



EMC

TEST REPORT

REPORT NO. : F87101402A
MODEL NO. : LD-521
DATE OF TEST : Nov. 20, 1998

PREPARED FOR : ADI CORP.

ADDRESS : 14TH FL. NO. 1, SEC. 4, NAN-KING E. RD.,
TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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

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**1. CERTIFICATION**

Issue Date: Nov. 24, 1998

Product : LCD MONITOR
Trade Name : ADI
Model No. : LD-521
Applicant : ADI CORP.
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. 20, 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: Bruce Lu , DATE: 11/24/98
(Bruce Lu)

CHECKED BY: Yemmy Soong , DATE: 11/24/98
(Yemmy Soong)

APPROVED BY: Mike Su , DATE: 11/24/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION**NVLAP[®]**

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	LCD MONITOR
Model No.	:	LD-521
Power Supply Type	:	Switching
Power Cord	:	Nonshielded DC (1.8m) Nonshielded AC (2.0m)
Data Cable to PC	:	Shielded (1.5m)

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

The EUT was tested and will be sold together with a UMEC Switching Power Adapter, Model: UP0451E-12P

Input rating : 100-240V, 1.0A, 47-63Hz

Output rating : 12Vdc, 3.75A

The EUT was tested with a USB HUB Model: UH-200L.

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	D4572A	FCC DoC Approved	Nonshielded Power (1.8m)
2	USB HUB	ADI	UH-200L	FCC DoC Approved	Shielded Signal (0.5m)
3	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4m)
4	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (2.2m) Nonshielded Power (1.8m)
5	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.8m)
6	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.5m)
7	CCD CAMERA x 2	COMPAQ	YC72-CPQ	EDUYC72-CPQ	Nonshielded Signal (2.1m)
8	VGA DISPLAY CARD	GORDIA	DSV3365	LUT-DSV3365	N/A

Note : 1. Support Unit 7 were connected to USB HUB (support unit 2).

2. Two USB cables (2.1m each) were connected to the two USB ports to form two open loop cables.

3. A USB cable (2.0m) was connected from the USB HUB to PC.

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)	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	:	23 °C
Humidity	:	74 %
Atmospheric Pressure	:	1005 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -10.4 dB at 3.915 MHz Minimum passing margin of radiated emission: -3.0 dB at 119.99 & 143.99 MHz

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

- * 1024x768 mode (60 kHz),
- * 800x600 mode (48 kHz),
- * 640x480 mode (31.5 kHz)

The worst emission levels were found under 1024x768 (60 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 & picture messages to LCD monitor (EUT) and LCD monitor displays them on its screen.
5. PC sends "H" messages to modem.
6. PC sends "H" messages to printer, and the printer prints them on paper.
7. CCD cameras capture images and send image messages to PC via USB HUB.
8. Repeat steps 3-8.



4.1.2 TEST DATA OF CONDUCTED EMISSION

EUT: LCD MONITOR

MODEL: LD-521

MODE: 1024x768 (60 kHz)

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: Bruce Lu

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	44.80	-	39.80	-	65.78	55.78	-21.0	-	-26.0	-
0.782	40.10	-	39.20	-	56.00	46.00	-15.9	-	-16.8	-
1.565	41.90	-	41.10	-	56.00	46.00	-14.1	-	-14.9	-
3.345	44.20	-	43.80	-	56.00	46.00	-11.8	-	-12.2	-
3.915	45.60	-	45.40	-	56.00	46.00	-10.4	-	-10.6	-
5.411	42.00	-	41.20	-	60.00	50.00	-18.0	-	-18.8	-

- 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



4.1.3 TEST DATA OF RADIATED EMISSION

EUT: LCD MONITOR

MODEL: LD-521

MODE: 1024x768 (60 kHz)

ANTENNA: CHASE BILOG CBL6112A

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL:

Bruce Lu

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
71.99	7.7	13.5	21.2	30.0	-8.8
120.01	14.4	9.0	23.4	30.0	-6.6
126.05	14.1	11.0	25.1	30.0	-4.9
130.07	14.0	12.8	26.8	30.0	-3.2
131.99	13.9	8.6	22.5	30.0	-7.5
131.99	13.9	9.6	23.5	30.0	-6.5
144.00	13.2	11.5	24.7	30.0	-5.3
149.36	12.6	8.6	21.2	30.0	-8.8
157.38	11.6	7.5	19.1	30.0	-10.9
227.99	13.9	9.5	23.4	30.0	-6.6
275.98	16.4	6.9	23.3	37.0	-13.7
384.03	19.4	9.5	28.9	37.0	-8.1
393.91	19.7	6.1	25.8	37.0	-11.2
400.94	19.9	3.0	22.9	37.0	-14.1
630.24	24.2	6.0	30.2	37.0	-6.8
709.00	24.9	8.5	33.4	37.0	-3.6

- 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: LCD MONITOR

MODEL: LD-521

MODE: 1024x768 (60 kHz)

ANTENNA: CHASE BILOG CBL6112A

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL:

Bruce Ly

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
71.99	6.7	16.2	22.9	30.0	-7.1
119.99	14.4	12.6	27.0	30.0	-3.0
126.21	14.3	12.5	26.8	30.0	-3.2
129.98	14.2	12.7	26.9	30.0	-3.1
132.00	14.2	12.4	26.6	30.0	-3.4
138.01	14.1	8.3	22.4	30.0	-7.6
143.99	13.6	13.4	27.0	30.0	-3.0
145.49	13.4	12.3	25.7	30.0	-4.3
149.41	12.9	9.4	22.3	30.0	-7.7
157.60	11.9	13.3	25.2	30.0	-4.8
228.04	13.9	10.2	24.1	30.0	-5.9
275.95	15.8	13.4	29.2	37.0	-7.8
384.05	19.8	8.5	28.3	37.0	-8.7
400.94	20.5	8.1	28.6	37.0	-8.4
630.24	24.0	6.1	30.1	37.0	-6.9
400.94	25.3	8.1	33.4	37.0	-3.6

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



6. ATTACHMENT I-TECHNICAL DESCRIPTION OF EUT

SPECIFICATIONS:

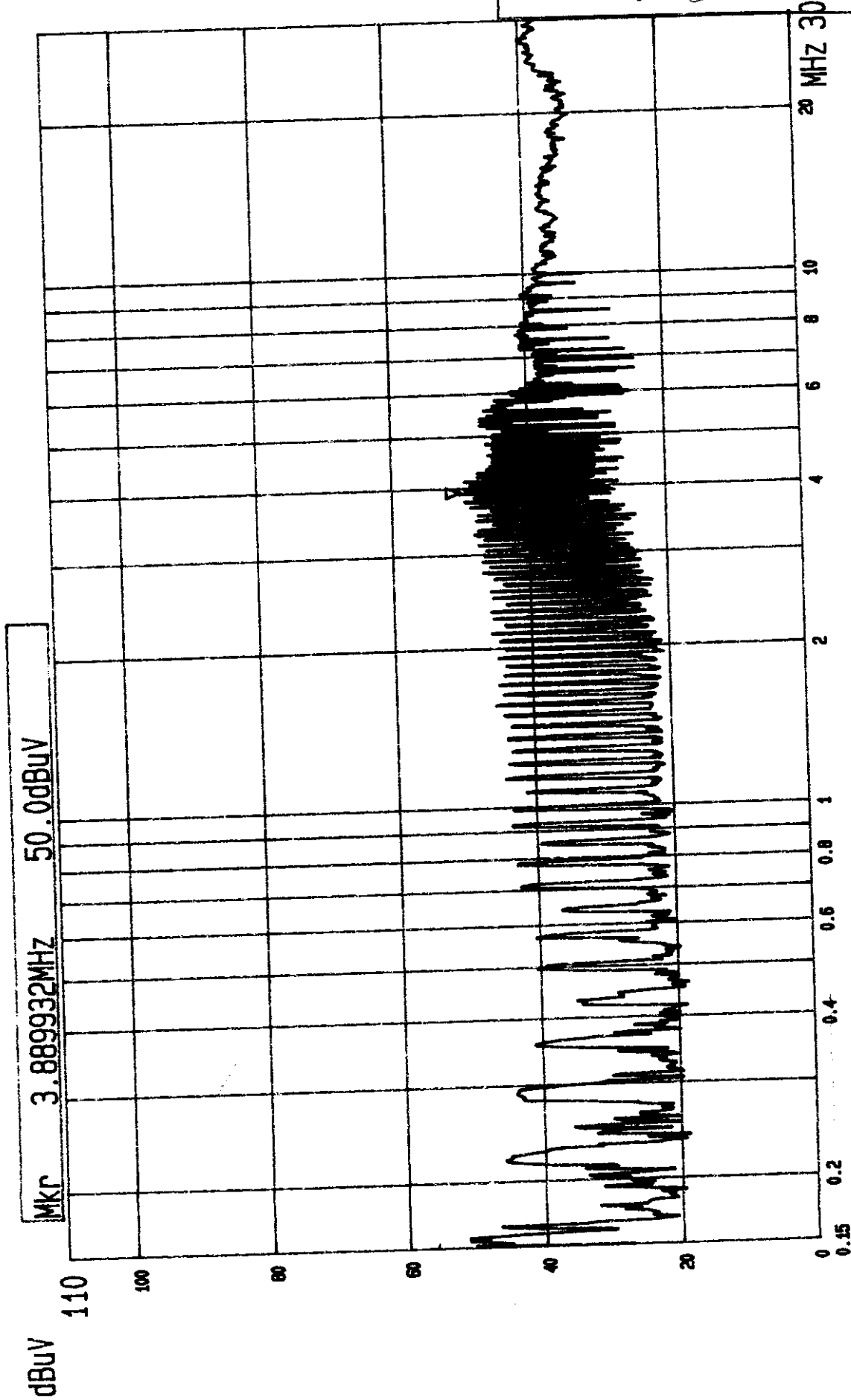
* Picture panel	15-inch diagonal viewable screen TFT (thin film transistor) active matrix, color liquid Cristal display, RGB interface													
* Resolution	XGA 1024 x 768													
* Display area (H x V)	304 mm x 228 mm													
* View angle	110° (V) 120° (H)													
* Input signals	Horizontal : 31.5 to 60 kHz Vertical : 56 to 75 kHz Video : 0.7 Vp-p Sync : TTL level													
* Max. video input	80 MHz													
* Display color	262 K													
* Signal system	Analog RGB signals													
* Luminance	200 cd/m ² (typ.)													
* Contrast ratio	150 : 1 (min.)													
* Response time	20ms (typ.)													
* Front panel controls	Menu - (decrease/down), + (increase/up), Power standby													
* OSD menu controls	Brightness, Contrast, H-Position, V-Position, H-size, Phase, Center/Expand, Factory Defaults, 5 Language, OSM Position, OSM Turn Off Time, Exit													
* Input connectors	15-pin D-sub Type DC 12V IN, USB hub 5V input													
* Power source	90-240 VAC													
* Power consumption	35 W (max.) <table border="1"><thead><tr><th>Input</th><th>Voltage</th><th>PW</th></tr></thead><tbody><tr><td rowspan="2">110V</td><td>Normal</td><td>< 32.4 W</td></tr><tr><td>Power saving</td><td>< 2.2 W</td></tr><tr><td rowspan="2">220V</td><td>Normal</td><td><34.2 W</td></tr><tr><td>Power saving</td><td><3.4 W</td></tr></tbody></table>	Input	Voltage	PW	110V	Normal	< 32.4 W	Power saving	< 2.2 W	220V	Normal	<34.2 W	Power saving	<3.4 W
Input	Voltage	PW												
110V	Normal	< 32.4 W												
	Power saving	< 2.2 W												
220V	Normal	<34.2 W												
	Power saving	<3.4 W												
* Dimension (H x W x D)	410mm x 429.4mm x 213.9mm													
* Net weight	5.4 kg													
* Operating Temperature	10°C to 40°C													
* Storage Temperature	-20°C to 60°C													

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Tested by Bruce L



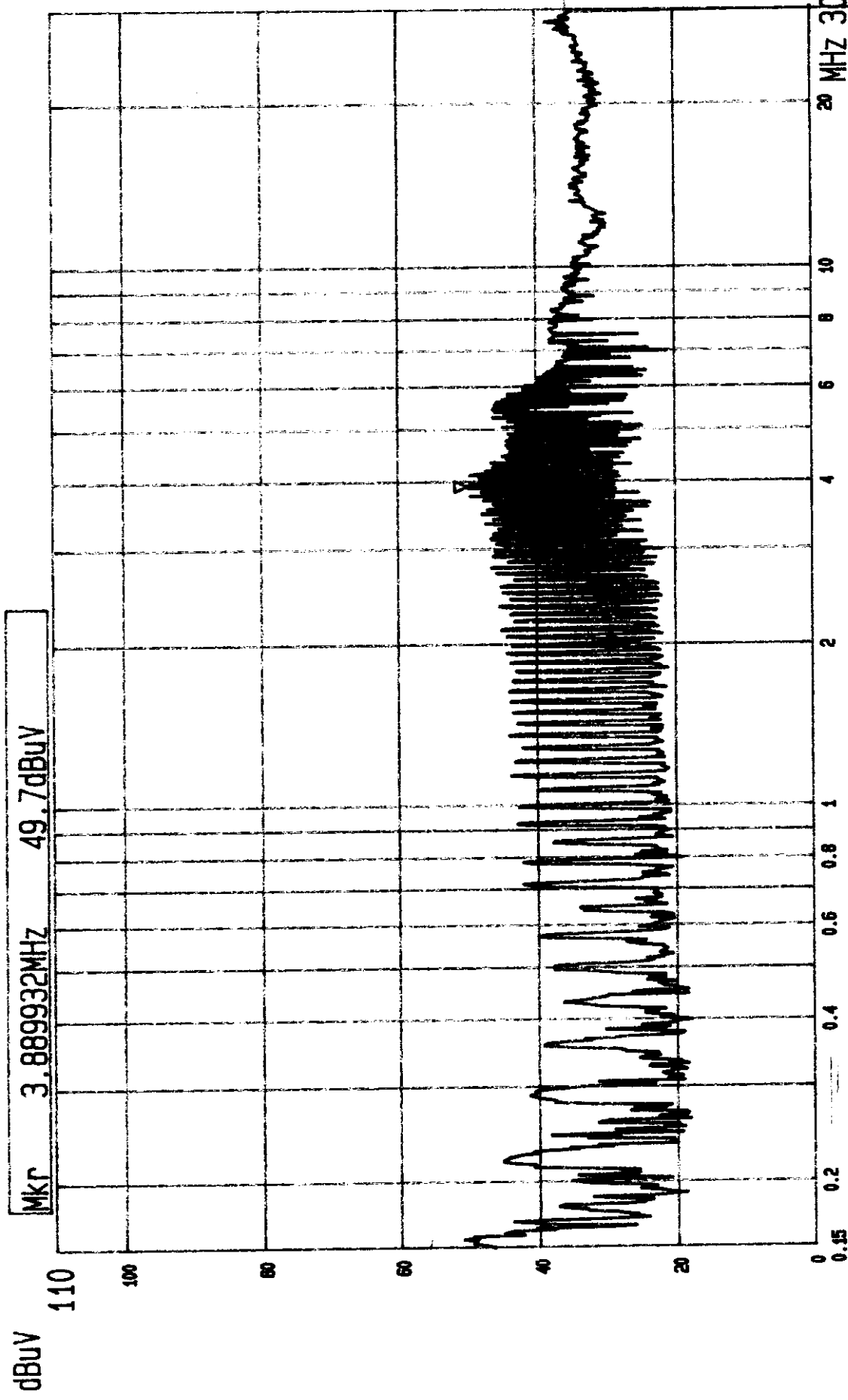
--- Date 20.NOV.'98 Time 10:17:18

CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)

MODE: LD-521 1024X768 75Hz/60k FULL SYSTEM

ADT CORP.

LISN: L



--- Date 20.NOV.'98 Time 10:25:45

CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)

MODE: LD-521 1024X768 75Hz/60K FULL SYSTEM

ADT CORP.

LISN: N