

FCC EVALUATION REPORT FOR CERTIFICATION

KOREA Standard Technology

Test report No.: KST-FCC0413

Manufacturer's Name : Hyundai Corporation

Manufacturer's Address : 140-2, Kye-Dong, Chongro-Gu, Seoul, 110-973, Korea

EUT's:

FCC ID : RQQHLT-3010

Product Name : LCD Monitor

Model Number(s) : HLT-3010

Product Options : N/A

Category : FCC Part 15 subpart B

Class B Computing Digital Device

Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C63.4-1992.

I attest to the accuracy of data and all measurements reported herein were performed by or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test Date : May 17, 2004.

Issued Date : May 22 , 2004

Tested by:



Kim, Ha-Hyoung

Approved by:



Lee, Weon-Woo

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Specifications.

1. Description of Device

1) Kind of equipment:	LCD Monitor
2) FCC ID:	RQQHLT-3010
3) Model Name:	HLT-3010
4) Serial No.:	None
5) Type of Sample Tested:	Pre-production
6) High Frequency Used:	8.000 / 12.000 / 13.500 MHz 18.432 / 20.250 / 25.000 MHz
7) Adapter	Model name: None Manufacturer: None Serial no: None
8) Power Rating:	1phase AC100-240V, 50/60Hz, 280W Output: -
9) Tested Power supply:	1phase AC110V, 60Hz
10) Date of Manufacture:	May , 2004
11) Manufacture:	Hyundai Corporation
12) Description of Operating:	Scroll All "H" Character Resolution 1024*768 , Vertical Frequency: 75Hz
13) Dates of Test:	May 17, 2004
14) Place of Tests:	Korea Standard Technology EMC site
15) Test Report No:	KST-FCC0413

2. Test Facility

The open field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site was fully described in a report dated November 14, 2002, that was submitted to the FCC.

Korea Standard Technology (KOSTEC Co., Ltd)

Head office:

4F, 1503-2, Kwanyang-dong, Dongan-gu, Anyang-shi, Kyunggi-do, Korea

Telephone No : 82-31-388-2051

Facsimile No: 82-31-388-2052

Test Lab

:180-254, Annyung-Ri, Taeon-Yup, Hwasung-shi, Kyunggi-do, Korea

Telephone No : 82-31-222-4251

Facsimile No: 82-31-222-4252

MIC(Ministry of Information and Communication) No: **KR0042**

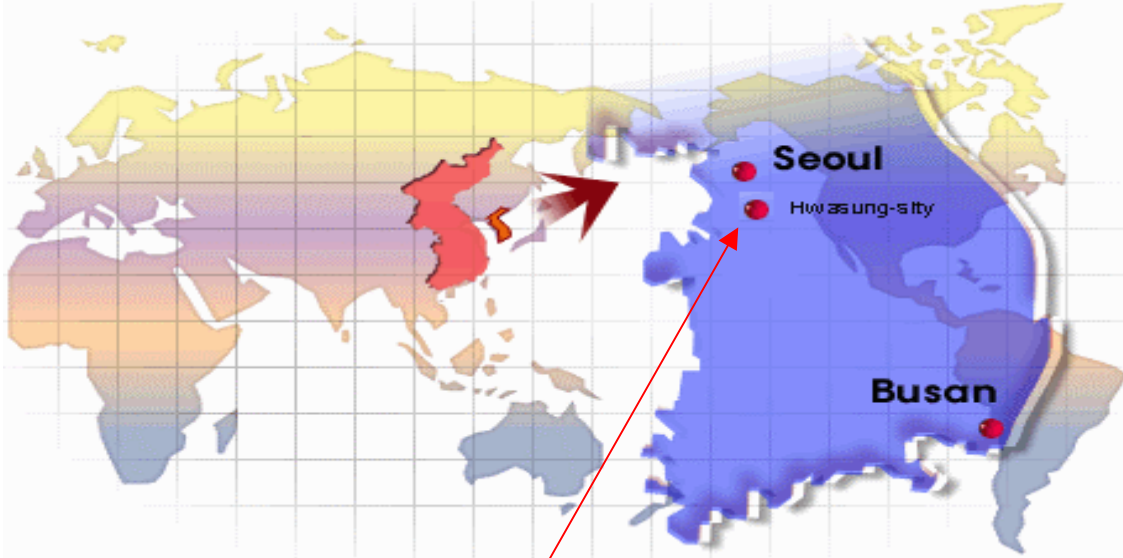
FCC Filing No. : **525762**

VCCI Membership Number : **2005**

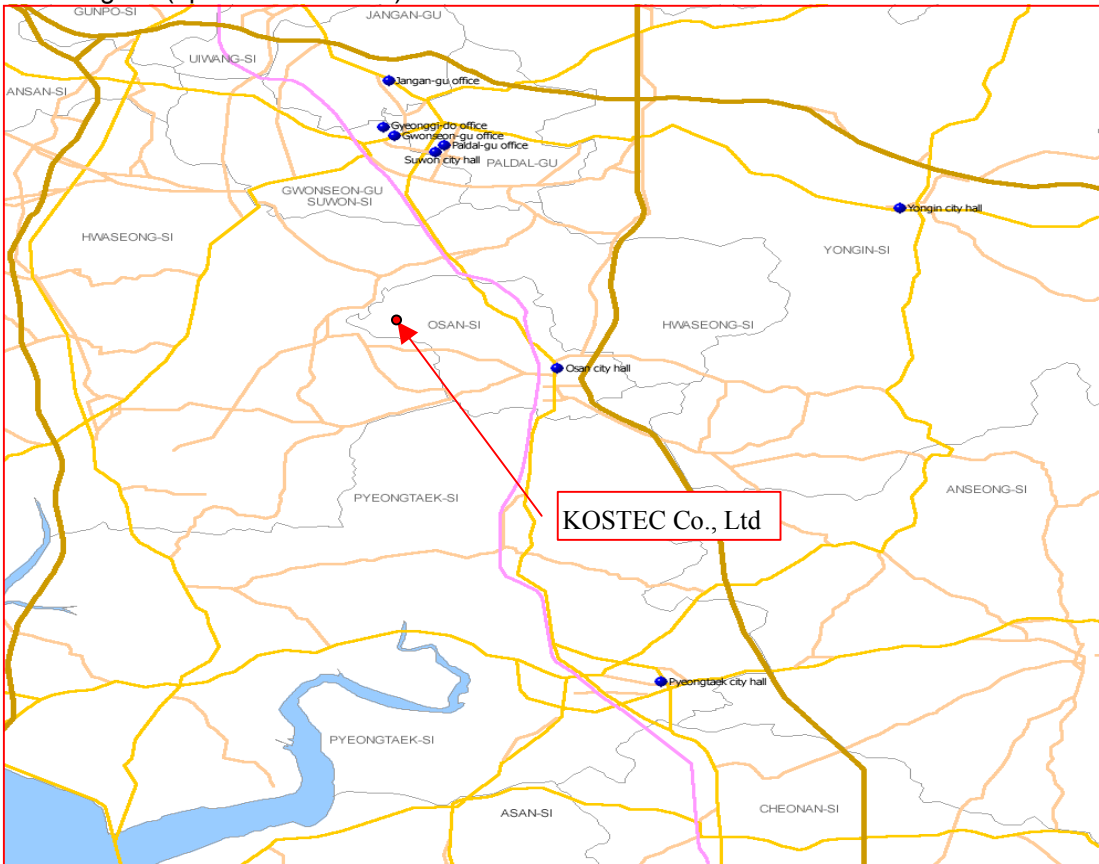
VCCI Registration Number : **R-1657 / C-1763**

3. MAP

Korea



Hwasung-shi (open area test site)



4. Test System Configuration

Operation Environment

Ambient	<u>Temperature</u> (° C)	<u>Humidity</u> (%)	<u>Pressure (hPa)</u>
10m Open Area site	18.2	38	1014
Shielded room:	17.5	39	1014

Test site

These testing were performed following locations ;

Shielded room : Conducted Emission,

10m Open Area Site: Radiated Emission

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, its imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95% confidence level were applied.

sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.

The sample calculation is as follows:

$$\begin{aligned} FS &= MR + LF + CL \\ MR &= \text{Meter Reading} \\ LF &= \text{LISN Factor} \\ CL &= \text{Cable Loss} \end{aligned}$$

If MR is 30dB, LISN Factor 1dB, CL 1dB

The result (MR) is

$$30 + 1 + 1 = 32\text{dBuV}$$

5. Description of E.U.T.

Product Description

Manufactured By:	Hyundai Corporation
Address:	140-2, Kye-Dong, Chongro-Gu, Seoul, 110-973, Korea
Model:	HLT-3010
Serial Number:	None

Configuration of EUT

Description	Manufacturer	Model / Part #	Serial Number
Main controller	Hyundai Corporation	LC-23IE20	-
Tuner board	Hyundai Corporation	A/V LC-23IE20	-
Tuner	LG Innotek Co.,Ltd.	TAFH-S312D	402D0532
Power supply	H & E Co.,Ltd.	A1T4L30PN00	040412
OSD	Hyundai Corporation	23"KEYB/D	-
LCD Panel	CHI MEI Optoelectronics	V296W1-L11	26C12113CS20427
Remote Control	Hyundai Corporation	None	None

EUT Used cables

Cable Type	Shield	Length (m)	Ferrite	Connector	Connection Point 1	Connection Point 2
POWER	Y	1.5	-	AC INLET	Main power source	EUT
VGA In	Y	1.5	yes	D-sub	EUT	PC
S-Video	Y	1.0	-	Din	EUT	-
DVI	Y	1.0	Yes	D-sub	EUT	-
Audio	Y	1.5	-	Jack	EUT	Speaker
Antenna	-	-	-	NTSC	EUT Ant	75Ω terminated

Operating conditions

The operating mode/system were as follows in details:

Operating: After Connected from personal comput to E.U.T by RGB cable(D-sub 15 pin).
And then use to "H" pattern program for data transmission and continuously 'H' pattern displayed on the LCD Monitor.

7. TEST RESULTS

7.1 Conducted emission

Measurement procedure

Mains

The measurements were performed in a shielded room. EUT was placed on a non-metallic table height of 0.4m above the reference ground plane. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.

Both lines of power cord, hot and neutral, were measured.

Used equipment

Equipment	Model no.	Serial no.	Makers	Next cal date	Used
Test receiver	ESPI3	100109	R&S	2005.3.15	x
L.I.S.N.	ESH2-Z5	100044	R&S	2005.4.23	x
	ESH2-Z5	100147	R&S	2005.4.23	x

Measurement uncertainty

Conducted Emission measurement : ± 2.4 (K=2)

Test data

FREQ. (MHz)	LEVEL (dB μV)		LINE Pol	Loss (dB)	LIMIT (dB μV)		MARGIN (dB μV)	
	QP	AV			QP	AV	QP	AV
0.166	60.43	37.47	N	0.29	65.57	55.57	5.43	18.39
0.214	54.68	43.79	N	0.29	61.89	51.89	7.50	8.39
0.306	43.29	42.05	N	0.29	59.66	49.66	16.66	7.90
0.466	25.19	19.90	N	0.29	56.00	46.00	31.10	26.39
0.922	21.12	15.89	N	0.43	56.00	46.00	35.31	30.54
17.182	24.23	20.76	N	1.77	60.00	50.00	37.54	31.01
21.342	20.42	19.81	N	1.83	60.00	50.00	41.41	32.02

* Level = test receiver reading value

* Loss = LISN insertion Loss + Cable Loss

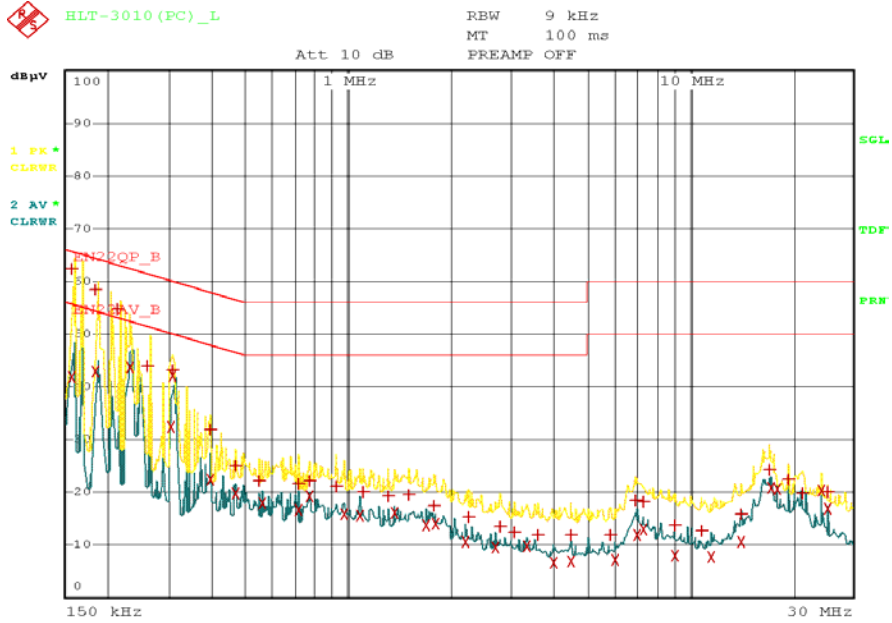
EMI TEST REPORT



Report reference No: KST-FCC0413

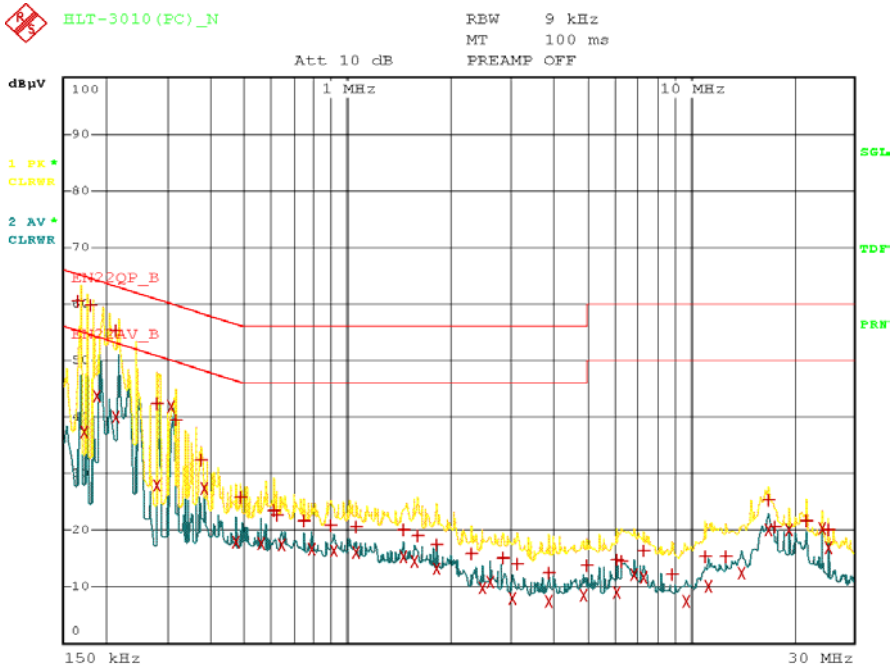
Conducted emission test graph

Line. Live



Date: 17.MAY.2004 10:49:57

Line. Neutral



Date: 17.MAY.2004 10:45:49

EMI TEST REPORT



Report reference No: KST-FCC0413

7.2 Radiated Emission

Measurement procedure

A pretest was performed at 3m distances in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10m open area test site with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8m above the reference ground plane. Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Used equipment

Equipment	Model no.	Serial no.	Makers	Next cal date
Test receiver	ESCS30	100111	R&S	2005.3.17
Ultra broadband antenna	HL562	100075	R&S	2005.3.16
Matching network	RAM	358.5414.02	R&S	-
Antenna Mast	AT14	none	Daeil EMC	-
Turn Table	TT15	none	Daeil EMC	-
10m Open area site	none	none	KOSTEC Lab	-
chamber(3m)	none	none	FRANCONIA	-

Measurement uncertainty

Radiated Emission measurement :
 30-300MHz +3.96dB / -4.04dB
 300-1000MHz +3.04dB / -3.00dB

Test data : ("H" pattern scroll) – PC Mode

Freq (MHz)	Reading (dBuV/m)	P (H/V)	H (m)	A (.)	Antenna (dB)	Cable Loss (dB)	Result (dBuV/m)	Limit (dB)	Margin (dB)
79.35	19.10	V	2.00	260	8.10	3.32	30.21	40.0	9.79
184.20	20.78	H	3.60	180	7.48	4.64	32.90	43.5	10.60
200.46	21.10	H	3.20	170	7.30	5.10	33.50	43.5	10.00
243.90	21.93	H	3.00	280	9.22	5.35	36.50	46.0	9.50
394.05	19.18	H	2.70	160	13.38	7.34	39.90	46.0	6.10
550.86	12.60	V	1.80	180	16.20	9.10	37.90	46.0	8.10
708.85	10.24	H	1.90	220	18.48	10.08	38.80	46.0	7.20
946.92	7.36	H	1.60	160	20.96	12.28	40.60	46.0	5.40

Reading = Test receiver reading / P= antenna Polarization / H=antenna H
 A=turn table Angle / Antenna = antenna factor / Cable loss = used cable loss
 Result = reading + antenna + loss / Margin = Limit - result
 * Receiving Antenna Mode: Horizontal, Vertical / * Test site: 3m Open area site