



EMC

TEST REPORT

REPORT NO. : F87102805
MODEL NO. : 765X
DATE OF TEST : Oct. 31, 1998

PREPARED FOR: PROVIEW ELECTRONICS (TAIWAN) CO. LTD.

ADDRESS : 6F, NO. 1, PAU-SHENG RD., YUNG-HO CITY,
TAIPEI HSIEN, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

12F, NO.1, SEC.4, NAN-KING EAST RD.,
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**1. CERTIFICATION**

Issue Date: Nov. 03, 1998

Product : COLOR MONITOR
Trade Name : PROVIEW, EMC, MIRAGE
Model No. : 765X
Applicant : PROVIEW ELECTRONICS (TAIWAN) CO. LTD.
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 Oct. 31, 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: 11/03/98
(John Liao)

CHECKED BY: Yemmy Soong, DATE: 11/03/98
(Yemmy Soong)

APPROVED BY: Mike Su, DATE: 11/03/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

Accredited Laboratory



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	Color Monitor
Model No.	:	765X
Power Supply Type	:	Switching
Power Cord	:	Nonshielded (1.3 m)
Data Cable	:	Shielded (1.25 m)

Note: The EUT is a 17" color monitor with resolution up to 1280x1024.

The "X" in the above model name could be defined as 0 – 9, A – Z or blank for marketing distinction only.

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	NTI	PII-233	FCC DoC Approved	Nonshielded Power (1.8m)
2	KEYBOARD	FORWARD	FDA-104GA	F4ZDA-104G	Shielded Signal (1.4 m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (2.2m) Nonshielded Power (1.9m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.9m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.5m)
6	EARPHONE	GAMMA	LH115	N/A	Nonshielded Signal (1.4m)
7	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	N/A
8	SOUND CARD	YA HSIN	AUDIO 1869	FCC DoC Approved	N/A
9	SPEAKER	KOKA	KS-201	N/A	Nonshielded Signal (1.4m)

Note: 1. Two audio cables (0.15m each) were connected from both internal speakers to EUT.

2. An audio cable (1.75m) was connected between EUT and PC.

3. An audio cable (0.45m) was connected between the internal speaker to 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 3m 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. 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 : 24 °C
 Humidity : 63 %
 Atmospheric Pressure : 998 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -11.7 dB at 21.754 MHz
	Minimum passing margin of radiated emission: -3.1 dB at 48.19 MHz

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

- ♦ 1280 x 1024 (64kHz)
- ♦ 1024 x 768 (69kHz)
- ♦ 640 x 480 (31.5kHz)

The worst emission levels were found under 1280 x 1024 (64kHz) and therefore test data of 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 the EUT's speakers and earphone.
8. Repeat steps 3-8.



4.1.2 TEST DATA OF CONDUCTED EMISSION

EUT: **COLOR MONITOR**MODEL: **765X**MODE: **1280x1024 (64kHz)**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL:

John Liad

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	43.80	-	44.10	-	66.00	56.00	-22.2	-	-21.9	-
0.254	44.30	-	43.70	-	61.61	51.61	-17.3	-	-17.9	-
0.575	29.40	-	32.00	-	56.00	46.00	-26.6	-	-24.0	-
5.957	37.90	-	35.90	-	60.00	50.00	-22.1	-	-24.1	-
12.701	41.20	-	37.70	-	60.00	50.00	-18.8	-	-22.3	-
21.754	48.10	-	48.30	-	60.00	50.00	-11.9	-	-11.7	-

- 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: **COLOR MONITOR**MODEL: **765X**MODE: **1280x1024 (64kHz)**

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: *John Liao*

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
76.20	8.1	14.1	22.2	30.0	-7.8
87.08	9.5	13.3	22.8	30.0	-7.2
108.81	12.9	3.9	16.8	30.0	-13.2
130.60	14.0	5.3	19.3	30.0	-10.7
141.48	13.5	5.2	18.7	30.0	-11.3
152.37	12.2	7.0	19.2	30.0	-10.8
163.26	11.3	7.5	18.8	30.0	-11.2
185.04	11.6	4.9	16.5	30.0	-13.5
195.91	11.8	10.2	22.0	30.0	-8.0
206.81	12.4	5.9	18.3	30.0	-11.7
228.57	13.9	2.8	16.7	30.0	-13.3

- 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: **765X**MODE: **1280x1024 (64kHz)**

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:

John Liao

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.64	17.3	9.1	26.4	30.0	-3.6
48.19	7.9	19.0	26.9	30.0	-3.1
54.42	6.8	15.7	22.5	30.0	-7.5
64.77	6.6	15.6	22.2	30.0	-7.8
76.18	7.2	15.1	22.3	30.0	-7.7
87.05	9.0	14.0	23.0	30.0	-7.0
108.84	12.2	7.0	19.2	30.0	-10.8
130.60	14.2	10.8	25.0	30.0	-5.0
141.50	13.9	8.1	22.0	30.0	-8.0
163.27	11.6	10.2	21.8	30.0	-8.2
185.04	11.7	8.4	20.1	30.0	-9.9
195.92	12.4	12.6	25.0	30.0	-5.0

- 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 Tube	Size : 17-inch (43.18cm) diagonal Dot pitch : 0.27 - 0.28 mm Surface/transmission : Tinted screen glass non-glare, Black matrix.
* Maximum viewable area	15.70-inch (39.8cm) diagonal
* Display size(factory setting)	300mm (H) x 255mm (V) Adjustable
* Synchronization Range	Horizontal frequency: 30-70 kHz (automatically) Vertical frequency: 50-120 Hz (automatically)
* Max. Resolution	1280x1024
* Max. Video Bandwidth	100 MHz at -3dB
* Dimensions	420 (L) x 406 (W) x 408 (H) mm
* Weight	Net : 16.5 kgs (36.3 lb). Gross : 19 kgs (41.8 lbs)
* Power Consumption	110 Watts maximum
* Input Signal	Video: Analog: 0.7 Vp-p / 75 Ohms Sync.: Separate sync.: TTL Level
* Display Analog Input	Unlimited Number of colors (depends upon video card)
* Power Supply	AC 100-240 volts 60/50 Hz
* Environmental	Operating Temp.: 0°C to 40°C Humidity: 20% to 80% Storage Temp.: -20°C to 60°C Humidity: 10% to 90%



PROVIEW ELECTRONICS (TAIWAN) CO., LTD.

6F, NO.1 PAU-SHENG RD., YUNG-HO CITY,
TAIPEI COUNTY, TAIWAN, R.O.C.
TEL : 886-2-2231-6789 FAX : 886-2-2231-5678

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Rd.
Columbia, MD. 21046

Date: Nov. 20, 1998

Attention: Authorization and Evaluation Division

Subject: RFI related modifications incorporated into unit with
Color Monitor - FCC ID: IJE765

Dear Sirs:

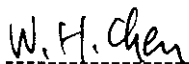
This letter serves as our declaration that all modifications listed below were implemented in the sample submitted for testing. We further declare that the same modifications will be implemented into all production units to enhance compliance of the units to FCC limits.

The modifications include the following:

- 1) Added two ferrite cores on the video cable, one outside and one inside the monitor. (see photo 3 & 9)
- 2) Added a metal cover on the rear side of CRT board and it was connected to chassis by five ground wires. (see photo 5)
- 3) Added a ferrite core on the safety ground wire with three turns. (see photo 9)
- 4) Added a ferrite core on the horn of G2 wire and focus wire with two turns. (see photo 9)
- 5) Added two small ferrite cores on the RGB wires. (see photo 13)
- 6) Added seven capacitors for electrical improvement only and three bead cores for EMI on the solder side of the main board. They will be built into component side after the circuit relayout. (see photo 10)
- 7) Added one bead core for EMI & one jump wire for electrical improvement only on the solder side of CRT board. They will be built into component side after the circuit relayout. (see photo 12)
- 8) Added a ferrite core on the speaker wire with 1 turn. (see photo 17)
- 9) Added two resistors for electrical improvement only and one bead core for EMI on the solder side of the speaker board. (see photo 18)

If you have any further questions or comments regarding the above, please don't hesitate to contact Mr. Mike Su of ADT Lab. at fax No.: 886-2-2602-2943 or E-mail: mike@mail.adt.com.tw

Sincerely yours,



W. H. Chen/Engineer
PROVIEW ELECTRONICS (TAIWAN) CO., LTD.

cc. Mr. Harris W.Lai - Advance Data Technology Corporation

dBuV

Mkr 21.702165MHz 49.2dBuV

110

100

80

60

40

20

0

0.15

0.2

0.4

0.5

0.6

0.8

1

2

4

6

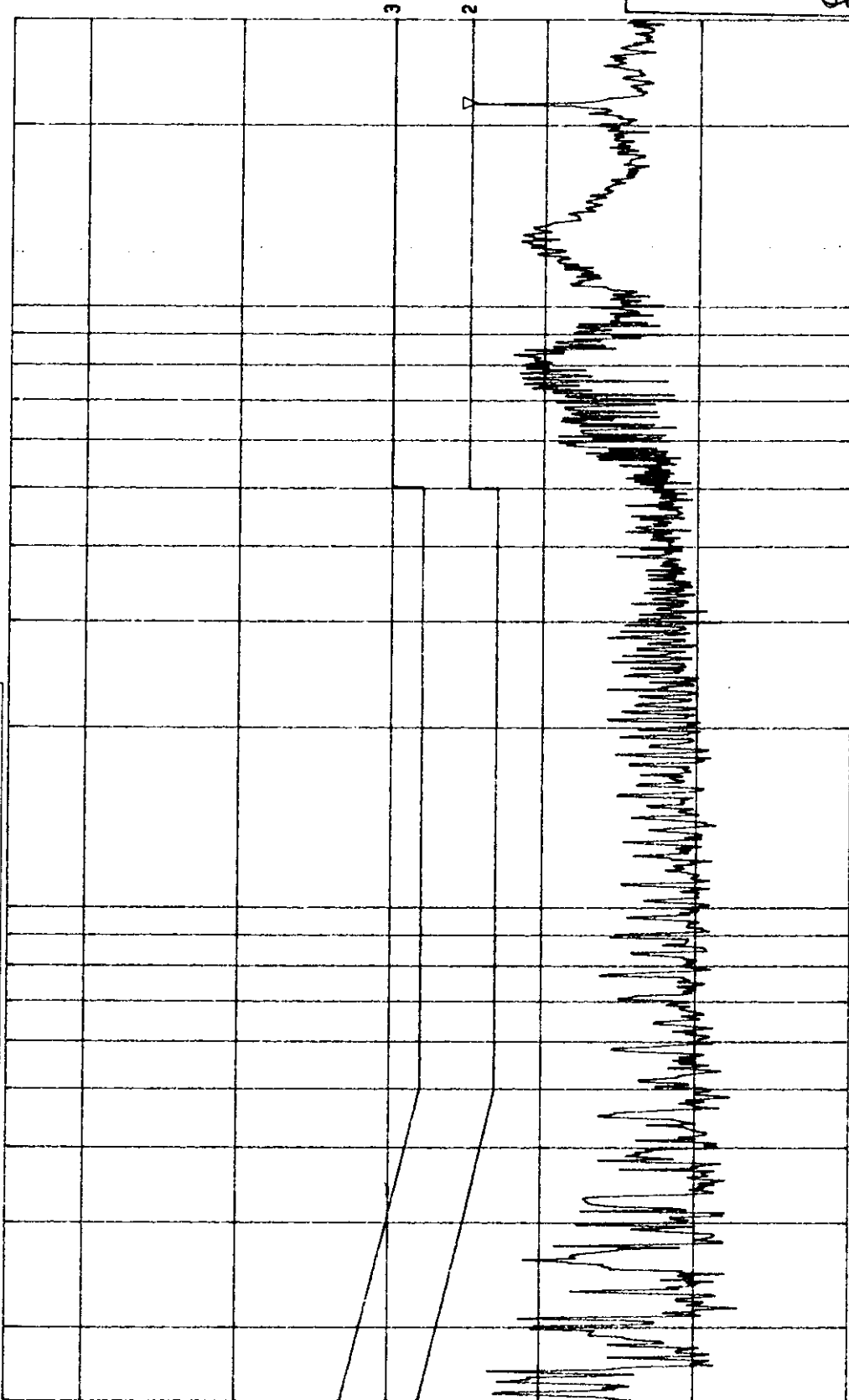
8

10

20

30

MHz



Tested by John Lico

--- Date 31.OCT '98 Time 11:41:24

CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)

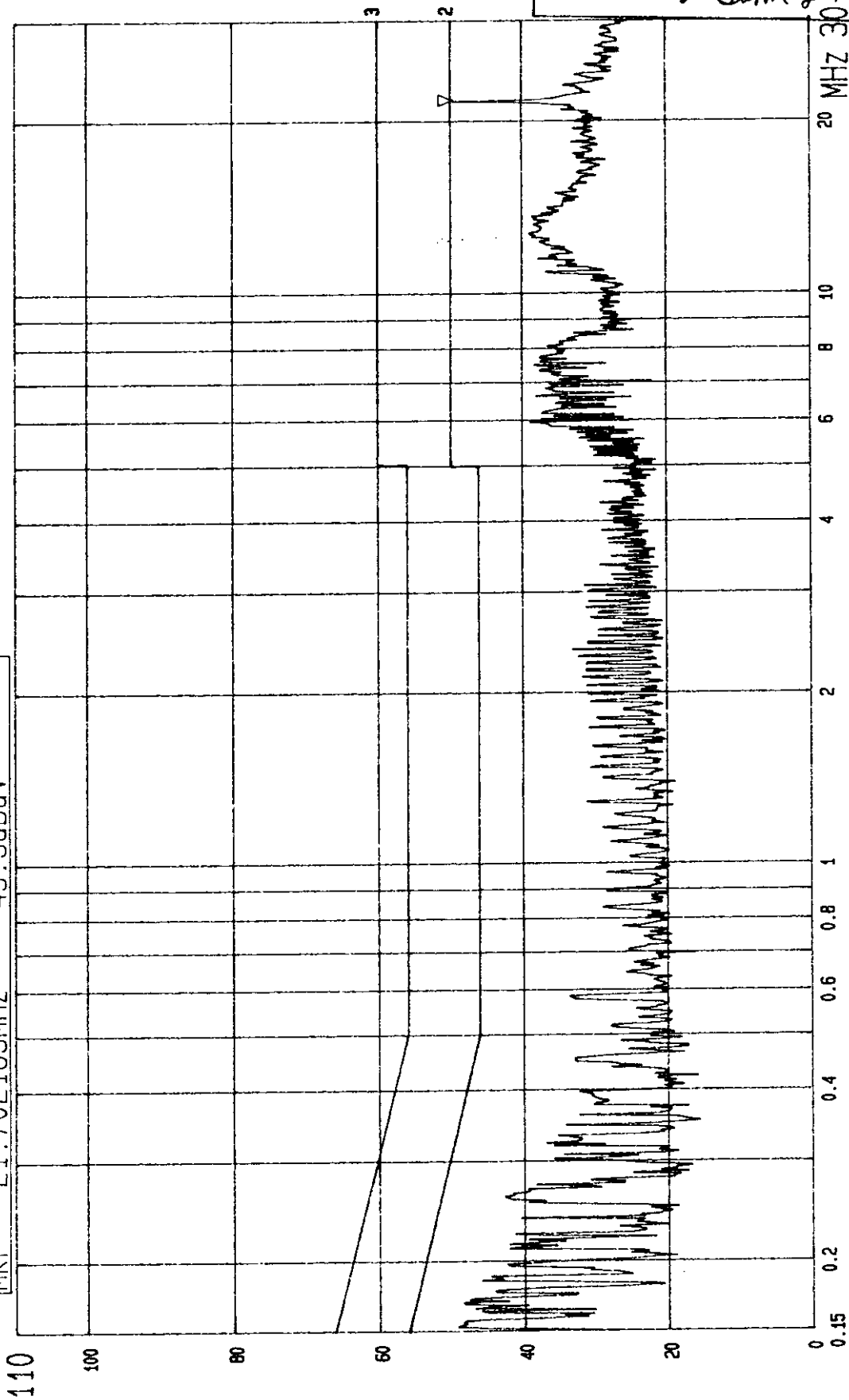
MODE: 765X 1280X1024 64KHZ

ADT CORP.

LISN: L

dBuV

MKR 21.702165MHz 49.5dBuV



Tested by John Liao

---- Date 31.OCT '98 Time 11:34:55
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODE: 765X 1280X1024 64kHz LISN: N