FCC ID: H79DC-570

EMC

TEST REPORT

REPORT NO. : F87030603
MODEL NO. : SD5904CM, RD15M2, SD5904C
DATE OF TEST : April 2, 1998

PREPARED FOR: DELTA ELECTRONICS INC.

ADDRESS : NO. 31-1, SHIEN PAM ROAD,
KUEI SHAN INDUSTRIAL ZONE,
TAOYUAN 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.

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1. **CERTIFICATION**

Issue Date: April 6, 1998

Product	:	COLOR MONITOR
Trade Name	:	MITSUBISHI
Model No.	:	SD5904CM, RD15M2, SD5904C
Applicant	:	DELTA ELECTRONICS INC.
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 April 2, 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.

TESTED BY: Jackey Chang , DATE: 4/6/98
(Jackey Chang)

CHECKED BY: Sharon Hsiung , DATE: 4/6/98
(Sharon Hsiung)

APPROVED BY: Mike Su , DATE: 4/6/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	COLOR MONITOR
Model No.	:	SD5904CM, RD15M2, SD5904C
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8 m)
Data Cable	:	Shielded (1.6 m)
Audio Cable	:	Shielded (1.5 m)

Note: The EUT has three model names which are identical to each other in all aspects except for their outer appearances:

Model: SD5904CM
Model: RD15M2
Model: SD5904C

From the above model names, model: SD5904CM was selected as representative model for the test, and its data is recorded in this report.

The EUT is a 15" color monitor with resolution up to 1280x1024.

There is one 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	HP	C3758A	CIGEO3633	Shielded Signal (1.2m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.8m)
4	MODEM	DATATRON ICS	1200CK	E2O5OV1200CK	Shielded Signal (1.2m) Nonshielded Power (1.8m)
5	MOUSE	HP	M-S34	DZL211029	Shielded Signal (1.8m)
6	VGA DISPLAY CARD	GORDIA	DSV3365	LUT-DSV3365	N/A
7	SOUND CARD	YA HSIN	AUDIO 1869	FCC DoC approved	N/A
8	EARPHONE	GAMMA	LH115	N/A	Nonshielded signal (1.4m)

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 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	ESHS30	828765/002	July 31, 1998
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	828075/003	July 28, 1998
EMCO-L.I.S.N.	3825/2	90031627	July 28, 1998
Shielded Room	Site 5	ADT-C05	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	:	21 ℃
Humidity	:	55 %
Atmospheric Pressure	:	1060 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -15.8 dB at 21.692 MHz Minimum passing margin of radiated emission: -3.1 dB at 44.65 MHz

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

* 1280x1024 mode (64 kHz),
* 1024x768 mode (69 kHz),
* 640x480 mode (31.5 kHz)

The worst emission levels were found under 1280x1024 mode (64 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. PC sends audio messages to earphone.
8. Repeat steps 3-8.

4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR** MODEL: **SD5904CM**

MODE: **1280x1024 (64 kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: Jackey Chang

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
0.192	45.70	-	44.70	-	63.93	53.93	-18.2	-	-19.2	-
0.450	39.40	-	38.20	-	56.87	46.87	-17.5	-	-18.7	-
0.771	29.00	-	28.90	-	56.00	46.00	-27.0	-	-27.1	-
5.844	26.60	-	29.40	-	60.00	50.00	-33.4	-	-30.6	-
17.150	41.30	-	40.40	-	60.00	50.00	-18.7	-	-19.6	-
21.692	44.20	-	44.00	-	60.00	50.00	-15.8	-	-16.0	-

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

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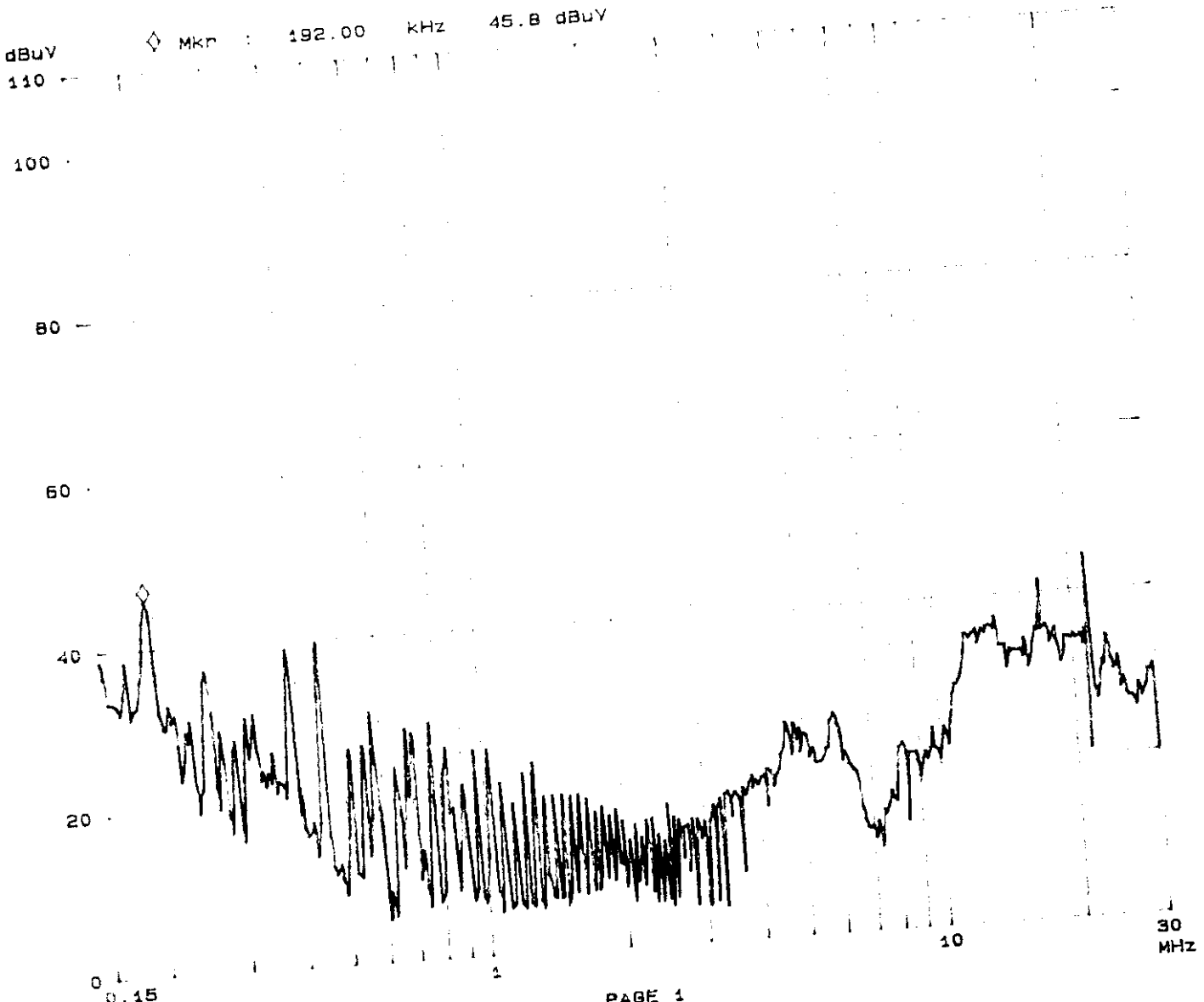
ADT CO. SITE 5
CISPR 22 CLASS B

Report No. [illegible]
Page [illegible]
Tested by Jackey Chang

Manuf: SD5904CM
Operator: JACKEY
Test Spec: LISN : L
Comment: 1280X1024 64kHz

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150K	450K	3k	10k	PK	1ms	10dBLN	OFF	60dB
450K	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



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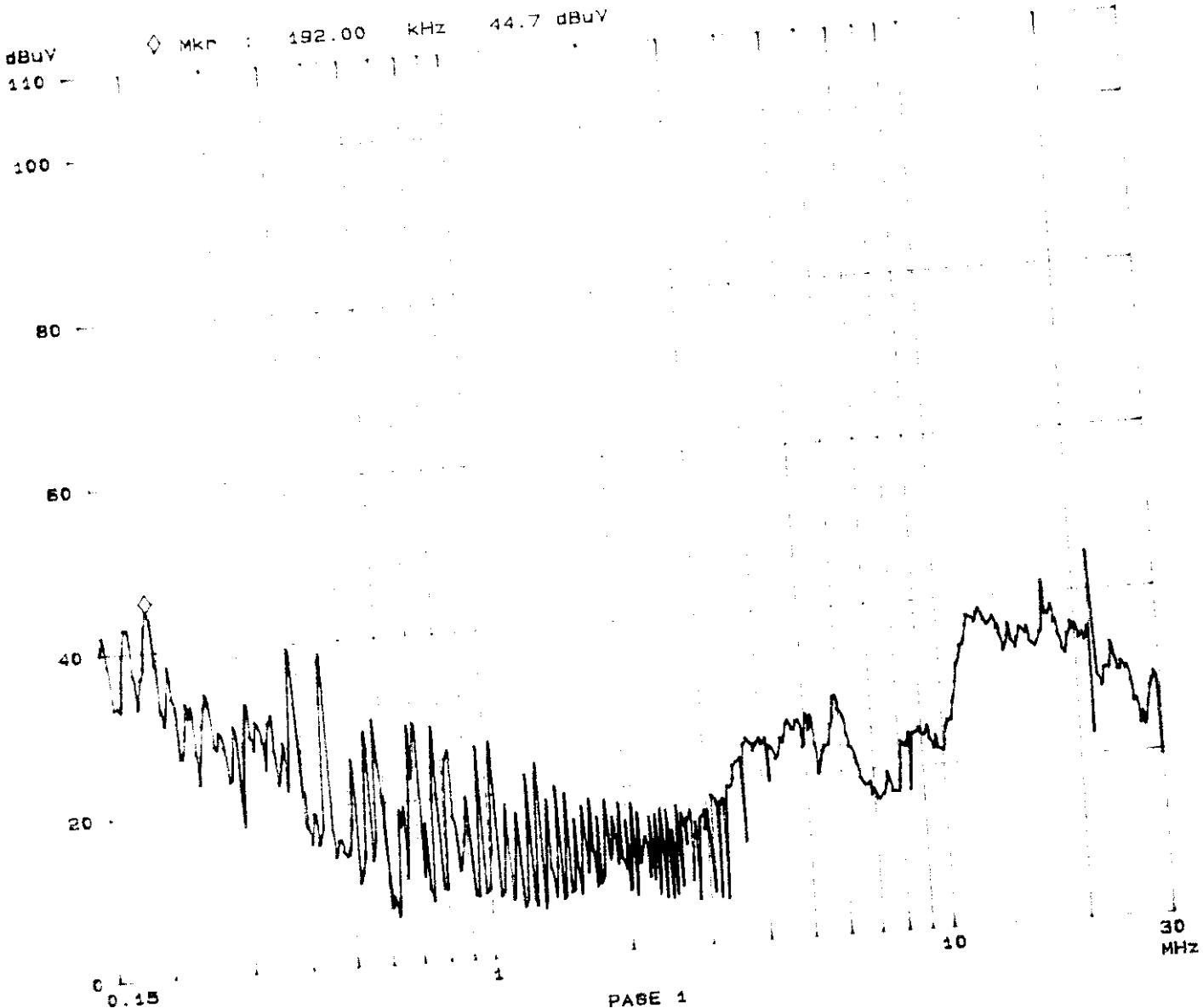
ADT CO. SITE 5
CISPR 22 CLASS B

Report No.
Page
Tested by Jackey Chong

Manuf: SD5904CM
Operator: JACKEY
Test Spec: LISN : N
Comment: 1280X1024 64kHz

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten Preamp	OpRge
150k	450k	3k	10k	PK	1ms	10dBLN OFF	60dB
450k	5M	3k	10k	PK	1ms	10dBLN OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN OFF	60dB



4.3 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **SD5904CM**

MODE: **1280x1024 (64 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: Jackey Chang

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
55.58	9.7	15.2	24.9	30.0	-5.1
75.77	8.4	15.4	23.8	30.0	-6.2
86.67	9.9	10.7	20.6	30.0	-9.4
108.32	13.8	6.1	19.9	30.0	-10.1
162.43	12.4	7.5	19.9	30.0	-10.1
216.64	14.1	6.3	20.4	30.0	-9.6

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

TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **SD5904CM**

MODE: **1280x1024 (64 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: Jackey Chang

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
44.65	11.9	15.0	26.9	30.0	-3.1
52.80	9.4	16.4	25.8	30.0	-4.2
75.68	7.6	18.4	26.0	30.0	-4.0
108.32	12.8	7.9	20.7	30.0	-9.3
162.46	12.1	7.2	19.3	30.0	-10.7
195.00	13.4	7.1	20.5	30.0	-9.5

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 size	15" (13.8" diagonal viewable image)
* Gun	Shadow mask
* Deflection angle	In-Line, Mini-neck
* Phosphors	90 degree
* Dot Pitch	Red, Greeen, Blue (medium short persistence)
* Face Plate	0.28mm
* Transmission	Anti-Reflective and Anti-static coating
* Input Signal	Approx. 57%
* Interface	Video: 0.7 Vp-p analog RGB Sync.: separated H,V Sync. Or composite sync.
* Scanning Frequency	Input Connector: D-Sub 15P Input Impedance: 75 ohm (video)
* Resolution	Horizontal: 30-70 kHz Vertical: 50-100 Hz
* Video Bandwidth	1280x1024 (Max.)
* Display Area	85 MHz
* Power Source	270mm x 200mm (typ.)
* Operating Environment	AC100-120V/220-240V+/-10% 50/60 Hz
* Cabinet	Temp.: 0-35 °C Humidity: 10-80% RH (without condensation)
* Weight	(W) 365mm x (H) 371mm x (D) 397.5mm
	14.5 kg.