



EMISSION TEST REPORT

Test report file No. : **02-IST-062/FA** Date of issue : Apr. 04, 2002

Model / Type No. : HLM151X ☐ Basic ☒ Alternate

Kind of product : LCD Monitor

Brand name : Han Gil Telecom

Applicant : Han Gil Telecom Co., LTD.

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

Manufacturer : Han Gil Telecom Co., LTD.

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

License holder : Han Gil 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 :	HT15X13
Manufacturer :	HYUNDAI ELECTRONICS INDUSTRIES Co.,Ltd.
Frequency Range :	Vertical 55 ~ 75 Hz, Horizontal 31 ~ 60 kHz
PC Input Signal :	H / V separated (LVDS)
Power Supply Input :	100 ~ 240 Vac, 50/60 Hz
Power consumption :	25 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 : 1024 X 768, 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 AC power cable : 1.8 m
- Unshielded Speak cable : 1.0 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 HLM151X)

1. Alternate components :

Item		Original HLM151X	Changed HLM151X
T.F.T LCD Pannel	Type No.	LM151X2	HT15X13
	Manufacturer	LG PHILIPS	HYUNDAI ELECTRONICS INDUSTRIES Co.,Ltd.
DC / AC Inverter	Type No.	DS-1005NA-V2.0.	DS-1005NP-V1.1
	Manufacturer	DS-Plus Inc	DS-Plus Inc.
Power board	Type No.	U07-1138	U07-1161
	Manufacturer	SUN KOREA	SUN KOREA
Function board	Type No.	165 X 136.5	180 X 47.5
	Manufacturer	Han Gil Telecom	Han Gil Telecom
A/D board	Type No.	TTL	LVDS
	Manufacturer	Han Gil Telecom	Han Gil Telecom
Speak board	Type No.	-	DS4-V-0
	Manufacturer		Han Gil Telecom

2. Shape of Front Cover :



Original HLM151X



Changed HLM151X

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	Jun. 16, 2001	861742/015
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. 13, 2001	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 :



S. J. Oh / Research 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	Jun. 12, 2001	861744/018
VULB 9160	Antenna	Schwarzbeck	Jun. 04, 2001	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 :



S. J. Oh / Research Engineer
IST EMC Lab.

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are.

☒ KEPT ☐ NOT KEPT

Min. limit margin

9.5 dB at 18.799 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

3.3 dB at 393.8 MHz

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

TEST SETUP (Photos)

Type : HLM151X



Conducted Emissions 0.15 MHz - 30 MHz



TEST SETUP (Photos)

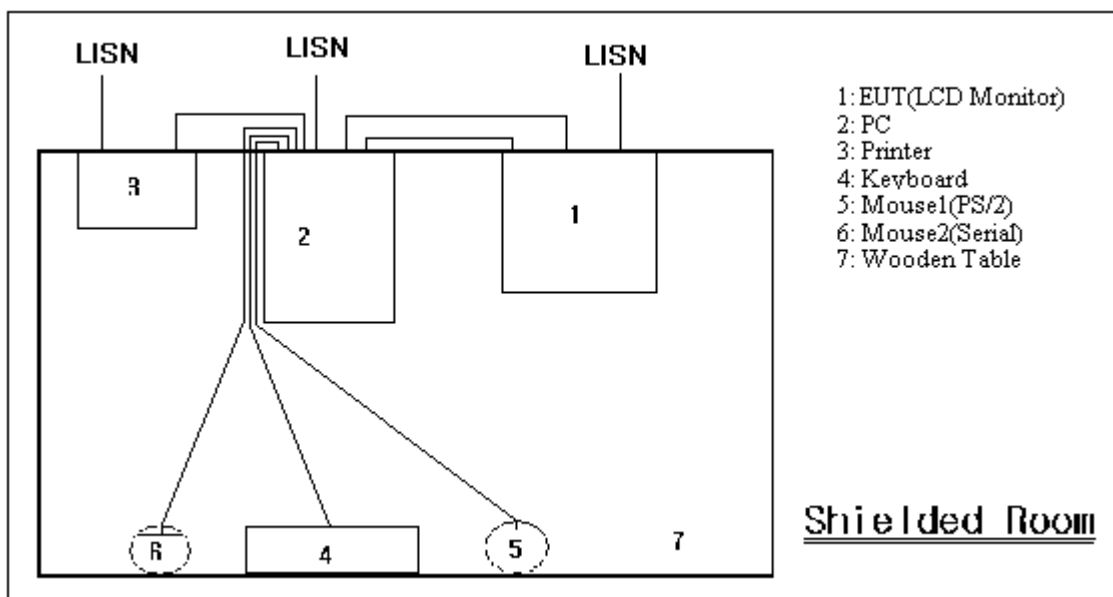
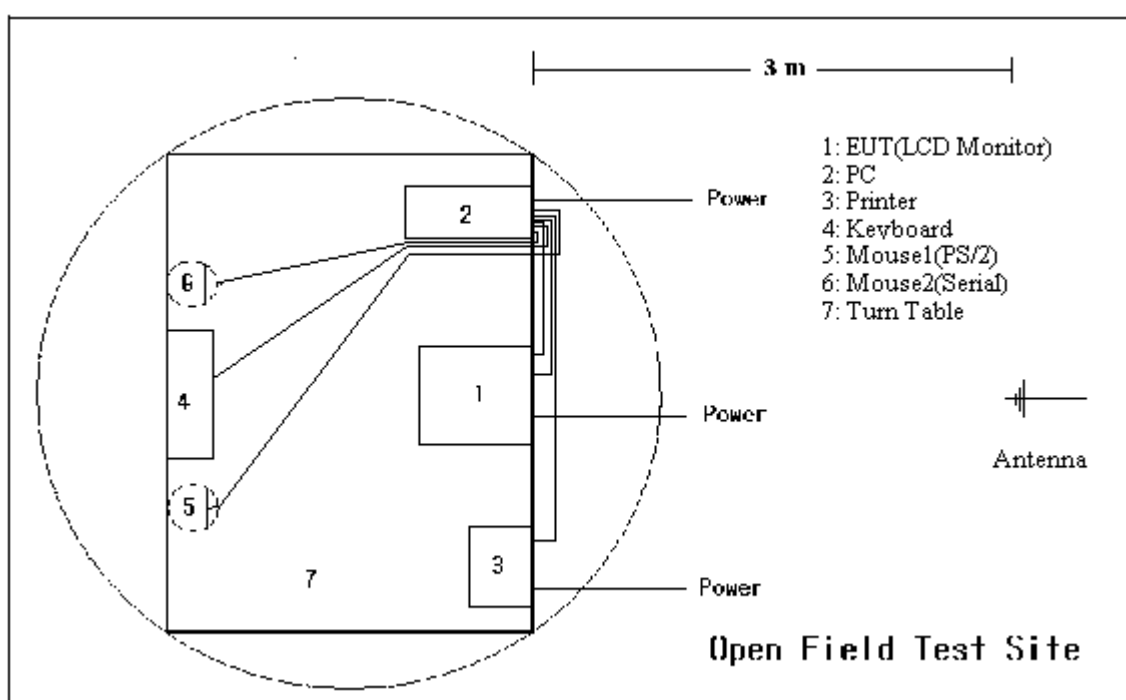
Type : HLM151X



Radiated Emissions 30 MHz - 1000 MHz



TEST SETUP (Drawings)

Type : HLM151XConducted Emissions 0.15 MHz - 30 MHzRadiated Emissions 30 MHz - 1000 MHz

Conducted Emission Test Data

Type	HLM151X		
Manufacturer	Han Gil Telecom Co., Ltd.		
Operation mode	Scrolling "H" pattern display 1024 x 768, 75Hz Sound Play Mode		
Environmental Condition	Temperature	:	18 °C
	Humidity	:	40 %
	Atmospheric pressure	:	1000 mbar
Date	Mar. 24, 2002		

Highest Emissions relative to the limit

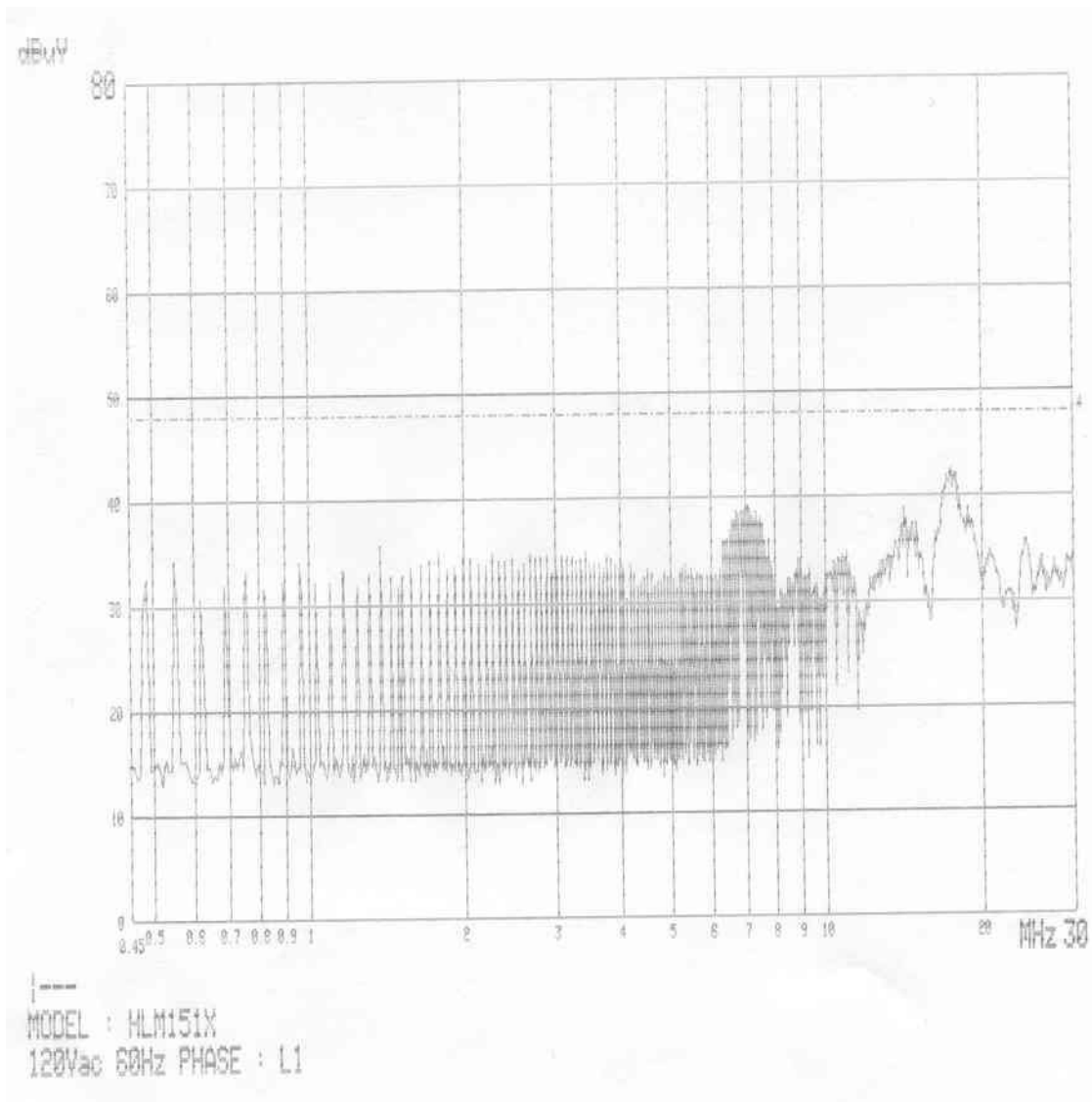
Frequency [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (L1/N)	Result [dBμV]	Limit [dBμV]	Margin [dB]
0.5493	33.7	0.8	L1	34.5	48.0	13.5
0.9615	33.5	0.8		34.3	48.0	13.7
1.3727	34.3	0.8		35.1	48.0	12.9
70.0010	36.9	0.8		37.7	48.0	10.3
14.2098	33.1	0.8		33.9	48.0	14.1
17.5005	34.1	0.8		34.9	48.0	13.1
0.4805	32.3	0.8	N	33.1	48.0	14.9
1.5783	28.9	0.8		29.7	48.0	18.3
2.6752	30.5	0.8		31.3	48.0	16.7
6.7937	35.6	0.8		36.4	48.0	11.6
14.8209	33.4	0.8		34.2	48.0	13.8
18.7990	37.7	0.8		38.5	48.0	9.5

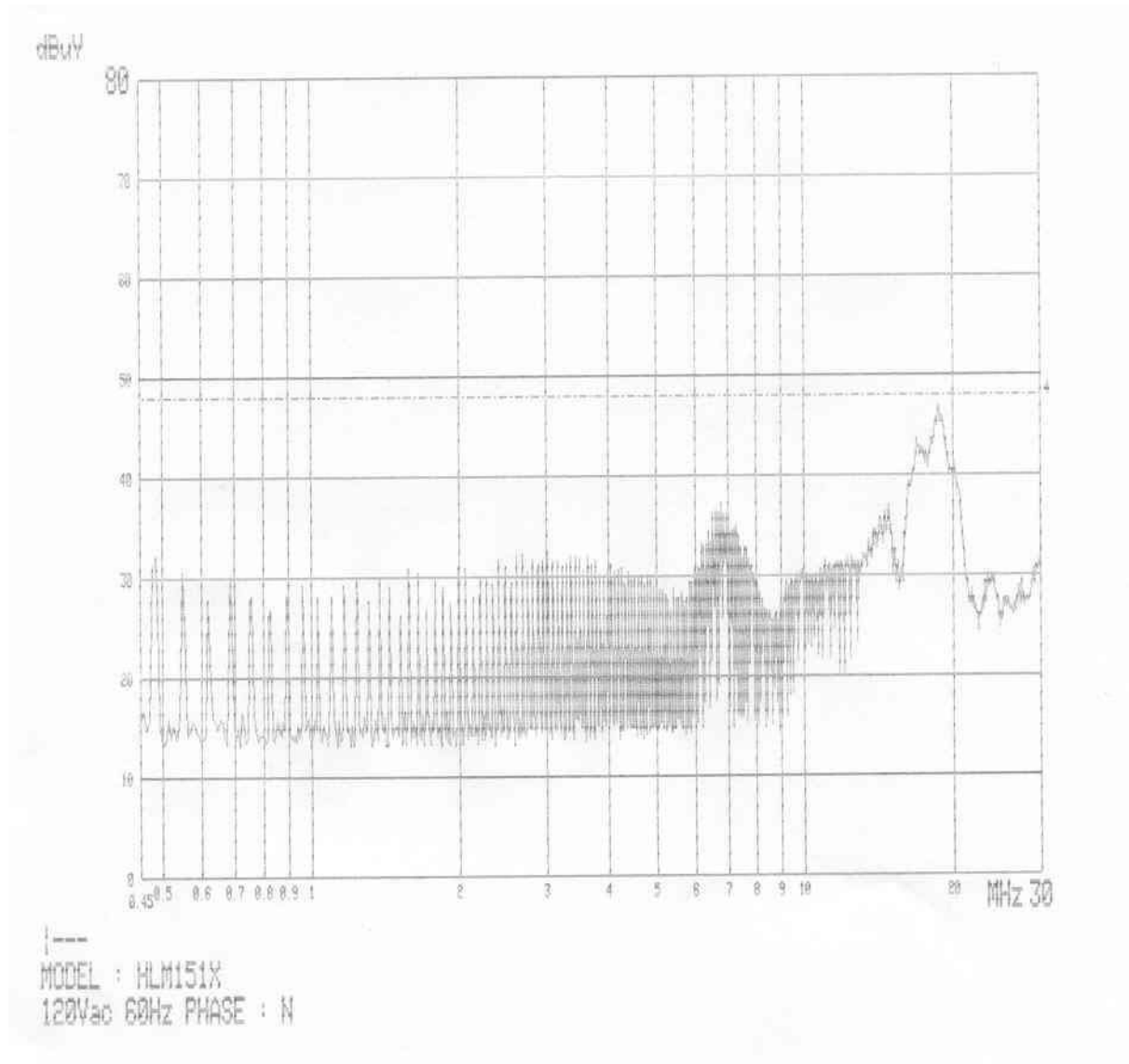
Cable loss are less than 0.1 dB

*L1 : Live Line

**N : Neutral Line

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



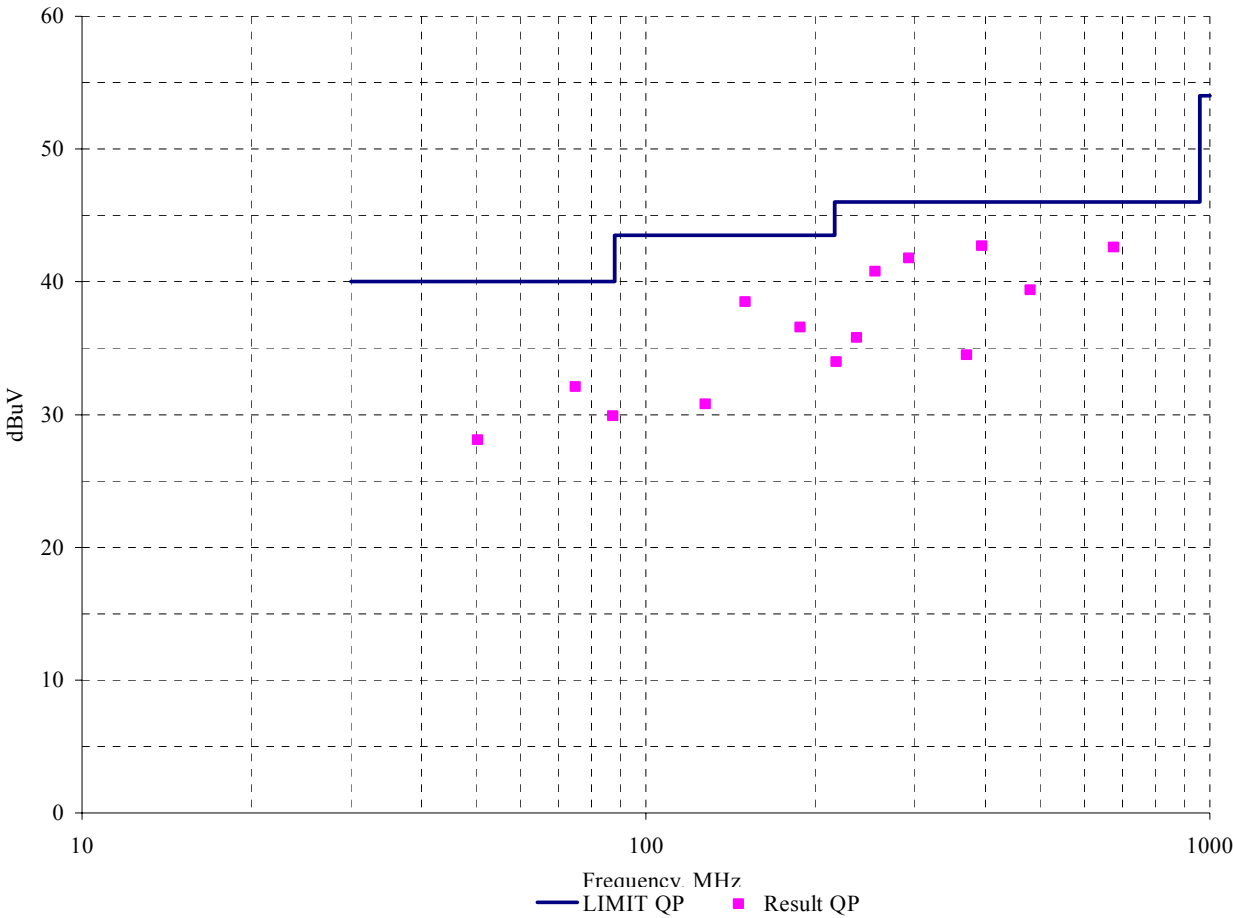


Radiation Test Data

Type HLM151X
 Manufacturer Han Gil Telecom Co., Ltd.
 Operation mode Scrolling "H" pattern display 1024 x 768, 75Hz
 Sound Play Mode
 Environmental Conditon Temperature : 18 °C
 Humidity : 40 %
 Atmospheric pressure : 1000 mbar
 Test distance 3 m
 Antenna VULB9160
 Date Mar. 25, 2002

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
50.3	16.2	10.6	1.3	117	134	V	28.1	40.0	11.9
75.0	21.7	8.8	1.6	11	146	V	32.1	40.0	7.9
87.3	21.0	7.2	1.7	58	162	V	29.9	40.0	10.1
127.5	18.2	10.5	2.1	130	100	V	30.8	43.5	12.7
150.0	24.0	12.2	2.3	275	100	V	38.5	43.5	5.0
187.6	24.6	9.5	2.5	267	100	V	36.6	43.5	6.9
217.6	22.8	8.5	2.7	264	100	V	34.0	46.0	12.0
236.3	23.0	9.9	2.9	310	100	V	35.8	46.0	10.2
255.0	27.1	10.9	2.8	264	100	V	40.8	46.0	5.2
292.6	26.8	11.8	3.2	253	100	V	41.8	46.0	4.2
370.1	18.7	12.1	3.7	68	100	V	34.5	46.0	11.5
393.8	25.4	13.1	4.2	45	100	V	42.7	46.0	3.3
480.4	20.0	14.6	4.8	153	181	V	39.4	46.0	6.6
675.1	19.5	18.1	5.0	285	104	V	42.6	46.0	3.4

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 : Apr. 01, 2002

End of testing : Apr. 02, 2002

Reviewed by :



Joon H, Lee. EMC Manager
Daewoo EMC Lab.

Approved by :



G, Chung. Chief of EMC Lab.