



Test Report



Applicant :	KOUKAAM a.s.
Address of Applicant :	Kaplanova 2252/8, 148 00 Prague 4, Czech Republic
Equipment Under Test :	NVR (Network Video Recorder)
Model Number :	KNR-090
Series :	N/A

Matrix Test Laboratory
2F, No.146, Jian Yi Rd., Chung-Ho City,
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Verification

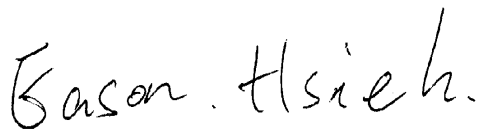
Applicant :	KOUKAAM a.s.
Manufacturer :	KOUKAAM a.s.
Equipment Under Test :	NVR (Network Video Recorder)
Model Number :	KNR-090
Series :	N/A
Sample Received Date :	2010-07-15
Test Standards :	<input checked="" type="checkbox"/> FCC Part 15 B and CISPR 22 Class B

Remark

This report details the results of the test carried out on one sample. The test results are contained in this test report and Matrix Test Laboratory assumes full responsibility for the accuracy and completeness of these tests. This report shows the EUT is technically compliant with FCC Part 15 B and CISPR 22 Class B official requirements. This report applies to the above sample only and shall not be reproduced in part without written approval of Matrix Test Laboratory.



Documented by: _____ **Date:** 2010-08-06
Jody Peng/ ADM. Dept Staff



Tested by: _____ **Date:** 2010-08-05
Eason Hsieh/ ENG. Dept. Staff



Approved by: _____ **Date:** 2010-08-06
Peter Chin/ Head of Laboratory

Summary of Test Result

Emission			
Test Standard	Test Item	Test Result	Remark
FCC Part15B CISPR22 Class B	Conducted Emission	Pass	Highest Emission L: 0.176MHz, Q.P.54.01dBuV, Margin -10.67 dB, N: 0.510MHz, Q.P.45.71dBuV, Margin -10.29 dB, A.V.35.54dBuV, Margin -10.46 dB,
FCC Part15B CISPR22 Class B	Radiated Emission	Pass	Highest Emission H: 652.74MHz, 35dBuV, Margin-2.00 dB Antenna Height 1.5 m, Turntable Angle 170° V: 903MHz, 35.61dBuV, Margin-1.39 dB Antenna Height 1.5 m, Turntable Angle 180°

1 General Description

1.1 Description of EUT

Equipment Under Test	:	NVR (Network Video Recorder)
Model Number	:	KNR-090
Series	:	N/A
Applicant Address of Applicant	:	KOUKAAM a.s. Kaplanova 2252/8, 148 00 Prague 4, Czech Republic
Manufacturer Address of Manufacturer	:	KOUKAAM a.s. Kaplanova 2252/8, 148 00 Prague 4, Czech Republic
Power Supply	:	<p>Switch Adapter Manufacturer: Sunny Model No.: Sys1308-2412-W2E Part No.: SYS1308-2412 EMC Approval: FCC Input: 100-240Vac, 1A, 60 / 50Hz Output: 12Vdc, 2A Power Cord: 2 Pin</p> <p> <input type="checkbox"/>Shielded <input checked="" type="checkbox"/>Non-Shielded <input checked="" type="checkbox"/>Detachable, 1.8m <input type="checkbox"/>Un-Detachable <input type="checkbox"/>w Ferrite Core <input checked="" type="checkbox"/>w/o Ferrite Core </p>
Data Cable	:	<p><input checked="" type="checkbox"/>RJ45 Cable</p> <p> <input type="checkbox"/>Shielded <input checked="" type="checkbox"/>Non-Shielded <input checked="" type="checkbox"/>Detachable, 1.5m <input type="checkbox"/>Un-Detachable <input type="checkbox"/>w Ferrite Core <input checked="" type="checkbox"/>w/o Ferrite Core </p>
Description of EUT	:	<p>Dimensions : 145 cm (L) X 21 cm (W) X 4 cm (H) Weight : 600 g Position : <input checked="" type="checkbox"/>Table-top / <input type="checkbox"/>Floor-standing Intended Function : The EUT is a NVR (Network Video Recorder).</p>

1.2 Test Instruments

Instruments Used for Emission Measurement

Instrument	Manufacturer	Model	Serial No.	Calibration Date	Application
L.I.S.N.	Mess Tec	NNB-2/16Z	03/1006	2010-05-12	Conducted Emission
L.I.S.N.	EMCIS	LN2-16	LN04023	2010-02-08	Conducted Emission
Pulse Limiter	Mess Tec	PL10	N/A	2009-12-16	Conducted Emission
RF Cable	N/A	N/A	N/A	2010-06-25	Conducted Emission
EMI Receiver	R&S	ESCI	100615	2010-03-03	Conducted Emission Radiated Emission
Bilog Antenna	Teseq GmbH	CBL6111D	25769	2010-03-03	Radiated Emission
Pre-Amplifier	Schaffner	CPA9231A	N/A	2009-07-20	Radiated Emission
Spectrum Analyzer	HP	8595E	3829A03763	2009-07-19	Radiated Emission
Spectrum Analyzer	R & S	FSL6	100564	2009-12-05	Radiated Emission
RF Cable	MIYAZAKI	8D-F8	N/A	2009-07-20	Radiated Emission

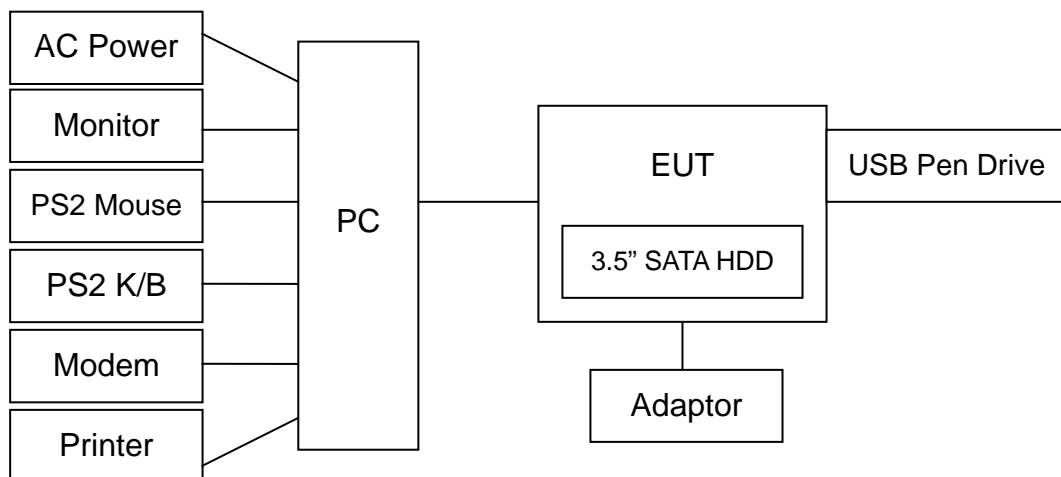
Note: The instruments listed above are within their calibration period of 1 year.

1.3 Auxiliary Equipments

Provided by Matrix Test Lab.

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Power Cord
1.	PC No.7	HP Pavilion T278D	TWL33500K2	FCC, BSMI	HP	Non-shielded, Detachable, 1.5m
2.	Monitor No. 1	E2210Hc	CN-0G337R-6418 0-021-0FNL	CE FCC BSMI	DELL	VGA CABLE Shielded, Detachable, 1.5m, With Core DVI CABLE Shielded, Detachable, 1.5m, With Core
3.	PS2 Key Board No. 2	Y-SU61	BT911DG4374	CE, FCC	LOGITECH	PS2 CABLE Non-shielded, Un-detachable, 1.7m, Without Core
4.	PS2 Mouse No. 2	M-SBF96	HC9070E036B	CE FCC	LOGITECH	PS2 CABLE Non-shielded, Un-detachable, 1.8m, Without Core
5.	Printer No. 1	EPSON STYLUS C61	EK5Y014949	3912E328	EPSON	PRINTER CABLE Non-shielded, Detachable, 1.8M
6.	Modem No. 1	1456VQE-C	1234A36998	3882B582	LEMEL	RS-232 CABLE Non-shielded, Detachable, 3M
7.	Pen Drive No. 12	SDK-USM8GL(B) 09728KEDV	N/A	CE, FCC	SONY	N/A
8.	3.5" SATA HDD No. 3	WD1600AAJS-OOB4A O	WCAT20009583	CE, BSMI	WD	N/A

1.4 Block Diagram



1.5 Identifying the Final Test Mode (Worst Case)

1. Standby Mode
2. Operation Mode

Note: After pre-test, we identified that the Operation Mode (the worst case) was most likely to cause maximum disturbance. Therefore, the Final Test was performed for the worst case.

1.6 Final Test Mode

Operation Mode

1.7 Condition of Power Supply

AC 110V, 60Hz

1.8 EUT Configuration

1. Setup the EUT and peripheral as shown in Section 1.4.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode.

1.9 Test Facility

Site Description	:	All tests are completed by Matrix Test Laboratory. Radiated emission is performed at HongAn's open-site.
Name of Firm	:	Matrix Test Laboratory
Site Location	:	2F, No.146, Jian Yi Rd., Chung-Ho City, Taipei Hsien, Taiwan, R.O.C.

1.9.1 Test Methodology

Both Conducted and Radiated Emission Tests were performed according to the procedures stated in FCC Part15 B Sec. 15.31. Radiated Emission Test was performed at 10 m distance from the antenna to EUT.

2 Conducted Emission Test

2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

2.2 Test Arrangement and Procedure

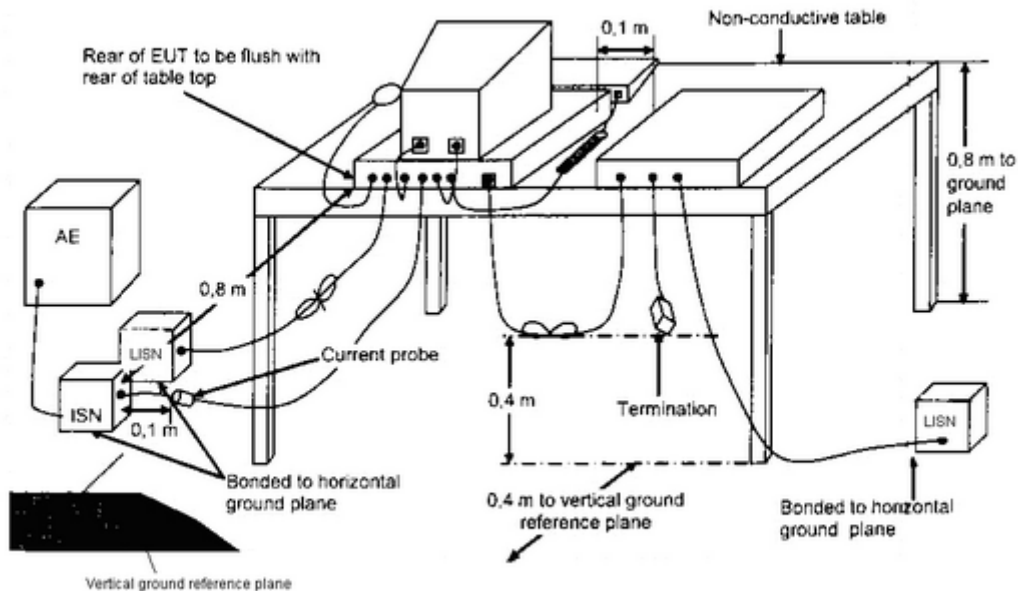


Table-top Equipment

- The EUT was placed on a non-conductive table which was 80 cm above the horizontal coupling plane. The rear of the EUT was 40 cm from the vertical coupling plane.
- The excess interface cables were folded at the cable center into a bundle no longer than 40 cm, so that the bundles were on the table.
- The EUT was connected to the main power through a L.I.S.N. This set up provided 50 ohm / 50 μ H coupling impedance for the measuring equipment.
- All auxiliary equipment received power from a second L.I.S.N.
- The conducted emissions were measured between the Line Phase and the PE ground and between the Neutral Phase and the PE ground using an EMI Receiver.
- The values were recorded.

2.3 Conducted Limit CISPR 22 / FCC Part 15 B

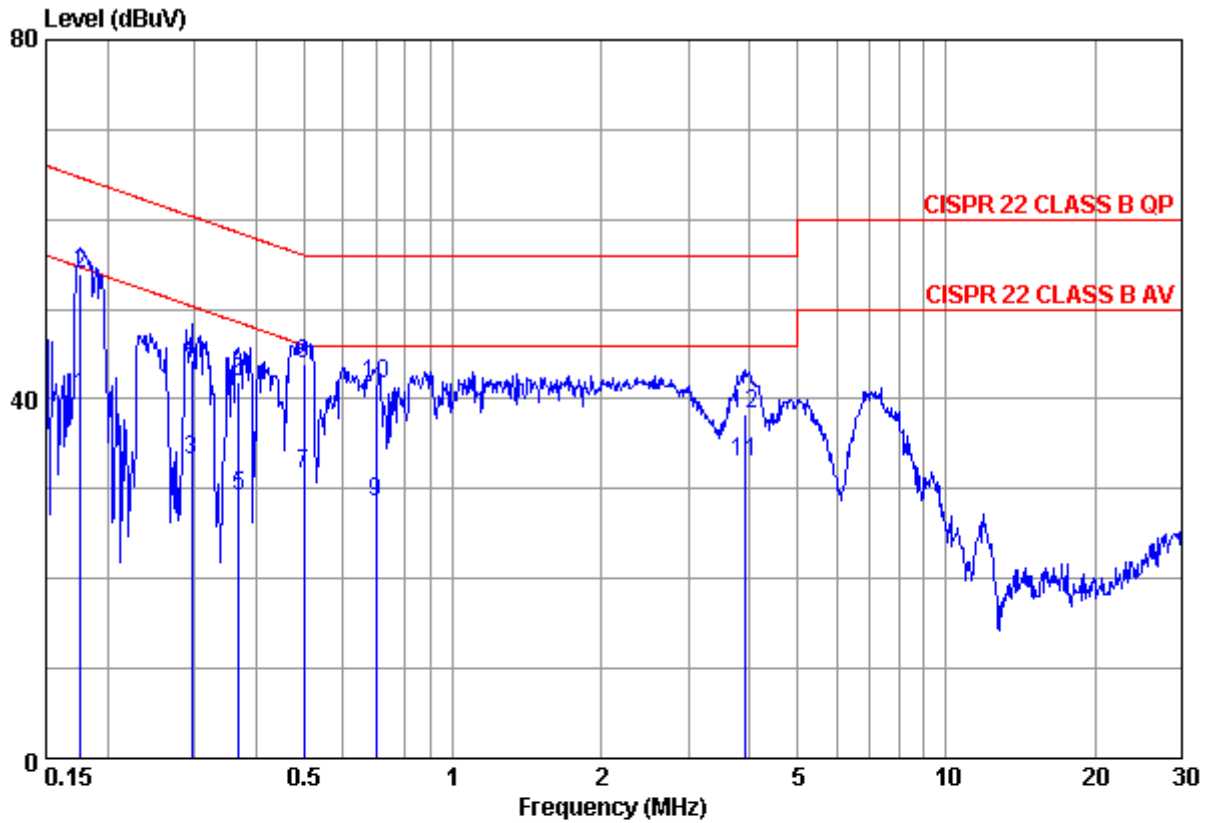
Frequency (MHz)	<input type="checkbox"/> Class A		<input checked="" type="checkbox"/> Class B	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	79	66	66 to 56	56 to 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30	73	60	60	50

2.4 Test Result**PASS**

The final tests data are shown on the following page(s).

Power Line Conducted Test Data

Test Date : 2010-07-20 Power Line : Line
 Temperature : 29°C Humidity : 30%



	Freq	Level	Read Level	Over Level	Limit Line	Factor	Remark
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV	
1	0.176	40.44	30.39	-14.24	54.68	10.05	Average
2	@ 0.176	54.01	43.96	-10.67	64.68	10.05	QP
3	0.296	33.19	23.15	-17.18	50.37	10.04	Average
4	0.296	44.42	34.38	-15.95	60.37	10.04	QP
5	0.369	29.08	19.04	-19.44	48.52	10.04	Average
6	0.369	41.92	31.88	-16.60	58.52	10.04	QP
7	0.499	31.64	21.59	-14.37	46.01	10.05	Average
8	0.499	43.90	33.85	-12.11	56.01	10.05	QP
9	0.701	28.60	18.54	-17.40	46.00	10.06	Average
10	0.701	41.62	31.56	-14.38	56.00	10.06	QP
11	* 3.901	32.91	22.86	-13.09	46.00	10.05	Average
12	3.901	38.44	28.39	-17.56	56.00	10.05	QP

Level(dBuV) = Read Level(dBuV) + Factor(dBuV)
 Factor(dBuV) = LISN Factor(dBuV) + Cable Loss + PLUSE Limiter(dBuV)

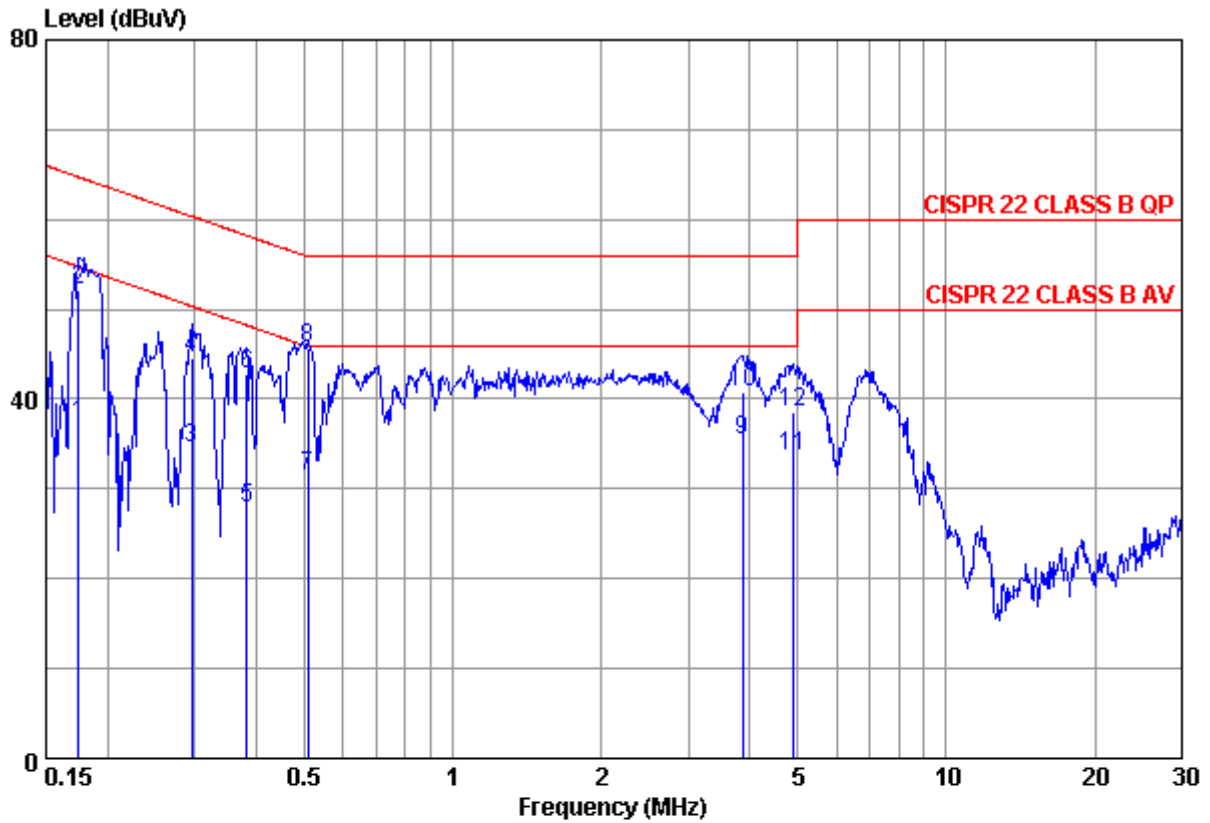
@ :Maximum QP * :Maximum AVG x :Over Limit ! :Over Margin
 Red Point(or Red Trace) For Average Detector
 Green Point(or Green Trace) For Quasipeak Detector

Receiver : R&S ESCI
 LISN : MessTec NNB - 2/16 Z
 Pluse Limiter : MessTec PL10

Remark : All readings are Quasi-Peak and Average values.

Power Line Conducted Test Data

Test Date : 2010-07-20 Power Line : Neutral
 Temperature : 29°C Humidity : 30%



	Freq	Level	Read Level	Over Level	Limit Line	Factor	Remark
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV	
1	0.175	37.32	27.14	-17.40	54.72	10.18	Average
2	0.175	52.24	42.06	-12.48	64.72	10.18	QP
3	0.296	34.52	24.34	-15.85	50.37	10.18	Average
4	0.296	44.62	34.44	-15.75	60.37	10.18	QP
5	0.383	27.89	17.71	-20.32	48.21	10.18	Average
6	0.383	42.83	32.65	-15.38	58.21	10.18	QP
7	0.510	31.39	21.20	-14.61	46.00	10.19	Average
8	@ 0.510	45.71	35.52	-10.29	56.00	10.19	QP
9	* 3.860	35.54	25.35	-10.46	46.00	10.19	Average
10	3.860	40.68	30.49	-15.32	56.00	10.19	QP
11	4.874	33.55	23.39	-12.45	46.00	10.16	Average
12	4.874	38.50	28.34	-17.50	56.00	10.16	QP

Level(dBuV) = Read Level(dBuV) + Factor(dBuV)
 Factor(dBuV) = LISN Factor(dBuV) + Cable Loss + PLUSE Limiter(dBuV)

@ :Maximum QP * :Maximum AVG x :Over Limit ! :Over Margin
 Red Point(or Red Trace) For Average Detector
 Green Point(or Green Trace) For Quasipeak Detector

Receiver : R&S ESCI
 LISN : MessTec NNB - 2/16 Z
 Pluse Limiter : MessTec PL10

Remark : All readings are Quasi-Peak and Average values.

3 Radiated Emission Test

3.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

3.2 Test Configuration and Procedure

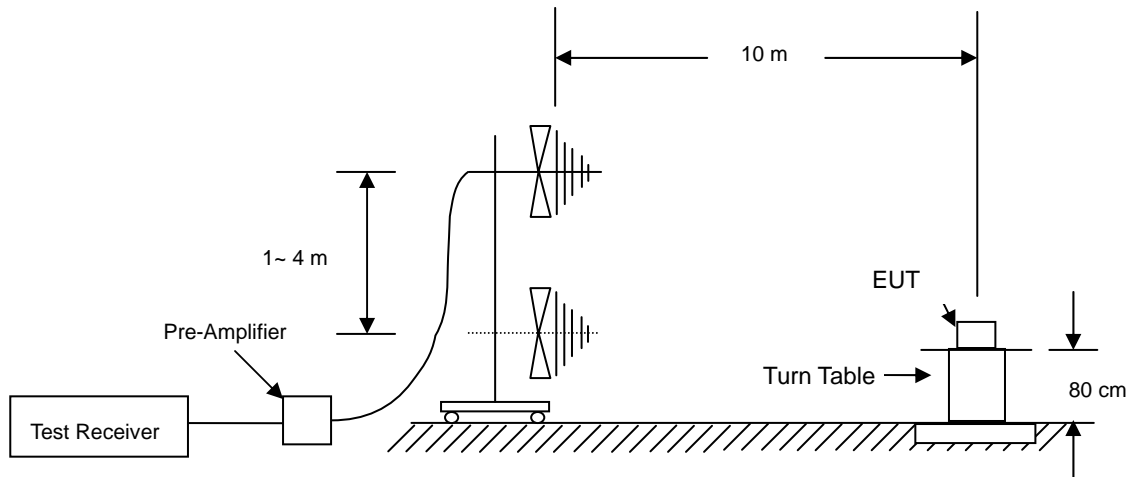


Table-top Equipment

- The EUT was placed on a non-conductive turntable which was 80cm above the horizontal ground plane. The EUT was set 10m away from the receiving antenna that was mounted on a non-conductive mast.
- Main cables draped to the ground plane and were routed to the mains power outlet. The mains power outlet was bonded to and did not protrude above the ground plane.
- The antenna was adjusted between 1m and 4m in height above the ground plane and the Antenna-to-EUT azimuth was also varied during the measurements to find the top 6 maximum meter readings within the frequency range limit as indicated in Sec 3.3.
- The radiated emissions were measured when the Antenna-to-EUT polarization was set horizontally and vertically.
- The values were recorded.

3.3 Radiated Limit

FCC Part 15 B

Frequency (MHz)	<input type="checkbox"/> Class A (10m)		<input type="checkbox"/> Class B (3m)	
	Field Strength ($\mu\text{V/m}$)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)	Field Strength ($\mu\text{V/m}$)	Quasi-Peak ($\text{dB}\mu\text{V/m}$)
30 ~ 88	90	39.08	100	40.00
88 ~ 216	150	43.52	150	43.52
216 ~ 960	210	46.44	200	46.02
Above 960	300	49.54	500	53.98

Emission Level ($\text{dB}\mu\text{V/m}$) = $20 \text{ Log Emission Level } (\mu\text{V/m})$

CISPR 22

	<input type="checkbox"/> Class A (10m)	<input checked="" type="checkbox"/> Class B (10m)
Frequency (MHz)	Quasi-Peak (dB μ V/m)	Quasi-Peak (dB μ V/m)
30 ~ 230	40.0	30.0
230 ~ 1000	47.0	37.0

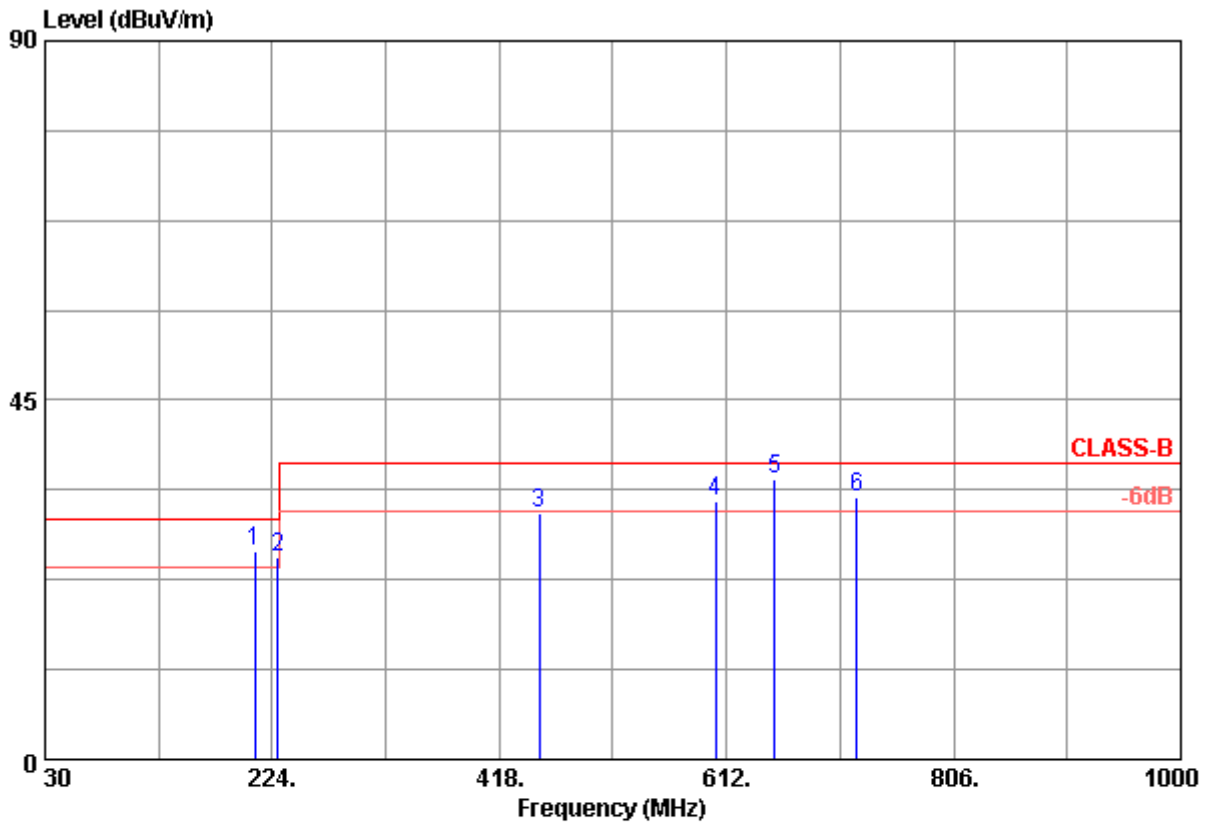
3.4 Test Result

PASS

The final tests data are shown on the following page(s).

Radiated Emission Test Data

Test Date : 2010-08-05 Polarization : Horizontal
 Temperature : 27°C Humidity : 36%



Freq	Level	Read Level	Over Level	Limit Line	Factor	A/pos	T/pos	Remark
MHz	dBuV	dBuV	dBuV	dBuV	dBuV			
1 ! 209.450	26.17	44.83	-3.83	30.00	-18.66	100	10	
2 ! 228.850	25.43	45.02	-4.57	30.00	-19.59	100	10	
3 451.950	30.78	45.66	-6.22	37.00	-14.88	150	100	
4 ! 602.300	32.33	44.13	-4.67	37.00	-11.80	150	170	
5 @ 652.740	35.00	46.01	-2.00	37.00	-11.01	150	170	
6 ! 723.550	32.89	42.29	-4.11	37.00	-9.40	150	200	

Level(dBuV) = Read Level(dBuV) + Factor(dBuV)
 Factor(dBuV) = Antenna Factor(dBuV) + Cable Loss(dBuV) + Preamp(dBuV)

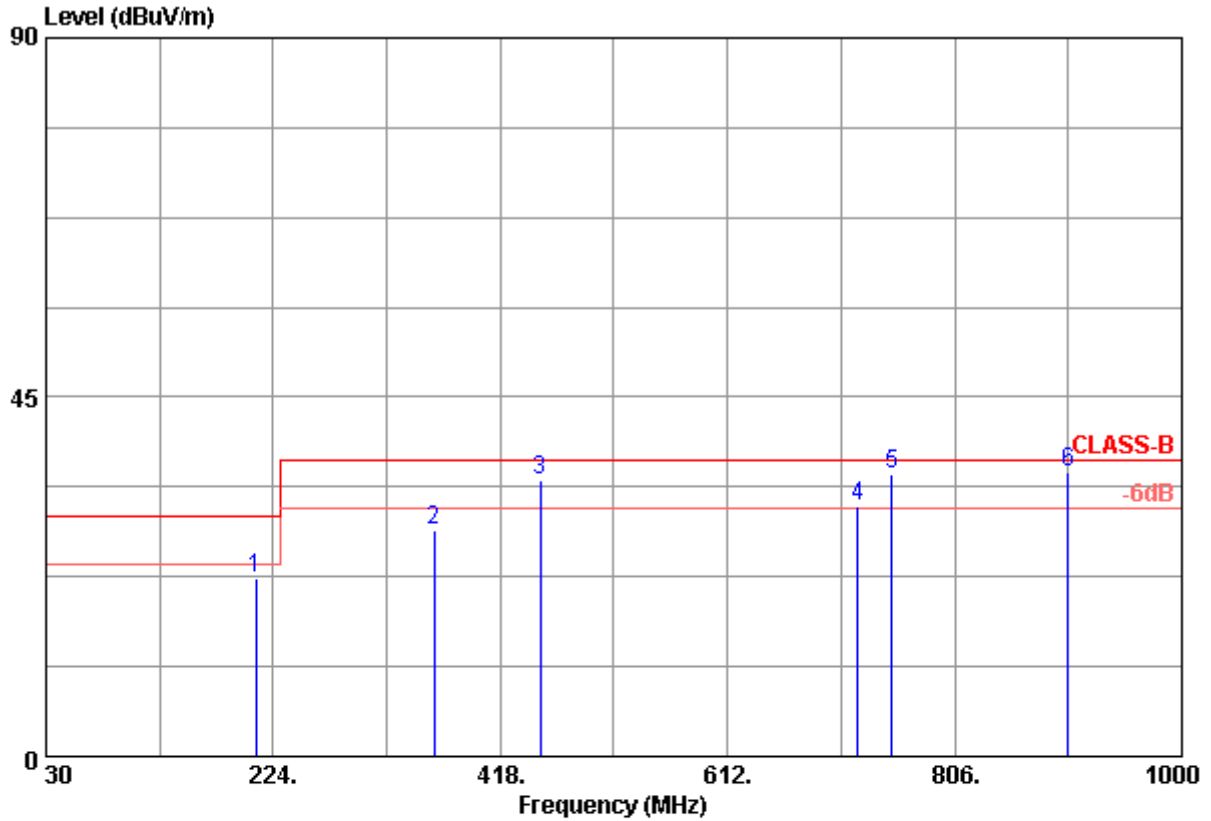
@ :Maximum Data x :Over Limit ! :Over Margin

SPECTRUM : hp 8590L
 ANTENNA & TABLE CONTROLLER : CM886(1.00)

Remark : All readings are Quasi-Peak values.

Radiated Emission Test Data

Test Date : 2010-08-05 Polarization : Vertical
 Temperature : 27°C Humidity : 36%



	Freq	Level	Read Level	Over Level	Limit Line	Factor	A/pos	T/pos	Remark
	MHz	dBuV	dBuV	dBuV	dBuV	dBuV			
1	209.450	22.38	41.04	-7.62	30.00	-18.66	150	10	
2	361.740	28.31	44.65	-8.69	37.00	-16.34	100	80	
3	! 451.950	34.55	49.43	-2.45	37.00	-14.88	150	100	
4	! 723.550	31.26	40.66	-5.74	37.00	-9.40	150	200	
5	! 752.650	35.46	44.62	-1.54	37.00	-9.16	100	180	
6	@ 903.000	35.61	42.75	-1.39	37.00	-7.14	150	180	

Level(dBuV) = Read Level(dBuV) + Factor(dBuV)
 Factor(dBuV) = Antenna Factor(dBuV) + Cable Loss(dBuV) + Preamp(dBuV)

@ :Maximum Data x :Over Limit ! :Over Margin

SPECTRUM : hp 8590L
 ANTENNA & TABLE CONTROLLER : CM886(1.00)

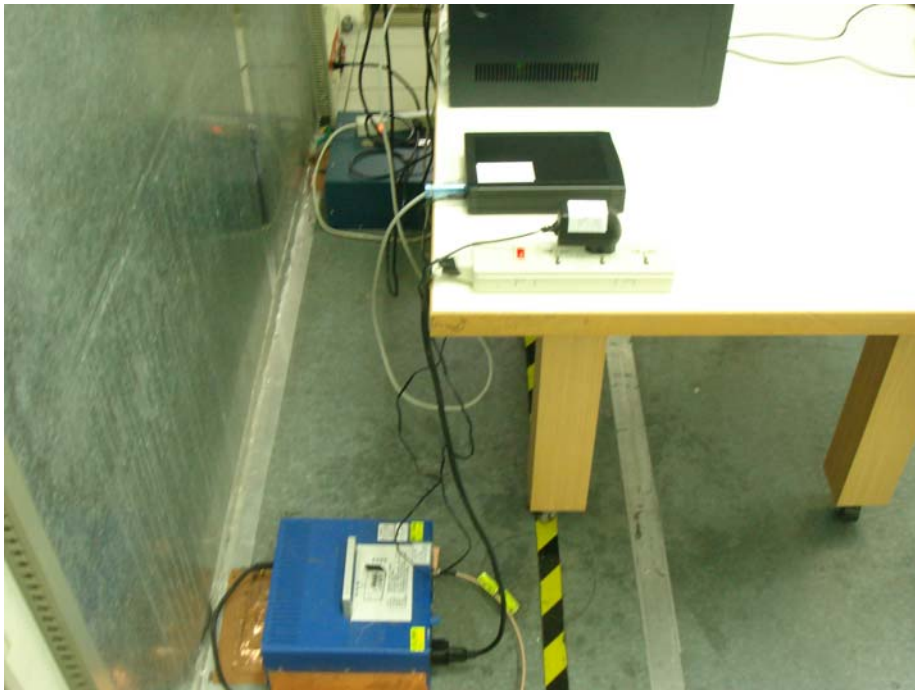
Remark : All readings are Quasi-Peak values.

4 Photographs of Test

4.1 Conducted Emission Test



Front View



Rear View

4.2 Radiated Emission Test



Front View



Rear View

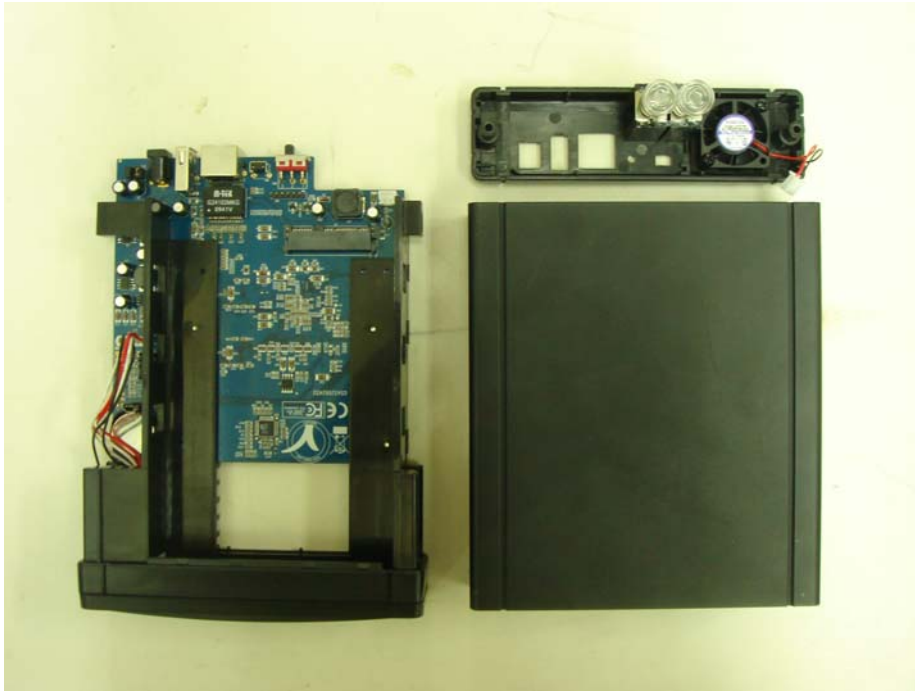
5 Photographs of EUT



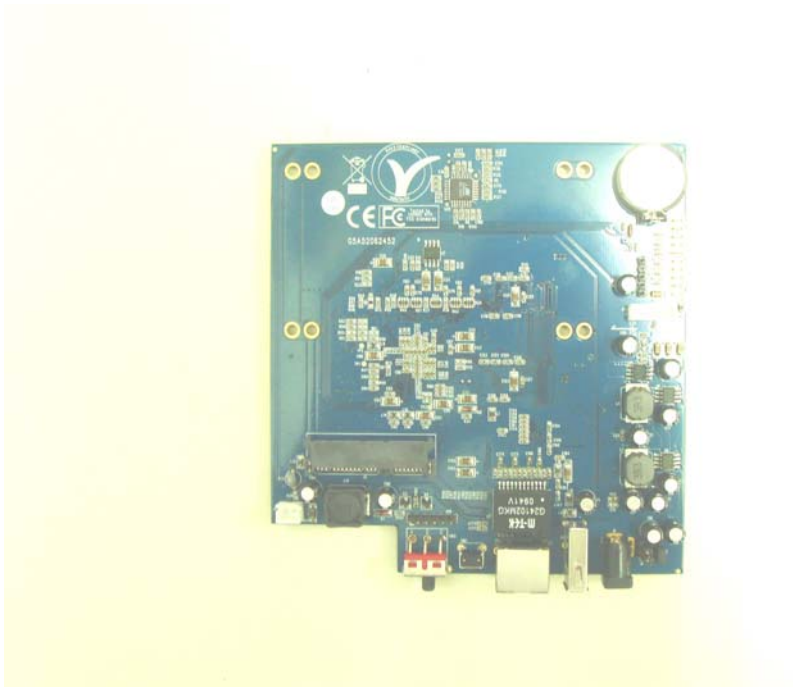
Front View of the EUT



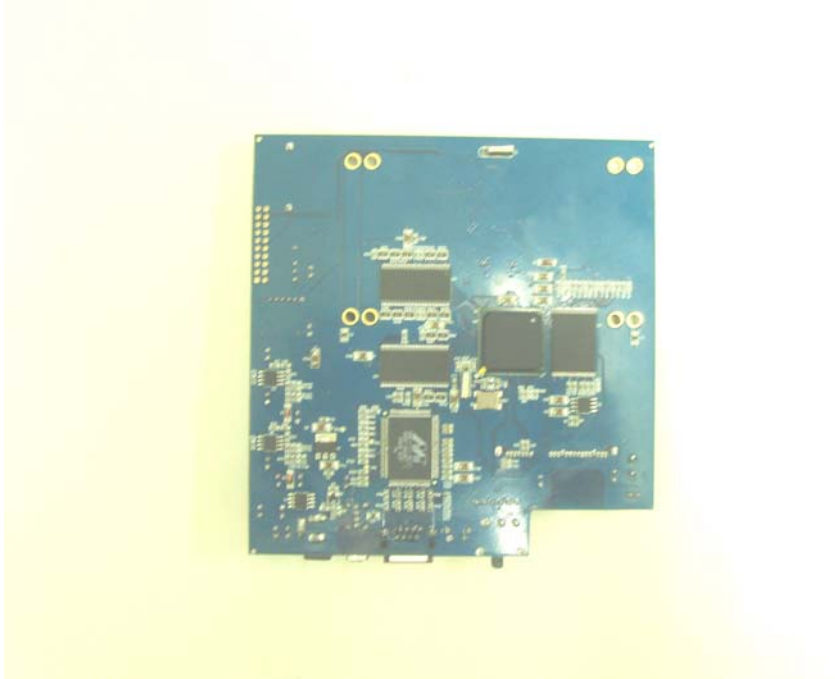
Rear View of the EUT



Inside View of the EUT



Front View of the PCB



Rear View of the PCB



View of the EUT's Adapter



View of the EUT's Fan



View of the RJ45 Cable