SK TECH CO., LTD.

FCC-Certificate of Compliance

Test Report No.:	**SKTFCE-070227-026**		
NVLAP CODE :	**200220-0**		
Applicant:	**Woo Young Telecom Co., Ltd.**		
Applicant Address:	222-6, Suwolam-ri, Seotan-myeon, Pyeongtaek-si, Gyeonggi-do, 451-852, Rep. of Korea.		
Manufacturer :	**Woo Young Telecom Co., Ltd.**		
Manufacturer Address:	222-6, Suwolam-ri, Seotan-myeon, Pyeongtaek-si, Gyeonggi-do, 451-852, Rep. of Korea.		
Product:	**LCD Monitor**		
FCC ID:	**PXWHL910A**	**Model No.:**	HL910A, Q99D, HL910
Receipt No.:	SKTEU07-0154	**Date of receipt:**	Feb. 23, 2007
Date of Issue:	Feb. 27, 2007		
Testing location:	**SK TECH CO., LTD.** 820-2, Wolmoon-Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea		
Test Standards:	**ANSI C63.4 / 2003**		
Rule Parts:	**FCC part 15 Subpart B, CISPR 22**		
Equipment Class :	**Class B Digital Device Peripheral**		
Test Result:	The above mentioned product has been tested and passed.		

Prepared by: *S.Y.Ye*	**Tested by**:*H.P.Kim/Engineer*	**Approved by**: *D.H.Kang /Manager& Chief Engineer*
Signature *Date*	*Signature* *Date*	*Signature* *Date*
Other Aspects :		
Abbreviations :	**· OK, Pass = passed · Fail = failed · N/A = not applicable**	

☞
- **•This test report is not permitted to copy partly without our permission.**
- **•This test result is dependent on only equipment to be used.**
- **•This test result is based on a single evaluation of one sample of the above mentioned.**
- **•This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S Government.**
- **• We certify that this test report has been based on the measurement standards that is traceable to the national or International standards.**
- **• This test report is the accredited testing items by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.**

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NVLAP Lab. Code: 200220-0

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1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. All measurements reported herein were performed by SK TECH Co., Ltd. and were made under Chief Engineer's supervision.
We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

SK TECH Co., Ltd.

2.1 Location

820-2, Wolmoon Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea

The test site is in compliance with ISO/IEC 17025 for general requirements for the competence of testing and calibration laboratories.
This laboratory is recognized as a Conformity Assessment Body(CAB) for CAB's Designation Number: **KR0007** by FCC, is accredited by NVLAP for NVLAP Lab. Code : **200220-0** and DATech for DAR-Registration No.:**DAT-P-076/97-01** and KOLAS for Accreditation No.:**KT191.**

2.2 List of Test and Measurement Instruments

Table 1 : List of Test and Measurement Equipment

- **Conducted Disturbance**

Kind of Equipment	Type	S/N	Calibrated until
EMI Receiver	ESHS10	835871/002	09.2007
Artificial Mains Network	ESH2-Z5	834549/011	07.2007

- **Radiated Disturbance**

Kind of Equipment	Type	S/N	Calibrated until
EMI Receiver	ESIB40	100277	02.2008
Amplifier	8447F	3113A05153	07.2007
Trilog-Broadband Antenna	VULB9168	9168-230	07.2007
Antenna Turntable Driver	5907	91X518	N/A
Antenna Turntable controller	5906	91X519	N/A

2.3 Test Date

Date of Application : Feb. 23, 2007

Date of Test : Feb. 23, 2007 ~ Feb. 26, 2007

2.4 Test Environment

See each test item's description.

3. Description of the tested samples

The EUT is a LCD Monitor.

HL910A is basic model, HL910D is multi listing model, and Q99D is buyer model name.

3.1 Rating and Physical Characteristics

MODEL		**HL910A**
PANEL	Type	TFT active matrix
	Size	19 inch
		376.32 X 301.056(mm)
	Pixel Pitch	0.294 x 0.294(mm)
	Display Color	8 bit (16,777,216 colors)
Frequency	Horizontal	Analog:31.5 ~ 80 KHz/ Digital:31 ~ 64 KHz
	Vertical	Analog: 56 ~75 Hz/ Digital: 59~61Hz
Display Resolution	Basic	1280 x 1024@ 60 Hz
	Maximum	Analog :1280 x 1024 @75 Hz, Digital : 1280 x 1024 @ 60Hz
Connectors		Analog :15 pin D-Sub, Digital:24 pin DVI-D
		Speaker Input/ Headphone Output(Audio Cable)*[1]
Plug & Play		VESA DDC 1/2B
Power	Input	12 V (DC), 3A
	Consumption	Under 35W
	Standby Mode	1W less
Power Management		Power Saver
Environmental Consideration	Temperature	0~25℃ (32°F ~ 77°F)
	Humidity	90% less
Dimensions	Outside	406x332x212mm(WxHxD)
Weight(Net)		4Kg

3.2 Submitted Documents

N/A

4. Measurement Conditions

Operating voltage of the EUT is supplied from DC Adaptor.

The rating is AC 120V/ 60Hz at input, and DC 12V/ 3A output.

4.1 Modes of Operation

The EUT was in the following operating mode during all testing.

The EUT is connected to PC by VGA interface cable.

The EUT is tested in the mode of “H” on the screen and played windows media player.

4.2 List of Peripherals

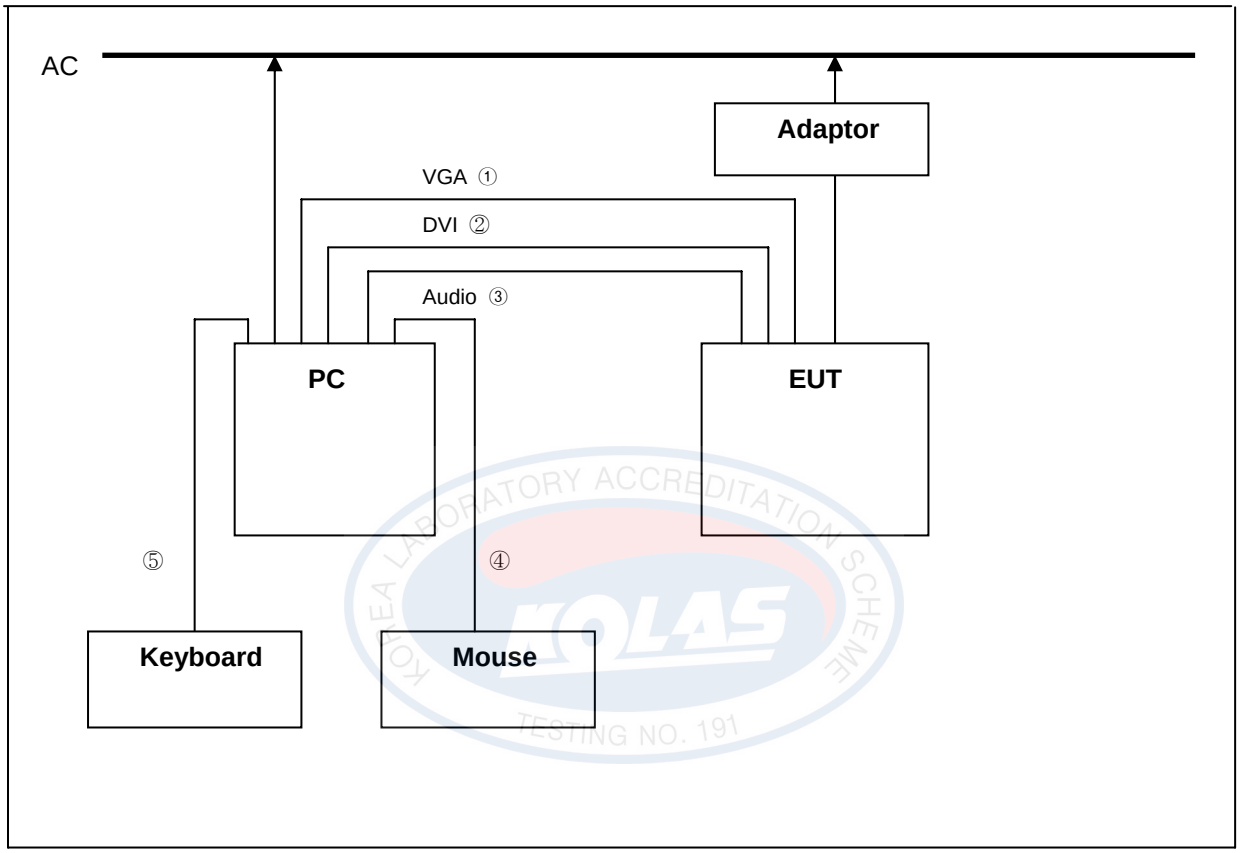
Equipment	Manufacturer	Model Name	Serial No.
PC (EMI)	DELL	DCSM	HJD4J1S
Keyboard (EMI)	DELL	SK-8115	N/A
Mouse	DELL	M056V0A	F1E0011Q

4.3 Type of Used Cables

	START		END		Cable	
	Name	I/O Port	Name	I/O Port	Length(m)	Shielded
1	EUT	VGA	PC		1.8	Shielded
2		DVI	PC		1.8	Shielded
3		Audio	PC		1.5	Unshielded
4	PC	PS/2	Mouse		1.8	Unshielded
5		USB	Keyboard		1.5	Unshielded

4.4 Test Setup

The test setup photographs showed the external supply connections and interfaces.



[System Block Diagram of Test Configuration]

4.5 Uncertainty

1) Radiated disturbances from 30 MHz to 1000 MHz at a distance of 3m and 10 m

Expanded Uncertainty

U = k * Uc(xi) = 2 * 2.3 = 4.60dB

The coverage factor k =2 yields approximately a 95% level of confidence.

2) Conducted disturbance from 150 KHz to 30 MHz using a 50 Ω/50 uH AMN

Expanded uncertainty

U= k * Uc(xi) = 2 * 1.96 = 3.92dB

The coverage factor k =2 yields approximately a 95% level of confidence.

※ When the measured emission is positioned within the range of the uncertainty of measurement from the emission limit, the uncertainty of measurement shall be concerned as follow.

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If Ulab is less than or equal to Ucispr

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If Ulab is greater than Ucispr

- compliance is deemed to occur if no measured disturbance, increased by (Ulab - Ucispr), exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by (Ulab - Ucispr), exceeds the disturbance limit.

※ If the measurement value is lower or equal to the limit, the EUT is considered to pass the test.

5. EMISSION Test

5.1 Conducted Emissions

Result: **PASS**

The line-conducted facility is located inside a 2.6M x 3.6M x 7.0M shielded enclosure.
The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 604-05.
A 1 m x 1.5 m wooden table 80 cm high is placed 40 cm. away from the vertical wall and 1.5 m away from the side wall of the shielded room. ROHDE & SCHWARZ Model ESH3-Z5 (10 kHz-30 MHz) 50 ohm/50 uH Line-Impedance Stabilization Networks(LISNs) are bonded to the shielded room.
The EUT is powered from the ROHDE & SCHWARZ LISN and the support equipment is powered from the ROHDE & SCHWARZ LISN. Power to the LISNs are filtered by a high-current high-insertion loss Lindgren enclosures power line filters (100dB 14 kHz-10 GHz).
The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure.
All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2".
If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the ROHDE & SCHWARZ LISN.
All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.
Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.
The spectrum was scanned from 150 kHz to 30 MHz with 100msec. sweep time.
The frequency producing the maximum level was reexamined using EMI/field Intensity Meter (ESHS 10) and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode.
The bandwidth of the receiver was set to 10 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.
Each emission was maximized by: switching power lines; varying the mode of operation or resolution;clock or data exchange speed; if applicable; whichever determined the worst-case emission.
Photographs of the worst-case emission can be seen in photograph of conducted test.
Each EME reported was calibrated using self-calibrating mode.

Table 2: Test Data, Conducted Disturbance

<Quasi-Peak>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.215	43.49	L	0.11	0.02	43.62	63.01	19.39
0.285	40.53	N	0.13	0.02	40.68	60.67	19.99
0.355	37.50	L	0.11	0.02	37.63	58.84	21.21
13.040	39.05	L	0.31	0.24	39.60	60.00	20.40
13.325	39.98	N	0.35	0.24	40.57	60.00	19.43
24.000	39.23	N	0.51	0.36	40.10	60.00	19.90

<Average>

Frequency (MHz)	Reading (dBuV)	Line	C/F (dB)	C/L (dB)	Actual (dBuV)	Limit (dBuV)	Margin (dB)
0.355	31.99	L	0.09	0.01	32.09	48.84	16.75
5.980	31.90	N	0.28	0.15	32.33	50.00	17.67
5.985	33.36	L	0.25	0.15	33.76	50.00	16.24
13.040	33.96	L	0.31	0.24	34.51	50.00	15.49
14.820	34.30	L	0.31	0.24	34.85	50.00	15.15
24.000	38.28	L	0.51	0.36	39.15	50.00	10.85

▶ NOTE

*** C/F = Correction Factor**

*** C/L = Cable Loss**

*** LINE : L = Line-PE, N = Neutral-PE**

*** Margin Calculation**
Margin(Q.P) = Limit - Actual
[Actual(Q.P)= Reading(Q.P) + C/F + C/L]

Figure 1: Spectral Diagram, LINE – PE

SK TECH Co., Ltd. 23 Feb 2007 16:18

CONDUCTED DISTURBANCE

EUT: HL910A
Manuf:
Op Cond: AC 120 V / 60 Hz
Operator:
Test Spec: FCC Part15 Subpart B
Comment: LINE-PE

Result File: 910af_l.dat : HL910A (FCC)

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

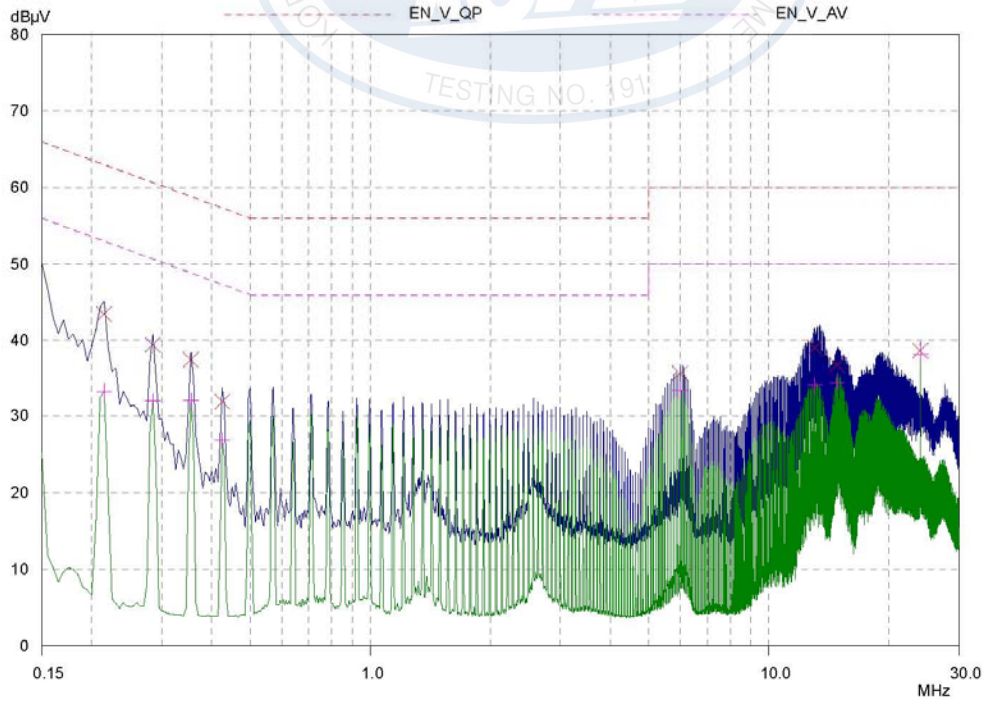


Figure 2: Spectral Diagram, NEUTRAL – PE

SK TECH Co., Ltd. 23 Feb 2007 15:58

CONDUCTED DISTURBANCE

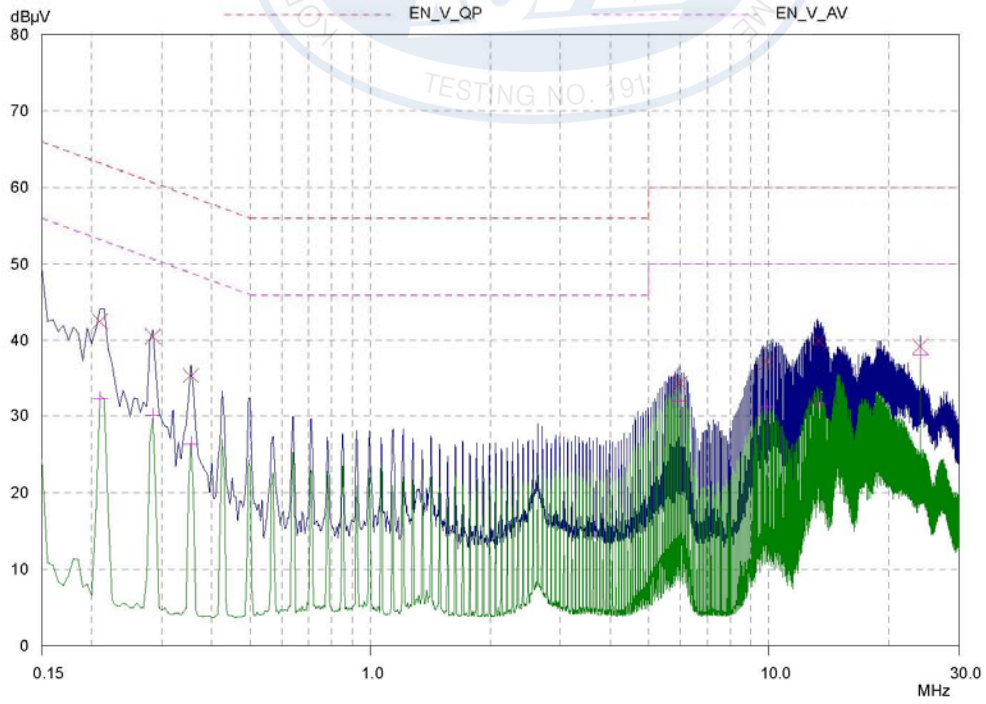
EUT: HL910A
Manuf:
Op Cond: AC 120 V / 60 Hz
Operator:
Test Spec: FCC Part15 Subpart B
Comment: NEUTRAL-PE

Result File: 910af_n.dat : HL910A(FCC)

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB



5.2 Radiated Emissions

Result : **PASS**

Preliminary measurements were made indoors at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME.

Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found.

The spectrum was scanned from 30 to 300 MHz using biconical antenna and from 300 to 1000 MHz using log-periodic antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using SCHWARZBECK dipole antennas.

The test equipment was placed on a wooden table situated on a 4x4 meter area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with FRP.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter(ESVS 10) and Quasi-Peak Adapter.

The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100 kHz or 1 MHz depending on the frequency or type of signal.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non- metallic 1 x 1.5 meter table.

The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission.

Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in photograph of radiated emission test.

Each EME reported was calibrated using self-calibrating mode.

Table 3 : Test Data, Radiated Emissions

Frequency [MHz]	Pol.	Height [m]	Real Reading	Correction Factor		T-Fact [dB]	Data [dBuV/m]	Limits [dBuV/m]	Margin [dB]
				Antenna	Cable				
196.38	H	4.0	17.1	11.0	1.3	12.3	29.4	43.5	14.1
216.01	V	1.0	15.7	9.3	1.4	10.7	26.4	43.5	17.1
302.39	V	1.0	18.7	12.9	1.6	14.5	33.2	46.0	12.8
370.01	V	1.0	23.6	14.1	1.7	15.8	39.4	46.0	6.6
636.56	V	1.0	12.7	19.4	2.3	21.7	34.4	46.0	11.6

Table. Radiated Measurements at 3-meters

NOTES:

1. All modes of operation were investigated and the worst-case emission are reported.
2. All other emission are non-significant.
3. All readings are calibrated by self-mode in receiver.
4. Measurements using CISPR Quasi-Peak mode.
5. H = Horizontal, V = Vertical Polarization
6. Data = Real Reading + T – Fact (Antenna+Cable)
7. Margin = Limits – Data