



## HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

PRODUCT COMPLIANCE TEAM  
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA  
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# CERTIFICATION

**Manufacture;**  
CORNEA TECHNOLOGY CO., Ltd.

Rm#201, Na Dong, Shilla-Technoville, 39-3 Dong-Dong,  
Kunpo-Shi, Kyunggi-Do, Korea  
CORNEA : 0006-5809-55

**Date of Issue: FEBRUARY 20, 2002**  
**Test Report No.: HCT-F02-0204**

Test Site: HYUNDAI CALIBRATION & CERTIFICATION  
TECHNOLOGIES CO., LTD.  
**HCT FRN : 0005-8664-21**

**FCC ID :**

**PL4CT1701**

**MODEL / TYPE :**

**CT1701**

<b>FCC Rule Part(s):</b>	<b>Part 15 &amp; 2; ET Docket 95-19</b>
<b>Classification:</b>	<b>FCC Class B Peripheral Device (JBP)</b>
<b>Standard(s):</b>	<b>FCC Class B: 1998 (CISPR 22)</b>
<b>Equipment(EUT) Type:</b>	<b>17" LCD Monitor</b>
<b>Max Resolution:</b>	<b>1280 X 1024 Non-interlaced (@80KHz/ 75Hz)</b>
<b>Port/ Connector(s)</b>	<b>17pin D-sub VGA connector</b>

The device bearing the trade name and model specified above, has been shown to comply 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. (See Test Report if any modifications were made for compliance)

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.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988, 21 U.S.C. 853(a).

Report prepared by : Ki-Soo Kim  
Manager of EMC Tech. Part



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# 1. GENERAL INFORMATION

## 1.1 Product Description

The CORNEA TECHNOLOGY CO., LTD. Model CT1701 (referred to as the EUT in this report) is a 17"LCD Monitor with HOR. Freq. 80KHz (Max) and Resolution of 1280 X 1024 (Non-Interlaced). Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	PLASTIC
LIST OF EACH OSC. OR XTAL. FREQ.(FREQ. 1MHz)	12MHz , 14.318MHz
POWER REQUIREMENT	AC 100 - 240 V, 50/60Hz Input 12V, 5A Max DC Output
NUMBER OF LAYERS	MAIN BOARD 4 LAYER OSD BOARD 1 LAYER POWER BOARD 1 LAYER INVERTER BOARD 2 LAYER
MAX. RESOLUTION	1280 X 1024 NON-INTERLACED (@80KHz/ 75Hz)
H-SYNC FREQUENCY RANGE	31.5KHz 80KHz
V-SYNC FREQUENCY RANGE	56Hz 75Hz
LCD TYPE	17" ( LCD Type :HT17E11-200, HYUNDAI)

## 1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

### 1.3 Tested System Details

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
MONITOR (EUT)	CORNEA TECHNOLOGY CO., LTD.	CT1701	PL4CT1701	HOST
PC(HOST)	H/P	DTPC-17	DoC	N/A
KEY BOARD	H/P	SK-2501-2D-K	GYUR385K	HOST
PRINTER	H/P	HP 895C	DoC	HOST
MODEM	3COM CORPORATION	56K FAX MODEM	DoC	HOST
VIDEO CARD	DIAMOND	3D3000	DoC	HOST
MOUSE	H/P	INTELLIMOUSE 1.1	DZL211029	HOST

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

### 1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 10 meters.

### 1.5 Test Facility

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 24,2000(Confirmation Number: EA90661)

## 2.SYSTEM TEST CONFIGURATION

### 2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	CORNEA TECHNOLOGY CO., LTD.	NPM-CT170-000
POWER BOARD	LI SHIN INTERNATIONAL ENTERPRISE CORP	LSE9802A1240
OSD BOARD	CORNEA TECHNOLOGY CO., LTD.	NMH-CT170-000
INVERTOR BOARD	CORNEA TECHNOLOGY CO., LTD.	NMT-170-000
LCD BOARD	Hyundai Display Technology Inc.	HT17E11-200

### 2.2 EUT exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disc, was inserted into drive A and is auto starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is :(1) Display test, (2) RS 232 test (3) Key board test,(4) Printer test,(5) FDD test,(6) HDD test. The complete cycle takes about 20 seconds and is repeated continuously. As the keyboard and mouse are strictly input devices, no data is transmitted to them during test. They are however, continuously scanned for data input activity. The video resolution modes setup and change program was used during the radiated and conducted emission testing.

## 2.3 Cable Description

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

	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
MONITOR(EUT)	N	Y	1.8(P), 1.5(D)
PC(HOST)	N	N/A	1.8(P)
PRINTER	N	Y	2.0(P),1.8(D)
KEY BOARD	N/A	Y	2.0(D)
MODEM	N	Y	2.0(P),0.8(D)
MOUSE	N/A	Y	1.8(D)

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

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
MONITOR(EUT)	Y	PC END	Y	PC END
PRINTER	N	N/A	Y	BOTH END
KEY BOARD	Y	PC END	Y	PC END
MODEM	N	N/A	Y	BOTH END
MOUSE	N	N/A	Y	PC END

## **2.5 Equipment Modifications**

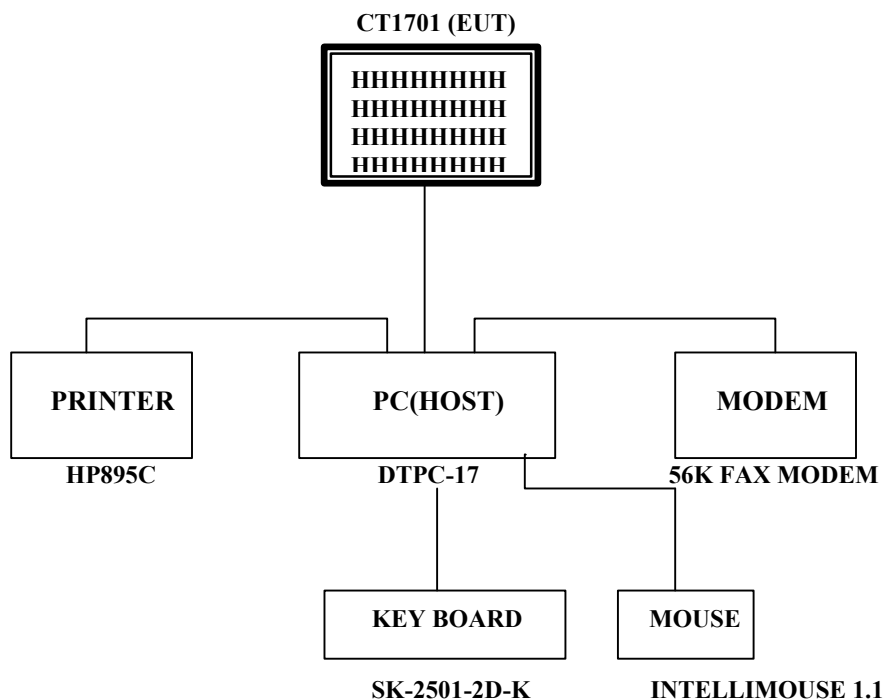
N/A

## 2.6 Configuration of Test system

**Line Conducted Test** : EUT was connected to LISN, all other supporting equipment were connected to another LISN.  
Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test** : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating condition. Final Radiated Emission tests were conducted at 10 meter open area test site.

### [Configuration of Tested System]





### 3. PRELIMINARY TESTS

#### 3.1 AC Power line Conducted Emission Tests

During Preliminary Tests, the following operating mode were investigated

Processor Speed (MHz)	Video Resolution (w/max)	The worst operating condition
Pentium 350 MHz	1280 X 1024 Non-Interlaced (80KHz/75Hz)	X
	1024 x 768 Non-Interlaced (60KHz/75Hz)	
	1024 x 768 Non-Interlaced (56.6KHz/70Hz)	
	800 x 600 Non-Interlaced (46.9KHz/75Hz)	
	800 x 600 Non-Interlaced (37.9KHz/60Hz)	
	640 x 480 Non-Interlaced (31.5KHz/60Hz)	

#### 4.2 Radiated Emission Tests

During Preliminary Tests, the following operating mode were investigated

Processor Speed (MHz)	Video Resolution (w/max)	The worst operating condition
Pentium 350 MHz	1280 X 1024 Non-Interlaced (80KHz/75Hz)	X
	1024 x 768 Non-Interlaced (60KHz/75Hz)	
	1024 x 768 Non-Interlaced (56.6KHz/70Hz)	
	800 x 600 Non-Interlaced (46.9KHz/75Hz)	
	800 x 600 Non-Interlaced (37.9KHz/60Hz)	
	640 x 480 Non-Interlaced (31.5KHz/60Hz)	

Measured by : Kyoung-Houn SEO / Engineer

Date : FEBRUARY 5, 2002

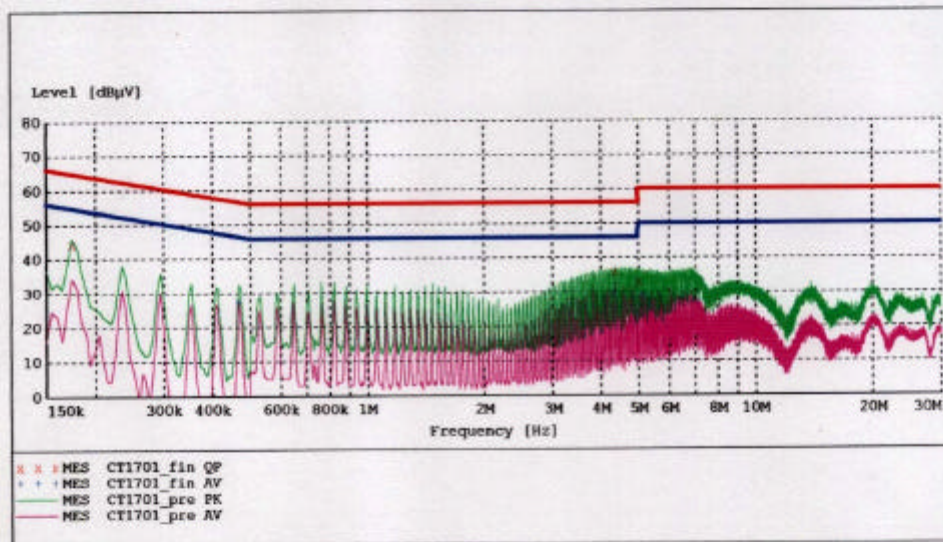


**HYUNDAI C-TECH. CO., LTD.**  
**EMC TEST LAB.**

EUT: CT1701  
Manufacturer: CORNEA  
Operating Condition: 1280 X 1024 80K 75Hz  
Test Site: SHIELD ROOM  
Operator: KH, YOON  
Test Specification: EN 55022 CLASS B  
Comment: N[110]  
Start of Test: 2/19/01 / 10:28:09PM

**SCAN TABLE: "EN 55022 V (PKH)"**

Short Description:		EN 55022 Voltage				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	100.0 ms	9 kHz	CABLE LOSS (NEW)
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	CABLE LOSS (NEW)
			Average			

**MEASUREMENT RESULT: "CT1701\_fin\_QP"**

2/19/01 10:32PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.175000	44.30	0.5	65	20.4	1	---
4.360000	35.80	0.8	56	20.2	1	---
5.000000	33.00	0.9	56	23.0	1	---

**MEASUREMENT RESULT: "CT1701\_fin\_AV"**

2/19/01 10:32PM

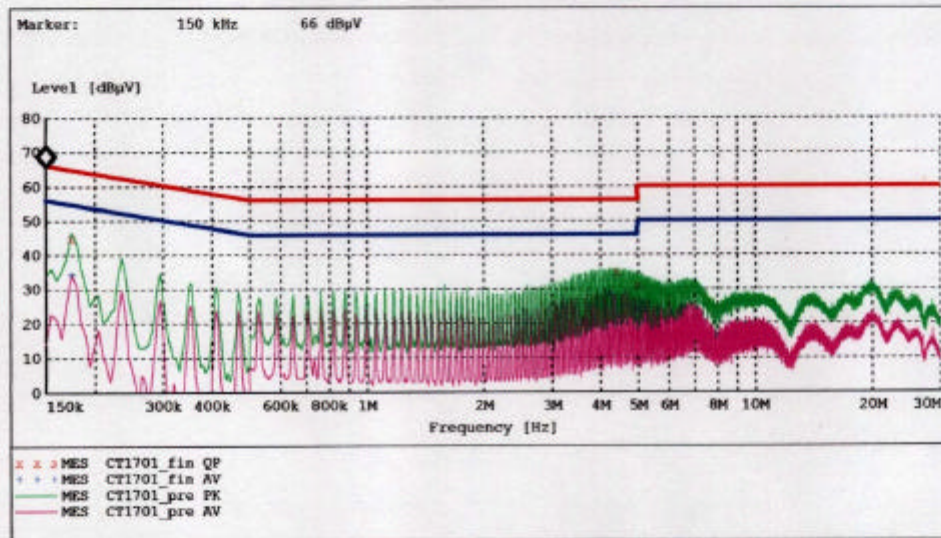
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.470000	27.50	0.5	47	19.0	1	---
4.360000	30.00	0.8	46	16.0	1	---
5.125000	29.30	0.9	50	20.7	1	---

**HYUNDAI C-TECH. CO., LTD.**  
**EMC TEST LAB.**

EUT: CT1701  
Manufacturer: CORNEA  
Operating Condition: 1280 X 1024 80K 75Hz  
Test Site: SHIELD ROOM  
Operator: KH, YOON  
Test Specification: EN 55022 CLASS B  
Comment: H[110]  
Start of Test: 2/19/01 / 10:24:18PM

**SCAN TABLE: "EN 55022 V (PKH)"**

Short Description:		EN 55022 Voltage				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	100.0 ms	9 kHz	CABLE LOSS (NEW)
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	CABLE LOSS (NEW)
			Average			

**MEASUREMENT RESULT: "CT1701\_fin QP"**

2/19/01 10:27PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.175000	44.70	0.5	65	20.0	1	---
4.415000	35.00	0.8	56	21.0	1	---
5.000000	30.90	0.9	56	25.1	1	---

**MEASUREMENT RESULT: "CT1701\_fin AV"**

2/19/01 10:27PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.175000	34.40	0.5	55	20.3	1	---
4.240000	28.80	0.8	46	17.2	1	---
5.000000	23.80	0.9	46	22.2	1	---

### 4.3 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Humidity Level : 39 %                      Temperature : 15  
 Limit apply to : CISPR 22  
 Type of Tests : CLASS B  
 Date : FEBRUARY 15, 2002  
 Result : PASSED BY -3.0 dB

EUT : 15" LCD MONITOR(CT1502 with D-Tech Adapter)  
 Operating Condition : 1024 X 768 Non-Interlaced (Hf :60.0 kHz, Vf : 75 Hz)  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth : 120 KHz)

Frequency MHz	Reading dBuV/m	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dBuV
54.3	14.41	9.49	1.50	H	25.4	30.0	-4.6
109.7	13.10	11.60	2.20	V	26.9	30.0	-3.1
142.7	9.09	14.61	2.50	V	26.2	30.0	-3.8
153.5	8.03	14.77	2.60	V	25.4	30.0	-4.6
164.3	9.45	14.85	2.70	H	27.0	30.0	-3.0
201.5	7.47	15.83	3.00	H	26.3	30.0	-3.7
403.3	9.75	16.55	4.20	V	30.5	37.0	-6.5
511.8	9.64	18.76	5.00	V	33.4	37.0	-3.6
545.0	7.55	19.15	5.30	V	32.0	37.0	-5.0
602.8	7.26	20.74	5.80	H	33.8	37.0	-3.2
672.0	1.45	22.25	6.00	V	29.7	37.0	-7.3
763.8	4.22	22.68	6.50	H	33.4	37.0	-3.6

**NOTE:**

- 1.All video modes and resolutions were investigated and the worst-case emissions are reported.
- 2.Other video modes & resolution were tested and found to be in compliance.

Measured by : Kyoung-Houn SEO / Engineer

Date : FEBRUARY 15, 2002



## 5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm } [(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$$

## 6. LIST OF TEST EQUIPMENT

<b>TYPE</b>	<b>MANUFACTURE</b>	<b>MODEL</b>	<b>CAL . DATE</b>
EMI Test Receiver	Rohde & Schwarz	ESH3	2001.6.29
EMI Test Receiver	Rohde & Schwarz	ESVP	2002.2.14
EMI Test Receiver	Rohde & Schwarz	ESI40	2001.11.5
EMI Test Receiver	Rohde & Schwarz	ESVS30	2001.3.6
Spectrum Monitor	Rohde & Schwarz	EZM	N.A
Graphic Plotter	Rohde & Schwarz	DOP2	N.A
Printer	Rohde & Schwarz	PDN	N.A
Spectrum Analyzer	H.P	8591EM	2001.7.11
LISN	EMCO	3825/2	2002.2.7
LISN	Rohde & Schwarz	ESH2-Z5	2001.8.12
Amplifier	Hewlett-Packard	8447E	2001.3.2
Dipole Antennas	Rohde & Schwarz	VHAP	2001.6.28
Dipole Antennas	Rohde & Schwarz	UHAP	2001.6.28
Biconical Antenna	Rohde & Schwarz	BBA-9106	2001.6.28
Log-Periodic Antenna	Rohde & Schwarz	UHALP-9107	2001.6.26
Antenna Position Tower	EMCO	1051-12	N.A
Turn Table	EMCO	1060-06	N.A
Line Filter	KEENE	ULW 2X30-60	N.A
Power Analyzer	Voltech	PM 3300	2001.2.20
Reference Network Impedance	Voltech	IEC 555	N.A
AC Power Source	PACIFIC	Magnetic Module	N.A
AC Power Source	PACIFIC	360AMX	N.A