

# **FCC TEST REPORT**

for

## **PART 15, SUBPART B CLASS B**

**EQUIPMENT : CARDEXPERT ST3D**

**MODEL NO. : 9802-30**

**F C C I D : ICUVGA-GW802C**

**FILING TYPE : Original Grant**

**APPLICANT : GAINWARD CO., LTD.**  
12F., No. 96, Hsin Tai Wu Rd., Sec. 1, Hsi-Chih,  
Taipei Hsien, Taiwan, R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.

**SPORTON INTERNATIONAL INC.**

6F, No. 106, Hsin Tai Wu Rd., Sec. 1, Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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## CERTIFICATE OF COMPLIANCE

for  
FCC PART 15, SUBPART B CLASS B

EQUIPMENT : CARDEXPERT ST3D

MODEL NO. : 9802-30

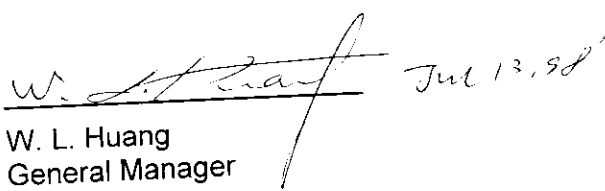
F C C I D : ICUVGA-GW802C

APPLICANT : **GAINWARD CO., LTD.**  
12F., No. 96, Hsin Tai Wu Rd., Sec. 1, Hsi-Chih,  
Taipei Hsien, Taiwan, R.O.C.

### I HEREBY CERTIFY THAT :

The measurement shown in this report were made in accordance with the procedures given in **ANSI C63.4 -1992** and the energy emitted by this equipment was **passed** both radiated and conducted emissions **Class B** limits.

Testing was carried out on **June 24, 1998** at **SPORTON International Inc.**

  
W. L. Huang  
General Manager

**SPORTON INTERNATIONAL INC.**

6F, No. 106, Hsin Tai Wu Rd., Sec. 1, Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

## **1. GENERAL DESCRIPTION OF EQUIPMENT UNDER TEST**

### **1.1. APPLICANT**

#### **GAINWARD CO., LTD.**

12F., Hsin Tai Wu Rd., Sec. 1, Hsi-Chih,  
Taipei Hsien, Taiwan, R.O.C.

### **1.2. MANUFACTURER : Same as 1.1**

### **1.3. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST**

EQUIPMENT : CARDEXPERT ST3D

MODEL NO. : 9802-30

TRADE NAME : CARDEXPERT

FCC ID : ICUVGA-GW802C

DATA CABLE : SHIELDED

POWER SUPPLY TYPE : N/A

POWER CORD : N/A

### **1.4. FEATURE OF EQUIPMENT UNDER TEST**

- Enhanced 128-bit graphics engine.
- Integrated 230MHz RAMDAC.
- Enhanced Streams Processor™ technology for hardware-assisted high-quality video playback of two video streams against a graphics background.
- Supports simultaneous display of graphics and video of different color depths.
- 110MHz Streams Processor operation permits video resolution support of up to 1280x1024x256 @60Hz refresh.
- 66MHz Baseline AGP bus (Trio3D AGP), 33MHz PCI bus (Trio3D PCI).
- Bus Mastering.
- Resolution support of up to 1152x864x16M, 1600x1200x64K.
- 100MHz Memory Clock support functionality for high performance, support SGRAM block write.
- BIOS support for VESA Display Power Management Signaling (DPMS) monitor power savings modes, DDC monitor communications support.

## **2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST**

### **2.1. TEST MANNER**

- a. The EUT has been associated with personal computer and peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The DELL keyboard, HITACHI monitor, HP printer, ACEEX modem, PRIMAX PS/2 mouse and EUT were connected to the FIC P.C. for EMI test.
- c. The following display resolution were investigated during the compliance test:
  1. Horizontal frequency ( 640 x 480 to 1600 x 1200, 31.5KHz to 106KHz )
  2. Vertical frequency ( 60Hz to 85Hz)
- d. According to the above tests, we listed the following display modes as the worst cases:
  1. 1280 x 1024 ( Non-interlanced 91.0KHz ), refresh rate 85Hz.
  2. 1600 x 1200 (106KHz), refresh rate 85Hz.
- e. Frequency range investigated: Conduction 450 KHz to 30 MHz, Radiation 30 MHz to 2000MHz.
- f. During the test, the monitor AC power cord was plugged into the PC computer-mounted AC outlet and a floor-mounted AC outlet to search the maximum emission.

### **2.2. DESCRIPTION OF TEST SYSTEM**

#### **Support Device 1. --- KEYBOARD (DELL)**

|            |                                                   |
|------------|---------------------------------------------------|
| FCC ID     | : GYUM92SK                                        |
| Model No.  | : AT101 (DE8M)                                    |
| Serial No. | : SP1009                                          |
| Data Cable | : Shielded, 360 degree via metal backshells, 1.9m |

#### **Support Device 2. -- PS/2 MOUSE (PRIMAX)**

|            |                  |
|------------|------------------|
| FCC ID     | : EMJMUSJQ       |
| Model No.  | : MUS9J          |
| Serial No. | : SP1012         |
| Data Cable | : Shielded, 1.7m |

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### **Support Device 3. --- PRINTER (HP)**

FCC ID : B94C2642X  
Model No. : DESKJET 400  
Serial No. : SP0037  
Data Cable : Shielded, 360 degree via metal backshells, 1.35m  
Power Supply Type : Linear

### **Support Device 4. -- MODEM (ACEEX)**

FCC ID : IFAXDM1414  
Model No. : DM1414  
Power Supply Type : Linear, AC Adapter  
Power Cord : Non-shielded  
Serial No. : SP1019  
Data Cable : Shielded, 1.15m

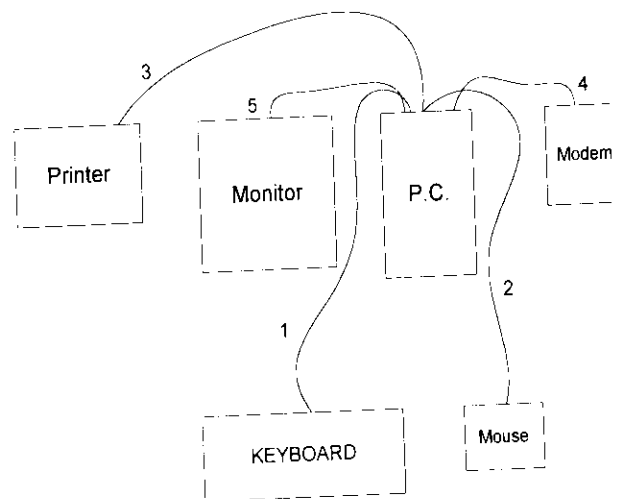
### **Support Device 5. --- MONITOR (HITACHI)**

FCC ID : M9U9705C978BMD  
Model No. : CM803ET  
Serial No. : SP1006  
Data Cable : Shielded, 360 degree via metal backshells, 1.7m  
Power Supply Type : Switching  
Power Cord : Non-shielded

### **Support Device 6. --- P.C. (FIC)**

FCC ID : N/A  
Model No. : P2L97  
Serial No. : SP1003  
Data Cable : Shielded  
Power Cord : Non-shielded  
Power Supply Type : Switching

( Remark : This support device was tested to comply with FCC standards and  
authorized under a declaration of conformity.)

**2.3. CONNECTION DIAGRAM OF TEST SYSTEM**

1. The I/O cable is connected to the support device 1.
2. The I/O cable is connected to the support device 2.
3. The I/O cable is connected to the support device 3.
4. The I/O cable is connected to the support device 4.
5. The I/O cable is connected to the support device 5.

### **3. TEST SOFTWARE**

An executive program, WINFCC.EXE under WIN 98, which generate a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows :

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the floppy disk drive and runs it.
- c. The PC sends " H " messages to the monitor, and the monitor displays " H " patterns on the screen.
- d. The PC sends " H " messages to the printer, then the printer prints them on the paper.
- e. The PC sends " H " messages to the modem.
- f. The PC sends " H " messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
- g. Repeat the steps from b to f.

## **4. GENERAL INFORMATION OF TEST**

### **4.1. TEST FACILITY**

This test was carried out by SPORTON INTERNATIONAL INC.

Test Site Location : No. 30-1, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,  
Taipei Hsien, Taiwan, R.O.C.  
TEL : 886-2-2601-1640, FAX : 886-2-2601-1695

### **4.2. STANDARD FOR METHODS OF MEASUREMENT**

ANSI C63.4-1992

### **4.3 .TEST IN COMPLIANCE WITH**

FCC PART 15, SUBPART B CLASS B

### **4.4. FREQUENCY RANGE INVESTIGATED**

- a. Conduction : from 450 KHz to 30 MHz
- b. Radiation : from 30 MHz to 2000 MHz.

### **4.5. TEST DISTANCE**

The test distance of radiated emission from antenna to EUT is 3M.

## **5. TEST OF CONDUCTED POWERLINE**

Conducted Emissions were measured from 450 KHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in Figure 5-3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

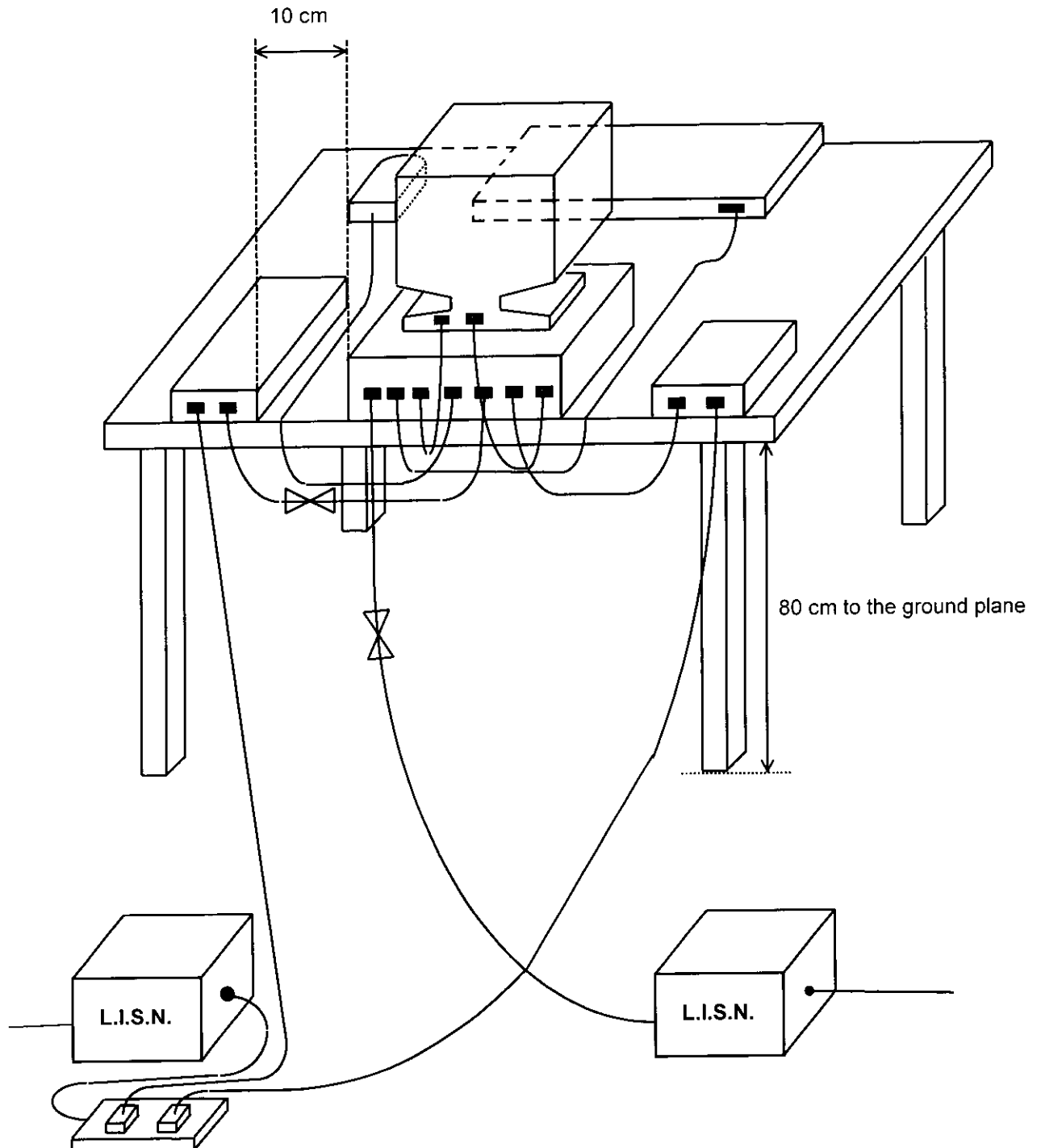
### **5.1. MAJOR MEASURING INSTRUMENTS**

- Test Receiver ( HP 85462A )
  - Attenuation 0 dB
  - Start Frequency 0.45 MHz
  - Stop Frequency 30 MHz
  - Step MHz 0.007 MHz
  - IF Bandwidth 9 KHz

**5.2. TEST PROCEDURES**

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room and was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network ( LISN ).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm , 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 450 KHz to 30 MHz was searched.
- h. Set the test-receiver system ( HP receiver 8546A ) to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- i. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported otherwise the emissions which do not have 6 dB margin will be retested on by one using the quasi-peak method and reported.

**5.3. TYPICAL TEST SETUP LAYOUT OF CONDUCTED POWERLINE**



**5.4. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION**

- Frequency Range of Test : from 0.45 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 20°C
- Relative Humidity : 68 % RH
- Test Mode : **1600 × 1200, 106k, 85Hz**
- Test Date : June 24, 1998

**The Conducted Emission test was passed at Line 7.82 MHz / 41.30 dBuV.**

| Frequency<br>( MHz ) | Line /<br>Neutral | Meter Reading |        | Limits   |        | Margin |
|----------------------|-------------------|---------------|--------|----------|--------|--------|
|                      |                   | ( dBuV )      | ( uV ) | ( dBuV ) | ( uV ) | ( dB ) |
| 0.77                 | L                 | 38.80         | 87.10  | 48.00    | 251.19 | -9.20  |
| 1.11                 | L                 | 35.90         | 62.37  | 48.00    | 251.19 | -12.10 |
| 7.82                 | L                 | 41.30         | 116.14 | 48.00    | 251.19 | -6.70  |
| 0.77                 | N                 | 39.30         | 92.26  | 48.00    | 251.19 | -8.70  |
| 0.85                 | N                 | 36.10         | 63.83  | 48.00    | 251.19 | -11.90 |
| 1.11                 | N                 | 36.70         | 68.39  | 48.00    | 251.19 | -11.30 |

Test Engineer : *Bruce Huang*

**5.4.1. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION**

- Frequency Range of Test : from 0.45 MHz to 30 MHz
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Temperature : 20°C
- Relative Humidity : 68 % RH
- Test Mode : **1280 × 1024, 91k, 85Hz**
- Test Date : June 24, 1998

**The Conducted Emission test was passed at Line 7.82 MHz / 41.70 dBuV.**

| Frequency<br>( MHz ) | Line /<br>Neutral | Meter Reading |        | Limits   |        | Margin |
|----------------------|-------------------|---------------|--------|----------|--------|--------|
|                      |                   | ( dBuV )      | ( uV ) | ( dBuV ) | ( uV ) | ( dB ) |
| 0.77                 | L                 | 39.30         | 92.26  | 48.00    | 251.19 | -8.70  |
| 1.11                 | L                 | 37.10         | 71.61  | 48.00    | 251.19 | -10.90 |
| 7.82                 | L                 | 41.70         | 121.62 | 48.00    | 251.19 | -6.30  |
| 0.77                 | N                 | 39.30         | 92.26  | 48.00    | 251.19 | -8.70  |
| 1.11                 | N                 | 37.00         | 70.79  | 48.00    | 251.19 | -11.00 |
| 7.82                 | N                 | 39.70         | 96.61  | 48.00    | 251.19 | -8.30  |

Test Engineer : *Bruce Huang*

## **6. TEST OF RADIATED EMISSION**

Radiated emissions from 30 MHz to 2000 MHz were measured with a bandwidth of 120 KHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in Figure 6-3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

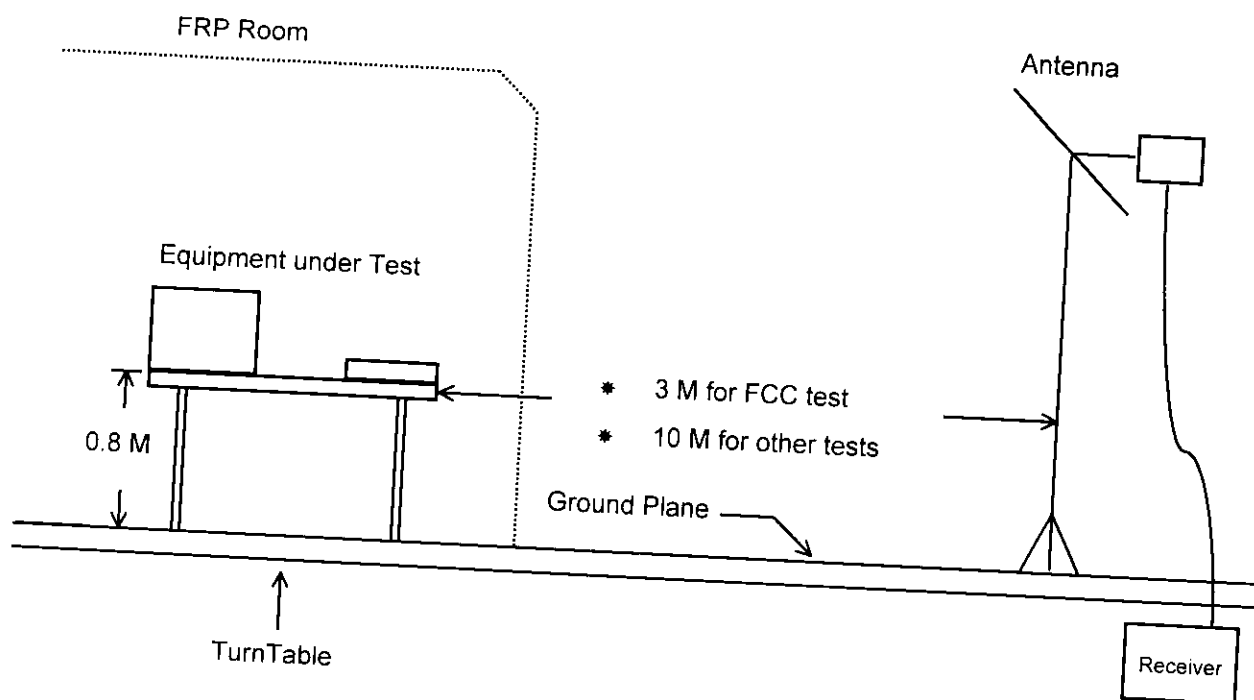
### **6.1. MAJOR MEASURING INSTRUMENTS**

- RF Preselector
  - Attenuation 0 dB
  - RF Gain 20 dB
  - Signal Input Input 2 ( for 20 MHz to 2 GHz )
  
- Spectrum Analyzer 8568B/8594a
  - Attenuation 0 dB
  - Start Frequency 30 MHz
  - Stop Frequency 2000 MHz
  - Resolution Bandwidth 1 MHz
  - Video Bandwidth 1 MHz
  - Signal Input Input 1 ( for 9KHz to 2.9GHz )
  
- Quasi-Peak Adapter
  - Resolution Bandwidth 120 KHz
  - Frequency Band 30 MHz to 1 GHz
  - Quasi-Peak Detector ON for Quasi-Peak Mode
  - OFF for Peak Mode

**6.2. TEST PROCEDURES**

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower ( from 1 M to 4 M ) and turn table ( from 0 degree to 360 degrees ) to find the maximum reading.
- f. Set the test-receiver system ( HP 8568B ) to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported otherwise the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

**6.3. TYPICAL TEST SETUP LAYOUT OF RADIATED EMISSION**



## 6.4. TEST RESULT OF RADIATED EMISSION

- Equipment meets the technical specifications of 15.109
  - Frequency Range of Test : from 30 MHz to 2000 MHz
  - Test Distance : 3 M
  - Temperature : 29°C
  - Relative Humidity : 71% RH
  - Test Mode : **1600 × 1200, 106k, 85Hz**
  - Test Date : June 17, 1998
- Emission level ( dBuV/m ) = 20 log Emission level ( uV/m )
  - Sample Calculation at 54.11 MHz  
Corrected Reading = 3.01 + 1.09 + 29.93 = 34.03 (dBuV/m)

The Radiated Emission test was passed at

**248.00 MHz / 41.40 dBuV ( Vertical )**

**Antenna Height 1.5 Meter , Turntable Degree 313°**

| Frequency<br>( MHz ) | Antenna<br>Polarity | Antenna<br>Factor<br>(dB/m) | Cable<br>Loss<br>( dB ) | Reading<br>( dBuV ) | Limits<br>(dBuV/m) (uV/m) | Emission<br>(dBuV/m) | Level<br>(uV/m) | Margin<br>( dB ) |
|----------------------|---------------------|-----------------------------|-------------------------|---------------------|---------------------------|----------------------|-----------------|------------------|
| 54.11                | V                   | 3.01                        | 1.09                    | 29.93               | 40.00 100                 | 34.03                | 50.29           | -5.97            |
| 85.58                | V                   | 7.61                        | 1.40                    | 25.84               | 40.00 100                 | 34.85                | 55.27           | -5.15            |
| 209.60               | V                   | 14.17                       | 2.40                    | 17.04               | 43.50 150                 | 33.61                | 47.92           | -9.89            |
| 248.00               | V                   | 15.91                       | 2.54                    | 22.69               | 46.00 200                 | 41.14                | 114.02          | -4.86            |
| 85.23                | H                   | 7.56                        | 1.40                    | 24.99               | 40.00 100                 | 33.95                | 49.83           | -6.05            |
| 189.71               | H                   | 13.49                       | 2.30                    | 18.14               | 43.50 150                 | 33.93                | 49.72           | -9.57            |

Test Engineer : *Terry Chang*

## 6.4.1. TEST RESULT OF RADIATED EMISSION

- Equipment meets the technical specifications of 15.109
- Frequency Range of Test : from 30 MHz to 2000 MHz
- Test Distance : 3 M
- Temperature : 29°C
- Relative Humidity : 71% RH
- Test Mode : **1280 × 1024, 91k, 85Hz**
- Test Date : June 17, 1998
- Emission level ( dBuV/m ) = 20 log Emission level ( uV/m )
- Sample Calculation at 39.23 MHz  
Corrected Reading = 0.32 + 0.92 + 33.82 = 35.07 (dBuV/m )

The Radiated Emission test was passed at

**39.23 MHz / 35.07 dBuV ( Vertical )**

**Antenna Height 1.2 Meter , Turntable Degree 73°.**

| Frequency | Antenna | Cable  | Reading  | Limits   | Emission | Level    | Margin |        |       |
|-----------|---------|--------|----------|----------|----------|----------|--------|--------|-------|
| Polarity  | Factor  | Loss   |          |          |          |          |        |        |       |
| ( MHz )   | (dB/m)  | ( dB ) | ( dBuV ) | (dBuV/m) | (uV/m)   | (dBuV/m) | (uV/m) | ( dB ) |       |
| 39.23     | V       | 0.32   | 0.92     | 33.82    | 40.00    | 100      | 35.07  | 56.69  | -4.93 |
| 372.80    | V       | 21.21  | 3.36     | 15.39    | 46.00    | 200      | 39.96  | 99.54  | -6.04 |
| 57.19     | H       | 3.69   | 1.15     | 27.55    | 40.00    | 100      | 32.39  | 41.64  | -7.61 |
| 80.45     | H       | 7.14   | 1.40     | 25.29    | 40.00    | 100      | 33.83  | 49.15  | -6.17 |
| 234.40    | H       | 14.89  | 2.47     | 20.99    | 46.00    | 200      | 38.35  | 82.70  | -7.65 |
| 371.20    | H       | 21.08  | 3.36     | 15.10    | 46.00    | 200      | 39.53  | 94.73  | -6.47 |

Test Engineer :

*Terry Chang*

**7. ANTENNA FACTOR AND CABLE LOSS**

| Frequency ( MHz ) | Antenna Factor ( dB ) | Cable Loss ( dB ) |
|-------------------|-----------------------|-------------------|
| 30                | -1.91                 | 0.90              |
| 35                | -0.50                 | 0.92              |
| 40                | 0.61                  | 1.04              |
| 45                | 1.40                  | 1.28              |
| 50                | 2.39                  | 1.10              |
| 55                | 3.54                  | 1.11              |
| 60                | 4.40                  | 1.30              |
| 65                | 4.84                  | 1.40              |
| 70                | 5.59                  | 1.37              |
| 75                | 6.21                  | 1.24              |
| 80                | 7.60                  | 1.51              |
| 85                | 7.73                  | 1.60              |
| 90                | 8.22                  | 1.60              |
| 95                | 8.90                  | 1.70              |
| 100               | 9.36                  | 1.70              |
| 110               | 10.01                 | 1.70              |
| 120               | 10.41                 | 1.90              |
| 130               | 10.84                 | 1.90              |
| 140               | 11.42                 | 1.91              |
| 150               | 11.91                 | 2.01              |
| 160               | 12.25                 | 2.11              |
| 170               | 12.72                 | 2.21              |
| 180               | 13.02                 | 2.30              |
| 190               | 13.50                 | 2.30              |
| 200               | 14.05                 | 2.40              |
| 220               | 15.11                 | 2.50              |
| 240               | 16.81                 | 2.60              |
| 260               | 17.51                 | 2.71              |
| 280               | 17.70                 | 2.90              |
| 300               | 17.89                 | 2.91              |
| 320               | 18.00                 | 3.10              |
| 340               | 18.33                 | 3.20              |
| 360               | 19.44                 | 3.30              |
| 380               | 20.31                 | 3.40              |
| 400               | 21.19                 | 3.50              |
| 450               | 21.10                 | 3.70              |
| 500               | 22.21                 | 4.10              |
| 550               | 23.42                 | 4.30              |
| 600               | 24.01                 | 4.50              |
| 650               | 25.11                 | 4.70              |
| 700               | 26.00                 | 4.90              |
| 750               | 26.41                 | 5.11              |
| 800               | 27.10                 | 5.50              |
| 850               | 27.51                 | 5.60              |
| 900               | 27.90                 | 5.80              |
| 950               | 28.01                 | 5.90              |

## 8. LIST OF MEASURING EQUIPMENT USED

| Instrument                           | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark     |
|--------------------------------------|--------------|-----------|------------|-----------------|------------------|------------|
| EMC Receiver<br>(site 2)             | HP           | 8591EM    | 3710A01187 | 9 KHz - 18 GHz  | Sep. 29, 1997    | Conduction |
| LISN (EUT)<br>(site 2)               | Telemeter    | NNB-2/16Z | 98009      | 50 ohm / 50 uH  | Jan. 29, 1998    | Conduction |
| LISN (Support Unit)<br>(site 2)      | EMCO         | 3810/2NM  | 9703-1839  | 50 ohm / 50 uH  | March 06, 1998   | Conduction |
| Quasi-Peak Adapter<br>(site 5)       | HP           | 85650A    | 2521A00821 | 9KHz - 1000KHz  | Nov. 12, 1997    | Radiation  |
| Spectrum Analyzer<br>(Site 5)        | HP           | 8568B     | 2634A03000 | 100Hz - 1.5GHz  | Nov. 12, 1997    | Radiation  |
| Amplifier (Site 5)                   | HP           | 8447D     | 2944A09073 | 0.1MHz -1.3GHz  | Sep. 17, 1997    | Radiation  |
| Bilog Antenna (Site 5)               | CHASE        | CBL6112A  | 2322       | 30MHz -2GHz     | Jan. 22, 1998    | Radiation  |
| Half-wave dipole<br>antenna (Site 5) | EMCO         | 3121C     | 9705-1285  | 28 M - 1GHz     | May 19, 1998     | Radiation  |
| Turn Table (site 5)                  | EMCO         | 2080      | 9711-2021  | 0 ~ 360 degree  | N/A              | Radiation  |
| Antenna Mast (site 5)                | EMCO         | 2075      | 9711-2115  | 1 m- 4 m        | N/A              | Radiation  |

*Remark : Except the calibration interval of LISN (EMCO/3810/2NM) is one and half years, the  
Calibration interval of all instruments are one year.*