

**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: Apr. 16. 2007

Test Report No.: HCT-F07-0406

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  
LC420WU2 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  
: Kyoung Houn, Seo  
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Approved by  
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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.

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

- **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:** Apr.10. 2007 ~ Apr. 12. 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

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

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

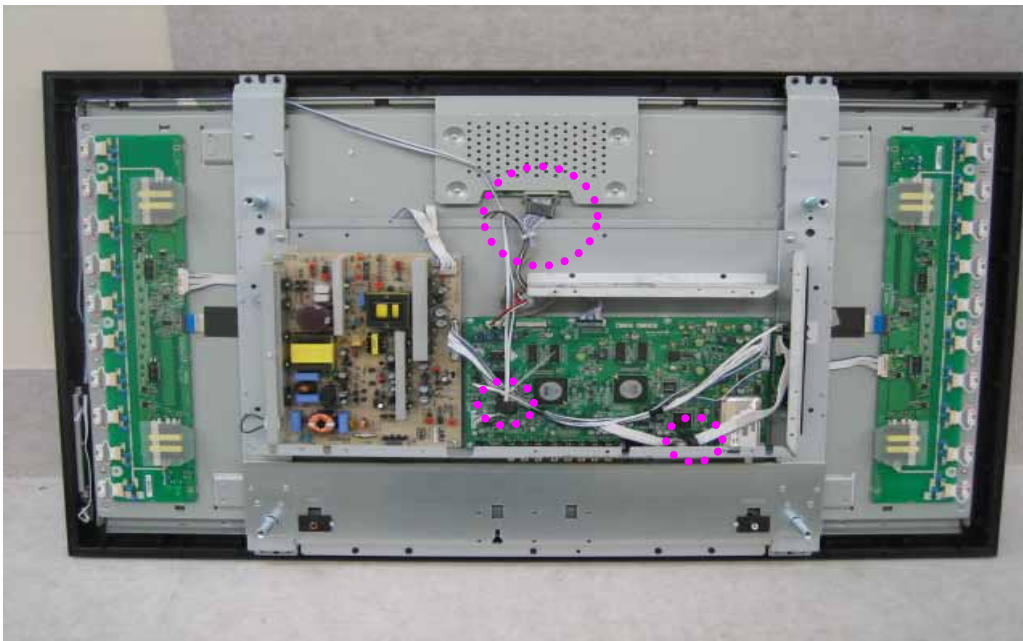


### 3.3 EMI Suppression Devices

Attached the Shield tape



Attached the Core



## 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)	
	Quasi-Peak	Average
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.

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

**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
Keyboard	DELL	SK-8115	DoC	PC END
MPEG-Recoder	Tektronix	MTX 100	DoC	-
MPEG-Recorder	Tektronix	MTX 100	DoC	-
All Channel Converter	EIDEN	4200C-006	DoC	-
TV PATTEN GENERATOR	PROMAX	GV698	DoC	-

## 5.2 Cable Description

		Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
LCD TV (EUT)	AV 1 In	N/A	Y	D(1.6)
	AV 2 Out	N/A	Y	D(1.6)
	Component Audio In 1	N/A	Y	D(1.6)
	Component Video In 1	N/A	Y	D(1.6)
	Component Audio In 2	N/A	Y	D(1.6)
	Component Video In 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 Out	N/A	Y	D(1.8)
	AC In	N	N/A	P(1.8)
	D-Sub In	N/A	Y	D(1.6)
	Audio In	N/A	Y	D(1.5)
	Serial	N/A	Y	D(1.5)
PC	USB	N/A	Y	D(1.8)
	USB	N/A	Y	D(1.8)
	AC In	N	N/A	P(1.8)
	Serial	N/A	Y	D(1.5)
	Audio Out	N/A	Y	D(1.5)
	Parallel	N/A	Y	D(1.5)
	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 Audio In 1	N	N/A	Y	Both END
	Component Video In 1	N	N/A	Y	Both END
	Component Audio In 2	N	N/A	Y	Both END
	Component Video In 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 Out	N	N/A	Y	Both END
	Audio In	N	N/A	Y	Both END
	D-Sub In	Y	Both END	Y	Both END
	Serial (Mouse)	N	N/A	Y	Both END
PC	USB (Mouse)	N	N/A	Y	PC END
	USB (Keyboard)	N	N/A	Y	PC END
	Serial	Y	Both END	Y	Both END
	Audio Out	N	N/A	Y	Both END
	Parallel	N	N/A	Y	Both END

## 6.1 CONDUCTED TEST DATA

[D-Sub mode]

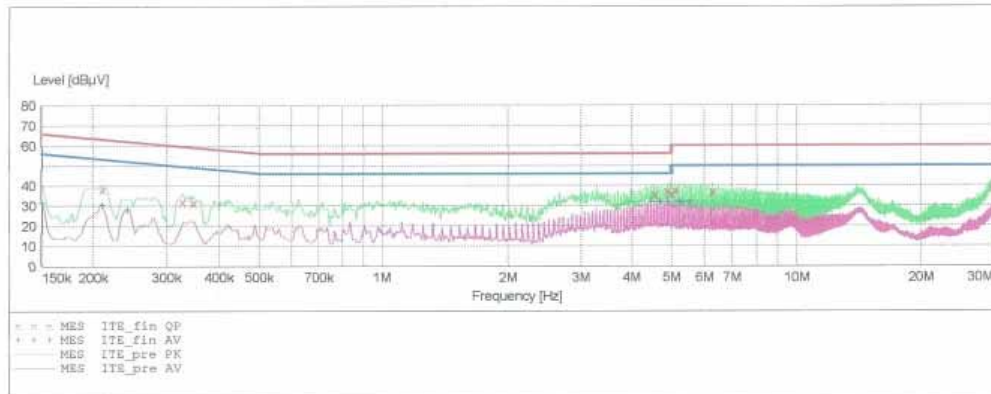
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EMC TEST LAB.

EUT: LT42DW000  
 Manufacturer: HYUNDAI IT CORP.  
 Operating Condition: 1920 X 1080 60Hz  
 Test Site: SHIELD ROOM  
 Operator: KH-SEO  
 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: "ITE\_fin QP"

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Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.210100	38.60	10.0	63	24.6	---	---
0.327600	31.90	10.0	60	27.6	---	---
0.347600	31.40	10.0	59	27.6	---	---
4.525000	35.70	10.6	56	20.3	---	---
4.875000	37.40	10.6	56	18.6	---	---
4.950000	35.90	10.6	56	20.1	---	---
5.085000	37.90	10.6	60	22.1	---	---
6.270000	37.10	10.8	60	22.9	---	---
29.955000	38.60	12.8	60	21.4	---	---

MEASUREMENT RESULT: "ITE\_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150100	31.70	10.0	56	24.3	---	---
0.210100	30.70	10.0	53	22.5	---	---
0.242600	28.20	10.0	52	23.8	---	---
4.460000	31.80	10.6	46	14.2	---	---
4.670000	31.70	10.6	46	14.3	---	---
4.875000	32.00	10.6	46	14.0	---	---
5.225000	32.30	10.7	50	17.7	---	---
5.295000	32.50	10.7	50	17.5	---	---
5.505000	32.20	10.7	50	17.8	---	---

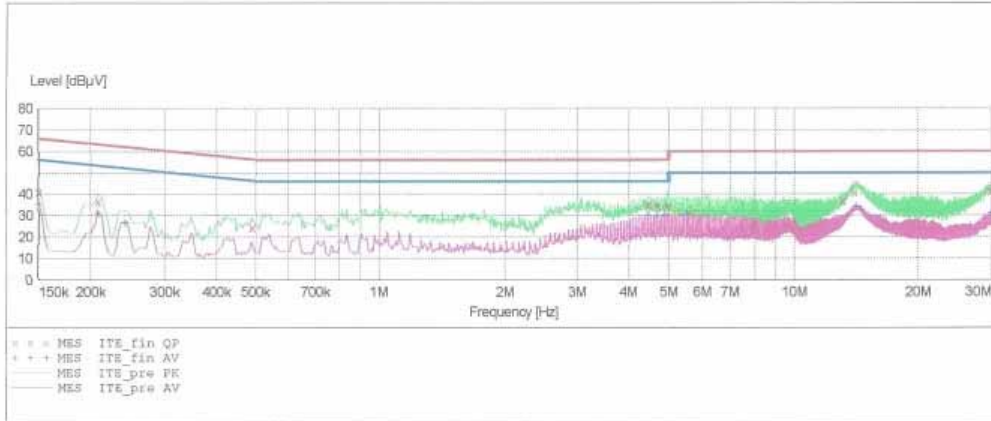
HCT

EMC TEST LAB.

EUT: LT42DW000  
 Manufacturer: HYUNDAI IT CORP.  
 Operating Condition: 1920 X 1080 60Hz  
 Test Site: SHIELD ROOM  
 Operator: KH-SEO  
 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
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: "ITE\_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150100	41.00	10.0	66	25.0	---	---
0.207600	36.30	10.0	63	27.0	---	---
0.490100	24.50	10.1	56	31.7	---	---
4.460000	35.20	10.6	56	20.8	---	---
4.670000	34.70	10.6	56	21.3	---	---
4.950000	34.30	10.6	56	21.7	---	---
13.165000	36.90	11.6	60	23.1	---	---
13.995000	40.80	11.7	60	19.2	---	---
29.740000	41.20	12.8	60	18.8	---	---



MEASUREMENT RESULT: "ITE\_fin AV"

4/6/2007 9:49AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150100	35.40	10.0	56	20.6	---	---
0.207600	31.30	10.0	53	22.0	---	---
0.242600	26.90	10.0	52	25.1	---	---
4.460000	30.20	10.6	46	15.8	---	---
4.670000	30.10	10.6	46	15.9	---	---
4.875000	30.60	10.6	46	15.4	---	---
5.505000	31.20	10.7	50	18.8	---	---
14.145000	34.60	11.8	50	15.4	---	---
29.995000	31.20	12.8	50	18.8	---	---

**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

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\*\* 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
78.9	15.0	8.6	2.0	V	25.6	30.0	4.4
199.9	11.7	9.2	3.2	H	24.1	30.0	5.9
232.7	17.0	10.4	3.5	V	30.9	37.0	6.1
299.1	14.5	12.7	4.0	V	31.2	37.0	5.8
598.2	6.8	19.0	5.6	V	31.4	37.0	5.6
750.0	3.9	21.8	6.3	H	32.0	37.0	5.0

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:

@ 4.875 MHz

Class B limit	=	46.0 dB $\mu\text{V}$
Reading	=	32.0 dB $\mu\text{V}$ (calibrated level)

<b>Margin</b>	=	32.0 – 46.0 = - 14.0 dB $\mu\text{V}$
	=	<b>14.0 dB below limit</b>

### 8.3 Example 2:

@ 750.0 MHz

Class B limit	=	37.0 dB $\mu\text{V}/\text{m}$
Reading	=	3.9 dB $\mu\text{V}/\text{m}$ (calibrated level)
Antenna Factor + Cable Loss	=	28.1 dB
Total	=	32.0 dB $\mu\text{V}/\text{m}$

<b>Margin</b>	=	32.0 – 37.0 = - 5.0 dB $\mu\text{V}/\text{m}$
	=	<b>5.0 dB below limit</b>

## 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	9168	2008.03.19
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.