

HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

Product Compliance Division, EMC Team
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
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TEST REPORT

Manufacture;

HYUNDAI IT CORP.

SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI,
KYOUNKI-DO, 467-701, KOREA

HYUNDAI IMAGEQUEST FRN : 0005-8664-39

Date of Issue: March 28. 2007

Test Report No.: HCT-F07-0310

Test Site: HYUNDAI CALIBRATION & CERTIFICATION
TECHNOLOGIES CO., LTD.

HCT FRN: 0005-8664-21

FCC ID :

PJILT42DW000

MODEL:

LT42DW000

Rule Part(s): Part 15 & 2
Equipment Class: FCC Class B Peripheral Device (JBP)
Standard(s): FCC Class B: (CISPR 22)

LCD Panel: PC Audio In, AV 1 In, AV 2 Out, Component In Audio 1, Component In Video 1,
Component In Audio 2, Component In Video 2, AV3 In, S-Video In, ANT In, HDMI
Out, AC In, D-Sub
LC420WX5/ LG PHILIPS LCD

This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003

I attest to the accuracy of data. All measurements reported herein were performed by me 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.


Report prepared by
: Kun-Hyoung Kim
Test engineer of EMC Tech.Part

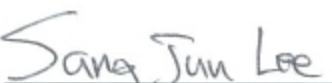

Approved by
: Sang Jun LEE
Manager of EMC Tech.Part



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MEASUREMENT REPORT

1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

Applicant Name:	HYUNDAI IT CORP.
Address:	SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA

- **FCC ID :** PJILT42DW000
- **Equipment Class:** FCC Class B Peripheral Device (JBP)
- **EUT Type:** LCD TV
- **Model(s):** LT42DW000
- **Power:** AC 100 – 240 V, 50/ 60 Hz
- **Dimension (X x D x H mm – Stand included):** 1237 x 310 x 708
- **Max. resolution:** 1920 x 1080 @ 60 Hz
- **Weigh (Stand included)** 32.6 Kg
- **Rule Part(s):** FCC Part 15 Subpart B
- **Test Procedure(s):** ANSI C63.4 (2003)
- **Dates of Tests:** March 06. 2007 ~ March 27. 2007
- **Place of Tests:**
254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO,467-701,KOREA

2.1 INTRODUCTION

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **HYUNDAI IT CORP. LCD TV FCC ID: PJILT42DW000**

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, MAEKOK-RI, HOBUP-MYUN, ICHON-SI, KYOUNGKI-DO, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 23, 2003 (Confirmation Number: EA90661)

3.1 PRODUCT INFORMATION

3.2 Equipment Description

Equipment Under Test (EUT) is **HYUNDAI IT CORP.** LCD TV
 (FCC ID: PJILT42DW000)

Product Specifications

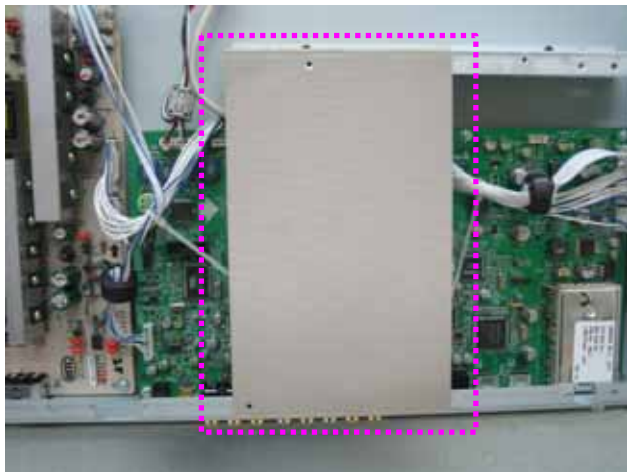
Model	LT42 DW000	
Input	S-Video	1(A/V audio common)
	Video (RCA)	2(Audio included)
	Component(Y/Cb/Cr)	2(Audio included)
	Antenna	1
	PC Connection jack	D-SUB
	Max. resolution	1920 X1080 @ 60 Hz
	Audio	L/R
	HDMI	2
	Memory Slot	No
Output	Video	1
	Audio	2(L/R, SPDIF)
TV/Video	Analog	NTSC M / FM
	Digital	ATSC
	Video system	Component, S-Video, Composite, PC, HDMI
Power	Supply	AC 100 - 240 V, 50/60 Hz
	Consumption power	200W (Typical)
	Stand-by power	< 1W
Dimension (W x D x H mm - Stand included)		1237 x310 x 708
Weigh (Stand included)		32.6 Kg
Control type		Remote control, Key control

- The above specifications may be subject to change without prior notice.

EMI Suppression Devices:

Modifications were made to the device. Please refer to the next page.

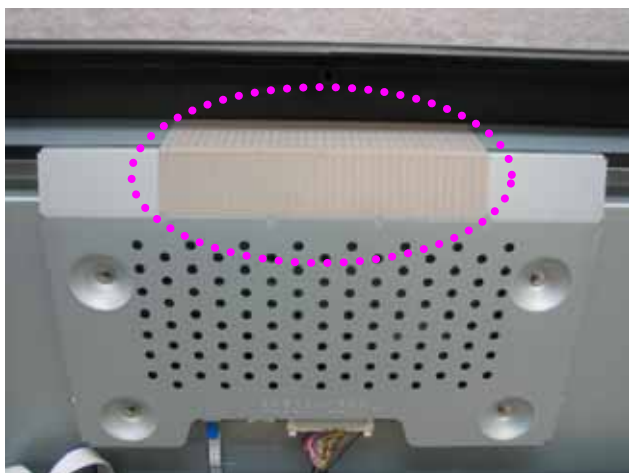
1. Attached the Shield tape



2. Attached the Core



3. Attached the Shield tape



4. Attached the Gasket



4.1 Description of Tests(Conducted)

4.2 Powerline Conducted RFI (150kHz- 30MHz)

The power line conducted RFI measurements were performed according to **ANSI C63.4 (2003)**.

The EUT was placed on a non-conducting 1.0 by 1.5 meter table which is 0.8 meters in height and 0.40 meters away from the vertical wall of the shielded enclosure. Power to the EUT is provided through a Rohde & Schwarz 50 Ω / 50 uH Line Impedance Stabilization Network (LISN) and the support equipment through a separate Solar 50 Ω / 50 uH Line- Conducted Test Facility LISN. Sufficient time for the EUT, support equipment, and test equipment were 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. The spectrum was scanned from 150kHz to 30 MHz. Each maximum EME was remeasured using an EMI receiver. The detector function of the receiver was set to CISPR quasi- peak and average mode with the bandwidth set to 9 kHz. Each emission was maximized consistent with the typical applications by varying the configuration of the test sample. Interface cables were connected to the available interface ports of the test unit. The effect of varying the position of cables was investigated to find the configuration that produces maximum Diagram emission. Excess cable lengths were bundled at the center with 30- 40cm. in length. The worst-case configuration is noted in the test report and the photographs are attached. Each EME reported was calibrated using the Rohde & Schwarz SMT signal generator and are listed on Table 1. RFI Conducted FCC Class B.

RFI CONDUCTED	FCC CLASS B Limits dB(uV)	
	ANSI C63.4 (2003) Quasi-Peak	ANSI C63.4 (2003) Quasi-Peak
Freq. Range		
150kHz - 0.5MHz	66-56**	56-46**
0.5MHz – 5MHz	56	46
5MHz - 30MHz	60	50
**Limits decreases linearly with the logarithm of frequency		

Table 1. RFI Conducted Limits

4.3 Description of Tests (Radiated)

Radiated Emissions

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 spectrum was scanned from 30 to 1000 MHz using Tri-log antenna, and above 1 GHz using linearly polarized horn antennas. For frequencies above 1 GHz, horn antennas were used. Sufficient time for the EUT, support equipment, and test equipment were allowed in order for them to warm up to their normal operating condition. The EMI receiver detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120 kHz. The EUT, support equipment, and interconnecting cables were arranged to the configuration that produces the maximum EME emission found during preliminary scan. 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. Horizontal and vertical antenna polarizations were checked. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/ or support equipment, and powering the monitor the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission.

ITE Radiated Limits			
Frequency (MHz)	FCC Limit @ 3m. Quasi- Peak dB[μ V / m]	FCC Limit @ 10m.* Quasi – Peak dB [μ V / m]	CISPR Limit @ 10m. Quasi-Peak dB [μ V / m]
30-88	40.0	29.5	30.0
88-216	43.5	33.0	30.0
216-230	46.0	35.6	30.0
230-960	46.0	35.6	37.0
960-1000	54.0	43.5	37.0
> 1000	54.0	43.5	No Specified Limit
* Limit extrapolated 20 dB/decade			

Table 2. Radiated Class B limits @ 10-meters

5.1 Support Equipment Used

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
LCD TV	HYUNDAI IT CORP.	LT42DW000	DoC	EUT
PC	DELL	OPTIPLEXGX620	DoC	EUT
Mouse	DELL	MO56U0	DoC	PC END
Serial Mouse	LOGITECH	M-M28	DoC	PC END
Keyboard	DELL	SK-8115	DoC	PC END

5.2 Cable Description

		Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
LCD TV (EUT)	PC Audio In	N/A	Y	D(1.8)
	AV 1 In	N/A	Y	D(1.6)
	AV 2 Out	N/A	Y	D(1.6)
	Component In Audio 1	N/A	Y	D(1.6)
	Component In Video 1	N/A	Y	D(1.6)
	Component In Audio 2	N/A	Y	D(1.6)
	Component In Video 2	N/A	Y	D(1.6)
	AV3 In	N/A	Y	D(1.6)
	S-Video In	N/A	Y	D(1.6)
	ANT In	N/A	Y	D(3.0)
	HDMI In	N/A	Y	D(1.8)
	AC In	N	N/A	D(1.8)
	D-Sub	N	Y	D(1.6)
PC	USB (Mouse)	N/A	Y	D(1.8)
	USB (Keyboard)	N/A	Y	D(1.8)
	Serial (Mouse)	N/A	Y	D(1.3)
	AC In	N	N/A	P(1.8)

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

5.3 Noise Suppression Parts on Cable. (I/O CABLE)

		Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
LCD TV (EUT)	AV1 In	N	N/A	Y	Both END
	AV2 Out	N	N/A	Y	Both END
	Component In Video 1	N	N/A	Y	Both END
	Component In Audio 1	N	N/A	Y	Both END
	Component In Video 2	N	N/A	Y	Both END
	Component In Audio 2	N	N/A	Y	Both END
	AV 3 In	N	N/A	Y	Both END
	S-Video In	N	N/A	Y	Both END
	HDMI	N	N/A	Y	Both END
	PC Audio In	N	N/A	Y	Both END
	D-Sub In	Y	Both END	Y	Both END
PC	USB (Mouse)	N	N/A	Y	PC END
	USB (Keyboard)	N	N/A	Y	PC END
	Serial (Mouse)	N	N/A	Y	PC END

6.1 CONDUCTED TEST DATA

[D-Sub mode]

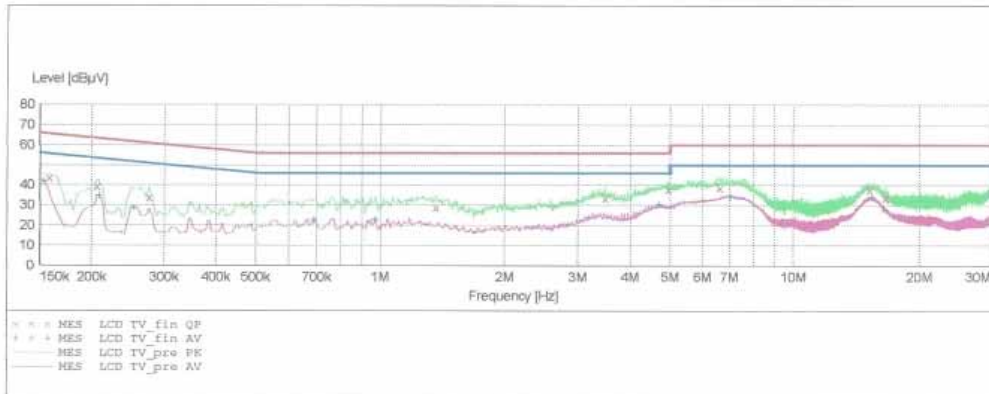
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EMC TEST LAB.

EUT: LT42DW000
 Manufacturer: HYUNDAI IT CORP.
 Operating Condition: 1360 X 768 60Hz (DSUB)
 Test Site: SHIELD ROOM
 Operator: KH-KIM
 Test Specification: CISPR 22 CLASS B
 Comment: H

SCAN TABLE: "CISPR 22 Voltage"

Short Description:			CISPR 22 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "LCD TV_fin QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.157600	43.60	10.1	66	22.0	---	---
0.205100	39.50	10.1	63	23.9	---	---
0.275100	33.90	10.1	61	27.1	---	---
1.360000	28.80	10.2	56	27.2	---	---
3.480000	33.60	10.2	56	22.4	---	---
4.945000	37.80	10.3	56	18.2	---	---
6.620000	38.70	10.3	60	21.3	---	---
15.210000	37.90	10.5	60	22.1	---	---
16.590000	33.70	10.5	60	26.3	---	---

MEASUREMENT RESULT: "LCD TV_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.152600	42.00	10.1	56	13.8	---	---
0.207600	35.00	10.1	53	18.3	---	---
0.252600	29.00	10.1	52	22.7	---	---
0.690000	22.90	10.2	46	23.1	---	---
0.970000	23.10	10.1	46	22.9	---	---
4.700000	30.50	10.3	46	15.5	---	---
7.050000	34.60	10.3	50	15.4	---	---
15.475000	34.00	10.5	50	16.0	---	---
16.540000	27.90	10.5	50	22.1	---	---

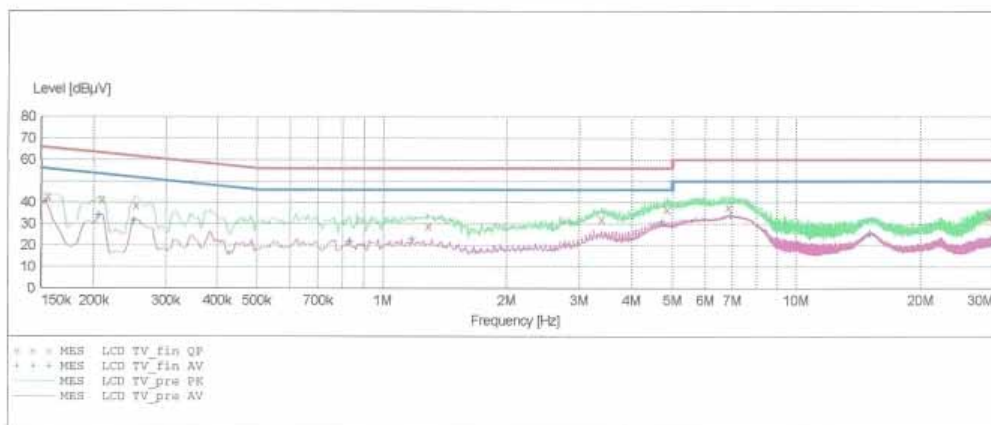
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EMC TEST LAB.

EUT: LT42DW000
 Manufacturer: HYUNDAI IT CORP.
 Operating Condition: 1360 X 768 60Hz (DSUB)
 Test Site: SHIELD ROOM
 Operator: KH-KIM
 Test Specification: CISPR 22 CLASS B
 Comment: N

SCAN TABLE: "CISPR 22 Voltage"

Short Description:			CISPR 22 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "LCD TV_fin QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.155100	42.60	10.1	66	23.1	---	---
0.207600	41.40	10.1	63	21.9	---	---
0.252600	39.10	10.1	62	22.5	---	---
1.285000	29.20	10.2	56	26.8	---	---
3.390000	32.50	10.2	56	23.5	---	---
4.840000	36.80	10.3	56	19.2	---	---
6.830000	37.80	10.3	60	22.2	---	---
29.175000	33.50	10.6	60	26.5	---	---
29.945000	33.40	10.6	60	26.6	---	---

MEASUREMENT RESULT: "LCD TV_fin AV"

3/6/2007 7:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.152600	40.50	10.1	56	15.4	---	---
0.205100	34.30	10.1	53	19.1	---	---
0.250100	31.90	10.1	52	19.9	---	---
0.830000	22.10	10.1	46	23.9	---	---
1.175000	23.10	10.1	46	22.9	---	---
4.700000	31.10	10.3	46	14.9	---	---
6.915000	33.90	10.3	50	16.1	---	---
15.130000	25.90	10.5	50	24.1	---	---
29.980000	24.40	10.6	50	25.6	---	---

NOTES:

1. All modes of operation were investigated, and the worst-case emissions are reported.
2. The conducted limits are listed on Table 1 (Page 7).
3. Line H = Hot Line N = Neutral

** Measurements using CISPR quasi-peak mode.

7.1 RADIATED TEST DATA

[D-Sub]

Frequency MHz	Reading dBuV	Ant. Factor dB / m	Cable Loss dB	ANT POL (H / V)	Total dBuV / m	Limit dBuV / m	Margin dB
58.9	14.5	11.7	1.7	V	27.9	30.0	2.1
117.1	11.8	10.8	2.4	V	25.0	30.0	5.0
194.5	7.3	9.7	3.1	H	20.1	30.0	9.9
538.0	3.9	17.8	5.3	H	27.0	37.0	10.0
799.9	3.5	21.8	6.4	H	31.7	37.0	5.3
899.9	3.3	22.9	6.8	V	33.0	37.0	4.4

Radiated Measurements at 10-meters.

NOTES:

1. All modes of operation were investigated, and the worst-case emissions are reported.
2. The radiated limits are listed on Table 2 (Page 8).

*** Measurements using CISPR quasi-peak mode.

8.1 Sample Calculations

$$\text{dB } \mu\text{V} = 20 \log_{10} (\mu\text{V})$$

$$\text{dB } \mu\text{V} = \text{dBm} + 107$$

8.2 Example 1:

@ 0.1526 MHz

Class B limit	= 56.0 dB μV
Reading	= 42.0 dB μV (calibrated level)

Margin	= 42.2 – 56.0 = - 13.8 dB μV
	= 13.8 dB below limit

8.3 Example 2:

@ 58.9 MHz

Class B limit	= 30.0 dB $\mu\text{V}/\text{m}$
Reading	= 14.5 dB $\mu\text{V}/\text{m}$ (calibrated level)
Antenna Factor + Cable Loss	= 13.4 dB
Total	= 27.9 dB $\mu\text{V}/\text{m}$

Margin	= 27.9 – 30.0 = - 2.1 dB $\mu\text{V}/\text{m}$
	= 2.1 dB below limit

9.1 Test Equipment

<u>Type</u>	<u>Manufacture</u>	<u>Model Number</u>	<u>CAL Due Date</u>
Conducted Emission			
EMI Test Receiver	Rohde & Schwarz	ESCI	2007.08.24
LISN	Rohde & Schwarz	ESH2-Z5	2007.04.26
LISN	EMCO	703125	2007.04.26
PULSE LIMITER	Rohde & Schwarz	ESH3-Z2	2007.10.30
Radiated Emission			
EMI Test Receiver	Rohde & Schwarz	ESCI40	2007.11.06
TRILOG Antenna	Schwarzbeck	9160	2007.04.17
Antenna Position Tower	HD	MA240	N/A
Turn Table	EMCO	1050	N/A
Controller	HD GmbH	HD 100	N/A
Slide Bar	HD GmbH	KMS 560	N/A

10.1 Test Software Used

The EUT was acted standby mode during radiated and conducted testing.

NOTE: This is a sample of the basic program used during the test. However, during testing, a different software program may be used; whichever determines the worst-case condition. In addition, the program used also depends on the number and type of devices being tested.

11.1 Conclusion

The data collected shows that **HYUNDAI IT CORP. LCD TV (FCC ID: PJILT42DW000)** complies with §15.107 and §15.109 of the FCC Rules.