



# 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****NVLAP®**

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## **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)<br>Nonshielded Power (1.9m) |
| 4   | MODEM             | ACEEX   | 1414       | IFAXDM1414       | Shielded Signal (1.2m)<br>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<br>TEST RECEIVER      | ESVP                 | 893496/030         | July 15, 1999    |
| SCHWARZBECK Tunable<br>Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>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<br>Receiver            | ESH3      | 893495/006 | July 15, 1999    |
| ROHDE & SCHWARZ<br>Spectrum Monitor         | EZM       | 893787/013 | July 16, 1999    |
| ROHDE & SCHWARZ<br>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<br>(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<br>(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<br>(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                                                              |
|-------------|----------------------------------------------------------------------|
| <b>PASS</b> | 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<br>(MHz) | Correction<br>Factor<br>(dB/m) | Reading<br>Data<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(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<br>(MHz) | Correction<br>Factor<br>(dB/m) | Reading<br>Data<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(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<br>Dot pitch : 0.27 - 0.28 mm<br>Surface/transmission : Tinted screen glass non-glare,<br>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)<br>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).<br>Gross : 19 kgs (41.8 lbs)                                                                                    |
| * Power Consumption             | 110 Watts maximum                                                                                                                         |
| * Input Signal                  | Video: Analog: 0.7 Vp-p / 75 Ohms<br>Sync.: Separate sync.: TTL Level                                                                     |
| * Display Analog Input          | Unlimited Number of colors<br>(depends upon video card)                                                                                   |
| * Power Supply                  | AC 100-240 volts 60/50 Hz                                                                                                                 |
| * Environmental                 | Operating Temp.: 0°C to 40°C<br>Humidity: 20% to 80%<br>Storage Temp.: -20°C to 60°C<br>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](mailto:mike@mail.adt.com.tw)

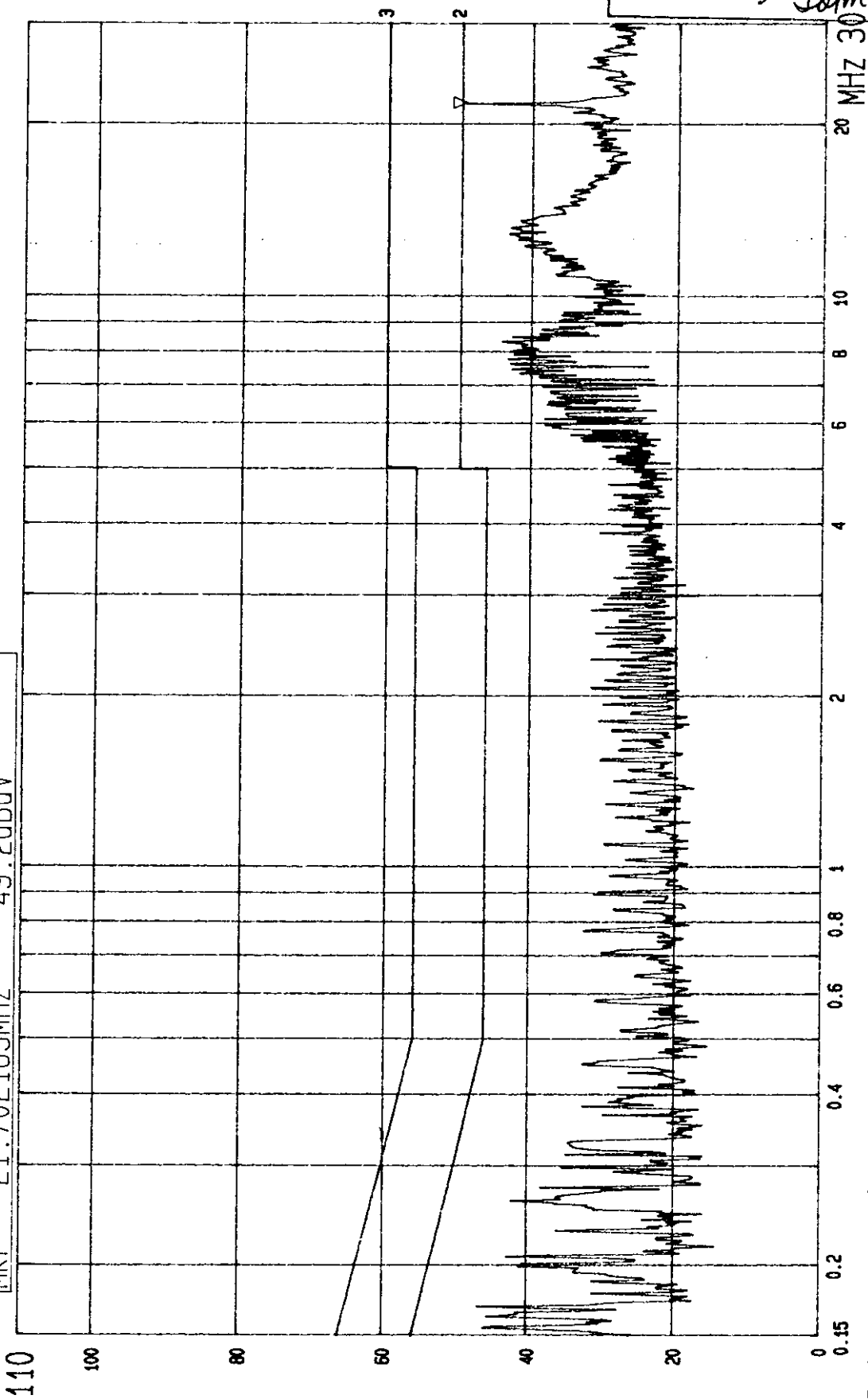
Sincerely yours,

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

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

dBuV

Mkr 21.702165MHz 49.2dBuV

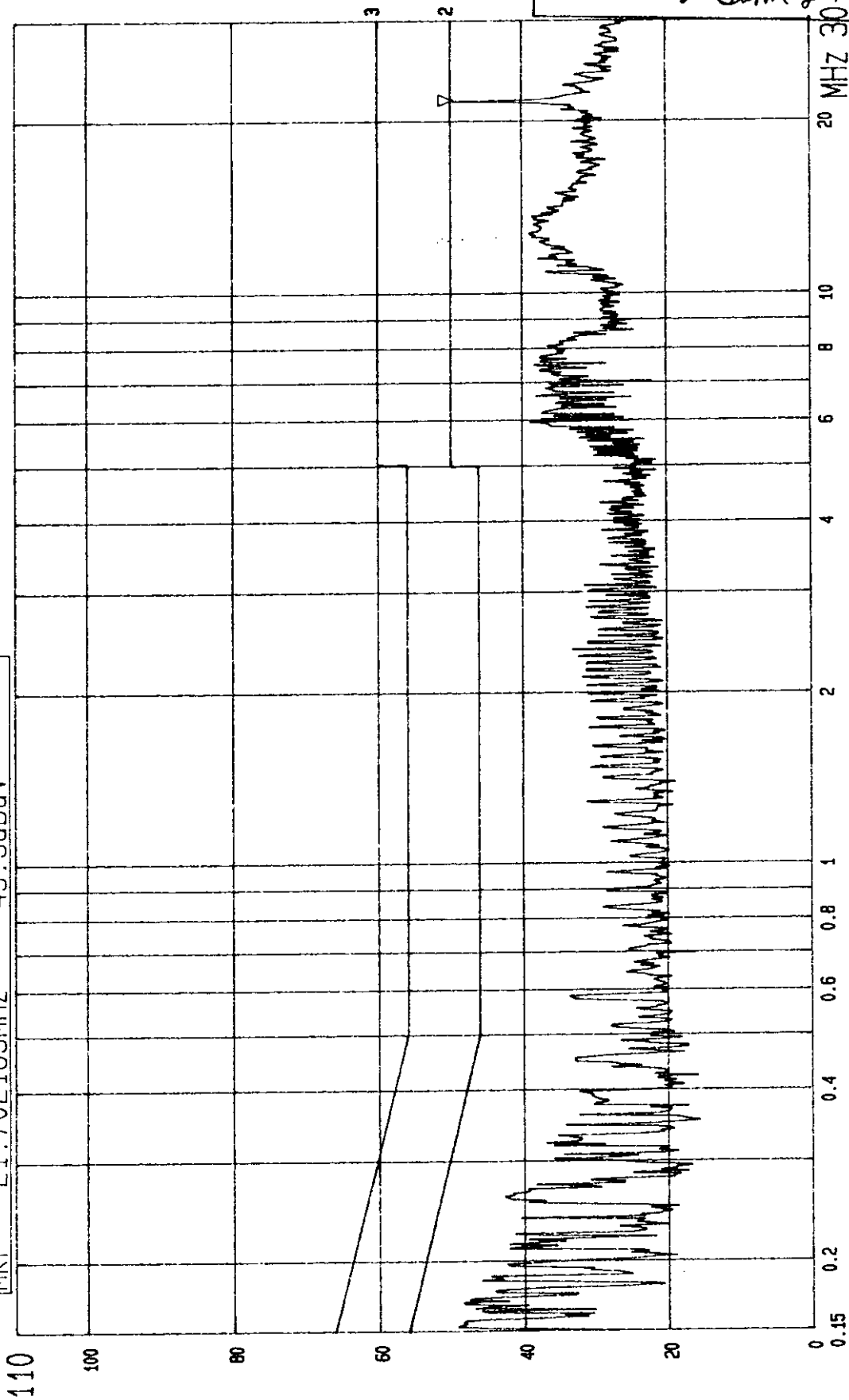


Tested by John Lico

--- Date 31.OCT '98 Time 11:41:24  
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.  
MODE: 765X 1280X1024 64KHZ 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