



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Home Monitoring Gateway

Model: iHUB-3000

Trade Name: iControl

Issued to

iControl Networks Inc.
3045 Park Blvd. 2nd floor
Palo Alto, CA 94306, U.S.A

Issued by

Compliance Certification Services Inc.
No. 11, Wu-Gong 6th Rd., Wugu Industrial Park,
Taipei Hsien 248, Taiwan (R.O.C.)
<http://www.ccsemc.com.tw>
service@tw.ccsemc.com



Note: This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document.



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION.....	3
2. EUT DESCRIPTION	4
3. TEST METHODOLOGY	5
3.1 EUT CONFIGURATION	5
3.2 EUT EXERCISE	5
3.3 GENERAL TEST PROCEDURES	5
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS	6
3.5 DESCRIPTION OF TEST MODES	6
4. INSTRUMNET CALIBRATION.....	7
4.1 MEASURING INSTRUMENT CALIBRATION	7
4.2 MEASUREMENT EQUIPMENT USED	7
5. FACILITIES AND ACCREDITATIONS	8
5.1 FACILTIES.....	8
5.2 EQUIPMENT	8
5.3 TABLE OF ACCREDITATIONS AND LISTINGS	9
6. SETUP OF EQUIPMENT UNDER TEST	10
6.1 SETUP CONFIGURATION OF EUT	10
6.2 SUPPORT EQUIPMENT	10
7. FCC PART 15.231 REQUIREMENTS.....	11
7.1 20DB BANDWIDTH	11
7.2 LIMIT OF TRANSMISSION TIME	13
7.3 DUTY CYCLE CORRECTION FACTOR.....	15
7.4 RADIATED EMISSIONS	17
7.5 POWERLINE CONDUCTED EMISSIONS	22
APPENDIX I PHOTOGRAPHS OF TEST SETUP	25



1. TEST RESULT CERTIFICATION

Applicant: iControl Networks Inc.
3045 Park Blvd. 2nd floor
Palo Alto, CA 94306, U.S.A

Equipment Under Test: Home Monitoring Gateway

Trade Name: iControl

Model: iHUB-3000

Date of Test: March 14 ~ June 26, 2008

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.207, 15.209, Part 15.231 and RSS-210 Issue 7.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Rex Lai
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Amanda Wu
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Home Monitoring Gateway
Trade Name	iControl
Model Number	iHUB-3000
Model Difference	N/A
Power Supply	DSA-15P-12 US 120150 I/P: AC 100-240V, 0.5A, 50-60Hz O/P: DC 12V, 1.25A
Frequency Range	319.2MHz ~ 319.8MHz
Modulation Technique	On/Off keying
Antenna Designation	Dipole Antenna / Gain: 1.8 dBi

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID: **S23-IHUB3000** filing to comply with Section 15.207, 15.209 and 15.231 of the FCC Part 15, Subpart C Rules.*



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 (2003) and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.231.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT (model: iHUB-3000) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.



4. INSTRUMNET CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	02/24/2009

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/11/2008
Test Receiver	Rohde&Schwarz	ESCI	100064	11/30/2008
Switch Controller	TRC	Switch Controller	SC94050010	05/03/2009
4 Port Switch	TRC	4 Port Switch	SC94050020	05/03/2009
Horn-Antenna	TRC	HA-0502	06	06/04/2009
Horn-Antenna	TRC	HA-0801	04	06/19/2009
Horn-Antenna	TRC	HA-1201A	01	08/11/2009
Horn-Antenna	TRC	HA-1301A	01	08/11/2009
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/28/2009
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC: 965860 IC: IC 6106	09/25/2008
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than +/- 3.7046dB (30MHz ~ 1GHz), +/- 3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	11/19/2008
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/11/2008
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/09/2009
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than +/- 2.81dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, IEC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 ACCREDITED TESTING CERT #0824.01
USA	FCC	3M Semi Anechoic Chamber (965860 and 898658) to perform FCC Part 15/18 measurements	 965860, 898658
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method –47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 6106 & IC 6106A-2) to perform RSS 212 Issue 1	 IC 6106 IC 6106A-2

* No part of this report may be used to claim or imply product endorsement by A2LA any agency of the US Government.



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	DELL	PP05L	7T390 A03	E2K5HCKT	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	USB 2.0 External HDD	Portable	ME-911U2	N/A	FCC DoC	Shielded, 1.8m	N/A
3.	USB 2.0 External HDD	TeraSyS	F12-U	A0100214-2Bq0039	FCC DoC	Shielded, 1.8m	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

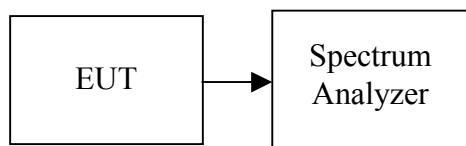
7. FCC PART 15.231 REQUIREMENTS

7.1 20DB BANDWIDTH

LIMIT

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Configuration



TEST PROCEDURE

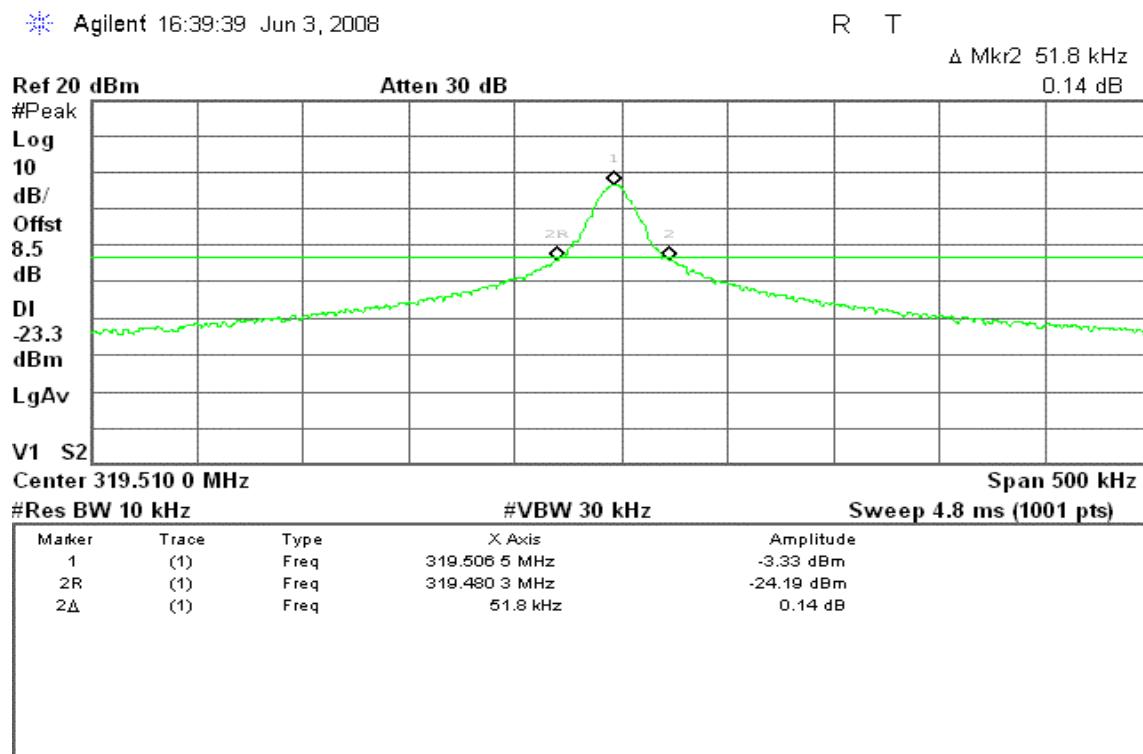
The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10 kHz and VBW is set 30kHz.

TEST RESULTS

No non-compliance noted.

Test Data

Frequency (MHz)	20 dB Bandwidth (kHz)	Limit (MHz)	Result
319.51	51.80	0.7988	PASS

Test Plot

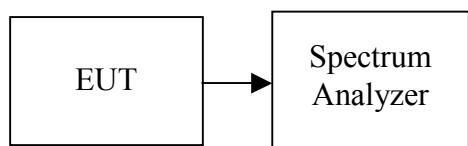


7.2 LIMIT OF TRANSMISSION TIME

LIMIT

According to 15.231(e), in addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

Test Configuration



TEST PROCEDURE

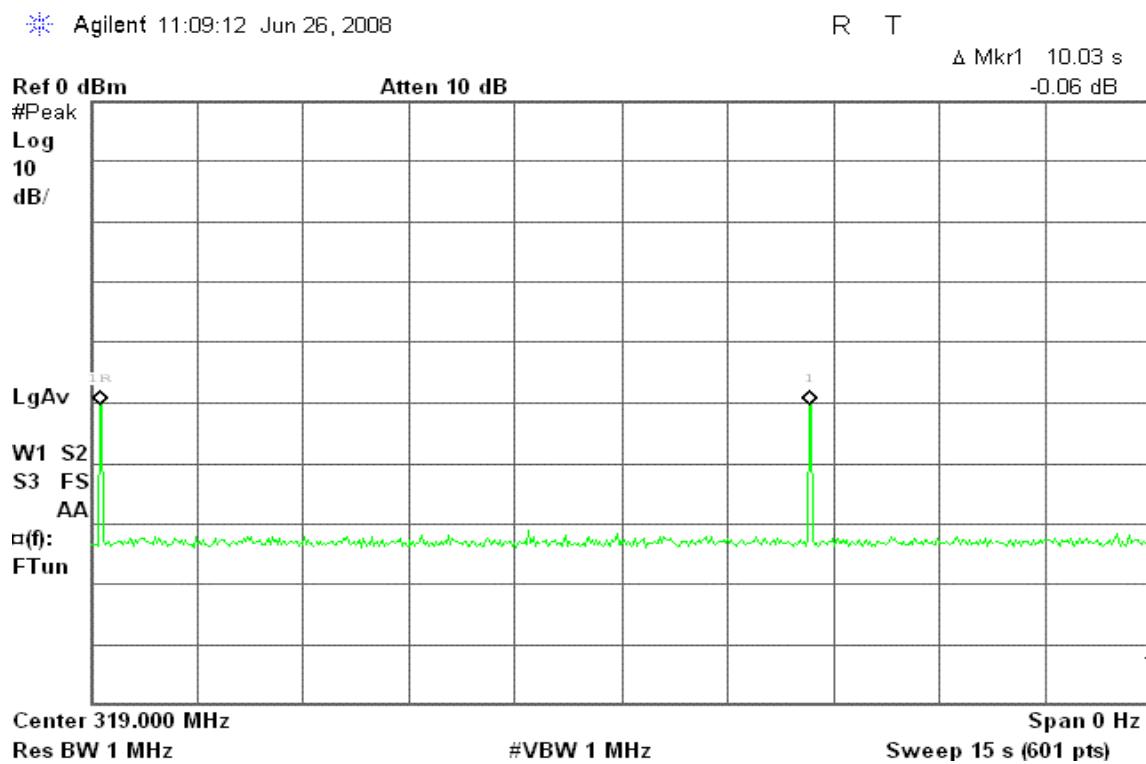
The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 1MHz.

TEST RESULTS

No non-compliance noted

Test Data

Frequency (MHz)	Transmission Time (s)	Maximum Transmission Limit (s)	Silent Duration (s)	Minimum Silent Duration Limit (s)	Silent Period Versus Transmission Time Ratio	Minimum Ratio Limit	Result
319.00	0.04700	1.00	10.03	10.00	213.40	30.00	Pass

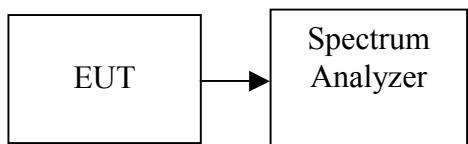
Test Plot

7.3 DUTY CYCLE CORRECTION FACTOR

LIMIT

Nil (No dedicated limit specified in the Rules)

Test Configuration



TEST PROCEDURE

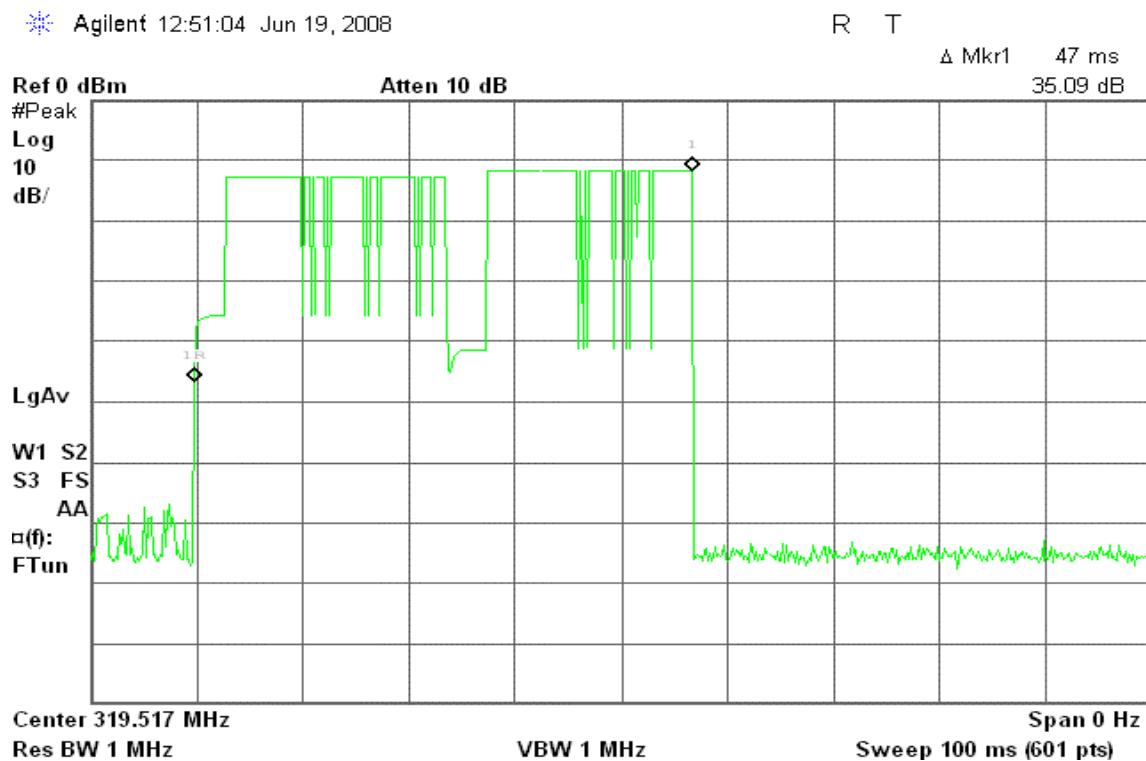
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Adjust Sweep = 100ms.
5. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

No non-compliance noted

Test Data

Duty Cycle Correction Factor = $20 * \log (47/100) = -6.55\text{dB}$

Test Plot



7.4 RADIATED EMISSIONS

LIMIT

- According to §15.231(e), intentional radiators may operate at a periodic rate exceeding that specified in paragraph (a) and may be employed for any type of operation, including operation prohibited in paragraph (a), provided the intentional radiator complies with the provisions of paragraphs (b) through (d) of this Section, except the field strength table in paragraph (b) is replaced by the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 – 40.70	1000	100
70 – 130	500	50
130 – 174	500 to 1500 **	50 to 150 **
174 – 260	1500	150
260 – 470	1500 to 5000 **	150 to 500 **
Above 470	5000	500

Remark: ** linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu V/m$ at 3 meters = $22.72727(F) - 2454.545$; for the band 260-470 MHz, $\mu V/m$ at 3 meters = $16.6667(F) - 2833.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

- Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

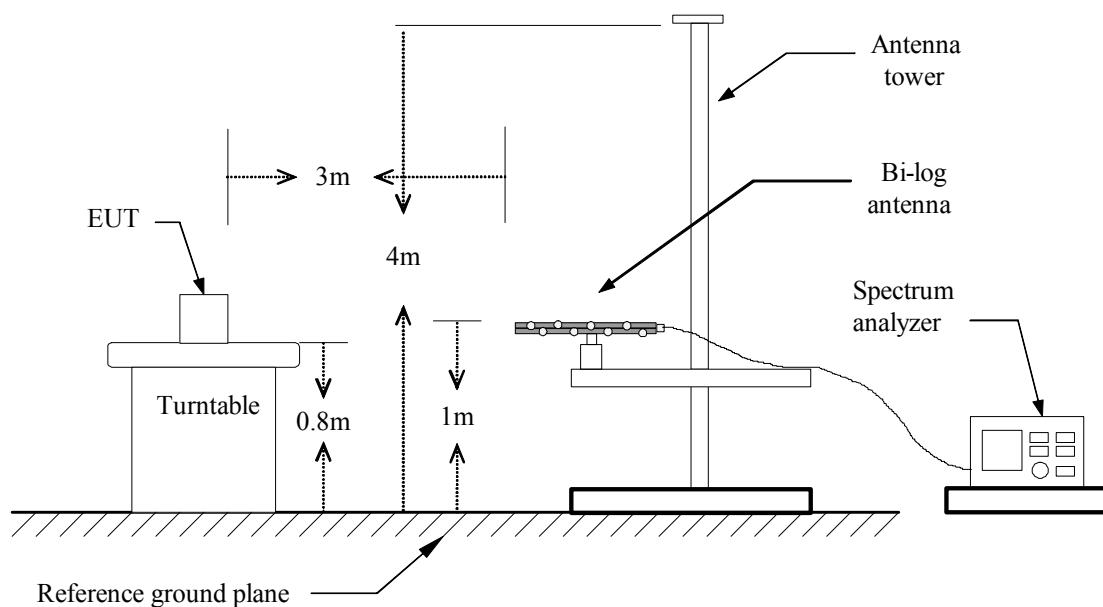
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

- In the above emission table, the tighter limit applies at the band edges.

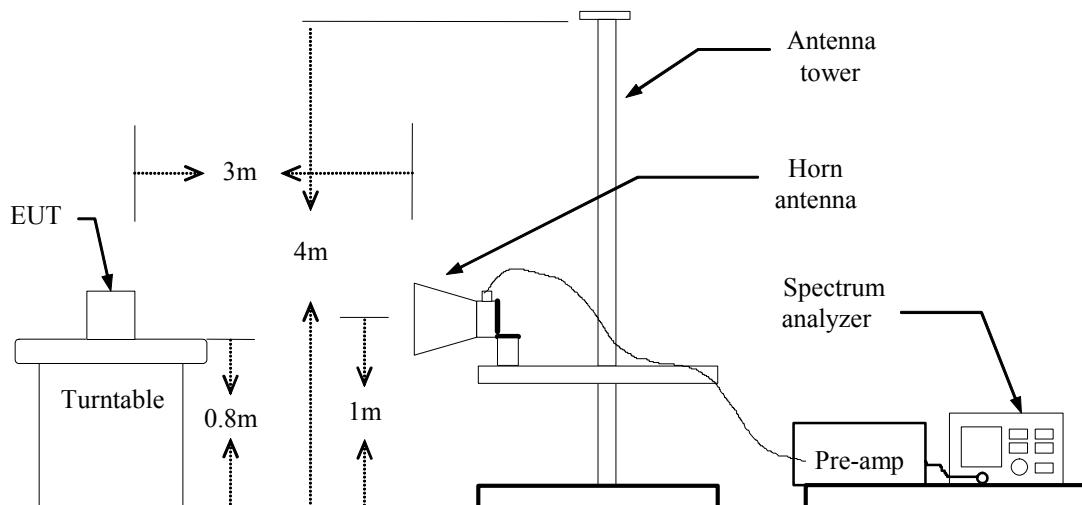
Frequency (MHz)	Field Strength ($\mu V/m$ at 3-meter)	Field Strength ($dB\mu V/m$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

Below 1 GHz



Above 1 GHz





TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

7. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1 GHz****Operation Mode:** Tx**Test Date:** June 20, 2008**Temperature:** 20°C**Tested by:** Wolf Huang**Humidity:** 43 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol (H/V)	Reading (Peak) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Duty Cycle Correction Factor (dB)	Result (Average) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
319.38	V	82.37	-11.56	70.81	-6.55	62.31	67.92	-5.61	AVG
157.72	V	43.94	-9.07	34.87	---	---	43.50	-8.63	Peak
253.10	V	46.33	-7.74	38.59	---	---	46.00	-7.41	Peak
479.43	V	44.54	-1.53	43.01	---	---	46.00	-2.99	Peak
600.68	V	32.53	1.12	33.65	---	---	46.00	-12.35	Peak
720.32	V	35.53	3.08	38.62	---	---	46.00	-7.38	Peak
959.58	V	31.93	7.62	39.55	---	---	46.00	-6.45	Peak
319.38	H	86.53	-11.56	74.97	-6.55	64.51	67.92	-3.41	AVG
159.33	H	39.63	-9.17	30.46	---	---	43.50	-13.04	Peak
254.72	H	45.28	-7.67	37.61	---	---	46.00	-8.39	Peak
359.80	H	39.42	-4.94	34.49	---	---	46.00	-11.51	Peak
479.43	H	42.41	-1.53	40.88	---	---	46.00	-5.12	Peak
720.32	H	37.12	3.08	40.20	---	---	46.00	-5.80	Peak
959.58	H	35.57	7.62	43.19	---	---	46.00	-2.81	Peak

Remark:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak/average detector mode.
3. Average/quasi-peak test would be performed if the peak result were greater than the average/quasi-peak limit or as required by the applicant.
4. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “N/A” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark Result (dBuV/m) – Limit (dBuV/m).

**Above 1 GHz****Operation Mode:** TX **Test Date:** March 14, 2008**Temperature:** 25°C **Tested by:** Mimic Young**Humidity:** 55 % RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1440.00	V	53.71	---	-10.07	43.64	---	74.00	54.00	-10.36	Peak
1596.67	V	51.87	---	-9.01	42.86	---	74.00	54.00	-11.14	Peak
1703.33	V	55.99	---	-7.95	48.04	---	74.00	54.00	-5.96	Peak
1810.00	V	58.88	---	-6.89	51.99	---	74.00	54.00	-2.01	Peak
1916.67	V	56.82	---	-5.83	50.98	---	74.00	54.00	-3.02	Peak
2463.33	V	60.26	36.45	-3.85	56.41	32.60	74.00	54.00	-21.40	AVG
1440.00	H	56.05	51.41	-10.07	45.98	41.34	74.00	54.00	-8.02	Peak
1596.67	H	57.76	---	-9.01	48.75	---	74.00	54.00	-5.25	Peak
1810.00	H	53.60	---	-6.89	46.71	---	74.00	54.00	-7.29	Peak
1916.67	H	53.91	---	-5.83	48.08	---	74.00	54.00	-5.92	Peak
2770.00	H	52.79	---	-3.05	49.74	---	74.00	54.00	-4.26	Peak
3283.33	H	50.05	---	-2.09	47.96	---	74.00	54.00	-6.04	Peak

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “N/A” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



7.5 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator 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 μ H/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 boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

Operation Mode:	Normal Link	Test Date:	June 16, 2008
Temperature:	22°C	Tested by:	Jerry Lin
Humidity:	45% RH		

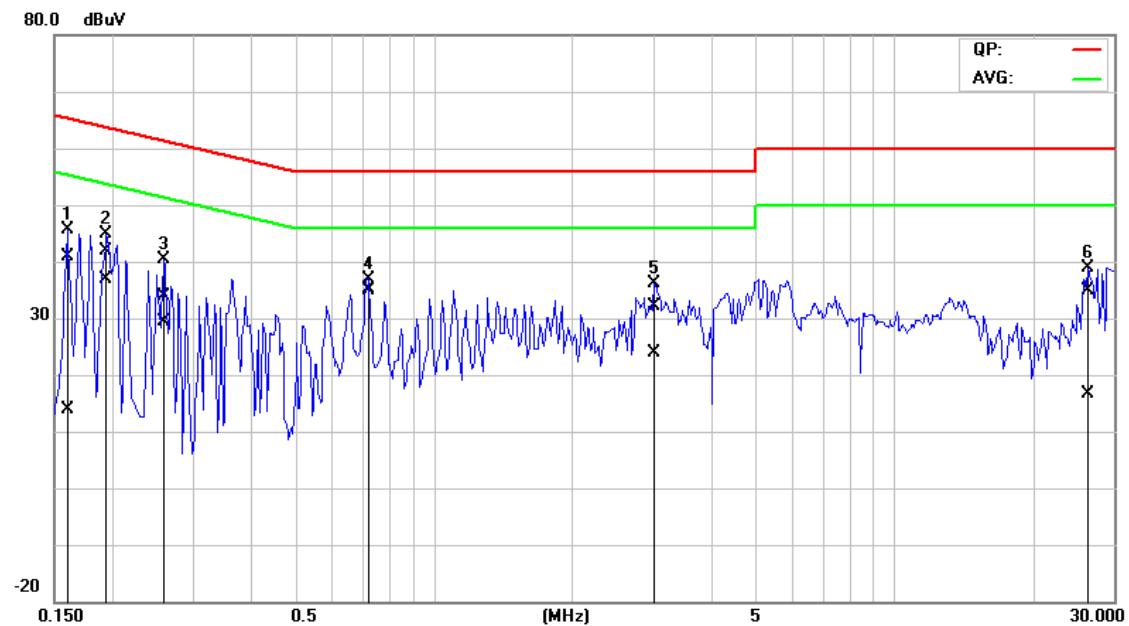
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1600	40.61	13.71	0.19	40.80	13.90	65.46	55.46	-24.66	-41.56	L1
0.1950	41.74	36.74	0.16	41.90	36.90	63.82	53.82	-21.92	-16.92	L1
0.2600	33.67	29.17	0.13	33.80	29.30	61.43	51.43	-27.63	-22.13	L1
0.7200	35.07	34.97	0.03	35.10	35.00	56.00	46.00	-20.90	-11.00	L1
3.0150	32.10	23.90	0.10	32.20	24.00	56.00	46.00	-23.80	-22.00	L1
26.2850	34.07	15.67	0.93	35.00	16.60	60.00	50.00	-25.00	-33.40	L1
0.1750	33.93	9.63	0.17	34.10	9.80	64.72	54.72	-30.62	-44.92	L2
0.2200	29.46	7.86	0.14	29.60	8.00	62.82	52.82	-33.22	-44.82	L2
0.7200	35.57	31.67	0.03	35.60	31.70	56.00	46.00	-20.40	-14.30	L2
2.9400	28.80	22.20	0.10	28.90	22.30	56.00	46.00	-27.10	-23.70	L2
4.9400	22.46	14.76	0.24	22.70	15.00	56.00	46.00	-33.30	-31.00	L2
24.3200	33.20	24.00	0.90	34.10	24.90	60.00	50.00	-25.90	-25.10	L2

Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9 kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

