

HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

PRODUCT COMPLIANCE TEAM
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
TEL : +82 31 639 8518 FAX : +82 31 639 8525 www.hctec.co.kr

CERTIFICATION (Permissive change class II)

Manufacture; IMAGEQUEST CO., LTD. SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA IMAGEQUEST FRN : 0005-8664-39	Date of Issue: DECEMBER 4, 2002 Test Report No.: HCT-F02-1201 Test Site: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD. HCT FRN : 0005-8664-21
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FCC ID :

PJILT15U

MODEL / TYPE :

LT15u

FCC Rule Part(s):	Part 15 & 2
Classification:	FCC Class B Computing Device Peripheral (JBP)
Standard(s):	FCC Class B: 1998 (CISPR 22)
Equipment(EUT) Type:	15" LCD Monitor
Max Resolution:	1024 X 768 (@60KHz/ 75Hz)
Port/ Connector(s)	15-pin D-sub VGA connector, USB 1 upstream port and 4 downstream ports
LCD PANEL	AU Optronics Corporation. (M150XN05)

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



TABLE OF CONTENTS

	PAGE
1. GENERAL INFORMATION.....	3
1.1 Product Description.....	3
1.2 Related submittal(s)/Grant(s).....	3
1.3 Tested System Details.....	4
1.4 Test Methodology.....	4
1.5 Test Facility.....	4
2. SYSTEM TEST CONFIGURATION.....	5
2.1 Justification.....	5
2.2 EUT Exercise Software.....	5
2.3 Cable Description.....	6
2.4 Noise Suppression Parts on Cable.....	6
2.5 Equipment Modifications.....	7
2.6 Configuration of Tested System.....	8
3. PRELIMINARY TESTS.....	9
3.1 Power line Conducted Emissions Tests.....	9
3.2 Radiated Emissions Tests.....	9
4. FINAL CONDUCTED AND RADIATED EMISSION TESTS SUMMARY.....	9
4.1 Conducted Emission Tests.....	10
4.2 Radiated Emission Tests.....	11
5. FIELD STRENGTH CALCULATION.....	12
6. LIST OF TEST EQUIPMENT	13

ATTACHMENT A	ID Label / Location Info.
ATTACHMENT B.....	External Photos.
ATTACHMENT C	Block Diagram..
ATTACHMENT D	Test Setup Photos.
ATTACHMENT E	User's Manual.
ATTACHMENT F	Internal Photos.

1. GENERAL INFORMATION

1.1 Product Description

The ImageQuest CO., LTD. Model LT15u (referred to as the EUT in this report) is a 15" LCD Monitor HOR. Freq. 60KHz w/max. Resolution of 1024 X 768 . 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 , 20MHz , 30MHz
POWER REQUIREMENT	100-240V AC 1.2A 60 / 50 Hz
NUMBER OF LAYERS	MAIN BOARD 4 LAYER OSD BOARD 1 LAYER POWER BOARD 2 LAYER INVERTER BOARD 2 LAYER
MAX. RESOLUTION	1024 X 768 (@60KHz/ 75 Hz)
H-SYNC FREQUENCY RANGE	31.0KHz ~ 60.0KHz
V-SYNC FREQUENCY RANGE	56Hz ~ 75Hz
LCD TYPE	15" (LCD Type NO : M150XN05)

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.	LT15u	PJILT15U	HOST
PC(HOST)	H/P	KR14111606	DoC	N/A
VIDEO CARD	NVIDIA	NVIDIA GeForce MX 200	DoC	HOST
KEY BOARD	H/P	5181	DoC	HOST
MOUSE	IntelliMouse	Optical USB and PS/2 Compatible	DoC	HOST
PRINTER	H/P	C6410A	DoC	HOST
MODEM	3COM CORPORATION	56K FAX MODEM	DoC	HOST
USB MOUSE	LOGITECH	M-BE55	DoC	EUT
USB MOUSE	LOGITECH	M-BE55	DoC	EUT
USB FLASH DRIVE	Jung Myung Telecom Co.,Ltd	E-D900-00-4988	DoC	EUT
USB FLASH DRIVE	Jung Myung Telecom Co.,Ltd	E-D900-00-4988	DoC	EUT

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	ImageQuest CO., Ltd.	3041001045
POWER BOARD	C&C TECH CO.,LTD.	3610200105
OSD BOARD	ImageQuest CO., Ltd.	3010700807
INVERTOR BOARD	ImageQuest CO., Ltd	3610400246
LCD BOARD	AU Optronics Corporation	M150XN05

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), 1.5(D)
PC(HOST)	N	N/A	1.8(P)
KEY BOARD	N/A	Y	2.0(D)
MOUSE	N/A	Y	1.8(D)
PRINTER	N	Y	2.0(P),1.8(D)
MODEM	N	Y	2.0(P),0.8(D)
UPLOAD	N/A	Y	1.8(D)
USB MOUSE	N/A	Y	0.8(D)
USB MOUSE	N/A	Y	0.8(D)
USB FRESH DRIVE	N/A	N/A	N/A
USB FRESH DRIVE	N/A	N/A	N/A

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

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

2.5 Equipment Modifications

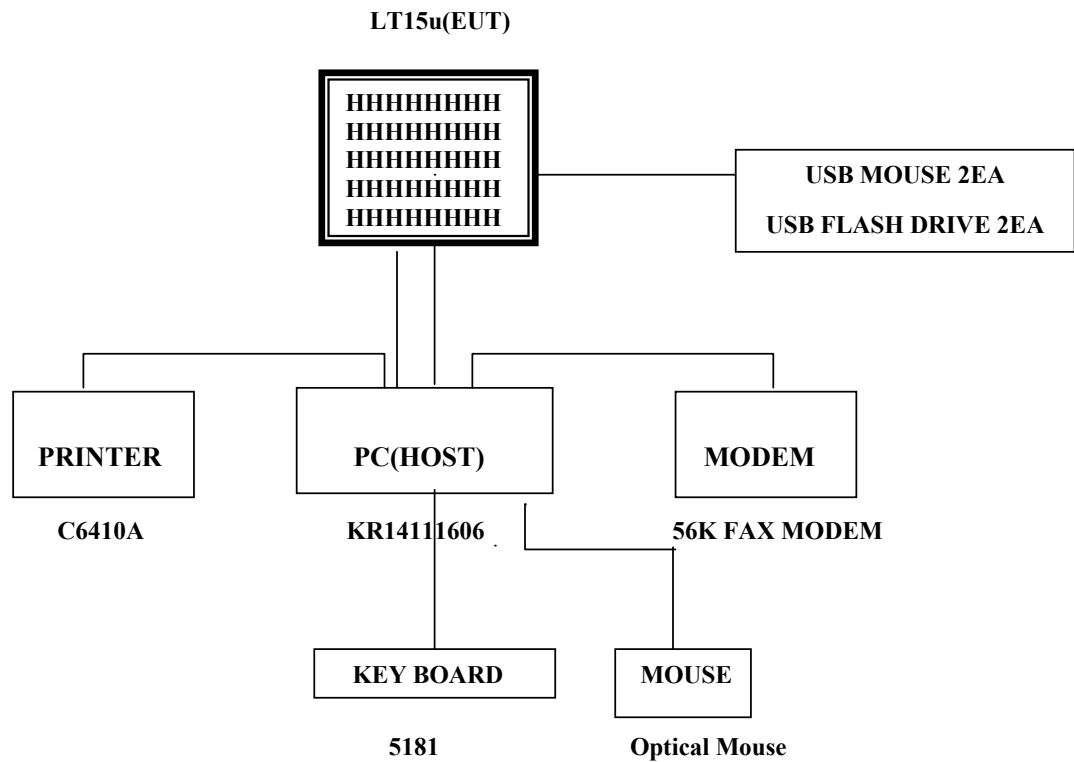
N/A

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 1GHz	1024X768 (60KHz/75Hz)	X
	1024X768 (56.5KHz/70Hz)	
	800X600 (37.9KHz/60Hz)	
	800X600 (35.2 KHz/56Hz)	
	640X480 (31.5KHz/70Hz)	

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 1GHz	1024X768 (60KHz/75Hz)	X
	1024X768 (56.5KHz/70Hz)	
	800X600 (37.9KHz/60Hz)	
	800X600 (35.2 KHz/56Hz)	
	640X480 (31.5KHz/70Hz)	

Tested by Kyoung-Houn SEO / Engineer

Date : NOVEMBER 12, 2002

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	: 36 %	Temperature	: 20 °C
Limit apply to	: CISPR 22		
Type of Tests	: CLASS B		
Date	: NOVEMBER 15, 2002		
Result	: PASSED BY -10.7 dB		
EUT	: 15" LCD MONITOR		

Operating Condition : 1024 X 768 (Hf : 60KHz, Vf : 75Hz)
 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
0.310	39.2	HOT	50.0	-10.7	Average
0.415	35.9	HOT	48.0	-11.7	Average
0.205	41.2	HOT	53.0	-12.2	Average
0.520	31.1	HOT	46.0	-14.9	Average

Measured by : Kyoung-Houn SEO / Engineer

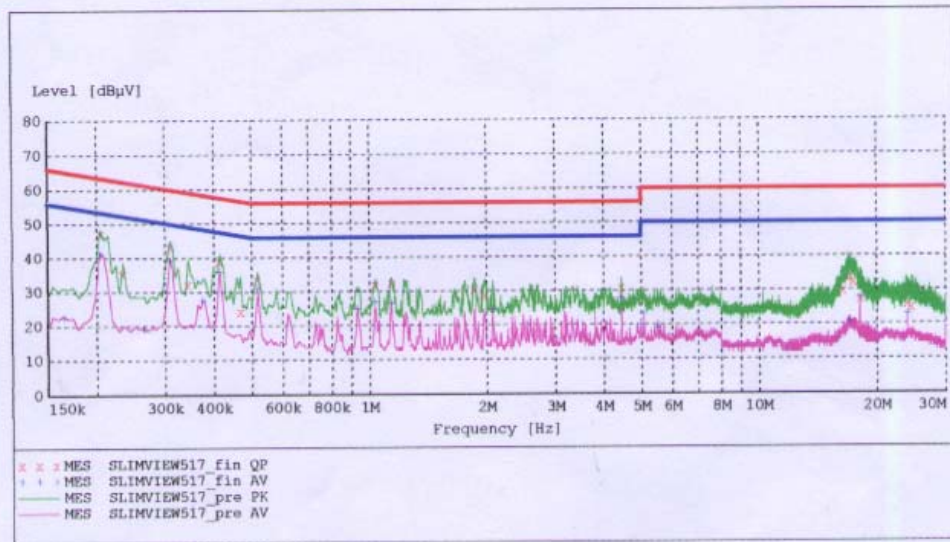
Date : NOVEMBER 15, 2002

HYUNDAI C TECH
EMC Testing Laboratory

EUT: SLIMVIEW517
 Manufacturer: IMAGEQUEST
 Operating Condition: 1024 X 768 75Hz
 Test Site: SHIELD ROOM
 Operator: KH-SEO
 Test Specification: CISPR22 CLASS B
 Comment: N
 Start of Test: 11/15/02 / 9:24:15PM

SCAN TABLE: "EN 55022 Voltage"

Short Description:		EN 55022 Voltage				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	ESH3-Z5
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	ESH3-Z5
			Average			



MEASUREMENT RESULT: "SLIMVIEW517_fin QP"

11/15/02 9:28PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.205000	47.20	10.1	63	16.2	1	---
0.235000	35.40	10.1	62	26.9	1	---
0.310000	43.30	10.1	60	16.6	1	---
0.345000	32.30	10.1	59	26.8	1	---
0.415000	38.90	10.1	58	18.7	1	---
0.470000	24.10	10.1	57	32.4	1	---
0.520000	33.60	10.1	56	22.4	1	---
1.040000	32.00	10.2	56	24.0	1	---
1.145000	32.40	10.2	56	23.6	1	---
1.875000	30.70	10.3	56	25.3	1	---
1.985000	28.70	10.3	56	27.3	1	---
4.450000	30.80	10.4	56	25.2	1	---
16.420000	29.70	10.8	60	30.3	1	---
16.995000	33.30	10.8	60	26.7	1	---

MEASUREMENT RESULT: "SLIMVIEW517_fin QP"
(continued)

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
17.525000	23.90	10.8	60	36.1	1	---
18.165000	29.90	10.8	60	30.1	1	---
19.115000	22.90	10.9	60	37.1	1	---
24.000000	24.60	11.0	60	35.4	1	---

MEASUREMENT RESULT: "SLIMVIEW517_fin AV"
11/15/02 9:33PM

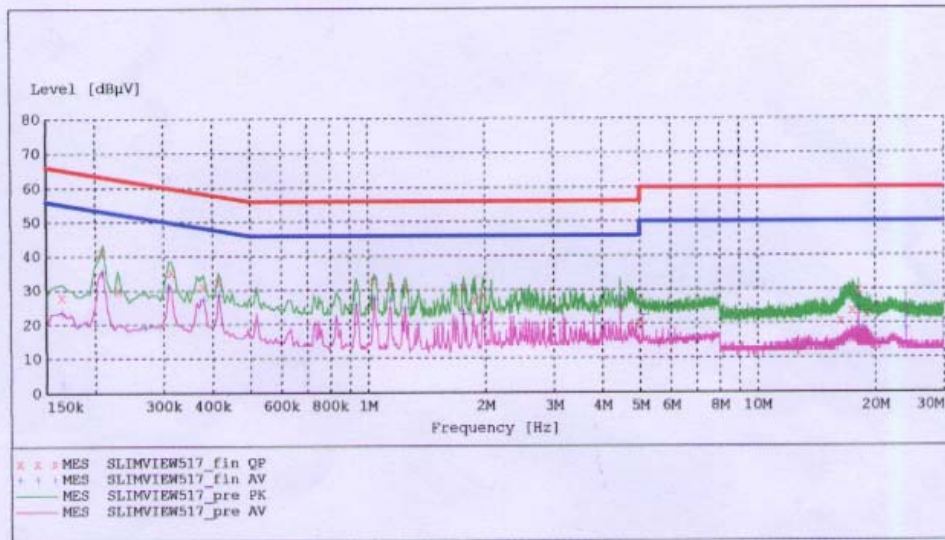
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.165000	23.50	10.1	55	31.8	1	---
0.210000	35.40	10.1	53	17.8	1	---
0.270000	19.20	10.1	51	31.9	1	---
0.310000	31.10	10.1	50	18.9	1	---
0.380000	27.40	10.1	48	20.9	1	---
0.415000	28.50	10.1	48	19.0	1	---
0.935000	25.60	10.2	46	20.4	1	---
1.040000	27.60	10.2	46	18.4	1	---
1.145000	27.20	10.2	46	18.8	1	---
1.250000	24.70	10.2	46	21.3	1	---
1.765000	23.00	10.3	46	23.0	1	---
4.450000	28.00	10.4	46	18.0	1	---
5.085000	22.70	10.4	50	27.3	1	---
18.150000	24.70	10.8	50	25.3	1	---
18.165000	27.80	10.8	50	22.2	1	---
18.550000	19.10	10.9	50	30.9	1	---
24.000000	22.10	11.0	50	27.9	1	---
24.030000	18.60	11.0	50	31.4	1	---

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EMC Testing Laboratory

EUT: SLIMVIEW517
 Manufacturer: IMAGEQUEST
 Operating Condition: 1024 X 768 75Hz
 Test Site: SHIELD ROOM
 Operator: KH-SEO
 Test Specification: CISPR22 CLASS B
 Comment: H
 Start of Test: 11/15/02 / 9:29:32PM

SCAN TABLE: "EN 55022 Voltage"

Short Description:			EN 55022 Voltage			
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	ESH3-Z5
500.0 kHz	5.0 MHz	5.0 kHz	Average	10.0 ms	9 kHz	ESH3-Z5
			MaxPeak			
			Average			



MEASUREMENT RESULT: "SLIMVIEW517_fin QP"

11/15/02 9:33PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.165000	28.00	10.1	65	37.2	1	---
0.210000	41.20	10.1	63	22.0	1	---
0.230000	30.00	10.1	62	32.5	1	---
0.315000	35.20	10.1	60	24.6	1	---
0.380000	31.20	10.1	58	27.1	1	---
0.415000	32.70	10.1	58	24.8	1	---
1.040000	32.60	10.2	56	23.4	1	---
1.150000	31.50	10.2	56	24.5	1	---
1.250000	30.90	10.2	56	25.1	1	---
1.770000	30.80	10.3	56	25.2	1	---
1.890000	27.20	10.3	56	28.8	1	---
1.985000	28.50	10.3	56	27.5	1	---
5.000000	20.40	10.4	56	35.6	1	---
16.325000	20.80	10.8	60	39.2	1	---

MEASUREMENT RESULT: "SLIMVIEW517_fin QP"

(continued)

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
17.505000	32.40	10.8	60	27.6	1	---
18.215000	27.50	10.8	60	32.5	1	---
24.030000	25.80	11.0	60	34.2	1	---
24.635000	24.70	11.0	60	35.3	1	---

MEASUREMENT RESULT: "SLIMVIEW517_fin AV"

11/15/02 9:28PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.165000	22.70	10.1	55	32.5	1	---
0.205000	41.20	10.1	53	12.2	1	---
0.265000	19.40	10.1	51	31.8	1	---
0.310000	39.20	10.1	50	10.7	1	---
0.375000	27.70	10.1	48	20.6	1	---
0.415000	35.90	10.1	48	11.7	1	---
0.520000	31.10	10.1	46	14.9	1	---
0.935000	25.00	10.2	46	21.0	1	---
1.040000	27.00	10.2	46	19.0	1	---
1.145000	26.80	10.2	46	19.2	1	---
2.080000	24.70	10.3	46	21.3	1	---
4.450000	27.90	10.4	46	18.1	1	---
5.000000	20.00	10.4	46	26.0	1	---
5.085000	23.30	10.4	50	26.7	1	---
5.515000	19.40	10.4	50	30.6	1	---
17.135000	20.70	10.8	50	29.3	1	---
18.165000	27.70	10.8	50	22.3	1	---
24.000000	23.00	11.0	50	27.0	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 : 41 %
 Temperature : 20 °C
 Limit apply to : CISPR 22
 Type of Tests : CLASS B
 Date : NOVEMBER 19, 2002
 Result : PASSED BY -3.0dB

EUT : 15" LCD MONITOR
 Operating Condition : 1024 X 768 (Hf : 60 kHz, Vf : 75 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 dBuV/m	Margin dB
42.3	11.26	14.34	1.30	V	26.9	30.0	-3.1
59.7	14.44	8.46	1.60	V	24.5	30.0	-5.5
71.9	16.79	5.71	1.80	V	24.3	30.0	-5.7
120.5	9.99	13.41	2.40	V	25.8	30.0	-4.2
134.0	4.72	14.28	2.50	H	21.5	30.0	-8.5
144.0	9.86	14.64	2.50	V	27.0	30.0	-3.0
434.8	9.12	17.08	4.50	V	30.7	37.0	-6.3
482.0	7.59	18.11	4.80	H	30.5	37.0	-6.5
529.3	8.20	19.00	5.10	V	32.3	37.0	-4.7
541.5	9.48	19.12	5.30	V	33.9	37.0	-3.1
557.3	6.21	19.69	5.30	V	31.2	37.0	-5.8
769.0	4.47	22.73	6.50	H	33.7	37.0	-3.3

NOTE:

1.All video modes and resolutions were investigated and the worst-case emissions are reported.

Measured by Kyoung-Houn SEO / Engineer

Date : NOVEMBER 19, 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

<u>TYPE</u>	<u>MANUFACTURE</u>	<u>MODEL</u>	<u>CAL. DATE</u>
EMI Test Receiver	Rohde & Schwarz	ESH3	2002.6.29
EMI Test Receiver	Rohde & Schwarz	ESVP	2002.2.14
EMI Test Receiver	Rohde & Schwarz	ESI40	2002.2.28
EMI Test Receiver	Rohde & Schwarz	ESVS30	2002.3.6
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	2002.7.11
LISN	EMCO	3825/2	2002.2.7
LISN	Rohde & Schwarz	ESH2-Z5	2002.8.12
Amplifier	Hewlett-Packard	8447E	2002.3.2
Dipole Antennas	Rohde & Schwarz	VHAP	2002.6.28
Dipole Antennas	Rohde & Schwarz	UHAP	2002.6.28
Biconical Antenna	Rohde & Schwarz	BBA-9106	2002.6.28
Log-Periodic Antenna	Rohde & Schwarz	UHALP-9107	2002.6.26
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	2002.2.20
Reference Network Impedance	Voltech	IEC 555	N.A
AC Power Source	PACIFIC	Magnetic Module	N.A
AC Power Source	PACIFIC	360AMX	N.A