FCC ID: FMALM88

EMC

FCC/BCC DEC 02 1998

TEST REPORT

REPORT NO. : F87111804
MODEL NO. : LM 85
DATE OF TEST : Nov. 18, 1998

PREPARED FOR : NAN TAN COMPUTER CO.
ADDRESS : 2F, NO. 35, WU-GON 6TH ROAD, WU-KU IND. PARK.
TAIPEI HSIEN, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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11F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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1.

CERTIFICATION

Issue Date: Nov. 30, 1998

Product	:	LCD MONITOR
Trade Name	:	CLEVO
Model No.	:	LM 85
Applicant	:	NAN TAN COMPUTER CO.
Standard	:	FCC Part 15, Subpart B, Class B ANSI C63.4-1992 CISPR 22:1993+A1:1995+A2:1997

We hereby certify that one sample of the designation has been tested in our facility on Nov.18, 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: San Lin , DATE: 11/30/98
(San Lin)

CHECKED BY : Ariel Hsieh , DATE: 11/30/98
(Ariel Hsieh)

APPROVED BY: Mike Su , DATE: 11/30/98
(Mike Su)

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	LCD MONITOR
Model No.	:	LM 85
Power Supply Type	:	Switching
Power Cord	:	Nonshielded
Data Cable	:	Shielded (1.5m)

Note: The EUT is a 15" LCD monitor using Fujitsu LCD Panel with resolution up to 1024 x 768 (69 kHz).

The EUT was tested using the following modes:

Mode 1: Delta Power Adapter (AC power cord: 1.95m, DC power cord: 1.5m)

Model : ADP-40GB
Input :100~240Vac 1.5A 50-60Hz
Output :12.5 Vdc 3.2A

Mode 2: Acbel Power Adapter (AC power cord: 1.95m, DC power cord: 1.8m)

Model :API-8558
Input :100~240 Vac 1.5A 50-60Hz
Output :12 Vdc 3.6A

There is a ferrite core on the power cord of both the above adapters.

Both modes were tested separately and their data are recorded in this report.

There is two ferrite cores on the video cable outside the LCD 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.	Serial No	I/O Cable
1	PERSONAL COMPUTER	HP	D4579A	SG73001726	Nonshielded Power (1.8 m)
2	USB KEYBOARD	BTC	7932	D7A140012	Nonshielded Signal (1.8 m)
3	KEYBOARD	FORWARD	FDA-104GA	FDKB8110160	Shielded Signal (1.4m)
4	PRINTER	HP	2225C+	3030S79138	Shielded Signal (2.1 m) Nonshielded Power (1.8 m)
5	USB MOUSE	LOGITECH	N/A	LTC73700536	Shielded Signal (1.8 m)
6	MOUSE	DEXIN	A2P800A	80110021	Shielded Signal (1.8m)
7	MODEM	ACEEX	1414	980020569	Shielded Signal (1.5 m) Nonshielded Power (1.8 m)
8	VGA CARD	GORDIA	DSV3365	E600782851	N/A
9	SOUND CARD	Ya Hsin	Audio 1869	7C05000505	N/A

Note: 1. An audio cable (1.8m) was connected between the EUT and PC.
2. Two USB cables (1.8m) were connected to the two USB ports of EUT to form two open loop cables.
3. A USB cable (1.8m) was connected from the EUT to PC.
4. Support unit 2 & 5 were connected to the USB ports of EUT.

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. 3, 1999
HP Preamplifier	8447D	2944A08119	Jan. 20, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 15, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE Bilog Antenna	CBL6112A	2329	Sept. 19, 1999
EMCO Turn Table	1060	1195	N/A
EMCO Tower	1051	1163	N/A
Open Field Test Site	Site 2	ADT-R02	Sept. 18, 1999

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 15, 1999
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 16, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 14, 1999
EMCO-L.I.S.N.	3825/2	9204-1964	July 14, 1999
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	:	24 ℃
Humidity	:	78 %
Atmospheric Pressure	:	1003 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: - 19.2 dB at 0.150 MHz Minimum passing margin of radiated emission: -2.6 dB at 227.82 MHz

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

* 1024x768 mode (69 kHz),
* 800x600 mode (54 kHz),
* 640x480 mode (31.5 kHz)

The worst emission levels were found under 1024x768 (69 kHz) and therefore the test data of only this mode is recorded

4.2 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 then LCD Monitor displays"H" patterns on screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and then printer prints them on paper.
7. PC sends audio messages to internal speaker of EUT.
8. Repeat steps 3-8.

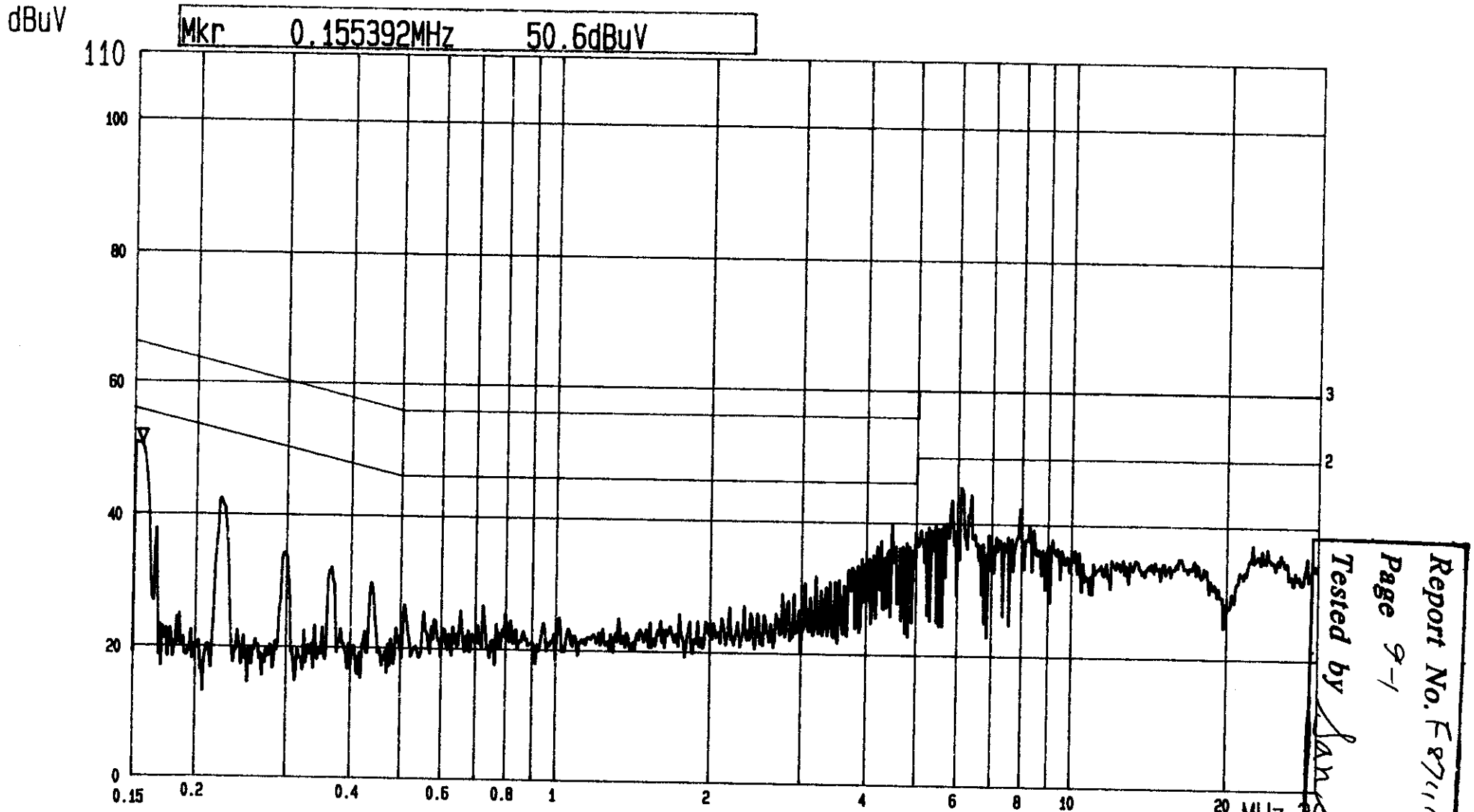
4.3 TEST DATA OF CONDUCTED EMISSION (A)

EUT: **LCD MONITOR** MODEL: **LM 85**

6 dB Bandwidth: 10 kHz MODE: **DELTA ADAPTER**

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	36.80	-	36.90	-	66.00	56.00	-29.2	-	-29.1	-
0.214	40.20	-	40.70	-	63.00	53.00	-22.8	-	-22.3	-
4.418	31.30	-	32.00	-	56.00	46.00	-24.7	-	-24.0	-
6.189	34.90	-	35.20	-	60.00	50.00	-25.1	-	-24.8	-50.0
7.775	32.50	-	33.70	-	60.00	50.00	-27.5	-	-26.3	-
22.544	29.60	-	29.50	-	60.00	50.00	-30.4	-	-30.5	-

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



Report No. F871184
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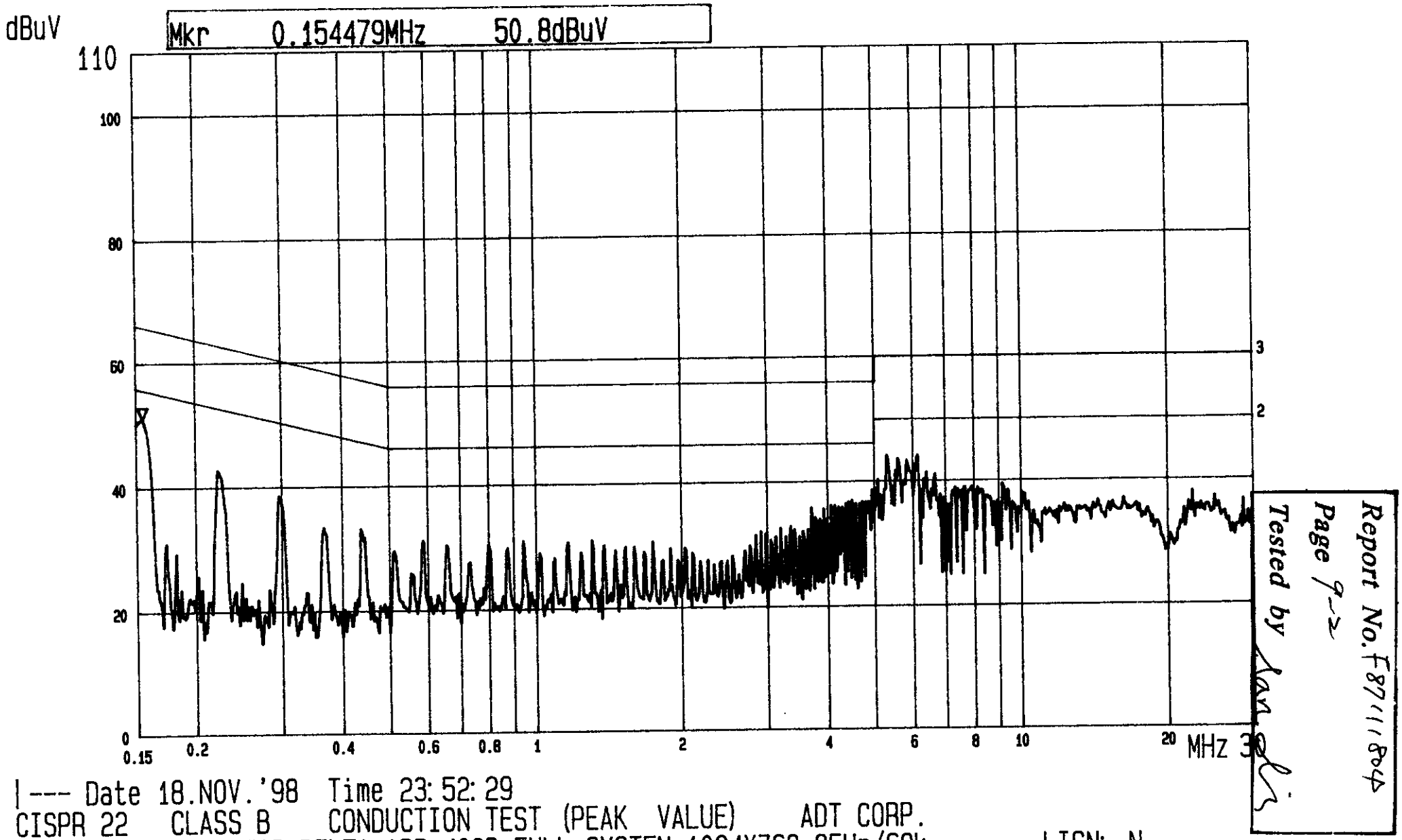
Tested by

|--- Date 18.NOV.'98 Time 23:50:35
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODE: LM 85 ADAPTOR DELTA ADP-40GB FULL SYSTEM 1024X768 85Hz/69k LISN: L



Report No. F871180A
Page 9-2
Tested by Dan Li

|--- Date 18.NOV.'98 Time 23:52:29
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODE: LM 85 ADAPTOR DELTA ADP-40GB FULL SYSTEM 1024X768 85Hz/69k LISN: N

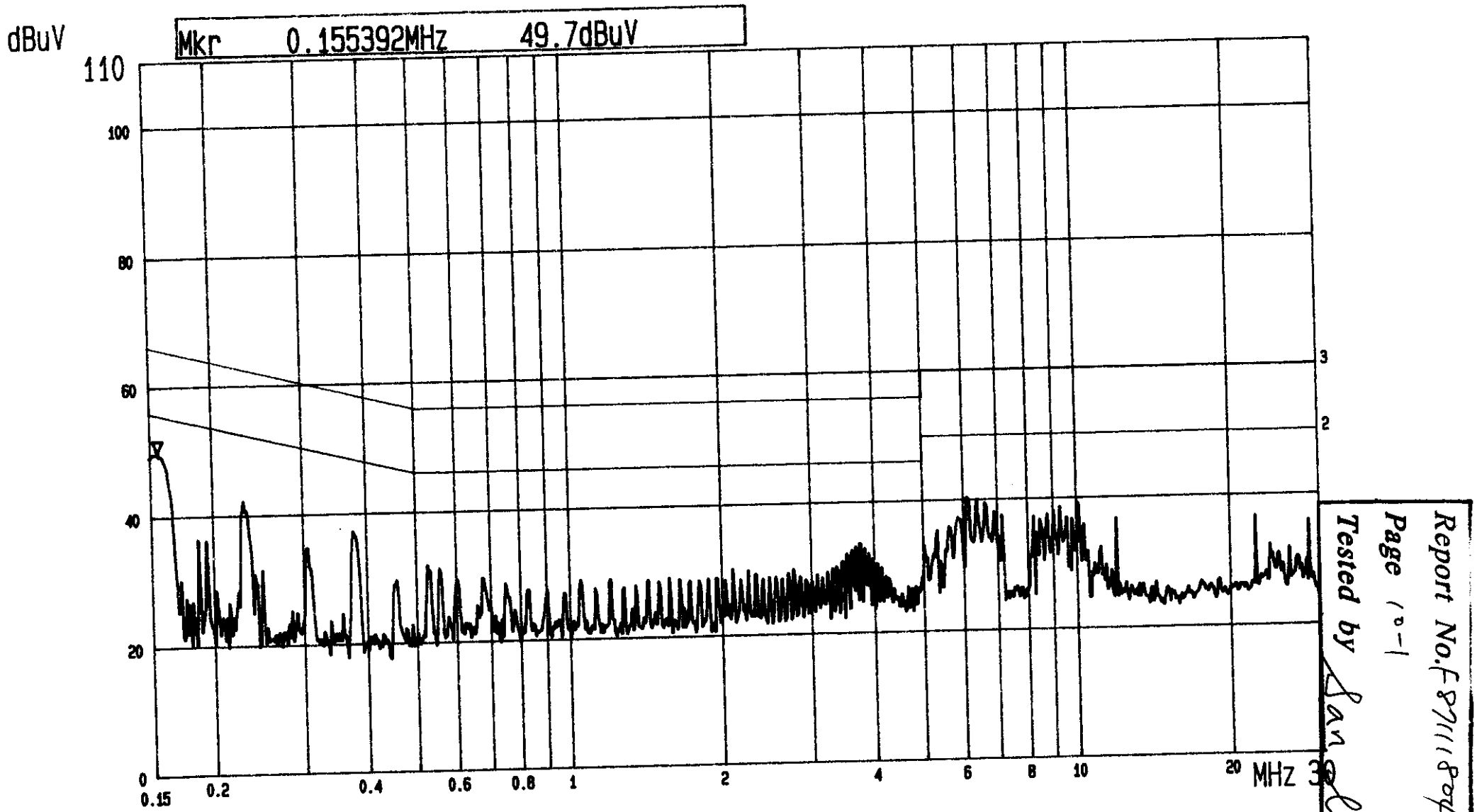
4.4 TEST DATA OF CONDUCTED EMISSION (B)

EUT: **LCD MONITOR** MODEL: **LM 85**

6 dB Bandwidth: 10 kHz MODE: **ACBEL ADAPTER**

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	46.70	-	46.80	-	66.00	56.00	-19.3	-	-19.2	-
0.375	34.10	-	34.70	-	58.30	48.30	-24.2	-	-23.6	-
3.768	27.00	-	26.80	-	56.00	46.00	-29.0	-	-29.2	-
6.103	30.10	-	29.70	-	60.00	50.00	-29.9	-	-30.3	-
10.095	29.30	-	30.70	-	60.00	50.00	-30.7	-	-29.3	-
28.634	31.40	-	32.00	-	60.00	50.00	-28.6	-	-28.0	-

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



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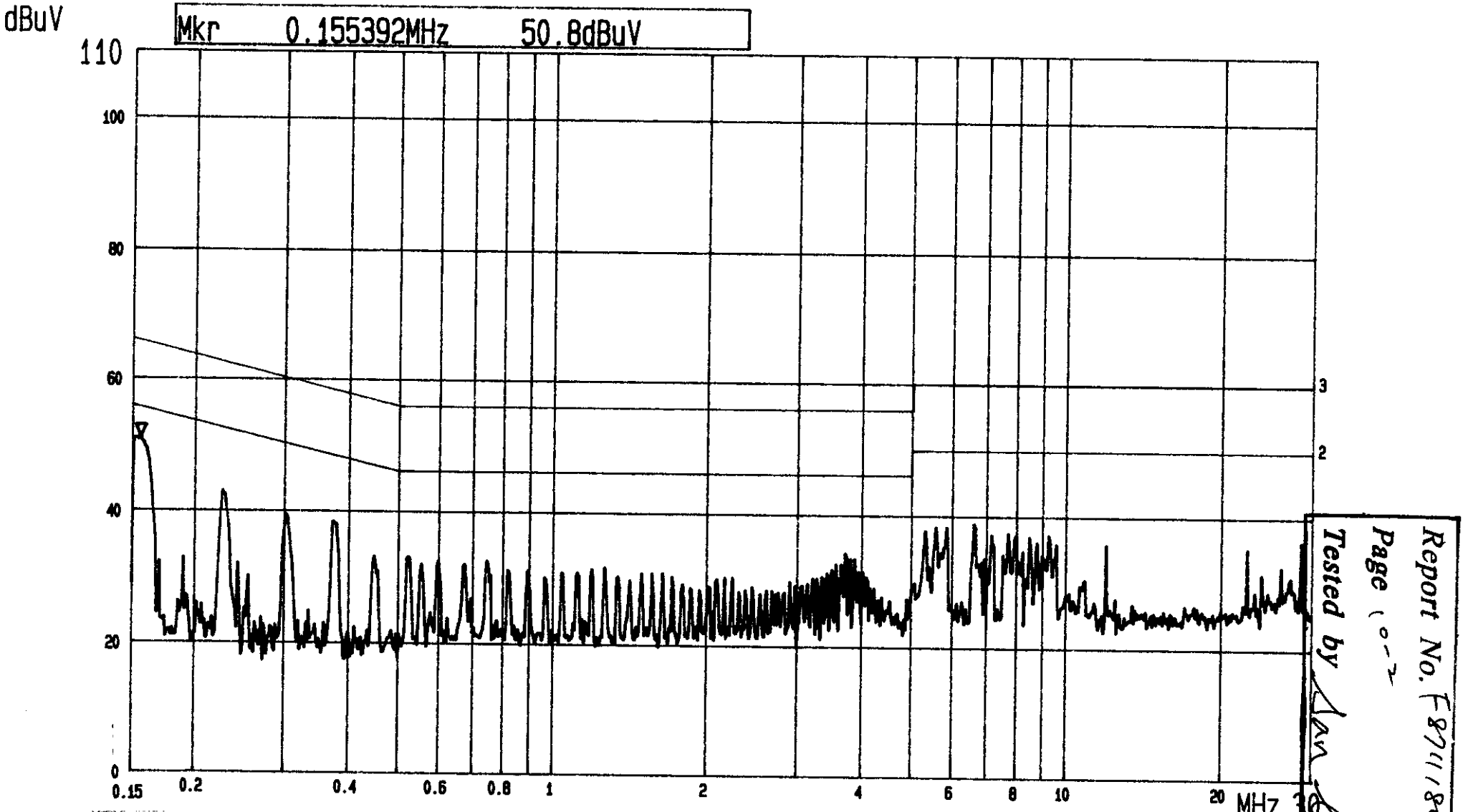
Tested by Sanli

|--- Date 19.NOV.'98 Time 01:34:11
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODE: LM 85 ADAPTOR: ACBEL API-8558 FULL SYSTEM 1024X768 85Hz/69k LISN: L



Report No. F821118-04
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Tested by

| --- Date 19.NOV.'98 Time 01:26:18
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODE: LM 85 ADAPTOR: ACBEL API-8558 FULL SYSTEM 1024X768 85Hz/69k LISN: N

4.5 TEST DATA OF RADIATED EMISSION (A)

EUT: **LCD MONITOR** MODEL: **LM 85**

MODE: **DELTA ADAPTER** POLARITY: Horizontal

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

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

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
48.00	12.1	14.4	26.5	30.0	-3.5
79.99	8.5	13.2	21.7	30.0	-8.3
130.17	14.0	8.9	22.9	30.0	-7.1
144.02	13.2	5.9	19.1	30.0	-10.9
180.28	11.6	7.7	19.3	30.0	-10.7
195.28	11.8	13.4	25.2	30.0	-4.8
205.26	12.2	7.6	19.8	30.0	-10.2
212.83	12.8	5.2	18.0	30.0	-12.0
227.81	13.9	13.1	27.0	30.0	-3.0
324.80	17.1	1.7	18.8	37.0	-18.2

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 (A)

EUT: **LCD MONITOR** MODEL: **LM 85**

MODE: **DELTA ADAPTER** POLARITY: Vertical

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

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

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.99	8.1	16.0	24.1	30.0	-5.9
80.83	7.7	10.1	17.8	30.0	-12.2
130.16	14.2	10.1	24.3	30.0	-5.7
144.06	13.6	11.7	25.3	30.0	-4.7
157.75	11.9	11.7	23.6	30.0	-6.4
180.28	11.4	9.4	20.8	30.0	-9.2
195.23	12.3	14.0	26.3	30.0	-3.7
205.27	12.9	12.3	25.2	30.0	-4.8
212.82	13.2	9.6	22.8	30.0	-7.2
227.81	13.9	12.9	26.8	30.0	-3.2
325.91	17.2	0.3	17.5	37.0	-19.5

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

4.6 TEST DATA OF RADIATED EMISSION (B)

EUT: **LCD MONITOR** MODEL: **LM 85**

MODE: **ACBEL ADAPTER** POLARITY: Horizontal

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

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

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
48.00	12.1	13.6	25.7	30.0	-4.3
122.46	14.3	4.4	18.7	30.0	-11.3
130.17	14.0	8.0	22.0	30.0	-8.0
144.03	13.2	8.2	21.4	30.0	-8.6
157.72	11.6	8.7	20.3	30.0	-9.7
195.28	11.8	14.1	25.9	30.0	-4.1
205.25	12.2	6.7	18.9	30.0	-11.1
216.06	13.0	6.2	19.2	30.0	-10.8
227.82	13.9	13.5	27.4	30.0	-2.6
325.45	17.2	1.8	19.0	37.0	-18.0
390.47	19.6	0.3	19.9	37.0	-17.1

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

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TEST DATA OF RADIATED EMISSION (B)

EUT: **LCD MONITOR** MODEL: **LM 85**

POLARITY: Vertical MODE: **ACBEL ADAPTER**

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

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

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.98	8.1	17.0	25.1	30.0	-4.9
85.91	8.8	9.5	18.3	30.0	-11.7
122.69	14.4	10.4	24.8	30.0	-5.2
130.18	14.2	12.5	26.7	30.0	-3.3
144.02	13.6	9.4	23.0	30.0	-7.0
157.70	11.9	13.2	25.1	30.0	-4.9
180.27	11.4	10.0	21.4	30.0	-8.6
195.23	12.3	14.6	26.9	30.0	-3.1
205.25	12.9	7.0	19.9	30.0	-10.1
212.80	13.2	3.6	16.8	30.0	-13.2
216.03	13.4	3.3	16.7	30.0	-13.3
227.82	13.9	13.2	27.1	30.0	-2.9

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:

*** Size**	15."
*** Resolution (Max)**	XGA (1024 x 768)
*** Pixel Pitch**	0.297mm
*** Color**	256k
*** View Angle (H/V)**	160° / 160° , CR>5
*** Contrast**	300 : 1
*** Brightness**	200 cd/m^2
*** Input Signal**	analog RGB
*** Power Consumption**	33W
*** Dimension (W x H x D)**	388 x 384 x 165 (mm) 15.28" x 15.12" x 6.14"
*** Weight**	6.2 kg
*** Effective Display Area**	304.1mm/11.97"(H) 228.1mm/8.98"(V)
*** Scanning Frequency**	Horizontal: 15KHz ~ 75KHz Vertical: 55Hz ~ 90Hz
*** USB HUB**	Output: USB-a (downstream) x 4 Input: USB-b (upstream) x 1
***Tilt Angle**	-5° ~ +20°
*** Audio**	2W amplifier & 2W speaker (x2)

ADT CORP. TEL:(02)2603-2180-3 FAX:(02)2602-2943

TEST REPORT & CERTIFICATION SERVICES QUESTIONNAIRE

We, ADT Corp., would like to provide you a high quality report and certification in a timely manner. To achieve this goal, we would like you to response to the brief questions listed below in this questionnaire. Therefore your feed back is vital to us in order to determine how good our services are, and what areas could be improved.

Please indicate beside each question what you feel is the rating. Also, feel free to make comments and suggestions directly on this questionnaire, or by attaching separate sheet. The completed form should then be returned by mail or FAX to ***Harris W. Lai,*** *Director. Your cooperation and effort are truly appreciated.*

TEST REPORT NUMBER : _____

	YES	NO
1. Was the information presented clearly	[ ]	[ ]
2. Was the report complete ?	[ ]	[ ]
3. Was the report timely ?	[ ]	[ ]
4. Did the report satisfy your requirement ?	[ ]	[ ]
5. Was the Certification (if any) completed in the scheduled time ?	[ ]	[ ]

Your working field ? [ ] Engineering [ ] Manufacturing
[ ] Marketing [ ] Other

YOUR CONTACT INFORMATION (OPTIONAL) : _____

OPTIONAL COMMENTS : _____