Test Report

Compliance with Industry Canada Interference-Causing Equipment Standard ICES-003

Product Name ： Wireless Thin Client (WebPad)

Model No. ： TX-4000

Applicant ： TATUNG CO.

Address ： 22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

Date of Receipt ： 2010/07/02

Issued Date ： 2010/08/05

Report No. ： 107325R-ITUSP02V02

Report Version ： V2.0

Test Report Certification

Issued Date : 2010/08/05
Report No. : 107325R-ITUSP02V02

Product Name	:	Wireless Thin Client (WebPad)
Applicant	:	TATUNG CO.
Address	:	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.
Manufacturer	:	TATUNG CO.
Model No.	:	TX-4000
EUT Rated Voltage	:	AC 100-240V, 50/60Hz
EUT Test Voltage	:	AC 120 V / 60 Hz
Trade Name	:	TATUNG
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart B: 2009, Class B CISPR 22: 2008, ANSI C63.4: 2003 ICES-003 Issue 4: 2004
Test Result	:	Complied
Performed Location	:	Quietek Corporation (Linkou Laboratory) No.5-22, Ruei-Shu Valley, Ruei-Ping Tsuen Lin Kuo Shiang, Taipei, 244 Taiwan, R.O.C. TEL:+866-2-8601-3788 / FAX:+886-2-8601-3789

Documented By : Anny Chou
(Adm.Assistant / Anny Chou)

Reviewed By : Lance Chi
(Engineer / Leslie Chi)

Approved By :
(Manager / Vincent Lin)

Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scopes:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0

Testing Laboratory 1313

LinKou Testing Laboratory :

No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0

Testing Laboratory 0914

Suzhou (China) Testing Laboratory :

No. 99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou,China.
TEL : +86-512-6251-5088 / FAX : +86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code : 200743-0

Testing Laboratory 1596

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

Product Name	Wireless Thin Client (WebPad)
Trade Name	TATUNG
Model No.	TX-4000

Component	
CPU	Intel (R) Atem (TM) CPU Z510, Speed: 1.1GHz Intel (R) Atem (TM) CPU Z530, Speed: 1.6GHz
Main Board	TX-4000
Wireless LAN Card	AzureWave, AW-NE768H 802.11b/g/n
Battery	GLW, WP-B26, 2600mAh, 10.95V
Power Adapter	MFR: UMEC, M/N: UP0501Q-16P Input: AC 100-240V, 47-63Hz, 1.0A Output: DC +16V⎓3.13A Cable Out: Non-shielded, 1.5m, with one ferrite cores bonded.

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode	
Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz) Mode 2: Intel (R) Atem (TM) CPU Z510 @1.1GHz(1024*768/60Hz)	
Final Test Mode	
Emission	Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz)

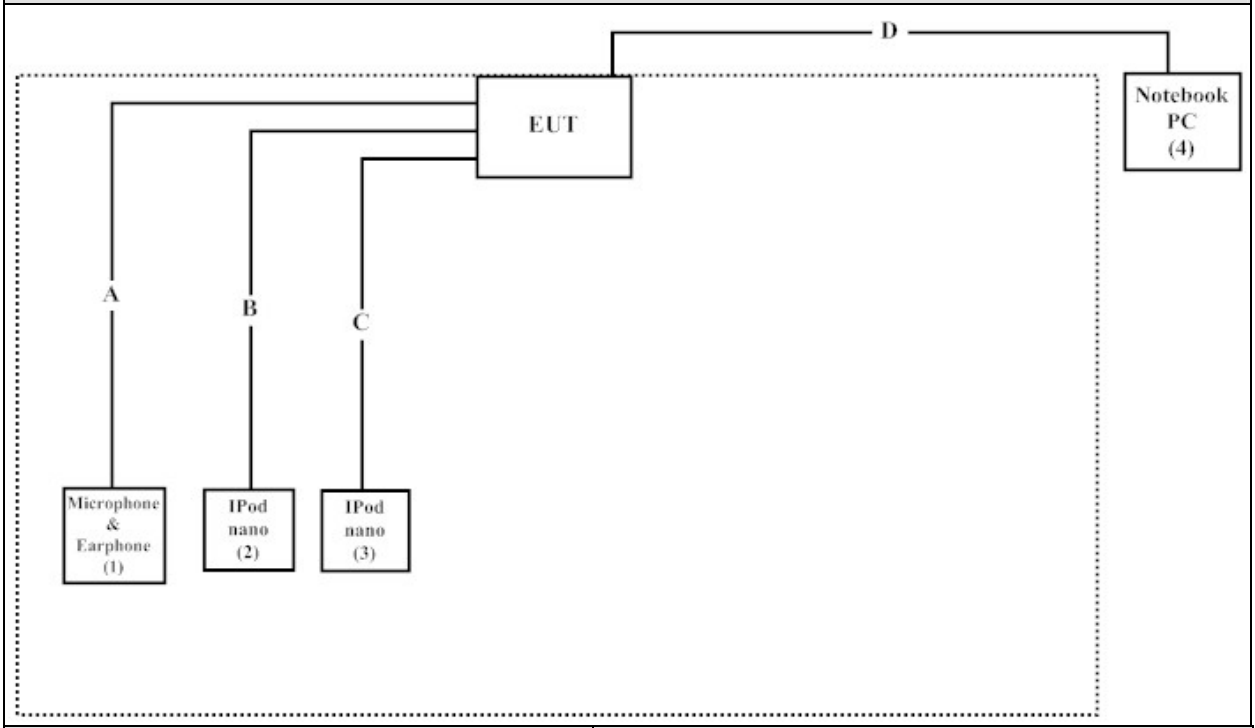
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Microphone & Earphone	PCHOME	N/A	N/A	N/A
2	IPod nano	Apple	A1236	7K823E7AY0P	N/A
3	IPod nano	Apple	A1236	7K823DY3Y0P	N/A
4	Notebook PC	DELL	PP04X	7607342512	Non-Shielded, 1.8m

1.4. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	Microphone & Earphone Cable	Shielded, 1.6m
B	USB Cable	Shielded, 1m
C	USB Cable	Shielded, 1m
D	LAN Cable	Non-Shielded, 5.0m

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	A mufti meter was used to verify the model operation before the measurement.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Emission			
Performed Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart B: 2009, Class B, ANSI C63.4: 2003	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart B: 2009, Class B, ANSI C63.4: 2003	Yes	No

2.2. List of Test Equipment

Conducted Emission / SR8

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCS 30	838251/001	2010/04/27
LISN	R&S	ESH3-Z5	836679/020	2010/02/17
LISN	R&S	ENV216	100097	2010/05/28
Pulse Limiter	R&S	ESH3-Z2	100324	2010/04/16

Radiated Emission / Site4

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Bilog Antenna	Schaffner Chase	CBL6112B	2793	2010/08/01
Broadband Horn Antenna	Schwarzbeck	BBHA9170	209	2010/07/25
EMI Test Receiver	R&S	ESCS 30	100369	2009/09/02
Horn Antenna	Schwarzbeck	BBHA9120D	305	2009/08/26
Pre-Amplifier	QTK	N/A	N/A	2010/08/01
Spectrum Analyzer	Advantest	R3162	100803480	2010/04/09

Radiated Emission / 9x6x6_Chamber

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Spectrum Analyzer (9K-26.5GHz)	Agilent	E4408B	MY45102743	2009/08/12
Horn Antenna	Schwarzbeck	9120D	576	2009/10/21
Pre-Amplifier	QuieTek	AP-180C	CHM/071920	2010/08/04

2.3. Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.26 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.19 dB.

2.4. Test Environment

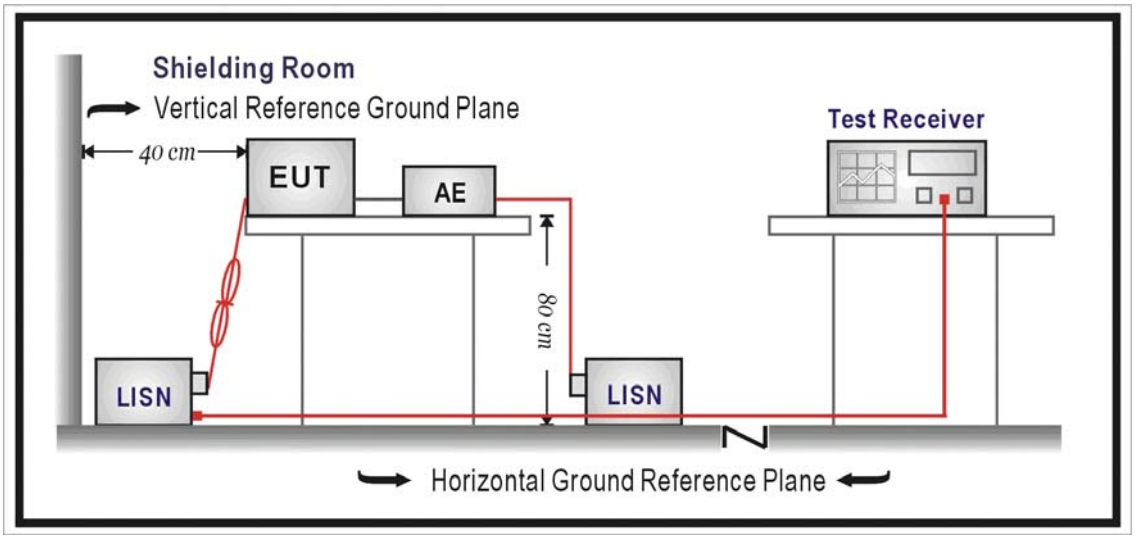
Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Radiated Emission	Temperature (°C)	15-35	25
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

3.1. Test Specification

According to Standard : FCC Part 15 Subpart B, ANSI C63.4

3.2. Test Setup



3.3. Limit

Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 – 46
0.50-5.0	56	46
5.0 - 30	60	50

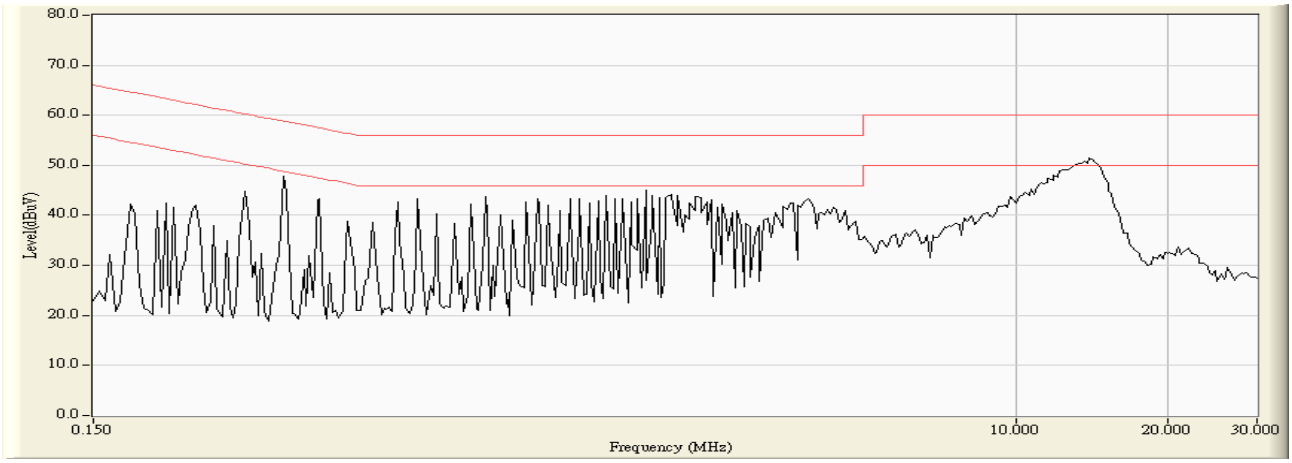
Remarks: In the above table, the tighter limit applies at the band edges.

3.4. Test Procedure

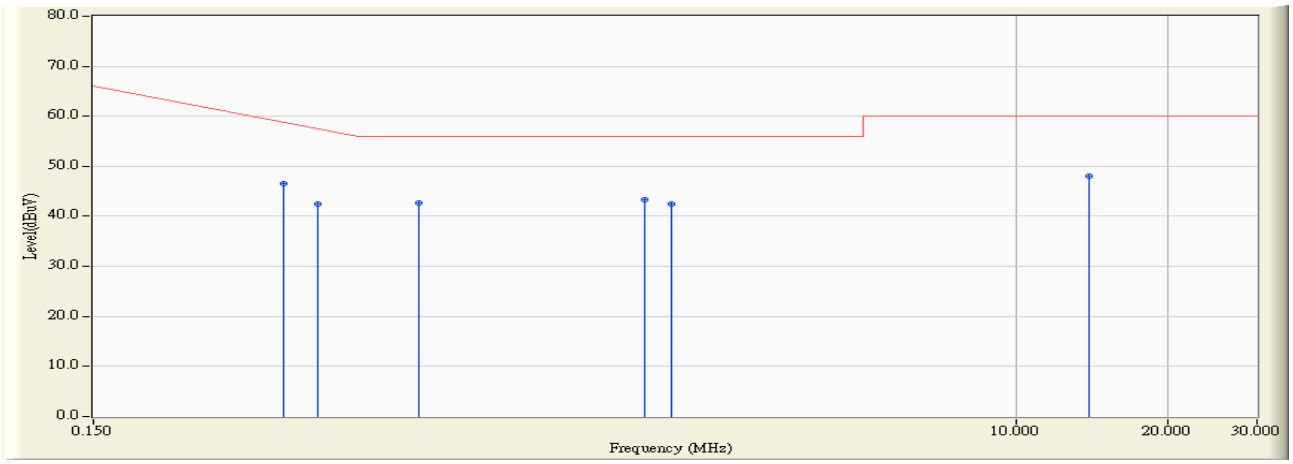
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
(Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Test Result

Site : SR-8	**Time : 2010/07/23 - 17:45**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : ENV216-L1 - Line1	**Power : AC:120V/60Hz**
EUT : Wireless Thin Client (WebPad)	**Note : Mode 1**



Site : SR-8	**Time : 2010/07/23 - 17:49**
Limit : CISPR_B_00M_QP	**Margin : 0**
Probe : ENV216-L1 - Line1	**Power : AC:120V/60Hz**
EUT : Wireless Thin Client (WebPad)	**Note : Mode 1**

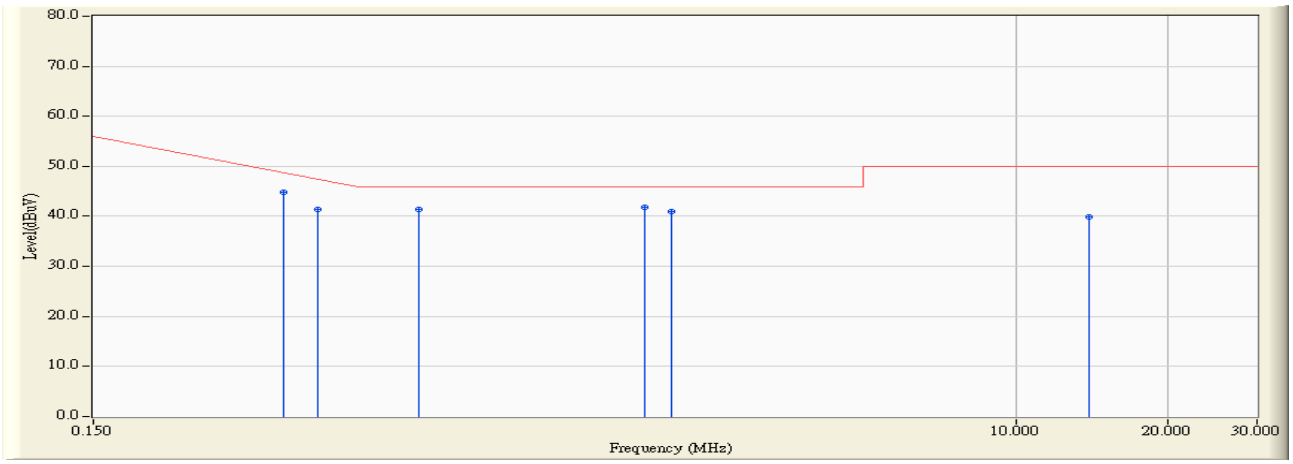


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.357	9.650	36.850	46.500	-13.586	60.086	QUASIPEAK
2		0.418	9.644	32.910	42.554	-15.789	58.343	QUASIPEAK
3		0.658	9.630	33.070	42.700	-13.300	56.000	QUASIPEAK
4		1.852	9.680	33.630	43.310	-12.690	56.000	QUASIPEAK
5		2.091	9.680	32.880	42.560	-13.440	56.000	QUASIPEAK
6	*	13.976	9.950	38.200	48.150	-11.850	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR-8	**Time : 2010/07/23 - 17:49**
Limit : CISPR_B_00M_AV	**Margin : 0**
Probe : ENV216-L1 - Line1	**Power : AC:120V/60Hz**
EUT : Wireless Thin Client (WebPad)	**Note : Mode 1**

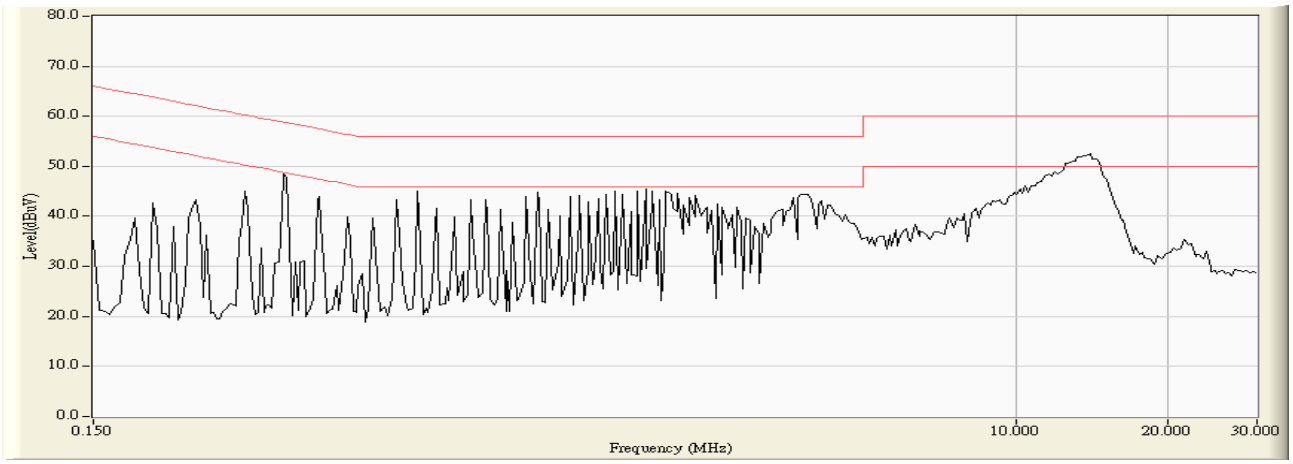


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.357	9.650	35.220	44.870	-5.216	50.086	AVERAGE
2		0.418	9.644	31.850	41.494	-6.849	48.343	AVERAGE
3		0.658	9.630	31.670	41.300	-4.700	46.000	AVERAGE
4	*	1.852	9.680	32.120	41.800	-4.200	46.000	AVERAGE
5		2.091	9.680	31.340	41.020	-4.980	46.000	AVERAGE
6		13.976	9.950	29.850	39.800	-10.200	50.000	AVERAGE

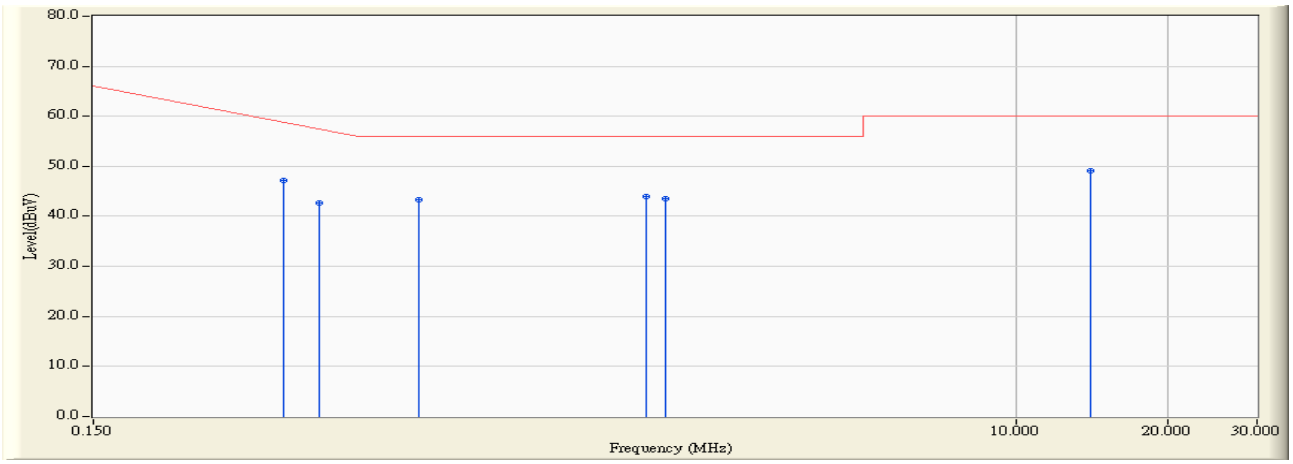
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR-8	**Time : 2010/07/23 - 17:50**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : ENV216-N - Line2	**Power : AC:120V/60Hz**
EUT : Wireless Thin Client (WebPad)	**Note : Mode 1**



Site : SR-8	**Time : 2010/07/23 - 17:54**
Limit : CISPR_B_00M_QP	**Margin : 0**
Probe : ENV216-N - Line2	**Power : AC:120V/60Hz**
EUT : Wireless Thin Client (WebPad)	**Note : Mode 1**

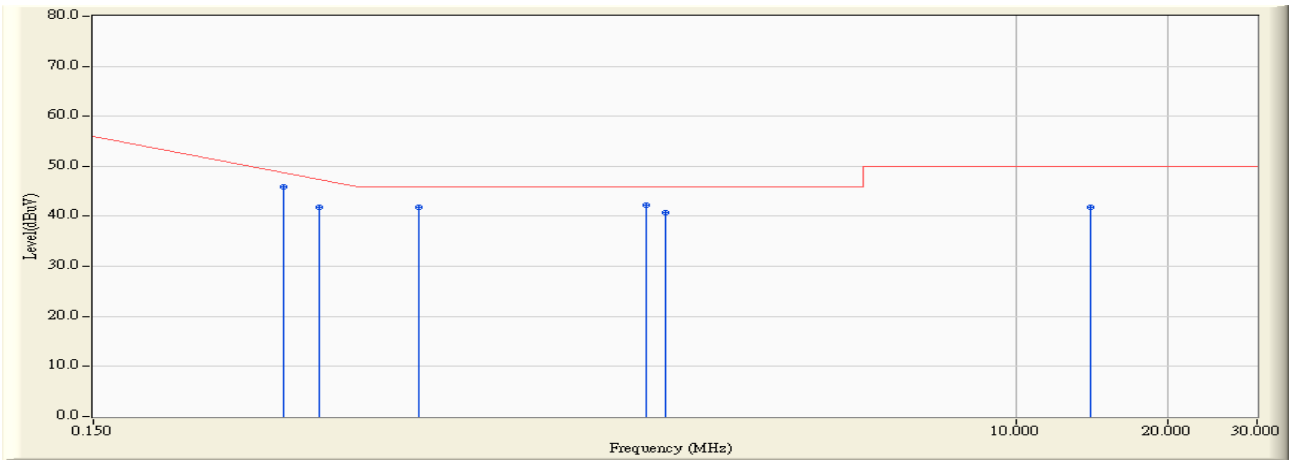


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.357	9.654	37.550	47.204	-12.882	60.086	QUASIPEAK
2		0.419	9.650	33.130	42.780	-15.534	58.314	QUASIPEAK
3		0.658	9.650	33.600	43.250	-12.750	56.000	QUASIPEAK
4		1.853	9.680	34.230	43.910	-12.090	56.000	QUASIPEAK
5		2.031	9.680	33.890	43.570	-12.430	56.000	QUASIPEAK
6	*	14.041	9.960	39.210	49.170	-10.830	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR-8	**Time : 2010/07/23 - 17:54**
Limit : CISPR_B_00M_AV	**Margin : 0**
Probe : ENV216-N - Line2	**Power : AC:120V/60Hz**
EUT : Wireless Thin Client (WebPad)	**Note : Mode 1**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.357	9.654	36.150	45.804	-4.282	50.086	AVERAGE
2		0.419	9.650	32.160	41.810	-6.504	48.314	AVERAGE
3		0.658	9.650	32.130	41.780	-4.220	46.000	AVERAGE
4	*	1.853	9.680	32.470	42.150	-3.850	46.000	AVERAGE
5		2.031	9.680	31.010	40.690	-5.310	46.000	AVERAGE
6		14.041	9.960	31.780	41.740	-8.260	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

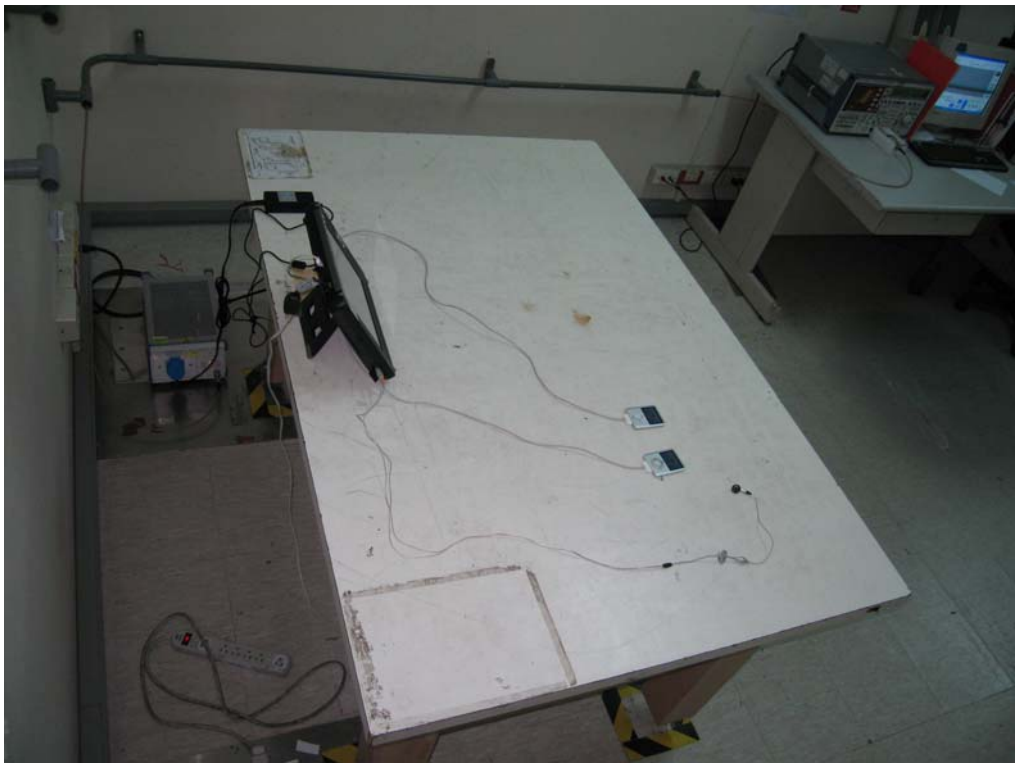
3.6. Test Photograph

Test Mode : Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz)

Description : Front View of Conducted Test

Test Mode : Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz)

Description : Back View of Conducted Test



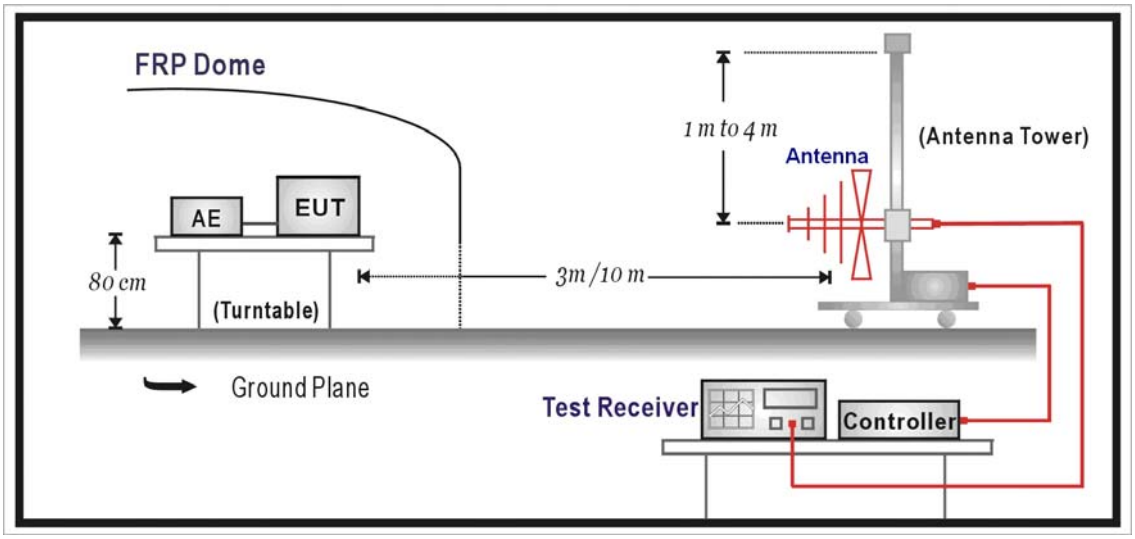
4. Radiated Emission

4.1. Test Specification

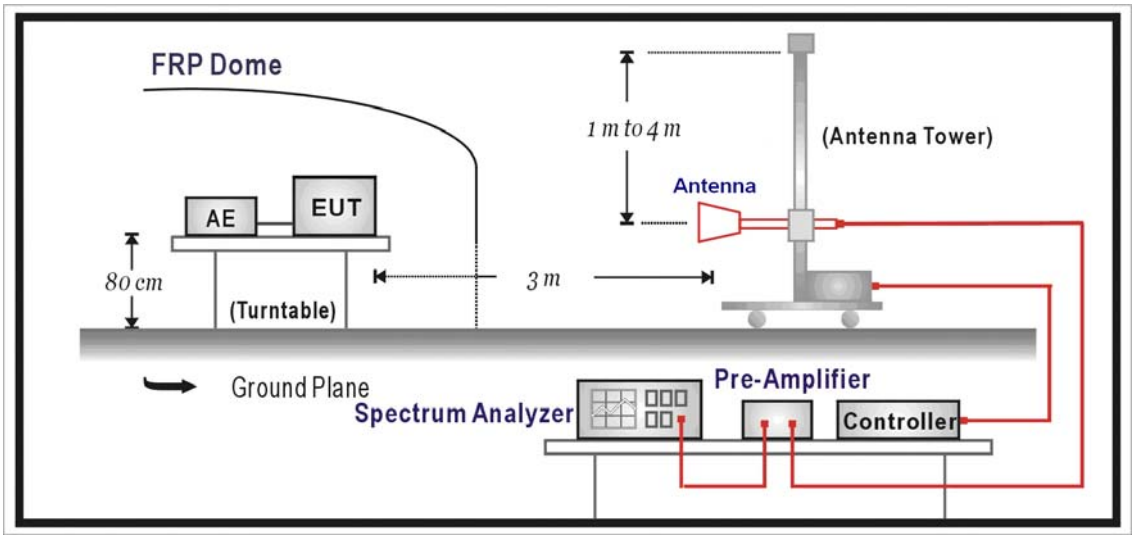
According to EMC Standard : FCC Part 15 Subpart B, ANSI C63.4

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

Under 1GHz test shall not exceed the following value:

Limits		
Frequency (MHz)	Distance (m)	dBuV/m
30 – 230	10	30
230 – 1000	10	37

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Above 1GHz test shall not exceed the following value:

FCC Part 15 Subpart B Paragraph 15.109 Limits (dBuV/m)		
Frequency (MHz)	Distance (m)	dBuV/m
30-88	3	40
88-216	3	43.5
216-960	3	46
Above 960	3	54

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground.

The turn table can rotate 360 degrees to determine the position of the maximum emission level and the antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the folowing table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

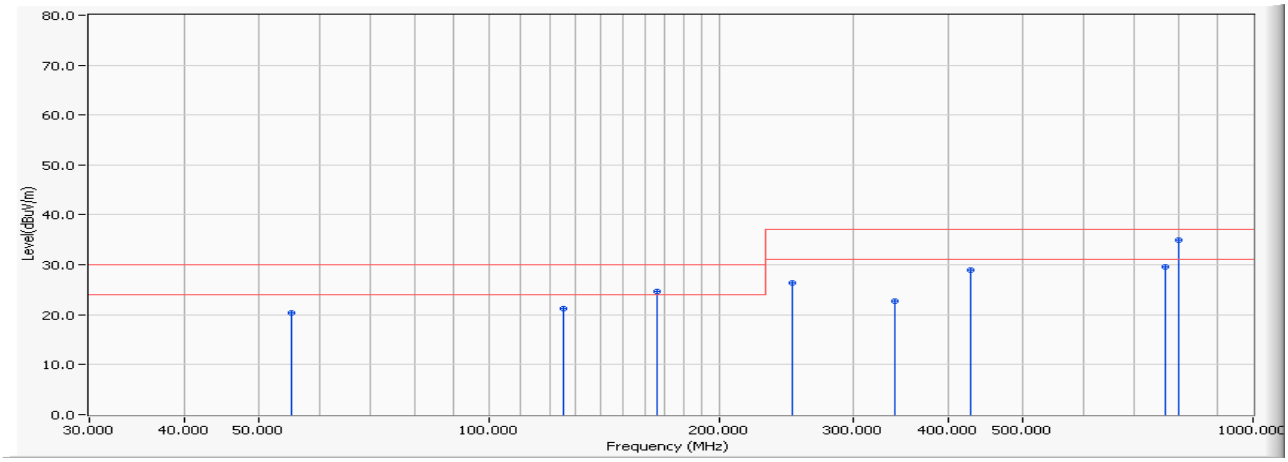
For class A, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 kHz and above 1GHz is 1MHz.

4.5. Test Result

Site : OAST4	**Time : 2010/07/02 - 11:58**
Limit : CISPR_B_10M_QP	**Margin : 6**
EUT : Wireless Thin Client (WebPad)	**Probe : Site4_CBL6112_10M_0811 - HORIZONTAL**
Power : AC 120V/60Hz	**Note : Mode 1**

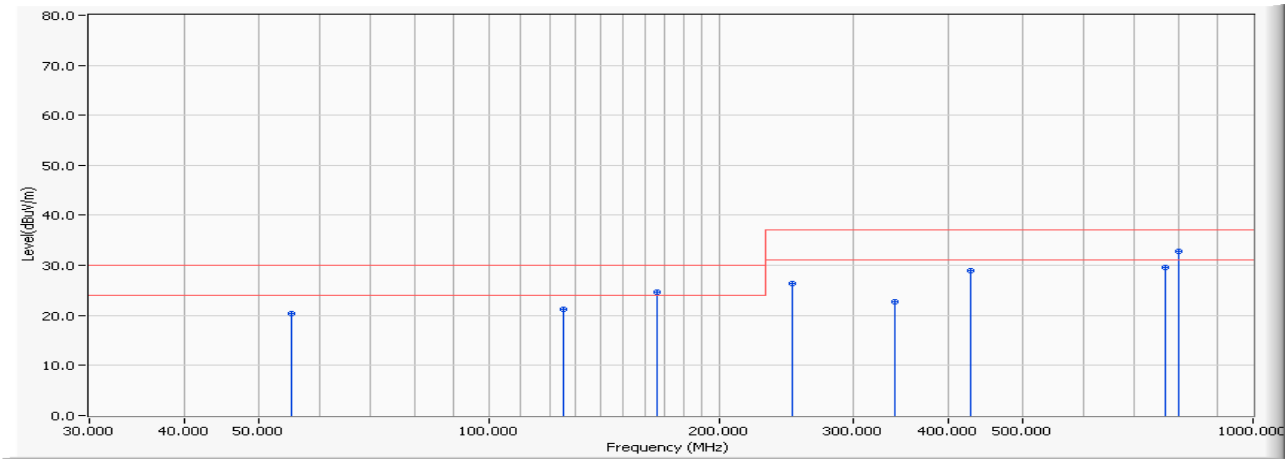


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		55.200	9.317	11.000	20.317	-9.683	30.000	QUASIPEAK
2		125.000	14.972	6.300	21.272	-8.728	30.000	QUASIPEAK
3		165.885	12.957	11.700	24.656	-5.344	30.000	QUASIPEAK
4		250.000	16.088	10.300	26.388	-10.612	37.000	QUASIPEAK
5		339.790	18.568	4.200	22.767	-14.233	37.000	QUASIPEAK
6		427.000	20.746	8.200	28.946	-8.054	37.000	QUASIPEAK
7		767.250	25.991	3.500	29.491	-7.509	37.000	QUASIPEAK
8	*	799.363	26.364	8.500	34.863	-2.137	37.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site : OAST4	**Time : 2010/07/02 - 11:46**
Limit : CISPR_B_10M_QP	**Margin : 6**
EUT : Wireless Thin Client (WebPad)	**Probe : Site4_CBL6112_10M_0811 - HORIZONTAL**
Power : AC 120V/60Hz	**Note : Mode 1**

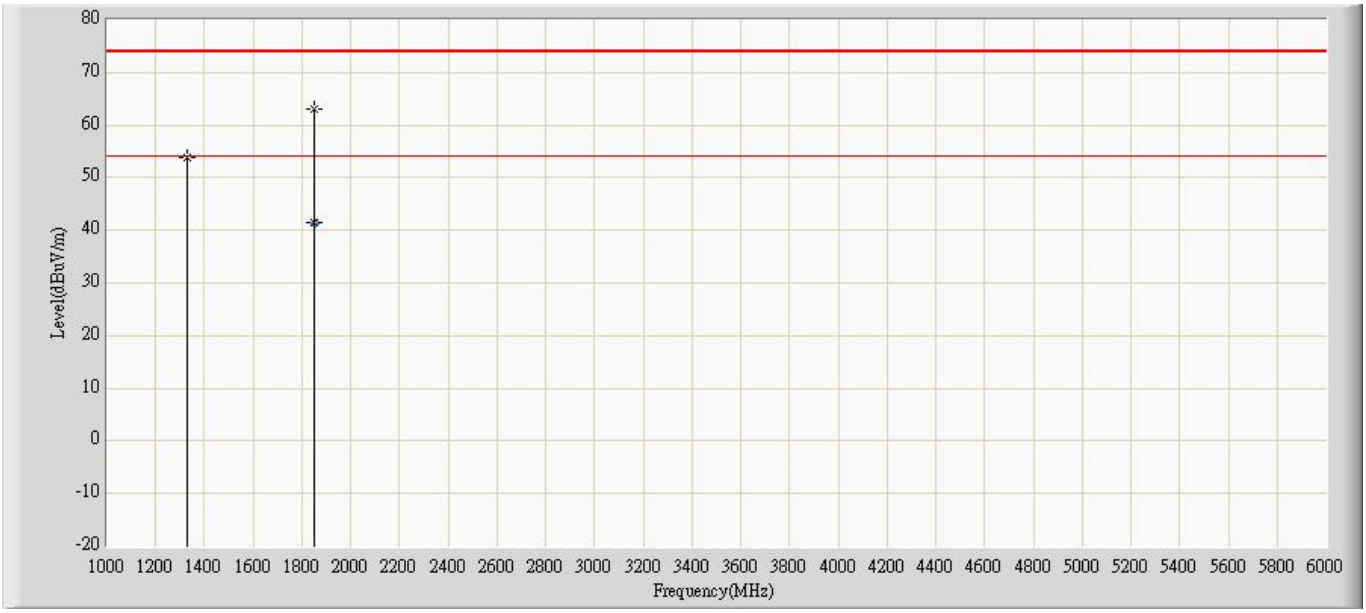


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		55.200	9.317	11.000	20.317	-9.683	30.000	QUASIPEAK
2		125.000	14.972	6.300	21.272	-8.728	30.000	QUASIPEAK
3		165.885	12.957	11.700	24.656	-5.344	30.000	QUASIPEAK
4		250.000	16.088	10.300	26.388	-10.612	37.000	QUASIPEAK
5		339.790	18.568	4.200	22.767	-14.233	37.000	QUASIPEAK
6		427.000	20.746	8.200	28.946	-8.054	37.000	QUASIPEAK
7		767.250	25.991	3.500	29.491	-7.509	37.000	QUASIPEAK
8	*	799.636	26.368	6.500	32.869	-4.131	37.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Site: CB7 (9x6x6_Chamber)	Time: 2010/07/28 - 09:57
Limit: FCC_B_(Above_1G)	Margin: 0
Probe: 9120D_1-18G_Horn	Polarity: Horizontal
EUT : Wireless Thin Client (WebPad)	Power: AC 120V/60Hz
Note : Mode 1	

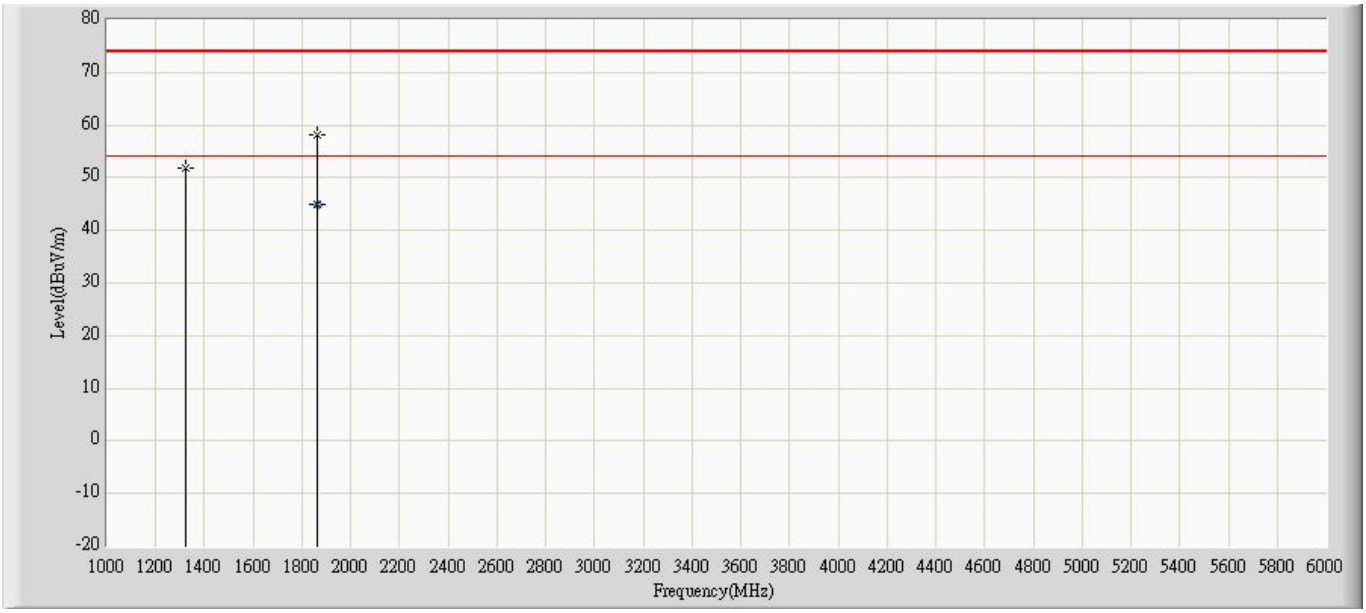


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1331.210	53.797	59.170	-20.203	74.000	-5.373	PK
2	*	1852.420	62.925	66.970	-11.075	74.000	-4.045	PK
3		1852.420	41.625	45.670	-12.375	54.000	-4.045	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Site: CB7 (9x6x6_Chamber)	Time: 2010/07/28 - 09:59
Limit: FCC_B_(Above_1G)	Margin: 0
Probe: 9120D_1-18G_Horn	Polarity: Vertical
EUT : Wireless Thin Client (WebPad)	Power: AC 120V/60Hz
Note : Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1321.580	51.804	57.210	-22.196	74.000	-5.405	PK
2		1862.310	58.254	62.290	-15.746	74.000	-4.036	PK
3	*	1862.310	44.874	48.910	-9.126	54.000	-4.036	AV

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

4.6. Test Photograph

Test Mode : Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz)

Description : Front View of Radiated Test

Test Mode : Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz)

Description : Back View of Radiated Test

Test Mode : Mode 1: Intel (R) Atem (TM) CPU Z530 @1.6GHz(1024*768/60Hz)

Description : Front View of High Frequency Radiated Test

5. Attachment

➢ EUT Photograph

(1) EUT Photo

(2) EUT Photo

(3) EUT Photo

(4) EUT Photo

(5) EUT Photo

(6) EUT Photo

(7) EUT Photo

(8) EUT Photo

(9) EUT Photo

(10) EUT Photo

(11) EUT Photo

(12) EUT Photo