FCC ID: HSUTRLX-555

EMC

TEST REPORT

REPORT NO. : F87070311
MODEL NO. : X-555, C&C-15RQ
DATE OF TEST : July 6, 1998

PREPARED FOR: ROYAL INFORMATION ELECTRONICS CO., LTD.

ADDRESS : NO. 3, LANE 11, TZU-CHANG ST., TU-CHENG IND.
DISTRICT TAIPEI HSIEN, TAIWAN,R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

NVLAP®
Accredited Laboratory

12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

TABLE OF CONTENTS

1. CERTIFICATION

Issue Date: July 10, 1998

Product	:	COLOR MONITOR
Trade Name	:	TRL/RIC, NEC
Model No.	:	X-555, C&C-15RQ
Applicant	:	ROYAL INFORMATION ELECTRONIC CO., LTD.
Standard	:	FCC Part 15, Subpart B, Class B ANSI C63.4-1992 CISPR 22:1993+A1+A2

We hereby certify that one sample of the designation has been tested in our facility on July 6, 1998. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

PREPARED BY: Sharon Hsiung , DATE: 7/10/98
(Sharon Hsiung)

TESTED BY: Jone Lin , DATE: 7/10/98
(Jone Lin)

APPROVED BY: Mike Su , DATE: 7/10/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

NVLAP®
Accredited Laboratory

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	X-555, C&C-15RQ
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	Shielded (1.85m)

Note: The EUT is a 15" color monitor with resolution up to 1024x768.

It has two model names which are identical to each other in all aspects except for their brand name:

Model: X-555, brand: TRL/ RIC
Model: C&C-15RQ, brand: NEC

From the above models, model: X-555 was chosen as representative model for the test.

There is a ferrite core on the video cable outside the monitor.

For more detailed features description, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.

2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	HP	VL Series 4 5/100	B94VECTRA500T	Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded signal (1.2m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.8m) Nonshielded Power (1.2m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded signal (1.2m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded signal (1.5m)
6	VGA DISPLAY CARD	GORDIA	DSV3365	LUT-DSV3365	N/A

2.3 TEST METHODOLOGY AND CONFIGURATION

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 and 10 m on an open area test site. Please refer to the photos of test configuration in Item 5.

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594A	3144A00308	Sept. 1, 1998
HP Preamplifier	8447D	2944A08119	Aug. 2, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 17, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112	2086	Dec. 26, 1998
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 26, 1998

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 23, 1998
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 24, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	Aug. 1, 1998
EMCO-L.I.S.N.	3825/2	9204-1964	July 22, 1998
Shielded Room	Site 2	ADT-C02	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's document NIS81.

2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) dBuV/m	Class B (at 10m) dBuV/m
30 - 230	40	30
230 - 1000	47	37

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range	:	0.15 - 30 MHz (Conducted Emission) 30 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz
Temperature	:	25 ℃
Humidity	:	55 %
Atmospheric Pressure	:	990 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -12.7 dB at 19.539 MHz Minimum passing margin of radiated emission: -3.1 dB at 182.45 & 182.46 MHz

Note: The EUT was pretested under the following resolution & horizontal synchronization speed mode:

* 1024x768 mode (48 kHz),
* 800x600 mode (54 kHz)
* 640x480 mode (31.5 kHz)

The worst emission levels were found under 1024x768 (48 kHz) and therefore the test data of only this mode is recorded.

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. PC sends "H" messages to monitor (EUT) and monitor displays "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. Repeat steps 3-7.

4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR** MODEL: **X-555**

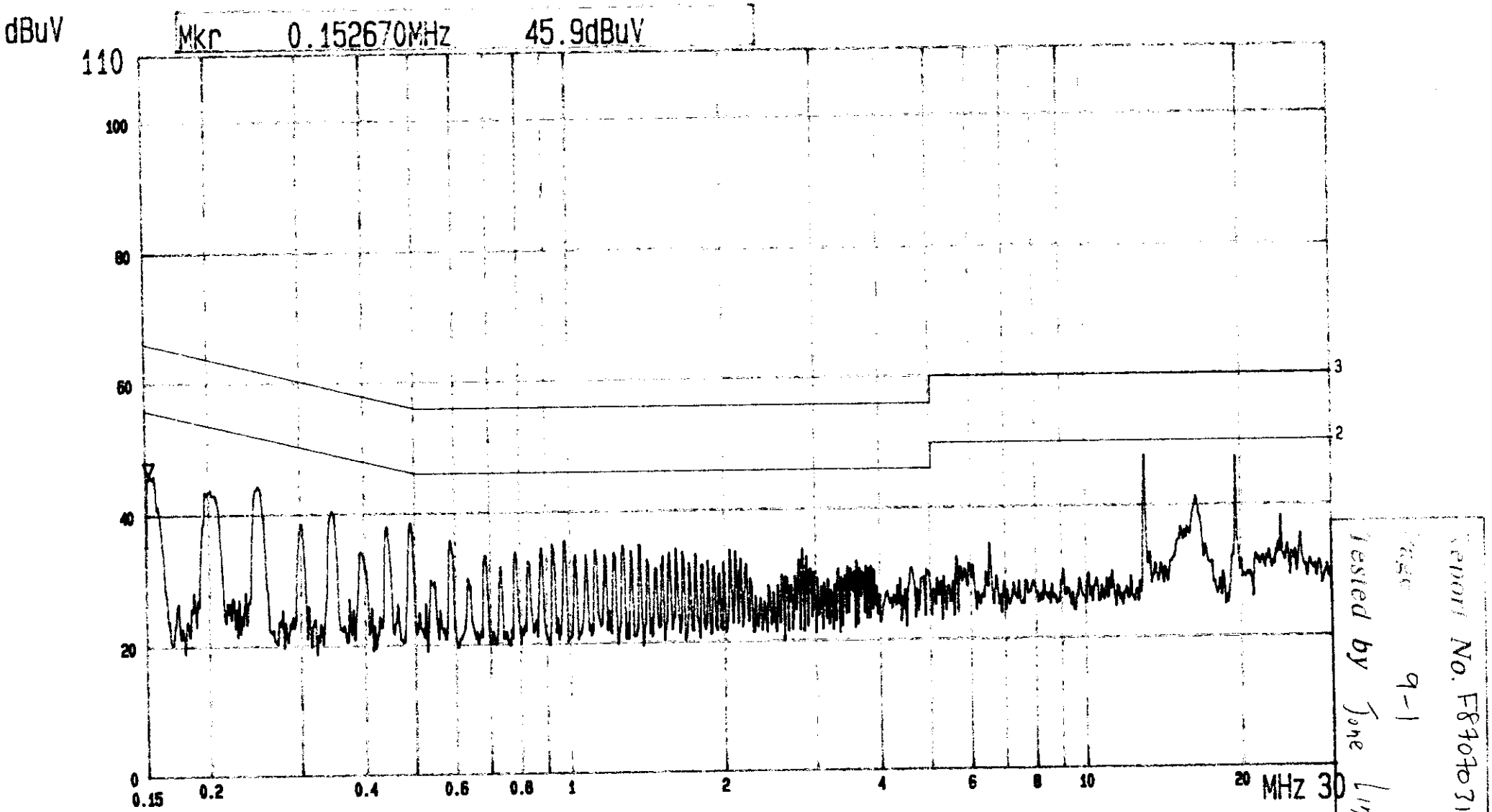
MODE: **1024x768 (48 kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: Jone Lin

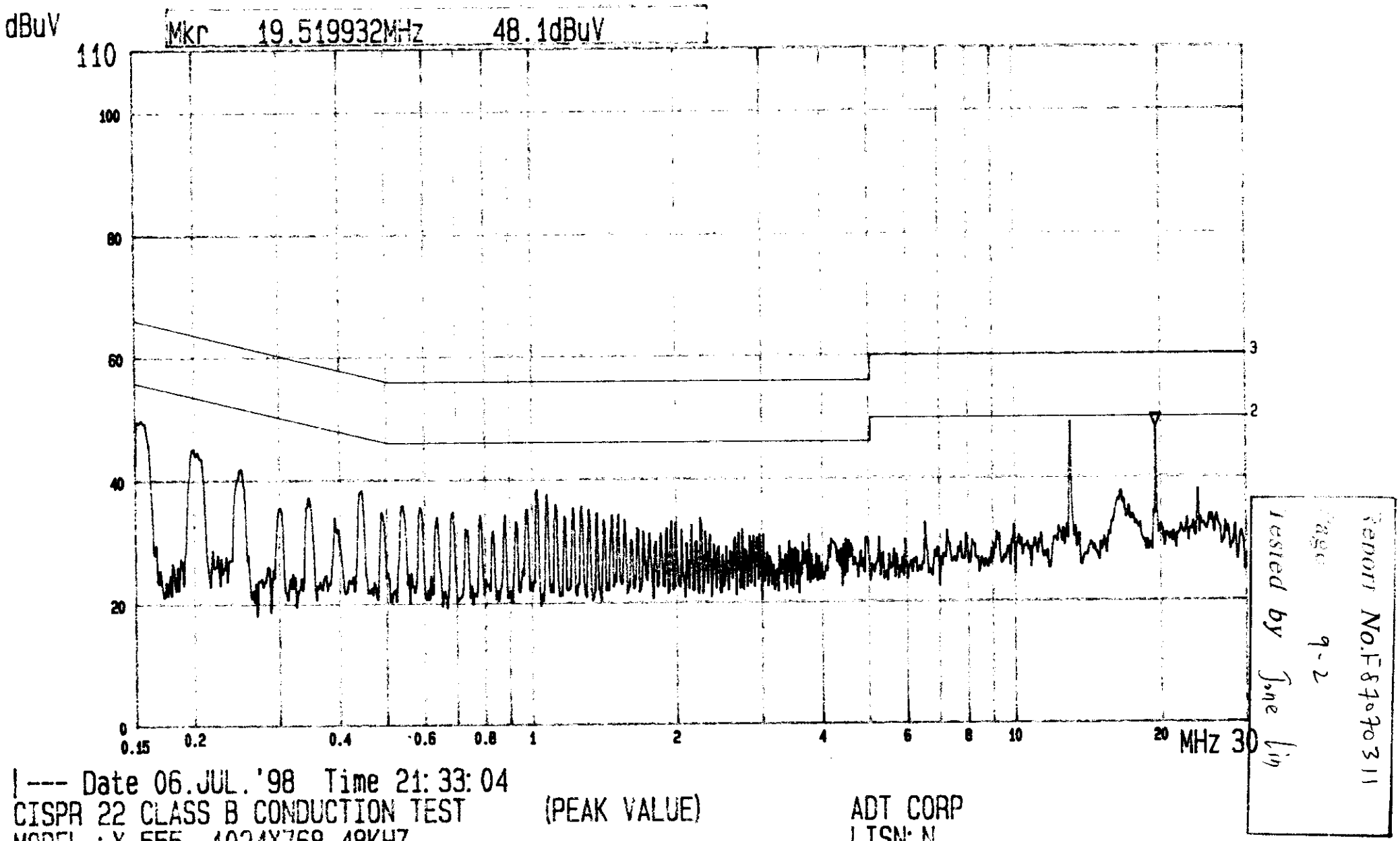
Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.150	31.50	-	30.80	-	66.00	56.00	-34.5	-	-35.2	-
0.436	35.30	-	32.70	-	57.13	49.13	-21.8	-	-24.4	-
1.019	35.50	-	32.20	-	56.00	46.00	-20.5	-	-23.8	-
2.230	29.50	-	26.90	-	56.00	46.00	-26.5	-	-29.1	-
12.992	41.40	-	41.00	-	60.00	50.00	-18.6	-	-19.0	-
19.539	47.30	-	46.50	-	60.00	50.00	-12.7	-	-13.5	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
4. The emission level of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value.



Report No. F8707031
Page 9-1
Tested by June Lin

| --- Date 06.JUL.'98 Time 21:41:48
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP
MODEL : X-555 1024X768 48KHZ LISN: L


dBuV
Mkr 19.519932MHz 48.1dBuV
110
100
80
60
40
20
0
0.15
0.2
0.4
0.6
0.8
1
2
4
6
8
10
20
MHz 30
3
2
Report No.F8707031
Page 9-2
Tested by June Liu
--- Date 06.JUL.'98 Time 21:33:04
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP
MODEL : X-555 1024X768 48KHZ LISN: N

4.3 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **X-555**

MODE: **1024x768 (48 kHz)**

ANTENNA: CHASE BILOG CBL6112 POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: Jone Lin

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
97.72	12.4	11.0	23.4	30.0	-6.6
110.76	14.1	11.5	25.6	30.0	-4.4
117.28	14.8	11.3	26.1	30.0	-3.9
130.32	14.6	9.8	24.4	30.0	-5.6
175.94	12.2	11.7	23.9	30.0	-6.1
182.45	12.3	14.6	26.9	30.0	-3.1
188.96	12.7	10.7	23.4	30.0	-6.6
195.47	13.0	13.3	26.3	30.0	-3.7
208.51	13.7	12.1	25.8	30.0	-4.2
215.02	14.0	10.3	24.3	30.0	-5.7

REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) +Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value.

FCC ID: HSUTRLX-555

TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **X-555**

MODE: **1024x768 (48 kHz)**

ANTENNA: CHASE BILOG CBL6112 POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

TEST PERSONNEL: Jane Lin

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
65.16	7.5	18.1	25.6	30.0	-4.4
84.74	9.6	8.3	17.9	30.0	-12.1
97.74	11.0	14.4	25.4	30.0	-4.6
110.77	13.4	10.8	24.2	30.0	-5.8
143.36	14.7	7.5	22.2	30.0	-7.8
149.87	13.6	11.0	24.6	30.0	-5.4
175.96	12.5	12.4	24.9	30.0	-5.1
182.46	12.7	14.2	26.9	30.0	-3.1

REMARKS :
1. Emission level (dBuV/m) = Correction Factor(dB/m) +Meter Reading (dBuV).
2. Correction Factor(dB/m) = Ant. Factor(dB/m)+Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value.

6. ATTACHMENT I -TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS:

CRT

* Visible Size	35 cm (13.8") max. Screen Diagonal
* Deflection	90-degree deflection
* Dot pitch	0.28 mm
* Phosphor	P22
* Surface	Nonglare
* Transmission	57%

Video and Synchronization Signals

* Signal cable	15-pin D-type connector
* Video	Analog levels
* Horizontal Sync	TTL Positive/Negative
* Vertical Sync	TTL Positive/Negative
* Bandwidth	88 Mhz(-3Db)
* Display Area	260x195mm ± 5mm(STANDARD MODE)
* Display Colors	limited by VGA card
* Video signal input	0.7 Vpp

Display Data Channel

* Compatibility	VESA DDC 1/2B

Scanning Frequency

* Horizontal	29 kHz to 70 kHz
* Vertical	47 Hz to 120 Hz

Power supply	
* Input voltage	100-240 Vac, 60/50 Hz
* Consumption	100 Watts maximum
Environment	
* Operating Temperature	0°C to 40°C
* Operating Humidity	20% to 80%
* Nonoperating Temperature	-20°C to 65°C
* Nonoperating Humidity	10% to 85%
Dimension	370 mm(W)x 367 mm(H)x 390 mm(D) (with base)
Weight	Approx. 12 Kgs(NET)