



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

INT'L STANDARD CERTIFICATION TEAM  
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA  
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# CERTIFICATION

**Manufacture;**  
**IMAGEQUEST CO., LTD.**

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

**Date of Issue: SEPTEMBER 18, 2001**

**Test Report No.: HCT-F01-0903**

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

**FCC ID :**

**PJIA727**

**MODEL / TYPE :**

**A727**

**FCC Rule Part(s):**

**Part 15 & 2; ET Docket 95-19**

**Classification:**

**FCC Class B Peripheral Device (JBP)**

**Standard(s):**

**FCC Class B: 1998 (CISPR 22)**

**Equipment(EUT) Type:**

**17" CRT Monitor**

**Max Resolution:**

**1280 X 1024 Non-interlaced (@64KHz/ 60Hz)**

**Port/ Connector(s)**

**15-pin D-sub VGA connector**

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 G'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 ImageQuest CO., LTD. Model A727 (referred to as the EUT in this report) is a 17" CRT Monitor with HOR. Freq. 70KHz (Max) and Resolution of 1280X1024 (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
POWER REQUIREMENT	100 - 240 V~ 1.5A 60/50Hz
NUMBER OF LAYERS	MAIN BOARD 1 LAYER CRT BOARD 1 LAYER
MAX. RESOLUTION	1280 X 1024 NON-INTERLACED(@64KHz/ 60Hz)
H-SYNC FREQUENCY RANGE	30KHz 70KHz
V-SYNC FREQUENCY RANGE	50Hz 150Hz
CRT TYPE	17" ( CRT Type :M41KXU100XX071)

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

ORIGINAL SUBMITTAL ONLY

### 1.3 Tested System Details

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

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
MONITOR (EUT)	IMAGEQUEST CO., LTD.	A727	PJIA727	HOST
PC(HOST)	H/P	DTPC-17	DoC	N/A
KEY BOARD	H/P	SK-2501-2D-K	GYUR385K	HOST
PRINTER	H/P	HP895C	DoC	HOST
MODEM	3COM CORPORATION	56K FAX MODEM	DoC	HOST
VIDEO CARD	DIAMOND	3D3000	DoC	HOST
MOUSE	H/P	M-S34	DZL211029	HOST

### 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)

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## 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	ImageQuest CO., Ltd..	3040100883
CRT BOARD	ImageQuest CO., Ltd.	3040100884

### 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	Y	PC END	Y	BOTH END
KEY BOARD	Y	PC END	Y	PC END
MODEM	Y	PC END	Y	BOTH END
MOUSE	N	N/A	Y	PC END

## 2.5 Equipment Modifications

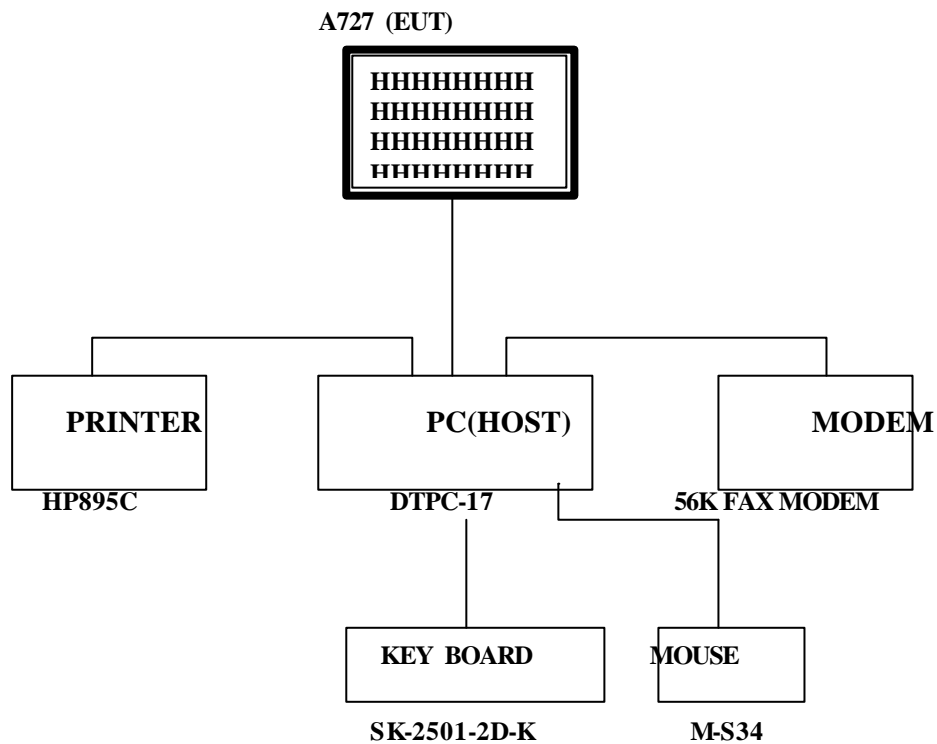
N/A

## 2.6 Configuration of Test system

**Line Conducted Test** : EUT was connected to LISN, all other supporting equipment were connected to another LISN.  
**Preliminary Powerline 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 (64KHz/60Hz)	
	1024 x 768 Non-Interlaced (68.67KHz/85Hz)	X
	800 x 600 Non-Interlaced (63.70KHz/120Hz)	
	800 x 600 Non-Interlaced (63.92KHz/100Hz)	
	640 x 480 Non-Interlaced (43.27KHz/85Hz)	

#### 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 (64KHz/60Hz)	
	1024 x 768 Non-Interlaced (68.67KHz/85Hz)	X
	800 x 600 Non-Interlaced (63.70KHz/120Hz)	
	800 x 600 Non-Interlaced (63.92KHz/100Hz)	
	640 x 480 Non-Interlaced (43.27KHz/85Hz)	

Tested by **Kyounghoun Seo / Engineer**

Date : **AUGUST 29, 2001**

**4. FINAL CONDUCTED AND RADIATED EMISSION TESTS SUMMARY**

**4.1 Conducted Emission Test**

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Humidity Level : 33% Temperature : 23  
 Limit apply to : CISPR 22  
 Type of Tests : CLASS B  
 Date : SEPTEMBER 1, 2001  
 Result : PASSED BY -8.1 dB

EUT : 17" CRT MONITOR  
 Operating Condition : 1024 X 768 Non-Interlaced (Hf : 68.7 KHz, Vf : 85 Hz)  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth : 9 KHz)  
 CISPR Average (6 dB Bandwidth : 9 KHz)

**Line Conducted Emission Tabulated Data**

Power Line Conducted Emissions			CISPR 22		
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)	Detector Mode
0.550	37.90	NEUTRAL	46.0	-8.1	Average
13.290	51.80	NEUTRAL	60.0	-8.2	Quasi-Peak
0.205	44.40	NEUTRAL	46.0	-9.0	Average
0.550	36.00	HOT	46.0	-10.0	Average

NOET:

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

Measured by : **Kyoung-Houn Seo / Engineer**

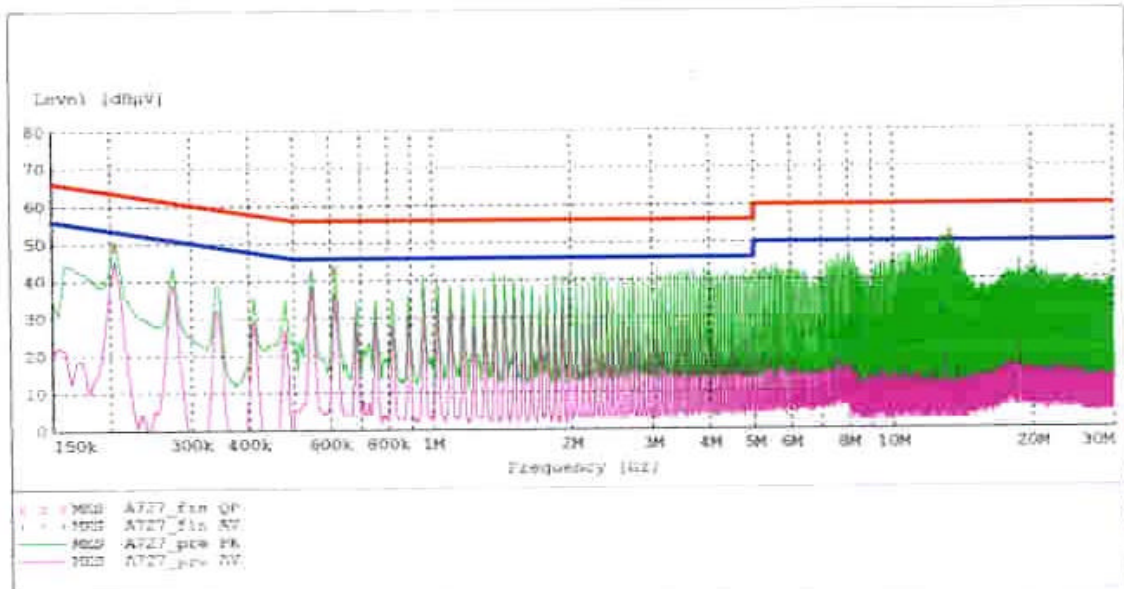
Date : **SEPTEMBER 1, 2001**

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

EUT: A727  
 Manufacturer:  
 Operating Condition:  
 Test Site: Shield Room  
 Operator:  
 Test Specification: EMS9022 Class B  
 Comment: N  
 Start of Test: 9/1/01 / 12:03:04PM

SCAN TABLE: "EM 55022 V (PKH)"

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



MEASUREMENT RESULT: "A727\_fin QP"

9/1/01 12:05PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.205000	49.30	0.5	53	14.1	1	---
0.615000	43.20	0.5	56	12.6	1	---
13.290000	51.80	1.4	60	8.2	1	---

MEASUREMENT RESULT: "A727\_fin AV"

9/1/01 12:05PM

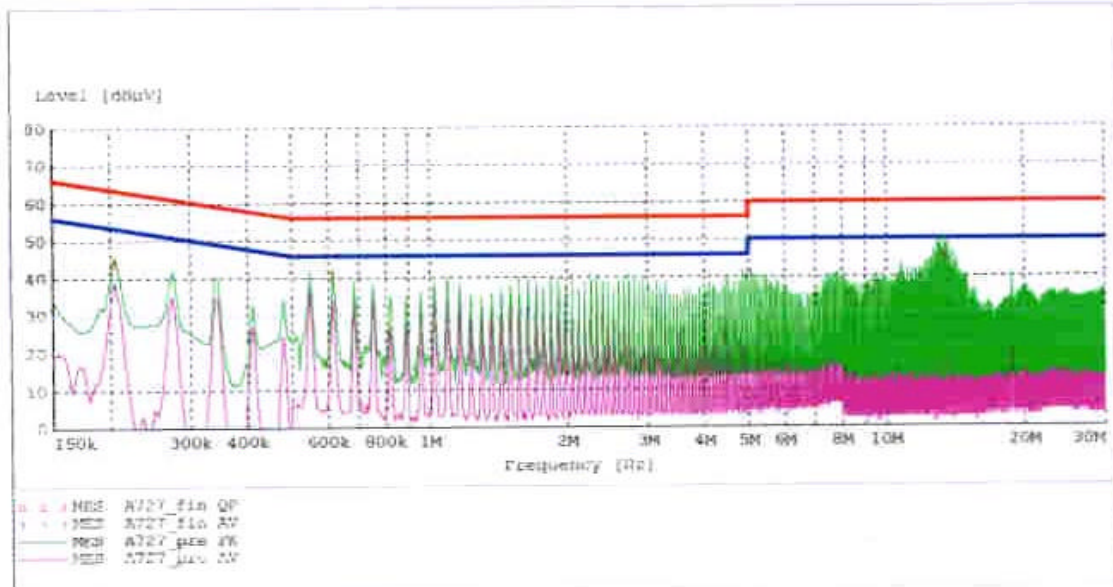
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.205000	44.40	0.5	53	9.0	1	---
0.550000	37.90	0.5	46	8.1	1	---
12.740000	31.40	1.4	50	18.6	1	---

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

EUT: A727  
 Manufacturer:  
 Operating Condition:  
 Test Site: Shield Room  
 Operator:  
 Test Specification: EN55022 Class B  
 Comment: H  
 Start of Test: 9/1/01 / 12:06:35PM

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

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



**MEASUREMENT RESULT: "A727\_fin GP"**

9/1/01 12:09PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	FE
0.205000	44.00	0.5	63	19.4	1	---
0.615000	41.20	0.5	56	14.8	1	---
13.425000	46.00	1.4	60	14.0	1	---

**MEASUREMENT RESULT: "A727\_fin AV"**

9/1/01 12:09PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	FE
0.205000	38.50	0.5	53	14.5	1	---
0.550000	36.00	0.5	46	10.0	1	---
13.765000	32.20	1.5	50	17.8	1	---

## 4.2 Radiated Emissions Tests

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

Humidity Level : 33 %    Temperature : 23  
 Limit apply to : CISPR 22  
 Type of Tests : CLASS B  
 Date : SEPTEMBER 7, 2001  
 Result : PASSED BY -3.8 dB

EUT : 17" CRT MONITOR  
 Operating Condition : 1024 X 768 Non-Interlaced (Hf :68.7 kHz, Vf : 85 Hz)  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth : 120 KHz)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dB	Margin dB
41.6	10.13	14.77	1.30	V	26.2	30.0	-3.8
65.8	17.21	6.49	1.70	H	25.4	30.0	-4.6
84.0	13.83	7.17	1.90	V	22.9	30.0	-7.1
123.2	10.08	13.62	2.40	H	26.1	30.0	-3.9
134.0	8.72	14.28	2.50	H	25.5	30.0	-4.5
136.0	4.36	14.34	2.50	H	21.2	30.0	-8.8
212.3	3.94	16.36	3.20	H	23.5	30.0	-6.5
403.3	3.95	16.55	4.20	H	24.7	37.0	-12.3
468.0	8.45	17.95	4.80	H	31.2	37.0	-5.8
503.0	9.58	18.62	4.90	V	33.1	37.0	-3.9
545.0	5.75	19.15	5.30	H	30.2	37.0	-6.8
669.3	1.17	22.23	6.00	V	29.4	37.0	-7.6

**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 : SEPTEMBER 7, 2001**

## 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

TYPE	MANUFACTURE	MODEL	CAL. DATE
EMI Test Receiver	Rohde & Schwarz	ESH3	2001.6.26
EMI Test Receiver	Rohde & Schwarz	ESVP	2001.2.14
EMI Test Receiver	Rohde & Schwarz	ESI40	2001.1.18
EMI Test Receiver	Rohde & Schwarz	ESVS30	2001.6.26
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	2001.7.13
LISN	Rohde & Schwarz	ESH2-Z5	2001.7.19
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