Certificate

Issue Date: December 13, 2013
Ref. Report No. ISL-13HE352FA

Product Name : 6 LAN Ports Desktop Network Appliance
Model : xFWS-2160x (x - Where x may be any combination of alphanumeric characters or "-"or blank)
Applicant : AAEON Technology Inc.
Address : 5F,NO.135,Lane 235,Pao Chiao Rd. Hsin-Tien Dist,New Tapei City,Taiwan,R.O.C.

We, **International Standards Laboratory**, hereby certify that:

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified. (refer to Test Report if any modifications were made for compliance).

Standards:

FCC CFR Title 47 Part 15 Subpart B: 2010- Section 15.107 and 15.109
ANSI C63.4-2009
Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 5: 2012

Class A

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

International Standards Laboratory

Jim Chu / Director

☒ **Hsi-Chih LAB**:
No. 65, Gu Dai Keng St., Hsichih District,
New Taipei City 22179, Taiwan
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NVLAP LAB CODE 200234-0

FCC TEST REPORT

of

CFR 47 Part 15 Subpart B Class A

Product : **6 LAN Ports Desktop Network Appliance**

Model: **xFWS-2160x (x - Where x may be any combination of alphanumeric characters or "-"or blank)**

Applicant: **AAEON Technology Inc.**

Address: **5F,NO.135,Lane 235,Pao Chiao Rd. Hsin-Tien Dist,New Tapei City,Taiwan,R.O.C.**

Test Performed by:

International Standards Laboratory
<Hsi-Chih LAB>
*Site Registration No.
BSMI:SL2-IN-E-0037; SL2-R1/R2-E-0037; TAF: 1178
FCC: TW1067; IC: IC4067A-1; NEMKO: ELA 113A
VCCI: <Conduction01>C-354, T-1749, <OATS01>R-341, <Chamber01>G-443
*Address:
No. 65, Gu Dai Keng St.
Hsichih District, New Taipei City 22179, Taiwan
*Tel: 886-2-2646-2550; Fax: 886-2-2646-4641

Report No.: **ISL-13HE352FA**
Issue Date : **December 13, 2013**

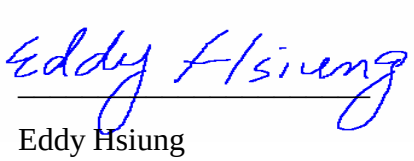
This report totally contains 24 pages including this cover page and contents page.

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

Contents of Report

1. General

1.1 Certification of Accuracy of Test Data

Standards:	FCC CFR Title 47 Part 15 Subpart B: 2010- Section 15.107 and 15.109 ANSI C63.4-2009 Industry Canada Interference-Causing Equipment Standard ICES-003 Issue 5: 2012
Equipment Tested:	6 LAN Ports Desktop Network Appliance
Model:	xFWS-2160x (x - Where x may be any combination of alphanumeric characters or "-"or blank)
Applicant:	AAEON Technology Inc.
Sample received Date:	December 3, 2013
Final test Date:	refer to the date of test data
Test Site:	International Standards Laboratory OATS 01; Chamber 01; Conduction 01
Test Distance:	10M; 3M (above1GHz)
Temperature:	refer to each site test data
Humidity:	refer to each site test data
Input power:	Conduction input power: AC 120 V / 60 Hz Radiation input power: AC 120 V / 60 Hz
Test Result:	**PASS**
Report Engineer:	Winnie Huang
Test Engineer:	 Louis Yu
Approved By:	 Eddy Hsiung

1.2 Description of EUT

EUT

Product Name	6 LAN Ports Desktop Network Appliance
Condition	Pre-Production
Model Number	xFWS-2160x (x - Where x may be any combination of alphanumeric characters or "-"or blank)
Serial Number	N/A
Power Supply	FSP (Model: FSP060-DBAE1) AC INPUT: 100-240V~, 1.5A, 50-60Hz DC Output: 12.0V---5.0A MAX
CPU	AMD G-T24L Processor 1GHz
Motherboard	Model: FWS-2160
VGA Board	Model: GD-SM750
Power Switch Button	one
SATA Hard Disk	WD (Model: WD1600BEVT-22A23T0) 160GB
Memory	DSL 4GB DDR3-1333MHz*2
USB 2.0 Port	two 4-pins
COM Port	one 9-pins
RJ45 Port	six 8-pins (10/100/1000M bps)
D-SUB Port	one 15-pins
DC IN	one
Resolution	1280*1024
Maximum Operating Frequency	1GHz

EMI Noise Source

Motherboard Crystal	25MHz (Y1), 25MHz (Y2), 32.768KHz (Y3), 25HMz(Y4) 25MHz (Y5), 25MHz (Y6), 25MHz (Y7), 25MHz (Y8) 25MHz (Y9)
VGA Board Crystal	14.318MHz (Y1)

EMI Solution

Solution	Quantity	Specification	Location
Core	1	King Core(25x15x13mm)	The same as Photo EUT-22

1.3 Description of Support Equipment

Unit	Model Serial No.	Brand	Power Cord	FCC ID
Keyboard	SK-8115, S/N: MY-05N456-38843-2BK-3315	DELL	N/A	FCC DOC
Mouse	MO71KC S/N: 511092011	DELL	N/A	FCC DOC
Notebook Personal Computer	U36J S/N: N/A	ASUS	Non-shielded, Detachable	FCC DOC
Rack mountable Switch	DGS-1016D	D-Link	Non-shielded, Detachable	FCC DOC
24” LCD Monitor	2408WFP S/N: N/A	DELL	Non-shielded, Detachable	FCC DOC

1.4 Software for Controlling Support Unit

Test programs exercising various part of EUT were used. The programs were executed as follows:

A. Send H pattern to the D-SUB port device (Monitor).
B. Read and write to the disk drives.
C. Send package to the Router RJ45 port (Router).
D. Receive and transmit package of EUT to the Rack mountable Switch HUB through RJ45 port.
E. Used Tfgen.exe to send signal to EUT RJ45 port through Notebook RJ45 Port.
F. Repeat the above steps.

	Filename	Issued Date
RJ45	ping.exe	05/05/1999
RJ45	Tfgen.exe	06/23/1999
Monitor	Intel EMC.exe	9/04/2000
EUT Hard Disk	InterEMC.exe	9/04/2000

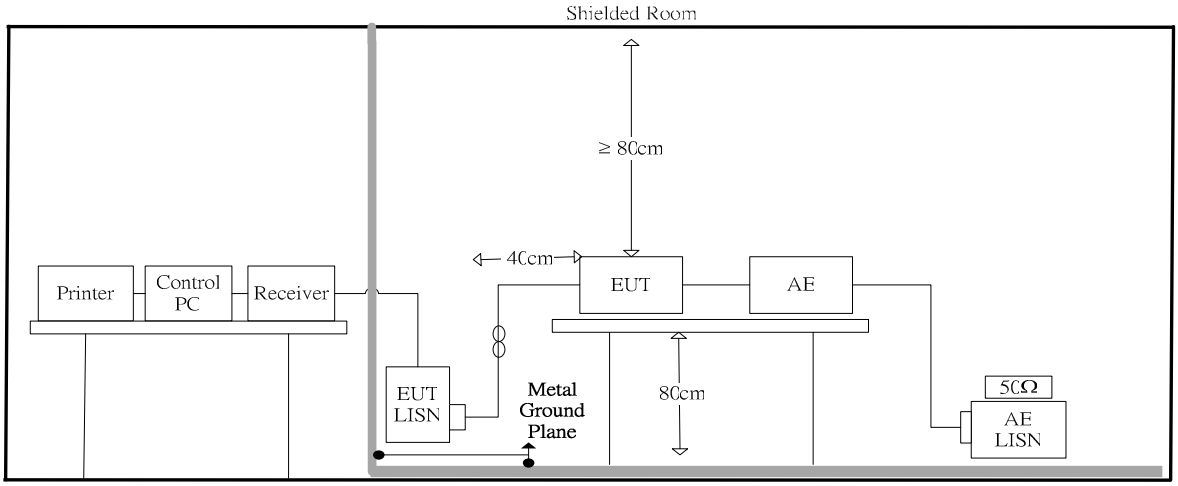
1.5 I/O Cable Condition of EUT and Support Units

Description	Path	Cable Length	Cable Type	Connector Type
AC Power Cord	110V (~240V) to EUT SPS	1.8M	Non-shielded, Detachable	Plastic Head
Keyboard Data Cable	Keyboard to EUT USB2.0 Port	2M	Shielded, Un-detachable	Metal Head
Mouse Data Cable	Mouse to EUT USB2.0 port	1.8M	Shielded, Un-detachable	Metal Head
RJ45 Data Cable*6	EUT RJ45 Port to Switch HUB RJ45 Port	10M	Non-shielded, Detachable	RJ-45, with Plastic Head
RJ45 Data Cable	Switch HUB RJ45 port to Notebook RJ45 Port	1M	Non-shielded, Detachable	RJ-45, with Plastic Head
Display Data Cable	EUT D-SUB Port to LCD Monitor D-SUB Port	1.8M	Shielded, Detachable	Metal Head
COM load Cable	EUT COM Port with Dummy	1.5M	Non-Shielded, Detachable	Metal Head

2. Powerline Conducted Emissions

2.1 Test Setup and Procedure

2.1.1 Test Setup



2.1.2 Test Procedure

The measurements are performed in a 3.5m x 3.4m x 2.5m shielded room, which referred as Conduction 01 test site, or a 3m x 3m x 2.3m test site, which referred as Conduction 02 test site. The EUT was placed on non-conduction 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured. All of the interface cables were manipulated according to ANSI C63.4 requirements.

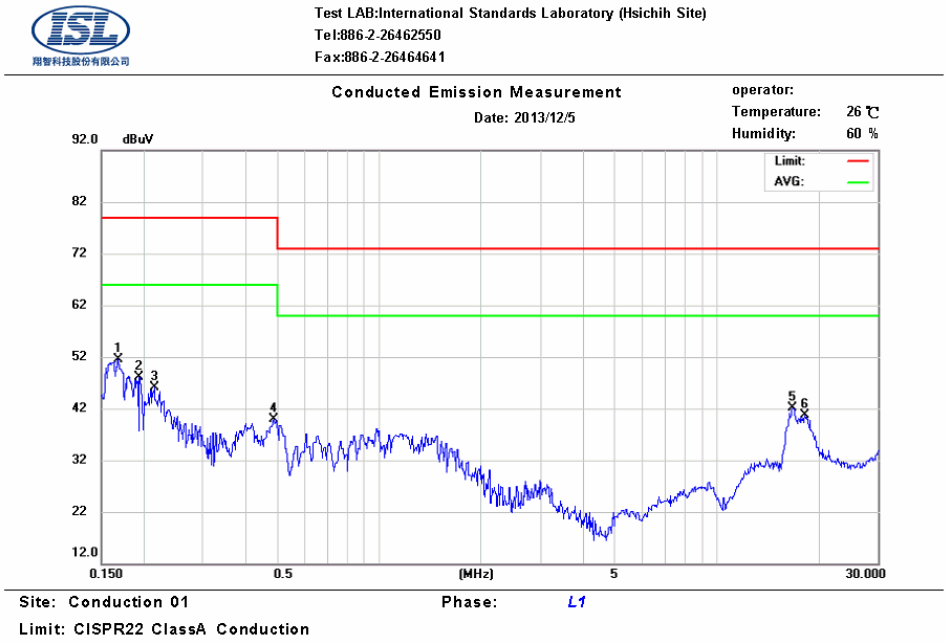
The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

2.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz~30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

2.2 Conduction Test Data:

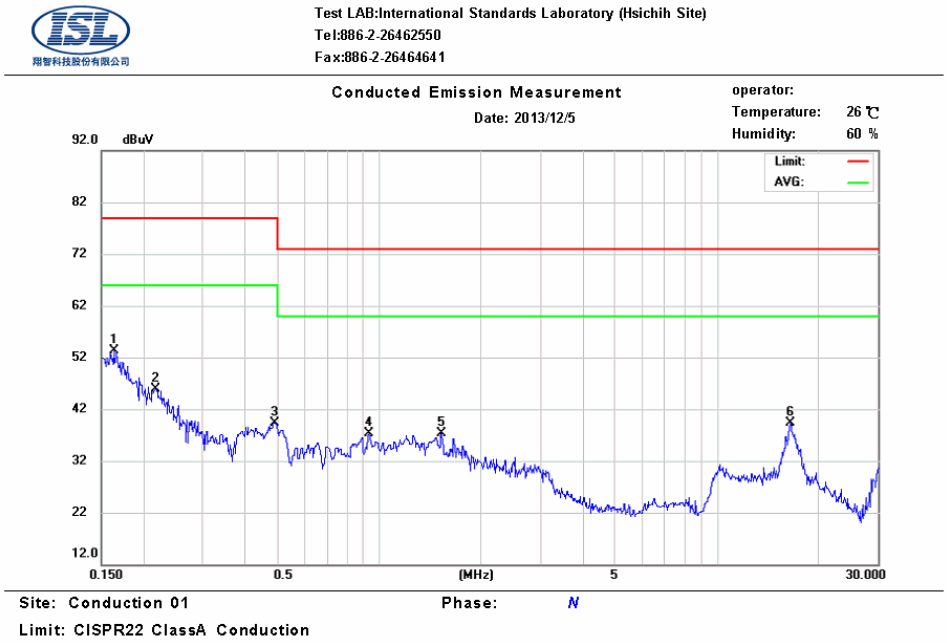
Table 2.2.1 Power Line Conducted Emissions (Line)



No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.17	9.66	51.40	79.00	-27.60	51.40	66.00	-14.60	
2	0.20	9.66	48.03	79.00	-30.97	48.03	66.00	-17.97	
3	0.21	9.66	46.02	79.00	-32.98	46.02	66.00	-19.98	
4	0.48	9.67	39.95	79.00	-39.05	39.95	66.00	-26.05	
5	16.70	9.83	42.05	73.00	-30.95	42.05	60.00	-17.95	
6	18.20	9.84	40.63	73.00	-32.37	40.63	60.00	-19.37	

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = Receiver Reading + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.
If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.
The CISPR 22 limits would be applied to all FCC Part 15 devices.

Table 2.2.2 Power Line Conducted Emissions (Neutral)



No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.16	9.74	53.20	79.00	-25.80	53.20	66.00	-12.80	
2	0.22	9.74	45.98	79.00	-33.02	45.98	66.00	-20.02	
3	0.48	9.75	39.27	79.00	-39.73	39.27	66.00	-26.73	
4	0.93	9.76	37.38	73.00	-35.62	37.38	60.00	-22.62	
5	1.52	9.78	37.30	73.00	-35.70	37.30	60.00	-22.70	
6	16.50	9.92	39.24	73.00	-33.76	39.24	60.00	-20.76	

Note:
Margin = QP/AVG Emission - Limit
QP/AVG Emission = Receiver Reading + Correct Factor
Correct Factor = LISN Loss + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
The frequency spectrum graph is for final peak graph, and the attached table is for QP/AVG test result.
If peak data can pass, it will be shown in "QP/AVG Correct" column, if not, QP/AVG data will instead.
The CISPR 22 limits would be applied to all FCC Part 15 devices.

2.3 Test Setup Photo

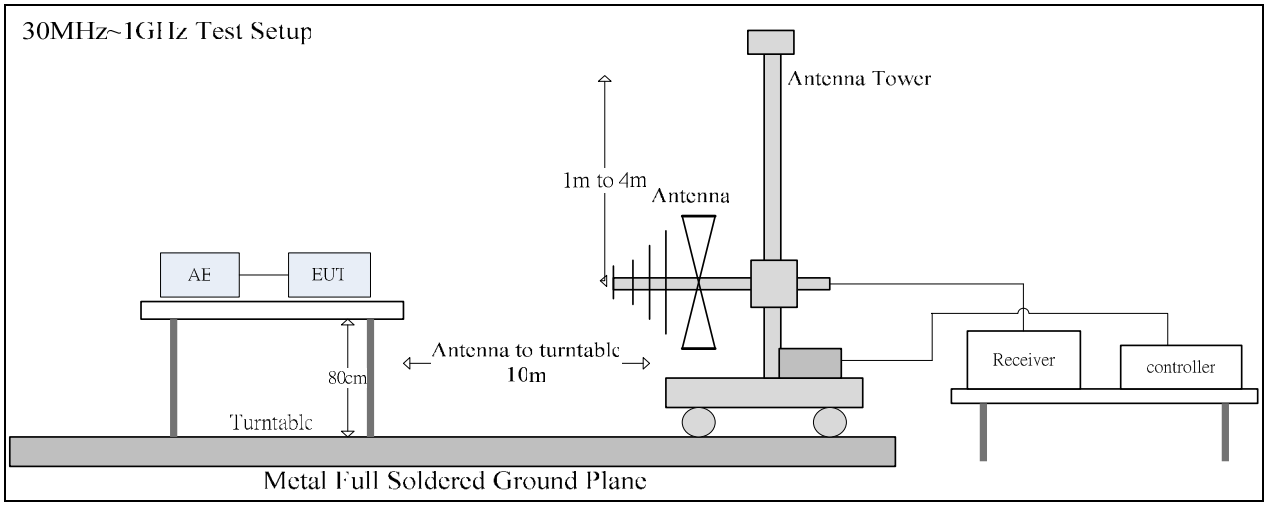
Front View

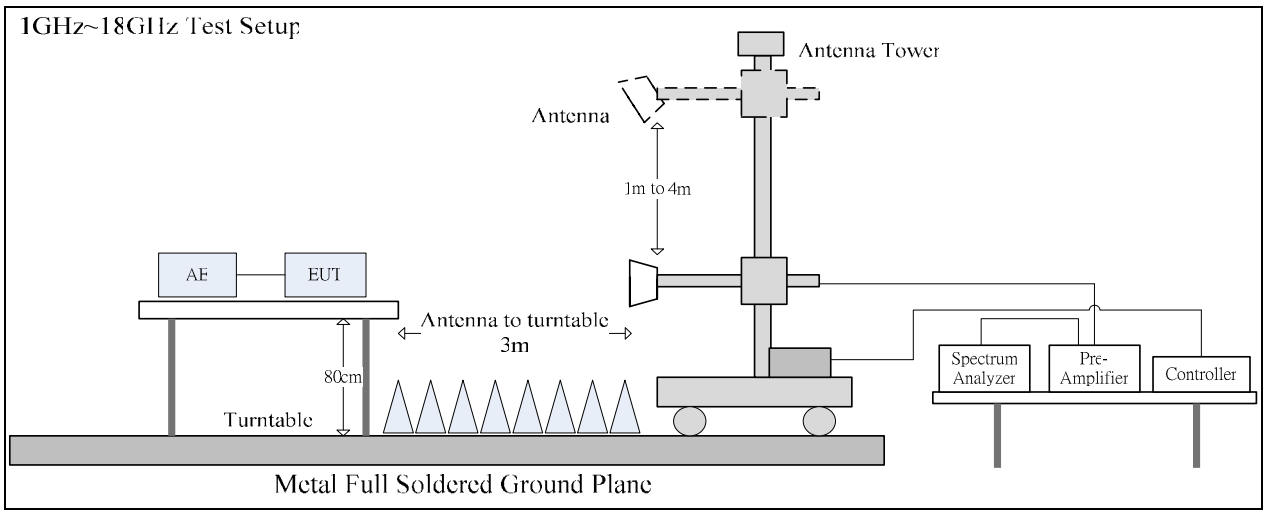
Back View

3. Radiated Emissions

3.1 Test Setup and Procedure

3.1.1 Test Setup





3.1.2 Test Procedure

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of one of 10 meter open field sites or 10 meter chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. The highest emissions between 1 GHz to 40 GHz were analyzed in details by

operating the spectrum analyzer in peak and average mode to determine the precise amplitude of the emissions.

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the antenna in the cone of radiation from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response. At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings. All of the interface cables were manipulated according to ANSI C63.4 requirements.

The highest internal source of the EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less. Spectrum Analyzer Configuration (for the frequencies tested).

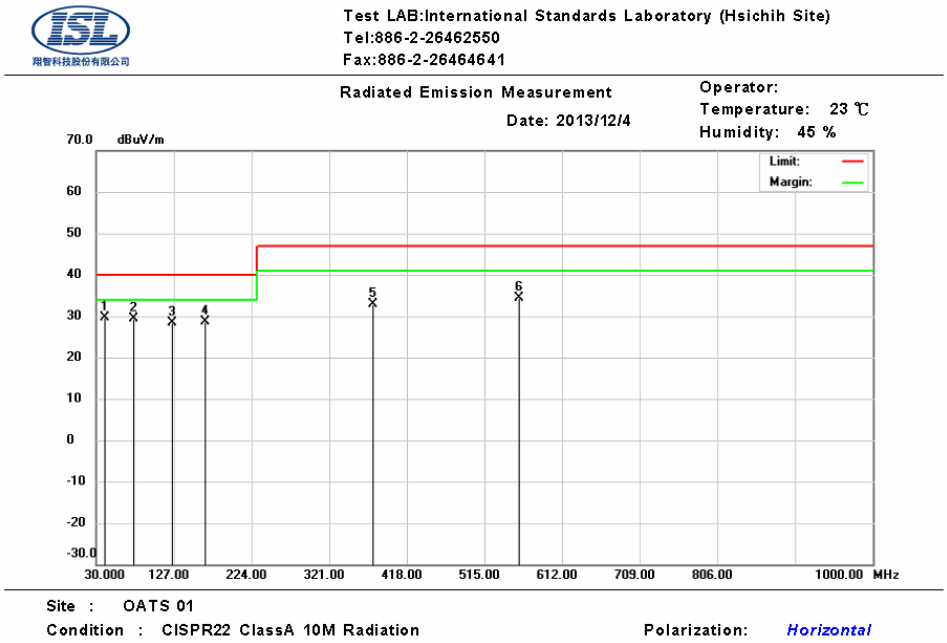
3.1.3 Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	30MHz--1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth:	120KHz

Frequency Range:	Above 1000MHz
Detector Function:	Peak/Average Mode
Resolution Bandwidth:	1MHz

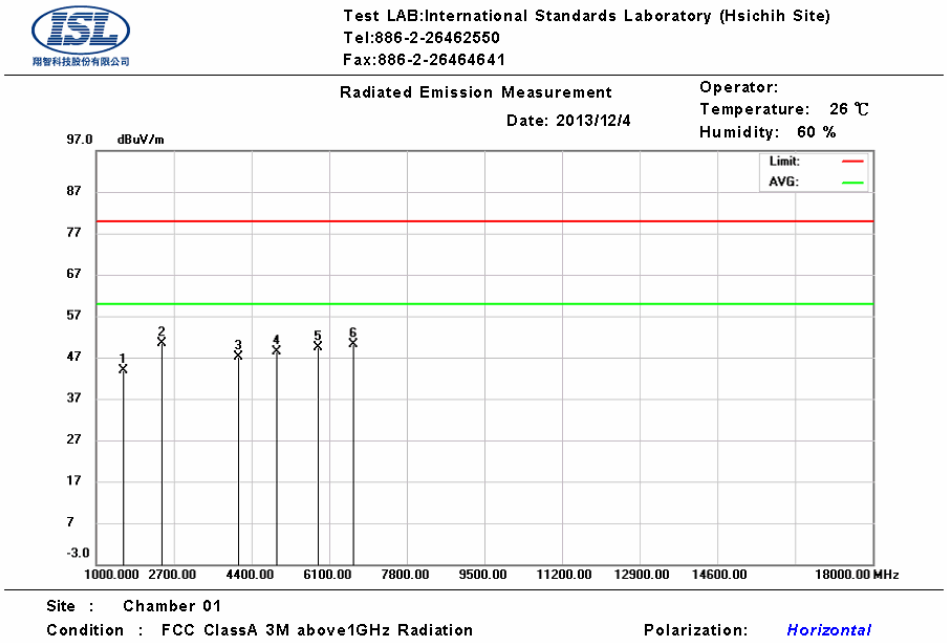
3.2 Radiation Test Data:

Table 3.2.1 Radiated Emissions (Horizontal)



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	40.6700	15.25	14.34	29.59	40.00	-10.41	100	1	QP
2	76.5600	20.25	9.03	29.28	40.00	-10.72	343	150	QP
3	125.0600	13.25	15.19	28.44	40.00	-11.56	100	121	QP
4	166.7700	15.25	13.43	28.68	40.00	-11.32	100	313	QP
5	375.3200	15.85	17.04	32.89	47.00	-14.11	231	51	QP
6	557.6800	13.25	21.23	34.48	47.00	-12.52	274	167	QP

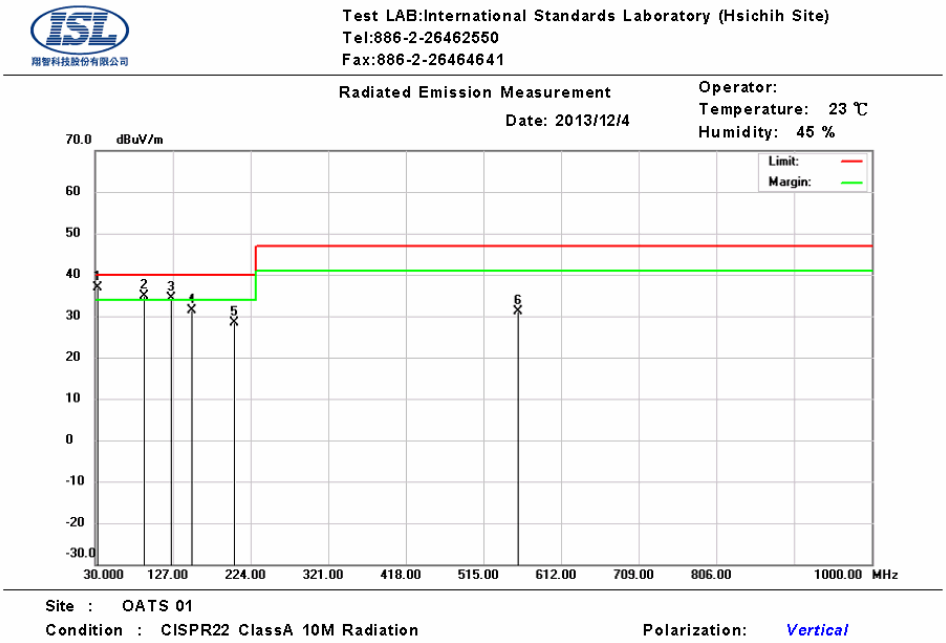
* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement. measurement.



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	1595.000	63.93	-19.98	43.95	80.00	-36.05	124	180	peak
2	2428.000	66.17	-15.69	50.48	80.00	-29.52	120	124	peak
3	4111.000	60.30	-13.17	47.13	80.00	-32.87	218	227	peak
4	4961.000	60.11	-11.80	48.31	80.00	-31.69	262	316	peak
5	5862.000	59.81	-10.34	49.47	80.00	-30.53	114	57	peak
6	6627.000	59.41	-9.34	50.07	80.00	-29.93	185	291	peak

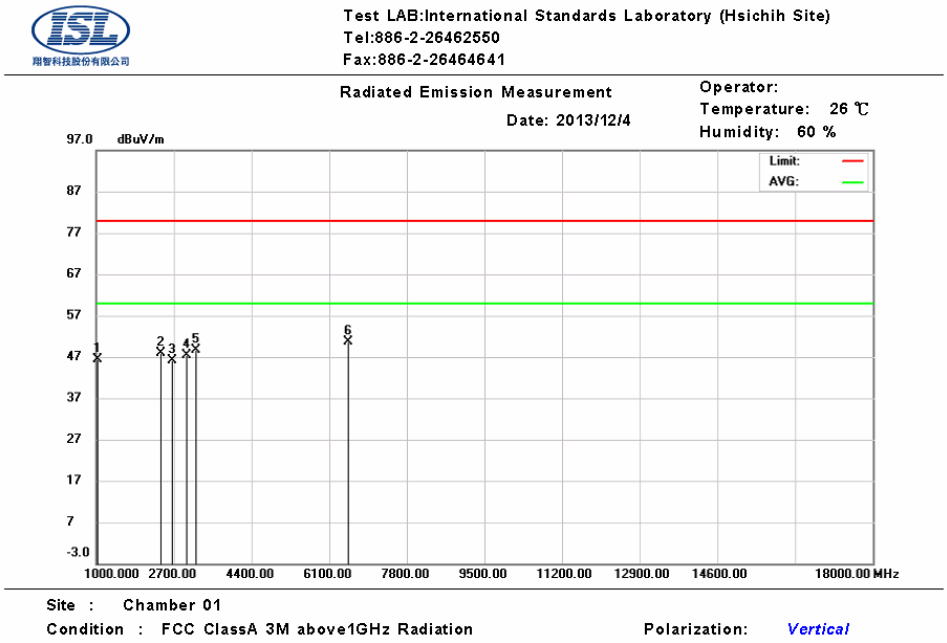
* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Horn Antenna Distance: 3 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.

Table 3.2.2 Radiated Emissions (Vertical)



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	32.2200	16.70	20.25	36.95	40.00	-3.05	100	131	QP
2	91.1100	25.65	9.13	34.78	40.00	-5.22	100	217	QP
3	125.0100	19.25	15.19	34.44	40.00	-5.56	335	354	QP
4	150.2800	17.52	13.79	31.31	40.00	-8.69	393	271	QP
5	203.6300	14.85	13.65	28.50	40.00	-11.50	136	281	QP
6	557.6800	9.85	21.23	31.08	47.00	-15.92	109	347	QP

* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss
A margin of -8dB means that the emission is 8dB below the limit
BILOG Antenna Distance: 10 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
Below 1GHz test, if the peak measured value meets the QP limit, it is unnecessary to perform the QP measurement. measurement.



Mk.	Frequency (MHz)	RX_R (dBuV)	Correct Factor(dB/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pos (cm)	Tab.Pos (deg.)	Detector
1	1034.000	67.43	-21.04	46.39	80.00	-33.61	100	236	peak
2	2411.000	63.55	-15.72	47.83	80.00	-32.17	100	82	peak
3	2666.000	61.47	-15.23	46.24	80.00	-33.76	100	310	peak
4	2989.000	61.88	-14.59	47.29	80.00	-32.71	125	154	peak
5	3193.000	63.05	-14.31	48.74	80.00	-31.26	187	202	peak
6	6508.000	60.02	-9.37	50.65	80.00	-29.35	202	310	peak

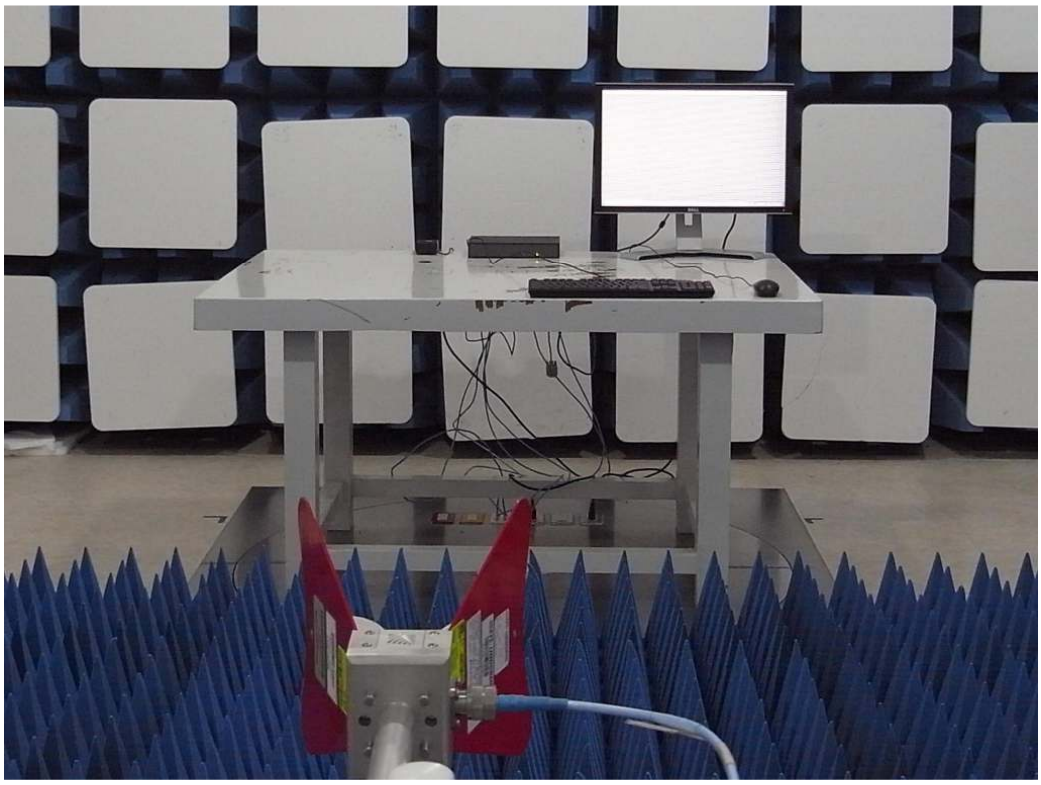
* Note:
Margin = Emission – Limit
Emission = Radiated Amplitude + Correct Factor
Correct Factor = Antenna Correction Factor + Cable Loss – Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit
Horn Antenna Distance: 3 meters
The CISPR 22 limits would be applied to all FCC Part 15 devices.
Above 1GHz test, if the peak measured value meets the average limit, it is unnecessary to perform the average measurement.

3.3 Test Setup Photo

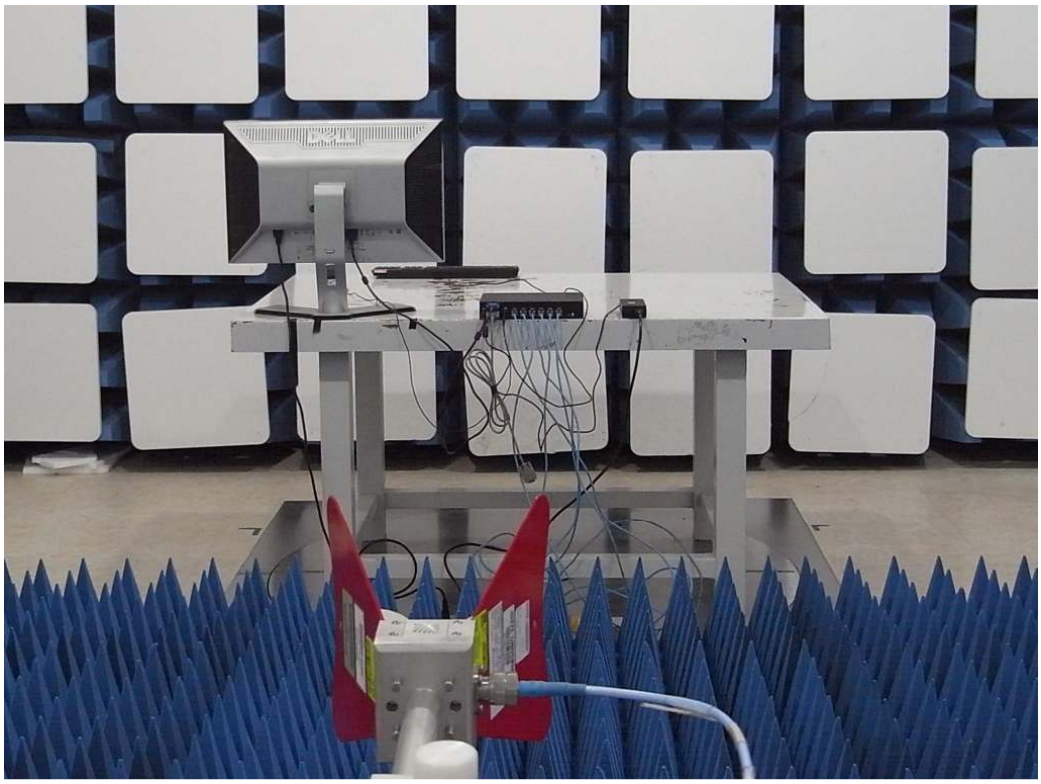
Front View

Back View

Front View (above 1GHz)



Back View (above 1GHz)



4. Appendix

4.1 Appendix A: Warning Labels

Label Requirements

A Class A digital device subject to certification by the FCC shall carry a warning label which includes the following statement:

*** * * W A R N I N G * * ***

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

4.2 Appendix B: Warning Statement

Statement Requirements

The operators' manual for a Class A digital device shall contain the following statements or their equivalent:

*** * * W A R N I N G * * ***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses, and can radiate radio frequency energy and, if not installed and uses in accordance with the instruction manual, may cause harmful interference to radio communications Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice: The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equivalent.

* * * * * * * * *

If the EUT was tested with special shielded cables the operators manual for such product shall also contain the following statements or their equivalent:

Shielded interface cables and/or AC power cord, if any, must be used in order to comply with the emission limits.

4.3 Appendix C: Test Equipment

4.3.1 Test Equipment List

Location CON01	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Conduction	Coaxial Cable 1F-C1	EMEC	5D Cable	1F-C1	10/25/2013	10/25/2014
Conduction	LISN 21	ROHDE & SCHWARZ	ENV216	101476	05/14/2013	05/14/2014
Conduction	LISN 22	ROHDE & SCHWARZ	ENV216	101478	05/14/2013	05/14/2014
Conduction	ISN T2 03	FCC	FCC-TLISN-T2-02	20618	08/13/2013	08/13/2014
Conduction	ISN T4 05	FCC	FCC-TLISN-T4-02	20619	08/13/2013	08/13/2014
Conduction	INS T8 07	Teseq GmbH	ISN T800	30834	06/01/2013	06/01/2014
Conduction	ISN T8 06 (Shielding)	Teseq GmbH	ISN ST08	33999	08/10/2013	08/10/2014
Conduction	EMI Receiver 15	ROHDE & SCHWARZ	ESCI	101166	04/30/2013	04/30/2014

Location OATS01	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Radiation	BILOG Antenna 10	Sumol Sciences	JB1	A013004-1	07/10/2013	07/10/2014
Radiation	Coaxial Cable 3F-10M	EMCI	CFD400-NL	ISL-R001	03/15/2013	03/15/2014
Radiation	EMI Receiver 13	ROHDE & SCHWARZ	ESCI	101015	02/26/2013	02/26/2014

Location Chamber 01	Equipment Name	Brand	Model	S/N	Last Cal. Date	Next Cal. Date
Rad. above 1Ghz	Horn Antenna 11	ETS-LINDGREN	3117	00114397	03/18/2013	03/18/2014
Rad. above 1Ghz	Horn Antenna 03	COM-Power	AH-826	08010	04/01/2013	04/01/2015
Rad. above 1Ghz	Horn Antenna 05	Com-Power	AH-640	100A	01/09/2013	01/09/2015
Rad. above 1Ghz	Microwave Cable-16	HUBER SUHNER	SUCFLEX 104	345761/4	12/24/2012	12/24/2013
Rad. above 1Ghz	Preamplifier 20	EMCI	EMC051845	980084	10/30/2013	10/30/2014
Rad. above 1Ghz	Microwave Cable-19	HUBER SUHNER	SUCFLEX 102	MY 2151/2	05/09/2013	05/09/2014
Rad. above 1Ghz	Preamplifier 22	EMCI	EMC184045	980124	04/02/2013	04/02/2014
Rad. above 1Ghz	Spectrum Analyzer 23	ROHDE & SCHWARZ	FSU43	101255	11/01/2013	11/01/2014

4.3.2 Software for Controlling Spectrum/Receiver and Calculating Test Data

Site	Filename	Version	Issue Date
Conduction/Radiation	EZ EMC	ISL-03A2	3/6/2013

4.4 Appendix D: Uncertainty of Measurement

The measurement uncertainty refers to CISPR 16-4-2:2003. The coverage factor k = 2 yields approximately a 95 % level of confidence.

<Conduction 01>
AMN: ±3.29dB
ISN: ±4.43dB

<OATS 01 (10M)>
Horizontal
30MHz~200MHz: ±3.06dB
200MHz~1000MHz: ±3.22dB
Vertical
30MHz~200MHz: ±3.41dB
200MHz~1000MHz: ±3.20dB

<Chamber 01 (3M)>
1GHz~6GHz: ±4.69dB
6GHz~18GHz: ±4.72dB
18GHz~26.5GHz: ±3.44dB
18GHz~26.5GHz: ±3.49dB