FCC ID: DK4L5MXA

EMC

TEST REPORT

REPORT NO. : F87070907
MODEL NO. : L5MX-TA
DATE OF TEST : July 11, 1998

PREPARED FOR : GVC CORPORATION

ADDRESS : 14F, NO. 76, SEC. 2, TUN HWA S. RD.,
TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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

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1. CERTIFICATION

Issue Date: July 13, 1998

Product	:	LCD MONITOR
Trade Name	:	GVC
Model No.	:	L5MX-TA
Applicant	:	GVC CORP.
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 11, 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: John Liao , DATE: 7/13/98
(John Liao)

CHECKED BY : Ariel Hsieh , DATE: 7/13/98
(Ariel Hsieh)

APPROVED BY: Mike Su , DATE: 7/13/98
(Mike Su)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	LCD MONITOR
Model No.	:	L5MX-TA
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.8 m)
Data Cable	:	Shielded (1.5m)

Note: The EUT is a 15" TFT LCD monitor with resolution up to 1024x768 (60 kHz).

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	D4579A	FCC DoC Approved	Nonshielded Power (1.8 m)
2.	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded signal (1.4 m)
3.	USB KEYBOARD	BTC	7932	E5XKBUCP10410	Shielded Signal (1.7m)
4.	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2 m) Nonshielded Power (1.9 m)
5.	MOUSE	HP	C1413A	B94C1413X	Shielded signal (2.8 m)
6.	MODEM	ACEEX	1414	IFAXDM1414	Shielded signal (1.2 m) Nonshielded Power (1.9 m)
7.	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	N/A
8.	HEADPHONE	GAMMA	CH115	N/A	Shielded Signal (2.5m)

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	8590L	3544A01176	April 28, 1999
HP Preamplifier	8447D	2944A08485	Oct. 28, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 22, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BILOG Antenna	CBL6112A	2221	Aug. 19, 1998
EMCO Turn Table	1060	1115	N/A
SHOSHIN Tower	AP-4701	A6Y005	N/A
Open Field Test Site	Site 5	ADT-R05	Aug. 18, 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)	Class B (at 10m)
	dBuV/m	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	:	30 ℃
Humidity	:	56 %
Atmospheric Pressure	:	998 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: - 13.3 dB at 0.196 MHz Minimum passing margin of radiated emission: -3.4 dB at 144.01 MHz

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 LCD monitor (EUT) and monitor displays "H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and printer prints them on paper.
7. Repeat steps 3-7.

4.2 TEST DATA OF CONDUCTED EMISSION

EUT: **LCD MONITOR** MODEL: **L5MX-TA**

MODE: **1024x768 (60 kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: John Liao

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
0.154	52.00	-	49.40	-	65.73	55.73	-13.7	-	-16.3	-
0.196	50.50	-	48.80	-	63.78	53.78	-13.3	-	-15.0	-
0.854	36.90	-	36.20	-	56.00	46.00	-19.1	-	-19.8	-
3.972	32.20	-	32.60	-	56.00	46.00	-23.8	-	-23.4	-
6.857	30.80	-	32.80	-	60.00	50.00	-29.2	-	-27.2	-
28.700	29.40	-	27.60	-	60.00	50.00	-30.6	-	-32.4	-

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 levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value

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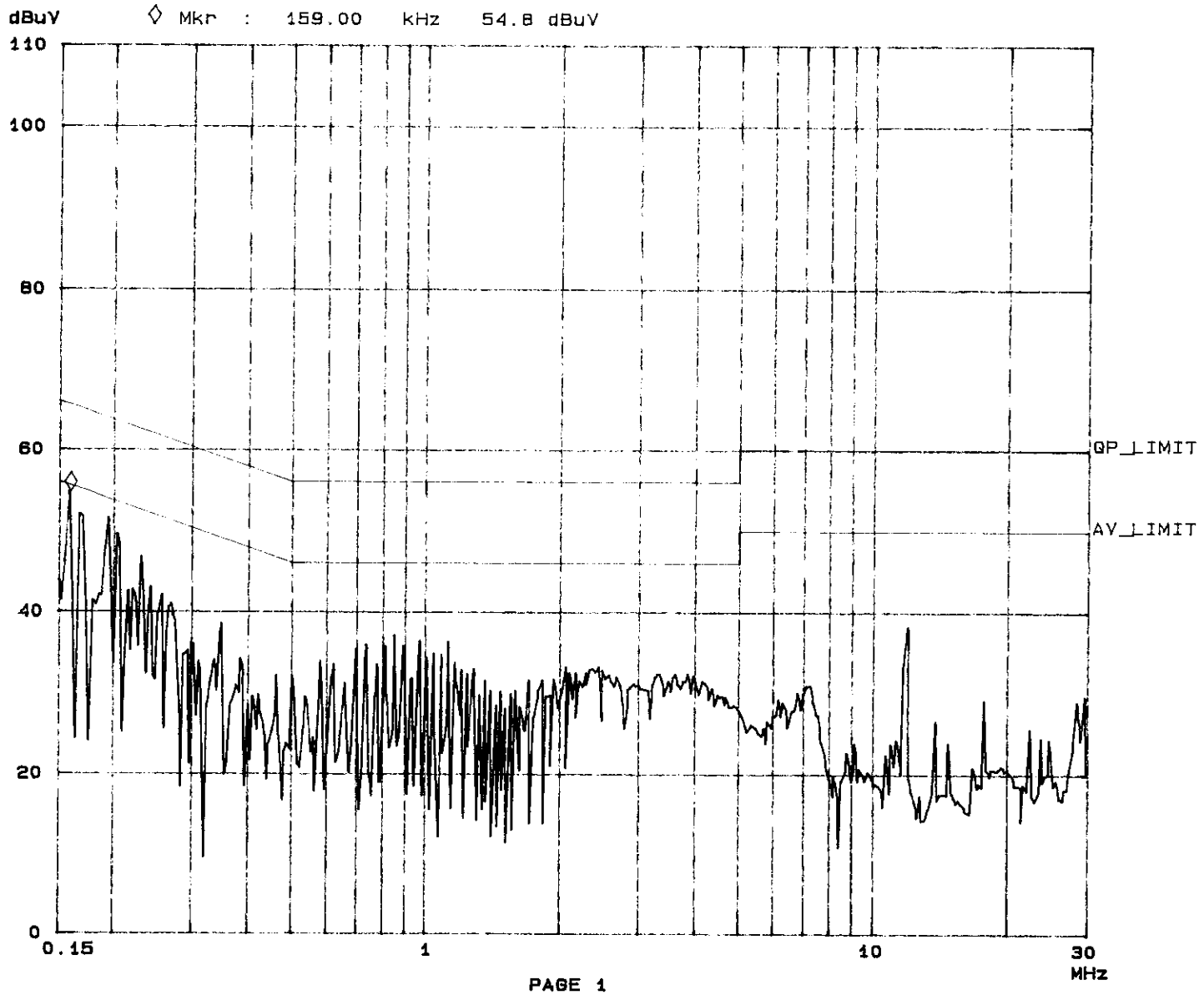
Tested by John Liao

EUT: MODEL: L5MX-TA
Op Cond: 1024x768 60khz
Test Spec: LISN : L
Comment: FULL SYSTEM

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpAge
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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Tested by John Liao

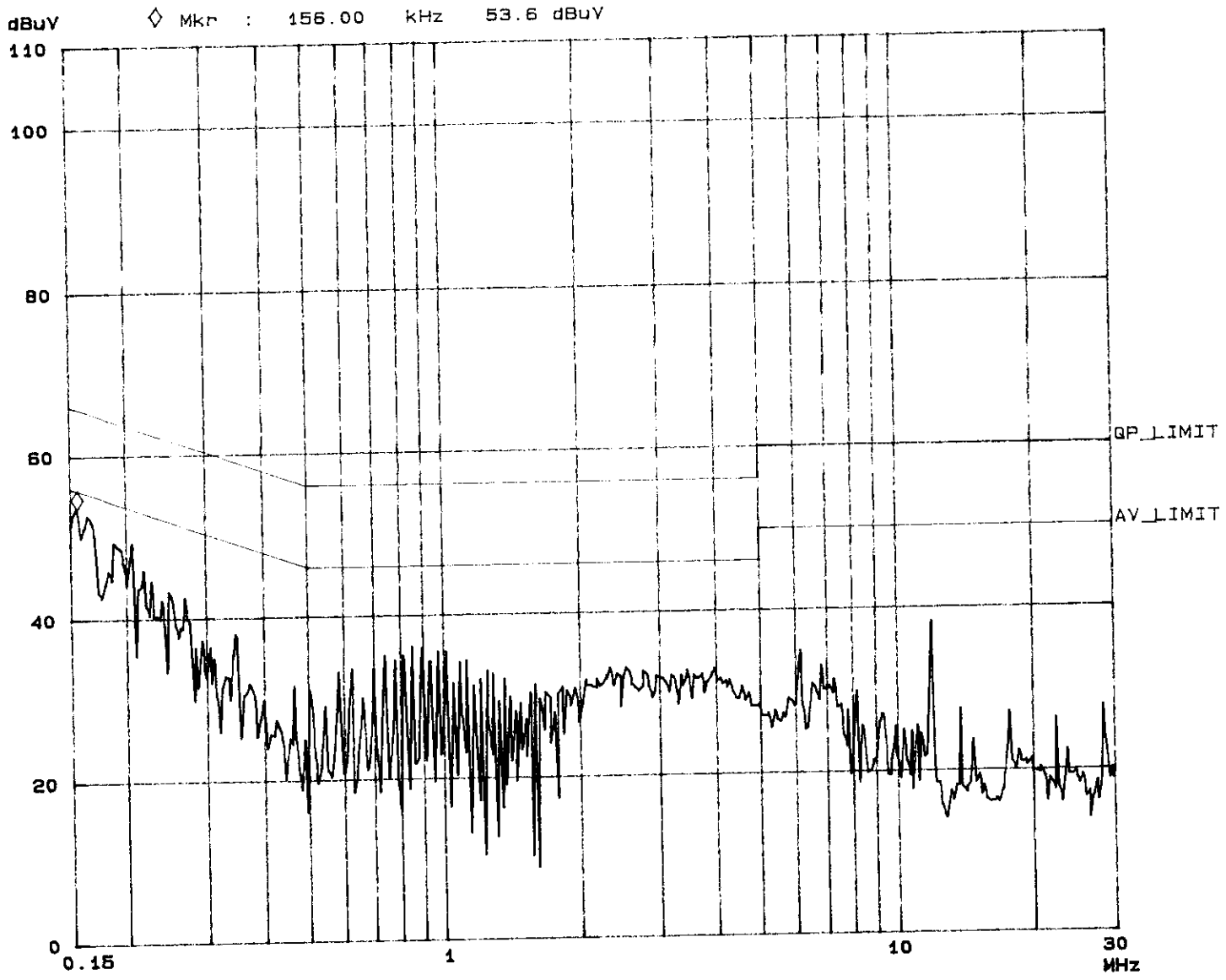
EUT: MODEL: L6MX-TA
Op Cond: 1024x768 60khz
Test Spec: LISN : N
Comment: FULL SYSTEM

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

Final Measurement Results:

no Results



4.2.1 TEST DATA OF RADIATED EMISSION

EUT: **LCD MONITOR** MODEL: **L5MX-TA**

MODE: **1024x768 (60 kHz)**

ANTENNA: CHASE BILOG CBL 6112A POLARITY: Horizontal

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

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

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
120.00	15.8	5.8	21.6	30.0	-8.4
132.00	14.9	7.4	22.3	30.0	-7.7
141.81	14.1	6.1	20.2	30.0	-9.8
144.04	13.9	10.5	24.4	30.0	-5.6
173.30	12.1	12.2	24.3	30.0	-5.7
181.18	12.0	7.1	19.1	30.0	-10.9
189.06	12.4	11.3	23.7	30.0	-6.3
196.96	12.8	11.8	24.6	30.0	-5.4
215.32	14.0	7.8	21.8	30.0	-8.2
228.18	14.9	10.5	25.4	30.0	-4.6

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

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TEST DATA OF RADIATED EMISSION

EUT: **LCD MONITOR** MODEL: **L5MX-TA**

MODE: **1024x768 (60 kHz)**

ANTENNA: CHASE BILOG CBL 6112A POLARITY: Vertical

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

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

TEST PERSONNEL: John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
68.00	8.0	9.8	17.8	30.0	-12.2
82.98	8.2	17.9	26.1	30.0	-3.9
94.50	10.6	10.1	20.7	30.0	-9.3
120.00	13.0	11.2	24.2	30.0	-5.8
133.92	14.2	11.1	25.3	30.0	-4.7
141.79	14.5	10.9	25.4	30.0	-4.6
144.01	14.3	12.3	26.6	30.0	-3.4
149.68	13.8	9.9	23.7	30.0	-6.3
168.02	12.3	10.1	22.4	30.0	-7.6
173.30	11.9	14.5	26.4	30.0	-3.6
181.18	11.6	13.8	25.4	30.0	-4.6
189.04	12.4	11.4	23.8	30.0	-6.2
228.14	15.2	11.0	26.2	30.0	-3.8

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:

* LCD Display		15.0" TFT Active Matrix Panel
* Display Size		304 (H) x 228 (V) mm
* Pixel Pitch		0.297 (H) x 0.297 (V) mm
* Max. Resolution		XGA 1024 x 168 N.I.
* Contrast Ratio		150:1 (Typical)
* Brightness		200 Cd/m^2 (Typical)
* Response Time		50 ms
* Display Color		16M
* Viewing Angle		+50° ~ -50° (L/R), +30° ~ -40° (U/D)
* Input Signal	Video	R.G.B. Analog 0.7 $V_{peak-peak}$
	Sync	TTL Positive or Negative
* Signal Connector		15 Pin Mini D-Sub
* Front Control		Soft Power Switch, Menu, Reset, Adjust (+,-)
* Rear Control		Main Power Switch
* OSD		Brightness, Contrast, Clock, Phase
		H-Position, V-Position, Reset
*Rotation		90 degree Clockwise Rotate For Portrait Display
* Plug & Play		DDC1 / 2B
* Audio System	Speaker	3W / Per Channel
	Control	Audio Power Switch, Volume, 3D, Bass
	Connector	Earphone plug, Audio-In
* Microphone		Imbedded Omnidirectional Mic.
* USB		1 Upstream Port, 2 Downstream Ports
* Power		Imbedded AC Input, Universal 90 ~ 264 V
* Operating Condition	Temperature	0℃ ~ 40℃
	Humidity	10% ~ 80% (No Condensation)
	Altitude	To 10,000 Feet
* Storage Conditions	Temperature	-20℃~ 60℃
	Humidity	10% ~80% (No Condensation)
* Dimensions		408.6 x 385 x 230.7 mm
		(With Audio System, Width is 426.6 mm)
* Weight (Net)		5.5 Kg