



EMISSION TEST REPORT

Test report file No. : **02-IST-154/FA** Date of issue : Jul. 25, 2002

Model / Type No. : HLM170S

☐ Basic ☒ Alternate

Kind of product : LCD Monitor

Brand name : Wooyoung Telecom

Applicant : Wooyoung Telecom Co., Ltd.

Address : 2221-1, Suwolam-Ri, Seotan-Myun, Pyungtak-Si, Kyungki-Do, Korea

Manufacturer : Wooyoung Telecom Co., Ltd.

Address : 2221-1, Suwolam-Ri, Seotan-Myun, Pyungtak-Si, Kyungki-Do, Korea

License holder : Wooyoung Telecom Co., Ltd.

Test result according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report with appendix consists of **17** pages.

The test result only responds to the tested sample.

It is not allowed to copy this report even partly without the allowance of the Test Laboratory.

This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

DIRECTORY

A) Documentation.

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B) Test Data.

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>12 ~ 14</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>15 ~ 16</u>

C) Appendix

TEST REGULATIONS

The tests were performed according to the following regulations ;

- - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

Information of Test Laboratory

IST EMC Lab.

San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, Korea

International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.

Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

EQUIPMENT UNDER TEST

Equipment Description :

LCD Pannel Type No :	HT17E11-200
Manufacturer :	HYUNDAI ELECTRONICS INDUSTRIES Co.,Ltd.
Frequency Range :	Vertical 55 ~ 75 Hz, Horizontal 31.5 ~ 80 kHz
PC Input Signal :	H / V separated
Power Supply Input :	100 ~ 240 Vac, 50/60 Hz
Power consumption :	40 W (Max)
Micom Type :	12.0 MHz, 14.318 MHz on the main board

EUT Type :

- ☒ Table-Top.
☐ Floor-Standing.
☐ Table-Top and Floor-Standing(Combination).

Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- ☐ Standby.
☒ Operational Condition : Scrolling “H” characters under MS Windows 98,
 Test mode : 1280 X 1024, 75 Hz
 Activating Speaker (Sound Play mode)

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No.
PC	Brio BA600/550	HP	SG01902402
Keyboard	SK-2502C	HP	M0004102821
Mouse1	M-S48A	HP	LZE01251424
Printer	A0302384	Northern Telecom	26633S60168
Mouse2	M-MD14-2	Logitech	N/A

Connecting Interface Cables :

- Unshielded power cable : AC : 1.8 m DC : 1.3 m
- Unshielded Speak cable : 1.2 m
- Shielded monitor's signal cable : 1.5 m
- Shielded printer's signal cable : 1.8 m

Description of Difference

(Difference between Original and Changed HLM170S)

1. Alternate components :

Item		Original HLM170S	Changed HLM170S
A/D board	Type No.	97E6500300-00	97E6500800-01
	Manufacturer	Wooyoung Telecom	Wooyoung Telecom
Adapter type	Type	LSE9901B1250	LAD6019AB4
	Brand	LISHIN INTERNATIONAL ENTERPRISE CORP.	LINEARITY 1 ELECTRONICS., LTD.

2. Change of stand structure and shape

TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

Test location :

☒ Shielded room. No.1

☐ Compact chamber 2

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jul. 25, 2002	892108/018
3725/2	LISN	EMCO	Jul. 30, 2001	9101-2068
KNW-407	LISN	Hyup-Rip	Jul. 26, 2001	8-883-10
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 25, 2002	357.8810.52

Test - accessories :

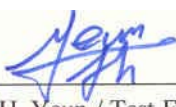
Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



J. H. Yeun / Test Engineer
IST EMC Lab.

The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

Location : ☒ Open Site No. 1 ☐ Open Site No. 2 ☐ Open Site No. 3
 Distance : ☒ 3 meters ☐ 10 meters

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	Jul. 26, 2002	860688/011
VULB 9160	Antenna	Schwarzbeck	Jul. 10, 2002	3048

Test - accessories :

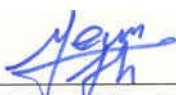
Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 “Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”. The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for “quasi-peak” within a bandwidth of 120kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



J. H. Yeun / Test Engineer
 IST EMC Lab.

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are.

☒ KEPT

☐ NOT KEPT

Min. limit margin

4.6 dB at 4.4024 MHz

Remarks : See test-graph to be attached at pages 12 ~ 14.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are.

☒ KEPT

☐ NOT KEPT

Min. limit margin

5.3 dB at 438.1 MHz

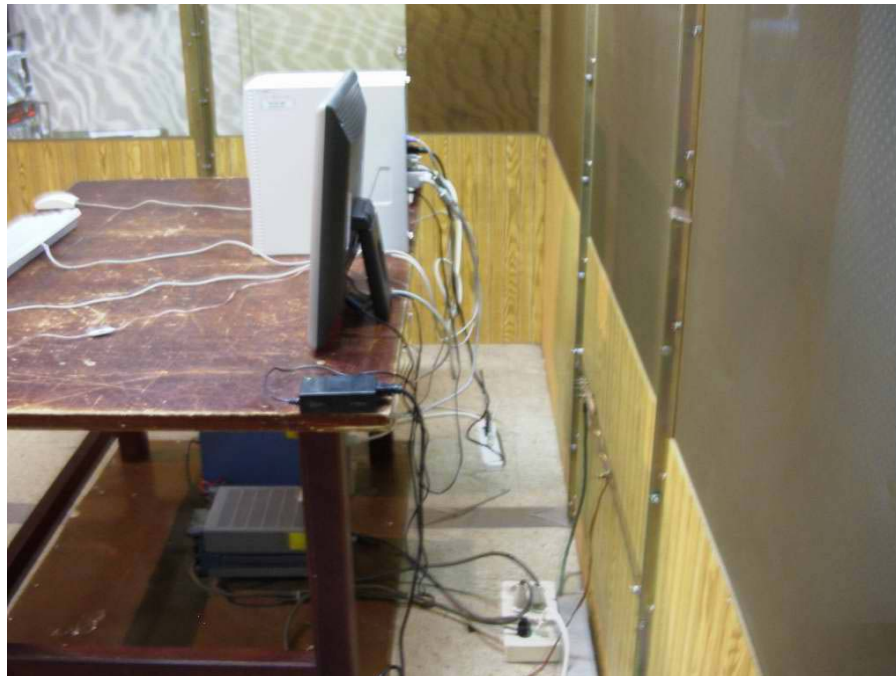
Remarks : See test-data at page 15 ~ 16.

TEST SETUP (Photos)

Type : HLM170S



Conducted Emissions 0.15 MHz - 30 MHz



TEST SETUP (Photos)

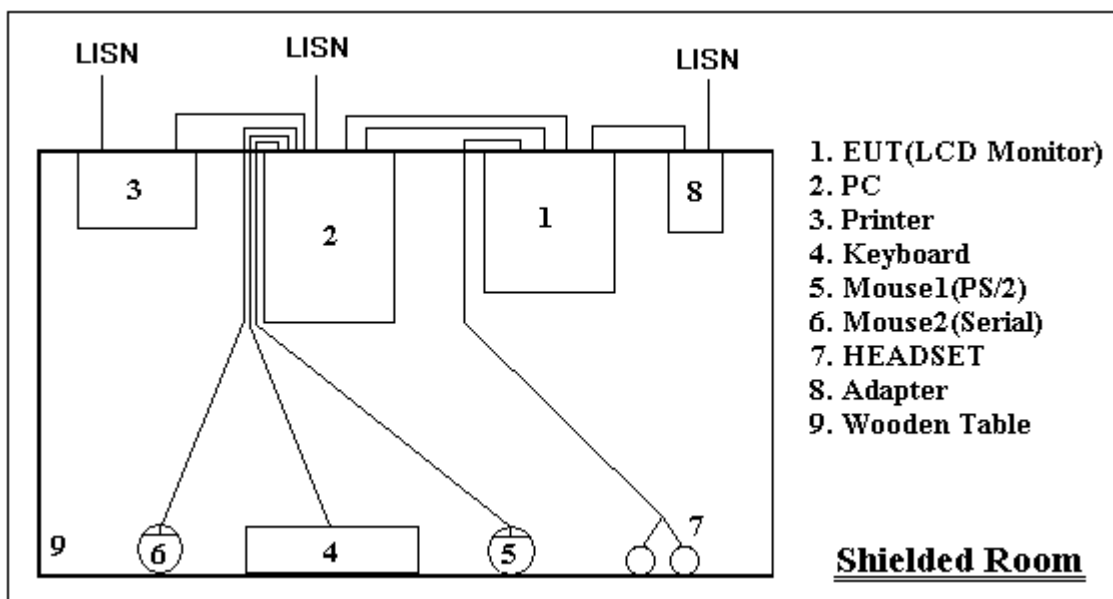
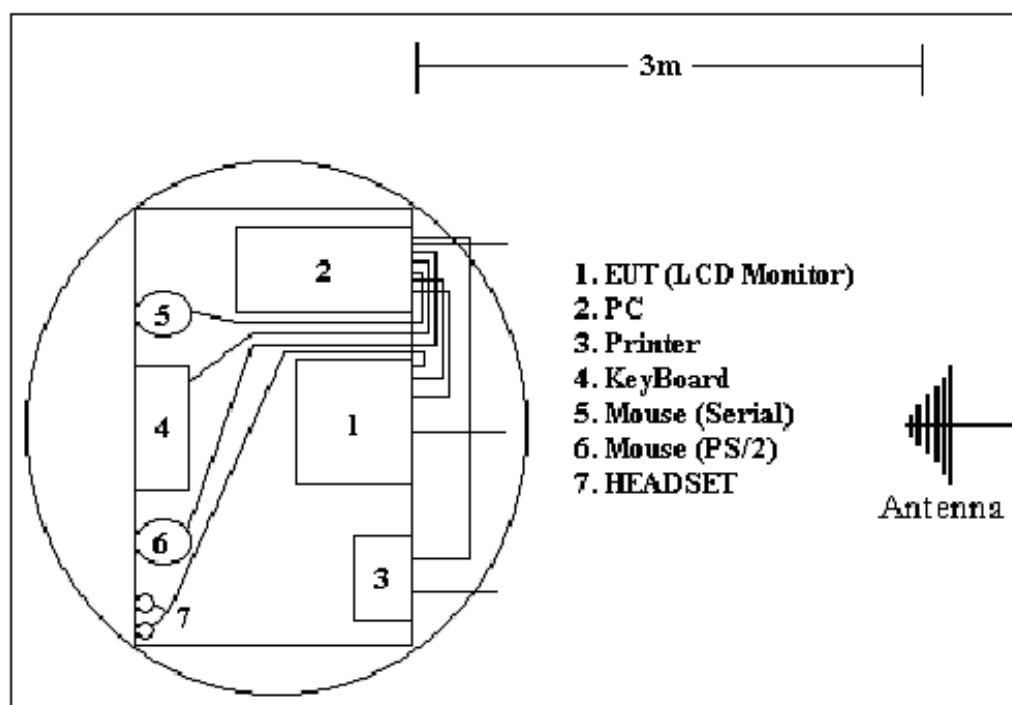
Type : HLM170S



Radiated Emissions 30 MHz - 1000 MHz



TEST SETUP (Drawings)

Type : HLM170SConducted Emissions 0.15 MHz - 30 MHzRadiated Emissions 30 MHz - 1000 MHz

Conducted Emission Test Data

Type	HLM170S		
Manufacturer	Wooyoung Telecom Co., Ltd.		
Operation mode	Scrolling "H" pattern display 1280 x 1024, 75Hz sound Play mode		
Environmental Conditon	Temperature	:	21 °C
	Humidity	:	40 %
	Atmospheric pressure	:	1000 mbar
Date	Jul. 22, 2002		

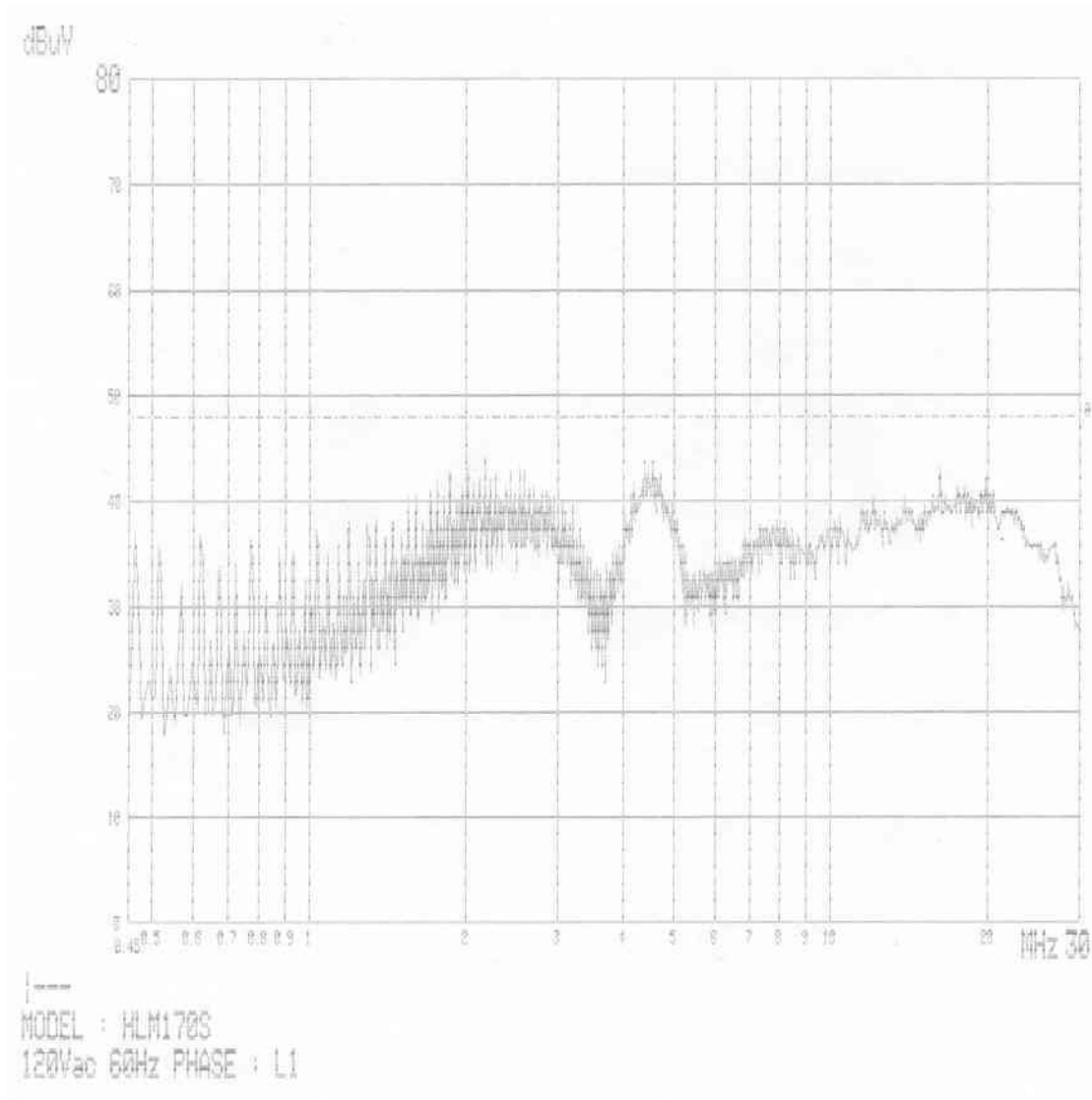
Highest Emissions ralative to the limit

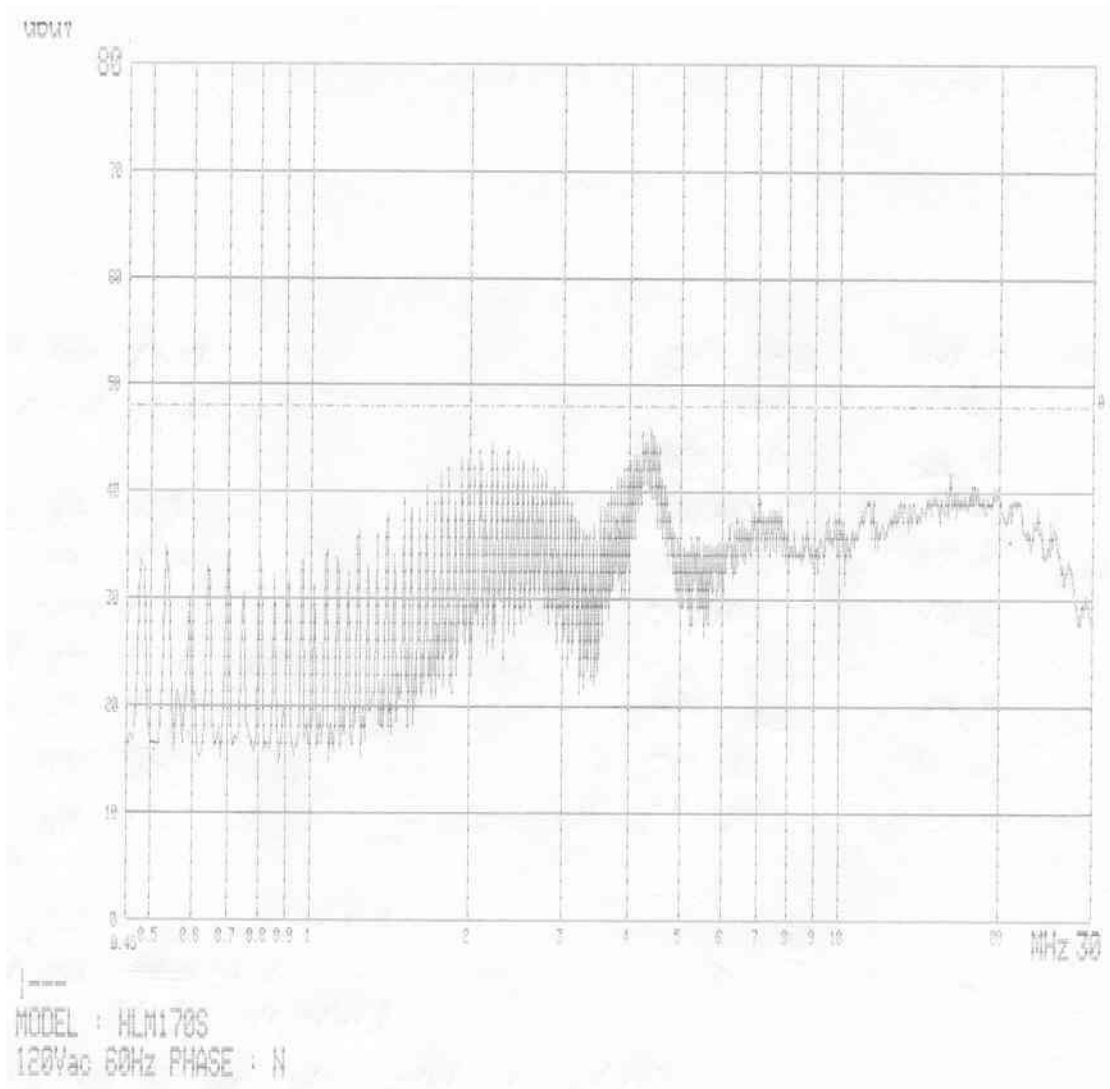
Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (L1/N)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.4745	36.2	0.8	L1	37.0	48.0	11.0
0.7927	35.7	0.8		36.5	48.0	11.5
2.1690	42.0	0.8		42.8	48.0	5.2
4.5588	40.4	0.8		41.2	48.0	6.8
16.2111	38.4	0.8		39.2	48.0	8.8
19.8635	33.9	0.8		34.7	48.0	13.3
0.5516	34.6	0.8	N	35.4	48.0	12.6
0.7169	32.8	0.8		33.6	48.0	14.4
2.2622	42.1	0.8		42.9	48.0	5.1
4.4024	42.6	0.8		43.4	48.0	4.6
7.0656	35.6	0.8		36.4	48.0	11.6
16.2079	38.5	0.8		39.3	48.0	8.7
Cable loss are less than 0.1 dB						

*L1 : Live Line

**N : Neutral Line

*** Please refer to data graphs at page 13 ~ 14



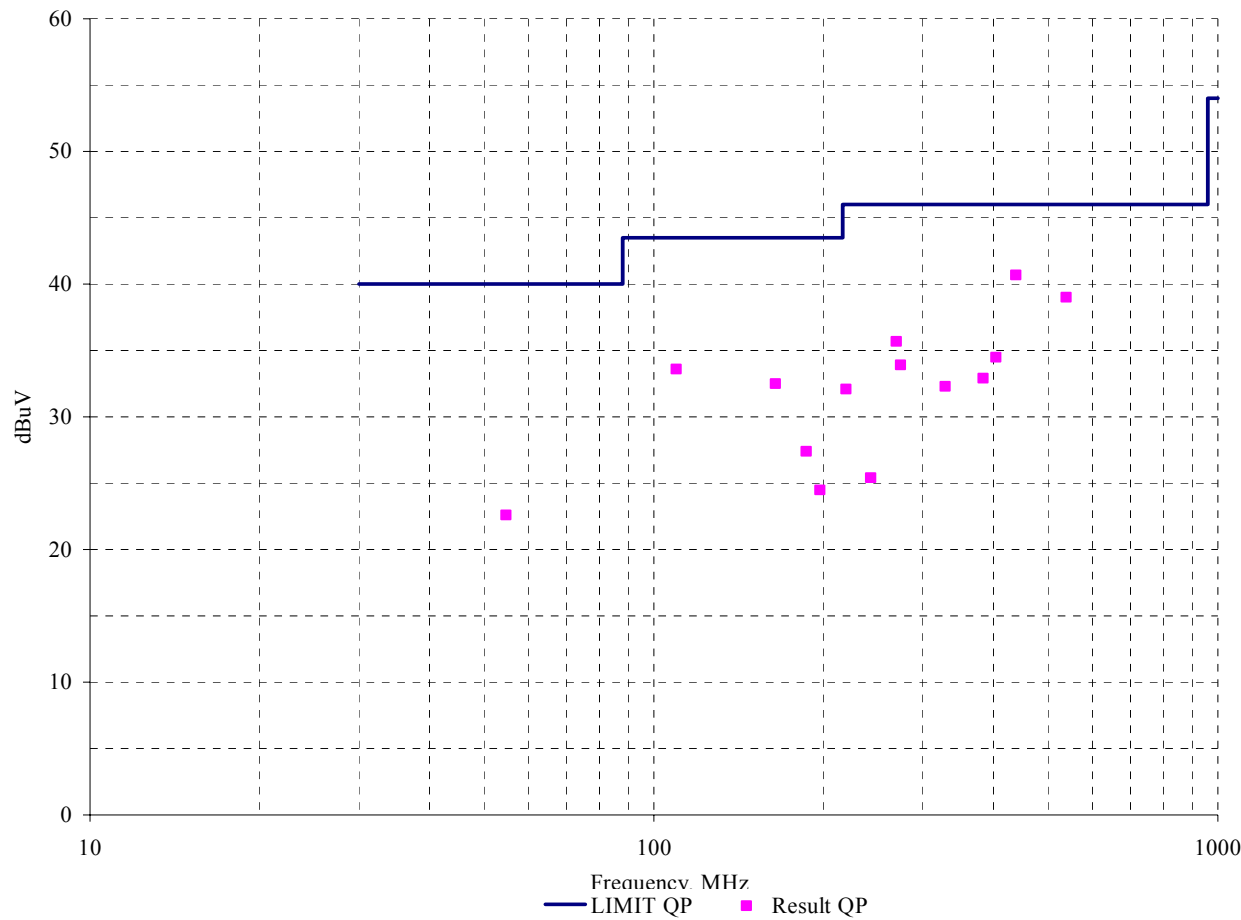


Radiation Test Data

Type	HLM170S
Manufacturer	Wooyoung Telecom Co., Ltd.
Operation mode	Scrolling "H" pattern display 1280 x 1024, 75Hz sound Play mode
Environmental Conditon	Temperature : 26 °C Humidity : 40 % Atmospheric pressure : 1000 mbar
Test distance	3 m
Antenna	VULB9160
Date	Jul. 23, 2002

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
54.7	10.4	10.9	1.3	117	134	V	22.6	40.0	17.4
109.5	22.4	9.3	1.9	11	146	V	33.6	43.5	9.9
164.3	17.9	12.3	2.3	58	162	V	32.5	43.5	10.9
186.1	15.1	9.8	2.5	130	100	V	27.4	43.5	16.1
197.1	13.2	8.8	2.5	275	100	V	24.5	43.5	19.0
219.0	20.9	8.5	2.7	267	100	V	32.1	46.0	13.9
242.2	12.2	10.3	2.9	264	100	H	25.4	46.0	20.6
269.2	21.2	11.5	3.0	310	100	H	35.7	46.0	10.3
273.8	19.2	11.7	3.0	264	100	H	33.9	46.0	12.1
328.6	17.2	11.7	3.4	253	100	V	32.3	46.0	13.7
383.3	16.6	12.5	3.8	68	100	H	32.9	46.0	13.1
403.7	16.9	13.3	4.3	45	100	H	34.5	46.0	11.5
438.1	22.4	13.8	4.5	153	181	V	40.7	46.0	5.3
538.3	18.5	15.8	4.7	285	104	V	39.0	46.0	7.0

MEASUREMENT OF DISTURBANCE RADIATION



SUMMARY

GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

FINAL JUDGMENT :

The requirements according to the technical regulations are

☒ Kept ☐ Not kept

The equipment under test does

☒ Fulfill the general approval requirements mentioned on page 3.
☐ Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Jul. 22, 2002

End of testing : Jul. 23, 2002

Reviewed by :



Joon H. Lee / EMC Manager
IST EMC Lab.

Approved by :



G. Chung / Chief of EMC Lab.