FCC ID: IJE986

# EMC

## TEST REPORT

REPORT NO. : F88071609
MODEL NO. : 986X
DATE OF TEST : Aug. 4, 1999

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

NVLAP®
Accredited Laboratory

11F, NO.1, SEC.4, NAN-KING EAST RD.,
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# 1. CERTIFICATION

Issue Date: Aug. 11, 1999

| | | |
|---|---|---|
| Product | : | COLOR MONITOR |
| Trade Name | : | PROVIEW |
| Model No. | : | 986X |
| Applicant | : | PROVIEW ELECTRONICS (TAIWAN) CO. LTD. |
| Standard | : | FCC Part 15, Subpart B, Class B<br>CISPR 22: 1993+A1: 1995+A2: 1996, Class B<br>ANSI C63.4-1992 |

We hereby certify that one sample of the designation has been tested in our facility on Aug. 4, 1999. 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 : Kevin Pan. , DATE: 8/11/'99
( Kevin Pan )

CHECKED BY : Yemmy , DATE: 8/11/99
( Yemmy Soong )

APPROVED BY : Mike Su , DATE: 8/11/'99.
( Mike Su )

**ADVANCE DATA TECHNOLOGY CORPORATION**

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# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| Product | : | COLOR MONITOR |
| Model No. | : | 986X |
| Power Supply Type | : | Switching |
| Power Cord of monitor | : | Nonshielded (1.8 m) |
| Data Cable of monitor | : | Shielded (1.5 m) |

Note: The EUT is a 19" COLOR MONITOR with an internal microphone and external speakers, and its resolution is up to 1600 x 1200.

The "X" in model: 986X could be defined as A ~ Z, 1 ~ 9 or blank according to different customers' requirement.

There is a ferrite core on the video cable outside the monitor.

For more detailed features description, please refer to Manufacturer's Specification or 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-450T | FCC DoC Approved | Nonshielded Power (1.8m) |
| 2. | KEYBOARD | FORWARD | FDA-104GA | F4ZDA-104G | Shielded Signal (1.4m) |
| 3. | PRINTER | HP | 2225C+ | DSI6XU2225 | Shielded Signal (1.2m)<br>Nonshielded Power (1.2m) |
| 4. | MODEM | ACEEX | 1414 | IFAXDM1414 | Shielded Signal (1.2m)<br>Nonshielded Power (1.2m) |
| 5. | MOUSE | DEXIN | A2P800A | NIYA2P800A | Shielded Signal (1.5m) |
| 6. | SPEAKER | AUDIO-TECHNICA | AT-SP25 | NA | Nonshielded Signal (1.5m)<br>Nonshielded Power (1.8m) |
| 7. | VGA CARD | CARDEX | CD-GX2A44T | ICUVGA-GW710 | NA |
| 8. | SOUND CARD | YA HSIN | AUDIO 1869 | FCC DoC Approved | NA |

Note: 1. An audio cable (1.8m) was connected between the mic. port of EUT and sound card of PC.
2. An audio cable (1.3m) was connected between the ext. speaker (R) of EUT to sound card of PC.
3. Two audio cables (0.2m) was connected between EUT and its ext. speakers.
4. A power cable (0.2m) was connected between EUT and its ext. speaker (R).

## 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 3/10 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)

**CONDUCTED EMISSION MEASUREMENT**

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESH3 | 893495/006 | July 7, 2000 |
| ROHDE & SCHWARZ Spectrum Monitor | EZM | 893787/013 | July 8, 2000 |
| ROHDE & SCHWARZ Artificial Mains Network | ESH3-Z5 | 839135/006 | July 7, 2000 |
| EMCO-L.I.S.N. | 3825/2 | 9204-1964 | July 7, 2000 |
| Shielded Room | Site 2 | ADT-C02 | NA |

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS 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.

**RADIATED EMISSION MEASUREMENT**

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| HP Spectrum Analyzer | 8594A | 3144A00308 | Sept. 3, 1999 |
| HP Preamplifier | 8447D | 2944A08119 | Jan. 12, 2000 |
| HP Preamplifier | 8347A | 3307A01088 | Sept. 9, 1999 |
| ROHDE & SCHWARZ TEST RECEIVER | ESVP | 893496/030 | July 13, 2000 |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055 | Nov. 25, 1999 |
| CHASE Bilog Antenna | CBL6112A | 2329 | Sept. 19, 1999 |
| EMCO Double Ridged Guide Antenna | 3115 | 9312-4192 | April 5, 2000 |
| EMCO Turn Table | 1060 | 1195 | NA |
| EMCO Tower | 1051 | 1163 | NA |
| 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 NAMAS 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 |

* Detector Function: Quasi-Peak

### LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) | | Class B (dBuV/m) (at 3m) | |
|---|---|---|---|---|
| | Peak | Average | Peak | Average |
| Above 1000 | 80.0 | 60.0 | 74.0 | 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)<br>30 - 2000 MHz (Radiated Emission) |
| Input Voltage | : | 120 Vac, 60 Hz |
| Temperature | : | 24 ℃ |
| Humidity | : | 69 % |
| Atmospheric Pressure | : | 982 mbar |

| TEST RESULT | Remarks |
|---|---|
| PASS | Minimum passing margin of conducted emission: -10.8 dB at 0.160 MHz<br>Minimum passing margin of radiated emission: -3.9 dB at 83.32 MHz |

Note: The EUT was pre-tested under the following resolution & horizontal synchronization speed mode:

- 1600 x 1200 (75 kHz)
- 1280 x 1024 (80 kHz)
- 640 x 480 (31.5 kHz)

The worst emission levels were found under 1280 x 1024 (80 kHz) and therefore test data of this mode is recorded.

## 4.2 EUT OPERATION CONDITION

1. Turn on the power of all equipment.
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 speakers.
8. Repeat steps 3-8.

## 4.3 TEST DATA OF CONDUCTED EMISSION

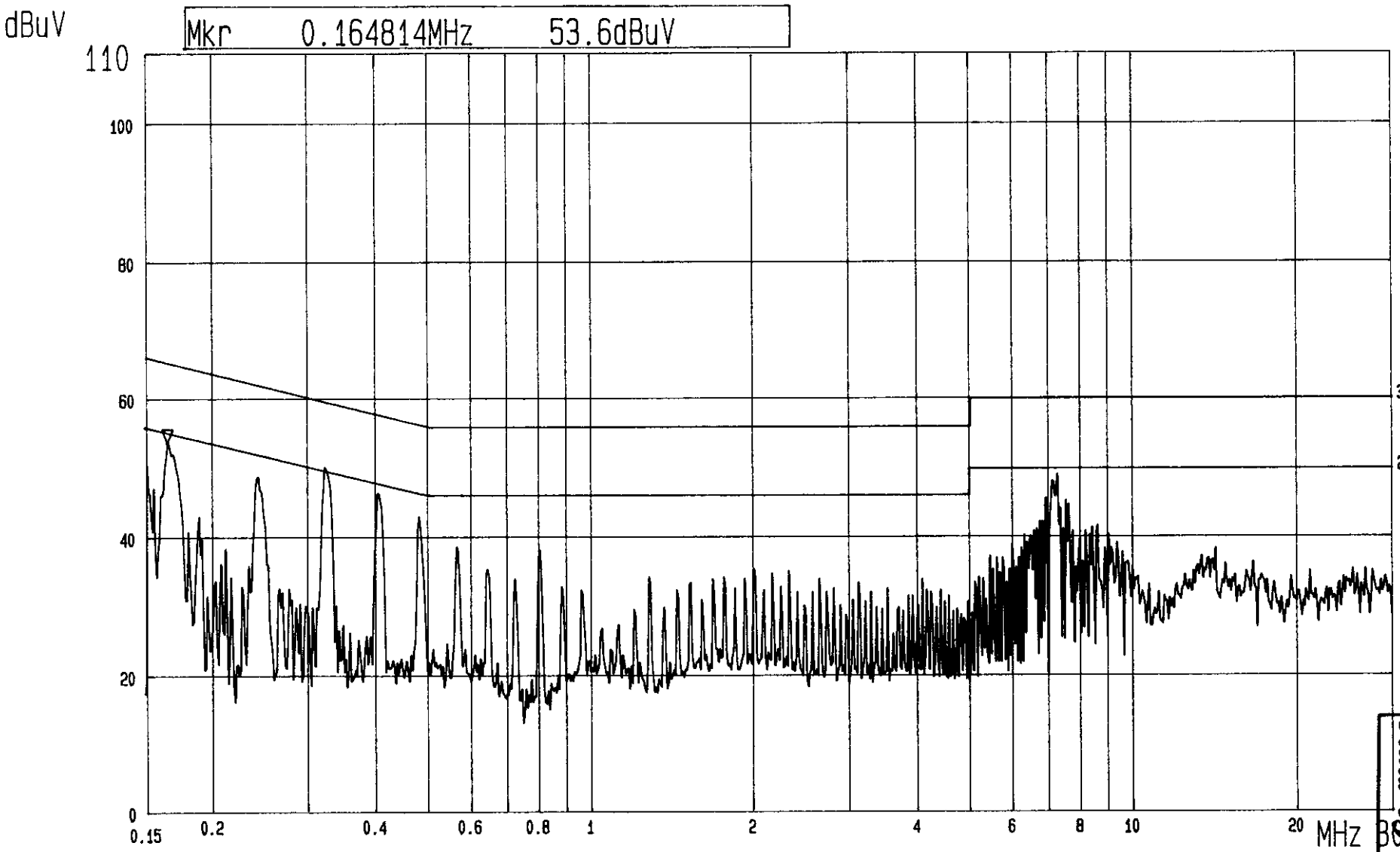
EUT: **COLOR MONITOR** MODEL: **986X**

MODE: **1280x1024 (80 kHz)** 6 dB Bandwidth: 10 kHz

PHASE: LINE (L)

| Freq. [MHz] | Corr. Factor (dB) | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 0.160 | 0.2 | 53.5 | - | 53.7 | - | 65.5 | 55.5 | -11.8 | - |
| 0.239 | 0.2 | 46.5 | - | 46.7 | - | 62.1 | 52.1 | -15.4 | - |
| 0.319 | 0.2 | 48.5 | - | 48.7 | - | 59.7 | 49.7 | -11.0 | - |
| 0.399 | 0.2 | 42.8 | - | 43.0 | - | 57.9 | 47.9 | -14.9 | - |
| 0.478 | 0.2 | 39.1 | - | 39.3 | - | 56.4 | 46.4 | -17.1 | - |
| 7.370 | 0.7 | 43.7 | - | 44.4 | - | 60.0 | 50.0 | -15.6 | - |

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak emission level 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
6. Emission Level = Correction Factor + Reading Value.




--- Date 04.AUG '99 Time 21:12:11
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODEL : 986X 1280X1024 75Hz/80KHz LISN: L

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Tested by Kevin Pan

FCC ID: IJE986

## TEST DATA OF CONDUCTED EMISSION

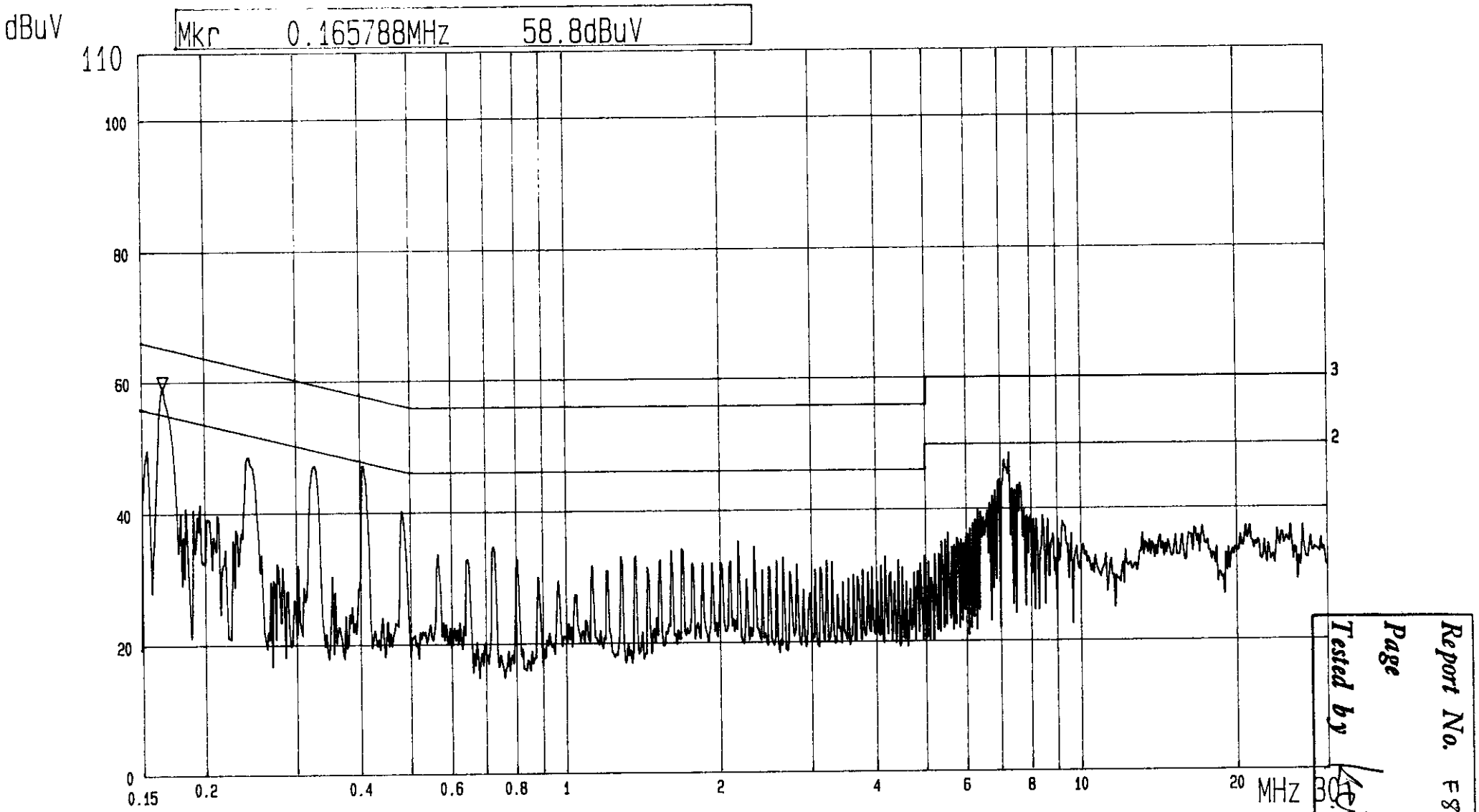
EUT: **COLOR MONITOR** MODEL: **986X**

MODE: **1280x1024 (80 kHz)** 6 dB Bandwidth: 10 kHz

PHASE: NEUTRAL (N)

| Freq. [MHz] | Corr. Factor (dB) | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 0.160 | 0.2 | 54.5 | - | 54.7 | - | 65.5 | 55.5 | -10.8 | - |
| 0.239 | 0.2 | 49.0 | - | 49.2 | - | 62.1 | 52.1 | -12.9 | - |
| 0.319 | 0.2 | 46.8 | - | 47.0 | - | 59.7 | 49.7 | -12.7 | - |
| 0.399 | 0.2 | 42.4 | - | 42.6 | - | 57.9 | 47.9 | -15.3 | - |
| 0.478 | 0.2 | 39.6 | - | 39.8 | - | 56.4 | 46.4 | -16.6 | - |
| 7.370 | 0.6 | 43.0 | - | 43.6 | - | 60.0 | 50.0 | -16.4 | - |

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak emission level 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
6. Emission Level = Correction Factor + Reading Value.




|--- Date 04.AUG '99 Time 21:19:46
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)
MODEL : 986X 1280X1024 75Hz/80KHz

ADT CORP.
LISN: N

Report No. F880716Q9
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Tested by

## 4.4 TEST DATA OF RADIATED EMISSION

EUT: **COLOR MONITOR** MODEL: **986X**

MODE: **1280x1024 (80 kHz)** ANT. POLARITY: Horizontal

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

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

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) |
|---|---|---|---|---|---|---|---|
| 54.60 | 8.8 | 15.6 | 24.4 | 30.0 | -5.6 | 400 | 1 |
| 134.52 | 13.3 | 7.9 | 21.2 | 30.0 | -8.8 | 400 | 145 |
| 168.09 | 10.6 | 12.0 | 22.6 | 30.0 | -7.4 | 400 | 227 |
| 174.92 | 10.7 | 11.2 | 21.9 | 30.0 | -8.1 | 400 | 255 |
| 188.36 | 10.9 | 11.5 | 22.4 | 30.0 | -7.6 | 400 | 252 |
| 215.28 | 12.0 | 7.7 | 19.7 | 30.0 | -10.3 | 400 | 244 |
| 228.81 | 12.9 | 7.2 | 20.1 | 30.0 | -9.9 | 400 | 244 |
| 256.35 | 15.0 | 12.7 | 27.7 | 37.0 | -9.3 | 400 | 63 |
| 298.36 | 14.8 | 7.3 | 22.1 | 37.0 | -14.9 | 400 | 348 |

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+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: **COLOR MONITOR** MODEL: **986X**

MODE: **1280x1024 (80 kHz)** ANT. POLARITY: Vertical

DETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)
Peak, 1 MHz (1000 MHz-2000 MHz)

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

FREQUENCY RANGE: 1000-2000 MHz MEASURED DISTANCE: 3 M

| Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) |
|---|---|---|---|---|---|---|---|
| 54.31 | 6.6 | 18.3 | 24.9 | 30.0 | -5.1 | 100 | 314 |
| 83.32 | 7.8 | 18.3 | 26.1 | 30.0 | -3.9 | 140 | 356 |
| 134.72 | 13.6 | 9.1 | 22.7 | 30.0 | -7.3 | 100 | 175 |
| 148.07 | 12.4 | 9.1 | 21.5 | 30.0 | -8.5 | 100 | 25 |
| 168.11 | 10.7 | 11.4 | 22.1 | 30.0 | -7.9 | 100 | 79 |
| 174.89 | 10.6 | 11.8 | 22.4 | 30.0 | -7.6 | 100 | 232 |
| 201.86 | 11.9 | 9.7 | 21.6 | 30.0 | -8.4 | 100 | 37 |
| 215.30 | 12.4 | 13.6 | 26.0 | 30.0 | -4.0 | 100 | 20 |
| 229.11 | 12.9 | 11.6 | 24.5 | 30.0 | -5.5 | 100 | 20 |
| 242.23 | 13.4 | 8.7 | 22.1 | 37.0 | -14.9 | 100 | 2 |
| 296.02 | 14.7 | 5.8 | 20.5 | 37.0 | -16.5 | 100 | 324 |

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

# 6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

## Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

| | |
|---|---|
| • USA | FCC, UL, NVLAP |
| • Germany | TUV Rheinland |
| | TUV Product Service |
| • Japan | VCCI |
| • New Zealand | RFS |
| • Norway | NEMKO, DNV |
| • U.K. | INCHCAPE |
| • R.O.C. | BSMI |

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

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