laptop. There were no data errors reported by the monitoring software on the PC Laptop.
Note 2:	The EUT turned off. After the voltage drop the EUT turned back again. The EUT passes this test.

Client:	Ubiquiti Networks	Job Number:	J83024
Model:	AirCam Mini	T-Log Number:	T85030
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Immunity Standard(s):	EN 55024:1998 w/ A1:2001 & A2:2003 & KN 24	Environment:	-

Test Configuration Photograph(s)



Appendix C Product Labeling Requirements

The following information has been provided to clarify notification, equipment labeling requirements and information that must be included in the operator's manual. These requirements may be found in the standards/regulations listed in the scope of this report.

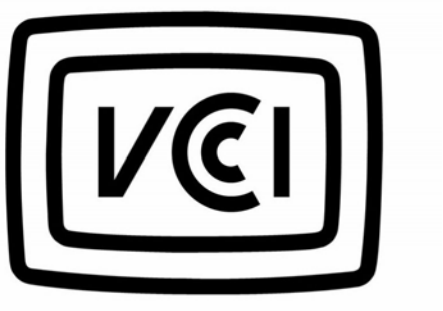
Label Location

The required label(s) must be in a *conspicuous location* on the product, which is defined as any location readily visible to the user of the device without the use of tools.

Label Attachment

The label(s) must be *permanently attached* to the product, which is defined as attached such that it can normally be expected to remain fastened to the equipment during the equipment's expected useful life. A paper gum label will generally not meet this condition.

Japanese Class B Label



Industry Canada

For ICES-003 (digital apparatus), the product must be labeled with a notice indicating compliance e.g.

This Class B digital apparatus complies with Canadian ICES-003 Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

If there is limited space on the product then the text may be placed in the manual.

Appendix D User Manual Regulatory Statements

Where special accessories, such as shielded cables, are required in order to meet the emission limits, appropriate instructions regarding the need to use such accessories must be contained on the first page of text concerned with the installation of the device in the operator's manual.

A requirement by FCC regulations, and recommended for all regulatory markets, is a cautionary statement to the end user that changes or modifications to the device not expressly approved by you, the manufacturer, could void their right to operate the equipment.

United States Class B Manual Statement

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. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and the receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

Note: Additional information about corrective measures may also be provided to the user at the company's option.

The FCC has indicated that the radio interference statement be bound in the same manner as the operator's manual. Thus, a loose-leaf insert page in a bound or center-spine and stapled manual would not meet this condition.

Japanese Class B Manual Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＢ情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

The English translation for the text is: *This is Class B product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.*

Appendix E Additional Information for VCCI

The VCCI requires a notification for each product sold with the VCCI label. A notification letter on your company letterhead with 2 copies of Form 1 must be sent to the VCCI in Japan at the following address:

Voluntary Control Council for
Interference by Information Technology Equipment
NOA Building, 7th Floor
3-5 Azabudai 2-chome, Minato-ku,
Tokyo 106-0041, Japan

You may also submit the form electronically on the VCCI web site http://www.vcci.or.jp/vcci_e/member/index.html. Go to "Documents and Forms, Report of Compliance" in Members only section. Enter your username and password and click "OK". Then click "Please click here if you submit report of compliance electronically" to open the submission form. Fill all required columns and click "CONFIRM" after making sure everything is filled properly.

Appendix F Additional Information for Australia and New Zealand

In Australia, an application to use the C-Tick mark must be made by the importer of the product. The importer must hold a Declaration of Conformity and compliance folder, of which this report forms a part, for each product sold with a C-Tick mark.

The European harmonized standards and international (CISPR/IEC) standards are acceptable for demonstrating compliance with the Australian/New Zealand compliance framework. This is explained in the document "Electromagnetic Compatibility - Information for suppliers of electrical and electronic products in Australia and New Zealand", dated July 2003. While this document is being revised information can be found on the Australian Communications and Media Authority (ACMA) website by following links from their homepage (http://www.acma.gov.au/WEB/HOMEPAGE/pc=HOME) to EMC compliance & labeling regulatory arrangements.

Appendix G Basic and Reference Standards

Subpart B of Part 15 of FCC Rules for digital devices.

FCC Part 15 Subpart B references the use of ANSI C63.4–2003: "*Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz*" for the purposes of evaluating the radiated and conducted emissions from digital devices.

VCCI Regulations For Information Technology Equipment, dated April 2009

The VCCI Regulations For Voluntary Control Measures of radio interference generated by Information Technology Equipment make reference to the following National and International standards for the purposes of making measurements. Elliott's test procedures associated with measurements against VCCI rules use these standards in addition to the procedures laid out in the VCCI regulations.

Standard	Description / Title
CISPR 22: Ed 5.2:2006	Information Technology Equipment – Radio disturbance characteristics - Limits and methods of measurement
CISPR 16-1-1 Ed2.1:2006	Specification for radio disturbance and immunity measuring apparatus and method – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus.
CISPR 16-1-2 Ed1.2:2006	Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Measuring apparatus – Ancillary equipment – Conducted disturbances
CISPR 16-1-4 Ed2.0:2007	Specification for radio disturbance and immunity measuring apparatus and methods –Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radio disturbances
CISPR 16-2-3 Ed1.0:2003	Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbance and immunity – Radiated disturbance measurements
CISPR 16-4-2 Ed1.0:2003	Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements
ANSI C63.4:2003	American National Standard for Method of Measurement of Radio Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range 9kHz to 40 GHz.

EN 55022:2006 including amendment A1:2007

EN 55022:2006 references various international and European standards to be used when making the required measurements. The references all cite dated versions of the standards, therefore the editions cited are used.

International and EN equivalent standard	Description	Standard Used
CISPR 16-1-1 2003 EN 55016-1-1 2004	Specification for radio disturbance and immunity measuring apparatus and methods Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	CISPR 16-1-1 2003
CISPR 16-1-2 2003 + A1 2004 EN 55016-1-2 2004 + A1 2005	Specification for radio disturbance and immunity measuring apparatus and methods Part 1-2: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Conducted disturbances	CISPR 16-1-2 2003 + A1 2004
CISPR 16-1-4:2003 + A1 2004 EN 55016-1-4: 2004 + A1: 2005	Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances	CISPR 16-1-4:2003 + A1 2004
CISPR 16-4-2 2003 EN 55016-4-2 2004	Specification for radio disturbance and immunity measuring apparatus and methods Part 4-2: Uncertainties, statistics and limit modelling - Uncertainty in EMC measurements	CISPR 16-4-2 2003
Unless the international publication has been modified by common modifications, indicated by ***(mod)***, either the intentional or the EN standard may be used. Where the EN standard differs from the intentional standard then the EN version is used. For all of the standards listed above there are no common modifications therefore Elliott makes use of the international version of all standards listed.		

EN 55024:1998 including amendments A1:2001 and A2:2003

EN 55024 references various European standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions (or its international equivalent) are used.

Referenced standard	Description	Standard Used
IEC 61000-4-2 1995 EN 61000-4-2 1995	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques -" Section 2: Electrostatic discharge immunity test	IEC 61000-4-2:2008 EN 61000-4-2:2009
IEC 61000-4-3 1995 (mod) EN 61000-4-3 1996	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3:2006 A1:2007 A2:2010 EN 61000-4-3:2006 A1:2008 A2:2010
IEC 61000-4-4 1995 EN 61000-4-4 1995	Section 4: Electrical fast transient/burst immunity test	IEC 61000-4-4:2004 A1:2010 EN 61000-4-4:2004 A1:2010
IEC 61000-4-5 1995 EN 61000-4-5 1995	Section 5: Surge immunity test	IEC 61000-4-5:2005 EN 61000-4-5:2006
IEC 61000-4-6 1996 EN 61000-4-6 1996	Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6:2008 EN 61000-4-6:2009
IEC 61000-4-8 1993 EN 61000-4-8 1993	Section 8: Power frequency magnetic field immunity test	IEC 61000-4-8 1993 A1:2000 EN 61000-4-8:1993 A1:2001
IEC 61000-4-11:1994 EN 61000-4-11:1994	Section 11: Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11:2004 EN 61000-4-11:2004
Although all of the references to the standards are dated references, all of the basic EN 61000-4-x standards referenced by EN .55024 have been superseded by more recent versions. As the date of withdrawal has passed for the older versions of standards, the EN / IEC versions of these basic standards as detailed in the third column are used.		

CISPR 24:1997 including amendments A1:2001 and A2:2002

CISPR 24 references various IEC basic standards to be used when making the required measurements. When the referenced standard is cited by version (date or revision) then that version is used except where noted. In instances where the standards are referenced without citing the version to be used, the current versions are used.

Referenced standard	Description	Standard Used
IEC 61000-4-2 1995	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques -" Section 2: Electrostatic discharge immunity test	IEC 61000-4-2:2008
IEC 61000-4-3 1995	Section 3: Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3:2006 A1:2007 A2: 2010
IEC 61000-4-4 1995	Section 4: Electrical fast transient/burst immunity test	IEC 61000-4-4:2004 A1:2010
IEC 61000-4-5 1995	Section 5: Surge immunity test	IEC 61000-4-5:2005
IEC 61000-4-6 1996	Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6:2008
IEC 61000-4-8 1993	Section 8: Power frequency magnetic field immunity test	IEC 61000-4-8 1993 A1:2000
IEC 61000-4-11 1994	Section 11: Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11:2004
Although all of the references to the standards are dated references, all of the basic IEC 61000-4-x standards referenced by CISPR 24 have been superseded by more recent versions. As the date of withdrawal has passed for the older versions of standards, the versions of these basic standards as detailed in the third column are used.		

End of Report

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