FCC ID: JVPUSBKB

# EMC

## TEST REPORT

REPORT NO. : F87060402
MODEL NO. : 6511-MU, 6512-MU
DATE OF TEST : June 11, 1998

PREPARED FOR : ACER PERIPHERALS, INC.

ADDRESS : 157, SHAN-YING ROAD, KWEISHAN,
TAOYUAN 333, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

NVLAP®
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12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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1. **CERTIFICATION**

Issue date: June 24, 1998

| | | |
|---|---|---|
| Product | : | USB KEYBOARD |
| Trade Name | : | ACER |
| Model No. | : | 6511-MU, 6512-MU |
| Applicant | : | ACER PERIPHERALS, INC. |
| Standard | : | FCC Part 15, Subpart B, Class B<br>ANSI C63.4-1992<br>CISPR 22: 1993 +A1+A2 |

We hereby certify that one sample of the designation has been tested in our facility on June 11, 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 VCCI Class B ITE limits of mains terminal interference voltage and radiated interference field strength of applicable standards.

TESTED BY: Leo Hong , DATE: 6/24/98
( Leo Hong )

CHECKED BY: Sharon Hsiung , DATE: 6/24/98
( Sharon Hsiung )

APPROVED BY: , DATE: 6/24/98
( Harris W. Lai )

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# 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| Product | : | USB KEYBOARD |
| Model No. | : | 6511-MU, 6512-MU |
| Power Supply | : | DC 5V |
| Data Cable | : | Shielded (1.5M) |

Note: The EUT is a USB keyboard which is fully compatible with IBM AT and PS/2.

The EUT has two model names , which are identical to each other, except for the follawing:

Model: 6511-MU (104 Key)
Model: 6512-MU (105 Key)

From the above model names, model: 6511-MU was selected as representative model for the test, and its data is recorded in this report.

For more detailed features, 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 | HP | D5220B | FCC DoC | Nonshielded Power (1.8m) |
| 2 | MONITOR | ADI | 937G | BR8937G | Shielded Signal (1.5m)<br>Nonshielded Power (1.8m) |
| 3 | PRINTER | HP | 2225C+ | DSI6XU2225 | Shielded Signal (1.2m)<br>Nonshielded Power (1.8m) |
| 4 | MODEM | GVC | F-1128V1R6 | FK4F1128VR6 | Shielded Signal (1.2m)<br>Nonshielded Power (1.8m) |
| 5 | MOUSE | HP | M-S34 | DZL211029 | Shielded Signal (1.8m) |

## 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 | 8590L | 3544A00941 | Dec. 14, 1998 |
| HP Pre-Amplifier | 8447D | 2944A08312 | Sept. 10, 1998 |
| R&S Receiver | ESVS10 | 844591/010 | Sept. 23, 1998 |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055 | Nov. 28, 1998 |
| CHASE BiLOG Antenna | CBL6111A | 1500 | Sept. 12, 1998 |
| EMCO Turn Table | 1060-04 | 1196 | N/A |
| EMCO Tower | 1051 | 1264 | N/A |
| Open Field Test Site | Site 1 | ADT-R01 | Sept. 5, 1998 |

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 23, 1998 |
| ROHDE & SCHWARZ Spectrum Monitor | EZM | 893787/013 | July 24, 1998 |
| ROHDE & SCHWARZ Artificial Mains Network | ESH3-Z5 | 839135/006 | Aug. 1, 1998 |
| EMCO-L.I.S.N. | 3825/2 | 9204-1964 | July 22, 1998 |
| 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 | : | 27 ℃ |
| Humidity | : | 58 % |
| Atmospheric Pressure | : | 1060 mbar |

| TEST RESULT | Remarks |
|---|---|
| PASS | Minimum passing margin of conducted emission: -18.4 dB at 0.177 MHz |
| | Minimum passing margin of radiated emission: -3.1 dB at 144.00 MHz |

### 4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC reads a test program to enable all functions.
3. PC sends "H" messages to monitor and monitor display "H" patterns on screen.
4. PC sends "H" messages to modem.
5. PC sends "H" messages to printer, and the printer prints them on paper.
6. Repeat steps 3-6.

## 4.1.2 TEST DATA OF CONDUCTED EMISSION

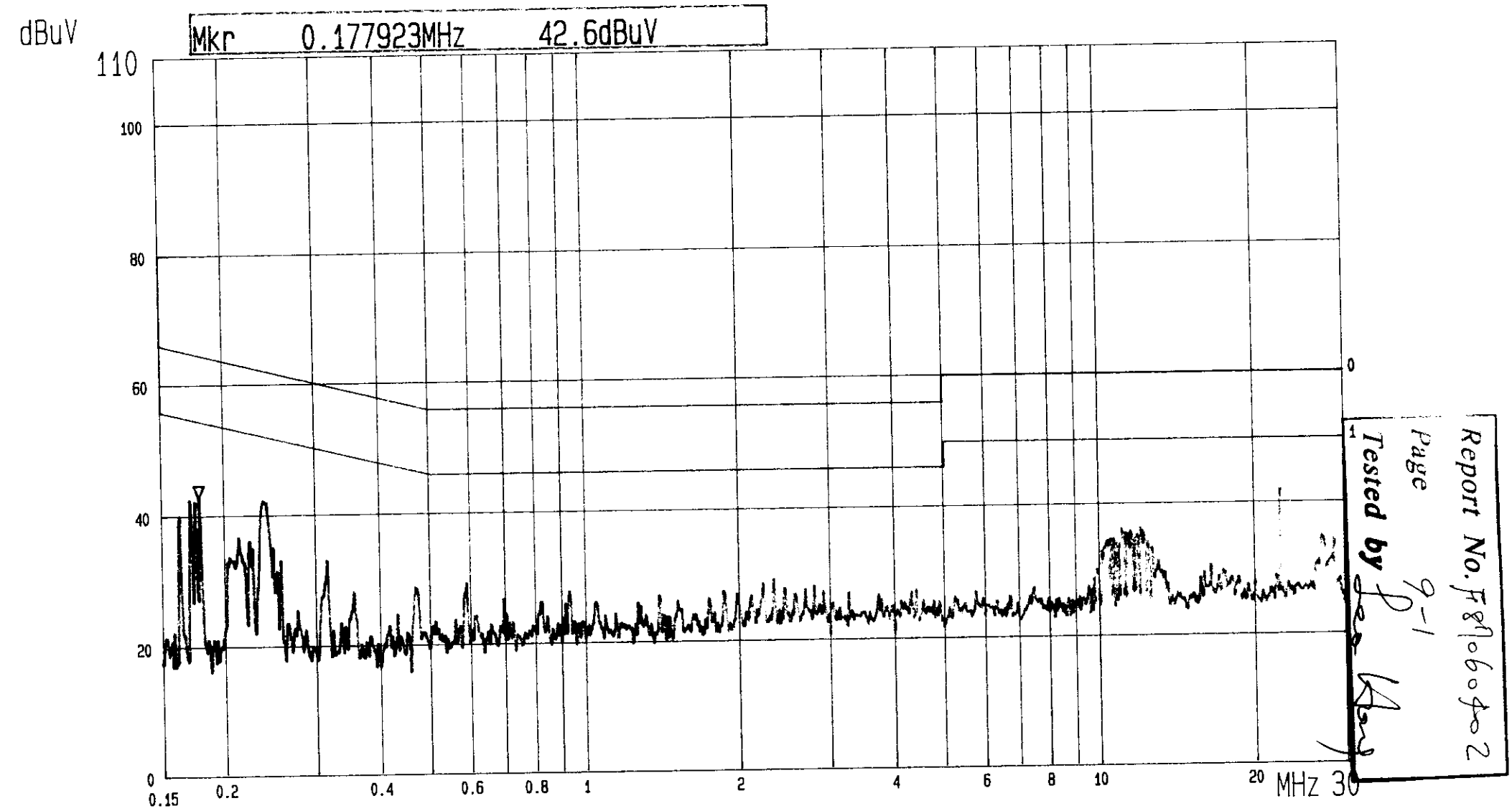
EUT: **USB KEYBOARD** MODEL: **6511-MU**

6 dB Band Width: 10 kHz

TEST PERSONNEL:

| 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 |
| 0.177 | 39.60 | - | 46.20 | - | 64.58 | 54.58 | -25.0 | - | -18.4 | - |
| 0.237 | 40.10 | - | 39.50 | - | 62.19 | 52.19 | -22.1 | - | -22.7 | - |
| 0.314 | 30.50 | - | 28.90 | - | 59.84 | 49.84 | -29.3 | - | -30.9 | - |
| 0.587 | 27.00 | - | 23.50 | - | 56.00 | 46.00 | -29.0 | - | -32.5 | - |
| 11.224 | 32.40 | - | 28.50 | - | 60.00 | 50.00 | -27.6 | - | -31.5 | - |
| 22.482 | 39.80 | - | 39.50 | - | 60.00 | 50.00 | -20.2 | - | -20.5 | - |

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 level of other frequencies were very low against the limit.

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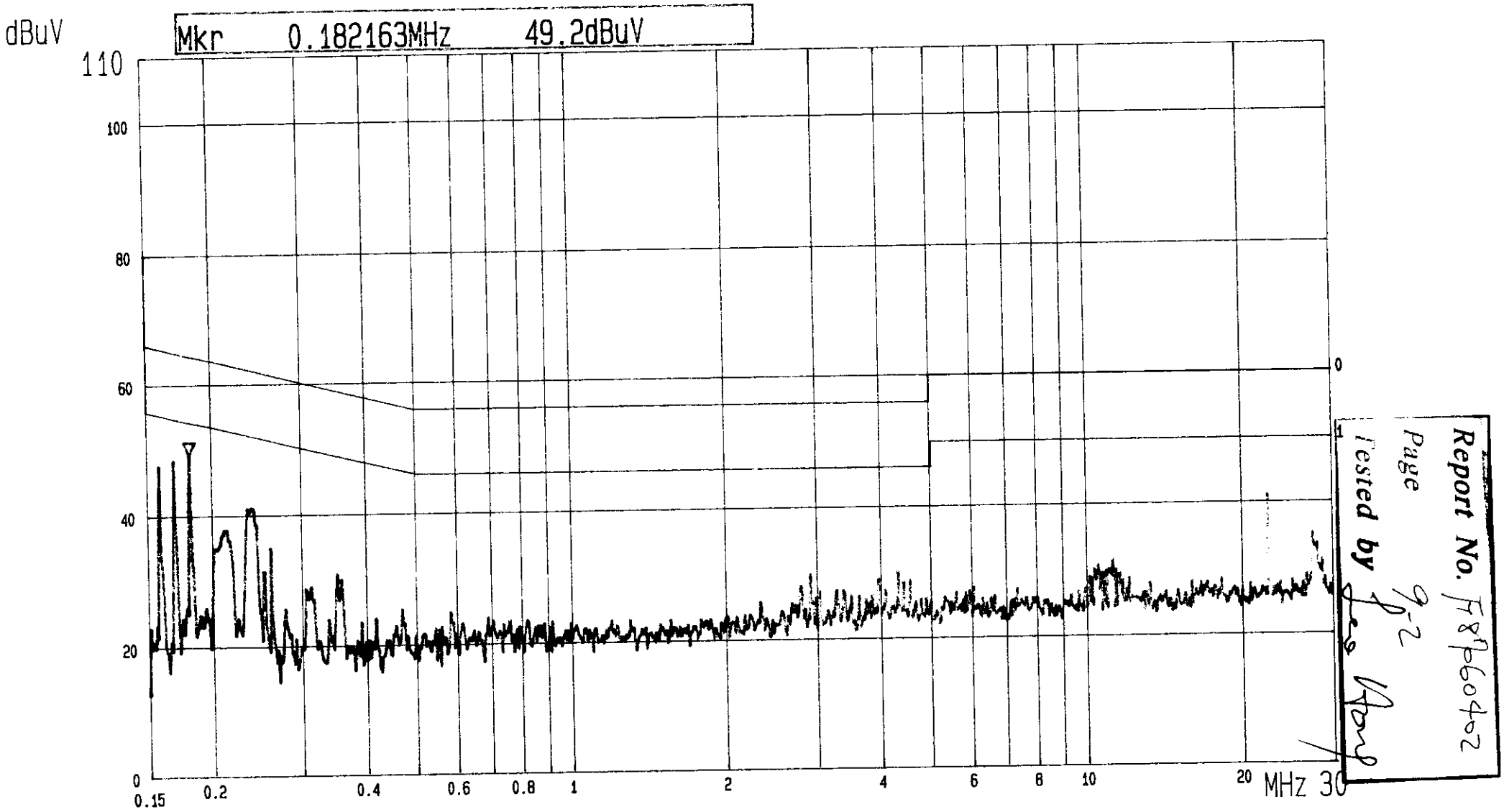
|--- Date 11.JUN.'98 Time 20:52:55
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)
MODEL : 6511-MU

ADT CORP.
LISN : L

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Tested by

|--- Date 11.JUN.'98 Time 20:56:45
CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE)
MODEL : 6511-MU

ADT CORP.
LISN : N

## 4.1.3 TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD** MODEL: **6511-MU**

ANTENNA: CHASE BILOG CBL6111A POLARITY: Horizontal

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

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

TEST PERSONNEL:

| Frequency (MHz) | Correction Factor (dB/m) | Reading Data (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|
| 36.27 | 17.7 | 6.7 | 24.4 | 30.0 | -5.6 |
| 132.97 | 14.7 | 5.5 | 20.2 | 30.0 | -9.8 |
| 144.04 | 14.2 | 12.2 | 26.4 | 30.0 | -3.6 |
| 149.99 | 13.5 | 10.2 | 23.7 | 30.0 | -6.3 |
| 186.15 | 12.3 | 11.2 | 23.5 | 30.0 | -6.5 |
| 216.06 | 14.3 | 6.9 | 21.1 | 30.0 | -8.9 |
| 228.07 | 15.3 | 5.7 | 21.0 | 30.0 | -9.0 |
| 240.05 | 16.5 | 13.9 | 30.4 | 37.0 | -6.6 |

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.

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## TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD** MODEL: **6511-MU**

ANTENNA: CHASE BILOG CBL6111A POLARITY: Vertical

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

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

TEST PERSONNEL: Leo Kang

| Frequency (MHz) | Correction Factor (dB/m) | Reading Data dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|
| 36.28 | 16.5 | 9.1 | 25.6 | 30.0 | -4.4 |
| 48.41 | 11.4 | 14.9 | 26.3 | 30.0 | -3.7 |
| 108.02 | 13.2 | 13.1 | 26.3 | 30.0 | -3.7 |
| 114.55 | 14.3 | 12.5 | 26.8 | 30.0 | -3.2 |
| 131.97 | 16.5 | 8.6 | 25.1 | 30.0 | -4.9 |
| 144.00 | 16.5 | 10.4 | 26.9 | 30.0 | -3.1 |
| 186.16 | 13.0 | 11.3 | 24.3 | 30.0 | -5.7 |
| 216.04 | 14.6 | 11.3 | 25.9 | 30.0 | -4.1 |
| 228.07 | 15.3 | 9.7 | 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.